An aerial photograph of the White House area in Washington, D.C. The map shows a grid of streets. A central area, including the White House and Lafayette Park, is highlighted with a thick orange border. The highlighted area is roughly rectangular, extending from H Street to Constitution Avenue and from Pennsylvania Avenue to New York Avenue. The text "White House Area Transportation Study" is overlaid on the map in a large, bold, black serif font. Below the title, the text "National Capital Planning Commission" and "October 7, 2010" are also overlaid in a bold, black serif font. Various street names are visible on the map, including H Street, Lafayette Park, Pennsylvania Avenue, New York Avenue, State Place, E Street, and Constitution Avenue.

***White House Area  
Transportation Study***

**National Capital Planning  
Commission**

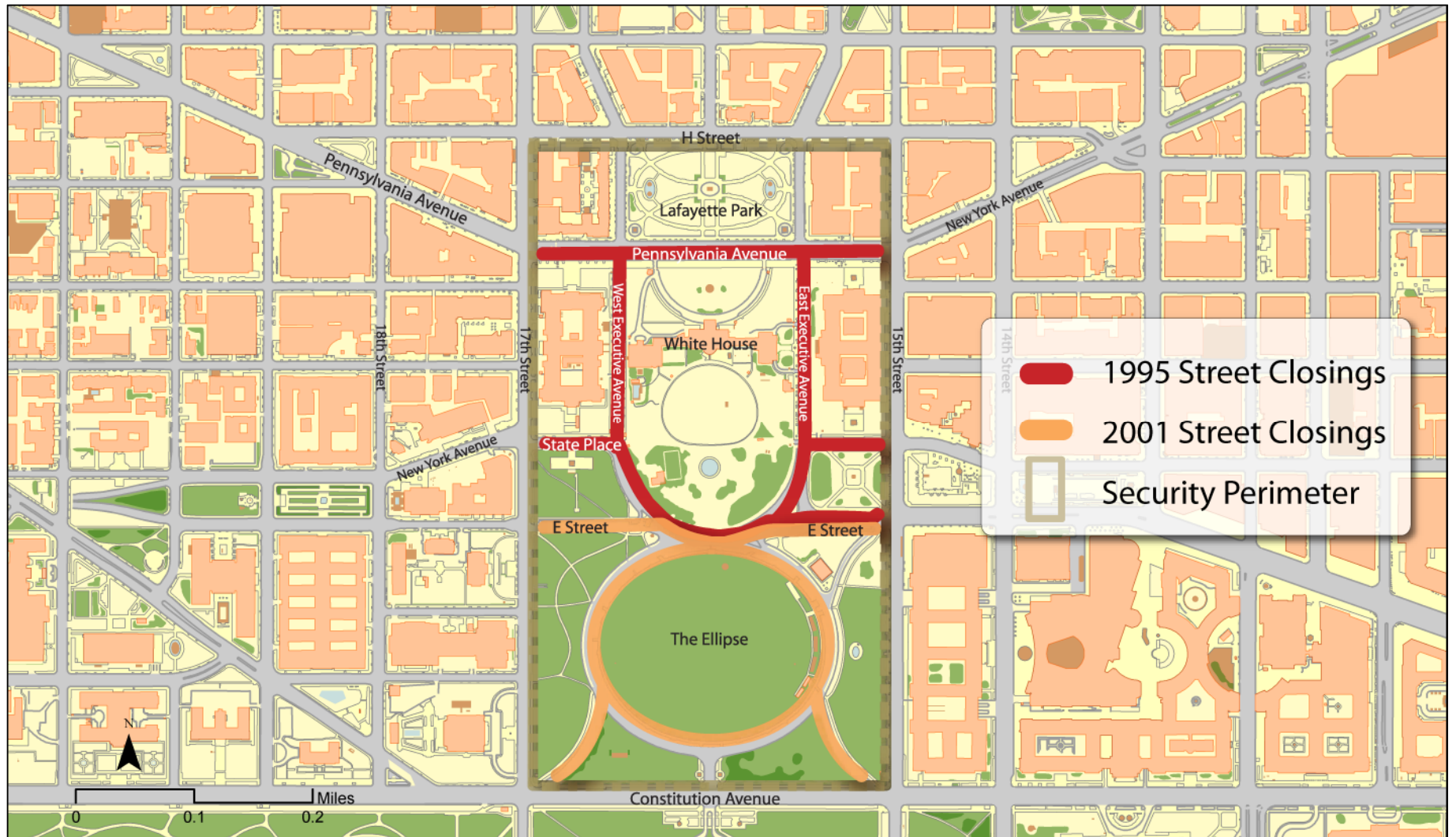
**October 7, 2010**



# *Agenda*

- Study background and purpose
- Major findings
- Street closure impacts
- Repairing the street grid
- Transit and operational alternatives
- Findings

# White House Area Closures



# *Broader Impact Area*



# *Authorizing Legislation*

- 2003 Omnibus Appropriations Act:  
Conduct “transportation studies to **address traffic problems** in the immediate vicinity of the White House...to **alleviate congestion** resulting from street closures...and report (on) the impacts of street closures and traffic restrictions.”

“The project is to be managed by **FHWA** in consultation with the **National Capital Planning Commission**.”

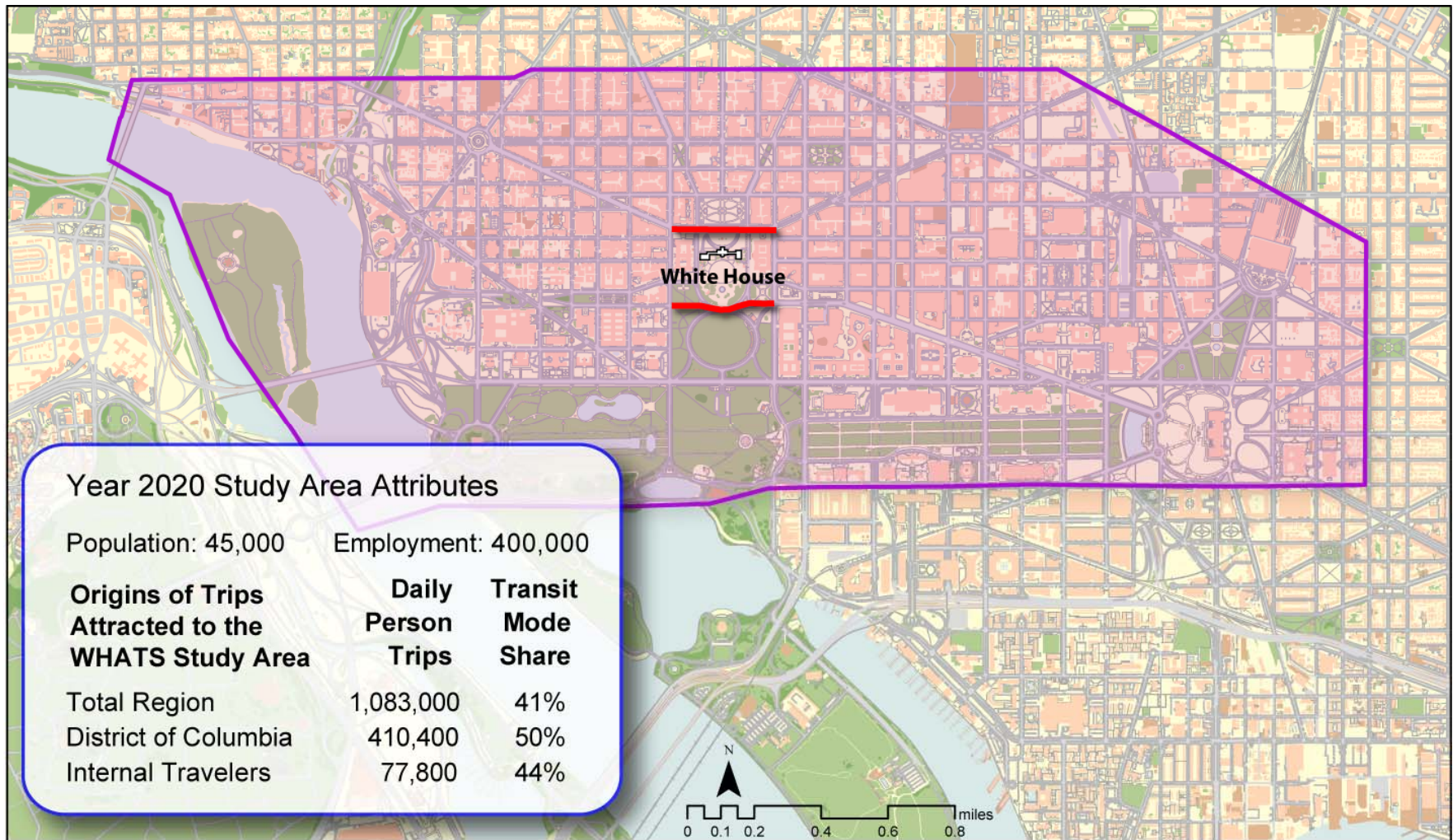
## *Study Phases*

- Alternatives designed to repair or reinforce the street grid
- Alternatives designed to improve transit and traffic operations

# *Analysis Concepts*

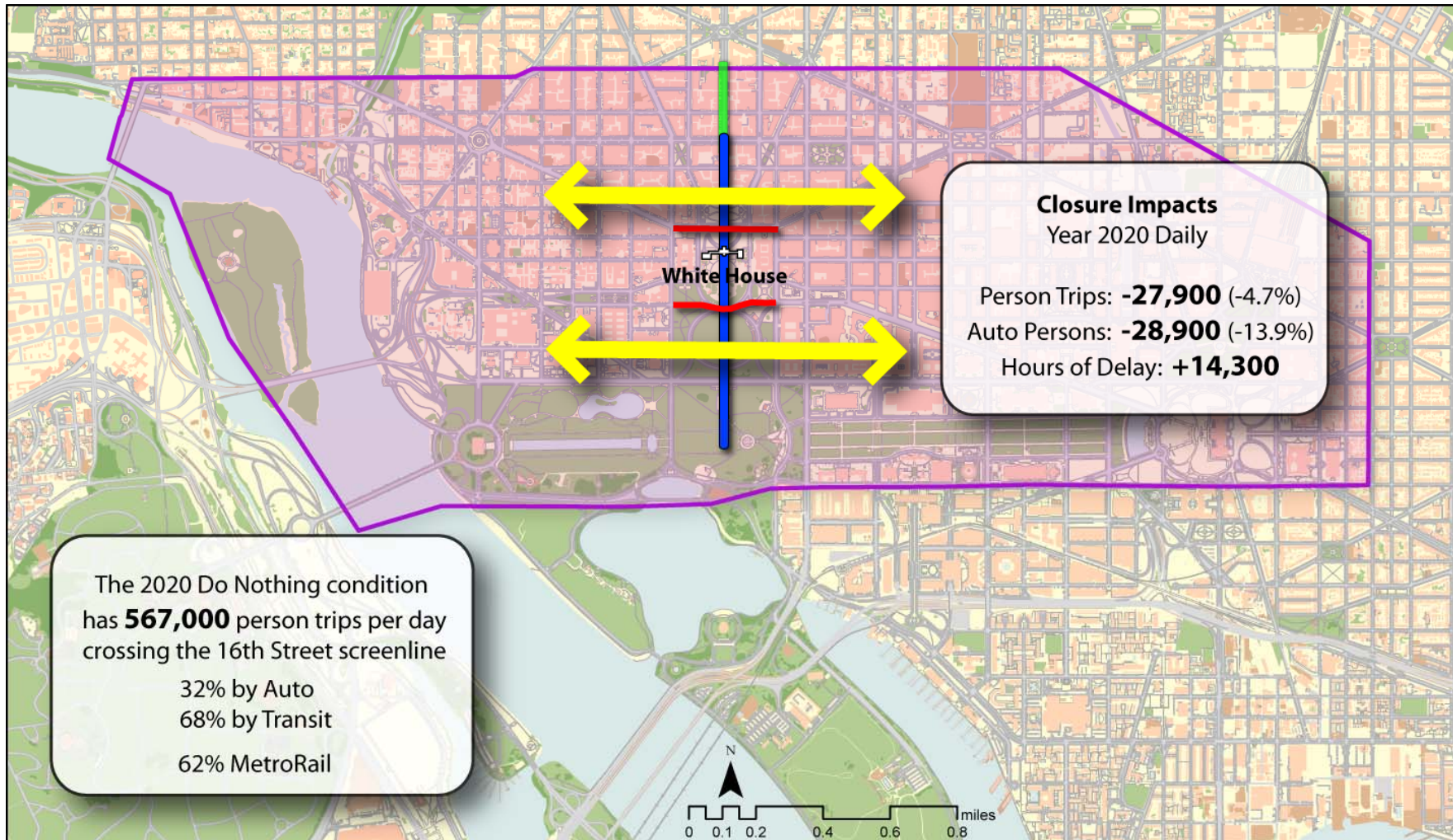
- TRANSIMS model simulates autos, trucks, buses, and trains
  - Includes waiting and stop dwell times
  - All modes, including Metrorail are capacity constrained
  - Includes traffic signal system operations
- Calculates benefits for all travelers using autos, trucks, buses or trains
- Compares total person benefits to the street closures

# WHATS Study Area





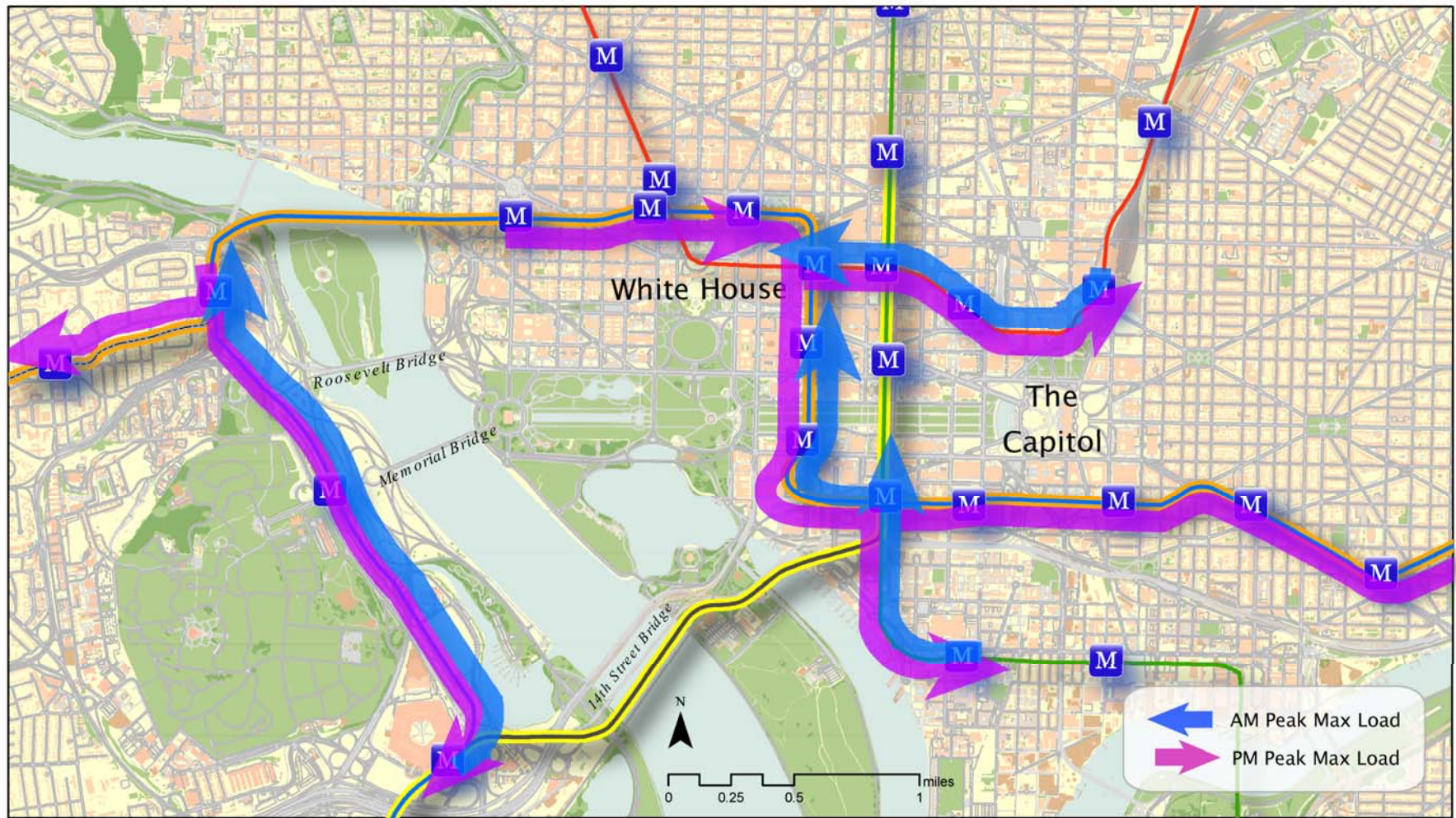
# 16<sup>th</sup> Street Screenline



# *Major Findings*

- Closures measurably affect travelers on downtown surface modes
  - fewer travelers, longer travel times
- Infrastructure alternatives to repair the street grid have high capital and non-capital costs
- Transit alternatives can benefit bus riders but are constrained
  - Downtown capacity/congestion
  - Operations inside the transitway
- Metrorail ridership largely unaffected
  - Closures
  - Alternatives
- A combination of transit and traffic operations can provide measurable travel improvements

# *Metrorail Bottlenecks Remain (with Silver Line/partial Blue Line re-route)*

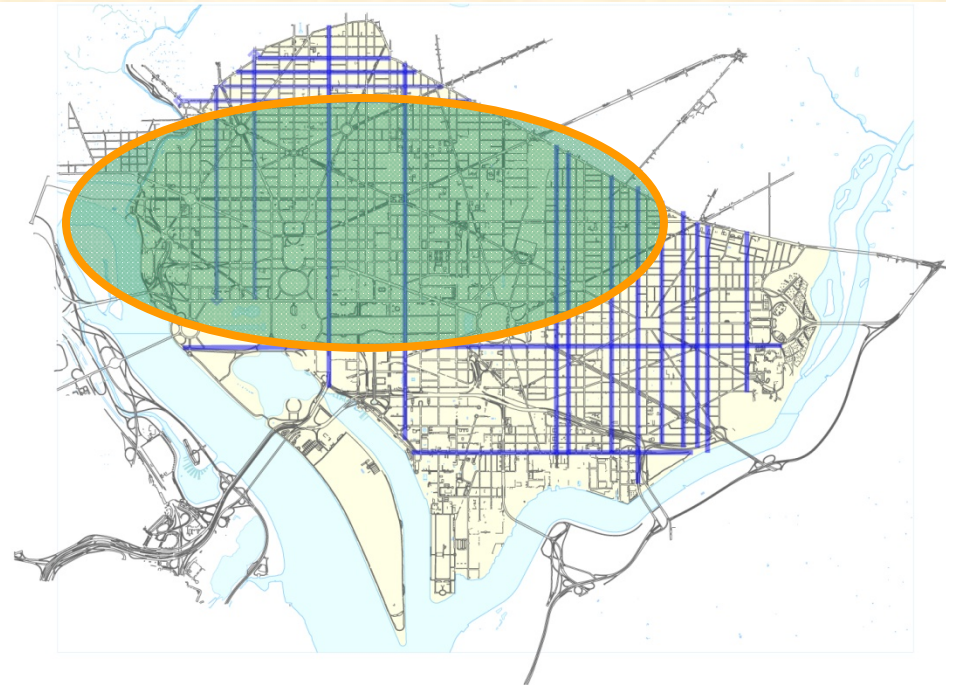
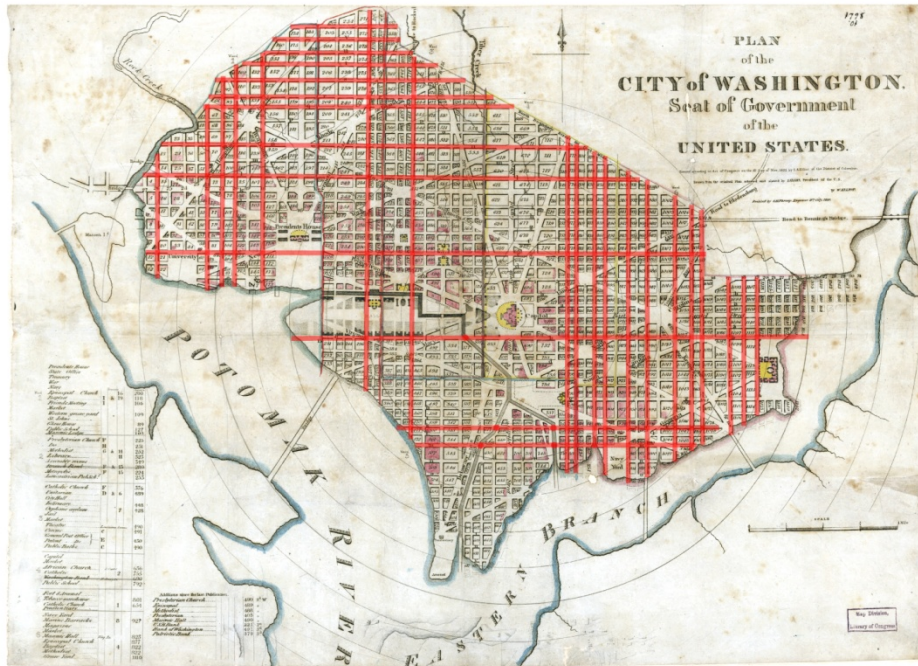


**Historical  
Context**

*Historical Context*

Historical  
Context

# *Continuous Streets Adopted L'Enfant Plan and Today*



Adopted L'Enfant Plan

2010 Washington DC

Less cross-town continuity today

10/7/2010

Historical  
Context

# *East-West Streets Adopted L'Enfant Plan and Today*



Adopted L'Enfant Plan

2010 Washington DC

Less cross-town continuity today

10/7/2010

Closure  
Impacts



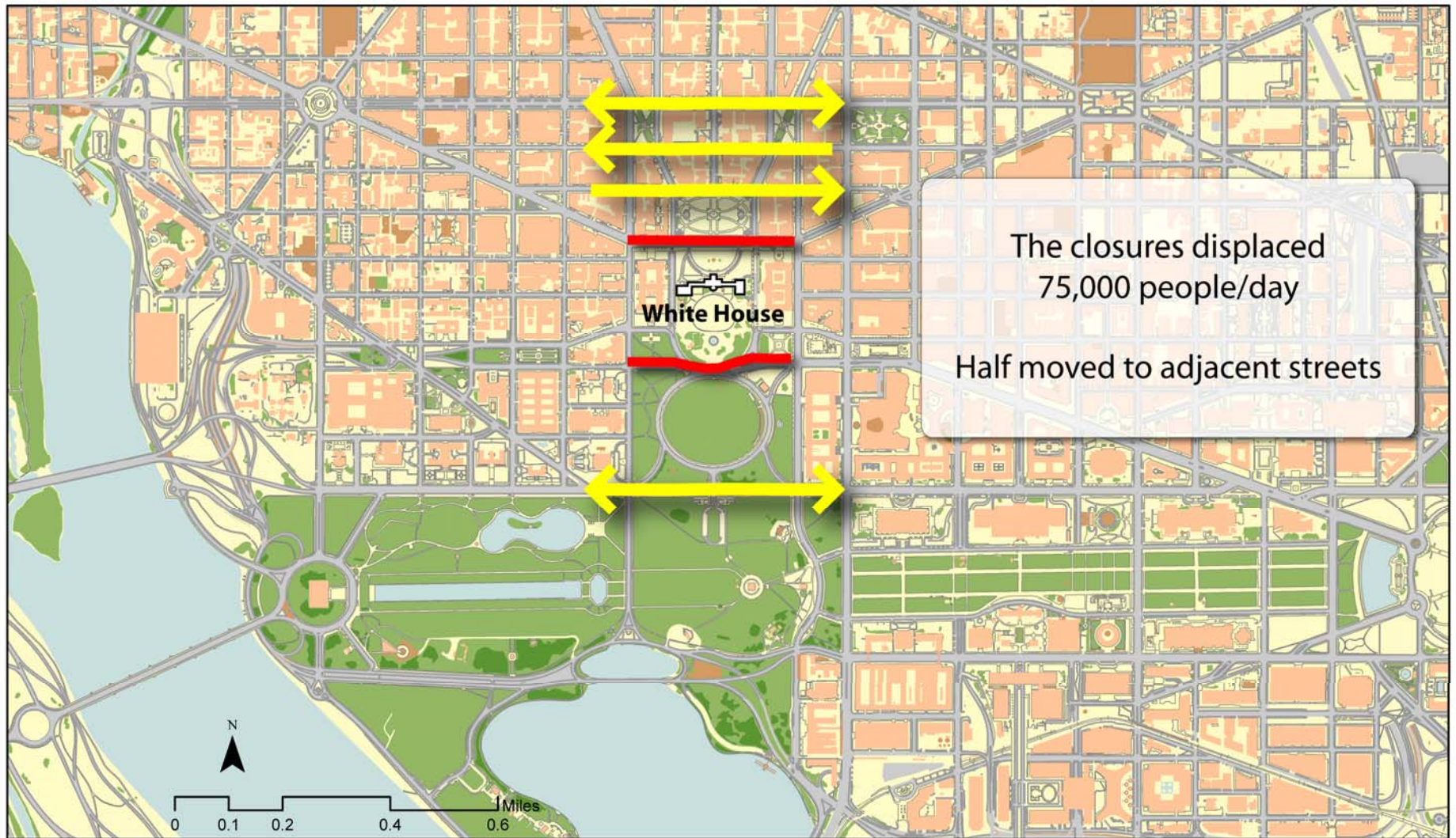
# *Closure Impacts*

10/7/2010

White House Area Transportation Study

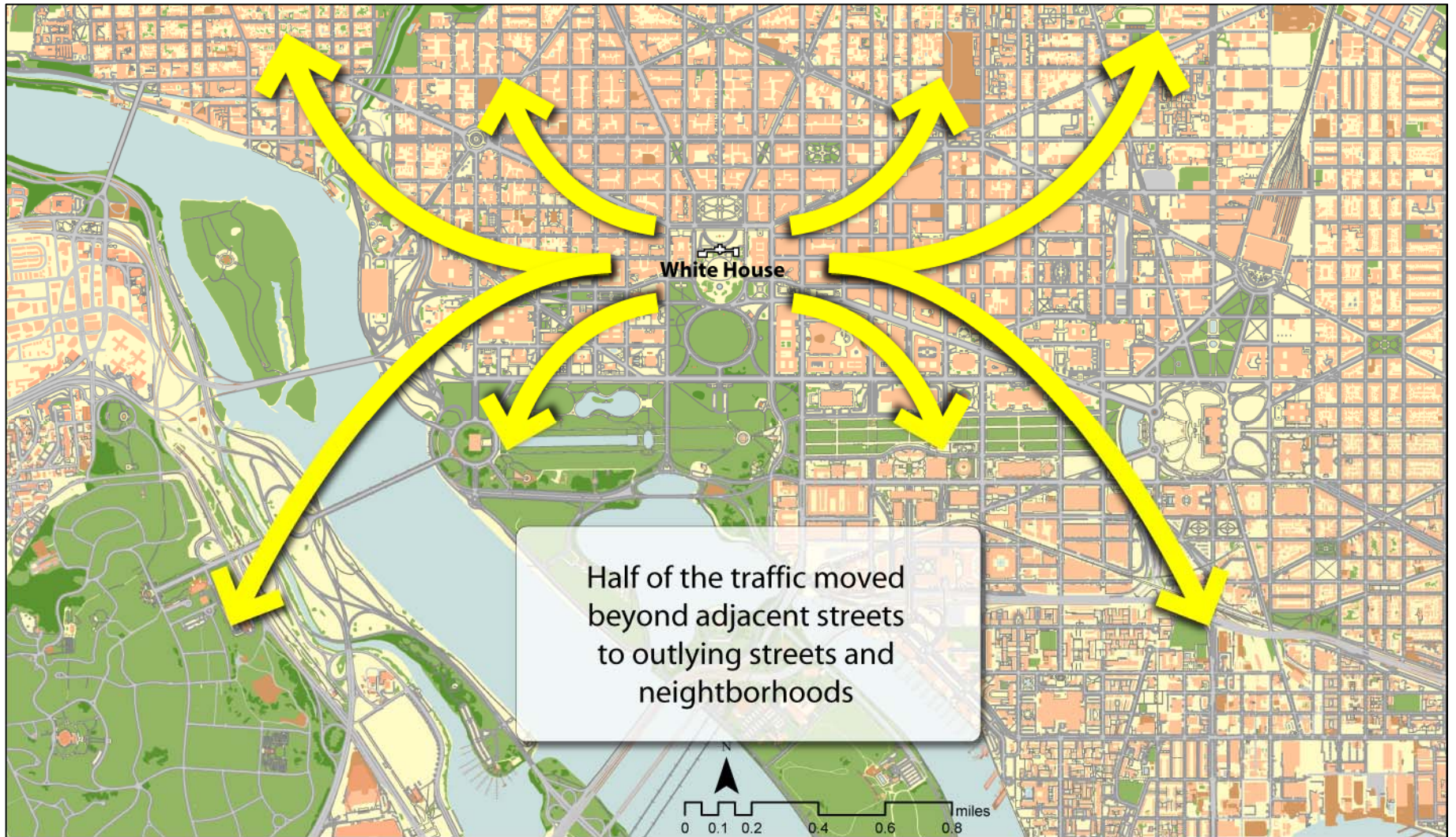
15

# *Closings Displaced Traffic*

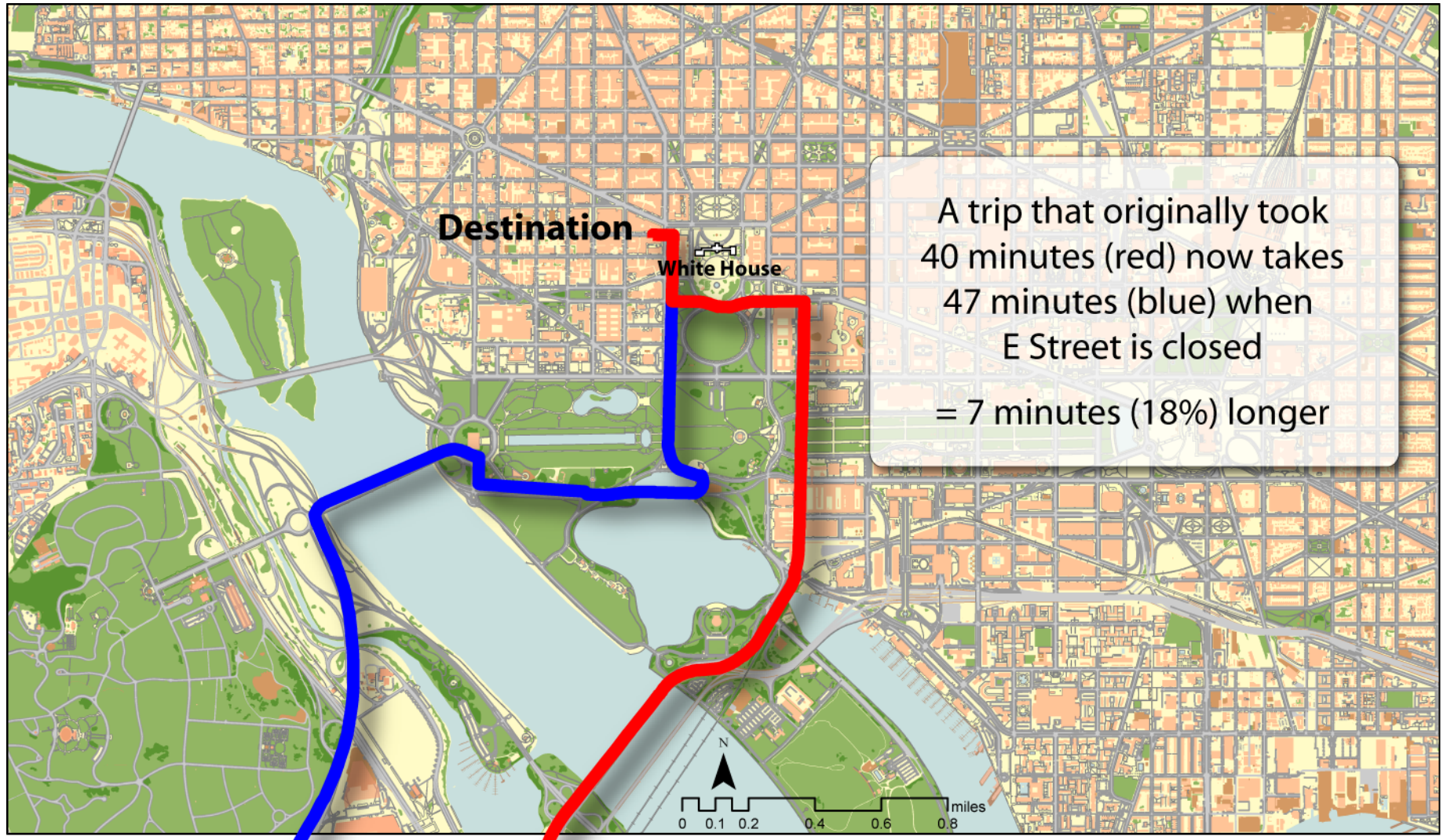




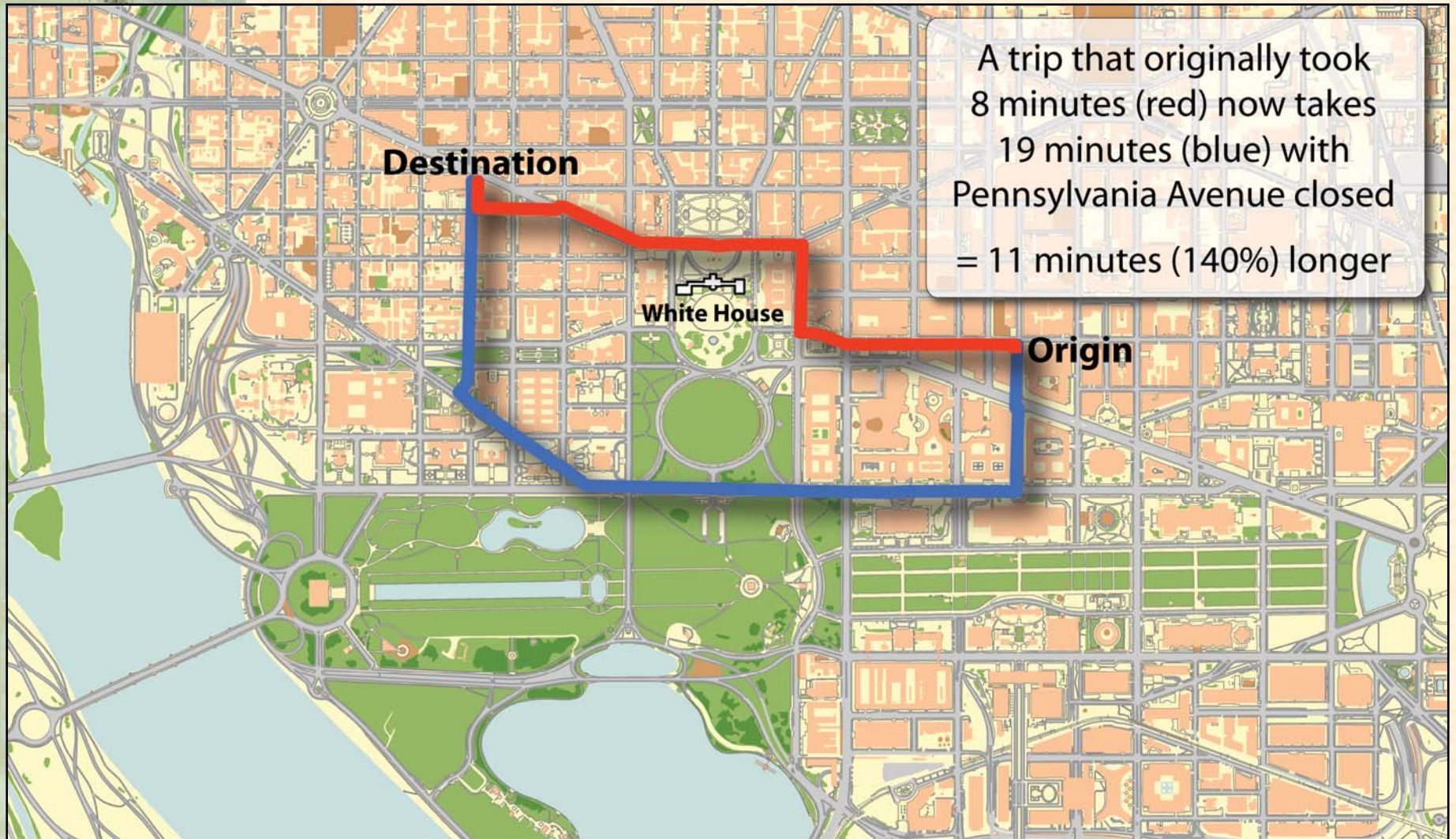
# *Closings Displaced Traffic*



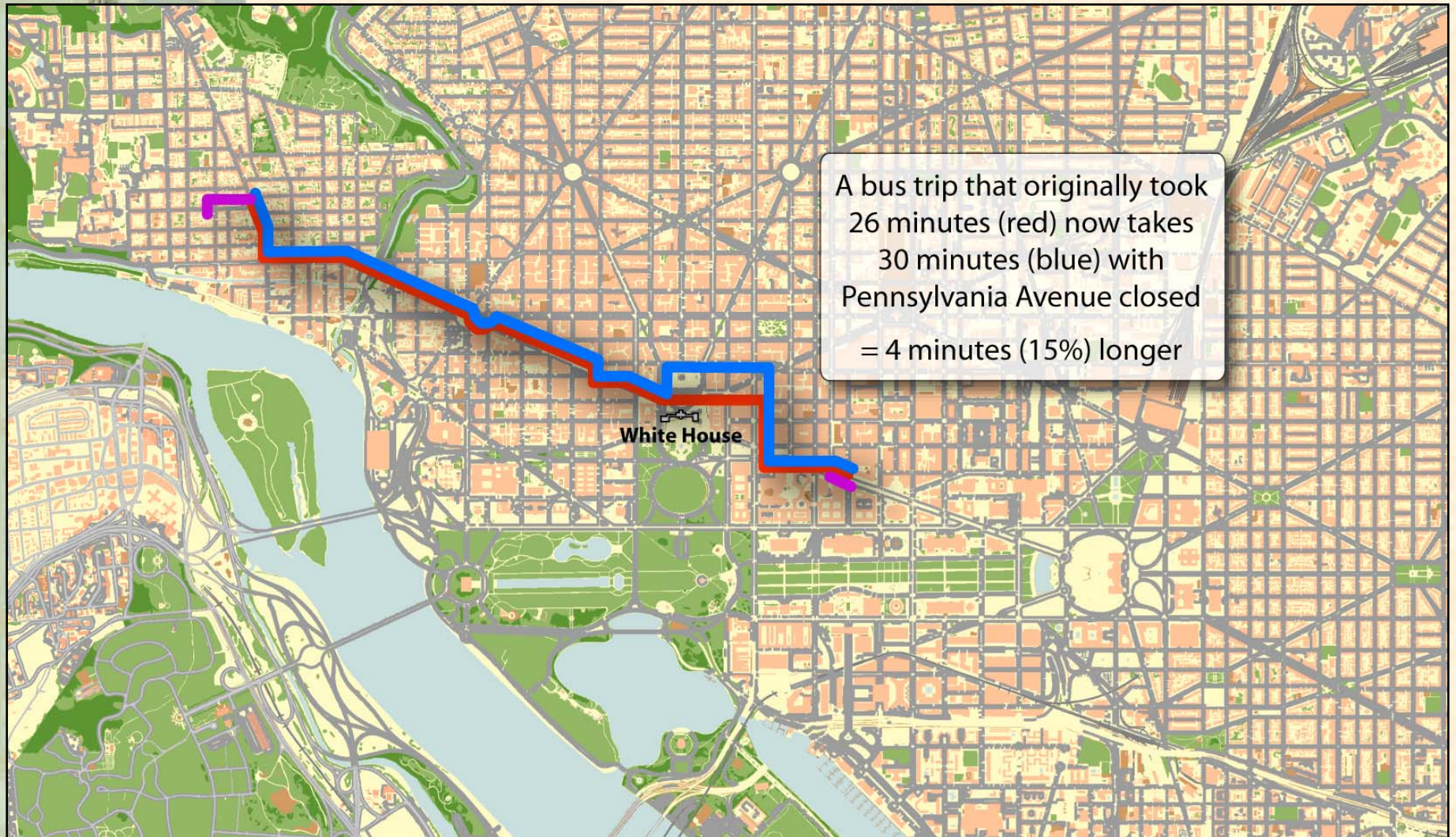
# *Closings Increased Travel Times...*



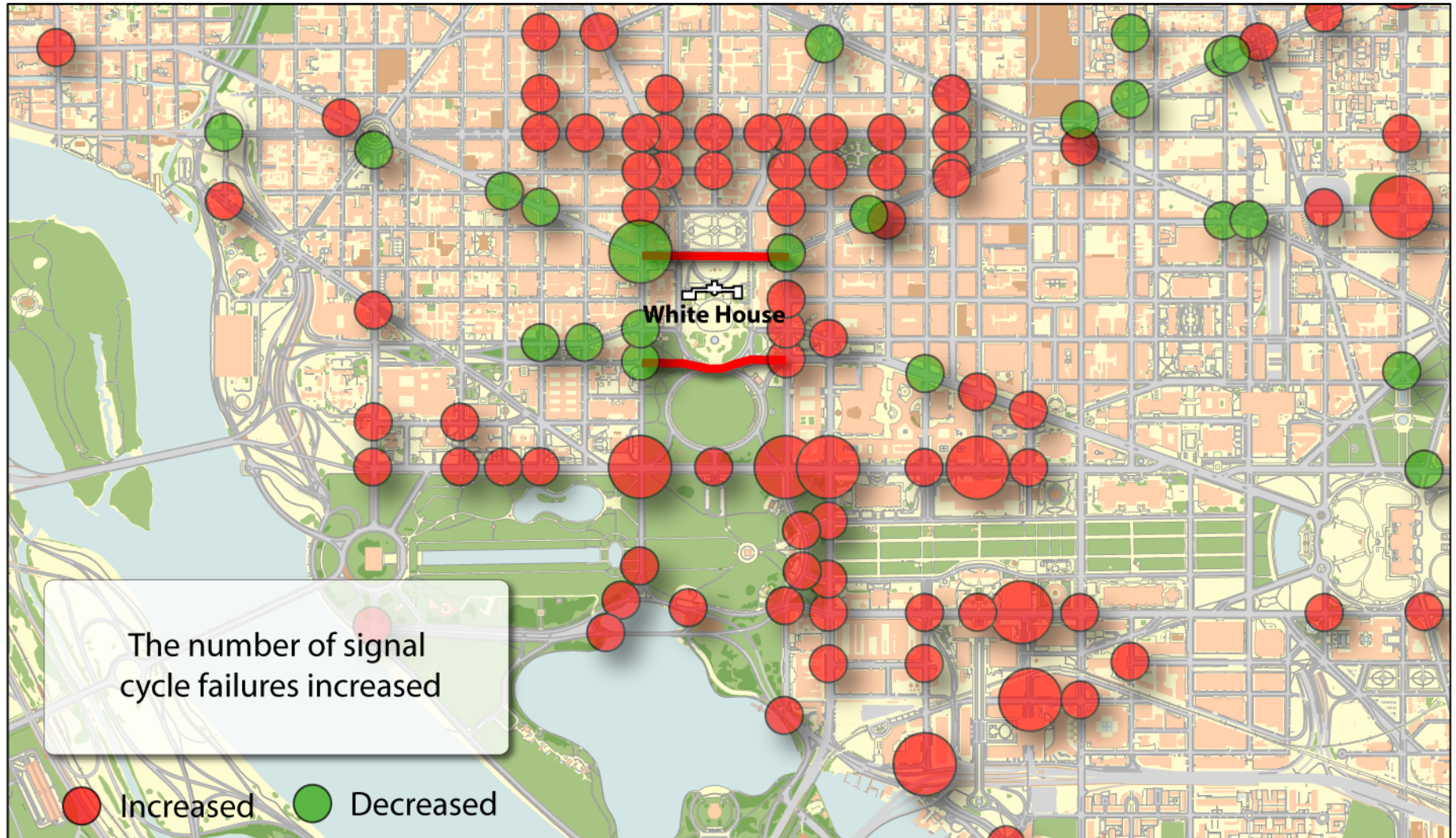
# ... *With Crosstown Impacts*



# *...Including Crosstown Transit*

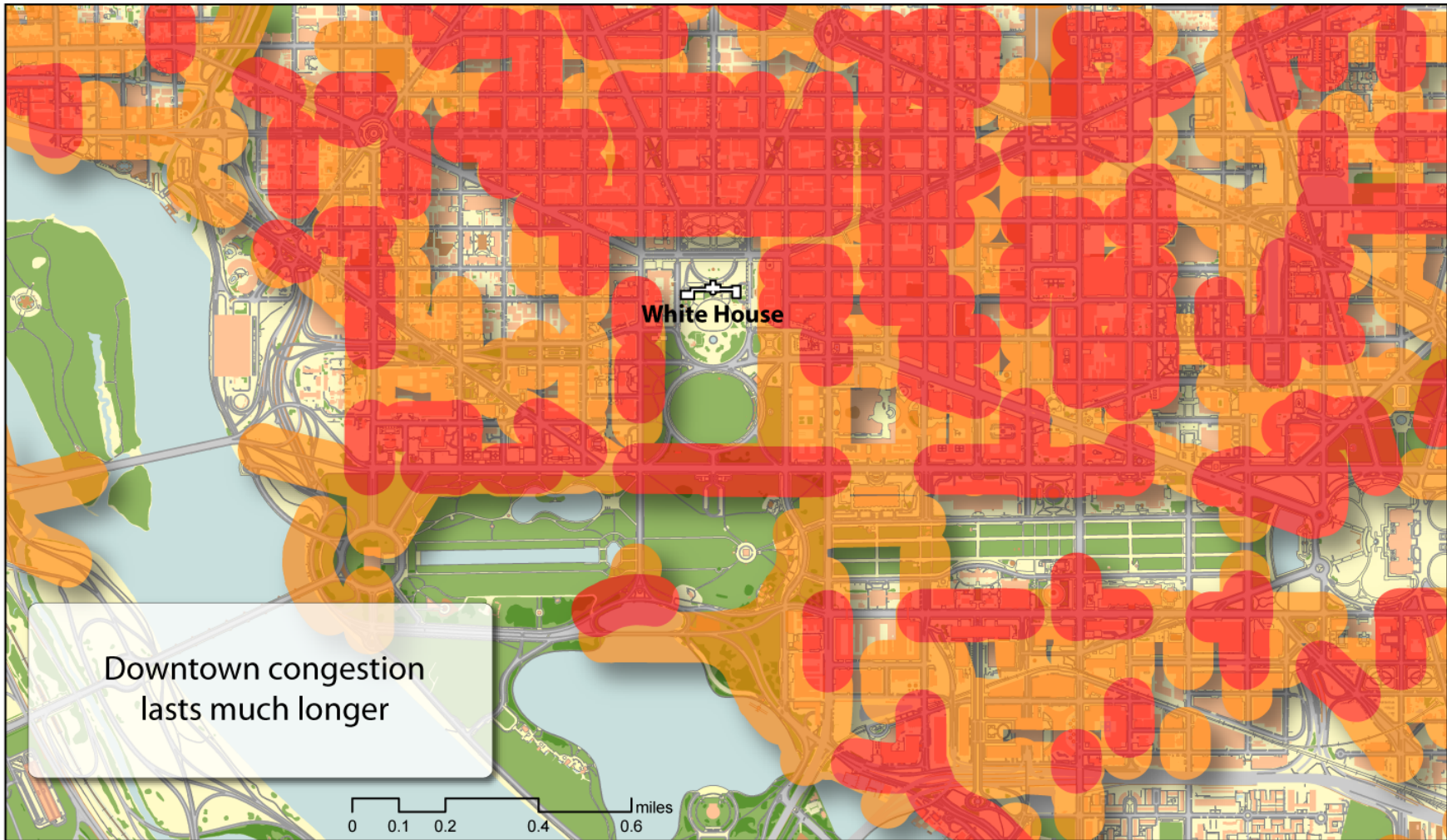


# *Closings Increased Congestion*



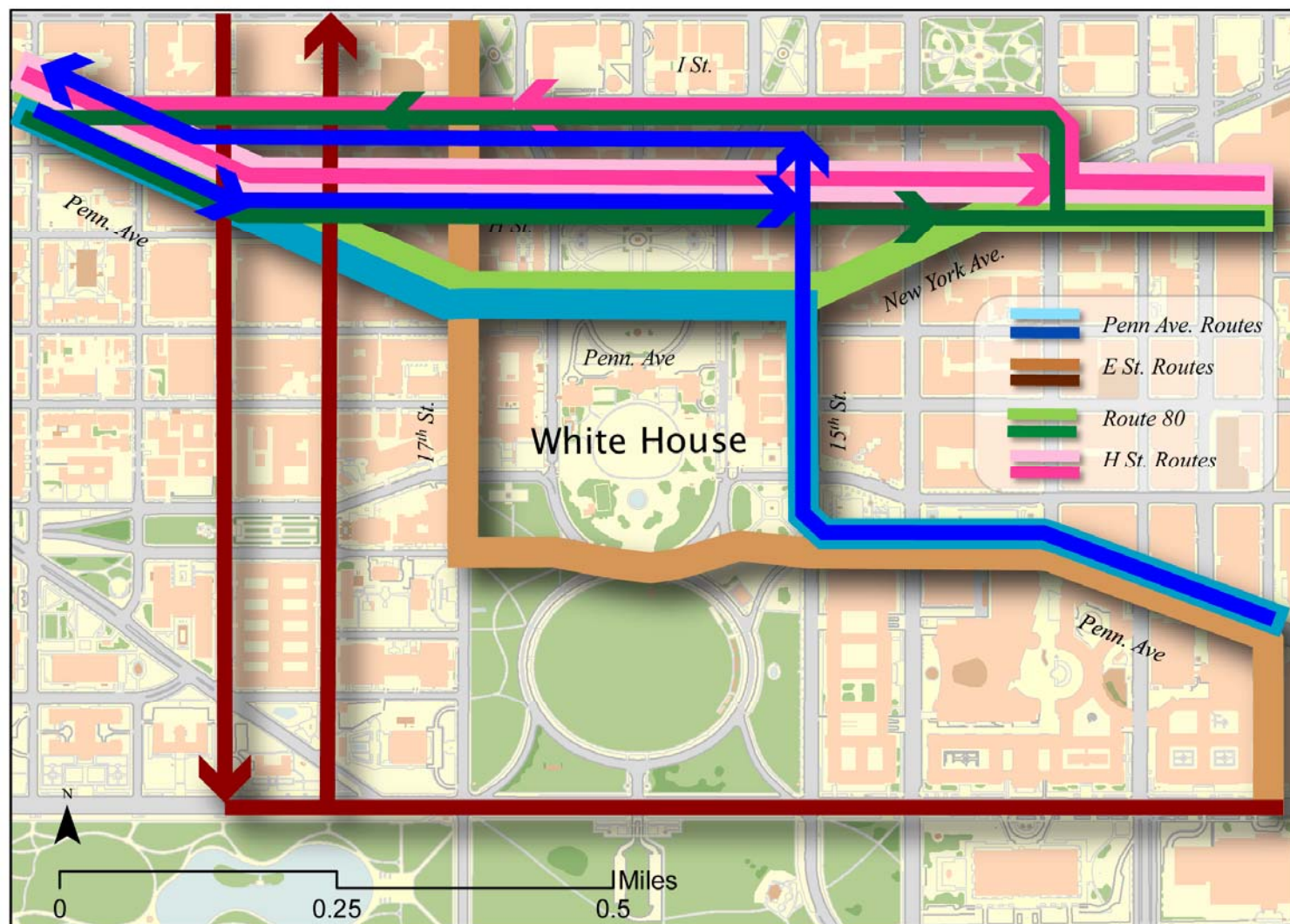
10/7/2010

# *Closings Increased Congestion*

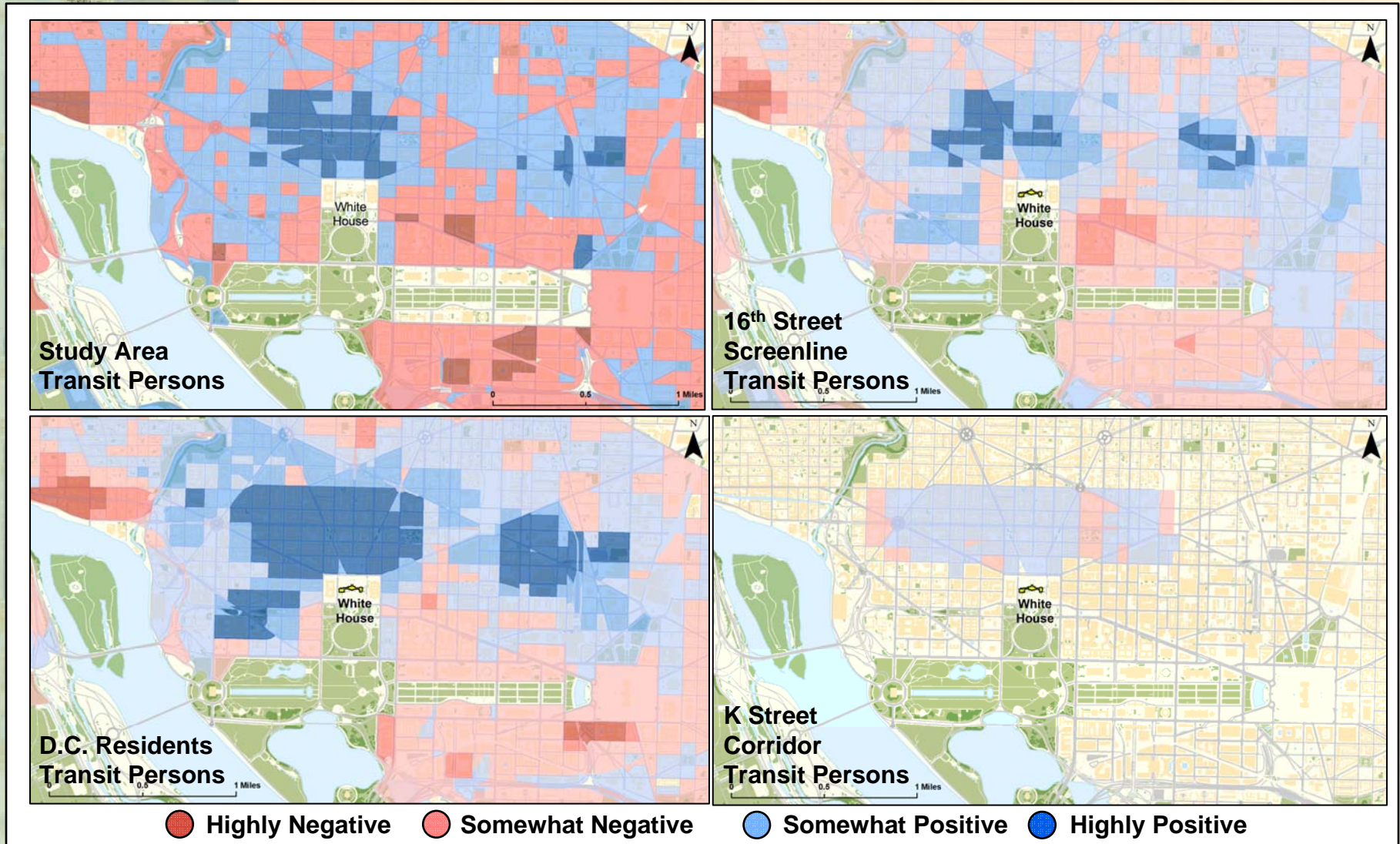


1 to 3 hours longer    3+ hours longer -- than 2005 with E Street and Pennsylvania Ave. Open

# Bus Route Changes



# *Transit Traveler Impacts*





# *Study Phase I*

- **Alternatives designed to repair or reinforce the street grid**
- Alternatives designed to improve transit and traffic operations

Study Phase I

# Major Infrastructure Alternatives

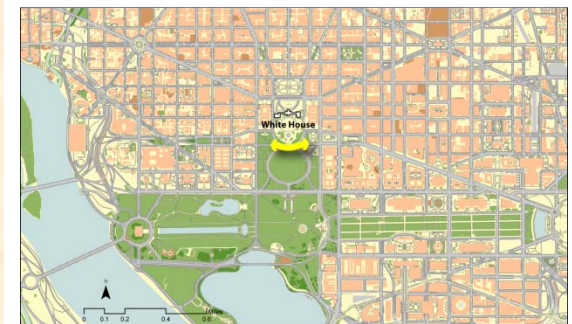
**E Street Re-opens**



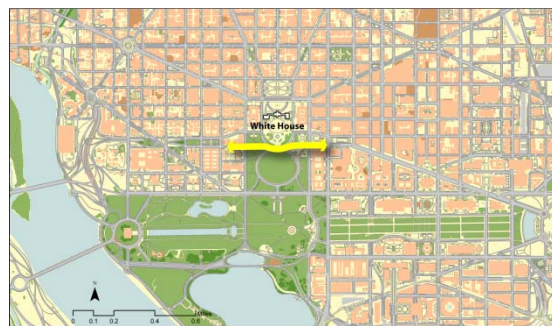
**Two-Way Streets**



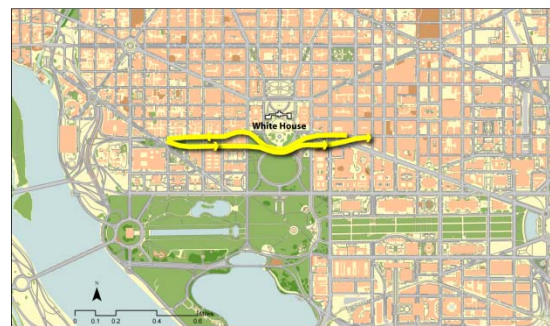
**E Street Park Deck**



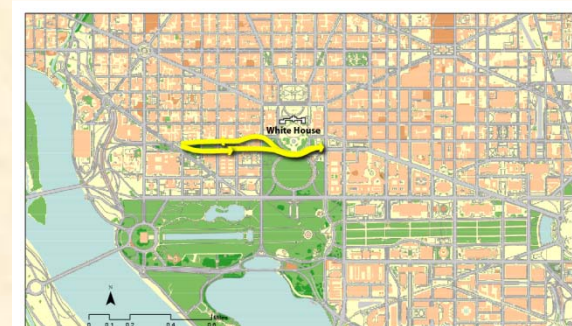
**Short E Street Tunnel**



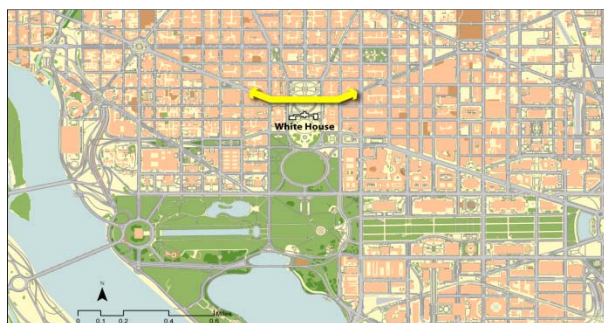
**Long E Street Tunnel**



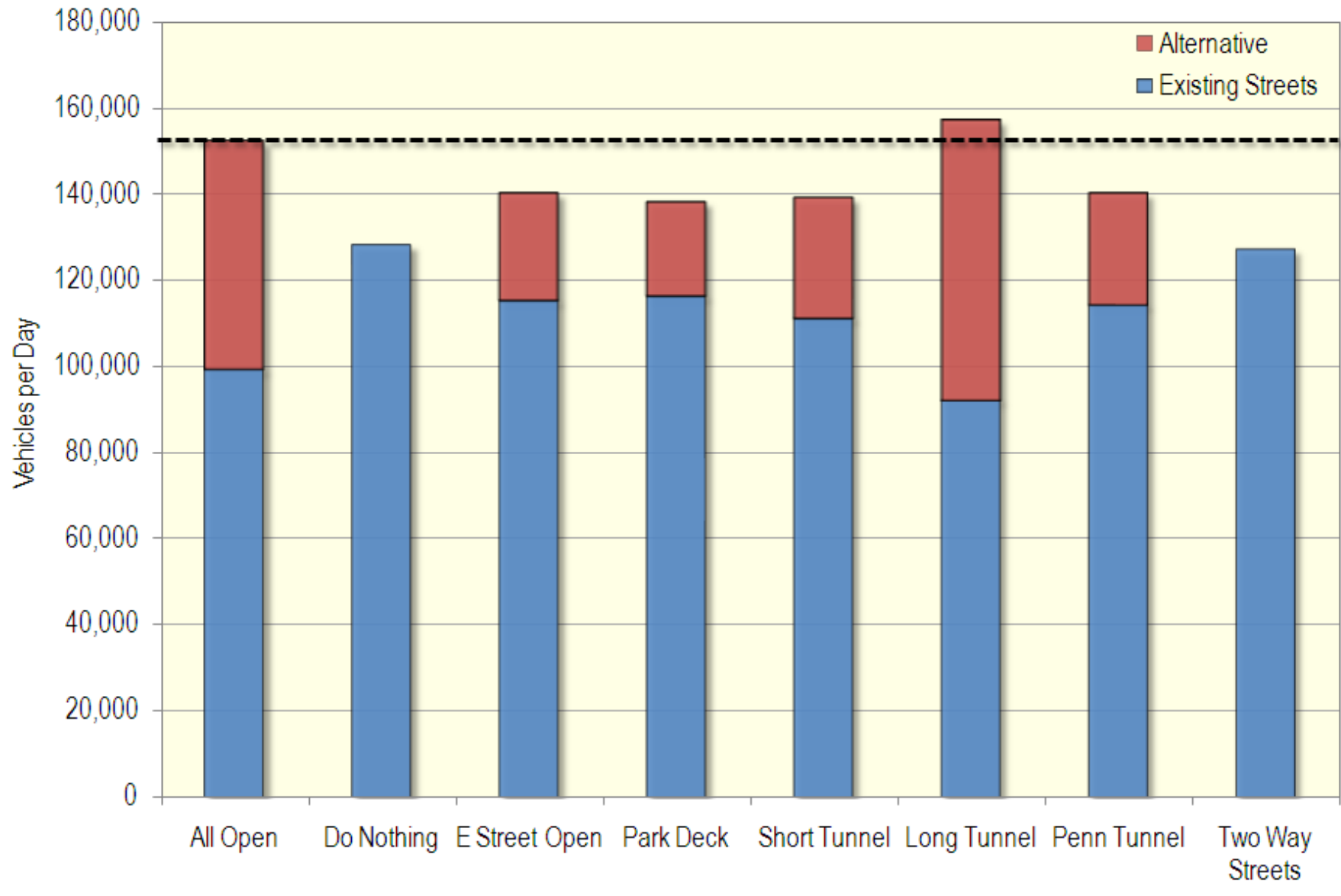
**Long E Street Tunnel (Truncated)**



**Pennsylvania Avenue Tunnel**

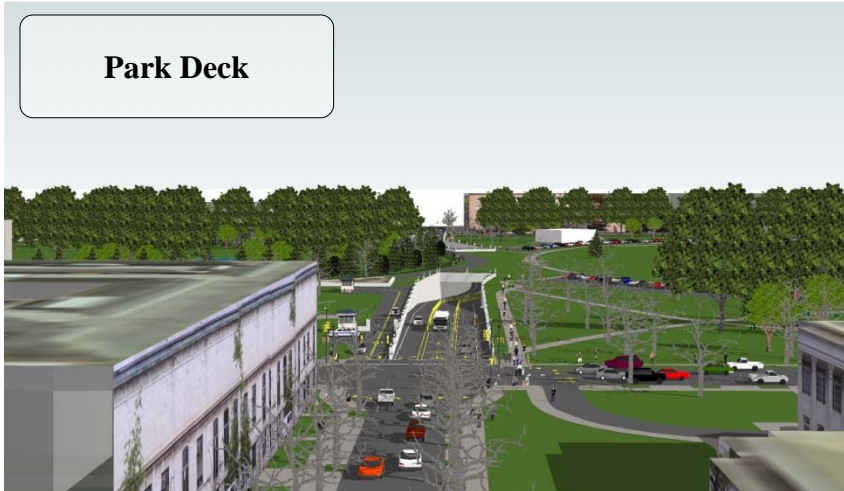


16th Street Screenline Volumes for 2020 CLRP Alternatives



# *Non-Transportation Impacts*

**Park Deck**



**Short Tunnel**



**Pennsylvania Ave. Tunnel**

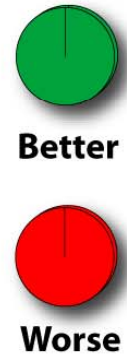


**Long Tunnel**



# Summary of Findings

Alternative	Mitigates Traffic Impacts	Non-Transportation Impacts		White House Security	Cost
		During Construction	After Construction		
Do Nothing		N/A	N/A		
E Street Re-Opens					
Two-Way Streets		N/A	N/A		
E Street Park Deck					
Short E Street Tunnel					
Pennsylvania Ave Tunnel					
Long E Street Tunnel					



## *Phase I Conclusions*

- Infrastructure alternatives repair the street grid and mitigate some of the closure effects
  - A long tunnel mitigates most of the impacts
  - Shorter tunnels are much less effective
- The alternatives have high capital (\$85m to \$1.3b) and non-capital costs

## *Study Phase II*

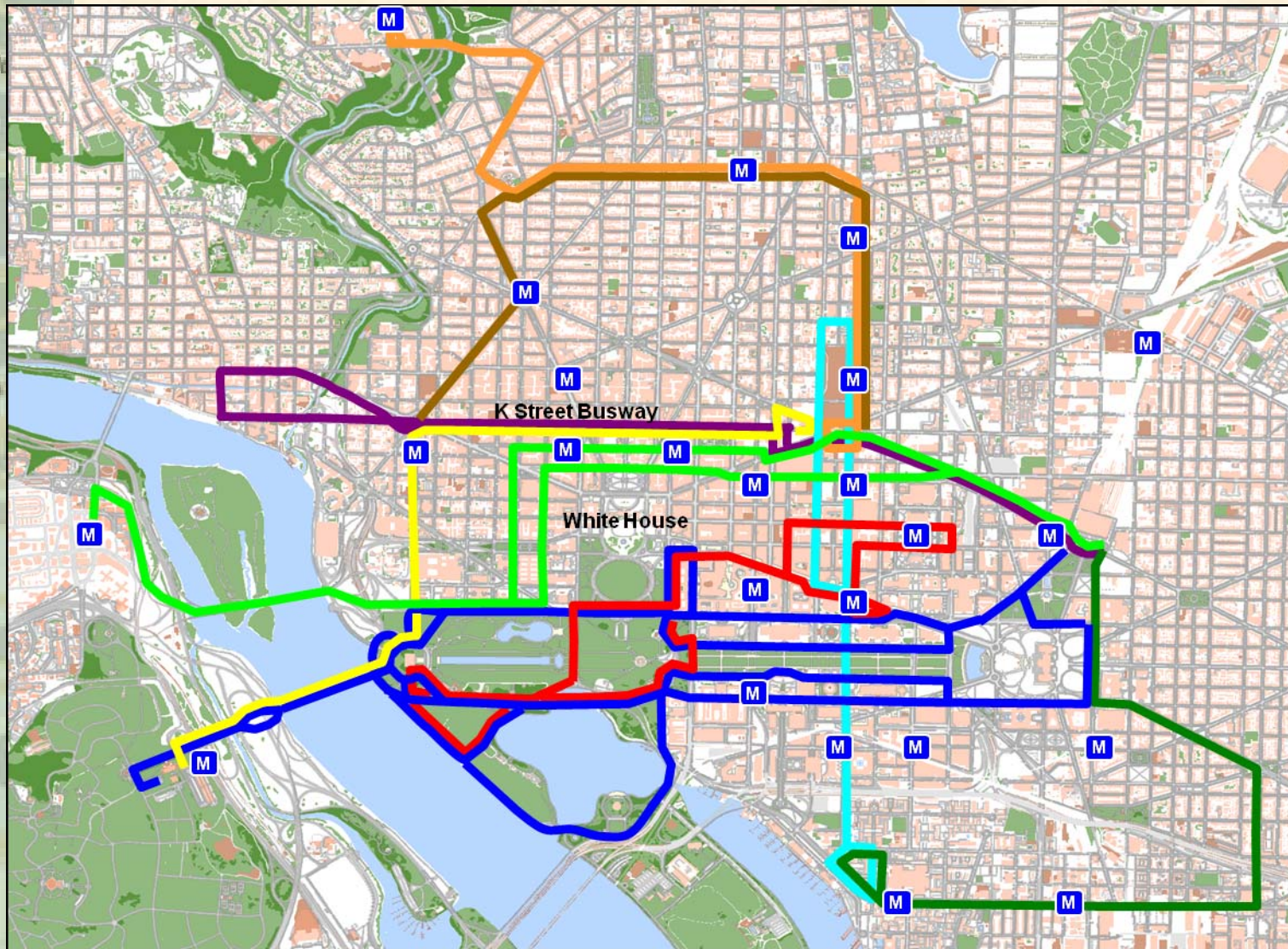
- Alternatives designed to repair or reinforce the street grid
- **Alternatives designed to improve transit and traffic operations**

# Transit/Traffic Alternatives

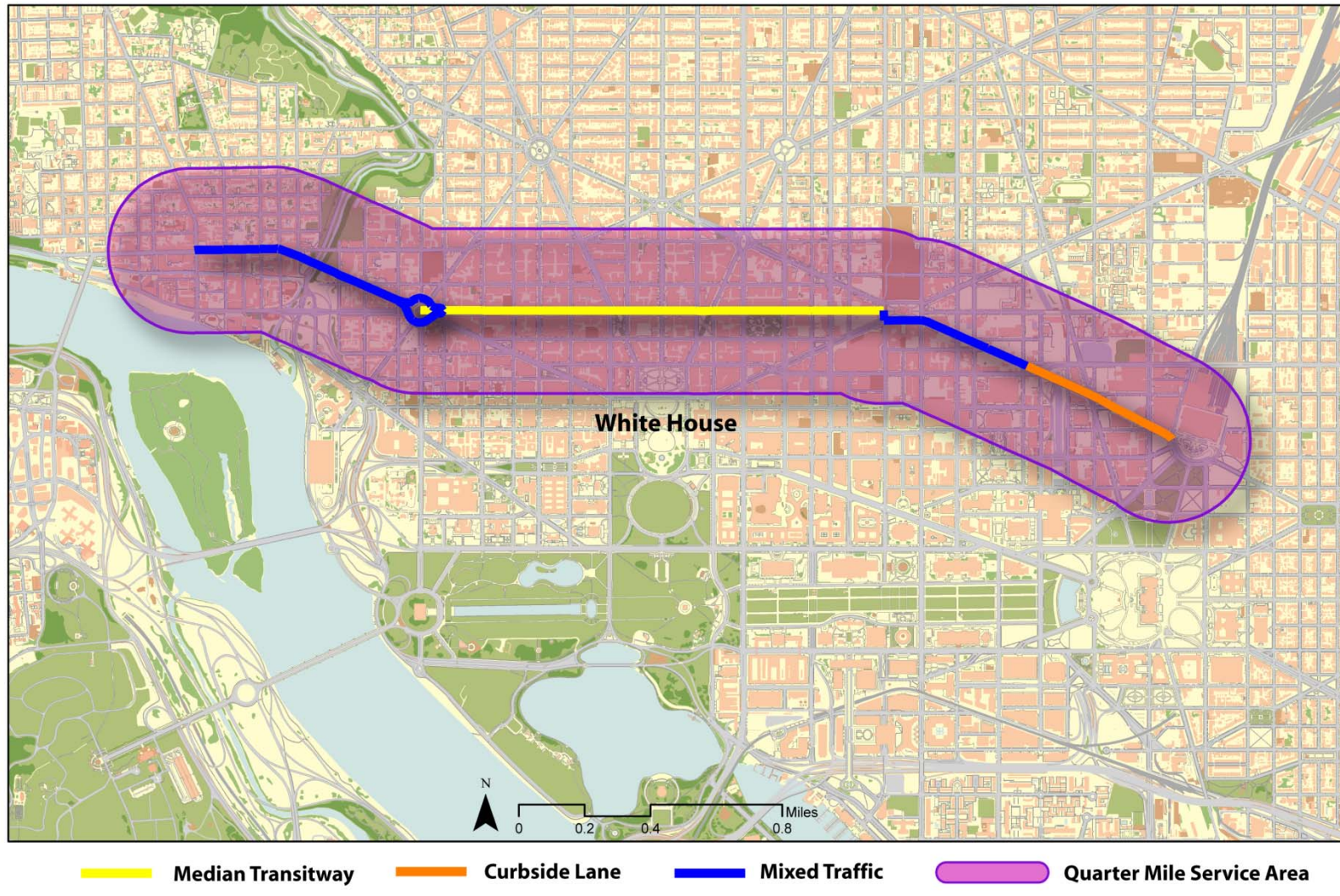
Mitigation Strategies	Alternatives									
	1	2	3	4	5	6	7	8	9	10
Existing K Street	X									
Expanded Circulators		X			X	X				
K Street Busway			X						X	
Busway w/ Passing Lanes				X	X					X
K Street Streetcar						X				
Free Fares on K Street					X	X				
Traffic Management							X		X	
Traffic Operations								X		X



# Expanded Circulator Routes



# *K Street Transitway*



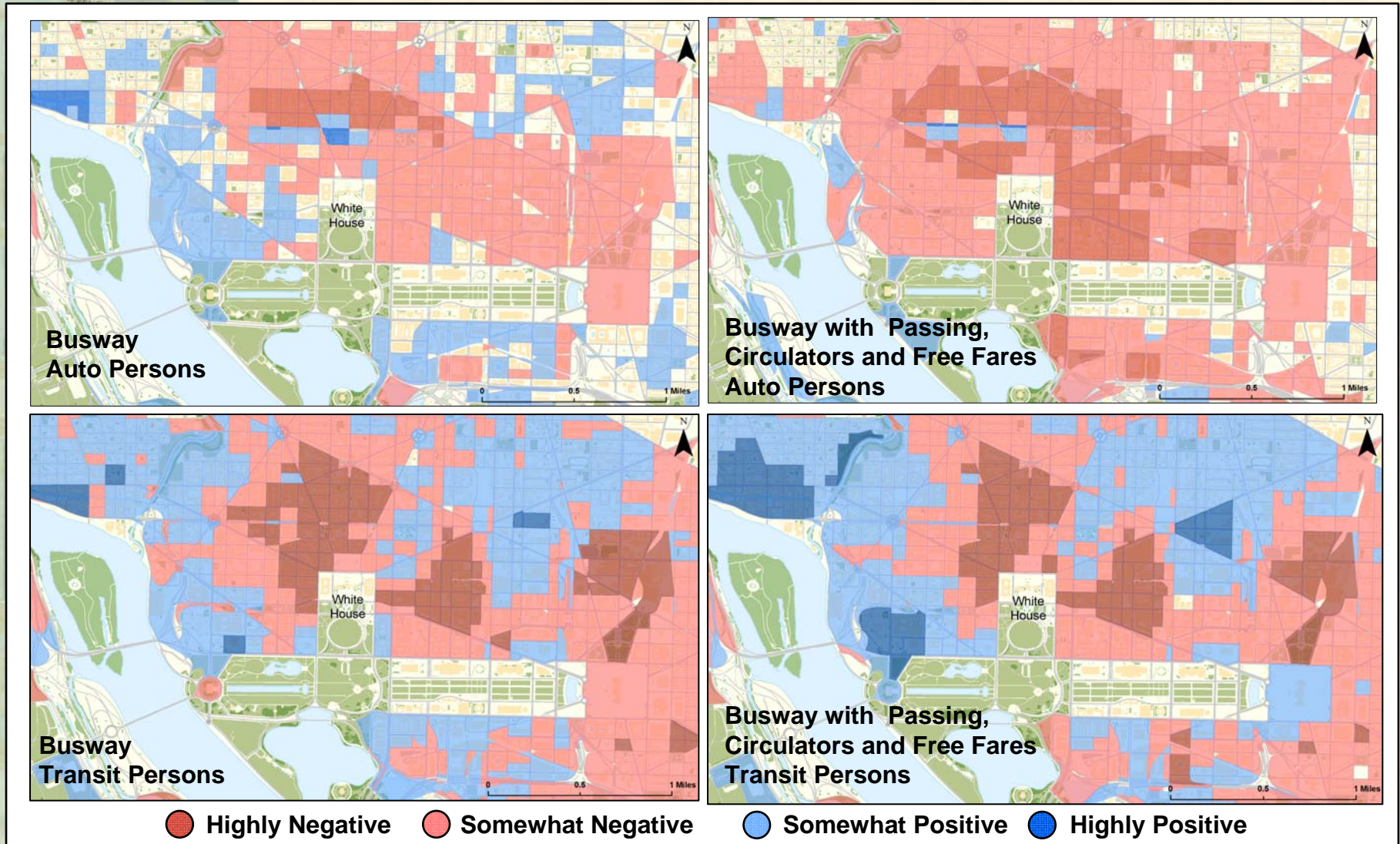
# *Transitway Performance*

- The transitway attracts 9,000 to 16,000 more transit trips to K Street (40%-74%)
  - Over 80% are existing transit riders
- The transitway displaces ~55% of the auto and truck traffic on K Street
  - Half is absorbed by adjacent streets
  - Half travel through neighborhoods
- Two lane transitways have operational challenges at stations and intersections
  - The passing lane improves transitway operations, but adds to congestion levels on adjacent streets

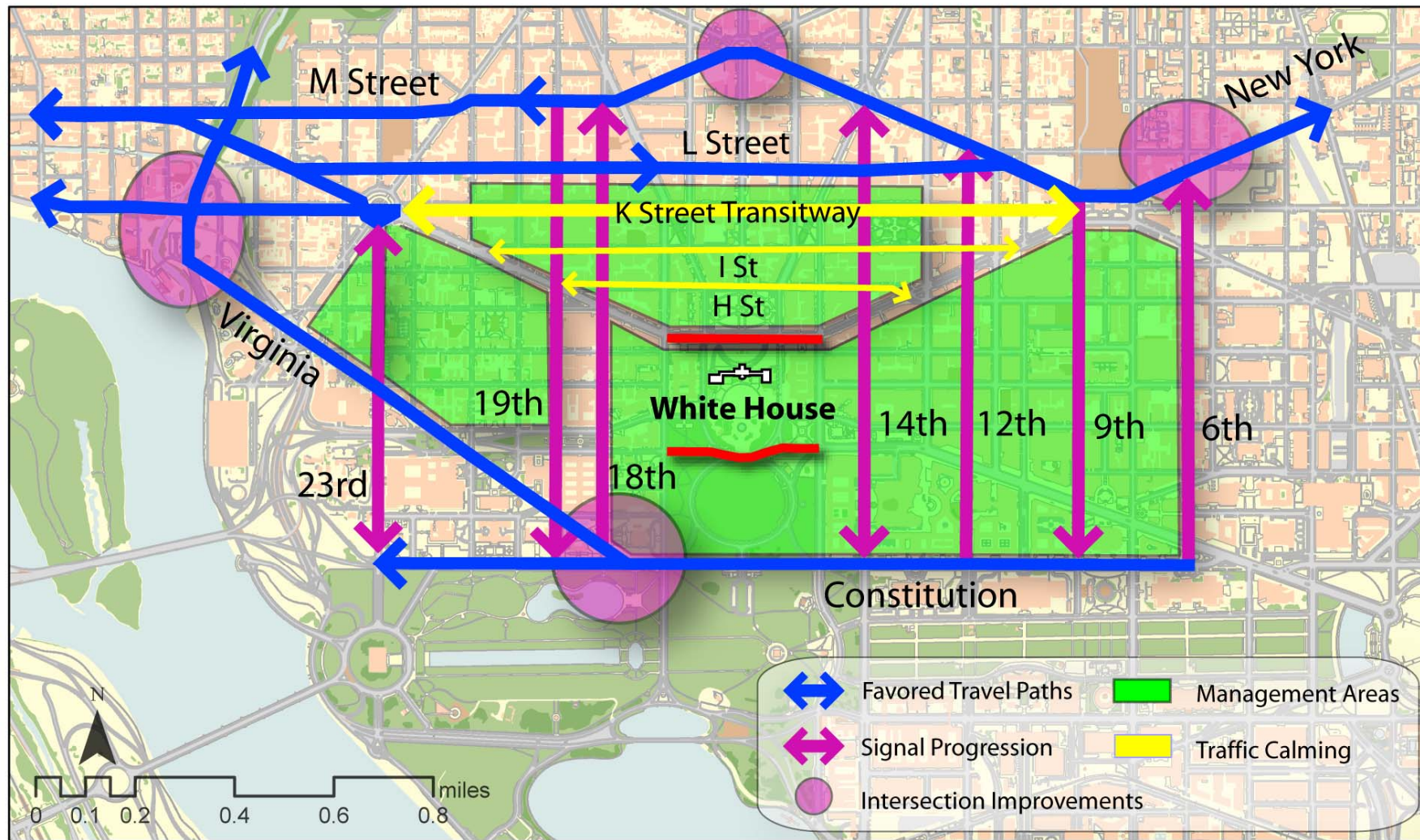
# *Total Person Performance*

- East-west bus travel generally faster and more reliable
- North-South bus travel and all auto/truck travel generally slower and less reliable
- Small net benefit for some transit travelers
- More travelers have slower travel times than benefit from the transit alternatives
- Transit alternatives reduce total person volumes crossing 16<sup>th</sup> Street

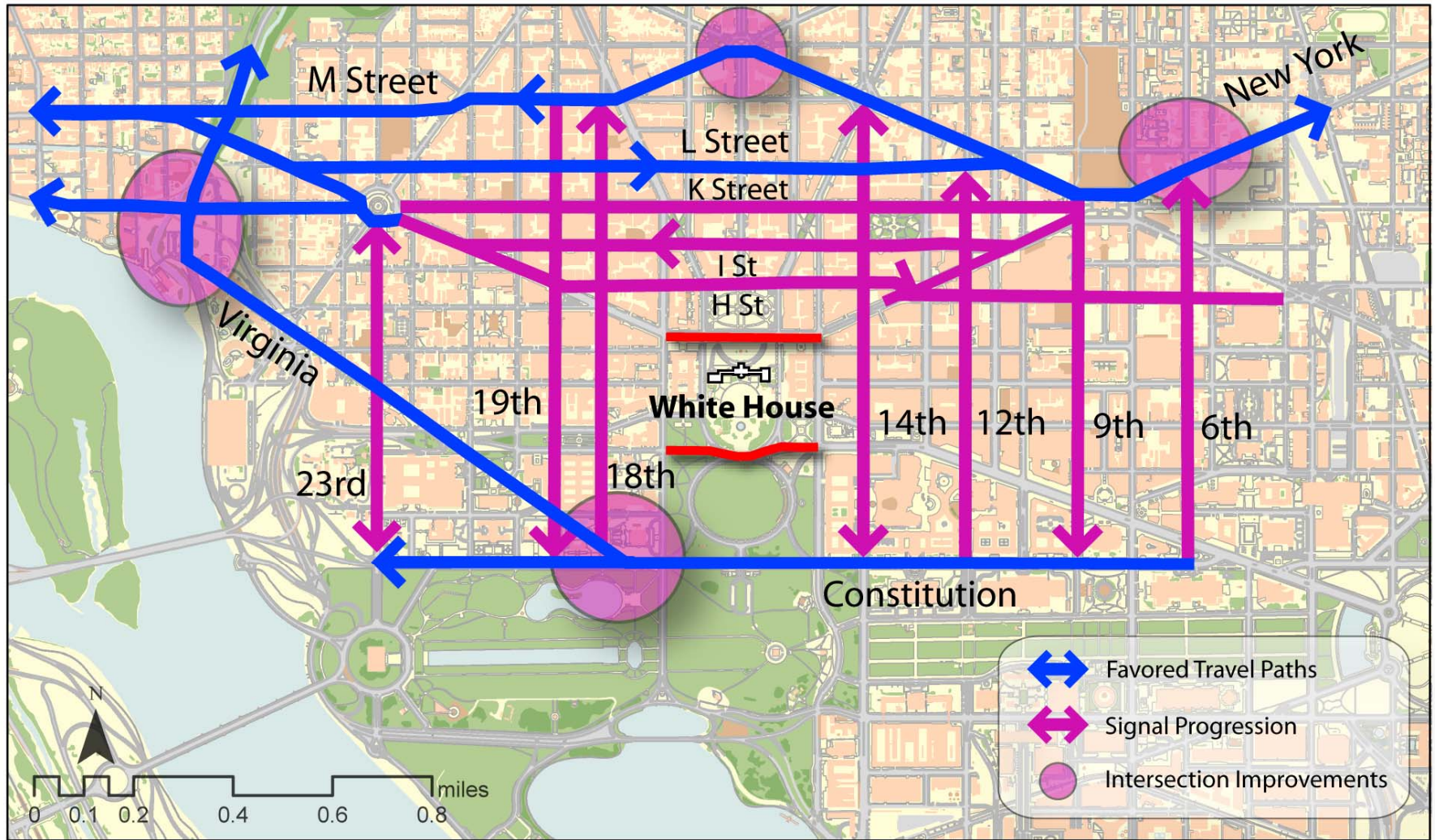
# Study Area Travel Benefits



# Traffic Management



# Traffic Operations



# *Management and Operations*

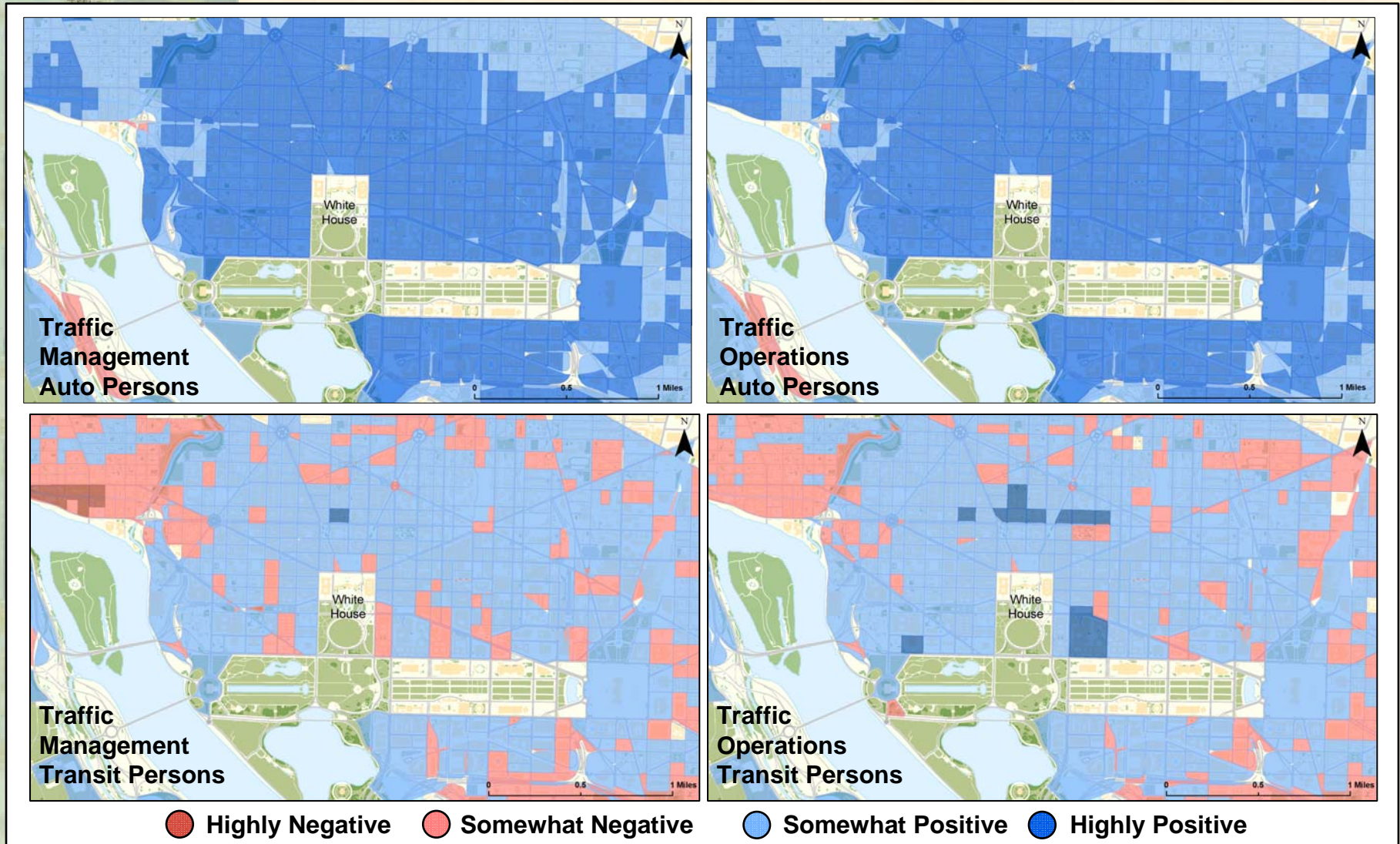
- Preferred travel paths around downtown core
  - Targeted intersection reconstruction
  - Strict parking enforcement
  - Improved signal coordination
- Traffic management
  - Pedestrian, bicycle and transit orientation to H, I and K Streets
  - Reduce east-west emphasis throughout remainder of core
- Traffic operations
  - Maintains H/I one-way pair
  - Balanced signal progression throughout downtown grid
- Transit operations
  - Adjust transit schedules to reflect 2020 travel conditions
  - Consolidate routes onto a dedicated transitway
  - Improve fare collection methods to reduce dwell times



# *Total Person Performance*

- Traffic operations
  - Restores person volumes across 16<sup>th</sup> Street
  - Rebalances person volumes on screenline
- Traffic management
  - Improves north-south travel
  - East-west travel more difficult
- Traffic strategies reduce the hours of congested travel by at least 20%

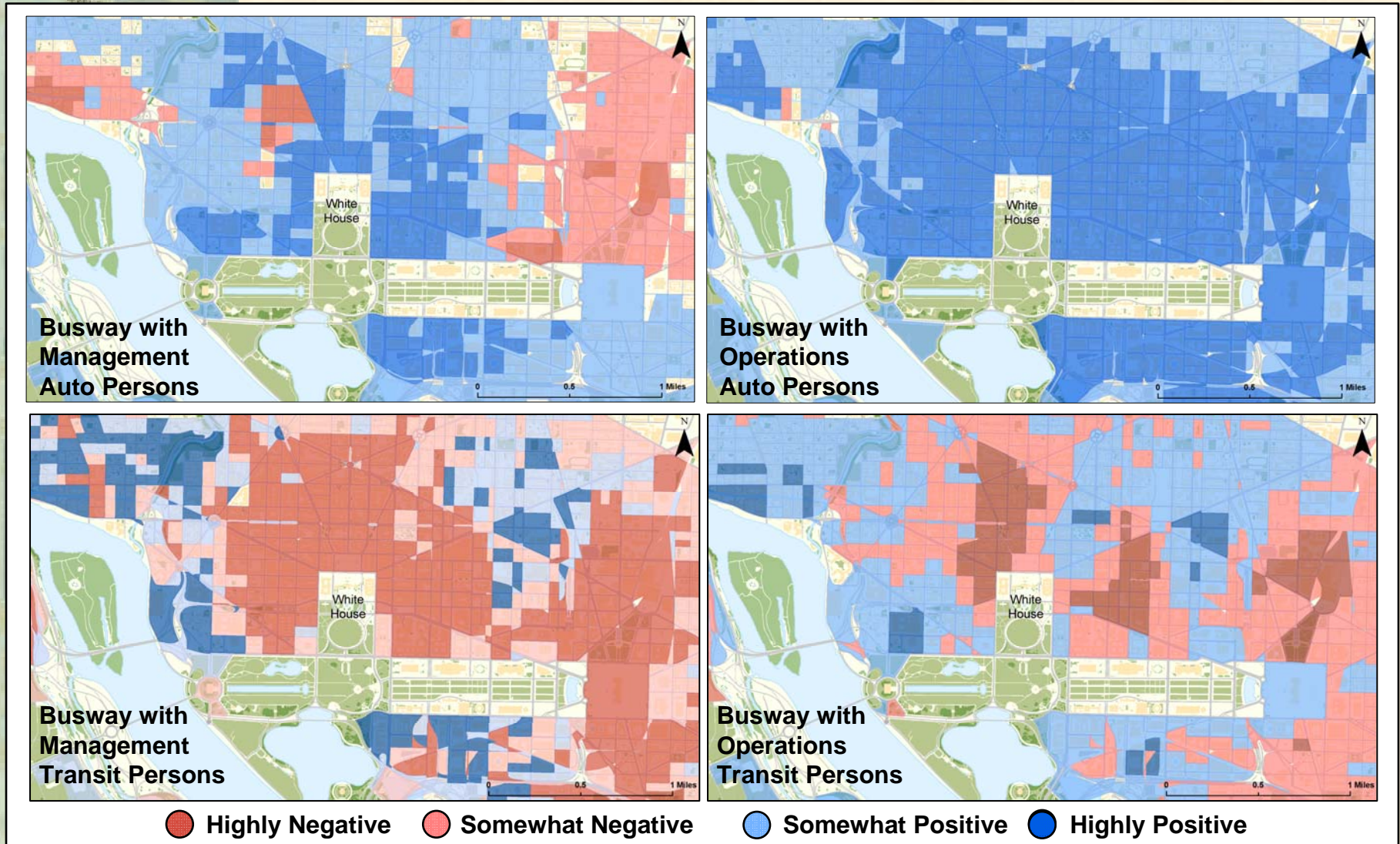
# Study Area Travel Benefits



## *Combination Results*

- Combining transit and operational improvements can make the busway work better and improve the transit benefits
- Busway with traffic management is less effective due to network instability
  - Capacity reductions from managing H, I, and K Streets and adding the busway create “near capacity” breakdowns

# Study Area Travel Benefits



Comparisons

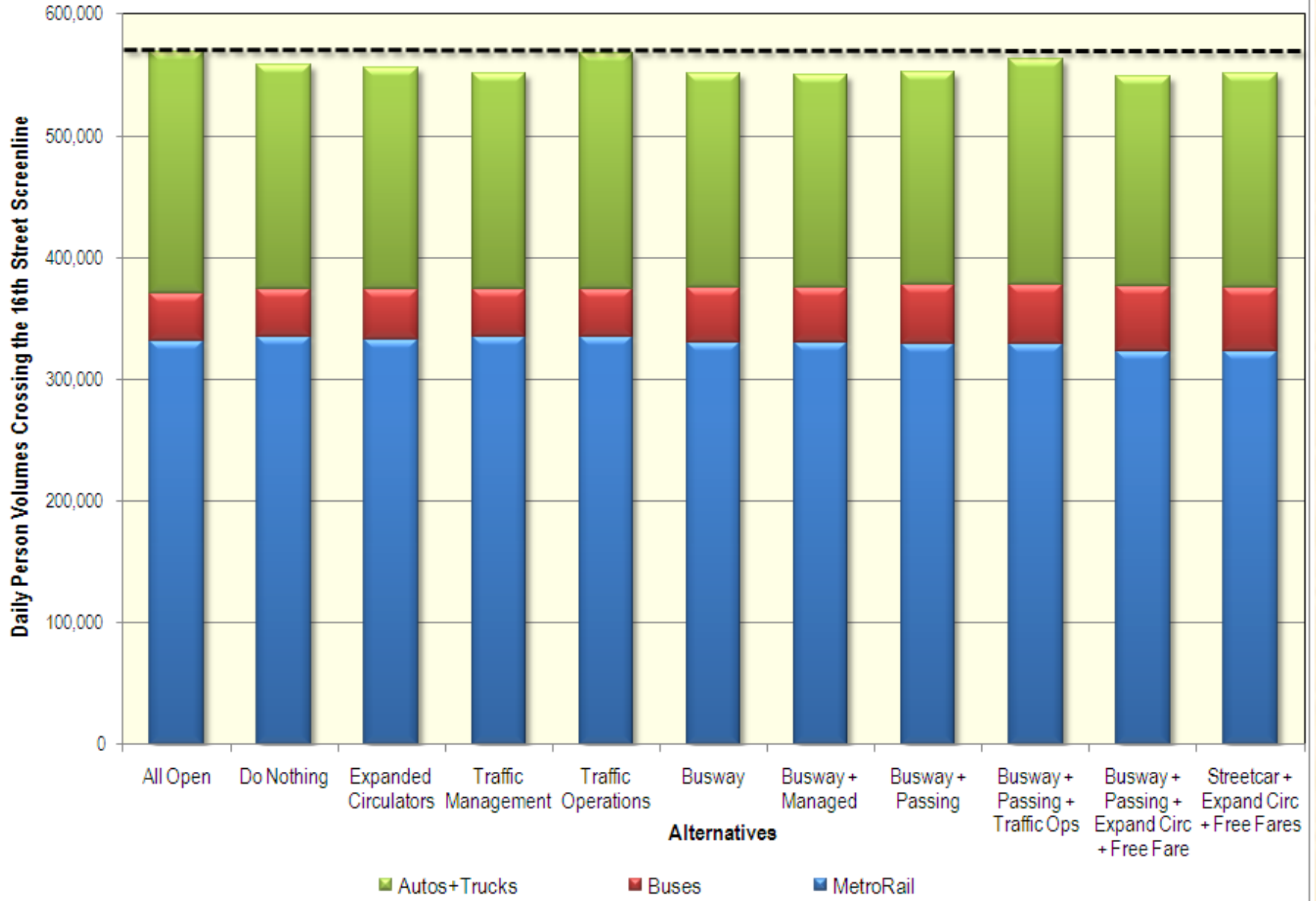
# *Comparisons*

10/7/2010

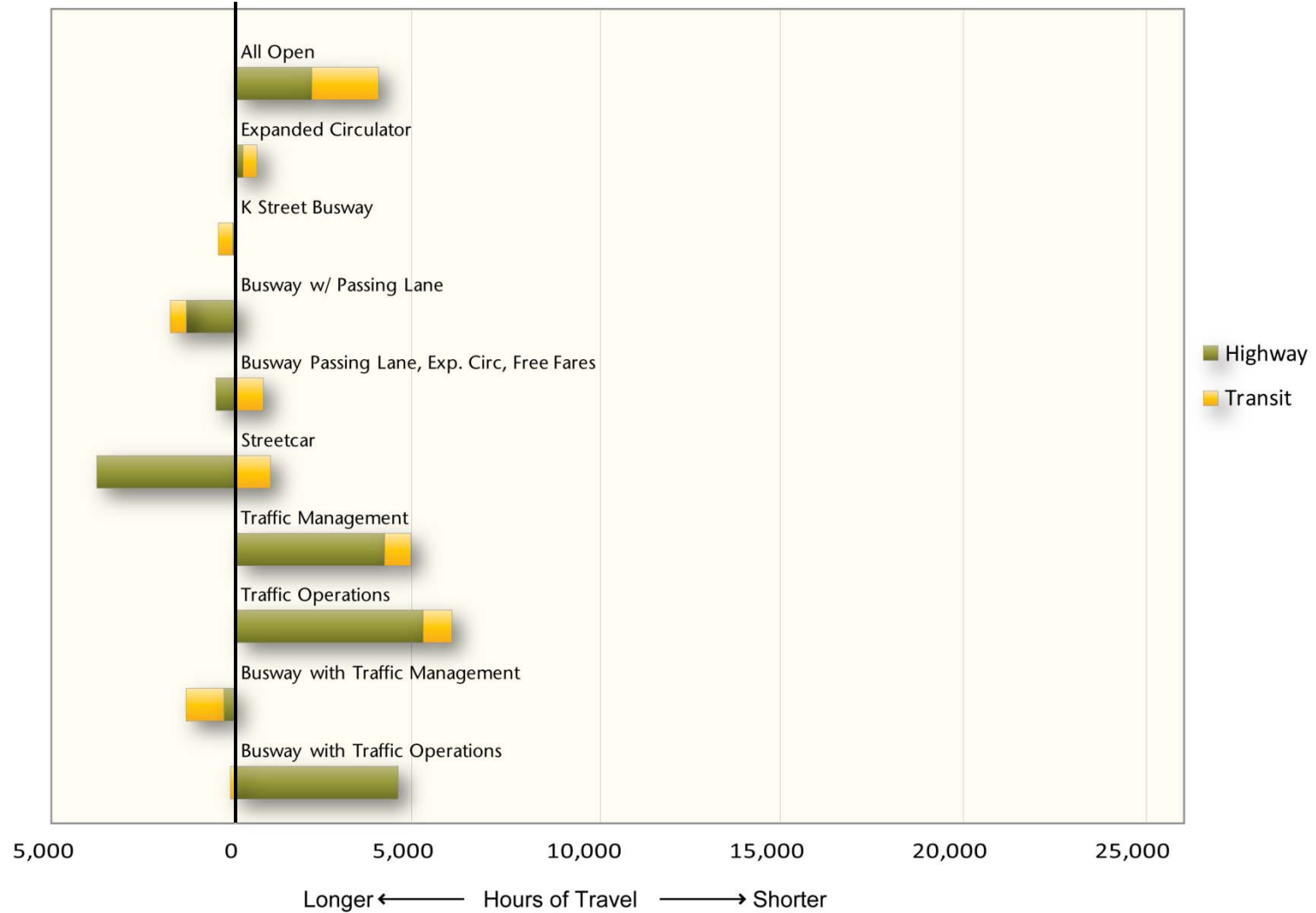
White House Area Transportation Study

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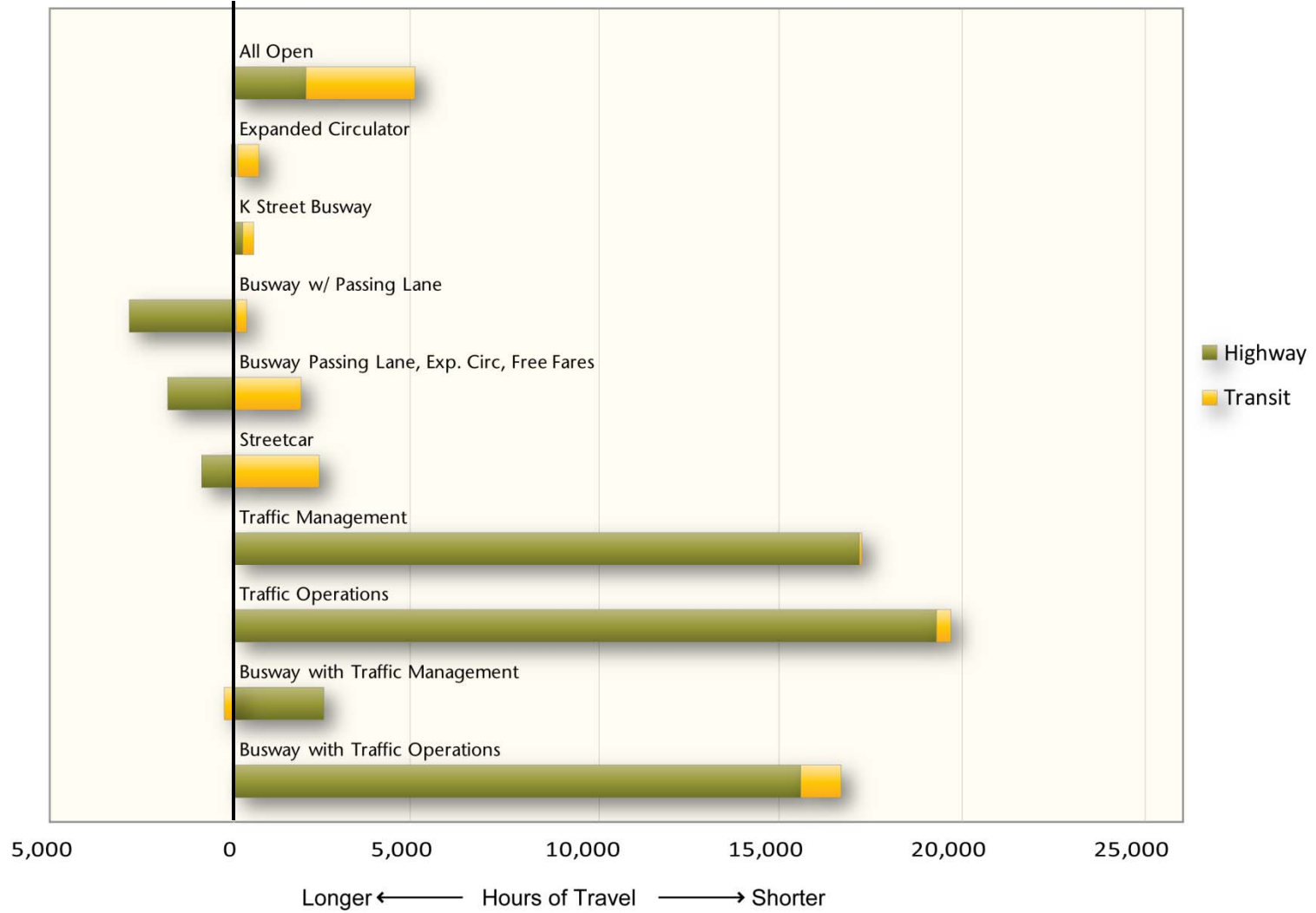
### 16th Street Screenline Person Volume



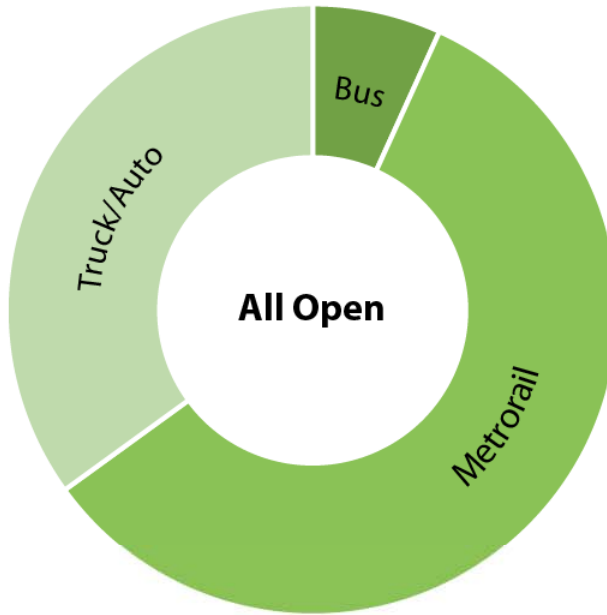
## 16th Street Screenline Travel Benefits (hours/day)



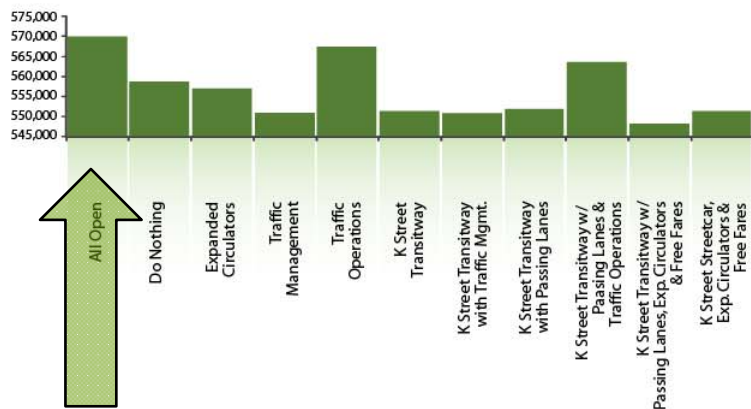
## Study Area Travel Benefits (hours/day)



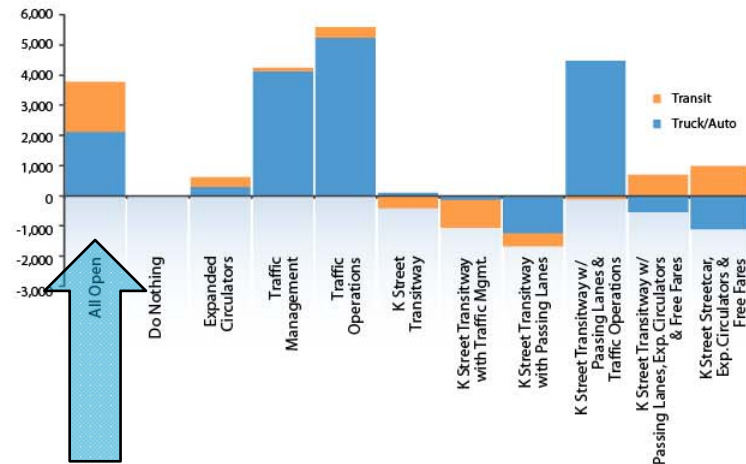




Persons Across 16th Street Screenline

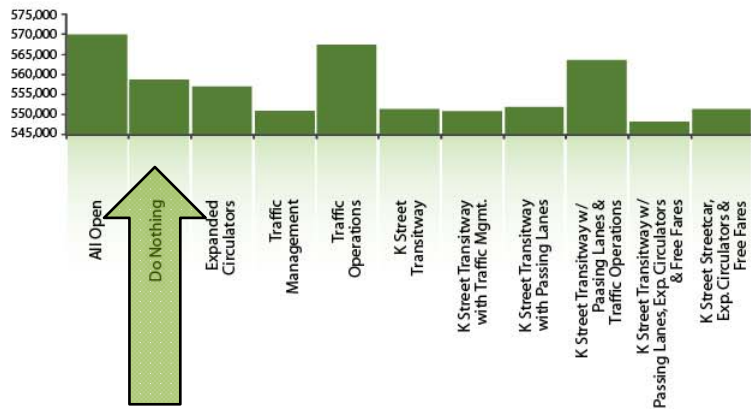


User Benefits - 16th Street Screenline (Hours per Day)

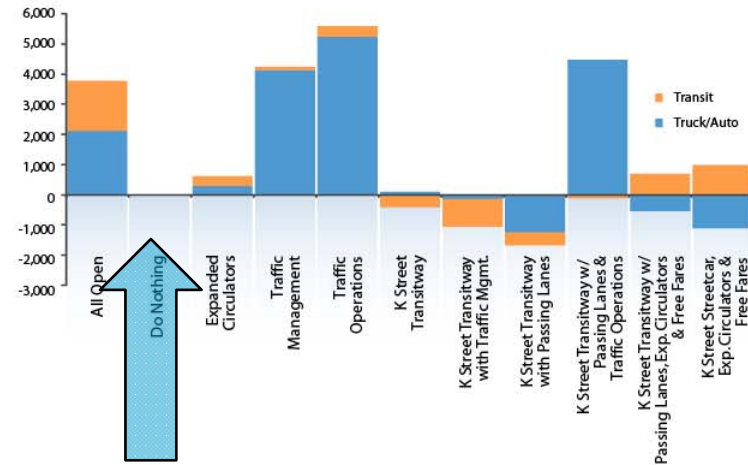


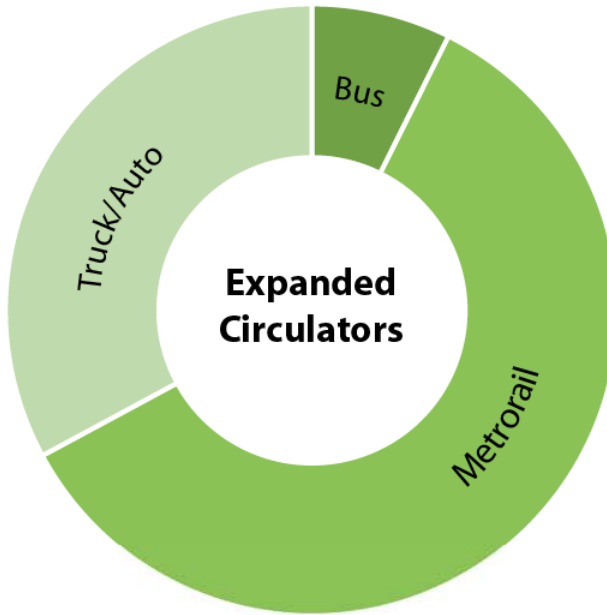


Persons Across 16th Street Screenline

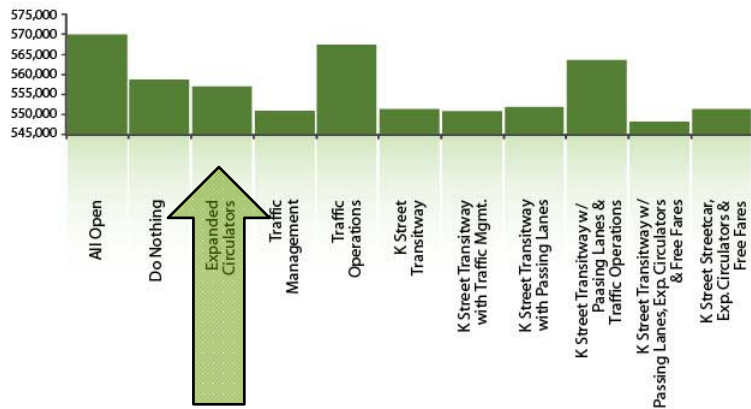


User Benefits - 16th Street Screenline (Hours per Day)

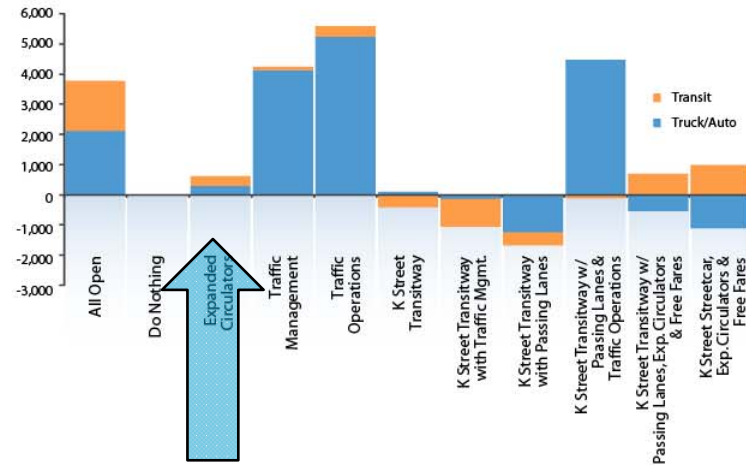




**Persons Across 16th Street Screenline**

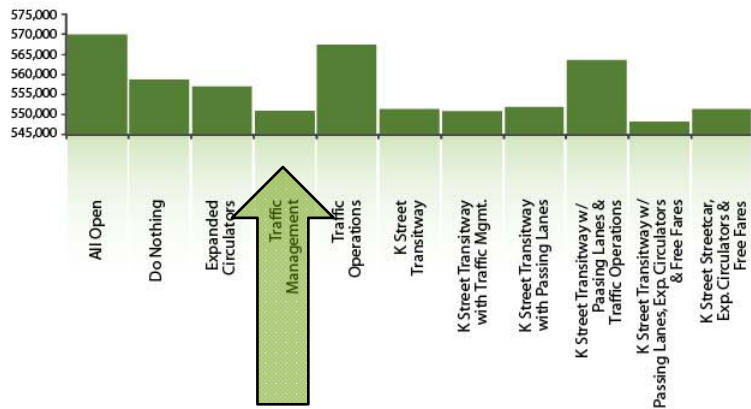


**User Benefits - 16th Street Screenline (Hours per Day)**

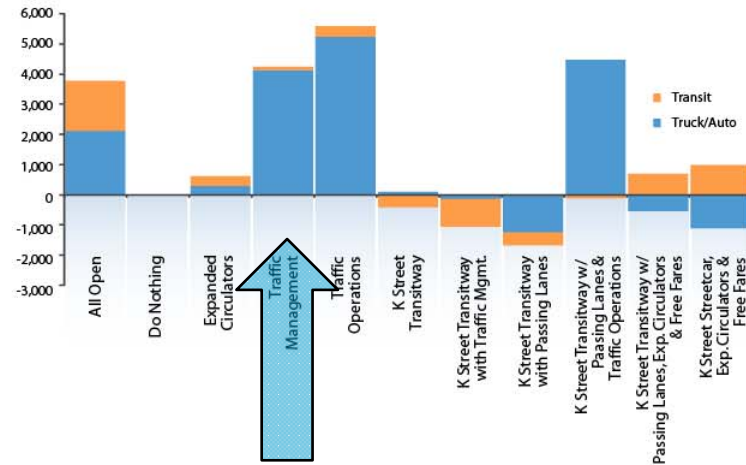


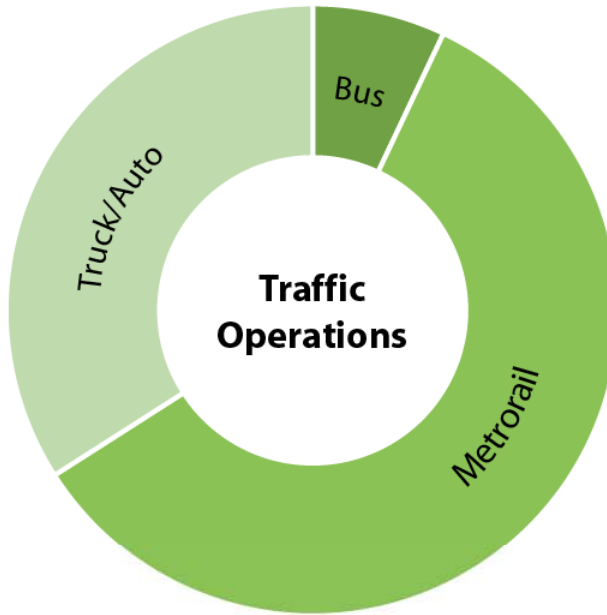


**Persons Across 16th Street Screenline**

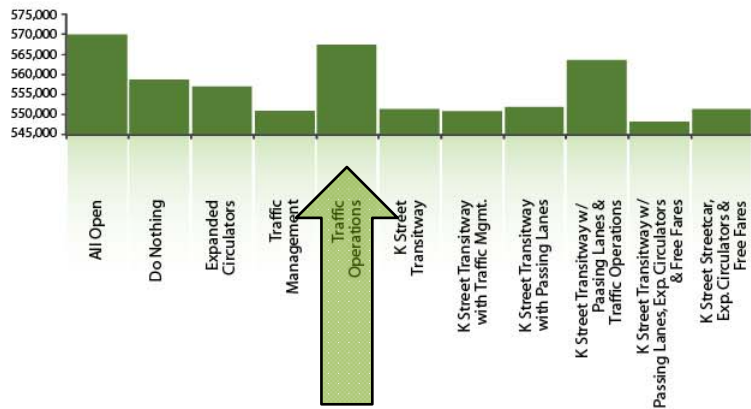


**User Benefits - 16th Street Screenline (Hours per Day)**

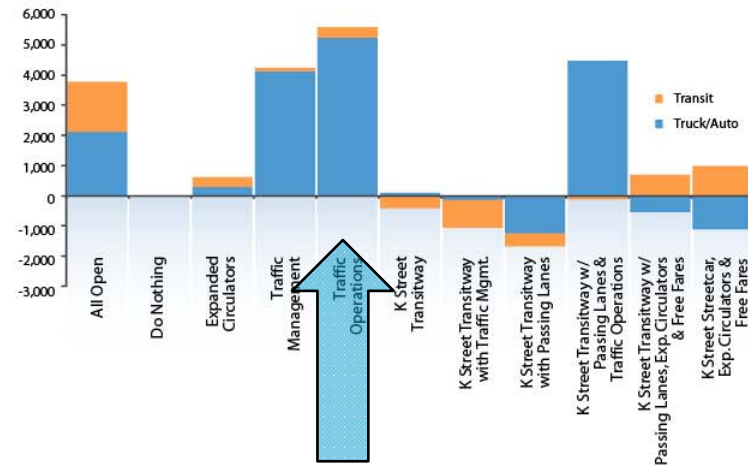


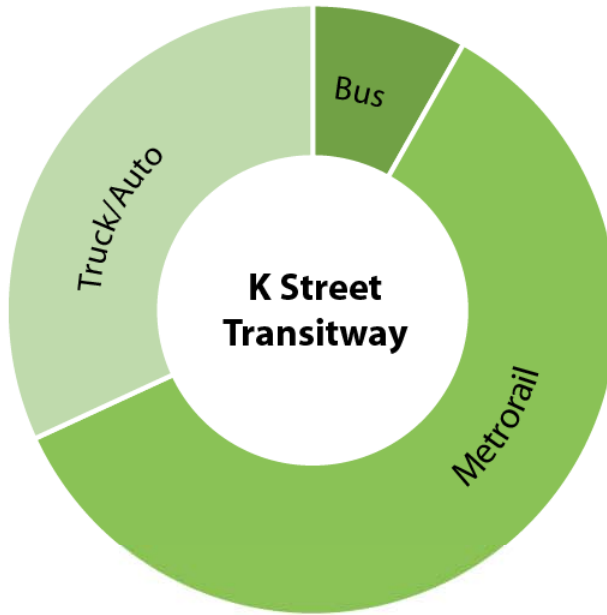


Persons Across 16th Street Screenline

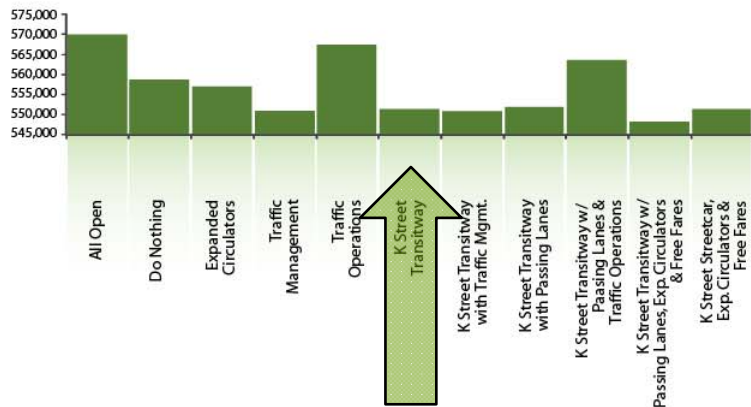


User Benefits - 16th Street Screenline (Hours per Day)

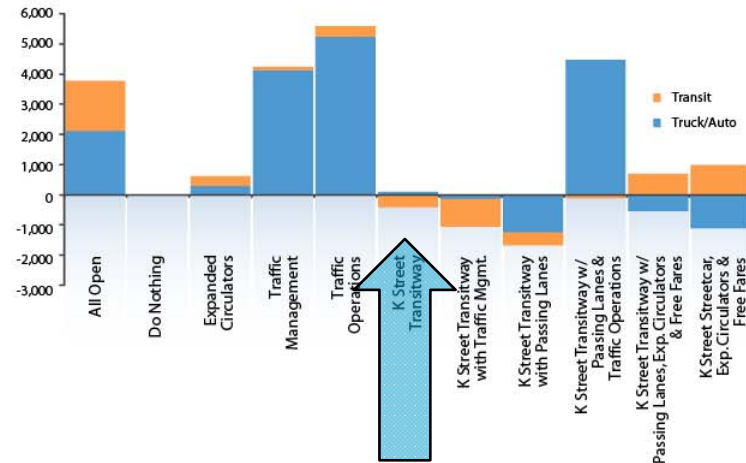




**Persons Across 16th Street Screenline**

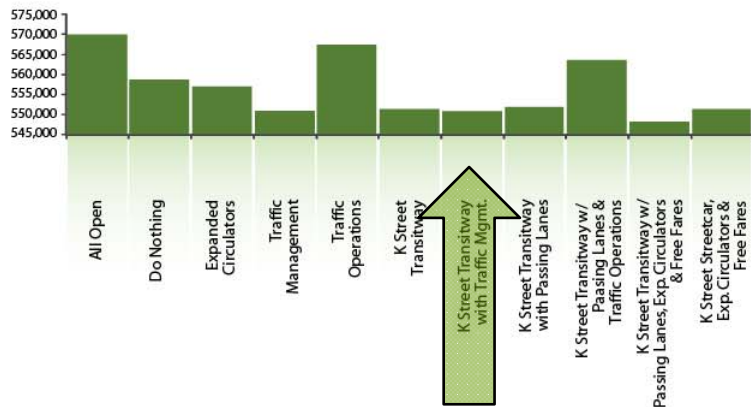


**User Benefits - 16th Street Screenline (Hours per Day)**

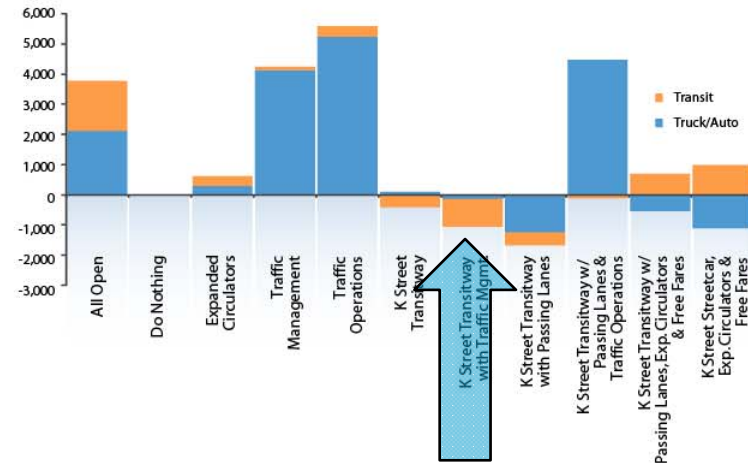


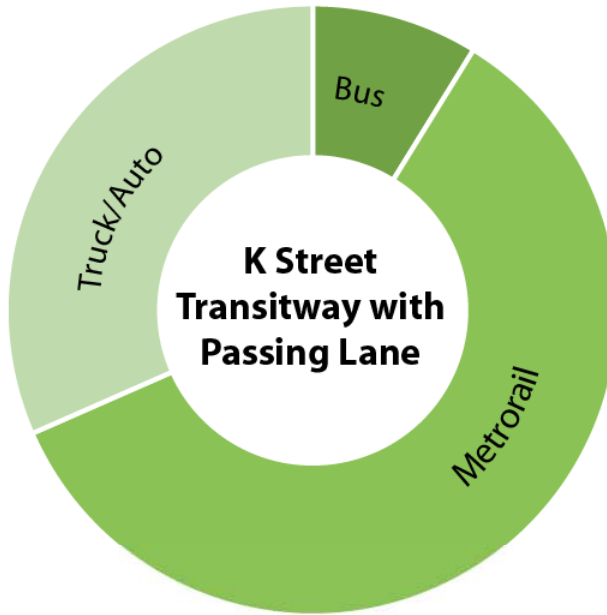


**Persons Across 16th Street Screenline**

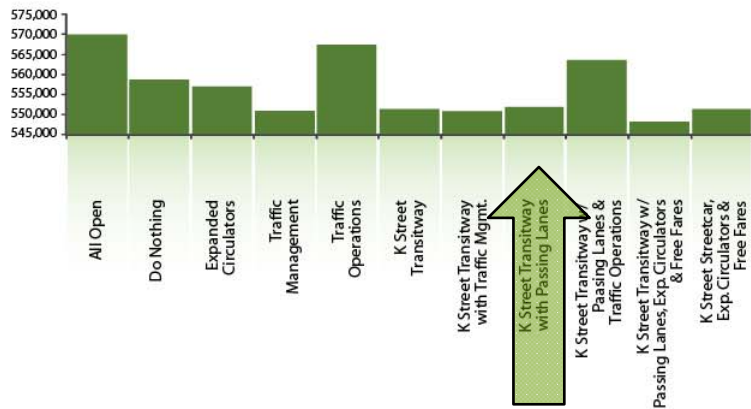


**User Benefits - 16th Street Screenline (Hours per Day)**

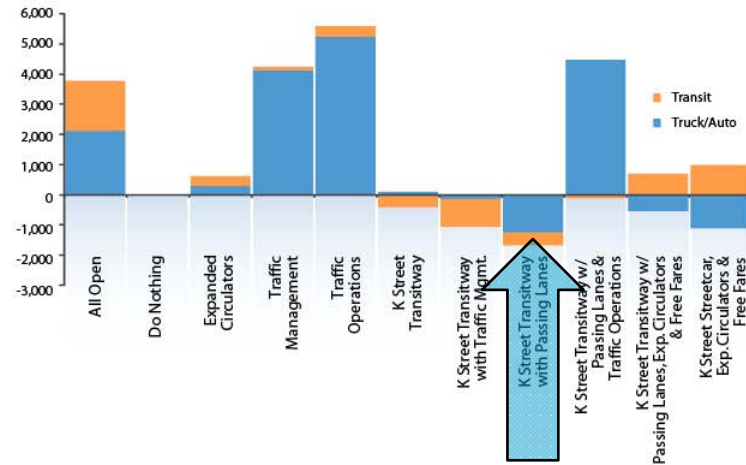




**Persons Across 16th Street Screenline**



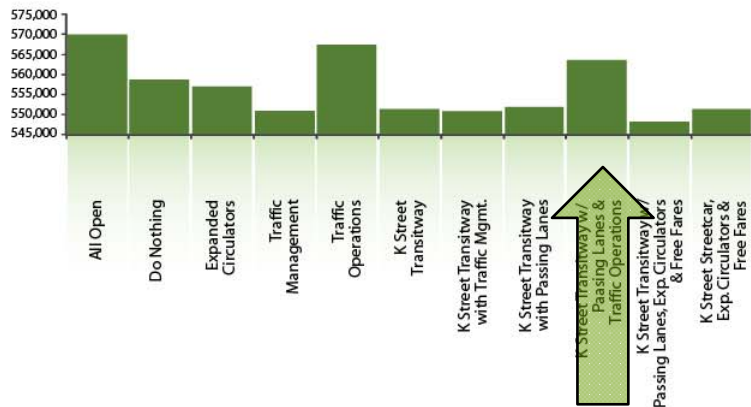
**User Benefits - 16th Street Screenline (Hours per Day)**



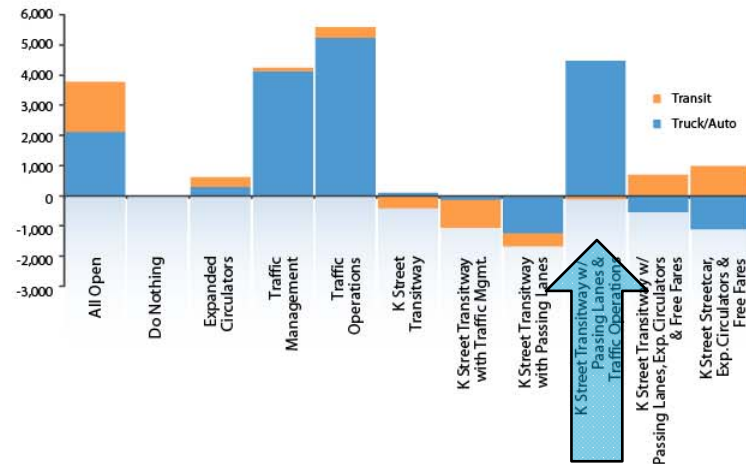


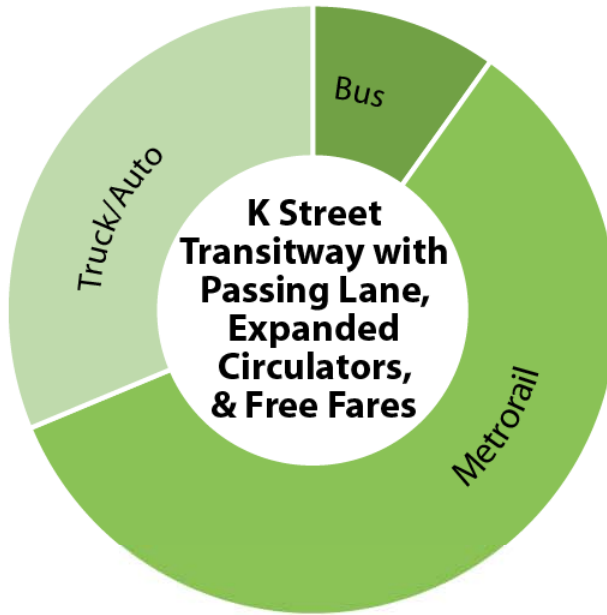


**Persons Across 16th Street Screenline**

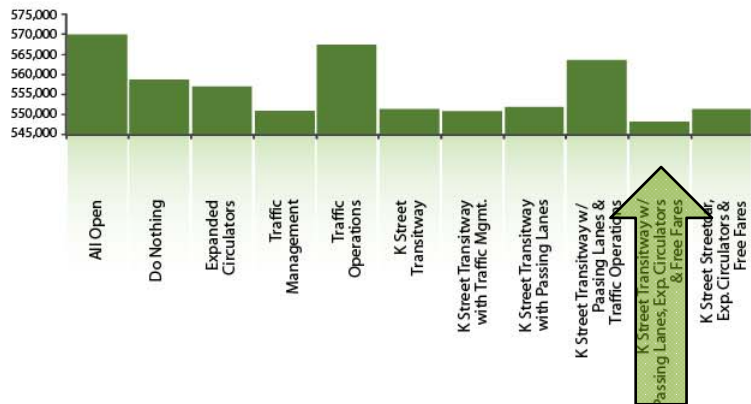


**User Benefits - 16th Street Screenline (Hours per Day)**

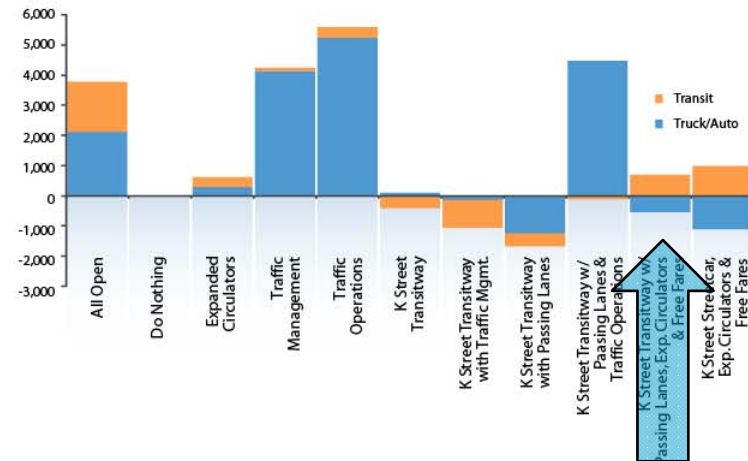




Persons Across 16th Street Screenline

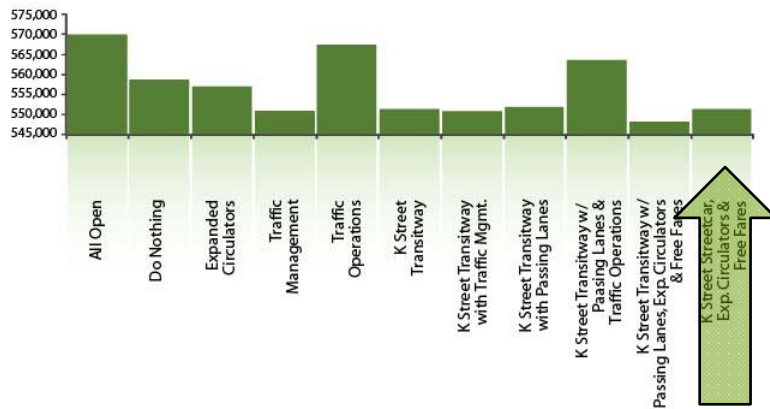


User Benefits - 16th Street Screenline (Hours per Day)

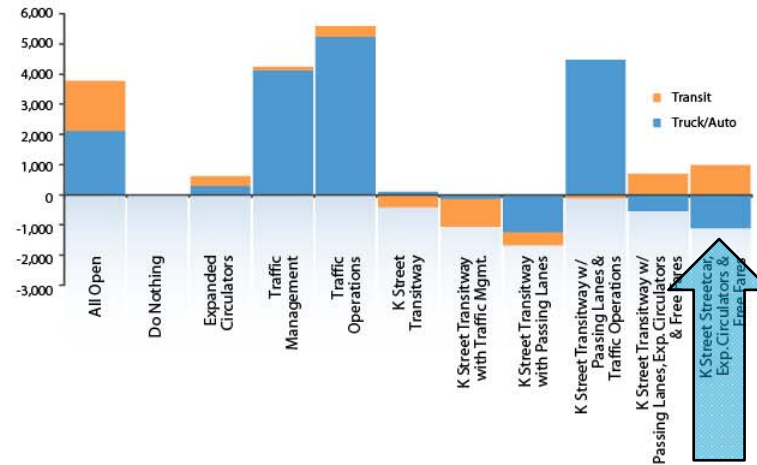




Persons Across 16th Street Screenline



User Benefits - 16th Street Screenline (Hours per Day)



Summary

# *Summary of Findings*

10/7/2010

White House Area Transportation Study

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# Aggregate Performance (vs. Do Nothing)

Change in 2020 Daily Aggregate Person Performance Statistics vs. Do Nothing									
Performance Measures Compared to the Do Nothing Scenario	Transit Alternatives					Traffic Alternatives		Combined Alternatives	
	Expanded Circulators	Busway	Busway with Passing Lanes	Busway with Passing Lanes, Expanded Circ. & Free Fares	Streetcar with Expanded Circ. & Free Fares	Traffic Management	Traffic Operations	Busway with Traffic Management	Busway with Passing Lanes & Traffic Operations
<b>16th Street Screenline Travel Benefits</b>									
Transit Persons	Green	Red	Red	Green	Green	Red	Green	Red	Red
Highway Persons	Green	Red	Red	Red	Red	Green	Green	Red	Green
Total Persons	Green	Red	Red	Red	Red	Green	Green	Red	Green
<b>Study Area Travel Benefits</b>									
Transit Persons	Green	Green	Green	Green	Green	Green	Green	Red	Green
Highway Persons	White	Red	Red	Red	Red	Green	Green	Green	Green
Total Persons	Green	Red	Red	Red	Red	Green	Green	Green	Green
<b>Study Area Congestion (Highway + Transit)</b>									
Number of Cycle Failures	Green	Red	Red	Red	Red	Green	Green	Red	Green
Average Mile per Hour	White	Red	Red	Red	Red	Green	Green	White	Green
Percent PHT Congested	White	Red	Red	Red	Red	Green	Green	Green	Green

# Aggregate Performance (vs. All-Open)

## Change in 2020 Daily Aggregate Person Performance Statistics vs. All Open

Performance Measures Compared to the All-Open Scenario	Transit Alternatives					Traffic Alternatives		Combined Alternatives	
	Expanded Circulators	Busway	Busway with Passing Lanes	Busway with Passing Lanes, Expanded Circ. & Free Fares	Streetcar with Expanded Circ. & Free Fares	Traffic Management	Traffic Operations	Busway with Traffic Management	Busway with Passing Lanes & Traffic Operations
<b>16th Street Screenline Travel Benefits</b>									
Transit Persons									
Highway Persons									
Total Persons									
<b>Study Area Travel Benefits</b>									
Transit Persons									
Highway Persons									
Total Persons									
<b>Study Area Congestion (Highway + Transit)</b>									
Number of Cycle Failures									
Average Mile per Hour									
Percent PHT Congested									

# *Summary of Findings*

- Infrastructure alternatives can mitigate many closure impacts
  - High capital and non-capital costs
- The transitway benefits some bus travelers, but does not benefit the areas affected by the closures
  - Increases congestion on adjacent streets
  - Affects all surface modes
  - Operational complexity in the transitway and competing demands reduce potential benefits

# *Summary of Findings*

- Traffic operations improvements do more to mitigate closure consequences
  - Benefits both auto and transit travelers
  - Substantial intersection reconstruction
  - Reorientation of traffic flow around the core
- The combination of transit and traffic operations strategies enhance the benefits generated by transit alone
  - Restores the majority of travel time lost following the street closures
- All alternative pose challenges





# *Final Report Outline*

- Executive Summary
  - 4 to 8 page brochure style
- Final Report
  - 50 pages plus Appendices
  - Includes Executive Summary
  - Appendix A: Street Closure Impacts
  - Appendix B: Alternatives Analysis
  - Appendix C: Technical Analysis Methods