# Castle Creek Bridge

**Prepared for the City of Aspen, Colorado**

**August 12, 2024**

**Jacobs Engineering Group Inc**

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# Presenters:

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# Agenda

- Traffic Modeling
- Economic Impact Analysis
- Funding and Financial Assessment
- Follow-up from Previous Meeting
  - PA Footprint and Cross Section
  - Approximate Poject Costs and Durations
  - Emergency Evacuation Planning
- Next Steps/Council Direction

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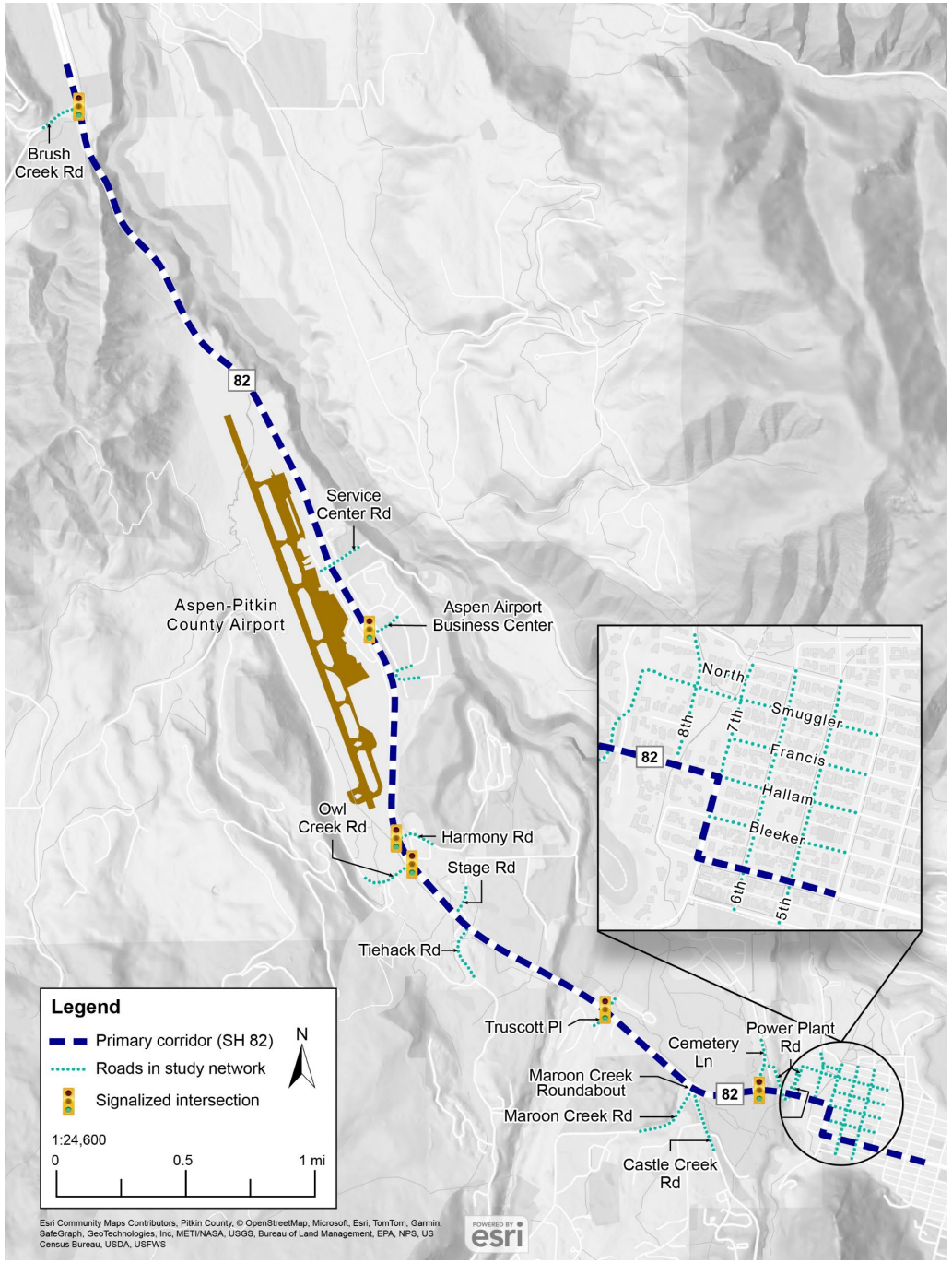
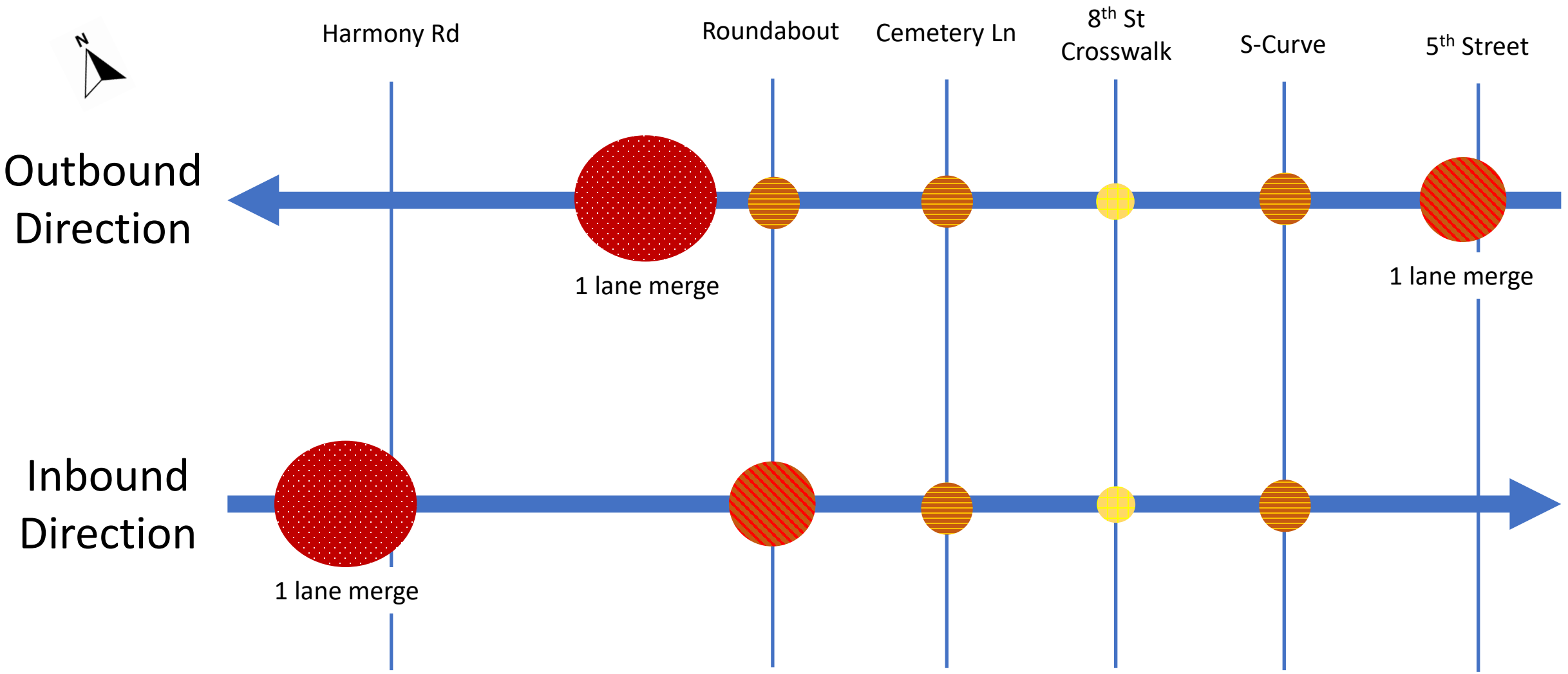
# Traffic Modeling

# Traffic Modeling

1. Review existing pinch points on Highway 82 (inbound & outbound)
2. Identify how each option impacts traffic & transit pinch points
3. Review scoring of options based on traffic & transit performance



# Bottlenecks Identified Along Highway 82



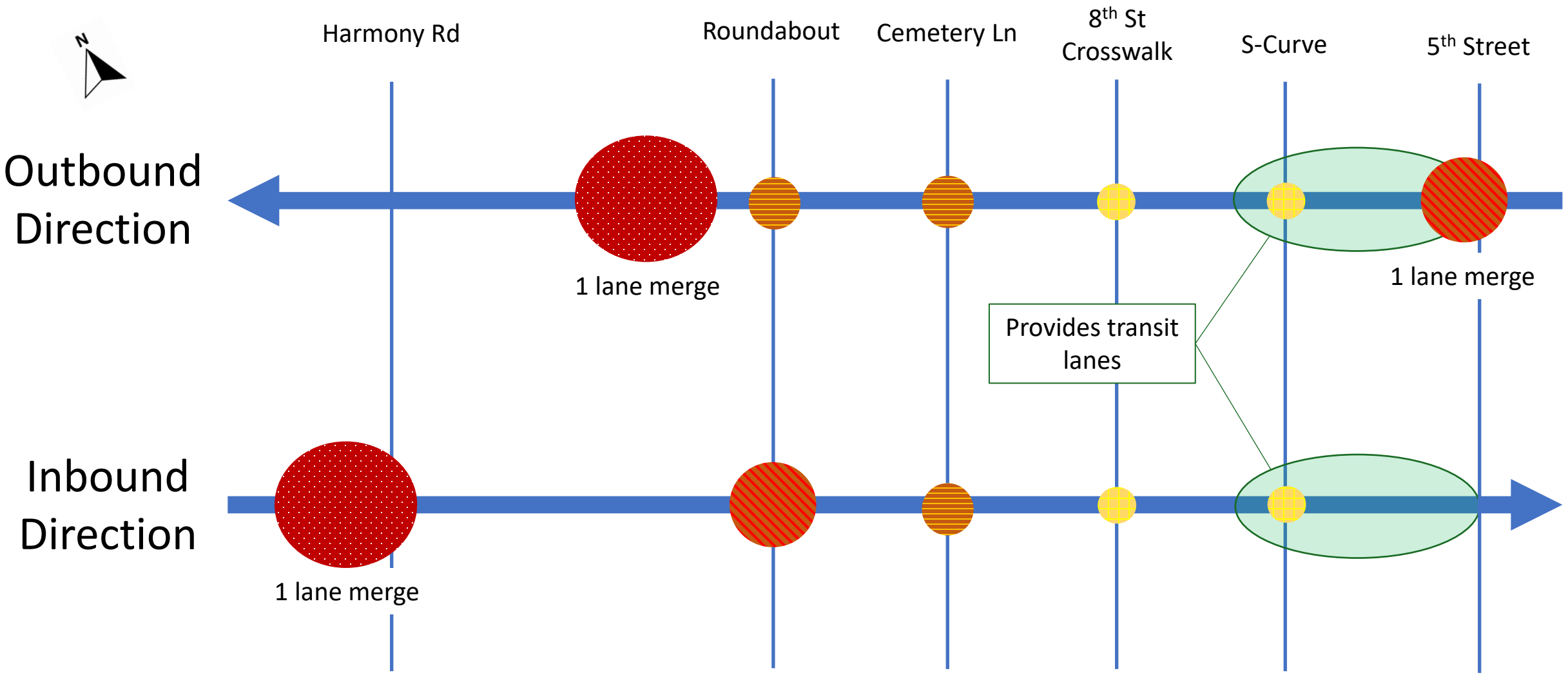

**Note: larger circles indicate heavier congestion and lower service capacity**

# Options Considered

1. S-Curve Improvements
2. S-Curve Improvements and 3-Lane Bridge
   A. 3-Lane Bridge with Cemetery Lane Bus Queue Jump
   B. 3-Lane Bridge with Bus Bypass at Roundabout
3. Phased Preferred Alternative (PA)
4. Splitshot (with S-Curve Improvements)
5. S-Curve Improvements and Down-valley Improvements

Questions?

# Option 1: S-Curve Improvements

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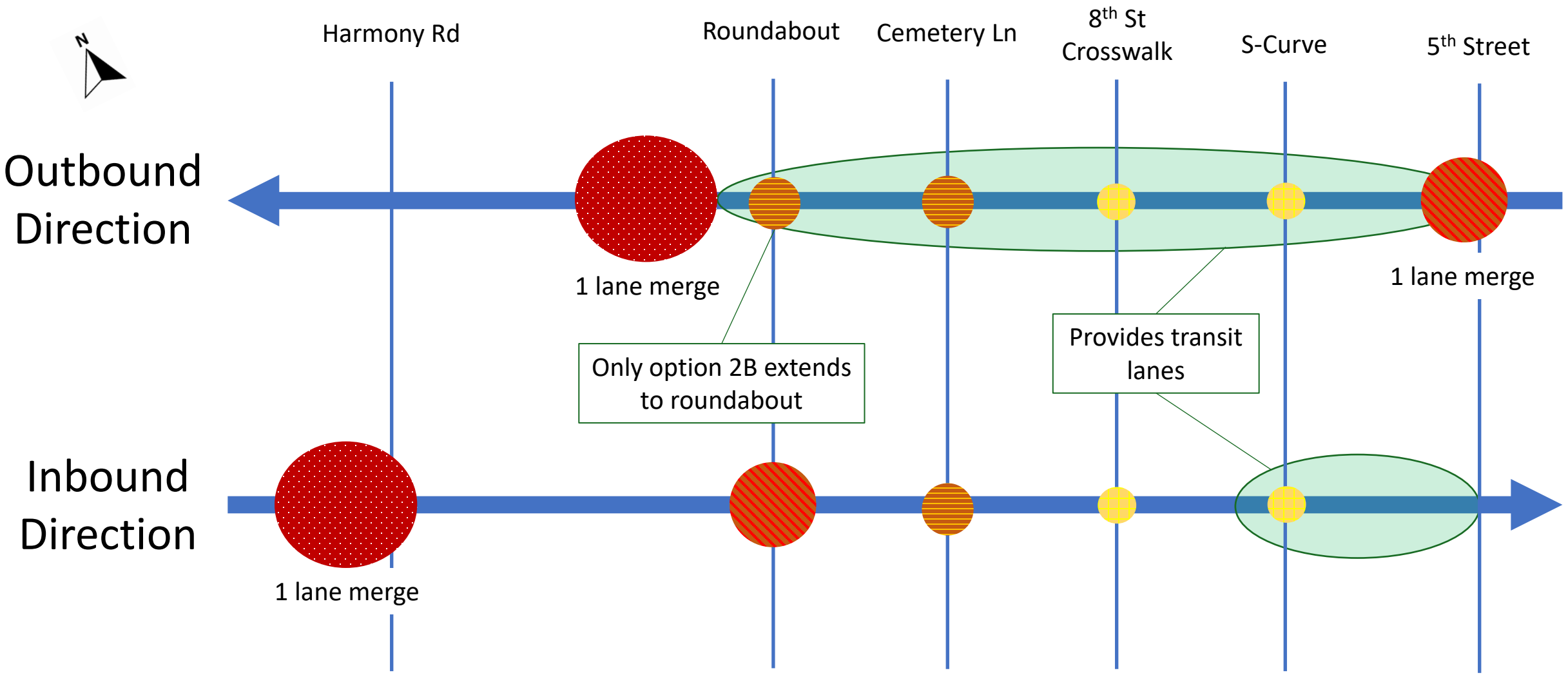
# Option 2: S-Curve Improvements and 3-Lane Bridge

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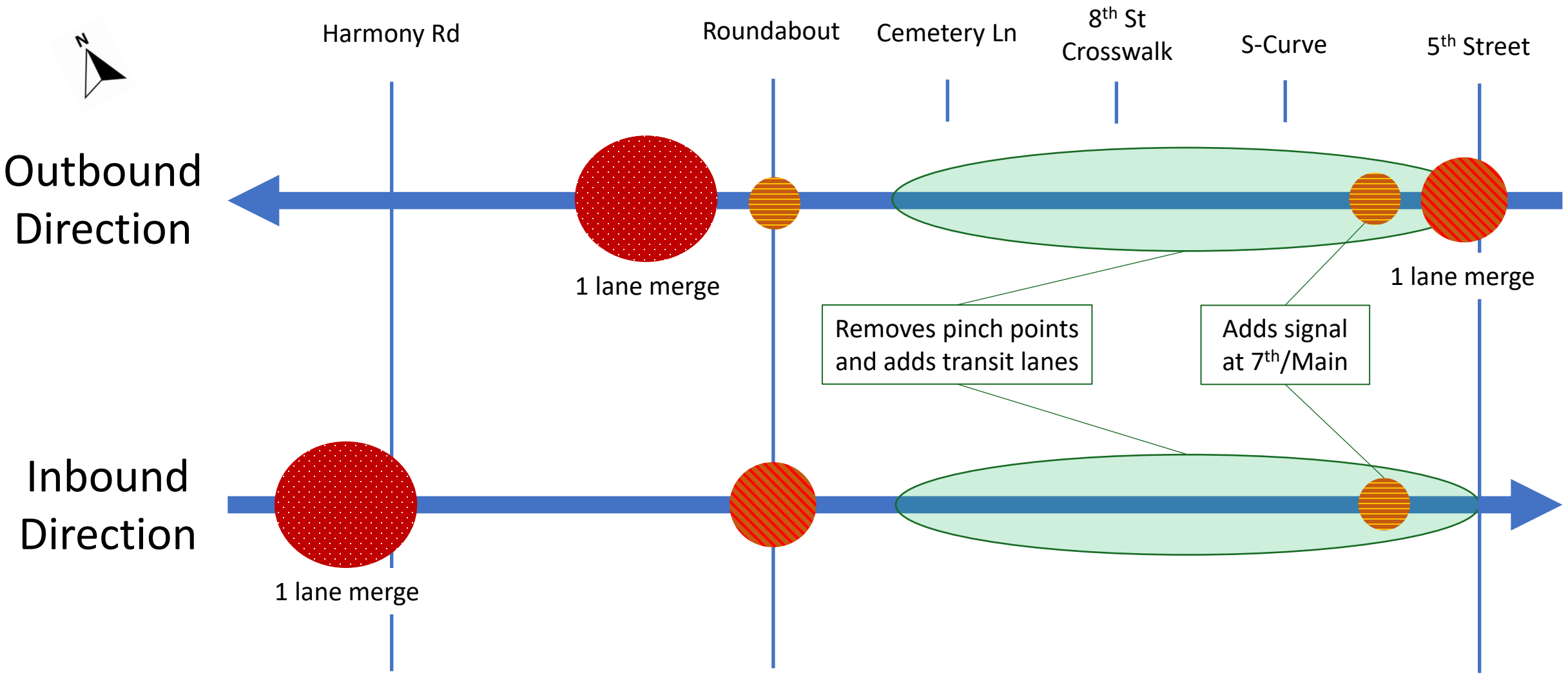
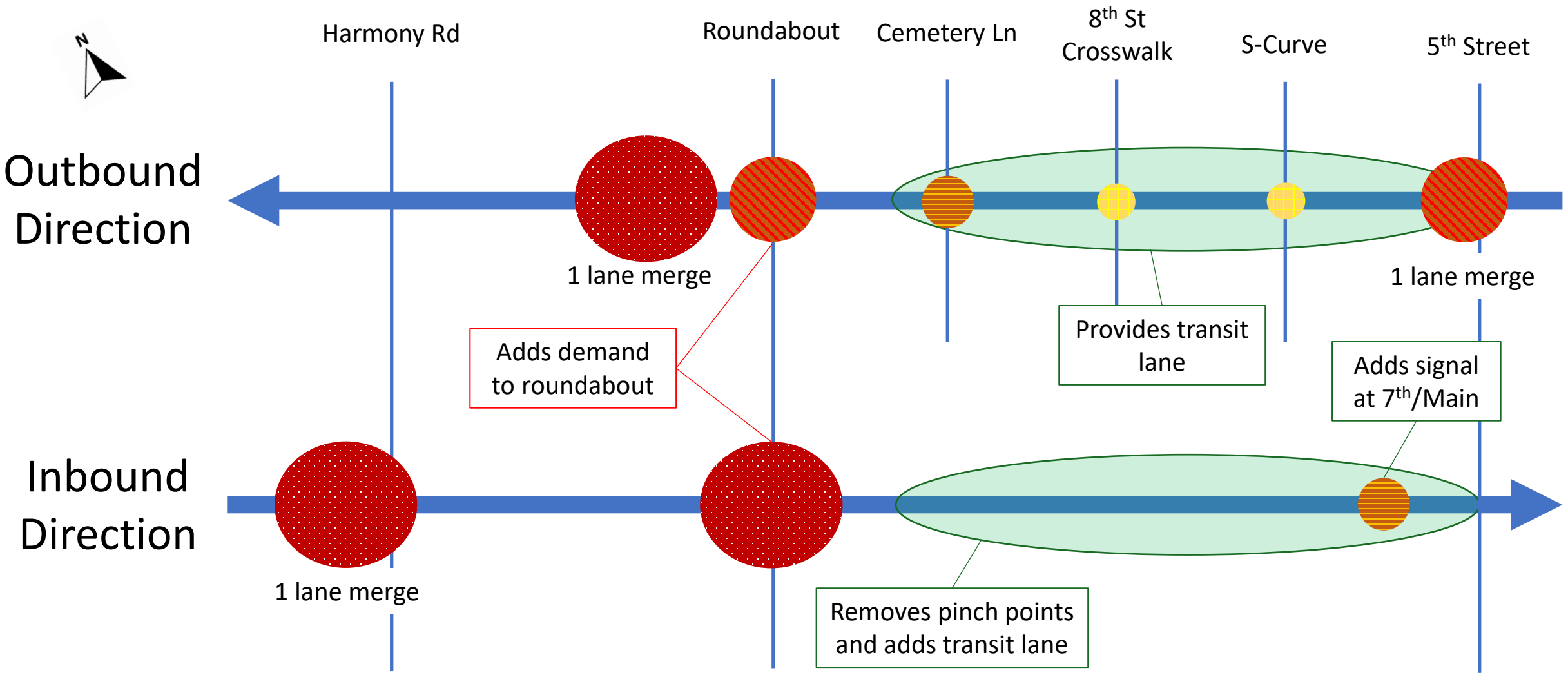
# Option 3: Phased Preferred Alternative (PA)



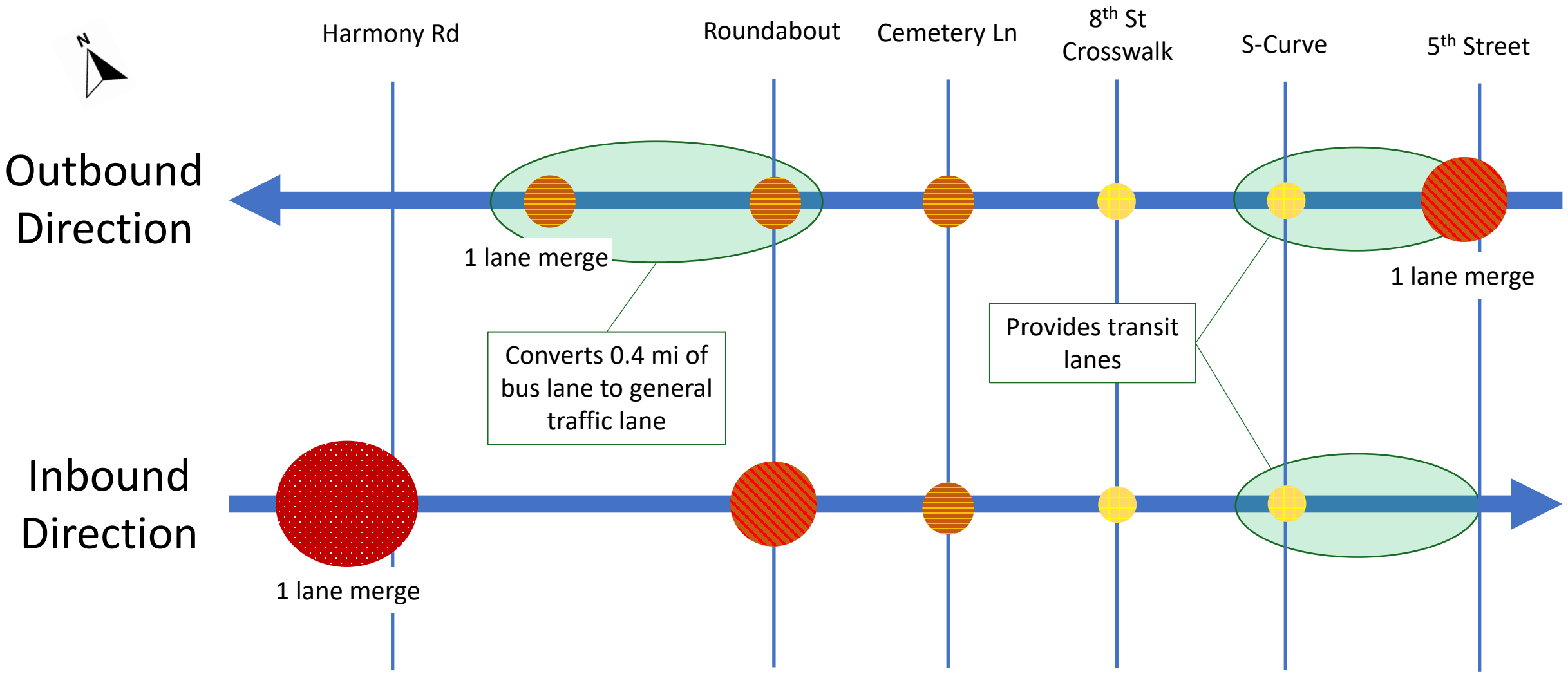

**Note: larger circles indicate heavier congestion and lower service capacity**

# Option 4: Splitshot




**Note: larger circles indicate heavier congestion and lower service capacity**

# Option 5: S-Curve Improvements and Down-Valley Improvements




**Note: larger circles indicate heavier congestion and lower service capacity**

# Scoring the Options based on Traffic & Transit Performance

- Option 1: S-curve Improvements
- Option 2: S-Curve Improvements and 3-Lane Bridge with (A) Bus queue jump; (B) Bus bypass at roundabout
- Option 3: Phased Preferred Alternative (PA)
- Option 4: Splitshot
- Option 5: S-curve Improvements and Down-valley Improvements

| Criteria | Weight | Option 1 Score | Option 2A Score | Option 2B Score | Option 3 Score | Option 4 Score | Option 5 Score |
|---|---|---|---|---|---|---|---|
| Benefit to corridor travel times | 25% | 3 | 3 | 4 | 5 | 1 | 4 |
| Benefit to overall congestion | 25% | 2 | 2 | 3 | 3 | 1 | 5 |
| Benefit to transit | 50% | 3.5 | 4 | 4.5 | 5 | 3.5 | 4 |
| Overall Score | 100% | **3.0** | **3.3** | **4.0** | **4.5** | **2.3** | **4.3** |

- Scoring from 1-5
- Score of 3 operates similar to the No Build
- Score of 1-2 is worse than the No Build; score of 4-5 is better than the No Build

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# Economic Impact Analysis

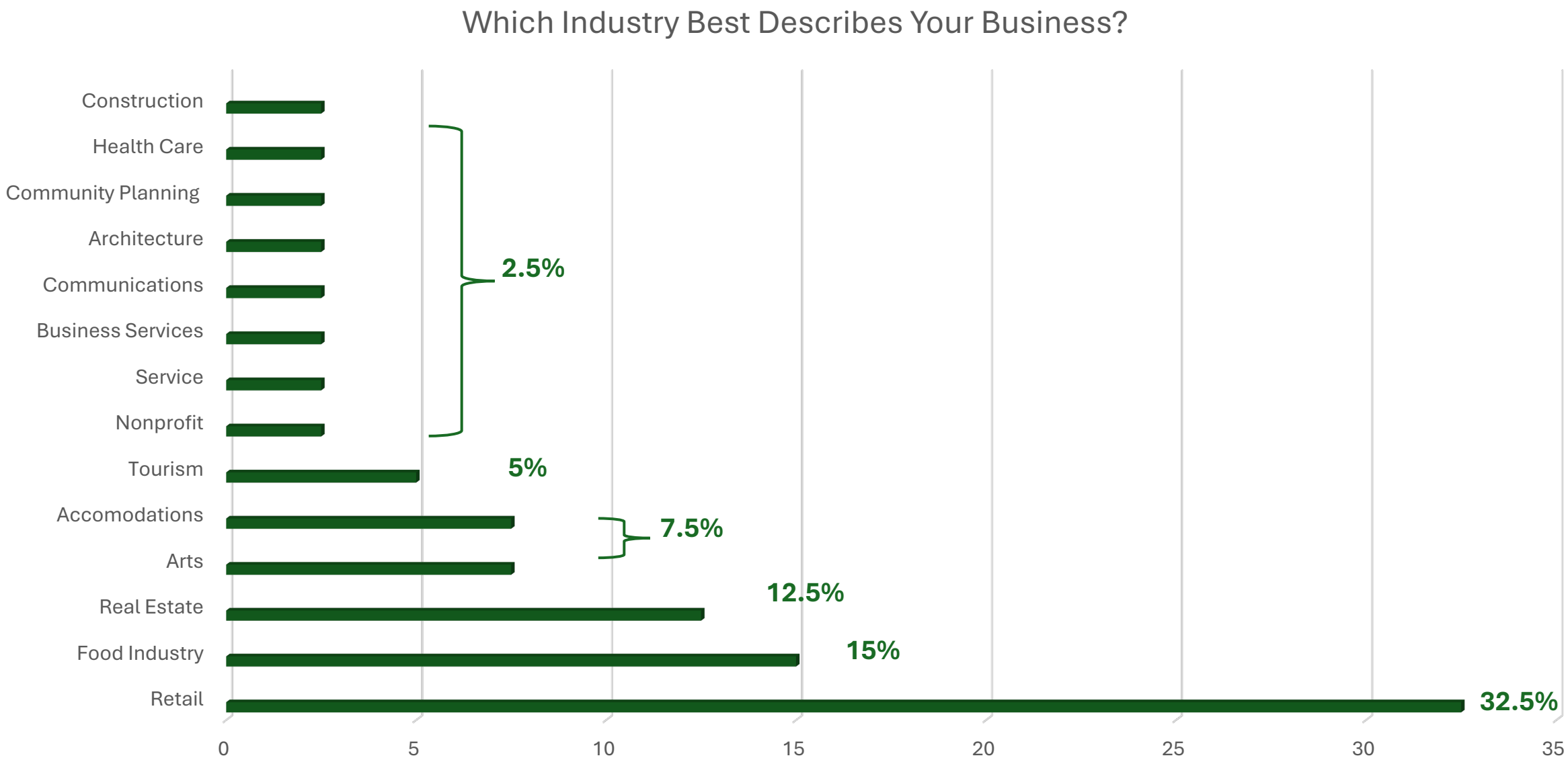
# Economic Impact Analysis

- **Purpose of Analysis:  Assess Economic Impacts of 3-Lane Bridge Construction**
  - 3-Lane Shifted and 3-Lane Faster
  - Long term effects not assessed.
- **Approach**
  - Characterize local and regional economies
  - Conduct Business Survey
  - Assess Construction Travel Delay and Costs
  - Assess benefits of construction spending
  - Model economic effects of construction

# Economic Impact Analysis: Business Survey

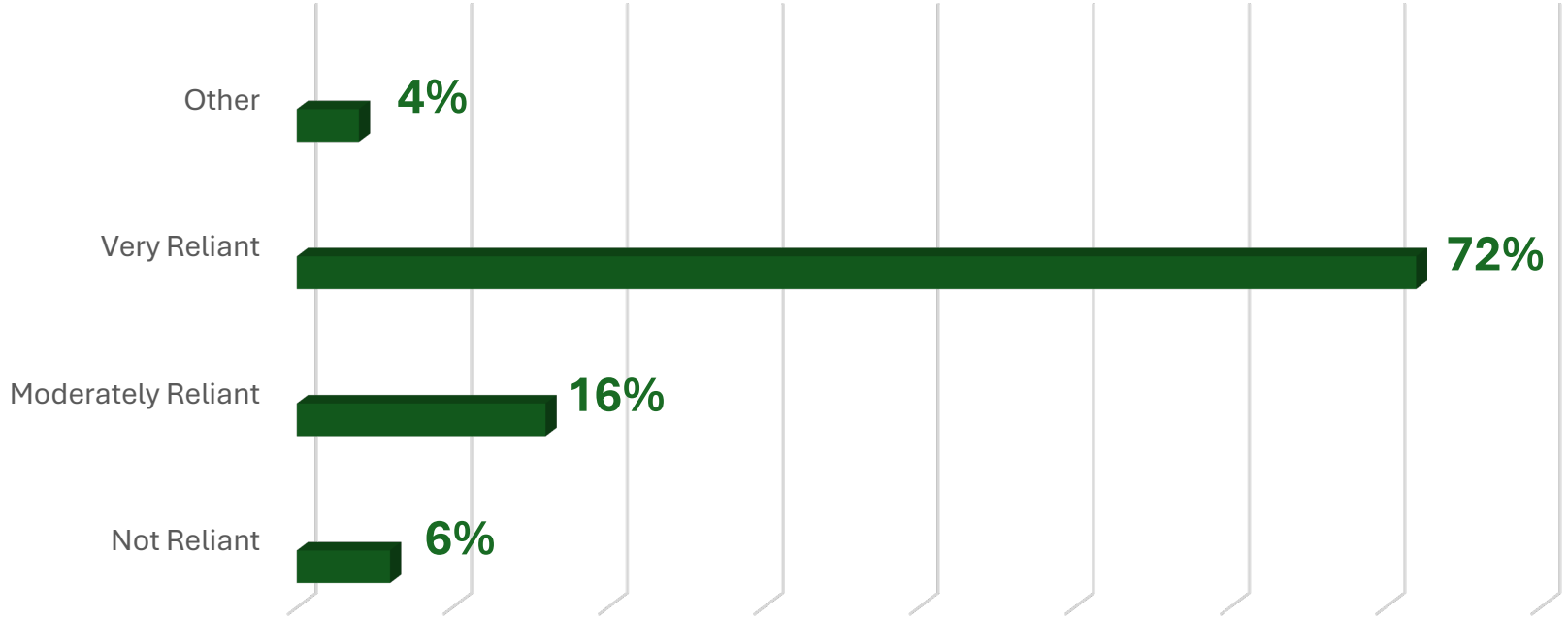
- Purpose of Survey:  Get feedback and inform the IMPLAN model
- Partnered with Aspen Chamber
- Surveyed 100 member businesses via email
- City staff directly connected with businesses
- 42 businesses responded

# Economic Impact Analysis: Business Survey



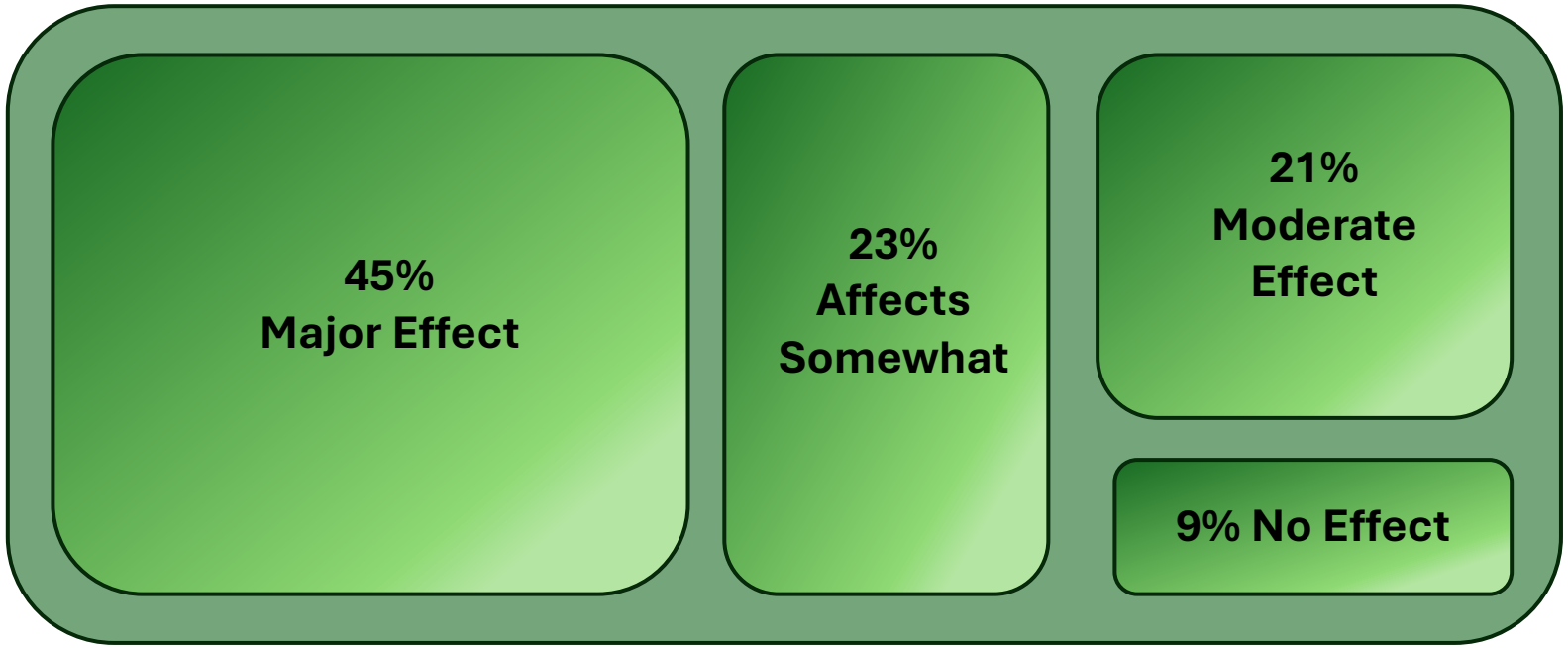
# Economic Impact Analysis: Business Survey

- How often do you travel on the Castle Creek Bridge?
  - Daily route (76%).
  - Occasional use (26%).
- How reliant is your business on traffic flow over the bridge to provide access for your customers?



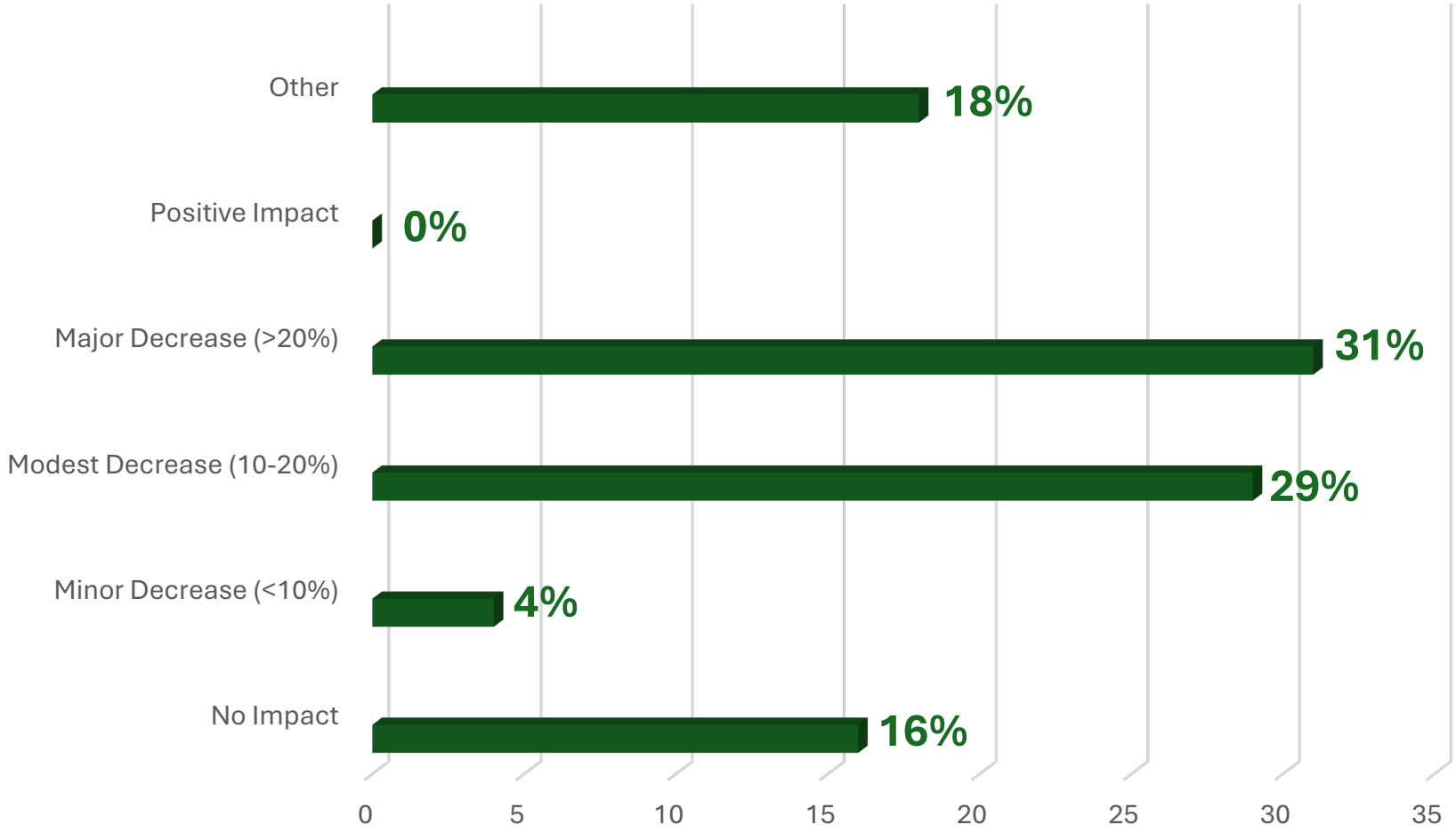
# Economic Impact Analysis: Business Survey

- To what extent does existing congestion at the Castle Creek Bridge or Entrance to Aspen affect your business?



# Economic Impact Analysis: Business Survey

- How might the bridge construction affect your business revenues?



# Construction Travel Delay and Costs: Methods

- Estimate delay during Project construction
- Input USDOT-recommended monetized values for travel time and operating costs.

# Construction Travel Delay and Costs: Results

## Annualized Construction-related Vehicle Hours Traveled (VHT)

| Direction | Annualized VHT |
|---|---|
| Inbound | 98,681 |
| Outbound | 86,817 |
| Total | 185,498 |

## Value* of Construction-related Delay

| Vehicle Type | 3-lane Faster | 3-lane Shifted |
|---|---|---|
| All-Purpose Vehicle | $14.35M | $18.84M |
| Commercial Vehicle | $0.377M | $0.49M |
| Total Value of Delay) | $14.72M | $19.34M |

*2022 Dollars
Faster - 3 years
Shifted - 4 years

# Construction Spending Effects: Methods

- Start with Project Costs
- Input into Economic Model
- Between 5% and 10% of total Project cost assumed to be spent within Pitkin County.
- Of local expenditures, assumed:
  - labor expenditures = 60%
  - materials, supplies, services, and other non-labor costs = 40%

# Construction Spending: Results

Annual Regional Employment and Labor Income: 3-lane Faster

| Impact | Employment (FTEs) | Labor Income |
|---|---|---|
| Total | 20 to 30 | $1.32M to $2.64M |

Annual Regional Employment and Labor Income:  3-lane Shifted

| Impact | Employment (FTEs) | Labor Income |
|---|---|---|
| Total | 10 to 20 | $0.84M to $1.67M |

# Tourism-Related Business Effects

- Assumed between 2-5% reduction in business activity
- Regional Employment and Labor Income Associated with Loss in Tourism-Related Business

| Impact | Employment (FTEs) | Labor Income |
|---|---|---|
| Total | -180 to -450 | -$11.1M to -$27.8M |

# Economic Impact Analysis: Summary

- 3-lane Faster: construction sector will experience an additional 10 to 20 jobs annually and $0.8 million to 1.6 million in labor income.
- 3-lane Shifted:  construction sector will experience an additional 10 jobs annually and $0.5 to $1.0 million in labor income.
- Both alternatives:  tourism sector will experience an annual decrease in direct employment of 120 to 310 jobs, resulting in an annual reduction of direct labor income of $7.5 to $18.8 million.
- Reductions in sales tax revenue range from $0.3 to $0.7 million.

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# Funding and Financial Assessment

# Funding and Financial Assessment

## Federal - Funded through the Infrastructure Investment and Jobs Act

- PROTECT – Community resilience to natural disasters, climate change
- Bridge Investment Program
- Rebuilding America's Infrastructure with Sustainability and Equity
    - Capital transportation projects that have a significant impact on a region

Picture of Jonathan Godes, former Mayor of Glenwood Springs CO., Secretary Buttigieg and Senator Bennet

## Considerations of Federal Funding Sources

- Federal program goals and political level of effort
- NEPA compliance required for Federal funding; State funding follows similar process

# Funding and Financial Assessment

## Key potential State and local funding opportunities and considerations:

### State

- Colorado Bridge and Tunnel Enterprise

### Local

- Potential funding cooperation with the EOTC
- Tax measure to support project and bonding

Picture of the 2017 reopening of the Grand Avenue Bridge in Glenwood Springs, CO.

# Funding and Financial Assessment

## Acquisition of SH 82 (Devolution)

## CDOT/FHWA July ‘24 letter:

- If City self-funds and/or seeks state funding, ROD stays in effect unless changed
- CDOT has stated that if the bridge sufficiency rating falls below a 50 and the project rises to the top of the CBTE and CDOT priority lists, CDOT and FHWA are required to implement the PA.
- NEPA process is required regardless of funding source


Picture of SH 82 traffic signals in downtown Aspen Colorado.

# Funding and Financial Assessment

## Conclusions:

- Federal or State funding is the easiest way to fund and offset the cost of a large project
- Alternatives that have regional benefit and improve social equity will be the most competitive.
- Even if the city had all of the funding today, a NEPA process still is required regardless of funding source
- Completion of the NEPA process will help in obtaining federal dollar grant sources.
- Depending upon the condition of the bridge, CBTE funding would be uncertain. Any funding allocated would design and construct the PA.
- Local funding through a tax measure or through other agencies can help meet local grant match requirements

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# Follow-Up from Aug. 5th Meeting

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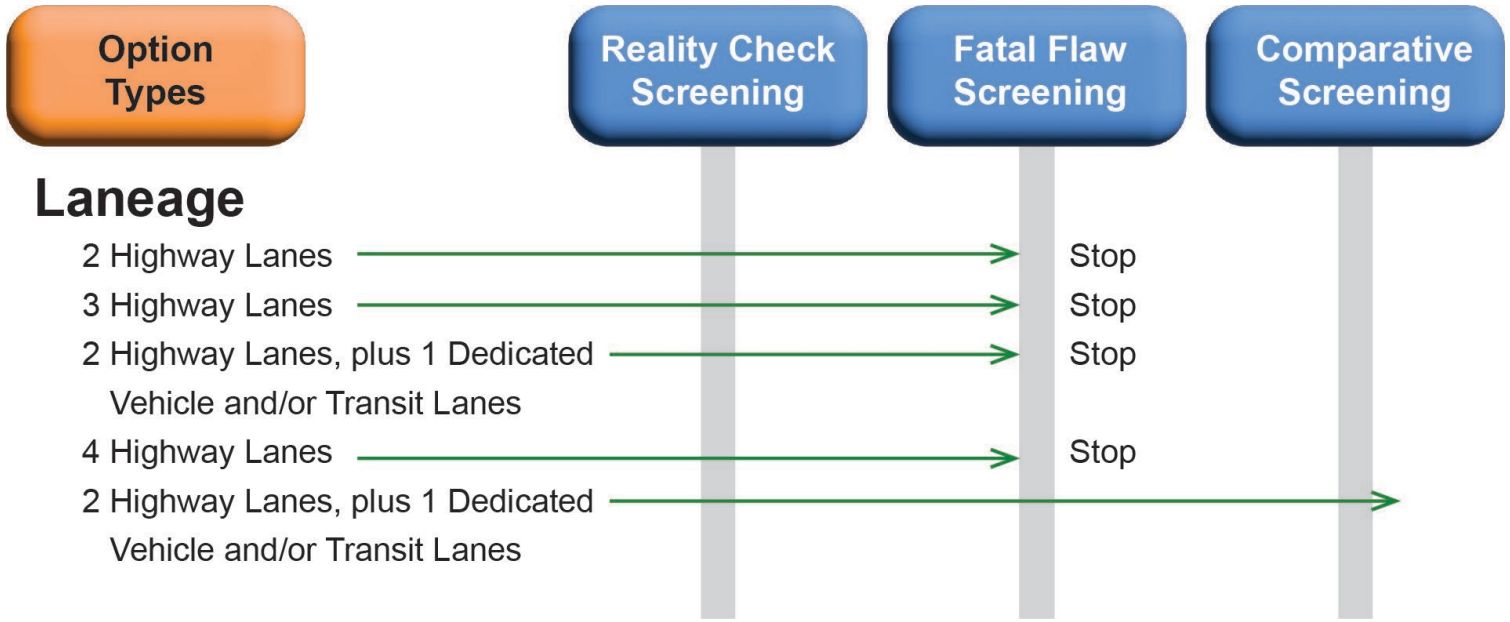
# Phased PA Footprint

# Phased PA Footprint (with Buses)

- **What does the ROD say about a bus system?**
  - Page 1: *"The transit component includes an LRT system that, if local support and/or funding are not available, will be developed initially as exclusive bus lanes."*
  - Page 1: *"The transit platform is of adequate width to allow the exclusive Bus lanes to continue in operation during the Construction of the LRT (Table 1)."*



# Phased PA Footprint (with Buses)

- **What does the ROD say about a bus system?**
  - Table 1 notes Maximum Platform Widths
    - 93.5’ (Roundabout to 7th)
    - 78.5’ (Cut & Cover)
    - 73’ (Castle Creek Bridge)

| Corridor Section | Maximum Platform Widths [1] | Maximum Total Right-of-Way Width |
|---|---|---|
| **Buttermilk to the Maroon Creek Bridge** | 34 meters (112 feet) | 82 meters (270 feet) [2] |
| **Maroon Creek Bridge** | 22 meters (73 feet) | 27 meters (90 feet) |
| **Maroon Creek Bridge to Maroon Creek Road** | 31 meters (101 feet) | 40 meters (130 feet) |
| **Castle Creek Bridge** | 22 meters (73 feet) | 27 meters (90 feet) |
| **Maroon Creek Road to 7th and Main (excluding Cut and Cover Tunnel)** | 28 meters (93.5 feet) | 40 meters (130 feet) |
| **Cut and Cover Tunnel** | 24 meters (78.5 feet) [3] | 61 meters (200 feet) |

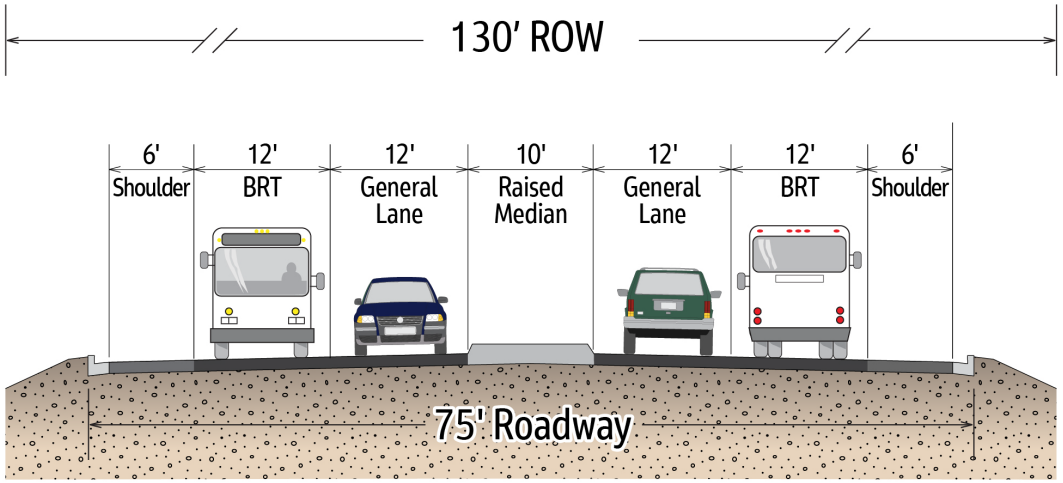
*[1] Platform width is defined as the distance between the outside edges of the curb and/or barriers. The platform widths are from the Joint Resolution #1 (Series of 1997) passed by the City of Aspen, Pitkin County, and the Town of Snowmass Village.*

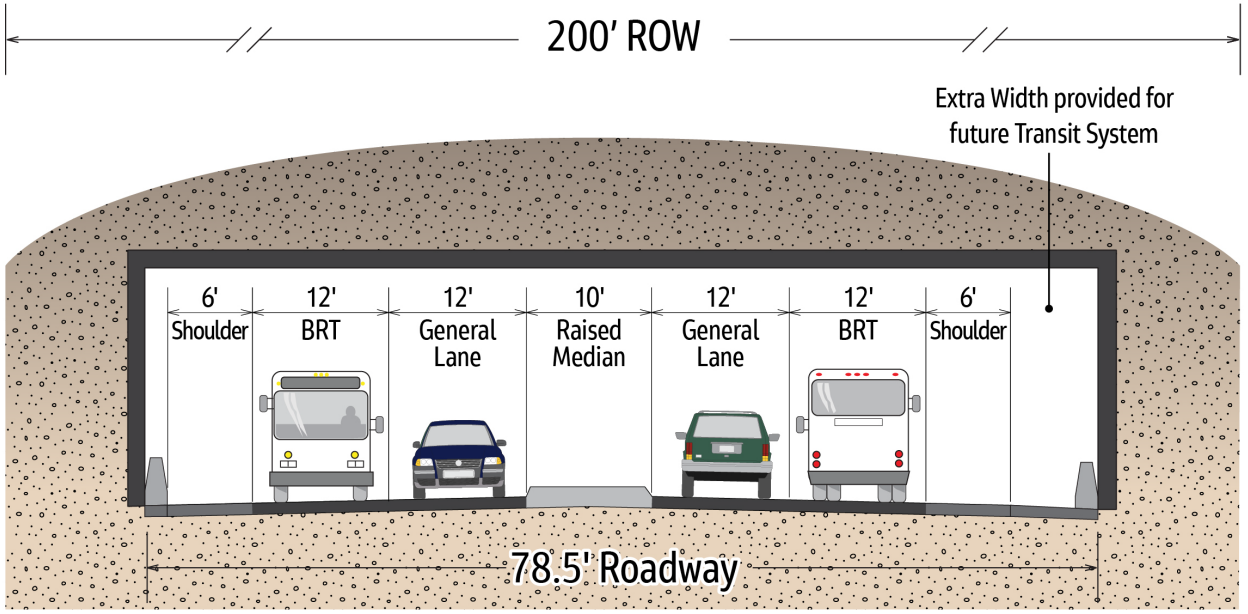
*[2] The right-of-way for the Buttermilk to Maroon Creek Bridge segment is significantly larger than other segments. This is because the LRT veers slightly south near the Buttermilk Ski Area to go into the LRT station. This results in a larger area of right-of-way being needed. For more information on the variation of platform and right-of-way widths, please see the technical memorandum **Platform and Right-of-Way Width**.*

*[3] The platform width for the cut and cover tunnel was originally 22 meters (73 feet) for the Phased Modified Direct Alternative in the DSEIS. The updated Phased Alternative requires a platform width of 24 meters (78.5 feet) for a maintenance access adjacent to the LRT and to provide lanes of adequate width for busses during phasing.*

# Phased PA Footprint

- Phased Preferred Alternative (PA) – Platform Widths



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# Project Costs & Duration

# Project Costs and Durations by Alternative

| Description | Phased PA | Splitshot | 3-Lane Bridge w/Bus Bypass |
|---|---|---|---|
| Construction Items | $71,050,000 | $57,332,000 | $54,538,000 |
| Design/NEPA/CE&I/PI | $29,376,000 | $25,881,000 | $25,475,000 |
| ROW and TCEs | $47,219,000 | $51,327,000 | $65,847,000[b] |
| **Project Costs[a]** | **$147,645,000** | **$134,540,000** | **$145,860,000** |
| NEPA & Prelim Design | 1 yr. | 1 ½ to 2 ½ yrs. | 1 ½ to 2 ½ yrs. |
| Final Design/ROW | 1 ½ to 2 yrs. | 1 ½ to 2 yrs. | 2 ½ to 3 ½ yrs. |
| Bid | ½ yr. | ½ yr. | ½ yr. |
| Construct | 2 yrs. | 2 ½ to 3 yrs. | 4 yrs. |
| **Project Timeline[c]** | **4 ½ to 5 ½ yrs.** | **6 to 8 yrs.** | **8 ½ to 10 ½ yrs.** |

[a] 2024 dollars

[b] Includes a potential property take below the bridge

[c] Does not account for time to address potential legal issues

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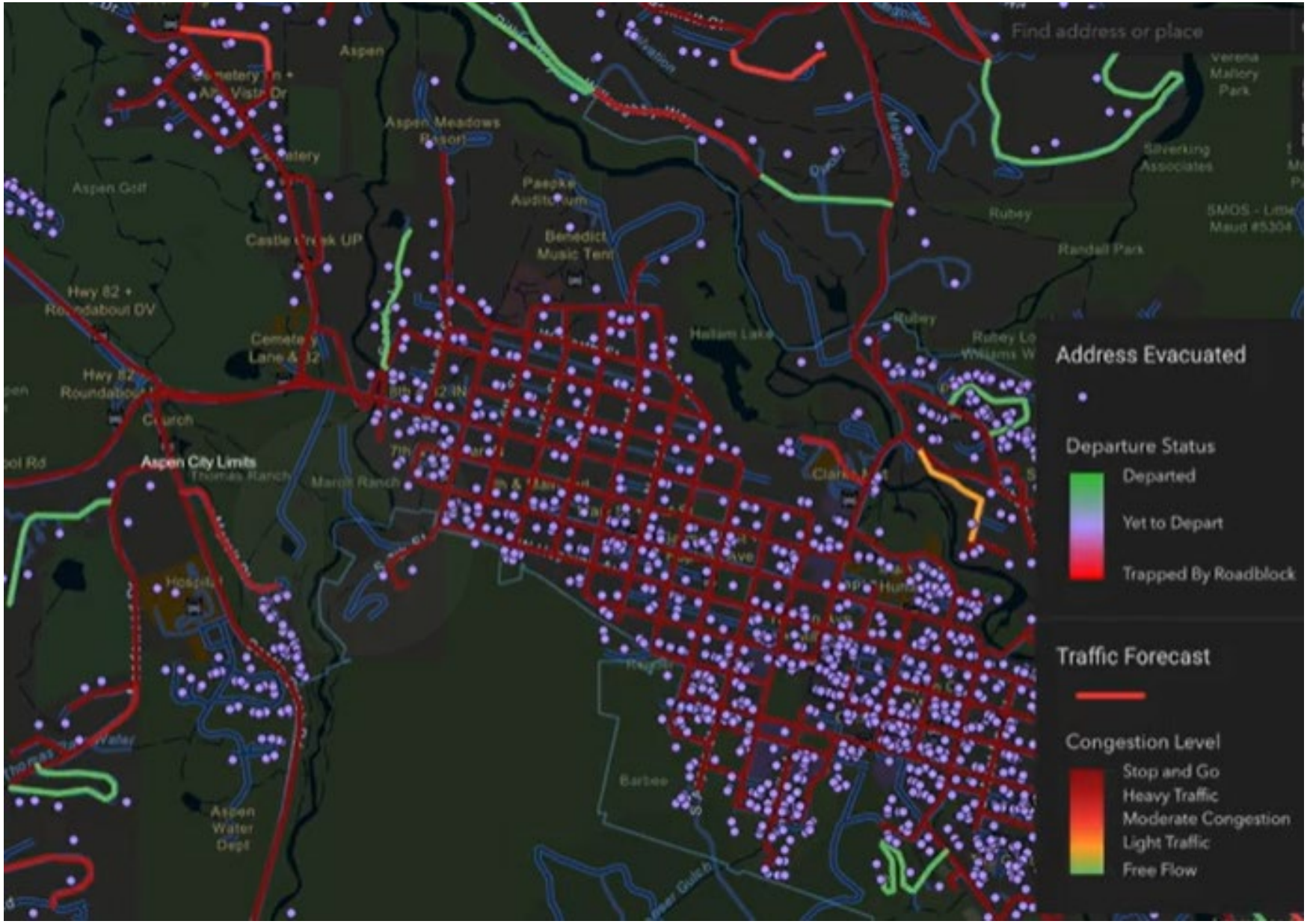
# Emergency Evaluation Planning

# Emergency Evacuation Planning




Screen shot of Aspen evacuation model

# End of Presentation