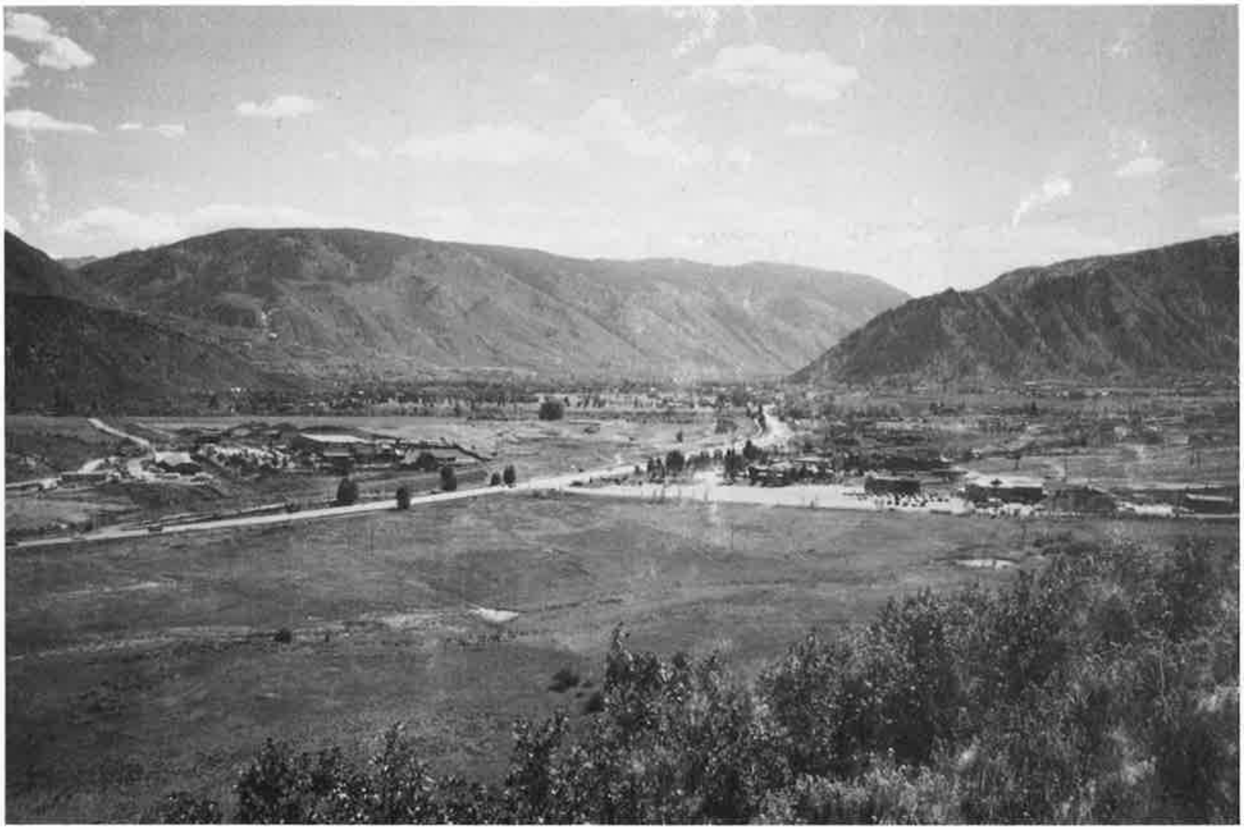
Project STA 082A - 008



STATE HIGHWAY 82

ENTRANCE TO ASPEN

DRAFT ENVIRONMENTAL IMPACT STATEMENT
4(f) EVALUATION
VOLUME 1

DOT

COLORADO DEPARTMENT OF TRANSPORTATION

AUGUST 1995

FHWA-CO-EIS-95-01-D

PROJECT STA 082A-008
STATE HIGHWAY 82 ENTRANCE TO ASPEN
PITKIN COUNTY, COLORADO

DRAFT ENVIRONMENTAL IMPACT STATEMENT/ 4(f) EVALUATION

SUBMITTED PURSUANT TO 42 U.S.C. 4332 (2) (c) AND
49 U.S.C. (303)

BY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
COLORADO DEPARTMENT OF TRANSPORTATION

COOPERATING AGENCIES

ASPEN/PITKIN PLANNING OFFICE
ASPEN CITY COUNCIL
BUREAU OF LAND MANAGEMENT
COLORADO DIVISION OF WILDLIFE
FEDERAL AVIATION ADMINISTRATION
PITKIN COUNTY BOARD OF COUNTY COMMISSIONERS
ROARING FORK TRANSIT AGENCY
U.S. ARMY CORPS OF ENGINEERS
U.S. ENVIRONMENTAL PROTECTION AGENCY
U.S. FISH AND WILDLIFE SERVICE
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ABSTRACT

This Draft Environmental Impact Statement provides a detailed evaluation of the State Highway 82 Entrance to Aspen Transportation Improvement Project. This project corridor lies entirely within Pitkin County, Colorado and extends from milepost 38.57 on State Highway 82 near the Buttermilk Ski Area to milepost 40.49 at the intersection of 7th Street and Main Street (State Highway 82) in the City of Aspen. The Draft Environmental Impact Statement includes an examination of the purpose and need, transportation management, alternatives evaluated, the affected environment, future transportation demand, environmental consequences and mitigation measures. Ten alternatives, including the No-Action Alternative, are considered for improvements to the Entrance of Aspen. The existing safety and capacity problems experienced on the highway are documented, followed by a description of the social, economical and physical environment of the project corridor. Impacts which may be created by any of the alternatives are noted with appropriate mitigation measures.

Comments on this Draft Environmental Impact Statement are due by September 18, 1995 and should be sent to Mr. Ralph Trapani, Colorado Department of Transportation, Mount Sopris Transportation Project, at the address listed above.

45 day comment.
Fed. Regstr Deadline.

NOTE TO THE READER: This Draft Environmental Impact Statement / 4(f) Evaluation (DEIS) is organized to follow Federal requirements. A careful review of the **Table of Contents** or **Chapter XI: Index** will help the reader locate specific sections and topics. This document is Volume 1. Volume 2 contains project meeting notes, correspondence, and comments related to the DEIS. In addition to Volumes 1 and 2, there are technical documents which support the environmental analysis. These reports are listed in **Chapter IX: Availability of Technical Reports**, along with the locations where they may be reviewed.

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Summary

DESCRIPTION OF PROPOSED ACTION

The Entrance to Aspen Draft Environmental Impact Statement/4(f) Evaluation (DEIS) has been prepared by the Colorado Department of Transportation (CDOT) in conjunction with the Federal Highway Administration (FHWA). This document evaluates transportation solutions that address the present and future transportation inadequacies in the project corridor. The format and organization of this EIS follows FHWA guidelines for preparing environmental and Section 4(f) documents. The project corridor, which lies entirely in Pitkin County, Colorado concentrates on Colorado State Highway 82 between the Buttermilk Ski Area (milepost 38.57) and the City of Aspen at the intersection of 7th Street and Main Street (milepost 40.49). Figure S-1 shows the project corridor and key landmarks.

The environmental impact statement (EIS) process is the tool used to evaluate and determine the transportation alternatives. A Preferred Alternative will be recommended in the Final Environmental Impact Statement (FEIS) prepared for this project.

The primary purpose of this project (the Entrance to Aspen EIS) is to develop and evaluate potential solutions which will improve transportation and safety along the State Highway 82 project corridor for those who travel it. In addition to this general goal, each of the potential alternatives studied in this document must address the ten project objectives developed as part of the scoping process. The topic of each of these objectives is listed below:

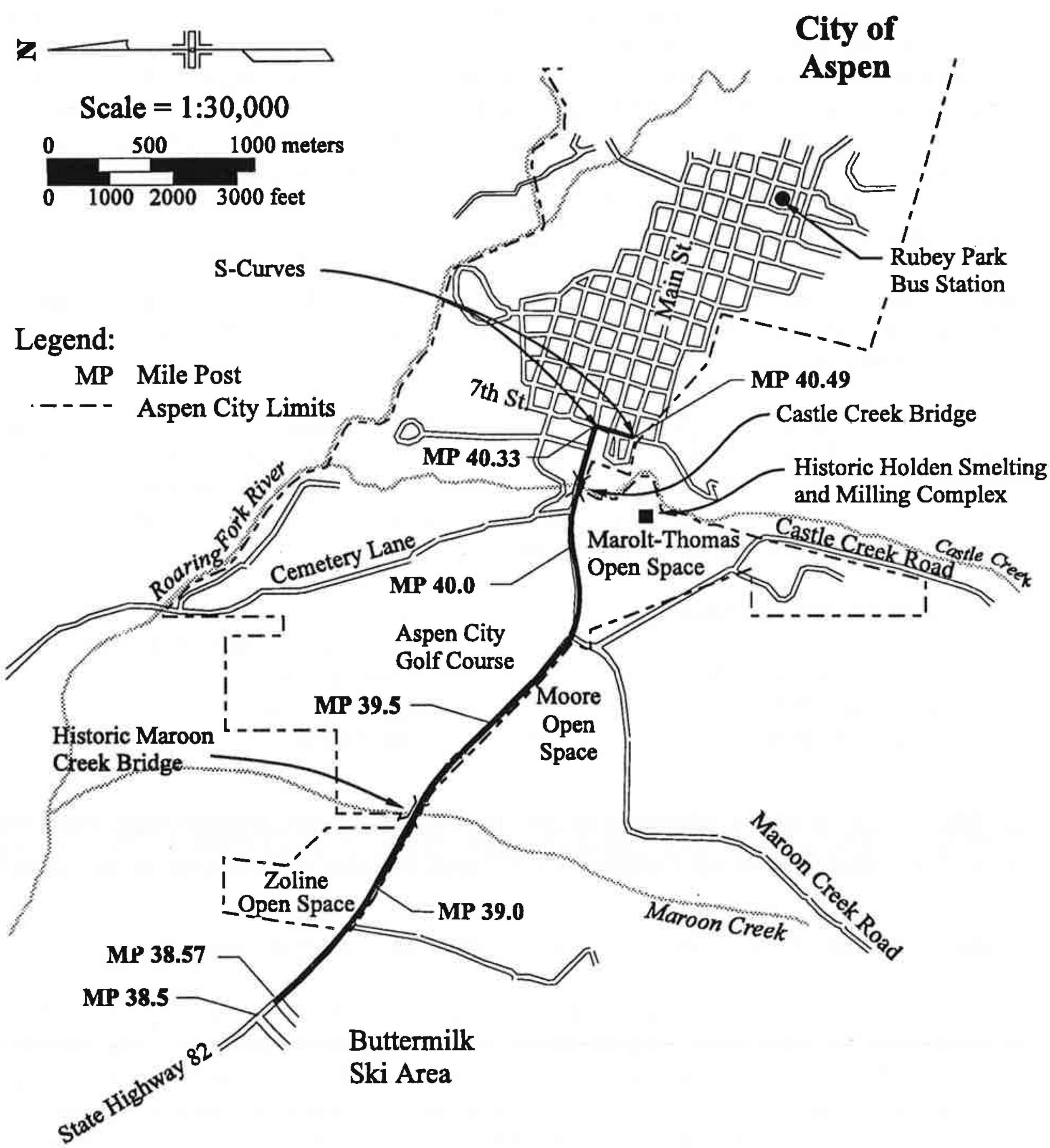
- Community Based Planning
- Safety
- Community Acceptability
- Clean Air Act Requirements
- Livable Communities
- Transportation Capacity
- Environmentally Sound Alternative
- Financial Limitations
- Emergency Access
- Project Phasing

ACTIONS PROPOSED BY OTHER GOVERNMENTAL AGENCIES

Basalt to Buttermilk Final Environmental Impact Statement

In October 1993, CDOT, in conjunction with FHWA, released the ***State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement*** (BBFEIS). The Record of Decision (ROD) for this project was released in December 1993. The Preferred Alternative includes widening State Highway 82 from two to four lanes between Basalt and the Buttermilk Ski Area, with two of the four lanes between Gerbazdale and Buttermilk Ski Area operating as bus/high occupancy

Figure S-1
State Highway 82 Entrance to Aspen EIS
Study Corridor



FIG_S1.CDR

vehicle (HOV) lanes during peak travel periods. Other improvements include a bicycle/pedestrian/recreational trail paralleling the State Highway 82 corridor, park and ride lots, provision for a future fixed guideway transit envelope along the corridor, and other transportation related commitments.

State Highway 82/Airport Realignment

The Federal Aviation Administration (FAA), in conjunction with Pitkin County and CDOT, is currently finalizing construction plans for relocating State Highway 82 approximately 137 meters (450 feet) northeast of its present alignment at the north end of the airport. Construction is scheduled for the summer of 1995.

Snowmass Ski Area Expansion

In spring 1994, the United States Forest Service (USFS) released the FEIS and the ROD for the Snowmass Ski Area Expansion Project. The selected alternative includes upgrading the existing facility on Bald Mountain and expanding the ski area onto Burnt Mountain.

Snowmass Village is located northwest of Aspen and southeast of Basalt. It is approximately eight kilometers (five miles) west of State Highway 82 and is accessed primarily from Brush Creek Road with secondary access from Owl Creek Road.

Aspen to Snowmass Transportation Project

In 1992, the Aspen City Council, the Town of Snowmass Village, and the Pitkin County Board of Commissioners completed a joint resolution (Intergovernmental Resolution #396) which set up a framework and group for working on the uppervalley transportation needs. The mission of the group (Decision Maker's) included reducing and/or managing the volume of vehicles on the road system and developing a long range strategy to ensure a convenient and efficient transportation system.

Both City of Aspen and Pitkin County voters passed a 1/2 percent sales tax in 1993 for transportation improvements. The transportation improvements proposed included a dedicated, separate transitway from Aspen to the Buttermilk Ski Area and on to Snowmass; increased bus service; construction of park and ride lots; and purchase of the remaining Denver & Rio Grande right-of-way for future rail use.

As a result of the 1992 intergovernmental resolution #396 and the 1993 1/2 percent transportation sales tax, the Aspen to Snowmass Transportation Project Plan was prepared in 1994 for public vote to obtain bonding approval. This plan was based on a design/vendor competition and focused on selecting the best affordable transitway link between Aspen and Snowmass. The winner of the competition proposed separate busway/dedicated vehicle lanes that could be converted to rail in the future between Aspen and Buttermilk, and combined busway/dedicated vehicle lanes from Buttermilk to Snowmass. The dedicated busway/vehicle lanes were proposed to cross the Marolt-Thomas property into Aspen and follow the existing State Highway 82 alignment between Buttermilk and Maroon Creek Road.

In November of 1994, both City of Aspen and Pitkin County voters defeated the measure that would have given bonding approval to use the 1993 1/2 percent transportation sales tax for the Aspen to Snowmass Transportation Project. Voters also defeated two other transportation-related measures. The DEIS analysis includes the portions of the Aspen to Snowmass Transportation Project which are part of the EIS study corridor.

Entrance to Aspen Resolutions

In February of 1995, the Aspen City Council agreed to the project objectives and developed project need and intent statements for the Entrance to Aspen EIS. The project objectives are fully discussed in **Chapter I: Purpose and Need.** The project need and intent statements are shown below.

Project Need

> "The capacity of the existing transportation system is insufficient during peak periods. Safety, clean air, the visitor's experience, and residents' quality of life are compromised."

Project Intent

> "To provide a balanced, integrated transportation system for residents, visitors, and commuters that reduces congestion and pollution by reducing and/or managing the number of vehicles on the road system. The system should reflect the character and scale of the Aspen community.
>
> Through a process responsive to community-based planning, the EIS shall identify, analyze, select, and implement the best transportation alternative for the short- and long-term goals of community compatibility, safety, environmental preservation, clean air, quality of life, and transportation capacity. The alternative chosen should be consistent with the Aspen/Snowmass/Pitkin County goal of limiting vehicles in 2015 to levels at or below those of 1994."

As part of their involvement in the EIS process, the Aspen City Council passed Resolution Number 42 (1995 Series) regarding the Entrance to Aspen project on June 26, 1995. The resolution specifically requested the inclusion of an alternative (Alternative G) which analyzed two improved lanes on the existing alignment from Maroon Creek Road to 7th Street and Main Street and a transitway across the Marolt-Thomas property.

Following the passage of the City's resolution, the Pitkin County Commissioners passed a resolution that also stated that Alternative G should be included in the DEIS analysis. Copies of both of these resolutions are included in **Volume 2: Comments and Coordination** of the DEIS.

INNOVATIVE APPROACH

A balanced solution to the transportation challenge of the State Highway 82 Entrance to Aspen corridor requires highway/transit improvements, control of traffic growth, and increased transit useage. It is not an environmentally acceptable solution to make only highway improvements.

The following discussion presents innovative approaches towards a balanced transportation solution, focusing on four options to supplement highway improvements:

- Transportation Management (TM)
- Transit
- Multimodal Centers
- Incremental Staging

The first option, TM (definition and description in next section), deals with ways to reduce travel demand. TM offers incentives and disincentives to discourage the use of single occupant vehicles (SOVs) and encourage the use of transit and carpools. TM measures generally fall under the jurisdiction of the local government.

The second option is transit. The Roaring Fork Transit Agency (RFTA) is already providing excellent local and regional bus service given the existing institutional and budget constraints. The DEIS discusses ways to further improve transit operations and includes design concepts which provide for rail transit operation in mixed flow conditions or on a separate corridor.

The third option involves the development of multimodal transfer centers which serve as park and ride facilities, as well as locations where a traveler can transfer from a car to a bus, a bus to a gondola, or a van to an airplane. The ability to transfer from a car to a wide variety of alternative transportation modes is the difference between a park and ride facility where a traveler shifts from a car to a bus and a facility where a traveler shifts from a car or bus to a much wider variety of alternative transportation modes. Joint use of the land within and adjacent to the center is another distinguishing characteristic of multimodal facilities. The DEIS identifies four general locations for multimodal facilities along the corridor and defines the size and potential joint uses of each facility.

The fourth option to unconstrained traffic flow and expansion of the capacity of the highway is to develop the system incrementally (in stages) while focusing on locally applied techniques to control SOV travel demand. The ultimate long-term solution to the transportation problems will involve many creative elements in addition to State Highway 82 transportation improvements. Various techniques such as improving the continuity of the bike and pedestrian system; improving non-auto access to the corridor; utilizing electronic information systems; improving pedestrian crossings; effectively controlling access; managing parking; integrating land use development with transportation improvements; and using the multimodal sites as areas to develop liveable communities all need to be part of the long-term solution. Implementing these improvements in a rational staged process will be part of the long-term transportation solution.

The intent of the DEIS is to present a technical, unbiased analysis of all alternatives that meet the project objectives. The DEIS does not make any recommendations because there are a multitude of options available which meet the solution criteria. By providing the community with a document that details these choices, the public process following the release of the DEIS will be used to identify what is acceptable to the community. From this process the FEIS will recommend the most appropriate solution which satisfies the project criteria and objectives while minimizing impacts to the environment.

Most of the alternatives presented in the DEIS can solve the existing and future transportation inadequacies in the corridor if the techniques of controlling future travel demand to existing levels fail. The purpose of this effort is to identify all alternatives that solve the transportation problem and give the community the opportunity to influence the final solution. **Chapter II: Transportation Management** outlines measures which will reduce travel demand and **Chapter III: Alternatives** defines the alternatives which are evaluated. The challenge is for the community, through a public process, to help decide the appropriate ultimate long-term solution.

TRANSPORTATION MANAGEMENT

Transportation management (TM) refers to programs and policies designed to reduce travel demand and improve utilization of the transportation system. TM incorporates transportation demand management (TDM), actions that reduce travel demand, and transportation systems management (TSM), actions that improve the use of the existing transportation system. TM can be applied to any alternative under consideration, but the success of the TM programs requires local initiation and implementation.

The DEIS presents three levels of TM measures and programs that demonstrate the potential for changing travel behavior and reducing traffic congestion within the study corridor. These TM programs and policies include a variety of incentives and disincentives directed primarily at drivers of SOVs. TM techniques include land use policy changes that reduce the need to travel, pedestrian and bike facilities that give travelers an alternative to driving, incentives to carpool, traffic calming, transit improvements, paratransit improvements, and economic incentives to influence times of day when people drive.

The three TM programs evaluated are the Base Case, Moderate, and Aggressive. The Base Case TM Program consists of the measures outlined in the BBFEIS and the elements from Aspen's 1994 PM_{10} Air Quality State Implementation Plan (SIP), most of which have already been implemented. The measures in the SIP which have already been implemented to reduce the amount of vehicle miles traveled (VMT), include paid parking charges in Aspen's commercial core and a cross-town shuttle program in Aspen. The Moderate TM Program includes an increase in transit service, reduction in transit fares and an increase in paid parking rates, in addition to the measures in the Base Case. The Aggressive TM Program includes a congestion pricing program, increased subsidies for transit, and a program limiting the parking supply, in addition to the Base Case TM Program elements.

The opportunities and constraints of the various TM programs are discussed in the context of the No-Action Alternative and the various build alternatives. Some TM measures can stand-alone and are not dependent on the transportation improvements in the Entrance to Aspen corridor. Because TM programs are implemented by local government and the private sector without federal funding, environmental clearances (such as an EIS) are not required.

Demand side techniques, based in part on charging travelers the true cost of traveling, have been presented by some as the solution to the increasing transportation demand in the corridor. However, there has been little public support. The concept of pricing has been promoted for years by transportation experts, but the reality is that few communities have had the political will to implement such strong TM programs and are unable to overcome the institutional barriers and public resistance.

The effectiveness of TM programs are dependent on the availability of alternative modes of transportation. Experience has shown strong public resistance to aggressive disincentives, such as congestion pricing without transportation improvements as part of the overall program. As part of an overall transportation approach, the inclusion of multimodal centers is essential to provide a convenient, direct connection between parking, transit and ski area access or airport access. The importance of these centers is magnified with the use of TM measures, because TM expands the need for park and ride facilities, transit, and effective modal linkages.

The fact that TM combined with transit improvements could solve the future travel needs of the corridor is documented in this DEIS. The unknown is whether the community is willing to impose the restrictions necessary to make a TM solution work. Since CDOT does not have implementing authority, the local agencies must adopt and commit to such a TM program.

ALTERNATIVES CONSIDERED

The alternatives evaluated in the DEIS were developed from reasonable combinations of alignment, laneage, and profile options that passed the screening process. Additional alternatives that did not pass the screening process are included to provide a useful baseline for comparing alternatives and due to public interest or at the request of the Aspen City Council.

The alternatives considered in the DEIS were developed through a three-level screening process. Because the project is multi-modal in nature, the options screened were divided into four general categories: potential alignments, potential laneage, potential profiles, and potential modes. These alternatives are part of a long-term solution to the transportation problems. Combining transportation management and innovative techniques with these options will most likely yield a Preferred Alternative.

The alternatives evaluated in the DEIS were developed from reasonable combinations of the alignment, laneage, and profile options that passed the screening process. The only laneage/ alignment option to pass the screening process is the two highway lanes plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property. Another option, the two improved lanes on existing State Highway 82 plus a transitway across the Marolt-Thomas property is included in response to a request by the Aspen City Council. This alternative meets the project objectives only if specific measures are taken to reduce the anticipated future vehicle demand. The two profile options carried into the DEIS for evaluation are the at-grade and the cut and cover.

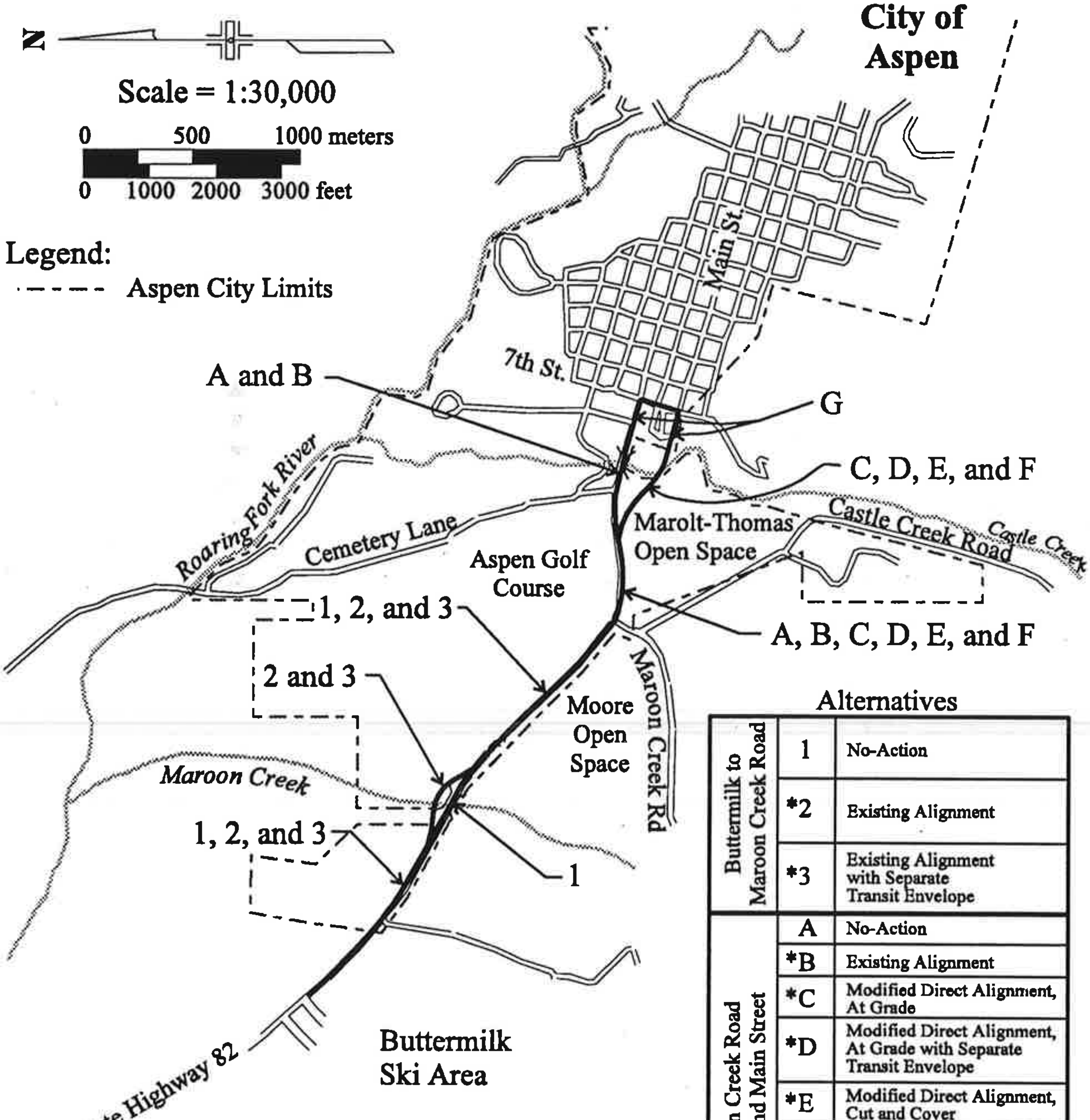
The alternatives also consider a separate transit envelope within the designated right-of-way, in addition to the two highway lanes and the two dedicated vehicle and/or transit lanes. A separate transit envelope along the roadway assures that long-term technology options are not precluded.

The alternatives evaluated are categorized by two corridor sections: (1) Buttermilk Ski Area to Maroon Creek Road and (2) Maroon Creek Road to the intersection of 7th Street and Main Street. Because the technologies for the two dedicated vehicle and/or transit lanes are generally not dependent upon the alignment, laneage, and profile options, the technologies are treated as a separate subset of alternatives. From a systems approach, the technology is assumed to be the same for both corridor sections.

Figure S-2 shows a schematic of each of these alternatives. The methodology used to identify the alternatives is summarized in Table S-1.

The FEIS will determine a Preferred Alternative from these alternatives or new alternatives developed between the release of the DEIS and the completion of the FEIS. Since the Preferred Alternative must demonstrate air quality conformity, all elements of it must be committed to by the implementing agencies and must be enforceable.

Figure S-2
Alignment Alternatives Schematic
State Highway 82 Entrance to Aspen EIS



Alternatives

Buttermilk to Maroon Creek Road	1	No-Action
	*2	Existing Alignment
	*3	Existing Alignment with Separate Transit Envelope
Maroon Creek Road to 7th and Main Street	A	No-Action
	*B	Existing Alignment
	*C	Modified Direct Alignment, At Grade
	*D	Modified Direct Alignment, At Grade with Separate Transit Envelope
	*E	Modified Direct Alignment, Cut and Cover
	*F	Modified Direct Alignment, Cut and Cover with Separate Transit Envelope
	**G	Two Improved Lanes on Existing Alignment and Transitway on the Modified Direct Alignment, At-Grade.

* These alternatives consist of two general traffic lanes plus two dedicated vehicle and/or transit lanes.

** The transitway for Alternative G is for transit vehicles only and does not include carpools.

FIG_S2.CDR

Table S-1
Methodology for Naming the Alternatives

Corridor Section	Number/ Letter	Alternative
Buttermilk to Maroon Creek Road	1	No-Action
	* 2	Existing Alignment
	* 3	Existing Alignment with Separate Transit Envelope
Maroon Creek Road to 7th and Main Street	A	No-Action
	* B	Existing Alignment
	* C	Modified Direct Alignment At-Grade
	* D	Modified Direct Alignment, At-Grade, with Separate Transit Envelope
	* E	Modified Direct, Cut and Cover
	* F	Modified Direct, Cut and Cover, with Separate Transit Envelope
	** G	Two Improved Lanes on Existing Alignment and Transitway on Modified Direct Alignment, At-Grade

* These alternatives consist of two highway lanes plus two dedicated vehicle and/ or transit lanes.

** The transitway for Alternative G is for transit vehicles only and does not include carpools.

Buttermilk Ski Area to Maroon Creek Road

Alternative 1: No-Action

This alternative consists of minor safety and maintenance improvements on State Highway 82. The existing roadway would remain as is and tie in to the previously approved transportation improvements discussed in the BBFEIS. It is also sometimes referred to as the No-Build or Do-Nothing Alternative. Although this alternative does not meet the project objectives, it is carried through the DEIS as a comparison alternative as required by Federal guidelines.

Alternative 2: Existing Alignment

This alternative consists of two highway lanes and two dedicated vehicle and/or transit lanes, which follow the existing alignment between Buttermilk Ski Area and Maroon Creek Road. The only significant deviation from the existing alignment is where the new alignment crosses Maroon Creek. The new crossing of Maroon Creek is to the north of the existing bridge.

Alternative 3: Existing Alignment with a Separate Transit Envelope

This alternative has the same alignment, laneage and profile as Alternative 2, except it includes a separate transit envelope in addition to the two highway lanes and two dedicated vehicle and/or transit lanes. This envelope is right-of-way set aside for future technologies.

Maroon Creek Road to 7th Street and Main Street

The alternatives in this section consist of two general alignments: the existing State Highway 82 alignment and the modified direct alignment. In addition, the modified direct alignment is combined with two profile options (at-grade and cut and cover) and evaluated with and without a separate transit envelope. The existing alignment is not evaluated with a separate transit envelope because of the additional right-of-way impacts through the S-curves. The S-curves refer to the portion of State Highway 82 between the Castle Creek Bridge and the intersection of 7th Street and Main Street in the City of Aspen.

Alternative A: No-Action

This alternative consists of minor safety and maintenance improvements on State Highway 82. The existing roadway would remain in its present state. Although this alternative does not meet the project objectives, it is carried through the EIS process for comparative purposes.

Alternative B: Existing Alignment

Although the existing alignment from Maroon Creek Road to the intersection of 7th Street and Main Street did not pass the screening analysis, it is carried into the DEIS for comparative purposes. This alternative provides two highway lanes and two dedicated vehicle and/or transit lanes. The technology options for the dedicated vehicle and/or transit lanes are limited to the buses, carpools, and shuttle vans. Light rail is excluded as an option because at reasonable operating speeds (24 to 32 km/hr [15 to 20 mph]) the minimum curvature required for the tracks creates significant relocations and right-of-way acquisition.

Alternative C: Modified Direct Alignment, At-Grade

This alternative provides two highway lanes and two dedicated vehicle and/or transit lanes for all modes and technologies passing the screening process. It does not include a separate transit envelope.

The modified direct alignment, which is at-grade, follows the existing State Highway 82 to a point approximately 150 meters (500 feet) east of Maroon Creek Road, where it curves southeast onto the Marolt-Thomas property. A gradual S-curve to the east brings the alignment 204 meters (670 feet) south of the existing Castle Creek Bridge. The alignment continues across Castle Creek on a new bridge structure to reconnect to the existing State Highway 82 at 7th Street and Main Street.

Alternative D: Modified Direct Alignment, At-Grade, with Separate Transit Envelope

This alternative has the same alignment, laneage, and profile as Alternative C except that a separate transit envelope is provided in addition to the two highway lanes and two dedicated vehicle and/or transit lanes. The transit envelope is next to the two highway lanes and two dedicated vehicle and/or transit lanes.

Alternative E: Modified Direct Alignment, Cut and Cover

Alternative E has the same alignment and laneage as Alternative C. It, however, has a cut and cover section near Castle Creek. A section of this alternative is depressed with the right-of-way above the cut and cover returned to open space. This creates the appearance of a short tunnel. A transit envelope is not included in this alternative.

Alternative F: Modified Direct Alignment, Cut and Cover, with Separate Transit Envelope

Alternative F is similar to Alternative D except that a cut and cover section is provided near Castle Creek.

Alternative G: Two Improved Lanes on the Existing Alignment, Transitway on Modified Direct Alignment, At-Grade

This alternative is a combination of two improved lanes on the existing State Highway 82 alignment and an exclusive transitway (fixed guideway or busway) across the Marolt-Thomas property (the modified direct alignment). The two alignments separate at MP 39.9 and rejoin at the intersection of 7th Street and Main Street. This alternative requires a new bridge structure for the transitway across Castle Creek. This alternative alignment and laneage does not pass the screening process unless it is combined with the Aggressive TM Program and there is a significant expansion of the transit system and a significant increase in transit use. It is included as an alternative for evaluation at the request of the Aspen City Council.

Options for Dedicated Vehicle And/Or Transit Lane

Different modes and technologies are analyzed for use in the two dedicated vehicle and/or transit lanes for each of the alternatives. These two restricted lanes are part of Alternatives 2, 3, B, C, D, E, and F. The restrictions applied to these two lanes in addition to the improved transit operations provide incentives for SOV drivers to shift to higher occupancy vehicles and transit. In addition to carpools and hotel shuttles, self-propelled buses, electric trolley buses, and light rail transit are analyzed for inclusion on the two dedicated vehicle and/or transit lanes.

COMBINING TRANSPORTATION OPTIONS

In this section, for comparative purposes, alternatives evaluated and the TM measures discussed earlier are overlayed to show the inter-relationships. The TM programs discussed can be stand-alone programs or they can be combined with one of the build alternatives. The effectiveness of these programs on reducing congestion, however, are very dependent upon the availability of alternative modes of transportation. Likewise, the availability of alternative modes and the incentive to use them directly correlates to the efficiency of the transit system. Table S-2 shows the relationship between the alternatives and the TM programs by comparing future traffic volumes on State Highway 82 at Cemetery Lane with the different alternatives and TM programs.

Table S-2 shows that the TM programs can be effective measures to reduce traffic volumes in all alternatives. With the existing (1993) winter average daily traffic volume at 24,800 vehicles per day, it is clear that only an aggressive TM program can produce future (2015) traffic volumes below the existing level. It is important to remember that although the No-Action Alternative with aggressive TM could theoretically provide 2015 traffic volumes below the existing level, the buses, carpools, and other transit vehicles will be caught in the congested traffic stream. This situation will offer no strong incentive for using the transit system or carpools and, instead, the congestion will force trips to be deferred or to be made to a different destination. In the case of Alternatives B, C, D, E, and F, the transportation improvement provides separate lanes for dedicated vehicles and/or transit. These vehicles can be either buses, carpools, and shuttles or light rail vehicles. A light rail transit system (with or without a transfer to a multimodal station) provides similar volumes to the bus/carpool system as shown in Table S-2. Alternative G does not provide a separate lane for carpools. Despite slight differences in the future traffic volumes for these alternatives (B, C, D, E, F, and G) the 2015 traffic volumes are below existing levels with the Aggressive TM Program, regardless of alternative.

MAJOR ENVIRONMENTAL IMPACTS

Beneficial Impacts

Major beneficial impacts, which vary according to alternative, include:

- A safer transportation corridor resulting in reduced accident rates.
- Reduced congestion.
- Increased transportation capacity to provide for both existing and future demands.
- Reduced air pollution.

Table S-2
2015 High Growth Winter Average Daily Traffic Volumes at Cemetery Lane on State Highway 82

Alternative	Transportation Management Program								
	Base Case			Moderate			Aggressive		
	General Lane	Transit Lane	Total Vehicle Volume	General Lane	Transit Lane	Total Vehicle Volume	General Lane	Transit Lane	Total Vehicle Volume
A - No Action Existing two-lane with no improvements.	36,400[3]	NA	36,400	30,900[3]	NA	30,900	23,800[3]	NA	23,800
B, C, D, E, and F[1] Dedicated vehicle and/or transit lanes employ buses and carpools.	24,000	11,300	35,300	20,100	10,400	30,500	14,200	9,000	23,200
B, C, D, E, and F[1] Dedicated vehicle and/or transit lanes employ a light rail transit system without a transfer at a multimodal facility.	35,100	LRVs	35,100	30,200	LRVs	30,200	22,900	LRVs	22,900
With a transfer to a multimodal facility.	35,400	LRVs	35,400	30,400	LRVs	30,400	23,100	LRVs	23,100
G[2] Transitway as a fixed guideway.	35,300	LRVs	35,300	30,200	LRVs	30,200	22,900	LRVs	22,900
Transitway as a busway (buses only, no carpools)	34,200	900	35,100	28,600	1,200	29,800	21,400	1,300	22,700

Existing winter average daily traffic (1993) = 24,800
LRVs = Light Rail Vehicles

[1] Two general highway lanes plus two dedicated vehicle and/or transit lanes on the existing alignment (Alternative B) or across Marolt-Thomas property (Alternatives C, D, E, and F).

[2] Two improved lanes on existing alignment and separate transitway across the Marolt-Thomas property. Assumes a transfer at multimodal facility for the transitway.

[3] General lane for the No-Action Alternative includes buses and HOVs.

Adverse Impacts

Major adverse impacts, which vary according to alternative, include:

- Relocation of residences and/or businesses.
- Encroachment on residences and businesses (right-of-way acquisition).
- Encroachment and impact on sites listed on or eligible for the National Register of Historic Places or State Register.
- Encroachment on recreational and open space lands.

CONTROVERSIAL ISSUES

Project History

The need for a safer, less congested transportation connection into Aspen from the vicinity of the Buttermilk Ski Area has been debated in the upper end of Pitkin County since the late 1960s. A number of formal votes and adopted local government resolutions regarding how to improve the 3.1 kilometers (1.9 miles) of highway have been made with no clear decision on how to proceed with the needed improvements. In 1970, Pitkin County voted to widen State Highway 82 to four lanes and the City of Aspen voted against four lanes. In 1982, the City of Aspen voted against using the Marolt-Thomas property for four-lane improvements. In 1984, the County voted for four-lane improvements between Brush Creek Road and Aspen. In June of 1984, the Aspen City Council adopted a resolution to upgrade State Highway 82 along its current route. In 1986, two choices to improve State Highway 82 were put to the voters: provide a new direct connection into Aspen across the Marolt-Thomas Property or widen the existing S-curve alignment. Both lost at the polls, the direct connection by 10 votes. Based in part on this vote, the Aspen City Council adopted a resolution in February 1989 stating the Council's preference for an improved four-lane along the existing State Highway 82 alignment. A year later, the Aspen voters approved a direct four-lane alignment across the Marolt-Thomas property. As part of this vote, voters also favored the acquisition of city-owned parkland and open space for the improved transportation corridor.

In 1993, both Pitkin County and the City of Aspen approved a 1/2 percent transportation sales tax for transit improvements. In 1994, both the City of Aspen and Pitkin County voters defeated several transportation measures on the ballot. One measure proposed using the 1993 1/2 percent transportation sales tax to provide bonding for a dedicated transitway between Aspen and Buttermilk Ski Area across the Marolt-Thomas property. Other measures defeated included conveyance of open space lands for transportation improvements and the relocation of State Highway 82 alignment to the Marolt-Thomas property. A summary of the Pitkin County and City of Aspen votes related to project corridor is included in **Volume 2: Comments and Coordination** of this DEIS.

The passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) and changes in the Clean Air Act, coupled with a growing concern over increased traffic congestion and quality of life issues, led to re-evaluating an approach to the transportation link into Aspen. In 1991, the three upper valley governments--the City of Aspen, Pitkin County, and the Town of Snowmass Village--adopted a joint resolution to collectively address and solve the three main transportation issues: traffic congestion, traffic safety, and air pollution. Working collectively during an 18-month period, the elected officials representing the three jurisdictions adopted Resolution #396 in October of 1992. This intergovernmental resolution established a framework for an overall transportation system responsive to both ISTEA and the changes in the Clean Air Act. The following are the three components of the adopted intergovernmental agreement:

- Travel demand management strategies.
- Transportation enhancements to the existing roadway system for both automobiles and buses.
- The development of a fixed guideway system as an alternative transportation link between downtown Aspen, the airport, and the Snowmass Village Mall.

Multimodal Center Location

As part of a multimodal approach to transportation, the inclusion of multimodal centers is essential. These centers are parking and transfer facilities that provide direct connection by transit to ski area access, airport access, or downtown Aspen. The importance of these centers is magnified with the use of TM measures, because TM expands the need for park and ride facilities and improved transit service.

The operation of the multimodal center is dependent upon its location within the study corridor. Four general areas, presented by the community, represent the range of potential locations for multimodal centers. The first and second areas are east of Maroon Creek in the vicinity of the Marolt-Thomas Property or the Moore Property (Figure S-1). An underground parking facility with a direct connection to rail transit has been proposed for either of these locations. A rail connection could extend from the multimodal facility to downtown Aspen at Rubey Park. A facility located on either of these sites would serve the day visitors to Aspen. The surface of the underground facility could be landscaped. Joint land uses compatible with parking and transit could be developed adjacent to the facility.

The third area is west of Maroon Creek in the vicinity of the Buttermilk Ski Area. A parking facility and transit station with a landscaped deck on top of the parking structure has been proposed for the area between the existing Buttermilk Ski Area parking lot and Owl Creek Road. This facility would primarily serve visitors and skiers traveling to Snowmass Village. The fourth facility could be located at the Aspen Airport on a site west of the terminal building. This facility would serve airport users and downvalley commuters. Further analysis of the environmental impacts of each multimodal site will be performed either during the FEIS or in supplemental documents. It has not been included in the DEIS due to the uncertainty of sites and spaces required.

Air Quality

Concern has been expressed that transportation improvements to the Entrance to Aspen project corridor would increase traffic and air pollution in the Aspen PM_{10} air quality nonattainment area (PM_{10} is particulate matter less than 10 microns in diameter). The 1990 Clean Air Act Amendments (CAAA) require that any transportation improvements within a nonattainment area must not: (1) cause or contribute to a violation of federal air standards; (2) increase the frequency or severity of any existing violations of any standard; or (3) delay attainment of any standard. The 1993 Air Quality Conformity Final Rule provides the criteria for establishing a conformity finding. The Preferred Alternative, which will be identified in the FEIS, must demonstrate air quality conformity.

The conformity rule places a ceiling on emissions under which the Preferred Alternative must fall. The emission ceiling is called the motor vehicle emissions budget. The PM_{10} budget of 6,337 kg/day (13,974 lbs/day) for the Aspen non-attainment area is specified in the State Implementation Plan (SIP). This emissions budget applies as a ceiling on emissions for the year 1997 and all subsequent years, until the SIP is revised with a new emissions budget. Under no circumstances may the motor vehicle emissions predicted in a conformity finding for the Preferred Alternative exceed the emissions budget.

Since the conformity determination must consider all factors which relate to future emissions, unresolved issues must be determined. There are four critical questions that must be answered before the conformity finding can be developed for the Preferred Alternative in the FEIS:

1. To what extent can sanding be reduced on State Highway 82 outside the city limits?

2. Is the City of Aspen willing to commit to continue its current practice of limited sanding on State Highway 82 within the city limits?

3. What level of TM is acceptable to the community?

4. Is the community willing to increase the PM_{10} emissions budget, and if so, to what level?

Recreational Lands, Open Space Lands, and Historic Resources

Significant concerns have been raised over potential adverse impacts to recreational and open space lands and to historic properties located throughout the project corridor. Within the Entrance to Aspen corridor there are three open space parcels, one designated park, five historic sites on or eligible for inclusion on the National Register of Historic Places, three additional properties locally designated as historic, one golf course, and one extensive recreational trail system. All of the alternatives considered in the DEIS except the No-Action Alternative, will impact some of these resources to some degree. Every effort has been made to avoid or minimize these impacts to the degree practicable and these efforts will continue throughout the EIS and project design process.

OTHER FEDERAL ACTIONS REQUIRED

Construction of some of the transportation improvements will require issuance of a Section 404 dredge and fill permit by the Army Corps of Engineers (ACOE). The Preferred Alternative recommended in the FEIS for the Entrance to Aspen will require an air quality conformity determination before final approval.

PUBLIC INVOLVEMENT

CDOT, as the lead agency in the development of the EIS, has worked closely with the citizens and elected officials in the study corridor for many years. This work has been ongoing since 1974. A significant amount of public participation was conducted between 1987 and 1991 with the environmental analysis performed for the original 1989 ***State Highway 82 East of Basalt to Aspen DEIS***. From 1991 through 1993, through the opening of a local office (called the Mount Sopris Transportation Project), CDOT completed the BBFEIS. The BBFEIS provided an important foundation for the Entrance to Aspen EIS. The approved BBFEIS calls for the widening of State Highway 82 between Basalt and Buttermilk Ski Area to four lanes, with two of these lanes between Gerbazdale and Buttermilk being bus/HOV lanes during peak periods.

The continued debate over how to improve the Entrance to Aspen led CDOT to conduct an extensive public involvement program as an integral part of the scoping and development of the Entrance to Aspen DEIS. The public involvement program recognized areas of agreement reached by the community through the Aspen Area Community Planning Process and the Aspen to Snowmass Transportation Project. There were five community agreements which were considered in the development of this DEIS. These were agreed to by elected officials, June 21, 1994, and presented to community focus groups for their approval on June 22-23, 1994.

- The community agrees that something must be done to accommodate the increased trips into and out of Aspen. Residents want a workable solution that is implemented soon.

- An unrestricted four-lane is not feasible using a systems approach because it does not provide incentives for transit use. The Preferred Alternative for the BBFEIS has two bus/HOV lanes up to Buttermilk Ski Area.

- The connection between the Buttermilk Ski Area and Aspen must include a variety of measures to reduce the actual number of automobile trips into and out of Aspen. Dedicated busways, HOV lanes, a fixed guideway system, and other measures that reduce the actual number of trips in a SOV must all be considered.

- All transportation solutions must comply with the 1990 CAAA. A combination of travel modes, alignments, and transportation demand management actions should be identified that meet the stated community goal of limiting the number of vehicles in 2015 to levels at or below those in 1994.

- Residents remain very concerned about getting something done to address the following three transportation issues: traffic congestion, traffic safety, and air pollution.

With a long history of controversy and debate, the DEIS public involvement process was directed toward resolving the following problem statement:

> *How can the community, working in partnership with CDOT, collectively resolve the fact that there are competing interests regarding how to develop a better transportation link into Aspen?*

The public involvement process went far beyond the normal National Environmental Policy Act (NEPA) requirements. The public participation program included the following techniques:

- Open house public meetings and workshops.
- Focus group meetings with affected interests.
- Periodic reconnaissance interviews with elected and appointed officials and area staff.
- Confidential interviews with a cross section of the community.
- Participation in one- or two-day transportation symposiums and round table discussions sponsored by the City of Aspen.
- Technical Advisory Committee (TAC) meetings with area staff.
- Regularly scheduled project status reports and dialogue with the Pitkin County Board of Commissioners, Aspen City Council, and the intergovernmental group of elected officials known as the Decision Makers or Elected Officials Transportation Committee (EOTC).
- Roaring Fork Forum Transit Council briefings.
- Development of a community-based information sharing/consensus building process with Leadership Aspen, the Rocky Mountain Institute, and the City of Aspen.
- Presentations to area civic organizations, neighborhoods, and special interest groups on an as-requested basis, with written questionnaires.
- Periodic newsletters distributed as an insert to the local papers.
- A 24-hour hotline for area citizens to call with comments and suggestions or to request additional factual information.

Summary

- A comprehensive ongoing display at the Pitkin County Library and other public facilities in the Roaring Fork Valley, explaining project objectives, the screening process, potential alternatives, transportation management principles, and 4(f) properties.
- Ongoing media coverage through the two local papers, Grass Roots TV, and the local radio station.

Summaries of these meetings, in addition to a chronology of the project history, are included in **Volume 2: Comments and Coordination** of the DEIS.

I. Purpose and Need

A. FOREWORD

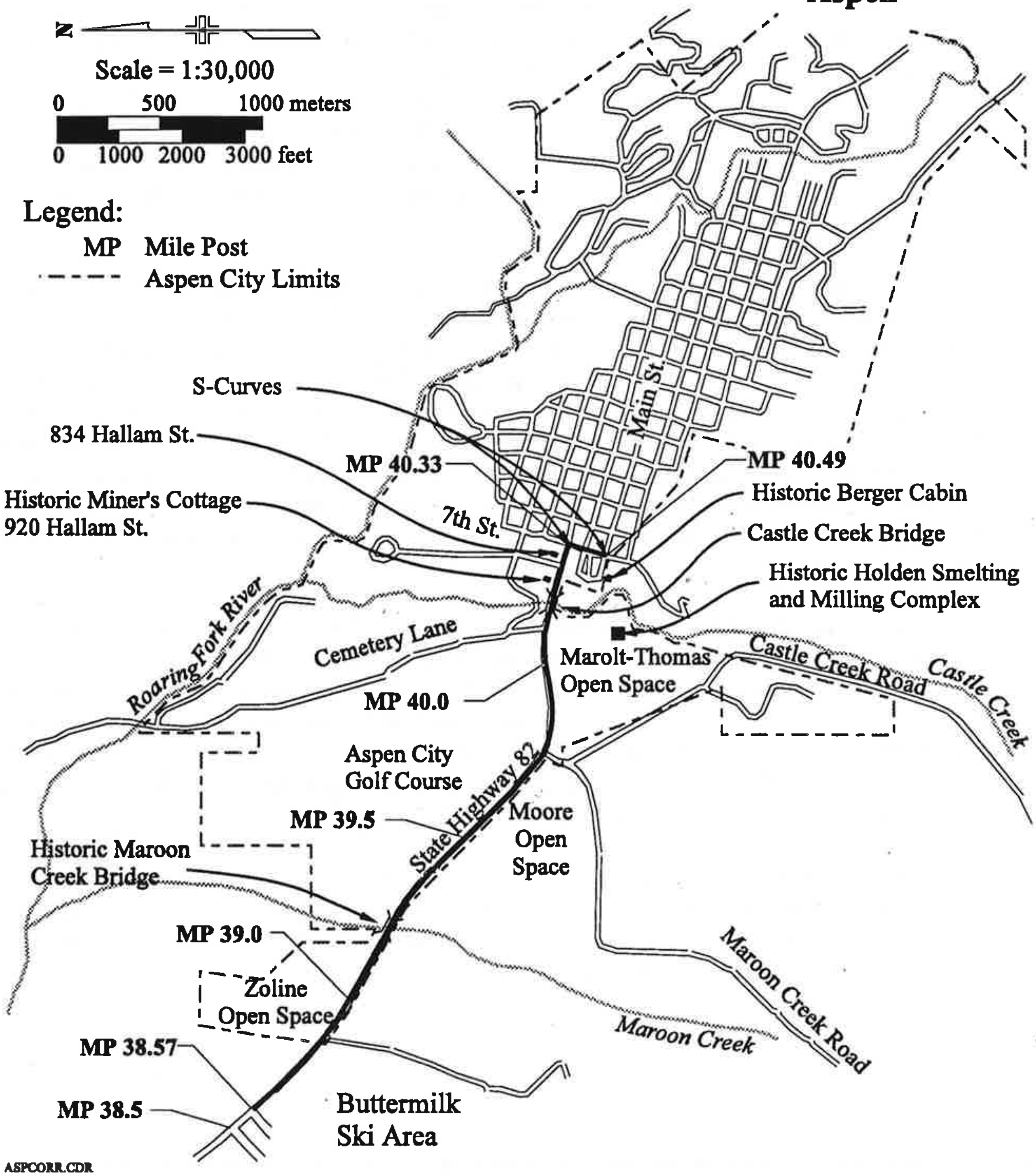
The purpose of the Entrance to Aspen Environmental Impact Statement (EIS) process is to develop a transportation solution that addresses the transportation capacity inadequacies and safety problems of the study corridor while avoiding or minimizing adverse environmental impacts. The study corridor is located on Colorado State Highway 82 between the Buttermilk Ski Area (milepost 38.57) and the City of Aspen at the intersection of 7th Street and Main Street (milepost 40.49). Figure I-1 shows the project corridor and several key landmarks for identification, including Buttermilk Ski Area, the historic Maroon Creek Bridge, the Aspen City Golf Course, Castle Creek Bridge, and the existing State Highway 82 S-curves at the Entrance to Aspen. The S-curves refer to the portion of State Highway 82 between Cemetery Lane and the intersection of 7th Street and Main Street in the City of Aspen.

The capacity of State Highway 82 within the project corridor is limited by the existing substandard roadway which does not sufficiently accommodate the travel needs of the residents, employees and visitors of Aspen. Currently, during peak periods, State Highway 82 is extremely congested and operates at failure (stop and go) conditions. The safety of the highway in the analysis corridor is extremely poor when compared to similar Colorado highways. The accident rate on the S-curves is 386 percent of the state rural highway accident rate average and 149 percent of the urban Colorado rate. Insufficient roadway design in the analysis corridor is evidenced by narrow laneage, narrow and non-existent shoulder width, over-capacity intersections, and sharp right-angle turns with high speed approaches. All of these items contribute to the lack of capacity and a poor safety record for the existing highway.

Transportation demand forecasts indicate that traffic demand will continue to rise and the system will be operating over the available capacity of the corridor for large portions of the day. The transportation problems associated with State Highway 82 have been recognized since the late 1960s. There is a strong understanding in the community that these serious and significant transportation problems need to be addressed and that these problems have become worse over the years. Numerous studies and reports that attempted to develop solutions to State Highway 82 inadequacies have been completed since the early 1970s.

The recent completion of the ***State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement*** (BBFEIS) provided for multimodal improvements from Basalt to the Buttermilk Ski Area. The current study corridor is the only portion of the valleywide transportation system that has not been addressed.

Figure I-1
State Highway 82 Entrance
to Aspen EIS Study Corridor



B. PROJECT OBJECTIVES

The primary purpose of the EIS process is to develop solutions that will improve transportation and safety along the State Highway 82 corridor between the Buttermilk Ski Area and Aspen while avoiding or minimizing adverse environmental effects. The project objectives are the foundation of the EIS process and must be met by the proposed transportation improvements.

The objectives were developed based on known problems and concerns related to the State Highway 82 transportation system and corresponding issues raised by the Aspen area community. Consensus on the objectives was developed from the affected agencies, elected officials and staff of area governments, concerned members of the public through a series of individual meetings (community focus groups, open house exhibitions, community leadership workshops) and a technical advisory committee (TAC) consisting of the various local governments and state and federal agency staff. These objectives incorporate the need for improvements to the State Highway 82 transportation corridor, as previously discussed. Ten objectives for the project have been identified:

1. *Community Based Planning. Provide a process which is responsive to local community-based planning efforts, including the Aspen to Snowmass Transportation Project and the Aspen Area Community Plan, with special attention focused on limiting vehicle trips into Aspen to create a less congested downtown core.*

   Local governments have done extensive work in preparing plans for the future of their communities and jurisdictions. It is important and necessary to consider these plans and the input of the community to create a project the community can be proud of, and one that is consistent with community based long-range planning goals.

2. *Transportation Capacity. Provide needed transportation capacity for the forecasted person trips in the year 2015. In doing this, this project will identify a combination of travel modes, alignments, and transportation management actions to seek to achieve the stated community goal of limiting the number of vehicles in 2015 to levels at or below those in 1994.*

   Traffic demand forecasts presented in **Chapter V: Future Transportation Demand** indicate that traffic demand is expected to increase. Because existing traffic movement on State Highway 82 is already very poor, capacity improvements are necessary to handle the existing and forecasted demand and reduce the congestion. There is strong sentiment in the City of Aspen to reduce or control the amount of vehicle traffic, therefore, it is important to provide both incentives and disincentives to reduce the use of single occupancy vehicles (SOVs) on State Highway 82. This would require increased use of higher occupancy vehicles such as buses, carpools, or other transit modes to accommodate the forecasted demand. Because tourist businesses are dependent upon efficient delivery of goods, an improved transportation system is needed to accommodate increased truck movements.

3. *Safety. Reduce the high accident rate on State Highway 82 and the existing S-Curves at State Highway 82/7th Street/Main Street and provide safety improvements for bicyclists and pedestrians. Provide safe access at all intersections for all movements.*

   One of the primary responsibilities of the Colorado Department of Transportation (CDOT) is to provide a safe transportation system. The existing S-Curves on State Highway 82 on the west end of Aspen have consistently been one of the most dangerous sections on the state roadway system based on the high number of accidents. Improving the safety of this known high-accident area, while providing safe and efficient improvements for the entire project, is critical.

4. *Environmentally Sound Alternative. Develop an alternative which minimizes and mitigates adverse impacts. A process will be used which follows the National Environmental Policy Act (NEPA), the 1990 Clean Air Act Amendments (CAAA), the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), and all pertinent legislation.*

   Even if development of an alternative that minimizes and mitigates adverse impacts were not required by law, this would be an exceedingly important objective of both the local community and the CDOT. The environment of the Aspen area is special and unique. The town's essence and primary economic functions depend upon retaining these qualities. Any transportation improvements must be environmentally sound to be effective at providing service to the Aspen area.

5. *Community Acceptability. Develop an alternative which fits the character of the community and is aesthetically acceptable to the public.*

   The Aspen area has a very unique physical and social environment that helps define the nature of projects that can be built. It is centered in an outdoor recreational mecca largely dependent upon the exceptional scenery and numerous recreational facilities. This spectacular setting and rich history have combined to create an area that has attracted a highly educated population (almost 50 percent of Pitkin County residents have a college degree compared to a Colorado average of 27 percent) and a population that is generally more affluent (the per capita income of Pitkin County residents is almost 70 percent greater than Colorado as a whole. The average home price in Aspen is more than $1 million.)

   The population of the Aspen area is socially conscious and environmentally aware. The community has a history of being very proactive and knowledgeable concerning local issues. The community must gain consensus on an acceptable Preferred Alternative that meets the project's purpose and need.

6. *Financial Limitations. Develop an alternative that is financially realistic with respect to current and expected funding levels and programs, while being responsive to both the community's character and prudent expenditures of public funds.*

Public officials have a responsibility to ensure that public funds are spent efficiently and prudently. There are always more needs than available funds. Those projects that represent the best value are often the ones that are implemented. While the transportation needs within this study corridor are great, financial resources that can be used to respond to them are limited. This EIS process should be responsive to these needs while being realistic about potential funding.

7. Clean Air Act Requirements. *Since the Aspen area is a PM_{10} air quality non-attainment area, the Preferred Alternative must meet the requirements of the 1990 Clean Air Act Amendments by demonstrating project conformity.*

This is a special legal requirement for the Aspen area because of the wintertime air pollution caused by small airborne particulate matter (PM_{10}) and the corresponding non-attainment status designated by the Environmental Protection Agency (EPA). Because a large portion of PM_{10} pollution is caused by the traffic grinding up sand on roadways in the wintertime, increased traffic will increase PM_{10} pollution. The Preferred Alternative combined with transportation management (TM) measures must prevent an increase in PM_{10} emissions.

8. Emergency Access. *Respond to the need for an alternate route for emergency response to incidents inside and outside of Aspen.*

Currently, all traffic between Aspen and downvalley[1] must cross Castle Creek. Only one major two-lane traffic bridge crosses Castle Creek on State Highway 82. A minor local roadway bridge crosses Castle Creek below the State Highway 82 bridge, but its load restrictions prohibit access for fire equipment. A significant emergency or congestion on the State Highway 82 bridge could cut off access across both bridges into and out of Aspen. This could cause a life threatening situation if emergency vehicles cannot get into or out of Aspen.

9. Livable Communities. *Provide a system which reflects the small town character and scale of the Aspen community and which enhances the quality of life for residents and visitors. The system shall provide more accessible transportation which increases the mobility of the community and therefore provides for a more livable community.*

The purpose of this objective has been well described by the United States Department of Transportation[2] (USDOT) and is repeated here for explanation. The purpose of providing

[1] Downvalley generally refers to the portion of the Roaring Fork Valley that is to the north and west of Brush Creek Road. Upvalley generally refers to the area south and east of Brush Creek Road.

[2] ***Livable Communities Initiative***. United States Department of Transportation, Federal Transit Administration, June 6, 1994, Page 3.

livable communities is (1) to strengthen linkages between transit and community development planning including land use policies supportive of transit, (2) to stimulate greater involvement in the local planning and design process by neighborhood and community organizations, small and minority businesses, persons with disabilities and other public users who are not currently participants in the process, and (3) to increase access to or generate employment through high quality community-oriented transit services and facilities.

10. *Phasing.* *Provide an alternative which allows for future transit options and upgrades.*

The Aspen community has long expressed a desire for a high quality transit system and has significant interest in a wide range of transit options. It is important to preserve options for future upgrading of the transportation system as new technologies become available.

These objectives are essential because they form the basis for determining the alternatives that are evaluated in this Draft Environmental Impact Statement (DEIS). **Chapter III: Alternatives** identifies the screening process used to determine a reasonable range of options that accomplish the project's objectives.

C. SYSTEM RELATIONSHIPS

Transportation systems can no longer be considered to include only roadways. With increasing congestion on the nation's highways, air pollution problems caused by automobile and truck traffic, and limited funds to address these issues, transportation systems must now consider all modes of travel and the relationships among them.

Transportation systems of particular interest in the upper Roaring Fork Valley that affect the Entrance to Aspen study corridor include other roadway links, air service, bus service, pedestrian/bicycle options, potential future commuter rail service from downvalley, light rail transit, and long-term transportation planning options.

1. Other Roadway Links

State Highway 82, from Aspen northwest to Glenwood Springs, is by far the most important surface transportation link in Pitkin County and the Roaring Fork Valley. It is the only through highway route along the valley floor, carrying most of the highway and transit traffic, and providing access to most of the major Pitkin County/City of Aspen roads and facilities.

During approximately seven months of the year, access to the Roaring Fork Valley is closed from the east via State Highway 82 over Independence Pass (elevation 3,665 meters [12,095 feet]) because of heavy snow accumulation. State Highway 82 essentially operates as a cul-de-sac during the ski season with Aspen at the terminus. During the summer when the pass is open, Independence Pass does not serve as a major access to the Roaring Fork Valley because of its steep, narrow roadway and curved alignment.

No other roads traverse the entire Roaring Fork Valley in Pitkin County. Various roadways parallel portions of State Highway 82 and are increasingly used by some travellers as a means to bypass State Highway 82 congestion.

2. Air Travel

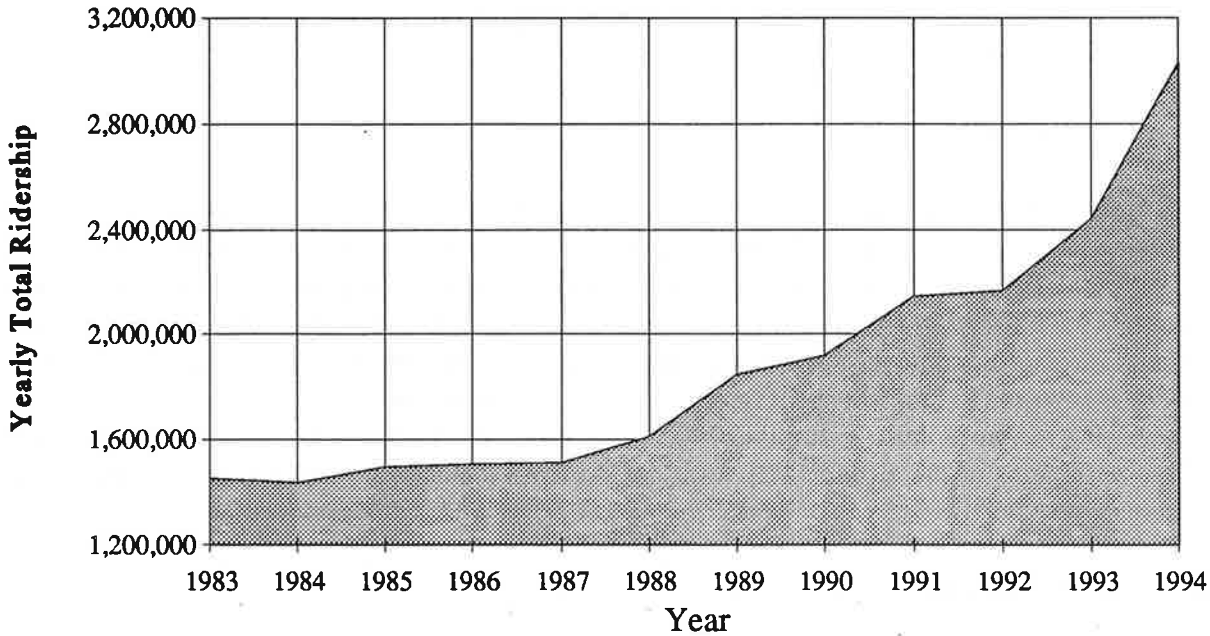
The Aspen-Pitkin County Airport was the third busiest commercial airport in Colorado during 1993, following Denver and Colorado Springs. However, one of the two scheduled commercial airlines, Continental Express, discontinued service in 1994. The remaining airline, United Express, has increased the number of flights but is not expected to match the number of enplanements of recent years. Demand for airline service has been increasing steadily during the past twelve years, therefore, service is expected to rebound in the future. Several smaller airlines have already expressed interest in beginning service as early as summer 1995. Private aviation constitutes an important component of the operations of the airport. All traffic to and from the airport must use State Highway 82 to access Aspen.

3. Bus Travel

The Roaring Fork Transit Agency (RFTA) operates up to 60 buses per hour (during peak periods) on eight bus routes within or connecting to the Entrance to Aspen corridor. These routes include downvalley service, Aspen to Snowmass service, Aspen Airport park and ride, Highlands Ski Area service, Maroon/Castle Creek service, Cemetery Lane service (serving residential areas northwest of Aspen on Cemetery Lane), and Buttermilk Ski Area service. The RFTA system has a very high level of annual ridership, which increases during peak tourist seasons. Figure I-2 shows that total RFTA ridership has doubled since 1987. In 1994, RFTA carried more than three million passengers. Between 1993 and 1994, RFTA ridership on valley routes grew 34 percent. Also in 1994, ridership on RFTA's skier shuttles increased 19 percent over 1993 to carry 658,000 passengers. Much of this increase is due to the addition of service to the Aspen Highlands Ski Area. The rapid increase in all ridership is expected to grow, however, increasing congestion on State Highway 82 may begin to limit this growth.

CDOT's 1993 and 1994 origin and destination surveys determined that approximately 6 percent of the summer person trips and 17 percent of the winter person trips that crossed the Aspen entrance survey site (west of Maroon Creek Road) were being carried by RFTA buses. The extremely high winter share of passenger trips includes a large number of skiers who are transported between Aspen, Buttermilk Ski Area, and Snowmass Village. Traffic congestion is partly the cause for the RFTA's high winter percentage of trips. In return, this high percentage helps lessen the existing congestion during peak periods.

Figure I-2
Roaring Fork Transit Agency Ridership



Source: Roaring Fork Transit Agency

4. Pedestrian/Bicycle Routes

The project corridor includes a pedestrian/bicycle trail (Airport Business Center Trail) that parallels State Highway 82 on the north side between Buttermilk Ski Area and Aspen. Another trail, the High School Bike Path, exists on the south side between Maroon Creek Road and Aspen. No dedicated crossing of State Highway 82 exists for these trails, causing dangerous conflicts between pedestrians/bicyclists and vehicles on the existing highway. There are tentative plans for a new pedestrian/bike bridge over Maroon Creek. Cross country ski trails also pass through the project area. These trails are heavily used but do not serve to significantly reduce the transportation demand on State Highway 82. See **Section IV.A.4b: Hiking/Bicycle Trails** for a complete description.

5. Potential Future Rail Travel

There is significant interest in establishing passenger rail service within the Roaring Fork Valley. Although this would help relieve traffic congestion on State Highway 82, a rail feasibility study has shown that rail ridership will not eliminate the need to increase the capacity of State Highway 82. A feasibility study (***Glenwood-Aspen Rail Corridor Feasibility Project, Final Report***, Mount Sopris Transportation Project, Colorado Department of Transportation, May 1995) was performed for a rail corridor between Glenwood Springs and Aspen. The findings suggest that the rail ridership between Aspen and the airport would be approximately 7,900 person trips per day for the high winter average ridership estimate in 2015. With the 2015 winter average daily traffic (WADT) of the No-Action Alternative equal to approximately 71,000 person trips per day, the rail ridership estimate would remove 11% of the person trips from State Highway 82. Even so, the vehicle demand on State Highway 82 (approximately 32,400 vehicles per day [vpd]) would still be beyond the capacity of the two-lane roadway.

A 1/2 percent transportation use tax passed in 1993 will provide partial funding for the purchase of the existing Denver & Rio Grande Western Railroad (D&RGW) right-of-way in the Roaring Fork Valley to serve as a future transportation corridor.

The Glenwood-Aspen Rail Corridor Feasibility Project determined that the best locations for a fixed-guideway transit crossing are upvalley from Shale Bluffs. The preliminary results of this study show that a preferred fixed guideway transit corridor would use the existing D&RGW right-of-way between Glenwood and a location north of the Aspen-Pitkin County Airport. At this location, the fixed-guideway transit corridor would cross the Roaring Fork River to join State Highway 82 at the new airport intercept lot. Alternatives also exist that would continue the rail service on the existing Rio Grande Trail (presently a pedestrian/bicycle trail occupies the old D&RGW track bed) into Aspen or extend the fixed guideway service from the airport to downtown Aspen.

The Snowmass to Aspen Transportation Plan, completed in 1994, included rail technology as an alternative. Because of the cost of rail options, rail proposals were not considered as cost effective as improved bus technology.

6. Multimodal Facilities

As part of a multimodal approach to transportation, the inclusion of multimodal centers that provide a direct connection between parking and transit, ski area access, or airport access is essential. Multimodal facilities differ from park and rides in that they provide access to more than a bus stop. Multimodal facilities provide parking, a direct connection to transit (bus, rail, etc.), and direct connections to associated land uses such as the airport or the Buttermilk Ski Area. Because of the limited land and street capacity within Aspen, the use of multimodal facilities only on the periphery of the community and linked to downtown Aspen by rail, is included in this analysis. The multimodal facilities are in addition to the numerous existing and proposed park and ride facilities within the Roaring Fork Valley.

A free parking lot was opened in January 1995 as a complimentary measure to the paid parking program in Aspen. The lot consists of 340 parking spaces located southeast of the airport and is the last free lot heading east into Aspen. The shuttles servicing the lot and the Aspen Airport Business Center average 300 one-way person trips per day and provide 10 minute headways during the peak periods (30 minute headways all other times).

7. Long-Term Transportation Planning Options

Consideration must be given to both short-term (0 to 20 years) and long-term (20+ years) transportation requirements. The alternatives analyzed should provide the community with options for future phasing or implementation of technologies that are currently new or unproven. A separate transit envelope reserved for future transportation options would allow for the creation of an integrated and multimodal approach to transportation within the Roaring Fork Valley. Another option that should remain open is the implementation of new TM strategies. This element of the transportation solution is discussed in **Chapter II: Transportation Management.**

D. TRAFFIC CHARACTERISTICS

Existing traffic congestion is a primary issue associated with the need for improvement of the State Highway 82 transportation corridor. The characteristics and extent of this traffic congestion are discussed below.

1. Existing Traffic

1a. Traffic Operations

Traffic operations are affected by the type of roadway, the number of vehicles on the roadway, the ability of vehicles to pass slow-moving vehicles, the percentage of trucks on the roadway, vehicle speeds, terrain type, and weather. Traffic operations vary by location, season, time of day, and travel direction.

Highway traffic congestion is expressed in terms of Level of Service (LOS) as defined by the ***Highway Capacity Manual***[3] (HCM). LOS is a letter code ranging from A for excellent conditions to F for unsatisfactory failure conditions. Completely free-flow conditions with no restrictions caused by traffic conditions are described as LOS A. LOS F represents forced or breakdown flow of the traffic stream, characterized by the familiar traffic jam. LOS B through LOS D describe progressively worse traffic conditions. The conditions defining the LOS are summarized from the HCM in Table I-1.

[3] Transportation Research Board. ***Highway Capacity Manual.*** Special Report 209, Third Edition, 1994.

Table I-1
Descriptions of Level of Service

Level of Service	Description
A	Represents the best operating conditions and is considered free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
B	Represents reasonably free-flowing conditions but with some influence by others.
C	Represents a constrained constant flow below speed limits, with additional attention required by the drivers to maintain safe operations. Comfort and convenience levels of the driver decline noticeably. Level of Service C is the Colorado Department of Transportation's design service level (design capacity) for rural highways.
D	Represents traffic operations approaching unstable flow with high passing demand and passing capacity near zero, characterized by drivers being severely restricted in maneuverability. Level of Service D is the Colorado Department of Transportation's design service level for urban highways.
E	Represents unstable flow at near capacity. Level of Service often changes to Level of Service F very quickly because of disturbances (road conditions, accidents, etc.) in traffic flow.
F	Represents the worst conditions with heavily congested flow and traffic demand exceeding capacity, characterized by stop-and-go waves, poor travel time, low comfort and convenience, and increased accident exposure.

The entire section of State Highway 82 within the study corridor operates at LOS E or F during peak summer and winter seasons for much of the day. The maximum capacities for several sections of the State Highway 82 study corridor are shown in Table I-2 and are compared with the existing average summer peak-hour volumes.

Based on the existing LOS shown in Table I-2, it is clear that the traffic operations on State Highway 82 dictate the need for transportation improvements within the study corridor.

Table I-2
State Highway 82 Existing Level of Service
1993 Summer Average Peak Hour

Section (Mileposts)	Average PM Peak Hour Volume	Percent No Passing Zones	Truck Percentage	Maximum Capacity [1/]	Level of Service
Buttermilk Ski Area to Maroon Creek Bridge (38.5 to 39.2)	1,950	65%	8%	2,420	E
Maroon Creek Bridge to Maroon Creek Road (39.2 to 39.8)	2,030	80%	8%	2,420	E
Maroon Creek Road to Cemetery Lane (39.8 to 40.1)	2,280	100%	8%	2,420	E
Cemetery Lane to 7th Street and Main Street (40.1 to 40.5)	2,430	100%	8%	2,260	F

1/ Maximum capacity is the hourly flow rate under ideal conditions of Level of Service E. The definition of capacity assumes that good weather and pavement conditions exist. At capacity, no more vehicles can reasonably be expected to traverse a section of roadway during the given time period under prevailing roadway, traffic, and control conditions. The capacity for the Cemetery Lane to 7th Street and Main Street is less due to lower speeds through the S-curves.

1b. Variation by Location

Traffic volumes on State Highway 82 near the entrance to Aspen vary considerably by location. Figure I-3 shows the increasing traffic volume between the Buttermilk Ski Area and the Castle Creek Bridge into Aspen. The annual average volumes represented in the figure are taken from CDOT traffic counts for 1993. The largest volume occurs at the Castle Creek Bridge. Traffic in the year 2015 is expected to have a similar pattern with the highest volumes crossing the Castle Creek Bridge.

1c. Seasonal Variation

Figure I-3 shows the 1993 average annual, winter, and summer traffic volumes at several locations between Buttermilk Ski Area and the entrance to Aspen. The unique character and recreational opportunities of the Roaring Fork Valley attract many visitors to the area, especially during the summer and winter months. Figure I-4 is a graph of the traffic fluctuation during a 12-month period at the Castle Creek Bridge. The graph shows the percentage of annual average daily traffic (AADT) for each week in 1993. The traffic

Figure I-3
1993 Daily Traffic and Peak Hour Volumes
State Highway 82 Entrance to Aspen Study Corridor

AVERAGE DAILY TRAFFIC

Location	*Annual*	*Winter*	*Summer*
1 - Buttermilk to Maroon Crk. Bridge	19,100	19,900	22,900
2 - Maroon Crk. Bridge to Maroon Crk. Rd.	19,800	20,700	23,900
3 - Maroon Crk. Rd. to Cemetery Lane	22,300	23,300	26,900
4 - Cemetery Lane to 7th St. and Main St.	23,800	24,800	28,600

PEAK HOUR TRAFFIC

Location	*Winter*	*Summer*
1 - Buttermilk to Maroon Crk. Bridge	1,690	1,950
2 - Maroon Crk. Bridge to Maroon Crk. Rd.	1,760	2,030
3 - Maroon Crk. Rd. to Cemetery Lane	1,980	2,280
4 - Cemetery Lane to 7th St. and Main St.	2,110	2,430

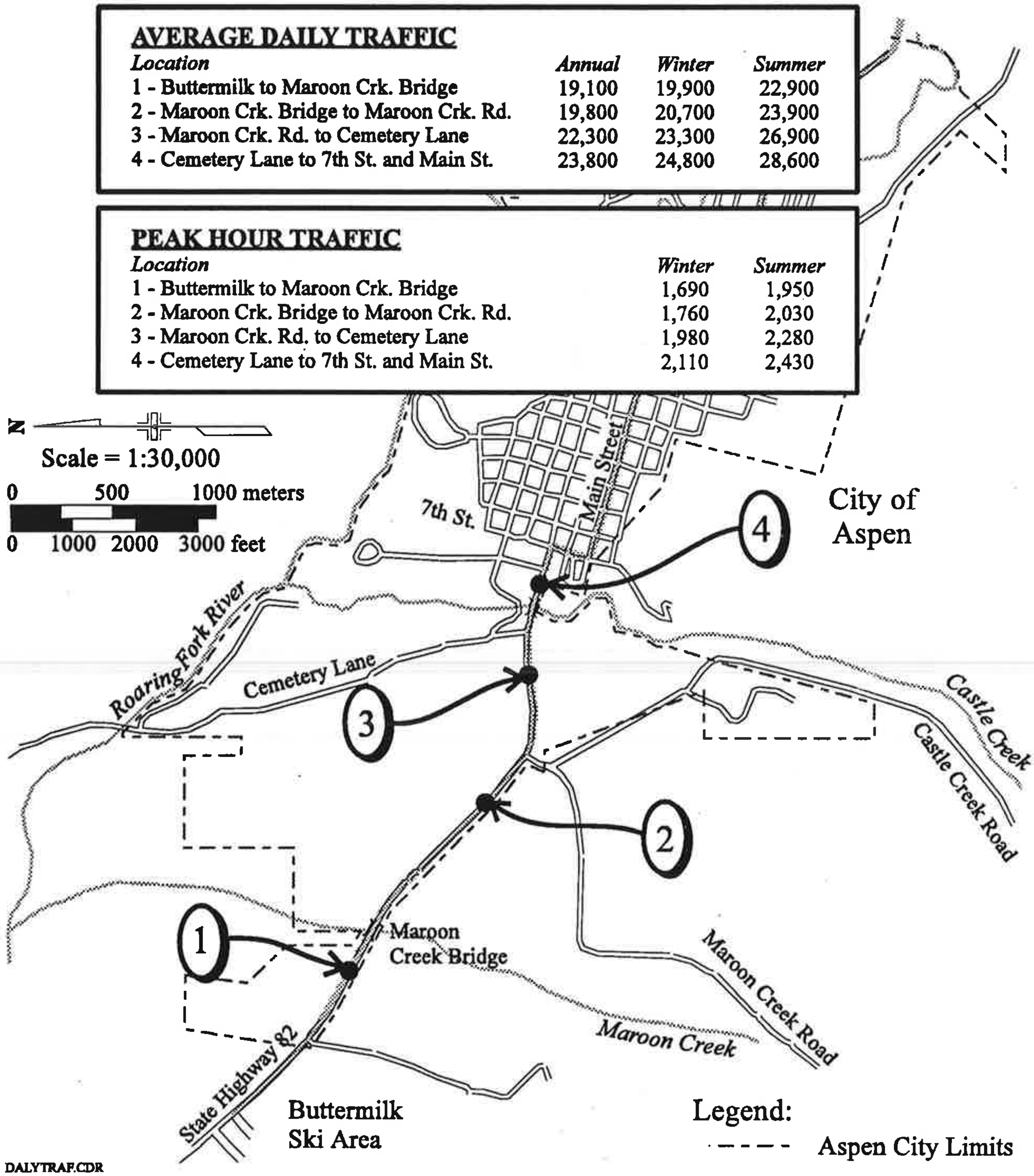


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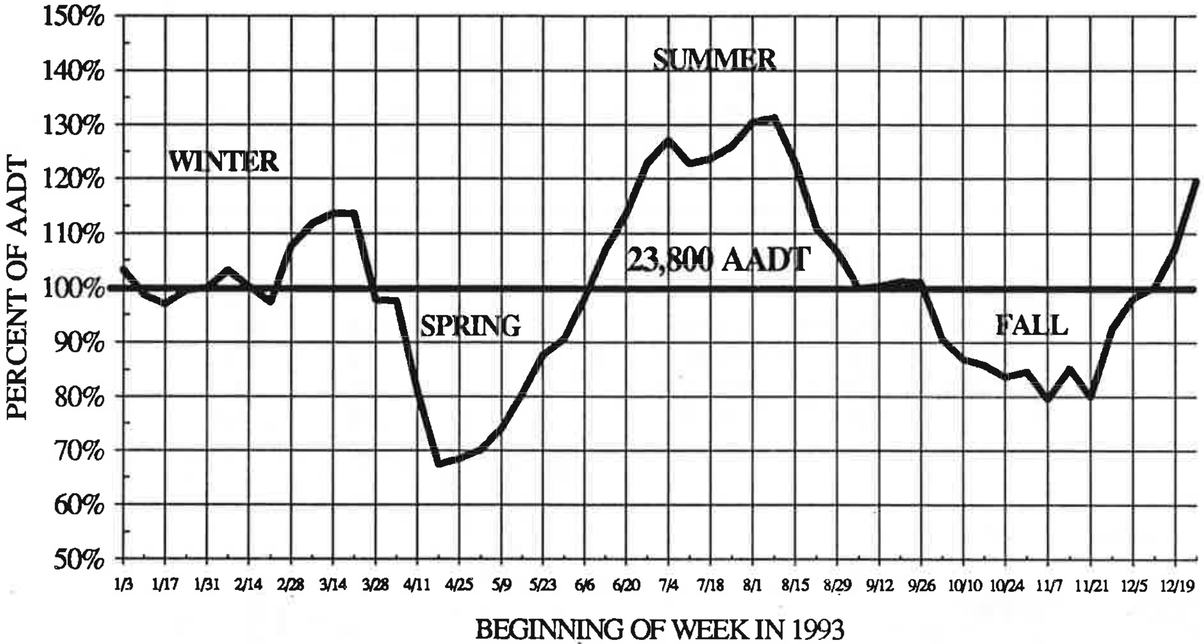
Figure I-4
1993 Seasonal Traffic Fluctuation
State Highway 82 East of Cemetery Lane



volumes presented in the figure are from actual CDOT counts taken in 1993. As shown in Figure I-4, during the summer and winter months the traffic volume on State Highway 82 has very distinct peaks. These peaks coincide with the height of summer tourist season between June and August and the winter ski season from late December through late March. The two predominant winter peaks occur during the winter holiday period and the early spring break period. The average winter and summer volumes exceed the AADT volume by approximately 4 percent and 20 percent, respectively. This pattern has been documented in the past and is expected to continue into the future.

The existence of these two distinct and separate high-volume seasons makes the use of the annual averages for evaluating daily traffic volumes inappropriate. The annual average traffic volume is exceeded by daily traffic volumes during approximately six months of the year, obscuring the real peak congestion periods. The best indicator of peak congestion periods would be the summer average daily traffic when the tourist season is at its peak. The 1993 summer average daily traffic between Cemetery Lane and 7th Street and Main Street was 28,600 vehicles per day.

The concern for air quality in the Aspen PM_{10} non-attainment area is best addressed by the use of the winter average daily traffic volumes. Because PM_{10} is an air quality problem that is most prevalent during the winter months, the winter average daily traffic volume is used to determine mitigation measures for air quality. Detailed discussions of air quality appear later in **Section IV.C.1: Air Quality.**

1d. Variation by Time and Direction

Figure I-5 and Figure I-6 show hourly traffic fluctuation for average winter and summer days, respectively, east of Cemetery Lane. There is a noticeable difference in the distribution patterns between the winter and summer hourly volumes.

The winter hourly distribution is largely dependent upon the opening and closing of the local ski areas. Figure I-5 shows a sharp rise in winter traffic volume between 6 and 8 am, peaking at 9 am. The early peak between 6 and 8 am is primarily caused by commuter and recreational traffic arriving from downvalley to work/school or ski in Aspen. The additional rise in volume between 8 and 9 am coincides with the opening of ski areas in the Aspen area and the end of the morning commute. Traffic volumes drop slightly until mid-day but rise after noon until the evening peak between 3 and 5 pm when employees leave Aspen and skiers travel into and out of the Aspen area.

The summer traffic distribution looks similar to the winter distribution from midnight to 8 am (Figure I-6). After 8 am, the comparison is very different. The summer morning peak rises much sharper than the winter peak and does not have the additional volume after 8 am. Traffic remains at a fairly constant volume with a peak at noon and a peak between 3 and 5 pm. The summer volume is spread throughout the day and, consequently, high congestion levels are fairly consistent from morning to evening.

The peak periods are dependent upon the directional variation of traffic movements throughout the day. The directional variation of the 1993 winter volumes is shown in Figure I-7 for State Highway 82 at Cemetery Lane. In the morning peak period, from 8 to 10 am, the predominant direction of travel is eastbound as 62 percent of the traffic is entering Aspen to work or ski. The peak direction (53 percent) becomes outbound from Aspen (west) during the evening peak period between 3 and 5 pm. The directional variations are caused mainly by commuter traffic from downvalley, especially for the morning peak. Figure I-8 contains a graph of the 1993 summer directional variation that follows the same general patterns as the winter distribution for the same location.

Figure I-5
Daily Traffic Distribution--Winter 1993
State Highway 82 East of Cemetery Lane

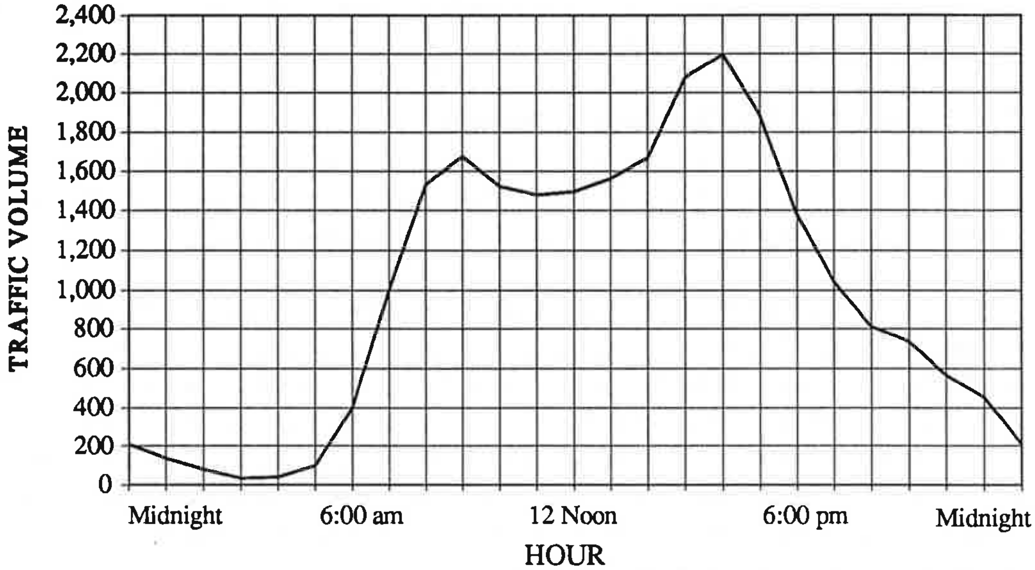


Figure I-6
Daily Traffic Distribution--Summer 1993
State Highway 82 East of Cemetery Lane

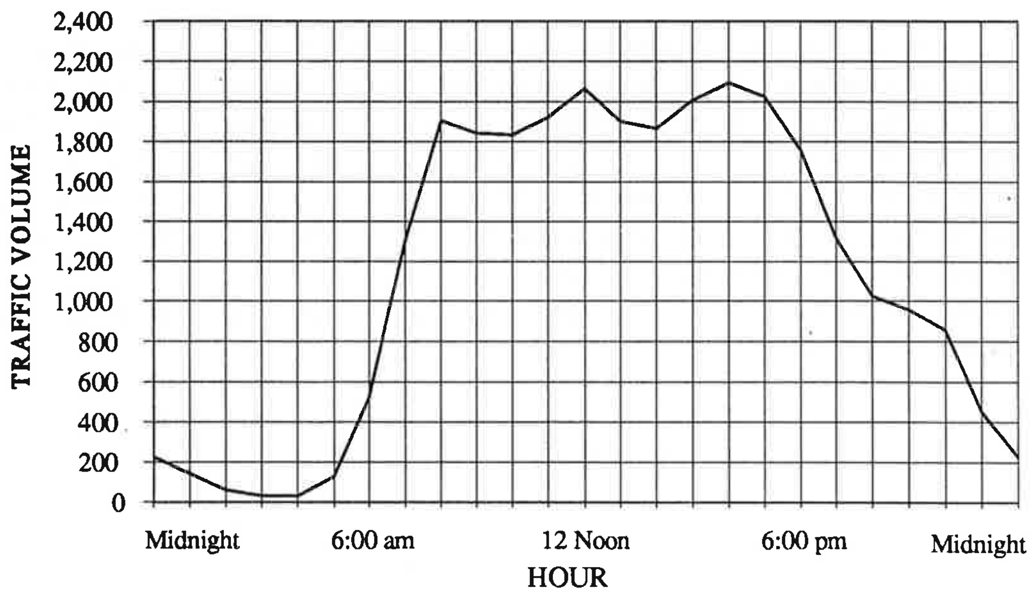


Figure I-7
Directional Distribution--Winter 1993
State Highway 82 East of Cemetery Lane

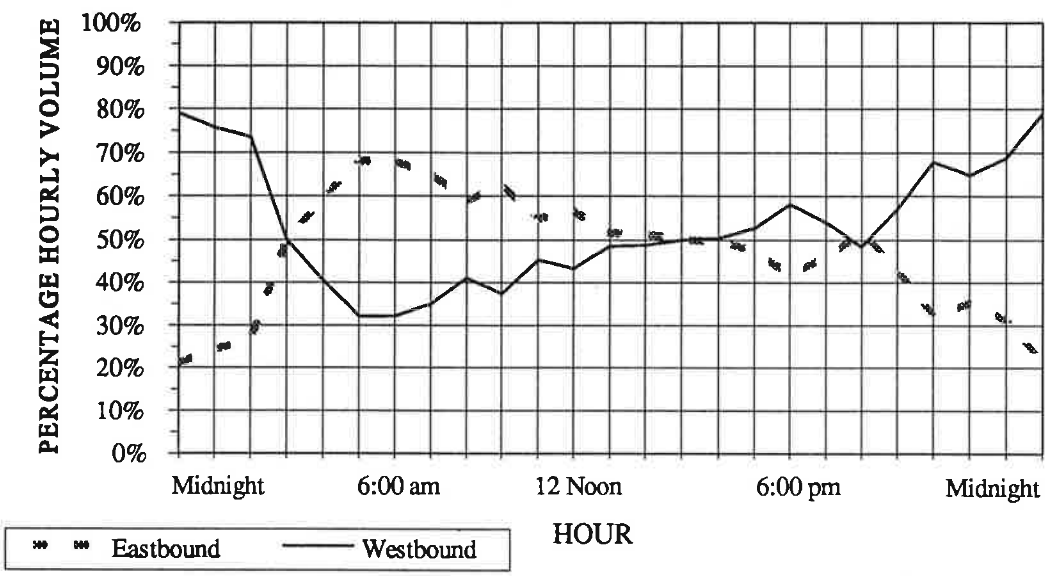
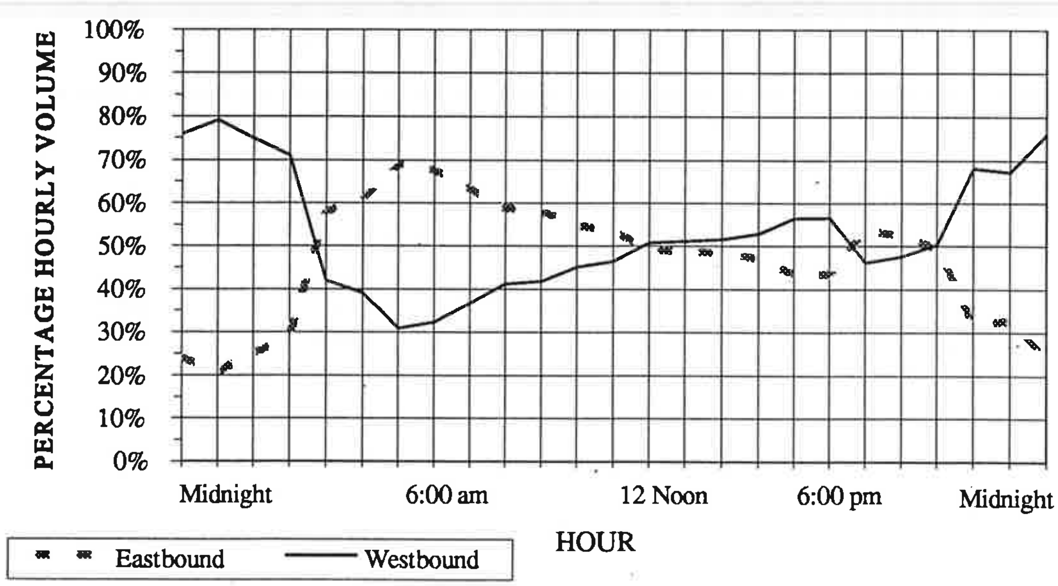


Figure I-8
Directional Distribution--Summer 1993
State Highway 82 East of Cemetery Lane



2. Future Traffic

Traffic on State Highway 82 has increased consistently in the past as development has increased and more people visit the Aspen area. Historically, traffic has grown at an annual rate of 4.4 percent since 1980. Given the high level of existing congestion on State Highway 82, it is important to consider how land use decisions, both within and beyond the study corridor, will impact future travel demand and future traffic.

2a. Future Traffic Volumes

Part of this EIS process includes the development of a transportation demand model. The model uses data from both summer and winter origin and destination surveys to forecast the number of people making trips (person trips) in the Roaring Fork Valley. Using average vehicle occupancy (AVO) rates from the origin and destination surveys, the forecasted person trips are converted into forecasted vehicle trips or traffic demand on State Highway 82. The results of this model show that traffic demand on State Highway 82 across Castle Creek is expected to increase approximately 50 percent between 1994 and 2015 unless changes are made in trip-making behavior. This increase in traffic creates the need for transportation capacity improvements on State Highway 82. The transportation demand model is presented in **Section V.A: Transportation Demand Model**. Chapter V also includes a discussion of transportation demand model assumptions regarding travel demand, different modes of transportation, and future traffic volumes.

2b. Future Traffic Operations

Currently, traffic is congested on State Highway 82 between Buttermilk Ski Area and Aspen for increasing periods of the peak seasons. As the traffic increases, the traffic operations on State Highway 82 are expected to get even worse. The existing highway reaches capacity at about 2,300 vehicles per hour (vph) at Cemetery Lane. For the No-Action Alternative, future traffic demand for 2015 high growth scenario at Cemetery Lane is forecasted to be 42,000 vehicles per day during the summer and 36,400 vehicles per day during the winter. With the afternoon peak hour accounting for 8.5 percent of daily traffic, the summer traffic demand would be 3,600 vph during the pm peak hour. The capacity of the existing highway would be extremely insufficient and would not handle the forecasted traffic demand during the pm peak hour. Even under the most ideal conditions[4], an improved two-lane, two-way highway reaches capacity at 2,800 vph. The existing highway would need to operate at capacity (LOS F) for 16 hours a day to process the summer demand of 42,000 vehicles. The LOS on State Highway 82 is expected to further deteriorate well below acceptable levels, for longer time periods, along the entire study corridor if steps are not taken to mitigate the increasing traffic congestion.

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[4] Ideal conditions for a two-lane rural highway: design speed ≥60 mph, lane width ≥12 feet, clear shoulder width ≥6 feet, no "no passing zones," only passenger car vehicles, 50/50 directional split, level terrain, and no impediments to through traffic due to turning vehicles or traffic control.

2c. Future Land Use

ISTEA clearly recognizes the strong correlation between land use and travel demand. While the City of Aspen and Pitkin County, through the adoption of the Aspen Area Community Plan, continue to promote affordable housing in close proximity to jobs and to manage the rate of development within their jurisdiction, large scale development continues throughout the State Highway 82 corridor. Last year, in Carbondale alone, the Town reviewed three new subdivisions, which at build-out, would result in an addition of 933 more housing units mid-valley. Garfield County has had five major residential subdivisions under consideration or in the preliminary building stages since 1994. Several ski area expansions are currently underway at Burnt Mountain in Snowmass Village and at Aspen Highlands. These developments create additional travel demand and result in increased traffic. Additional bus service throughout the valley, the development of park and rides throughout the corridor, and other TM measures have helped manage the traffic resulting from the tremendous increase in residential units throughout the valley. However, the transportation model demonstrates that even with very aggressive measures to get vehicles off the road, the existing capacity of State Highway 82 needs to be upgraded to meet current travel demand.

E. SAFETY

1. Traffic Safety Characteristics

State Highway 82 between Buttermilk Ski Area and Aspen has had worse than average accident rates for more than 20 years. An evaluation of accident statistics is presented to demonstrate the extent of the safety problem.

Accident statistics for State Highway 82 from Buttermilk Ski Area to Aspen (7th Street and Main Street) were compiled for three years from April 1, 1991 to March 31, 1994. A summary of this accident analysis by highway section is contained in Table I-3, along with average Colorado rural and urban accident rates for similar highways.

There were 113 total accidents between Buttermilk Ski Area and Aspen during the three-year period; 38 of these were injury accidents. Fifty of these accidents occurred between Cemetery Lane and the intersection of 7th Street and Main Street, including 12 injury accidents. Of these 50, 38 occurred (over 1/3 of the 113 total accidents) between 8th Street and the intersection of 7th Street and Main Street (S-curves). No fatalities occurred during this three-year period. Many of the accidents that occurred at the S-curves were caused by a combination of poor weather conditions and substandard roadway design. The total accident rate for the Cemetery Lane to 7th/Main section is 4.48 accidents per million vehicle miles traveled (acc/ MVM). This rate is 386 percent of the average rural Colorado rate of 1.16 acc/MVM and 149 percent of the average urban Colorado rate of 3.00 acc/MVM. State Highway 82 has been well above the average state accident rate in the past, and this trend is expected to worsen until appropriate transportation improvements are made.

Of the 113 total accidents between Buttermilk Ski Area and Aspen, five of these involved bicycles and one involved a pedestrian. The majority of the bicycle accidents (four out of five) took place at intersections. Four bicycle accidents occurred on the S-curves between 8th Street and the intersection of 7th Street and Main Street. The pedestrian accident occurred around the Aspen City Golf Course. Of these six accidents, there were five injuries and no fatalities.

Table I-3
Aspen Entrance Accident Rates for Three Years
April 1, 1991 - March 31, 1994

Section	Section Length km(Miles)	Total Accidents	Accident Rate *	Injury Accidents	Inj Acc Rate *1	Property Damage Only	Prop Dmg Rate *
Buttermilk Ski Area to Maroon Creek Road	2.08 (1.29)	47	1.71	18	0.65	29	1.05
Maroon Creek Road to Cemetery Lane	0.48 (0.30)	16	1.9	8	0.95	8	0.95
Cemetery Lane to 7th/Main (S-Curves)	0.61 (0.38)	50[2]	4.48	12	1.08	38	3.41
STATEWIDE, 1992							
Federal-Aid Primary (Rural)	6,084 (3,781)	4,638	1.16	1,765	0.44	2,874	0.72
Federal-Aid Primary (Urban)	827 (514)	12,966	3.00	4,451	1.03	8,515	1.97

* Total accidents, injury, and property damage rates are per million vehicle miles of travel. Aspen area rates are expressed as an annual average for three years.

1 This rate is for the number of injury accidents per million vehicle miles traveled, not the number of persons injured. Because there may be multiple injuries in accidents, the injury rate per person is higher.

2 Thirty-eight (75 percent) of these accidents occurred between 8th Street and the intersection of 7th Street and Main Street.

2. Emergency Access

When the City of Aspen or Pitkin County experiences a situation that requires the movement of emergency vehicles on State Highway 82, these vehicles are often significantly delayed by traffic congestion. If State Highway 82 were to be closed, particularly at the Castle Creek bridge, due to a hazardous material spill, a major traffic accident, or another significant event, emergency response could be completely jeopardized with no access into or out of Aspen.

In addition to public emergency response vehicles, numerous private vehicles must also use State Highway 82 for medical emergencies en route to Aspen Valley Hospital (located on Castle Creek Road). Traffic congestion and lack of alternate routes across Castle Creek create additional hardships for those with medical emergencies.

Although the need for improved access on State Highway 82 is clear for emergency access purposes, it is even more important to provide alternate access across Castle Creek. If an accident occurred on State Highway 82 at the Castle Creek Bridge, it would close the only crossing of Castle Creek sufficient enough to safely provide emergency access into and out of Aspen. Some traffic would be able to use the existing crossing under State Highway 82 on Power Plant Road, but this bridge across Castle Creek has load restrictions which would prevent some emergency vehicles from using this route.

3. Roadway Deficiencies

Roadway deficiencies affect both the capacity and safety of State Highway 82. Geometric deficiencies on State Highway 82 include narrow shoulders, sharp curves (S-curves), lack of acceleration and deceleration lanes, and the presence of numerous private access points onto the highway. Access points represent traffic "conflict" locations and introduce the increased potential for accidents. These access points also reduce the capacity of the roadway and impact the traffic operations.

CDOT design standards for rural, noncurbed highways require a minimum of 3.0 meters (10 feet) of shoulder width for emergency parking. The average shoulder width for State Highway 82 between Buttermilk Ski Area and Maroon Creek Road is 2.0 meters (6 feet). The average shoulder width between Maroon Creek Road and Cemetery Lane is less than 2.0 meters (6 feet). Sharp curves at 7th Street and Hallam Street and 7th Street and Main Street also pose a hazard to the motorist. CDOT design standards for low-speed urban arterials require a minimum horizontal radius of 50 meters (150 feet) at 40 kilometers per hour (km/h) (25 miles per hour [mph]). The existing S-curves have radii of 25 meters (80 feet), corresponding to safe speeds of less than 20 km/h (15 mph).

F. ECONOMIC CONDITIONS

The economy of the Aspen area is primarily based on tourism and related commerce. A critical element of providing service to visitors and guests is the provision of adequate transportation facilities. These transportation facilities are needed not only to improve access to the Aspen area, but also to sustain economic conditions. Also, the current transportation system is critical for workers who serve the tourist industry. Limited access to the City of Aspen creates traffic delay which results in greater shipping supply costs and worker costs. The quality of life for residents and visitors will be compromised due to delay, noise, and other impacts generated by the congestion of State Highway 82.

I. Purpose and Need

The need for adequate transportation facilities is evidenced by the high level of interest in transportation issues and the willingness of both City of Aspen voters and Pitkin County voters to pass sales tax increases to fund transportation services and improvements.

Improvements in transportation systems are instruments of economic sustainability in recreational areas. Examples include the development of Summit and Eagle Counties on the western slope of Colorado after construction of the Eisenhower Tunnel on Interstate 70 and the significant increase in skier visits experienced by Steamboat Springs when commercial air service was added to the Steamboat regional airport.

Annual population growth continues in the Aspen area at an estimated rate exceeding 2-1/2 percent. Economic vitality at this rate of growth can only be sustained by providing adequate transportation service to the community. Improvements to the transportation system are essential to provide this type of service. Although it is clear that transportation improvements to the State Highway 82 corridor are needed, it is not clear how those improvements will best be accomplished to provide the best service and value to visitors, guests, and residents. The purpose of this project is to identify the best combination of transportation services that meet the project objectives and Aspen's growth plan.

II. Transportation Management

A. INTRODUCTION

Transportation management (TM) refers to programs and policies designed to reduce travel demand and to improve utilization of the transportation system. Those actions seeking to reduce demand are often referred to as transportation demand management (TDM). Similarly, those applied to improve the use of existing transportation systems are referred to as transportation systems management (TSM). Both TDM and TSM are subsets of TM. TM programs and policies include a variety of incentives and disincentives directed primarily at drivers of single occupant vehicles (SOV).

The purpose of introducing transportation management as part of this Draft Environmental Impact Statement (DEIS) is to show the potential of TM for changing travel behavior and reducing SOV travel demand within the project corridor. When used as an overlay to the alternatives, which are evaluated in the next chapter, TM programs can both reduce the growth of travel demand and alleviate some of the traffic congestion.

TM can also be a stand-alone opportunity not necessarily related to the transportation improvements of State Highway 82. Because TM programs can be implemented by local government and the private sector without federal funding, environmental clearances are usually not required. Within this context, TM is presented here as a supplemental overlay to the alternatives described in **Chapter III: Alternatives.**

This chapter describes:

- TM actions
- TM packages developed for Aspen
- TM applications to the No-Action Alternative

B. TRANSPORTATION MANAGEMENT ACTIONS

The intent of a TM measure is to encourage people to select transit or carpools as an alternative to SOV trips, or to combine or eliminate trips. A TM measure can accomplish this by either incentives or disincentives or both.

1. Incentives and Disincentives

An effective TM program includes a combination of incentives and disincentives that affect both the demand for travel and the use of the existing capacity.

Incentive TM measures tend to be either improvements to SOV alternatives or supporting measures. Alternatives to SOV travel include transit, carpooling, bicycling and walking. Transit is the most practical alternative for most, particularly for the work commute. Carpooling is another good alternative for many, and more so if those in a carpool receive some additional incentive such as discounted paid parking or use of High Occupancy Vehicle (HOV) lanes. Pedestrian and bicycle modes are usually less attractive due to trip length and weather.

Because transit is the most practical option to SOVs for most commuters, it should be made as attractive as possible. To compete with the automobile, it must be convenient. Increasing the frequency of transit service and providing direct origin-to-destination service is the first step to shifting riders from SOVs to transit. If transit can reduce trip time through use of dedicated vehicle and/or transit lanes or separate transitways, it becomes an even more attractive alternative. Transit must also be offered at a price which will appeal to potential riders. If the perceived cost of driving is less than the transit fare, it will be difficult to shift people from their cars into transit.

Experience indicates that the most effective TM measures are disincentives, such as paid parking or congestion pricing (although experience with congestion pricing is limited). Even though driving a car carries a considerable price in addition to the fuel costs (such as vehicle depreciation, insurance, and maintenance), these costs are generally not recognized by the driver. Attaching a specific price to each trip with disincentives, such as paid parking and roadway tolls, will increase the awareness of the cost of driving. Roadway tolls are best accepted in corridors where new capacity or new roadways are being developed. The costs associated with these measures will cause some people to not make a trip at all, and others to seek out alternative transportation.

The most successful TM program will incorporate the strategies such as those mentioned above, and a number of supporting measures such as carpool ridematching and the guaranteed ride home. Examples of these and other incentive TM measures are shown in Table II-1 with a brief description and their potential effectiveness in the Aspen area.

Disincentive measures discourage driving, particularly for SOVs. For example, increased parking costs for SOVs are a disincentive to driving alone. Other examples are shown in Table II-2. Disincentives such as paid parking or congestion pricing are usually more effective in reducing trips than are incentives. However, incentives are an integral part of a TM program, because they provide travel options to persons affected by disincentives. These TM measures are described in greater detail in the ***Transportation Measures (TM) Technical Report,*** TDA Inc., May, 1995 (see **Chapter IX: Availability of Technical Reports** for a complete list of technical reports). For each measure, the document provides a brief description, optional elements, administrative considerations, costs, potential travel behavior impacts, and a brief description of experiences elsewhere.

Table II-1
Transportation Management Incentive Measures

TM Measure	Definition	Effect
Transit Expansion	Increased transit frequency and/or increased service area.	Improved downvalley and local transit service makes transit more convenient.
Park and Ride Lots	Free parking lots that provide a place for carpools to meet or for people to catch transit.	Transit and ride sharing become more attractive by shortening travel time.
Seamless Transit Service	Elimination of transfers on popular transit routes.	Reduces travel time for downvalley transit users destined for Aspen.
Rail Transit	Light or heavy rail system that replaces existing express bus service.	Rail provides service between downvalley locations and Aspen instead of express buses. This service is not affected by traffic congestion.
Free or Reduced Transit Fares	Reductions in bus or rail fares through increased public subsidy of transit.	Increases ridership by making transit less expensive compared to auto travel.
HOV Lanes	Special lanes on a roadway that only allow carpools or transit vehicles.	Allows HOVs to travel at higher speeds (equals shorter travel time) on State Highway 82 during congested periods.
Taxi Sweeper	Taxis pick up transit riders after regular transit service hours.	Provides extended service hours. Offers more flexibility to transit riders.
Jitneys	Privately-operated transit vehicles used to supplement regular transit services.	Provides additional service and convenience during times of high demand or to areas with limited service.
Bicycle and Pedestrian Improvements	Bicycle and pedestrian paths or facilities (lockers, racks and showers) to encourage bicycle use.	Bicycle and pedestrian routes in town and downvalley encourage non-motorized travel.
Carpool Programs (Ridematching)	Promotional programs used to match people interested in sharing a ride in a carpool or vanpool.	May target downvalley residents, especially if HOV facilities are built.
Free or Discounted HOV Parking	Provides free or discounted parking for carpools or vanpools.	Provides an additional incentive when a paid parking program is in place.
Preferential HOV Parking	Carpools and vanpools are given preferential parking spaces.	Promotes HOV use by offering incentive, particularly if non-HOV parking is scarce or inconvenient.

Table II-1 (continued)
Transportation Management Incentive Measures

TM Measure	Definition	Effect
Guaranteed Ride Home Program	Allows carpool/transit users free taxi ride in an emergency or if they become stranded in Aspen.	Acts as insurance for those who use transit or carpool to work.
Subsidies	Employer pays for portion or full costs of transit pass or carpool expenses.	Encourages transit ridership by lowering the cost of transit. Especially attractive when transit costs less than parking.
In-town Shuttle Service	A frequently run bus convenient for residents, workers and visitors.	Provides efficient mobility in Aspen without a car.
Travel Allowance (Parking Cash-out)	A monthly sum given to employees for paid parking or to purchase a transit pass.	Employer pays employees a fixed monthly amount and then charges for parking, making SOV less attractive.
Telecommuting	Allows employees to work at home, by setting up home offices.	For applicable jobs, allows reduction in commute trip.
Transportation Coordinator	A person in charge of promoting and administering TM program.	Provides personal assistance in finding travel alternatives.
Commute Information Center	A central location for providing information on transportation alternatives.	Assist tourists, residents, and commuters with information about transportation alternatives.
Real-Time Commuter Info	Current, accurate information on bus schedules, parking availability/price, and congestion.	Commuter decisions based on current, accurate information.
Demand Transit	A system that picks up and drops off people at specific locations when requested by user.	Increases transit's flexibility to allow better service to more areas.
Vanpool Programs	Employer sponsored programs to form and provide employee vanpools.	Vanpools eliminate several auto trips. Works best for those commuting far distances.
Flex-Time/ Compressed Work Week (load management)	Changes in work hours that allow employees to start earlier or later or to work fewer days per week (such as, four 10 hour days).	Certain jobs may allow alternative work schedules to reduce commute trips.

Table II-2
Transportation Management Disincentive Measures

TM Measure	Definition	Effect
Congestion Pricing	A fee charged to driver for use of a roadway facility.	Discourages driving by increasing out-of-pocket costs.
Limited Capacity for SOV drivers	Provides less roadway capacity than needed for uncongested traffic flow.	Limits growth of SOV traffic by allowing traffic to worsen for those unwilling to shift to transit.
Paid Parking	An hourly or daily fee charged for parking.	Discourages trips to Aspen due to higher costs.
Limited Parking Supply	Limits the amount of parking available.	Decreases the convenience of driving personal automobiles.
Licensing Fees or Quotas	Purchased monthly or annual permit to enter or park in an area.	Might negatively affect retail and tourist. Effect is limited, since it doesn't effect daily out-of-pocket expenses.
Gasoline Tax	An additional tax placed on gasoline sales within a certain area.	May result in additional travel to out of area gasoline stations.

Aspen's recent experience with paid parking and increased transit service demonstrates how a successful combination of incentives and disincentives can change travel behavior. Figure II-1 shows a chart identifying the compatibility of different incentive and disincentive measures. For example, a telecommuting program allowing people to work at home complements the policy of limiting the parking supply in Aspen. Note that some actions are solely supportive; for example, a guaranteed ride home program helps remove a barrier to ride sharing by providing an option for late hours or emergencies. However, a guaranteed ride home program by itself is unlikely to cause much traffic reduction.

Figure II-1 distinguishes between TM measures that are within the project corridor and outside the project corridor. TM measures within the corridor are those that are either physically part of the improvements or operate within the corridor. The TM measures which are outside the corridor are typically more area wide policy measures or physical improvements outside the corridor.

Figure II-1
Compatibility of TM Measures
Within and Outside of the Project Corridor

TM MEASURE	Congestion Pricing	Limited Capacity of SOV Lanes	Transit Expansion	Park& Ride/Park & Pool Lots	Seamless Transit Service	Rail Transit	Reduced/Free-Fare Service	HOV Lanes	Taxi Sweeper	Jitney Service	Corridor Bicycle/Ped. Imprvmnts.	Pay for Parking	Limited Parking Supply	Licensing Fees or Quotas	Gasoline Tax	Carpool Ridematch Program	Free/Discounted HOV Parking	Preferential HOV Parking	Guaranteed Ride Home Program	Transit Subsidies	Shuttle Services w/in Aspen	Travel Allowance	Bicycle/Pedestrian Improvements	Telecommuting	Transportation Coordinator	Commute Information Center	Demand Responsive Transit	Vanpool Program	Flexible/Compressed Work Hours
Within the Project Corridor																													
Congestion Pricing		X	X	X		X	X	X				X	X			X					X	X		X			X	X	X
Limited Capacity of SOV Lanes	X							X				X	X			X					X			X			X	X	X
Transit Expansion	X			X	X	X		X	X	X					X				X	X	X	X				X			
Park& Ride/Park & Pool Lots	X		X			X		X		X	X	X	X			X		X	X	X	X					X		X	
Seamless Transit Service			X	X		X		X						X	X				X	X	X	X							
Rail Transit			X	X	X								X	X	X				X	X	X	X				X			
Reduced/Free-Fare Service			X	X	X	X			X				X	X	X					X	X								
HOV Lanes	X	X	X	X	X	X										X	X	X	X		X	X						X	
Taxi Sweeper			X			X													X		X								
Jitney Service			X	X		X							X	X					X	X	X	X							
Corridor Bicycle/Ped. Imprvmnts.		X		X								X	X	X	X				X		X	X	X						
Outside the Project Corridor																													
Pay for Parking			X	X									X				X	X			X	X	X	X					
Limited Parking Supply			X	X								X					X	X			X	X		X					
Licensing Fees or Quotas			X	X									X		X						X	X		X			X	X	X
Gasoline Tax			X			X					X		X	X										X					X
Carpool Ridematch Program				X				X									X	X	X		X	X			X	X	X	X	
Free/Discounted HOV Parking								X				X	X	X		X		X	X		X	X				X		X	
Preferential HOV Parking								X				X	X	X		X	X		X		X	X				X		X	
Guaranteed Ride Home Program			X		X	X			X							X					X				X	X		X	X
Transit Subsidies			X	X		X	X	X	X										X		X	X			X				X
Shuttle Services w/in Aspen			X			X	X				X	X	X	X									X			X			
Travel Allowance			X	X		X	X			X		X					X			X			X		X			X	
Bicycle/Pedestrian Improvements		X									X	X			X				X		X	X							
Telecommuting	X														X							X							
Transportation Coordinator			X	X		X			X	X						X			X	X	X	X		X			X	X	X
Commute Information Center			X	X		X			X	X						X	X	X	X		X		X		X		X	X	
Demand Responsive Transit				X			X					X	X		X														
Vanpool Program	X			X				X								X	X	X	X	X	X	X			X	X	X		X
Flexible/Compressed Work Hours	X				X								X	X	X	X						X		X				X	

X - Denotes compatability of TM measures.

2. Staging Opportunities

TM programs offer opportunity for staged improvements. A step-by-step combination of TM actions could be coupled with roadway improvements. For example, Aspen's paid parking/intercept lot program could be followed by increased transit service, and roadway and HOV lane improvements. Those, in turn, could be followed by more extensive TM (such as variable tolls) and later followed by addition of light rail transit (LRT). These opportunities for staged improvement can be addressed as part of a Preferred Alternative to alleviate the transportation inadequacies of the study corridor.

3. Other Potential Measures

Although this chapter is not an all-inclusive presentation of every available TM measure, it does provide a representative sample of the most applicable types of TM for the Aspen area. Additional measures exist and new ones are continuously being developed. An example is the use of free "loaner" bikes which has recently been suggested for downtown Aspen. A full, contemporary list of potential actions should be considered when, and if, a comprehensive program is designed to meet the specific needs of the Aspen area.

There is a group of TM actions relating to land use changes that work towards reducing demand and encouraging alternatives to SOVs. These include zoning actions affecting the jobs/housing balance or limiting development impacts. These local land use actions are a worthy subject for local consideration, the population and employment projections used in this EIS were based on information and projections contained in the various planning documents for each community. A full discussion on the projections is included in the ***Transportation Demand Model Technical Report*** prepared for this project.

C. TRANSPORTATION MANAGEMENT PACKAGES DEVELOPED FOR ASPEN

Two TM Programs, in addition to the Base Case TM Program, were developed and analyzed to model how driver behavior might change in the study corridor. The TM Programs (Base Case, Moderate, Aggressive) are evaluated assuming that the ***East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement*** (BBFEIS) Preferred Alternative is in place. Although the BBFEIS improvements will be phased in, it was unreasonable for the analysis to consider the phasing and implementation schedule of the BBFEIS. The BBFEIS Preferred Alternative includes an improved four-lane highway between Basalt and Buttermilk Ski Area with two of four lanes between Gerbazdale and Buttermilk Ski Area designated as bus/HOV lanes during peak periods. As part of the BBFEIS Preferred Alternative, a commitment was made to provide park and ride lots near Brush Creek Road and the Buttermilk Ski Area.

II. Transportation Management

The Moderate and Aggressive TM Programs were modeled to assess their impact on year 2015 traffic levels. They are considered to be more extensive than many communities would be willing to implement. Selection of items for the Moderate and Aggressive TM Programs recognized:

- The need to go beyond the actions of the Base Case TM Program.
- The need for relatively major trip making behavior changes in order to meet the City's objective of limiting future traffic to today's levels.

Estimating the benefits of individual TM's is an inexact science, and estimating the benefits of combining several TM's is more complex. For this reason, the Moderate and Aggressive TM Programs each depend on a few primary actions, supplemented by supporting actions that can be adjusted when implemented to achieve the desired result.

Many sources were consulted to estimate the effects of the alternatives and potential TM strategies. A more detailed document, the ***Transportation Management (TM) Applications in Aspen Technical Report***, provides estimated numerical quantification of the potential impacts of a TM measure whenever possible. Assumptions are also provided about the projected impacts of a combination of programs where appropriate. As noted at the Transportation Research Board's symposium on Transportation Management Innovation and Research, "predicting the effects of TM strategies and estimating their benefits is likely to remain an inexact science."[1] It is difficult to isolate the impact of a specific measure. Cumulative impacts and the dependence of one measure's success upon another measure's success must be considered.

The Base Case, Moderate, and Aggressive TM Programs are described in the following sections, along with the assumptions for each.

1. Base Case TM Program

The Base Case TM Program is the benchmark against which the Moderate and Aggressive TM Programs are compared. This program consists of TM measures already implemented as part of the revised 1994 State Implementation Plan (SIP) and adopted by the City of Aspen and Pitkin County to meet the 1990 Clean Air Act Amendments. Base Case TM Program SIP elements include:

- Paid parking charges in Aspen's commercial core (implemented in January of 1995). The charge is approximately $3 per day for on-street parking outside the commercial core area, with on-street metered parking available for shorter durations at a rate of $1 per hour.

- Downvalley park and ride lots.

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[1] Innovation Briefs, Urban Mobility Corporation, December 1993.

- Intercept lot, including free shuttles to and from the lot.

- Expanded mass transit service.

- A cross-town shuttle program in Aspen. This service is currently provided and will be expanded.

- A bus priority lane on Main Street in Aspen. Although this measure has been suspended by the City of Aspen, it is an element of the SIP, and the EIS analysis must include it as a traffic control measure. As of July 1995, there were discussions on removing this measure from the SIP. The measure accounts for less than one half of one percent of the total vehicle miles traveled (VMT) in the nonattainment area. The FEIS and associated conformity funding will reflect the discontinuation of this measure.

The elements in the Base Case TM Program also include the highway improvements committed to in the BBFEIS. The Base Case TM Program elements account for an estimated 5.0 percent reduction in traffic volume on State Highway 82 at Cemetery Lane. The majority of this reduction results from the paid parking program and the effect of the bus/HOV lanes included as part of the Preferred Alternatives in the BBFEIS. The other TM measures (shuttle service, park and rides) in the Base Case TM Program help to further reduce the traffic.

2. Moderate TM Program

The Moderate TM Program includes all elements of the Base Case TM Program in addition to the following:

- A 50 percent increase in transit service (both upvalley and downvalley services) with a corresponding reduction in headways (more frequent transit service) and a 50 percent decrease in bus fares. The expanded transit service takes priority over the decreased bus fares, however, to get the best results both elements are important.

- Parking within Aspen is limited through new development standards and the price of parking is increased by 60 percent over base rates.

Some incentive TM elements which could be included to further reduce traffic congestion include the following:

- Pedestrian and bicycle amenities along the corridor and within Aspen.
- Guaranteed ride home program.
- Travel allowances or transit subsidies to low income families.
- Preferential HOV parking.

3. Aggressive TM Program

The Aggressive TM Program was designed to maintain the existing levels of traffic in the future. The elements of the Base Case TM Program are also assumed for the Aggressive TM Program. Additional elements of the Aggressive TM Program include the following:

- A congestion pricing program charging $3 to $5 per inbound trip. The congestion pricing program includes toll booths located on State Highway 82 west of Castle Creek for eastbound multi-purpose lanes. Special lanes would allow HOVs to bypass the toll stations. The toll booths could provide automated technology for vehicle identification and toll collection (in-motion toll collection for frequent highway users). The in-motion toll collection is accomplished with electronic scanners in the toll booth deducting fees from coded cards carried in the vehicle as it passes the tolling station. A potential aspect of this program is to give regular users a single-trip pass once a week to enter the Aspen area without charge. This encourages users to consolidate trips into one free trip a week.

- An increased subsidy to transit service and improved service over Base Case TM levels. This measure is secondary to the congestion pricing program. Expanded transit service accommodates the need for transportation alternatives developed by the effects of the congestion pricing program. As in the case of the Moderate TM Program, expanded transit service should take precedence over reducing transit fares. Improvements to the transit service can be partially funded by the fees collected from the congestion pricing program.

- A program limiting the supply of parking in Aspen.

Some incentive TM elements which could be included to help meet reduction goals are:

- Pedestrian and bicycle amenities along the corridor and within Aspen.
- Guaranteed ride home program.
- Travel allowances or transit subsidies to low income families.
- Preferential HOV parking.

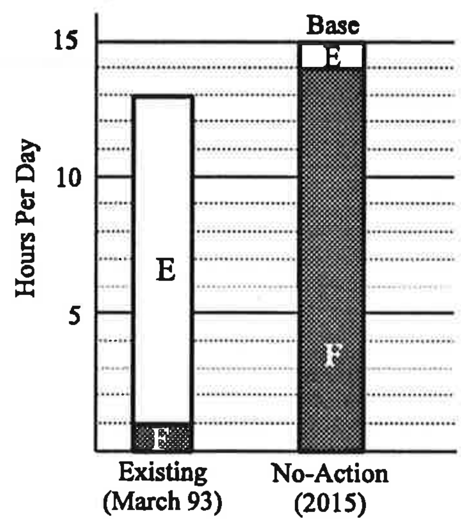
D. TRANSPORTATION MANAGEMENT APPLICATIONS TO THE NO-ACTION ALTERNATIVE

The No-Action Alternative, discussed in **Chapter III: Alternatives**, makes no physical changes to existing State Highway 82 corridor between Buttermilk Ski Area and the intersection of 7th Street and Main Street in Aspen. The travel demand would continue to grow due to the continued growth of the community. Today's winter average daily demand of 44,000 person-trips (24,800 vehicle trips) is projected to increase to 71,000 person-trips (36,400 vehicle-trips) in year 2015 under the high growth scenario. This high growth scenario is based on the forecasts contained in the ***Aspen Area Community Plan***, the ***Midvalley Plan***, the ***Snowmass Ski Area Expansion EIS***, and discussions with the Technical Advisory Committee (TAC). This projected demand would result in average daily traffic volumes of 18,200 vehicles per lane under the existing two-lane No-Action Alternative.

1. Base Case TM Program

The traffic volumes imposed on the existing roadway under the Base Case TM Program condition would result in additional hours of daily congestion. As shown on Figure II-2, level of service (LOS) E or worse conditions would increase from today's 13 hours per day to 15 hours per day in the year 2015 (Table I-1 in **Chapter I: Purpose and Need** defines LOS). Even more critical would be the increase from today's one hour per day at LOS F to 14 hours in year 2015 winter conditions. Speeds would average 16 to 27 km/h (10 to 17 mph) throughout most of the day. It is likely that potential travelers would find the conditions so intolerable that they would avoid making the trip at all. This could be particularly critical for recreation trips and for employment trips related to the recreation/visitor trips. While Aspen is an area of unique historic significance and quality, there are competing opportunities for recreational visitors. Visitors with other recreation opportunities may react to Aspen congestion by going elsewhere.

Figure II-2
Hours at LOS E or Worse for No-Action Alternative
Winter Average Conditions
(existing versus year 2015)



TDMFIG2.CDR

While some might view the result of forcing some trips to not be made at all as an advantage, there is an economic cost. Those trips not made for recreational purposes or to a job have a value to the individuals involved. This value is at least equal to the cost of their trip and possibly the dollar value of expenditures they might make while on that trip. When the opportunity cannot be realized, that value is lost.

2. Moderate and Aggressive TM Programs

The Moderate TM Program's increase in parking prices may have some effect in modifying demand due to transit becoming more price-competitive. However, there will be little benefit to added transit service, because the buses will be required to travel in the same traffic congestion as the automobiles.

The congestion pricing element of the Aggressive TM Program will have a greater effect on travel behavior than the Moderate TM Program. Most current work on congestion pricing focuses on shifting traffic away from peak hours, but with the projected 15 hour period of congestion in the year 2015, there will be few opportunities to shift traffic. There is, for example, a relatively fixed time for the ski-day--starting the ski day at 4:00 pm is not an option.

There is little current experience with the effect of road pricing on dampening total demand. The estimated reduction in person trips with application of the Aggressive TM Program is 9 percent for the No-Action Alternative. A road pricing program in Oslo, Norway brought about an 11 percent reduction in total trips; in Singapore, the trip rate per household dropped 12 percent with a pricing program. For both, there were more losses in social/recreational and shopping/personal business than in the work category.

Figure II-3 shows the estimated effect on winter daily vehicle trips for the Moderate and Aggressive TM Programs to the No-Action Alternative. The portion of Figure II-3 to the left shows total daily projected volumes and suggests that, with the Aggressive Program, future volumes could be reduced to near current levels. The portion of Figure II-3 to the right shows the same information on a per lane basis. Even with the Aggressive TM Program for the No-Action Alternative, 2015 high growth per lane traffic volumes are similar to existing volumes.

Figure II-4 shows the winter daily hours of operations at LOS E or worse. Even with the Aggressive TM Program, the time period of congested operation would be unchanged from today's estimated 13 hours. The estimates suggest that today's one hour at LOS F would be improved to LOS E.

Figure II-3
2015 Winter Average Daily Traffic For No-Action Alternative
High Growth Scenario - State Highway 82 at Cemetery Lane

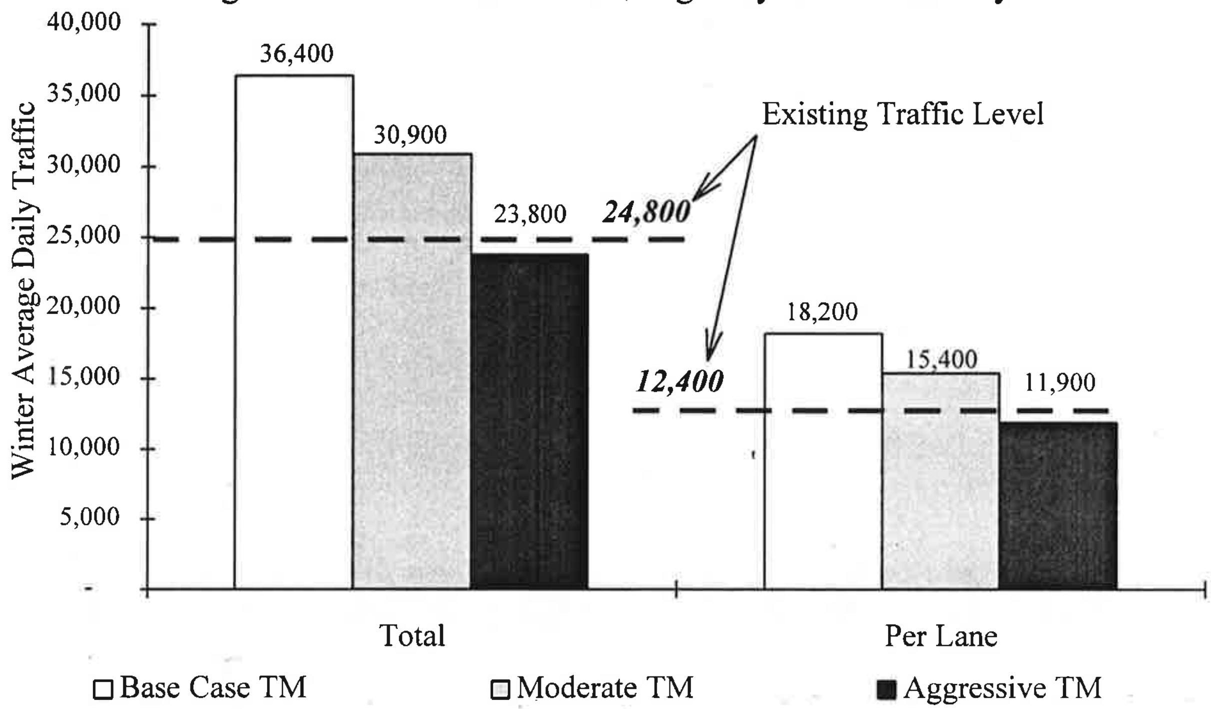
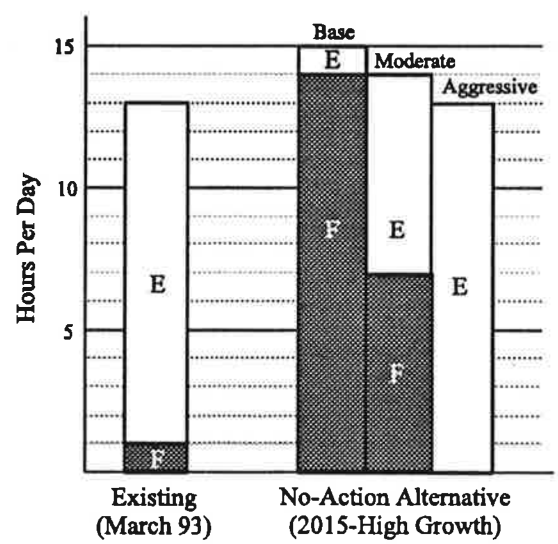


Figure II-4
Comparison of Hours at LOS E or Worse
Winter Average Daily Traffic



3. Social and Economic Impacts

Achieving the Aggressive TM Program under No-Action Alternative is problematic. United States experience suggests that imposing a $3 to $5 congestion pricing fee would be very difficult under the best of circumstances. With the exception of a few new toll-roads, congestion pricing projects have encountered stiff public opposition. Under existing conditions, drivers in the Aspen area would be asked to pay $3 to $5 without any major improvement in congestion or safety.

Current, though limited, experience in the United States suggests strong public resistance to road pricing that provides no new capacity. This program would generally be mostly disincentives with few incentives. This is similar to converting an existing unrestricted lane to an HOV lane. While conversions of existing lanes face stiff public opposition, the idea of building new lanes in the highway median is widely accepted.[2]

Under the No-Action Alternative, no improvements would be made to the existing alignments, including the S-curves.

E. CONCLUSION

Achieving zero vehicle growth on State Highway 82 by applying an Aggressive TM Program to the No-Action Alternative appears to be both unlikely and full of implementation difficulties. The application of TM to the No-Action Alternative will not satisfy the need to improve the traveling conditions on State Highway 82. Even under the Aggressive TM Program the congestion on State Highway 82 in 2015 will be similar to existing conditions with no special treatments for buses, carpools, and shuttle vans. In addition, this combination of TM measures with the No-Action Alternative meets only a few of the ten project objectives defined in **Chapter 1: Purpose and Need.** Application of TM to the build alternatives is much more promising and should be considered as an element of any build alternative to achieve conformity with the Clean Air Act Amendments (CAAA). Application of TM programs to other State Highway 82 improvement alternatives will be discussed in a following chapter.

[2] Prendergast, John, "What Price Congestion Management," Civil Engineering, April 1995.

III. Alternatives

A. INTRODUCTION

This environmental impact statement (EIS) discusses the range of reasonable alternatives that address the purpose and need of the Entrance to Aspen project. As part of this analysis, care has been taken to assure that both long-term transportation options and transportation management (TM) programs are not precluded by the alternatives evaluated. This EIS recognizes the need for a multimodal approach to the transportation problems of not only the upper Roaring Fork Valley (area south and east of the intersection of State Highway 82 and Brush Creek Road) but the entire Roaring Fork Valley (Glenwood Springs to Aspen).

The ultimate long-term solution to the Entrance to Aspen transportation problems will likely be a combination of highway/transit improvements, control of traffic growth, and increased transit usage. While some of the transportation improvements and programs remain the responsibility of the Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA), many techniques are best instituted by the local jurisdictions or the Roaring Fork Transit Agency (RFTA). Besides the Preferred Alternative from the ***State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement*** (BBFEIS), the ultimate long-term solution may include a Glenwood to Aspen fixed guideway system, an improved Aspen to Snowmass transit connection, multimodal centers located in the upper valley, TM measures including but not limited to those in the PM_{10} Air Quality State Implementation Plan (SIP) and the Preferred Alternative developed through this Entrance to Aspen EIS process. It is not an environmentally acceptable solution to make only highway improvements. With this outlook, it becomes apparent that the transportation alternatives evaluated in this DEIS must be compatible with the long-term planning process.

The alternatives evaluated in this section are responsive to the Entrance to Aspen project objectives described in **Chapter I: Purpose and Need**. The options evaluated are of four general categories: potential alignments, potential laneage, potential profiles, and potential travel modes. Because there is an immediate need for transportation improvements and due to the limited financial resources available, several of the transportation modes and technologies that were initially looked at in the screening process were eliminated from the alternatives evaluation in this chapter. These eliminated modes and technologies, however, deserve additional consideration as long-term planning options and have been included as a special topic, **Section III.C.1: Future Travel Modes and Technologies**, within this chapter.

The multimodal alternative evaluation approach is used in response to both new federal legislation and local desires. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 encourages a multimodal approach. The ISTEA addresses not only roadway systems but all potential modes of transportation. It recognizes that transit modes must play an important role in transportation systems and requires the planning of transportation improvements to address these modes. The ISTEA legislation does not require the construction of any particular mode, but it does encourage the development of transportation systems that are economically efficient and environmentally sound.

Local sentiment includes a very strong commitment to the role of transit in the community's transportation system. This is shown by the existing high levels of transit usage, the numerous transit studies commissioned by the communities, and the recent passage of a 1/2 percent sales tax for transit improvements.

The alternatives evaluated provide for the use of TM programs as developed by CDOT in partnership with the local communities. TM measures are defined and explained in **Chapter II: Transportation Management**. TM measures provide opportunities to reduce congestion within the study corridor; but to a certain extent, they are independent of alternatives evaluated in this chapter. TM measures and programs, therefore, are used as overlays that can be incorporated with or without any of the alternatives discussed in this document. This overlay approach to TM is consistent throughout the document.

B. POTENTIAL SYSTEM COMPONENTS (AND OTHER PROPOSED SOLUTIONS)

Many options exist that help to solve the transportation problems in the Roaring Fork Valley. These options include numerous combinations of roadway improvements, transit alternatives, and TM strategies. A balanced solution to the transportation challenge of the State Highway 82 Entrance to Aspen corridor requires highway/transit improvements, control of traffic growth through land use controls and access controls, and increased transit useage. The solution as a whole may be to initiate incremental improvements and programs in the transportation system. This EIS addresses community concerns, avoids short-sighted solutions, and provides direction toward an ultimate long-term transportation solution.

The following discussion includes ideas that the community has developed. Included are discussions of the application of TM strategies to the alternatives evaluated in the EIS, an improved two-lane State Highway 82 with the addition of TM strategies to control traffic growth, the use and location of multimodal centers, and the option of a couplet on the existing S-curves alignment and across the Marolt-Thomas property. Some of these ideas could form part of the ultimate long-term solution; none of these ideas are stand alone solutions.

1. Transportation Management

This section describes the effectiveness of the Moderate and Aggressive TM Programs to the alternatives evaluated in this chapter and discusses the parking implications and potential social and economic impacts. These programs are defined in **Chapter II: Transportation Management.** TM used in conjunction with alternatives which pass the screening process described later in this chapter can provide a viable transportation solution.

The TM programs were applied to several scenarios of alignment and laneage (these scenarios are defined in **Chapter V: Future Transportation Demand**). Two general laneage options are compared in this analysis. The first laneage option is two general highway lanes plus two dedicated vehicle and/or transit lanes. The second laneage option is two improved highway lanes plus transit-only lanes (excludes carpools).

The application of TM programs to the No-Action Alternative is evaluated in **Chapter II: Transportation Management**. The No-Action Alternative analysis suggests that TM programs alone (without transportation improvements to State Highway 82) are not enough to solve the transportation problems of the study corridor.

1a. Application of Moderate and Aggressive Transportation Management to Alternatives Evaluated

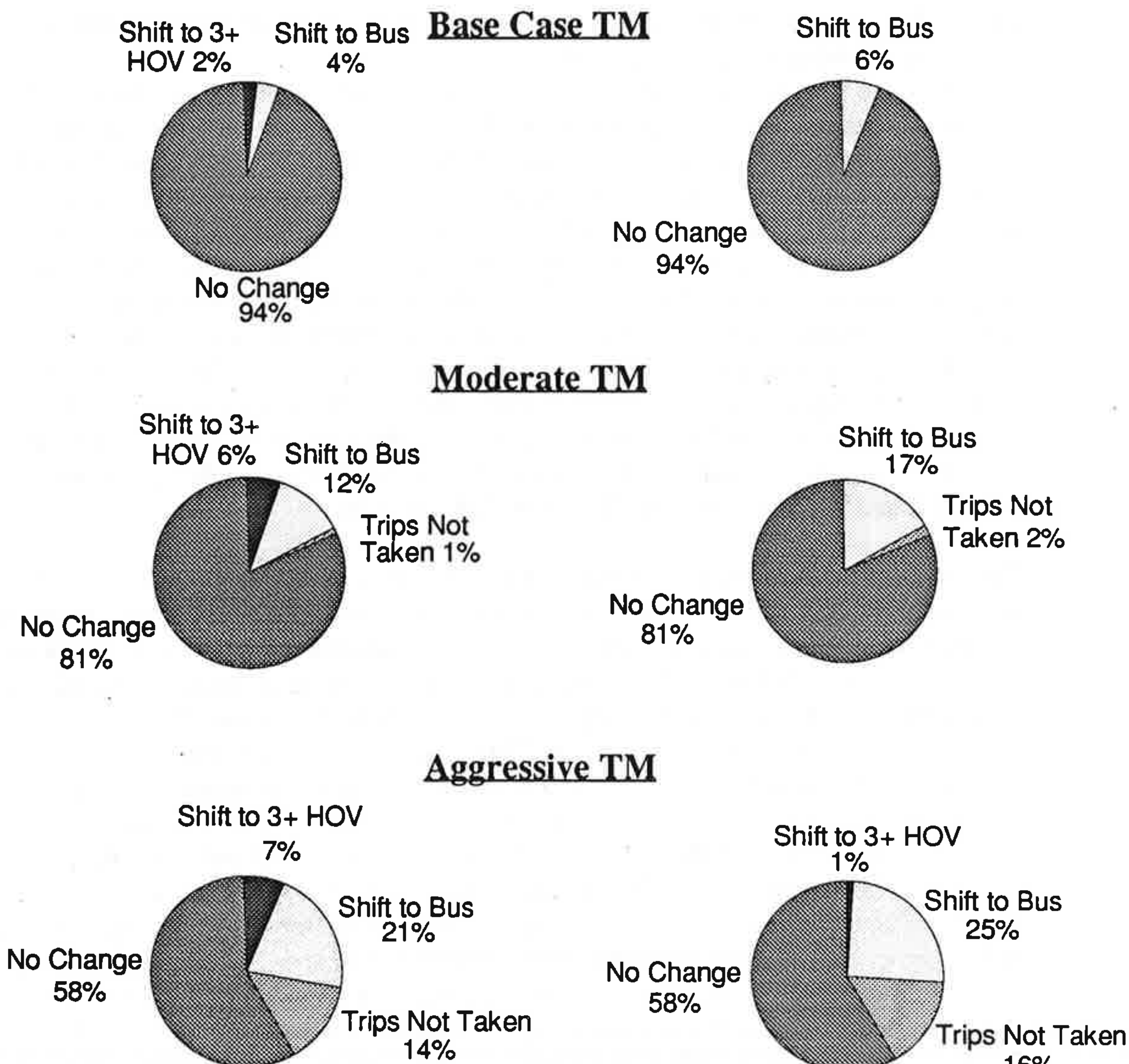
The Moderate TM Program was estimated to reduce traffic volumes on State Highway 82 between 13 percent and 15 percent over the Base Case TM Program. Similar reductions in traffic volumes would be expected for minor arterials, such as Cemetery Lane, Maroon Creek Road and Castle Creek Road. The reductions in vehicle trips come primarily from the increases in parking costs and improved, less expensive transit service. Limiting the parking supply in Aspen serves mainly to support the other TM measures. The Moderate TM Program accounts for an 18 percent shift of single- and double-occupancy vehicle drivers into higher occupancy vehicles, including transit and carpools, and a 1 to 2 percent reduction in vehicle trips because drivers decide not to make the trip. Figure III-1 shows the effect of the three TM programs on the dedicated vehicle and/or transit lanes and the transit-only lanes options. As shown in the figure, the majority of carpools switch to transit under the transit-only laneage option. Additionally, the number of those who decide not to make the trip increased to 2 percent under the Moderate TM Program.

The results of the Aggressive TM Program depend upon the level of congestion pricing set. Because of the lack of current U.S. experience, a certain degree of experimentation may be required to set the congestion price that meets the desired reduction goal. A preliminary estimate in 1995 dollars is that a fee of $3-$5 per entering automobile would achieve a vehicle trip reduction of approximately 35 percent from the Base Case TM Program. In year 2015, the application of the Aggressive TM Program results in a 26 to 28 percent shift of drivers in single- and double-occupancy vehicles into higher occupancy vehicles, including transit and carpools. Overall average vehicle occupancy (AVO) would increase from approximately 2.00 for the Base Case TM Program to about 2.75 under the Aggressive TM Program. This difference in AVO represents a reduction of 13,000 daily winter vehicle trips in the year 2015 for the high growth estimate. In addition, the congestion pricing program in the Aggressive TM Program results in the elimination of about 14 to 16 percent of single- and double-occupancy vehicle trips (that is, drivers who decide not to make the trip). The shift from single- to double-occupancy vehicle trips are summarized in Figure III-1. Under the two dedicated vehicle and/or transit lanes (shared carpool/transit lanes) option, about 28 percent would shift to the dedicated vehicle and/or transit lane (7 percent shift to 3+ HOV

Figure III-1
The Effect of TM Programs on the
Travel Behavior of Single and Double Occupancy Vehicles
with Transportation Improvements on State Highway 82
2015 High Growth Scenario

Two general traffic lanes plus two dedicated vehicle and/or transit lanes.

Two general traffic lanes plus transit-way (excludes carpools).

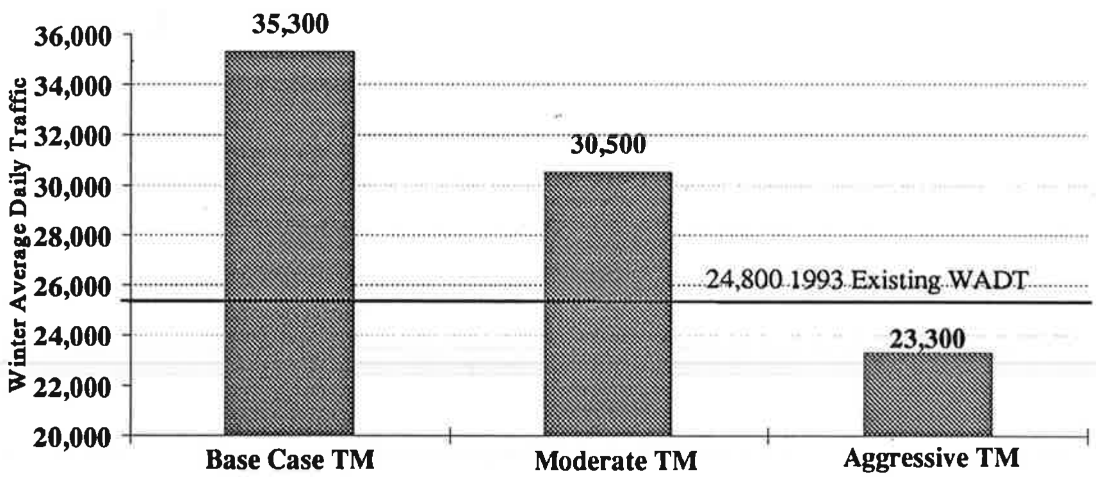


Source: TDA, Inc., 1995

and 21 percent shift to bus) and 14 percent would not make the trip. With a transit option that does not include carpools, double occupancy vehicles would shift to transit and 16 percent would choose not to make the trip. The Base Case TM Program and the Moderate TM Program have little or no impact on the growth of person trips. Congestion pricing, supported by the limited parking and Base Case TM Program, is the primary reason for this large reduction in vehicle trips.

Figure III-2 shows the combined winter average daily traffic (WADT) volumes on the two general highway lanes and the two dedicated vehicle and/or transit lanes for the Base Case, Moderate, and Aggressive TM Programs for the year 2015 high growth estimate. Based on these estimates, the Aggressive TM Program could achieve the objective of maintaining traffic volumes at existing levels.

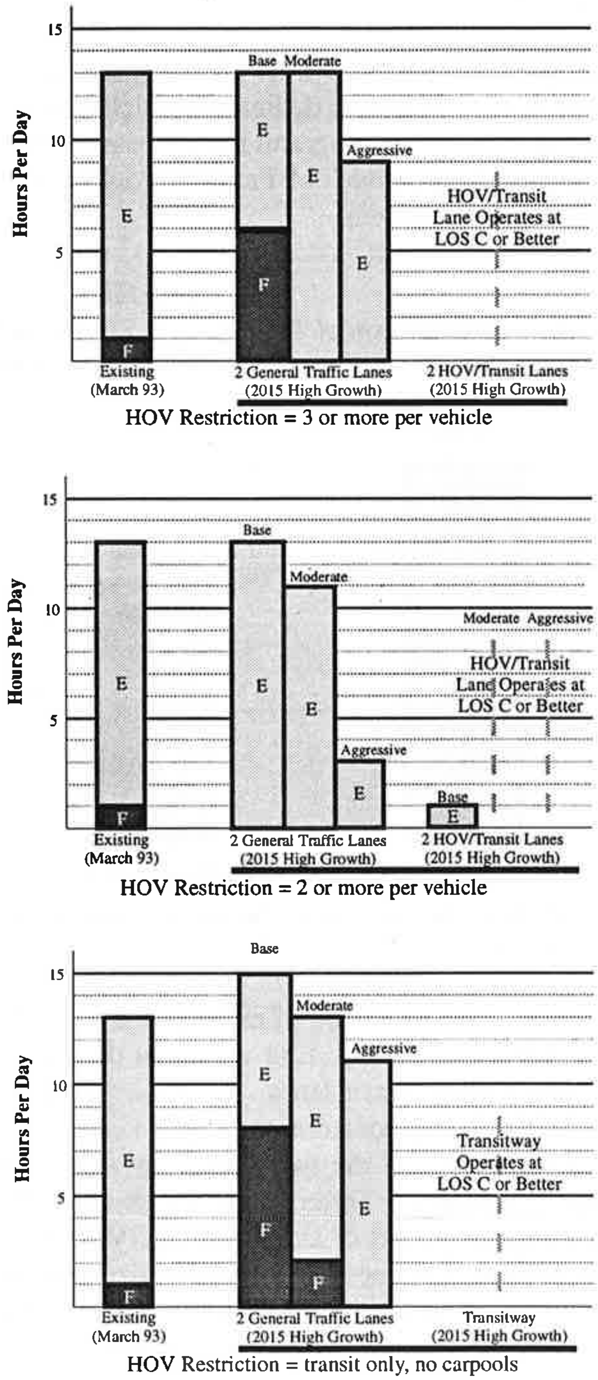
Figure III-2
Comparison of TM Program Effects on Traffic Volume*
with Transportation Improvements on State Highway 82



* 2015 High Growth Winter Average Daily Traffic. Two general highway lanes plus two dedicated vehicle and/or transit lanes assumed for analysis.

Figure III-3 contains a comparison of existing and year 2015 average winter day hours of operation at level of service (LOS) E or worse for the two general traffic lanes and the two dedicated vehicle and/or transit lanes. **Chapter I: Purpose and Need** has a complete description of LOS. To demonstrate the LOS in each lane it was necessary to identify the two general traffic lanes and the two dedicated vehicle and/or transit lanes (for brevity, HOV/transit lanes) separately. Three graphs are shown. The first graph shows the hours at LOS E or worse for both sets of lanes if the HOV/transit lane allows a minimum of three passengers per vehicle. The second graph is similar, however, the minimum occupancy for the HOV lanes has been reduced to two passengers per vehicle. The third graph shows the results if the restricted lanes are limited to transit vehicles only.

Figure III-3
Comparison of Winter Average Daily Traffic Hours at Los E or Worse
Existing versus the Build Alternative
With Two General Lanes and Two Restricted Lanes
(existing versus year 2015 High Growth)



ALTFIG3.CDR

Considering the HOV/transit lanes with a three-person minimum occupancy per vehicle, only the Moderate or Aggressive TM Programs would provide improvements over existing conditions for the general purpose lanes. Under the Base Case TM Program, operations in the general traffic lanes would be more congested in year 2015 than today (with 6 hours of LOS F, compared to 1 hour existing). With either the Moderate or Aggressive TM Program, the general traffic lanes would operate at LOS E or better. For the Aggressive TM Program, the period of congested operations would be reduced from today's 13 hours to 9 hours. At all times the two lanes carrying HOVs and transit operate at LOS C or better. This condition provides a major incentive to HOV travel. However, the disparity in operating conditions between the general purpose lanes and the dedicated vehicle and/or transit lanes may result in significant differences in speeds.

Alternatively, the minimum occupancy on the HOV/transit lane could be lowered to two or more persons per vehicle. This would allow the general traffic lanes to operate at no worse than LOS E under all levels of TM. The impact of the Moderate and Aggressive TM Programs would reduce the number of congested hours to as few as three under the Aggressive TM Program. The HOV/transit lanes would experience a higher level of traffic under the two person minimum occupancy per vehicle. If only the Base Case TM Program is implemented, the HOV/transit lanes would experience a one hour congested period (LOS E).

Finally, the third graph shows the LOS if the restricted lanes were limited solely to transit. Under all three levels of TM, the restricted lanes would operate at all times at LOS A or B, but the traffic in the general purpose lanes would degrade. Under the Base Case TM Program, the congested period increased to 15 hours with 8 of the hours at LOS F. The application of the Moderate TM Program reduces the length of the congested period to 13 hours, but two hours still operate at LOS F. The Aggressive TM Program relieves the worst congestion, but for eleven hours the general purpose lanes will operate at LOS E.

Whether the dedicated vehicle and/or transit lanes are used for transit only, transit and 3+ carpools, or transit and 2+ carpools is a policy decision. This policy decision should consider the project objectives and level of TM program instituted.

More information on the TM programs is available in **Chapter II: Transportation Management** and two separate technical reports: ***Transportation Management Applications in Aspen***, and ***Transportation Management Measures.***

1b. Parking Implications

The Moderate and Aggressive TM Programs will increase the demand for park and ride parking spaces throughout the valley. According to the RFTA, approximately 37 percent of those who currently use transit board the bus after driving to a park and ride location. The same rate was assumed to apply to those who carpool. Calculations based upon the origin and destination of trips to and from Aspen found that between 2,830 to 3,230 new parking spaces (in addition to the 3,150 spaces identified in the BBFEIS) would be needed throughout the valley for the year 2015 under the Aggressive TM Program and high growth scenario. The majority of these spaces would be required at intercept lots and multimodal centers located in the upper valley.

Table III-1 shows the estimated parking demand as stated in the BBFEIS and the number of additional spaces required under the Aggressive TM Program. The large number of spaces indicated at the intercept lot reflects the high number of trips made between Aspen and Snowmass and the capture of Aspen residents destined for downvalley locations who desire to avoid congestion pricing charges. For trips from Snowmass to Aspen, an improved transit connection might be preferred over taking a relatively short drive from Snowmass to an intercept lot. Radio messages or informational display boards could be used to direct commuters to parking locations where capacity exists. Less aggressive TM programs would result in lower parking space requirements.

Table III-1
Park & Ride Parking Spaces Required Under an Aggressive TM Program
Year 2015 High Growth Scenario

Program	Buttermilk/Marolt (intercept)	Brush Creek Road	Basalt	El Jebel	Carbondale	Glenwood Springs	Total
Basalt/Buttermilk FEIS	700	500	500	500	500	450	3,150
Aggressive TM	1,900-2,300	*	580	*	130	220	2,830-3,230
Total Parking Spaces	2,600-3,000	500	1,080	500	630	670	5,980-6,380

* Locations not identified in the origin/destination study. Additional parking demand may occur here.

1c. Social and Economic Impacts of Transportation Management Programs to the Alternatives Evaluated

The social and economic impacts of the Moderate and Aggressive TM Programs must be evaluated in order to assess the costs to groups of individuals and the likelihood that a TM program can be implemented.

Political Feasibility - Unlike the No-Action Alternative described in **Chapter II: Transportation Management**, and later in this chapter, there would be an incentive of a new transit facility with the build alternatives, particularly the dedicated vehicle and/or transit lanes to go with the disincentive of congestion pricing. However, based on limited United States experience, the difficulty of implementing a $3-$5 congestion pricing charge should not be underestimated. The congestion fee is likely to be highly unpopular with both downvalley and upvalley residents who drive the project corridor. Projected reductions may not be achieved because of measures that soften the TM Program, such as discounted monthly passes or limited hours of operation.

Eliminated Trips - There is an economic cost to the community by the trips not made because of increasing congestion or TM disincentives. This would particularly affect the recreational visitors and employees dependent upon those visitors. The likelihood of an internal trip being eliminated because of increasing congestion or TM disincentives would not be as great.

Equity- Equity relates to the fair distribution of the transportation costs as opposed to the transportation benefits received. For example, congestion pricing will have a greater impact on those living downvalley who commute to Aspen than for those living in Aspen. Lower income groups will also be affected more than those with higher incomes. The perception may exist that congestion pricing will price out the lower income groups. Special programs, however, would be designed to respond to some of these inequities. FHWA and CDOT are required to identify and address disproportionately high and adverse human health or environmental effects of projects on minority and low-income populations consistent with Executive Order 12898 on Environmental Justice and Title VI of the Civil Rights Act of 1964.

2. Improved Two-Lane with Transportation Management Measures

The improved two-lane option with TM measures is presented in response to public interest. This is not the same as the No-Action Alternative discussed in **Chapter II: Transportation Management,** and later in this chapter. This is also not the same as the two general highway lanes, exclusive transitway, and TM measures alternative. The discussion which follows is intended to describe only the improved two-lane plus TM concept.

Alignment

The improved two-lane alignment discussed here follows the existing State Highway 82 with improvements to the substandard geometry of the highway. Figure III-4 shows a conceptual layout of this option. These improvements include widened shoulders and travel lanes, adequate turn lanes, and improved roadway curvature. This alignment follows the existing State Highway 82 for the entire length of the project corridor. The S-curves between Cemetery Lane and the intersection of 7th Street and Main Street would be softened to flatten the existing curvature and accommodate a 40 km/h (25 mph) design speed. The curvature improvements to the S-curves would require the acquisition of right-of-way at the southwest corner of 7th Street and Hallam Street and at the northeast corner of 7th Street and Main Street. The right-of-way expansion includes the acquisition of one business on the northeast corner of 7th Street and Main Street. In addition to the curvature improvements, the existing S-curve intersections would be modified to eliminate sidestreet traffic onto State Highway 82.

As shown in Figure III-4, the intersection of 7th Street and Hallam Street is bisected from northwest to southeast with a barrier to eliminate access to the north and east legs of the intersection. The barrier would be mountable for emergency vehicle access only. Access to the Aspen Institute would be through 8th Street. In a similar manner, the south and west legs of the 7th Street and Main Street intersection would also be closed.

Possible Intersection Improvements

Because the operation of State Highway 82 is linked to the intersection operations at Cemetery Lane and Maroon Creek Road, these intersections would also receive improvements under this option. Each of these intersections experience severe congestion during peak traffic periods. Suggestions for improving these intersections include relocating Maroon Creek Road or Castle Creek Road to split the demand at the existing intersection or creating roundabouts at the existing intersections of State Highway 82 and Cemetery Lane and State Highway 82, Castle Creek Road, and Maroon Creek Road.

Maroon Creek Road could be relocated west to an alignment joining State Highway 82 east of the Maroon Creek Bridge (near the golf course entrance). Separating Maroon Creek Road and Castle Creek Road would reduce the demand at the existing State Highway 82 intersection. Another option to separating the two roads would be to realign Castle Creek Road across the Marolt-Thomas property to connect with Cemetery Lane. Both of these options are discussed further in **Section III.F.2: Connections to State Highway 82.**

Roundabouts have been suggested to solve the congestion problem at these intersections. The roundabout could improve the traffic flow in the intersections but would not improve the congested flow along the entire improved two-lane highway. The capacity of the highway corridor would remain virtually unchanged. Roundabouts are discussed further in **Section III.F.2: Connections to State Highway 82.**

Operation of the Improved Two-Lane with Transportation Management

The connection of the improved two-lane State Highway 82 to Main Street does not create a traffic calming[1] environment. Opening up the two-lane roadway onto a multi-lane Main Street would promote increased speeds on Main Street. In the opposite direction, funneling the high volume of traffic from Main Street into the two-lane facility would result in the same congested conditions experienced today.

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[1] Traffic calming refers to the atmosphere of the roadway environment that is conducive to slower speeds. Physical enhancements to provide traffic calming include items such as narrow lanes and landscaped medians.

In this option TM strategies would be implemented to reduce traffic demand. The effectiveness of the TM measures would be similar to that of the TM programs for the No-Action Alternative discussed in **Chapter II: Transportation Management**. The Moderate TM Program may have some effect in modifying traffic demand. However, there would be little impact of adding improved transit service because the buses would be in the same congested lanes as the general traffic. As a component of the Aggressive TM Program, congestion pricing would have a greater effect on travel behavior.

Even with TM programs, the vehicle demand on the improved two-lane roadway would exceed the available capacity. There is no incentive for drivers to use bus transit or carpool because the buses and HOVs operating in the two congested traffic lanes experience the same congestion and delay as non-transit users. It is estimated that in year 2015 the improved two-lane State Highway 82 with TM programs would still experience per lane volumes equal to the existing per lane volumes. This equates to approximately 13 hours of heavy congestion (LOS E) throughout the day.

The improved two-lane with TM programs but without transit improvements may function well in the short-term or as an early phasing step to a higher capacity solution. The long-term outlook for this option, however, does not appear to satisfy the needs of the community. This option would not provide safe and efficient transportation, lacks capacity for future demand, and does not address the need for a multi-modal solution to the transportation problems in the Roaring Fork Valley. Based on the current analysis, implementation of this concept would not satisfy the project objectives.

3. Multimodal Facilities

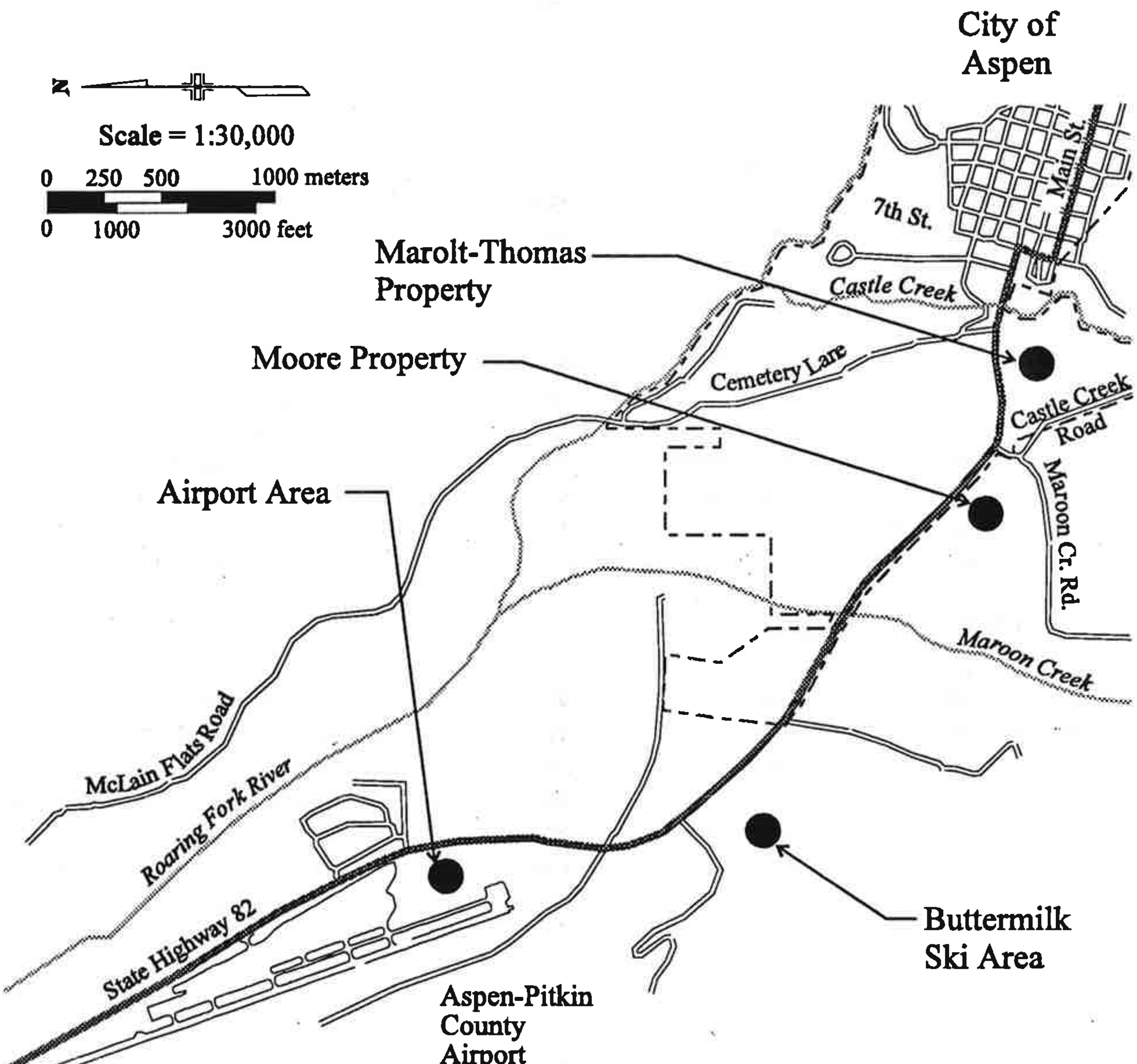
As part of a multimodal approach to transportation, the inclusion of multimodal facilities that provide a direct connection between parking, transit, and ski area access or airport access is an essential part of the long-term transportation solution. Multimodal facilities provide more access to transit opportunities and associated land uses than a park and ride. The importance of these centers is magnified with the use of TM measures, because TM expands the need for park and ride facilities and transit. The purpose of this discussion is to present the multimodal facilities concept and discuss how the concept fits within the various alternatives. Inclusion of multimodal facilities within the alternatives provides a viable solution which meets the project objectives.

The operation of the multimodal facilities is dependent upon its location within the study corridor. Four general areas represent the range of potential locations for multimodal centers:

- Marolt-Thomas Property
- Moore Property
- Buttermilk Ski Area
- Airport Area

Figure III-5 shows these potential locations for the multimodal facility.

Figure III-5
Potential Locations for Multimodal Facilities
in the Aspen Area



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The first and second areas are east of Maroon Creek in the vicinity of the Marolt-Thomas property and the Moore property. An underground parking facility with a direct connection to rail transit has been proposed for either of these locations. The land form of the Moore property would be better suited for an underground parking structure than the Marolt-Thomas property. A rail connection would extend from the multimodal facility to Rubey Park in downtown Aspen. A facility located on either of these sites would serve the day visitors to Aspen. The surface of the facility could be landscaped. Joint land uses compatible with parking and transit, such as employee housing, could be developed adjacent to or on top of the facility.

The third area is west of Maroon Creek in the vicinity of the Buttermilk Ski Area. A parking facility and transit station with a landscaped deck on top of the parking structure has been proposed for the area between the Buttermilk Ski Area existing parking lot and Owl Creek Road. This facility would primarily serve skiers and visitors traveling to Snowmass Village. The fourth facility could be located at the Aspen Airport on a site east of the terminal building. This facility would serve airport users and downvalley commuters.

The parking demand generated by an Aggressive TM Program and the demand identified in the BBFEIS requires a total parking capacity of approximately 2,600 to 3,000 spaces by year 2015 for the high growth scenario in the Buttermilk-Aspen corridor (see Table III-1). A single facility containing 3,000 parking spaces requires 12.1 hectares (30 acres) of land for a single-level parking lot. A multi-level parking structure consumes less space, but the costs can be up to six times higher for a three- or four-level garage above ground while an underground structure can cost 10 times as much. Environmental impacts to the open space properties identified would require mitigation both during and after construction of the facility.

Initial analysis indicates that it is more appropriate to develop three smaller multimodal facilities during the next twenty years instead of building one large facility. Sequential construction of the facilities will enable the community to build joint-use parking facilities that serve the needs of individual segments of the market. For example, the parking location for a day skier at Buttermilk Ski Area is different than for a trip from the Aspen Highlands to downtown Aspen. In addition, phasing of development will allow intercept lot sizes and designs to be tailored to the travel mode. Additionally, the needs of the night parking user, who may be a resident of a residential area developed in conjunction with the parking facility, would be served as well. Sequential construction will also allow phased expansion of a rail transit system that could be developed to ultimately connect downtown Aspen with the airport. This system could also have stops at the Buttermilk and Moore multimodal centers.

The four multimodal centers grouped by the general areas east and west of Maroon Creek are discussed below.

Marolt-Thomas and Moore Property Area - The two options east of Maroon Creek include the Marolt-Thomas property and the Moore property, both of which are designated open space. Operationally, either of the locations is acceptable. The land available provides sufficient space to build a 600-space single-level facility with a landscaped deck on the top of the facility. The sloping terrain at the Moore site would favor a multi-leveled earth sheltered structure. This location may further eliminate trips into Aspen by serving as a parking lot for Aspen Highlands and the Maroon Bells Wilderness. Many of these transit trips currently originate in downtown Aspen at Rubey Park. This site also lends itself well to a pedestrian village and the development of affordable housing for the community.

A multimodal facility (as described above) in this location would cost in the range of $4.5 - $6.0 million to build. This does not include the purchase of land or the operating and maintenance costs.

Buttermilk Ski Area and Aspen Airport Area - The Buttermilk site has been identified by the Aspen Skiing Company and others as a 750-space facility with landscaping and possible active open space fields for soccer or softball on the roof of the facility. This facility is used in the cost analysis of the alternatives to represent the intercept lot discussed in the BBFEIS. The airport facility has sufficient space to be a large multistory structure with an ultimate capacity greater than the 1,650 spaces remaining of the total 3,000 predicted in this analysis[2].

If all parking is priced at the same rate, vehicular parking will not be distributed evenly throughout the various multimodal facilities. For example, a multimodal facility 4.8 kilometers (3 miles) from downtown would attract fewer trips heading towards Aspen than the facility located east of Maroon Creek, which is approximately 1.6 kilometers (1 mile) from downtown. This is because visitors arriving in the area wish to park as close to their destination as possible. Also, congestion pricing would likely be imposed west of Maroon Creek Road. Congestion pricing west of Maroon Creek Road would discourage internal trips[3] leaving Aspen to use the Buttermilk/Airport area multimodal facility since they would pay a congestion pricing fee in addition to the parking fee. Instead the trips would use the Moore multimodal facility.

The total vehicle trips expected to use the multimodal facilities in year 2015 is approximately 3,300 per day (50 percent inbound, 50 percent outbound) during the peak summer season under the high growth scenario. This amounts to a reduction in vehicle miles traveled (VMT) of approximately 2.8 percent in the air quality non-attainment area.

The cost of the Buttermilk Ski Area multimodal center (as described above) would be in the range of $5.6 - $7.5 million, exclusive of right-of-way and operating and maintenance costs. The cost of a 1,650 space airport multimodal facility (as described above) would be between $16.5 and $21.5 million. This also does not include right-of-way or maintenance and operating costs.

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[2] 3,000 total spaces less 600 at Marolt-Thomas or Moore property less 750 at the Buttermilk Ski Area leaves 1,650 spaces.

[3] Internal trips are defined as trips that start and end in the Aspen/Snowmass area, upvalley of Brush Creek Road.

Further analysis of the environmental impacts of each multimodal site will be performed either during the FEIS or in supplemental documents. It has not been included in the DEIS due to the final determination of the exact locations.

4. Couplet (One-way Pair)

The couplet, sometimes referred to as the one-way pair, is a combination of the existing alignment and an alignment across the Marolt-Thomas property (Figure III-6). Traffic flows on the couplet are one way to the west (out of town) on the existing State Highway 82 alignment and one way to the east (into town) on the Marolt-Thomas alignment.

For this option, the alignment would follow the existing State Highway 82 between the Buttermilk Ski Area and Maroon Creek Road. Just east of Maroon Creek Road, the roadway would separate into two separate alignments. One continues to the northeast following the existing State Highway 82 alignment, and the second half crosses the Marolt-Thomas property on the modified direct alignment. Both alignments are considered to have standard two-lane sections. The alignment along the existing State Highway 82 from Maroon Creek Road to 7th Street and Main Street is identical to the option described in **Section II.B.2: Improved Two-Lane with Transportation Management Measures.**

The couplet presents operational problems for Cemetery Lane traffic wanting to head east on State Highway 82. This traffic must turn from Cemetery Lane onto westbound State Highway 82 (a one-way roadway) and make a U-turn where the eastbound and westbound traffic come together.

Based on focus group meetings, in comparison to other combinations of alignments, laneage, and profile options, the couplet alignment was not favored by the community and does not meet the project objectives.

C. LONG-TERM PLANNING OPTIONS

Long-term transportation planning for the Entrance to Aspen and the Roaring Fork Valley has been ongoing for years. It has involved the affected agencies and communities as well as hundreds of interested citizens. It has produced numerous studies and reports and resulted in the creation of CDOT's Mount Sopris Transportation Project. Although the transportation planning process for the Roaring Fork Valley contains many elements, the most recent programs related to the EIS study corridor include the following.

- ***Grassroots Program.*** In December 1994, a group of concerned citizens of the upper valley initiated a grassroots program to disseminate information and to monitor and critique the EIS alternatives and process. This program was facilitated by Leadership Aspen and the Rocky Mountain Institute in cooperation with CDOT and the City of Aspen.

- *Glenwood to Aspen Rail Feasibility Project.* This CDOT study analyzes the feasibility of implementing fixed-guideway transit service on the existing Denver & Rio Grande Western (D&RGW) railroad corridor between Glenwood Springs and Aspen. Aspects of the study included terminus location, ridership estimates, existing conditions analysis, cost estimates, and potential phasing.

  On a parallel approach, the communities of the Roaring Fork Valley are pursuing the purchase of the D&RGW right-of-way between Glenwood and Woody Creek to assure its availability for a future fixed-guideway, valleywide system.

- *The Aspen to Snowmass Transportation Project.* As a result of the passage of a 1/2 percent sales tax in 1993, an Aspen to Snowmass Transportation Plan was prepared in 1994 for public approval. The plan that won the vendor design competition included separate busway/dedicated vehicle lanes between Aspen and the Buttermilk Ski Area and combined busway/dedicated vehicle lanes from the Buttermilk Ski Area to Snowmass Village. The bonding approval for the plan was defeated in the November 1994 election.

- *The East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement.* In 1993, CDOT, in conjunction with FHWA, completed the BBFEIS. The Preferred Alternative includes widening State Highway 82 from two to four lanes between Basalt and Buttermilk Ski Area with two of the four lanes from Gerbazdale to Buttermilk Ski Area operating as restricted bus/HOV lanes during peak periods. Also included are park and ride lots, a bicycle/pedestrian/recreation trail paralleling the corridor, provisions for a future fixed guideway transit envelope along the corridor, and other transportation related commitments. The Record of Decision (ROD) for the BBFEIS was signed in December 1993.

- *Aspen Area Community Plan.* In 1992, the City of Aspen and Pitkin County completed a community plan that set various goals. Those specific to the Entrance to Aspen EIS include reducing parking and traffic congestion while increasing mobility by transit, park and rides, carpooling, pedestrian, and bicycle modes. Specific to the State Highway 82 corridor is the objective to "establish an HOV lane on State Highway 82 from Brush Creek Road to the 7th Street and Main Street intersection."

1. Future Travel Modes and Technologies

Although the ultimate long-term solution to the transportation needs of the entire Roaring Fork Valley is outside the realm of this EIS, the alternatives evaluated in this EIS must not preclude such long-term solutions.

The State Highway 82 Entrance to Aspen Alternative Screening Analysis started with an extensive list of transit modes and technologies. From that list, three general transit technologies were determined to be reasonable within the context of the Entrance to Aspen EIS. Those three are:

- Self-propelled buses.
- Electric trolley buses (drawing their power from an overhead wire).
- Light rail transit (LRT) (also requiring overhead power).

The alternatives described in subsequent sections of this EIS make two types of provisions for transit:

- All build alternatives reserve two lanes for transit (either two lanes for dedicated vehicles and/or transit or a separate transitway).

- Some alternatives provide a separate transit envelope independent of the roadway and transit improvements. The transit envelope is in addition to the two lanes for dedicated vehicle and/or transit or the separate transitway.

The dedicated vehicle lanes without electrification or embedded rails could be used immediately for buses, hotel shuttles and carpools. However, the ultimate use of either these lanes or the separate transit envelope will depend upon decisions yet to be made. For example, there is the potential for using the old Denver and Rio Grande Western (D&RGW) rail alignment between Glenwood Springs and Aspen for future transit connections. This is discussed in further detail in the ***Glenwood to Aspen Rail Corridor Feasibility Project Final Report*** prepared by CDOT in May, 1995. Also, there is continuing interest in an improved transit connection between Snowmass Village and Aspen. Long-range decisions about these services may introduce other modes and technologies including some that were screened out in the context of the Entrance to Aspen EIS. These long-term options include, but are not limited to, commuter rail, wire rope systems, guided busways (O-Bahn), unproven technologies, and personal rapid transit (PRT). For example, a likely candidate for Glenwood to Aspen transit service is a diesel commuter train.

The provisions being made for the alternatives evaluated in the EIS are flexible in their ability to adapt to technology selection. Some of the specific considerations are:

Dedicated Vehicle and/or Transit Lanes

These could serve self-propelled buses, electric trolley buses or light rail. Because of the different operating characteristics, use of commuter rail (diesel powered multi-car trains) in these lanes is an unlikely choice.

Transitway

The separate transitway could serve self-propelled buses, electric trolley buses, or light-rail. Because of the exclusiveness of the separate transitway (no carpools), commuter rail is also a potential technology.

Transit Envelope

The transit envelopes described in the next section of this chapter could provide for self-propelled buses, electric trolley buses, light rail or commuter rail.

Additionally, there is the possible application of grade-separated, automated transit systems, such as an elevated monorail, either in the median of the roadway section or the separate transit envelope. However, vertical clearance requirements may be a problem. The separate transit envelope cannot reasonably provide sufficient vertical clearance for an elevated system. Elevated automated systems require enough clearance not only to cross roadways, but other areas must either be fenced or vertically separated by enough distance that the guideway and its power systems cannot be reached by pedestrians, bicyclists or those on horseback.

2. Separate Transit Envelope

To assure that the long-term technology options previously discussed are not precluded, several alternatives evaluated in the EIS include a separate transit envelope for future transit systems between Buttermilk Ski Area and Aspen. This separate transit envelope is in addition to the two dedicated vehicle and/or transit lanes provided in the alternatives. The separate transit envelope provides for a separate future transit facility parallel to the existing or new State Highway 82 alignment.

The characteristics of the separate transit envelope are based on existing and estimated future fixed-guideway systems. The separate transit envelope width used for the alternatives evaluated in the EIS is 6.0 meters (19.7 feet) for a single track and 9.0 meters (29.5 feet) for a double track. This width accommodates all existing and foreseeable transit modes and technologies.

D. SCREENING ANALYSIS SUMMARY

To narrow the multitude of transportation options, a screening process was used to determine which alternatives were to be evaluated in the Entrance to Aspen EIS.

The screening process applies progressively more demanding criteria to the range of potential options through a series of three screening levels. Transportation options that are screened are categorized into four general types: potential alignments, potential laneage, potential profiles, and potential travel modes. At each screening level, options that do not meet the respective criteria for that screening level are eliminated from further evaluation. Following the screening process, the options that remain are combined to create the transportation alternatives evaluated in the EIS. A full documentation of the screening process is available in the technical report entitled ***State Highway 82 Entrance to Aspen Alternatives Screening Analysis.***

The first screening level is the reality check screening that eliminates options that are clearly unrealistic, inappropriate, or unreasonable by applying common knowledge. This screening is qualitative. The potential option types that are eliminated at this level have no realistic chance of being implemented because of physical constraints, funding, technology limitations, or impacts on private property.

The second screening level is the fatal flaw screening that eliminates options that clearly do not meet one or more of the ten project objectives (see **Chapter I: Purpose and Need**). Although the options eliminated at this level may seem conceivable, they do not solve the transportation problems and concerns identified for the Entrance to Aspen corridor.

The third screening level is the comparative screening that eliminates options that, although they may meet the objectives of the project, are not logical when compared to the other available options. Transportation options evaluated at the comparative screening level undergo analysis of key environmental parameters and issues (cost, safety, open space/4(f) issues, and community acceptability). At this level, the four general option categories are combined to form potential alternatives that allow for a comparative analysis. That is, a specific alignment is combined with a specific profile and a laneage to develop cost estimates and amount of right-of-way acquisition for comparative purposes.

1. Options Eliminated from Consideration

Figures III-7 to III-9 chart the elimination of options at each screening level (reality check, fatal flaw, comparative) for potential alignment, laneage, profile, and travel mode options. The following paragraphs document the level where options were screened out and briefly describe the reasons for elimination.

1a. Reality Check Screening

The following are screened out as unrealistic and unacceptable options for the Entrance to Aspen project corridor (Figure III-7):

- The D&RGW Right-of-Way Alignment.
- Alignments west of Maroon Creek Road other than the existing alignment.
- An Elevated Roadway Structure Profile.
- Tunnel profiles greater than 215 meters (700 feet) long.
- Unproven Transportation Technologies.
- Personal Rapid Transit (PRT) systems technology.

1b. Fatal Flaw Screening

Options surviving the reality check screening are evaluated against the project objectives and checked for fatal flaws. An option screened out at this level indicates that it does not meet one or more of the project objectives. The following options are eliminated at the fatal flaw screening level (Figure III-8):

Old Colorado Midland Railroad Alignment Along Shadow Mountain - This alignment would require extensive disruption to existing developments along Shadow Mountain and within the Aspen downtown area. The Midland alignment is eliminated because of financial constraints and the negative impacts on the surrounding community.

Figure III-7
Reality Check Screening

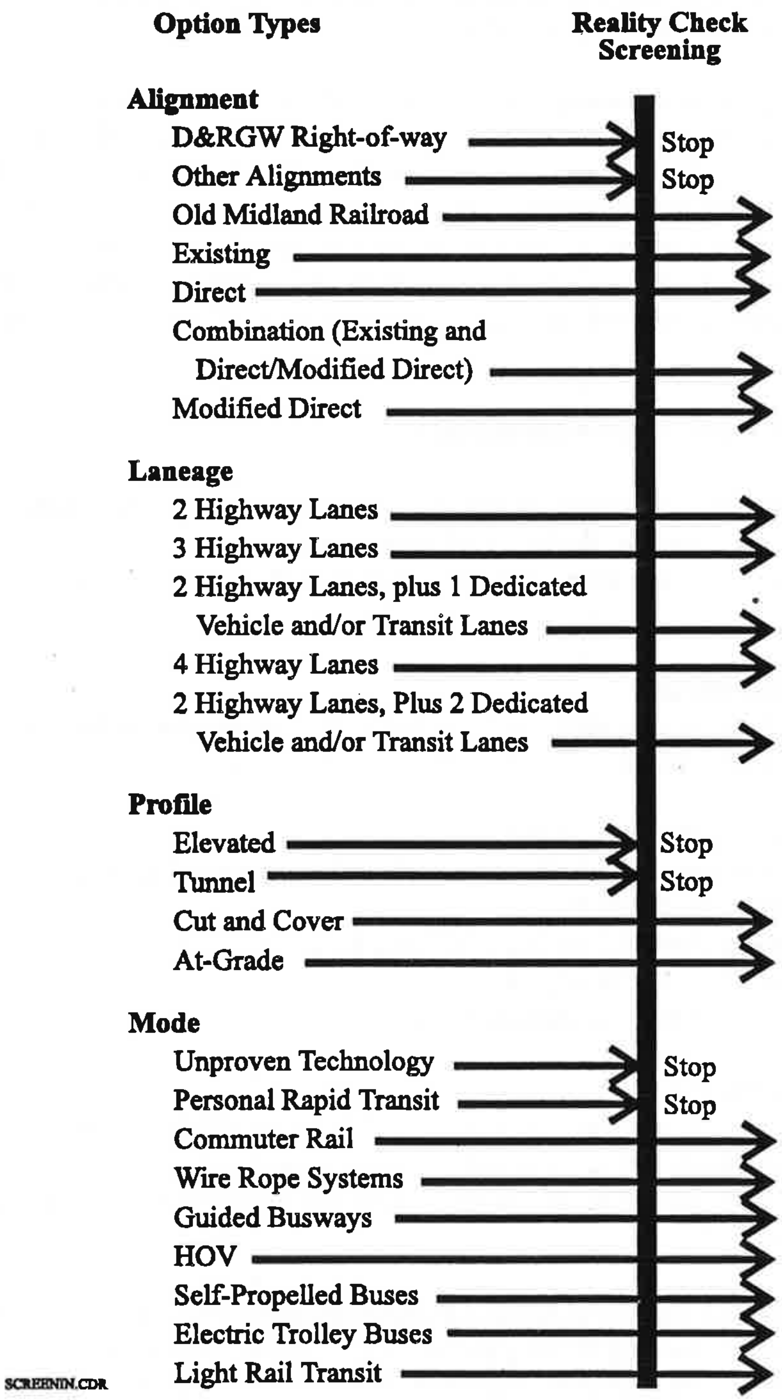
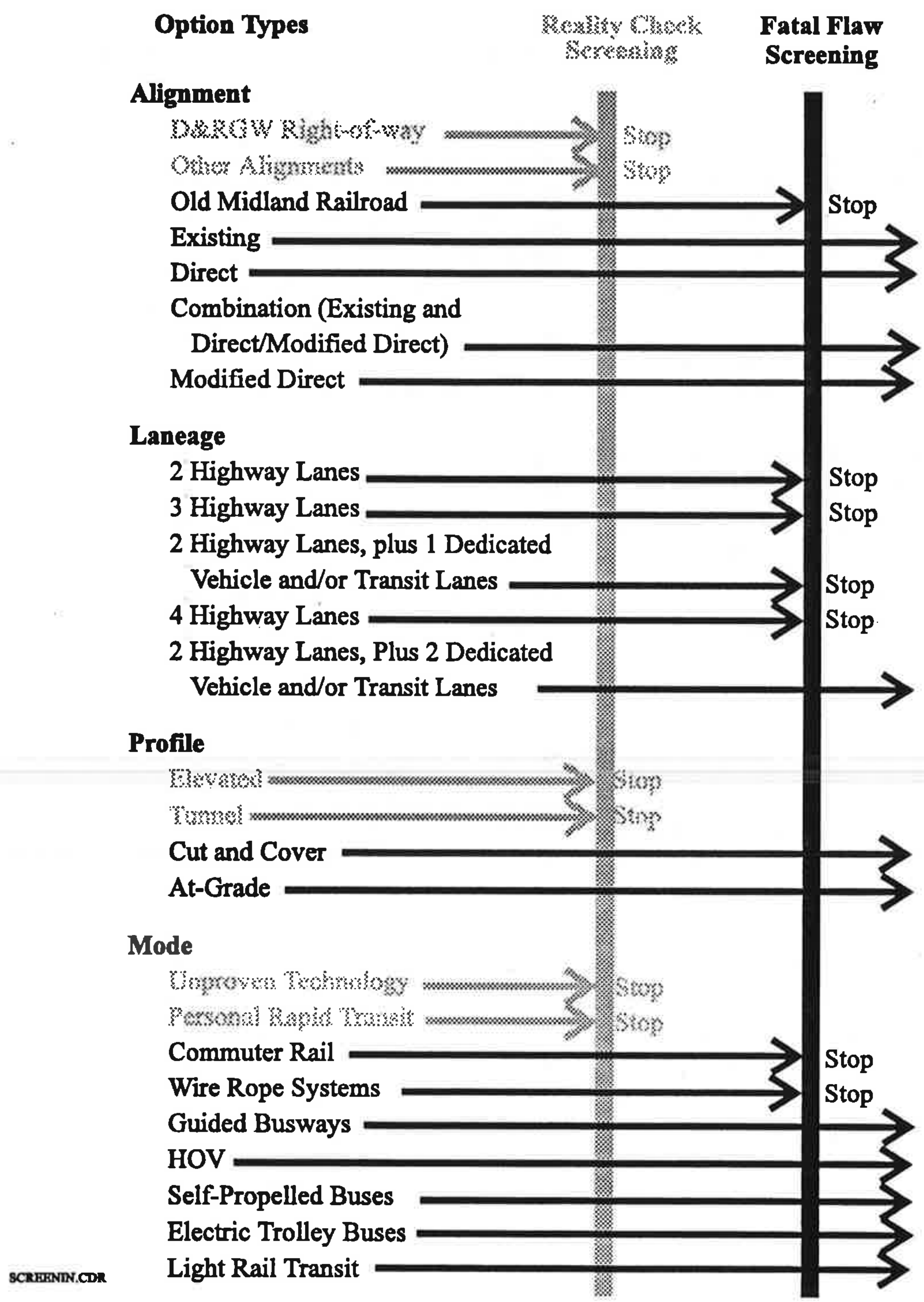


Figure III-8
Fatal Flaw Screening



Two Highway Lanes - This laneage option is screened out because it does not meet the capacity requirements for future traffic demand. Only if the Aggressive TM Program and significant transit improvements are implemented does this option meet the capacity screening criteria. The two-lane option on the existing alignment also does not meet the emergency access objective. The two-lane option also does not provide for future transit options and upgrades that are part of Aspen's Community Plan.

Three Highway Lanes - Because the peak-hour distribution of the highway is approximately 50/50, a reversible lane would not provide the needed future traffic capacity for both directions of State Highway 82. This laneage option does not meet the phasing objective and would likely be unacceptable to the community because of the large number of signs required to safely implement and regulate the reversible lane.

Two Highway Lanes and One Dedicated Vehicle and/or Transit Lane - This laneage option is eliminated for the same reasons the three highway lane option was eliminated.

Four Highway Lanes - This laneage option does not provide the incentive for transit or carpool use that is essential if the traffic growth on State Highway 82 is to be controlled. Four lanes of unrestricted traffic is not consistent with community-based planning goals. Discontinuing the bus/HOV lane (established by the BBFEIS) at the Buttermilk Ski Area would be disruptive to the efficient movement of traffic into Aspen. The benefits of the bus/HOV lane and the integrity of the transportation system would be lost at this location.

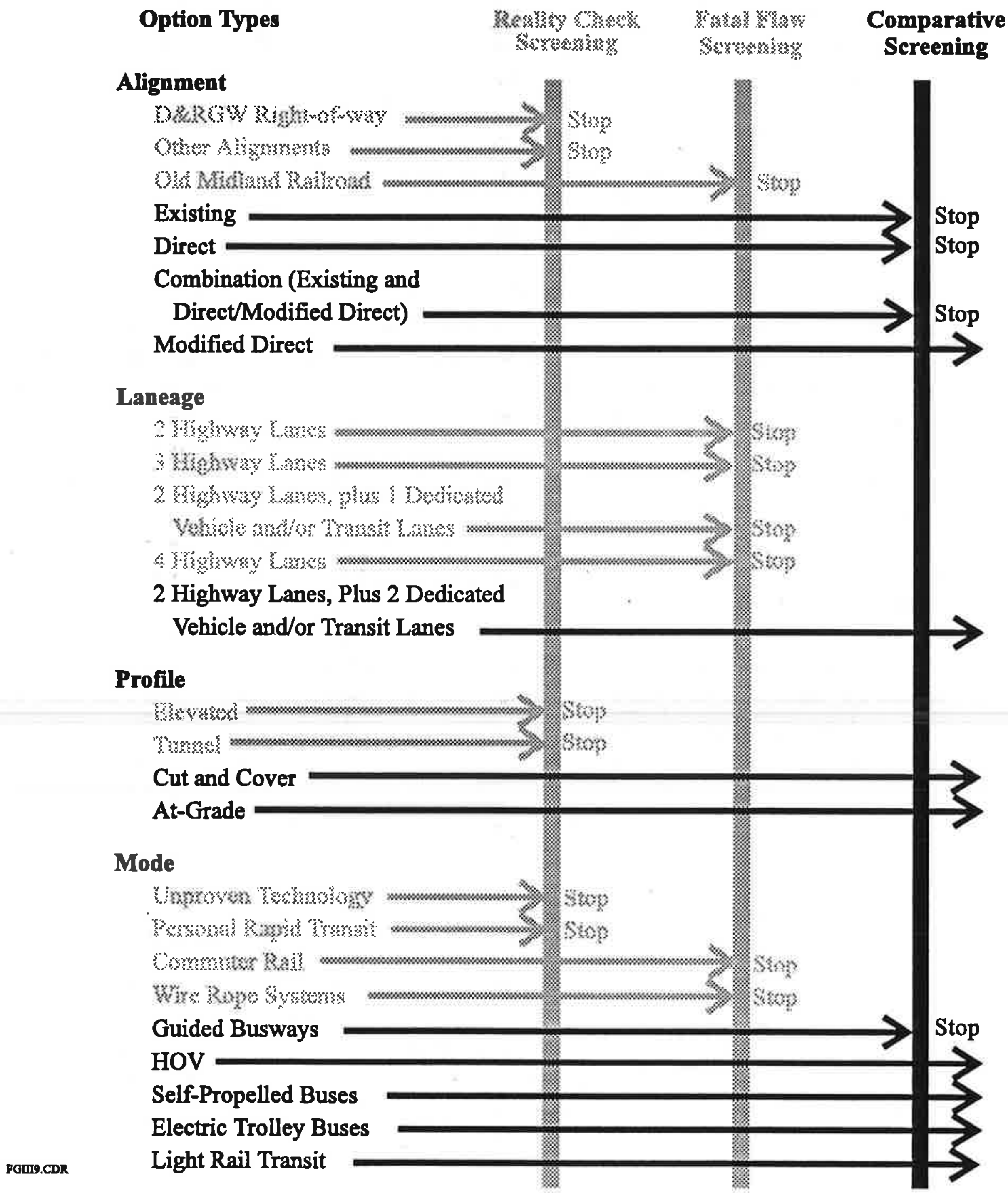
Commuter Rail - Commuter rail is a mode that requires a fixed-guideway system and a separate right-of-way. A typical commuter rail system consists of one locomotive train car and several passenger train cars. Because of commuter rail's inability to operate efficiently in mixed-flow traffic conditions, this mode option does not meet the capacity objective or the limited resources objective. Also, there is a strong chance that diesel locomotives entering the City of Aspen are not consistent with local planning objectives. Commuter rail, however, may be a valleywide solution and should not be precluded from future consideration.

Wire Rope Systems - Wire rope systems are similar to gondolas and chair-lift systems, requiring overhead cables and pole supports. The capacity and the trips that can be served by this technology are limited. This mode is screened out because it is not acceptable to the City of Aspen as an in-town transit system visually, operationally, or financially.

1c. Comparative Screening

At this screening level, survivors of the fatal flaw analysis are compared against each other to determine the most reasonable alternatives for full evaluation. The options surviving the fatal flaw screening are combined to develop alternatives for comparison. The comparison

Figure III-9
Comparative Screening



is made using five factors that affect the options between Maroon Creek Road and Aspen: operations, cost, safety, open space/4(f) issues, and community acceptability.

The remaining alignment options for comparison (existing, direct, modified direct, and combination) are combined with the remaining laneage option and evaluated either at-grade or as a depressed cut and cover. The only remaining laneage option consists of two general highway lanes and two dedicated vehicle and/or transit lanes. The two general highway lanes are unrestricted and available for use by any visitor or commuter with any vehicle occupancy. The two dedicated vehicle and/or transit lanes are reserved strictly for use by mode and technology options surviving the screening process (page III-46). This laneage option is assumed for all alternatives in the comparative screening.

The remaining profile options are the at-grade and the cut and cover. With the at-grade option, the roadway follows the vertical profile of the existing landscape to the extent possible. The cut and cover option drops the roadway below the surface of the existing landscape and into a short tunnel approximately 122 meters (400 feet) long. The cut and cover option is only combined with the direct and modified direct alignments in the comparative evaluation.

The comparative screening analysis of the alignment, profile, and laneage combinations eliminated the following options (Figure III-9):

Existing - The existing alignment between Maroon Creek Road and the intersection of 7th Street and Main Street was screened out on the basis of safety and community acceptability issues as compared to other alignment options. The safety of State Highway 82 is not significantly improved because of the existence of the S-curves. Compared to the alignments across the Marolt-Thomas property, the S-curves are expected to have a higher accident rate even with improvements to the roadway. The existing alignment also does not address the need for an alternative emergency access route in and out of Aspen. In a public survey of alignment preferences (September 1994 Public Open House), the existing alignment was chosen as the least favorable in comparison to other alignments.

Direct Connection - The cost and safety issues of the direct alignment are similar to those of the modified direct alignment. Both alignments have impact on the Marolt open space property and the Thomas property acquired by the City of Aspen for transportation purposes. The direct alignment bisects the Marolt-Thomas property and impacts several key open space areas, including the community garden and the landing field for hang-gliders. These areas are not affected by the modified direct alignment. Additionally, the direct alignment does not have the community acceptability of the modified direct alignment. A survey conducted in fall 1994 indicated that the most desired alignment between the two was the modified direct and not the direct alignment.

Because of the more significant impacts to open space (as compared to the modified direct alignment) and the lack of community support, the direct alignment is not carried into a full evaluation in the DEIS.

Combination (Existing plus Direct/Modified Direct)- The couplet, or one-way pair, and the split alignment, or two-way pair, are both defined as a combination of the existing alignment and either of the direct or modified direct alignments. Traffic flow on the couplet is one way to the west on the existing alignment and in the opposite direction on the Marolt-Thomas alignment. The couplet creates significant operational problems for Cemetery Lane traffic wanting to head east on State Highway 82. This traffic must first head west on State Highway 82 and U-turn where the two one-ways come together. This creates a dangerous turning movement on a highway facility. The split alignment, or two-way pair, is similar to the geometry of the couplet, but the traffic on both the existing and Marolt-Thomas alignments flows two ways. This creates significant operational problems where the direct/modified direct alignment and the existing alignment separate and the intersection of 7th Street and Main Street where the two alignments come back together. With the split alignment, general traffic is restricted to the existing alignment between Maroon Creek Road and Main Street. The dedicated vehicle and/or transit traffic is routed across the Marolt-Thomas property. Operational problems occur when traffic must be separated and directed into appropriate lanes at the intersection of 7th Street and Main Street.

Guided Buses (O-Bahn) - The guided bus system operates in a U-shaped concrete track that guides the bus without help from the driver. The driver controls the speed and deceleration of the bus. This option was evaluated in more detail during the Aspen to Snowmass Transportation Project. From a comparative evaluation, the guided busway has a relatively high cost versus the self-propelled bus and electric trolley bus technologies. Increased maintenance requirements, including the problem of snow accumulation in the track and the maintenance of the track itself, are other concerns about this mode. As a long-term planning option, the use of the concrete tracks for a guided busway eliminates the possibility of using the lane for dedicated vehicles and/or transit use. This option was screened out based on the project objectives and key issues (cost, maintenance, and community acceptability) in comparison to other options.

E. ALTERNATIVES EVALUATED

The alternatives evaluated in the EIS are developed from reasonable combinations of the alignment, laneage, and profile options that passed the screening process or which provide a useful baseline for comparing alternatives. Additional alternatives that did not pass the screening process are also evaluated due to community interest or at the request of the Aspen City Council. Some of the alternatives also consider a separate transit envelope within the designated right-of-way. The transit envelope is discussed in **Section III.C: Long-Term Planning Options** at the beginning of this chapter.

The existing alignment from Maroon Creek Road to 7th Street and Main Street is carried into the alternative evaluation for comparison purposes, even though it did not pass the screening analysis. This alignment is evaluated as Alternative B which consists of two highway lanes and two dedicated vehicle and/or transit lanes at-grade. A combination alignment with two improved highway lanes on the existing alignment combined with a transitway across the Marolt-Thomas property is carried into the alternative evaluation at the request of the Aspen City Council. This alignment is Alternative G.

The only alignment and laneage option to pass the screening process is the two general highway lanes plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property. Another option, the two improved lanes on existing State Highway 82 plus a transitway across the Marolt-Thomas property, is included in response to a request by the Aspen City Council. The first option addresses the need to shift the traffic from the single occupant vehicle (SOV) into high occupancy vehicles (HOV) such as transit and carpools in order to reduce congestion on State Highway 82. This laneage option also provides for future long-term transportation opportunities. The second laneage option does not provide incentives for carpools, but will provide incentives for transit use.

The two profile options carried into the EIS for evaluation are the at-grade and the cut and cover. Both options have received public support and are financially realistic. Alternative G is at-grade but it could be developed as a cut and cover option.

The alternatives evaluated are categorized by two corridor sections: (1) Buttermilk Ski Area to Maroon Creek Road and (2) Maroon Creek Road to 7th Street and Main Street. Because the modes and technologies for the dedicated vehicle and/or transit lanes are generally not dependent upon the alignment, laneage, and profile options, the modes and technologies are treated as a separate subset of the alternatives. The technology selected is assumed to be the same for both the Buttermilk Ski Area to Maroon Creek Road section and the Maroon Creek Road to 7th Street and Main Street section.

The methodology used to identify and name the alternatives is summarized in Table III-2. The letters and numbers given to the alternatives evaluated in Table III-2 *do not* correspond to the letters of the modeled scenarios in **Chapter V: Future Transportation Demand.**

The cost estimate for each alternative includes right-of-way, design engineering, construction management, construction mobilization, traffic control (for construction), construction, and contingencies. Table III-3 at the end of this section is a summary of the cost of each alternative.

Table III-2
Methodology for Naming the Alternatives

Corridor Section	Number/Letter	Alternative
Buttermilk Ski Area to Maroon Creek Road	1	No-Action
	* 2	Existing Alignment
	* 3	Existing Alignment with Separate Transit Envelope
Maroon Creek Road to 7th Street and Main Street	A	No-Action
	* B	Existing Alignment
	* C	Modified Direct Alignment, At-Grade
	* D	Modified Direct Alignment, At-Grade, with Separate Transit Envelope
	* E	Modified Direct, Cut and Cover
	* F	Modified Direct, Cut and Cover, with Separate Transit Envelope
	** G	Two Improved Lanes on the Existing Alignment and Transitway on the Modified Direct Alignment, At-Grade

* These alternatives consist of two general highway lanes and two dedicated vehicle and/or transit lanes.
** The transitway for Alternative G is for transit vehicles only and does not include carpools.

1. Buttermilk Ski Area to Maroon Creek Road

The alternatives for the Buttermilk Ski Area to Maroon Creek Road section are essentially limited to the existing alignment because of the lack of useable land in the corridor for transportation improvements. Three alternatives are presented for evaluation in the EIS: the No-Action Alternative and the improved existing alignment with and without a separate transit envelope. Figure III-10 shows the alignments and the potential transit envelope for these alternatives.

Alternative 1: No-Action Alternative

Although the No-Action Alternative does not meet the project objectives, it is carried through the EIS evaluation process as a comparison alternative as required by Federal guidelines. The No-Action Alternative (sometimes referred to as the No-Build or Do-Nothing Alternative) provides a benchmark to compare the magnitude of environmental effects of the various build alternatives. It can also become the recommended and Preferred Alternative if no other alternative is selected. This alternative consists of minor safety and maintenance improvements on the State Highway 82 corridor between the Buttermilk Ski

Area and Maroon Creek Road. The roadway would remain as is and tie in to the previously approved transportation improvements in the BBFEIS.

The only costs associated with this alternative are the short-term safety improvements and annual maintenance.

Alternative 2: Existing Alignment

This alternative essentially follows the existing alignment between Buttermilk Ski Area and Maroon Creek Road (Figure III-10). The only significant deviation of Alternative 2 from the existing alignment is where the new alignment crosses Maroon Creek to the north of the existing bridge. The maximum vertical grade in this new section is +2.3 percent and the minimum grade is 0.5 percent. The standard right-of-way used for this alternative is 50 meters (164 feet), however, to avoid impacts the right-of-way may be narrowed as appropriate during final design. The design speed of this section is 90 km/h (55 mph).

Beginning at the Buttermilk Ski Area (milepost [MP] 38.5), the alternative is similar to the four-lane platform adopted in the ***State Highway 82 East of Basalt to Buttermilk Ski Area FEIS*** (two lanes for general traffic and two lanes for dedicated vehicle and/or transit use) and follows the centerline of the existing State Highway 82 to MP 38.8. At this point, the horizontal alignment leaves the existing roadway to cross Maroon Creek approximately 34 meters (110 feet) north of the existing bridge (centerline to centerline). The new bridge is approximately 220 meters (720 feet) in length. Crossing north of the existing bridge avoids several residences, business locations and private open space to the south. The alignment does, however, impact an existing soccerfield/ballfield. The issues surrounding the relocation or replacement of this active open space are discussed in **Section VI.B.4m: 4(f) Resources** and **Appendix A: 4(f) Evaluation.**

From the new Maroon Creek Bridge, the alignment ties back into the existing alignment at the Aspen Golf Course (MP 39.4). This intersection with the Golf Course entrance is widened on State Highway 82 to provide auxiliary lanes 3.6 meters (12 feet) wide. On the west leg of this intersection, acceleration and deceleration lanes are provided; on the east leg left-turn lanes are provided for both directions. The alignment continues to follow the existing centerline to Maroon Creek Road (MP 39.8) carrying the typical two highway lanes and two dedicated vehicle and/or transit lanes section. At Maroon Creek Road, the roadway is again widened to provide acceleration and deceleration lanes 3.6 meters (12 feet) wide for eastbound traffic and two left-turn lanes each 3.6 meters (12 feet) wide for westbound traffic.

Alternative 2 provides the needed capacity to support the anticipated future traffic demand. The capacity is achieved without the use of the Moderate or Aggressive TM Programs and multimodal centers. The pursuit of these TM programs, however, is encouraged to further enhance the efficiency of the transportation system and limit future traffic growth.

The right-of-way cost for Alternative 2 is $3.0 million. The construction cost for Alternative 2 is $14.9 million. The total cost of Alternative 2 is $17.9 million.

Alternative 3: Existing Alignment with a Separate Transit Envelope

Alternative 3 is identical to Alternative 2 except that a separate transit envelope is provided. Figure III-10 shows the provision of a separate transit envelope beside the widened existing alignment. Near the Maroon Creek Bridge (at MP 48.9) the transit envelope may continue on the existing alignment, using the existing bridge structure to cross Maroon Creek or follow along the south side of the new alignment to the north of the existing bridge. The second option, following the new alignment (shown in Figure III-10), would require a wider new bridge structure and would shift the alignment further north than Alternative 2.

The right-of-way required in this section is a combination of the 50 meters (164 feet) used in Alternative 2 and an additional 6.0 - 9.0 meters (19.7 - 29.5 feet) of right-of-way required for the separate transit envelope. The 9.0 meters (29.5 feet) of additional right-of-way for the separate transit envelope will extend from the beginning of the project at Buttermilk Ski Area to a point approximately 440 meters (1,444 feet) west of the new Maroon Creek Bridge. At this point the additional right-of-way is narrowed to 6.0 meters (19.7 feet) and carried across the bridge for a length of 920 meters (3,018 feet). From this location (250 meters [820 feet] east of the new Maroon Creek Bridge) the additional right-of-way becomes 9.0 meters (29.5 feet) again, and continues to the end of the section at Maroon Creek Road. The right-of-way could be narrowed in certain sections to avoid or minimize impacts as appropriate during final design.

The distinction between the two transit envelope widths is that the 9.0 meters (29.5 feet) provides for a double track and 6.0 meters (19.7 feet) only provides for a single track.

The total cost of Alternative 3 is $21.9 million. This includes the additional cost of right-of-way and wider bridge structure required for the transit envelope over Alternative 2. The right-of-way cost is $4.1 million and includes the cost of two property acquisitions.

2. Maroon Creek Road to 7th Street and Main Street

The alternatives in this section consist of three general alignments: the existing alignment, the modified direct alignment, and the combination alignment. In addition, the modified direct alignment is combined with two profile options (at-grade and cut and cover) and evaluated with and without a separate transit envelope. The existing alignment and the combination alignment are not evaluated with a separate transit envelope. Figure III-11 shows Alternatives A, B, C, D, E, and F from Maroon Creek Road to 7th Street and Main Street with the potential transit envelope for the modified direct alignment. Alternative G is shown in Figure III-12.

Alternative A: No-Action Alternative

This alternative consists of minor short-term safety and maintenance improvements on State Highway 82. The existing roadway would remain as it currently is. Although this alternative does not meet the project objectives, it is carried through the EIS process for comparative purposes as required by Federal guidelines. It could become the recommended alternative if no other alternative is selected.

Alternative B: Existing Alignment

The existing alignment from Maroon Creek Road to the intersection of 7th Street and Main Street did not pass the screening analysis, however, it is carried into the DEIS for comparative purposes. Figure III-11 shows the widened existing alignment without a transit envelope. The design speed for this alternative, between Maroon Creek Road and Cemetery Lane, is 60 km/h (approximately 35 to 40 mph).

This alternative provides two general highway lanes and two dedicated vehicle and/or transit lanes. The technology options for the dedicated vehicle and/or transit lanes are limited to the bus technologies, carpools, and shuttle vans. Light rail is excluded as an option because at reasonable operating speeds (24 to 32 km/h [15 to 20 mph]) the minimum curvature required of the track creates significant right-of-way acquisition and structure takes. The standard right-of-way for this section is 50 meters (164 feet), however, east of Castle Creek Bridge the right-of-way is narrowed to 30.5 meters (100 feet) to the intersection of 7th Street and Main Street.

Beginning at Maroon Creek Road (MP 39.8), the alternative follows the existing alignment of State Highway 82 to Cemetery Lane (MP 40.1) The intersection of State Highway 82 with Cemetery Lane is widened to provide acceleration and deceleration lanes 3.6 meters (12 feet) wide for westbound traffic and left-turn lanes for eastbound traffic. East of Cemetery Lane, the new alignment shifts south of the existing centerline and crosses Castle Creek. The existing Castle Creek Bridge is used for westbound traffic and is widened to the south to accommodate the eastbound traffic. The alternative continues to follow the existing State Highway 82 around the S-curves to 7th Street and Main Street (MP 40.5).

Several design speeds have been considered through the S-curves including 30, 40 and 50 km/h (approximately 20, 25, and 30 mph). The existing design speed of the S-curves is less than 20 km/h (15 mph). The existing posted speed on Main Street is 40 km/h (25 mph). The 40 km/h (25 mph) design speed option is used for evaluation.

Figure III-13 shows a before and after computer simulation of Alternative B looking east from the Castle Creek Bridge. The simulation shows widening around the S-curves for a 40 km/h (25 mph) design speed. Note also that the existing intersection has been modified in the computer simulation to prevent side road traffic from accessing State Highway 82 at this location.

Figure III-14 shows a before and after computer simulation of Alternative B, looking south on State Highway 82 (7th Street) from Bleeker Street, for a 40 km/h (25 mph) design speed (a radius of 60 meters [200 feet]). The minimum turning radius of a light rail vehicle is approximately 45 to 75 meters (150 to 250 feet) at 24 to 32 km/h (15 to 20 mph) and would not be practical to build around the S-curves. Similarly, a separate transit envelope would require an additional 6 meters (19.7 feet) of widening to the roadway and would create additional impacts to the properties adjacent to the S-curves.

Without TM programs or multimodal facilities, Alternative B will operate over capacity during peak periods of the day. In general, this alternative can provide the needed capacity for general lanes and restricted lanes during the off-peak hours. The TM programs and multimodal facilities would help to lessen the traffic demand for this alternative.

The construction costs of Alternative B is $5.5 million and the right-of-way cost is $0.8 million. This includes the cost of five properties at an estimated total of $0.5 million. The total cost of this alternative, including the cost of the Buttermilk multimodal facility ($6.5 million), is $12.8 million.

Alternative C: Modified Direct Alignment, At-Grade

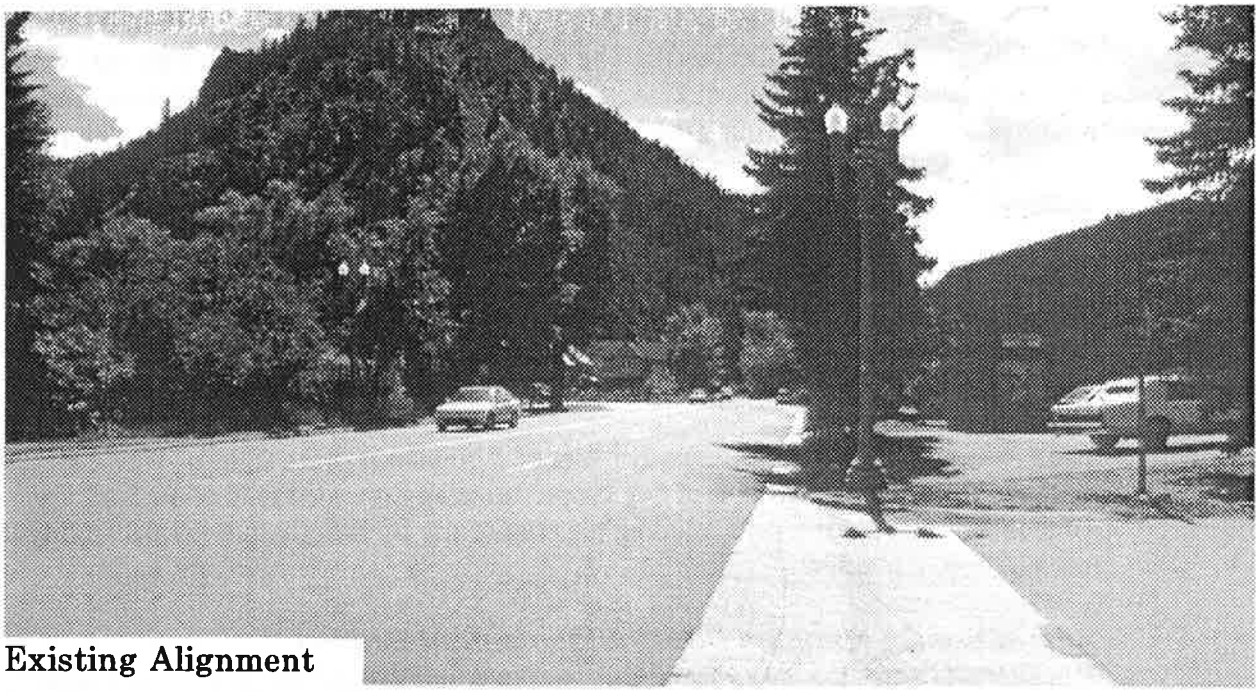
This alternative provides two general highway lanes and two dedicated vehicle and/or transit lanes for all technologies passing the screening process. It does not provide a separate transit envelope. The standard right-of-way for this section is 50 meters (164 feet), however, to avoid impacts the right-of-way may be narrowed as appropriate during final design. This is likely for right-of-way east of the new Castle Creek Bridge. The design speed for this alternative (and Alternatives D, E, and F) is 60 km/h (approximately 35 to 40 mph). Figure III-11 shows the modified direct alignment, at-grade.

The alignment follows the existing State Highway 82 from Maroon Creek Road (MP 39.8) east to MP 39.9, where the alignment curves southeast onto the Marolt-Thomas property. A gradual S-curve to the east brings the alignment 204 meters (670 feet) south of the existing Castle Creek Bridge. The alignment continues across Castle Creek on a new bridge to join the existing State Highway 82 at 7th Street and Main Street. The bridge structure is approximately 168 meters (550 feet) long and 122 meters (400 feet) west of 7th Street and Main Street.

Figure III-15 is a computer simulation showing before and after views of the modified direct, at-grade alignment. The view in Figure III-15 is looking east (upvalley) across the Marolt-Thomas property.

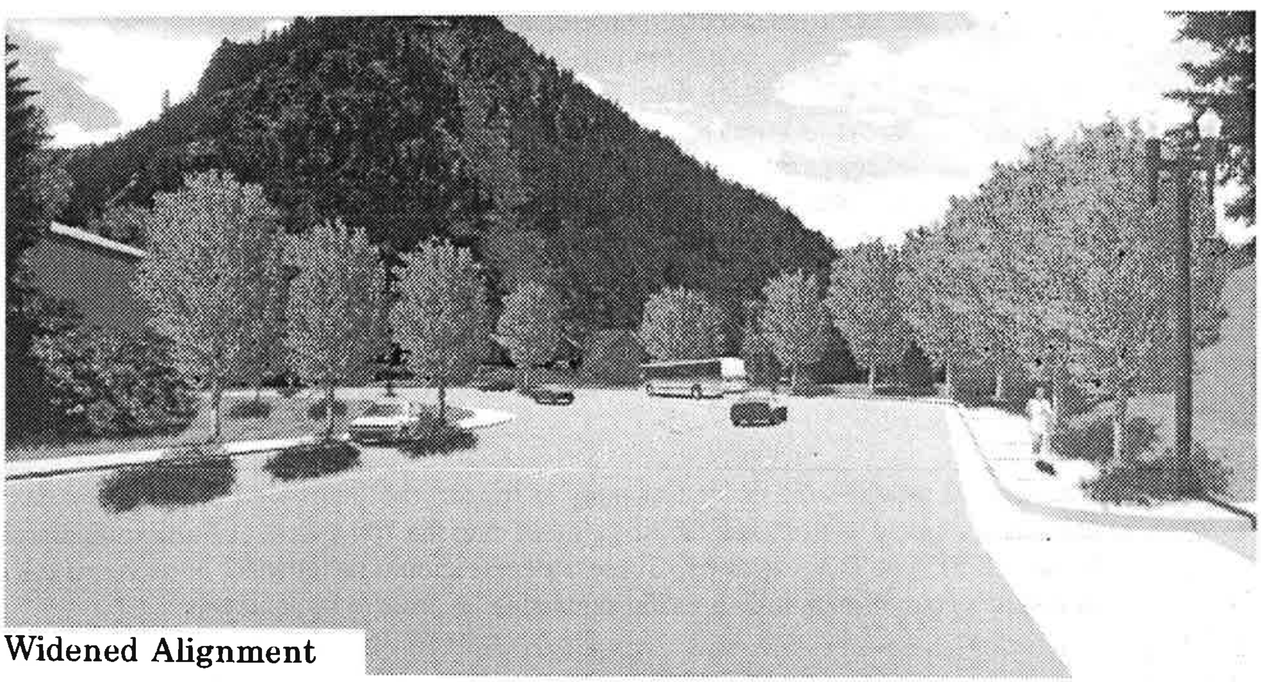
Alternative C provides the needed capacity to support the anticipated future traffic demand without additional multimodal facilities (other than the 700 spaces at Buttermilk discussed in the BBFEIS) or TM programs. These concepts should be pursued, however, if the City of Aspen's goal of maintaining traffic at existing levels is to be achieved.

Figure III-14. State Highway 82 at 7th Street and Bleeker Street – Alternative B



Existing Alignment

Looking south from Bleeker Street (actual photo)

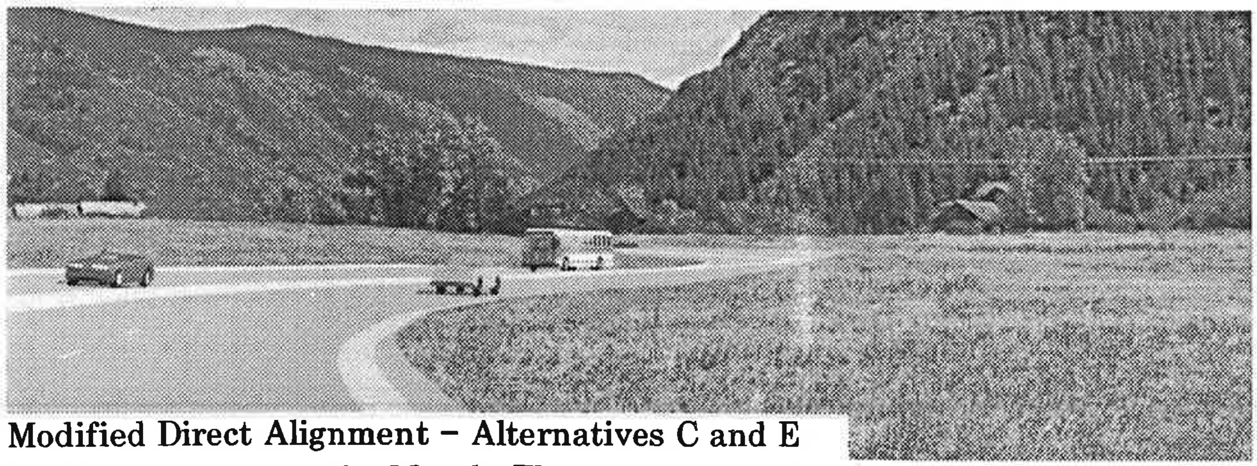


Widened Alignment

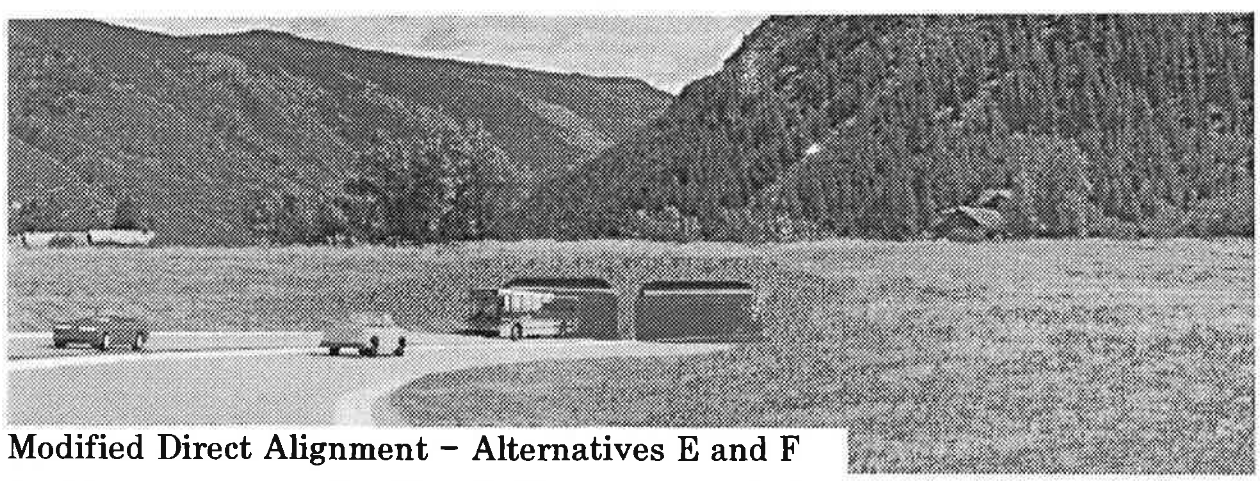
Looking south from Bleeker Street (computer simulation)

Figure III-15. State Highway 82 - Modified Direct Alignment

Existing Alignment
Looking east across the Marolt-Thomas property



Modified Direct Alignment - Alternatives C and E
Looking east across the Marolt-Thomas property (at-grade)



Modified Direct Alignment - Alternatives E and F
Looking east across the Marolt-Thomas property (cut and cover)

The total cost of Alternative C is $15.1 million. This includes $6.5 million for the multimodal facility at the Buttermilk site. The construction cost is $8.1 million and the total right-of-way cost is $0.5 million.

Alternative D: Modified Direct Alignment, At-Grade, with Separate Transit Envelope

This alternative provides two general highway lanes and two dedicated vehicle and/or transit lanes for all technologies passing the screening process. This alternative is identical to Alternative C except that a separate transit envelope is provided in addition to the two dedicated vehicle and/or transit lanes. The right-of-way required in this section will be treated similar to Alternative C with the addition of 6.0 meters (19.7 feet) of right-of-way for the separate transit envelope. The additional 6.0 meters (19.7 feet) of right-of-way extends from Maroon Creek Road to the intersection of 7th Street and Main Street. Figure III-11 shows the location of the separate transit envelope for Alternative D.

The alignment follows the existing State Highway 82 from Maroon Creek Road (MP 39.8) east to MP 39.9, where the alignment curves southeast onto the Marolt-Thomas property. A gradual S-curve to the east begins the alignment 204 meters (670 feet) south of the existing Castle Creek Bridge. Angling slightly to the north, the alignment continues across Castle Creek on a new bridge structure to join the existing Main Street at 7th Street. The bridge structure is approximately 168 meters (550 feet) long and 122 meters (400 feet) west of 7th Street and Main Street. Additional width is required for the separate transit envelope.

Similar to Alternative C, Alternative D provides for the future anticipated traffic demand without additional multimodal facilities or TM programs.

The total cost of Alternative D is $17.1 million including $6.5 million for the Buttermilk multimodal facility. The construction cost for Alternative D is $10.0 million and the total right-of-way cost is $0.6 million.

Alternative E: Modified Direct Alignment, Cut and Cover

Alternative E is similar to Alternative C in laneage and alignment but provides a cut and cover profile near Castle Creek. The right-of-way requirement (50 meters [164 feet]) is also similar to Alternative C, except that the right-of-way above the cut and cover in Alternative E is to be returned to open space. Figure III-11 shows the modified direct alignment with the location of the cut and cover section identified. A separate transit envelope is not included in this alternative.

The alignment follows the existing State Highway 82 from Maroon Creek Road east to MP 39.9 where the alignment curves southeast onto the Marolt-Thomas property. A gradual S-curve to the east brings the alignment 204 meters (670 feet) south of the existing Castle Creek Bridge. Within the S-curve, the vertical profile of the highway begins to drop below the existing ground level. The cut and cover begins at milepost 40.1 (along the new alignment) and continues for 122 meters (400 feet). The clearance beneath the cut and cover is six meters (19.7 feet) high. Figure III-15 is a before and after computer simulation of the modified direct alignment, cut and cover on the Marolt-Thomas property. After passing through the cut and cover, the alignment angles to the north and continues across Castle Creek. A new bridge structure is provided to join the alignment to 7th Street and Main Street.

The new bridge structure is approximately 168 meters (550 feet) long and 122 meters (400 feet) west of 7th Street and Main Street. The western edge of the new bridge deck is three meters (nine feet) lower in elevation than the at-grade option (Alternative C). The elevation of the eastern edge of the bridge deck is approximately one meter (three feet) lower than the at-grade option.

The cut and cover option has no significant effect on the traffic capacity of the roadway, but may serve as a traffic calming measure. Alternative E provides the needed capacity for the anticipated future demand without additional TM programs or multimodal facilities.

The total cost of Alternative E is $19.3 million. This includes the cost of the tunnel structure for the cut and cover and the $6.5 million for the Buttermilk multimodal facility. The construction cost for this alternative is $12.4 million. The right-of-way cost of this alternative is $0.4 million. The right-of-way costs do not include the cost of property within the cut and cover portion that is returned to open space.

Alternative F: Modified Direct Alignment, Cut and Cover, with Separate Transit Envelope

Alternative F is similar to Alternative E except that a separate transit envelope is provided in addition to the two dedicated vehicle and/or transit lanes. The separate transit envelope requires the cut and cover section be an additional six meters (19.7 feet) wide. The right-of-way requirement (50 meters [164 feet]) plus an additional 6.0 meters [19.7 feet] for the separate transit envelope) for Alternative F is similar to Alternative D, except that the right-of-way above the cut and cover is to be returned to open space. Figure III-11 shows the modified direct alignment with a transit envelope and the location of the cut and cover section.

The alignment follows the existing State Highway 82 from Maroon Creek Road east to MP 39.9 where the alignment curves southeast onto the Marolt-Thomas property. A gradual S-curve to the east brings the alignment 204 meters (670 feet) south of the existing Castle Creek Bridge. Within the S-curve, the vertical profile of the highway begins to drop significantly below the existing ground level. The cut and cover begins at MP 40.1 (along the new alignment) and continues for 122 meters (400 feet). The clearance beneath the cut and cover is six meters (19.7 feet) high. After passing through the cut and cover, the alignment angles to the north and continues across Castle Creek. A new bridge structure is provided to join the alignment to 7th Street and Main Street.

The new bridge structure is approximately 168 meters (550 feet) long and 122 meters (400 feet) west of 7th Street and Main Street. The new bridge structure accommodates the additional width required for the transit envelope. The western edge of the new bridge deck is three meters (nine feet) lower in elevation than the at-grade option (Alternative D). The elevation of the eastern edge of the bridge deck is approximately one meter (three feet) lower than the at-grade option.

Alternative F provides the needed capacity for the anticipated future demand without the use of TM programs or additional multimodal facilities. As with Alternatives C, D, and E, these measures should be pursued if zero vehicle growth is to be achieved.

The right-of-way cost of Alternative F is $0.6 million. The right-of-way cost does not include the cost of property above the cut and cover which is returned to open space. The construction cost is $15.1 million. Including the Buttermilk multimodal facility ($6.5 million), the total cost of Alternative F is $22.2 million.

Alternative G: Two Improved Lanes on Existing Alignment and Transitway on the Modified Direct Alignment, At-Grade

Alternative G is a combination of two improved general lanes on the existing alignment and a two-lane transitway across the Marolt-Thomas property (Figure III-12). The transitway will be referenced as the fixed guideway or busway depending upon the mode being evaluated. This alternative does not pass the screening process unless it is combined with an Aggressive TM Program and a significant increase in transit use. It was included for evaluation at the request of the Aspen City Council.

The section of State Highway 82 between milepost (MP) 39.8 (Maroon Creek Road) and MP 39.9 is a four-lane section with two general highway lanes on the inside and the transit lanes on the outside. Each travel lane is 3.6 meters (12 feet) wide and the shoulders are 3.0 meters (10 feet) wide. At MP 39.9 the general lanes continue on the existing alignment and the transitway curves southeast onto the Marolt-Thomas property.

The improved two lane State Highway 82 between MP 39.9 and MP 40.0 for the general lanes consists of 3.0 meter (10 feet) shoulders, two 3.6 meter (12 feet) travel lanes and a left-turn lane. From Cemetery Lane (MP 40.0), the general lanes follow the existing alignment around the S-curves to 7th Street and Main Street (MP 40.5). Between MP 40.0 and MP 40.5 the cross section of the general highway lanes consists of two 3.6 meter (12 feet) travel lanes and a center turn lane. There is an attached 1.5 meter (5.0 feet) sidewalk within this cross section. There is no bridge widening at the Castle Creek Bridge, but minor improvements to the existing bridge structure are required. The design speed of the S-curves on the new roadway is 32 km/h (20 mph). This design speed is higher than the current design speed of approximately 25 km/h (15 mph). The S-curves and Main Street are currently signed at 40 km/h (25 mph). Design standards require the S-curves to be widened along with the larger radius.

The transitway leaves the existing roadway at MP 39.9 to create two separate alignments for the State Highway 82 transportation corridor. The transitway continues east across the Marolt-Thomas property, curving southeast. A gradual S-curve to the east brings the alignment 204 meters (670 feet) to the south of the existing Castle Creek Bridge. The alignment continues across Castle Creek to join the general lanes as the west leg of the intersection of 7th Street and Main Street. The width of the transitway is dependent upon the technology used for the dedicated lanes. A transitway for buses only would require two 3.6 meter (12 foot) travel lanes plus the width of curb and gutter and sidewalks if necessary. A light-rail transitway would be designed with wider separation between opposing directions, requiring approximately 4.1 meters (13.5 feet) per lane. The design speed of the transitway would be 60 km/h (approximately 35 to 40 mph).

Several intersections will be modified to control the access to State Highway 82 in the urban area. The existing intersection at 7th Street and Hallam Street is modified to prevent the north and east legs from accessing State Highway 82. Landscaped barrier medians are put in place across the intersection to eliminate the access onto State Highway 82 from the side streets. The intersection of 7th Street and Main Street is also modified to prevent the south leg of 7th Street from accessing State Highway 82. The west leg of this intersection becomes the transitway and 8th Street becomes a dead-end at Main Street. More information on the impacts of these intersection modifications is included in the discussion on future traffic operations in **Chapter V: Future Transportation Demand.**

Alternative G does not provide the needed capacity for the general lanes of traffic unless specific measures are taken to reduce the anticipated future vehicle demand. An Aggressive TM Program, significantly improved local and regional transit, and multimodal facilities near Maroon Creek Road, Buttermilk Ski Area, and the airport are needed if this alternative is to operate efficiently and to achieve zero vehicle growth.

The total cost of this alternative, including the Buttermilk, Airport, and Marolt-Thomas/Moore multimodal facilities, is estimated to be $38.8 million for a busway and $43.1 million for a double track fixed guideway (not including rolling stock). The right-of-way cost for this alternative is $0.5 million for both options. The construction cost for Alternative G is $7.3 million for the busway and $11.6 million for the fixed guideway. The multimodal facilities are expected to cost in the range of $26.6 to $35.0 million in addition to the above costs. For comparison purposes in Table III-3, an average cost of $31.0 million is used for the multimodal facilities ($6.5 million/Buttermilk; $19.0 million/Airport; $15.5 million/ Marolt-Thomas/Moore).

Table III-3 is a cost summary of the build alternatives assuming bus/HOV technology. The table is divided into two specific conditions: the cost of each alternative for the capacity of State Highway 82 to meet the 2015 demand; and the cost of each alternative to meet the goal of zero vehicle growth. Included in all the build alternatives is the cost of the 700-750 space intercept lot (approximately $6.5 million) discussed in the BBFEIS. This lot is to be located in the Buttermilk/Airport area. Alternative G requires additional multimodal facilities to reduce the 2015 traffic demand in order for it to provide sufficient capacity. Alternatives 2 and 3 are assumed to be combined with any one of the lettered alternatives, and so Table III-3 does not show a multimodal facility cost for these two alternatives.

3. Mode and Technology Options for Dedicated Vehicle And/Or Transit Lane

As previously discussed in the screening analysis, the two lanes for dedicated vehicle and/or transit are to provide greater planning flexibility. These two restricted lanes are included in all of the alternatives except Alternatives 1, A, and G. The restrictions applied to these two lanes provide incentives for SOV drivers to shift to HOVs (carpools, hotel shuttles, and vanpools) or transit. The transit systems include self-propelled buses, electric trolley buses, or light rail transit (LRT). These were the modes and technologies that made it through the alternative screening process.

At this point in the planning process, it is not prudent to limit the use of these restricted lanes to only one mode or technology. A description of the modes and technologies follows.

3a. High Occupancy Vehicles

HOVs are considered to be self-propelled vehicles having a minimum of two or more passengers (including driver) in the vehicle. The operational efficiency of the HOV lane will be a consideration when determining the minimum vehicle occupancy for an HOV. For purposes of discussion, HOVs in this context include carpools, hotel shuttles, and vanpools. Buses are discussed separately.

The use of an HOV designation would provide a continuation of the bus/HOV lanes committed to between Gerbazdale and the Buttermilk Ski Area in the BBFEIS. There would be no significant additional costs for any of these technologies.

3b. Self-Propelled Buses

Two general types of self-propelled buses are considered: diesel buses or natural gas buses. Self-propelled buses run in mixed flow and would allow for greatest flexibility in transit planning in the near future. No additional costs are assumed for this mode, although the capital costs to purchase new buses should be considered.

Table III-3
Cost Summary of the Build Alternatives[1]
($ Million - 1994)

To Meet the 2015 High Growth Capacity Using Bus/HOV Technology:

Cost Summary of the Build Alternatives	Alternatives: Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th and Main Street					
	2	3	B	C	D	E	F	G
Construction Cost	$14.9	$17.7	$5.5	$8.1	$10.0	$12.4	$15.1	$7.3
Right-of-Way Cost	$3.0	$4.2	$0.8	$0.5	$0.6	$0.4	$0.6	$0.5
Multimodal Facilities Cost[2,3]	NA	NA	$6.5	$6.5	$6.5	$6.5	$6.5	$31.0
TOTAL COST	**$17.9**	**$21.9**	**$12.8**	**$15.1**	**$17.1**	**$19.3**	**$22.2**	**$38.8**

To Meet the Goal of Zero Vehicle Growth Using Bus/HOV Technology:

Cost Summary of the Build Alternatives	Alternatives: Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th and Main Street					
	2	3	B	C	D	E	F	G
Construction Cost	$14.9	$17.7	$5.5	$8.1	$10.0	$12.4	$15.1	$7.3
Right-of-Way Cost	$3.0	$4.2	$0.8	$0.5	$0.6	$0.4	$0.6	$0.5
Multimodal Facilities Cost[3]	NA	NA	$31.0	$31.0	$31.0	$31.0	$31.0	$31.0
TOTAL COST	**$7.9**	**$21.9**	**$37.3**	**$39.6**	**$41.6**	**$43.8**	**$46.7**	**$38.8**

1 Cost estimates have been rounded to nearest $100,000.
2 The multimodal facilities cost to meet the 2015 capacity for Alternatives B, C, D, E, F, and G includes a 700-750 space intercept lot in the Buttermilk/ Airport area as a commitment made in the BBFEIS.
3 The multimodal facilities cost does not include right-of-way acquisition.

3c. Electric Trolley Buses

Electric trolley buses are essentially the same vehicle as self-propelled buses except they are propelled by an electric motor and obtain power from two overhead electrical wires. Electric trolley buses are rubber tired and operate in mixed flow conditions. The major limitation of such vehicles is their reliance on the overhead wires for propulsion. The system requires electrification of the entire service area.

The additional capital costs associated with electric trolley buses would be the overhead electrification. The cost estimate for electrification is $0.62 million per kilometer ($1.0 million/mile) per lane. For example, electrification for both of the dedicated vehicle or/transit lanes would be $1.24 million per kilometer ($2.0 million/mile). The cost of electric trolley coaches range from $500,000 to $600,000 per vehicle.

3d. Light Rail Transit

LRT is a mode that runs on standard gauge rail. LRT can operate in a lane next to general traffic or even in the same lane. They are the most efficient in a separate right-of-way. Power is provided by an overhead electrical system in mixed flow conditions and by either overhead electrical wires or a third electrified rail when in a separate right-of-way. The train runs on fixed rails which are embedded in the pavement for mixed-flow or on a separate right-of-way.

The additional costs associated for LRT in the two dedicated vehicle and/or transit lanes would be the costs of the embedded rail and electrification. The rail would cost approximately $0.93 million per kilometer ($1.5 million/mile) per track. This cost is in addition to the construction cost discussed for each alternative. The electrification of LRT is very similar to that of electric trolley buses. The electrification costs are approximately $0.62 million per kilometer ($1.0 million/mile) per track. The costs of LRT vehicles range from $1.5 million to $1.8 million.

F. DESIGN CONSIDERATIONS

As part of the EIS planning process, certain design assumptions must be made for the conceptual analysis. These assumptions are preliminary and may be changed as the process proceeds. The issues discussed in this section include cross section, connections/intersections on State Highway 82 and recreational trail improvements.

1. Cross Sections

1a. Typicals

The only laneage option to survive the screening process is a four-lane platform with two general highway lanes and two lanes reserved for dedicated vehicle and/or transit use. An option added at the request of the Aspen City Council is an improved two-lane platform for general traffic on the existing alignment and a new two-lane platform for a separate transitway across the Marolt-Thomas property. The first laneage option is used for Alternatives 2, 3, B, C, D, E, and F in the EIS and the second laneage option is used for Alternative G. Regardless of the alternative, the typical travel lane width for all cross sections is 3.6 meters (11.81 feet). This includes all travel lanes and auxiliary lanes (acceleration, deceleration, right- and left-turn lanes). The center turn lane for Alternative B in the S-curves is the only exception. Several cross section designs are possible for the laneage configurations. The possibilities include considerations of curb and gutter versus shoulders, wide medians versus narrow medians, and the assignment of the two restricted lanes within the four-lane platform. Each of these considerations is discussed in the following sections.

The side slope is another consideration for design. The standard side slope used for planning purposes in the EIS is a 3:1 grade for cut and fill sections less than 3.03 meters (10 feet) high (or deep). For cut and fill sections greater than 3.03 meters (10 feet) high (or deep), the side slope is a 4:1 grade. More discussion of side slope is presented in **Section III.F.1b: Conceptual Design Cross Sections for the Alternatives.**

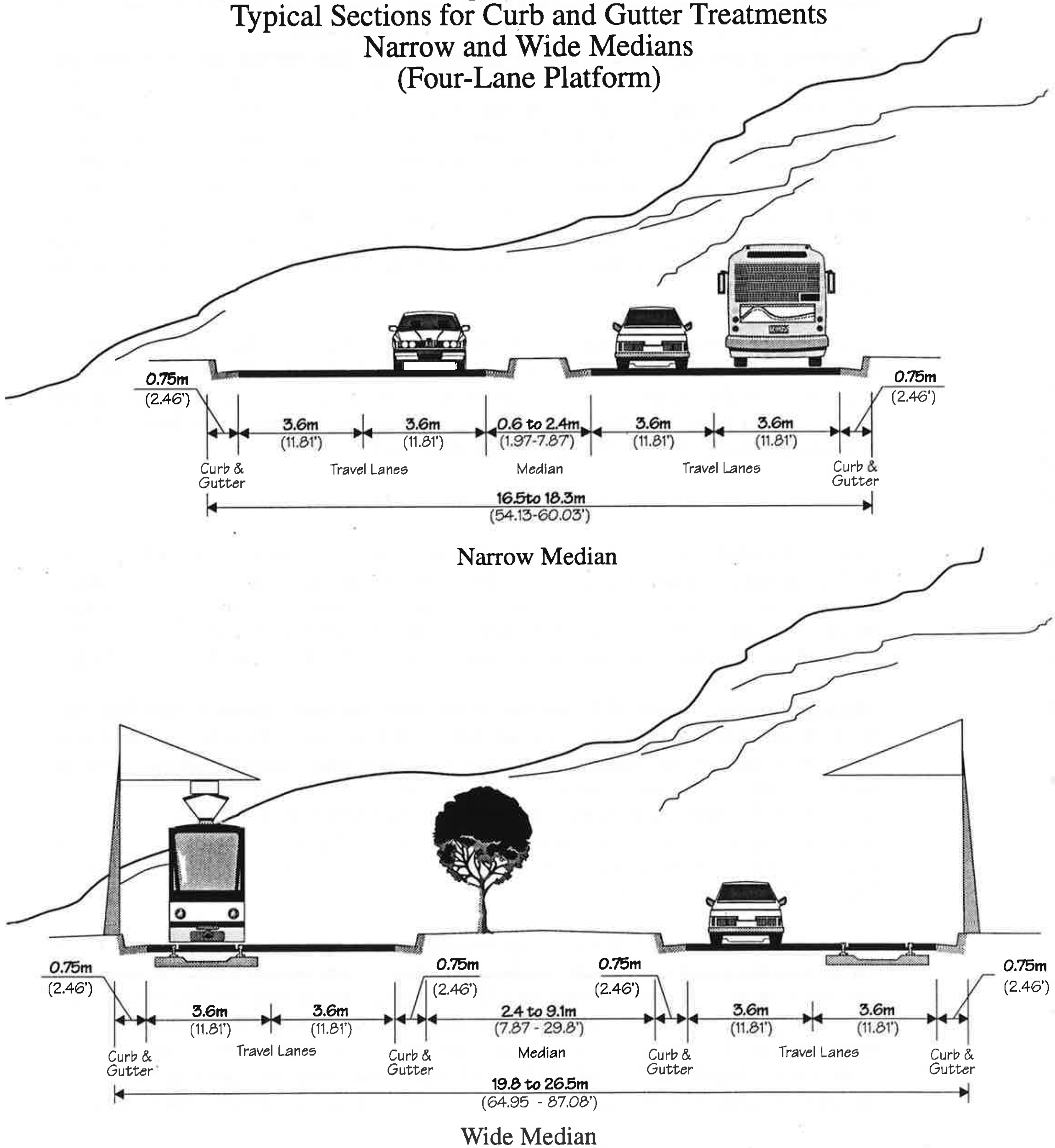
Typical Cross Section of the Four-Lane Platform

Curb and Gutter Section - A typical curb and gutter section is shown in Figure III-16 for both a narrow and wide median section. For safety reasons, the curb and gutter section is not allowed for speeds greater than 70 km/h (45 mph). This section is generally used in low-speed urban areas with an attached or separated sidewalk or pedestrian/bicycle path. The curb and gutter section includes a non-mountable curb 225 millimeters (8.8 inches) high.

Shoulder Section - Figure III-17 shows a typical four-lane cross section of State Highway 82 with shoulders for both a narrow and wide median section. The outside shoulders of these cross sections are typically 3.0 meters (9.84 feet) wide, allowing enough room for emergency parking on the roadway. The inside shoulder for the narrow median section is shown to be 1.2 meters (3.94 feet) wide but may be narrower in areas of restricted right-of-way. The figure shows the standard minimum clearance from the concrete barrier in the narrow median. The preferred inside shoulder width for a wide median is 1.8 meters (5.91 feet) to 2.4 meters (7.87 feet).

Narrow Median Section - The narrow median section is shown in Figures III-16 and III-17 for the curb and gutter and shoulder sections, respectively. The narrow median in both cases requires a barrier to separate the opposing flow of traffic. The narrow median width for the curb and gutter section is between 0.6 meters (1.97 feet) and 2.4 meters (7.87 feet) depending on the adjacent laneage requirements (i.e., turn lane versus through lane, respectively). Figure III-16 shows a barrier curb (non-mountable) and a median width of 2.4 meters (7.87 feet). The shoulder section in Figure III-17 shows a narrow median 3.0 meters

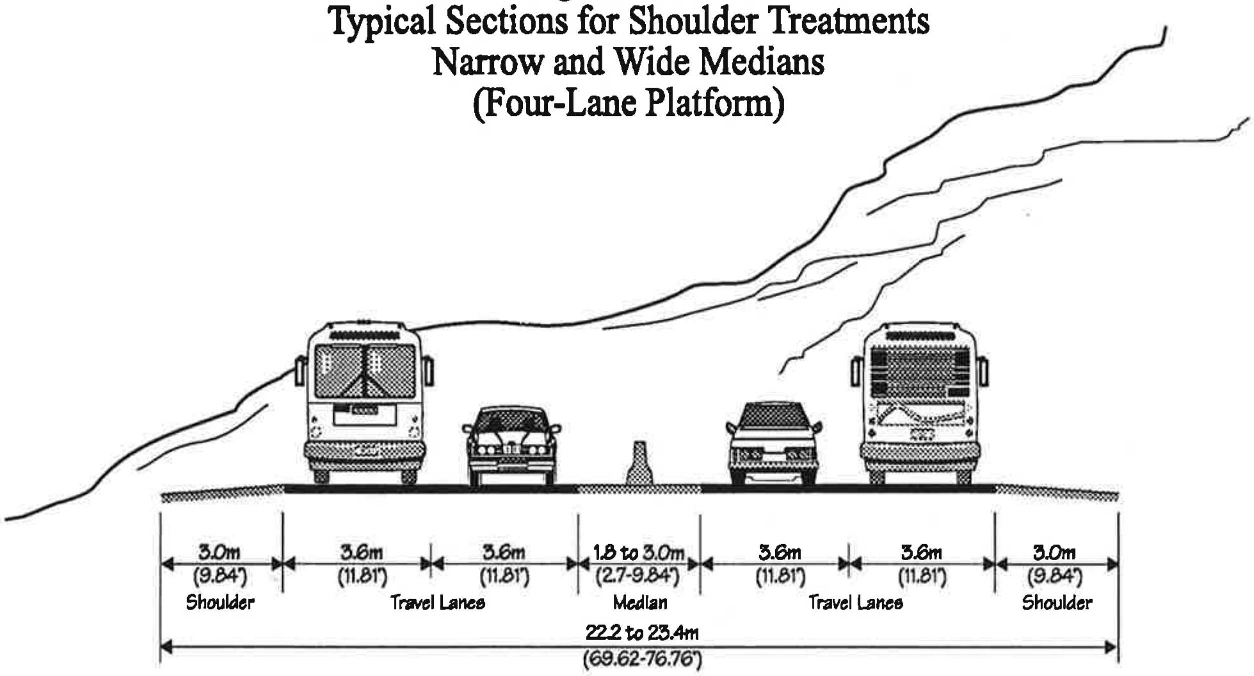
Figure III - 16
Typical Sections for Curb and Gutter Treatments
Narrow and Wide Medians
(Four-Lane Platform)



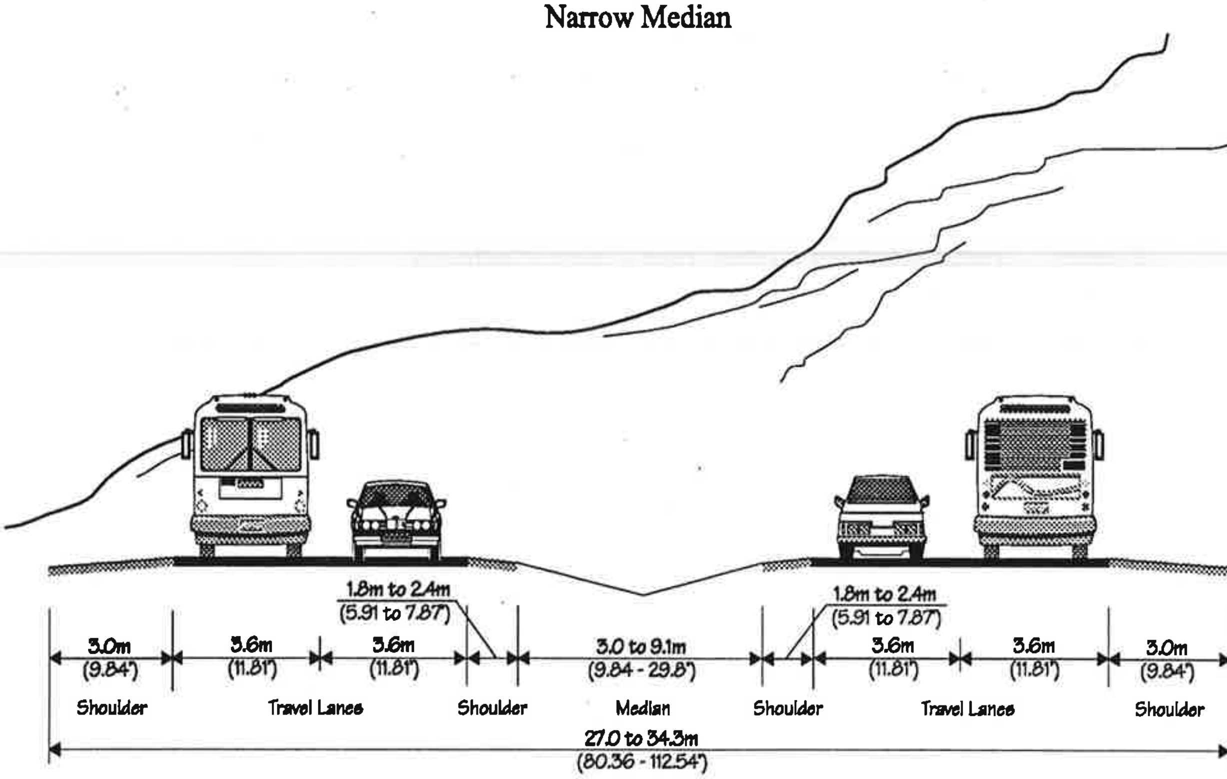
Narrow Median

Wide Median

Figure III - 17
Typical Sections for Shoulder Treatments Narrow and Wide Medians (Four-Lane Platform)



Narrow Median



Wide Median

(10 feet) wide which includes the inside shoulder width of 1.2 meters (3.94 feet) on either side of the barrier. For a shoulder section, a concrete barrier is typically used in a narrow median and is shown as such in Figure III-17. In either the curb and gutter or shoulder sections, the narrow median has less right-of-way acquisition impact than the wide median section.

Wide Median Section - The wide median sections for both curb and gutter and shoulder sections are contained in Figure III-16 and III-17, respectively. The wide median section in Figure III-17 allows full-width shoulders to be developed, where the narrow median provides only minimum shoulder width. No protective barriers are required in the case of either curb and gutter or shoulder wide-median sections.

Restricted Lane Assignment - The assignment of the two restricted lanes can be described as either a separated transitway or as dedicated vehicle and/or transit lanes adjacent to the general traffic lanes. A separate transitway is completely apart from the general traffic lanes, with both facilities operating as two-way, two-lane roadways. Figure III-18 shows both the restricted lane assignment as a separate transitway and the restricted lanes on the outside of the general traffic lanes for an integrated facility. In the case of an integrated facility, both the restricted lanes and dedicated vehicle and/or transit lanes operate in the same direction.

A consideration regarding the restricted lane includes the selection of light rail as a transit technology. Planning ahead for LRT to be phased in at a future date may include embedding the light rail tracks in the restricted lane during the initial construction of a new roadway. Figure III-19 shows the cross section of the restricted lanes with light rail tracks embedded in the pavement.

Typical Cross Section of the Two-Lane Platform

The typicals described in the following sections describe cross sections which are applicable to both the general traffic lanes and the busway or LRT lanes. A median is not generally used for a two-lane cross section.

Curb and Gutter Section - A typical curb and gutter section is shown in Figure III-20 for a two-lane roadway. For safety reasons, the curb and gutter section is generally used in low speed (<70 km/h [45 mph]) urban areas. The cross section may include a sidewalk or a pedestrian/bicycle path.

Shoulder Section - A typical shoulder section for a two-lane roadway is shown in Figure III-21. The outside shoulders for this cross section are typically 3.0 meters (9.84 feet) wide to allow for emergency parking on the roadway.

Figure III - 18
Restricted Lane Assignment

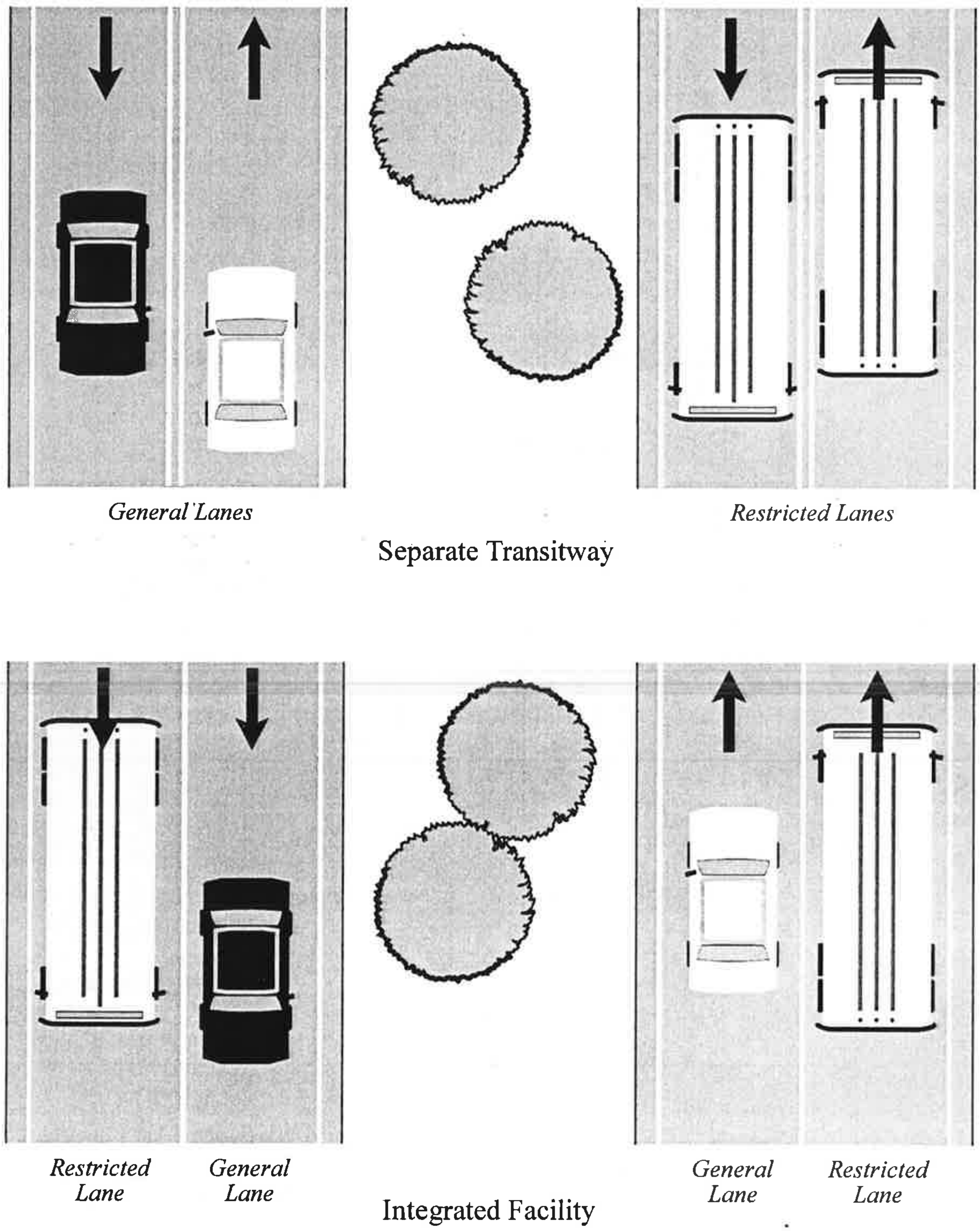


Figure III - 19
Light Rail Track
Embedded in Dedicated Vehicle and/or Transit Lanes

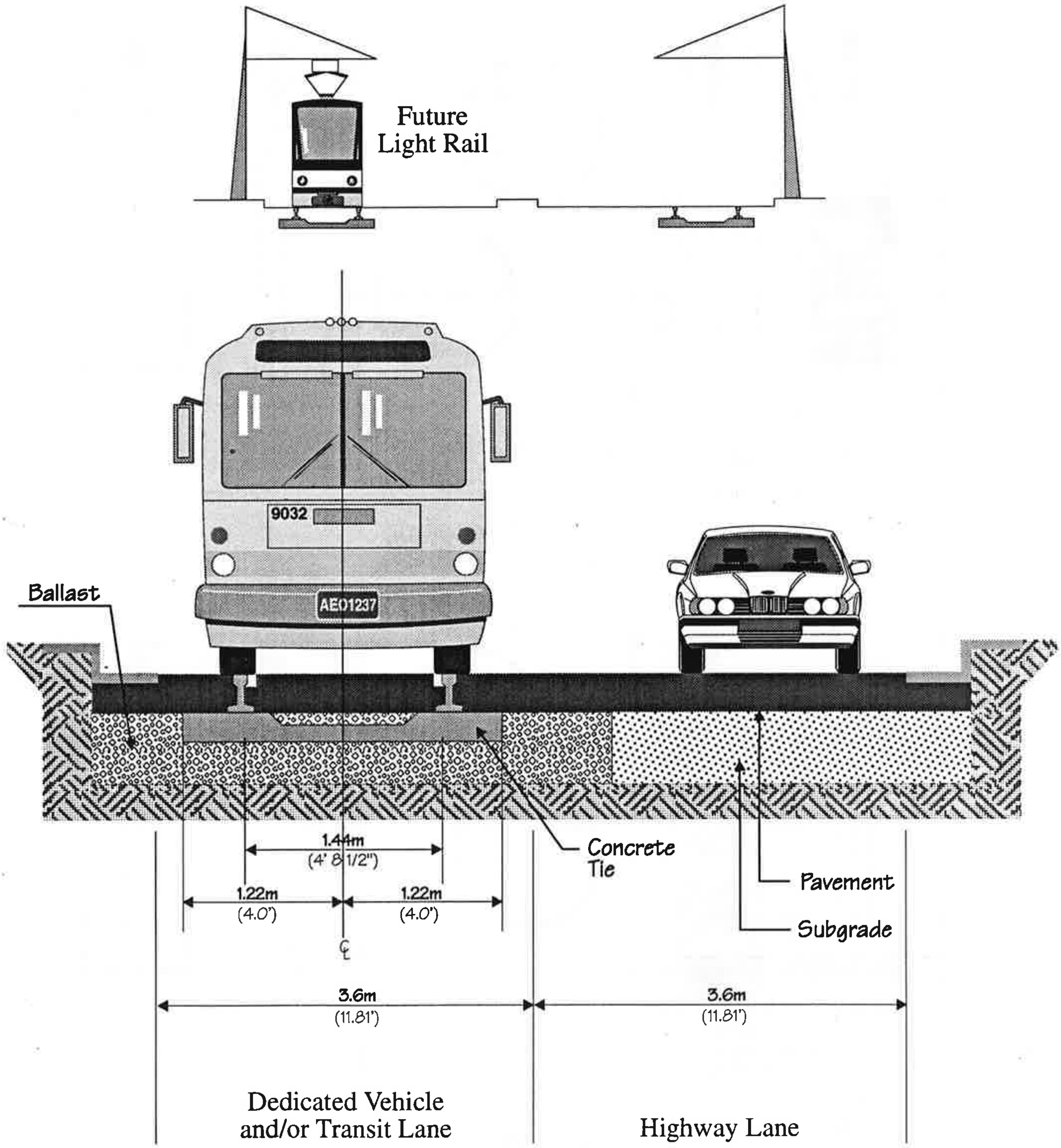


Figure III - 20
Typical Section for Curb and Gutter Treatment
(Two-Lane Platform)

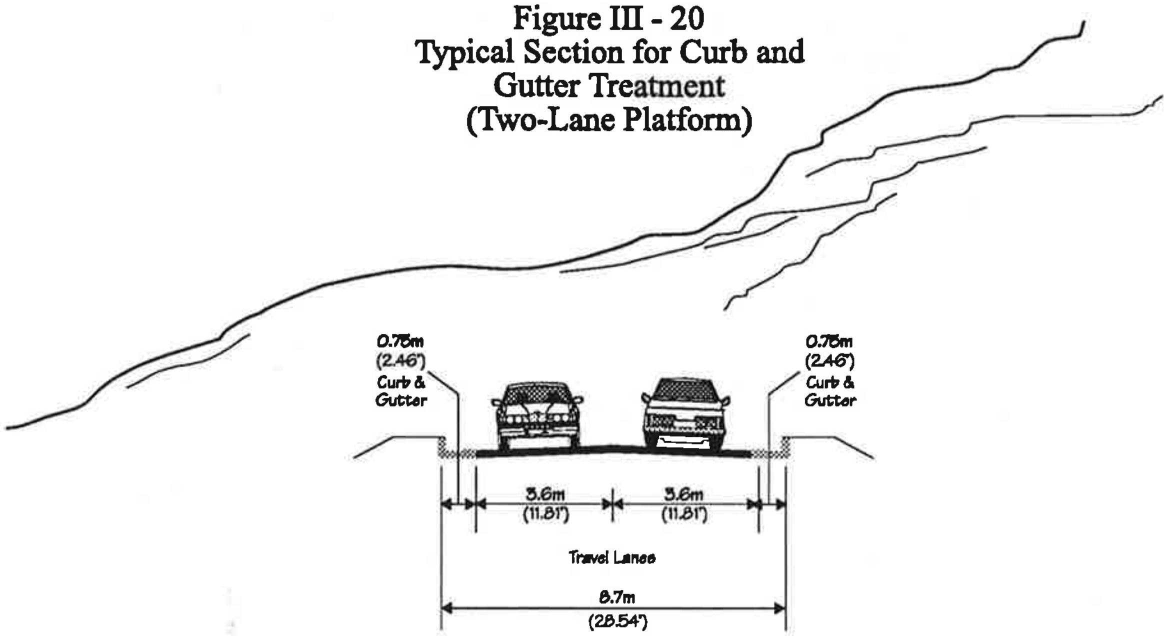
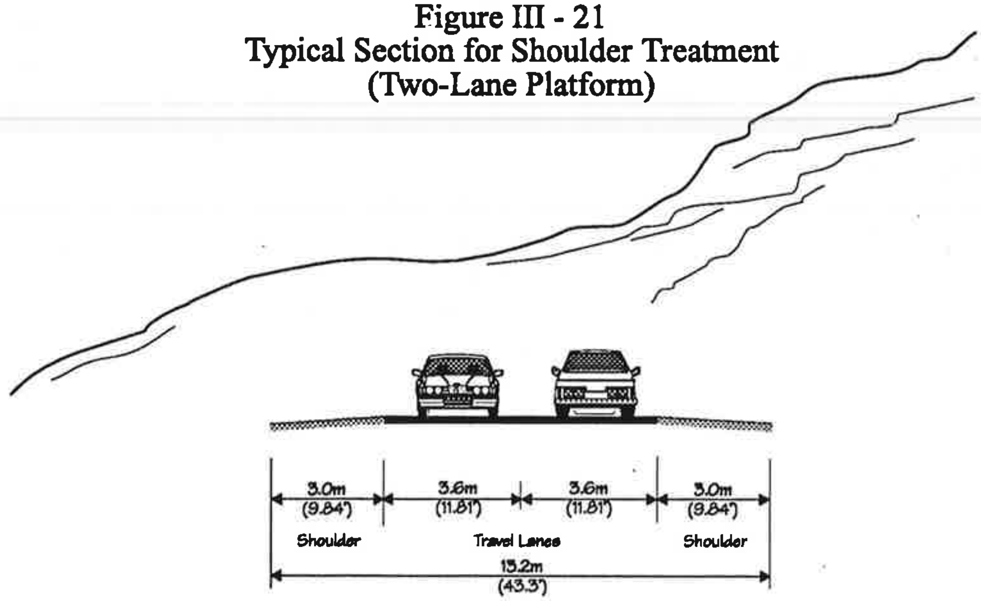


Figure III - 21
Typical Section for Shoulder Treatment
(Two-Lane Platform)



1b. Conceptual Design Cross Sections for the Alternatives

With consideration of the cross section issues previously mentioned, conceptual cross section designs for the build alternatives were created. The conceptual cross sections provide information relative to safety issues, right-of-way requirements, costs, section 4(f) impacts and other environmental impacts needed for evaluation of the alternatives. The cross sections of the alternatives are separated into several roadway sections. Figures that accompany the discussion of the cross sections are viewed looking east (towards Aspen) along the alignments.

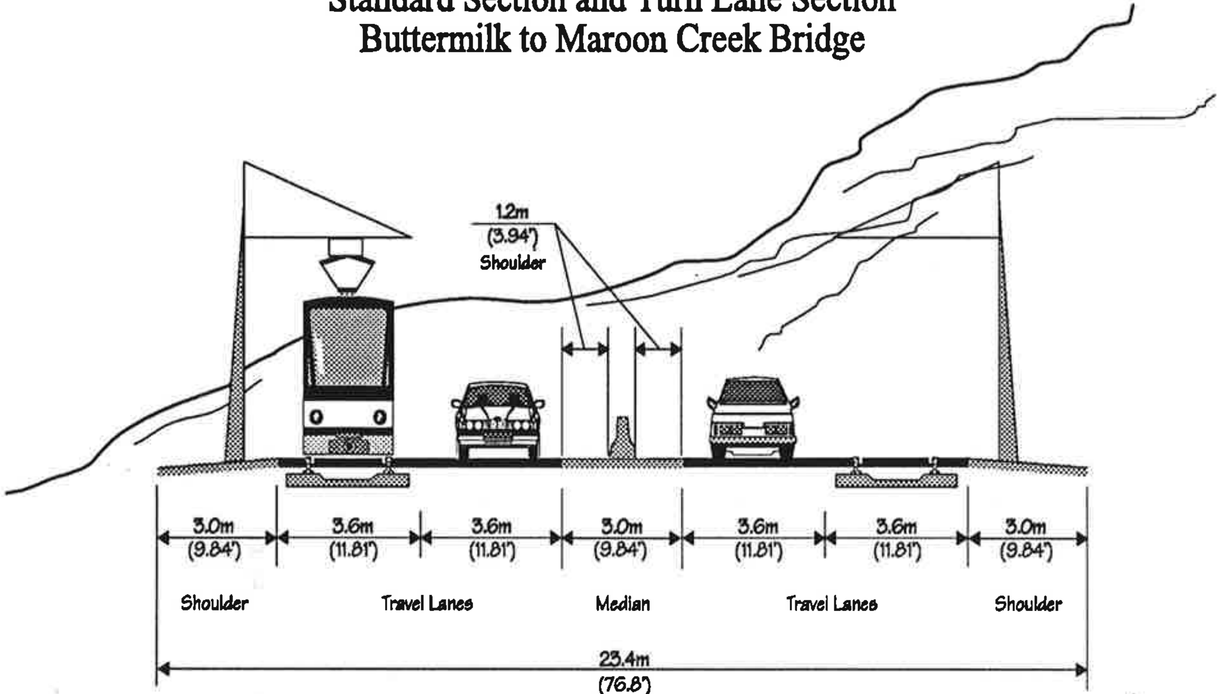
Buttermilk Ski Area to Maroon Creek - The typical cross section used between Buttermilk Ski Area and Maroon Creek Bridge is shown in Figure III-22 for Alternative 2. The typical section for Alternative 3 is similar to Figure III-22 except that it would include additional width on the south side to accommodate a separate transit envelope. The length of this segment is 885 meters (2,904 feet) between MP 38.57 and MP 39.12. The cross section is designed for 90 km/hr (55 mph) and consists of a narrow median section with shoulders and a center barrier. The full width of the cross section for Alternative 2 is 23.4 meters (76.8 feet). The width of the cross section for Alternative 3 varies between 29.4 meters (96.5 feet) and 32.4 meters (106.3 feet) to provide right-of-way for a single and double track transit envelope. The width of the transit envelope is 6.0 meters (19.7 feet) for a single track and 9.0 meters (29.5 feet) for a double track.

The turn lane section for this segment is also shown in Figure III-22 with a maximum of three additional lanes. The outside shoulders are reduced to 1.2 meters (3.94 feet) with the addition of auxiliary lanes 3.6 meters (11.81 feet) wide adjacent to the through lanes. The median is narrowed to 1.8 meters (11.81 feet) wide for a left-turn lane. This cross section is used at major intersections on State Highway 82 with adjustments made to the lane requirements to accommodate the turning movements at each location. These intersections include West Buttermilk Road, the driveway to the Inn at Aspen, the Maroon Creek Lodge intersection, and the business park/condominium entrances at MP 39.1.

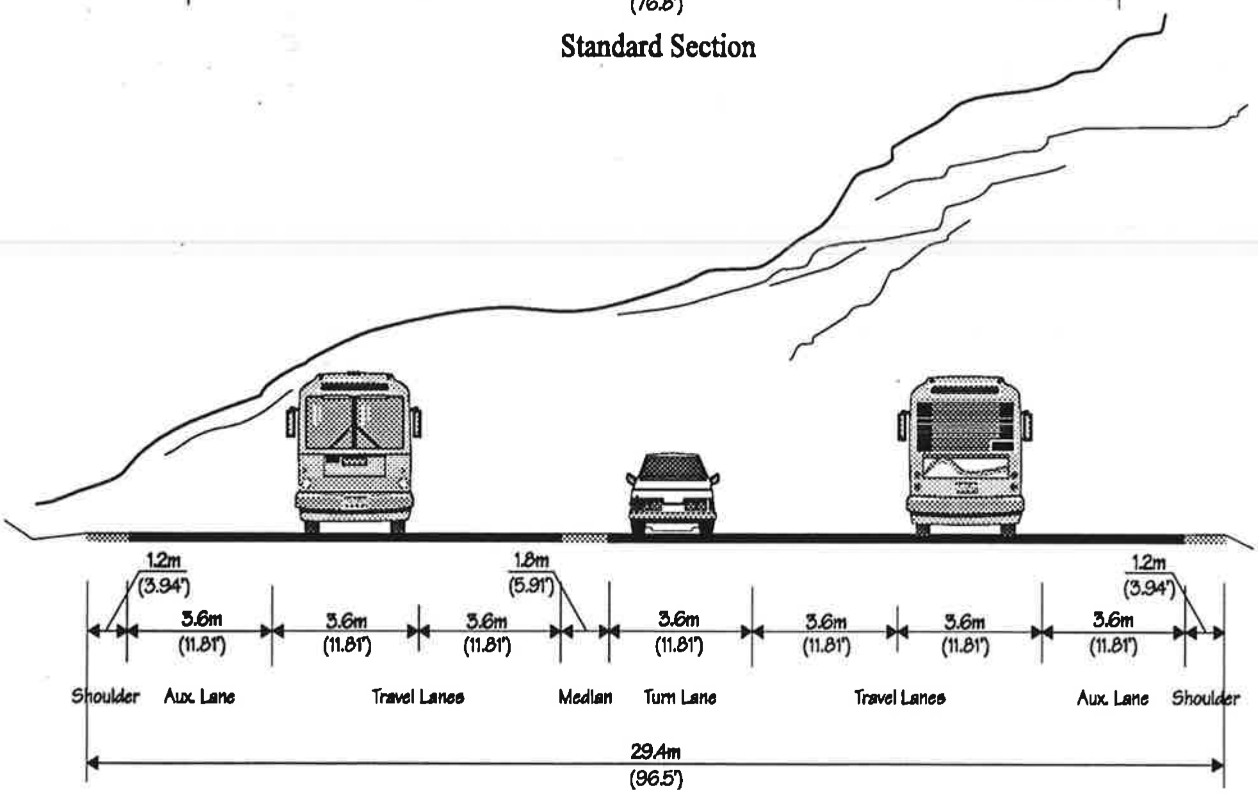
Maroon Creek Bridge - The Maroon Creek Bridge section is 220 meters (720 feet) long between MP 39.12 and MP 39.26. The cross section is shown in Figure III-23 for Alternative 2. The bridge section consists of four travel lanes with a narrow median and center barrier. Alternative 3 would include 6.0 meters (19.7 feet) of additional widening on the south side of the bridge to provide a transit envelope. The inside shoulders of the cross section in Figure III-23 are 0.9 meters (2.95 feet) wide and the outside shoulders are 1.8 meters (5.91 feet) wide. The north side of the bridge also includes a curb and gutter section with an attached sidewalk 1.5 meter (4.92 feet) wide. The width of the curb and gutter section is 0.75 meters (2.5 feet) and the full width of the bridge is 23.3 meters (76.3 feet) without a transit envelope for Alternative 2. The bridge with a transit envelope is 29.3 meters (96.1 feet) wide for Alternative 3.

Maroon Creek Bridge to Castle Creek Bridge - The roadway section between Maroon Creek Bridge and Castle Creek Bridge is 1,500 meters (4,921 feet) long from MP 39.26 to MP 40.19. Two cross sections are possible, depending upon the alternative under consideration.

Figure III - 22
Standard Section and Turn Lane Section
Buttermilk to Maroon Creek Bridge

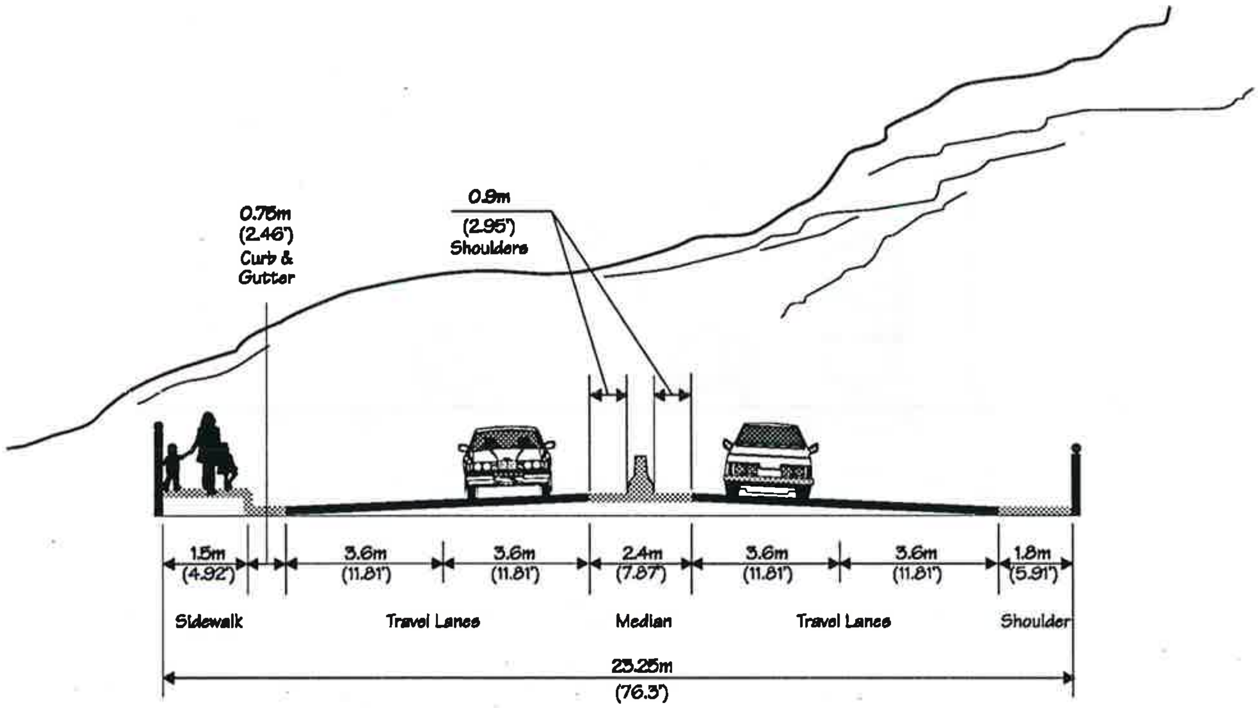


Standard Section



Turn Lane Section

Figure III - 23
Standard Section
Maroon Creek Bridge



As shown in Figure III-24, the cross section for Alternatives B, C, and E consists of a narrow median with curb and gutter and is 18.3 meters (60 feet) wide. This cross section would have additional transit envelope widening for Alternatives D and F. The additional 6.0 meters (19.7 feet) for a single track transit envelope increases the width of the cross section to 24.3 meters (79.7 feet). The double track transit envelope increases the cross section to 27.3 meters (89.6 feet). Design speed in this section is 60 km/h (approximately 35 to 40 mph). The raised center median and curb and gutter sections are more conducive to a lower speed environment than a shoulder section. The center median is 2.4 meters (7.87 feet) wide in Figure III-24 but is narrowed to 1.8 meters (5.91 feet) to accommodate a turn lane 3.6 meters (11.81 feet) wide at Cemetery Lane (Figure III-24) for Alternative B. This same cross section could be used if a Cemetery Lane was extended and connected to Alternatives C or E. The width of the turn lane section is 21.3 meters (69.9 feet) without a transit envelope.

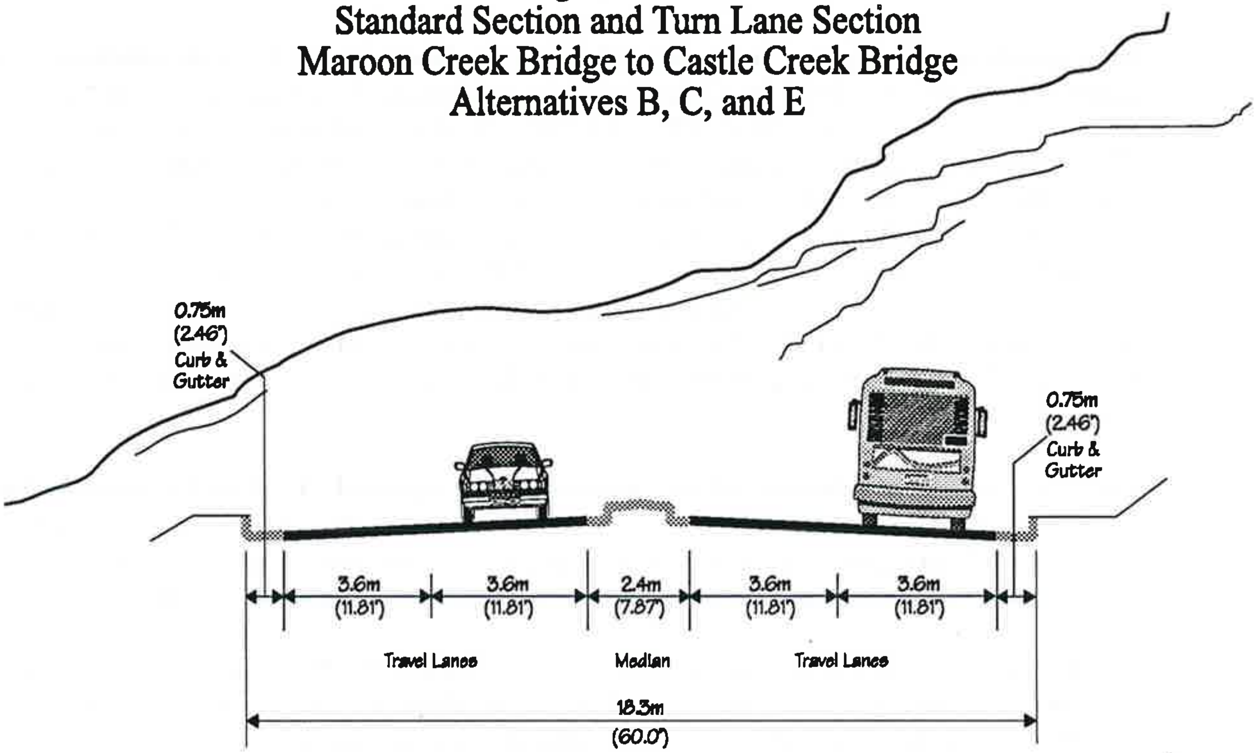
The cross section for Alternative G is identical to Alternatives C, D, E, and F between MP 39.8 and MP 39.9. After MP 39.9, the cross section for Alternative G is a combination of the improved two-lane existing alignment and the two-lane transitway across the Marolt-Thomas property. Each of these two-lane cross sections is discussed separately.

Figure III-25 shows the improved two-lane existing alignment for Alternative G with a center turn lane and a curb and gutter treatment. The total width of this cross section is 12.3 meters (40.35 feet). A separate median is not included in this cross section.

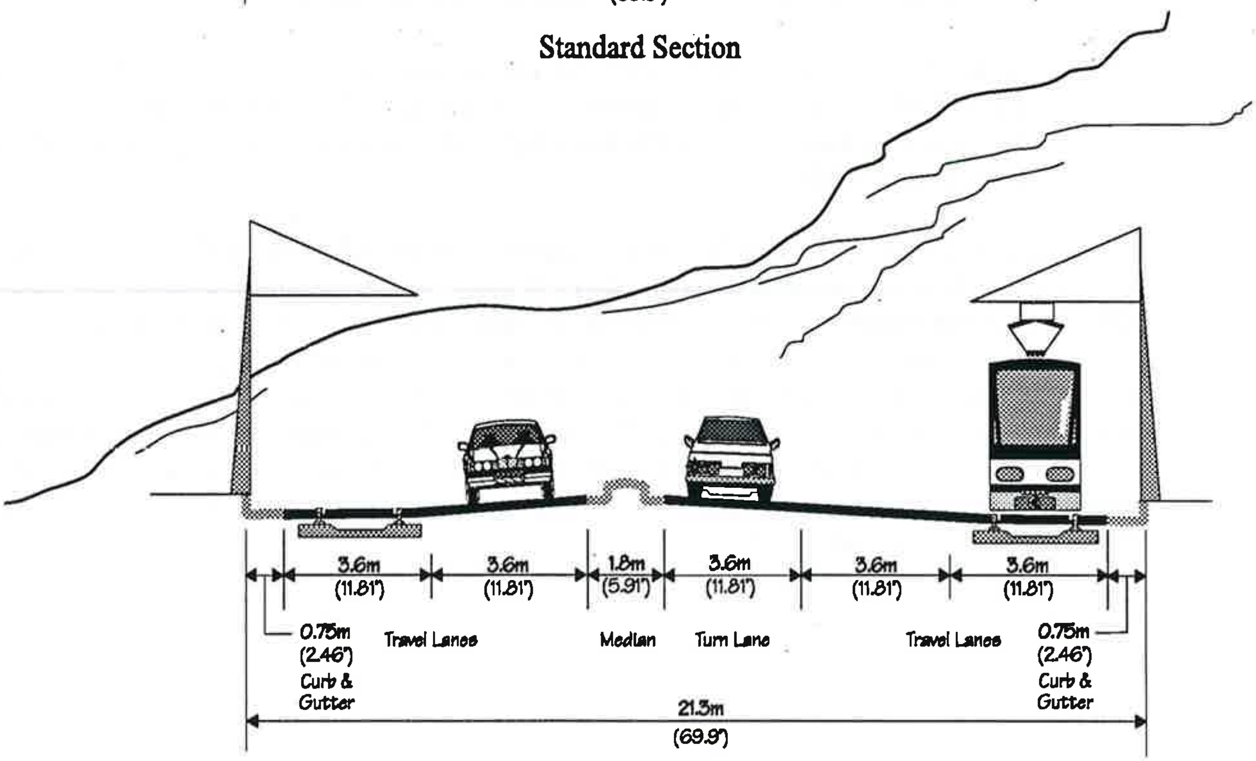
Also in Figure III-25 are the cross sections for the transitway. The section for the busway is 8.7 meters (28.54 feet) wide and is continuous from Cemetery Lane to 7th Street and Main Street. The section for a ballasted, double track light rail is approximately 11.2 meters (36.6 feet) for a minimum width.

Castle Creek Bridge - The Castle Creek Bridge section for Alternatives C and E is shown in Figure III-26. Cross sections for Alternatives D and F would include a separate 6.0 meter (19.7 feet) transit envelope to the south (right side in figure). The cross section in Figure III-26 is 21.9 meters (71.9 feet) wide and consists of a narrow median section with curb and gutter and an attached sidewalk on both the north and south sides. The cross section including a separate transit envelope is 27.9 meters (91.5 feet) wide. This bridge section is 168 meters (540 feet) long between MP 40.19 and MP 40.29 on the new alignment. The previous cross section is continued east of the new bridge to connect to Main Street at 7th Street (MP 40.29 to MP 40.37).

Figure III - 24
Standard Section and Turn Lane Section
Maroon Creek Bridge to Castle Creek Bridge
Alternatives B, C, and E

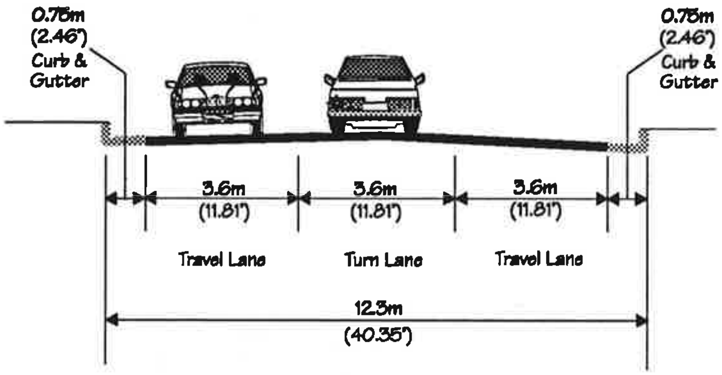


Standard Section

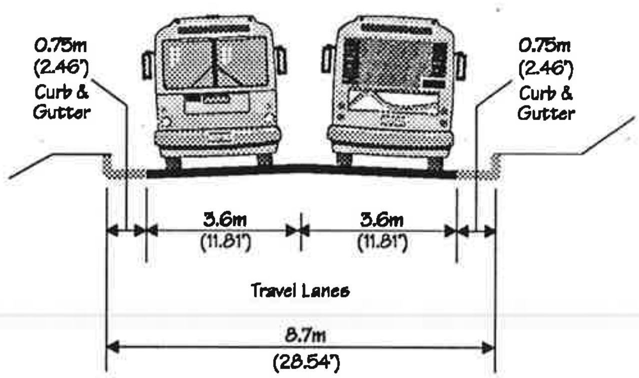


Turn Lane Section - Cemetery Lane

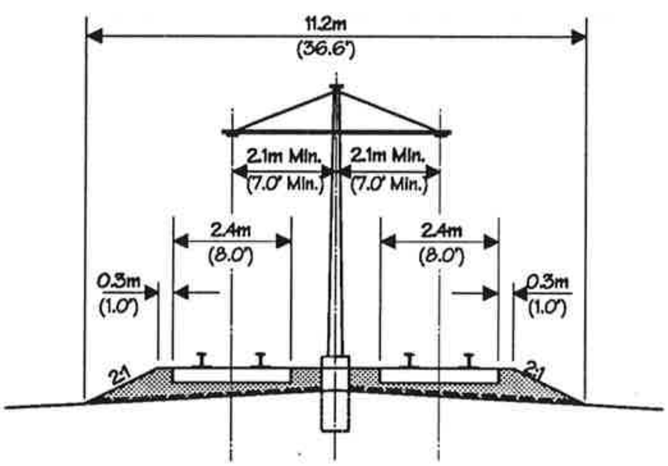
Figure III - 25
Standard Section and Turn Lane Section
Maroon Creek Bridge to Castle Creek Bridge
Alternative G



General Lanes
Turn Lane Section - Cemetery Lane

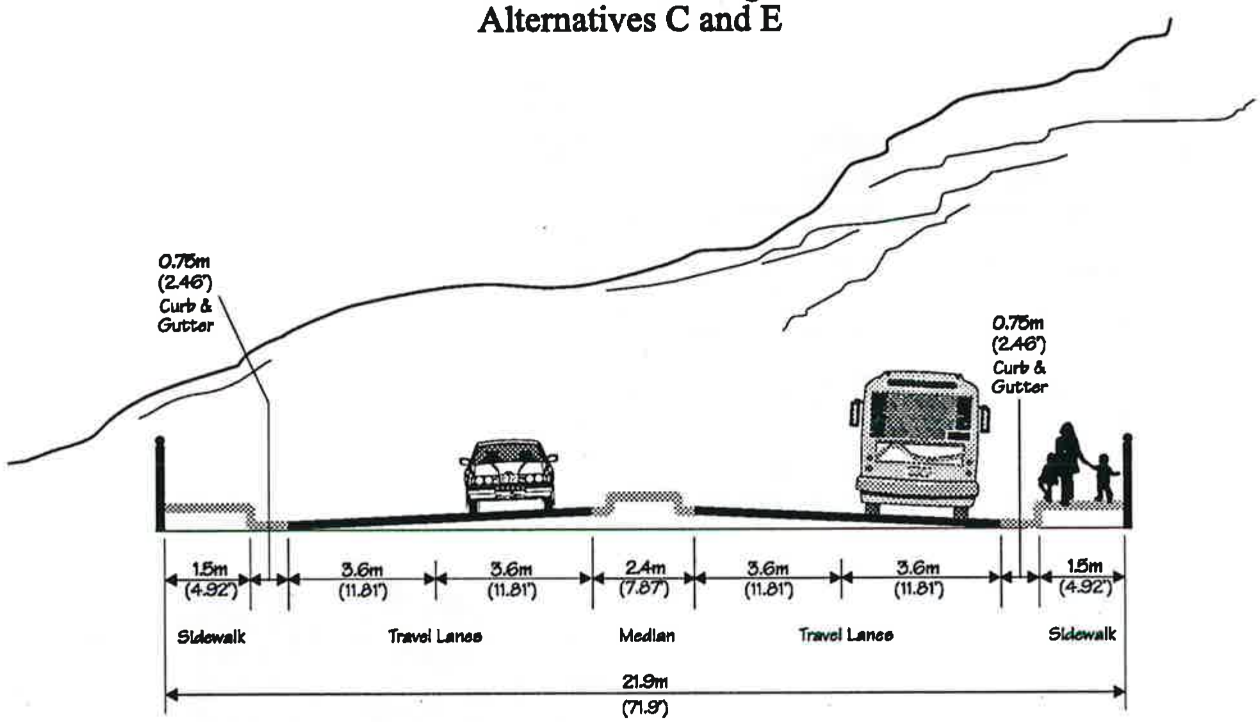


Busway



Light Rail

Figure III - 26
Standard Section
Castle Creek Bridge
Alternatives C and E



The Castle Creek Bridge section for Alternative B, on the existing alignment, is shown in Figure III-27. The existing Castle Creek Bridge is 129 meters (423 feet) long between MP 40.14 and MP 40.22. The cross section in Figure III-27 shows the existing bridge widened to the south to accommodate the wider roadway. The bridge is widened from 12.2 meters (40 feet) to 21.9 meters (71.9 feet). The curb and gutter section and the narrow median are maintained from the previous cross section. Sidewalks 1.5 meters (4.92 feet) wide are located on either side of the widened bridge.

Other options for widening the existing bridge (not shown) were (1) to widen the bridge to the north or (2) widen the bridge on both sides along the existing centerline.

The Castle Creek Bridge sections for Alternative G are shown in Figure III-28 for the improved two-lane existing alignment and the two-lane transitway. The existing Castle Creek Bridge would not require widening for the general lanes, but will receive minor safety improvements and structural enhancements. The new transitway bridge for the busway would be a total of 11.7 meters (38.38 feet) in width, including a pedestrian/bicycle path for future use. The new bridge for a LRT would be a minimum of 8.2 meters (27 feet) wide.

S-Curves Widening - This roadway section covers 435 meters (1,426 feet) between MP 40.22 and MP 40.49 on the existing State Highway 82. Two options exist for improvements to the S-curves. Alternative B is a widened four-lane platform and Alternative G is a two-lane platform with minimal widening.

The cross section for Alternative B is shown in Figure III-29. The existing highway is widened to 22.8 meters (74.8 feet) to provide four travel lanes, a left turn lane 3.3 meters (10.83 feet) wide, curb and gutter, and sidewalks. A narrow median 0.6 meters (1.97 feet) wide is also provided in this cross section. The design speed for the cross section in Figure III-29 is 40 km/h (25 mph). Higher design speeds would require a greater curve radius but with less width. Slower design speeds would require a smaller curve radius with a wider cross section.

The S-curves cross section for Alternative G is shown in Figure III-30. The design speed for the two-lane improvements is 32 km/h (20 mph). The existing roadway is widened slightly at the intersections of 7th Street and Hallam Street, and 7th Street and Main Street to accomplish the new curvature. The figure depicts the cross section at Bleeker Street and shows a two-lane roadway with a center turn lane. A median is not included in the total cross section width of 15.0 meters (49.21 feet).

Figure III - 27
Standard Section
Existing Castle Creek Bridge Widened to South
Alternative B

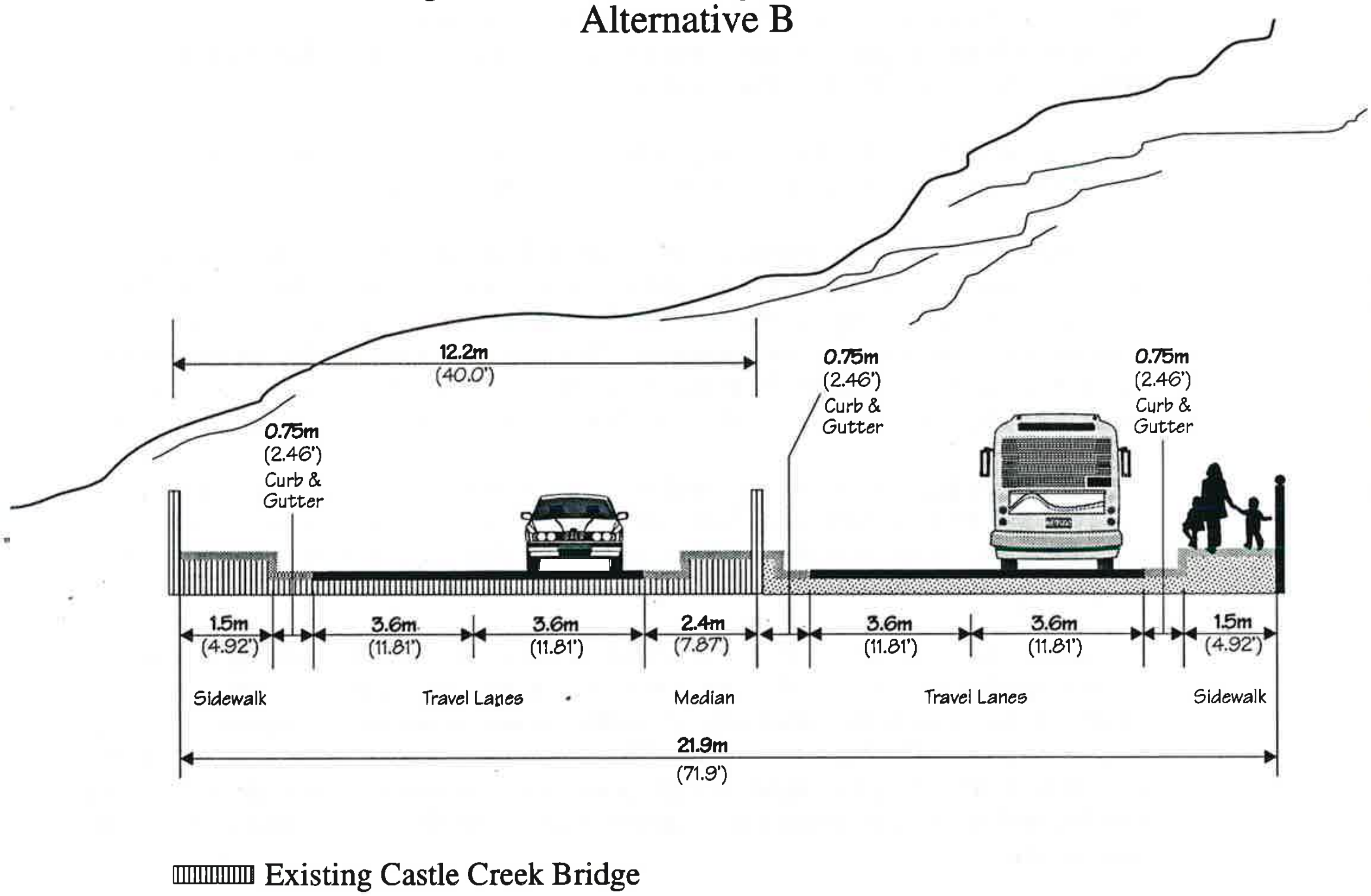
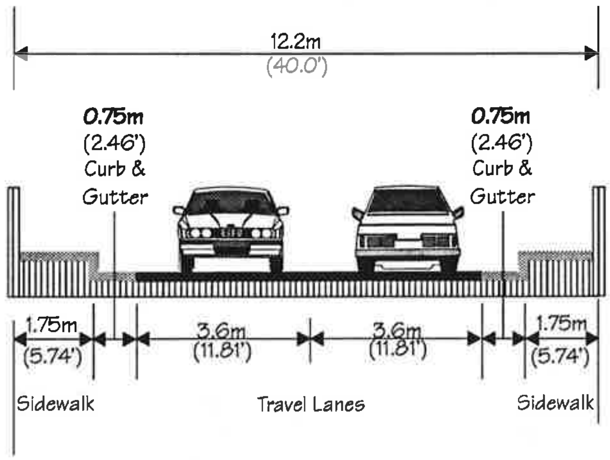
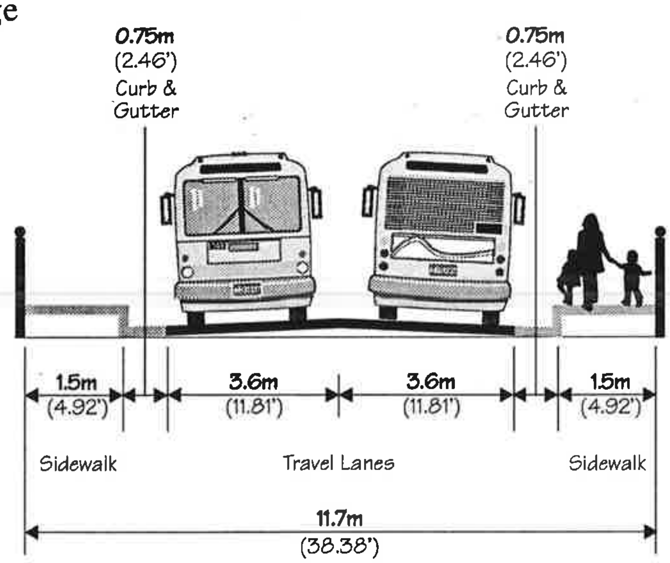


Figure III - 28
Standard Section
Castle Creek Bridge
Alternative G

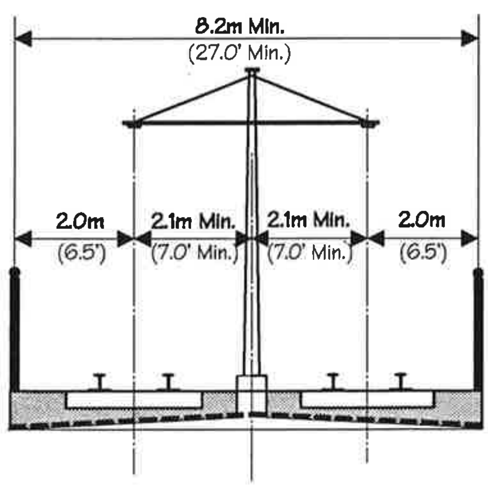


Existing Castle Creek Bridge

General Lanes: Existing Castle Creek Bridge



Busway: Castle Creek Bridge



Light Rail: Castle Creek Bridge

Figure III - 29
Standard Section
Widened Existing S - Curves
(Castle Creek to 7th Street and Main Street)
Alternative B

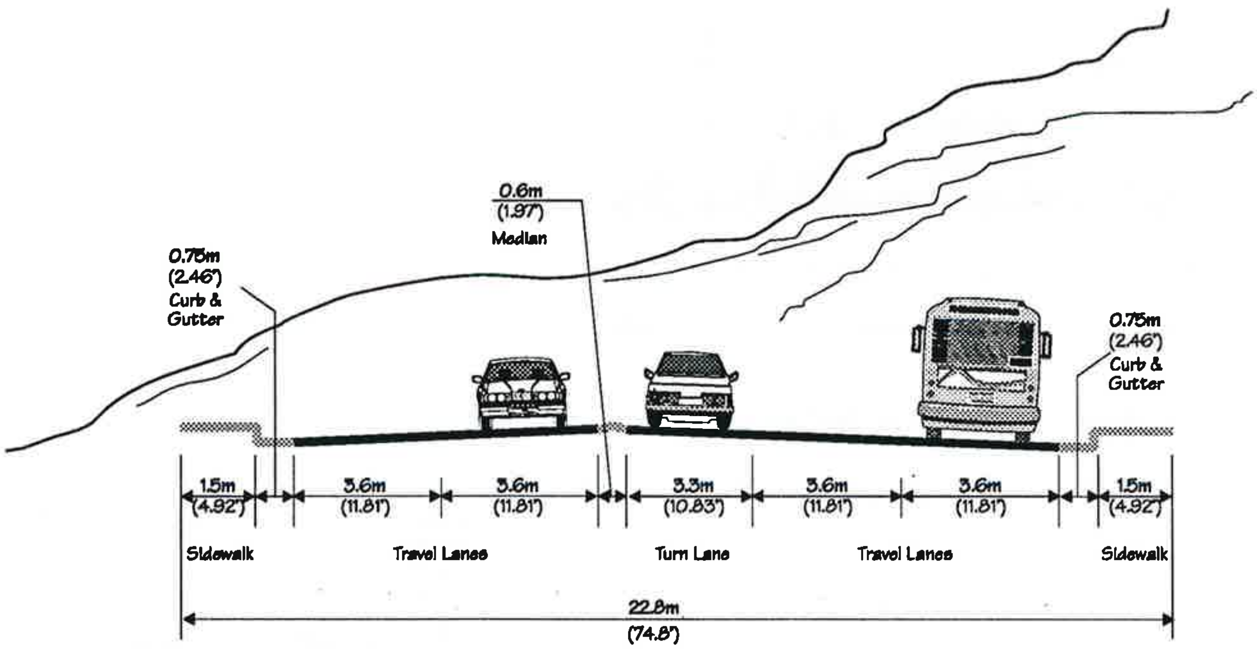
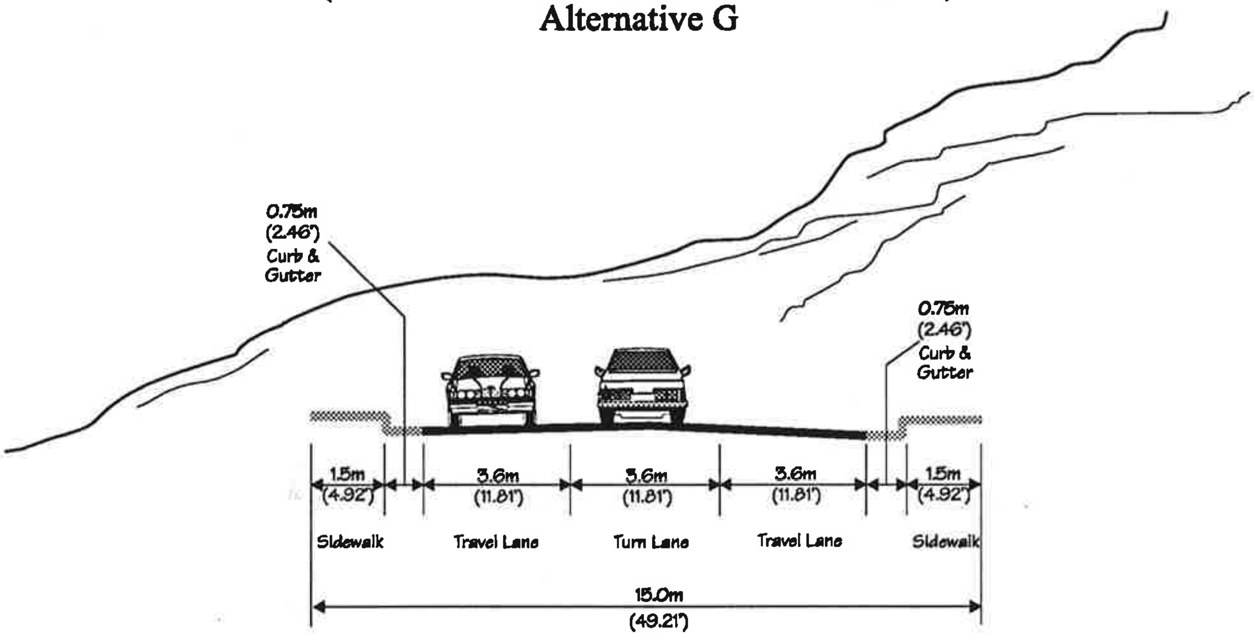


Figure III - 30
Standard Section
Widening Existing S - Curves
(Castle Creek to 7th Street and Main Street)
Alternative G



2. Connections to State Highway 82

2a. Cemetery Lane Connection

Four of the seven alternatives evaluated between Maroon Creek Road and 7th Street and Main Street realign existing State Highway 82 to the south of its current alignment at Cemetery Lane. The alternatives require the extension of Cemetery Lane to the new State Highway 82 alignment or the abandonment of a new intersection with Cemetery Lane. Three general options exist for the Cemetery Lane connection: (1) no connection, (2) connection to the new alignment using the existing State Highway 82, and (3) extend Cemetery Lane across the Marolt-Thomas property to connect to the new alignment. Figure III-31 shows each of these options.

No Connection - The existing State Highway 82 west of Cemetery Lane is removed and converted to open space. Drivers traveling eastbound on State Highway 82 who want to use Cemetery Lane are forced to travel out-of-direction to 7th Street and Main Street, backtracking around the S-curves. This backtracking is reversed for drivers on Cemetery Lane wanting to travel west on State Highway 82. During the summer afternoon peak hour, these out-of-direction trips account for 6 percent of the total vehicles entering the existing intersection (both State Highway 82 and Cemetery Lane traffic). This corresponds to less than 0.5 percent of the total VMT in the Aspen non-attainment area.

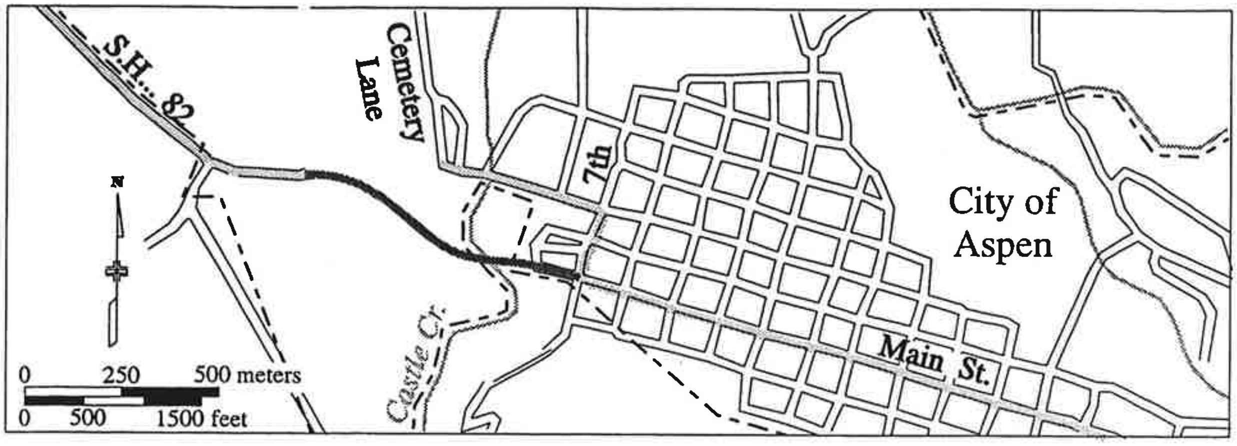
Existing State Highway 82 - The existing State Highway 82 is left in place west of Cemetery Lane, connecting the old and new alignments at a T-intersection. The existing State Highway 82 east of Cemetery Lane also remains in place. The new intersection is stop controlled with right turns only allowed from Cemetery Lane. Full access with left- and right-turn lanes to Cemetery Lane is provided for State Highway 82.

Extend Cemetery Lane - State Highway 82 west of Cemetery Lane is removed and converted to open space, while the existing State Highway 82 remains east of Cemetery Lane but only as a local road. Cemetery Lane is extended from its present intersection with the existing highway to the new alignment. The extension of Cemetery Lane to the new alignment requires a new T-intersection. The intersection needs to be signalized if it is to operate similar to the existing Cemetery Lane/State Highway 82 intersection. If this is not the case, then a roundabout or a stop control with right turn only restrictions is needed. The new intersection would need to be located so that it avoids conflict with the cut and cover section.

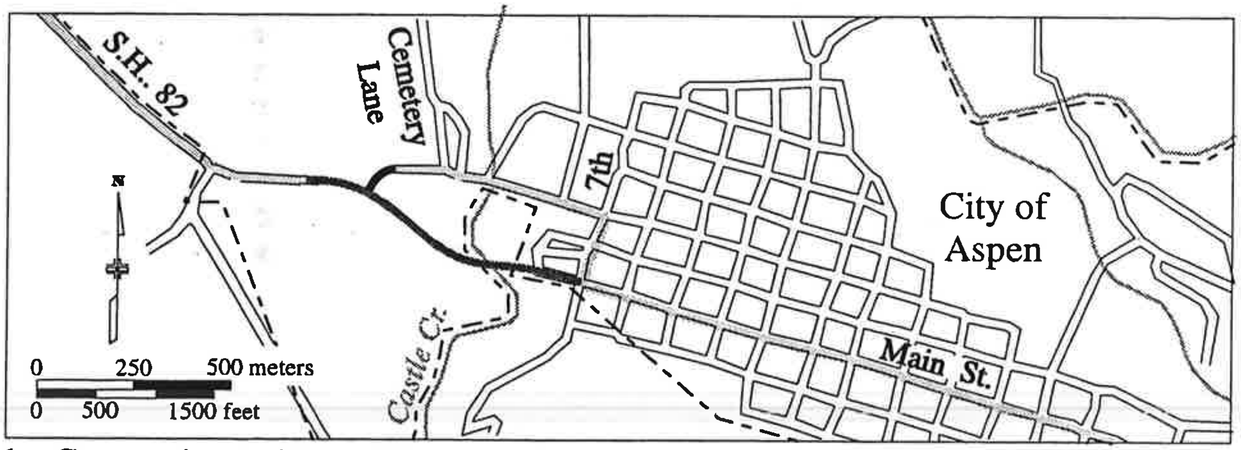
2b. Maroon Creek Road / Castle Creek Road

The connections of Maroon Creek Road and/or Castle Creek Road to State Highway 82 are presented for discussion purposes. Although it is not in the scope of this project to completely address the congestion problems on these two roads, the operations of these two roads do affect the operations of State Highway 82.

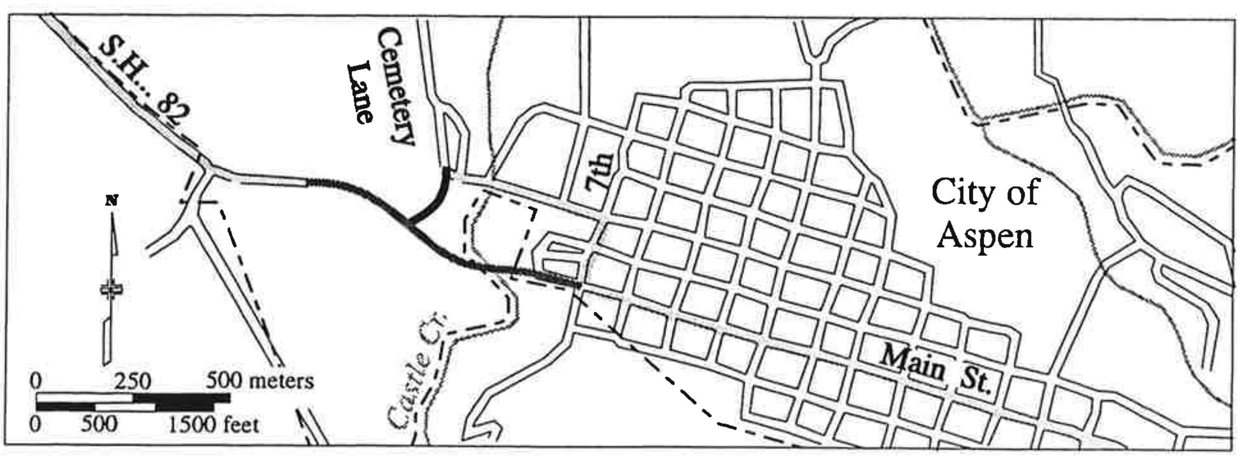
Figure III-31. Options for Cemetery Lane Connection



a. No Connection to New Alignment



b. Connection to New Alignment Using Existing State Highway 82 West of Cemetery Lane



c. Extension of Cemetery Lane to New Alignment

Maroon Creek Road and Castle Creek Road are significant links in the Aspen transportation system. Maroon Creek Road serves Aspen Highlands Ski Area, Aspen High School, and the middle and elementary schools. Castle Creek Road serves the Aspen Valley Hospital and the employee housing located on the south side of Marolt-Thomas. The combination of these two roads produces heavy traffic volumes during peak periods of the day. Complicating the situation, Castle Creek Road intersects Maroon Creek Road only 120 meters (400 feet) from the intersection of Maroon Creek Road and State Highway 82. Traffic on Maroon Creek Road backs up through the intersection with Castle Creek Road, leading to even longer delays for drivers on Castle Creek Road. The existing afternoon peak hour volume on Maroon Creek Road at State Highway 82 is approximately one-third Castle Creek Road traffic.

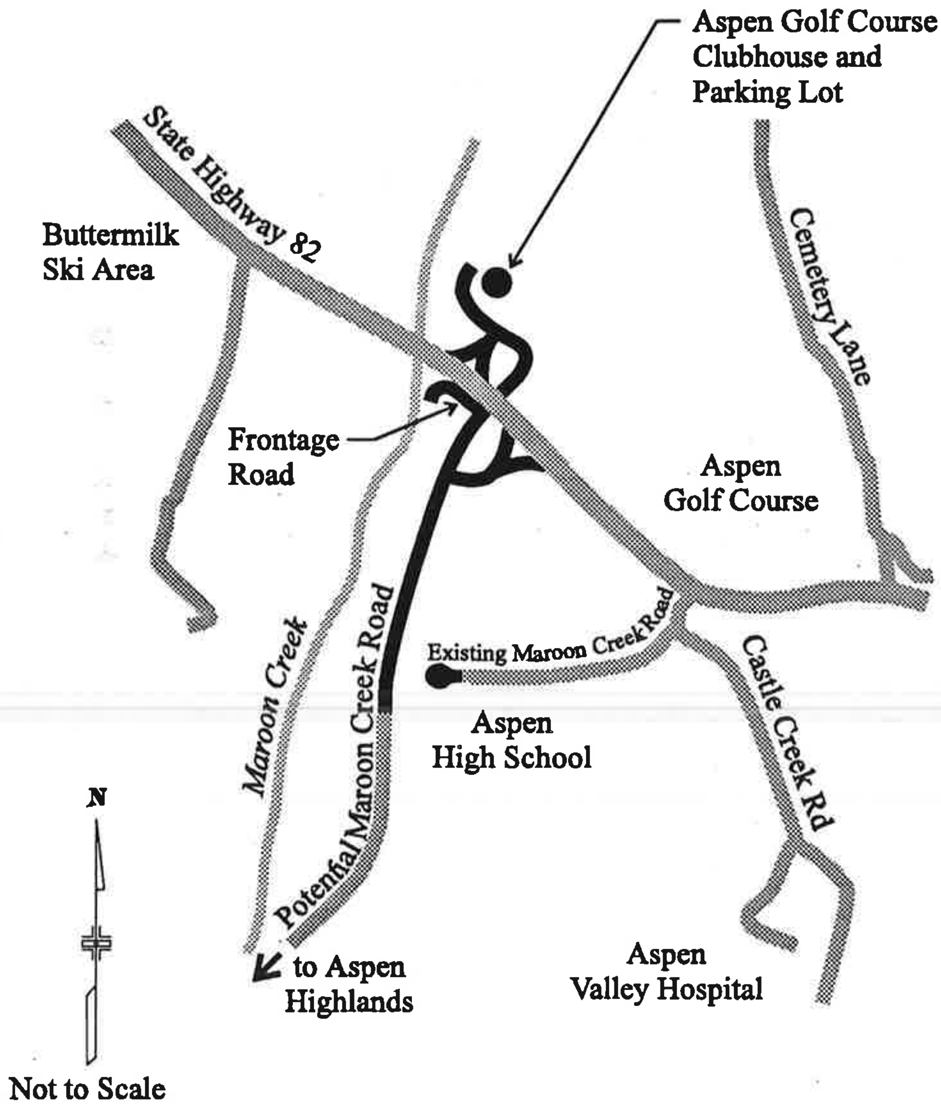
Relocation of Maroon Creek Road - Separating Maroon Creek Road and Castle Creek Road is an option that has been suggested to relieve the congestion at the existing intersections. As stated previously, 33 percent of the existing afternoon peak hour traffic on Maroon Creek Road at State Highway 82 is from Castle Creek Road. Relocation of Maroon Creek Road to the west removes the Castle Creek Road traffic demand from Maroon Creek Road.

Figure III-32 shows a schematic of a possible configuration for a relocated Maroon Creek Road. From Aspen Highlands extending north, the existing Maroon Creek Road alignment would remain in place to the high school. From the high school, the realignment continues to the north, intersecting State Highway 82 east of the Aspen Tennis Club development and across from the Aspen Golf Course clubhouse entrance. The right-of-way needed for the new alignment to traverse the Moore property was provided in an easement along the west side of the Moore property.

The old Maroon Creek Road becomes a cul-de-sac at the high school. Traffic volume on the new Maroon Creek Road is further reduced by the elimination of high school traffic. It is estimated that the volume of traffic at the existing Maroon Creek Road intersection with State Highway 82 will be reduced 25 percent during the afternoon peak hour in year 2015 if Maroon Creek Road was relocated to the west.

As shown in the figure, the new Maroon Creek interchange eliminates the left-turn movement onto State Highway 82. The grade-separated interchange uses offset right-in-right-out intersections with the highway and an underpass servicing the Aspen Golf Course clubhouse. From the new Maroon Creek Road alignment south of the underpass, an access road to the east leads to one of the right-in-right-out intersections for eastbound traffic. The westbound traffic is accommodated by following the new alignment beneath the underpass, turning west to the second right-in-right-out intersection. A frontage road is provided for residents south of State Highway 82 and west of the new interchange.

Figure III-32
Potential Maroon Creek Road Connection to State Highway 82



MAROON.CDR

Relocation of Castle Creek Road - Realignments of Castle Creek Road that would create a State Highway 82, Cemetery Lane, and Castle Creek Road standard four-legged intersection have been suggested. The realigned Castle Creek Road would cross the Marolt-Thomas property to the east of the community garden and connect to the new State Highway 82 alignment across from Cemetery Lane (if option [3] as shown in Figure III-31 of the Cemetery Lane connection is used). The average daily traffic volume on Maroon Creek Road would be reduced approximately 50 percent by the relocation of Castle Creek Road.

2c. Roundabout Intersections

A roundabout[4] is a circular intersection in which all traffic flows in the same (counter-clockwise) direction around the circle. Upon approaching a roundabout, the vehicle yields to traffic already circulating within the roundabout. When there is a sufficient gap, the vehicle proceeds into the circle and continues until the desired exit. Speeds in the roundabout are generally between 30 and 50 km/h (20 and 30 mph) depending on the radius of the roundabout.

Roundabout at the Intersection of State Highway 82 and Cemetery Lane - A roundabout intersection at Cemetery Lane and State Highway 82 does not offer sufficient circulation capacity to accommodate the future traffic assuming Base Case TM Measures (Figure III-33). A roundabout with an inner radius of 25 meters (80 feet) and outer radius of 40 meters (130 feet) was used for this analysis. The heavy traffic flow on State Highway 82 requires three entrance and three exit lanes, however, Cemetery Lane's volumes require only one entrance and one exit lane.

Roundabouts operate more efficiently when the traffic flows on all legs are balanced, creating sufficient gaps in the circulating traffic stream[5]. At this particular intersection Cemetery Lane has significantly less traffic volume than State Highway 82, creating insufficient gaps and excessive delay at Cemetery Lane. A traffic signal away from the roundabout may be used to meter the westbound State Highway 82 during peak periods. The signal will generate sufficient gaps for the traffic entering from Cemetery Lane.

With Aggressive TM Measures, State Highway 82 will need two entrance and two exit lanes while Cemetery Lane will need only one entrance and one exit lane. The circulating capacity of this roundabout is approximately 1,150 vph. The projected circulating traffic in the roundabout is expected to be approximately 1,000 vph.

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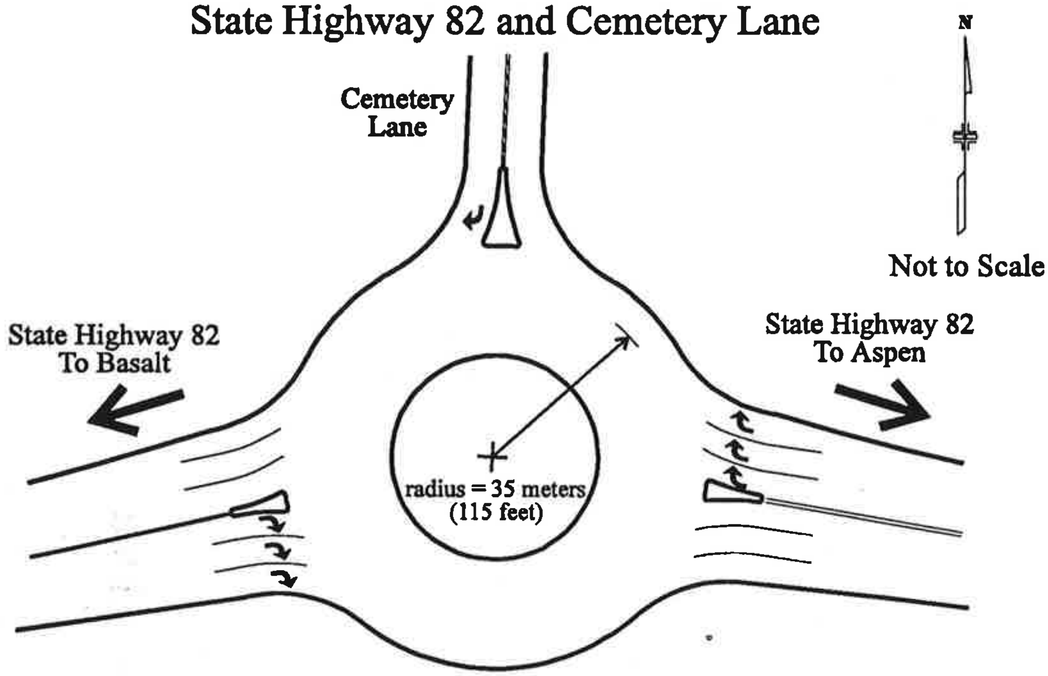
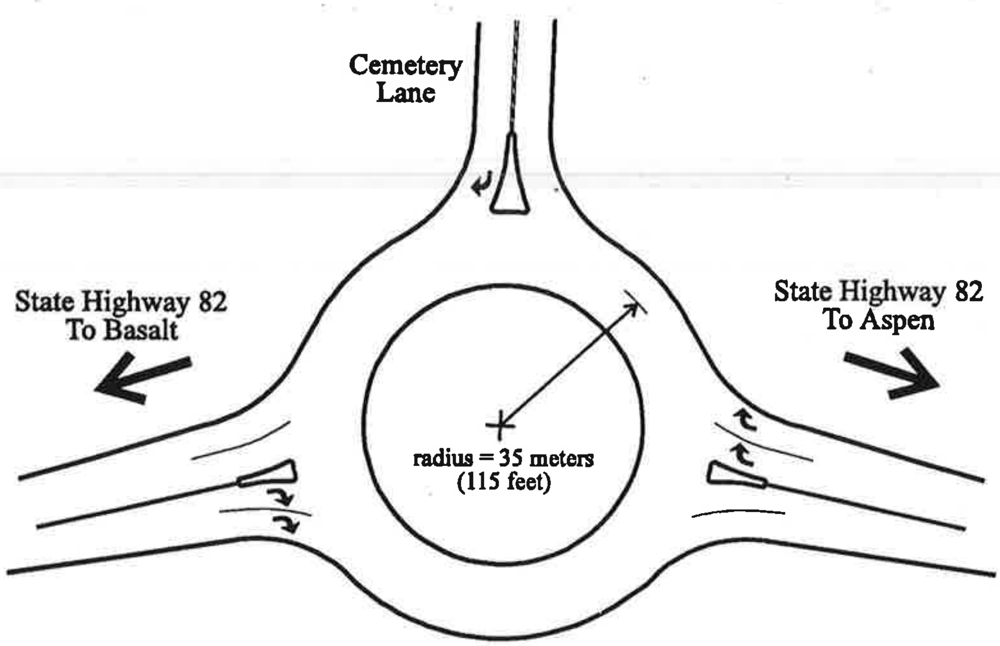
[4] A roundabout differs from a traffic circle in that traffic must yield before entering a roundabout. In a traffic circle the traffic within the circle yields to entering traffic. Typically, roundabouts are smaller in radius than traffic circles.

[5] ***Guide to Traffic Engineering Practice Part 6 - Roundabouts***, Austroads, Sydney, 1993.

Figure III-33
Roundabout Intersection
State Highway 82 and Cemetery Lane



Base Case TM Measures



Aggressive TM Measures

Note: These figures are conceptual and for informational purposes only. The radius of 35 meters (115 feet) allows for a 35 km/h (20 mph) design speed.

CEMRND.CDR

Roundabout Intersection of State Highway 82, Maroon Creek Road, and Castle Creek Road - A roundabout has been evaluated and found to have benefits to the traffic congestion problems at the intersections of State Highway 82, Maroon Creek Road, and Castle Creek Road. For analysis purposes, an inner radius of 40 meters (130 feet) and an outer radius of 55 meters (180 feet) was used. For this size roundabout, three lanes 5.0 meters (16.4 feet) wide are required to circulate traffic at a speed of 40 km/h (25 mph). The maximum capacity of such a roundabout is approximately 6,000 vehicles per hour (vph). Figure III-34 shows the Maroon Creek/Castle Creek/State Highway 82 roundabout.

The heavy flow of traffic on State Highway 82 requires three entrance lanes and three exit lanes to the roundabout. Maroon Creek Road and Castle Creek Road require only two entrance lanes and one exit lane each. Depending on the alternative assumed for State Highway 82, the year 2015 traffic volume entering this intersection is estimated to be between 3,800 and 4,000 vph (Alternatives B, C, D, E, and F) during the summer afternoon peak hour, below the 6,000 vph capacity of the roundabout. The 2015 summer afternoon peak hour traffic volume entering the intersection for Alternative G is 2,500 vph.

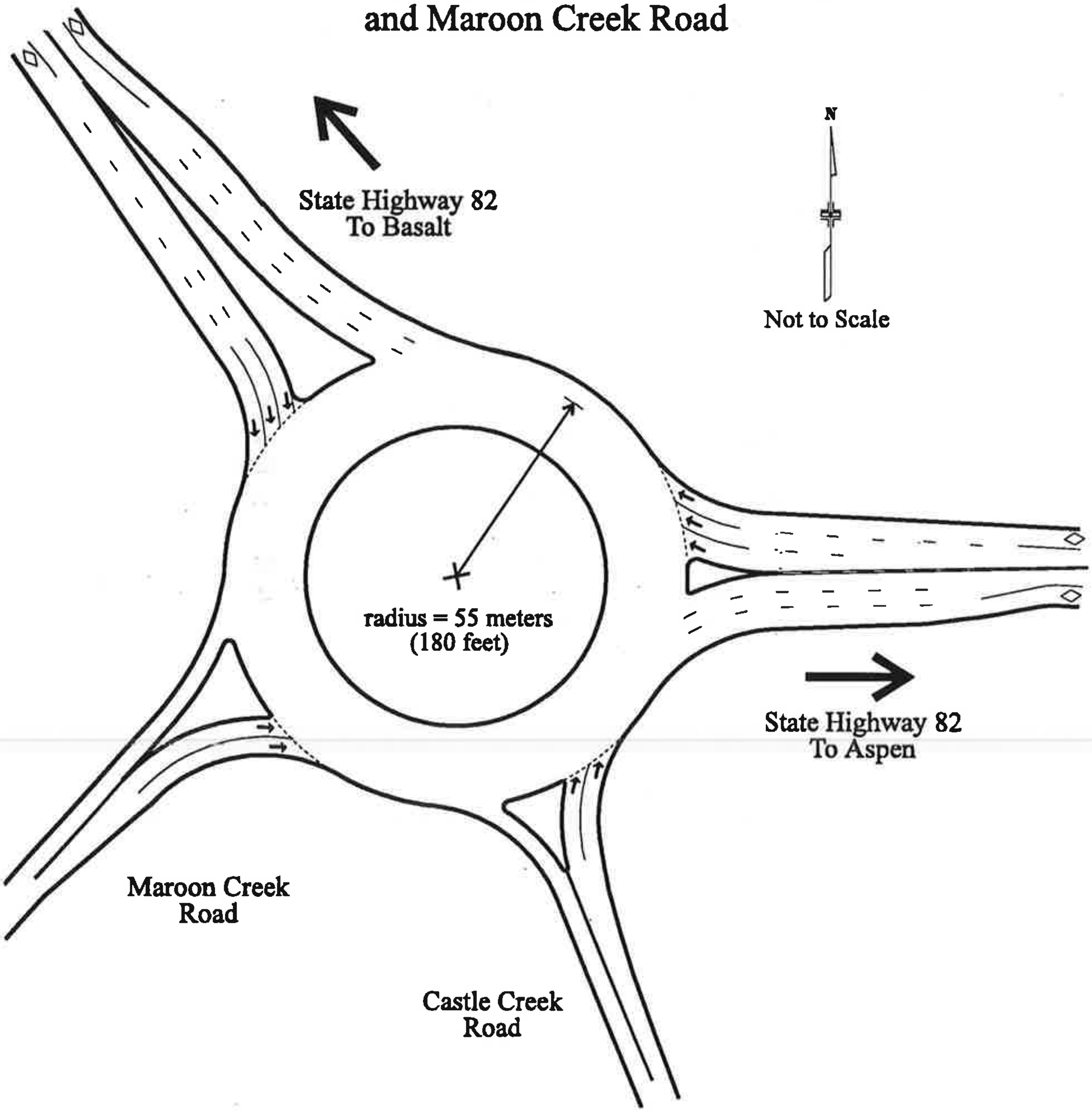
The use of a roundabout at Maroon Creek Road must consider the operations of HOV lanes, LRT, pedestrians, and cyclists. Servicing a separate HOV lane through the roundabout creates some challenges for weaving traffic. The restricted lane in the roundabout could confuse the drivers and create more complex movements in the roundabout. The restricted lanes could be combined with the general traffic before entering the roundabout to avoid this confusion. Servicing the LRT through the roundabout also creates complex movements. One solution may be to operate the LRT vehicles at a slower speed than the passenger vehicles and restrict the LRT to the outside lane of the roundabout. Another option may be a transit bypass lane which may include a grade separation of the LRT.

Pedestrian crossings should be located at least one car length back of the yield sign of each leg of the intersection. At this location, pedestrians cross behind vehicles waiting to enter the roundabout and only have one direction of travel to cross at a time, using the islands at the entrance to the roundabout for protection. Cyclists will have a much more difficult time negotiating the roundabout because the traffic does not stop. The merging movements required of the cyclist may be too hazardous for the recreational cyclist to attempt. The cyclist may resort to walking the bicycle through the crosswalks or to using a separate trail system to cross.

3. Recreational Trails/Bicycle-Pedestrian Access

The trail system for the Aspen area includes pathways and trails for hiking, biking, walking, and cross-country skiing. The preservation of these recreational amenities is essential to the character of the Aspen community. The opportunity exists for the alternatives to include improvements to existing trails which are outlined in the City of Aspen's Parks and Recreation Master Plan. These improvements may include upgrading to new design

Figure III-34
Roundabout Intersection
State Highway 82, Castle Creek Road, and Maroon Creek Road



Note: This figure is conceptual and for informational purposes only. The radius of 55 meters (180 feet) allows for a 40 km/h (25 mph) design speed. Design of this roundabout may include a transit by-pass lane either over or under Maroon Creek Road and Castle Creek Road.

ROUND.CDR

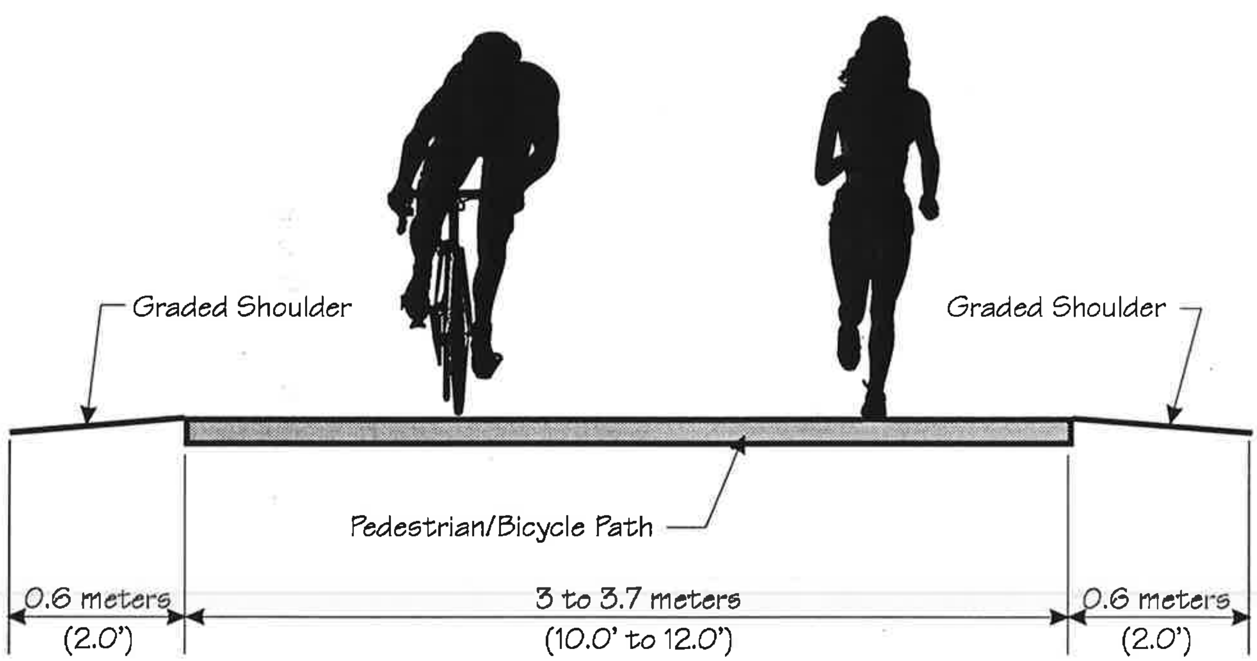
standards, improving accessibility to and from the trail facilities, safer roadway crossings, and better connections with respect to State Highway 82. A typical pedestrian/bicycle path is shown in Figure III-35.

Improving the accessibility of pedestrian and bicycle facilities is critical considering the multimodal approach of this EIS. The trail system provides a unique transportation system for the pedestrians, cyclists and the winter-time cross-country skiers. Access should be provided to shopping centers, ski areas, bus stops, park and rides, train stations and other significant destinations in the project corridor.

The Airport Business Center Trail is a good example of an accessible trail (See **Chapter IV: Affected Environment**, Figure IV-2, Page IV-15). Enhancements to this trail include a safer and more convenient way to cross Maroon Creek. Currently, cyclists cross on the narrow shoulders of the existing bridge or beneath the bridge from the Airport Business Center Trail to a pedestrian bridge south of State Highway 82. An easier crossing would be a separate bicycle facility on the proposed new Maroon Creek Bridge in addition to the sidewalk. Another option might be to use the existing bridge as part of the trail system. This would be accomplished by providing a connection from the Airport Business Center Trail, beneath the proposed Maroon Creek Bridge, to the existing bridge. The pedestrian/bicycle facility may be incorporated into the cross section if the bridge is used for a transit envelope.

Another example of a safer State Highway 82 crossing would be the realignment of the Marolt Trail over the cut and cover section for Alternatives D or F. In any of the build alternatives, the trails that are disturbed will be replaced or relocated to enhance the usability of the trail system.

Figure III - 35
Standard Cross Section of Pedestrian /Bicyle Path



PEDBIKE.CDR

IV. Affected Environment

Section IV.A: Social Environment and **Section IV.B: Economic Environment** include information developed from several sources including (but not limited to) the ***1987 Aspen/Pitkin County Annual Growth, Population, and Housing Report***, 1990 U.S. Census Data, data from several state sources, ***Aspen Area Community Plan, Mid Valley Community Master Plan***, the ***1991 Aspen/Pitkin County Housing Survey***, and several Pitkin County organizations. **Section IV.C: Physical Environment** was developed from various technical studies conducted as part of the environmental impact evaluation and documentation process (see **Chapter IX: Availability of Technical Reports** for the complete list).

A. SOCIAL ENVIRONMENT

1. Population

At least three distinct population segments--Pitkin County residents, visitors, and non-resident employees--traverse and are impacted by the Entrance to Aspen. For residents, this is the only outside road access in winter. The section of State Highway 82 that continues over Independence Pass is closed for several months each year because of snow. Winter visitors to the resorts of Aspen and Snowmass Village, including seasonal residents, presently have only two transportation choices: flying into the Aspen airport, or traveling (by bus, car, or bicycle) on State Highway 82 southeast from Glenwood Springs. Finally, although this study corridor is contained entirely within Pitkin County, a considerable number of Garfield County and Eagle County residents drive through this section daily as they commute to work in Aspen. Each of these populations will be addressed.

It should be noted that minor differences between the State of Colorado population projections for Pitkin County, the county's own projections, and the 1990 U.S. Census are caused by differences in collection and analysis methods and dates that data were collected.

1a. Pitkin County

Aspen, the county seat of Pitkin County, was incorporated in 1879. By the 1880s, this was one of the largest silver mining areas in the country. After the end of the mining boom in the 1890s, the county experienced a decline in population, with periodic fluctuations. The first ski slope was developed in the 1930s, and Pitkin County's population has been increasing steadily since the expansion of the area's ski and recreational industry in the 1950s.

Since the early 1970s, an attempt has been made to regulate growth in different sectors of the county, and a Growth Management Policy Plan was formulated in 1975. The preparation of the ***1987 Growth, Population and Housing Report*** was part of this effort. The ***1987 Aspen/Pitkin County Annual Down Valley Comprehensive Plan*** established a strategy and policies to guide growth and development of much of undeveloped Pitkin County. The ***1992 Aspen Area Community Plan*** continued these efforts.

Pitkin County's year-round population increased from 6,185 in 1970 to 10,466 in 1980. U.S. Census data for 1990 shows a total county population of 12,661. Of this, 5,049 lived in Aspen, 1,449 lived in Snowmass Village, and the remaining 6,163 lived in unincorporated Pitkin County. 1990 Census data show a lower population for Pitkin County than that projected in the ***1987 Aspen/Pitkin County Annual Growth, Population, and Housing Report*** but a larger downvalley population. This indicates a shift of population from Aspen to downvalley areas as more residents move downvalley and commute to Aspen, a trend that is expected to continue.

The Colorado Department of Revenue's ***1992 Annual Report*** listed Pitkin County's population as 12,872 as of July 1, 1991. This is consistent with the ***1992 Projections of Total Population for Colorado Counties*** by the Colorado Department of Local Affairs. The Colorado Department of Local Affairs estimated Pitkin County's year-round residential population at 12,703 in 1990 and 13,108 in 1992. Population figures for Pitkin County, in five-year incremental projections through year 2015, are detailed in Table IV-1:

Table IV-1
Estimated Permanent Pitkin County Population

1990	1995	2000	2005	2010	2015
12,703	13,771	14,786	15,763	16,696	17,648

Source: Colorado Department of Local Affairs

A study prepared for the United States Forest Service on the impacts of the proposed Burnt Mountain Ski Area development at Snowmass Village is consistent with the Aspen/Pitkin County population projections. The ***Snowmass Ski Area Draft Environmental Impact Statement***, released in May 1993, projects population through the year 2002 for six alternative scenarios. For Pitkin County's permanent population, the projections for 2002 range from 14,154 to 18,078 persons.

1b. Visitor Population

A wide seasonal fluctuation occurs in Pitkin County's general population related to its resort economy and the associated second-home market. The county's permanent population accounts for approximately one third of the total county population. Because of seasonal fluctuations, inconsistencies have occurred in city and county population data presented in past local studies. Most population counting methods, including the U.S. Census, focus only on the year-round, or permanent, population. The ***1987 Aspen/Pitkin County Growth, Population and Housing Report*** was an effort to provide more accurate and consistent data regarding the two populations. This DEIS includes resident/visitor information from the 1987 document, calculations from Colorado Department of Local Affairs projections, and data from the ***1992 Aspen Area Community Plan.***

The relationship between resident and visitor populations in Pitkin County is illustrated in Table IV-2. To develop the table, 1987 resident and visitor counts from the ***1987 Aspen/Pitkin County Annual Growth, Population and Housing Report*** were used as a baseline. These 1987 figures were based on the estimated number of resident and visitor dwelling units and an average number of occupants per dwelling. Ratios of resident to visitor populations and percentage of Pitkin County population allotted to each separate area of the county were calculated from the 1987 counts.

These ratios and percentages were then applied to Colorado Department of Local Affairs (DLA) population projections for Pitkin County through the year 2015 (Table IV-1). Several calculations were performed to reconcile the two counts. The original 1987 counts were also separated into permanent residents and seasonal residents. Because DLA population figures include only those defined by the U.S. Census as permanent residents, it was determined that seasonal residents needed to be added to the DLA counts. The percentage of seasonal residents was also developed from the 1987 figures. In addition, visitor population figures were calculated to reflect the resulting change in the resident/visitor ratio. Table IV-2 contains the combined permanent and seasonal resident counts and the adjusted visitor counts.

Table IV-2 was developed as a "low growth" scenario, but growth rates for the area have historically been higher. Therefore, a high growth scenario was used for the Traffic Model in **Chapter V: Future Transportation Demand.** These high and low growth projections are the same as those used in the ***State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement*** (BBFEIS).

In comparison, the ***1992 Aspen Area Community Plan*** reported a 1991 population count for the Aspen Metro area of 12,600 visitors and 9,940 residents. No figures were given for Pitkin County as a whole. Projections from the ***1987 Aspen/Pitkin County Annual Growth, Population and Housing Report*** were not updated.

1c. Downvalley Commuter Population: Eagle, Garfield, and Pitkin Counties

One of the effects of Aspen and Pitkin County's situation as an attractive resort destination with resulting high prices for housing is that many of the service and tourist related jobs are filled by employees who cannot afford to live in Aspen or Snowmass Village. (This is discussed further in the Economic Profile section.) This downvalley commuter population significantly increases the traffic on State Highway 82. Conversely, relatively few Pitkin County residents leave the county to work elsewhere. Pitkin County's downvalley neighbors in the Roaring Fork Valley are Eagle County and Garfield County. The 1990 U.S. Census reported that 8.52 percent of Pitkin County residents worked outside the county compared with 17.41 percent of Eagle County residents and 21.38 percent of Garfield County residents.

Table IV-2
Pitkin County Population Estimates

Geographic Area	1987 1/	1990	1992	1995	2000	2005	2010	2015
SNOWMASS VILLAGE								
Visitor	9,611	11,958	12,452	13,241	14,412	15,508	16,525	17,548
Resident	1,584	2,175	2,305	2,517	2,844	3,160	3,460	3,764
Permanent	1,297	1,775	1,881	2,054	2,319	2,575	2,819	3,067
Seasonal	287	400	424	463	525	585	641	697
TOTALS	11,195	14,133	14,757	15,758	17,256	18,668	19,985	21,312
CITY OF ASPEN								
Visitor	10,097	10,658	10,788	11,005	11,345	11,679	12,002	12,336
Resident	5,450	5,762	5,832	5,947	6,121	6,289	6,449	6,614
Permanent	4,622	4,887	4,946	5,043	5,191	5,333	5,469	5,608
Seasonal	828	875	886	904	930	956	980	1006
TOTALS	15,547	16,420	16,620	16,952	17,466	17,968	18,451	18,950
UNINCORPORATED ASPEN								
Visitor	3,321	4,393	4,647	5,075	5,750	6,419	7,075	7,753
Resident	2,588	3,466	3,661	3,981	4,471	4,942	5,392	5,851
Permanent	2,302	3,082	3,255	3,539	3,974	4,392	4,792	5,199
Seasonal	286	384	406	442	497	550	600	652
TOTALS	5,909	7,859	8,308	9,056	10,221	11,361	12,467	13,604
UNINCORPORATED PITKIN COUNTY								
Visitor	1,885	2,076	2,125	2,210	2,346	2,485	2,624	2,771
Resident	3,078	3,424	3,502	3,628	3,822	4,008	4,187	4,369
Permanent	2,660	2,959	3,026	3,135	3,302	3,463	3,617	3,774
Seasonal	418	465	476	493	520	545	570	595
TOTALS	4,963	5,500	5,627	5,838	6,168	6,493	6,811	7,140
TOTAL COUNTY								
Visitor	24,914	29,085	30,012	31,531	33,853	36,091	38,226	40,408
Resident	12,700	14,827	15,300	16,073	17,258	18,399	19,488	20,598
Permanent 2/	10,881	12,703	13,108	13,771	14,786	15,763	16,697	17,648
Seasonal	1,819	2,124	2,192	2,302	2,472	2,636	2,790	2,950
TOTALS	37,614	43,912	45,312	47,604	51,111	54,490	57,714	61,006

Notes:

1/ Figures for 1987 are from the 1987 Aspen/Pitkin County Growth, Population, and Housing Report.

2/ "Permanent Resident" total county projections are from the Colorado Department of Local Affairs. Other projections were calculated from these figures using a series of ratios derived from tables in the 1987 Aspen/Pitkin County Annual Growth, Population, and Housing Survey. Calculations may vary slightly due to differences in rounding.

As Aspen and Snowmass Village housing has become more expensive, the number of commuters and the distance they travel has been steadily increasing. In addition, population in each of the downvalley counties has also risen, as shown in Table IV-3. For three decades, each of the counties has out paced the state's annual rate of growth, as shown in Table IV-4.

Future growth rates are expected to continue to reflect a growing population within the region, as shown in Table IV-5.

County-level social and economic data for each of the three counties has been used to illustrate interdependence and differing factors among the counties. However, it is important to note that only one Eagle County 1990 U.S. Census Tract is along the State Highway 82 corridor. Census Tract 8532, which includes Basalt, had a 1990 population of 4,355 (Eagle County census count was 21,928). Growth rates for this tract and Eagle County are comparable. The Mid Valley Community Master Plan, which includes Census Tract 8532, reported a growth rate of 66.0 percent between 1980 and 1990. The growth rate for Eagle County during that period was 64.6 percent.

Table IV-3
Area Population by County
(in thousands)

	1980	1982	1984	1986	1988	1990
Eagle	13.5	15.4	16.8	18.9	19.6	22.4
Garfield	23.0	29.1	29.0	26.2	27.4	30.5
Pitkin	10.3	10.1	10.8	12.0	12.0	12.7

Source: Colorado Department of Transportation and Colorado Department of Local Affairs

Table IV-4
Growth Rates by State and County
(Percentage)

	1940-1950	1950-1960	1960-1970	1970-1980	1980-1990
Eagle	-16.3	4.2	60.3	77.6	64.6
Garfield	10.0	3.4	23.3	51.9	33.1
Pitkin	-10.3	44.7	59.8	67.1	22.5
Colorado	18.0	32.0	26.0	30.8	14.0

Source: Colorado Department of Transportation and Colorado Department of Local Affairs

Table IV-5
Future Population Growth by County
(in thousands)

	1995	2000	2005	2010	2015
Eagle	25.3	27.7	29.7	31.5	33.1
Garfield	34.0	36.3	38.5	40.6	42.5
Pitkin	13.8	14.8	15.8	16.7	17.7
Total	73.1	78.8	84.0	88.8	93.3

Source: Colorado Department of Transportation and Colorado Department of Local Affairs

2. Demographic Characteristics

Bureau of Census data for 1990 showed that 47 percent of the population in Pitkin County is female and 53 percent is male. The median age was 34.8 years, which is older than the Colorado median of 32.5 years. This represents a significant change from 1980 when the median age was 29.4 years, indicating a maturing population. This trend was corroborated in the ***1991 Aspen/Pitkin County Housing Survey***, in which respondents reported an average age of 39 years. In conjunction with this, the percentage of residents under thirty years of age fell from 65 percent in 1981 to 18 percent in 1991. This may represent a shift of the younger service-oriented employees to more affordable downvalley housing , or the national effect of the maturing "baby-boom" generation.

Approximately 35 percent of the work force is currently housed in the Aspen area, as compared to approximately 65 percent shown in surveys conducted in 1979, 1981, and 1983 and 55 percent in 1987. The ***1991 Aspen/Pitkin County Housing Survey*** concurred with this trend, finding that 32.9 percent of the Aspen work force resided in the Aspen metro area. Regarding ethnicity, 94.4 percent of the population is white, with no concentrations of any minority or ethnic group.

When compared with the State and the two other counties in the study, Pitkin County residents have higher education levels, are older, and have fewer married couple families. Income levels are also higher, as discussed in **Section IV.B. Economic Environment**. Selected population characteristics from the 1990 U.S. Census are displayed in Table IV-6.

Table IV-6
Selected Population Characteristics

	Eagle	Garfield	Pitkin	Colorado
% Caucasian	91.6	97.2	97.4	88.2
% Hispanic Origin	13.3	5.6	3.8	12.9
% College Degree	33.0	21.6	49.8	27.0
% Children in Private School	5.3	5.8	12.1	6.4
% Married - Couple Family	50.4	59.7	37.8	53.8
% 25 to 44 years of age	49.1	37.2	50.8	35.8
Median Age	30.6	32.8	34.8	32.5

Source: U.S. Department of Commerce, 1990 U.S. Census

3. Services

3a. Schools

The Aspen School District serves Aspen and Snowmass Village. Aspen public schools include two elementary schools (one in Aspen, one in Snowmass), a middle school, and a high school. The Aspen Elementary School, Middle School, High School, and administrative offices are located on High School Road in unincorporated Pitkin County, west of State Highway 82, accessed from Maroon Creek Road. (See Map, Figure IV-1.)

Total annual enrollment from 1979 to the present ranged from a low of 889 students to the 1,205 students present for opening day of 1994/95. There were 1,140 students for the 1993/94 school year. The largest increases in enrollment for 1994/95 were in grades kindergarten, 5th, 9th, and 12th.

As shown in Table IV-6, 12.1 percent of the school age children in Pitkin County are enrolled in private schools. Day-care and preschool facilities are located throughout the study area, although a recent survey indicated that some residents felt the number of existing facilities was not adequate.

Colorado Mountain College, a public two-year institution, operates fourteen facilities in six western counties, including four along the State Highway 82 corridor in Aspen, Basalt, Carbondale, and Glenwood Springs. Total year end 1993/94 enrollment for all campuses was 20,862 students. Enrollment on the Aspen campus has been steadily increasing. In 1990/91 there were 2,921 students; by 1993/94 there were 3,506 students enrolled.

Approximately 650 children were bused to school in the 1994/95 school year. This accounts for approximately 63,900 vehicle miles of travel for the school buses in the Aspen school district.

3b. Health Care

Aspen Valley Hospital, a 49-bed full-service facility, is the only hospital in Pitkin County. Aspen Valley Hospital is located off Castle Creek Road west of State Highway 82, accessed from Maroon Creek Road (Figure IV-1). An estimated 34 physicians practice in the Aspen/Snowmass Village area. The hospital operates a full time Advanced Life Support ambulance service with a service district ranging from Independence Pass to a point east of the Old Snowmass area. The district does not include Snowmass Village or Old Snowmass. The ambulance service responded to 721 calls in 1993, with 466 transports. Additional ambulance companies offer primarily non-critical response to the ski areas.

3c. Law Enforcement

The Pitkin County Sheriff's Office provides law enforcement along State Highway 82, with support from the Aspen Police Department. Aspen has a central dispatch system that serves the two law enforcement departments, the Snowmass Village Police Department, the State Patrol, fire departments, and other emergency equipment. In October 1994, the Pitkin County Sheriff's department employed 36 law enforcement officers and support staff, and the Aspen Police Department employed 33. Aspen also has a separate traffic/parking department with four additional positions. The county operates a detention facility in Aspen that maintains an average of 18 detainees, about half of which are typically Pitkin County residents.

3d. Fire Protection

The Aspen Volunteer Fire Department (AVFD) maintains four stations in Pitkin County. The main station is located at 420 East Hopkins in Aspen (Figure IV-1). Other stations are located at the Aspen/Pitkin County Airport, the entrance to Starwood, and the Stutsman-Gerbaz, Inc. garage near milepost (MP) 30.6 on State Highway 82. The AVFD has submitted a request to the City of Aspen to build a major substation near the intersection of Juniper Hill Road and State Highway 82. Distributed among the four stations are eight pumper trucks, a ladder truck, and a "Rescue Seven" unit. The AVFD offers secondary emergency response in support of the Aspen Valley Hospital. The AVFD serves an approximately 180-square kilometer (70-square mile) area and responds to calls along State Highway 82 from the Aspen Village mobile home community to east of Aspen. The AVFD has one paid fire chief, three paid employees, and an average of 40 to 45 volunteers.

Records of AVFD fire/rescue calls are separated into department calls and fire officer calls. Often, only the fire officer on duty responds and the entire department is not required. Therefore, on average, the officers recorded more calls. During the calendar year 1993, the department responded to 70 fire calls and 8 rescue calls; the officers responded to 165 calls.

Cross-Country. An extensive network of cross country trails and systems connects Pitkin County towns with one another and with other counties. Hut systems for over-night camping are located along the longer trails. Nine to eleven huts lie within a day's ski trip from Aspen, with others accessible for longer treks.

Two sets of groomed trails are also available. Both are open to the public. The Aspen-Snowmass Nordic Council maintains 60 kilometers (37.3 miles) of groomed trails. The longest trail (15 kilometers/9.3 miles) connects Snowmass Village and Aspen. There is no charge to use these trails. Several other organizations access these trails as well, including the Snowmass Club Touring Center and the Aspen Cross Country Center. Ashcroft Ski Touring maintains 35 kilometers (21.7 miles) of groomed trails. This system does have a trail fee.

4b. Fishing

The Roaring Fork River is classified by the Colorado Division of Wildlife as a cold water fishery and is the best winter fishery in the state for large trout and mountain whitefish. From above Aspen to Basalt, the river is classified as Wild Trout Water. From above Carbondale to Glenwood Springs, the river is classified as Gold Medal Water, a designation given to only 254 kilometers (158 miles) of the 12,875 kilometers (8,000 miles) of trout stream in Colorado. In 1982, the Eagle County section of the river produced the record Colorado whitefish: 2.32 kilograms (five pounds, two ounces), and 48 centimeters (18.75 inches) in length. Brown trout, brook trout, and Colorado River cutthroat trout, are found in the Roaring Fork.

In addition to the native species, the section of the Roaring Fork from the Upper Woody Creek Bridge to Glenwood Springs is stocked with rainbow trout. Fishing along this stretch of river is with artificial flies or artificial lures only. The bag and possession limit for trout is two fish, with a size limit of 40.6 centimeters (16 inches) or longer. Fishing designations and requirements vary along other lengths of the river. Other good fishing opportunities exist throughout Pitkin County, including Cunningham Creek, the Fryingpan River, Frying Pan Lakes 2 and 3, Rocky Fork Creek, and Ruedi Reservoir.

4c. Hunting

Both hunting and trapping are permitted along the rural areas of this section of State Highway 82, according to the Colorado Division of Wildlife. Game species in the area include deer, elk, and bighorn sheep. The State of Colorado is geographically divided into Wildlife Management Units. The area surrounding and including Aspen is divided among three of these units. Unit 43, to the south of State Highway 82 and west of Aspen, includes the Watson Divide area. Unit 47 is north of the highway and west of Aspen. Unit 471 is south and east of Aspen.

Hunting seasons for elk and deer begin in late August and continue through mid-November. Seasons vary according to the type of weapon used. Archery is the opening season, followed by muzzle-loading rifles. Three successive regular/combined rifle seasons generally begin in mid-October. Hunting season dates for 1994 are shown in Table IV-8.

Table IV-8
Hunting Season Dates for 1994
(Deer and Elk)

Archery	August 27 - September 25
Muzzleloading Rifle	September 10 - 18
Regular Rifle:	
First Combined Rifle	October 15 - 19
Second Combined Rifle	October 22 - November 2
Third Combined Rifle	November 5 - 13

Source: Colorado Division of Wildlife

Table IV-9 records the number of deer harvested and the number of hunters in each unit for the 1992 season. Table IV-10 contains corresponding information for the 1991 elk season. It should be noted that each of the three units includes a wider area than the State Highway 82 corridor, and counts specifically for this corridor are not available.

The area's bighorn sheep hunting units are S13E and S13W. In the 1993 season, a total of eight rams and no ewes were harvested from these two units. The number of hunters was not reported.

Table IV-9
1992 Deer Harvest and Number of Hunters
For All Seasons and Manner of Take

Unit	Bucks	Does	Fawns	Total Harvest	Total Hunters	% Success
43	600	429	41	1,070	3,573	29.95
47	96	57	0	153	808	18.94
471	30	4	0	34	93	36.56

Source: Colorado Division of Wildlife

Table IV-10
1991 Elk Harvest and Number of Hunters

Unit	Bulls	Cows	Calves	Total Harvest	Total Hunters	% Success
43	325	325	26	676	4,515	14.97
47	115	116	26	257	1,122	22.91
471	15	18	1	34	169	20.12

Source: Colorado Division of Wildlife

4d. Rafting

The stretch of the Roaring Fork River along State Highway 82 from Aspen to Basalt is known among rafters as a fast, moderate to difficult run, according to the owner of three local rafting companies. Rivers are classified for rafting from Class I (easiest) to Class V (most difficult); this particular section has been designated as Classes II and III. The rafting season for commercial rafting companies runs from approximately mid-May to mid-July, depending on the amount of snow runoff each year. Private rafters continue to run this section through the end of July.

Most commercial rafts hold six passengers and a guide. Professional rafters escort at least 3,000 passengers through this section each year, and some years the count may be as high as 8,000 people. The annual number of private-use rafters is estimated at 2,000 to 3,000 individuals.

4e. Kayaking

Kayak enthusiasts make up a smaller but substantial portion of the river traffic on the Roaring Fork River along State Highway 82. The stretch of river from Wink Jaffee Park to Wingo Junction is considered to be an easy to moderate kayak run, suitable for beginning to intermediate skill levels. More advanced kayakers often enter the water above this section, at Slaughterhouse Bridge, using Wink Jaffee Park as a takeout. Approximately 800 to 1,500 kayakers run the river each year, and instruction is available year-round at the Aspen Kayak School.

4f. Hiking/Bicycle Trails

Hiking and bicycling are popular Pitkin County activities, accommodated by trails of varying lengths and surfaces. Much of the county's open space is accessed from these trails for picnicking, wildlife observation, and other activities. Horses are welcome on some of the trails, and some Pitkin County ranchers rent horses to visitors. Although commuters bike along the highway, most mountain bikers prefer off-road trails. In recent years, in-line (roller blade) skaters have also taken advantage of the trail system. Several organizations are involved in creating and maintaining trails throughout Pitkin County and the Roaring Fork

Valley. Most of these trails are displayed on the Pitkin County Open Space and Trails Map, developed as a comprehensive effort to delineate the various trails, and to inventory and categorize parcels of open space throughout the county.

There are five trails which either follow or cross the State Highway 82 Entrance to Aspen project corridor. The Airport Business Center Trail runs along the north side of State Highway 82, from the Aspen-Pitkin County Airport to Cemetery Lane. This trail is approximately 3.86 km (2.4 miles). The High School Bike Path initiates at Aspen High School where it follows the east side of High School Road to State Highway 82, it then continues running south of State Highway 82 to Castle Creek. This trail is approximately 1.29 km (0.8 miles). The Marolt Trail runs north and south and crosses State Highway 82 just west of Power Plant Road. The Marolt Trail is approximately 0.45 km (0.28 miles). The Maroon Creek Nordic Trail crosses State Highway 82 just east of Maroon Creek. The Moore Nordic trail is generally located in the Moore Open Space, however, it extends across State Highway 82 to the Golf Course.

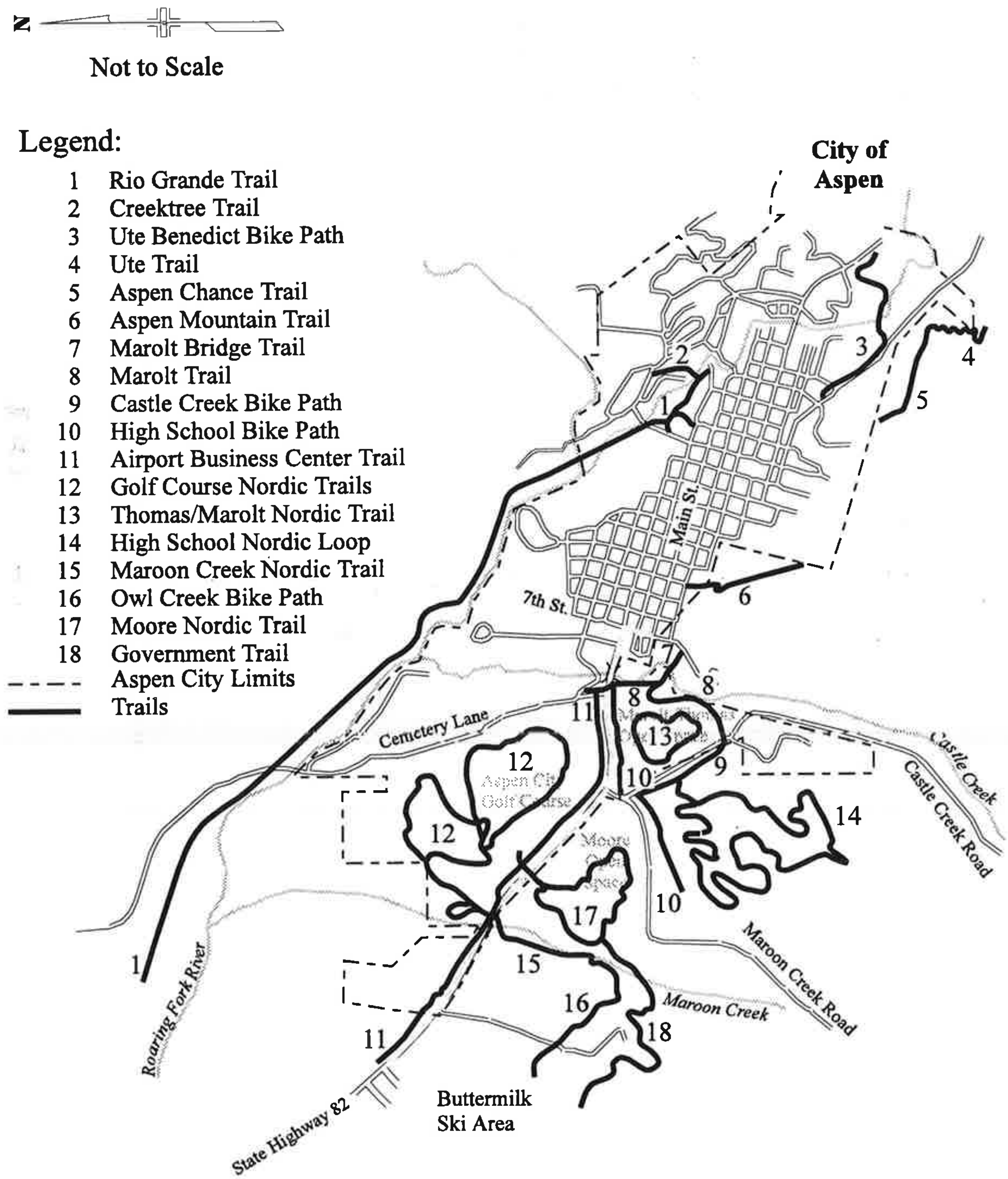
The Aspen area has many kilometers of paved and unpaved trails. The Rio Grande trail, which parallels the old highway from Wink Jaffee Park upstream to Aspen, has been developed as a pedestrian/bike trail. Of the trail's 10.5 kilometer (6.5 mile) length, approximately 7.2 kilometers (4.5 miles) are unpaved.

There are several other trails/paths surrounding the State Highway 82 Entrance to Aspen project corridor. They include:

- Aspen Chance Trail
- Aspen Mountain Trail
- Benedict Nordic Trail
- Castle Creek Bike Path
- Creektree Trail
- Golf Course Nordic Trail
- Government Trail
- High School Nordic Loop
- Marolt Bridge Trail
- Owl Creek Bike Path
- Post Office Trail
- Thomas/Marolt Nordic Trail
- Ute Benedict Bike Path
- Ute Trail

All of these trails/paths are shown in Figure IV-2.

Figure IV-2
State Highway 82 Entrance to Aspen
Hiking/Bicycle Trails



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4g. *Additional Activities*

The United Soccer Club of Aspen offers a thriving program for area youngsters from kindergarten to eighth grade. The club, composed of children from around the county, had 300 members on 24 teams in fall of 1992.

Two 18-hole golf courses are located in Pitkin County: the public Aspen Championship Golf Course near the west end of Aspen and the private Snowmass Club in Snowmass Village. Both are open to the public upon payment of fees.

The Snowmass Village Club also offers full health club facilities, with two outdoor and eleven indoor tennis courts, and a squash/racquetball court. Several other health and fitness facilities operate in the Aspen metropolitan area. The City of Aspen operates a public swimming pool and several recreational programs, as listed in Table IV-11.

A portion of the Marolt-Thomas property south of the modified direct alignment and east of Castle Creek Road is used for a hanggliding/paragliding landing site. This location is approximately 400 meters (1/4 mile) south of the existing State Highway 82.

Table IV-11
City of Aspen Recreation Programs for 1992

ACTIVITY	PARTICIPATION
Youth Basketball	200 youth for 10 weeks
Youth Gymnastics	80 youth per month
Science Class	10-25 students per month
Youth Baseball	200 youth for 10 weeks
Girls Softball	30 youth for 8 weeks
Youth Flag Football	70 youth for 8 weeks
Day Camp	80 youth/day for 12 weeks
Fishing	12 youth for one 4-week class
Adult Softball	17 co-ed teams 6 women's teams 24 men's teams
Adult Basketball	10 men's teams 4 women's teams
Adult Volleyball	Drop in play 2x/wk for 6 mos.

Table IV-11 (Continued)

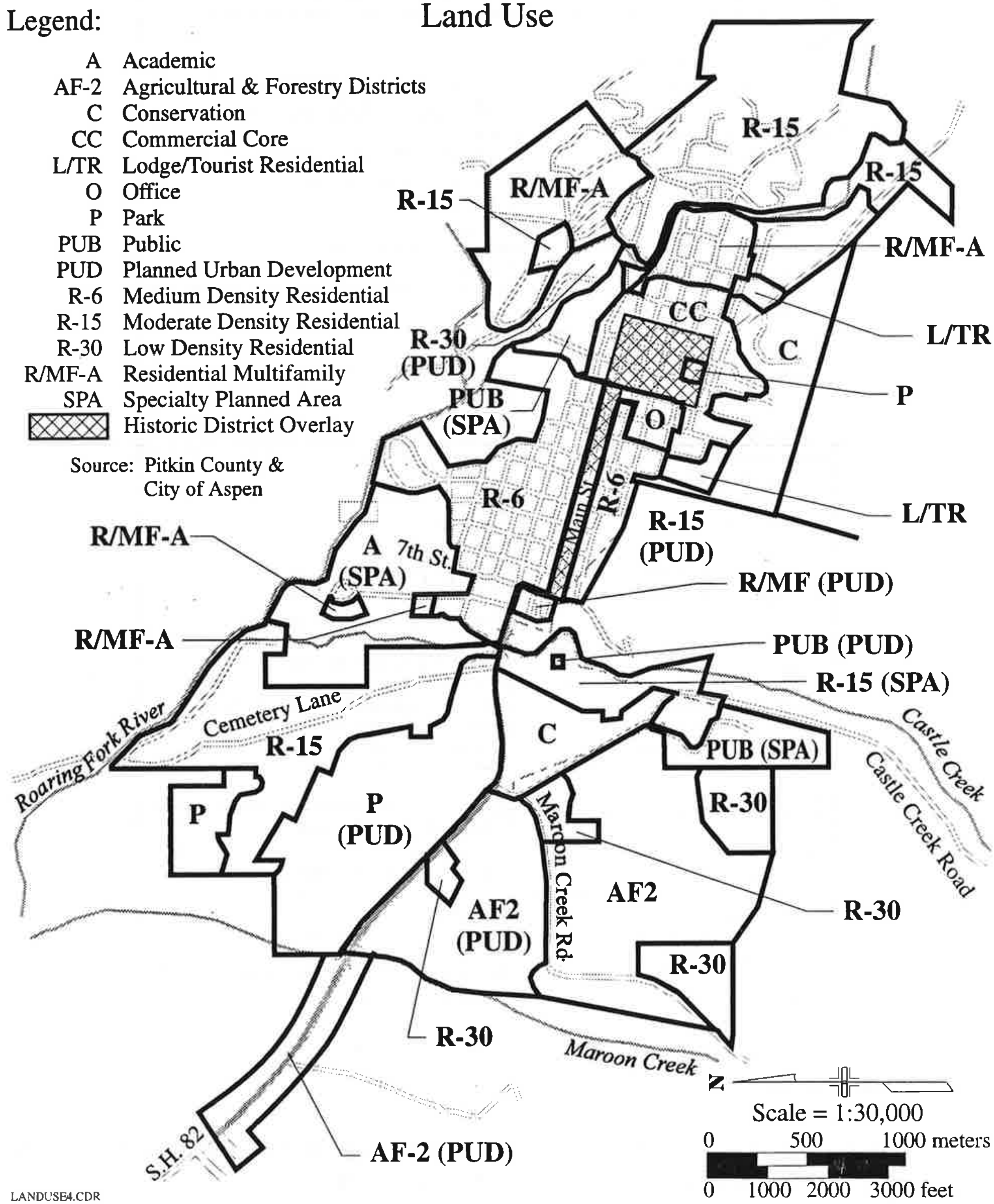
ACTIVITY	PARTICIPATION
Moore Pool	
Swimming Lessons	350 youth/week during school 90 youth/week during summer
Public Swim	average 200/week - summer average 50/week - winter
Lap Swim	12/day
Swim Team	40 youth for 20 wks of summer
Scuba, kayak & first aid	varies
Ice Garden	
Skating Lessons	50/week
Public Skating	40/session
Skating Club	60 youth
Hockey	160 - youth 125 - adult
Special Events	200 youth - hockey school 200 youth - skating shows
Aerobics	12 participants/2x/wk - 3 mos.
Ski Conditioning	12 participants/2x/wk - 3 mos.
Adult Flag Football	8 teams - 8 weeks
Tennis	
Lessons	60/week for 12 weeks
Team	20 members - 6 weeks
Public Play	20/day - summer
Tournament	50 participants

Source: City of Aspen Recreation Department

5. Land Use

Figure IV-3 shows the current land use surrounding the State Highway 82 Entrance to Aspen corridor. The figure illustrates primarily residential and agricultural uses.

Figure IV-3
State Highway 82 Entrance to Aspen
Land Use



LANDUSE4.CDR

Starting from the Buttermilk Ski area to Maroon Creek Road, the land along State Highway 82 is designated as Agriculture and Forestry (AF-2) with Planned Urban Development (PUD) allowed.

As the corridor enters the Aspen City Limits, land use along the north/east side of State Highway 82 to approximately Cemetery Lane is classified as Park (P), which is occupied by the Aspen Golf Course. Land along the south/west side of the highway to Maroon Creek Road is unincorporated land that has been designed as Open Space/AF-2. Scattered throughout this space are Single Family Residential, that is accordingly zoned as Low Density Residential (R-30).

From Cemetery Lane to Castle Creek, land on the north/east side of the highway is designated as P, where PUD is allowed. This area includes the historic Castle Creek Power Plant which is addressed in the Historic Resource section of this chapter. Land along the south/west side of State Highway 82 of this section is designated as Conservation (C) and Moderate Density Residential (R-15), with scattered Public (PUB). The Marolt-Thomas properties are located within this area, which is also addressed in the Historic Resource Section of this chapter.

Residential uses are predominate from Castle Creek to 7th Street. Land on the north/east side of State Highway 82 is zoned as Medium Density Residential (R-6), while land on the southwest side is zoned as R-15 and Residential Multi-Family (R/MF) with PUD permitted.

The land immediately surrounding State Highway 82 from 7th Street to Aspen Street is zoned as small Commercial Core (CC) with the outlying zoned as R-6.

6. Planning Process and Applicable Studies

6a. The Planning Process

The developmcnt of this DEIS was coordinated by the Colorado Department of Transportation (CDOT) in conjunction with the Federal Highway Administration (FHWA). The Mount Sopris Transportation Project was formed by CDOT to develop long-range solutions to the transportation needs of the Roaring Fork Valley. The Mount Sopris Transportation Project team coordinated efforts with the Pitkin County Board of County Commissioners (BOCC), the Aspen City Council, the Aspen/Pitkin Planning Office, a Technical Advisory Committee (TAC), and the public.

The planning process for this DEIS was created in January 1994 and was designed to complement activities and policies adopted by locally elected officials. These policies and activities are summarized in the 1992 intergovernmental agreement, Resolution #396, between the BOCC, Aspen City Council, and the Snowmass Village Town Council. This agreement sets forth a transportation framework to develop an integrated transportation system that includes transportation management (TM) strategies, transportation enhancements to the existing roadway system for both automobiles and buses, and the development of a fixed guideway system as an alternative transportation link between downtown Aspen, the Airport and the Snowmass Village Mall. These TM solutions, transportation enhancements to the existing transportation system, and the multimodal solutions will be developed jointly with local governments located within the Roaring Fork Valley, Roaring Fork Transit Agency (RFTA), and CDOT, as funding permits.

This DEIS identifies both short and long range solutions for the 3.09 kilometer (1.92 mile) transportation link between the City of Aspen and the Buttermilk Ski Area. The DEIS planning process adheres to the cooperative theme of the Mount Sopris Transportation Project, and to support the philosophy of the new ISTEA legislation, which requires that the public be involved in all aspects of the transportation decisions. In addition to the public notification process, scoping meetings, and public meetings required under the NEPA of 1969, the Federal Highway Manual and CDOT Action Plan, the draft development of the Entrance to Aspen EIS included one of the most substantial public involvement and community outreach programs ever undertaken by CDOT.

A technical advisory committee (TAC) was established with area staff with various professional responsibilities. The TAC provided overall direction and guidance to CDOT. A list of the TAC members is included in **Chapter VIII: List of Preparers**. This advisory group ensured that the EIS project team acknowledged all relevant plans, studies and adopted policies, and future confirmed transportation enhancements in the development of the EIS. This group also ensured that the alternatives complemented already implemented transportation programs in the upper end of the valley.

The public involvement process was designed to gain concurrence on how to best address traffic congestion, traffic capacity, safety, environmental, and quality of life concerns in this unique mountain environment. The public involvement process and outreach effort included:

- Public open house meetings.
- Focus group meetings with affected interests.
- Confidential interviews with a cross section of the community.
- Periodic reconnaissance interviews with elected and appointed officials and area staff.
- One and two day Transportation Symposiums or Round Table discussions.
- TAC meetings.
- Regularly scheduled project status reports and dialogue with the Pitkin County Board of County Commissioners and Aspen City Council, as well as the intergovernmental group of elected officials known as the "Decision-Makers."

- Roaring Fork Valley Transit Council briefings.
- Presentations to area civic organizations, neighborhood and special interest groups in cooperation with Leadership Aspen on an as-requested basis, with written questionnaires to survey audience preferences.
- Periodic newsletters distributed as inserts to the local papers.
- A 24-hour telephone hot line for area citizens to call in with comments, suggestions, or to request additional information.
- Comprehensive display at the Pitkin County Library as described on page S-12.
- On-going media coverage through the two local papers, Grass Roots TV and the local radio station.

A complete list of public meetings, TAC meetings, focus group events, symposiums and briefings can be found in **Volume II: Comments and Coordination** of this DEIS.

6b. Applicable Plans, Policies, and Technical Reports

In addition to the documents described in **Chapter 1: Purpose and Need**, the following planning documents were reviewed by the EIS project team during preparation of the document:

Colorado State Implementation Plan (SIP) for PM_{10} Aspen Element - The Aspen/Pitkin Planning Office and the Colorado Air Pollution Control Division prepared the SIP in a joint effort. The SIP was adopted in November 1991 and revised September 1994.

The Aspen SIP includes transportation control measures to reduce vehicle miles traveled, including expanded transit service and paid parking in the core business area. The SIP also requires the Colorado Department of Transportation and the City of Aspen to use clean sand for winter street sanding and to do more frequent street sweeping on State Highway 82.

In 1988, the Aspen City Council and the Pitkin County Commissioners enacted several ordinances to control smoke from woodburning fireplaces and a limit of one certified Phase II wood stove per dwelling. Aspen has also experimented with several street sanding/cleaning measures in an effort to reduce re-entrained dust. These measures include asphalt coated sand, harder and cleaner sand, sanding fewer streets, liquid deicers, and frequent street washing.

Aspen Area Community Plan **-** The Aspen/Pitkin Planning Office prepared the Aspen Area Community Plan. This plan was adopted on February 2, 1993 by the Aspen City Council and the Pitkin County Board of County Commissioners.

The overall intent of the Transportation Action Plan is:

> *The community seeks to provide a balanced, integrated transportation system for residents, visitors and commuters that reduces congestion and pollution.*

This intent is further stressed in the section of the Plan called Community Development Features. Under the heading of transportation, two themes are stated:

- Reduce auto impacts
- Develop a multi-modal valley-wide transportation system

As part of the transportation element of the adopted Comprehensive Plan, the City of Aspen is committed to seek innovative ways to limit vehicle trips into Aspen. Critical measures that are being pursued by the upper valley governmental entities include the implementation of a valley wide mass transit system, increasing the number of available transportation choices and continued education and marketing of transportation alternatives within the Aspen Metro community.

The transportation action plan also contained three general action themes: Actions to Create a Vehicle Limited Downtown Core, Actions to Improve Transit Facilities, and Actions to Improve the Pedestrian/Bicycle System. These actions for each theme were designated short-term (1992-1993) and mid-term (1993-1995). Actions relating to and affecting the EIS study corridor include:

- The implementation of a paid parking system within the commercial core of Aspen.
- The development of an airport intercept lot and the further intention to develop intercept lots at Brush Creek Road/State Highway 82, Buttermilk Ski Area or other appropriate locations, which would be free to the users of the lot. Provide frequent, effective and free transit service between the lot and the City of Aspen (mid-term action).
- Create a long term car storage/impound facility at Brush Creek/State Highway 82 or the Airport Business Center (mid-term action).

- Continue and enhance bus service between Aspen and Glenwood Springs (short-term action).
- Establish a high occupancy vehicle (HOV) lane on State Highway 82 between Brush Creek Road and the City of Aspen (mid-term action).
- Evaluate the utilization of a bus/transit corridor along Owl Creek Road (mid-term action).
- Endorse the continued work of the Roaring Fork Forum Transportation Task Force in their efforts to develop an integrated valley-wide transportation system (mid-term action).
- Recognize the Rio Grande Railroad right-of-way as a multi-use transportation corridor (mid-term action).
- Establish a designated transit corridor between the town of Snowmass Village and the City of Aspen (mid-term action).
- Designate all existing transit corridors as such (i.e., Highway 82, Rio Grande R.O.W.).

City of Aspen Transportation Implementation Plan - A Transportation Implementation Committee was subsequently formed to implement the transportation elements in the Aspen Area Community Plan. The document developed by this committee is the Transportation Element Implementation Plan. Specific items which were considered in the development of the draft DEIS include:

A Parking Element to include:

- a parking control system
- a residential parking permit program
- all-day parking pass in specific spaces within the residential parking control areas
- preferential HOV on-street parking
- on-street lodge parking
- annual business vehicle parking stickers
- increase in loading and service vehicle spaces
- a Parking Information Center
- an East End Parking Facility

Transit Service to include:

- expansion in downvalley/Snowmass service
- park and ride facilities
- the upvalley transit corridor which is a high-frequency free transit service on State Highway 82 between Aspen and the upvalley park and ride lots
- a return to and expansion of full year round city transit service
- the cross town shuttle
- the Dial a Ride/cab coupon program

Pedestrian and Bicycle Facilities to include:

- an improved Galena Street pedestrian corridor
- improved bicycle connections
- improved sidewalks between the commercial core and the residential areas

City of Aspen: Parks, Recreation and Open Space Needs Assessment and Master Plan - The Parks, Recreation and Open Space Plan was adopted by the Aspen City Council in 1994. Items in the plan which relate to the EIS study corridor include:

- Develop parallel trails on both sides of State Highway 82 from the City of Aspen to the airport. Insure safe crossing (above or below grade) of State Highway 82 where trails need to cross the highway right-of-way.

- Consider using the Marolt/Thomas Property for the construction of either regulation baseball/softball or multi-purpose football/soccer fields. The plan goes on to say:

  "While the Marolt/Thomas site has been recommended to remain natural and undeveloped (according to the Aspen Area Community Plan), the area is only one of two city owned properties that can accommodate regulation ball fields....Plans to develop ball fields in this park should be sensitive to the open character, history and existing use of the site.

  "The Marolt Park location was determined viable for the following reasons:

  - Property owned by the City of Aspen.
  - Access to park via the existing trail.
  - The proposed recreational use is compatible with the employee housing.
  - The proposed recreational ball fields are compatible with the history of the site and City of Aspen.
  - With proper planning the improvements could be visually screened from residents and State Highway 82.
  - The proposed location would not conflict with the paragliding landing point.

- The existing site conditions (topography, access, vegetation, etc.) is excellent for ball field development.
- The location is near the schools which is excellent for after school programs."

"Members of the CAC met with the Aspen parks Association and the Aspen Area Community Plan Open Space/Recreation/Environment Committee on two different occasions to discuss the Marolt/Thomas property. It was agreed to by all three groups that there is potential for use of the Marolt parcel as a multi- use recreation field... The CAC has identified the Marolt parcel as the number one potential location for the construction of the new recreational fields...to address everyone's concerns, the CAC is recommending that a conceptual master plan be completed for the Marolt/Thomas parcel."[1]

- Under the Implementation Section of the Plan the following statements were included:

  - "Develop a pocket park on the Marolt Property in the area between the barn and housing complex." (Short term project)
  - "Explore design concepts to develop recreational fields at the Marolt Property which is sensitive to the history, open rural character and surrounding residents." (Short term project)
  - "Study plans to develop to regulation ball fields /multi-use fields at the Marolt Property."

The Pitkin County Public Works Department: Mission, Goals, Road Management and Maintenance Objectives and Alternative Transportation Investment Objectives - The adopted Pitkin County Transportation Mission Statement is as follows:

> *"Provide an intermodal transportation system that moves people safely and efficiently while maintaining the unique character of our community and resort. Our future efforts will be invested in providing transportation alternatives to automobiles."*

There are two stated transportation goals: 1) safety and 2) compatibility with the unique environment which includes: air quality, scenic visual impact, relieve congestion, minimum capital improvement, rural experience, preservation of character, managed levels of service, resort/community balance, energy efficiency and cost. A key Existing Road Management and Maintenance objective stated by Pitkin County is:

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1 Reference: Pages v: 7-8 of Parks and Recreation Master Plan.

"Continue to develop, implement and staff the Aspen to Snowmass Transportation Plan.

- Provide capacity improvements which enhance safety while maintaining our existing, unique community.
- [Development should be] Consistent with the BOCC's goal of preserving and enhancing the unique quality of life in Pitkin County, and promoting a safe and healthy community."

Down Valley Comprehensive Plan - The 1987 Pitkin County Down Valley Comprehensive Plan, prepared by the Aspen/Pitkin Planning Office, was adopted by Resolution No. 87-7 of the Pitkin County Planning and Zoning Commission. The Down Valley Comprehensive Plan establishes strategy and policies to guide the growth of unincorporated Pitkin County. Included in the Down Valley Plan is this Transportation Goal:

- Upgrade State Highway 82 in a manner that complements the rural character of the Roaring Fork Valley and provides a more efficient and safer highway than the one that exists.

Also included are the following Transportation Objectives:

- Plan for a travel facility that complements the unique environmental qualities of the Roaring Fork Valley but is designed to meet the future travel demands of Pitkin County.
- Provide a safe operating environment for all modes of transportation including bicycles.
- Make special provisions for mass transit as part of or parallel to State Highway 82 improvements.
- Improve safety for pedestrians in the State Highway 82 right-of-way and provide safe access points for recreation along the Roaring Fork River.
- Generally maintain the existing highway alignment where feasible unless undeniable safety, environmental, or cost factors which support a new alignment can be demonstrated.
- Manage land uses adjacent to State Highway 82 by the use of land use controls such as the 60 meter (200 foot) greenbelt and the scenic foreground overlay technique.
- Upgrade State Highway 82 in a timely fashion with proper phasing to minimize disruptions to traffic flow.

The Colorado Department of Transportation has implemented these objectives, wholly or in part, in the BBFEIS.

Highway 82 Corridor Master Plan - The 1985 State Highway 82 Corridor Master Plan, prepared by the Aspen/Pitkin Planning Office, was adopted by Resolution No. 85-2 of the

Pitkin County Planning and Zoning Commission. It was the first adopted area plan of the Aspen Area Comprehensive Plan. Its focus is on planning a visually pleasing Entrance to Aspen for residents and visitors. The Corridor Master Plan presented the Transportation Goal and the first two objectives cited in the description of the Down Valley Comprehensive Plan. It also included these objectives:

- Identify and preserve right-of-way for the future alignment of State Highway 82.
- Provide a travel facility that does not create overwhelming pressures for change in land use in the corridor.

The Corridor Master Plan includes a map depicting realignments of State Highway 82 northeast and southwest of the airport as alternatives and widening of the existing highway entrance to Aspen. The Corridor Master Plan outlined these guidelines for upgrading the highway:

- Provide for the future possibility of the upgrading of State Highway 82 between Brush Creek Road and Maroon Creek to four lanes.
- The Colorado Department of Transportation should acquire a limited access, four-lane right-of-way for the upgrading of State Highway 82 generally following the alignment identified in the transportation element of the State Highway 82 Corridor Master Plan.
- If highway lanes are constructed on the southwest side of the airport, land development on the contiguous lands should be minimized to the greatest extent possible. The specific intent of the county is that there be no land use development contiguous with the new alignment.
- A prerequisite to the upgrading of State Highway 82 is the development of a plan to better accommodate mass transit in the Entrance to Aspen.
- Provisions should be made for adequate flexibility to allow for a smooth transition from a four-lane highway to a two-lane highway if segments of the highway either upvalley of Maroon Creek or downvalley of Brush Creek Road remain only two lanes.
- If possible, future highway plans should maintain the highway crossing of Maroon Creek in approximately the same location.
- Future highway plans should incorporate consolidated, manageable intersections to minimize the need for traffic signals or grade-separated interchanges.
- Consideration should be given to the State Highway 82 Corridor Master Plan or the relevant Aspen or Pitkin County adopted plans in any upgrading of the highway which is to take place.

The CDOT has made every effort to follow these guidelines during the preparation of the DEIS. Many of these same guidelines were incorporated into the adopted BBFEIS.

1983 Goals Task Force Report - The 1983 Goals Task Force Report, prepared by a nine-member committee of Aspen citizens, reports the results of three open community meetings held in September 1983 to solicit ideas from the public concerning the future of the Aspen/Snowmass Village community. Transportation issues emerged clearly as the overwhelming goal or priority of those who participated. It was repeatedly suggested that State Highway 82 be made safe and that consideration be given to the expansion to four lanes. Auto disincentives, bus system improvements, and development of a regional mass transit system were also mentioned.

Transit/Transportation Development Program - In 1986, the Roaring Fork Transit Agency Transit Development Program 1986-1990 was prepared as an element of the Aspen/Pitkin County Transit/Transportation Development Program 1986-2000 by Leigh, Scott & Cleary, Inc. The Transit Development Program described the demographic characteristics of the Roaring Fork Valley and its existing transportation services, evaluated the performance of the RFTA, and presented alternatives and recommendations for public transportation. RFTA is currently updating their transit development program (TDP).

High Occupancy Vehicle Study - In 1988, the RFTA funded the Highway 82 High Occupancy Vehicle Facility Feasibility and Conceptual Design Study, prepared by Leigh, Scott & Cleary, Inc. The Final Report for the study, dated June 17, 1988, evaluates five variations of an inbound HOV lane between the airport and Main Street in terms of cost and time savings and recommends short-term and long-term improvements. Among the report's conclusions are:

"The need for a four-lane Highway 82 between Brush Creek Road and Aspen cannot be avoided through the provisions of HOV facilities. . . . The need for four lanes is driven by the growth in summer traffic volumes, which are not substantially impacted by transit usage."

Plans to provide a short (1 mile) segment of HOV along the existing highway between Maroon Creek and the Airport were tabled in 1989 by the Pitkin County Commissioners due to the cost of such a project and the desire to support the advanced construction schedule for replacement of the Maroon Creek Bridge on State Highway 82.

In addition to the HOV study, RFTA initiated a carpool program for the Roaring Fork Valley in February 1990 in an effort to reduce the number of vehicles using State Highway 82. The response to the program has been very limited and has had little, if any, noticeable effect on reducing vehicular traffic on State Highway 82.

7. Environmental Justice

Executive Order 12898, "***Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations***," was signed on February 11, 1994. This Executive Order requires CDOT and FHWA to identify and address disproportionately high and adverse human health or environmental effects of its activities on minority populations and low-income populations. Where disproportionately high and adverse effects are identified, the activity may not be carried out unless: a) avoidance or mitigation of these effects is not practicable or b) a substantial need for the activity, based on the overall public interest, can be demonstrated or c) the alternatives that would avoid the disproportionately high and adverse effects are shown to have increased costs of extraordinary magnitude or other high adverse social, economic, environmental or human health impacts that are more severe.

The Entrance to Aspen project is an "activity" which requires analysis under the Executive Order. Within the project study corridor, no minority (persons who are citizens or lawful permanent residents of the United States who are African American, Hispanic, Asian American, American Indian or Alaskan Native) or low-income (persons whose median household income is below poverty guidelines) populations have been identified that would be disproportionately effected by this project. Socio-economic data on the project study corridor is presented in **Section IV.A: Social Environment** and **Section IV.B: Economic Environment**. An extensive effort has been taken to involve all segments of the community, including minority and low-income individuals, in the public participation activities associated with the development of this project. These public involvement activities are described in **Volume 2: Comments and Coordination**, in **Section II: Project Meetings**, and **Section IV: Public Comment and Coordination**.

B. ECONOMIC ENVIRONMENT

1. Economic Base

Since the introduction of downhill skiing to Pitkin County in the late 1930s, the basis of employment in the county has shifted from agriculture to tourism. The earlier mining employment base had already deteriorated. Tourism (winter downhill skiing and summer fishing, rafting, hiking, sight-seeing, and bicycling) along with conference center activity and cultural programs has become the focus of employment in Pitkin County. Retail trade and services, including hotels, restaurants, bars, and the ski industry, accounted for 57 percent of total county employment in 1987, increasing to 62 percent in 1993.

Although Pitkin County has developed and encouraged a variety of year-round recreational activities, downhill skiing continues to be a significant factor in the local economy. Aspen Skiing Company owns and operates the four Pitkin County ski resorts: Aspen Mountain, Buttermilk, Aspen

Highlands, and Snowmass. Skier visits to the four ski areas during the 1994/95 ski season totaled 1,424,771, down slightly from the 1,453,843 visits in 1993/94. Table IV-12 details skier visits for the past five seasons, 1990/91 through 1994/95.

Table IV-12
Annual Skier Visits in State Highway 82 Corridor

Ski Season	Aspen Highlands	Aspen Mountain	Buttermilk	Snowmass	Total
1994/95	159,288	329,535	168,439	767,509	1,424,771
1993/94	106,197	359,846	172,948	814,852	1,453,843
1992/93	145,364	1,381,753*	--	--	1,527,117
1991/92	152,379	395,591	163,658	732,617	1,444,245
1990/91	145,678	366,962	144,419	645,374	1,302,433

Source: Colorado Ski Country U.S.A.
* Figures were not separated for 1992/93 for Aspen Mountain, Buttermilk, and Snowmass.

Most of the other employment industries are in some way supportive of the tourist-oriented employment base, including construction, transportation, communications, utilities, finance, insurance, and real estate activities. A low level of mining and agricultural employment continues in the county.

2. Commercial Growth Trends

Table IV-13 compares the commercial development totals in the City of Aspen, the Town of Snowmass Village, and unincorporated Pitkin County for the period from 1975 through 1990.

An examination of retail sales in the State and the three counties for the past six years indicates that retail sales are up for each of the areas, as shown in Table IV-14. Growth rates were in fact higher for Eagle County, which is also home to Vail and Beaver Creek ski resorts. However, when retail sales per capita are analyzed (Table IV-15), the economic discrepancy between Pitkin County and the others is again apparent.

Table IV-13
Commercial Expansion in Pitkin County
1975 Through 1990

	Aspen	Snowmass Village	Unincorporated Pitkin County	Total
Commercial Square Footage (01/01/75)	1,014,964	87,000	150,390 [1/]	1,252,354
New Construction (01/01/75-12/31/86)	407,275	155,565	269,544	832,384
Commercial Square Footage (12/31/86)	1,422,239	242,565	419,934	2,084,738
Annual Average New Square Footage	33,940	12,964	22,462	69,366
Commercial Square Footage 1990	1,451,466	339,284	461,891	2,252,641

1/ Due to the unavailability of accurate records, the data on commercial buildings in existence in unincorporated Pitkin County prior to 1970 is sketchy and may be incomplete.

Sources: Aspen/Pitkin Planning Office documents: 1987 Aspen/Pitkin County Annual Growth, Population and Housing Report; Appendix A, Housing Master Plan Technical Background Report, January, 1988; Aspen Area Community Plan, 1992.

Table IV-14
1989 - 1994 Retail Sales ($1,000)

	1989	1990	1991	1992	1993	1994	% Growth 1989-94
Eagle	524,257	588,904	618,991	623,441	707,733	890,406	69.84
Garfield	473,633	526,971	529,584	550,487	621,510	724,601	52.99
Pitkin	467,214	477,434	486,412	511,945	566,410	648,063	38.71
Colorado	42,378,795	45,292,872	48,971,153	50,939,152	57,091,295	66,661,680	57.30

Source: Colorado Department of Revenue, 1993 Annual Report.

Table IV-15
Retail Sales Per Capita

	1993
Eagle	$29,513
Garfield	$19,759
Pitkin	$42,838
Colorado	$16,452

Source: Colorado Department of Revenue, 1993 Annual Report.

3. Employment

The residents of Pitkin County are primarily individuals and families who have selected the area for the recreational opportunities and high level of services available in a beautiful mountain environment. This population includes those who are financially independent or own second homes in Pitkin County as well as the large number of residents who are willing to work in the area even though employment opportunities are often seasonal and generally have an unfavorable average wage/average housing cost ratio. Because many of the area's employees reside outside the county, primarily in Eagle County and Garfield County, information is included for each of the three counties.

3a. Jobs and Labor Force

According to the Colorado Division of Labor and Employment, both the total number of jobs and the labor force within the area have increased considerably during the last decade. Table IV-16 shows the changes in both between 1980 and 1990 and the percent of growth for each area. Labor force figures for 1993 are also included. The Bureau of Economic Analysis (BEA) forecasts employment and labor force trends through 2015. Based on the projections in Table IV-17 both labor force and jobs are expected to continue to increase. As the two tables indicate, both Pitkin County and Eagle County have more jobs than can be filled by the resident labor force. Although studies show that many Pitkin County residents hold more than one job (the ***Aspen Area Community Plan*** reports an average of 1.29 jobs per person), a significant level of outside labor is required on a daily basis. Table IV-18, which assumes one job per employee, estimates the necessary amount of outside labor. Table IV-19, prepared with 1990 U.S. Census data, details the number of employees who work outside their county of residence. Together, the tables offer a range of the possible number of commuters traveling along State Highway 82 into Aspen each day.

Table IV-16
Area Jobs/Labor Force Comparisons

County	1980	1990	% Growth	1992/1993
JOBS				
Eagle	11,048	20,669	87	22,432
Garfield	12,144	18,311	51	18,743
Pitkin	11,807	17,804	51	17,553
Colorado	1,643,556	2,056,659	25	2,166,239
LABOR FORCE				
Eagle	8,914	13,650	53	14,483
Garfield	12,732	15,725	24	17,448
Pitkin	6,826	9,117	34	8,227
Colorado	1,500,000	1,695,000	13	1,904,000

Sources: Colorado Division of Local Government, Colorado Division of Labor and Employment.

Table IV-17
Estimated and Projected Jobs/Labor Force
1990 - 2015

County	1990	1995	2000	2005	2010	2015
JOBS						
Eagle	20,669	19,900	22,500	24,500	25,900	26,350
Garfield	18,311	17,400	18,900	19,900	20,500	20,550
Pitkin	17,804	16,600	18,100	19,100	19,800	19,850
Colorado	2,234,409	2,155,300	2,304,300	2,405,200	2,466,100	2,459,850
LABOR FORCE						
Eagle	15,037	16,280	17,900	19,480	21,030	22,660
Garfield	17,550	17,410	18,760	20,100	21,410	22,780
Pitkin	10,378	10,960	11,810	12,640	13,450	14,310
Colorado	1,756,000	1,821,200	1,934,900	2,057,500	2,165,500	2,279,200

Source: U.S. Bureau of Economic Analysis.

Table IV-18
Outside Labor Force Required
(By County)
1990

County	Jobs	Labor Force	Outside Labor Force Required (*)	% Outside Labor Force
Eagle	18,252	13,650	4,602	25.21
Garfield	16,334	15,725	609	3.73
Pitkin	15,579	9,117	6,462	41.48

* Assume 1.0 job per person; however, many employees hold more than one job. The Aspen Area Community Plan and the Aspen/Pitkin Housing Study estimate 1.29 jobs per person.

Source: Colorado Department of Transportation

Table IV-19
Commuter Percentile Analysis

County	Labor Force	Worked In County of Residence	% Worked In County of Residence	Worked Outside County of Residence	% Worked Outside County of Residence
Eagle	13,156	10,865	82.59	2,291	17.41
Garfield	14,756	11,601	78.62	3,155	21.38
Pitkin	8,179	7,482	91.48	697	8.52

Source: U.S. Department of Commerce, 1990 U.S. Census
NOTE: *Labor force data varies among sources due to different collection and analysis methods.*

Information from the State, Pitkin County and the 1990 U.S. Census supported the rising employment figures for Pitkin County. State labor force estimates of total employment for Pitkin County for 1986 were 7,849. Locally calculated figures, which were based on projections for commercial growth for Aspen only, varied somewhat, totalling 8,118 employees for Pitkin County, with figures for Aspen at 7,064, Snowmass Village at 854, and downvalley at 200 employees. The 1990 U.S. Census, which used different reporting boundaries, reported a Pitkin County labor force of 8,869. Of these, 5,713 were in the Aspen division (3,751 in Aspen) and 1,011 were in Snowmass Village.

3b. Employment Surveys for Pitkin County

In 1987 and 1990/91, the Aspen/Pitkin Housing Authority conducted surveys of employment and place of residence. Although each survey was administered to both Pitkin County residents and Pitkin County employees, the collection methods varied. The 1987 survey was sent to 11,300 mailing addresses between Carbondale and Aspen; 3,415 individuals (30 percent) responded to the survey. Based on the survey results, the Housing Authority compiled a series of tables that describe the relationships between where people live and where they work (Figure IV-4).

The 1990/91 survey was administered in two phases. The September 1990 questionnaire was distributed to 2,690 randomly selected households throughout the County, or approximately one of every two households. A total of 962 responses were received, for a rate of 36 percent. The March 1991 questionnaire was a shorter version distributed by employers to a pre-designed sampling of employees, to ensure that all employees had an equal chance of inclusion in the study. A total of 200 businesses participated, and approximately 3,300 employee surveys were distributed. Of these, 893 completed responses were received, for an approximately 27 percent return rate. Responses were received from employees residing in Pitkin, Eagle, and Garfield counties. Results of these surveys indicate that the number of employees who work in the Aspen/Snowmass area and commute from downvalley, or further, is increasing.

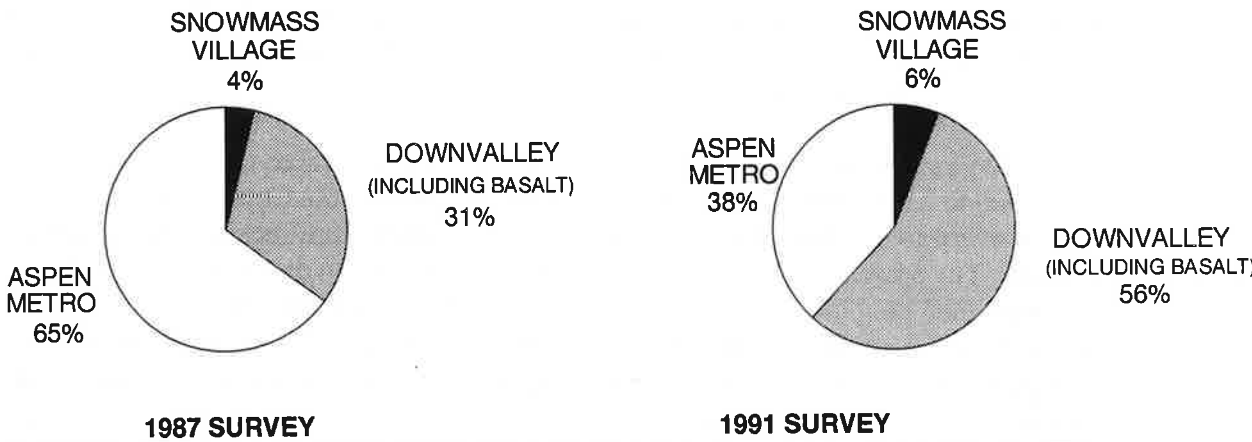
The results of the 1987 Housing Authority survey indicated that 65 percent of the people who worked in the Aspen metropolitan area also lived there. The 1990/91 survey separated Aspen and the Aspen metropolitan area. It found that, of the people who worked in Aspen, 50 percent lived in Aspen/Aspen metropolitan area. Of those who worked in the Aspen metropolitan area, 38 percent of employees lived in Aspen/Aspen metropolitan area.

The survey showed that of the people who lived in the Aspen metro area in 1987, 93 percent worked there, 4 percent worked in Snowmass Village, and 3 percent worked downvalley. In 1990/91, 87 percent of the people who lived in Aspen worked in the Aspen area, 10 percent worked in Snowmass Village, and 3 percent worked downvalley/elsewhere. In the Aspen metropolitan area, 73 percent worked in the Aspen metropolitan area, 20 percent worked in Snowmass, and 8 percent worked downvalley/elsewhere. Of the non-Pitkin County respondents, 68 percent worked in the Aspen metropolitan area, 21 percent worked in Snowmass Village, 5 percent worked in Basalt, and 6 percent worked downvalley/ elsewhere (in Pitkin County).

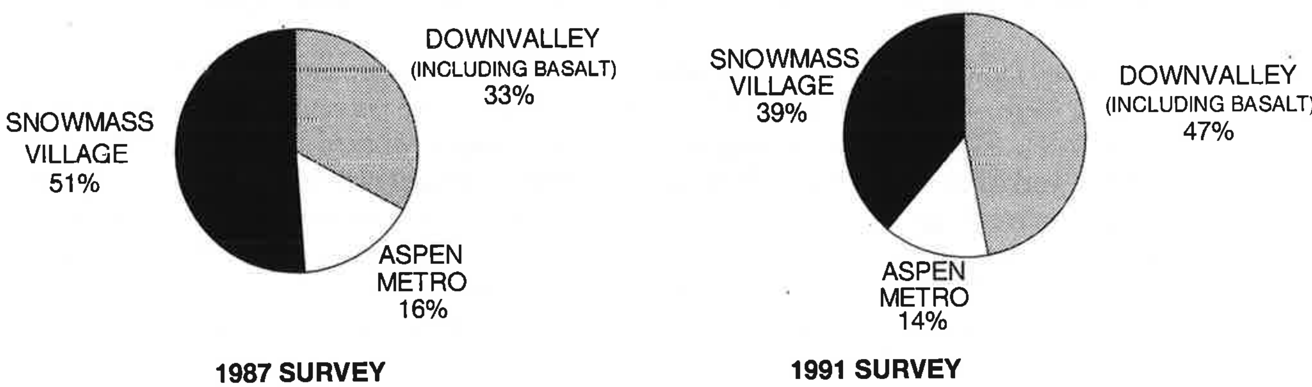
The information described above provides an understanding of the use of State Highway 82 for commuter traffic. Approximately 94 percent of the people employed in Pitkin County work in the Aspen/Snowmass Village area. The large amount of travel to the Aspen and Snowmass Village areas from downvalley for work purposes is apparent.

Figure IV-4

Where Aspen Metro Employees Live



Where Snowmass Village Employees Live



Sources:

- Aspen/Pitkin Housing Authority, 1988.
- Rosall, Remmen and Cares, Inc., Aspen/Pitkin Housing Study. Final Report, July 1991.
- Colorado Department of Labor and Employment, Colorado Labor Force Averages: January 1991 - December 1991.

4. Income

When the income levels for residents within the State and the tri-county study area are analyzed, it becomes abundantly clear that there are significant differences at all levels when median household, family, and non-family incomes are compared. Table IV-20, derived from 1990 U.S. Census figures, indicates that only Garfield County's income levels fall below the State level in every instance. Pitkin County levels are higher in all instances except non-family income, which is slightly lower than that in Eagle County.

Per capita income levels are another indicator of the economic well being of area residents. As shown in Table IV-21, when per capita income levels of 1989 are adjusted for the effect of inflation and compared with the income levels in 1980, all incomes except those in Pitkin County are less than they were in 1980. The comparison of per capita income levels of the three counties within the study area reveals a significant level of disparity. While overall income levels have risen throughout the decade, when adjusted for inflation, all except those of Pitkin County residents have fallen below 1980 levels.

5. Housing

5a. State Highway 82 Corridor

The type of households and the housing stock within the study area vary significantly, as shown in Table IV-22. The predominant household type in both Eagle and Garfield counties is the family household composed of people related through marriage. The predominate household type in Pitkin County is the non-family household composed of people not related through marriage.

The value of homes in the study area varies considerably, with homes in Pitkin County having the highest value in the state. Data from the 1990 Census, showing the variations in the median price of owner occupied housing and the differences in the value of those homes, is displayed in Tables IV-23a and 23b. In Aspen, the most profitable use of available land and housing stock is for expensive homes and visitor lodging. Many working people who choose to reside in Aspen live in crowded conditions because of the high cost of housing. Pitkin County housing prices continue to escalate, particularly in Aspen. According to the Aspen Board of Realtors, in 1991 the average sales price for single family homes was $1.1 million and almost $320,000 for condominiums. In 1992, the average single family residence price rose to $1.24 million, and condominiums were almost $370,000. By the third quarter of 1994, these figures were $1.7 million and $400,000, respectively.

This has resulted in the movement of growing families from Aspen to downvalley areas in search of affordable housing. Although prices have risen downvalley, the 1992 average single family home in Basalt was $198,000, and a condominium averaged $68,500.

Table IV-20
Median Income Levels
(By County)

	Household	Family	Non-Family	% Families below Poverty Level
Eagle	36,931	41,183	30,082	4.9
Garfield	29,176	32,377	17,193	7.3
Pitkin	39,991	52,976	29,518	2.9
Colorado	30,140	35,930	18,948	8.6

Source: U.S. Department of Commerce, 1990 U.S. Census

Table IV-21a
Per Capita Income
(Current $, in thousands)

	1980	1982	1984	1986	1988	1989
Eagle	13.0	14.9	16.0	15.3	17.5	18.6
Garfield	10.3	13.0	13.3	13.2	14.4	15.0
Pitkin	16.5	21.1	22.2	22.8	27.4	29.7
Colorado	10.6	12.7	14.2	15.2	16.6	17.7

Source: U.S. Department of Commerce, 1990 U.S. Census

Table IV-21b
Adjusted Per Capita Income
(Constant 1989 $)

	1980	1982	1984	1986	1988	1989
Eagle	19.3	18.2	17.8	16.5	17.8	18.6
Garfield	15.2	15.8	14.8	14.2	14.7	15.0
Pitkin	24.5	25.7	24.6	24.5	27.9	29.7
Colorado	15.7	15.4	15.7	16.4	16.9	17.7

Source: Colorado Division of Labor and Employment. Colorado Department of Transportation.

Table IV-22
Household Characteristics

	Total Households	% Family	% Non-Family
Eagle	8,354	61	39
Garfield	11,266	71	29
Pitkin	5,877	46	54
Colorado	1,282,487	66	34

Source: U.S. Department of Commerce, 1990 U.S. Census

Table IV-23a
Value of Owner Occupied Housing

	less than $99,000	$100,000 to $200,000	more than $200,000
Eagle	28%	48%	24%
Garfield	60%	34%	6%
Pitkin	6%	17%	77%
Colorado	70%	25%	5%

Table IV-23b
Median Price of Owner Occupied Housing - 1990

Eagle	135,900
Garfield	90,400
Pitkin	452,800
Colorado	82,700

Source: U.S. Department of Commerce, 1992 Census

According to the Aspen Area Community Plan, the housing stock available for permanent residents is decreasing. In 1986, units for permanent residents made up 85 percent of the housing inventory. By 1991, only 71 percent of the units were for permanent residents. At the same time, the average annual growth rate for new residential construction in the City of Aspen during the last fifteen years has been 1.9 percent, and a rate of 2.8 percent in the Aspen metro area.

The lack of affordable housing has directed much attention toward the issue of employee housing in Aspen during the past decade. A decision to provide rent-controlled and price-controlled housing for employees was reached in 1979 by the City of Aspen and Pitkin County. The Aspen/Pitkin Housing Authority was formed in 1982, and its original regulations required developers to construct housing units for 25 percent of the employees generated by their projects. The percentage was increased to 35 percent in 1986. In April 1988, the Aspen City Council agreed to require developers to house 100 percent of the employees generated by their projects. Developers are allowed to make "cash-in-lieu" payments to support Housing Authority efforts to provide employee housing instead of building housing as part of their projects. Under Housing Authority regulations, employee housing units may be legally occupied only by residents of the county who live in them full time and meet income guidelines.

In early 1988, approximately 800 employee housing units had been provided and more than $500,000 in cash-in-lieu payments from developers was available for Housing Authority use. As of June 1990, the Housing Authority inventory of affordable housing units totaled 966. By 1992, there were approximately 1,225 deed-restricted units, according to the ***Aspen Area Community Plan***. At the end of October 1994, the city had completed 50 additional units, and 285 were proposed for completion in the following 2-1/2 years. These units can only be sold or rented to area employees, and re-sale prices are restricted to ensure that the units continue as affordable housing for employees. The Housing Authority projects a need for an additional 805 affordable units in 1995.

Both Aspen and Pitkin County, through the Housing Authority, have begun to address the need for affordable housing with publicly initiated developments: Hunter Longhouse, Aspen Valley Hospital, Truscott Place, Marolt Ranch, Twin Ridge, East and West Hopkins, the accessory dwelling program, and several other potential developments that both the City and County are discussing. In addition, the City adopted the Affordable Housing Zone District, an area where incentives are offered for building reasonably priced housing units to encourage private sector development of affordable housing. The County has had the Permanent Moderate Housing (PMH) zone district in place for a number of years to encourage development of affordable housing, such as Centennial, Hunter Longhouse, and Lone Pine.

In addition to these production efforts, the County has up to $6 million in bonding authorization for affordable housing. The City has also dedicated tax revenues of more than $2 million per year for 10 years for affordable housing (1.0 percent local Real Estate Transfer Tax [RETT] and 0.45 percent sales tax).

5b. Housing and Traffic Volume

State Highway 82 is frequently mentioned during consideration of employee housing needs. The analysis for this DEIS concluded that changes in future employee housing and commuting characteristics would not be significant enough to remove the need for the transportation improvements. Current employee housing regulations are aimed primarily at providing for the employees generated by future growth and development. If successful, it may reduce the rate of overall traffic growth, but not significantly.

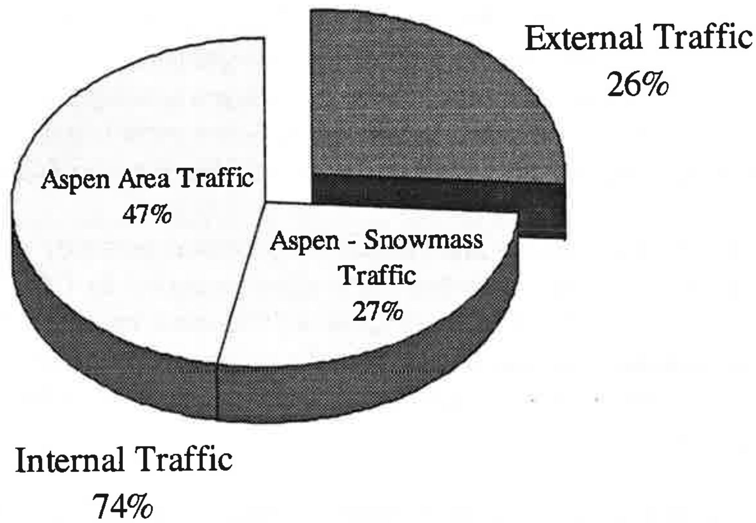
Serious traffic capacity and congestion problems presently exist and are expected to get worse. From origin and destination studies conducted by CDOT, 74 percent of the trips on State Highway 82 at Cemetery Lane in 1993 were internal traffic (Figure IV-5). Internal traffic is defined as trips having both the origin an destination within the Aspen/Snowmass area. External traffic consists of trips having the origin or destination outside the Aspen/Snowmass area.

The traffic volumes in the Buttermilk Ski Area increased approximately 12 percent between 1987 and 1992. Downvalley near Basalt the traffic increased 37.3 percent during the same period. Traffic volumes are far above the existing State Highway 82 capacity, and the highway frequently operates at very low Level of Service (LOS) during peak hours and bad weather conditions.

Currently, 44 percent of the Aspen metropolitan employees live upvalley from Aspen Village. The ***Aspen Area Community Plan*** has a projected goal of housing 60 percent of its employees upvalley, which in theory would decrease the number of commuter trips on State Highway 82. However, while more employee housing units are developed, the population and number of jobs will also increase. Therefore, the 40 percent of employees who are not housed in the Aspen area would be similar to the actual number of present-day commuters, as demonstrated in Table IV-24. If the 60 percent goal is not reached, the number of commuters would be even greater.

Employee housing has been suggested for an area at the Brush Creek Road and State Highway 82 intersection. If this project is successful, the employees would still be traveling the State Highway 82 study corridor. In order for the employee housing to reduce trips on this study corridor it must be east of Castle Creek.

Figure IV-5
Trip Characteristics on State Highway 82 at Cemetery Lane (1993)



Source: Colorado Department of Transportation Origin and Destination Survey, 1993.

Table IV-24
Labor Force

	1992 (Current Condition)	2015 (Projected Buildout)
Estimated Total Aspen Area Labor Force	8,400	10,700
Estimated Labor Force Living in the Aspen Area	3,780 (45%)	6,420 (60%)
Estimated Commuting Labor Force	4,620 (55%)	4,280 (40%)

Source: Aspen Area Community Plan, 1992.

C. PHYSICAL ENVIRONMENT

1. Air Quality

The City of Aspen and its surrounding area are designated as an air quality nonattainment area for suspended particulate matter referred to as PM_{10} (particulate matter less than 10 microns in diameter--by comparison a human hair is about 75 microns in diameter). The nonattainment designation by the Environmental Protection Agency (EPA) is in response to the air quality being worse than National Ambient Air Quality Standards (NAAQS). This standard is defined as concentrations of PM_{10} of 50 micrograms per cubic meter of air averaged over an annual period and 150 micrograms per cubic meter during a 24-hour period. Three exceedances of the federal 24-hour PM_{10} standard (150 micrograms per cubic meter) have been recorded in Aspen since PM_{10} monitoring began in January 1988.

The nonattainment boundary for the Aspen area includes the City of Aspen, the Aspen Airport Business Center and the developed areas around Aspen. The northerly boundary on State Highway 82 is approximately milepost 36.5. The entire EIS study corridor is within the nonattainment boundary.

Over 80 percent of the PM_{10} in Aspen is reentrained dust from paved roads which are heavily sanded in winter (suspended particulate matter which is kicked up off of the highway as vehicles drive over the sanded surfaces). The remainder is wood smoke from fireplaces, wood stoves, and restaurant grills with a certain percentage being from unknown sources.

The Aspen SIP includes transportation control measures to reduce vehicle miles traveled, including expanded transit service and paid parking in the core business area. The SIP also requires the Colorado Department of Transportation and the City of Aspen to use clean sand for winter street sanding and to do more frequent street sweeping on State Highway 82.

In 1988, the Aspen City Council and the Pitkin County Commissioners enacted several ordinances to control smoke from woodburning fireplaces and to establish a limit of one certified Phase II wood stove per dwelling. Aspen has also experimented with several street sanding/cleaning measures in an effort to reduce re-entrained dust. These measures include asphalt coated sand, harder and cleaner sand, sanding fewer streets, liquid deicers, and frequent street washing.

2. Water Quality

The Roaring Fork River and two of its tributaries, Maroon Creek and Castle Creek, are the primary water resources within the study corridor. The Roaring Fork River and Maroon Creek originate within the Hunter/Fryingpan and Maroon Bells/Snowmass Wilderness Areas, respectively; the mainstream of Castle Creek begins on the slopes of Castle Peak. Maroon Creek and Castle Creek join the Roaring Fork northwest of the town of Aspen. The mainstream of the Roaring Fork then flows in a northwesterly direction for approximately 80 kilometers (49.7 miles) before joining the Colorado River near the town of Glenwood Springs.

The headwaters of the river and its major tributaries are located in high alpine terrain where elevations exceed 4,260 meters (14,060 feet) above mean sea level. Rocks form the predominant ground cover in the upper elevations where snowpack persists through much of the year. Streambeds in the upper elevations are typically steep and the flow is turbulent, especially during peak flow periods. Below the headwaters, the river and its tributaries flow through alpine ecosystems where the slope of the streambeds becomes flatter. The river and tributaries ultimately reach the valley floor where the flow velocities decrease and the water bodies become wider and shallower relative to the higher elevation segments. In the valley, the river and creeks flow within incised beds; the beds consists primarily of rock cobbles.

2a. Sources of Water

The principal sources of water in the Roaring Fork River and its tributaries are runoff from snowmelt and precipitation and groundwater discharge. During the winter months, groundwater discharge is the primary source of flow. Snowmelt and precipitation runoff are the primary sources of flow in the warmer months. Water is diverted from the Roaring Fork to Twin Lakes and Turquoise Lake in the Arkansas River basin from the eastern portion of the Roaring Fork basin.

2b. Stream Classification

The Colorado Department of Health's Water Quality Control Commission (WQCC) has classified all segments of the Roaring Fork River and its tributaries in and above the study corridor for beneficial uses and has adopted water quality standards necessary to protect those uses. The segment of the Roaring Fork River and its tributaries within the project area has been classified for the following beneficial uses:

- Recreation, Class 1
- Aquatic Life, Cold Water, Class 1
- Water Supply
- Agriculture

The segment of the Roaring Fork River and its tributaries occurring within the project area is defined within the WQCC's ***Classifications and Numeric Standards for Upper Colorado Basin and North Platte (Planning Region 12)*** as Region 12; Basin: Roaring Fork River; Stream Segment Description: (3) Mainstream of the Roaring Fork River, including all tributaries, lakes, and reservoirs from a point immediately below the confluence with Hunter Creek to the confluence with the Colorado River except for those tributaries included in Segment 1 and specific listings in Segments 4 through 10 (WQCC, 1993)[2].

[2]"Water Quality Control Commission (WQCC), 1993. Classifications and Numeric Standards for Upper Colorado Basin and North Platte (Planning Region 12).

2c. Water Quality Standards

The water quality standards adopted for the segment occurring within the project area are summarized in Table IV-25. All of the adopted standards have been established using criteria set forth in the WQCC's ***Basic Standards and Methodologies for Surface Water***. The WQCC establishes these standards based on the segment's current suitability for its designated uses or goals for future uses. Standards for some parameters are numeric while others are considered "table value standards" (TVS). TVS are employed for metals where the toxicity of the metal is related to water hardness; TVS are determined using an equation that includes a factor for water hardness.

2d. Ambient Water Quality

The ambient water quality of the Roaring Fork River and its tributaries was assessed during the development of the BBFEIS. The assessment included a visual inspection of the river and its tributaries, and evaluation of data available in the STORET database (water quality data compiled by the United States Environmental Protection Agency [USEPA]) and in CDOT records. The results of these data analyses were presented in the technical reports prepared in support of the DEIS. The analyses include data collected from three stations along the Roaring Fork and one station along each of Castle and Maroon Creeks.

The data, collected primarily from the late 1970s through the early 1980s, did not include all parameters for which standards had been established. The available data indicated that the waters were of high quality for most parameters with the exception of metals. Numeric standards for copper, lead, and zinc were exceeded at stations in Maroon Creek and Castle Creek. Free cyanide and arsenic were recorded at levels above the numeric standards downstream of the town of Aspen.

The analysis indicated that the minimum dissolved oxygen standards are exceeded at all times in all segments. The pH standards were also met or exceeded with the exception of a few low values in the segment above Aspen. The waters are low in hardness and alkalinity. Historical data indicates that fecal coliforms, total ammonia, boron, nitrite, nitrate, chloride, sulfate, soluble or total manganese, selenium, and nickel parameters are within established limits.

The segment above the study corridor and Maroon Creek and Castle Creek tributaries near the southeast end of the study corridor had mean concentrations of copper, lead, and zinc that exceed the applicable numeric standards. The size of the database was sufficient to conclude that the ambient levels (defined in Colorado as the 85th percentile value) for these three metals are above the adopted standards. The maximum values observed for total and soluble iron exceeded the numeric limits at the stations in this segment, so the ambient value for total and soluble iron may also have exceeded the standards.

Table IV-25
Numeric Water Quality Standards for the Roaring Fork River and Tributaries Within the Project Area

Parameter	Units	Maximum	Minimum
Dissolved Oxygen			
w/o spawning	mg/l	-	6.0
w/ spawning	mg/l	-	7.0
pH	S.U.	9.0	6.5
Fecal Coliforms	/100 ml	200	-
Ammonia			
acute	mg/l	TVS	-
chronic	mg/l	0.02	-
Chloride			
acute	mg/l	0.019	-
chronic	mg/l	0.011	-
Cyanide (free)	mg/l	0.005	-
Sulfur	mg/l	0.002	-
Boron	mg/l	0.75	-
Nitrite	mg/l	0.05	-
Nitrate	mg/l	10.0	-
Chlorine	mg/l	250	-
Sulfate	mg/l	250	-
Arsenic			
acute	µg/l	50 (total recoverable)	-
Cadmium			
acute	µg/l	TVS (dissolved)(trout)	-
chronic	µg/l	TVS (dissolved)	-
Chromium			
III acute	µg/l	50 (total recoverable)	-
IV acute/chronic	µg/l	TVS (dissolved)	-
Copper	µg/l	TVS (dissolved)	-
Iron			
chronic	µg/l	300 (dissolved)	-
chronic	µg/l	1000 (total recoverable)	-
Lead			
acute/chronic	µg/l	TVS (dissolved)	-
Manganese			
chronic	µg/l	50 (dissolved)	-
chronic	µg/l	1000 (total recoverable)	-
Mercury	µg/l	0.01 (total recoverable)	-
Nickel			
acute/chronic	µg/l	TVS (dissolved)	-
Selenium	µg/l	10.0 (total recoverable)	-
Silver			
acute	µg/l	TVS (dissolved)	-
chronic	µg/l	TVS (dissolved)(trout)	-
Zinc			
acute/chronic	µg/l	TVS (dissolved)	-

Source: Colorado Department of Health Water Quality Control Commission. 1993.

mg/l = milligrams per liter
µg/l = micrograms per liter
TVS = table value standards

At the stations below Aspen within the study corridor, mean values for free cyanide and arsenic were above the numeric standards. The number of observations was not sufficient, however, to conclude that these standards were being exceeded. Furthermore, the maximum values for cadmium, copper, iron, lead, and zinc exceeded the numeric standards although the means were below the limits in effect at that time.

A meaningful evaluation of previous water quality data in terms of current water quality standards is precluded by the incompatibility of data based on differences in analytical methods. The CWQCC changed the water quality standards from numeric to table values in 1988 based, in part, on the ambient water quality within each stream segment. Considering the analyses conducted by the state in revising the standards and the lack of industrial development within the project area, it is unlikely that water quality within the project area has undergone significant changes since the initial analyses were conducted.

3. Upland and Floodplain Vegetation

Most land within the project area between Buttermilk Ski Area and downtown Aspen has been developed for either agricultural, residential, commercial, or recreational uses. Native vegetation is limited to small parcels of sagebrush shrublands near the airport, and the floodplain communities immediately surrounding the Roaring Fork River, Maroon Creek, and Castle Creek drainages. Vegetation growing on land developed for agricultural purposes consists primarily of grasses to support their use as irrigated pastures. Bluegrass and landscape plants are the predominant vegetation associated with residential and recreational land uses.

Sagebrush uplands consist of big sagebrush (*Artemisia tridentata*) interspersed with western wheatgrass (*Agropyron smithii*) and indian ricegrass (*Oryzopsis hymenoides*). Agricultural pastures consist primarily of smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*), and timothy (*Phelum pratense*).

Floodplain vegetation types consist primarily of woody species. The overstory of the Castle Creek and Maroon Creek drainages is dominated by narrow-leaf cottonwood (*Populus angustifolia*) and the understory is composed of willow (*Salix* spp.) and red-osier dogwood (*Cornus stolonifera*). Minor woody components of the understory include snowberry (*Symphoricarpos* sp.) and Woods rose (*Rosa woodsii*). Alder (*Alnus tenufolia*), blue spruce (*Picea pungens*), and gambel oak (*Quercus gambelli*) are present in the Roaring Fork River drainages. Herbaceous components of these moist to mesic communities include smooth brome, Kentucky bluegrass, sedges (*Carex* spp.), and rushes (*Juncus* spp.). One small wetland area located adjacent to the highway is composed of herbaceous species including sedges, rushes, and pasture grasses. Wetland vegetation is discussed in the next section.

4. Wetlands

The wetlands along the Roaring Fork River and its tributaries occur in response to changes in water patterns caused by shifts in stream flow and damming by beavers. Wetland vegetation also exists in upland areas where, in response to snowmelt or precipitation runoff, water collects for extended periods within the growing season. Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act (CWA) and Executive Order 11990. The United States Army Corps of Engineers (USACOE) and USEPA administer dredge and fill activities within these areas that are defined as:

> Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Three requirements are necessary to define wetlands: vegetation, soils, and hydrology. The definitions used by the agencies to identify wetlands differ somewhat in text but all focus on the three wetland criteria. Wetlands are typically identified by vegetation (hydrophytes), soils (hydric), and hydrology (frequency of flooding or soil saturation).

Hydrophytic vegetation is classified by the estimated probability of occurrence in wetland versus upland (non-wetland) areas throughout its distribution. Obligate wetland plants (OBL) almost always (>99 percent probability) occur in wetlands under natural conditions. Facultative wetland plants (FACW) usually (67-99 percent probability) occur in wetlands under normal conditions but are occasionally found in non-wetlands. Facultative plants (FAC) are equally likely (34 to 66 percent probability) to occur in wetlands and non-wetlands. Facultative upland plants (FACU) usually (67 to 99 percent probability) occur in non-wetlands but occasionally (1 to 33 percent) occur in wetlands (United States Fish and Wildlife Service [USFWS] 1988).

Hydric soils refer to characteristics sufficient to support predominantly wetland vegetation. Soils that are saturated, flooded, or ponded for sufficient periods during the growing season to develop anaerobic conditions in the upper part are referred to as hydric. Sufficient duration for saturation is generally considered to be 1 week or more when soil temperatures are above 5 degrees centigrade (°C) (biological zero). It should be noted that the duration period required for saturated soils is key to the identification of wetlands.

Wetland hydrology includes the frequency and duration of inundation and soil saturation. Permanent or periodic water inundation or soil saturation are considered significant forces in wetland creation. Although hydrology is essential for creating and maintaining wetlands, it is often difficult to quantify during field surveys. Wetland hydrology, including soil saturation or inundation, is generally required for a period of 2 consecutive weeks during the growing season. In the absence of actual observations during this 2-week period, hydrologic indicators are often used to assess whether wetland hydrology is present.

4a. Wetland Functions

Wetlands are widely recognized as providing a variety of important functions. Wetlands vary in the functions they provide and the value of these functions. Functions and values of wetlands are often used for evaluating wetlands and for guidance in selecting appropriate wetland mitigation. All three project area wetlands provide some degree of primary production export, sediment stabilization, sediment/toxicant retention, and floodflow alteration. Wetlands 2 and 3 also provide groundwater recharge/discharge, wildlife diversity/abundance, aquatic diversity/abundance, nutrient removal/transformation, and recreation.

4b. Wetland Survey Methodology

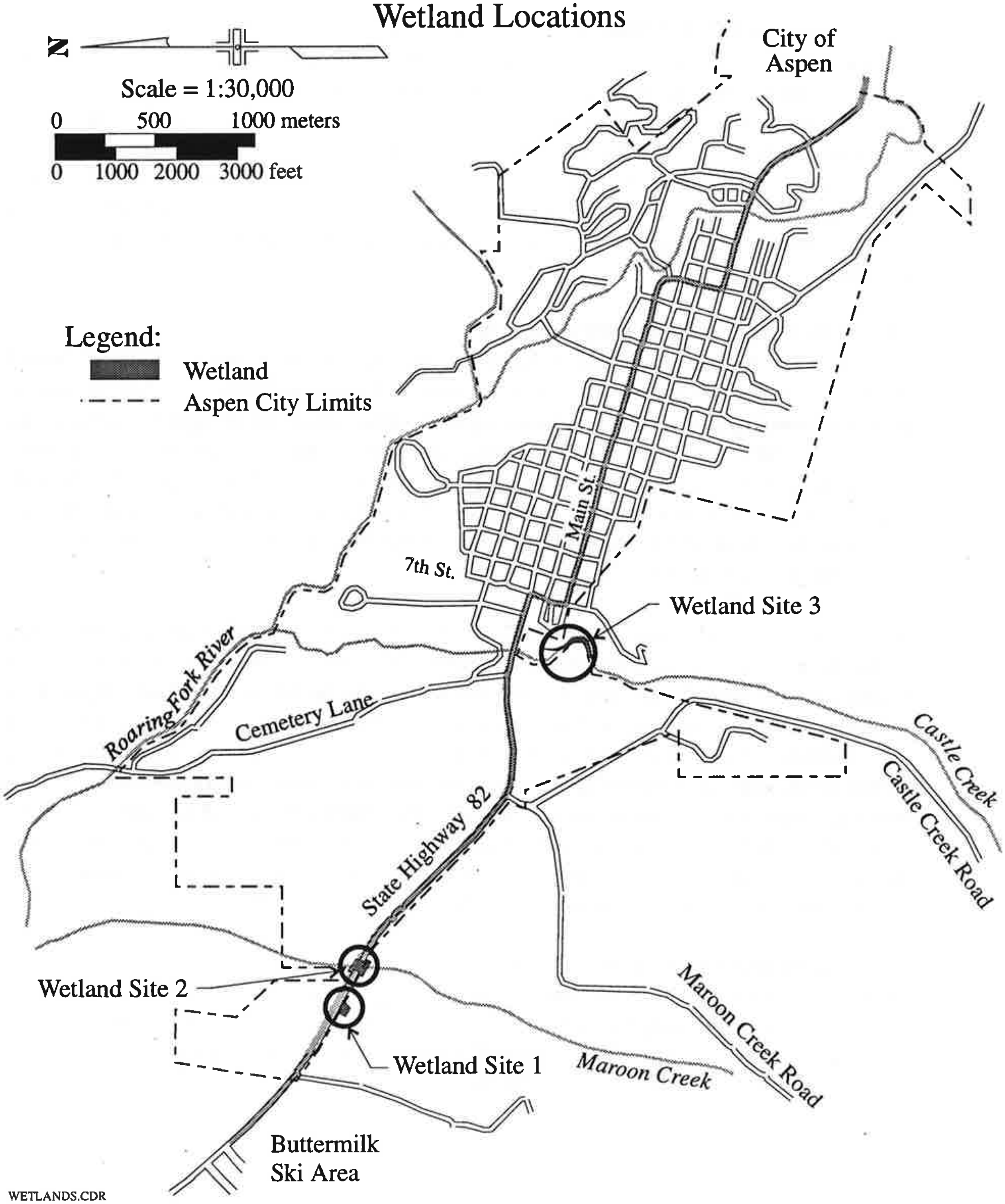
A wetland survey was conducted in August 1994 for the study corridor and the alignment alternatives under consideration. The entire length of State Highway 82 within the project area was investigated on foot, including riparian areas under the bridges crossing Castle Creek and Maroon Creek. Aerial photographs, topographic maps, and personal communication were used to ensure that potential wetland areas within the project area were not overlooked. A review of hydric soils for the Aspen and Gypsum areas indicated that the only soil type containing hydric inclusions, fluvaquents, was restricted to the drainages associated with Castle Creek and Maroon Creek.

The USACOE 1987 manual was followed for identification of wetlands (***Environmental Laboratory***, 1987). This methodology requires that each of three parameters--hydrology, vegetation, and soils--be present at a site for it to be identified as a wetland. Hydrologic indicators were assessed in the field in conjunction with the use of floodplain maps. Vegetation was identified in the field and soils were assessed using maps and descriptions published by the United States Soil Conservation Service (now National Resources Conservation Service). Soil pits dug at each site were used to assess potential hydric qualities of the soils present. A Munsell Soil Color Chart was employed to document soil color in assessing hydric qualities. Three wetland areas were located in the project area (Figure IV-6). Results of the survey were verified by the USACOE during a follow-up visit to the site in November 1994.

4c. Wetland Community Types

Wetlands associated with stream channels are typically riverine or palustrine in form and are restricted to the areas along the banks. These communities exist where the additional water available seasonally supports plant communities that have greater moisture requirements than those communities that exist in the uplands.

Figure IV-6
State Highway 82 Entrance to Aspen
Wetland Locations



The USFWS published a wetlands classification system for describing wetlands and deepwater habitat in the United States (Cowardin et al., 1979). Individual wetlands within the project area have also been classified using this system. The structure of this system is hierarchical, progressing from Systems to Subsystems, at the most general levels, to Classes, Subclasses, and Dominance types. The System and Class of each wetland is given at the end of each description of the respective wetland.

Wetland 1 (Figure IV-7) is located on the south side of exiting State Highway 82 near MP 39.2. The wetland covers approximately 0.363 hectares (0.902 acres). Wetland hydrology is supported in part by return flows of irrigation applied upgradient and is characterized by herbaceous vegetation and saturated, mottled soils. The predominant vegetation species include *Carex utriculata* (a sedge) and smooth brome. Under the Cowardin system, it is considered a palustrine, emergent wetland.

Wetland 2 (Figure IV-8) consists of approximately 0.960 hectares (2.372 acres) and includes portions of the embankment under the existing Highway 82 bridge and the floodplain surrounding Maroon Creek. This wetland includes tree-dominated seep areas and the cottonwood and willow-dominated areas within the floodplain. Soils are alluvial with surface horizons that range from fine sandy loams to gravel and cobbles; these soils contain hydric inclusions. This wetland is classified under the Cowardin system as a palustrine, scrub-shrub wetland.

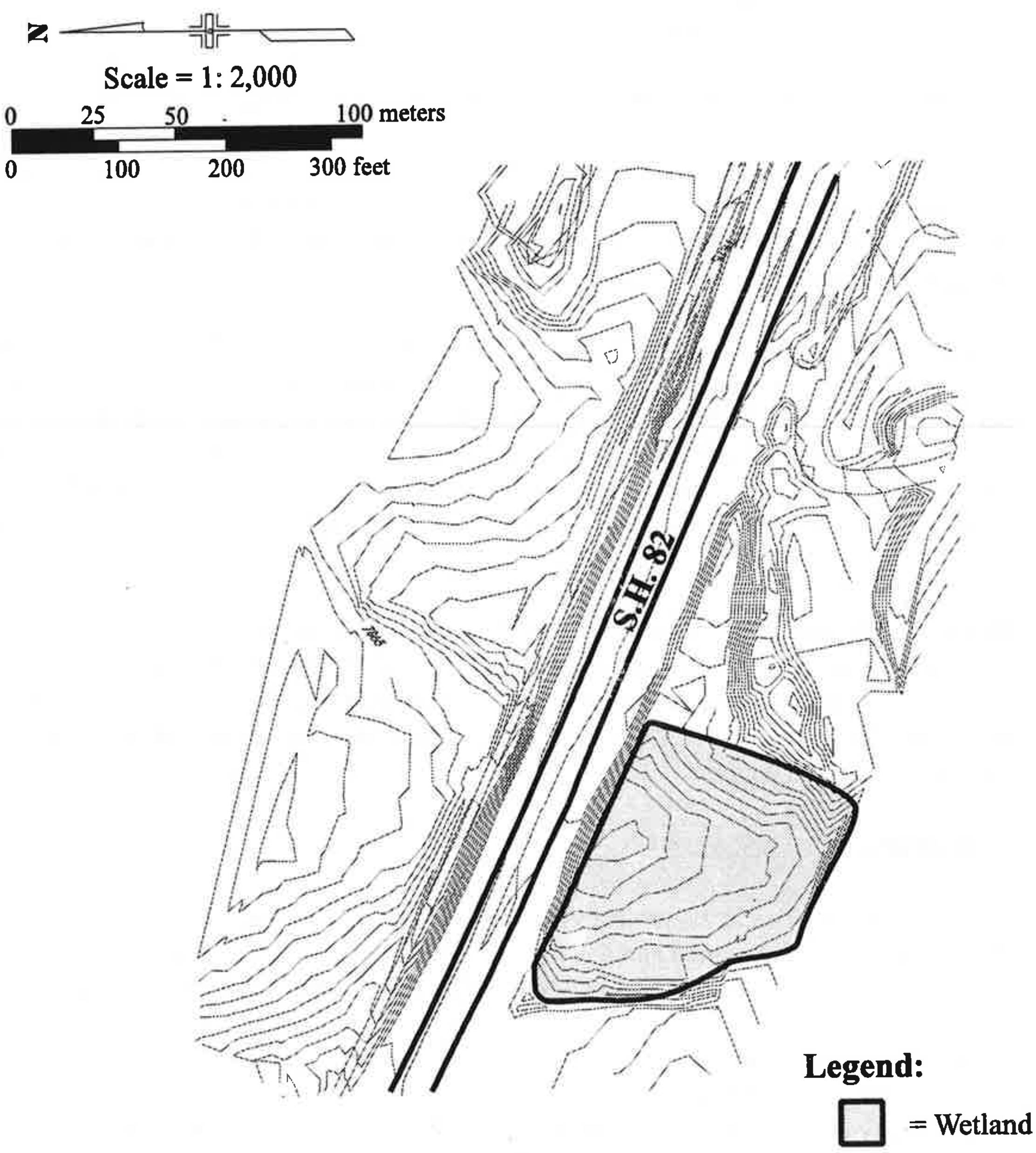
Wetland 3 (Figure IV-9) consists of 0.431 hectares (1.065 acres) located in the floodplain of Castle Creek from the existing State Highway 82 bridge, upstream to the footbridge. Trees and shrubs form the dominant vegetation community; the soils are similar to those described for Wetland 2. Under the Cowardin system, this wetland is considered a palustrine, forested wetland.

5. Fisheries

This section describes fisheries in the project vicinity. Fisheries are defined as all aquatic life in and around the project area. Threatened and endangered species such as the Colorado cutthroat trout (*Salmo clarki pleuriticus*) are discussed in **Section IV.C.9: Threatened and Endangered Species.**

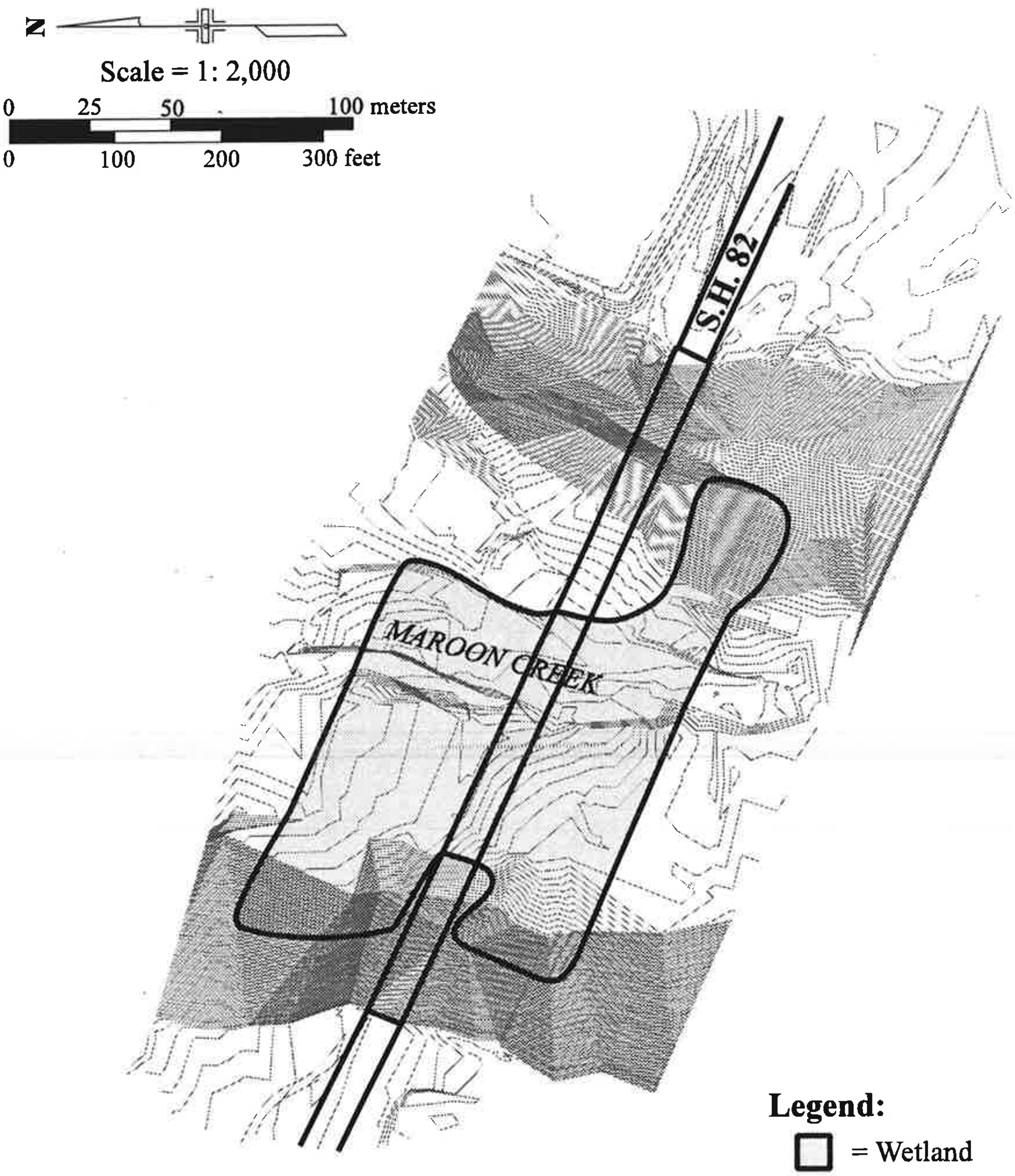
Several waterbodies are in the vicinity of the project area: the perennial Maroon Creek, Castle Creek, Roaring Fork River, and numerous intermittent streams (Figure IV-6). Maroon Creek and Castle Creek empty into the Roaring Fork River, which parallels the State Highway 82 study corridor. These streams are protected under the CWA.

Figure IV-7
Wetland Site No. 1
State Highway 82 Entrance to Aspen



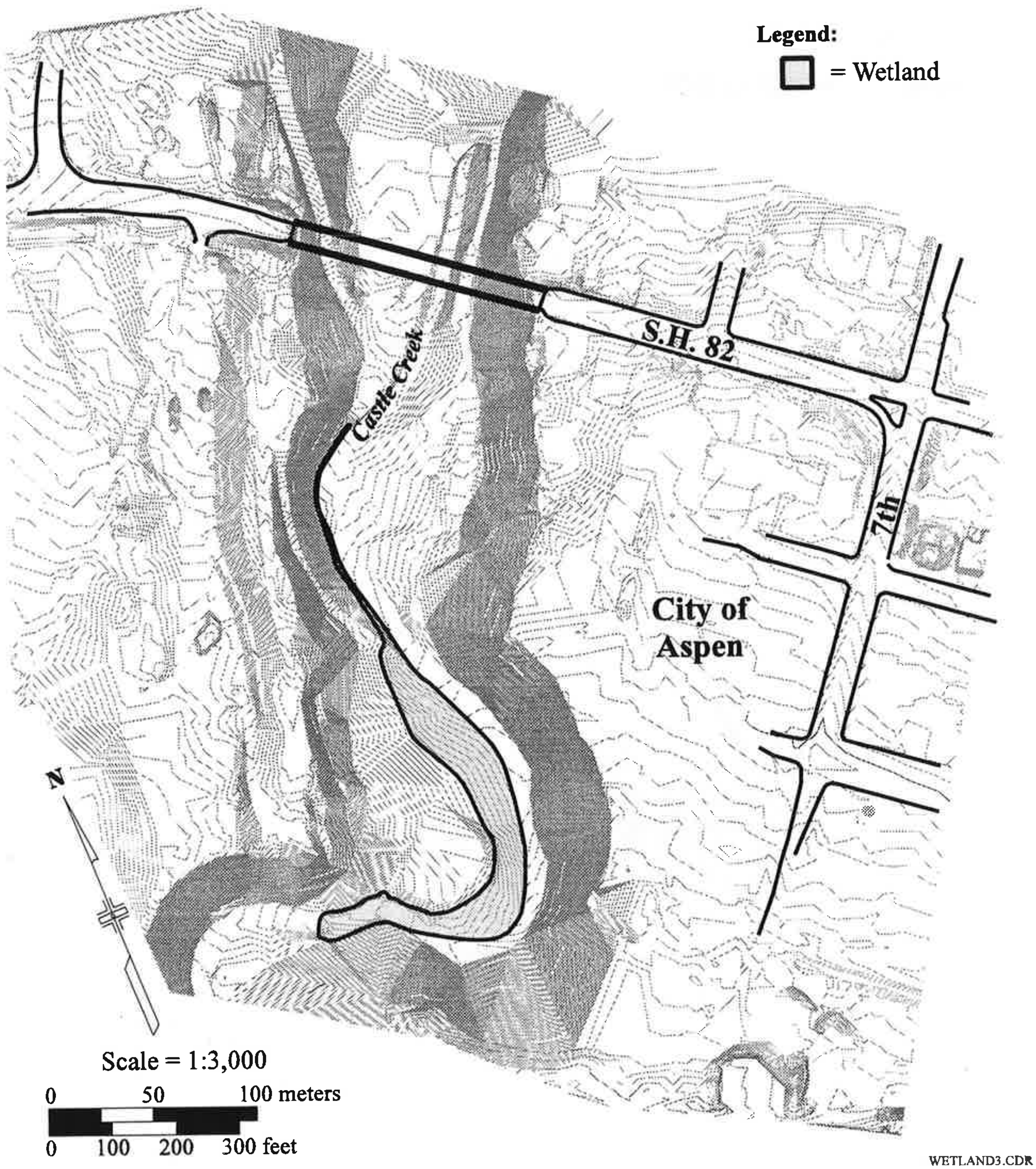
WETLAND1.CDR

Figure IV-8
Wetland Site No. 2
State Highway 82 Entrance to Aspen



WETLAND2.CDR

Figure IV-9
Wetland Site No. 3
State Highway 82 Entrance to Aspen



The brown trout (*Salmo trutta*) is the primary game fish species found in the Roaring Fork River (Sealing 1995). Other game fish expected to occur include the rainbow trout (*Salmo gairdneri*), and mountain whitefish (*Posopium williamsoni* [Girardi]) with a few brook trout (*Salvelinus fontinalis*) occurring where Hunter Creek enters the Roaring Fork (Sealing 1995)[3]. Rainbow trout are stocked annually by the Colorado Division of Wildlife (CDOW); all other species reproduce naturally within the Roaring Fork River drainage (United States Department of Transportation [USDOT] 1993). The Colorado cutthroat trout is discussed in **Section IV.C.9: Threatened and Endangered Species.**

According to CDOW - Grand Junction, the portion of the Roaring Fork River between Carbondale and Glenwood Springs has been designated a "Gold Medal" fishery (Toolen 1994). The highest quality aquatic habitat in the state is designated by CDOW as Gold Medal. Only 254 of the more than 12,000 kilometers (7,457 miles) of trout stream in Colorado are designated as Gold Medal (USDOT 1993). A Gold Medal trout stream may be stocked by CDOW and may yield trophy sized trout (Toolen 1994). The portion of the Roaring Fork River from McFarlane Creek (approximately 4 kilometers [2.5 miles] upstream of Aspen) to Upper Woody Creek Bridge (approximately 8 kilometers [5 miles] downstream from Aspen) is designated as "Wild Trout Waters." This designation is given to waters supporting naturally reproducing trout populations.

The primary non-game fish species expected to occur in the Roaring Fork River near Aspen is the mottled sculpin (*Cottus bairdi*) (Sealing 1995).

Although the project area has not been surveyed for macroinvertebrates, the United States Forest Service (USFS) conducted surveys in waterbodies upstream and downstream of Aspen. Lincoln Creek, which enters the Roaring Fork River 11 to 16 kilometers (6.8 to 9.9 miles) upstream of Aspen, was surveyed in 1992; and the Crystal River, which enters the Roaring Fork River near Carbondale, was surveyed in 1993. Based on these surveys, some of the macroinvertebrates expected to occur in the Roaring Fork River near Aspen include mayflies (e.g., *Baetis*), stoneflies (e.g., *Chloroperlidae*), caddisflies (e.g., *Rhyacophilidae*), beetles (e.g., *Elmidae*), and blackflies (e.g., *Chironomidae*) (Mangum 1992, 1993).

6. Wildlife

This section describes wildlife resources in the project vicinity. Wildlife and wildlife habitats are protected under numerous federal laws such as the Federal Land Policy and Management Act, Migratory Bird Treaty Act, Fish and Wildlife Coordination Act, and National Environmental Policy Act, as well as state hunting regulations.

Wildlife resources are defined as all terrestrial life in and around the project area. Threatened and endangered (T&E) species such as the bald eagle (*Haliaeetus leucocephalus*) and Mexican spotted

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[3] Clark, B. 1995. Senior Aquatic Biologist, Colorado Division of Wildlife, Grand Junction, Colorado. Personal Communication with C. Riebe, SAIC, May 19, 1995.

owl (*Strix occidentalis lucida*) and other species of special concern such as the North American lynx (*Felis lynx canadensis*), North American wolverine (*Gulo gulo luscus*), northern goshawk (*Accipter gentilis*), loggerhead shrike (*Lanius ludovicianus*), and boreal toad (*Bufo boreas boreas*) are discussed in **Section IV.C.9: Threatened and Endangered Species**. Aquatic resources are described in **Section IV.C.5: Fisheries.**

The diversity and abundance of wildlife within the project area is dependent, in part, on the quantity and quality of existing habitat. Wildlife habitat consists of all environmental attributes required by an animal species to survive and reproduce in the area. The three environmental attributes essential for wildlife habitat are food, water, and cover. Although each animal species has specific habitat requirements for these attributes, the geographical distribution and number of individuals for a given species are dependent on the quality, quantity, and distribution of available habitat. Impact assessment for wildlife populations is, therefore, often based on an assessment of habitat types and area impacted.

Habitat for the project area is discussed as plant communities in **Section IV.C.3: Vegetation**. In general, habitat types in the project area are classified as terrestrial and wetland. Terrestrial habitat consists of sagebrush shrublands, irrigated pastures, and managed landscapes. Wetland habitats include riparian and wetland plant communities identified in **Section IV.C.4: Wetlands**.

Wildlife groups identified for the current project area include mammals, birds, reptiles, and amphibians. Discussions of wildlife diversity, abundance, and distribution for the current project area are based on literature review, agency consultation, and field surveys.

Literature review for wildlife studies was designed to acquire baseline data and identify data gaps for wildlife species of concern in the project area. Literature review included examination of reports, Colorado Natural Heritage database, maps, and aerial photography. Resource agencies were consulted to identify species and issues of concerns and acquire baseline data. Field reconnaissance surveys for wildlife were conducted August 23 to 25, 1994. Field surveys consisted of habitat identification and verification, and incidental observations of wildlife.

The Colorado Wildlife Species database indicates that approximately 160 different species use the habitats found within the Roaring Fork Valley (USDOT 1993). Some of these species are not expected to occur in the project area because they tend to occur in more isolated areas, further from human activity.

6a. Mammals

Big game species such as mule deer (*Odocoileus hemionus*) and elk (*Cervus canadensis*) are known to occur in and near the project area. Mule deer scat was observed during the site visit. The Roaring Fork Valley and surrounding hillsides and drainages are important winter and summer habitat for resident populations of deer, elk, and other species. The project area is not located in an elk or mule deer migration corridor, winter concentration area, winter range, or critical habitat (Coté 1994). According to Wildlife Resource Information System mapping, a State Highway 82 elk crossing location occurs adjacent to the north end of the Sardy Field runway (USDOT 1989).

Several other mammalian game species occur in the area. Excellent black bear (*Ursus americanus*) habitat exists in the Aspen area with an abundant population of black bears present throughout the year (Byrne 1994). The red fox (*Vulpes vulpes*) population is on the increase, and this species is common in the project area. Other mammalian game species potentially occurring in the project area include the white-tailed jackrabbit (*Lepus townsendii*), mink (*Mustela vison*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), bobcat (*Felis rufus*), mountain cottontail (*Sylvilagus nuttalli*), beaver (*Castor canadensis*), and possibly a few mountain lions (*Felis concolor*) (Byrne 1994). Raccoon and beaver sign were observed during the site visit.

Small mammals likely to occur include rodents such as the Colorado chipmunk (*Eutamias quadrivittatus australis*), deer mouse (*Peromyscus maniculatus*), least chipmunk (*Eutamias minimus*), and meadow vole (*Microtus pennsylvanicus*) (USDOT 1993).

6b. Birds

Eagles, hawks, falcons, vultures, and owls, known collectively as raptors, could occur in the project area as seasonal or year-round residents. Several year-round residents include the sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), great horned owl (*Bubo virginianus*), and turkey vulture (*Cathartes aura*). Ospreys (*Pandion haliaetus*) have been observed migrating through the Roaring Fork Valley (Campbell 1995). The rough-legged hawk (*Buteo lagopus*) is a winter resident (Andrews and Righter 1992), and the Swainson's hawk (*Buteo swainsoni*) may fly through the area during fall migration (Byrne 1994). The red-tailed hawk was the only raptor observed during the site visit.

Numerous waterfowl and upland gamebird species could occur in and near the project area. Waterfowl occurring primarily during the summer and migration (both spring and fall) include the Canada goose (*Branta canadensis*), common mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*), northern shoveler (*Anas clypeata*), American wigeon (*Anas americana*), lesser scaup (*Aythya affinis*), and common merganser (*Mergus merganser*). According to CDOW (Byrne 1994), and fairly abundant numbers of blue grouse (*Dendragapus obscurus*) are in the area. Mourning doves (*Zenaida macroura*) also nest in the project area.

Many other bird species could occur around Aspen. Species observed during the site visit include the black-billed magpie (*Pica*), American robin (*Turdus migratorius*), Canada goose (*Branta canadensis*), mountain chickadee (*Parus gambeli*), common raven (*Corvus corax*), and northern flicker (*Colaptes auratus*). In addition to the waterfowl species already mentioned, species that potentially occur along the nearby Roaring Fork River include the belted kingfisher (*Ceryle alcyon*), great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis macularia*), and American dipper (*Cinclus mexicanus*). In addition to the pine siskin (*Carduelis pinus*) and house finch (*Carpodacus mexicanus*), which are very abundant in the Aspen area, a variety of other non-game birds (e.g., swallows, warblers, woodpeckers) are expected to occur as well (Byrne 1994).

6c. Reptiles and Amphibians

Relatively few reptiles and amphibians occur in this mountainous region. Some of the species that may inhabit the project area include the tiger salamander (*Ambystoma tigrinum*), northern leopard frog (*Rana pipiens*), and western terrestrial garter snake (*Thamnophis elegans*) (Byrne 1994; Hammerson 1986). A shedded snakeskin (species unknown) was found during the site visit. The boreal toad is discussed in **Section F: Threatened and Endangered Species.**

7. Wild and Scenic Rivers

Verbal communication with and a letter from the National Park Service dated October 17, 1994, established that there has been no effort to date to designate the Roaring Fork as a Wild and Scenic River and that no plans exist for such an effort in the future.

8. Floodplains

Executive Order (EO) 11988, Floodplain Management, requires federal agencies to avoid direct or indirect support of floodplain development whenever a practicable alternative exists. All federal agencies must evaluate the potential effects of any actions on floodplains. As defined in EO 11988, floodplains in their natural or relatively undisturbed state provide values including:

- Water resources, including natural moderation of floods, water quality maintenance, and groundwater recharge.
- Living resources, including fish wildlife and plant resources.
- Cultural resources, including, open space, recreation outdoor education, scientific study and aesthetic value.
- Cultivated resources, including agriculture, aquaculture, and forestry.

Floodplains within the project area are limited to those associated with the Roaring Fork River, Maroon Creek, and Castle Creek. The extent of the channels associated with the proposed bridge locations was assessed based on an examination of aerial photography, topographic maps, and a review of the Federal Emergency Management Agency (FEMA) Floodplain Insurance Study, Pitkin County and incorporated areas. These conditions were verified during a field visit conducted in August 1994.

The floodplain under the existing State Highway 82 bridge at Maroon Creek is stable and has a low erosion potential. The floodplain is not constricted in the vicinity of the bridge; the streambed consists of cobbles, and the banks are covered with well established herbaceous and woody vegetation.

The existing 135 meter (445.5 feet) State Highway 82 bridge over Castle Creek is located out of the designated floodplain. Castle Creek flows unconstricted within a valley through the project area. The creek's erosion potential is low because of the extensive vegetative cover within the floodplain and the vegetative cover revisions that form the stream bed.

9. Threatened and Endangered Species

To comply with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, federal agencies are required to obtain from the United States Fish and Wildlife Service (USFWS), information concerning listed and proposed threatened and endangered species that may be present in the area of a proposed construction project. This list of species represents the species to be addressed in the lead federal agency's environmental analysis. Documentation of the species list request and response for the current project are provided in **Volume 2: Comments and Coordination** of the DEIS.

Threatened and endangered species include individual plant and animal species that are protected by state and/or federal regulations or legislation. Federal-listed and proposed threatened and endangered species are provided statutory protection under the ESA of 1973, as amended, while candidate and sensitive species are not; however, many land and resource managers use these classifications to manage their actions so species' status or classification is not degraded. Furthermore, because lists of special concern species may change during the life of a project, candidate species are often assessed and managed as if they were federally protected.

This section contains several terms that merit definition including endangered, threatened, and proposed or candidate, as defined in the ESA. These terms are defined as follows:

Species - Any group of related plants or animals that, in nature, breed only with each other.

Endangered Species - A species in danger of extinction throughout all or a significant portion of its range.

Threatened Species - A species likely to become an endangered species within the foreseeable future through all or a significant portion of its range.

Candidate and Proposed Species - Those species being considered for listing as threatened or endangered. Candidate species fall into three categories:

> Category 1 - Species for which the USFWS currently has substantial information on hand to support the biological appropriateness of listing the species as endangered or threatened.
>
> Category 2 - Species for which the USFWS has information that indicates that listing is possibly appropriate, but for which conclusive data on biological vulnerability and threat are currently not available to support proposed inclusion.
>
> Category 3 - Species once considered for listing but not currently receiving such consideration. These species may be believed to be extinct, no longer taxonomically recognized, or are more widespread and abundant than previously thought.

It should be noted, however, that the status of some of these sensitive species is based on limited study of their abundance and distribution. Further, field investigations could confirm the designated status or increase or reduce the currently defined sensitivity.

Federal threatened and endangered species and state species of special concern are the two classes of special concern considered for the current study (Table IV-26).

The following agencies were contacted for information pertaining to threatened and endangered species: USFWS - Grand Junction, Golden, and Salt Lake City; Colorado Division of Wildlife (CDOW) - Aspen, Glenwood Springs, and Grand Junction; and the Colorado Natural Heritage Program (NHP).

According to the USFWS and Colorado NHP (Rose 1994; Pague 1994a and b), several special status species potentially occur in the project area: the bald eagle, Mexican spotted owl, North American lynx, North American wolverine, northern goshawk, loggerhead shrike, Colorado cutthroat trout, and boreal toad (Table IV-26). There are no known federally listed endangered plants, reptiles, or amphibians in Pitkin County (USFWS 1994). Although the black-footed ferret potentially occurs in Pitkin County (Wostl 1995), there are no prairie dog colonies (potential ferret habitat) in the project area. No special status wildlife species were observed during the site visit.

Bald Eagle

The bald eagle has been protected in the United States since passage of the Bald Eagle Protection Act of 1940. The bald eagle is listed as a federally endangered species in all 48 contiguous states except Washington, Oregon, Minnesota, Wisconsin, and Michigan, where it is listed as federally threatened (USFWS 1993). On July 12, 1994, however, the USFWS proposed to reclassify the bald eagle from endangered to threatened in all of the lower 48 states except certain portions of the southwest (USFWS 1994). This would not become final until at least 1 year after this reclassification

Table IV-26
Threatened, Endangered, and Rare Species
Potentially Occurring in the Proposed Project Area

SPECIES		
Common Name	**Scientific Name**	**STATUS[1]**
Bald eagle	*Haliaeetus leucocephalus*	FE, SE
Mexican spotted owl	*Strix occidentalis lucida*	FT
North American lynx	*Felis lynx canadensis*	C2, SE
North American wolverine	*Gulo luscus*	C2, SE
Northern goshawk	*Accipter gentilis*	C2
Loggerhead shrike	*Lanius ludovicianus*	C2
Boreal toad	*Bufo boreas*	C2, U
Colorado cutthroat trout	*Salmo clarki pleuriticus*	C2

1 - STATUS
FE = Federally endangered
SE = State endangered
FT = Federally threatened
C2 = Federal candidate category 2
C1 = Proposed for listing
U = Colorado Natural Heritage Program listed as uncertain

Source: Rose 1994; Pague 1994a, b; Finch 1992

was proposed (Copeland 1995). The bald eagle's range extends from Alaska and Canada to the southern United States (National Audubon Society 1983). Major threats to this species include habitat loss, disturbance by humans, biocide contamination, and illegal shooting. As of the early 1990s, populations in many areas had rebounded from the low levels that occurred before the pesticide dichloro-diphenyl-trichloroethane (DDT) use was banned in the United States (Idaho Natural Heritage Program 1989). Bald eagles are active mostly during daylight and twilight periods, often roosting communally at night in trees.

The bald eagle is known to occur in the Roaring Fork Valley (Rose 1994). According to the CDOW (Byrne 1994), there is an active nesting pair of bald eagles between Glenwood Springs and Carbondale, more than 40 kilometers (25 miles) north of the project area. No eagles were fledged from the nest in 1993 (USDOT 1993). During 1994, the pair appeared to be incubating, but no young were produced and the nest was abandoned (Byrne 1994). Bald eagles are common winter residents in the area; however, there are no known roosts around Aspen (Campbell 1995; Byrne 1994).

Mexican Spotted Owl

The Mexican spotted owl is found at scattered locations in canyons and mountains of Arizona, New Mexico, and southern Colorado and Utah (Finch 1992). This species occupies two distinct habitats in Colorado: large, steep canyons with exposed cliffs and dense old-growth mixed forest of Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), and ponderosa pine (*Pinus ponderosa*), and canyons in pinyon-juniper areas with small and widely scattered patches of old Douglas-firs (Andrews and Righter 1992). Threats to the Mexican spotted owl include small population size, apparently declining populations, competition with the newly sympatric barred owl (*Strix varia*), restricted range, and fragmentation of old-growth forests (Finch 1992).

There are historical sightings (early 1900s) of the Mexican spotted owl in Pitkin County (Ireland 1994; Rose 1994; Andrews and Righter 1992). The project area would be the northernmost edge of the range for this species (Byrne 1994). This species is not expected to exist within the corridor due to lack of appropriate habitat.

North American Lynx

The North American lynx formerly occurred throughout Alaska, Canada, and the northern half of the United States; however, its southern primordial range has been reduced because of hunting, predator control, and loss of wilderness (Finch 1992). A few northern and Rocky Mountain states still have remnant lynx populations (Turbak 1993). The lynx exists in large, interior tracts of subalpine, coniferous forest. It prefers areas with dense trees, intermittent bogs, rocky outcrops, small clearings, brushy undergrowth, and deep snow (Finch 1992). This species' abundance, reproduction, survival, and demography are highly dependent on the availability of its main prey, the snowshoe hare (*Lepus americanus*) (Turbak 1993; Finch 1992; Macdonald 1984). This solitary animal has home ranges varying in size from 10 to 240 square kilometers (4 to 93 square miles), depending on prey availability. Lynx populations have declined due to a number of factors including overtrapping, habitat loss, and the lynx's dependence on a principal prey source (Turbak 1993; Finch 1992).

Although the lynx has always been rare in Colorado, this species historically occurred in the Fryingpan River and Marble areas (Byrne 1994; Turbak 1993). A general record from 1969 indicates the presence of lynx in the vicinity of State Highway 82 and the Roaring Fork River (Pague 1994a). According to CDOW (Byrne 1994), the last lynx was collected in Colorado in 1974. Although there are periodically reports of lynx tracks in Colorado, the remaining lynx in the state most likely occur in rugged, remote country above 2,740 meters (9,040 feet) (Byrne 1994; Turbak 1993).

North American Wolverine

The wolverine once occupied most of North America. Today, this species is no longer abundant in any portion of its range. Wolverines occur in a wide range of habitats including alpine, riparian, swamp, and tundra habitat (Turbak 1993). The primary requirement for wolverine habitat is isolation from people, making this a true wilderness species (Byrne 1994; Turbak 1993; Finch 1992). Loss of such isolated habitat may be a primary reason this species had declined in numbers. A female wolverine maintains a territory of 50 to 350 square kilometers (20 to 135 square miles); male territories range from 600 to 1,000 square kilometers (230 to 390 square miles) (Macdonald 1984).

This species was never common in Colorado, and no scientific evidence documents a viable population of wolverines in the state (Turbak 1993). In 1979, two wolverines were released near the headwaters of Castle Creek (in the Montezuma Basin area); their fate is unknown (Byrne 1994).

Northern Goshawk

In western North America, the northern goshawk inhabits montane stands of coniferous, deciduous, and mixed trees, preferring tall, old-growth forests during the breeding season. This species prefers to nest within 400 meters (1,320 feet) of water in forest blocks greater than 80 hectares (200 acres) in size containing small openings. Nesting birds are intolerant of human disturbance and defend large areas around nest trees (Finch 1992). During the 1960s, pesticide contamination was found to cause eggshell thinning in many raptors, including the goshawk (Terres 1980). More recently, habitat loss is believed to be responsible for declining numbers in some states (Finch 1992). Breeding bird surveys showed the goshawk population in the U.S. to have declined significantly between 1980 and 1989, but the western population appeared to be stable (Finch 1992). The northern goshawk has a large home range, with nesting areas of 12 hectares (30 acres) and post-fledgling rearing habitat areas of nearly 170 hectares (420 acres) (USFS 1994).

The northern goshawk occurs in Colorado as a resident in the foothills and mountains and occasionally during migration and winter at lower elevations (Andrews and Righter 1992). At least three active goshawk nests were found during 1993 surveys of the Burnt Mountain Ski Area, several kilometers southwest of the project area (Byrne 1994).

Loggerhead Shrike

The loggerhead shrike is an uncommon summer resident of the western, central, and southeastern U.S. Primary habitat throughout its range consists of open country interspersed with improved pastures, grasslands, and hayfields. Breeding bird surveys from 1966 to 1987 indicate sharp population declines in loggerhead shrikes throughout much of North America (Andrews and Righter

1992; Finch 1992). These declines are attributed to contamination in the prey base (large insects and small mammals), the loss of nesting sites, and the loss of feeding habitat (Finch 1992).

In Colorado, the loggerhead shrike occupies open riparian areas, agricultural areas, grasslands, and shrublands (especially semidesert shrublands) (Andrews and Righter 1992). This species is an uncommon migrant through the project area (Byrne 1994).

Colorado Cutthroat Trout

The Colorado cutthroat trout once occurred in portions of Colorado, Utah, New Mexico, and Arizona. Although historically occurring in a wide range of habitats, this trout is better suited to small streams, beaver ponds, and lakes, than to large rivers. Most remaining populations occur in small headwater streams. Declines of native Colorado cutthroat trout populations are primarily attributed to introduction of non-native trout species, stocked since the 1800s, and habitat alteration. Habitat alterations include impacts to riparian vegetation and stream channel stability, water development with flow depletions during critical time periods, and water quality degradation caused by extensive watershed damage. An increase in the angling pressure on this highly susceptible trout also resulted in decreased populations (Sealing, et al. 1992).

Most remaining populations of Colorado cutthroat trout occur in small headwater streams. The limiting factor in many suitable habitats is lack of overwintering habitat (Sealing, et al. 1992). No populations of the Colorado cutthroat trout are in or near the project area. The closest population is on Express Creek, more than 3 kilometers (1.9 miles) upstream from the project area. No populations are in Castle Creek, Maroon Creek, or this part of the Roaring Fork River (Sealing, et al, 1995).

Boreal Toad

The boreal toad occurs throughout much of western North America, except in the arid southwest (Hammerson 1986). West of the Rocky Mountains, this species occurs in grasslands and dry habitats to sea level (Finch 1992). Population declines may be attributed to disturbance or loss of wetland habitats, conversion of small ponds into larger reservoirs by damming, and introduction of trout that prey on toad larvae (Finch 1992).

In Colorado, the boreal toad inhabits marshes, wet meadows, and the margins of streams, beaver ponds, springs, lakes, and ponds in foothill woodlands, mountain meadows, and moist subalpine forest (Finch 1992; Hammerson 1986). This species is most common at elevations from 2,600 to 3,200 meters (8,580 to 10,560 feet), rarely occurring as low as 2,130 meters (7,030 feet) (Hammerson 1986). Although records from 1952 indicate the presence of this species in the Aspen area (Pague 1994b), this species is not expected to occur in the project area because of lack of appropriate habitat (Byrne 1994; Ireland 1994).

Communities of Special Concern

NHP records also noted the presence of *Populus angustifolia (Picea pungens)/Alnus incana-Cornus sericea*, a significant stand of montane riparian forest, along the Roaring Fork River near the junction of State Highway 82 and Brush Creek Road. The status of this natural community is under investigation (Pague 1994a).

10. Historic Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended, applies to the historic properties listed on or eligible for listing on the National Register of Historic Places that may be impacted by this project. Additionally, locally designated historic properties located within the project area are also considered in the EIS (see Figure VI-6). Historic preservation analysis for this project consisted of a records search at the Colorado Historical Society/Office of Archaeology and Historic Preservation, and the Aspen Planning Department. The original field survey for this project was conducted in July, 1988. The survey was updated in September, 1988, October, 1991, May, 1992, and June, 1995. The following historic resources are located within the project area:

Maroon Creek Bridge: The historic Maroon Creek Bridge is located on State Highway 82, approximately 1.6 kilometers (1 mile) northwest of the center of Aspen. The bridge, built in 1888 by the Colorado Midland Railroad, was converted to automobile use in 1929. It is listed on the National Register of Historic Places as one of the last remaining metal multiple-span high railroad trestles in Colorado.

Holden Smelting and Milling Complex: The historic Holden Smelting and Milling Complex is located on approximately 3.2 hectares (8 acres) on what is now called the Marolt-Thomas property, open space owned by the City of Aspen. Although most of the buildings have been torn down, there are significant remains of the mill structure on the east end of the site: the salt warehouse has been cut in half, but is still in its original location; the sampling works building (barn) has been altered in the interior, but still retains most of its original appearance; and the office building, now known as the Marolt House, was significantly remodeled by the Marolts but is still in its original location. This complex was constructed in 1891 and purchased by the Marolts in the 1930's. The site has been listed on the National Register for its association with the mining history in Aspen, as one of the few remaining structures from the industrial aspects of Aspen's mining history, and because the site is likely to yield archaeological information about the smelting and mining industry in Aspen.

Colorado Midland Railroad: The Colorado Midland Railroad arrived in Aspen in 1887, a month after the Denver and Rio Grande. Very little of the railroad grade remains in Pitkin County, as the majority was obliterated by the construction of State Highway 82. One short segment remains intact from the junction of Maroon Creek Road and State Highway 82 to the Aspen city limits, crossing through approximately 1.6 hectares (4 acres) of the Marolt-Thomas property. The line is eligible for the National Register as the first standard gauge railroad to penetrate the Rockies, and for its association with Jerome Wheeler and the early railroad history in Colorado.

Castle Creek Power Plant: The Castle Creek Power Plant is located in Castle Creek Canyon on approximately 0.6 hectares (1.5 acres) of land, just below the existing State Highway 82 Castle Creek Bridge. Known originally as the Roaring Fork Electric Light and Power Plant Number 2, the building is a two story, brick warehouse type building with a gabled roof and is now publicly owned. It is eligible to the National Register for its association with three of Aspen's most significant individuals (H.P. Cowenhoven, D.R.C. Brown, and James H. Deveraux) and as only the second commercially run hydroelectric plant in the country. It was constructed in 1893.

920 West Hallam: This historic privately owned house is located on the north side of existing State Highway 82 on approximately 0.1 hectares (0.2 acres) of land just east of the Castle Creek Bridge within the Aspen city limits. The small, one story, wood house, built about 1888, is eligible for the National Register as an unaltered example of the typical late 19th century miner's cottage.

834 West Hallam: This 1889 Victorian residence is located on the north side of existing State Highway 82 on approximately 0.08 hectares (0.2 acres) of land just east of the Castle Creek Bridge within the Aspen city limits. It is currently used as a restaurant. The one and a half story frame house is not eligible for the National or State Registers of Historic Places due to significant alterations and lack of significant associations, but has been designated as a local landmark.

734 West Main Street: This two story Victorian residence is located on the north side of existing State Highway 82 at the intersection of 7th Street and West Main Street. Sitting on approximately 0.06 hectares (.14 acres) of land, it is currently used as a Christian Science Center. It is not eligible for the National or State Registers of Historic Places due to a lack of significant architectural or historical associations, but has been designated as a local landmark.

Berger Cabin: This privately owned residence, located at 835 Main Street, is on the western edge of the city limits on approximately 0.47 hectares (1.16 acres). The three-room, one story cabin was built in 1947 by local architect Fritz Benedict, who studied with Frank Lloyd Wright. The cabin is not considered eligible to either the National or State Registers of Historic Places because it does not meet the age criteria of 50 years old and is not considered to be exceptionally significant. However, the cabin has been designated as a local historic landmark.

Main Street Historic District: The historic district was formed in 1975 and extends nine blocks from Monarch to 7th Street. The architectural styles range from miners cabins to mountain chalet-style lodges. The historic district is not listed on the National or State Registers of Historic Places due to the significant number of intrusions, but has been designated as a local landmark.

11. Archaeological Resources

Archaeological analysis for this project consisted of a review of the archaeological report (Martin 1975) for the 1981 Carbondale-East EIS, a records search at the Colorado Office of Archaeology and Historic Preservation, and on-the-ground reconnaissance (1988). It was determined that the areas evaluated during this study effort are the same as those discussed in the 1981 EIS. From west of the Buttermilk Ski Area to the Aspen study area, a 14.8 hectare (35.8 acre) portion of the 1987 DEIS railroad alignment was inventoried by CDOT staff archaeologists in June 1988. No cultural materials were located from the Buttermilk Ski Area to Aspen during the field inventories.

A review of the files at the Office of Archaeology and Historic Preservation indicated that no archaeological sites have been recorded in the project corridor since the Carbondale-East 1981 survey.

12. Paleontological Resources

On-the-ground reconnaissance for paleontological resources within the study corridor was conducted by CDOT paleontologists in June and August 1988 and May 1990.

According to the best available published geologic maps of the area, deposits within the study corridor are the Paleozoic and Mesozoic rocks of the Maroon, State Bridge and Chinle formations, and the upper shale member of the Mancos Shale. Quaternary alluvial (stream), colluvial (slopewash), and glacial outwash deposits are recorded. All of these deposits have the potential to yield fossils and have produced fossil remains elsewhere in central and southwest Colorado.

The Mancos Shale, which crops out immediately east of Brush Creek Road, has produced many fossils in western Colorado, including numerous invertebrate fossil localities west of State Highway 82 in the Shale Bluffs area. This area is west of the Entrance to Aspen study corridor.

No exposures meriting on-the-ground reconnaissance were seen along State Highway 82 from Buttermilk Ski Area to Aspen. The detailed paleontological survey report for the study corridor from Basalt to Aspen, including lists of Mancos Shale vertebrate fauna and invertebrate fossils, is available for review.

13. 4(f) Resources

Section 4(f) resources are lands from publicly owned parks or recreation areas, wildlife or waterfowl refuges, or historic sites listed on or eligible for the National Register of Historic Places. Impacts to these resources are covered by Section 4(f) of the Department of Transportation Act of 1966, Public Law 89-670, 80 Stat. 934, which was amended in 1983 and 1987, and is now codified at 49 U.S.C. 303. In the Entrance to Aspen corridor, eleven 4(f) resources may be impacted by the alternatives under consideration. These properties include one recreation area, one trail system, four open space/park land (greenbelt) areas, and five National Register listed or eligible historic sites. These lands are fully described in **Appendix A: 4(f) Evaluation.**

14. Farmlands

The Farmland Protection Policy Act of 1981 (7 U.S.C. 4201 et. seq.) was enacted to ensure that federal programs minimize irreversible conversion of farmland to nonagricultural uses and to ensure that federal programs are compatible, to the extent practicable, with state and local policies to protect farmlands.

The act refers to farmland in the following four categories:

- Prime farmland.
- Unique farmland.
- Farmland other than prime or unique that is of statewide importance.
- Farmland other than prime or unique that is of local importance.

The Important Farmland Inventory, Colorado, prepared by the Soil Conservation Service (now the National Resources Conservation Service [NRCS]), U.S. Department of Agriculture, October 1982, identifies the various farmland types within the state. According to the SCS Inventory, no soils in Pitkin County are identified as Prime Farmland because of cold temperatures and the short growing season. Irrigated hay meadows within these counties are in the category "Irrigated Lands Not Prime" and have been identified as being Farmlands of Statewide Importance.

When farmland is included in right-of-way acquisition, a Farmland Conversion Impact Rating (Form AD 1006) must be submitted to the NRCS. This form provides a determination whether the project contains prime, unique, statewide, or locally important farmland.

In an effort to protect the State Highway 82 corridor from extensive development, to enhance the open appearance of this gateway to Aspen, and to protect a scenic corridor, Pitkin County has designated historically irrigated land as "Valued Agricultural Land." These lands, as described and identified by the Property Management office staff of Pitkin County, fit into the Farmland Protection Policy Act category of "farmland other than prime or unique that is of local importance." Because soil types in Pitkin County generally are not productive enough to merit prime farmland classification, the irrigation criterion was used.

None of the agricultural lands between the Buttermilk Ski Area and Aspen have been classified by Pitkin County as valued agricultural land nor do they meet the criteria of the Farmland Protection Policy Act.

15. Noise

Based on land use, the Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) has established guidelines defining Noise Abatement Criteria (NAC) for maximum acceptable traffic noise levels (Table IV-27). These levels represent a balance between a desirable noise level and an achievable noise level. Noise levels are measured in dBA, which represents the average noise energy level of noise level fluctuation over an hour. An impact is noted when the predicted noise level exceeds the acceptable NAC for that land use--67 dBA for residences and 72 dBA for businesses--or when there is an increase of 10 or more dBA from roadway improvements. Colorado regulations further define an impact at an "Approaching" level of 1.0 dBA below the NAC. An increase of 10 dBA is perceived as a doubling of the noise level, whereas a doubling of traffic will generally cause a 3.0 dBA increase in noise. **Section VI.B.4o: Noise** describes existing and year 2015 noise levels within the study corridor.

Table IV-27
Noise Abatement Criteria

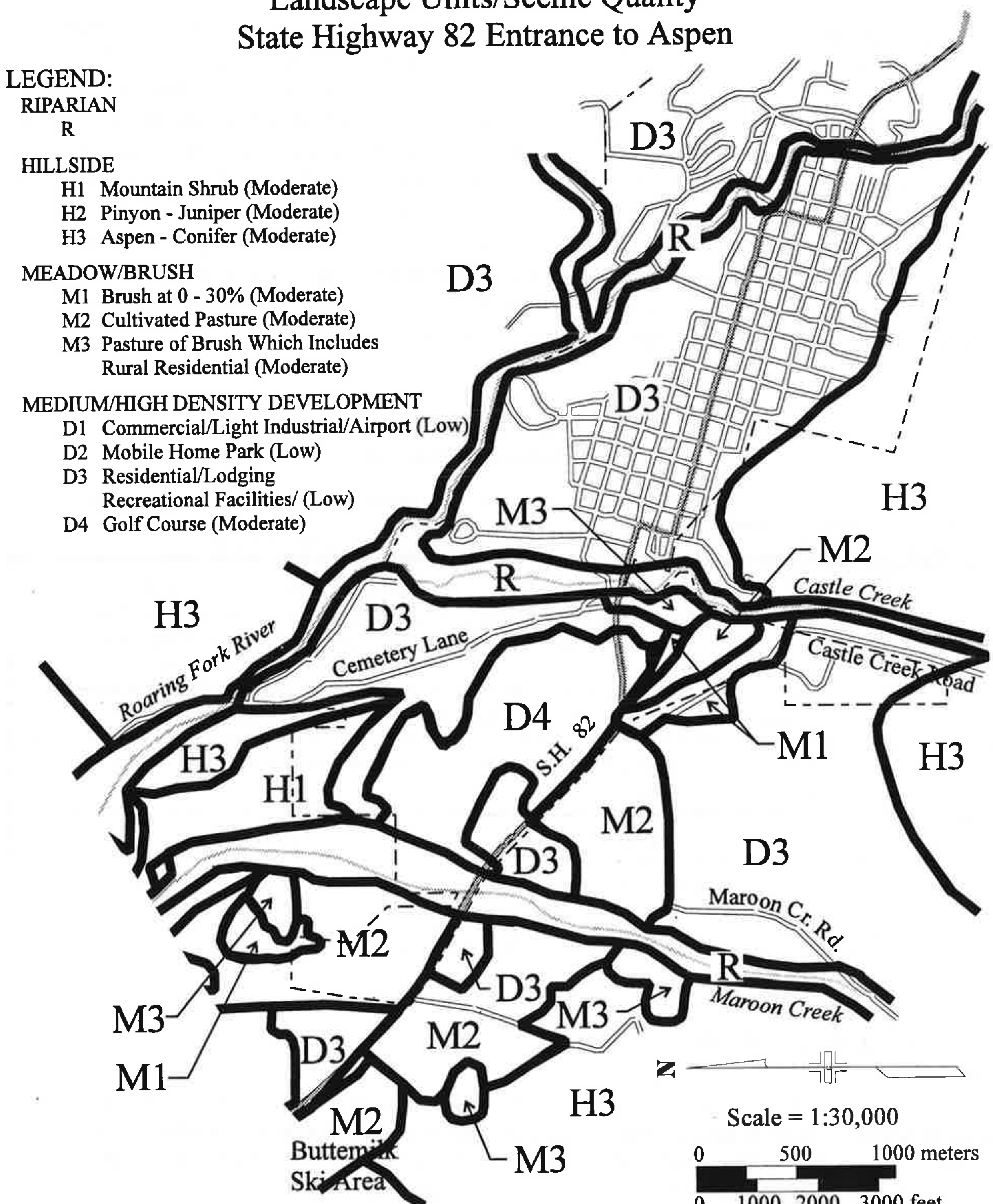
Activity Category	Acceptable Levels (dBA)	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 (exterior)	Developed lands, properties or activities not included in Categories A or B above
D	N/A	Undeveloped lands
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: Federal Register, Volume 47, No. 131, July 8,1982, Rules and Regulations

16. Visual Character

The State Highway 82 Entrance to Aspen corridor lies within the Roaring Fork River Valley. The existing highway in the project corridor passes through areas dominated by cultivated pasture land and open space, golf course land, and moderate rural residential development. The highway also passes over two riparian creek valleys. Figure IV-10 shows the visual landscape units surrounding the project corridor.

Figure IV-10
Landscape Units/Scenic Quality
State Highway 82 Entrance to Aspen



LANDSCAPE.CDR

The viewshed for the existing highway extends beyond the limit of the project corridor to distant hillsides, mountain peaks, and creek valleys. These views enhance the visual character of the valley by providing a scenic contrast to the short-grass pastureland and open space adjacent to the highway. In general, the valley possesses many of the qualities inherent in landscapes considered to be high in scenic quality. Although the residents of the City maintain that visual quality is important to their community, there is no clear consensus on what constitutes good visual quality.

The scenic views within the project corridor are readily visible from the existing roadway and are enjoyed by travelers to and from Aspen. Some travelers come to the valley just to drive the highway and experience the views. The residents of the Aspen area also enjoy the high quality of views of the valley as they contribute to the unique character of the area.

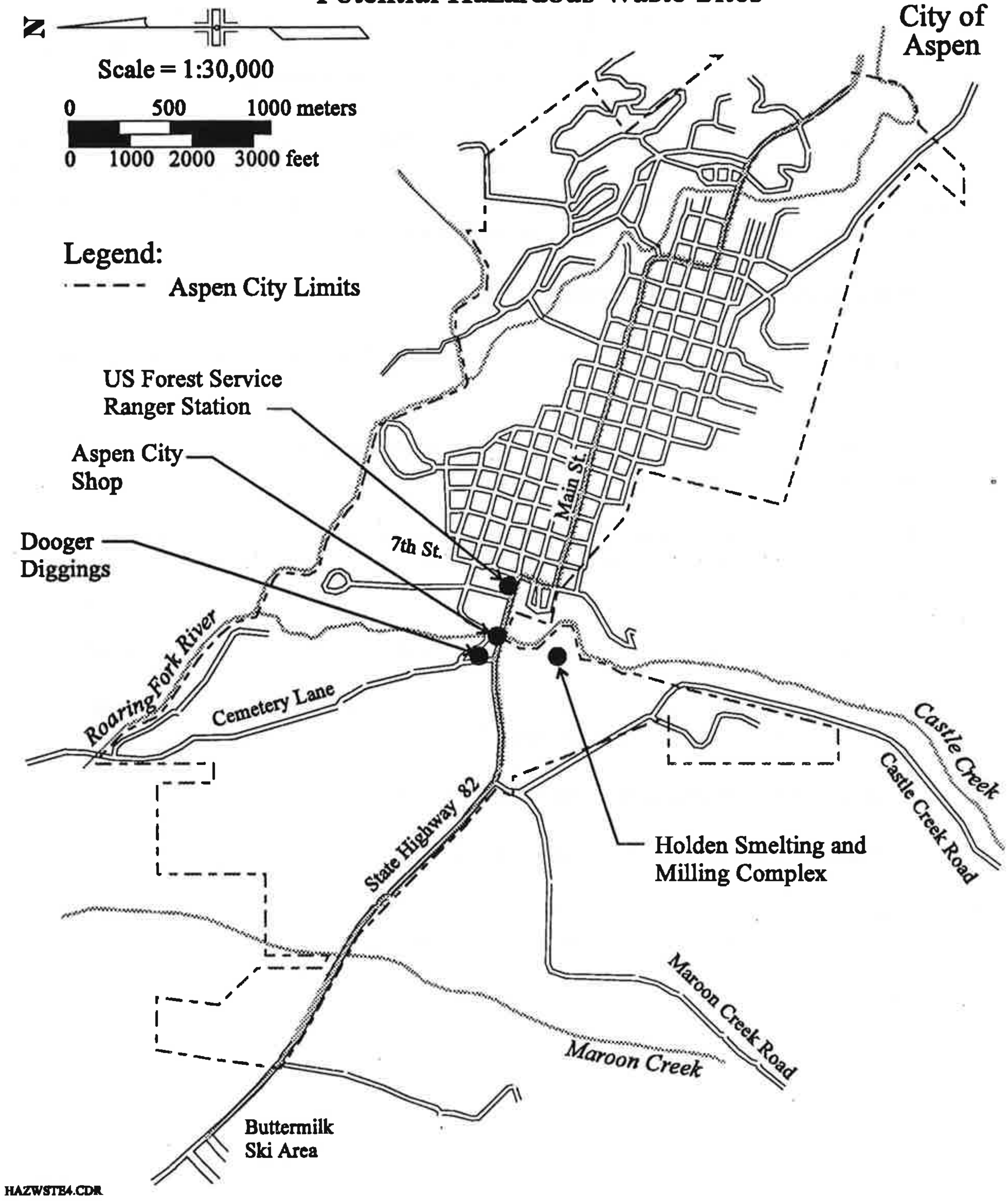
17. Potential Hazardous Waste Sites

The methods used to identify potential hazardous waste sites along State Highway 82 - Entrance to Aspen corridor include:

- Communication with representatives of Pitkin County Department of Environmental Health and the city of Aspen.
- Consultation with EPA regional staff and review of the EPA's Superfund National Priorities List and Comprehensive Environmental Response, Compensation, and Liability List (CERCLIS).
- Review of the Resource Conservation and Recovery Act (RCRA) list for Colorado.
- Consultation with the Colorado Department of Public Health and Environment landfill specialist and review of the Department's list of underground storage tanks.
- Review of aerial photographs of the study corridor.
- Conducted a Preliminary Site Investigation (PSI).

Four potential hazardous waste sites have been identified along the State Highway 82 Entrance to Aspen corridor during an initial site assessment (ISA) conducted in 1989. Their locations are shown in Figure IV-11.

Figure IV-11
State Highway 82 Entrance to Aspen
Potential Hazardous Waste Sites



The potential hazardous waste sites that may be impacted are listed in Table IV-28.

Table IV-28
Potential Hazardous Waste Sites

Site Identification	Reason for Listing	Milepost (Approx.)
Aspen City Shop	Underground storage tank	North of 40.4
Dooger Diggings	Underground storage tank	40.4
U.S. Forest Service Ranger Station	Underground storage tank	40.6
Holden Smelting & Milling Complex	Industrial Site	South of 40.4

Source: Walsh and Associates, ***Preliminary Site Investigation Highway 82: Basalt to Aspen.***

The Aspen City Shop is located in the old Castle Creek Power Plant near milepoint 40.4. Dooger Diggings is located on Power Plant Road. The U.S. Forest Service Ranger Station is located at 806 West Hallam Street (MP 40.6). All three of these sites contain underground storage tanks.

Walsh and Associates, Inc. performed an initial site assessment (ISA) for the Holden Smelting and Milling Complex. This ISA consisted of file reviews at the EPA and state, county, and local health departments; telephone interviews with regulatory officials and property owners; and previous site reports and history reviews.

The Holden Smelting and Milling Complex, also known as the Holden/Marolt Property, was a silver processing plant located on the west bank of Castle Creek (south of MP 40.4). The plant was constructed in 1891 and reduced silver ore using the lixiviation (leaching) process. The ores were roasted with salt, producing silver chloride, which was then dissolved with sodium or calcium hyposulfate. An alkaline sulfide was added to precipitate silver (National Park Service 1988). The plant operated for only three years before the silver crash of 1893 forced it to close. Scattered remains of the plant foundation are visible above the banks of the creek. The property was owned by the Marolt family and operated as a ranch before conversion to its present use as a museum. A barn on the property has been restored for use as a mining and ranching museum, now operated at the site by the Aspen Historical Society.

Activities associated with the lixiviation leaching plant may have resulted in soil or groundwater contamination. A previous investigation conducted for the City of Aspen at the site investigated heavy metals concentrations in the soils below and surrounding the lixiviation works. This investigation detected elevated concentrations of metals including cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), and selenium (Se).

The Holden Smelting and Milling Complex was identified as a potential hazardous waste site requiring a preliminary site investigation (PSI). PSI's determine whether properties scheduled for right-of-way acquisition or are affected by the proposed project have significant environmental contamination. The ***Preliminary Site Investigation State Highway 82: Basalt to Aspen*** concluded that there are elevated concentrations of arsenic (AS), lead (Pb) and cadmium (Cd) at the site. These concentrations found in soil samples did not fail the toxicity characteristic leaching procedure (TCLP) and therefore not classified as hazardous waste. All information concerning potential hazardous waste, in this section and **Chapter VI: Environmental Consequences**, is derived from Walsh and Associates, ***Preliminary Site Investigation State Highway 82: Basalt to Aspen.***

V. Future Transportation Demand

A. TRANSPORTATION DEMAND MODEL

The transportation demand model developed for the State Highway 82 Entrance to Aspen Environmental Impact Statement (EIS) is based on previous work performed for the ***State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement*** (BBFEIS). The transportation demand model for the BBFEIS was expanded for this EIS effort. Modifications were made to expand the Aspen area traffic zones and to combine the traffic zones west of Brush Creek Road into one external zone (external to the Aspen area). An origin and destination study was conducted by the Colorado Department of Transportation (CDOT) in February 1994 to obtain additional data on the travel patterns and characteristics of State Highway 82 in the Aspen area. These data were combined with the previous demand model data to create the Entrance to Aspen EIS transportation demand model. A complete discussion of the model is included in the ***Future Transportation Demand Technical Report.***

1. CDOT's Origin and Destination Studies

Three separate origin and destination studies were conducted by CDOT to gather information about existing travel demand patterns in the Roaring Fork Valley on State Highway 82. The first two studies, conducted during the summer of 1992 and winter of 1993, provided information to develop the transportation demand model used in the BBFEIS. A third origin and destination study was conducted in February of 1994 to expand the BBFEIS transportation demand model. The combined information of both studies provided the information for the Entrance to Aspen EIS transportation demand model.

1993 Carbondale/Maroon Creek Origin and Destination Study

The first two origin and destination studies were conducted in July 1992 and March 1993 at two State Highway 82 locations: north of Highway 133 near Carbondale and west of the Maroon Creek Bridge near Aspen. These surveys were used primarily to develop information about travel patterns external to the Aspen metropolitan area (west of the Buttermilk Ski Area). The information gathered included vehicle occupancy, vehicle type, trip origin and destination, time of trip, and trip purpose. The survey did not include pedestrian or bicycle trips.

The trip purpose was identified as either auto work, auto other, recreational, truck work, or truck other. Transit trips were surveyed separately during March 1993 at the same time as the origin and destination study. The trip purpose was used in the model to identify trips that could potentially shift to transit or a carpool. For example, a truck work trip would be an unlikely candidate to shift to transit, because the worker uses the truck to carry tools to a job site. The trip purpose category allows flexibility to shift specific person trips to another mode.

1994 Aspen Area Origin and Destination Study
The third origin and destination study was conducted in February 1994 at six locations around the Aspen area (Figure V-1): south of State Highway 82 on Maroon Creek Road and Castle Creek Road, north of State Highway 82 on Cemetery Lane, south of the Roaring Fork Bridge on Mill Street, north of the Roaring Fork Bridge on Neale Street and east of the Roaring Fork Bridge on Cooper Avenue. These surveys gathered information about the travel patterns internal to Aspen and the surrounding area. This survey was used to expand the information gathered in the previous winter origin and destination survey and provided the basis for a more detailed representation of the trip characteristics and trips made within the study area (State Highway 82 between Buttermilk Ski Area and the City of Aspen).

A mail-in survey of Aspen residents located within the City of Aspen (Figure V-1) and a transit survey of the Aspen Free Skier Shuttle, Aspen Fare Bus, and the Aspen Highlands Free Skier Shuttle were also included as part of the origin and destination survey. The mail-in survey was designed to survey trips that were not surveyed at any of the six survey stations. The transit and mail-in surveys provided information similar to the vehicle surveys.

2. Population and Employment Growth Forecasts

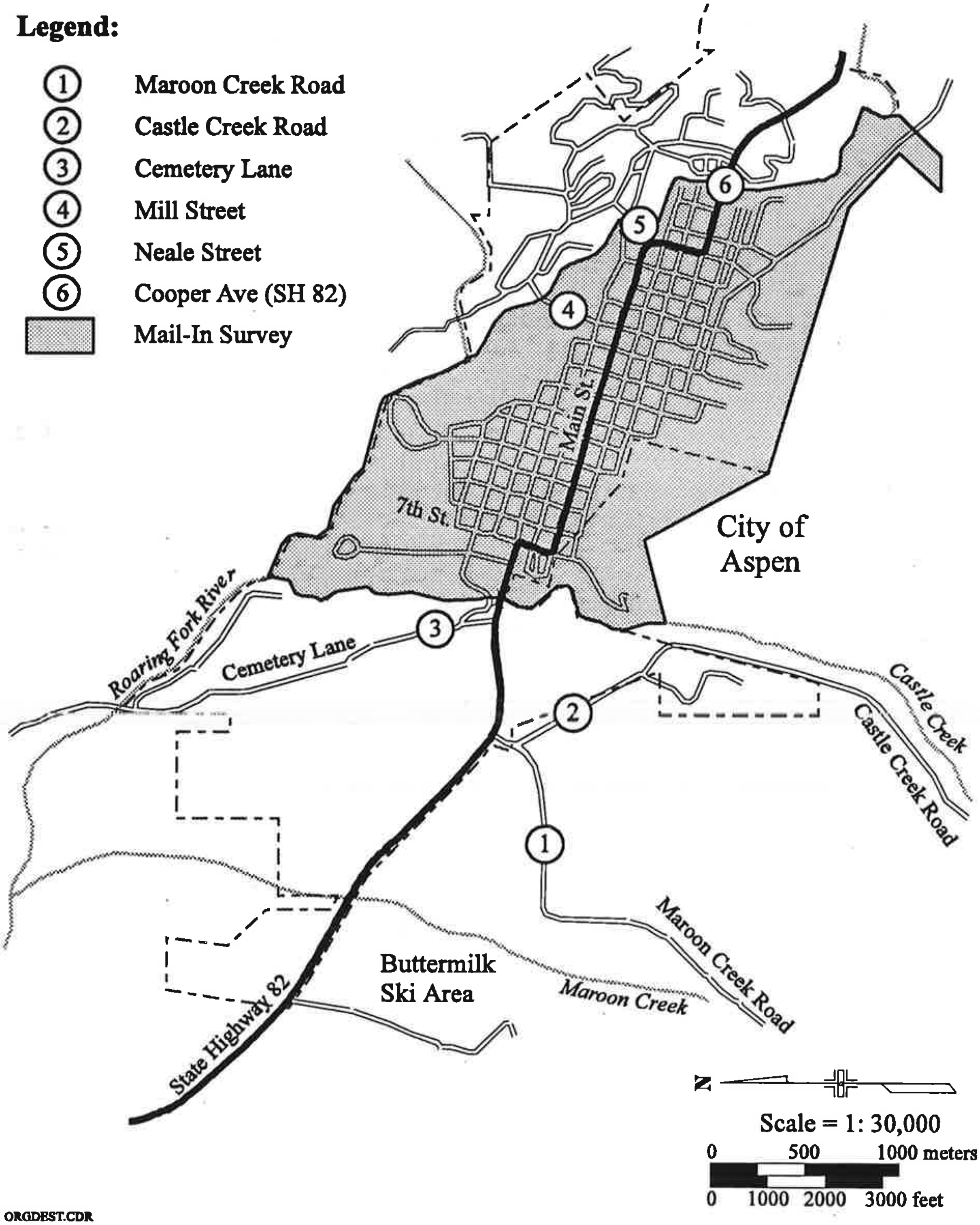
The traffic zones used to identify trip origins and destinations were also used as zones for growth estimates. The process by which the zones were created is documented in the ***Mount Sopris Transportation Project Final Report, 1993 Origin and Destination Winter Survey.***

The traffic forecasts for the transportation demand model were derived from established growth estimates in the BBFEIS. The growth rate for the Aspen area in the BBFEIS was 0.6 percent and 2.0 percent annually for low and high growth scenarios, respectively. Modifications were made to the Aspen area zones and zones west of Brush Creek Road (combined into one external zone) for both the low and high growth scenarios. The expanded Aspen area zones were adjusted to more correctly represent the areas of potential growth, however, the overall growth rate for the Aspen zone in the BBFEIS was maintained. Low and high growth factor estimates for the external zone are calculated using a weighted average of the BBFEIS growth factors for the zones west of Brush Creek Road.

The 2015 person trip forecasts are based on future growth estimates for the resident and visitor populations and the employment base in the Roaring Fork Valley. Both a low and high growth scenario were developed to forecast future transportation demand in the valley. The forecasted transportation demand numbers used in the Entrance to Aspen EIS are consistent with those used in the BBFEIS.

The low growth forecast was developed using the Colorado Department of Local Affairs estimates. Annual low population growth factors for the Aspen area range from a minimum of 0.2 percent per year for the zones including the Marolt-Thomas open space and the Aspen post office to a maximum of 2.4 percent per year in the Snowmass Village zone. Employment low growth forecasts range from a minimum of 0.4 percent per year near the Aspen Villas to a maximum of 2.4 percent at the Airport Business Center.

Figure V-1
1994 Origin and Destination Survey Locations



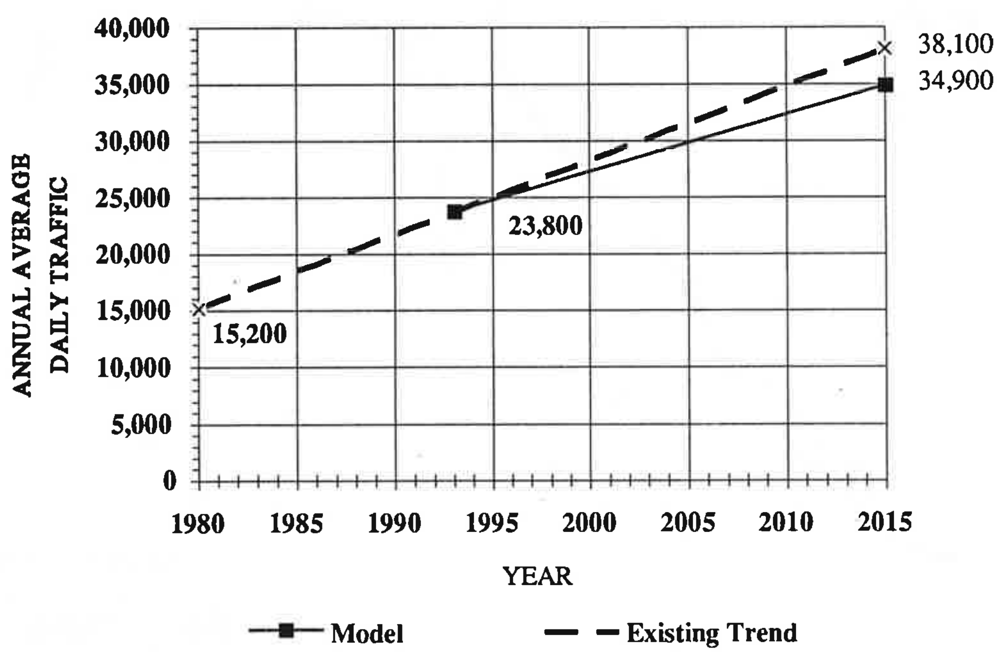
V. Future Transportation Demand

The high growth scenario was based on the ***Aspen Area Community Plan***, the ***MidValley Plan***, the ***Snowmass Ski Area Expansion FEIS***, and discussions with city planning officials. This high growth scenario increases the overall population and employment growth in the Aspen area and the Aspen Airport Business Center to 2.0 percent per year. Individually, several Aspen area zones exceed 2.0 percent with a maximum of 3.5 percent per year at Aspen Highlands, but these zones are balanced with many zones below 2.0 percent. A minimum growth rate of 1.0 percent per year was used for the zones including the Aspen Villas and the Marolt-Thomas open space property. The growth rates used in the BBFEIS for the zones downvalley of Brush Creek Road (Woody Creek, Basalt, Carbondale, Glenwood Springs, east and west I-70, and out-of-state zones) are combined as a weighted average growth factor for the external zone in the Entrance to Aspen model.

The growth trends in the United States show that the population is making more and longer trips per person than in the past. The model developed for the EIS does not account for these changes in the vehicle miles of travel (VMT) per capita. If the model accounted for the national growth in per capita trips, the person trips and vehicle trips would increase over the values shown.

The growth of the annual average daily traffic (AADT) on State Highway 82 east of Cemetery Lane (Castle Creek Bridge) is documented in Figure V-2. The figure also shows the expected future traffic growth to the year 2015 given by the model. The historical annual growth on State Highway 82 east of Cemetery Lane between 1980 and 1993 (15,200 and 23,800, respectively) is 4.4 percent. In comparison, the model shows a slower growth rate of 2.1 percent annually to the year 2015.

Figure V-2
Traffic Trends and Forecasts
State Highway 82 East of Cemetery Lane



3. Trip Factors

Because the model is based on person trips, it is responsive to changes in trip-making characteristics. The person trip factors that will likely affect the modeled scenarios include trips diverted from another parallel route, trips shifting downvalley, trips induced by improved highway conditions, and trips converted to another mode of transportation (bus, carpool, light rail, etc.). The trip factors are used to increase or decrease the number of person trips for each scenario. By adjusting the person trip factors, the model accounts for differences in physical design and modal options. The values of the person trip factors and their effect on the model are discussed further in the ***Future Transportation Demand Technical Report.***

The modeled scenarios are referenced from the Base Case Scenario. The Base Case assumes that the Preferred Alternative from the BBFEIS has been built and no transportation improvements are made to the existing State Highway 82 corridor from Buttermilk to Aspen. The Base Case Scenario is the same as the No-Action Alternative evaluated in **Chapter III: Alternatives**.

Diverted Trips - These are trips that are currently made on routes that are parallel to State Highway 82. These trips may shift (divert) to State Highway 82 when the capacity and safety of the highway is improved. Conversely, if a significant time savings could be achieved on a parallel route, trips may be diverted away from State Highway 82. Trips east (upvalley) of Cemetery Lane cannot be diverted to or from State Highway 82 because there is no alternate route. It is assumed that all the trips that could be diverted to or from River Road, McLain Flats Road, and other parallel routes downvalley have been accounted for by highway improvements between Basalt and the Buttermilk Ski Area. Therefore, for the purpose of the model, no additional trips will be diverted to or from State Highway 82 by roadway improvements between the Buttermilk Ski Area and Aspen.

Downvalley Shift - The trips that are made because of the shift of Aspen and Snowmass workers living downvalley are also assumed to have been maximized by highway improvements between Basalt and the Buttermilk Ski Area for the worst case scenario. The existing population of workers who live downvalley is estimated to be 62 percent. The Base Case Scenario assumes a maximum shift of 75 percent as a worst case scenario. A sensitivity analysis of the eight scenarios (discussed in next section) shows that if the downvalley shift were to grow to 80 percent, the increase in downvalley trips would account for fewer than 1/2 of 1 percent of the total number of trips. Therefore, for the purpose of modeling, it is assumed that the downvalley shift is unaffected by the changes made between the Buttermilk Ski Area and Aspen on State Highway 82 because of the eight scenarios.

Induced Trips - These are new trips made because of increased capacity and safety of State Highway 82 due to the transportation improvements. These trips currently are not made because of congestion. The characteristics of trips on State Highway 82 between the Buttermilk Ski Area and Aspen are predominantly upvalley trips (trips that begin or end upvalley of Brush Creek Road). Because the study corridor is much more congested than downvalley sections of State Highway 82, the study corridor accounts for a larger percentage of the total trip time for upvalley trips. Because of the potential time savings, upvalley trips are more likely to be induced by transportation improvements between the Buttermilk Ski Area and Aspen than downvalley trips (past Brush Creek Road). Downvalley trips (trips that begin or end downvalley of Brush Creek Road) will still be induced by the increased convenience of the highway.

Converted Trips - Converted trips occur as people shift between modes of transportation. The shift may occur when traffic congestion is significantly reduced (shift from single occupancy vehicle [SOV] to carpool/transit) or when options such as an improved transit system are offered as an alternative to driving on congested roadways (shift from SOV to carpool/transit). Generally, as conditions deteriorate, the majority of the shifts are taken from the SOV and moved to a higher occupancy vehicle (HOV) such as carpool or transit.

4. Modeled Scenarios

The scenarios that are modeled are referenced from the Base Case, which represents the No-Action Alternative discussed in **Chapter III: Alternatives.** The four trip factors associated with each scenario are used to adjust the Base Case person trip volumes to develop forecasted trip volumes for each modeled scenario. The modeled scenarios are listed below:

Scenario	Description
A	Base Case.
B	Unrestricted four lanes across the Marolt-Thomas property or along existing S-curve alignment.
C	Two lanes plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property or along existing S-curve alignment.
D	Two lanes plus a light rail transitway across the Marolt-Thomas property without a transfer to a multimodal center (D1) or with a transfer to a multimodal center (D2).
E	Two improved lanes on the existing State Highway 82 plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property.
F	Two improved lanes on the existing State Highway 82 plus a light rail transitway across the Marolt-Thomas property without a transfer to a multimodal center (F1) or with a transfer to a multimodal center (F2).
G	Existing State Highway 82 (no improvements) plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property.
H	Two improved lanes on the existing State Highway 82 plus bus-only transitway across the Marolt-Thomas property.

Each scenario represents changes in the laneage and mode options that are different from the Base Case. The transit envelope, cut and cover, and at-grade profile options have negligible influence on the travel behavior of the motorist and the demand model forecasts. The modified direct and existing alignment also have negligible influence on the behavior of the motorist and the demand model forecasts. The model assumes that the laneage described by each scenario is continuous for the length of the study corridor and that the alignment west (downvalley) of Maroon Creek Road is the existing alignment.

The scenarios that are modeled are not the same group as the alternatives that are evaluated in the DEIS. The majority of the scenarios have been modeled because of public interest, requests from the City of Aspen, and to establish a range of options for comparison to the Base Case Scenario. Five of the scenarios are representative of alternatives evaluated in the DEIS: the Base Case, Scenario C, Scenario D, Scenario F, and Scenario H. Scenario C represents the laneage and mode options described as two lanes plus two dedicated vehicle and/or transit lanes (excluding light rail transit), without regard to the alignment or profile options. Scenario D represents the two lanes plus light rail transit (LRT) laneage and mode options across the Marolt-Thomas property, without regard to a profile option. Scenario F represents two lanes along the existing alignment plus LRT across the Marolt-Thomas property. Scenario H represents two lanes along the existing plus a busway across the Marolt-Thomas property. All of the modeled scenarios are listed below, followed by a brief description of each.

4a. Scenario A: The Base Case

The Base Case Scenario represents the No-Action Alternative in the year 2015. This scenario assumes that the 1994-97 State Implementation Plan (SIP) measures have taken effect and the BBFEIS Preferred Alternative has been built with no transportation improvements between the Buttermilk Ski Area and Aspen. The BBFEIS Preferred Alternative includes widening State Highway 82 from two to four lanes with two of the four between Gerbazdale and the Buttermilk Ski Area being bus/high occupancy vehicle (HOV) lanes; park and ride lots; and an intercept lot at the Buttermilk Ski Area. It was assumed for the BBFEIS demand model that there were no improvements on the State Highway 82 corridor between Buttermilk Ski Area and Aspen. All scenarios that are modeled in this effort will be referenced from this starting point (i.e., the Base Case).

The BBFEIS modeling analysis of the Preferred Alternative assumed that the vehicle miles traveled (VMT) credits for the cross-town shuttle and voluntary no-drive days were applicable to State Highway 82/Main Street (SIP dated January 1993). Since that time, the 5 percent reduction for the voluntary no-drive program has been considered unenforceable by the EPA. The cross-town shuttle reduction credit of 400 VMT is not applicable to Main Street but will be taken into account for the local and collector streets in the City of Aspen.

The revised September 1994 SIP outlines three measures that are applicable to State Highway 82/Main Street: the intercept lot, commercial core paid parking, and the bus priority lane on Main Street. Only the commercial core paid parking and bus priority lane reduction credits for the year 1997 will be taken into account in the Base Case. The intercept lot reduction is already accounted for in the Base Case as SOV reductions captured by the Buttermilk Ski Area intercept lot. Because the remaining SIP reduction credits will be taken in the Base Case, they are carried through to all scenarios that are modeled. The combined effect of these two SIP measures reduces VMT on State Highway 82 by approximately 5 percent.

4b. Scenario B: Unrestricted Four Lanes Across the Marolt-Thomas Property or Along the Existing S-curve Alignment

This scenario is representative of a four lane urban or rural highway section. The alignment of the highway does not influence the 2015 traffic forecast demand. The travel time savings acquired by crossing the Marolt-Thomas property is negligible when compared to a widened and improved four lane section on the existing alignment.

4c. Scenario C: Two Lanes plus Two Dedicated Vehicle and/or Transit Lanes Across the Marolt-Thomas Property or Along the Existing S-curve Alignment

As described previously, Scenario C represents the laneage and technology option having two general lanes and two dedicated vehicle and/or transit lanes (excluding LRT for modeling purposes) in the same corridor, either along the existing S-curves or across the Marolt-Thomas property. Again, the alignment and profile options have little effect on the 2015 traffic demand forecast.

4d. Scenario D: Two Lanes plus Light Rail Transitway Across the Marolt-Thomas Property

Scenario D is similar to Scenario C except that LRT is the mode option used for the modeling and the alignment crosses only the Marolt-Thomas property. In modeling Scenario D, consideration was given to the possibility of a transfer at a multimodal center. A transfer would require additional travel time and would induce fewer trips to the rail system from SOVs than a non-transfer. Both cases, without a transfer (D1) and with a transfer (D2), were modeled.

4e. Scenario E: Two Improved Lanes on Existing State Highway 82 plus Two Dedicated Vehicle and/or Transit Lanes Across the Marolt-Thomas Property

This scenario represents a split alignment from Maroon Creek Road to 7th Street and Main Street. The general traffic is routed on an improved existing State Highway 82 alignment and the dedicated vehicle and/or transit lanes are across the Marolt-Thomas property. The model assumes that the traffic operations at the intersection of 7th Street and Main Street have no affect on the traffic demand forecast.

4f. *Scenario F: Two Improved Lanes on Existing State Highway 82 plus Light Rail Transitway Across the Marolt-Thomas Property*

Scenario F is similar to Scenario E except that LRT is the technology option used across the Marolt-Thomas property. Buses, shuttle vans, and carpools are not allowed to use the transitway across the Marolt-Thomas property. Again, consideration is given to the possibility of a transfer at a multimodal center. Both cases, without a transfer (F1) and with a transfer (F2), are modeled.

4g. *Scenario G: Existing State Highway 82 (No Improvements) plus Two Dedicated Vehicle and/or Transit Lanes Across the Marolt-Thomas Property*

This scenario assumes that there are no improvements made to the existing highway but that dedicated vehicle and/or transit lanes are built across the Marolt-Thomas property. The model assumes that the traffic operation at the intersection of 7th Street and Main Street are inconsequential to the traffic demand forecast.

4h. *Scenario H: Two Improved Lanes on Existing State Highway 82 plus a Bus-Only Transitway Across the Marolt-Thomas Property*

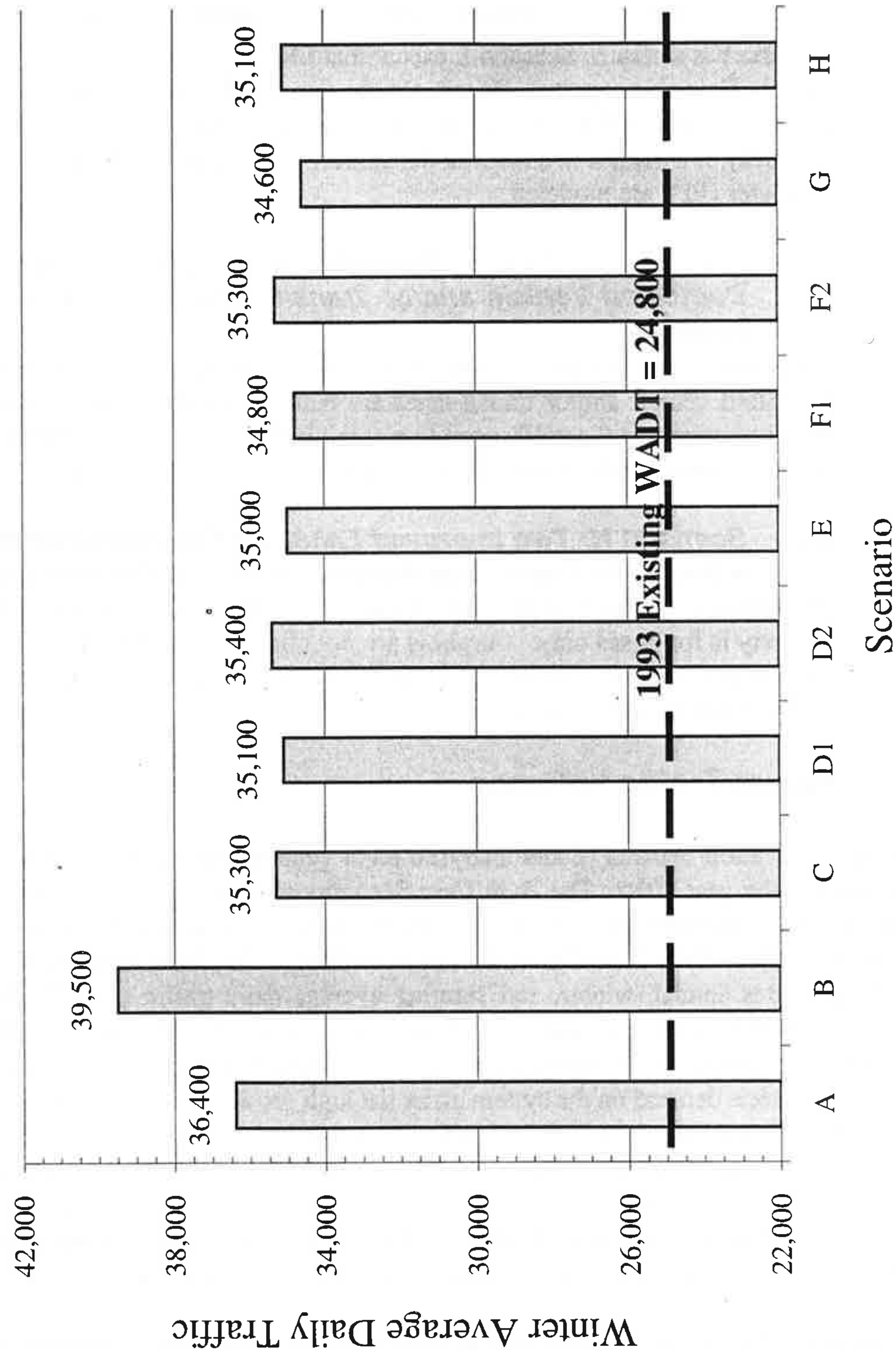
This scenario is similar to Scenario E except that the transitway across the Marolt-Thomas property is for buses only. Carpools are not allowed to use the transitway. This modeled scenario also assumes that the traffic operations at 7th Street and Main Street have no affect on the travel demand forecast.

5. Future Traffic Volumes

The transportation demand model analyzed eight general scenarios for both winter and summer volumes for the year 2015. The Base Case Scenario was used in the analysis as the starting point from which to compare other scenarios. Each model scenario was associated with a set of trip factors that adjusted the Base Case volumes according to the characteristics of each scenario. The model provides annual, winter, and summer average daily traffic (AADT, WADT and SADT, respectively) volumes for all scenarios. Figure V-3 is a graph comparing the 2015 State Highway 82 WADT volumes at Cemetery Lane for each modeled scenario. The volumes shown are the forecasted vehicle demand on the system under the high growth scenario. The figure also shows the 1993 WADT volume of 24,800 vehicles. *(This number is different from the volume of 26,300 vehicles reported in the BBFEIS. This volume has been adjusted to reflect the more accurate information gathered within the last year.)* The 2015 WADT volumes are used in the air quality analysis which is explained in **Section VI.B.4a: Air Quality.** The summer model results are used to develop the future transportation capacity and operations analyses.

Scenarios F, G, and H are two-lane options on the existing State Highway 82 with a separate transitway across the Marolt-Thomas property. Scenarios F and H do not allow the use of carpools on the transitway and without aggressive TM measures, the two-lane roadway does not provide

Figure V-3
2015 High Growth Winter Average Daily Traffic
State Highway 82 at Cemetery Lane



adequate capacity for the unrestricted traffic. Through an Aggressive TM Program, the volume of vehicle trips can be reduced to below the capacity of the roadway, however, the expected number of winter average daily person trips on the transit system can be expected to reach nearly 47,000 trips per day. This is a modal split of approximately 65 percent (the existing modal split is about 20 percent) if all carpools shift to transit. The other scenarios provide sufficient highway capacity without an Aggressive TM Program and also provide incentives for the carpools on the dedicated vehicle and/or transit lanes. The transit use with these other scenarios is expected to be between 15,000 and 17,000 winter person trips per day on transit in the year 2015.

6. Transportation Management

Transportation management (TM) measures are programs and policies designed to reduce traffic demand on the roadway system. The goal of TM is to reduce congestion and increase the efficiency (not necessarily the capacity) of the roadway system. TM measures are included as part of the demand model analyses to address concerns of increased congestion and safety issues on State Highway 82. Moderate and Aggressive TM programs were evaluated to determine the effect of each program on reducing traffic volume. Information on the TM programs evaluated is located in **Chapter II: Transportation Management.** Figure V-4 is a graph comparing the 2015 State Highway 82 WADT demand at Cemetery Lane of each modeled scenario for both the Moderate and Aggressive TM Programs.

Scenario A is not shown with TM strategies applied because it represents the Base Case Scenario. In the Base Case Scenario, it is assumed that no attempts to improve State Highway 82 are undertaken, including TM. An improved two-lane State Highway 82 with TM is discussed in **Chapter III: Alternatives.**

B. FUTURE TRAFFIC OPERATIONS

The operational analysis of the alternatives evaluated in the DEIS use the traffic demand model forecasts for year 2015 summer volumes. Summer volumes are used because the highest vehicle trip demand occurs during this time of year, as compared to the winter when person trips are greatest. Winter vehicle demand is lower due in part to the high ridership on the Roaring Fork Transit Agency (RFTA) bus services and skier shuttles.

The No-Action Alternative is evaluated in the operational analysis as the basis for comparison to the other alternatives. Figure V-5 shows annual, winter and summer average daily traffic demand (high growth) for the No-Action Alternative for locations between the Buttermilk Ski Area and Aspen in year 2015. The alternatives discussed in **Chapter III: Alternatives** are also evaluated in the operational analysis. These alternatives consist of two unrestricted lanes and two dedicated vehicle and/or transit lanes, with alignment options including the existing alignment and the modified direct

Figure V-4
2015 High Growth Winter Average Daily Traffic with Transportation Management Program Comparisons State Highway 82 at Cemetery Lane

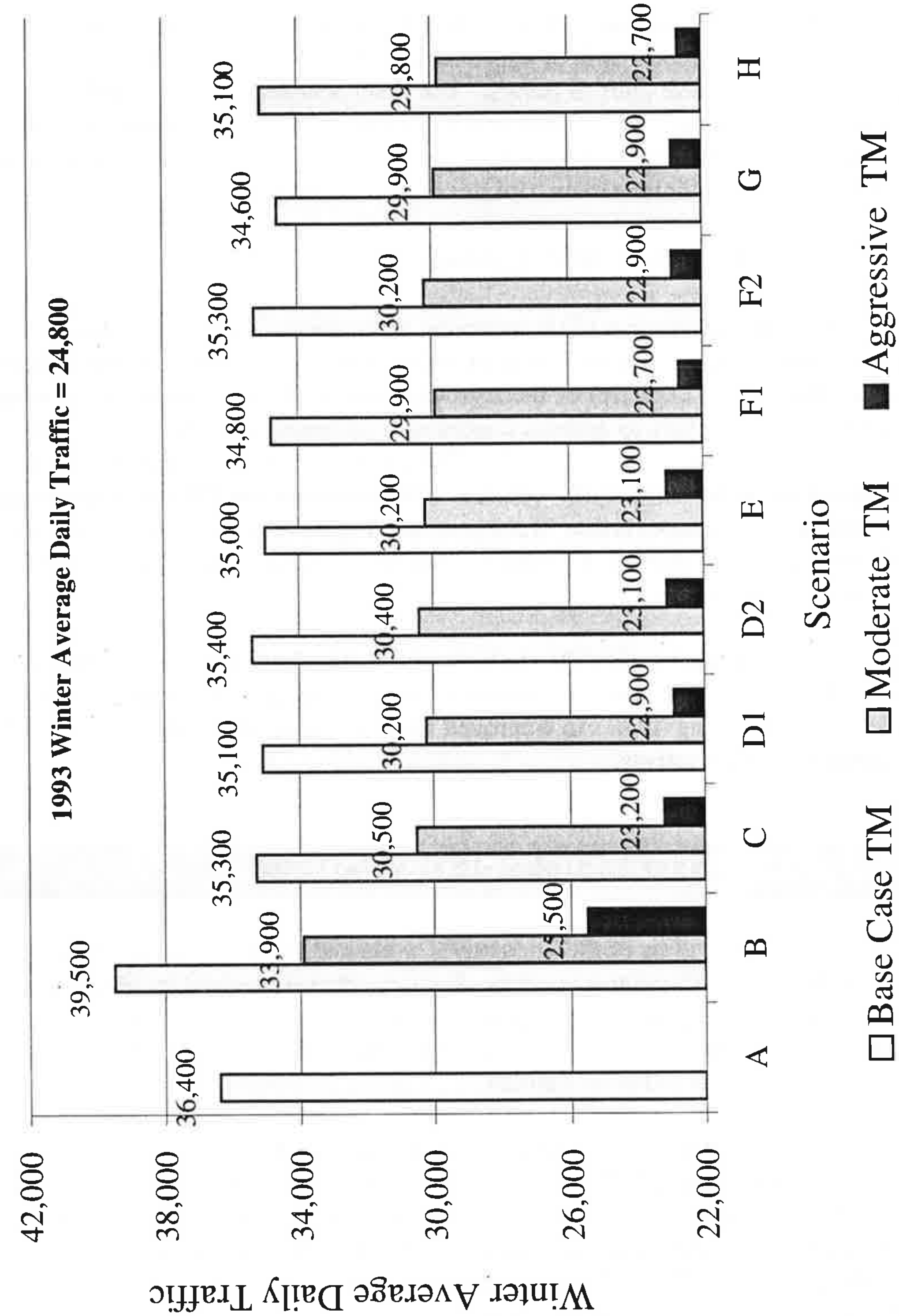
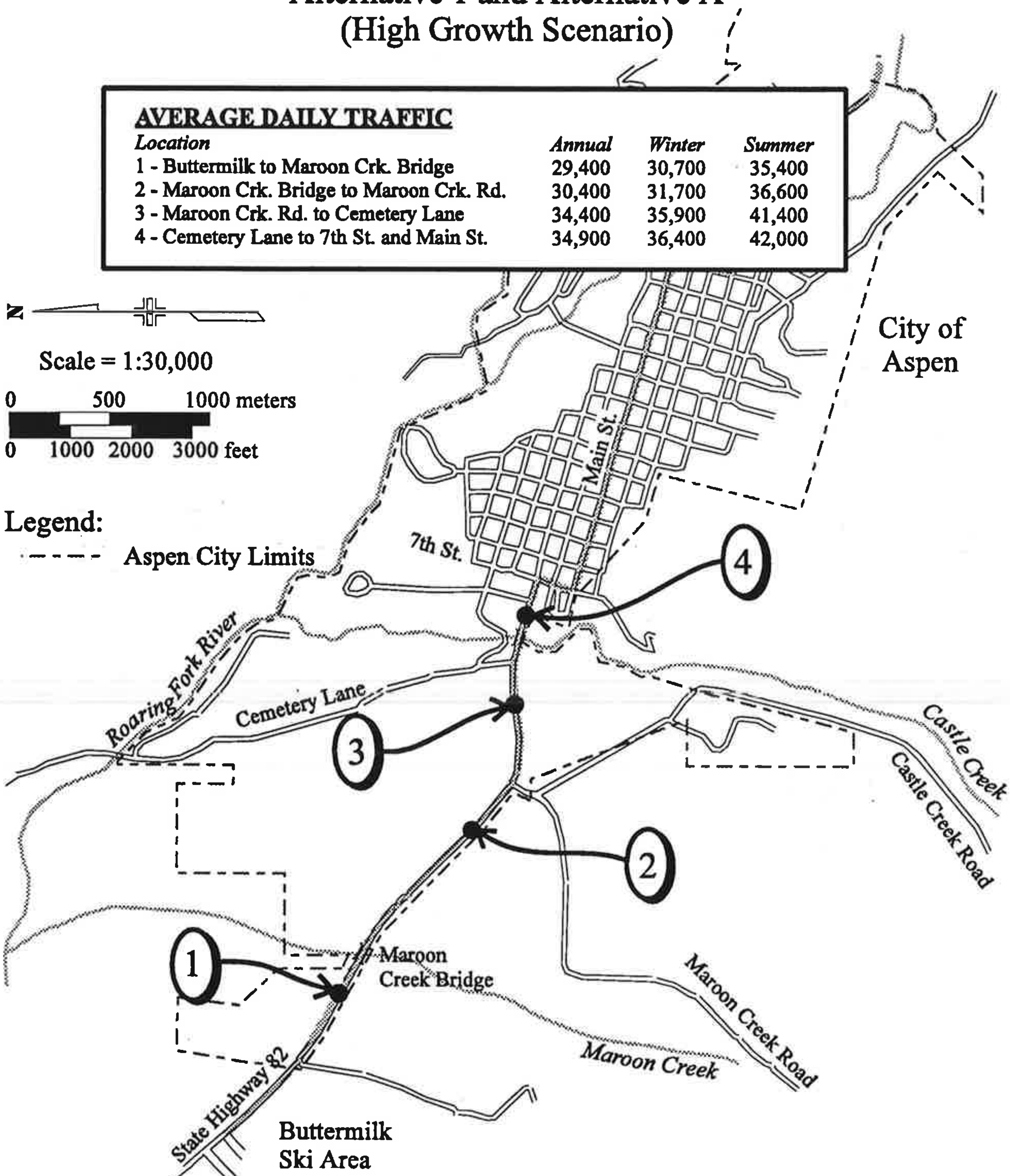


Figure V-5
2015 Daily Traffic Demand for the No-Action Alternative Alternative 1 and Alternative A (High Growth Scenario)

AVERAGE DAILY TRAFFIC

Location	*Annual*	*Winter*	*Summer*
1 - Buttermilk to Maroon Crk. Bridge	29,400	30,700	35,400
2 - Maroon Crk. Bridge to Maroon Crk. Rd.	30,400	31,700	36,600
3 - Maroon Crk. Rd. to Cemetery Lane	34,400	35,900	41,400
4 - Cemetery Lane to 7th St. and Main St.	34,900	36,400	42,000



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alignment across the Marolt-Thomas property (Model Scenario C). The cut and cover and at-grade options have no significant effect on the operational analysis, although the cut and cover may tend to slow traffic. Figure V-6 shows the year 2015 annual, winter, and summer average daily traffic demand (high growth) for locations between the Buttermilk Ski Area and Aspen for the two general highway lanes and two dedicated vehicle and/or transit lanes alternatives across either the Marolt-Thomas property or the existing alignment. Although the alignment has no significant influence on the traffic volumes, it does affect the capacity of the highway.

The alternative consisting of two improved lanes on the existing State Highway 82 plus a transitway (fixed guideway or busway) across the Marolt-Thomas property (Model Scenario F and H) is evaluated. Figure V-7 shows the year 2015 annual, winter, and summer average daily traffic demand (high growth) for locations between Buttermilk Ski Area and Aspen for an improved existing State Highway 82 plus a transitway across the Marolt-Thomas property. The traffic volumes shown in Figure V-7 reflect an Aggressive TM Program to provide the 2015 capacity for Alternative G.

The operational analyses of the No-Action Alternative, the two general highway lanes and two dedicated vehicle and/or transit lanes alternatives, and the two improved lanes on existing State Highway 82 and a transitway across the Marolt-Thomas property are reported below.

1. No-Action Alternative (Alternative 1 and Alternative A)

The No-Action Alternative represents only minor, short-term safety improvements and routine maintenance for the existing highway corridor. The 2015 transportation demand east of Cemetery Lane is expected to increase 47 percent over the existing demand levels and increase 55 percent west of the Maroon Creek Bridge. The forecasted summer afternoon peak hour demand at Cemetery Lane for the No-Action Alternative is 3,570 vehicles per hour (vph). This demand is well in excess of the capacity of the existing two-lane highway and is expected to create a Level of Service (LOS) F for 16 hours of the day and result in vehicle speeds averaging less than 20 km/h (13 mph). Table V-1 shows the 2015 summer pm peak hour demand and the expected LOS for several locations on State Highway 82 for the No-Action Alternative. The transportation demand cannot be serviced by the existing highway; in fact, the traffic flow is expected to be below 3,570 vehicles per hour because of stop and go driving conditions. In all likelihood, this demand would spread throughout the day and heavy congestion levels would result for most of the day.

2. Two Highway Lanes plus Two Dedicated Vehicle and/or Transit Lanes (Alternatives 2 & 3 and Alternatives B,C,D,E, & F)

This alternative represents two general highway lanes and two dedicated vehicle and/or transit lanes. The alignment west (downvalley) of Maroon Creek Road is the same for all alternatives. It represents Alternatives 2 and 3 between Buttermilk Ski Area and Maroon Creek Road and Alternatives B, C, D, E, and F between Maroon Creek Road and 7th Street and Main Street. Figure V-6 shows the annual, winter, and summer average daily traffic demand for the two lane plus two dedicated vehicle and/or transit lane option for the modified direct alignment and the S-curve alignment.

Figure V-6
2015 Daily Traffic Demand for 2 Lanes plus
2 Dedicated Vehicle and/or Transit Lanes
Alternatives 2 & 3 and Alternatives B, C, D, E & F
(High Growth Scenario)

AVERAGE DAILY TRAFFIC

Location	*Annual*	*Winter*	*Summer*
1 - Buttermilk to Maroon Crk. Bridge	28,400	29,600	34,100
2 - Maroon Crk. Bridge to Maroon Crk. Rd.	29,500	30,800	35,500
3 - Maroon Crk. Rd. to Cemetery Lane	33,200	34,700	40,000
4 - Cemetery Lane to 7th St. and Main St.*	33,800	35,300	40,700

* Traffic volume on State Highway east of Cemetery Lane is unaffected by the choice of alignment: Modified Direct or Existing.

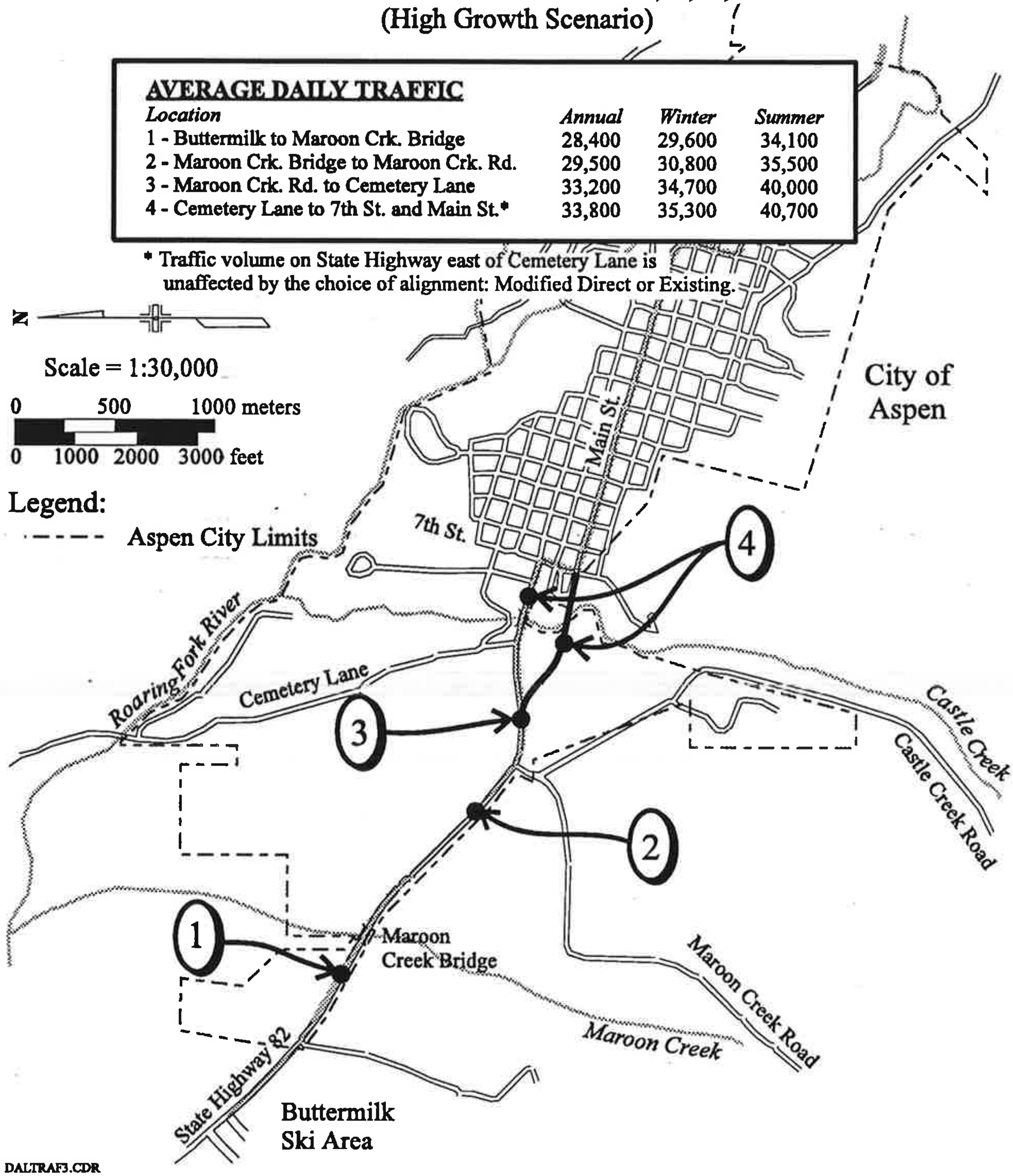

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Figure V-7
2015 Daily Traffic Demand for 2 Improved Lanes on Existing Alignment and a Transitway on the Modified Direct Alignment Alternative G
(High Growth Scenario plus Aggressive TM Program)

FIXED GUIDEWAY

Location	*Annual*	*Winter*	*Summer*
1 - Buttermilk to Maroon Crk. Bridge	18,400	19,200	22,100
2 - Maroon Crk. Bridge to Maroon Crk. Rd.	19,000	20,600	23,000
3 - Maroon Crk. Rd. to Cemetery Lane	21,600	22,600	26,000
4 - Cemetery Lane to 7th St. and Main St.			
Two Unrestricted Lanes	21,900	22,900	26,400
Fixed Guideway	—— Light Rail Vehicles ——		

BUSWAY

Location	*Annual*	*Winter*	*Summer*
1 - Buttermilk to Maroon Crk. Bridge	18,200	19,000	21,900
2 - Maroon Crk. Bridge to Maroon Crk. Rd.	18,800	19,700	22,700
3 - Maroon Crk. Rd. to Cemetery Lane	21,300	22,200	25,400
4 - Cemetery Lane to 7th St. and Main St.			
Two Unrestricted Lanes	20,600	21,600	24,900
Busway	1,100	1,100	1,300

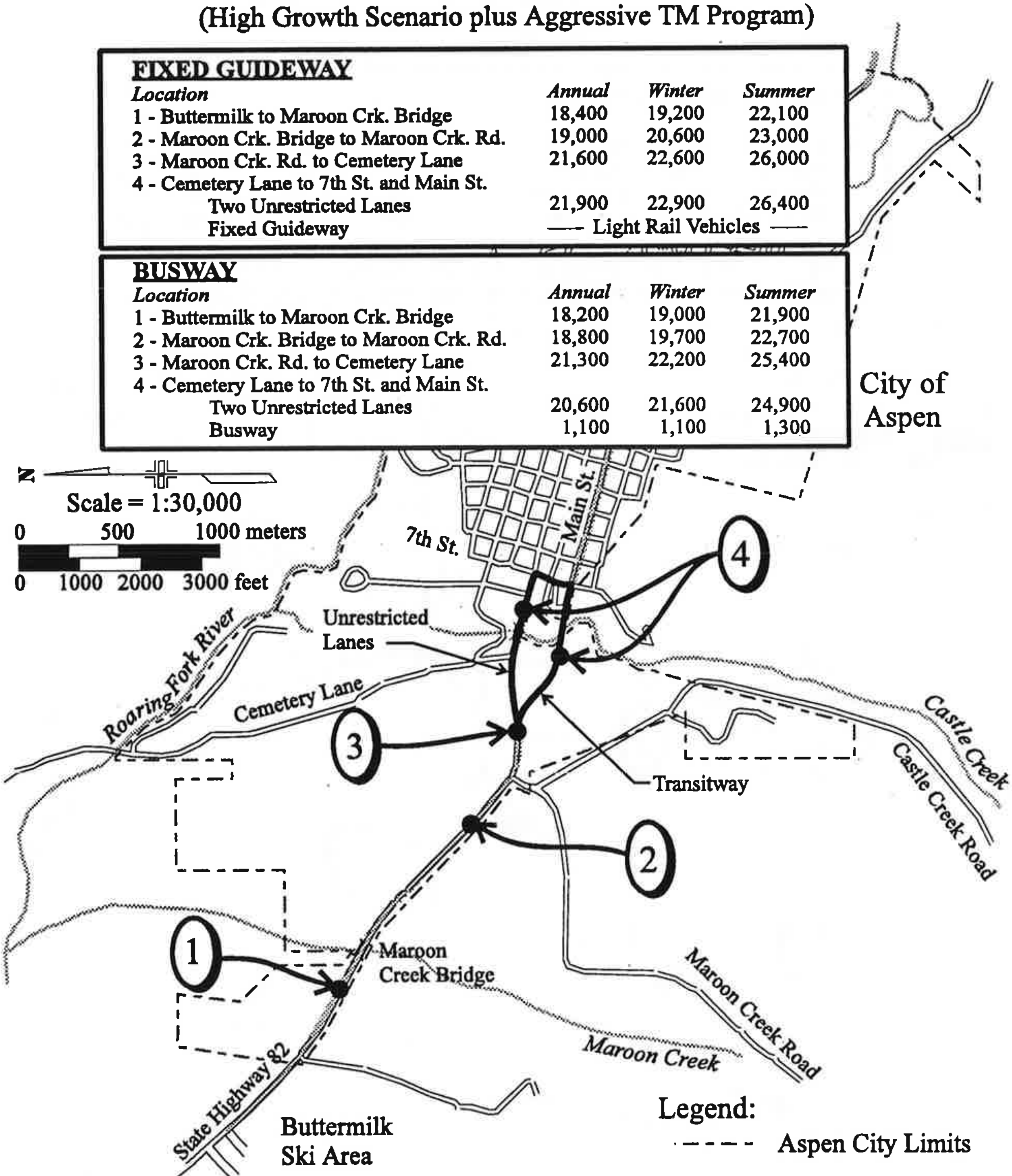

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Table V-1
No-Action Alternative (Alternative 1 and Alternative A)
2015 Level of Service, Summer Average PM Peak Hour
(High Growth Scenario)

Segment (Mileposts)	Average PM Peak Hour Volume	Percent No Passing Zones	Truck Percentage	Maximum Capacity[1]	Level of Service
Buttermilk Ski Area to Maroon Creek Bridge (38.5 - 39.2)	3,010	65%	8%	2,420	F
Maroon Creek Bridge to Maroon Creek Road (39.2 - 39.8)	3,110	80%	8%	2,420	F
Maroon Creek Road to Cemetery Lane (39.8 - 40.1)	3,520	100%	8%	2,420	F
Cemetery Lane to 7th and Main Streets (40.1 - 40.5)	3,570	100%	8%	2,260	F

1 - Capacity is the maximum hourly flow rate under ideal conditions at Level of Service E. The definition of capacity assumes that good weather and pavement conditions exist. At maximum capacity, no more vehicles can reasonably be expected to traverse a section of roadway during the given time period under prevailing roadway, traffic, and control conditions. The capacity for Cemetery Lane to 7th Street and Main Street is less due to lower speeds through the S-curves.

The intent of a dedicated vehicle and/or transit lane (restricted lane) is to provide a facility that will create an incentive for travelers to switch from their SOVs. For the purpose of this analysis, buses and HOVs (carpools and shuttle vans) are assumed as the technology for the dedicated vehicle and/or transit lanes. Because the restrictions applied to the facility are dynamic, a LOS C or better for the restricted lanes is assumed. At the same time, the general lane must operate at LOS E or worse to provide an incentive to use the restricted lane. LOS C for the restricted lane limits the traffic flow to less than 750 vehicles per hour (vph) (including buses). This maximum capacity is representative of normal highway operations. The maximum capacity for the restricted lane drops to 600 vph around the S-curves because of slower speeds and diminished lateral clearance. It is expected that when capacity is reached, new restrictions on the users of the dedicated vehicle and/or transit lane will be implemented to shift more person trips into HOVs or transit, thereby raising the level of service and increasing the traffic flow of the restricted lane. These calculations assume that the dedicated vehicle and/or transit lane will include carpools of two or more passengers. The minimum volume of traffic flow to maintain LOS E or worse in the unrestricted lane depends upon the design speed of the facility. The minimum volume for LOS E or worse is discussed in more detail below.

2a. Buttermilk Ski Area to Maroon Creek Road (Alternatives 2 & 3)

For traffic flowing at 80 km/h (50 mph), LOS E for the general highway lane is defined as a traffic volume in excess of 1,320 vph. This volume corresponds to the alternative between the Buttermilk Ski Area and Maroon Creek Road. Table V-2 shows the summer afternoon peak hour demand for this alternative at several locations in the study corridor for both the general and restricted lanes. Also contained in Table V-2 are the LOS criteria of both the general and restricted lanes for each location. The improved transportation corridor between the Buttermilk Ski Area and Maroon Creek Road will operate within the criteria for the restricted lane but not the general lane. The general lane is shown to operate at LOS D, less than the minimum requirement of 1,320 vph if 2-person carpools are allowed to use the restricted lane. Increasing the minimum requirement for carpool users in the restricted lane will increase the traffic volume in the general lane and lower the LOS.

2b. Maroon Creek Road to 7th and Main Streets (Alternatives B,C,D,E, & F)

Existing Alignment (At-Grade)

The design speed for the improved S-curves is 40 km/h (25 mph). The diminished lateral clearance and the slower progression of traffic in the S-curves limits the capacity of the restricted lane to no more than 600 vph. The minimum volume in the general lane for a design speed of 40 km/h (25 mph) at LOS E or worse is 630 vph. Table V-2 shows that the LOS criteria for both lanes are met but also that the unrestricted lane is operating at LOS F, well in excess of the total capacity of the lane.

Modified Direct (At-Grade or Cut and Cover) East of Maroon Creek Road

The design speed between Maroon Creek Road and 7th and Main Streets is 65 km/h (40 mph), corresponding to a minimum capacity in the general lane of 1,070 vph. As shown in Table V-2, the volume demands for both the restricted and general lane meet the criteria for efficient operation of the facility across the Marolt-Thomas property.

3. Two Improved Lanes on Existing Alignment and a Transitway (Fixed Guideway or Busway) on the Modified Direct Alignment plus an Aggressive TM Program (Alternative G)

This laneage is representative of Alternative G between Maroon Creek Road and the intersection of 7th Street and Main Street. The remainder of the project corridor to the west of Maroon Creek Road is assumed to consist of two general highway lanes plus a dedicated vehicle and/or transit lane (Alternatives 2 & 3). The transitway across the Marolt-Thomas property is modeled as a fixed guideway (Scenario F) or a busway (Scenario H) for this analysis. Both of these scenarios can represent Alternative G, depending upon the mode option chosen for the transitway. Figure V-7 (previously shown) shows the annual, winter, and summer average daily traffic volumes in the year 2015 for this alternative. The figure shows the future vehicle demand with an Aggressive TM Program for both a fixed guideway and a busway.

Table V-2
Two Lanes Plus Two Dedicated Vehicle and/or Transit Lanes
Alternatives 2 & 3 and Alternatives B,C,D,E,&F
2015 Summer Average PM Peak Hour Traffic Volumes and Levels of Service
(High Growth Scenario)

Alternatives 2 & 3 Segment (Mileposts)	Average PM Peak Hour Volume (2-way)	Peak Hour Direction Volumes (1-way)		Peak Hour Direction Volume Criteria (1-way)	
		General Lane[1] (LOS)	Restricted Lane[1] (LOS)	General Lane Min Vol[2]	Restricted Lane Max Vol[3]
Buttermilk Ski Area to Maroon Creek Bridge - (38.5 - 39.2)	2,900	1,180 (D)	560 (C)	1,320	750
Maroon Creek Bridge to Maroon Creek Road - (39.2 - 39.8)	3,020	1,230 (D)	580 (C)	1,320	750

Alternatives B,C,D,E, & F Segment (Mileposts)	Average PM Peak Hour Volume (2-way)	Peak Hour Direction Volumes (1-way)		Peak Hour Direction Volume Criteria (1-way)	
		General Lane[1] (LOS)	Restricted Lane[1] (LOS)	General Lane Min Vol[2]	Restricted Lane Max Vol[3]
Existing Alignment, S-curves (Alternative B)					
Maroon Creek Road to Cemetery Lane (39.8 - 40.1)	3,400	1,270 (E)	600 (C)	1,070	750
Cemetery Lane to 7th and Main Streets (40.1 - 40.5)	3,460	1,180 (F)	550 (C)	630	600
Modified Direct Alignment (Alternatives C, D, E & F)					
Maroon Creek Road to Cemetery Lane (39.8 - 40.1)	3,400	1,270 (E)	600 (C)	1,070	750
Cemetery Lane to 7th and Main Streets (40.1 - 40.5)	3,460	1,180 (E)	550 (C)	1,070	750

[1] Assumes the restricted lane carries buses, shuttle vans, and carpools of 2 or more persons.
[2] The minimum volume required for the general lane to operate at LOS E or worse.
[3] The maximum capacity of the restricted lane to operate at LOS C or better.

A transit envelope between the airport and Maroon Creek Road is an option which may be chosen to create a continuous LRT link to downvalley locations. This link would be necessary to capture more internal trips and increase the performance of the system. For this analysis, the fixed guideway is assumed to be constructed in phases. Phase one, the configuration analyzed, is a fixed guideway connection between downtown Aspen and the intermodal site in the vicinity of Maroon Creek Road. Phase two extends the fixed guideway system to the airport. The fixed guideway influences the traffic operations on State Highway 82 between Buttermilk Ski Area and Maroon Creek Road. A fixed guideway across the Marolt-Thomas property with a transfer to a multimodal center will be less of a transit incentive than the busway. More vehicle demand on this highway can be expected if a fixed guideway is in place as opposed to a busway, because some carpools will not shift to a rail facility at Maroon Creek Road.

3a. Buttermilk Ski Area to Maroon Creek Road (Alternatives 2 & 3)

The summer pm peak hour vehicle demand with an Aggressive TM program for several locations within the project corridor is given in Table V-3. As mentioned before, LOS E for the general lanes in this section is defined as a vehicle demand in excess of 1,320 vph. The vehicle demand in this section of the project corridor will be less than the capacity criteria for both the unrestricted and the restricted lanes, regardless of the transit system from Maroon Creek Road into Aspen.

3b. Maroon Creek Road to 7th and Main Streets (Alternative G)

Two options exist for Alternative G between Maroon Creek Road and the intersection of 7th Street and Main Street. Each option, either a fixed guideway or busway, is discussed below.

Improved Existing State Highway 82, Fixed Guideway Across Marolt

The fixed guideway is assumed to operate at a LOS conducive to attracting ridership. Table V-3 shows that there will be more than 2,200 vph in the general lanes during the summer pm peak hour from Maroon Creek Road to 7th Street and Main Street. The maximum two-way capacity of the improved State Highway 82 is approximately 2,520 vph between Maroon Creek Road and Cemetery Lane and 2,410 vph in the S-curves. The general lanes will have a demand that is approaching the capacity of the roadway and operate at LOS E. At this demand (2,240 vph) and LOS the system is operating near failure, even with an Aggressive TM Program.

Improved Existing State Highway 82, Busway Across Marolt

Table V-3 shows that the busway will operate at LOS A from Maroon Creek Road to 7th Street and Main Street. In the same section, the capacity of the general lanes on the existing State Highway 82 is the same as before: 2,520 vph between Maroon Creek Road and 2,410 vph on the S-curves. The general lanes will have a demand over 2,000 vph and operate at LOS E with an Aggressive TM Program in place.

Table V-3
Two Improved Lanes on the Existing Alignment and a Transitway on the Modified Direct Alignment
Alternative G
2015 Summer Average PM Peak Hour Traffic Volumes and Levels of Service
(High Growth Scenario plus Aggressive TM Program)

Alternatives 2 & 3 Segment (mileposts)	Average PM Peak Hour Volume (2-way)	Peak Direction Volume (1-way)		Peak Direction Volume Criteria (1-way)	
		General Lane[1] (LOS)	Restricted Lane[1] (LOS)	General Lane Min Vol[2]	Restricted Lane Max Vol[3]
Buttermilk Ski Area to Maroon Creek Bridge (38.5 - 39.2)	1,880	730 (C)	400 (B)	1,320	750
Maroon Creek Bridge to Maroon Creek Road (39.2 - 39.8)	1,960	780 (C)	400 (B)	1,320	750

Alternative G Segment (mileposts)	Average PM Peak Hour Volume (2-way)	Average PM Peak Hour Volume (2-way)		2-Way Peak Hour Maximum Capacity	
		General Lane[4] (LOS)	Transitway[4] (LOS)	General Lane Max Vol[5]	Transitway Max Vol[5]
FIXED GUIDEWAY					
Maroon Creek Road to Cemetery Lane (39.8 - 40.1)	2,210	2,210 (E)	---	2,520	---
Cemetery Lane to 7th and Main Streets (40.1 - 40.5)	2,240	2,240 (E)	---	2,410	---
BUSWAY					
Maroon Creek Road to Cemetery Lane (39.8 - 40.1)	2,160	2,040 (E)	120 (A)	2,520	1,760
Cemetery Lane to 7th and Main Streets (40.1 - 40.5)	2,230	2,110 (E)	120 (A)	2,410	1,760

[1] Assumes the restricted lane carries buses and carpools of 2 or more persons.
[2] The minimum volume required for the general lane to operate at LOS E or worse.
[3] The maximum capacity of the restricted lane to operate at LOS C or better.
[4] Assumes the restricted lanes are for buses or LRT only.
[5] Maximum capacity (LOS F) of the roadway facility.

3c. Intersection of 7th Street and Main Street

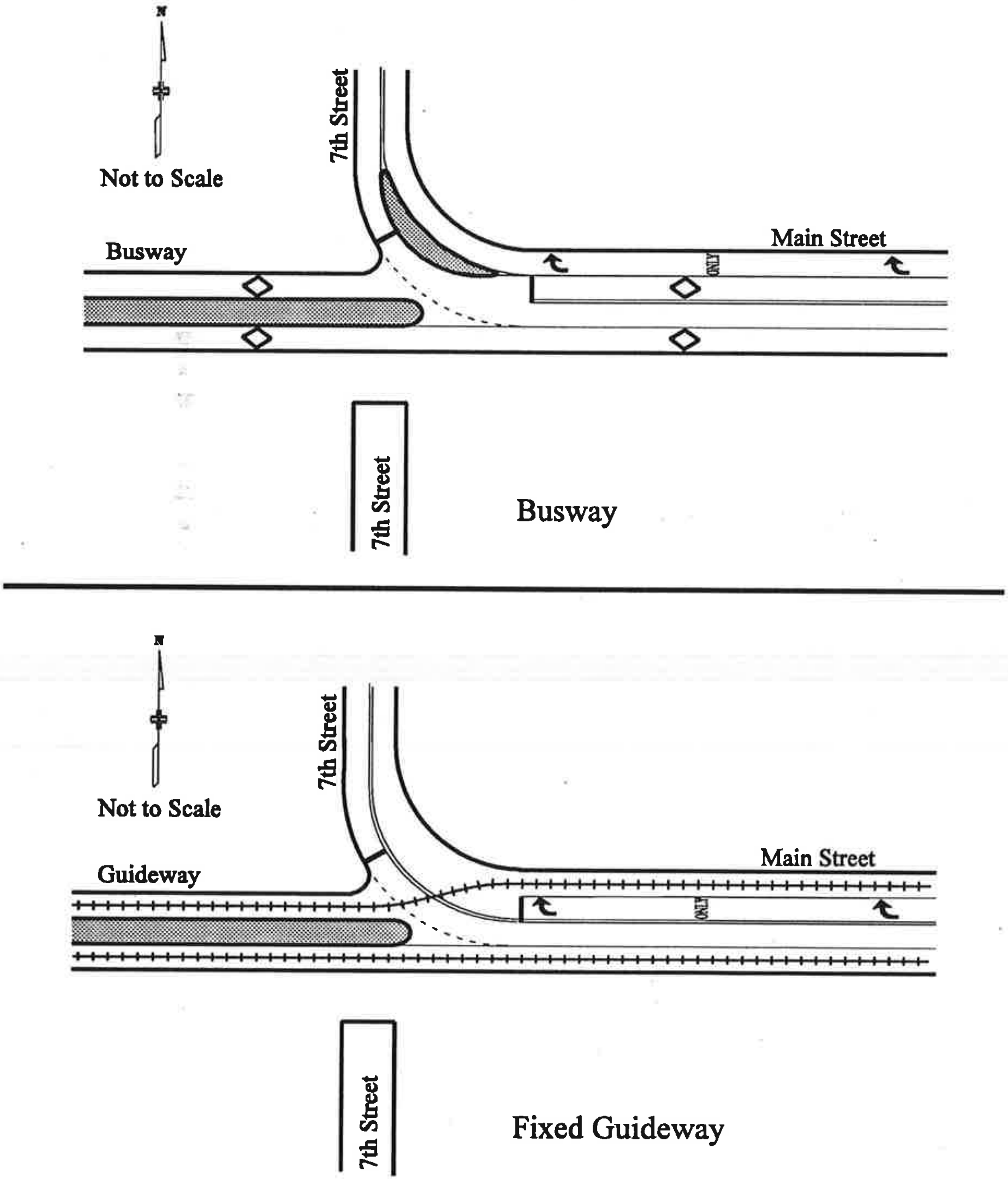
The intersection at 7th Street and Main Street requires special consideration. The predominant movements at this intersection are the southbound left turn and the westbound right turn. The controlling movement for the intersection would be the southbound left turn. The most prudent intersection design would be a signalized intersection providing separation of movement for vehicles on State Highway 82 and vehicles on the transitway. Median barriers and islands would need to be placed to prevent non-transit vehicles from entering the transitway. To increase the efficiency of the intersection and minimize the vehicle conflicts, the southern leg of the intersection would need to be blocked off, creating a T-intersection. Figure V-8 shows a conceptual design layout of the signalized intersection of 7th Street and Main Street for both the busway and fixed guideway.

The lane configuration of Main Street at 7th Street is dependent upon the mode chosen for the transitway. Considering the busway, the westbound right lane of Main Street needs to be reserved for general lane traffic continuing north onto 7th Street. This lane can be treated as a non-stop, free-right turn. The left lane needs to be reserved for the transit traffic. Heading east on Main Street (into town), the right lane would be reserved for transit traffic and the left lane reserved for vehicles coming off the general lanes from 7th Street. This lane configuration must be used to minimize the vehicle conflicts and increase the efficiency of the intersection. Prior to reaching the 7th Street and Main Street intersection from the east, the transit vehicles and other vehicles must be separated from each other. This may require the addition of signs warning of the restricted lane assignment and perhaps the elimination of bus stops several blocks east of 7th Street. With this intersection design, the westbound buses are able to merge from the right lane (the passenger pick-up lane) into the left lane to access the busway. This separates the busway vehicles from the westbound State Highway 82 vehicles. General lane traffic is required to merge to the right lane, similar to the current situation at 7th Street and Main Street.

Considering the fixed guideway, the transit lanes would need to be on the outside lanes of Main Street and the general traffic lanes on the inside. Heading west on Main Street, the LRT vehicle would be unable to cross from the right lane to the left lane without disruption to the traffic flow. The design of the 7th Street and Main Street intersection would require the westbound LRT vehicles to be separated from the right turning vehicles on Main Street. The lane changing maneuver for the LRT is directly across the path of the westbound right turning general lane vehicles on Main Street. This situation creates a dangerous conflict in addition to reducing the capacity of the intersection by approximately 500 vph for the right turn lane.

The design of the intersection would allow for a two-phase signal. Analysis of this intersection indicates that the flow of southbound vehicles on 7th Street would completely control the intersection and that any delay for this movement would disrupt the flow of the traffic in and out of the intersection. This intersection would operate at LOS F for the southbound movement regardless of the mode option assumed for the transitway. If a fixed guideway is assumed, then the right turning movement for the general lane would also operate at LOS F.

Figure V-8
Signalized Intersection of 7th and Main Street for both the Busway and Fixed Guideway



GUIDEWAY.CDR

4. Mode Shift

The City of Aspen has stated that it is committed to keeping future vehicle traffic on State Highway 82 at the existing level. As mentioned previously in **Chapter I: Purpose and Need**, the existing WADT on State Highway 82 at Cemetery Lane is 24,800 vehicles per day (equals 44,200 person trips per day). Currently, 20 percent of all person trips made at this location are on the transit system. Given the expected 60 percent increase in person trips in the year 2015, the number of trips made on transit must increase if the vehicle volume is to remain constant. This amounts to a modal split of approximately 65 percent, higher than any existing mode split in the United States, assuming all carpools are shifted to transit vehicles at Moore/Marolt-Thomas multimodal facility location.

Realistically, the peak hours of traffic during the day will spread before a significant shift to transit is realized. In an area dominated by recreational activities, however, it is unlikely that the peaks will spread much beyond 6:00 am in the morning and 7:00 pm in the evening. Because of the restrictions on peak hour spreading, and the fact that the number of trips per person is on the rise nationwide, it is reasonable to assume that the modal split will need to be greater than 65 percent to meet the goal of maintaining traffic levels at existing levels.

5. Summary

The operational analysis of the No-Action Alternative indicates that the traffic volumes expected in year 2015 will exceed the capacity of the existing State Highway 82. Traffic in this instance experiences heavy congestion and significant delays as speeds average less than 30 km/h (19 mph). Because of this congestion, there are no incentives for people to use the transit system or to carpool.

In contrast, the alternatives which include two general traffic lanes and two dedicated vehicle and/or transit lanes provide appropriate LOS. In these alternatives, the general lane is kept at LOS E or worse to provide incentive to qualify for the restricted lane. At the same time, the restricted lane is kept at LOS C or better to expedite transit operations. The restrictions placed on this lane are a matter of local policy. It is noted that if the LOS of the restricted lane drops below LOS C, the restrictions on carpools should be adjusted accordingly (a requirement of higher occupancy) to improve operations to LOS C or better. In comparison to the No-Action Alternative, the build alternatives provide a greater service to those choosing to use carpools and transit. The improved service of the dedicated vehicle and/or transit lanes help to reduce the amount of vehicle miles traveled (VMT) in the non-attainment area by providing incentives to use carpools and transit, thus reducing the number of vehicles on State Highway 82.

The two improved lanes on existing alignment and a transitway on the Modified Direct alignment provides a LOS B or better for the transit users. On the existing alignment between Maroon Creek Road and 7th Street and Main Street, the general lane traffic (including carpools and vanpools) will experience extreme congestion and delay at LOS F without an Aggressive TM Program. In addition, the operational and capacity problems at the intersection of 7th Street and Main Street restrict the movement of traffic.

Several key issues arise in the discussion of the future transportation demand at the Entrance to Aspen. These issues need to be resolved during the process of selecting a Preferred Alternative in the FEIS.

- With respect to the City's desire to maintain future traffic at existing levels, several innovative proposals have been presented. These proposals are based on variations of TM and land use control. Given that there is marginal success of these programs in the United States and limited experience worldwide, the City of Aspen needs to clearly identify and commit to a TM program.

- Alternative G (as adopted by the Aspen City Council) does not provide incentive for the use of carpools and vanpools because these vehicles would be required to use the two general highway lanes. Assuming that the car/vanpools would utilize a multimodal center and take transit into town (mode split = 65 percent), how will travelers not destined for downtown Aspen reach their destination? What can be done with local transit to complement the mainline system?

- Will an Aggressive TM Program create a negative influence on the economic vitality of the community? Can the transportation system be developed to improve the livability of the community?

It is expected that direction and input to these issues will be received during the formal public review of this DEIS.

VI. Environmental Consequences

The evaluation of the impacts for the various alternatives to the State Highway 82 Entrance to Aspen was based on guidelines issued by the Federal Highway Administration (FHWA) (Technical Advisory T6640.8A, 1987). The following impact categories were considered during the preparation of this DEIS:

- Permits and Approvals
- Neighborhoods
- Relocation and Right-of-Way
- Recreational Resources
- Travel Patterns and Accessibility
- Public Safety
- Land Use
- Local Economy
- Air Quality
- Water Quality
- Upland and Floodplain Vegetation
- Wetlands
- Fisheries
- Wildlife
- Wild and Scenic Rivers
- Floodplains
- Threatened or Endangered Species
- Historic Resources
- Archaeological Resources
- Paleontological Resources
- 4(f) Resources
- Farmland
- Noise
- Visual Resources
- Hazardous Waste Sites
- Energy
- Construction
- The Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity
- Any Irreversible and Irretrievable Commitments of Resources Which Would Be Involved in the Proposed Action

In this section, the No-Action (No-Build or Do-Nothing) Alternative is evaluated first, followed by an analysis of the build alternatives.

If a particular impact category is not described for a given alternative, it means that no impact was identified.

A tabular summary of quantifiable impacts identified in the Table VI-9 follows the impacts analysis at the end of this chapter.

A. NO-ACTION ALTERNATIVE IMPACTS

Adoption of a policy of No-Action for the Entrance to Aspen State Highway 82 corridor would have no impacts on many of the environmental issues discussed in this Chapter. No direct land use impacts would occur and no open space would be taken for right-of-way. No relocations would be required. No sedimentation or potential spills related to construction would affect the Roaring Fork River. No wetlands or fisheries would be disturbed, and no additional impacts on wildlife would result. Floodplain hydraulics would not be altered, and no historic resources would be affected.

The No-Action Alternative would, however, result in several other impacts. Without additional corridor and transit improvements, further deterioration of existing levels of service on State Highway 82 would occur with the increase in traffic volumes. The congestion and delays currently experienced during peak traffic periods would become much worse and extend through more hours of the day. Some increase in the number of minor (fender bender) traffic accidents would be expected with the projected increased traffic volumes. The local economy would also experience impacts and the consumption of energy would increase.

The No-Action Alternative would not alleviate existing traffic conflicts between cyclists/pedestrians and motorists, as currently, the travel lanes are narrow with no paved shoulders. Increase in traffic volumes with no additional improvements to the roadway would create additional conflicts.

Without additional improvements for efficient operation of traffic, it would be impossible to promote increased ridership on Roaring Fork Transit Agency buses by commuters because the buses would be stopped in State Highway 82 traffic congestion with the other highway traffic. Buses, along with all other vehicles on an increasingly congested two-lane highway, would experience longer delays as the peak period congestion extends over more hours during the day. Air quality would also deteriorate due to lack of incentives for getting commuters to convert to transit.

The No-Action Alternative would not be responsive to planning efforts of the community. The No-Action Alternative would not address the local need for a second access across Castle Creek for emergency response.

All highway users would experience delays; however, downvalley workers who commute to Aspen would incur the greatest loss of personal time by any further deterioration of traffic operations.

B. BUILD ALTERNATIVE IMPACTS

1. Permits and Approvals Required

Construction of transportation improvements on State Highway 82 will require the following actions:

- Issuance of a Clean Water Act Section 404 dredge and fill permit by the Army Corps of Engineers (ACOE). (The 404 permit application for the entire 3.2 kilometer (2 mile) corridor will be prepared after the DEIS, when an alternative has been recommended for construction and sufficient design detail is available. This information will be available for the FEIS.)
- The Colorado Department of Health 402 Permit (point source discharge). It will be used as necessary according to the requirements of the permit.
- Review of impacts to fisheries by the Colorado Division of Wildlife (CDOW) as regulated by Senate Bill 40 (S.B. 40).
- National Pollution Discharge Elimination System (NPDES) Stormwater Permit from the Colorado Department of Health.
- Concurrence with the air quality conformity finding for the Preferred Alternative by the Colorado Department of Public Health and Environment.
- Contact and project coordination with the ACOE, including identification and description of wetland areas.
- Construction of bridges over Maroon and Castle Creeks for all build alternatives will be included in the Section 404 permit for State Highway 82 improvements.
- Potential impacts to Park/Recreational Lands - 4(f) Resources are included in **Appendix A: 4(f) Evaluation.**
- Impacts to the Historic - 4(f) Resources are included in **Appendix A: 4(f) Evaluation.**

2. Social Impacts

2a. Neighborhood Impacts

Changes in neighborhood or community cohesion are discussed below by alternatives. These changes include isolation of portions of neighborhoods, generation of new development, changing property values, and the separation of residents from community facilities. Table VI-1a contains a summary of the neighborhood impacts.

Alternatives 2 and 3 - Existing Alignment
Alternatives 2 and 3 follow the existing alignment from the Buttermilk Ski Area to Maroon Creek Road with the exception of Maroon Creek Bridge. There are no neighborhoods in this section and no neighborhood impacts.

Alternative B - Existing Alignment
Alternative B widens the existing alignment from Maroon Creek Road to the intersection of 7th Street and Main Street by adding additional lanes of traffic. This widening will intensify the perception of the neighborhood between Hallam Street and Main Street on 7th Street as a transportation corridor and reduce its desirability as a residential neighborhood. Compared to Alternatives C, D, E, and F, Alternative B will create a greater split between this neighborhood, however, no groups will be isolated or cut off from community facilities by the highway improvements. Currently, 67 households between Maroon Creek Road and the intersection of 7th Street and Main Street are within 30 meters (100 feet) of State Highway 82 pavement. With Alternative B, seven of those households will be relocated, and 34 of the remaining 60 will be at least 25% closer to the widened roadway than they are to the existing roadway. The relocated households will likely be moved to different neighborhoods.

Alternatives C, D, E, and F - Modified Direct Alignment
The modified direct alignment will change the character of the Main Street neighborhood between 7th Street and 8th Street from residential to transportation corridor, by adding four through lanes of traffic where currently there is a local city street ending at 8th Street, with minimal traffic. Two households on Main Street, between Castle Creek and 7th Street, are within 30 meters (100 feet) of State Highway 82. With Alternative C or E in place, nine households in that area will be within 30 meters (100 feet) of the highway. With Alternative D or F, eight households will be within 30 meters (100 feet) of the highway and one household will be relocated. In addition, fifteen households within the area will be at least 25% closer to the modified direct connection highway than they currently are to Main Street.

If Alternatives C, D, E, or F are constructed, the residential neighborhood in the area of Hallam, 7th Street, and Main Street will be enhanced by the removal of State Highway 82 traffic.

Alternative G - Existing Alignment and a Transitway on Modified Direct Alignment
Minimal widening of the existing alignment and construction of a transitway on the modified direct alignment will change the character of both the 7th Street neighborhood between Hallam Street and Main Street and the Main Street neighborhood between 7th Street and 8th Street from a residential area to transportation corridor. Alternative G outlines the neighborhood west and north of the 7th Street and Main Street intersection, isolating it from the City of Aspen. Currently 67 households between Castle Creek Bridge and the intersection of 7th Street and Main Street are within 30 meters (100 feet) of State Highway 82 between Maroon Creek Road and 7th Street and Main Street. With Alternative G, one household will be relocated and 61 households will be located within 30 meters (100 feet) of State Highway 82. In addition, 24 of the 61 households will be 25% closer to State Highway 82 then they are currently.

2b. Relocation and Right-of-Way Impacts

Residential and business relocations are summarized by alternative in Table VI-1b. In addition, general structure takes are also listed in Table VI-1b. The property ownerships and land area affected by the alternatives, are summarized by corridor section in Table VI-2 on page VI-8.

Relocations described in this document are only those in which a structure is actually being taken by road construction. Some residences or businesses may be negatively affected due to their proximity to the widened or realigned State Highway 82. In some cases, right-of-way acquisitions may decrease the value of residences without actually taking them. Acquisitions can also result in parcel remainders that are unusable due to size or shape. This level of impact will be defined in more detail as design plans are finalized for a Preferred Alignment selected through the EIS process. In some cases, the highway alignment may be shifted to avoid or minimize impacts.

It is customary to include family characteristics in relocation studies of this type; however, when there are few displacees, information on race, ethnicity and income levels are not included to protect the privacy of those affected. Their locations are quite easily identified by alternative and no data will be published about the specific characteristics of individuals potentially affected. There is no indication that disproportionately high and adverse human health or environmental effects or minority or low-income populations will result from any of the alternatives under consideration.

The Colorado Department of Transportation (CDOT) will comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (1989). The purpose of this act is to provide for uniform and equitable treatment of all persons displaced from their homes, businesses or farms. All relocatees are given a minimum of 90 days in which to find replacement housing or business locations. All qualified relocatees receive monetary payments, which may include payments for moving expenses, business in lieu of payments, rent supplements, down payments, and increased interest payments.

No person shall be displaced by a federal-aid project unless and until adequate replacement housing has been offered to all affected persons regardless of race, color, religion, sex or national origin.

In addition to full compliance with the Uniform Relocation Assistance Act of 1970, as amended, the CDOT will provide assistance to any eligible owner or tenant in relocating their business or residence at the time of displacement. Benefits under the Act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail in addition to information regarding their financial options.

Table VI-1
Neighborhood and Relocation Impacts Summary

Table VI-1a
Neighborhood Impacts

Alternative	Households within 30 meters (100 feet)
Buttermilk Ski Area to Maroon Creek Road	
Alternative 1	0
Alternative 2	0
Alternative 3	0
Maroon Creek Road to 7th and Main Street	
Alternative A	67
Alternative B	66
Alternative C	9
Alternative D	8
Alternative E	9
Alternative F	8
Alternative G	61

Table VI-1b
Relocation Impacts

	Residential		Business	Structure	TOTAL
	Single Family	Multi-Family			
Buttermilk Ski Area to Maroon Creek Road					
Alternative 1	0	0	0	0	0
Alternative 2	2	0	0	0	2
Alternative 3	2	0	0	0	2
Maroon Creek Road to 7th and Main Street					
Alternative A	0	0	0	0	0
Alternative B	1	1*	3	0	5
Alternative C	1	0	0	1	2
Alternative D	2	0	0	1	3
Alternative E	1	0	0	1	2
Alternative F	2	0	0	1	3
Alternative G	1	0	1	1	3

* This multi-family unit consists of six households.

Pitkin County Housing - Before proceeding with a discussion of potential relocations by corridor section, a summary of the housing situation in Pitkin County follows. Three types of residential relocations may occur: single family residences, apartment units, and mobile homes.

In general, Pitkin County has a housing shortage. Not only is there a shortage of housing units of all types, but there is also a shortage of immediately developable land. While a large number of housing units have been planned for development in Aspen and areas downvalley, there is limited affordable housing available at this time.

Currently, the Aspen area housing market is in a state of flux. There are a number of potential sites for development in the project corridor, but at this time none are available. Development of these sites is dependent upon the interest and cooperation of the land owners and the support of the community.

Last resort housing can be provided as a part of the State Highway 82 project itself. Where the standard relocation reimbursements are insufficient or where there is an absence of available housing, last resort housing funds can be provided or the construction of replacement housing can be included within the budget of this highway project; however, there has to be a place to locate such housing. Considering the housing shortage and average cost of a home in Aspen (over $1 million), relocations ranked very high among the factors for consideration in the alternative selection process. Pitkin County has expressed its willingness to work with the State on this very sensitive problem.

The acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and all other applicable laws and regulations. Relocation resources will be available to all residential and business relocatees without discrimination.

Buttermilk Ski Area to Maroon Creek Road - To minimize impacts to the Aspen City Golf Course, Alternatives 2 and 3 require relocation of two residences south of existing State Highway 82 near the east end of Maroon Creek Bridge. Both alternatives result in impacts to an existing ballfield north of the highway and immediately east of Maroon Creek. Alternative 3, (with the transit envelope) increases the chance that the ballfield will be relocated and not just shifted to the north. With the transit envelope added to the bridge, the alignment of the bridge structure is shifted to the north and further encroaches upon the ballfield. The golf course is also affected more by Alternative 3 than Alternative 2. A total of 1.2 hectares (3.0 acres) of golf course land is taken by right-of-way for Alternative 2, compared to 1.4 hectares (3.5 acres) for Alternative 3 (Table VI-2). The total right-of-way required for Alternatives 2 and 3 is 5.1 hectares (12.9 acres) and 6.7 hectares (17.0 acres) respectively. In general, Alternative 3 has more right-of-way acquisition than Alternative 2 for all properties in this corridor section.

Maroon Creek Road to 7th Street and Main Street - Alternative B results in the relocation of three business and seven residences (one single family and one multifamily). The residences are located at the east end of the existing Castle Creek bridge, one on the south side of State Highway 82 (multi-family), and the other beneath the bridge in the Castle Creek Valley (single family).

Alternatives C and E require the relocation of one residence and one general building structure. The residence is referred to as the Berger Cabin, and is located on the far west end of Main Street. The general structure taken by the right-of-way is a maintenance and storage shed for the Holden Museum.

Of the alternatives crossing the Marolt-Thomas property, Alternative E requires the least new right-of-way, 2.1 hectares (5.4 acres). The cut and cover option of Alternative E gives back 0.8 hectares (2.0 acres) to the open space property. This is the difference between the right-of-way acquisition for Alternative C, 2.9 hectares (7.4 acres) and E, 2.1 hectares (5.4 acres) Alternatives D and F are similar to Alternatives C and E, except for the addition of a separate transit envelope. These alternatives require the same relocations as Alternatives C and E; however, the separate transit envelope requires an additional residence to be relocated. The residence is located on the southwest corner of 7th Street and Main Street.

Alternative D requires the acquisition of 3.3 hectares (8.4 acres) of new right-of-way. The cut and cover section of Alternative F returns 0.8 hectares (2.2 acres) of the right-of-way acquisition back to the open space property. The total right-of-way needed for Alternative F on the Marolt-Thomas property is 2.5 hectares (6.2 acres).

The general lanes of Alternative G will remain in the existing right-of-way to the extent possible. The general lane alignment will require the taking of one business on the northeast corner of 7th Street and Main Street. The right-of-way take for the restricted lanes is based on a 35 meter (115 feet) right-of-way across the Marolt-Thomas property. The total take of the Marolt-Thomas property for the restricted lanes is 2.0 hectares (4.9 acres). The alignment will displace the Berger Cabin because of right-of-way encroachment onto the Berger property. The total right-of-way acquisition for Alternative G is 2.2 hectares (5.4 acres).

Table VI-2
Right-of-Way Acquisition Impacts*
Hectares (Acres)

Property Ownership	Project Corridor Segment							
	Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th and Main Street					
	Alternative							
	2	3	B	C	D	E	F	G
General ROW west of Maroon Creek Road	2.1 (5.3)	3.0 (7.6)						
Zoline Open Space	1.2 (3.0)	1.4 (3.5)						
Moore Open Space	0.6 (1.6)	0.9 (2.4)						
- *Easement*	*0.5 (1.3)*	*0.8 (2.0)*						
- *Non-Easement*	*0.1 (0.2)*	*0.1 (0.4)*						
Golf Course	1.2 (3.0)	1.4 (3.5)						
- *Improved (Fields)*	*0.4 (0.9)*	*0.5 (1.1)*						
- *Unimproved (M.C.)*	*0.8 (2.1)*	*0.9 (2.4)*						
Marolt-Thomas			1.2 (3.0)	2.6 (6.5)	2.9 (7.3)	1.8 (4.5)	2.0 (5.1)	2.0 (4.9)
- *Old Midland*			*0.1 (0.3)*	*0.1 (0.3)*	*0.2 (0.4)*	*0.1 (0.3)*	*0.1(0.4)*	*0.1 (0.3)*
- *Thomas Only*			*0.7 (1.7)*	*1.2 (3.0)*	*1.4 (3.5)*	*1.1 (2.7)*	*1.3 (3.2)*	*1.0 (2.5)*
- *Road Plats*			*0.1 (0.2)*	*1.0 (2.4)*	*1.0 (2.5)*	*0.4 (0.7)*	*0.4 (1.0)*	*0.7 (1.7)*
- *Marolt Only*			*0.3 (0.8)*	*0.3 (0.8)*	*0.4 (1.0)*	*0.2 (0.5)*	*0.2 (0.6)*	*0.2 (0.4)*
General ROW Maroon Creek Rd to Castle Creek Bridge			0	0.3 (0.8)	0.4 (1.0)	0.3 (0.8)	0.4 (1.0)	0.2 (0.4)
Bugsy Barnard Park			0	0	0	0	0	0
Historic Properties			0	0.04 (0.1)	0.04 (0.1)	0.04 (0.1)	0.04 (0.1)	0.02 (0.05)
- *920 Hallam Street*				*0*	*0*	*0*	*0*	*0*
- *834 Hallam Street*				*0*	*0*	*0*	*0*	*0*
- *Berger Cabin*				*0.04 (0.1)*	*0.04 (0.1)*	*0.04 (0.1)*	*0.04 (0.1)*	*0.02 (0.05)*
General ROW east of Castle Creek Bridge			0.2 (0.6)	0	0	0	0	0.01 (0.03)
Returned SH 82 ROW			0	0.4 (1.1)	0.4 (1.1)	0.4 (1.1)	0.4 (1.1)	0
Structure Acquisition	2	2	5	2	3	2	3	3
Relocations: Household (H); Business (B)	2 (H)	2 (H)	7(H) 3(B)	1 (H)	2 (H)	1 (H)	2 (H)	1(H) 1 (B)
TOTAL ROW	**5.1 (12.9)**	**6.7(17.0)**	**1.4 (3.6)**	**2.9 (7.4)**	**3.3 (8.4)**	**2.1 (5.4)**	**2.5 (6.2)**	**2.2 (5.4)**

* does not include space required for multimodal facilities.

2c. Recreational Impacts

The Colorado Department of Transportation will replace all pedestrian and/or bicycle paths that are impacted by State Highway 82 improvements. Relocation and replacement of existing trails are required for all build alternatives at the west end of the City Golf Course property.

Alternatives 2 and 3 - Existing Alignment

Widening the existing alignment from Buttermilk Ski Area to Maroon Creek Road will create an impact on the existing pedestrian/bicycle trails. Alternative 2 will take approximately 768 meters (2,518 feet) from the Airport Business Center Trail, 26 meters (85 feet) from the Moore Nordic Trail, and 37 meters (120 feet) from the Maroon Creek Nordic Trail. Alternative 3 requires approximately 774 meters (2,538 feet) of the Airport Business Center Trail, 26 meters (85 feet) from the Maroon Nordic Trail, and 37 meters (120 feet) from the Maroon Creek Nordic Trail.

Alternative B - Existing Alignment

Widening the existing alignment requires relocation of approximately 611 meters (2,005 feet) of existing trail on the Marolt-Thomas Property (the High School Bike Path) adjacent to the existing highway. Also, the existing sidewalks on Hallam Street, 7th Street, and Main Street will require replacement.

Alternatives C, D, E & F - Modified Direct Alignment

The modified direct alignment requires the replacement of several trails located on the Marolt-Thomas Property. Alternatives C and E would require the taking of 311 meters (1,020 feet) from the High School Bike Path, 102 meters (335 feet) from the Marolt Trail, and 152 meters (500 feet) from the Thomas/Marolt Nordic Trail. Alternatives D and F would require the taking of 320 meters (1,050 feet) from the High School Bike Path, 126 meters (415 feet) from the Marolt Trail, and 164 meters (540 feet) from the Thomas/Marolt Nordic Trail.

Alternative G - Existing Alignment and Transitway on Modified Direct Alignment

Improving the existing alignment and constructing a transitway across the Marolt-Thomas property will impact approximately 404 meters (1,325 feet) of the Aspen Trail System. This includes 280 meters (920 feet) of the High School Bike Path, 87 meters (285 feet) of the Thomas/Marolt Nordic Trail, and 37 meters (120 feet) of the Marolt Trail.

2d. Impacts on Travel Patterns and Access

Changes in local access and travel patterns are noted below by alternatives.

Alternatives 2 and 3

In general, these two alternatives will not impact the existing travel patterns. East of Maroon Creek Bridge the cross section includes a narrow median and curb and gutter. Median breaks and turning lanes will be provided to access properties on either side of the roadway. The properties include the Aspen City Golf Course and the Aspen Tennis Club subdivision. West of Maroon Creek Bridge a narrow median with a center barrier and a shoulder cross section is present. Breaks in the median for turn lanes will be provided and access to adjacent properties will not differ from the existing.

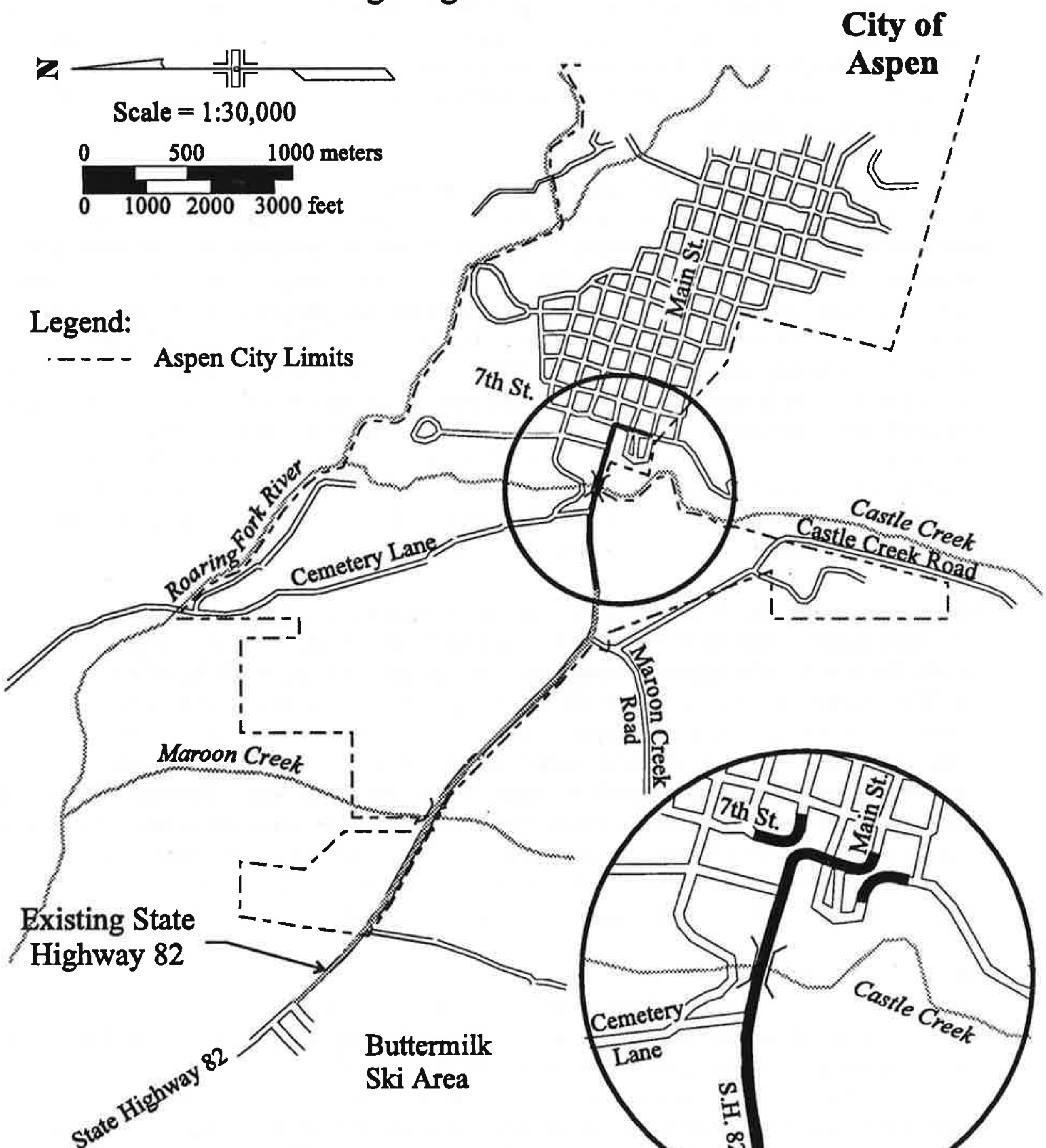
Alternative B - Existing Alignment
To maintain an adequate level of service on the highway, widening the existing alignment requires the elimination of side street access to State Highway 82 at the intersections of 7th and Hallam and 7th and Main, as shown in Figure VI-1. Access to State Highway 82 from the Aspen Meadows area located northeast of Castle Creek Bridge will be from 8th Street. The barrier separating State Highway 82 and the side streets will be mountable to provide emergency access only. Access to the Aspen Villas would be from either Bleeker Street at 7th Street or from 6th Street at Main Street.

Alternatives C, D, E, and F - Modified Direct Alignment
The existing S-curves will remain as a local street. The portion of existing State Highway 82 between Cemetery Lane and Maroon Creek Road may be removed and the right-of-way converted to open space (Figure VI-2). Cemetery Lane traffic headed downvalley would travel via 7th Street and the new alignment across the Marolt-Thomas property. This out-of-direction travel for the Cemetery Lane traffic and the State Highway 82 traffic heading to Cemetery Lane would account for approximately 6 percent of the total entering traffic at the existing intersection. This is less than one-half of one percent of the total VMT in the Aspen non-attainment area. Alternatives C, D, E, and F would also cut off 8th Street at Main Street. The access to the Aspen Villas would be from Bleeker Street at 7th Street. The Main Street connection from 8th Street to 7th Street would be removed. 8th Street between Bleeker and Main Street would end in a cul-de-sac at Main Street. The existing traffic volume in this area is low and impacts are not expected to be significant.

Alternative G -Existing Alignment and Transitway on Modified Direct Alignment
The travel patterns near State Highway 82 will change as a result of the closure of one-half of the 7th Street and Hallam Street intersection and the closure of the south leg of the 7th Street and Main Street intersection. Also, the north leg of the intersection of 8th Street and Main Street will be closed to eliminate general traffic access to the transitway (see Figure VI-3). Some out of direction travel will be expected with the closure of these access points, however, the overall impact on the system will be insignificant. Access to State Highway 82 from the Aspen Meadows area northeast of Castle Creek Bridge will be from 8th Street. The barrier separating State Highway 82 and the side streets will be mountable for emergency access only. Access to the Aspen Villas would be from 7th Street at Bleeker Street. Access to 7th Street south of Main Street would be from Main Street at 6th Street.

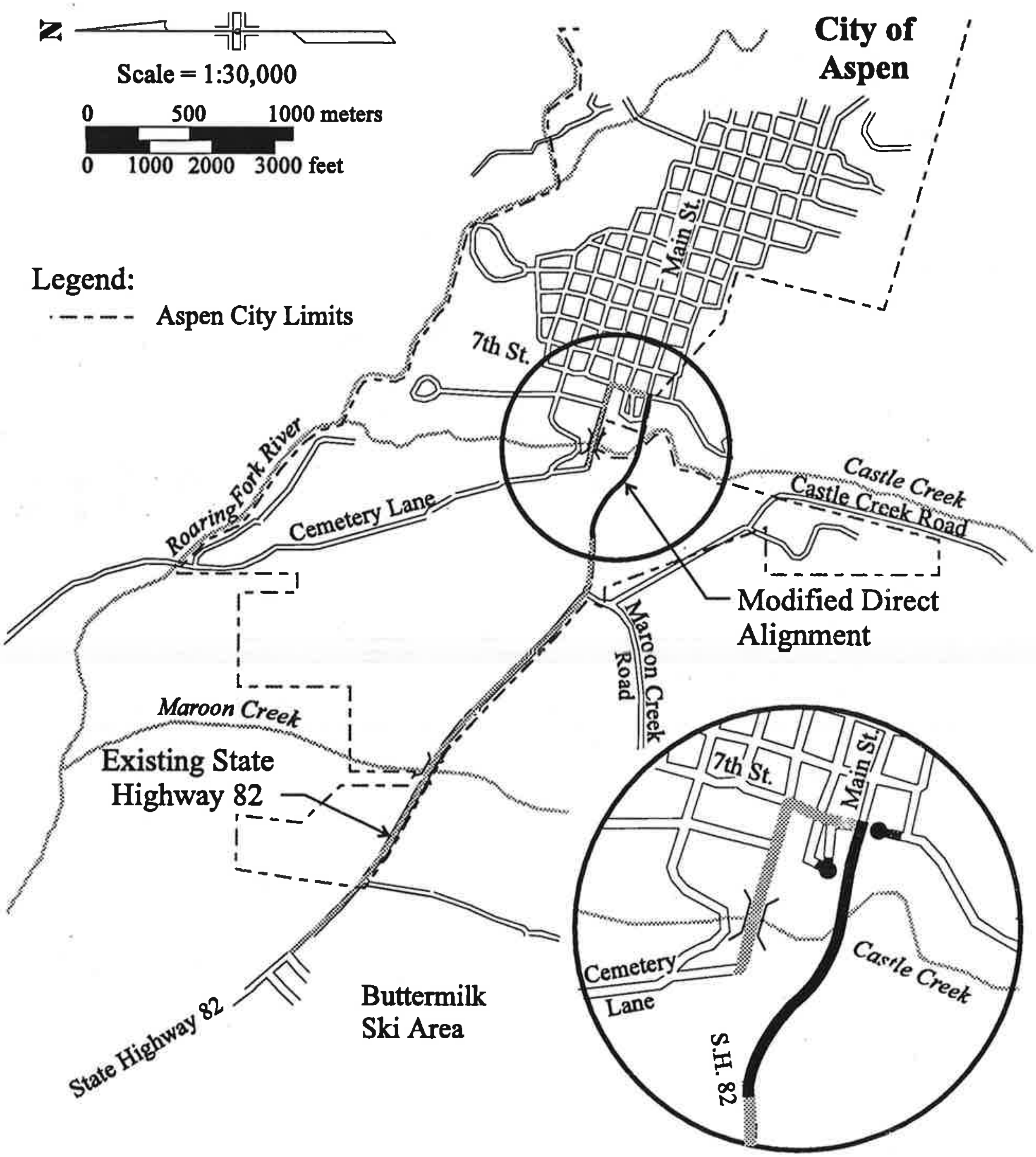
2e. Public Safety Impacts
All users of State Highway 82 will benefit from the improved safety of a new, modernized facility. All build alternatives improve traffic safety through the addition of shoulders, flatter slopes, and better curve geometry. Some portions of the four-lane alignments (Alternatives B, C, D, E, and F) under study will provide other safety features including wide and naturally vegetated medians or concrete median barriers, and intersection turn lanes. Police, fire, and emergency response time will also improve due to reduced congestion on an improved State Highway 82 transportation corridor.

Figure VI-1
State Highway 82 Entrance to Aspen
Existing Alignment - Alternative B



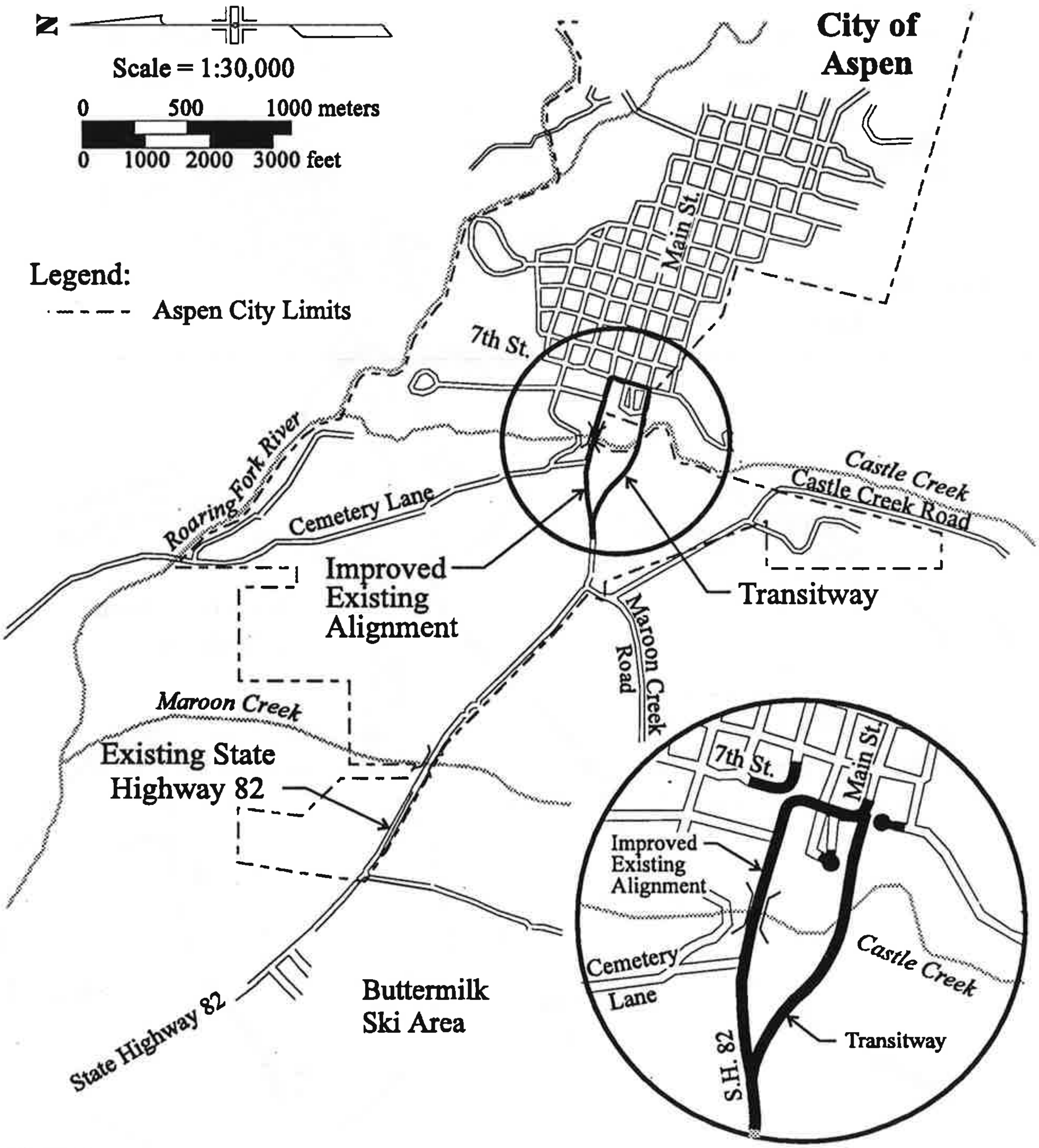
EXIST.CDR

Figure VI-2
State Highway 82 Entrance to Aspen
Modified Direct Alignment - Alternatives C, D, E, and F



MODIFIED.CDR

Figure VI-3
State Highway 82 Entrance to Aspen
Improved Existing Alignment and Transitway
across Marolt-Thomas Property - Alternative G



EXI&TRAN.CDR

The existing S-curves on Hallam, 7th, and Main Streets at the entrance to Aspen will be improved with Alternatives B and G. However, since these curves still exist the accident rate on these curves is expected to be higher than the State Highway 82 average. For the modified direct alignment (Alternatives C, D, E, and F), these curves no longer exist on State Highway 82, therefore, a lower accident rate is expected. Alternatives C, D, E, F, and G also provide a second emergency access across Castle Creek.

2f. Land Use Impacts

The proposed build alternatives for State Highway 82 Entrance to Aspen DEIS will not create significant land use changes. The Pitkin County Growth Management Plan, the Aspen Plan, the people of Aspen, and market forces based on Aspen's worldwide popularity will determine the future development of land in the Entrance to Aspen corridor and Pitkin County. The land use areas that will be affected by the build alternatives include:

- Open Space
- Open Space/Recreational/Parks

Alternatives C, D, E, F, and G require a larger portion of existing open space than the other alternatives. See **Section C.4.m: 4(f) Impacts** for a complete discussion on this impact.

The zoning areas affected include:

- Agriculture/Forestry (AF-2) - Moderate density housing, historic housing concentrations.
- Single Family Residential (R-15) - minimum 1,377 square meters (15,000 square feet) lot size.
- Single Family Residential (R-30) - minimum 2,755 square meters (30,000 square feet) lot size.

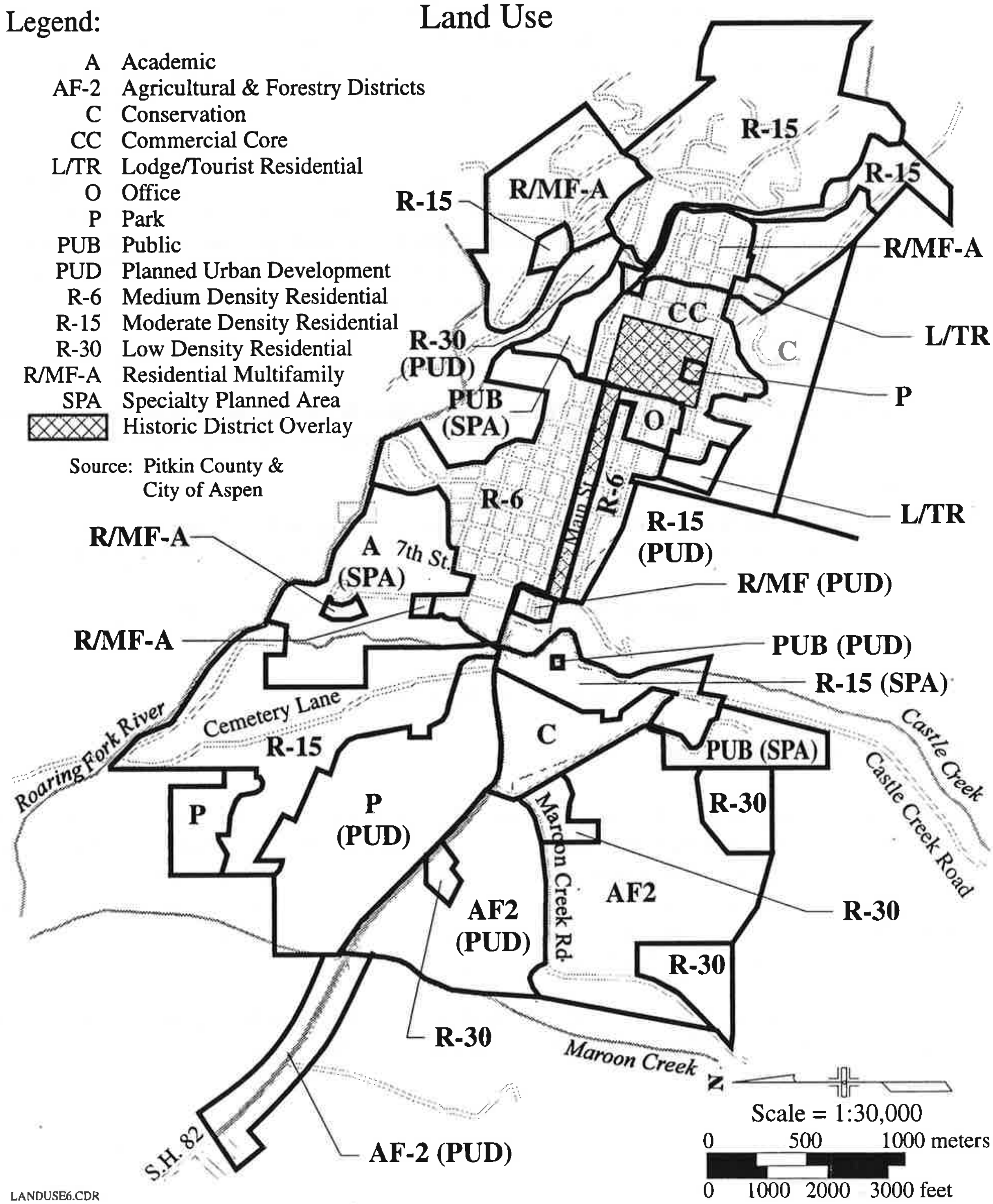
Land use and zoning districts are shown on Figure VI-4.

3. Economic Impacts

Acquisition of private property for State Highway 82 right-of-way will reduce county tax revenues. Highway improvements, however, directly create construction jobs. An improved transportation corridor will also support increases in retail sales, sales tax revenue, and service employment in Pitkin County's resort economy. Additionally, because the majority of Aspen's consumer goods are delivered by trucks, an improved transportation corridor may reduce the pollution and lower consumer costs by expediting the deliver of their goods.

For the build alternatives, businesses along the widened State Highway 82 between Buttermilk Ski Area and Maroon Creek will benefit from reduced traffic congestion and additional laneage.

Figure VI-4
State Highway 82 Entrance to Aspen
Land Use



Alternative B displaces the Christian Science Reading Room and the Hickory House Restaurant at the intersection of 7th Street and Main Street, in addition to the removal of the southeast wing of the Bavarian Inn nearby. Alternatives C, D, E, and F require no business relocations at the Entrance to Aspen. Alternative G displaces the Christian Science Reading Room on the northeast corner of 7th Street and Main Street.

4. Physical Impacts

4a. Air Quality Impacts

The 1990 Clean Air Act Amendments (CAAA) require that transportation projects within a nonattainment area will not: (1) cause or contribute to a violation of federal air quality standards; (2) increase the frequency or severity of any existing violations of any standards; and, (3) delay attainment of any standard. The 1993 Air Quality Conformity Final Rule (published 11/24/93 in Federal Register Notice 58FR62188) provides the criteria for establishing a conformity finding. The Preferred Alternative which will be identified in the FEIS must demonstrate air quality conformity.

As discussed in **Chapter V: Future Transportation Demand**, eight general scenarios were modeled in the transportation demand model developed for this DEIS. From these models the emission levels of PM_{10} for each scenario were calculated. As previously explained the modeled scenarios are not the same as the alternatives evaluated in the DEIS. The majority of the modeled scenarios were evaluated due to public interest, requests from the City of Aspen, and to establish a range of options for comparison to the Base Case Scenario (No-Action Alternative).

The modeled scenarios are listed below with a more complete description in **Section V.A.4: Modeled Scenarios.**

Scenario	Description
A	Base Case Scenario.
B	Unrestricted four lanes across the Marolt-Thomas property or along existing S-curves alignment.
C	Two lanes plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property or along the existing S-curves alignment.
D	Two lanes plus a light rail transitway across the Marolt-Thomas property (D1) without a transfer to a multimodal center or (D2) with a transfer to a multimodal center.
E	Two improved lanes on the existing State Highway 82 plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property.
F	Two improved lanes on the existing State Highway 82 plus a light rail transitway across the Marolt-Thomas property (F1) without a transfer to a multimodal center or (F2) with a transfer to a multimodal center.
G	Existing State Highway 82 (no improvements) plus two dedicated vehicle and/or transit lanes across the Marolt-Thomas property.
H	Two improved lanes on the existing State Highway 82 plus a bus-only transitway across the Marolt-Thomas property.

Table VI-3 shows the alternatives evaluated in the DEIS. **Section III.E.: Alternatives Evaluated** has a complete description of each alternative.

Table VI-3
Methodology for Naming the Alternatives

Corridor Section	Number/ Letter	Alternative
Buttermilk Ski Area to Maroon Creek Road	1	No-Action
	* 2	Existing Alignment
	* 3	Existing Alignment with Separate Transit Envelope
Maroon Creek Road to 7th Street and Main Street	A	No-Action
	* B	Existing Alignment
	* C	Modified Direct Alignment At-Grade
	* D	Modified Direct Alignment, At-Grade, with Separate Transit Envelope
	* E	Modified Direct, Cut and Cover
	* F	Modified Direct, Cut and Cover, with Separate Transit Envelope
	** G	Two Improved Lanes on Existing Alignment and Transit-way on the Modified Direct Alignment, At-Grade

* These alternatives consist of two general traffic lanes plus two dedicated vehicle and/or transit lanes.
** The transitway for Alternative G is for transit vehicles only and does not include carpools.

Five of the modeled scenarios are representative of alternatives evaluated in the DEIS: Scenario A, Scenario C, Scenario D, Scenario F, and Scenario H. Table VI-4 shows this comparison between the modeled scenarios and the alternatives evaluated. Scenario A represents the No-Action Alternative. Scenario C represents the laneage and mode options described as two lanes plus two dedicated vehicle and/or transit lanes (excluding LRT), without regard to the alignment or profile options. Scenario D represents the two lanes plus LRT across the Marolt-Thomas property without regard to the profile option. Scenario F represents two lanes on an improved existing State Highway 82 plus LRT across the Marolt-Thomas property. Scenario H represents two lanes on an improved existing State Highway 82 plus a bus-only transitway across the Marolt-Thomas property.

The 2015 PM_{10} emission levels are calculated by multiplying forecasted VMT by an emission factor. The emission factor varies depending on the facility type and/or sanding practice (a complete description of this analysis is included in the ***Air Quality Technical Report).***

Table VI-4
Comparison of Modeled Scenarios and Alternatives Evaluated

Scenarios Modeled	ALTERNATIVES EVALUATED IN THE DEIS													
	Corridor Section										Mode Options for Dedicated Vehicle and/or Transit Lanes			
	Buttermilk Ski Area to Maroon Creek Road			Maroon Creek Road to 7th Street and Main Street										
	1	2	3	A	B	C	D	E	F	G	HOV	Buses	LRT	Elect. Trolley
A	X			X										
B														
C		X	X		X	X	X	X	X		X	X		X
D		X	X			X	X	X	X				X	
E														
F		X	X							X			X	
G														
H		X	X							X		X		

Note: An **X** indicates that the scenario is representative of the Alternative.

For purposes of brevity, only the emission levels of Scenarios A, C, D, F, and H are explained in this section. For comparative purposes with Scenario D, Scenario C uses the modified direct alignment and not the existing S-curves alignment. If the existing S-curves horizontal alignment was used for Scenario C, the emissions levels would increase approximately 0.6 percent. These five scenarios include all alternatives evaluated in the DEIS.

The conformity rule places a ceiling on emissions under which the Preferred Alternative must fall. The emission ceiling is called the motor vehicle emissions budget and is specified in the State Implementation Plan (SIP). This emissions budget applies as a ceiling on emissions for the year 1997 and all subsequent years, until the SIP is revised with a new emissions budget. Under no circumstances may a major transportation project be approved if the motor vehicle emissions predicted in a conformity finding exceed the emissions budget. This fact limits the transportation options available in the Aspen Area. The PM_{10} emissions levels for the four scenarios are listed below. The applicable 1997 emissions budget is 6,337 kg/day (13,974 lbs/day).

	Forecasted 2015 Emissions (High Growth Scenario)	
Scenario	*kg/day*	*lbs/day*
A	9,885	21,797
C	9,557	21,073
D	9,519	20,989
F	9,617	21,207
H	9,558	21,076

These emission calculations assume that the measures committed to in the SIP remain in place, but assume no other change in sanding practice or in TM. Under these conditions, all of the scenarios exceed the budget. Additional opportunities are available which would reduce these emission levels below the 1997 emissions budget. These include some combination of reduced sanding on State Highway 82 outside of the city limits, reduced sanding within Aspen (Aspen currently uses chemical deicers on Main Street), and TM measures. Another option is to revise the existing emissions budget.

These issues raise four questions which must be determined before the conformity finding can be developed for the Preferred Alternative in the FEIS.

1. To what extent can sanding be reduced on State Highway 82 outside the city limits?
2. Is the City of Aspen willing to commit to continue its current practice of no sanding (minimum sanding) on State Highway 82 within the city limits?
3. What level of TM is acceptable to the community?
4. Is the community willing to increase the PM_{10} emissions budget, and if so, to what level?

Tables IV-5a and VI-5b show the different emission levels associated with Scenarios A, C, D, F and H in relationship to the possible changes in sanding on State Highway 82 and TM options identified in **Chapter II: Transportation Management**.

The Conformity Regulation requires that regional transportation emissions associated with the proposed action over the next 20 years be less than the emission budget identified in the SIP. All of the build alternatives will result in improved air quality over the No-Action Alternative.

Table VI-5a (Metric Units)
PM_{10} Emission (Kilograms/day)
Year 2015 High Growth Scenario

Base Case TM Program						
SH-82 Outside Aspen:	0% Reduction		40% Reduction		80% Reduction	
SH-82 Inside Aspen:	Sanding	No Sanding*	Sanding	No Sanding*	Sanding	No Sanding*
Scenario A	9,885	9,037	8,631	7,783	7,193	6,345
Scenario C	9,557	8,771	8,343	7,557	6,951	6,166
Scenario D	9,597	8,809	8,378	7,589	6,979	6,190
Scenario F	9,617	8,788	8,406	7,577	7,016	6,187
Scenario H	9,558	8,734	8,356	7,531	6,978	6,153
Moderate TM Program						
SH-82 Outside Aspen:	0% Reduction		40% Reduction		80% Reduction	
SH-82 Inside Aspen:	Sanding	No Sanding	Sanding	No Sanding	Sanding	No Sanding
Scenario A	9,885	9,037	8,631	7,783	7,193	6,345
Scenario C	8,258	7,578	7,209	6,530	6,006	5,327
Scenario D	8,242	7,565	7,195	6,517	5,993	5,316
Scenario F	8,255	7,544	7,215	6,504	6,022	5,311
Scenario H	8,220	7,511	7,186	6,476	6,001	5,291
Aggressive TM Program						
SH-82 Outside Aspen:	0% Reduction		40% Reduction		80% Reduction	
SH-82 Inside Aspen:	Sanding	No Sanding	Sanding	No Sanding	Sanding	No Sanding
Scenario A	9,885	9,037	8,631	7,783	7,193	6,345
Scenario C	6,307	5,789	5,507	4,988	4,588	4,069
Scenario D	6,236	5,723	5,443	4,931	4,538	4,022
Scenario F	6,239	5,701	5,453	4,915	4,551	4,014
Scenario H	6,212	5,677	5,432	4,895	4,536	3,499

*NOTE: * No sanding (minimum sanding) is the existing policy of the City of Aspen that refers to the use of chemical deicers instead of sand. The emissions budget for the entire non-attainment area (both on and off State Highway 82) for 1997 is 6,337 kg/day. Values in the shaded boxes signify levels that meet the conformity requirements. For additional analysis refer to the* ***Air Quality Technical Report.***

Table VI-5b (English Units)
PM_{10} Emission (lbs/day)
Year 2015 High Growth Scenario

Base Case TM Program						
SH-82 Outside Aspen:	0% Reduction		40% Reduction		80% Reduction	
SH-82 Inside Aspen:	Sanding	No Sanding*	Sanding	No Sanding*	Sanding	No Sanding*
Scenario A	21,797	19,927	19,031	17,162	15,860	13,990
Scenario C	21,073	19,340	18,397	16,664	15,328	13,595
Scenario D	21,163	19,423	18,473	16,733	15,389	13,649
Scenario F	21,207	19,379	18,535	16,707	15,470	13,643
Scenario H	21,076	19,259	18,426	16,606	15,387	13,567
Moderate TM Program						
SH-82 Outside Aspen:	0% Reduction		40% Reduction		80% Reduction	
SH-82 Inside Aspen:	Sanding	No Sanding	Sanding	No Sanding	Sanding	No Sanding
Scenario A	21,797	19,927	19,031	17,162	15,860	13,990
Scenario C	18,208	16,710	15,895	14,398	13,244	11,746
Scenario D	18,174	16,680	15,864	14,370	13,215	11,721
Scenario F	18,203	16,634	15,910	14,341	13,279	11,711
Scenario H	18,125	16,563	15,846	14,281	13,233	11,668
Aggressive TM Program						
SH-82 Outside Aspen:	0% Reduction		40% Reduction		80% Reduction	
SH-82 Inside Aspen:	Sanding	No Sanding	Sanding	No Sanding	Sanding	No Sanding
Scenario A	21,797	19,927	19,031	17,162	15,860	13,990
Scenario C	13,909	12,765	12,143	10,999	10,117	8,973
Scenario D	13,750	12,619	12,002	10,872	9,999	8,868
Scenario F	13,758	12,572	12,024	10,838	10,036	8,851
Scenario H	13,699	12,518	11,977	10,794	10,002	8,819

*NOTE: * No sanding (minimum sanding) is the existing policy of the City of Aspen that refers to the use of chemical deicers instead of sand. The emissions budget for the entire non-attainment area (both on and off State Highway 82) for 1997 is 13,974 lbs/day. Values in shaded boxes signify levels that meet the conformity requirements. For additional analysis refer to **Air Quality Technical Report.***

4b. *Water Quality Impacts*

Potential water quality impacts are associated with bridges over Maroon Creek and Castle Creek. Operation and maintenance activities may also result in water quality impacts, however, the exposure of surface water to these sources is limited.

Construction related impacts to surface water quality result from erosion by surface runoff or stream flows; spills, oils, solvents and other pollutants; discharges from dewatering systems; and application of fertilizers, pesticides, and herbicides during construction. Operation and maintenance impacts result from buildup of pollutants on the highway surface from atmospheric and traffic deposition and from maintenance activities such as spraying chemicals to control vegetation or spreading sand and salt to control ice and snow. Long-term impacts would occur during surface runoff or snowmelt periods when a mechanism is available to transport the pollutants to adjacent water bodies.

Construction Impacts - All build alternatives involve the construction associated with bridges over Maroon Creek and Castle Creek. During construction of footings, especially within areas bordering the streams, sediment discharges may slightly increase both the suspended solids and turbidity downstream from the discharge. Sediment discharge impacts include loss of beauty because the stream becomes turbid, deposition of sediment in the stream bed which is unsightly and may adversely affect trout spawning areas, and an increase in soluble constituents that may be attached to the sediment. CDOT will use current best management practices (BMP) to reduce erosion and sedimentation within the construction area and as required with the NPDES stormwater permits for the project.

Spills could involve many different undesirable materials, however, construction-related spills would most likely involve gasoline, diesel fuel, engine oils, and form oil. Usually, construction-related spills are small, but even small spills in or adjacent to a stream can have an adverse impact on water quality. At a minimum, such spills would create a surface sheen on the water and coat vegetation and rocks on the shoreline. A large spill could cause substantial wildlife mortality.

The Colorado State Patrol is the Designated Emergency Response Authority (DERA) for hazardous substance incidents for all federal, state, and county highways in Colorado. The State Patrol has a network of 36 people throughout the state who are trained to respond to hazardous waste emergencies. It is the contractor's responsibility to clean up and remediate spills to the satisfaction of the DERA, local health agencies, and CDOT. The State Patrol will respond to any spills of hazardous waste that could not be controlled by contractors during construction of State Highway 82 improvements.

Operation and Maintenance Impacts - The Federal Highway Administration (Federal Highway Administration, 1984) has catalogued the following expected highway runoff constituents:

- Particulates (suspended solids)*
- Nutrients (nitrogen and phosphorus compounds)
- Lead*
- Zinc*
- Iron*
- Copper*
- Cadmium*
- Chromium
- Nickel
- Manganese
- Bromide
- Cyanide (anticake chemical in salt)*
- Sodium and Calcium Chloride
- Chloride
- Sulfate
- Petroleum Compounds*
- Polychlorinated biphenyls (PCBs)
- Pesticides*
- Organic Priority Pollutants
- Pathogens
- Rubber*

* *Pollutants of primary concern for State Highway 82 improvements*

Nutrient buildup is not considered a primary problem because the nearest water impoundment is several hundred kilometers downstream of the study corridor. The chromium, nickel, manganese, bromide, chloride, sulfate, pathogens, and sodium and calcium chloride salts are not expected to create water quality problems because the ambient levels of those parameters are substantially below the applicable standards. The PCBs and organic priority pollutants are not likely to be problems resulting from normal use and maintenance, but they are possible runoff constituents resulting from a hazardous waste spill. In general, the comparatively small amount of pollutants collected on highway surfaces compared to the runoff and flow volume within the Castle Creek and Maroon Creek drainages limit the likelihood that the constituents of snowmelt and precipitation runoff could result in water quality impacts within the project area.

Winter Runoff Constituents - The water quality impacts associated with applying sand and salt to provide traction and to control snow and ice on the highway during the winter is difficult to assess. Since the amount of sand and salt applied is a function of the road surface area, the doubling of the pavement surface area from widening the highway should approximately double the amount of sand and salt applied each winter. That material would probably remain on the roadway surface or in snow windrows on each side of the travelled lanes until warmer temperatures cause snowmelt runoff. Since snowmelt velocities are usually low, the sand would generally remain in the windrow area. Salt, however, is highly soluble and would be carried by the runoff into the creeks and ultimately into the Roaring Fork River. The sodium, calcium, chloride, and salinity levels in the Roaring Fork River and its tributaries within the study corridor are very low, so there is little likelihood of violating standards. CDOT currently sands State Highway 82 in the study corridor with a low-salt mixture. Continuation of this practice would help minimize potential salt impacts. Furthermore, since the paved surface of the widened highway under study is such a small portion of the drainage basin and since the highway snowmelt runoff would occur when large portions of the basin are also experiencing snowmelt, it is very improbable that the impacts of highway runoff would be significant.

Comparison of Alternatives - In general, all build alternatives have nearly the same impact on the area's water quality. A temporary increase in sediment is likely during construction activities. However, the extent of the increase in sediment should not be significant with the implementation of BMPs currently in use by CDOT. Significant impacts from operation and maintenance activities are not anticipated because of the relatively high flow volumes within the creeks during times when pollutants of concern would be expected to be constituents of highway runoff.

4c. Impacts on Upland and Floodplain Vegetation

All build alternatives would result in permanent replacement of existing vegetated areas with pavement. Additional areas within the highway right-of-way would be disturbed during construction. This would predominantly result in the disturbance of grasses and irrigated pasture currently established along the highway right-of-way. Riparian vegetation would be affected for the long-term only in the immediate vicinity of any bridge footings that would need to be installed; these impacts are discussed in detail under **Section VI.B.6: Wetland Impacts.**

All build alternatives create an impact on upland and floodplain vegetation. Alternatives C, D, E, F, and G (those with the modified direct alignment) would result in the disturbance of irrigated pasture through the construction phase. Alternatives C, D, and G (those with an at-grade profile) would result in the permanent loss of pasture. Alternatives E and F (those with a cut-and-cover profile) would result in the partial re-establishment of some type of vegetation, depending on the ultimate land use of the area following construction.

Alternative B, which widens the existing S-curves, would result in the disturbance of right-of-way vegetation.

Mitigation measures for all build alternatives would include revegetation of disturbed upland areas with dryland shrubs and grasses similar to the species removed during construction. In riparian zones and wetlands, special seed mixes would be used which have been developed for riparian and wetland areas. Displaced trees and shrubs will be replaced, preferably with stock from other disturbed areas.

4d. Wetland Impacts

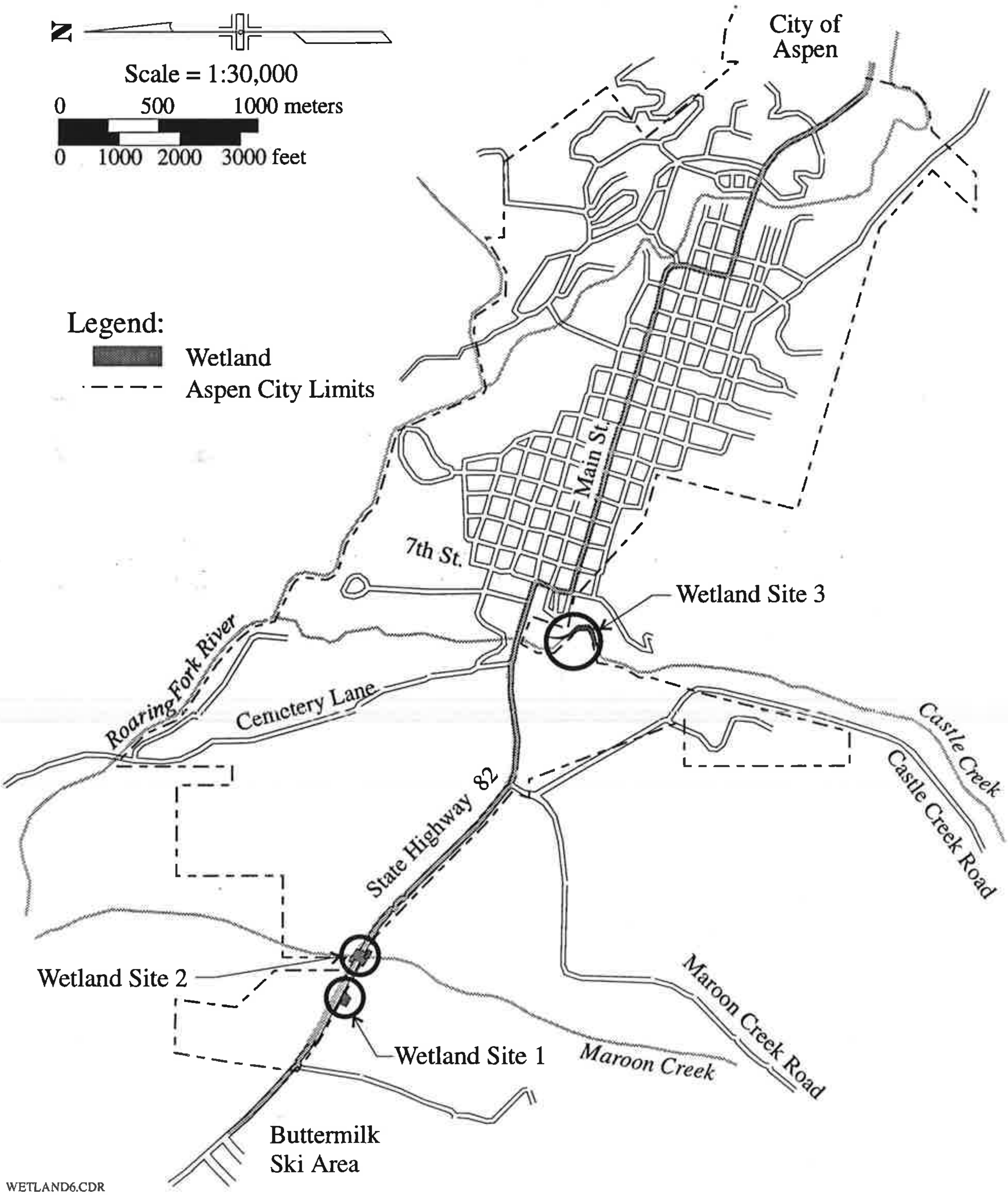
All wetlands identified in the State Highway 82 study corridor primarily perform the water purification and primary production functions described in **Section IV.C.4: Wetlands.** Primary and secondary impacts to wetlands would occur from construction-related activities. The extent of primary impacts (direct loss) was estimated from field observations in August, 1994. Estimates of primary impacts are based on the likely limits of roadway construction. Wetland locations are indicated in Figure VI-5.

Secondary impacts resulting from highway construction may include:

- Temporary or permanent influx of pollutants into wetlands resulting from unfiltered highway runoff.
- Temporary or permanent sediment influx resulting from denuded cut slopes or newly constructed fill slopes.
- Temporary damage to wetland vegetation resulting from heavy equipment use during construction.
- Permanent loss of sunlight resulting from shading by structures, high fills, or retaining walls.
- Permanent changes in wetland type.

These specific secondary impacts have general consequences for wetland plant communities and for wildlife dependent on wetlands. Wetland water balance is critical to overall wetland function because it influences vegetation composition and the extent to which nutrients flow efficiently through wetland systems. It is not possible to make accurate estimates of secondary impacts and resulting wetland losses until final design plans have been prepared. There would be continued coordination during the design phase with a CDOT staff biologist to minimize secondary impacts and develop mitigation plans for unavoidable losses.

Figure VI-5
State Highway 82 Entrance to Aspen
Wetland Locations



Riparian wetlands (Wetlands 2 and 3) depend largely on water from a swiftly flowing source (Maroon Creek and Castle Creek) and from spring runoff. The alluvial soils which characterize these wetlands have low water-holding capacity and, as a result, drainage is rapid. Wet meadows such as Wetland 1 are formed in areas of much-reduced water velocity. Deeper soils often develop from the accumulation of organic matter.

Alteration of drainage patterns from changes in flow volume or direction may cause significant changes in wetland vegetation, including die-off of many species unable to adjust to changed water regimes.

Increases in chemical and sediment levels (resulting, in part, from unbuffered highway runoff and unchecked erosion) may result in increased water turbidity and decreased oxygen levels, which could smother some wetland plants. Injury to wetland organisms has consequences for all wildlife species dependent on the wetland ecosystems for food and cover.

All of the wetlands identified in the study corridor are dependent to varying degrees on water flowing to the Roaring Fork River. The quality of Roaring Fork water and maintenance of flow volume and channel integrity of its tributaries are, in turn, dependent on the wetland systems associated with it. Minimizing alteration of natural water flow patterns and the extent to which sediments and chemicals impinge on wetland areas is critical to the maintenance of the overall balance of the Roaring Fork River ecosystem. The highway improvements under study include measures to minimize major impacts to the Roaring Fork River and its tributaries in the study corridor.

Under the proposed alternatives, no impacts are expected to Wetland No. 1; the alignment would be constructed on the north side of the existing State Highway 82. Although the proposed Maroon Creek Bridge would be above the extent of Wetland No. 2 for Alternative 2 and 3, at least one bridge pier would be placed within the wetland. It is possible to construct a bridge across Castle Creek for Alternatives C, D, E, F, and G (modified direct alignment) that avoids the placement of a bridge pier within Wetland No. 3. If Alternative B is selected, there would be no impacts to Wetland No. 3, because the widening of the existing Castle Creek Bridge would be away from the wetland.

Mitigation is a principal concern when evaluating impacts to wetlands within the project area. The principal goal of wetland mitigation is to avoid impacts wherever possible. Where avoidance is not possible, mitigation would be employed in all other circumstances to compensate for the loss of or damage to wetlands or the hydrologic systems on which they depend. One of the suspected functions of most wetlands in the study corridor is to filter and purify runoff flows prior to their entry into the Roaring Fork River or its tributaries, thereby mitigating potential water quality impacts.

Commitment to wetland mitigation measures is made with the realization that wetlands must often absorb impacts to and from other systems, on which they sometimes also depend. Mitigation measures would include:

- Avoidance of wetland systems or riparian strips wherever possible and minimizing loss of wetland acreage and tree loss.

- Use of CDOT Standard Erosion Control Measures to slow sediment and pollutant influx into wetlands including placing erosion hay bales near the foot of fill slopes, mulching fill slopes until revegetation can be achieved, placing erosion bales or rock check dams in ditches and gullies, and setting plastic sheets or mats over wetland vegetation to minimize damage from heavy equipment. Also, the addition of silt fences and geotextile fabric (with a layer of straw and a layer of dirt for protective covering) placed in work areas and detours in wetland. Trees and shrubs in these areas will be cut to ground line but not grubbed.

- Temporary fencing to protect adjacent wetlands from accidental construction equipment encroachment.

- Storage of equipment and construction materials away from wetland areas.

- No stockpiling of material or staging of equipment or supplies will occur in wetland or riparian areas.

- Wetland mitigation for unavoidable loss.

During the final design phase, there will be continued coordination with a CDOT staff biologist and all reviewing agencies. Individualized mitigation plans will be developed (including quantification of impacts and selection and design of replacement areas) for primary and secondary impacts for each wetland site. During construction, CDOT staff will review primary and secondary wetland and riparian area impacts to assure that temporary disturbances have been repaired and permanent wetland losses have been mitigated.

A summary of the wetland impacts are noted below. Wetland impacts are avoided wherever possible. If avoidance is not possible, mitigation is required to compensate for the loss of or damage to wetlands or the hydrologic systems on which they depend.

Wetland No. 1 — No impacts are expected to Wetland No. 1. All of the build alternatives are north of the site.

Wetland No. 2 — Alternatives 2 and 3 will have a minimal impact on Wetland No. 2. One bridge pier will be placed in the wetland.

Wetland No. 3 — Alternatives C, D, E, F, and G may produce minimal impact to Wetland No. 3. A bridge over Castle Creek will be constructed near the site. It is possible, however, to build the bridge and avoid placement of any bridge piers within the wetland. Alternative B will not impact Wetland No. 3 because the widening of Castle Creek Bridge will be north of the wetland site.

4e. Fisheries Impacts

Construction of all build alternatives could result in erosion and sedimentation of area streams. CDOT has committed to using Best Management Practices to minimize these potential impacts. Any construction-related impacts would be short-term and localized, and are not expected to adversely impact fishery populations.

Normal day-to-day traffic operations would not adversely affect fisheries in or near the project area.

4f. Wildlife Impacts

Potential impacts to wildlife from all build alternatives are discussed below. Potential impacts could occur through direct and indirect impacts of construction, operation, and maintenance of State Highway 82. Potential environmental impacts were analyzed by identifying wildlife resources in the project area and by noting the species' sensitivity to proposed disturbances. Impact analysis for wildlife considered potential positive and negative short- and long-term impacts from habitat loss and degradation and noise from construction.

Impact magnitude for wildlife was evaluated based on legal, commercial, recreational, ecological, or scientific importance of the resource; the proportion of the resource affected; the sensitivity of the resource to construction and operational activities; and duration or ecological consequences of the impact.

Construction of each of the build alternatives would affect wildlife through permanent habitat loss or alteration and through temporary disturbance from noise and human presence. Construction of Alternative B (the existing alignment) would adversely affect less wildlife habitat than Alternatives C, D, E, and F (the modified direct alignment) whereas, Alternative G (two improved lanes on existing alignment and transitway on modified direct alignment) will affect the most wildlife. However, due to the already disturbed nature of the project area, impacts from all alternatives would be minimal. Noise and ground-clearing activities would temporarily displace wildlife from the habitat in the immediate vicinity of construction, with some individuals possibly returning to nearby habitat after construction is completed. Smaller, less mobile species and those seeking refuge in burrows could inadvertently be killed during construction activities; however, adverse impacts to populations are expected to be negligible.

Since the proposed project would be located close to the present highway right-of-way, operation activities from each alternative would result in similar impacts to wildlife as do the current conditions. Negative impacts are not expected to result in more than minimal affects on wildlife populations.

4g. Impacts on Wild and Scenic Rivers

After consulting with the United States Forest Service Aspen Ranger District office, it has been determined that the Roaring Fork is not designated as a Wild and Scenic River and no plans exist for this designation in the future. Therefore, there are no impacts.

4h. *Floodplain Impacts*

The bridge site under consideration to cross Maroon Creek (Milepoint 39.4) for Alternatives 2 and 3 is located approximately 30 meters (100 feet) downstream of the existing State Highway 82 bridge and outside of the designated floodplain. The existing 135 meter (446 feet) State Highway 82 bridge over Castle Creek (Milepoint 40.2) is also located out of the designated floodplain. The bridges under consideration for all build alternatives between Maroon Creek Road and the intersection of 7th Street and Main Street would be constructed over the Castle Creek floodplain.

All bridges under consideration would provide adequate separation between the bottom of the bridge structure and the 100-year water surface. The existing crossings in the study corridor span the 100-year floodplain due to natural topography. The 100-year flood frequency was considered when selecting the proposed bridge locations -- even though design for the 50-year storm is the minimum requirement for rural highways -- to avoid encroachment on natural and beneficial floodplain values. The design of all major and minor structures will adhere to local and CDOT drainage criteria. The location of piers within the 100-year floodplain for the Maroon Creek crossing is expected to have only a minor impact on the 100-year water surface. Buried riprap will be provided as protection for the bridge piers. Bridge piers for the Castle Creek Bridge will be placed above and outside the 100-year floodplain, and riprap protection will not be necessary.

Significant encroachments on channels have been avoided for the two crossings within the study corridor. The design of bridges and roadway embankments has sought to minimize impacts to floodplains in compliance with FHWA requirements and Executive Order (EO) 11988. The bridges under consideration for all build alternatives span the low water river channel and have abutments outside of the 100-year floodplain. Impacts to floodplains are expected to be minor, as the bridge impacts are limited to the portion of the floodplain directly adjacent to the stream crossing. Temporary impacts are expected to occur during construction of bridges, especially in the placement of buried riprap. All disturbed areas of riprap would be revegetated with native vegetation.

4i. *Impacts on Threatened and Endangered Species*

In compliance with the Endangered Species Act (ESA) of 1973, the impacts to species that are considered rare, threatened, or endangered in the proposed project area are evaluated.

Bald Eagle - Removal of any large cottonwoods near water could adversely affect bald eagles which might use these trees for roosting during the winter. Since roost trees are not known to exist in the project area, impacts to wintering bald eagles are not expected to occur. Due to the distance between the active but unsuccessful eagle nest more than 40 kilometers (24.9 miles) north of the project area, nesting eagles are not expected to be adversely affected by any of the proposed build alternatives.

Mexican Spotted Owl - Due to the lack of appropriate Mexican spotted owl habitat in the project area, this species is not expected to be adversely affected by any of the proposed build alternatives.

North American Lynx - Due to the lack of appropriate lynx habitat in the project area, this species is not expected to be adversely affected by any of the proposed build alternatives.

North American Wolverine - Due to the lack of appropriate wolverine habitat in the project area, this species is not expected to be adversely affected by any of the proposed build alternatives.

Northern Goshawk - It is not known whether any goshawk nests occur in the project area. Considering that this species is intolerant of human disturbance near the nest, however, it is unlikely that goshawks are nesting in the already disturbed project area. Although appropriate habitat exists in the project area, this species is not likely to be adversely affected by any of the proposed build alternatives.

Loggerhead Shrike - Since the loggerhead shrike is an uncommon migrant through the project area, this species is not expected to be adversely affected by any of the proposed build alternatives.

Colorado Cutthroat Trout - Since the Colorado cutthroat trout is not expected to occur in or near the project area, this species is not expected to be adversely affected by any of the proposed build alternatives.

Boreal Toad - Due to the lack of appropriate boreal toad habitat in the project area, this species is not expected to be adversely affected by any of the proposed build alternatives.

Communities of Special Concern - The one subject of concern noted by the Natural Heritage Program was the montane riparian forest at State Highway 82 and Brush Creek Road. It, however, is located outside of the area of disturbance; therefore, no adverse impacts are expected to occur from any of the proposed build alternatives.

4j. Impacts on Historic Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended, applies to the historic properties listed on or eligible for listing on the National Register of Historic Places that may be impacted by this project. Additionally, locally designated historic properties located within the project are also considered in the EIS. The Aspen Historic Preservation Commission has provided comments for this project and the impacts to historic resources at the request of the SHPO. Copies of these comments are included in **Volume 2: Comments and Coordination** of the DEIS. Figure VI-6 shows the locations of the historic resources within the project corridor.

The following impacts to historic resources located within the project area are described below.

Maroon Creek Bridge: Under Alternative 1 (No-Action) there would be no direct impact to the historic Maroon Creek Bridge. Under the two build alternatives crossing Maroon Creek Bridge , (Alternatives 2 and 3), the bridge would stay in place and a new bridge would be built to the north. The new bridge would be 220 meters (720 feet) long and would curve toward the historic bridge on the east side. It would be approximately 9 meters (30 feet) away from the historic bridge at the closest point on the east side and approximately 18 meters (60 feet) at the closest point on the west side.

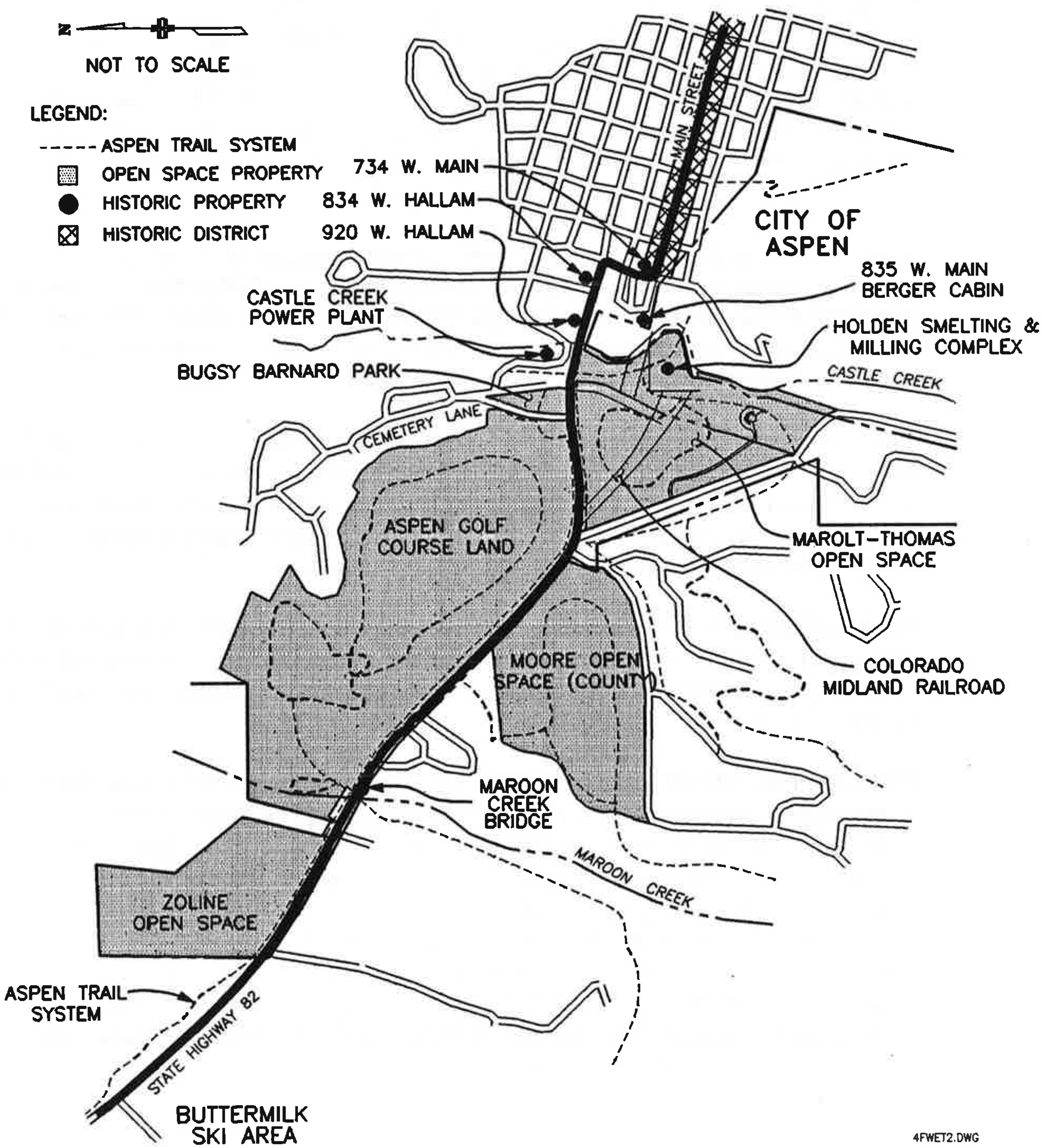
Alternative 3 would place a transit envelope along the corridor in one of two places. One would be placed on the new bridge and would push the new bridge farther to the north, leaving the distance between the two bridges the same as discussed above. The other option is to place the transit corridor on the existing historic bridge. This would not, however, result in a significant impact to the historic resource.

The State Historic Preservation Office (SHPO) has determined that there would be no adverse effect to the historic bridge under these two alternatives because the historic bridge will remain in place. Adaptive reuse of the bridge as a pedestrian or transit crossing of Maroon Creek does not constitute a significant impact because neither of these uses would substantially impair the integrity of the historic resource.

Holden Smelting and Milling Complex: Alternative A (No-Action) and B, (Existing Alignment) would have no direct impacts to the historic Holden Smelting and Milling Complex. Alternatives C, D, E, F, and G would traverse the property and have a direct impact on the historic resource.

Under Alternatives C and E, the total take would be approximately 0.22 hectares (0.53 acres) of the historic site (included in the Marolt-Thomas open space land) for construction. Although no buildings would be removed, areas of the site where industrial debris of archaeological interest could be located would be disturbed by the new roadway. The proposed edge of highway pavement passes within 85 meters (280 feet) of the Holden office building (Marolt House), within 41 meters (135 feet) of the sampling works building, and within 85 meters (280 feet) of the salt warehouse. The edge of the 50 meter (164-foot) right-of-way width extends to within 70 meters (230 feet) of the Marolt House, 26 meters (85 feet) of the sampling building, and 70 meters (230 feet) of the salt warehouse. This would result in a visual and audible intrusion on the historic site.

Figure VI-6
Section 4(f) and Historic Resources



Under Alternatives D, F, and G the total take would be approximately 0.3 hectares (0.73 acres) of the historic site (included in the Marolt-Thomas open space land) for construction. Although no buildings would be removed, areas of the site where industrial debris of archaeological interest could be located would be disturbed by the new roadway and the separate transit envelope. The proposed edge of highway pavement under Alternative D and F passes within 80 meters (260 feet) of the Holden office building (Marolt House), within 35 meters (115 feet) of the sampling works building, and within 80 meters (260 feet) of the salt warehouse. The edge of the 50 meter (164 foot) right-of-way width extends to within 64 meters (210 feet) of the Marolt House, 20 meters (65 feet) of the sampling building, and 64 meters (210 feet) of the salt warehouse. This would result in a visual and audible intrusion on the historic site.

The proposed edge of highway pavement under Alternative G passes within 88 meters (290 feet) of the Marolt House, 38 meters (125 feet) of the sampling works building, and within 88 meters (290 feet) to the salt warehouse. The edge of the 35 meter (115 feet) right-of-way width extends to within 76 meters (250 feet) of the Marolt House, within 32 meters (105 feet) of the sampling works building, and within 76 meters (250 feet) of the salt warehouse. This would result in a visual and audible intrusion on the historic site.

The SHPO has determined that there would be an adverse effect to this resource under Alternatives C, D, E, F and G. The SHPO has requested that CDOT consider the following two alternatives, which they state would avoid an adverse effect: 1) shift the pavement edge to the north to entirely miss the National Historic District (NHD) boundary, and 2) extend the length of the cut and cover past the NHD to directly connect with the proposed Castle Creek Bridge. If these conditions could be met, and subject to berm and landscape review and approval, the SHPO would agree to a no-adverse effect determination. In addition, the SHPO is requiring an on-site historic archaeological survey be conducted within the Area of Potential Effect (APE) within the boundaries of the National Historic District.

Colorado Midland Railroad: Under Alternative A (No-Action), there would be no direct impacts to the remaining segment of the historic railroad grade on the Marolt-Thomas property. However, under the remaining six alternatives, a very small portion of the total 1.6 hectares (4.0 acres) railroad grade (included in the Marolt-Thomas open space land) would be lost to right-of-way acquisition. Alternatives B, C, E and G would use 0.13 hectares (0.32 acres) of the historic railroad grade. Alternatives D and F would require a take of 0.17 hectares (0.42 acres). The SHPO has determined that this loss would not adversely effect the historic resource under the six build alternatives.

Castle Creek Power Plant: There would be no direct impact to the historic Castle Creek Power Plant under Alternatives A (No-Action), C, D, E, F and G because the existing bridge would remain as a local access route in its present configuration. Under Alternative B (Existing), the existing bridge would be widened to the south. The plant building is well below the elevation of the bridge deck and would not be physically affected, and the widened bridge would not intrude visually on the site. Conceptual bridge design studies indicate that the widened bridge deck would extend 0.6 to 1.0 meters (two to three feet) into the air space above the plant. Pier placement would not result in a significant impact on the historic site because they would be placed well to the south of the property, which had been defined as the building and the lot on which it sits as described by the Pitkin County Assessor. The SHPO has determined that there would be no effect to the historic site under Alternative B.

920 West Hallam Street: Under Alternatives A (No-Action), C, D, E, F, and G there would be no direct impact to this historic house. Alternative B would not require right-of-way acquisition from this property. The structure itself would not be affected, and the distance between the house and the edge of pavement, currently 12 meters (40 feet), would not be reduced. There are not expected to be visual impacts created by a wider highway because the roadway is already four lanes at this location. However, due to a potential grade difference of approximately three feet, a modest retaining wall and railing may be required to be installed along the pavement edge. The SHPO has determined that there would be no adverse effect on this historic resource under Alternative B, subject to their review and approval of the proposed retaining wall and railing design.

834 West Hallam: Under Alternatives A (No-Action), C, D, E, F, and G there would be no direct impact to this locally designated historic house. Alternative B would require a minor right-of-way acquisition from this property of 510 sq. ft., (0.005 hectares or 0.01 acres). The structure itself would not be affected. There are not expected to be visual impacts created by a wider highway because the roadway is already four lanes at this location. Because this structure is not eligible for the National or State Registers of Historic Places, the SHPO is not required to comment on the effects of the project on this resource.

734 West Main Street: Under Alternatives A (No-Action), C, D, E, and F there would be no direct impact to this locally designated historic house. Alternative B and G would require the removal of the building, which would constitute a total take. Because this structure is not eligible for the National or State Registers of Historic Places, the SHPO is not required to comment on the effects of the project on this resource.

Berger Cabin: Under Alternatives A (No-Action) and B (Existing), there would be no direct impact to this locally designated historic house. Alternatives C, D, E, F, and G would require the removal of the building, which would constitute a total take of 0.23 hectares (0.57 acres). Because this structure is not eligible for the National or State Registers of Historic Places, the SHPO is not required to comment on the effects of the project on this resource.

Main Street Historic District: Under Alternatives A (No-Action), B, C, D, E, F, and G there would be no direct impact to this locally designated historic district. Because this district is not eligible for the National or State Registers of Historic Places, the SHPO is not required to comment on the effects of the project on this resource.

Table VI-6 summarizes the impacts of each alternative on the historic resources within the project area.

Table VI-6
Impacts to Historic Resources

Historic Resource	Project Corridor Section							
	Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th and Main Street					
	Alternative							
	2	3	B	C	D	E	F	G
1) Maroon Creek Bridge	Visual Impact	Visual Impact	N/A	N/A	N/A	N/A	N/A	N/A
2) Holden Smelting & Milling Complex 3.2 ha (8.0 ac) included in #5 above	N/A	N/A	N/A	0.22 ha (0.53 ac) included in #5 above; potential historic archaeology and visual impacts	0.30 ha (0.73 ac) included in #5 above; potential historic archaeology and visual impacts	0.22 ha (0.53 ac) included in #5 above; potential historic archaeology and visual impact	0.30 ha (0.73 ac) included in #5 above; potential historic archaeology and visual impacts	0.13 ha (0.32 ac) included in #5 above; potential historic archaeology and visual impacts
3) Colorado Midland Railroad 1.6 ha (4.0 ac) included in #5 above	N/A	N/A	0.13 ha (0.32 ac)	0.13 ha (0.32 ac)	0.17 ha (0.42 ac)	0.13 ha (0.32 ac)	0.17 ha (0.42 ac)	0.13 ha (0.32 ac)
4) Castle Creek Power Plant 0.6 ha (1.5 ac)	N/A	N/A	No impact	N/A	N/A	N/A	N/A	No impact
5) 920 Hallam St. 0.1 ha (0.2 ac)	N/A	N/A	Visual impact	N/A	N/A	N/A	N/A	No impact
6) 834 W. Hallam	N/A	N/A	.005 ha (.01 ac) (510 sq. ft.)	N/A	N/A	N/A	N/A	No impact
7) 734 W. Main Street .06 ha (.14 ac)	N/A	N/A	.06 ha (.14 ac)*	N/A	N/A	N/A	N/A	.06 ha (.14 ac)*
8) Berger Cabin .23 ha (.57 ac)	N/A	N/A	N/A	.23 ha* (.57 ac)	.23 ha* (.57 ac)	.23 ha* (.57 ac)	.23 ha* (.57 ac)	.23 ha* (.57 ac)
9) Main Street Historic District	N/A	N/A	No Impact	No Impact	No impact	No impact	No impact	No impact

NOTE: 1 hectare (ha) = 2.471 acres (ac)
1 meter (m) = 3.281 feet (ft)

* Requires removal of the building

4k. Impacts on Archaeological Resources

Review of previous studies and the files of the Office of Archaeology and Historic Preservation in addition to limited field investigations indicate that there will be no effect on significant archaeological resources in the Buttermilk Ski Area to Aspen corridor.

When the preferred alignment is surveyed and staked, it will be compared to the alignments studied in 1974 by the Colorado Department of Transportation staff archaeologist. If any inconsistencies between the 1974 survey and the alignment which is to be constructed are evident, on-the-ground reconnaissance will be conducted as necessary to document that the final highway alignment has been adequately evaluated and that no archaeological resources will be adversely affected.

4l. Impacts on Paleontological Resources

No potential impacts on paleontological resources have been identified in the study corridor. In the event that paleontological resources are uncovered anywhere along the alignment corridor during construction, work in the immediate vicinity will cease. The staff paleontologist of the Colorado Department of Transportation will be notified, and the material will be evaluated by a qualified paleontologist.

4m. 4(f) Impacts

Section 4(f) resources include lands from publicly owned parks or recreation areas and historic sites listed on or eligible for the National Register of Historic Places. Transportation projects may not be approved by the U.S. Department of Transportation unless there is no prudent and feasible alternative to using that land and the project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site.

In the proposed project area eleven properties are potentially subject to Section 4(f) review (Figure VI-6). These properties include the Aspen Trail System, the Zoline Ranch Open Space, Aspen City Golf Course, the Moore Property Open Space, the Marolt-Thomas Open Space, Bugsy Barnard Park, Maroon Creek Bridge, the Holden Smelting and Milling Complex, the Colorado Midland Railroad, the Castle Creek Power Plant, and 920 West Hallam.

A Section 4(f) Evaluation is included in **Appendix A: 4(f) Evaluation.** Table A-1 in the 4(f) Evaluation summarizes the potential impacts to these resources for each alternative. Please refer to it for a complete discussion of the potential impacts of the proposed alternatives on the 4(f) resources.

4n. Farmland Impacts

The "Important Farmland Inventory," Soil Conservation Service (now the National Resources Conservation Service), U.S. Department of Agriculture, October 1982, indicates that no prime farmland, as defined by the Soil Conservation Service, exists within Pitkin County. This determination is based on the short growing season and low temperatures encountered in the mountain counties of Colorado. Potential impacts to lands not identified as prime or unique by the Farmland Protection Policy Act of 1971 (7 U.S.C. 420 et. seq.)

were identified for the study corridor. These include irrigated hay meadows, which are classified as "irrigated lands not prime" and are thus considered Farmlands of Statewide Importance, land designated by Pitkin County as Valued Agricultural Land (designated by the Farmland Protection Policy as "farmland other than prime or unique that is of local importance"), and other agricultural land. The Soil Conservation Service determined that these farmlands should not be included in the Farmland Conversion Impact Rating (Form AD 1006) as they do not meet the criteria of the Farmland Protection Policy Act.

No Valued Agricultural Lands, as classified by Pitkin County, have been identified in the Buttermilk Ski Area to Aspen study corridor, and there are no Farmlands of Statewide Importance. Therefore, this project will have no impact on classified farmlands and a Form AD 1006 is not required.

Other agricultural lands not purchased for right-of-way may be subject to access modifications, but access will be maintained to all properties not purchased. Impacts to existing irrigation systems due to highway construction will be temporary and completed out of irrigation season as much as possible. All irrigation systems impacted will be relocated and replaced during the State Highway 82 construction projects.

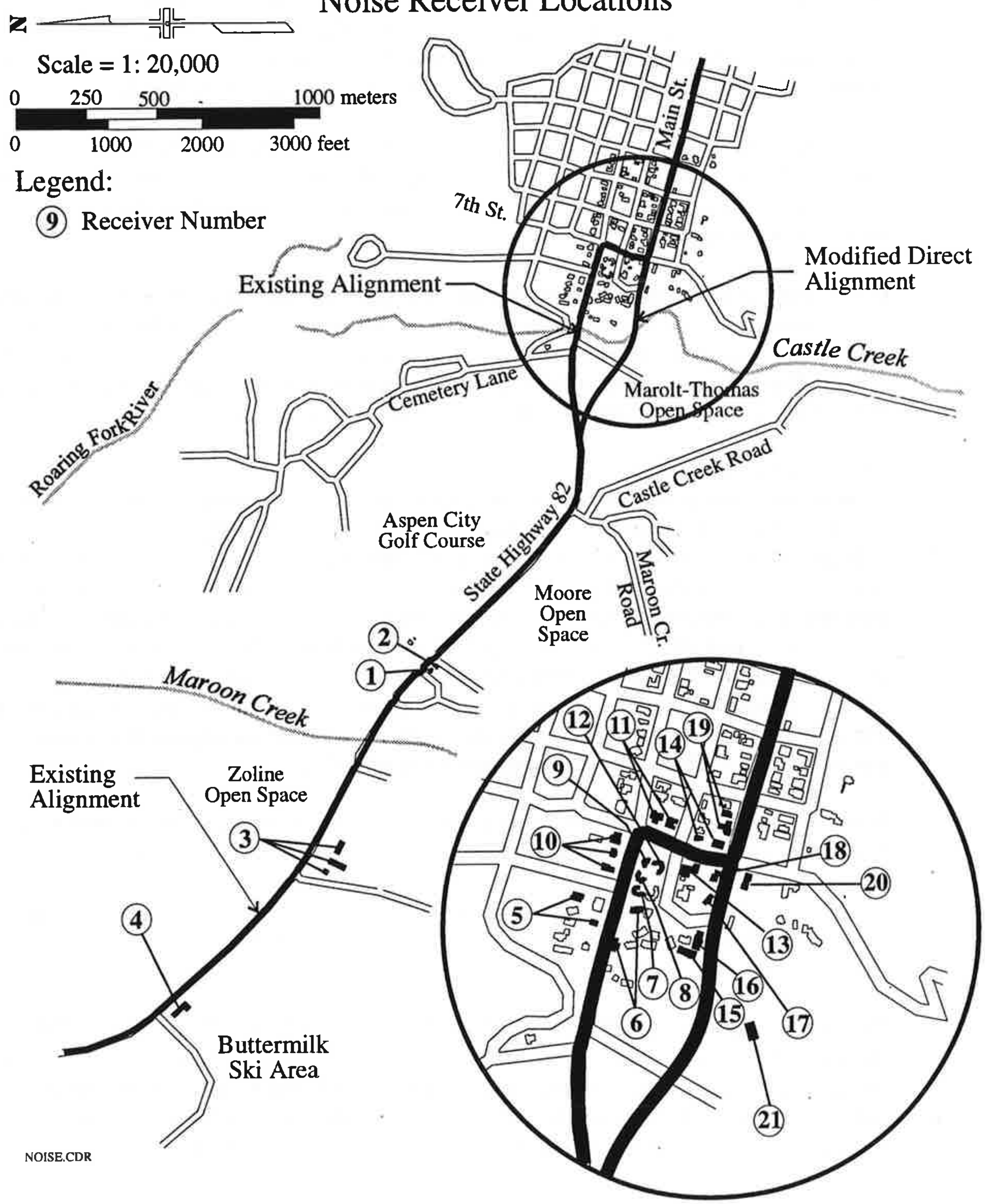
4o. Noise Impacts

A noise study was performed for two preliminary alignments (existing improved S-curves and modified direct) of the proposed State Highway 82 Entrance to Aspen improvements. An additional analysis was done for the combination alignment with buses using the modified direct alignment and all other traffic using the existing S-curves (Alternative G). The assessment identified noise-sensitive receptors based on existing and predicted noise levels and was prepared in accordance with 23 CFR 772, Code of Federal Regulations. Since noise levels are sensitive to distances from roadways and relative elevations, further noise assessment will be done during preliminary and final design to determine locations and heights for constructed noise barriers. The purpose of this assessment is to compare the noise impacts of one alignment versus the other and to estimate if effective noise mitigation can be provided.

Noise predictions were made with the STAMINA 2.0 (Federal Version) computer model. This model is based on the Federal Highway Administration (FHWA) method for predicting noise generated by constant speed highway traffic. The existing noise was measured in the field to determine the noise produced by traffic on State Highway 82, with noise from background sources being a very minor component of the noise. The existing noise measurements assist in calibrating the noise model.

The noise levels for year 2015 are estimated using a model developed by the FHWA for predicting traffic noise. The inputs to the model include the number of vehicles, the speed of the vehicles, the distance between the receiver and the road, and whether there are any noise barriers such as fences present. The receptor locations in the model are intended to represent individual or close groups of residences or businesses. Figure VI-7 shows the locations of these receivers.

Figure VI-7
State Highway 82 Entrance to Aspen
Noise Receiver Locations



The only public or non-profit building identified is the Holden Smelting and Milling Complex (Receiver 21). The future noise was projected at the receivers for the alignments based on future summer peak traffic conditions. Depending on the alignment, several more residences will have noise impacts in the future as compared to current conditions.

A summary of noise sensitive receivers along the proposed build alignments is presented in Tables VI-6 and VI-7. Receivers were chosen for evaluation based on their proximity and likely impacts from either improved alignment of State Highway 82. The receivers for this analysis represent residences and businesses. The FHWA's maximum noise level allowed for residential areas is 67.0 dBA and 72.0 dBA for commercial districts. Colorado defines noise 1.0 dBA below these levels as approaching noise impacts, and mitigation must be evaluated for these receivers.

Table VI-7
Summary of Noise Analysis
Existing Alignment from Buttermilk Ski Area to
7th Street and Main Street

Receiver #	Existing (dBA)	Projected - 2015 No Barriers (dBA)	Projected - 2015 With Barriers (dBA)	Projected - 2015 Alt. G (No Buses) (dBA) No Barriers
1	64.5	66.0	66.0	66.0
2	65.0	67.0	67.0	67.0
3	63.0	64.5	64.5 *	64.5
4	62.0	63.5	63.5 *	63.5
5	68.0	69.5	62.0	68.0
6	67.0	68.5	61.0	67.0
7	67.5	69.0	60.0	67.5
8	67.5	69.0	60.0	67.5
9	68.5	70.0	60.0	68.5
10	66.0	67.5	67.5 *	66.0
11	65.5	66.5	66.5	65.0
12	67.0	69.0	65.5	67.5
13	67.5	69.0	68.5 *	67.5
14	69.0	70.0	64.0 *	69.0
18	66.0	68.0	56.5	66.5
19	67.5	69.0	69.0 *	67.5
20	62.0	63.5	62.0	62.0

All numbers reported are hourly equivalent decibels
* Mitigation not proposed because of business location or potential property acquisition

Table VI-8
Summary of Noise Analysis
Existing Alignment from Buttermilk Ski Area to
Maroon Creek Road and Modified Direct Alignment

Receiver #	Existing (dBA)	Projected - No Barriers (dBA)	Projected - With Barriers (dBA)	Projected 2015 Alt. G (Buses Only) No Barriers (dBA)
1	64.5	66.0	66.0	66.0
2	65.0	67.0	67.0	67.0
3	63.0	64.5	64.5 *	64.5
4	62.0	63.5	63.5 *	63.5
15	58.5	66.0	65.0	60.5
16	58.5	67.5	63.5	62.0
17	60.5	67.5	64.0	62.0
18	66.0	65.5	65.5	68.0
19	67.5	69.0	69.0*	69.0
20	62.0	68.5	57.5	64.0
21	55.5	64.0	64.0	59.0

All numbers reported are hourly equivalent decibels
* Mitigation not proposed because of business location or potential property acquisition

Existing noise levels along the current alignment are near or above 67.0 dBA at most of the residences and businesses facing the roadway. Current noise levels along the proposed modified direct alignment (receptors 15, 16, 17, and 21) are generally below 60.0 dBA for receptors evaluated.

Proposed noise abatement can also be modelled with the STAMINA 2.0 program. Noise abatement in the form of a noise wall 2.4 meters (8 feet) in height was evaluated along both the improved existing S-curves and modified direct alignments where construction of a wall is possible. In order to be effective, noise walls must be continuous and not have large breaks or gaps such as driveways, side-streets, alleyways, or walkways.

The improved existing S-curves alignment receivers represent approximately 22 residences and 4 businesses adjacent to the alignment. Future traffic growth will raise noise levels approximately 1.0-2.0 dBA along the improved S-curves alignment. Effective noise mitigation will be difficult due to numerous driveways, roadways and alleyways. Use of the combined alignment will remove about half of the larger bus and truck traffic from the overall traffic. This reduction in bus traffic will help mitigate future noise impacts, helping keep traffic noise at existing levels rather than increasing noise by 1.0 - 2.0 dBA with mixed traffic.

The modified direct alignment has approximately 12 residences and one museum (Holden Smelting and Milling Complex) adjacent to the alignment. Noise levels with future traffic and the new alignment will raise noise levels from below 60.0 dBA existing to over 66.0 dBA for all residences. Noise mitigation on this alignment should be more effective since fewer gaps for roads and driveways are necessary. It should be noted that there are 26 first row receivers on the existing State Highway 82 alignment (improved S-curves) that would see a significant decrease in traffic noise if the modified direct alignment were built.

If the combination alignment were utilized, only bus traffic would be on the new modified direct alignment. This bus traffic would raise noise levels at receivers 15, 16, and 17 to approximately 62.0 dBA. The noise impacts along the existing S-curves would remain with the combination alignment.

Upon selection of an alignment alternative, Aspen officials will be advised of the results of an updated noise analysis for use in planning and land use decision making.

Construction noise from any future construction must comply with Aspen and Pitkin County ordinances pertaining to construction noise.

4p. Visual Impacts

The State Highway 82 Entrance to Aspen project corridor lies within the Roaring Fork Valley and is visually dominated by natural open space areas and the residential and ski area developments adjacent to the highway. The viewshed from the existing highway extends well beyond the vicinity of the project corridor, with distant mountain peaks, creek valleys and foothills easily visible from the highway. The City of Aspen lies within a valley defined by the land forms of Smuggler Mountain and Shadow Mountain, also easily visible. The unique quality of the view from State Highway 82 into Aspen contributes to the character of the community. The scenic river valley and mountain peaks are views shared by residents and travelers alike. The visual impacts associated with each alternative are discussed below.

Alternatives 2 and 3

The alignment of these alternatives do not differ significantly from the existing alignment, however, the views of motorists driving on Alternatives 2 and 3 will have greater expanses of pavement in the foreground. No adverse visual impacts are anticipated. The addition of a landscaped median between the Maroon Creek Bridge and Maroon Creek Road is expected to enhance the resident's and driver's viewing experience. Additionally, the median will reduce the visual scale of the roadway by dividing it in two. Tall trees or shrubs should be avoided as plantings in the median if the view on both sides of the roadway is to be preserved.

Alternative B - Existing Alignment
Alternative B follows the existing alignment to the S-curves where it changes to accommodate curvature for a 40 km/h (25 mph) design speed. The view from the new roadway will not change from the existing and no adverse impacts are expected. As mentioned before, large trees and shrubs should not be placed in the median area if the view on both sides of the roadway is to be preserved. The median will reduce the visual scale of the widened roadway by dividing it in two.

Widening the S-curves at 7th Street and Hallam Street, and 7th Street and Main Street will change the view experience for the driver and residents in the immediate vicinity. The viewshed in this area is limited to the immediate foreground and the shape of the roadway itself. The foreground will not change but the shape of the roadway will become smoother in transition around the S-curves. The smoother curvature of the roadway and the hardscaped separation of the sideroads may enhance the driver viewing experience. The new view for the residents in the immediate vicinity will consist of the existing foreground with changes in the roadway geometry. The widened existing roadway and widened Castle Creek Bridge may be seen as a visual intrusion by residents along Hallam, 7th Street and Main Street. The localized nature of these impacts is expected to be offset by the incorporation of landscaping and hardscaping of the roadway edges.

Alternatives C and E - Modified Direct Alignment (At-Grade)
These alternatives cross the Marolt-Thomas property on the modified direct alignment at grade. The Marolt-Thomas property is mostly cultivated pasture and brush pasturelands. The flatness of this open space allows distant views to be unobscured by trees or buildings.

Alternatives C and E would change the contrast of this open space for viewers away from the roadway. The new roadway alignment and new bridge over Castle Creek may be viewed by the residents of the Villas of Aspen and other homes near 8th Street and Main Street as a visual intrusion upon space that is currently open. The land form would become discontinuous at the roadway, and the view would be disrupted. The compensation for this visual impact is the conversion of the existing State Highway 82 to open space. The natural flow of open space from the golf course to the Marolt-Thomas property would no longer be interrupted by the existing highway.

The view from the new roadway would become less urban and more rural as compared to the existing alignment and provide new views of the open space and Shadow Mountain because of the alignment shift into the open space. The curb and gutter cross section with a narrow median helps to reduce the visual impact of the roadway by dividing the roadway in two. The character of the open space may be preserved if part of the median is landscaped to imitate the surrounding pastureland.

Alternatives D and F - Modified Direct Alignment (Cut and Cover)
Alternatives D and F follow the same alignment as Alternatives C and E across the Marolt-Thomas property but have a different visual impact. The vertical alignment drops below the existing grade of the Marolt-Thomas property to enter into a cut and cover section near Castle Creek. The cut and cover section is not completely hidden from a viewer away from the roadway; a slight hump will be present in the location of the tunnel. The cover section will mitigate some of the impact of the new roadway by hiding it from the residents to the northeast and south of the new alignment. The landscaping of the cover section will imitate the existing pattern of the Marolt-Thomas property. The roadway itself will be at least partially hidden from an outside viewer because the alignment is below the existing grade.

Alternatives D and F also convert an existing portion of the State Highway 82 between Cemetery Lane and Maroon Creek Road to open space. Returning and landscaping this piece of roadway creates a continuous visual flow of open space from the golf course into the Marolt-Thomas property, thus having a beneficial impact on the visual character of the area.

Alternative G - Existing Alignment and Transitway on Modified Direct Alignment
This alternative is a combination of two alignments, the existing alignment and the modified direct alignment. The visual impacts are discussed below with respect to each alignment.

Existing Alignment - Alternative G follows the existing alignment for the general lanes and improves the S-curves to accommodate a design speed of 32 km/h (20 mph). The view from the roadway will not change and no adverse impacts are anticipated. The new curvature of the S-curves at 7th Street and Hallam Street, and at 7th Street and Main Street will change the view experience for the driver and the residents in the immediate vicinity. The smoother curvature of the roadway and the landscaped separation of the side streets may enhance the driver viewing experience. The new view for the residents in the immediate vicinity will consist of the existing foreground with changes in the roadway geometry. The localized nature of these changes is expected to be offset by the incorporation of landscaping and hardscaping of the roadway edges.

Modified Direct Alignment - Alternative G crosses the Marolt-Thomas property on the modified direct alignment. Because this area is mostly cultivated pasture and brush pastureland, the views to and from the transitway would be unobscured. The new transitway and the new bridge structure across Castle Creek may be viewed by residents of the Aspen Villas and other homes near 8th Street and Main Street as a visual intrusion into the open space. The land form would become discontinuous at the transitway and the view would be disrupted.

The view from the new transitway would become less urban and more rural as compared to the existing alignment. New views of the open space and other landforms will also become available.

The combined affect of the two separate roadway facilities is more than if just one alignment were considered. The separation of the general lanes and the transitway eliminates the possibility of returning any portion of the existing roadway to open space. Also, there is no opportunity for the open space to be continuous on either side of State Highway 82.

4q. Impacts on Potential Hazardous Waste Sites

Potential hazardous waste sites within 152 meters (500 feet) of the highway construction are noted. This distance was selected as a reasonable limit for investigation in recognition of evidence that hazardous substances can migrate above or below ground from their sources. Hazardous waste impacts were identified by the right-of-way required from each of the potential hazardous waste sites.

During an initial site assessment (ISA) of the Entrance to Aspen corridor, four properties have been identified as potential hazardous waste sites due to past or present use. These sites include:

- Aspen City Shop (north of milepost 40.1)
- Dooger Diggings (milepost 40.1)
- U.S. Forest Service Ranger Station (milepost 40.3)
- Holden Smelting & Milling Complex (south of milepost 40.1)

Their locations are indicated on Figure VI-7. A brief description of each site may be found in **Chapter IV: Affected Environment.**

The Aspen City Shop, Dooger Diggings, and U.S. Forest Service Ranger Station have been eliminated as a potential hazardous waste site. The Aspen City Shop located in the old Castle Creek Power Plant and Dooger Diggings on Power Plant Road are underground fuel storage tank sites. Both the plant building and Dooger Diggings are located well below the elevation of the widened Castle Creek bridge deck and would not be physically affected. The operations of those properties are not expected to have any effect on the roadway operations overhead. Conceptual bridge design studies indicate that the widened bridge deck would extend two to three feet into the air space above the plant and require careful placement of piers near the building.

The U.S. Forest Service Ranger Station at 806 West Hallam Street is also an underground fuel storage tank site. Alternatives B and G widens the existing roadway near the Forest Service Station but does not require any right-of-way from the Forest Service Station. Similarly, the operation at this site will not have any effect on the roadway.

Alternatives C, D, E, F, and G pass the Holden Smelting and Milling Complex. A preliminary site investigation (PSI) for the Holden Smelting and Milling Complex was conducted by Walsh and Associates, Inc. (Walsh) in 1989. Results of this investigation are published in their report: ***Preliminary Site Investigation Highway 82 Basalt to Aspen***, CDOT Project No. FC 082-1(14), June 25, 1992. All information in this section and **Chapter IV: Affected Environment** is compiled from that report. The PSI consisted of a record search which recommended further field evaluation. This evaluation included drilling boreholes, collecting soil samples, installing piezometers, collecting groundwater samples, and analyzing laboratory samples.

Results of surface samples in the area showed elevated total concentrations of arsenic (As), cadmium (Cd), and lead (Pb), which could expose the public to heavy metal laden dust and soil. The water quality at the proposed bridge pier locations were within anticipated limits for a possible dewatering permit.

Further evaluation of potential hazardous waste sites will continue during preparation of the FEIS and highway design prior to property acquisition, along with continued coordination with the Colorado Department of Public Health and the Environment (CDPHE) and other appropriate agencies. The selected improvements will avoid potentially contaminated areas. Where avoidance of a site is not feasible, a detailed site investigation (DSI) will be conducted to determine the extent of contamination and the concentrations of contaminants. The DSI will provide the information that may be required for the preparation of a Health and Safety Plan (HASP) and the Materials Management Plan (MMP).

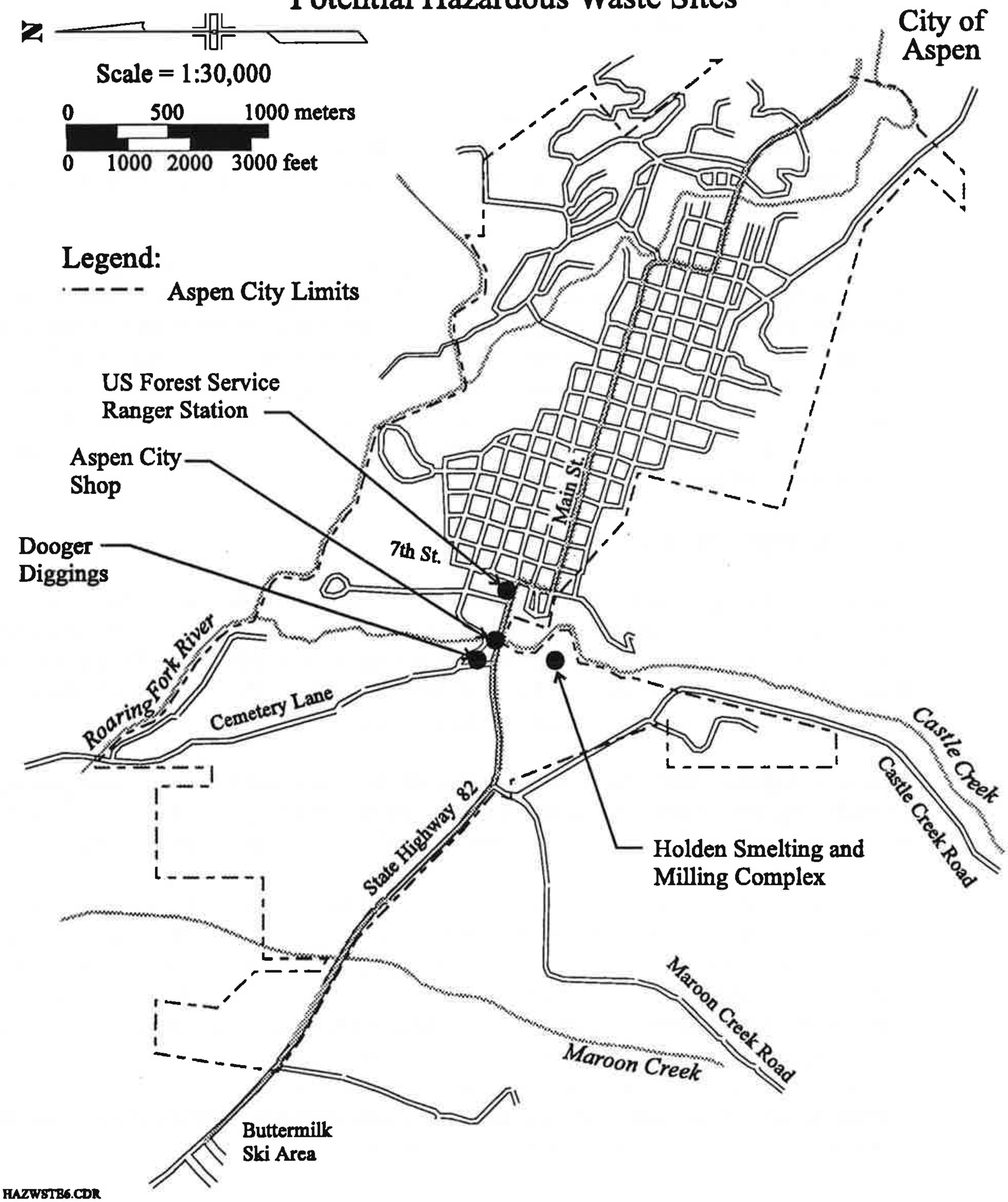
4r. Energy Impacts

Construction Energy - Each of the build alternatives has construction energy impacts of two types. The first type is energy needed to build the transportation improvements, primarily resulting from earthwork and the erection of retaining walls and bridges. The second type is energy wasted by vehicles delayed by construction activities. The No-Action Alternative, by definition, has no construction energy requirements.

Delays to highway traffic due to construction will be minimized by construction phasing. Overall congestion energy requirements will be offset in the long-term by fuel savings due to reduced congestion and improved operational efficiency on the widened highway.

Operational Energy - Each of the build alternatives also has two types of operational energy impacts. The first type results from new portions of the alignments under study that are longer than the corresponding existing alignment. The Entrance to Aspen corridor segment includes alignment options that diverge from the existing highway. The modified direct connection alignment at the Entrance to Aspen (Alternatives C, D, E, and F) is shorter than the corresponding existing alignment section, and will reduce operational energy requirements. The other new alignment sections (Alternatives 2, 3, B, and G) are from two percent to ten percent longer than the corresponding existing alignment sections, and will increase operational energy requirements accordingly.

Figure VI-8
State Highway 82 Entrance to Aspen
Potential Hazardous Waste Sites



The second type of operational energy impact results from operational efficiency. All of the build alternatives will significantly reduce operational energy requirements for State Highway 82 because they reduce congestion and improve the Level of Service of the highway.

Long-term fuel savings due to increased operational efficiency of the widened highway will offset increased energy needs for longer alignments. As a result, all of the build alternatives will have long-term fuel savings.

4s. Construction Impacts

General construction impacts are addressed by category in the following discussion for all build alternatives. A more detailed discussion, if different from the general discussion, for each build alternative in the two corridor sections follows.

Air Quality. Construction impacts on air quality result from the particulates released by earthwork and the carbon monoxide created by construction equipment exhausts and vehicles delayed by construction. Air quality impacts will be mitigated by minimizing construction activities during the critical winter air pollution season, pre-wetting cuts and fills when necessary.

Water Quality. Temporary increases in siltation will occur due to construction or improvement of bridges over Maroon Creek and Castle Creek. The water quality impacts will be mitigated by adherence to the conditions described in the 404 and NPDES stormwater permits issued for the project, through the application of standard Colorado Department of Transportation erosion control measures, and by the development and implementation of a spill prevention and emergency response plan as a contract condition. Temporary erosion control measures during construction and permanent revegetation in sidehill cut areas will also be required. NPDES guidelines will be followed, as discussed in the Water Quality section of this chapter.

Traffic Safety. Potential safety impacts are due to construction next to active traffic lanes. Increased accident potential is due to stop-and-go traffic and the presence of workers and equipment on the roadway. Safety impacts will be minimized by traffic control measures including signs, pavement markings, barriers and flagging.

Construction Materials. A balance of earthwork (equal amounts of fill material used and cut material obtained) is feasible for all of the alternatives. Road base material will be obtained from existing permitted borrow sources in the Roaring Fork Valley. There are approximately five operating sand, gravel, and concrete sources in the valley between Glenwood Springs and Aspen.

Noise. To minimize impacts of construction noise, construction equipment will include appropriate mufflers in good working condition, and noisy construction will be limited to daylight hours. For further information, refer to the Noise Impacts section of this chapter.

Utilities. Construction operations may require that electric, telephone, and other overhead utilities be relocated to avoid conflicts. Underground utilities, such as electric, telephone, gas, water, sewer, and others may require special construction techniques to avoid or to relocate in order to accommodate construction.

Hazardous Waste. Areas which have been identified as existing hazardous waste sites are identified in **Section B.4q: Hazardous Waste** of this chapter. Mitigation will follow Federal and State guidelines. Any newly identified sites or spills during construction will be investigated and mitigated as necessary.

Traffic Delays. Alignments which follow the existing State Highway 82, will result in more traffic delays due to construction than alignments which are separated from the existing highway. Alternatives in the Buttermilk Ski Area to Maroon Creek Corridor Section will all have a negative impact of traffic. In the Maroon Creek to 7th Street and Main Street Corridor Section, Alternative B and G (existing alignment) will have a significant adverse impact on traffic because of the Castle Creek Bridge replacement and the reconstruction of State Highway 82 under extremely heavy traffic volumes. Alternatives C, D, E, & F (modified direct alignment) will have minimal impacts on traffic since the construction work will be separate from the existing traffic except at the Maroon Creek Road intersection and the intersection of 7th Street and Main Street. The Colorado Department of Transportation will select construction project limits such that the completed transportation improvements can be quickly placed in service. Construction traffic conflicts will be confined to as few locations as possible.

When construction activities conflict with existing traffic, CDOT will utilize several techniques to minimize delays. These include:

- Establishment of two-lane detours adjacent to work zones on State Highway 82 to allow continuous traffic flows outside the work area.

- Inclusion of specifications in construction contracts to prohibit traffic stoppages during the morning and evening commuter and tourist (peak) periods.

- Inclusion of specifications in construction contracts that do not allow any traffic stoppages for longer than a specified number of minutes (20-25), with a penalty clause to the contractor for violation.

- Provision for traffic control coordination between construction projects or work zones to ensure the cumulative traffic delays are minimized.

- Specifying night construction periods when appropriate to minimize interference with traffic.

- Use of local radio and newspaper notices to inform local commuters of specific construction activities which could result in traffic delays and to recommend ways to avoid them.

- Inclusion of construction specifications that minimize the stoppage of RFTA buses and provide the opportunity to allow the buses to proceed to the front of construction traffic delay queues.

- Inclusion of construction specifications that avoid the stoppage of emergency vehicles and allow the emergency vehicles to proceed to the front of construction traffic delay queues.

- Encouragement of car and van pooling and use of expanded bus service to promote increased usage of high occupancy vehicles.

- Establishment of contract incentives for early completions of critical work.

- Establishment of contract penalties for delays in completion of critical or specialty work.

These traffic management techniques have been used successfully on many highway projects to minimize the inconveniences of highway construction. Traffic management will be a primary consideration that CDOT will address in the planning, design, and construction phases to ensure that traffic is safely and efficiently maintained.

4(f) Resources. The construction of any of the alternatives in both the Buttermilk Ski Area to Maroon Creek Road corridor section and the Maroon Creek Road to 7th Street and Main Street corridor section will have some negative impact on open space, parks, historic properties, and/or trails. The areas would likely include the Marolt-Thomas Open Space, Moore Open Space, the Airport Business Center Trail, and the Aspen Historic District.

Phasing. Alternatives both in the Buttermilk Ski Area to Maroon Creek Road corridor section and the Maroon Creek Road corridor section to 7th Street and Main Street will require phasing to accommodate commuter, tourist, and local traffic to the local businesses and residential areas in the corridor. With the area experiencing the highest traffic during the tourist seasons, construction of portions of the project causing the most conflict would be scheduled during the off-seasons, whenever possible.

Construction impacts specific to individual corridor sections and build alternatives are described in the following paragraphs.

BUTTERMILK SKI AREA TO MAROON CREEK ROAD

Alternative 2: Existing Alignment

Air Quality. Air quality may also be negatively impacted from the construction of access roads to the foundation sites of the Maroon Creek Bridge and the construction of the foundations.

Water Quality. This Alternative has a potential for impacts to water quality in Maroon Creek through spills of pollution materials during construction or operation of the highway because of proximity to the creek. Temporary increases in siltation may occur in Maroon Creek, especially during foundation construction for a new bridge. This may occur during the development of access roads to the foundation sites and the construction of the foundations.

Traffic Safety. Potential safety impacts will occur during operations for this Alternative due to construction next to active traffic lanes. The construction of a new bridge over Maroon Creek will not severely impact traffic, as the bridge can be constructed while running traffic over the existing bridge, thereby separating the traveling public from the construction operations.

Noise. Construction would impose negative noise impacts in this Alternative. Noise from foundation construction on the Maroon Creek Bridge would pose the highest impacts from pile driving efforts.

Traffic Delays. Delays would occur in the operations associated with this Alternative. Construction, especially near intersections, would cause delays due to the minimum space and the potential for lane closures without an effective alternate route.

4(f) Resources. Open space, parks and trails may be negatively impacted. This would likely include the Moore Open Space and the Airport Business Center Trail. Approximately 0.77 kilometers (0.5 miles) of the 4.02 kilometers (2.5 miles) Airport Business Center trail will be acquired and replaced.

Phasing. Construction phasing and traffic control measures will be necessary to minimize conflicts and congestion to commuters, tourist traffic, and local traffic. The construction of the Maroon Creek Bridge could occur during the best construction season as impacts would be minimal. Intersection work would need to be phased to provide the minimum impact. Construction could be phased to perform work to avoid peak commuter and tourist traffic.

Wetlands. The wetlands below Maroon Creek would be temporarily impacted as a result of development of an access road for construction.

Alternative 3: Existing Alignment with Separate Transit Envelope

The construction impacts of Alternative 3 are very similar to Alternative 2. The inclusion of a separate transit envelope does not create any substantial differences in construction impacts.

MAROON CREEK ROAD TO 7TH STREET AND MAIN STREET

Alternative B: Existing Alignment

Air Quality. Air quality may also be negatively impacted from the construction of access roads to the foundation sites of the Castle Creek Bridge and the construction of foundations.

Water Quality. This Alternative has a potential for impacts to water quality in Castle Creek through spills of pollution materials during construction or operation of the highway because of proximity to the creek. Temporary increases in siltation may occur in Castle Creek, especially during foundation construction for the bridge widening and rehabilitation. This may occur during the development of access roads to the foundation sites and the construction of the foundations.

Traffic Safety. Potential safety impacts will occur during operations for this Alternative due to construction next to active traffic lanes. The widening of the bridge over Castle Creek will severely impact traffic, as the bridge widening will be next to the travel lanes. Several pedestrian/bicycle paths are along this section of the corridor. Widening the existing alignment will create disruptions for cyclists and pedestrians maneuvering between active traffic and construction.

Construction Materials. No large cut and fill operations are required for this Alternative and an earthwork balance is feasible.

Noise. Construction would impose negative noise impacts in this Alternative. Noise from foundation construction on the widening of Castle Creek Bridge would pose the highest impacts from pile driving operations.

Utilities. Some utilities will require relocation. The exact treatment of the relocation will be determined during the project's design phase.

Hazardous Waste. No hazardous waste sites are expected to be uncovered within this Alternative. Any newly identified sites or spills during construction will be investigated and mitigated as necessary.

Traffic Delays. Delays could occur in the traffic operations associated with this Alternative. Construction, especially at the intersection of Maroon Creek Road and around the existing S-curves, could cause delays due to the minimum space and the potential for lane closures without an effective alternate route. Traffic delays are expected during the construction of the Castle Creek Bridge. One-way operations would be required. Cyclists and pedestrians will also experience delays at Maroon Creek Road, Castle Creek Bridge, and around the existing S-curves.

4(f) Resources. Open space, parks and trails may be negatively impacted. This would include the Marolt Open Space, Bugsy Barnard Park, and possible impacts to historical properties around the existing S-curves.

Phasing. Construction phasing and traffic control measures will be necessary to minimize conflicts and congestion to commuters, tourist traffic, and local traffic. The widening of the Castle Creek Bridge would require complex phasing. Intersection work would need to be phased to provide the minimum impact. Construction could be phased to perform work to avoid commuter and tourist traffic.

Alternative C: Modified Direct Alignment At-Grade

Air Quality. The cut and fill operations required in this Alternative are not expected to require any blasting operations based upon an initial surface investigation. However, localized blasting may be required upon further subsurface investigation. Dust and smoke from blasting operations will be controlled by specified blasting techniques consistent with the regulations of the Federal, State, and local governments. Air quality may also be negatively impacted from the construction of access roads to the foundation sites of the Castle Creek Bridge and the construction of the foundations.

Water Quality. This Alternative has a potential for impacts to water quality in Castle Creek through spills of pollution materials during construction or operation of the highway because of proximity to the creek. Temporary increases in siltation may occur in Castle Creek, especially during foundation construction for a new bridge and rehabilitation of the existing bridge. This may occur during the development of access roads to the foundation sites and the construction of the foundations.

Traffic Safety. Potential safety impacts will occur during operations for this Alternative due to construction at the tie-in locations near Maroon Creek Road and 7th Street and Main Street. The construction of a new bridge over Castle Creek will not severely impact traffic, as the bridge can be constructed while running traffic over the existing bridge, thereby separating the traveling public from the construction operations.

Noise. Construction would impose negative noise impacts in this Alternative. Noise from foundation construction on the Castle Creek Bridge pose impacts from pile driving operations. The cut and fill operations required in this Alternative are not expected to require any blasting operations based upon an initial surface investigation. However, localized blasting may be required upon further subsurface investigation. Noise from blasting operations will be controlled by specified blasting techniques consistent with the regulations of the Federal, State, and local governments.

Hazardous Waste. There is a possibility of hazardous waste in the Marolt Open Space, however, no new sites are expected to be uncovered within this Alternative. Any newly identified sites or spills during construction will be investigated and mitigated as necessary.

Traffic Delays. Delays would be minimal in the operations associated with this Alternative. Construction, especially at the intersection of Maroon Creek Road and at the intersection of 7th Street and Main Street, would cause delays during material deliveries and tie-ins.

4(f) Resources. Open space, parks and trails may be negatively impacted. This would include the Marolt Open Space. The area within the right-of-way should be enough room for construction staging operations, thereby minimizing impacts outside of the specified right-of-way.

Phasing. Construction phasing and traffic control measures will be necessary to minimize conflicts and congestion to commuters, tourist traffic, and local traffic. Phasing of the tie-ins and intersection work would be necessary to provide the minimum impact. Construction could be phased to perform work to avoid peak commuter and tourist traffic.

Alternative D: Modified Direct Alignment At-Grade with Separate Transit Envelope

The construction impacts of Alternative D are very similar to Alternative C. The inclusion of a separate transit envelope does not create any substantial difference in construction impacts.

Alternative E: Modified Direct Alignment, Cut and Cover

Air Quality. The cut and fill and the cut and cover operations required in this Alternative are not expected to require any blasting operations based upon an initial surface investigation. However, localized blasting may be required upon further subsurface investigation. Dust and smoke from blasting operations will be controlled by specified blasting techniques consistent with the regulations of the Federal, State, and local governments. Air quality may also be negatively impacted from the construction of access roads to the foundation sites in the Castle Creek Bridge and the construction of the foundations. The cut and fill and cut and cover operations will provide material in excess and will require hauling off site, thereby adding additional potential for air quality impact. This Alternative requires significantly more earthwork operations than previous alternatives and would likely pose the greatest impacts on air quality during construction.

Water Quality. This Alternative has a potential for impacts to water quality in Castle Creek through spills of pollution materials during construction or operation of the highway because of proximity to the creek. Temporary increases in siltation may occur in Castle Creek, especially during foundation construction for a new bridge and rehabilitation of the existing bridge. This may occur during the development of access roads to the foundation sites and the construction of the foundations.

Traffic Safety. Potential safety impacts will occur during operations for this Alternative due to construction at the tie-in locations near Maroon Creek Road and 7th Street and Main Street. The construction of a new bridge over Castle Creek will not severely impact traffic, as the bridge can be constructed while running traffic over the existing bridge, thereby separating the traveling public from the construction operations.

Construction Materials. Cut and fill operations are required for this Alternative across the Marolt Open Space to construct the cut and cover tunnel and approach roadway. The material generated from these operations will be in excess and will require hauling off-site.

Noise. Construction would impose negative noise impacts in this Alternative. Noise from foundation construction on the Castle Creek Bridge would pose the greatest impacts from pile driving operations. The cut and fill and the cut and cover operations required in this Alternative are not expected to require any blasting operations based upon an initial surface investigation. However, localized blasting may be required upon further subsurface investigation. Noise from blasting operations will be controlled by specified blasting techniques consistent with the regulations of the Federal, State, and local governments.

Hazardous Waste. There is a possibility of hazardous waste in the Marolt Open Space, however, no new sites are expected to be uncovered within this Alternative. Any newly identified sites or spills during construction will be investigated and mitigated as necessary.

Traffic Delays. Delays would be minimal in the operations associated with this Alternative. Construction, especially at the intersection of Maroon Creek Road and at the intersection of 7th Street and Main Street, would cause delays during material deliveries, tie-ins, and hauling excess material off-site.

4(f) Resources. Open space, parks and trails may be negatively impacted. This would include the Marolt Open Space. The area within the right-of-way may not provide enough area for staging of all earthwork and tunnel staging operations. Phasing construction will be implemented to minimize impacts outside of the specified right-of-way.

Phasing. Construction phasing and traffic control measures will be necessary to minimize conflicts and congestion to commuters, tourist traffic, and local traffic. Phasing of the tie-ins and intersection work would be necessary to provide the minimum impact. Construction could be phased to perform work to avoid peak commuter and tourist traffic.

Alternative F: Modified Direct Alignment, Cut and Cover, with Separate Transit Envelope

The construction impacts of Alternative F are very similar to Alternative E. The inclusion of separate transit envelope does not create any substantial difference in construction impacts.

Alternative G: Two Lanes on Improved Existing Alignment and Transitway on the Modified Direct Alignment, At-Grade

The construction impacts of Alternative G are very similar to the impacts associated with both Alternatives B and C.

Air Quality. Air quality may be negatively impacted from the construction of access roads to the foundation sites of both of the Castle Creek Bridges (existing and transitway) and the construction of the foundations. The cut and fill operations associated with the construction of a transitway along the modified direct alignment, are not expected to require any blasting operations based upon an initial surface investigation. However, localized blasting may be required upon further subsurface investigation. Dust and smoke from blasting operations will be controlled by specified blasting techniques consistent with the regulations of the Federal, State, and local governments.

Water Quality. Alternative G has a potential for impacts to water quality in Castle Creek through spill of pollution materials during construction or operation of the highway because of proximity to the creek. Temporary increases in siltation may occur in Castle Creek, especially during foundation construction for the Castle Creek Bridge along the transitway alignment and the rehabilitation of the Castle Creek Bridge for the improved existing alignment. This may occur during the development of access roads to the foundation sites and the construction of the foundations.

Traffic Safety. Potential safety impacts will occur during operations for the improved existing alignment for Alternative G due to construction next to active traffic lanes. Minimal impacts to traffic will occur during the rehabilitation of the existing Castle Creek Bridge. Potential impacts will also occur during construction of the transitway on the modified direct alignment due to the tie-in locations near Maroon Creek Road and the intersection of 7th Street and Main Street. Several pedestrian/bicycle paths are along the existing alignment and the modified direct alignment, creating disruptions for cyclists and pedestrians maneuvering between active traffic and construction.

Noise. The construction of Alternative G will impose negative noise impacts. Noise from foundation construction on the Castle Creek Bridge (modified direct alignment) pose impacts from pile driving operation. The cut and fill operations required in this Alternative are not expected to require any blasting operations based upon an initial surface investigation. However, localized blasting may be required upon further subsurface investigation. Noise from blasting operations will be controlled by specified blasting techniques consistent with the regulations of the Federal, State, and local governments.

Utilities. This Alternative will require some utilities to be relocated. The exact treatment of the relocation will be determined during the project's design phase.

Hazardous Waste. There is a possibility of hazardous waste in the Marolt Open Space, however, no new hazardous waste sites are expected to be uncovered within this Alternative. Any newly identified sites or spills during construction will be investigated and mitigated as necessary.

Traffic Delays. Delays could occur in the traffic operations associated with this Alternative. Construction, especially at the intersection of Maroon Creek Road and around the existing S-curves, could cause delays due to the minimum space and the potential for lane closures without an effective alternate route. Minimal traffic delays may be expected during improvements to the existing Castle Creek Bridge. Cyclists and pedestrians will also experience delays at Maroon Creek Road, Castle Creek Bridge, and around the existing S-curves.

4(f) Resources. Open space, parks and trails may be negatively impacted. This would include the Marolt Open Space, Bugsy Barnard Park, and possible impacts to historical properties around the existing S-curves.

Phasing. Construction phasing and traffic control measures will be necessary to minimize conflicts and congestion to commuters, tourist traffic, and local traffic. Phasing of the tie-ins and intersection work would need to be phased to provide the minimum construction impact. Construction could be phased to perform work to avoid commuter and tourist traffic.

4t. Short-Term Uses and Long-Term Productivity

All of the transportation build alternatives under consideration for the proposed action have similar short-term effects. These include additional right-of-way acquisitions, construction noise, temporary soil erosion, traffic disruption, unsightly construction activities and residence and business relocations.

The primary products, however, of the Aspen area are recreation and tourism and this industry is assumed to grow. This assumption is documented and consistent with local planning efforts. Because of this growth and current inadequacies, improvements to the transportation system are necessary. These improvements will provide a safer and larger capacity system which will help to ensure the future productivity and economic viability of the area.

4u. Commitments of Resources

Construction of any of the build alternatives for the Entrance to Aspen will involve a similar commitment of natural, physical, human and fiscal resources. These specifically include land, fossil fuels, labor, cement, aggregates and bituminous paving material. The use of the land for the transportation improvements is generally an irreversible commitment of the resource.

The use of the fossil fuels, labor, cement, aggregates and bituminous are generally not retrievable. However, these are not in short supply and their use will not have an adverse effect upon continued availability of these resources. The construction of the various alternatives will also involve the expenditure of fiscal resources.

Highway and air travel, however, are the primary forms of travel in the Roaring Fork Valley and the use of these resources is required if the transportation improvements are to meet the project objectives.

C. SUMMARY OF IMPACTS

Table VI-9 summarizes the various quantitative impacts discussed in this chapter.

Table VI-9
Summary of Quantitative Environmental Impacts

	Project Corridor Section							
	Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th Street and Main Street					
Alternative:	2	3	B	C	D	E	F	G
Alignment Length kilometers (miles)	2.24 (1.39)	2.24 (1.39)	1.11 (0.69)	0.99 (0.61)	0.99 (0.61)	0.99 (0.61)	0.99 (0.61)	*Existing:* 1.11 (0.69) *Transitway:* 0.99 (0.61)
COST (1995 $) (Millions)								Busway / Fixed Gwy*
- Construction	14.9	17.7	5.5	8.1	10.0	12.4	15.1	7.3 / 9.1
- Right-of-Way	3.0	4.2	0.8	0.5	0.6	0.4	0.6	0.5 / 0.5
- Multimodal Facilities Cost	NA	NA	6.5	6.5	6.5	6.5	6.5	31.0 / 31.0
TOTAL	17.9	21.9	12.8	15.1	17.1	19.3	22.2	38.8 / 40.6
SOCIAL IMPACTS								
- # NH's Affected	0	0	1	1	1	1	1	2
- Relocations:								
# Households	2	2	7	1	2	1	2	1
# Business	0	0	3	0	0	0	0	1
Total Relocations	2	2	10	1	2	1	2	2
- ROW Acquisition Hectare (acres)								
Open Space	3.0 (7.6)	3.7 (9.4)	1.2 (3.0)	(2.6 (6.5)	2.9 (7.3)	1.8 (4.5)	2.0 (5.1)	2.0 (4.9)
General ROW	2.1 (5.3)	3.0 (7.1)	0.2 (0.6)	0.3 (0.8)	0.4 (1.1)	0.3 (0.9)	0.4 (1.1)	0.2 (0.4)
Total ROW**	5.1 (12.9)	6.7 (17.0)	1.4 (3.6)	2.9 (7.4)	3.3 (8.4)	2.1 (5.4)	2.5 (6.2)	2.2 (5.4)
- Pedestrian & Bike Facilities Impacted	3	3	2	3	3	3	3	4
PHYSICAL IMPACTS								
- Air Quality (refer to Table VI-5)								
- Water Quality								
# River Crossings	1	1	1	1	1	1	1	1
# Brg Piers in Wetlands	1	1	—	—	—	—	—	—
- Upland/Floodplain Veg.	NI	NI	Disturb.	Perm. Loss	Perm. Loss	Re-estab.	Re-estab.	Perm. Loss
- Wildlife	MI	MI	MI	MI	MI	MI	MI	MI
- Floodplain Impact	NI	MI	MI	MI	MI	MI	MI	MI
- Threat.& Endang. Spec.	NI	NI	NI	NI	NI	NI	NI	NI
- Historic Resources hectares (acres)	0	0	0.195 (0.47)	0.36 (0.89)	0.40 (0.99)	0.36 (0.89)	0.40 (0.99)	0.42 (1.03)
- Archaeological Resource	NI	NI	NI	NI	NI	NI	NI	NI
- Paleontological Resource	NI	NI	NI	NI	NI	NI	NI	NI
- 4(f) Resources hectares (acres)	3 (7.6)	3.70 (9.4)	1.33 (3.32)	2.95 (7.35)	3.37 (8.45)	2.95 (7.35)	3.37 (8.45)	2.26 (5.54)
- Potential & Hazardous Waste Sites	NI	NI	NI	1	1	1	1	1

* Costs do not include rolling stock (train sets).
** Does not include right-of-way required for multimodal facilities.

NI = No Impact
MI = Minor Impact
Brg = Bridge
NH's = Neighborhoods
Perm = Permanent
Re-estab = Re-establishment
Disturb = Disturbance

VII. Mitigation Summary

The Colorado Department of Transportation (CDOT) is committed to the general mitigation measures listed below for all build alternatives for the State Highway 82 Entrance to Aspen corridor.

A. RELOCATIONS

The acquisition and relocation program for State Highway 82 Entrance to Aspen improvements will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (1989). Relocation resources will be available without discrimination to all residents and businesses that are required to relocate.

B. RECREATIONAL ACCESS

With respect to the multimodal approach of the EIS, a more friendly pedestrian/bicycle environment will be created in conjunction with any build alternative. CDOT will relocate, improve, and/or replace all existing trail/bike path facilities and sidewalks impacted by State Highway 82 Entrance to Aspen transportation improvements.

C. CONSISTENCY WITH LOCAL PLANS

Pitkin County's planning goal of complementing the rural character of lands currently undeveloped or developed at low density will be acknowledged wherever consistent with right of way requirements and local access requirements. This includes a narrow median serving as either a planting area or left-turn lane. A narrow median is also used to minimize right-of-way requirements in the vicinity of open space and park lands.

In keeping with Aspen's desire to slow traffic entering the city, traffic calming techniques will be incorporated into the design of the build alternative. These techniques may include a landscaped narrow median, narrow lanes or a cut and cover section.

D. AIR QUALITY

The air quality mitigation measures are dependent on the alternative, but will be in conformance with the PM_{10} State Implementation Plan (SIP) for Aspen, the Clean Air Act Amendments (CAAA), and subsequent regulations.

E. WATER QUALITY

Construction impacts to water quality will be mitigated by the following:

- Adherence to the conditions described by the National Pollution Discharge Elimination System (NPDES) Stormwater Permit.
- Adherence to CDOT Best Management Practices (BMPs).
- The development and implementation of a water quality management plan.
- Use of water quality control and erosion control specifications.
- The development and implementation of a spill prevention and emergency response plan.

The water quality management plan will include erosion control measures and water quality enhancement practices. The spill prevention and emergency response plan will consist of plans for storage, handling and use of chemicals and a detailed plan for emergency response in the event a spill occurs.

Water quality impacts from the operation and maintenance of State Highway 82 Entrance to Aspen improvements will be primarily mitigated by the design of the drainage system. This system includes long drainage pathways with wide bottoms. In the vicinity of river crossings, drainage will be directed away from the streambed. Vegetation will be planted and maintained in the drainageways in order to enhance natural constituent removals. Finally, runoff from above the project area will be intercepted and carried under the highway where it will be combined with highway runoff to promote dilution. CDOT will continue using a low salt mixture for sanding State Highway 82 study corridor to minimize potential salt impacts.

F. UPLAND AND FLOODPLAIN VEGETATION

Impacts on upland and floodplain vegetation will be minimized by mitigation measures which include revegetation of disturbed upland areas with dryland shrubs and grasses similar to the species removed during construction. In riparian zones and wetlands, special seed mixes will be used which have been developed for riparian and wetland areas. Displaced trees and shrubs, which are transplantable, will be transplanted from disturbance areas to areas where construction is nearly completed. Riprap protection at bridge piers will be buried and topsoiled to the high water elevation, then naturally revegetated to repair construction damage.

G. WETLANDS

Mitigation measures for wetland impacts will consist of:

- Avoiding wetland systems and riparian strips to the greatest practical extent.
- Minimizing loss of wetland acreage and trees.
- Using CDOT Standard Erosion Control Measures to slow sediment and pollutant influx into wetlands.
- No stockpiling of material or staging of equipment or supplies in wetland or riparian areas.
- Storing equipment and construction materials away from wetland and riparian areas.
- Replacing wetlands on a one to one basis in suitable sites along the highway corridor.
- Temporary fencing to protect adjacent wetlands from accidental construction equipment encroachment.

H. FISHERIES

Mitigation commitments for fisheries impacts include:

- Avoiding damage to or removal of shoreline vegetation.
- Revegetating according to CDOT Standard Erosion Control Measures.
- Avoiding channel restrictions and channel destabilization.
- Replacing pools and irregular bands where such existing features are lost.
- Filtering runoff in settlement ponds wherever practical.
- Avoiding in-stream activities during fall months and early spring when resident fish are spawning.
- Avoiding removal or damage to gravel substrates which are critical to the survival of fish eggs.

I. WILDLIFE

CDOT will cooperate with the Colorado Division of Wildlife during design of the project. The Division of Wildlife will review preliminary highway design plans and specific wildlife mitigation techniques will be requested at that time.

J. FLOODPLAINS

To minimize impacts to floodplains, extensive longitudinal encroachments to channels have been avoided in the study corridor in the design of bridges with 23 CFR 650, Subpart A, 771, and roadway embankments. This is in compliance with FHPM 6-7-3-2, "Location and Hydraulic Design of Encroachments on Floodplains" and Executive Order 12148. Buried riprap will be provided in design and construction phases to minimize erosion.

K. THREATENED AND ENDANGERED SPECIES

No Threatened and Endangered Species have been identified in the State Highway Entrance to Aspen corridor. The application of standard CDOT erosion and sediment control measures will ensure that long-distance impacts to federally-listed endangered fish, downstream in the Colorado River, will be avoided. No threatened and endangered species will be impacted in this project area.

L. HISTORIC RESOURCES

Mitigation measures for historic resources impacts will consist of:

Maroon Creek Bridge: The State Historic Preservation Office (SHPO) will be afforded the opportunity to review and approve the design of the new bridge. Should additional structural supports be necessary to strengthen the historic bridge for transit purposes, the SHPO will also be afforded the opportunity to review and approve the alterations prior to construction.

Holden Smelting and Milling Complex: Prior to construction of State Highway 82 improvements, a Memorandum of Agreement between the SHPO, CDOT, FHWA and the Advisory Council on Historic Preservation will be executed to mitigate the adverse effects of Alternatives C, D, E, F, and G. Possible mitigation measures might include slight reductions in right-of-way width requirements for the new State Highway 82 right-of-way, shifting the pavement edge to miss the National Historic District (NHD), conducting a historic archaeological survey, and SHPO review and approval of berm design and landscaping plans that partially screen buildings on the property from the highway.

Colorado Midland Railroad: Efforts to minimize harm to this historic resource will include designing the Preferred Alternative with the least possible right-of-way width for the new State Highway 82 and avoidance of railroad right-of-way wherever possible.

920 West Hallam: Efforts to minimize harm to this historic resource include SHPO review and approval of the proposed retaining wall and railing which may be required under Alternative B.

834 W. Hallam, 734 W. Hallam, and the Berger Cabin: The Colorado Department of Transportation commits to a photographic recordation of these locally designated resources if adverse effects cannot be avoided. Efforts to minimize harm to these resources will include designing the Preferred Alternative with the least possible right-of-way width where possible.

M. ARCHAEOLOGICAL RESOURCES

When a final alignment for the State Highway 82 Entrance to Aspen corridor is selected, it will be compared to previously studied alignments by the CDOT staff archaeologist. If any inconsistencies between the previous survey and the alignment which is to be constructed are evident, on-the-ground reconnaissance will be conducted as necessary to document that the final highway alignment has been adequately evaluated and that no archaeological resources determined to be significant by the SHPO will be adversely affected. Should any evidence of archaeological resources be discovered during construction, the work will be stopped in that vicinity until the CDOT staff archaeologist and the SHPO representative fully evaluate the importance of the resources.

N. PALEONTOLOGICAL RESOURCES

If any paleontological resources are uncovered along the alignment corridor during construction, work in the immediate vicinity will cease. The CDOT staff paleontologist will be notified, and the material will be evaluated by a qualified paleontologist and coordinated with the SHPO.

O. 4(f) RESOURCES

A discussion of mitigation measures for impacts to 4(f) resources is included in **Appendix A: 4(f) Evaluation**. These measures will be adopted by the FHWA prior to completion of the State Highway 82 Entrance to Aspen FEIS.

P. FARMLANDS

There are no significant Prime and Unique Farmlands in the State Highway 82 Entrance to Aspen study area. Impacts to existing irrigation systems due to highway construction will be relocated and replaced.

Q. NOISE

Noise abatement in the form of a noise wall 2.4 meters (8 feet) in height was evaluated along the existing S-curves (Alternative B), modified direct (Alternatives C, D, E, and F), and the combination alignment (Alternative G) where construction of a wall is possible. In order to be effective, noise walls must be continuous and not have breaks or gaps such as driveways, side-streets, or walkways. For the preliminary alignment information and the assumption of a 2.4 meter (8 foot) noise wall constructed along the respective alignment, mitigation below the 67 dBA level is possible for first floor receptors. On Main Street east of 7th Street, noise mitigation is not considered feasible due to existing buildings and developments, and the need to provide access openings at these numerous locations.

Residences which are affected by predicted traffic noise levels may also be subject to construction noise when improvements are built. Construction noise will vary depending on the activities involved and is anticipated to exceed 90 dBA for short durations in some instances. Two measures that will be used to minimize adverse construction noise for State Highway 82 are restricting noisy construction to daylight hours and requiring that each piece of construction equipment include an appropriate muffler in good working condition. These mitigation measures will eliminate construction noise during sensitive nighttime and early morning hours, and minimize it at other times. Some minor adverse construction economic impacts may result from these measures, in the form of higher costs to the contractor to have all equipment properly equipped to reduce noise.

R. VISUAL

The variety of proposed alignments for the State Highway 82 Entrance to Aspen corridor requires the consideration of many different types of visual mitigation. These mitigation measures include:

- A minimum-width planted median to visually separate the roadway lanes and lessen the feeling of an asphalt corridor.
- Revegetation of all disturbed areas with natural species to reduce soil erosion and minimize color contrasts caused by exposed soil surfaces.
- Adjusting the final roadway layout to save existing large trees and other significant groupings of vegetation.
- Creating slopes which approximately match the existing slopes.
- Using building materials which approximate the natural tones and textures of the area being traversed.
- Adjusting the alignment to provide enhanced views and vistas for highway users to minimize the effects of unavoidable impacts elsewhere.

These mitigation measures would directly benefit the design quality of the alignment alternatives. In addition to increased design quality through enhancement of the natural setting, sensitive roadway design and detailing could also enhance project design quality. Horizontal curvature and vertical profiles can be adjusted to provide visual interest for the highway user. Significant sections of retaining walls may be enhanced by the wall layout, texture, color and vertical profile; this may integrate with the landscape or accent unique natural or historic features, as well as building types and features within the project area.

S. HAZARDOUS WASTE

Further evaluation of potential hazardous waste sites will continue throughout the preparation of the FEIS and prior to property acquisition (once a Preferred Alternative is selected) and during preliminary highway design, along with coordination with the EPA and State and local agencies. The selected transportation improvement will avoid potentially contaminated areas whenever practical. However, where avoidance is not feasible, a detailed site investigation (DSI) will be conducted. Necessary cleanup plans will be coordinated with appropriate agencies and landowners.

The inclusion of environmental specifications in the construction bid package (such as Section 252 Fugitive Petroleum Product Management) may be necessary based on existing Preliminary Site Investigation (PSI) data or based on any future investigative activities.

T. CONSTRUCTION

During the reconstruction of the Preferred Alternative for the State Highway 82 Entrance to Aspen, CDOT will utilize appropriate traffic management techniques to minimize delays and inconvenience to the traveling public. This may be done by phased construction of the transportation improvements and by restricting the timing of construction activities and limiting traffic stoppages to off-peak traffic hours. Whenever feasible, provisions will be included to minimize the effects on Roaring Fork Transit Agency (RFTA) buses. Construction delays will be limited to 20 to 25 minutes duration whenever possible.

VIII. List of Preparers

The following people contributed to the making of the Draft Environmental Impact Statement - Entrance to Aspen:

COLORADO DEPARTMENT OF TRANSPORTATION
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IX. Availability of Technical Reports

Several sections of the DEIS are summaries of reports prepared by members of the study team. These detailed technical reports are available for agency and public review upon request from the Colorado Department of Transportation in their offices at Grand Junction, Basalt, Glenwood Springs, and Denver. A copy of these reports is also available at the Pitkin County Library and the Denver office of the Federal Highway Administration.

ALTERNATIVE SCREENING
Alternative Screening Analysis, July 1995, prepared by Steve Pouliot and Barry Schulz, Centennial Engineering, Inc.

AIR QUALITY
Air Quality Report, July 1995, prepared by George Gerstle and Jerry Piffer, Colorado Department of Transportation.

NOISE
State Highway 82, Entrance to Aspen, Noise Report, August 1995, prepared by David Woolfall and Jennifer Linden, Centennial Engineering, Inc.

PALEONTOLOGY
Reassessment of Proposed Paleontological Mitigation of the Mancos Shale at Shale Bluffs, August 1990, prepared by Steven M. Wallace, Colorado Department of Transportation.

ARCHAEOLOGY
An Archaeological Inventory of the State Highway 82 - Brush Creek Road Intersection between Basalt and Aspen, Pitkin County, Colorado, July 1993, prepared by Christian J. Zier, Centennial Archaeology, Inc.

Archaeological Status for Project FC 082-1(14), East of Basalt to Aspen, July 1988, prepared by Debra Angulski, Colorado Department of Transportation.

FUTURE TRANSPORTATION DEMAND
State Highway 82 Entrance to Aspen Transportation Demand Model, July 1995, prepared by Steve Pouliot and Barry Schulz of Centennial Engineering, Inc.

ORIGIN AND DESTINATION STUDY
Mount Sopris Transportation Project, Final Report: 1992 Origin and Destination Summer Study and Selected Traffic Count Information, March 1993, prepared by the Colorado Department of Transportation Mount Sopris Project Team.

Mount Sopris Transportation Project, Final Report: 1993 Origin and Destination Winter Survey and Selected Traffic Count Information, February 1994, prepared by the Colorado Department of Transportation Mount Sopris Project Team.

IX. Availability of Technical Reports

Mount Sopris Transportation Project, Final Report: 1994 Aspen Residential Origin and Destination Survey and Selected Count Information, April 1995, prepared by the Colorado Department of Transportation Mount Sopris Project Team.

HAZARDOUS WASTE

Preliminary Site Investigation: Highway 82 Basalt to Aspen, CDOT Project No. FC082-1 (14), June 1992, prepared by Walsh and Associates.

FARMLANDS

Prime and Unique Farmland and Valued Agricultural Land in Pitkin County and Impacts of the Proposed Project on Farmland Along the SH 82 Impact Area, September 1988, prepared by Joan Bossert of Environmental Research Consultants, Ltd.

SOCIAL AND ECONOMIC IMPACTS

Social Profile and Social Impacts and Relocation Analysis, July 1988, prepared by Joan Bossert of Environmental Research Consultants, Ltd.

Economic Profile and Economic Impacts Analysis, July 1988, prepared by Joan Bossert of Environmental Research Consultants, Ltd.

ECOLOGY AND WATER QUALITY

Ecology and Water Quality - Highway 82 Entrance to Aspen, February 1995, prepared by Science Applications International Corporation.

GEOLOGY

Preliminary Draft Geologic and Geotechnical Engineering Investigation, Proposed State Highway 82 Upgrade Alternatives Between Basalt and Aspen, Colorado, October 1987, prepared by Richard Tocher, P.E., Chen & Associates, Inc.

TRANSPORTATION MANAGEMENT

Transportation Management (TM) Applications in Aspen, May 1995, prepared by TDA, Inc.

Transportation Management (TM) Measures, May 1995, prepared by TDA, Inc.

ENVIRONMENTAL IMPACT STATEMENT

State Highway 82: East of Basalt to Buttermilk Ski Area - Final Environmental Impact Statement, October 1993, prepared by U.S. Department of Transportation, Federal Highway Administration, and Colorado Department of Transportation.

REPORT LOCATIONS

Copies of these reports are on file at the following locations:

Aspen/Pitkin Planning Department
130 S. Galena Street, Aspen, Colorado 81611
(970) 925-2020

Pitkin County Library
120 N. Mill Street, Aspen, Colorado 81611
(970) 925-4025

Colorado Department of Transportation
Region 3, 222 S. 6th Street
Grand Junction, Colorado 81502
(970) 248-7223

Colorado Department of Transportation
Office of Environmental Services
4201 E. Arkansas Avenue, Denver, Colorado 80222
(303) 757-9448

Colorado Department of Transportation
Mount Sopris Transportation Project
0020 Sunset Drive #9, Basalt, Colorado 81621
(970) 927-9852

Colorado Department of Transportation
Region 3, 202 Centennial
P.O. Box 1430
Glenwood Springs, CO 81602
(970) 945-8187

Federal Highway Administration
Colorado Division, 555 Zang Street, Room 250
Lakewood, Colorado 80228
(303) 236-3384

X. Acronyms

AADT	Annual Average Daily Traffic
ACC/MVM	Accidents Per Million Vehicle Miles Traveled
APE	Area of Potential Effect
AVFD	Aspen Volunteer Fire Department
BBFEIS	Basalt to Buttermilk Final Environmental Impact Statement
BEA	Bureau of Economic Analysis
BOCC	Board of County Commissioners
C°	Degrees Centigrade
CAAA	Clean Air Act Amendments
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and the Environment
CERCLIS	Comprehensive Environmental Response, Compensation and Liability List
CWA	Clean Water Act
CWQCC	Colorado Department of Water Quality Control Commission
dBA	Decibels - average noise fluctuations over an hour
D&RGW	Denver and Rio Grande Western Railroad
DDT	Dichloro-disphenyl-trichloroethane
DEIS	Draft Environmental Impact Statement
DERA	Designated Emergency Response Authority
DLA	Department of Local Affairs
DSI	Detailed Site Investigation
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAC	Facultative Plants
FACU	Facultative Upland Plants
FACW	Facultative Wetland Plants
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HASP	Health and Safety Plan
HCM	Highway Capacity Manual
HOV	High Occupancy Vehicle
ISA	Initial Site Assessment
ISTEA	Intermodal Surface Transportation Efficiency Act
KM/H	Kilometers Per Hour
LOS	Level of Service
LRT	Light Rail Transit
MMP	Materials Management Plan
MP	Milepost
MPH	Miles Per Hour

X. Acronyms

NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act of 1969
NHD	National Historic District
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
OBL	Obligate Wetland Plants
PM_{10}	Particulate matter 10 microns or smaller in diameter
PMH	Permanent Moderate Housing
PRT	Personal Rapid Transit
PSI	Preliminary Site Investigation
PUD	Planned Unit Development
R/MF	Residential Multi-family
RCRA	Resource Conservation and Recovery Act
RFTA	Roaring Fork Transit Agency
ROD	Record of Decision
ROW	Right-of-Way
SADT	Summer Average Daily Traffic
SCI	Service/Commercial/Indutrial
SCS	United States Soil Conservation Service
SH 82	State Highway 82
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SOV	Single Occupant Vehicle
T&E	Threatened and Endangered
TAC	Technical Advisory Committee
TCLP	Toxic Characteristics Leaching Procedure
TDM	Transportation Demand Management
TM	Transportation Management
TSM	Transportation System Management
TVS	Table Value Standards
USACOE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
VMT	Vehicle Miles Traveled
VPH	Vehicles Per Hour
WADT	Winter Average Daily Traffic
WQCC	Water Quality Control Commission

XI. Index

The topics listed in the index are for major topic matters. Page citations are referenced to sections with major discussion on the respective topic. If the topic is discussed on two or more pages in a row, only the first page is cited.

XI. Index

APPENDIX A

SECTION 4(f)
EVALUATION

STATE HIGHWAY 82
ENTRANCE TO ASPEN
PITKIN COUNTY, COLORADO

PROJECT STA 082A-008

PREPARED BY:

COLORADO DEPARTMENT OF TRANSPORTATION
OFFICE OF ENVIRONMENTAL SERVICES

AUGUST , 1995

A. 4(f) Evaluation

WHAT IS 4(f)?

Section 4(f) resources are lands from publicly owned parks or recreation areas, wildlife or waterfowl refuges, or historic sites listed on or eligible for the National Register of Historic Places. Impacts to parks, open space, and historic structures and sites on or eligible for listing on the National Register of Historic Places result from the need to improve existing State Highway 82 on or near the current alignment. Impacts to these resources are covered by Section 4(f) of the Department of Transportation Act of 1966, Public Law 89-670, 80 Stat. 934, which was amended in 1983 and 1987, and is now codified at 49 U.S.C. 303.

Under Section 4(f) the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge, or land from an historic site of national, State, or local significance only if there is no prudent and feasible alternative to using that land, and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use.

The Federal Highway Administration has adopted regulations (23 CFR 771.135) to guide implementation of this section of federal law. This regulation clarifies that the requirements of Section 4(f) apply only to historic properties on or eligible for the National Register of Historic Places (National Register) unless the Administration determines otherwise.

The Colorado Department of Transportation is preparing this document as part of the Draft Environmental Impact Statement (DEIS) being prepared for Project STA 082A-008, State Highway 82, Entrance to Aspen. The FHWA Regional administrator will be responsible for determining that this project meets the criteria and procedures set forth in this process.

PROPOSED ACTIONS

The Colorado Department of Transportation (CDOT) in conjunction with the Federal Highway Administration (FHWA) is proposing to improve an approximately 3.2 kilometer (2 mile) section of Colorado State Highway 82. The study corridor, which lies entirely in Pitkin County, Colorado, extends from the Buttermilk Ski Area (milepost 38.5) to the intersection of 7th Street and Main Street on the west side of Aspen (milepost 40.5).

More detailed descriptions of the action under study, the purpose and the need for the improvement of State Highway 82, Entrance to Aspen are outlined in the preceding Draft Environmental Impact Statement (DEIS). Refer to **Chapter I: Purpose and Need** for a statement of the proposed action and transportation problems and **Chapter III: Alternatives** for a detailed discussion of the alternatives under consideration. The methodology for naming the alternatives is summarized below in Table A-1. All alternatives except the No-Action Alternative would require some use of Section

4(f) lands in the form of parklands, recreation areas, greenbelt, open space, or lands from historic properties which lie adjacent to existing State Highway 82.

Table A-1
Methodology for Naming the Alternatives

Corridor Section	Number/ Letter	Alternative
Buttermilk to Maroon Creek Road	1	No-Action
	* 2	Existing Alignment
	* 3	Existing Alignment with Separate Transit Envelope
Maroon Creek Road to 7th and Main Street	A	No-Action
	* B	Existing Alignment
	* C	Modified Direct Alignment At-Grade
	* D	Modified Direct Alignment, At-Grade, with Separate Transit Envelope
	* E	Modified Direct, Cut and Cover
	* F	Modified Direct, Cut and Cover, with Separate Transit Envelope
	** G	Two improved Lanes on Existing Alignment and Transit-way on Modified Direct Alignment, At-Grade

* These alternatives consist of two highway lanes plus two dedicated vehicle and/or transit lanes.
** The transitway for Alternative G is for transit vehicles only and does not include carpools.

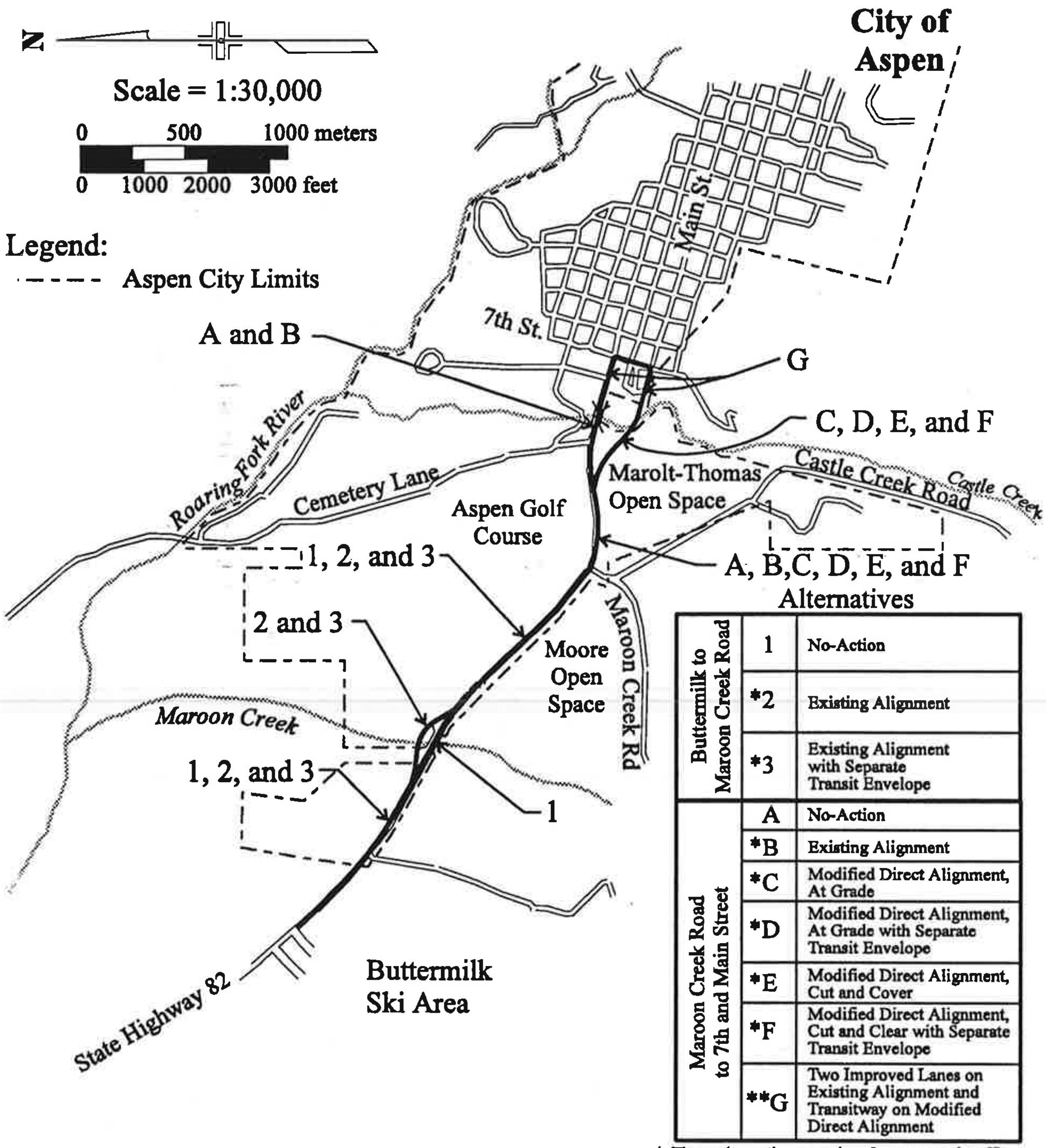
In this project, one recreation area, one trail system, four open space/park land (greenbelt) areas, five National Register listed or eligible historic sites, three locally designated historic structures, and one locally designated historic district may be impacted by any improvement of State Highway 82.

Figure A-1 identifies the general alignment alternatives evaluated in the DEIS and in this 4(f) evaluation.

Section 4(f) and Locally Designated Historic Properties

As discussed in **Section IV.C.13: 4(f) Resources** and **Section VI.B.4m: 4(f) Impacts**, 11 properties are potentially subject to Section 4(f) review because they may be impacted by alternatives under consideration for this project. In addition, three locally designated historic structures and a local historic district are also located in this project corridor. These locally designated historic structures and district have not been determined by FHWA to be subject to 4(f) evaluation, but are evaluated in **Section IV.C.10: Historic Resources** and **Section VI.B.4j: Impacts on Historic Resources**.

Figure A-1
Potential Alignment Alternatives Schematic
State Highway 82 Entrance to Aspen EIS



Alternatives

Buttermilk to Maroon Creek Road	1	No-Action
	*2	Existing Alignment
	*3	Existing Alignment with Separate Transit Envelope
Maroon Creek Road to 7th and Main Street	A	No-Action
	*B	Existing Alignment
	*C	Modified Direct Alignment, At Grade
	*D	Modified Direct Alignment, At Grade with Separate Transit Envelope
	*E	Modified Direct Alignment, Cut and Cover
	*F	Modified Direct Alignment, Cut and Clear with Separate Transit Envelope
	**G	Two Improved Lanes on Existing Alignment and Transitway on Modified Direct Alignment

* These alternatives consist of two general traffic lanes plus two dedicated vehicle and/or transit lanes

** The transitway for Alternative G is for transit vehicles only and does not include carpools.

4FFIG_1.CDR

4(f) RESOURCES

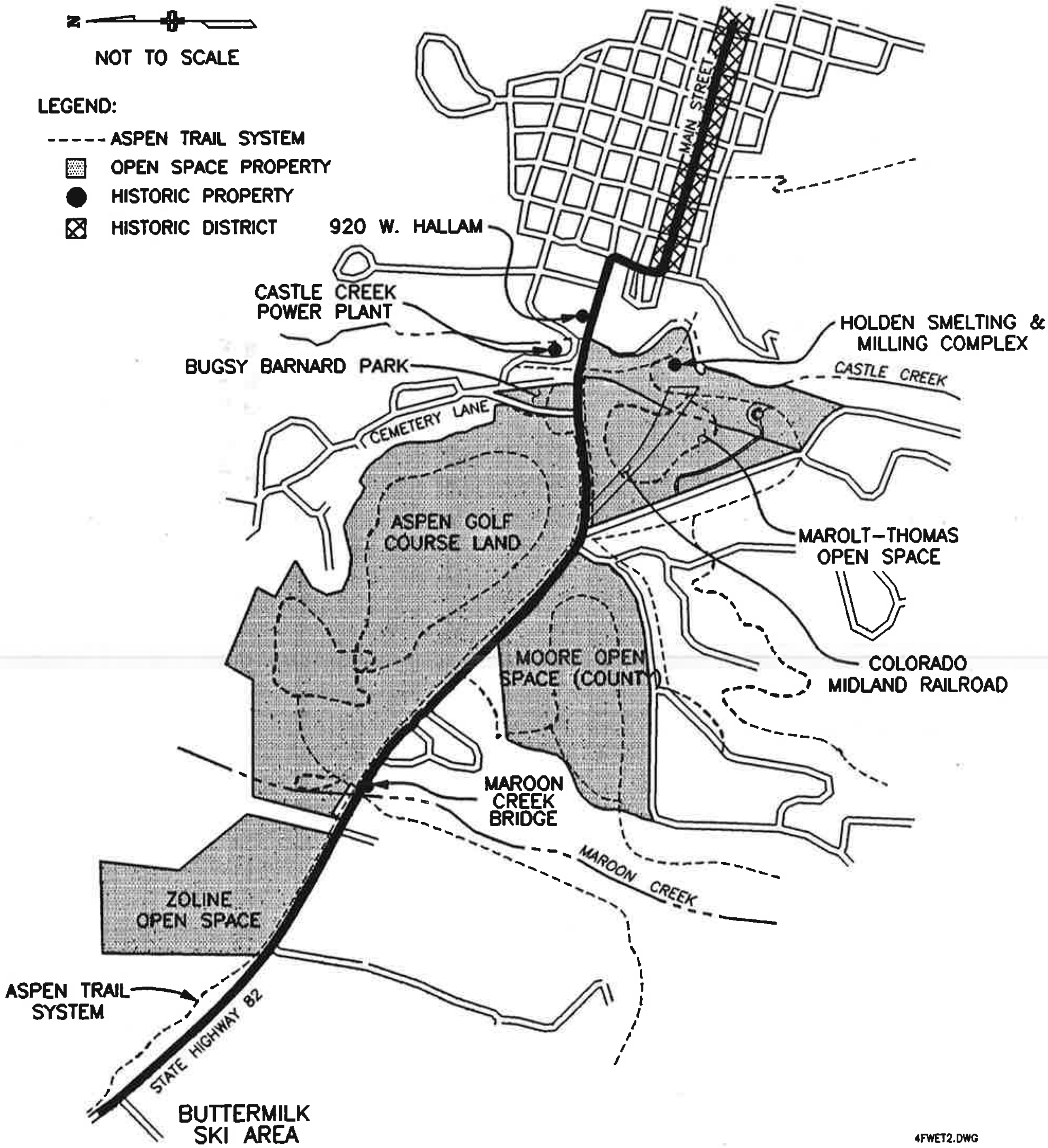
This section describes each of the properties eligible for 4(f) evaluation. Figure A-2 shows the location of each 4(f) resource.

1. *Aspen Trail System*: The Aspen Trail System includes 20 biking/hiking trails and 7 Nordic trails within the Aspen area. Within the State Highway 82 study corridor, the trail system includes approximately 4.8 kilometers (3.0 miles) of paved biking/hiking trail and 0.48 kilometers (0.3 miles) of gravel biking/hiking trail. The trails within this corridor include the Airport Business Center Trail, the High School Bike Path, the Marolt Trail, the Moore Nordic Trail, the Maroon Creek Nordic Trail, and the Thomas/Marolt Nordic Trail. The paved Airport Business Center trail runs along the north side of existing State Highway 82 from Milepoint 38.5 near the Buttermilk Ski Area into the City of Aspen. The High School Bike Path is along the south side of existing State Highway 82 from Milepoint 40.1 at Maroon Creek Road into the City of Aspen. The unpaved Marolt trail runs from the existing State Highway 82 at the Castle Creek bridge (Milepoint 40.4) and south along Castle Creek through the Marolt-Thomas property. The trails are used primarily for public recreation and receive extensive use during the summer tourist season for biking and hiking. They are also used in the winter for cross-country ski trails. The system is owned and maintained by the City of Aspen, but crosses private lands where easements have been obtained.

2. *Zoline Ranch Open Space*: The Zoline Open Space is located on the northwest side of the Maroon Creek Bridge at about Milepoint 39.2 This 18.2-hectare property (45 acres) on the north side of existing State Highway 82 was purchased by the City of Aspen for use as open space. The parcel of land currently has no recreation facilities or improvements located on the property. The Airport Business Trail passes through a portion of the property.

3. *Aspen City Golf Course*: The City Golf Course is a 63.1 hectare (156 acres) facility on the north side of existing State Highway 82. It stretches from the west end of the existing Maroon Creek Bridge to Cemetery Lane. The course is utilized primarily for public recreation, and receives extensive use during the summer tourist season and is used extensively by cross country skiers during the winter. The city also owns a soccer/baseball field that lies immediately northeast of the Maroon Creek Bridge and State Highway 82 and is part of the golf course property. This field, adjacent to the golf course on the west, is approximately 1.2 hectares (3 acres) in size and receives considerable public use for football, soccer, softball, and other seasonal activities. There are currently no plans to change the use of this area or expand the existing facilities. A portion of the Aspen Trail System forms the southern boundary of the golf course in the vicinity of the Marolt-Thomas Open Space.

Figure A-2
Section 4(f) Resources



4. *Moore Property Open Space*: Pitkin County purchased the Moore property in 1992. for open space. The property is approximately 26.25 hectares (64.87 acres) and is located on the northwest corner of the intersection of Maroon Creek Road and State Highway 82. The space is a "passive park" with no plans to construct fields for active recreation. The property will be crossed by trails and there may be benches or picnic tables at various locations on the property.

5. *Marolt-Thomas Open Space*: The City of Aspen presently owns a tract of land adjoining State Highway 82 on the south between Castle Creek and the Maroon Creek Road. This city-owned open space property (Marolt-Thomas) is a triangle-shaped piece of land consisting of approximately 29.9 hectares (74 acres). Also included on this site are two historical sites currently listed on the National Register of Historical Places: the Holden Smelting and Milling Complex, which includes the local historical museum and the Colorado Midland Railroad grade.

   The Marolt-Thomas property consists of land which was donated to or purchased by the City of Aspen to be kept and used as open space. The property is presently in pasture with portions of the site used for the Aspen Community Gardens. The land is skirted on its north, south, and east sides by sections of the Aspen Trail System. The majority of the parcel is intended for passive recreation with no recreational facilities or improvements (structures, ball fields, backstops) located on the property. The property is also used for para-sailing and hang gliding landings. A small section of the property on the south side near the Castle Creek Road has been developed for employee housing.

6. *Bugsy Barnard Park*: This park was created in 1971 and was part of the City's purchase of the Golf Course land. The park is approximately 0.81 hectares (2 acres). In 1993 it was upgraded to a more formal park with two ponds and an irrigation system. The park is named for Dr. Robert "Bugsy" Barnard, the mayor of Aspen from 1966 to 1970.

7. *Maroon Creek Bridge*: The historic Maroon Creek Bridge is located on State Highway 82, approximately 1.6 kilometers (1 mile) northwest of the center of Aspen. The bridge, built in 1888 by the Colorado Midland Railroad, was converted to automobile use in 1929. The structure is listed on the National Register of Historic Places as one of the last remaining metal multiple-span high railroad trestles in Colorado.

8. *Holden Smelting and Milling Complex*: The historic Holden Smelting and Milling Complex is located on approximately 3.2 hectares (8 acres) on what is now called the Marolt-Thomas Open Space owned by the City of Aspen. Although most of the buildings have been torn down, there are potentially significant archeological remains of the mill structure on the east end of the site: the salt warehouse has been cut in half, but is still in its original location; the sampling works building (barn) has been altered on the interior, but still retains most of its original exterior appearance; and the office building, now known as the Marolt House, was significantly remodeled by the Marolts but is still in its original location. This complex was

constructed in 1891 and purchased by the Marolts in the 1930's. The site has been listed on the National Register for its association with the mining history in Aspen, as one of the few remaining structures from the industrial aspects of Aspen's mining history, and because the site is likely to yield archaeological information about the smelting and mining industry in Aspen.

9. *Colorado Midland Railroad*: The Colorado Midland Railroad arrived in Aspen in 1887, a month after the Denver and Rio Grande. Very little of the railroad grade remains in Pitkin County, as the majority was obliterated by the construction of State Highway 82. One short section remains intact from the junction of Maroon Creek Road and State Highway 82 to the Aspen city limits, crossing through approximately 1.6 hectares (4 acres) of the Marolt-Thomas property. The line is eligible for the National Register as the first standard gauge railroad to penetrate the Rockies, and for its association with Jerome Wheeler and the early railroad history in Colorado.

10. *Castle Creek Power Plant*: The Castle Creek Power Plant is located in Castle Creek Canyon on approximately 0.6 hectares (1.5 acres) of land, just below and to the north of the existing State Highway 82 Castle Creek Bridge. It was constructed in 1893. Known originally as the Roaring Fork Electric Light and Power Plant Number 2, the building is a two story, brick warehouse type building with a gabled roof and is now owned by the City of Aspen. It is eligible for listing on the National Register for its association with three of Aspen's most significant individuals (H.P. Cowenhoven, D.R.C. Brown, and James H. Deveraux) and as only the second commercially run hydroelectric plant in the country.

11. *920 West Hallam*: This historic privately owned house is located on the north side of existing State Highway 82 on approximately 0.08 hectares (0.2 acres) of land just east of the Castle Creek Bridge within the Aspen city limits. The small, one story, wood house, built about 1888, is eligible for listing on the National Register as a good example of the typical late 19th century miner's cottage.

IMPACTS TO SECTION 4(f) RESOURCES

A description of impacts to the 4(f) resources identified is presented below and is summarized in Table A-2. Comments from the State Historic Preservation Office (SHPO) regarding the effects of each alternative on each historic property are also included. Prior to determining the effects of the alternatives, the Aspen Historic Preservation Commission was asked to comment on the impacts to both the 4(f) and locally designated historic properties (see **Volume 2: Comments and Coordination**). A full description of the alternatives evaluated for the Entrance To Aspen can be found in **Chapter III: Alternatives**. All build alternatives under consideration impact 4(f) resources to some extent. Refer to Figure A-1 for a diagram of the alternatives under consideration.

4(f) Evaluation

1. *Aspen Trail System*: Within the Buttermilk Ski Area to Maroon Creek Road section, there are three alternatives. Under the No-Action Alternative (Alternative 1), there would be no impacts to the Aspen Trail System, and therefore no Section 4(f) involvement. However, under the other two alternatives evaluated in the DEIS, impacts to the trail system occur.

   Alternative 2 results in a take of approximately 768 meters (2518 feet) from the Airport Business Trail; 26 meters (85 feet) from the Moore Nordic Trail; and 37 meters (120 feet) from the Maroon Creek Nordic Trail. Alternative 3 requires approximately 774 meters (2538 feet) of the Airport Business Center Trail; 26 meters (85 feet) from the Moore Nordic Trail; and 37 meters (120 feet) from the Maroon Creek Nordic Trail.

   Within the Maroon Creek Road to 7th Street and Main Street section, there are seven alternatives. Under the No-Action Alternative (Alternative A), there would be no impacts to the Aspen Trail System, and therefore no Section 4(f) involvement. However, under the remaining six alternatives, impacts to the trail system occur.

   Alternative B requires a 611 meter (2005 feet) take from the High School Bike Path. There would be no other impacts to the trail system. Alternatives C and E would require taking 311 meters (1020 feet) from the High School Bike Path; 102 meters (335 feet) from the Marolt Trail; and 152 meters (500 feet) from the Thomas/Marolt Nordic Trail. Alternatives D and F would require taking 320 meters (1050 feet) from the High School Bike Path; 126 meters (415 feet) from the Marolt Trail; and 164 meters (540 feet) from the Thomas/Marolt Nordic Trail. Alternative G would take a total of 404 meters (1,325 feet) from the trail system; 280 meters (920 feet) from the High School Bike Path, 87 meters (285 feet) from the Thomas/Marolt Nordic Trail, and 37 meters (120 feet) from the Marolt Trail.

2. *Zoline Open Space*: Under the No-Action Alternative (Alternative 1), there would be no impacts to the Zoline Open Space, and therefore, no Section 4(f) involvement. The impacts to this open space would be only slightly different under the two build alternatives. The improvements under Alternative 2 would result in a take of approximately 1.2 hectares (3 acres) from a total of 18 hectares (45 acres) designated as open space for the City of Aspen. Under Alternative 3, the take would be 1.4 hectares (3.5 acres). The area needed for right-of-way is currently undeveloped open space. The take is necessary to construct a new bridge north of the existing Maroon Creek Bridge in order to leave this National Register historic bridge in place as a pedestrian or transit crossing of Maroon Creek.

3. *Aspen City Golf Course*: There will be no impacts to the Aspen City Golf Course under the No-Action Alternative; therefore, there would be no Section 4(f) involvement. The impacts to the golf course would be similar under the two build alternatives. The widening under Alternative 2 would result in a total take of approximately 1.2 hectares (3.0 acres) from a total of 48 hectares (120 acres). Of the total take, 0.4 hectares (0.9 acres) would be from a developed playing field, located immediately east of the Maroon Creek Bridge.

Approximately 0.8 hectares (2.1 acres) are currently undeveloped golf course property or are in the Maroon Creek channel. The opportunity exists to shift the playing field approximately 15 meters (50 feet) to the north to avoid permanent loss of use.

Alternative 3 would require a total take of 1.4 hectares (3.5 acres). Of the total take, approximately 0.9 hectares (2.4 acres) are currently undeveloped golf course property or are in the Maroon Creek channel. The area needed for right-of-way that is currently used for recreation 0.5 hectares (1.1 acres), is a playing field, located immediately east of the Maroon Creek drainage. The opportunity exists to shift the playing field approximately 15 meters (50 feet) to the north.

This take would be necessary to construct a new bridge north of the existing Maroon Creek Bridge in order to leave this National Register historic bridge in place as a pedestrian or transit crossing of Maroon Creek.

4. *Moore Open Space*: Under the No-Action Alternative (Alternative 1), there would be no impacts to the Moore Open Space, and therefore, no Section 4(f) involvement. The widening under Alternative 2 would result in a take of approximately 0.6 hectares (1.6 acres) from a total of 26.25 hectares (64.87 acres) designated as open space for the City of Aspen. Under Alternative 3, the take would be 0.9 hectares (2.4 acres). The area needed for right-of-way is currently undeveloped open space.

5. *Marolt-Thomas Open Space*: There would be no impacts to the Marolt-Thomas property under the No-Action Alternative (Alternative A), therefore, there would be no Section 4(f) involvement. Under Alternatives B, C, D, E, F and G the existing highway would be improved, requiring acquisition of various amounts of land from the 30.1 hectare (74.26 acre) open space property.

   Alternatives C and E would require 50 meters (164 feet) of total right-of-way width and Alternatives D and F would require 56 meters (184 feet). Alternative B has a right-of-way width of 50 meters (164 feet) between Maroon Creek Road and Castle Creek Bridge. Between Castle Creek Bridge and 7th Street and Main Street, the right-of-way is minimized to 30 meters (100 feet). This would result in a take of approximately 1.2 hectares (3.0 acres) of right-of-way from the designated open space. Alternative C would result in a take of approximately 2.6 hectares (6.5 acres) of open space. Approximately 2.9 hectares (7.3 acres) would be taken from the property under Alternative D, while 1.8 hectares (4.5 acres), (of which 0.8 hectares [1.98 acres] will be returned to open space) would be required under Alternative E. Alternative F would take 2.0 hectares (5.1 acres) of property, of which 0.9 hectares (2.22 acres) would be returned to open space. Alternative G remains in the right-of-way on the existing alignment. Across the Marolt-Thomas property, the right-of-way required is 35 meters (115 feet). The transitway would require 2.0 hectares (4.9 acres) of the Marolt Thomas Open Space. All of these numbers include right-of-way takes from the

Holden Smelting and Milling Complex as well as the Colorado Midland Railroad, which are discussed below. Since this open space is undeveloped, there would be no loss of facilities or functions, however, this would result in a visual and audible intrusion on the open space site.

6. *Bugsy Barnard Park*: None of the alternatives will have an impact to this park, therefore, there would be no Section 4(f) involvement.

7. *Maroon Creek Bridge*: Under Alternative 1 (No-Action) there would be no direct impact to the historic Maroon Creek Bridge; therefore there would be no Section 4(f) involvement. Under the two build alternatives, the bridge would stay in place and a new bridge would be built to the north. The new bridge would be 220 meters (720 feet) long and would curve toward the historic bridge on the east side. It would be approximately 9.14 meters (30 feet) away from the historic bridge at the closest point on the east side and approximately 18.29 meters (60 feet) at the closest point on the west side. This visual intrusion on the surroundings of this historic bridge constitutes a 4(f) use.

   Alternative 3 would place a transit envelope along the corridor in one of two places. One option would be to place the transit envelope on the new bridge and push the new bridge farther to the north, leaving the distance between the two bridges the same as discussed above. The other option is to place the transit corridor on the existing historic bridge. This would not, however, result in a 4(f) use of the historic resource. Should additional structural supports be necessary to strengthen the historic bridge for transit purposes, the SHPO reserves the right to review and approve the alterations prior to making a final determination of effect. Adaptive reuse of the bridge in its present location as a pedestrian or transit crossing of Maroon Creek does not constitute a 4(f) use because it would not substantially impair the integrity of this historic resource.

   The SHPO has determined that there would be no adverse effect to the historic bridge under these two alternatives, conditional upon review and approval for compatibility of the design of the new bridge.

8. *Holden Smelting and Milling Complex*: Alternative A (No-Action) and B (Existing Alignment) would have no impacts to the historic Holden Smelting and Milling Complex, therefore, there would be no Section 4(f) involvement. Under Alternatives C, D, E, F and G the new alignment would traverse the property and have a direct impact on the historic resource.

   Under Alternatives C and E, the total take would be approximately 0.22 hectares (0.53 acres) of the historic site (included in the Marolt-Thomas open space land) for construction. Although no buildings would be removed, areas of the site where industrial debris of archaeological interest could be located could be disturbed by the new paved roadway. The proposed edge of highway pavement passes within 85 meters (280 feet) of the Holden office building (Marolt House), within 41 meters (135 feet) of the sampling works building which houses the Aspen Museum, and within 85 meters (280 feet) of the salt warehouse. The edge of the 50 meter (164-foot) right-of-way width extends to within 70 meters (230 feet) of the Marolt House, 26 meters (85 feet) of the sampling building, and 70 meters (230 feet) of the salt warehouse.

Under Alternatives D and F, the total take would be approximately 0.3 hectares (0.73 acres) of the historic site (included in the Marolt-Thomas open space land) for construction. Although no buildings would be removed, areas of the site where industrial debris of archaeological interest could be located could be disturbed by the new paved roadway and the separate transit envelope.

The proposed edge of highway pavement passes within 79 meters (260 feet) of the Holden office building (Marolt House), within 35 meters (115 feet) of the sampling works building, and within 79 meters (260 feet) of the salt warehouse. The edge of the 50 meter (164-foot) right-of-way width extends to within 64 meters (210 feet) of the Marolt House, 20 meters (65 feet) of the sampling building, and 64 meters (210 feet) of the salt warehouse.

Under Alternative G, the total take would be .13 hectares (.32 acres) of the historic site (included in the Marolt Thomas Open Space) for construction. Although no buildings would be removed, areas of the site where industrial debris of archaeological interest could be located could be disturbed by the new transit envelope.

The proposed edge of the envelope passes within 38 meters (125 feet) of the Museum, 88 meters (290 feet) of the Salt Warehouse, and 88 meters (290 feet) of the Marolt House. The edge of the right-of-way will be within 32 meters (105 feet) of the Museum, 76 meters (250 feet) of the Salt Warehouse and the Marolt House.

The SHPO has determined that there would be an adverse effect to this resource under Alternatives C, D, E, F and G. The SHPO has requested that CDOT consider the following two alternatives, which they state would avoid an adverse effect: 1) shift the pavement edge to the north to entirely miss the National Historic District (NHD) boundary, and 2) extend the length of the cut and cover past the NHD to directly connect with the proposed Castle Creek Bridge. The design variations will be analyzed as part of the Final Environmental Impact Statement (FEIS). The two alternatives would be determined a no adverse effect, subject to berm and landscape review and approval. In addition, the SHPO is requiring an on-site historic archaeological survey be conducted within the Area of Potential Effect (APE) within the boundaries of the National Historic District.

9. *Colorado Midland Railroad*: Under the No-Action (Alternative A), there would be no impacts to the remaining segment of the historic railroad grade on the Marolt-Thomas

property. However, under the six build alternatives, a small portion of the total 1.6 hectares (4 acres) railroad grade (included in the Marolt-Thomas open space land) would be lost to right-of-way acquisition. Alternatives B, C, E and G would use 0.13 hectares (0.32 acres) of the historic railroad grade. Alternatives D and F would require a take of 0.17 (0.42 acres). The SHPO has determined that there would be no effect to this historic resource under the six build alternatives.

10. *Castle Creek Power Plant*: There would be no impact to the historic Castle Creek Power Plant under Alternatives A (No-Action), C, D, E, F and G because the existing bridge would remain as a local access route in its present configuration. Under Alternative B, the existing bridge would be widened to the south. The plant building is well below the elevation of the bridge deck and would not be physically affected, and the widened bridge would not intrude visually on the site. In addition, these impacts do not constitute a constructive use of the property since there will be no imposition on the site of the power plant. Bridge pier placement with Alternatives C, D, E, F, and G would not result in a 4(f) use of land from the historic site because they would be placed well to the south of the property. Therefore, there will be no 4(f) involvement with this historic resource. The SHPO has determined that there would be no effect to the historic site under any of the build alternatives.

11. *920 West Hallam Street*: Under Alternatives A (No-Action), B, C, D, E, F and G there would be no impact to this historic house. Therefore, there would be no Section 4(f) involvement. Alternatives B and G would not require right-of-way acquisition from this property. The structure itself would not be affected, and the distance between the house and the edge of pavement, currently 12 meters (40 feet), would not be reduced. There are not expected to be visual impacts created by a wider highway because the roadway is already four lanes at this location. However, due to a potential grade difference of approximately three feet, a modest retaining wall and railing may be required to be installed along the pavement edge. This activity constitutes 4(f) involvement with this historic resource. The SHPO has determined that there would be no adverse effect on this historic resource under Alternative B and G, subject to their review and approval of the proposed retaining wall and railing design.

Table A-2a
Impacts to Section 4(f) Resources - Park/Recreational Lands

4(f) Resource	Project Corridor Section							
	Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th and Main Street					
	Alternative							
	2	3	B	C	D	E	F	G
1) Aspen Trail System	Bike path take:831 meters (2,727 ft). 0.25 ha (0.63 ac) Included in #2, #3, & #4 below	Bike path take: 837 meters (2,746 ft). 0.26 ha (0.63 ac) Included in #2, #3, & #4 below	Bike path take: 611 meters (2,005 ft). 0.19 ha (0.46 ac) Included in #5 below	Bike path take: 565 meters (1,854 ft). 0.17 ha (0.42 ac) Included in #5 below	Bike path take: 610 meters (2,001 ft). 0.19 ha. (0.46 ac) Included in #5 below	Bike path take: 565 meters (1,854 ft). 0.17 ha (0.42 ac) Included in #5 below	Bike path take: 610 meters (2,001 ft). 0.19 ha (0.46 ac) Included in #5 below	Bike path take: 404 meters (1,325 ft). (0.31 ha) (0.31 ac) Included in #5 below
2) Zoline Open Space - 18.2 ha (45.0 ac)	1.2 ha (3.0 ac)	1.4 ha (3.5 ac)	N/A	N/A	N/A	N/A	N/A	N/A
3) Aspen Golf Course - 85.0 ha (210.0 ac)	1.2 ha (3.0 ac)	1.4 ha (3.5 ac)	N/A	N/A	N/A	N/A	N/A	N/A
4) Moore Open Space - 26.3 ha (64.9 ac)	0.6 ha (1.6 ac)	0.9 ha (2.4 ac)	N/A	N/A	N/A	N/A	N/A	N/A
5) Marolt-Thomas Open Space - 30.1 ha (74.26 ac)	N/A	N/A	1.2 ha (3.0 ac)	2.6 ha (6.5 ac)	2.9 ha (7.3 ac)	2.6 ha (6.5 ac) returns 0.8 ha (2.0 ac) to open space	2.9 ha (7.3 ac) returns 0.9 ha (2.2 ac) to open space	2.0 ha (4.9 ac)
6) Bugsy Barnard Park - 0.81 ha (2.0 ac)	N/A	N/A	No impact	N/A	N/A	N/A	N/A	No impact

Table A-2b
Impacts to Section 4(f) Resources - Historic Resources

4(f) Resource	Project Corridor Section							
	Buttermilk to Maroon Creek Road		Maroon Creek Road to 7th and Main Street					
	Alternative							
	2	3	B	C	D	E	F	G
7) Maroon Creek Bridge	Visual Impact	Visual Impact	N/A	N/A	N/A	N/A	N/A	N/A
8) Holden Smelting & Milling Complex - 3.2 ha (8.0 ac) included in #5 in Table A-2a	N/A	N/A	N/A	0.22 ha (0.53 ac) included in #5 above; potential historic archaeology and visual impacts	0.30 ha (0.73 ac) included in #5 above; potential historic archaeology and visual impacts	0.22 ha (0.53 ac) included in #5 above; potential historic archaeology and visual impact	0.30 ha (0.73 ac) included in #5 above; potential historic archaeology and visual impacts	0.13 ha (0.32 ac) included in #5 above; potential historic archaeology and visual impacts
9) Colorado Midland Railroad - 1.6 ha (4.0 ac) included in #5 above	N/A	N/A	0.13 ha (0.32 ac)	0.13 ha (0.32 ac)	0.17 ha (0.42 ac)	0.13 ha (0.32 ac)	0.17 ha (0.42 ac)	0.13 ha (0.32 ac)
10) Castle Creek Power Plant - 0.6 ha (1.5 ac)	N/A	N/A	No impact	N/A	N/A	N/A	N/A	No impact
11) 920 Hallam St. - 0.1 ha (0.2 ac)	N/A	N/A	Visual impact	N/A	N/A	N/A	N/A	No impact

NOTE: 1 hectare (ha) = 2.471 acres (ac)
1 meter (m) = 3.281 feet (ft)

4(f) RESOURCES AVOIDANCE ALTERNATIVES

The use of 4(f) resources may not be approved unless there is no feasible and prudent alternative to the use of such land and the program or project includes all planning to minimize harm to the 4(f) resource. This section evaluates measures and alternatives that may be available to avoid impacts to each property evaluated under 4(f).

1. *Aspen Trail System*: Only the No-Action Alternatives would avoid taking right-of-way from the Aspen Trail System. Construction of any of the build alternatives would result in losses from 0.13 hectares (0.42 acres) to 0.26 hectares (0.63 acres) from the trail system. Because the trail system travels west to east and is parallel to State Highway 82 on the north side, the relocation of SH 82 to the north between Buttermilk Ski Area and the entrance to Aspen would result in greater takes of both the trail system and the City Golf Course. Shifting the alignment to the south would result in more severe impacts to the Marolt-Thomas open space, Moore Open Space, and the historic Colorado Midland Railroad grade for all build alternatives. Shifting the alignment to the south would also impact the High School Bike Path between Maroon Creek Road and the Marolt Trail for Alternatives B and G. Therefore, there are no prudent and feasible alternatives that meet the purpose and need of this project which avoid impacting the Aspen Trail System without impacting other 4(f) resources.

2. *Zoline Open Space*: Only Alternative 1, the No-Action, would avoid taking right-of-way from the Zoline Open Space. Construction of any of the remaining two build alternatives in this area would result in the loss of approximately 1.2 hectares (3.0 acres) to 1.4 hectares (3.5 acres). The location of the new Maroon Creek bridge, the need to avoid encroachment on the existing historic bridge, and the presence of 2 commercial properties south of existing SH 82 near this bridge make acquisition of right-of-way from the southeast portion of this open space the most prudent alternative. Therefore, there are no prudent alternatives under all build alternatives that meet the purpose and need of this project which would avoid taking land from this recreational property.

3. *Aspen City Golf Course*: Only Alternative 1, the No-Action Alternative would avoid taking right-of-way from the Aspen City Golf Course. Construction of any of the remaining two build alternatives in this area would result in the loss of approximately 1.2 hectares (3.0 acres) to 1.4 hectares (3.5 acres) from the golf course. The location of the new Maroon Creek Bridge, the need to avoid encroachment on the existing historic bridge, and the presence of 1 commercial and 2 residential properties south of existing SH 82 near this bridge make acquisition of right-of-way from the southwest portion of the golf course the most prudent approach. Therefore, there are no prudent alternatives to avoiding the Aspen City Golf Course under all build alternatives that meet the purpose and need of this project.

4. *Moore Property Open Space*: Only Alternative 1, the No-Action, would avoid taking right-of-way from the Moore Property Open Space. Construction of any of the remaining two build alternatives in this area would result in the loss of approximately 0.6 hectares (1.6 acres) to 0.9 hectares (2.4 acres) from the Moore Property Open Space. Shifting this alignment to the south would result in a greater take of the Moore Open Space property and shifting to the north would require additional takes from the Aspen Golf Course property. Therefore, there are no prudent and feasible alternatives except the build alternatives that meet the purpose and need of this project.

5. *Marolt-Thomas Open Space*: Alternative A, the No-Action, is the only alternative which avoids Section 4(f) land in this area. Under the build alternatives, acquisition of Section 4(f) land varies from 1.2 hectares (3 acres) to 2.9 hectares (7.3 acres).

   Shifting the alignment of Alternatives A and B to the south would result in a greater take of the Marolt-Thomas Open Space and the High School Bike Path. A shift to the north would create design problems in reaching the Main Street connection within the Aspen city limits at an acceptable design standard for the alignment and approach curves. Shifting the alignment of Alternatives C,D,E,F and G to the north a sufficient distance to avoid the Marolt-Thomas Open Space is not feasible since this open space property extends north beyond the city limits of Aspen. Therefore, there are no prudent and feasible alternatives that meet the purpose and need of this project that avoid the taking of open space.

6. *Bugsy Barnard Park*: There will be no 4(f) involvement with this property since no property will be taken by any alternative.

7. *Maroon Creek Bridge*: The No-Action alternative is the only alternative that will not impact this bridge. Alternatives 2 and 3 will effect this bridge since a new bridge will be constructed to the north of this structure. These alternatives will include either a transit envelope on the new structure, or use the existing structure for a transit purposes. In either case there will be 4(f) involvement with this property under Alternatives 2 and 3 that cannot be avoided since there will be a visual impact from the new structure on the current structure. Relocation of the new bridge sufficiently removed from the existing bridge to avoid a visual impact is imprudent, since the distance relocated to the north is directly related to the amount of property taken from the Zoline Open Space and Aspen City Golf Course.

8. *Holden Smelting and Milling Complex*: Alternatives A and B would avoid taking land from this historic property. A take would be necessary under Alternatives C, D, E, F and G. Within these five alternatives, there are no prudent and feasible alternatives to taking Section 4(f) land. Shifting the alignment to the south would result in a greater impact on the historic property. A reduced highway right-of-way would still impact the historic site and would not meet the needs of the project or be acceptable to the local residents and local government.

   Shifting the alignment to the north to avoid this property is feasible, however, such a shift would move the alignment closer to a residential complex opposite Castle Creek (The Villas of Aspen) of approximately 20 units. The two closest buildings in this complex each have 6 units. Design modification which could shift the alignment north to avoid the 4(f) resource while avoiding increased impact to the Villas of Aspen will be evaluated prior to completion of the Final EIS and Section 4(f) Evaluation.

9. *Colorado Midland Railroad*: There would be no Section 4(f) involvement under Alternative A, the No-Action alternative. The build alternatives all require a minor take of the railroad

grade near the intersection of Maroon Creek Road and State Highway 82. Under these alternatives, there are no feasible and prudent alternatives which avoid the use of this historic resource. Shifting the alignment to the north would result in a greater take of the City Golf Course located on the north side of existing State Highway 82. Shifting farther to the south would result in a greater loss of the historic railroad grade and more severe impact to Marolt-Thomas open space. Therefore, there are no prudent and feasible alternatives within these alternatives which would avoid taking Section 4(f) land and meet the purpose and need of this project.

10. *Castle Creek Power Plant*: There will be no 4(f) involvement with this historic resource.

11. *920 West Hallam*: There would be no Section 4(f) involvement under Alternative A, the No-Action Alternative or Alternatives C, D, E, or F. Alternatives B and G would impact this property since an approximately three foot high retaining wall must be constructed due to grade differences between the new alignment and the property. Additional impacts are avoided by shifting the alignment south and the construction of the retaining wall.

MEASURES TO MINIMIZE HARM

Federal transportation projects which require the use of properties protected under Section 4(f) must include all possible planning to minimize harm to such 4(f) properties. Table A-3 identifies the potentially available measures for minimizing harm to each Section 4(f) property impacted by a proposed alternative.

There is no build alternative which avoids impacts to one or more of the 4(f) resources in this area without causing the use of other 4(f) resources located either north or south of existing State Highway 82 and abutting proposed new alignments under consideration. Therefore, mitigation measures are required. This section discusses potential measures to mitigate the impacts of the alternatives under consideration on each effected 4(f) property.

1. *Aspen Trail System*: Efforts to minimize harm to this Section 4(f) resource will include:

   - Designing the Preferred Alternative with the least possible right-of-way width to avoid taking part of the trail system.

   - Where sections of the trail cannot be avoided, they will be relocated along the Preferred Alternative right-of-way.

2. *Zoline Open Space*: Efforts to minimize harm to this Section 4 (f) resource will include:

   - Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space.

   - Every reasonable effort will be made to replace any lost park or open space land or compensate the City of Aspen for the reasonable cost of purchasing replacement parks or open space land.

3. *Aspen City Golf Course*: Efforts to minimize harm to this Section 4 (f) resource will include:

   - Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space.

   - Shifting the playing field north to avoid permanent loss of use.

   - Every reasonable effort will be made to replace any lost park or open space land or compensate the City of Aspen for the reasonable cost of purchasing replacement parks or open space land.

4. *Moore Property Open Space* - Efforts to minimize harm to this Section 4 (f) resource will include:

   - Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the Pitkin County as open space.

   - Every reasonable effort will be made to replace any lost park or open space land or compensate the City of Aspen for the reasonable cost of purchasing replacement parks or open space land.

5. *Marolt-Thomas Open Space*: Efforts to minimize harm to this Section 4(f) resource will include:

   - Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space.

- Every reasonable effort will be made to replace any lost park or open space land or compensate the City of Aspen for the reasonable cost of purchasing replacement parks or open space land.

6. *Bugsy Barnard Park*: There will be no 4(f) involvement, therefore, no mitigation is required.

7. *Maroon Creek Bridge*: Efforts to minimize harm to this Section 4(f) resource include:

   - The SHPO will be provided the opportunity to comment on the architectural compatibility of the new bridge structure included in Alternative B or C.

   - If the Maroon Creek bridge is used for transit purposes and requires some structural modification, the SHPO will be provided the opportunity to review the alternatives and a photographic record, plans and drawings of the bridge before and after modification will be provided to the SHPO.

8. *Holden Smelting and Milling Complex*: Efforts to minimize harm to this Section 4(f) resource will include exploring design modifications in the FEIS which shift the pavement edge to the north to miss the National Register Site.

   If the pavement edge cannot be shifted to the north, a Memorandum of Agreement between the SHPO, CDOT, FHWA and the Advisory Council on Historic Preservation will be executed prior to construction to mitigate the adverse effects of Alternatives C, D, E, F, and G.

   Possible mitigation measures include:

   - Conducting a historic archaeological survey and monitoring during construction.

   - Slight reductions in right-of-way width requirements for the new State Highway 82 right-of-way.

   - Extension of the cut and cover to the bridge abutment (structural delineation) under alternatives E and F.

   - SHPO review and approval of berm design and landscaping plans that partially screen buildings on the property from the highway under alternatives C, D, and G.

9. *Colorado Midland Railroad*: Efforts to minimize harm to this Section 4(f) resource will include:

   - Designing the Preferred Alternative with the least possible right-of-way width for the new State Highway 82 right-of-way.

4(f) Evaluation

10. *Castle Creek Power Plant*: There will be no 4(f) involvement, therefore, no mitigation is required.

11. *920 West Hallam*: Efforts to minimize harm to this historic resource include:

    - SHPO review and approval of the proposed retaining wall and railing will be required under Alternatives B and G.

In addition to the mitigation strategies listed in this document, CDOT and FHWA will continue to take all steps necessary to reduce and minimize impacts to the 4(f) resources listed in this document. Additional mitigation opportunities will come during actual design of the transportation improvements in each alternative and may include construction and replacement of sidewalks and appropriate landscaping between Castle Creek and 7th Street and assuring design of the Preferred Alternative is architecturally and environmentally consistent with the surrounding landscape.

COORDINATION

This project and all alternatives under consideration have been coordinated over the past two years with the City of Aspen, Pitkin County and other agencies responsible for administration of 4(f) resources within the State Highway 82 study corridor. In addition to the public meetings, several smaller coordination meetings have been held with Pitkin County and the City of Aspen representatives to explain the alternatives and impacts. Informal meetings with SHPO staff to discuss the alternatives and the impacts on 4(f) resources have been held. The Aspen Historic Preservation Commission was asked to comment on the impact of the alternatives on properties on or eligible for inclusion on the National Register and locally designated historic sites. Their comments, along with the SHPO concurrence letter, is included in **Volume 2: Comments and Coordination** of this DEIS.

Table A-3
Proposed Mitigation Measures - Section 4(f) Resources

4(f) Resource	Proposed Mitigation
1) Aspen Trail System	Designing the preferred alternative with the least possible right-of-way width to avoid taking part of the trail. If the trail cannot be avoided, it will be relocated.
2) Zoline Open Space 18.2 ha (45.0 ac)	Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space. Making every reasonable effort to replace any lost parkland or compensate the City of Aspen for the reasonable cost of purchasing replacement parkland.
3) Aspen Golf Course 85.0 ha (210.0 ac)	Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space. Making every reasonable effort to replace any lost parkland or compensate the City of Aspen for the reasonable cost of purchasing replacement parkland.
4) Moore Open Space 26.3 ha (64.9 ac)	Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space. Making every reasonable effort to replace any lost parkland or compensate the City of Aspen for the reasonable cost of purchasing replacement parkland.
5) Marolt-Thomas Open Space 30.1 ha (8.0 ac)	Designing the Preferred Alternative with the least possible right-of-way width and/or selecting an alternative that would return some highway property back to the City of Aspen as open space. Making every reasonable effort to replace any lost parkland or compensate the City of Aspen for the reasonable cost of purchasing replacement parkland.
6) Bugsy Barnard Park 0.81 ha (2.0 ac)	There will be no 4(f) involvement.
7) Maroon Creek Bridge	The SHPO will be provided opportunity to comment on the architectural compatibility of the design of the new structure or modified existing structure in Alt. 2 and 3. A photo record, design plans and drawings will be provided to the SHPO if the existing bridge is structurally modified in any way to accommodate transit.
8) Holden Smelting & Milling Complex 3.2 ha (8.0 ac) Included in #5 above	A shift of the pavement edge to miss the NHD will be evaluated. If this shift is not feasible or prudent, prior to construction of State Highway 82 improvements, a Memorandum of Agreement between the SHPO, CDOT, FHWA, and the Advisory Council on Historic Preservation will be executed to mitigate the adverse effects of Alternatives C, D, E, F, or G. Possible mitigation measures include conducting a historic archaeological survey, slight reductions in right-of-way width requirements for the new State Highway 82 right-of-way, extending the cut and cover to the bridge portal, and SHPO review and approval of berm design and landscaping plans that partially screen buildings on the property from the highway.
9) Colorado Midland Railroad 1.6 ha (4.0 ac) Included in #5 above	Designing the Preferred Alternative with the least possible right-of-way width for the new State Highway 82 right-of-way.
10) Castle Creek Power Plant 0.6 ha (1.5 ac)	There will be no 4(f) involvement.
11) 920 Hallam Street 0.1 ha (0.2 ac)	Construction of a retaining wall and shifting of alignment to avoid taking of property. SHPO review and approval of the proposed retaining wall and railing which may be required under Alternatives B and G.

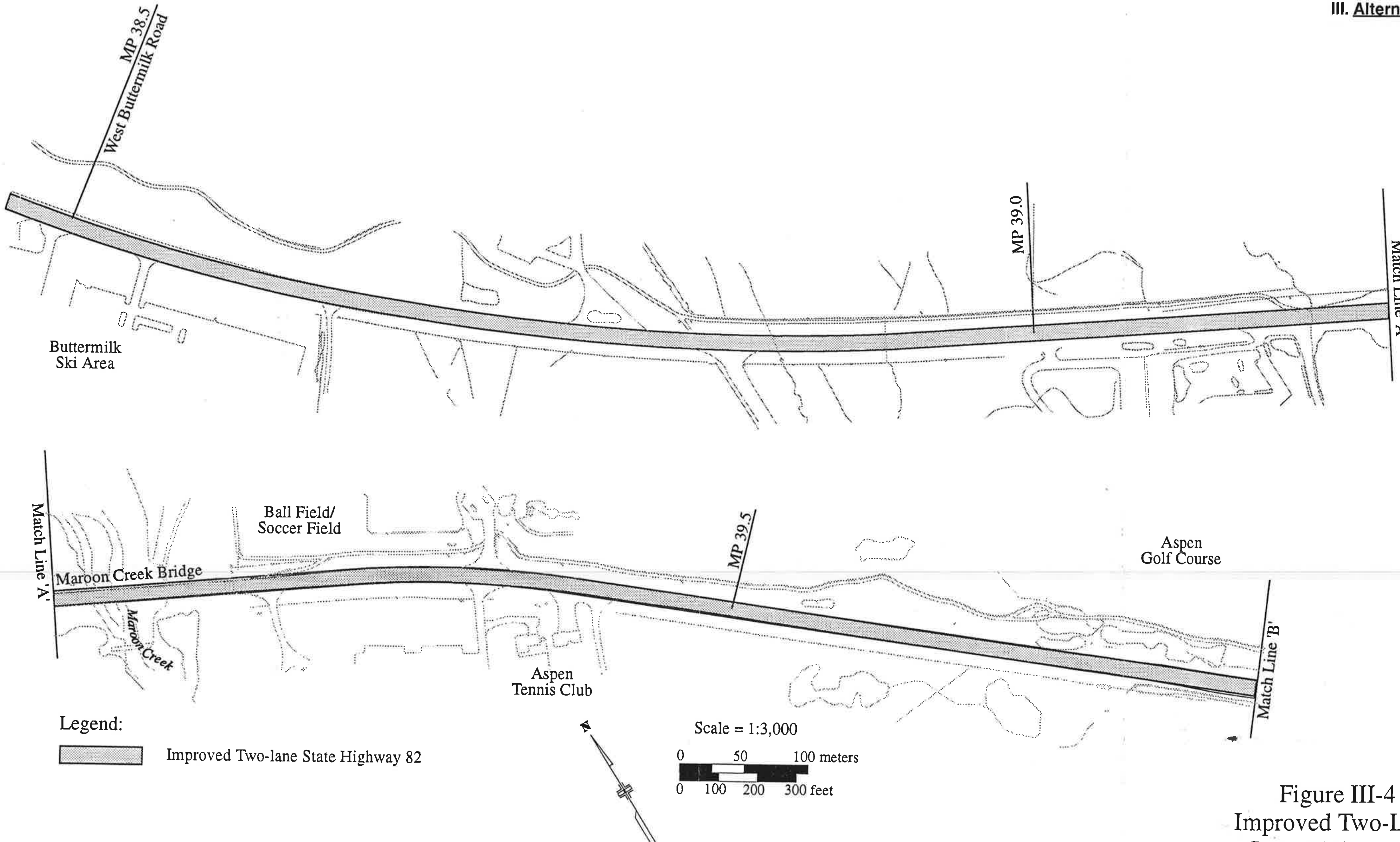


Figure III-4
Improved Two-Lane
State Highway 82

ALTFIGD.CDR

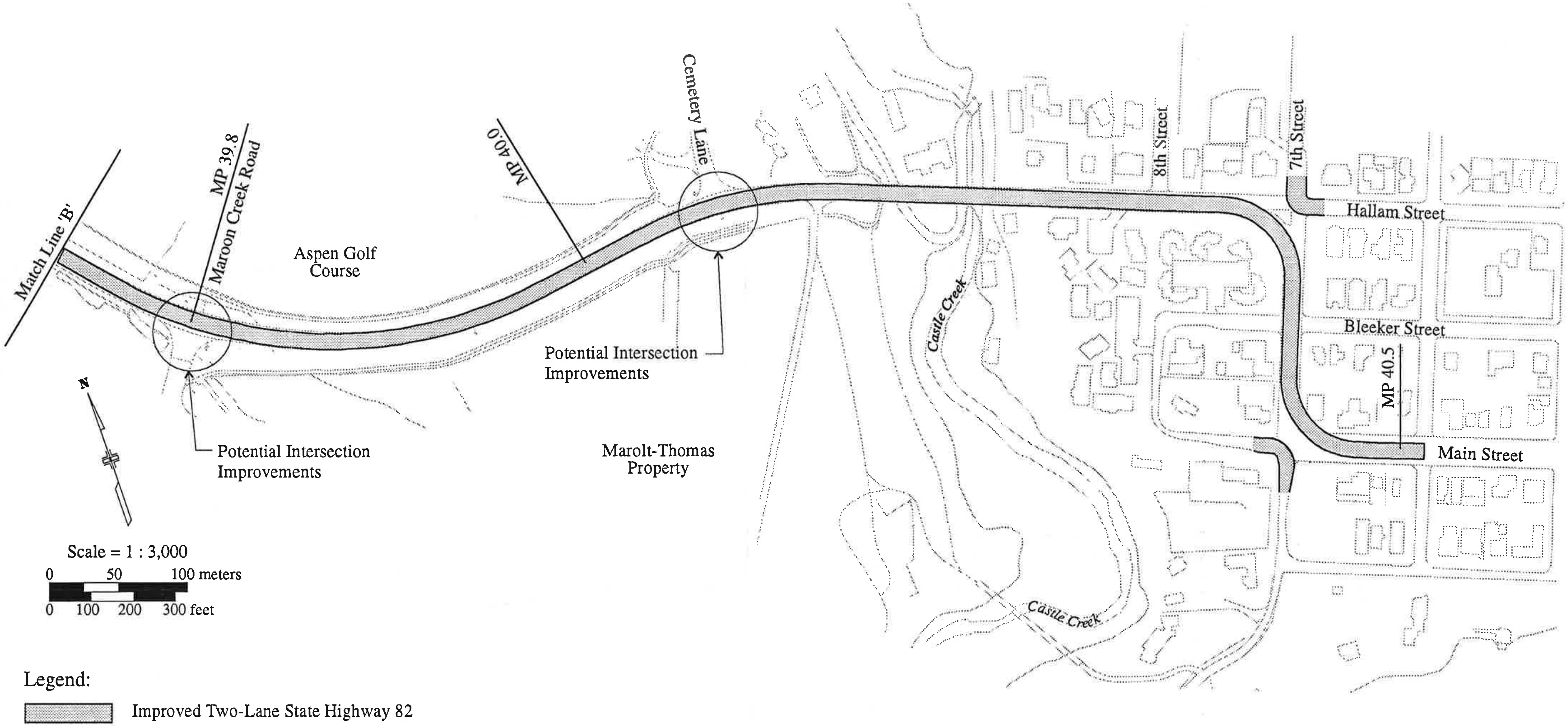


Figure III-4 (cont.)
Improved Two-Lane
State Highway 82

ALTFIGF.CDR

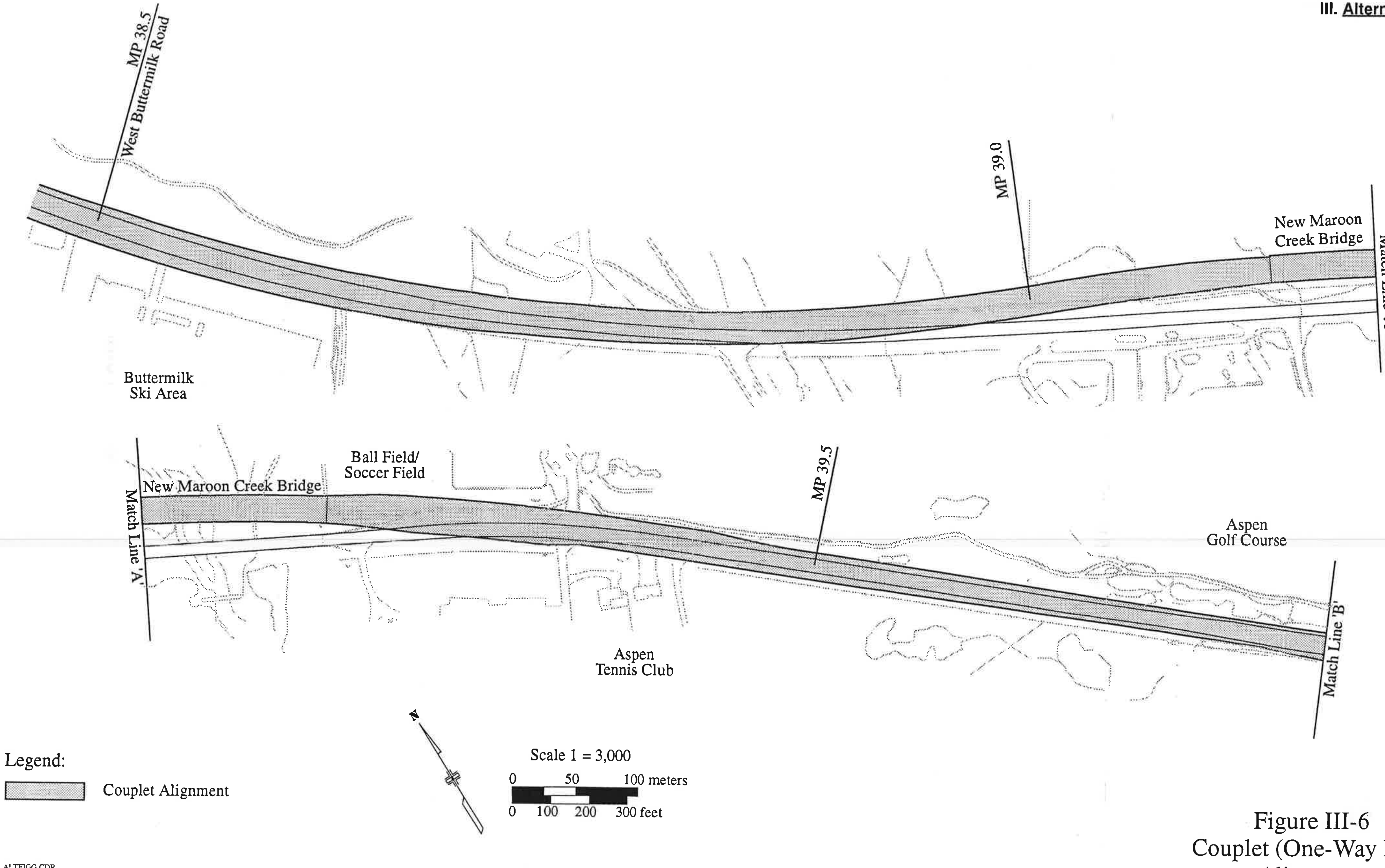


Figure III-6
Couplet (One-Way Pair)
Alignment

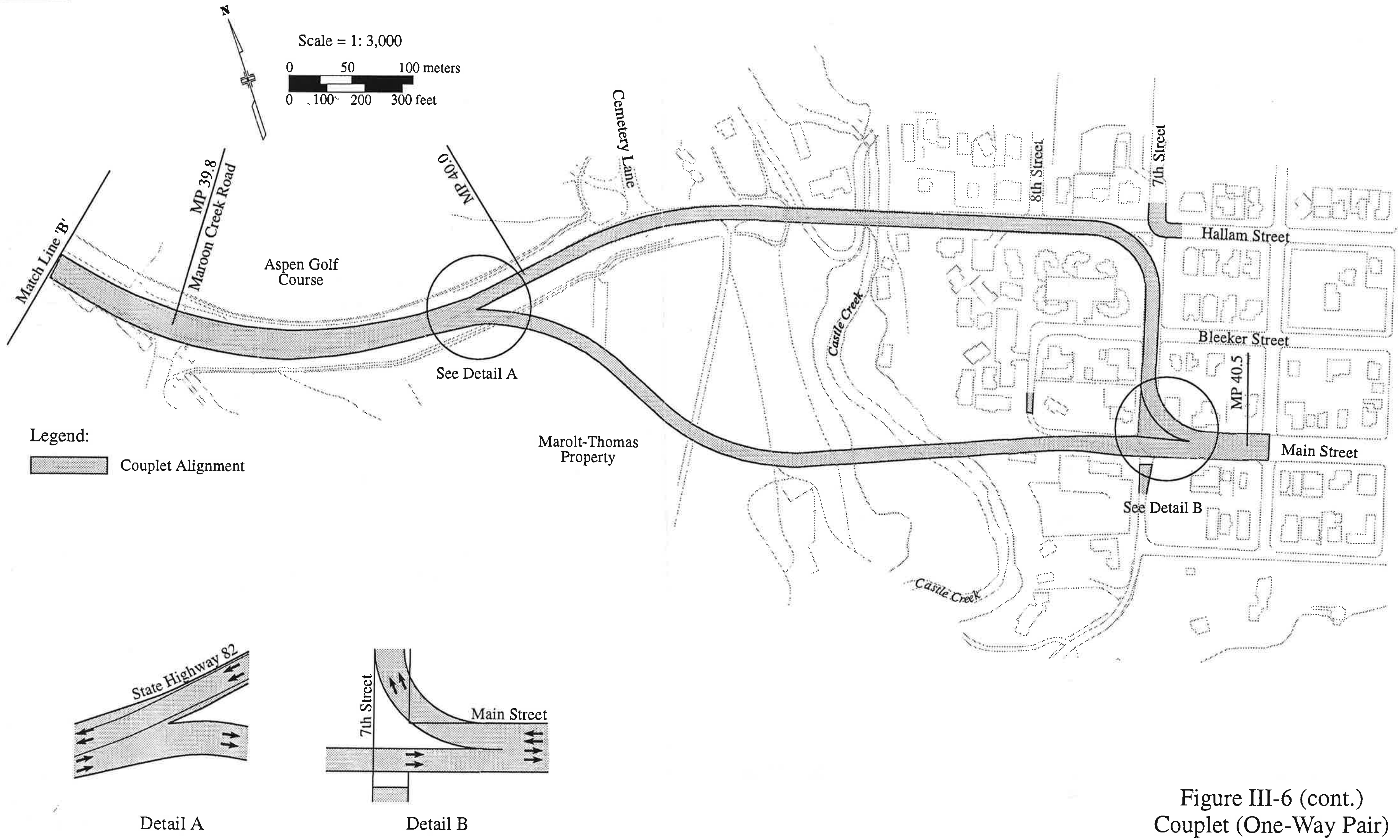


Figure III-6 (cont.)
Couplet (One-Way Pair)
Alignment

ALTFIGI.CDR

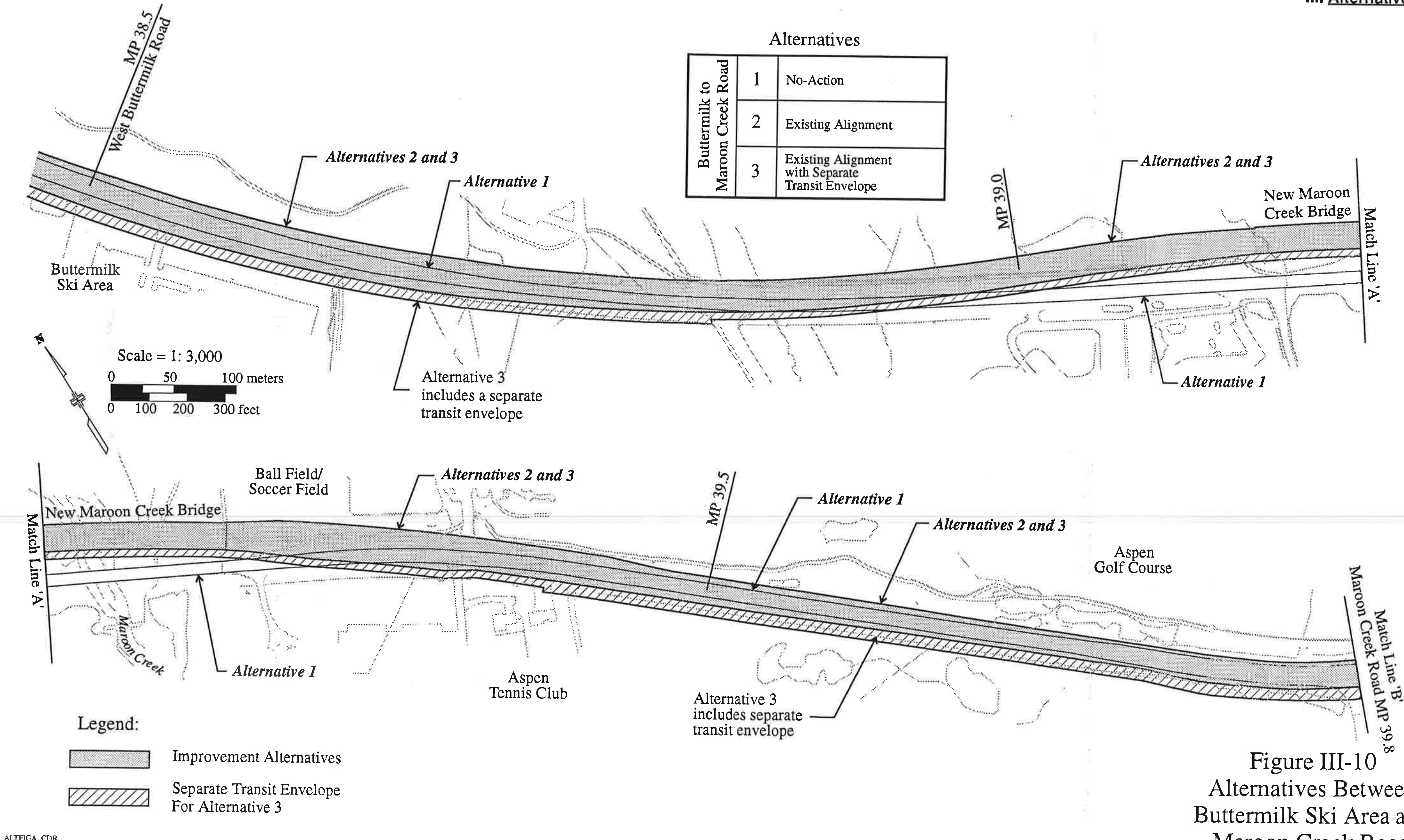
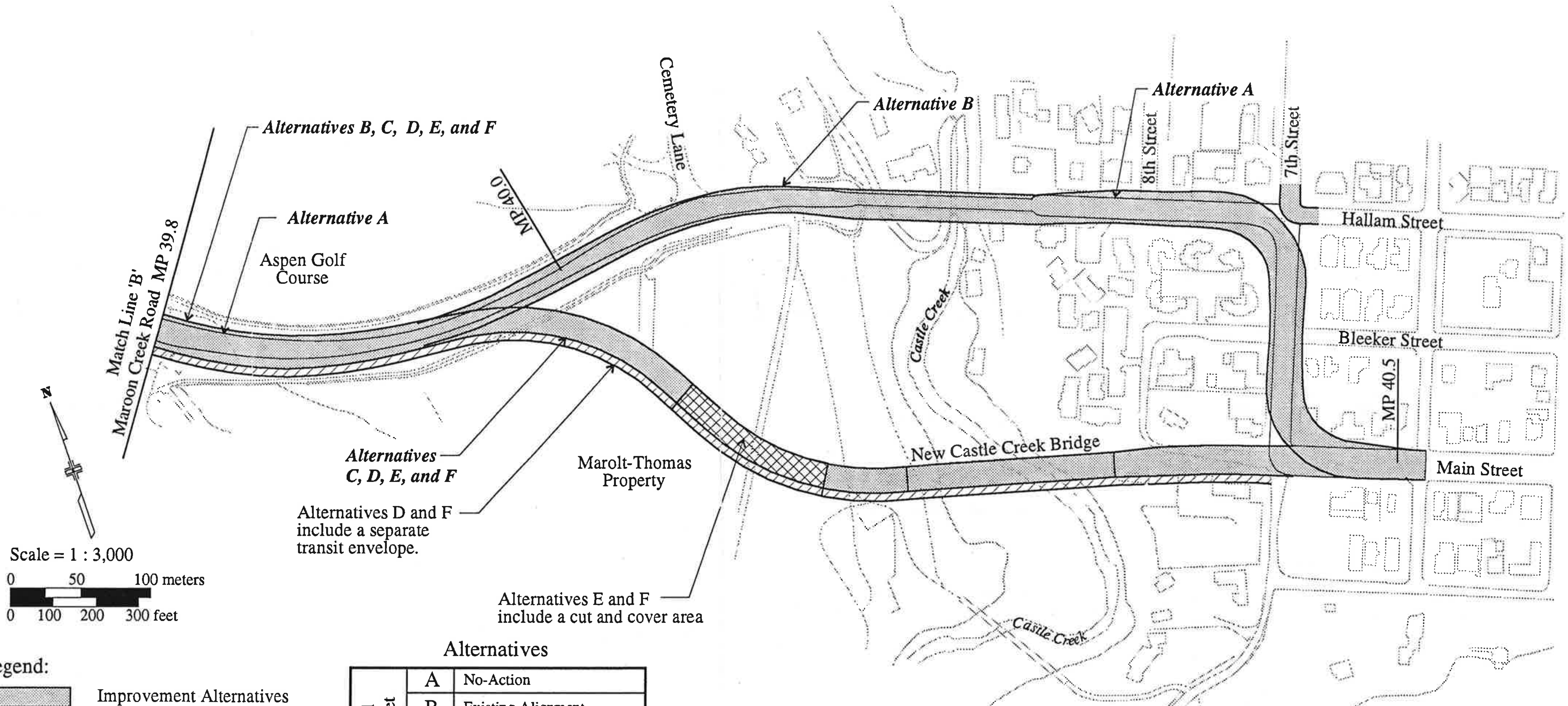


Figure III-10
Alternatives Between Buttermilk Ski Area and Maroon Creek Road



Legend:

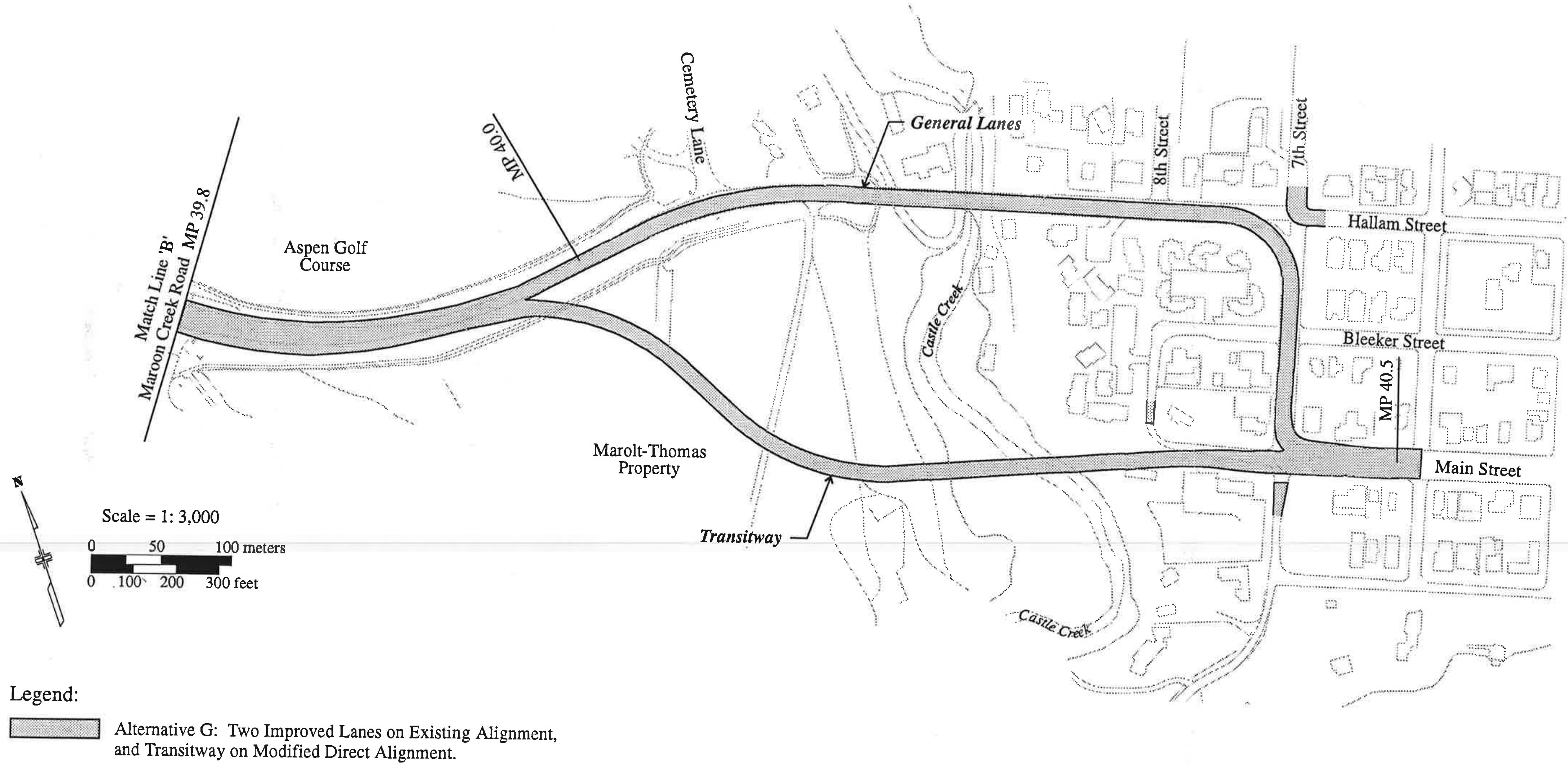
- Improvement Alternatives
- Separate Transit Envelope For Alternatives D and F
- Location of Cut and Cover for Alternatives E and F

Alternatives

Maroon Creek Road to 7th and Main Street	A	No-Action
	B	Existing Alignment
	C	Modified Direct Alignment, At Grade
	D	Modified Direct Alignment, At Grade with Separate Transit Envelope
	E	Modified Direct Alignment, Cut and Cover
	F	Modified Direct Alignment, Cut and Cover with Separate Transit Envelope

ALTFIGC.CDR

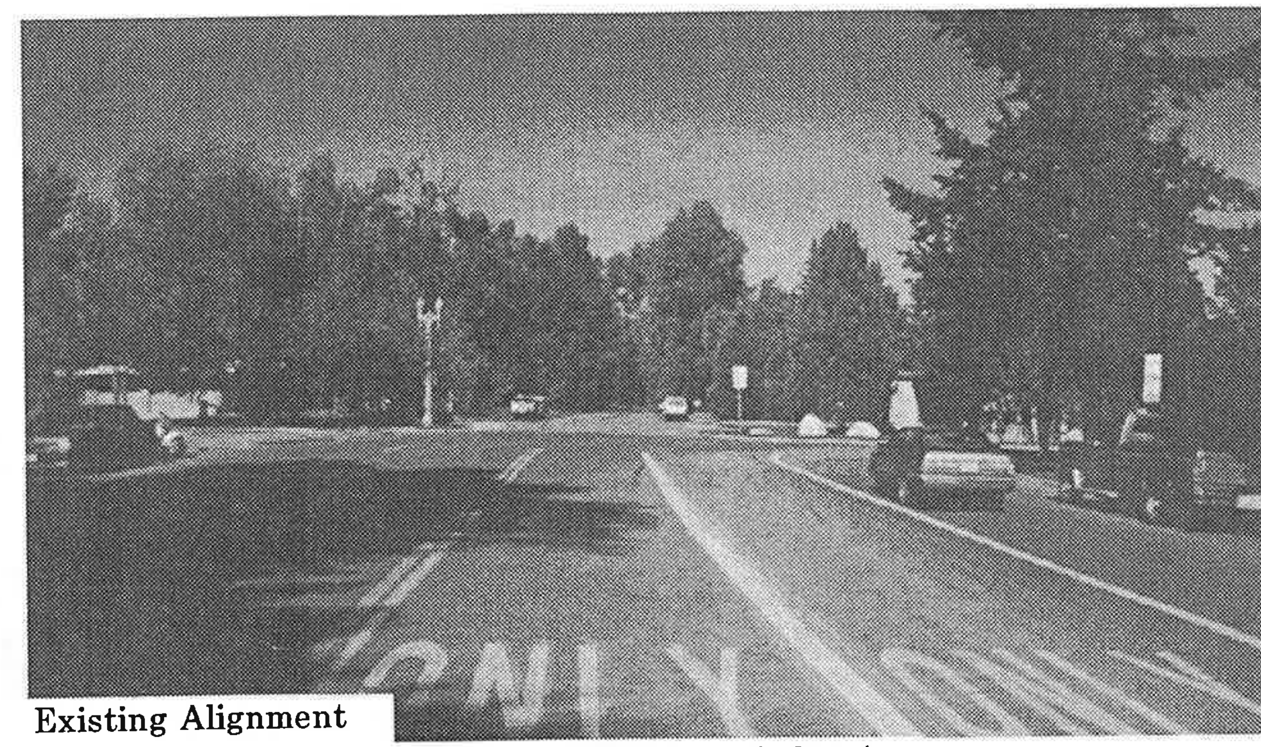
Figure III-11
Alternatives A-F



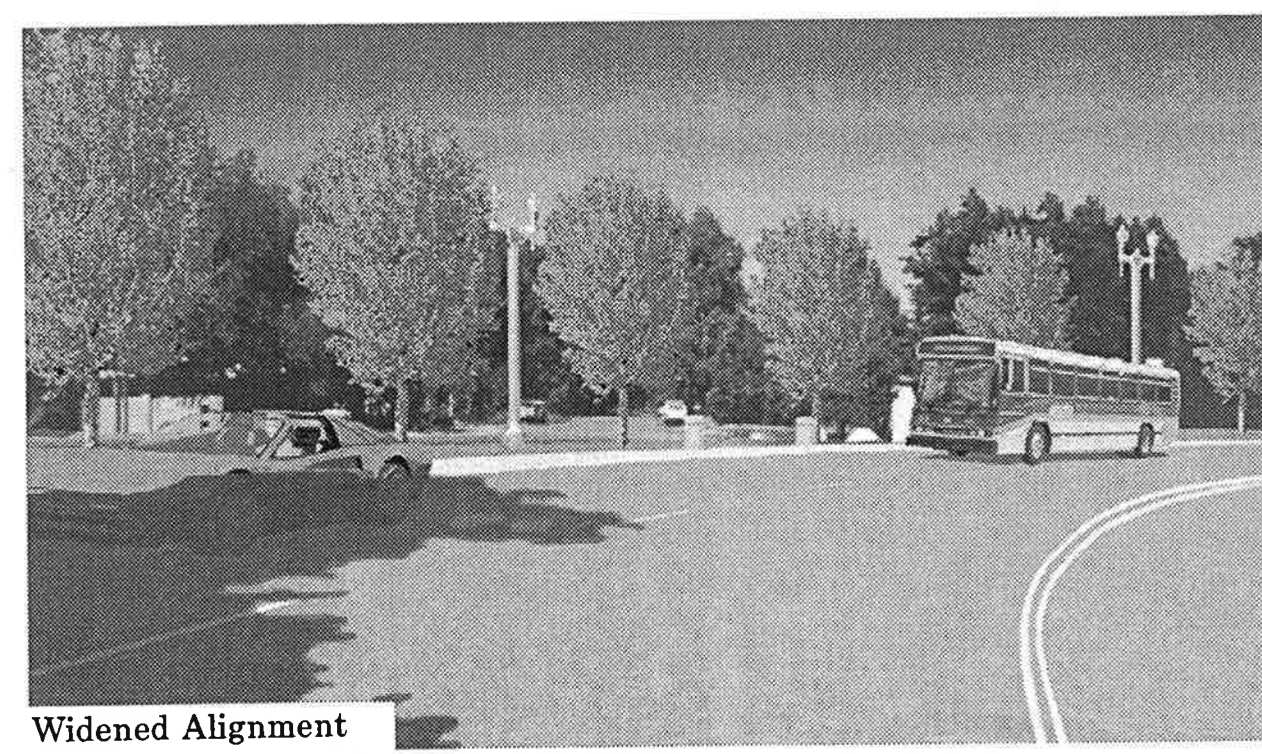
ALTFIGK.CDR

Figure III-12
Alternative G

Figure III-13. State Highway 82 at 7th Street and Hallam Street – Alternative B



Existing Alignment
Looking east from Castle Creek Bridge (actual photo)



Widened Alignment
Looking east from Castle Creek Bridge (computer simulation)

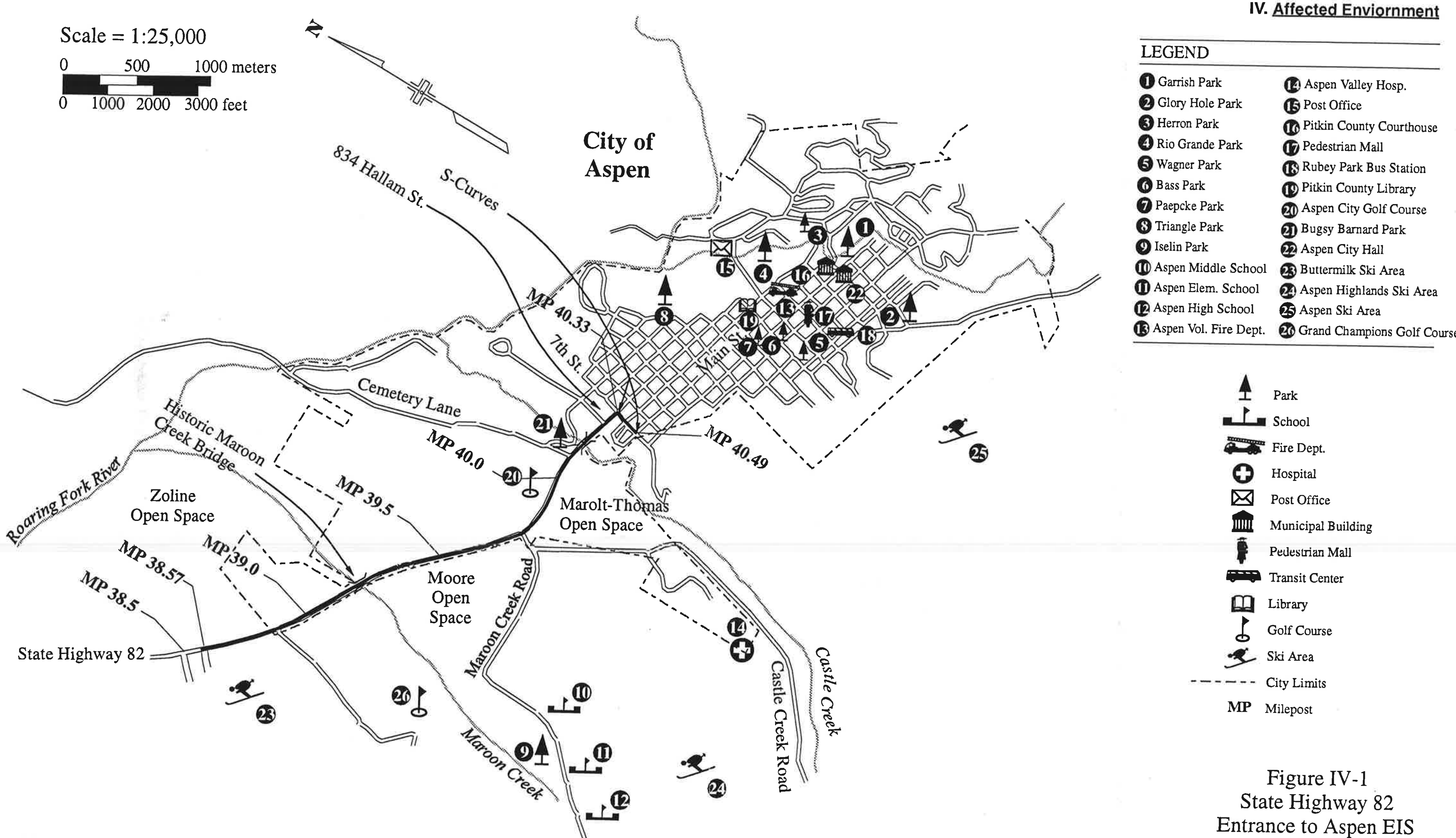


Figure IV-1
State Highway 82
Entrance to Aspen EIS
Project Corridor Vicinity

4. Recreation

Recreation and its associated activities are the mainstay of Pitkin County's economy and lifestyle. Although the winter ski industry (downhill and cross country) is still a primary attraction for both residents and visitors, year-round opportunities include fishing, hunting, rafting, kayaking, bicycling, hiking, and golf.

4a. Skiing

Pitkin County is internationally acclaimed for both downhill and cross country/nordic skiing. In an average year, the downhill ski season lasts from mid November to early April. The cross country season is about two weeks shorter, although back-country skiing can last into June. There are four separate downhill ski areas in Pitkin County: Aspen Highlands, Aspen Mountain, Buttermilk, and Snowmass. These are primarily destination resorts. Because the Denver metropolitan area is at least four hours away by vehicle, most winter visitors stay overnight or longer. Historic data for downhill skier visits are included in the Economic Profile section of this chapter. Cross country skiing is also addressed.

Downhill. Table IV-7 contains data for each of the four ski areas, including the number of skier visits, acres of skiable terrain, number of trails and lifts, and the percent of skiable terrain allotted to each level of skiing proficiency. As the table illustrates, the areas vary in size, and two of the areas are focused on opposite ends of skier levels of ability: Aspen Mountain has no runs for beginners; Buttermilk has no runs for experts.

Table IV-7
Pitkin County Ski Resorts

Ski Area	1994/95 Skier Visits	# Skiable Acres	# of Trails	# of Lifts	*Type of Terrain (%)* Begin	Intermed	Advanced	Expert
Aspen Highlands	159,288	540	77	10	23%	48%	14%	15%
Aspen Mountain	329,535	631	76	8	---	35%	35%	30%
Buttermilk	168,439	410	45	7	35%	39%	26%	---
Snowmass	767,509	2,500	72	16	10%	51%	18%	21%

Sources: Aspen Skiing Company; Colorado Ski Country USA

Each of the downhill trails is groomed and served by some form of ski lift (chairlift, gondola, etc.). Aspen Mountain also has skiing on the backside of the mountain, accessible only by SnoCats. The backside has 607 hectares (1,500 acres) of terrain, and skiers average 2,730 vertical meters (9,000 vertical feet) of skiing per day. Skier visits to this area are not included in counts for the main area, and the exact number of users is unknown.