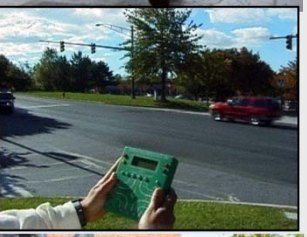
City of Annapolis

Bicycle, Automotive and Pedestrian Safety Study

March 21, 2011

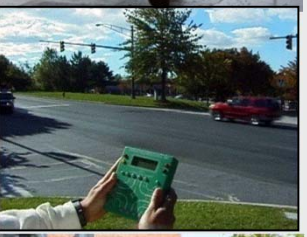


Outline

- Study Goals and Objectives
- Methodology and Data Collection
- Findings
  - Traffic Patterns
  - Conflict and Safety Assessment
  - Pedestrian and Bicycle Facility Assessment
  - Parking Operations
  - Circulation Assessment
- Recommended Mobility Strategies
- Summary

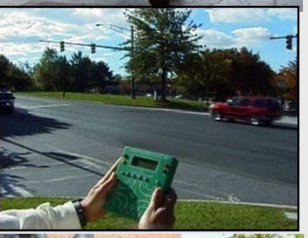
Bicycle, Automotive and Pedestrian Safety Study

Study Area and Intersections



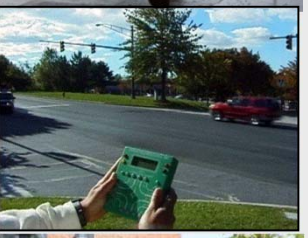
Study Goals and Objectives

- To improve safety and enhance transportation network efficiency, focusing on the City Dock area
- To identify key conflict points using a unique analysis methodology
- To document the non-motorized transportation network gaps & barriers
- To provide short- and long-term cost-sensitive strategies that:
  - enhance safety & mobility for all travelers while managing congestion
  - improve inter-modal connections and parking efficiency
  - create open spaces and improve access to the waterfront
  - minimize impact on residential streets
- To effectively guide visitors, tourists, and workers to key destinations within the City
- To improve travel choices and increase biking and walking trips



Key Issues – Pedestrians

- High Pedestrian Volumes
- Complicated Crossings/ wide vehicle lanes/ intersections
- Mid-block Desire Lines
- Tourists/ Distracted Pedestrians
- Turning Motor Vehicles
- High Motor Vehicle Volumes
- Major trip generators (Market House/ City Dock, USNA, St. Mary's School)



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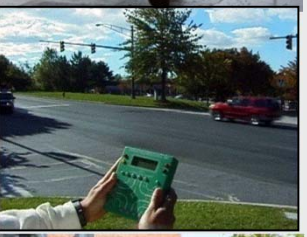
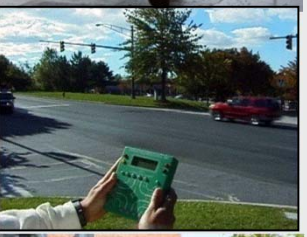
Key Issues – Bicycles

- High motor vehicle volumes
- Conflicts with turning vehicles and pedestrians
- Conflicts with parked cars
- Connections to other routes/trails
- Free Wheelin' Bike Program
- Bicycle parking
- Wayfinding



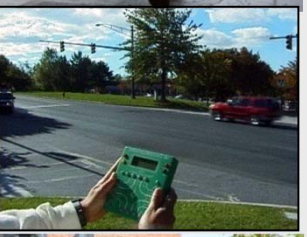
Key Issues – Motorized Vehicles

- Competition between automobiles & other modes for limited roadway space
  - Unfamiliar drivers
  - Friction of parking maneuvers and searching for available parking
  - Tour and transit bus operations, deliveries
  - Conflicts with pedestrians and bicycles
  - Accommodating through traffic in City Dock
  - Truck loading and unloading



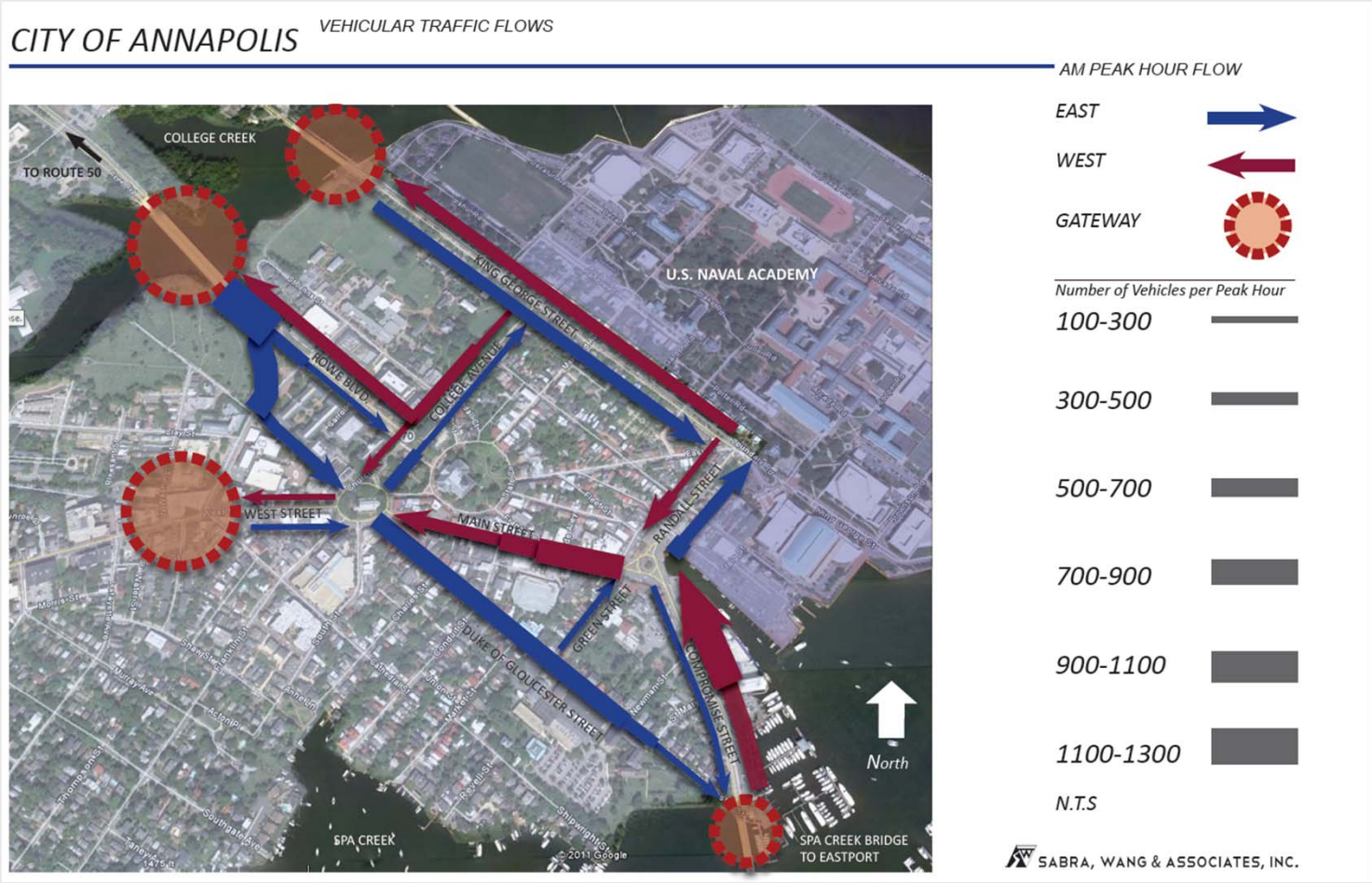
Key Issues – Transit

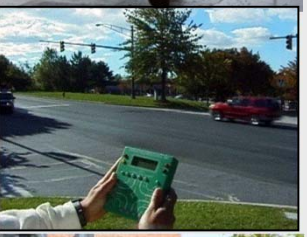
- Connections between satellite garages and City Dock
- Connections between MTA/ City buses
- Real-time transit info
- Upgraded bus stops/ shelters



Bicycle, Automotive and Pedestrian Safety Study

Vehicle Flow Diagram – Morning Peak





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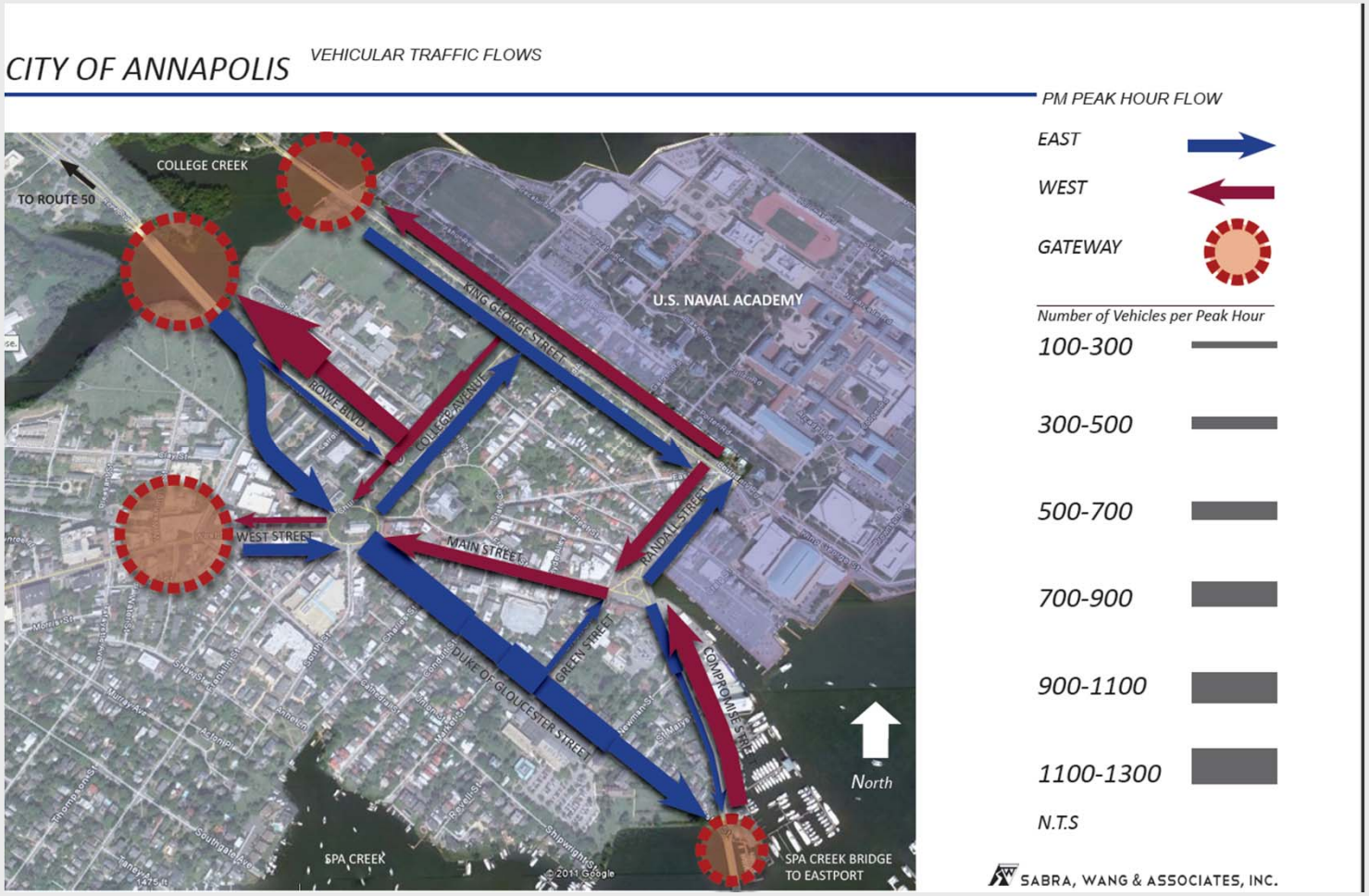
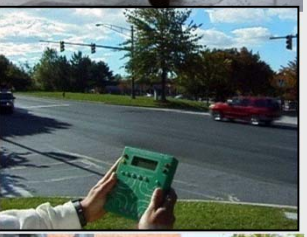
Vehicle Flow Diagram – Evening Peak





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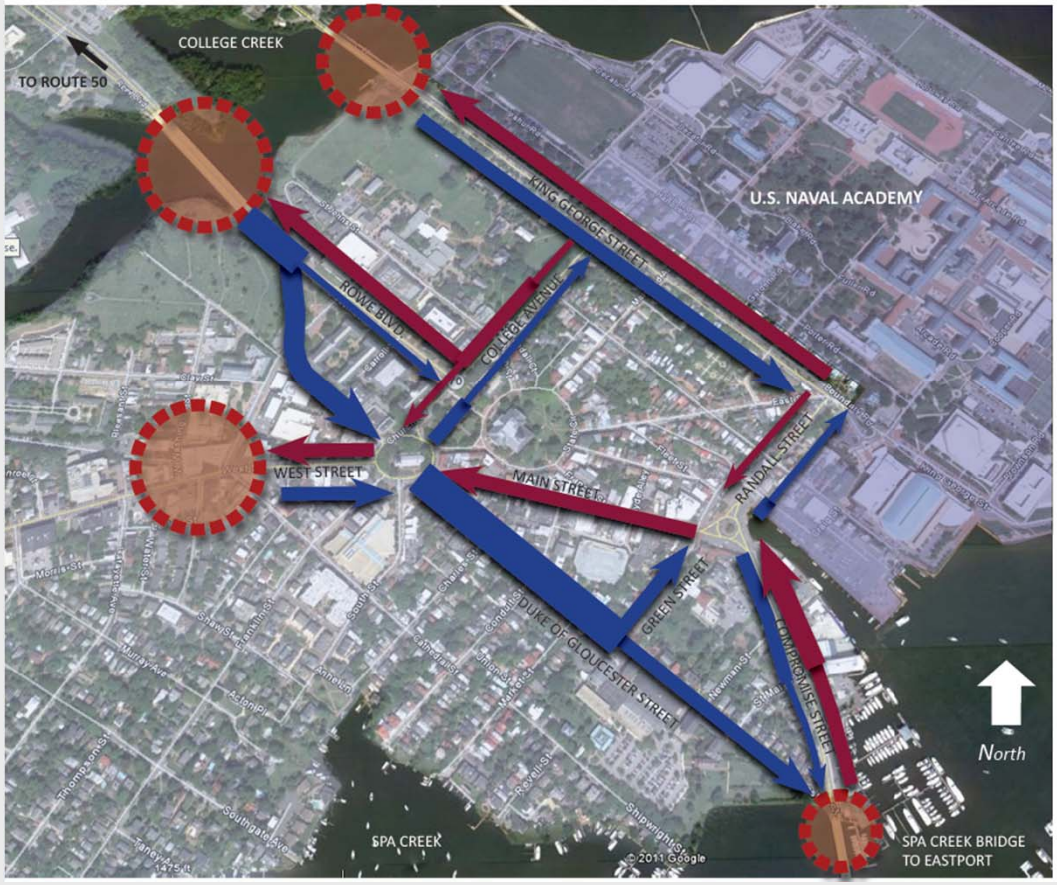
Traffic Flow Diagram – Saturday Peak

CITY OF ANNAPOLIS *VEHICULAR TRAFFIC FLOWS*



SATURDAY PEAK HOUR FLOW

EAST

WEST

GATEWAY

Number of Vehicles per Peak Hour

100-300

300-500

500-700

700-900

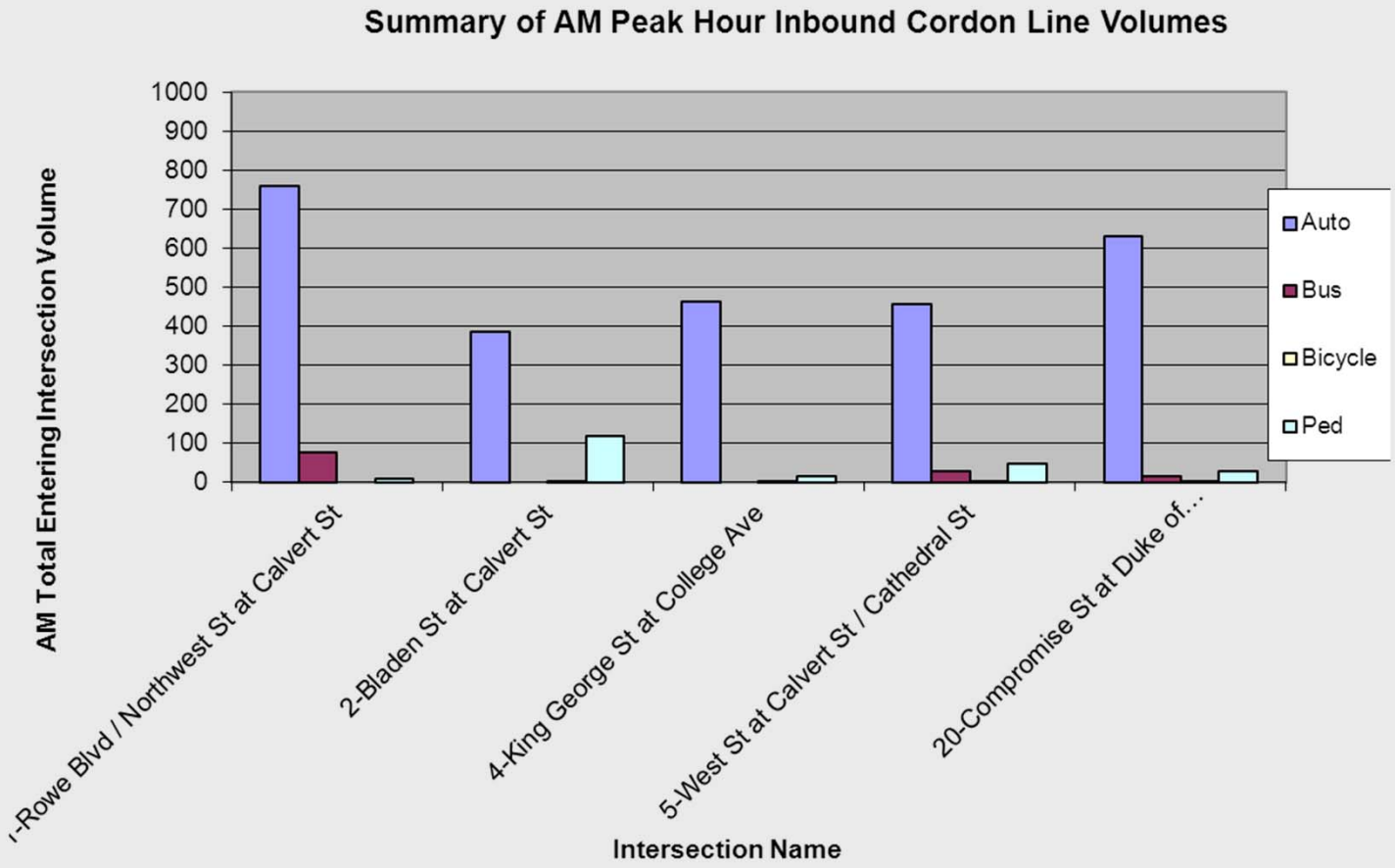
900-1100

1100-1300

N.T.S

SABRA, WANG & ASSOCIATES, INC.

Mode Share Analysis



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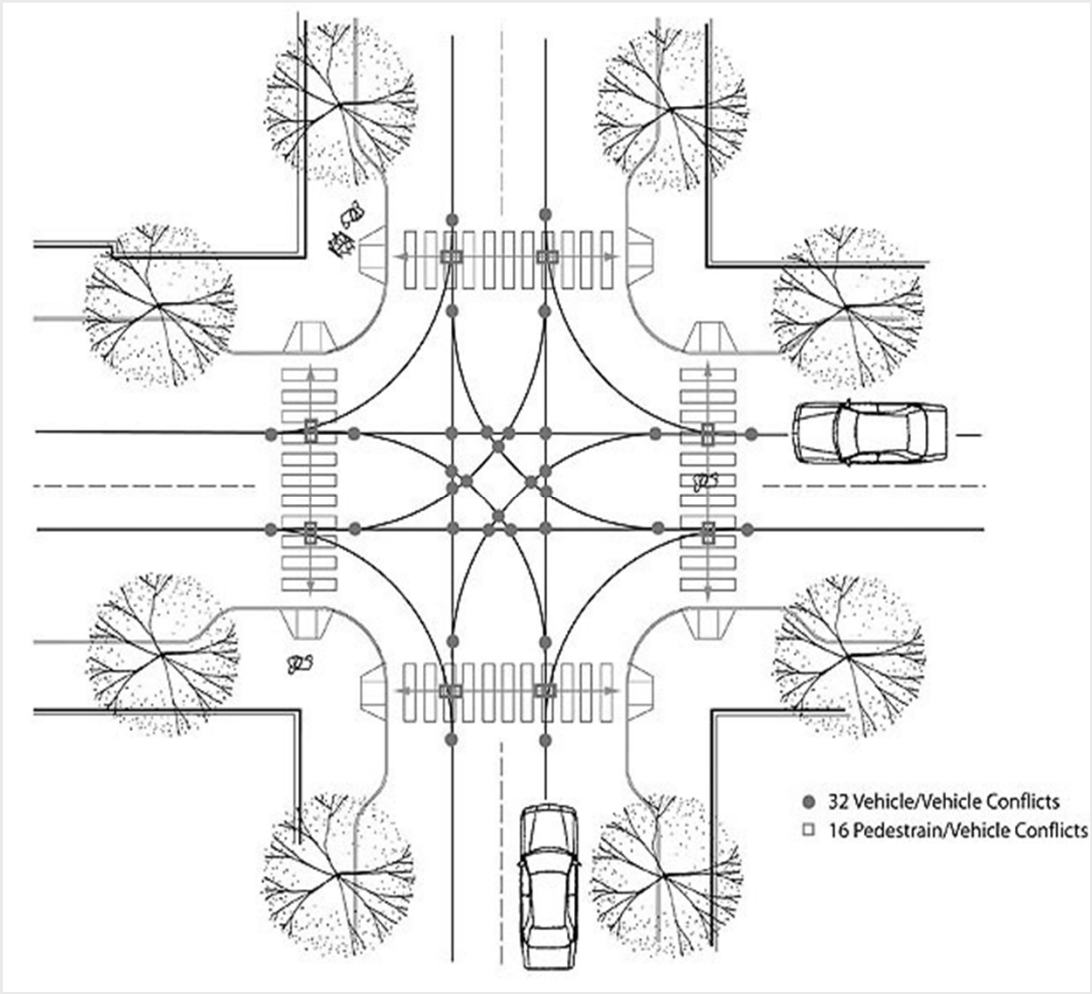
Conflict Point Methodology



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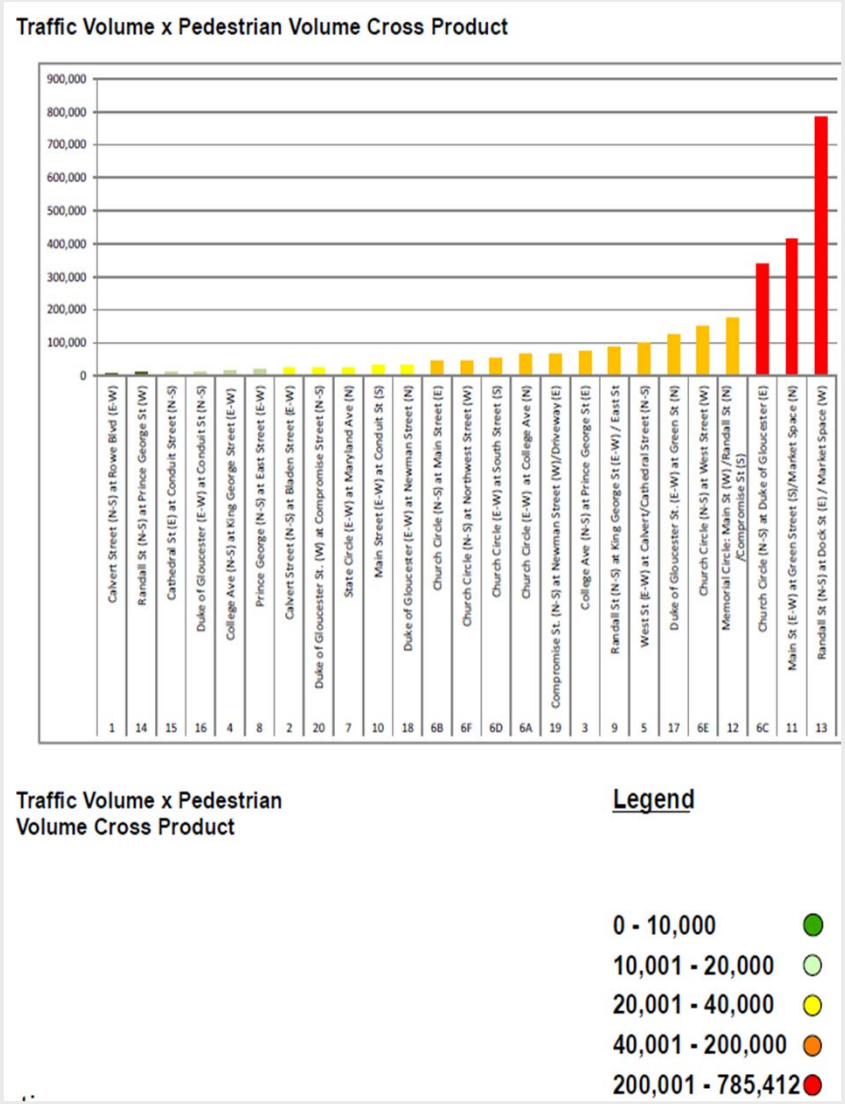
Cross Product Methodology



Traffic Volume x Pedestrian Volume Cross Product

Legend

- 0 - 10,000
- 10,001 - 20,000
- 20,001 - 40,000
- 40,001 - 200,000
- 200,001 - 785,412

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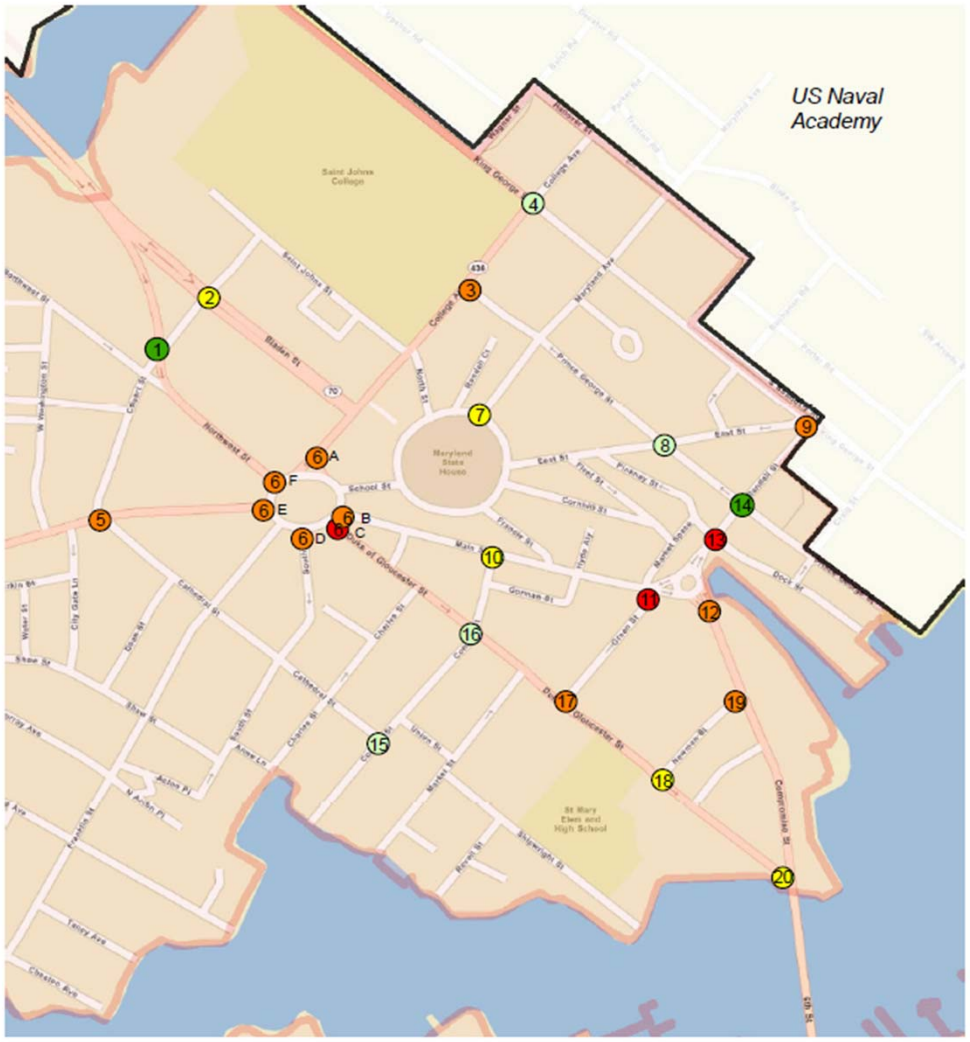
Cross Product Methodology



Risky Behavior Analysis

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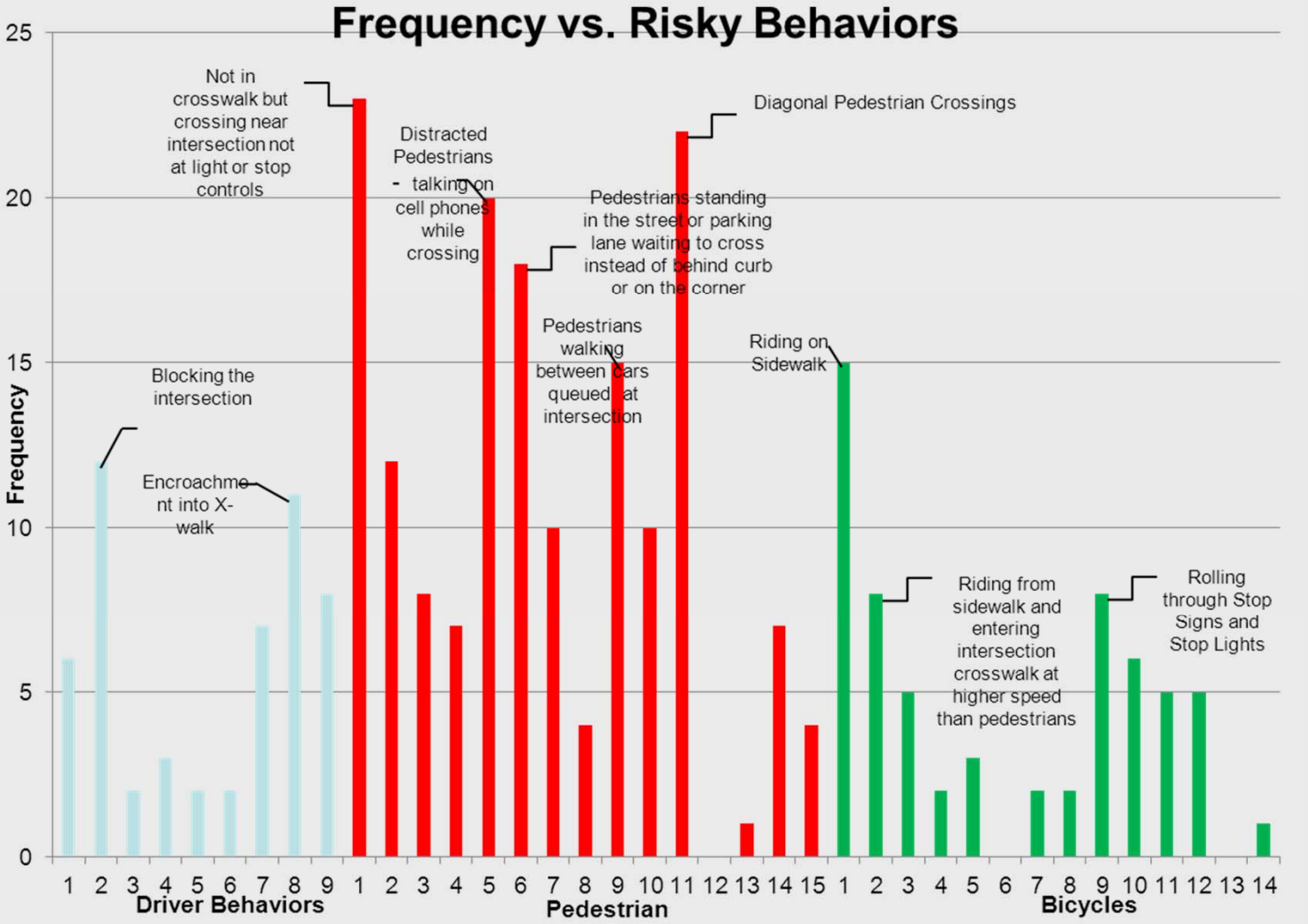

Pedestrian and Bicycle Environment

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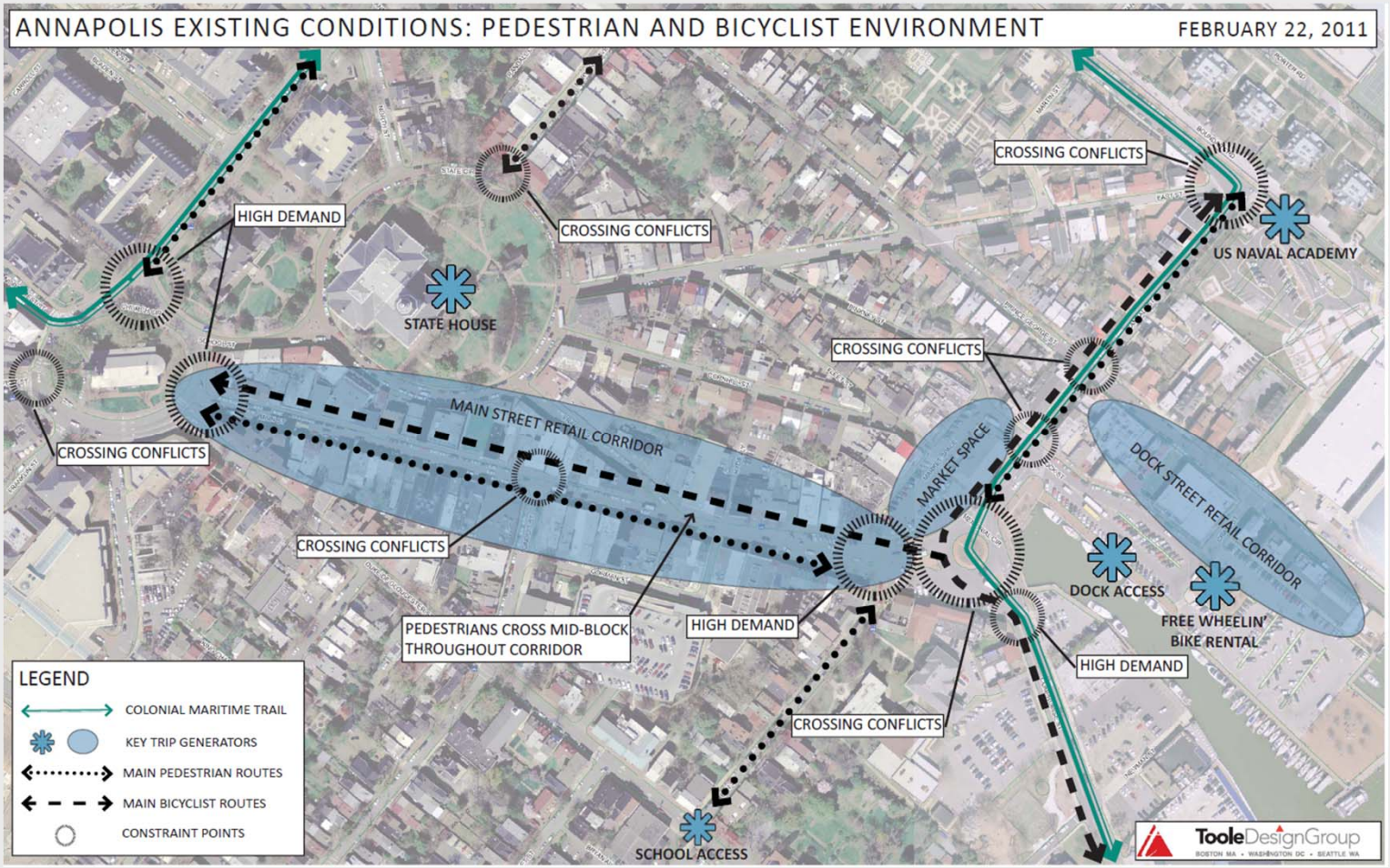
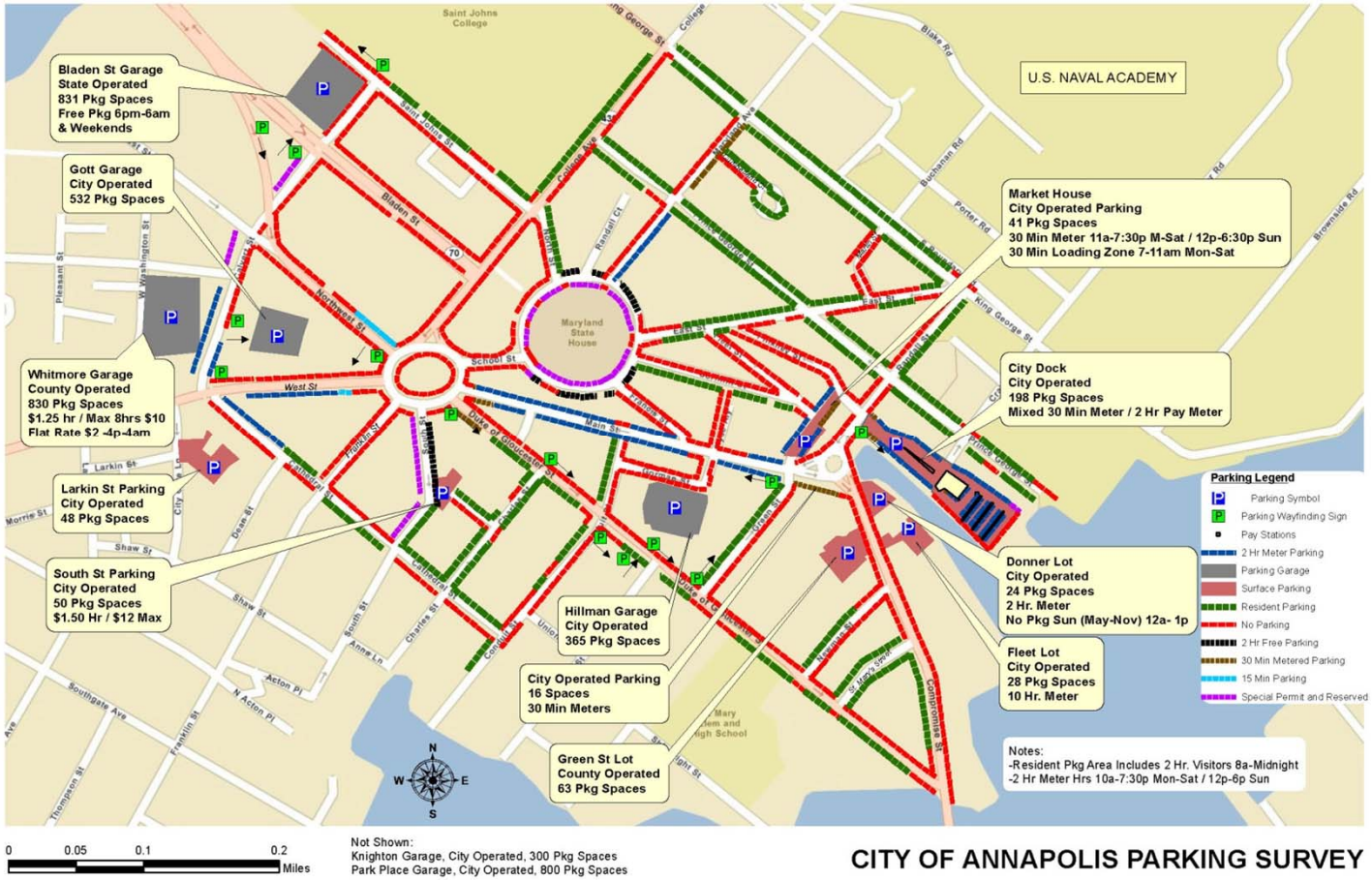


On and Off-Street Parking



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Weekday and Saturday Parking Utilization

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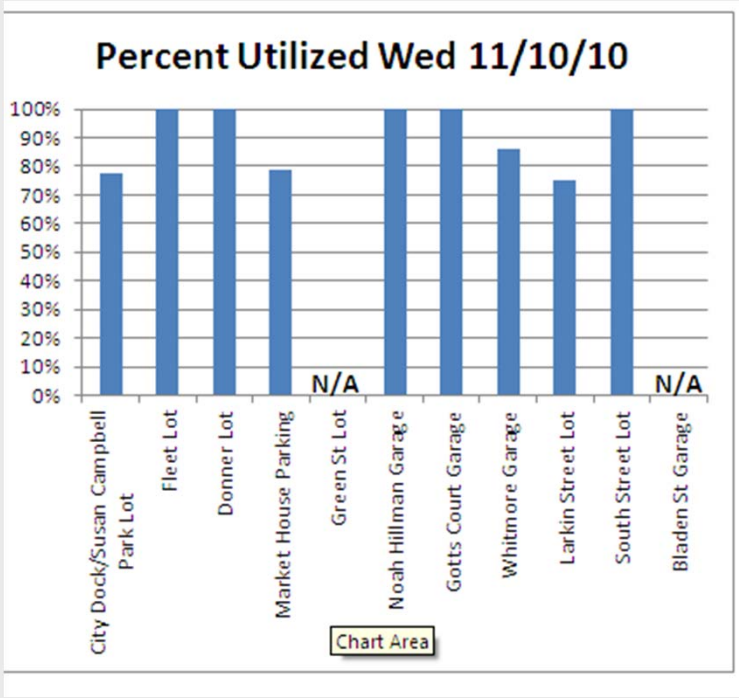

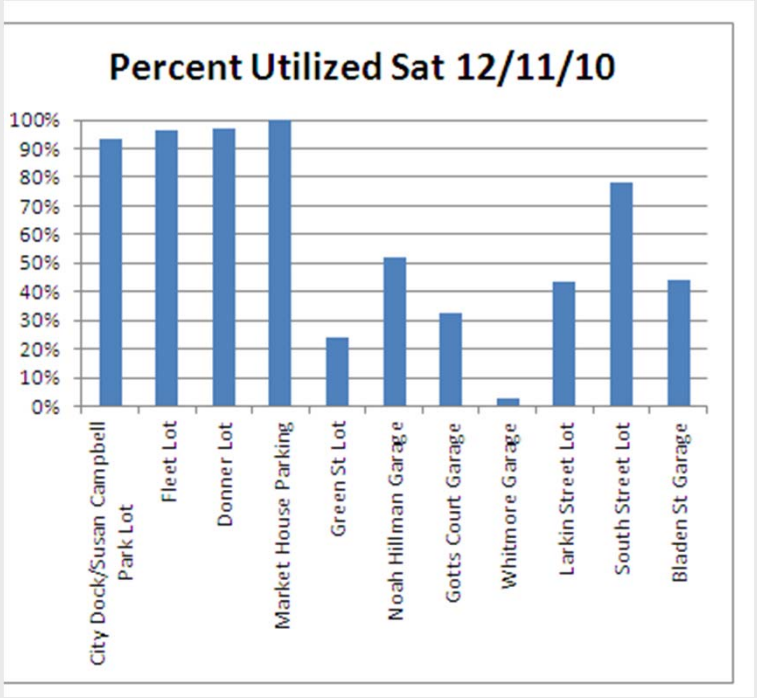

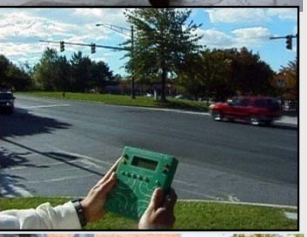

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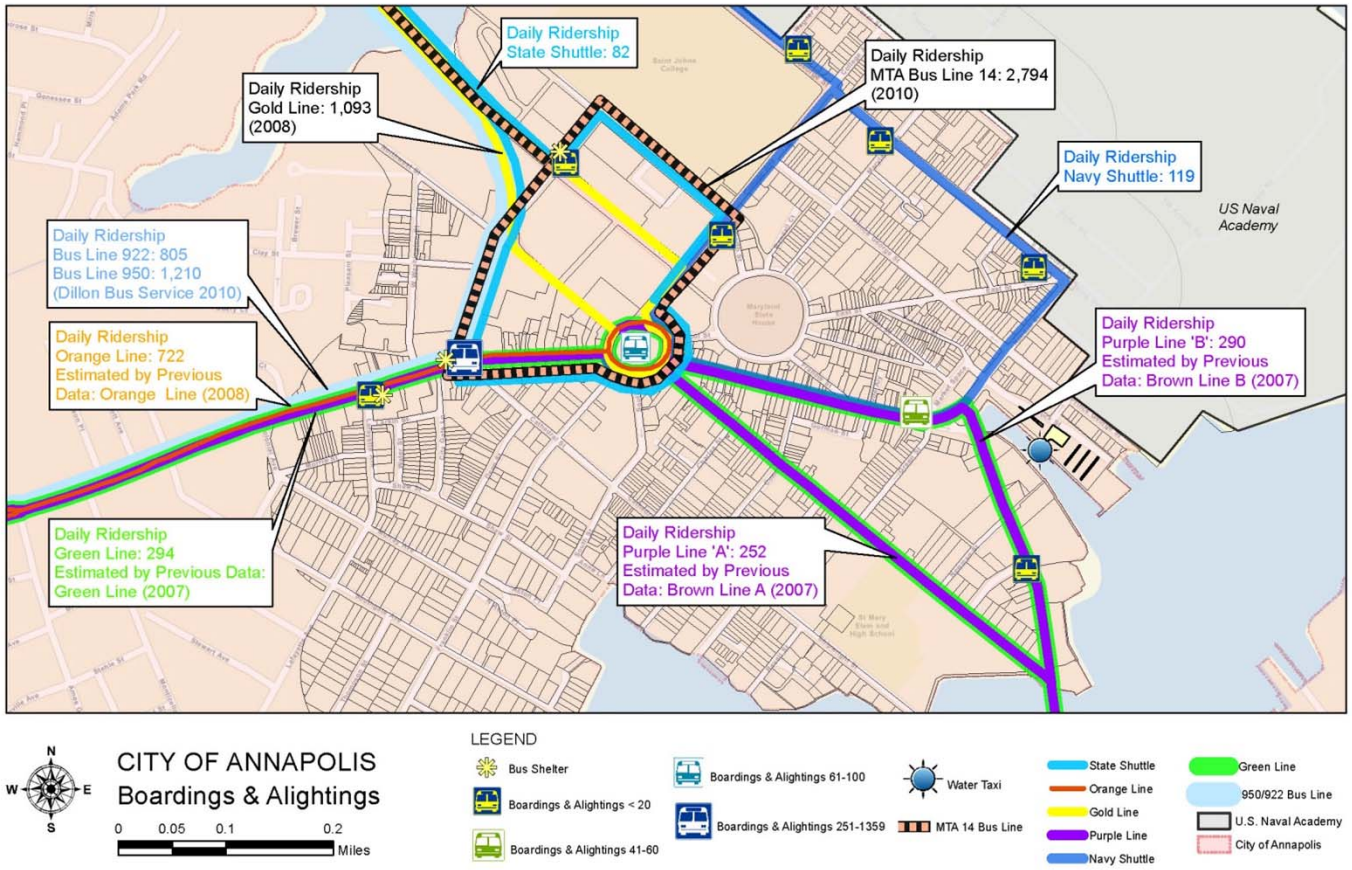
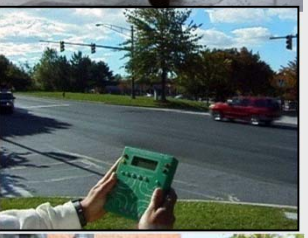
Transit Provisions





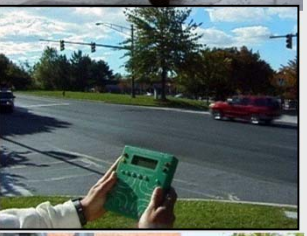
Bicycle, Automotive and Pedestrian Safety Study

Preliminary Findings

- Missing connections and gaps in pedestrian, bicycle and transit networks (sidewalks, lanes, parking, bus stops)
- Need more balance in roadway and intersections to prioritize vulnerable users
- Redundant traffic patterns and circulation
- Adequate parking supply, but need for enhanced parking management and information

Alternatives Development and Recommendations

- Balance Modal Needs
- Emphasize non-automobile modes
- Support pedestrian, bicycles and transit users – Complete Streets
- Manage parking and strengthen intermodal connections
- Better signing and public information about parking and travel options



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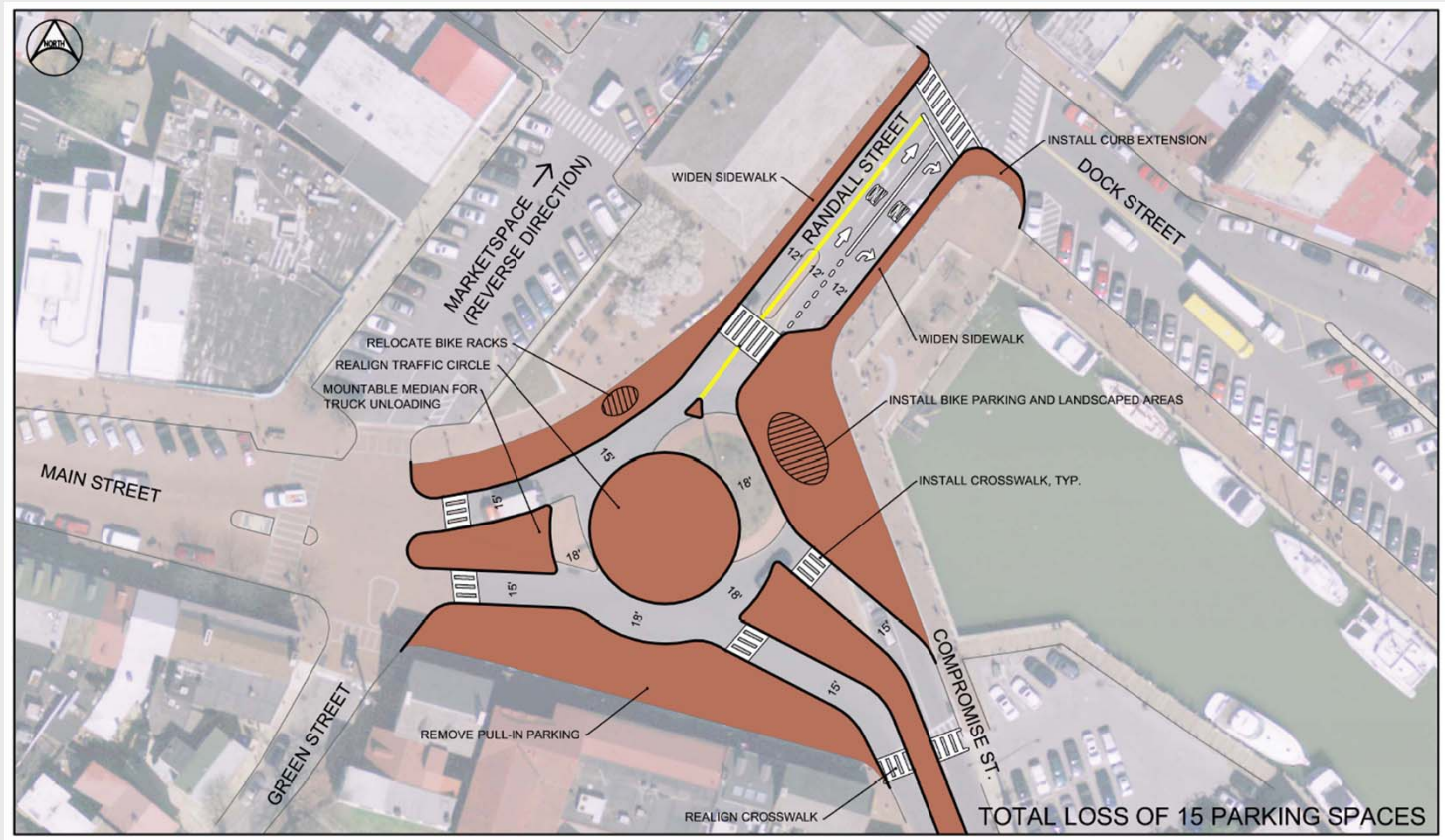
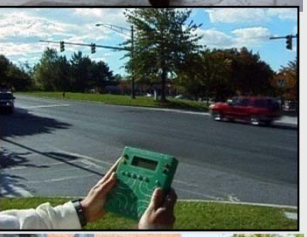
Memorial Circle – Option 1



MAIN STREET TRAFFIC CIRCLE ALTERNATIVE RECOMMENDATIONS



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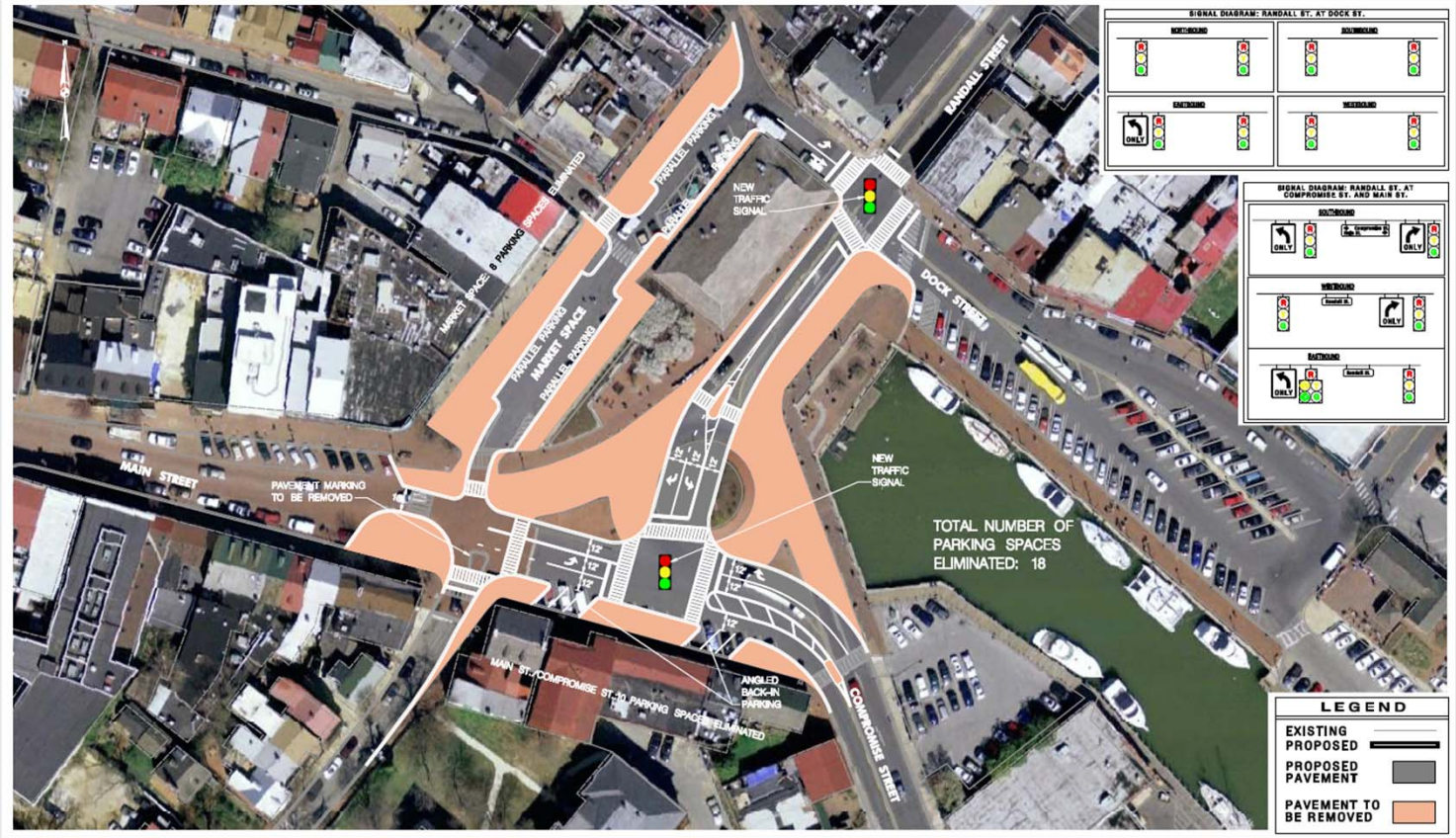
Memorial Circle – Option 2a with Market Space Road Diet



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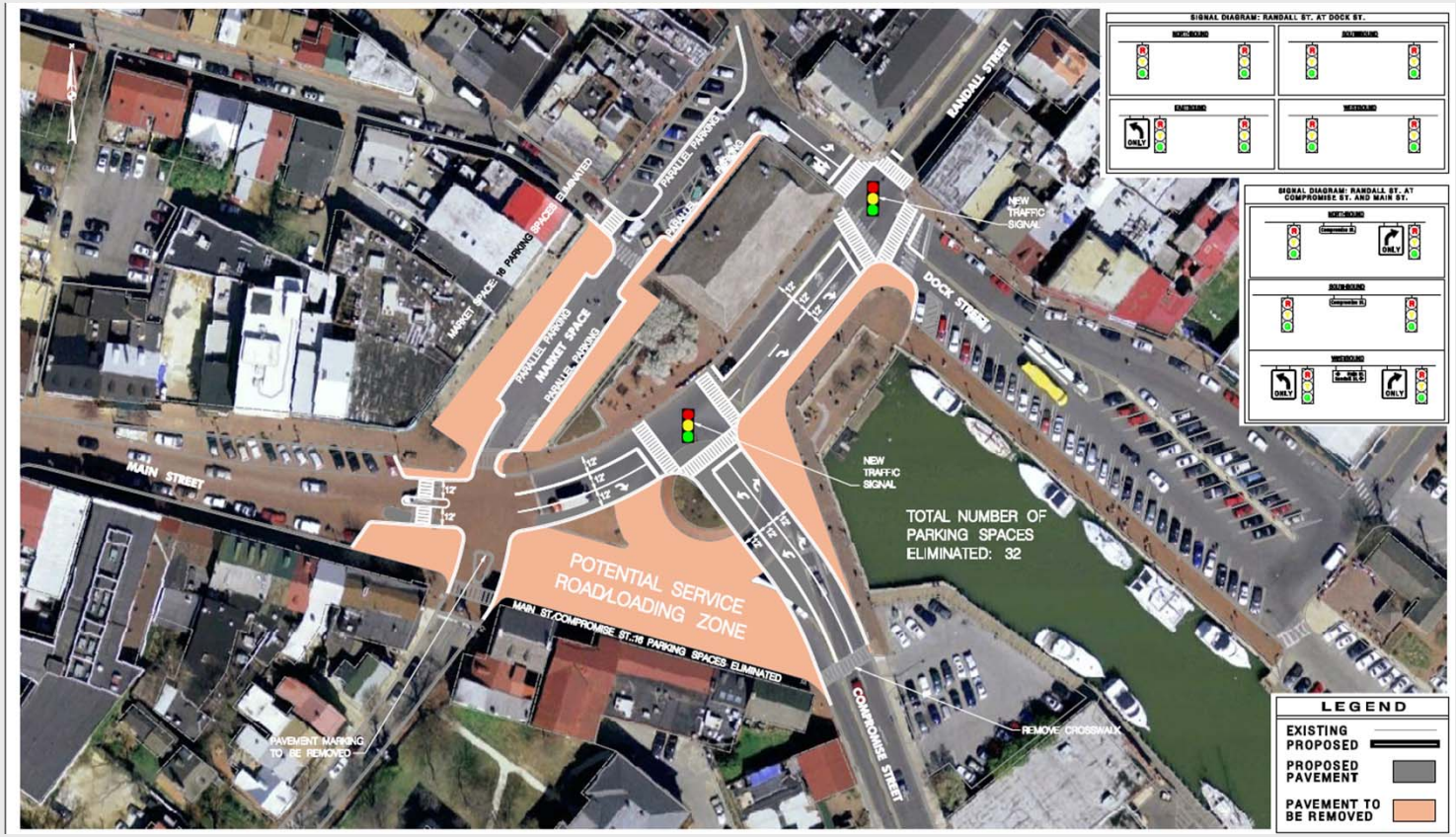
Memorial Circle – Option 2b with Market Space Road Diet



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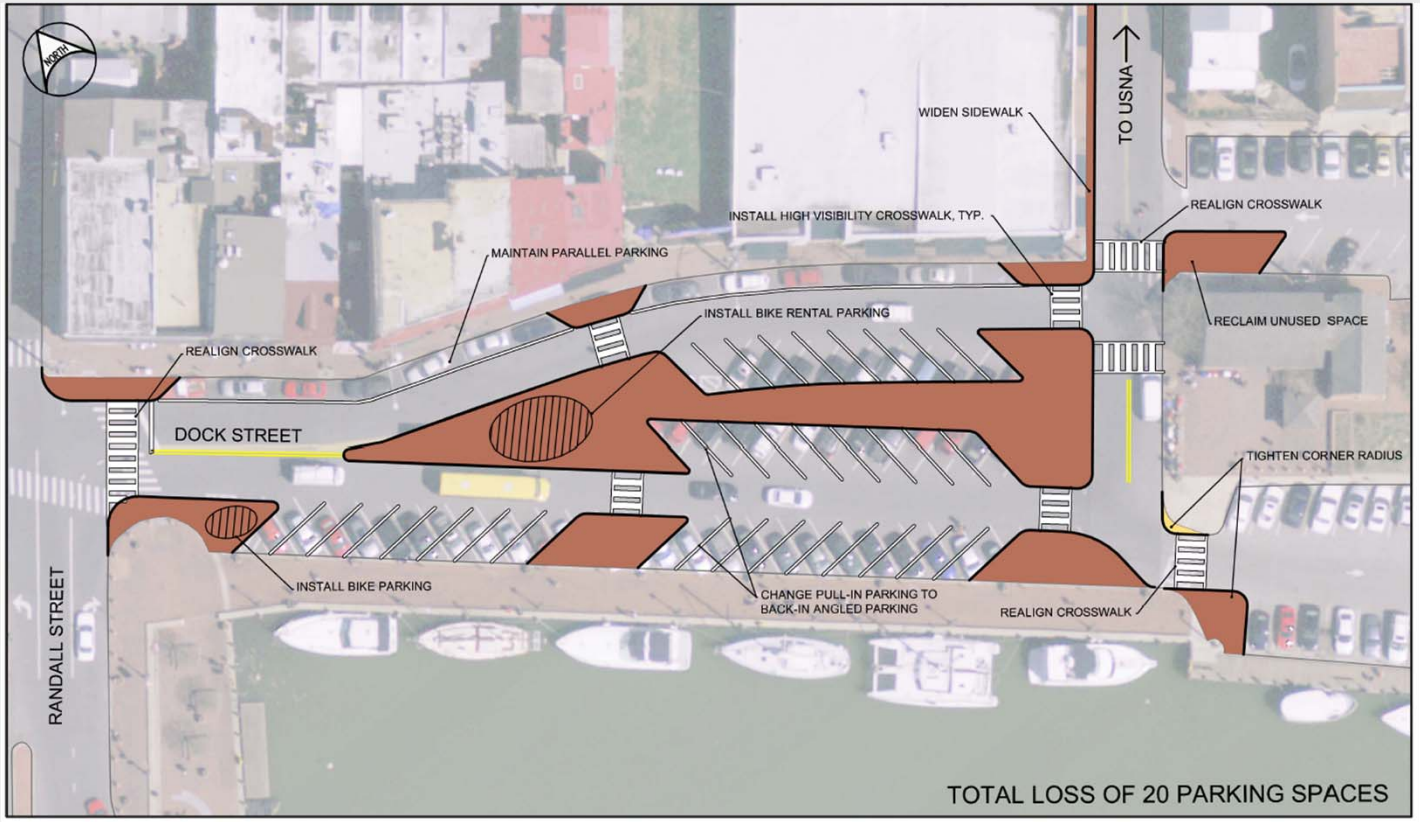
Randall at Dock Street Intersection Improvement and Dock Street Lot Pedestrian Improvements



Main Street Cycle Track Option

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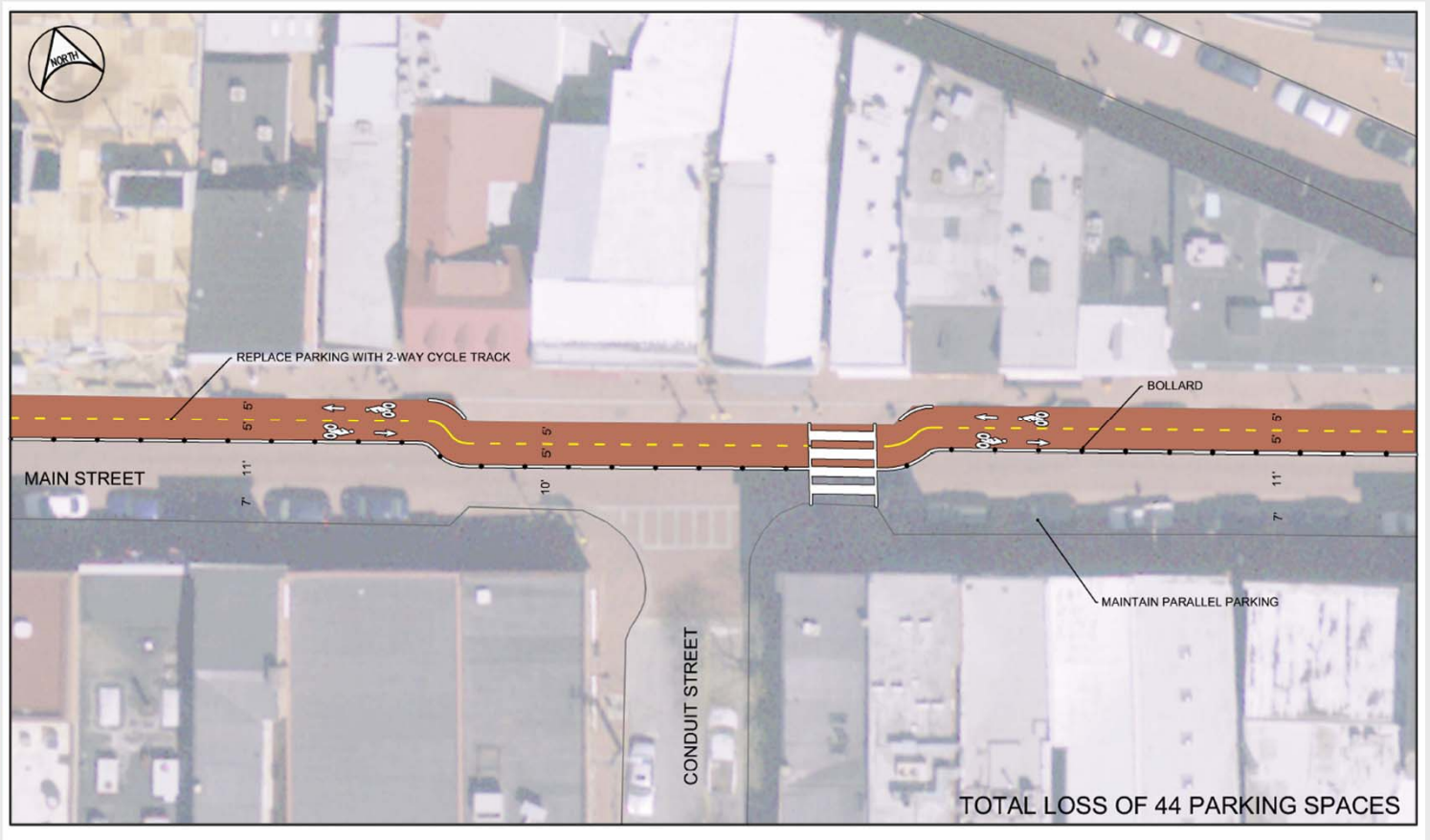

Compromise Street at St Mary's Pedestrian Improvement

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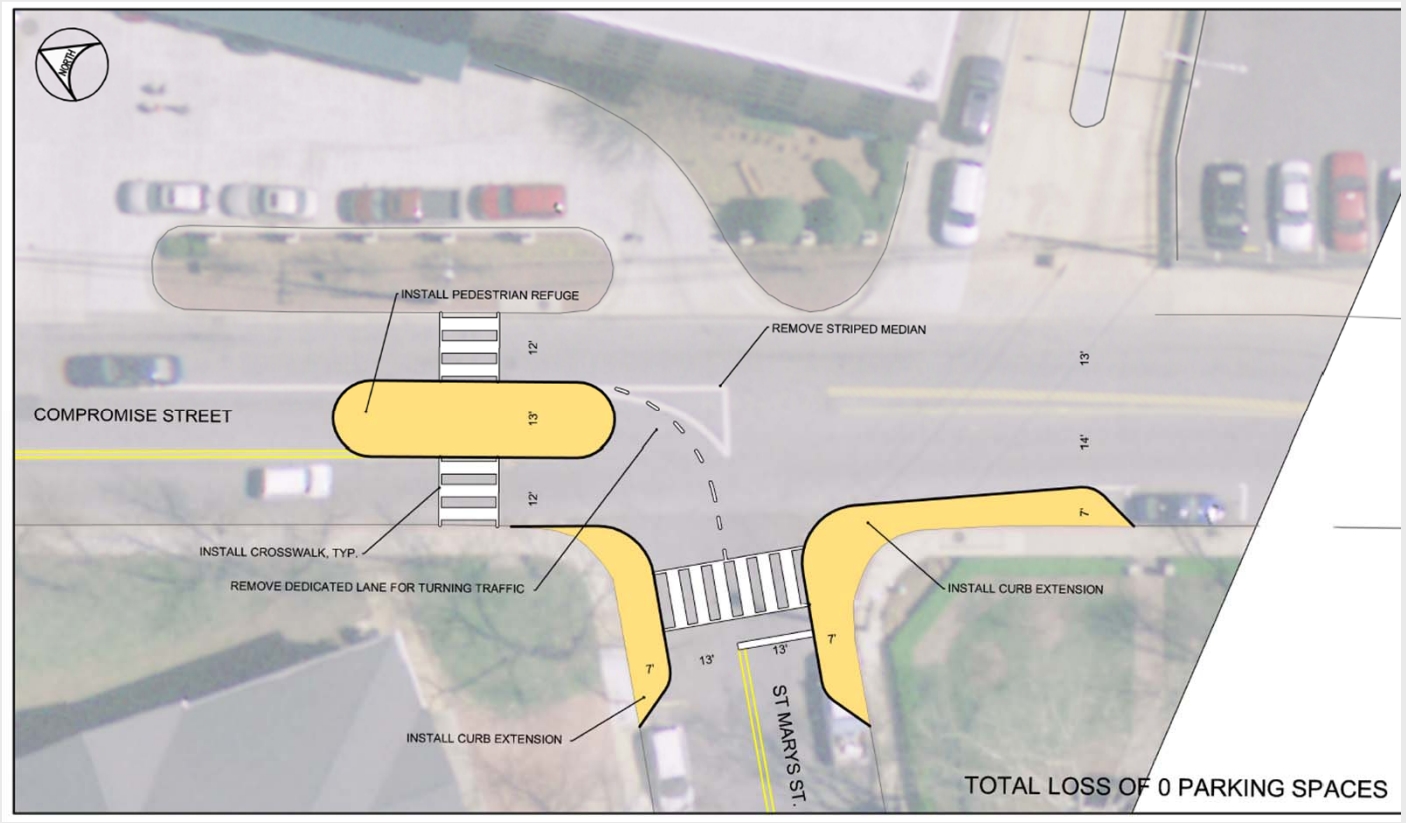

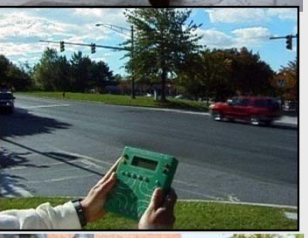

Bicycle, Automotive and Pedestrian Safety Study

Final Design and Further Study Issues

- Traffic Operations Analysis
- Parking Impacts
- Right-of-way
- Truck Compatibility (Turning Radius, Loading)
- Wayfinding
- Lighting/ Public Art
- Permitting/ Stormwater management
- Landscaping/ Streetscaping/ Bioretention
- Construction cost
- Construction sequencing

Questions & Answers

Thank You!