

# Managed Motorways Overview

*Presented to:*



# Agenda

- The managed motorways concept
- How does it work
- Why do freeways fail
- Managed motorways down under
- US efforts
- NC Corridors
- Lessons learned

# The Managed Motorways Concept

A collection of strategies and technologies that work in concert with each other to provide a holistic and integrated corridor management system that increases on-road outcomes by:

- Enhancing safety
- Improving reliability
- Reducing congestion
- Providing traveler information
- Lane use management system

## In Layman's Terms



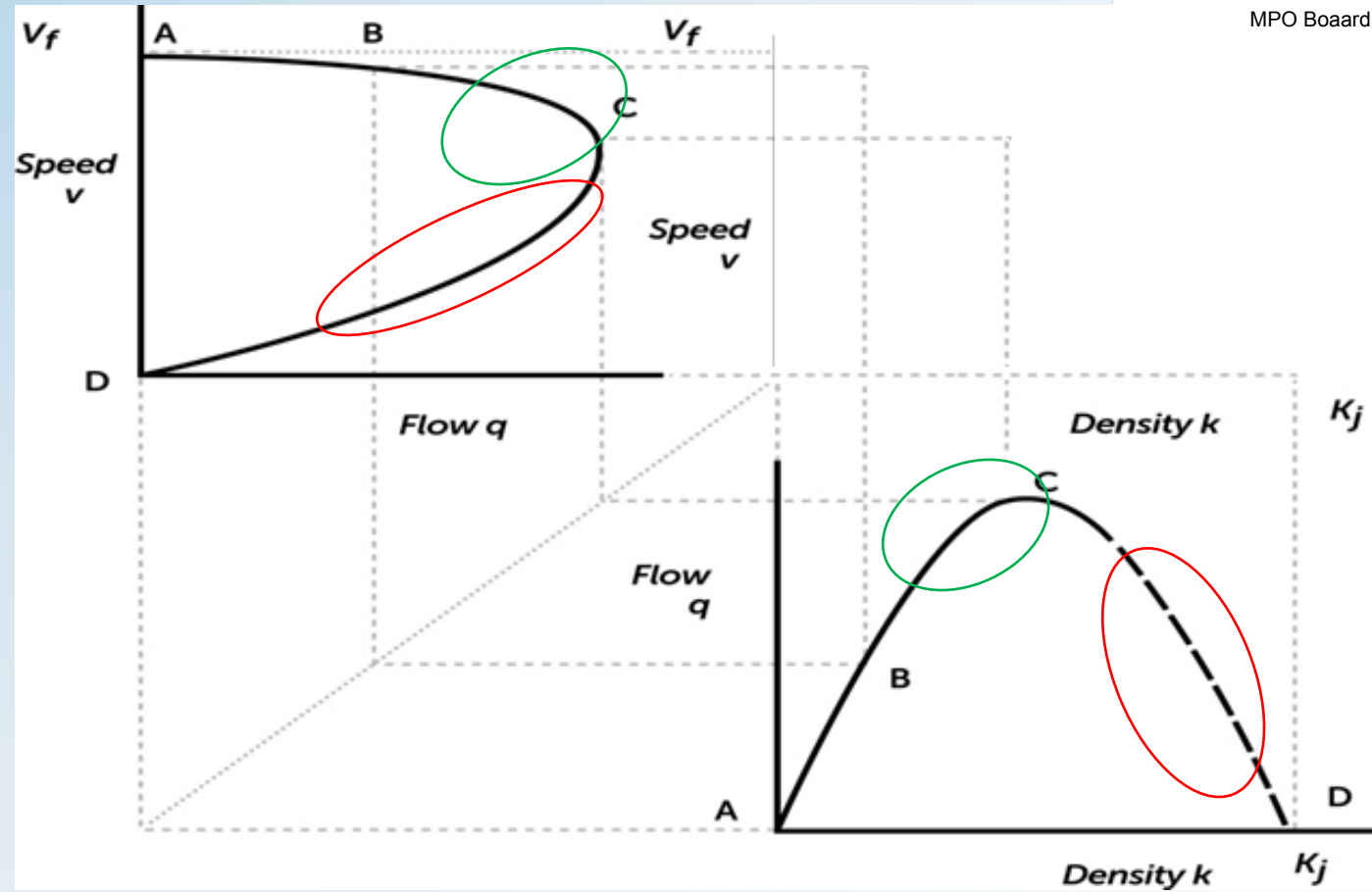
- A series of coordinated ramp meters
- Integrated sensors along freeway and surface streets collecting high resolution data
- Ramp improvements to handle additional queuing
- Command and control software
- Human intervention at Traffic Management Center
- Incident detection and CCTV surveillance
- Can include traveler information
- Can include lane management (variable speed limits, lane control, shoulder running, pricing)

## How Does It Work

- Synchronizes flow of vehicles entering a freeway to available capacity on the freeway
- Provides real time demand management (every 20 seconds) to control traffic and optimize overall freeway efficiency
- Interchanges coordinate with one another to prevent excessive wait times and queuing for all interchanges, metering rates differ for each ramp

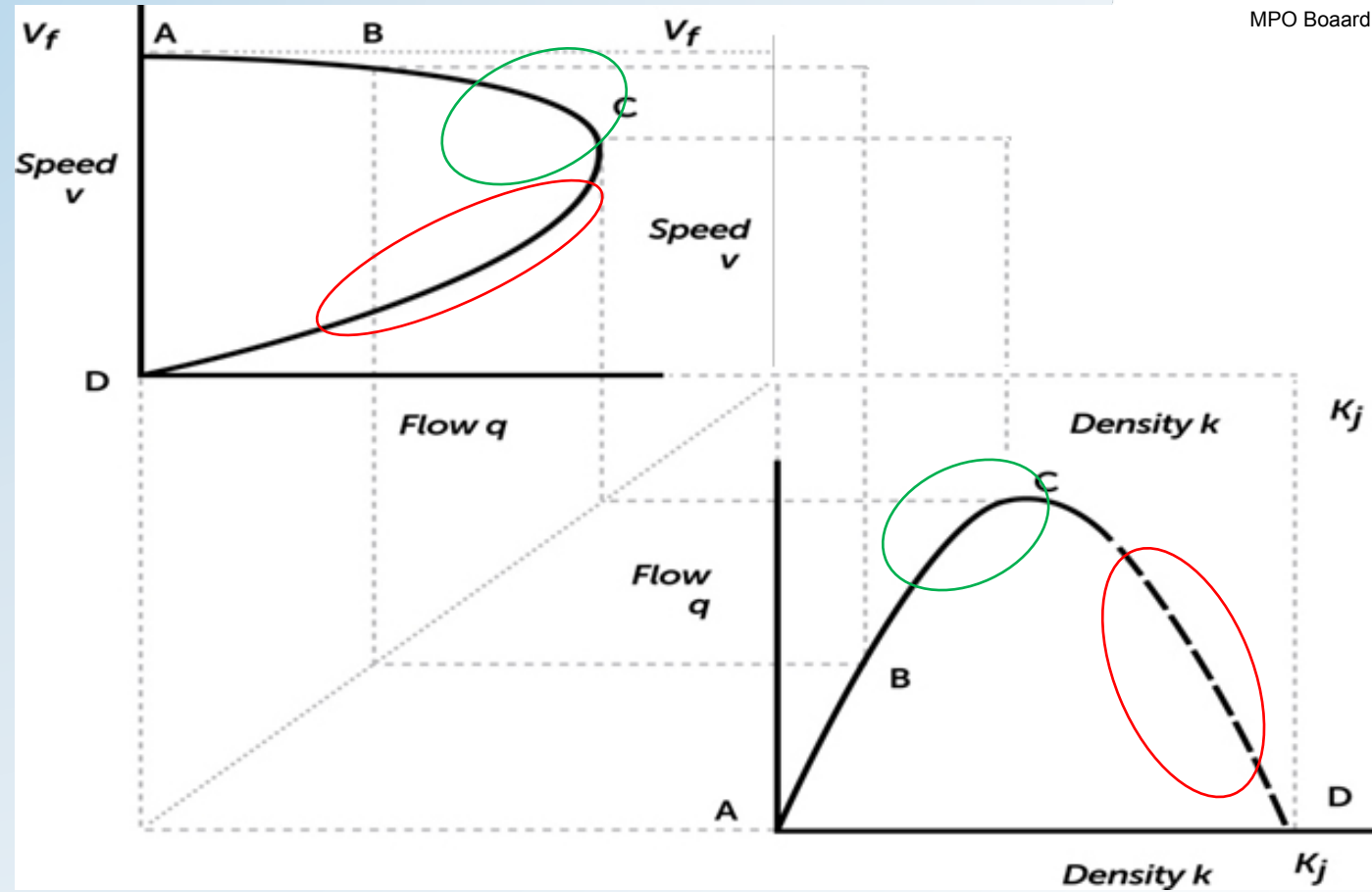


# Why Do Freeways Fail



Freeways perform at their worst when they are needed the most.

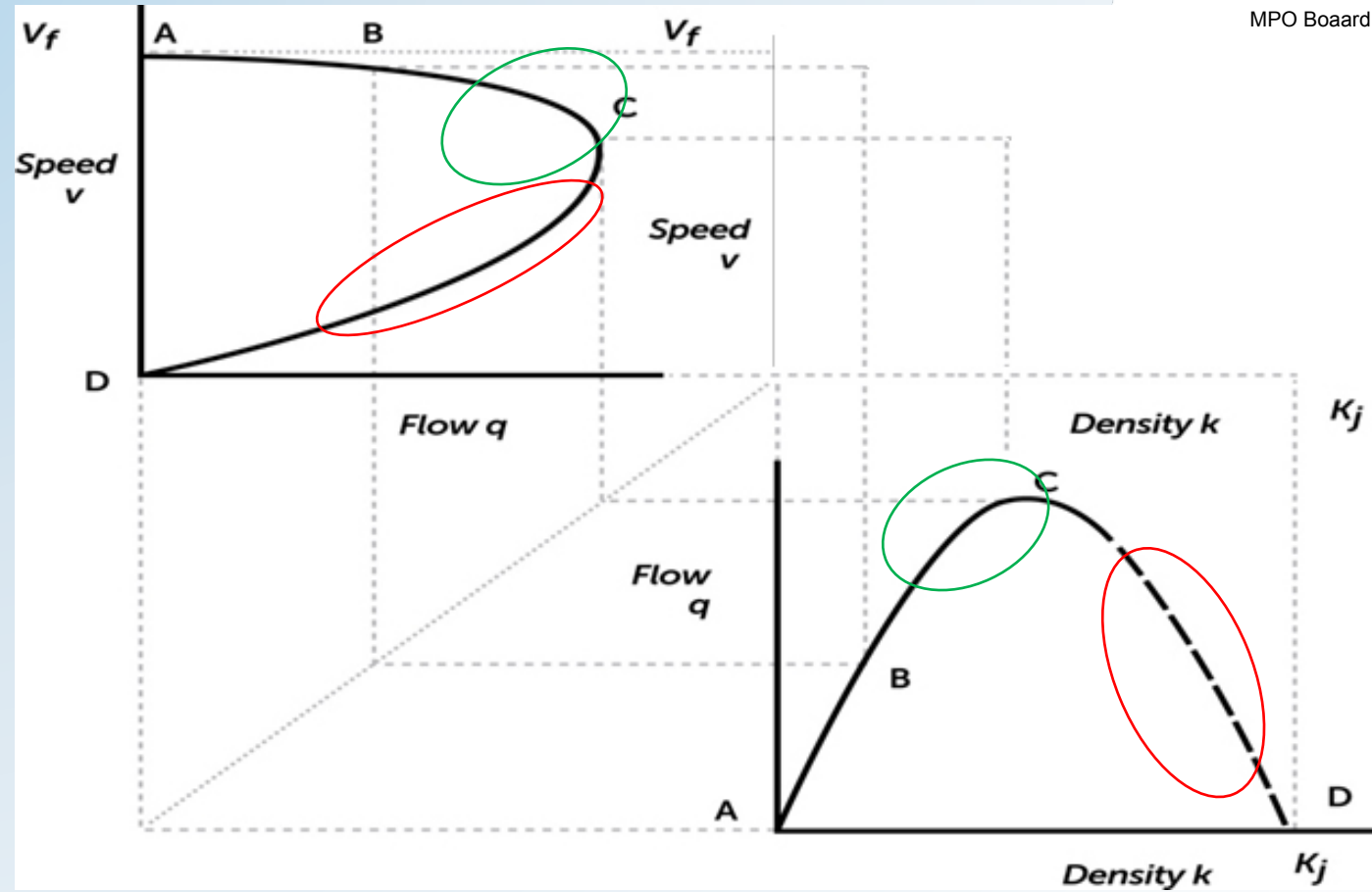
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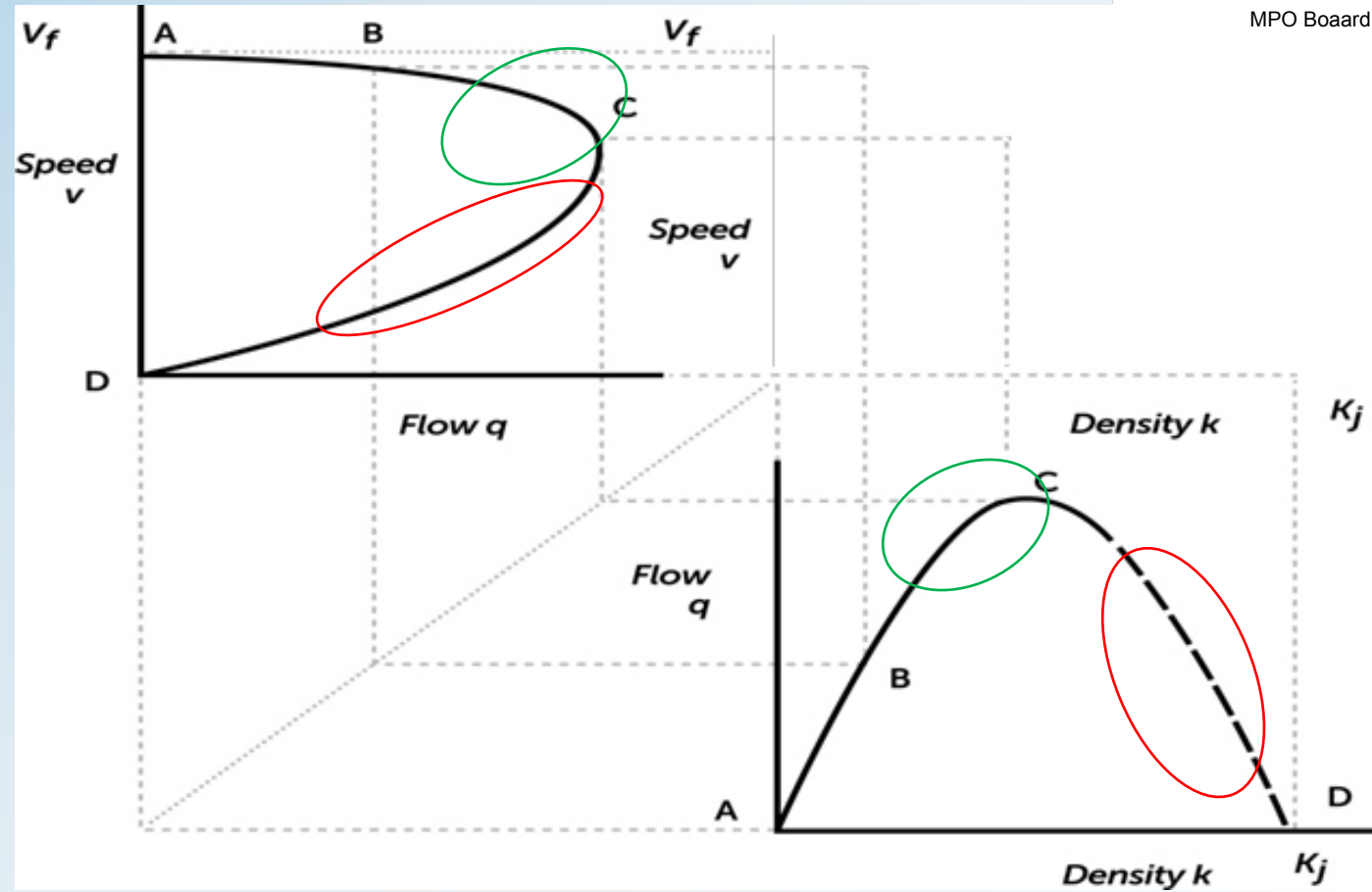


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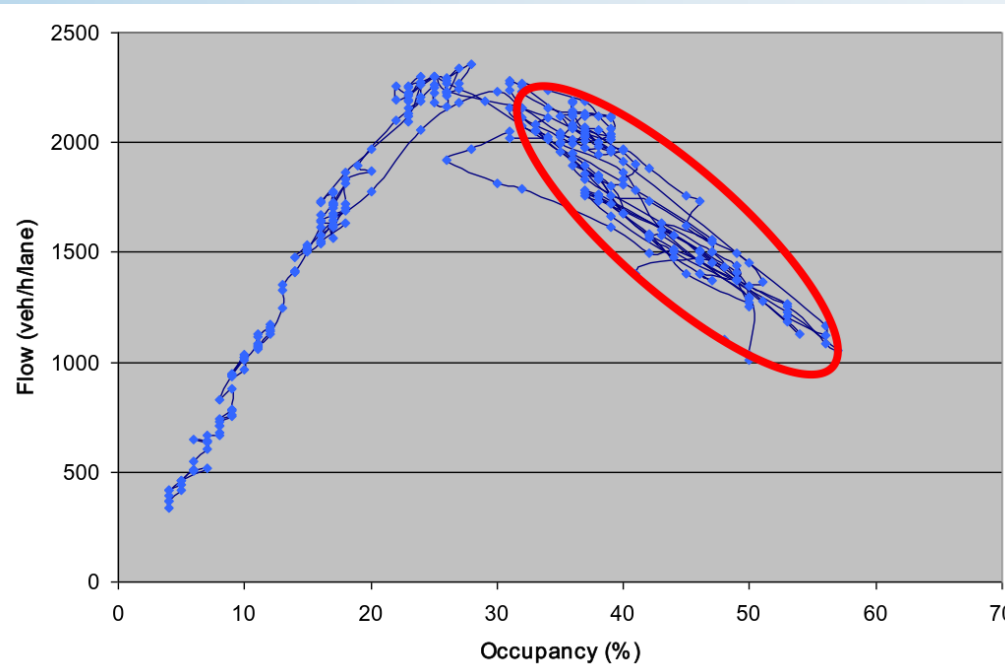
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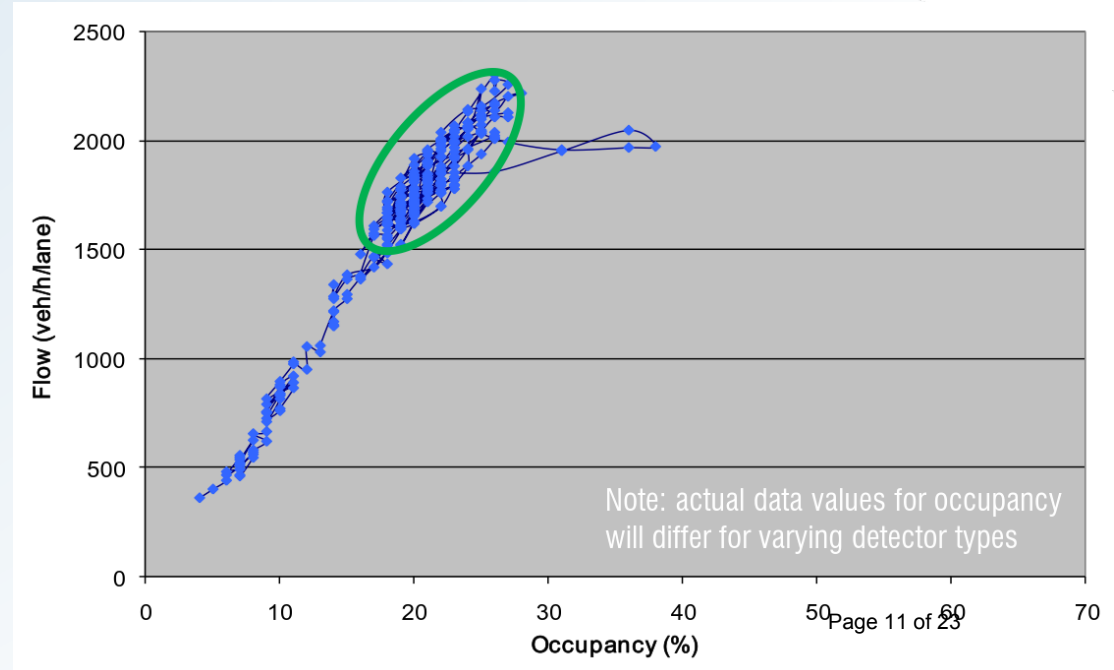


# Unmanaged vs Managed

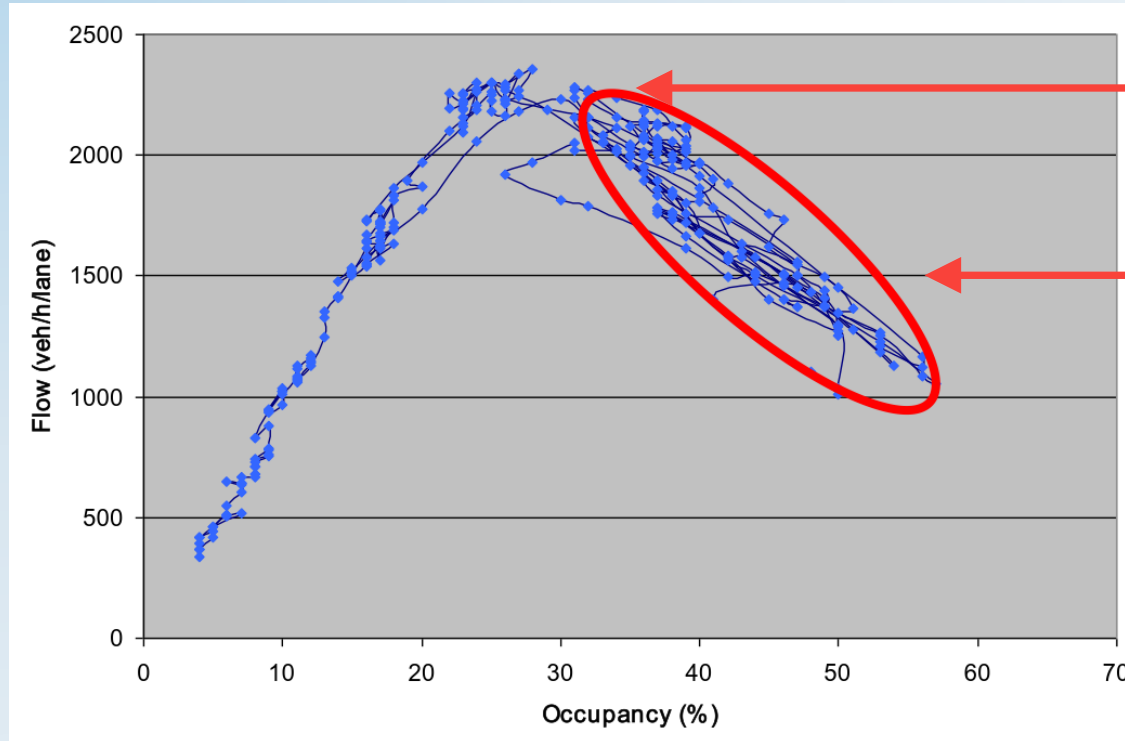


Unmanaged

Managed



# Unmanaged vs Managed



2,300

1,500

4 lanes @ 2,300 = 9,200

4 lanes @ 1,500 = 6,000

9,200 - 6,000 = 3,200

More than a lane worth of capacity!

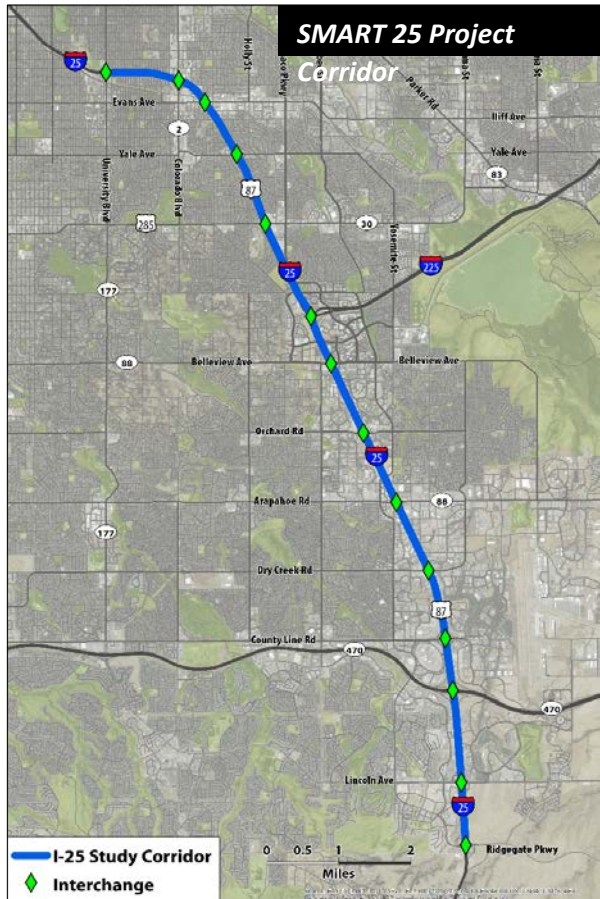
## Managed Motorways Down Under

- First deployed in Melbourne in 2009 on the M1 Freeway
- 47 miles, carrying over 160,000 vpd
- 1,100+ detection, signal, and communication devices
- Coordinated dynamic metering at 62 locations
- Ramp improvements at 30 locations
- Priority ramp bypass for transit, HOV, and trucks at ramp locations

## Managed Motorways Down Under

- 5% increase in peak traffic flow rate, 25% in overall flow
- Flow rate is now sustained throughout peak periods
- Traffic speeds improved between 35% and 60% during peak periods
- Decreased crash rates while other Melbourne freeways generally increased

## US Efforts



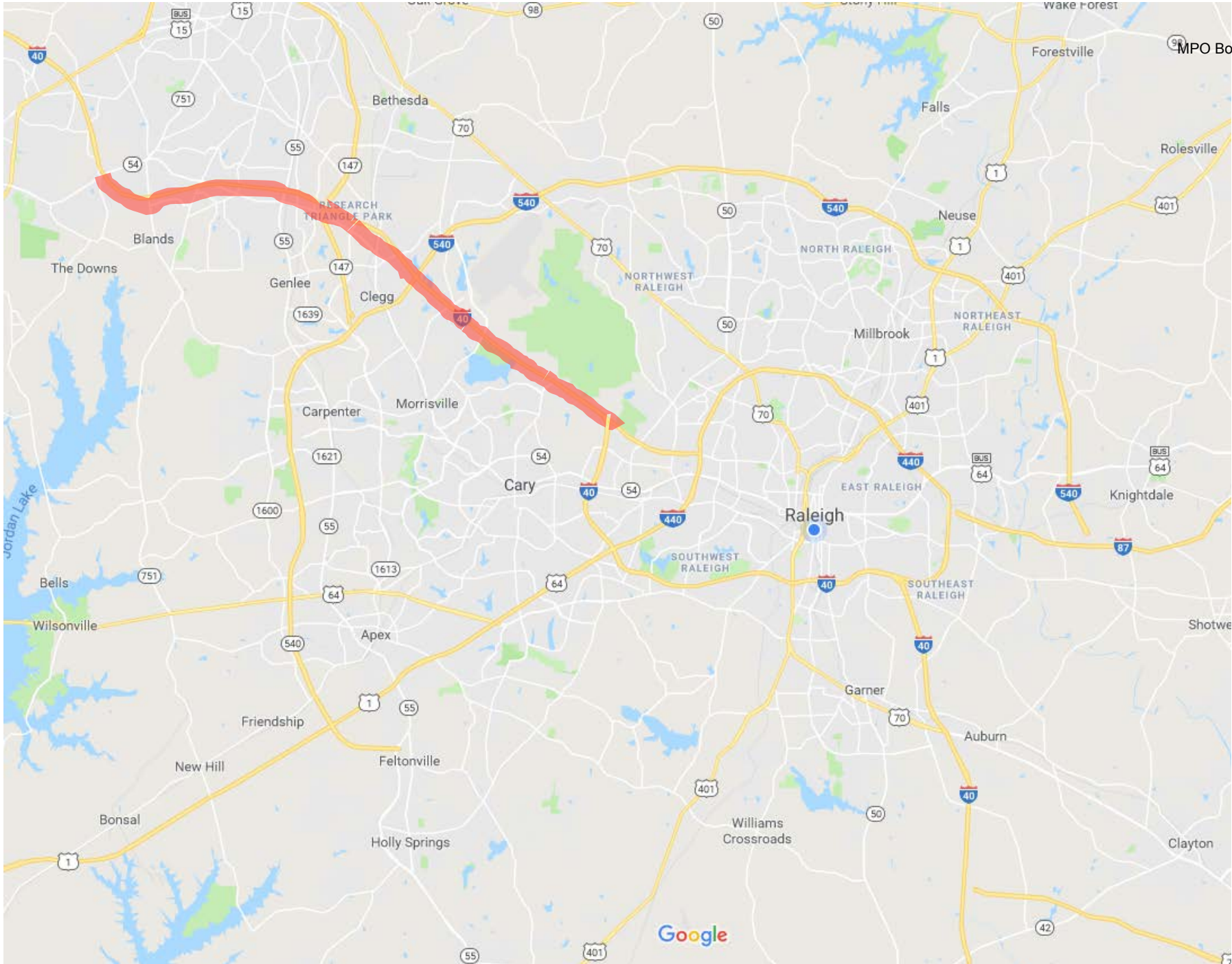
- Colorado – Construction starting on I-25 in Denver this fall
  - 14 miles, 14 interchanges,
  - 18 meters, 7 ramp improvements
- Utah – Feasibility study on I-15 in Salt Lake City completed. Design steps being developed
- Arizona – High level feasibility study complete
- Georgia – Working on pilot corridor, currently developing detection layouts

## Triangle Area Corridors

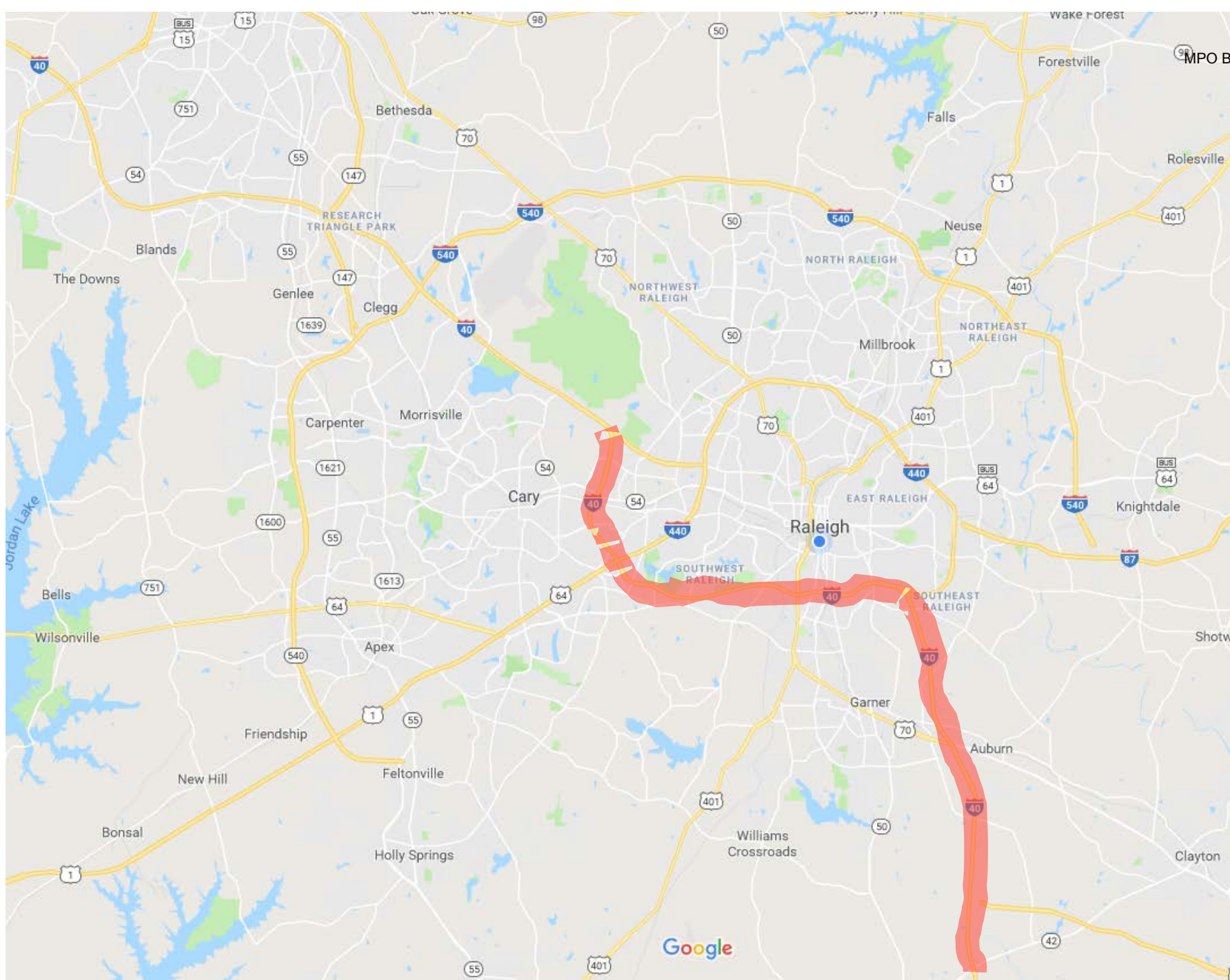
- Funded in statewide tier in latest round of SPOT
- Updated cost estimates based on lessons learned from Colorado



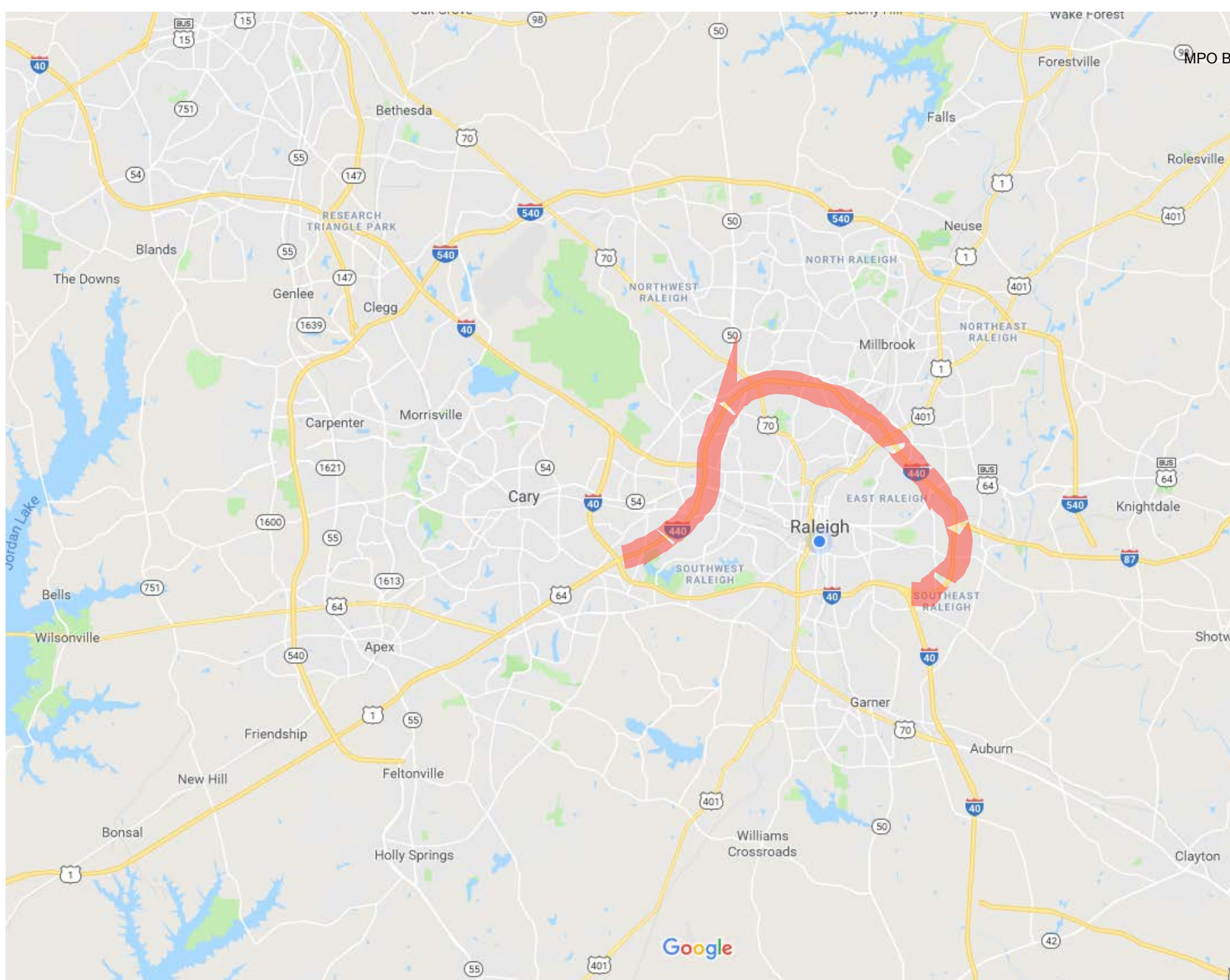
I-40 from NC  
54 to Wade  
Ave – \$42.4M



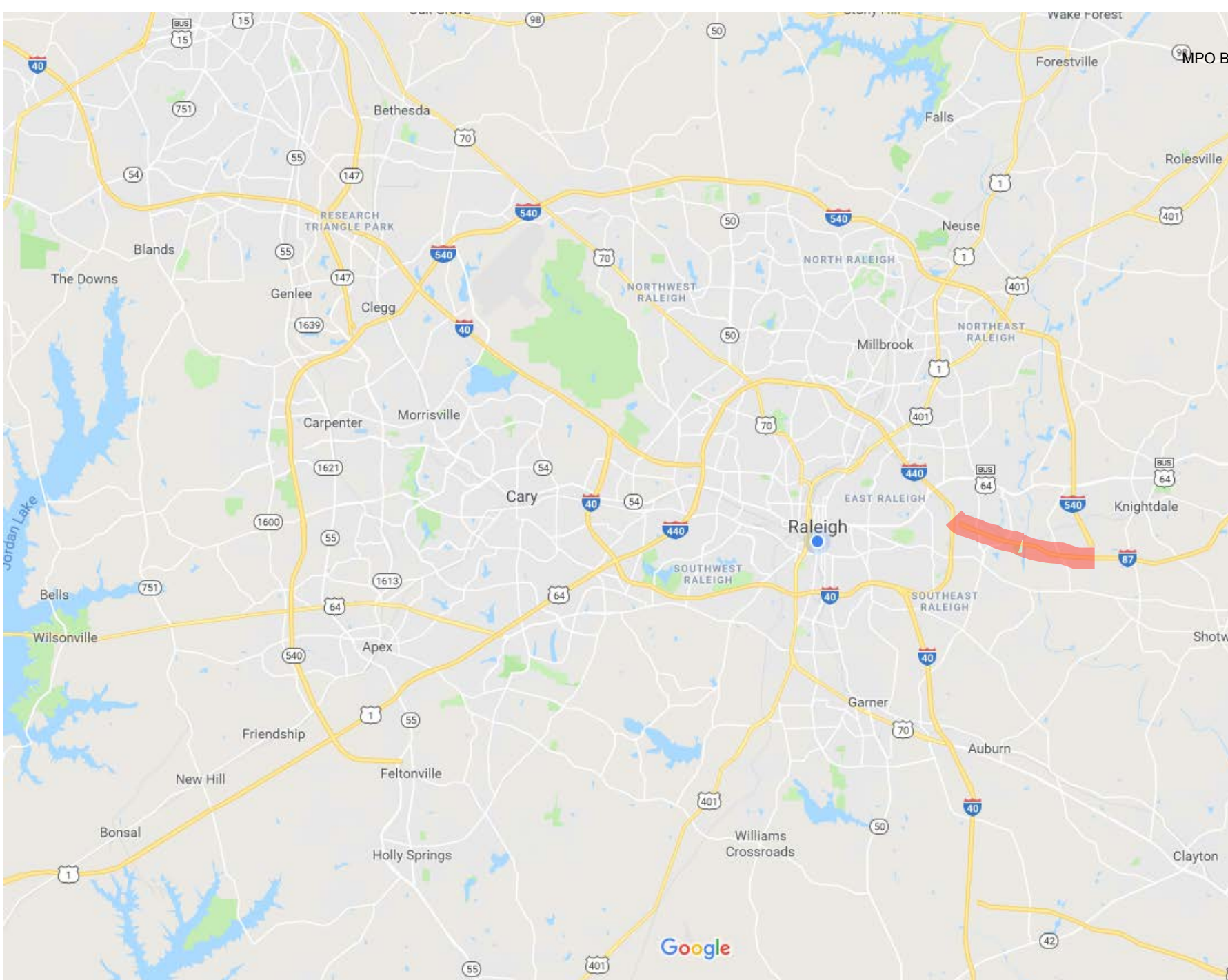
I-40 from NC  
42 to Wade  
Ave - \$52.6M



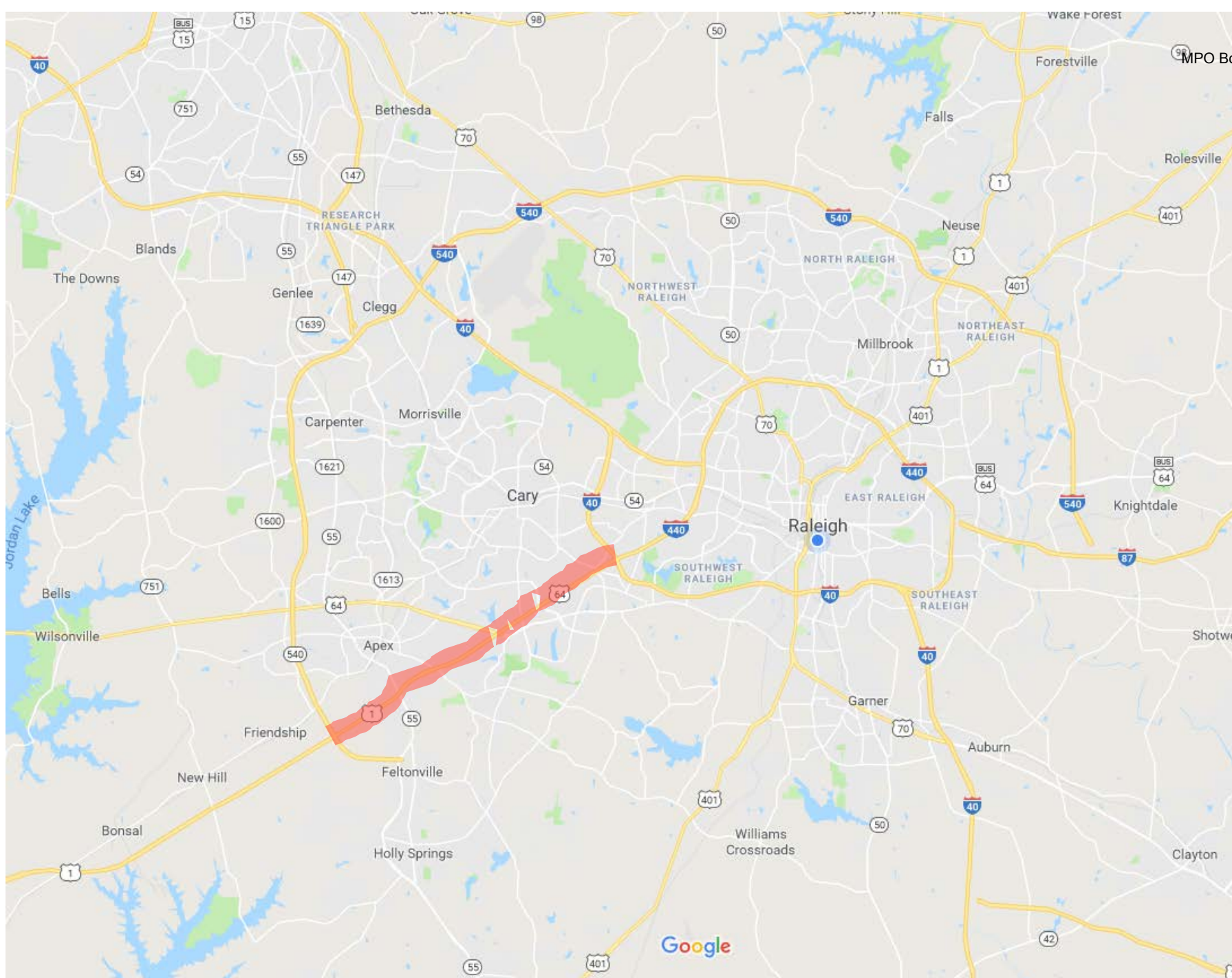
I-440 from I  
40 to Wade  
Ave / US 1–  
\$46.3M



I-87 from  
440 to I-540  
- \$67.8M



US 1 from I 40  
to NC 540 -  
\$23.6M



## Lessons Learned

- Managed motorways is a multi-faceted solution that involves new skill sets, communications systems, control engineering and systems, and optimization strategies
- It is important to control all access points
- Can significantly reduce delay and increase reliability
- Much cheaper than adding an additional lane
- Can be used in conjunction with managed lanes, toll facilities, and future widening

# Questions?

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