Tysons Corner Land Use Study

Prototypes and Networks Analysis

presented to

Tysons Corner Study Land Use Task Force

presented by

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Cambridge Systematics, Inc.

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Transportation leadership you can trust.

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Presentation Overview
What We Will Discuss

- Prototypes and Networks
- Analysis
- Findings
- Work Underway
- Observations
- Next Steps

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Presentation Overview
Where We Are Now

- In July, we completed an Initial Analysis
  - Saw benefits of improving Jobs/Housing ratio (Housing Emphasis)
  - Saw benefits of Grid
- …And we had questions
  - How do levels of congestion compare with other areas
  - What's the impact on surrounding areas
  - What's the benefit of increased multi-modal transportation investment

Presentation Overview
Where We Are Now

- Now, we have some Findings from a Prototypes and Networks Analysis
- For the Networks, that means…
  - Base Case – Consistent with existing plan
  - Network 1 – More roadway capacity enhancements
  - Network 2 – More transit, walk/bike enhancements
  - Both networks – More grid of streets
  - Both networks – Significant investments
- These are CONCEPTS for TESTING, not RECOMMENDATIONS

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Prototypes and Networks
Two Networks – Summary

	Network 1	Network 2
Metrorail extension and HOT lanes	●	●
Urban intersection improvements and traffic management	●	
Additional Ramps to Beltway and Dulles Toll Road	●	
Circulator on own lane/right-of-way		●
Emphasis on non-motorized travel and “complete streets”		●
More aggressive TDM and parking management		●
Operational elements to prevent cut through traffic	●	●

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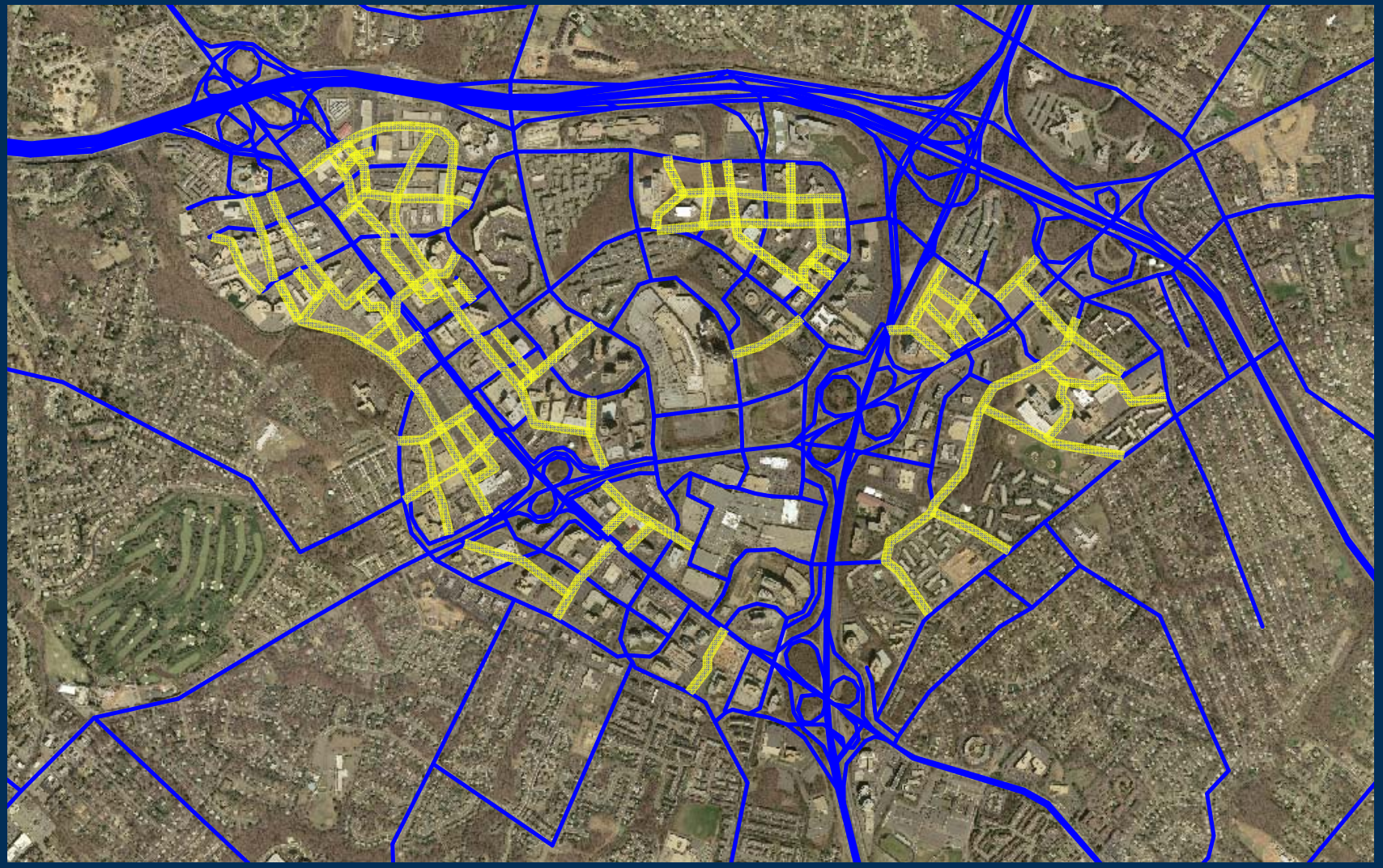
Prototypes and Networks
Network 1 – Grid of Streets



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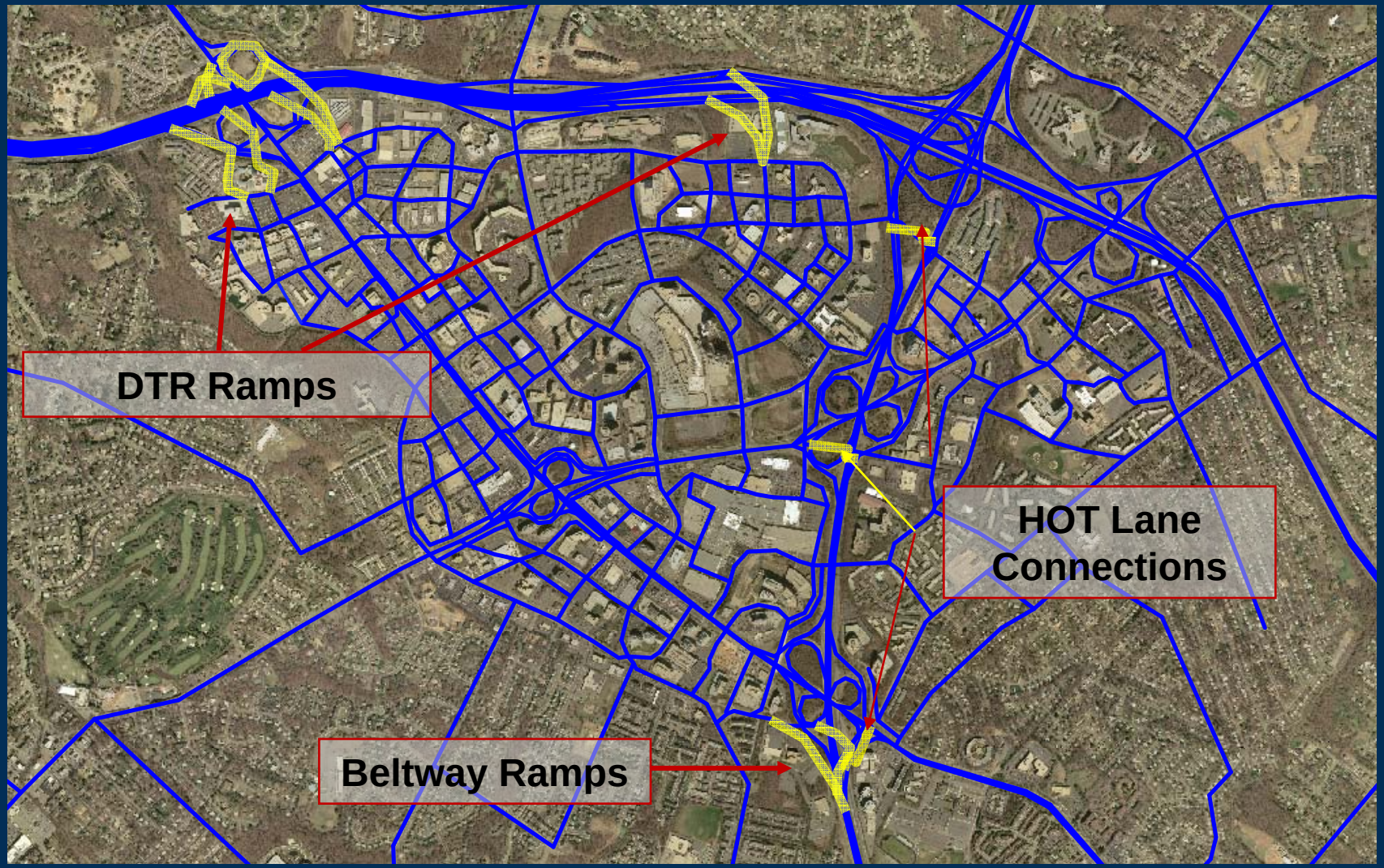
Prototypes and Networks
Network 1 – Ramps



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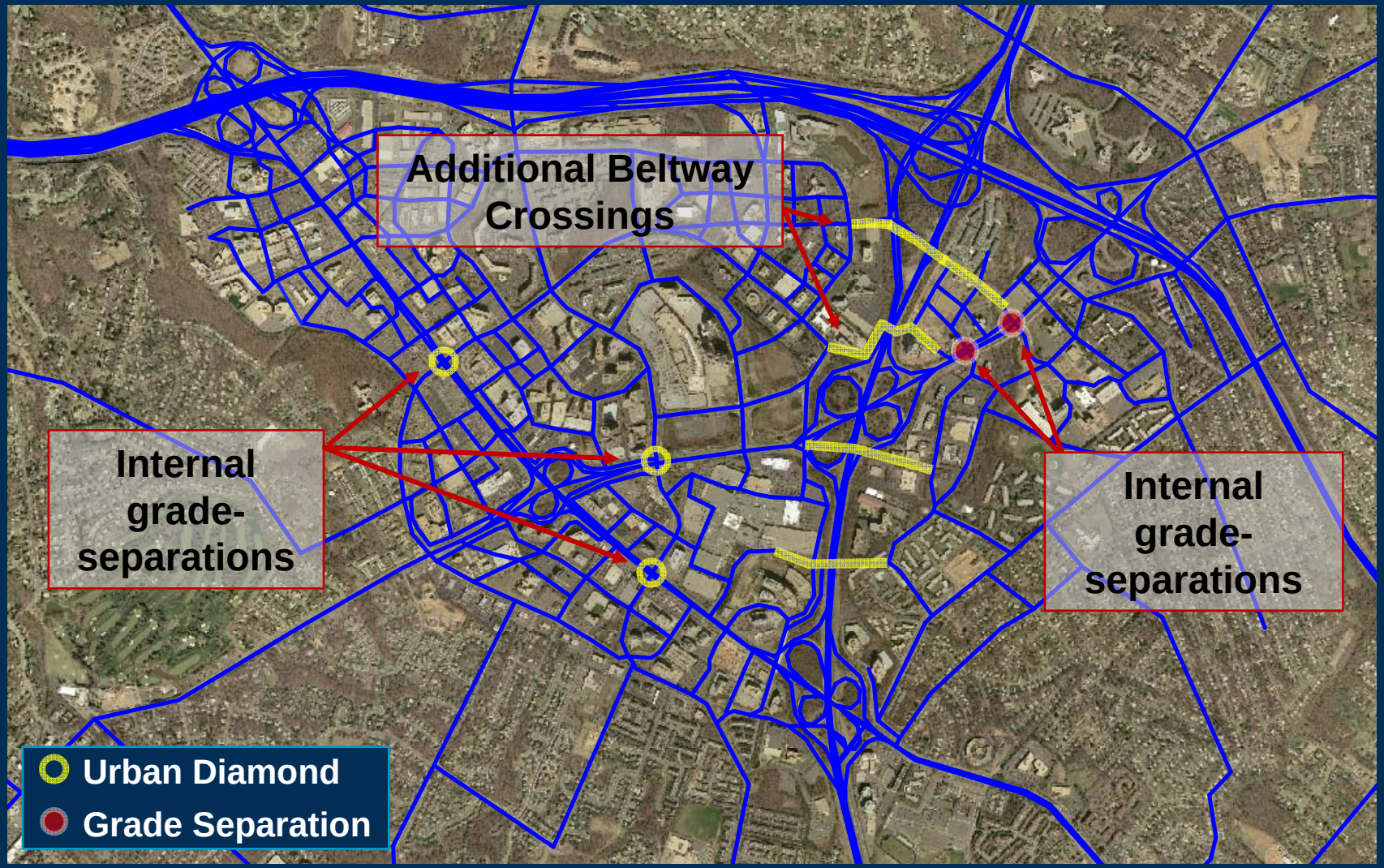
Prototypes and Networks
Network 1 – Crossings/Grade Separations



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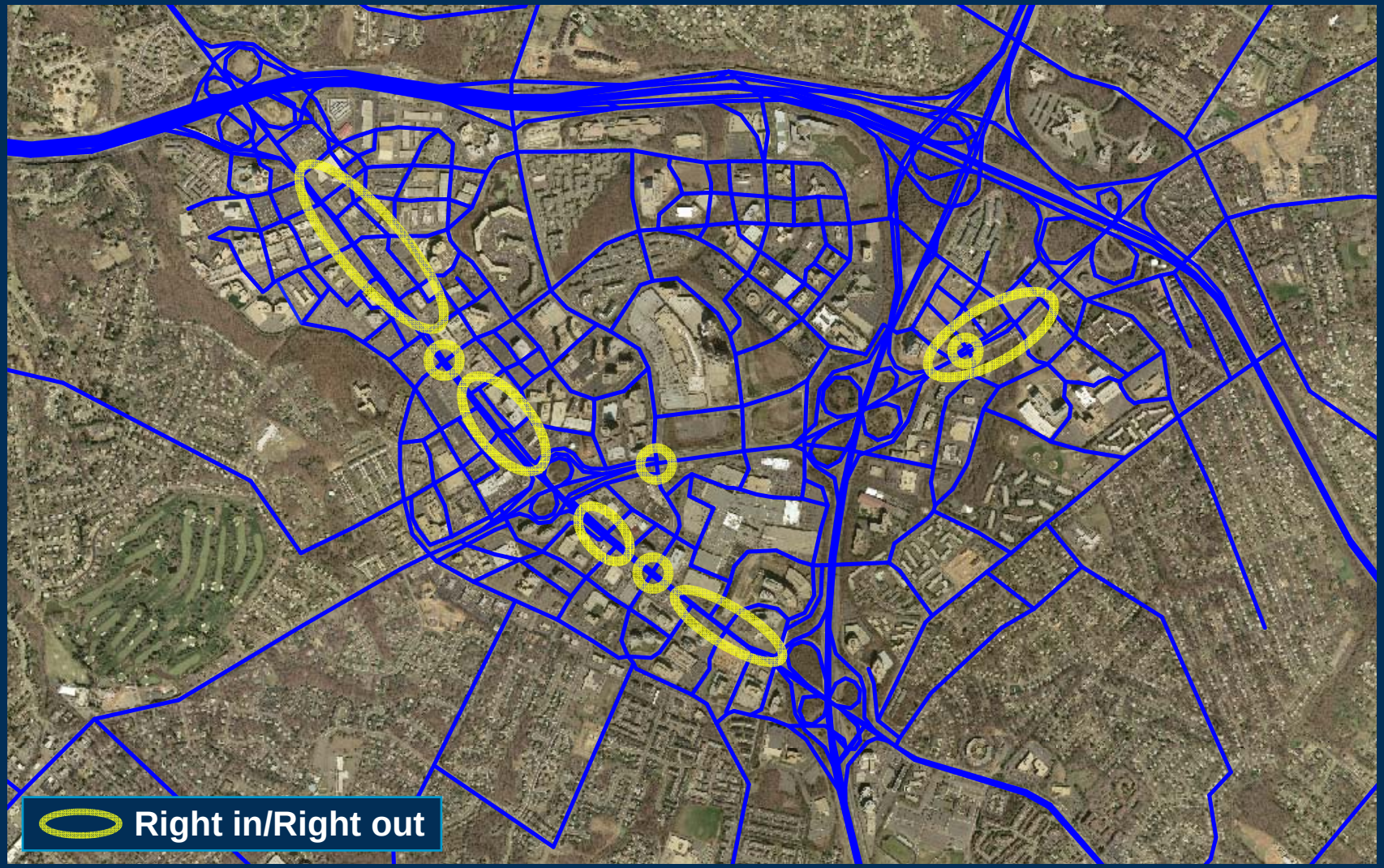
Prototypes and Networks
Network 1 – Intersection Operations



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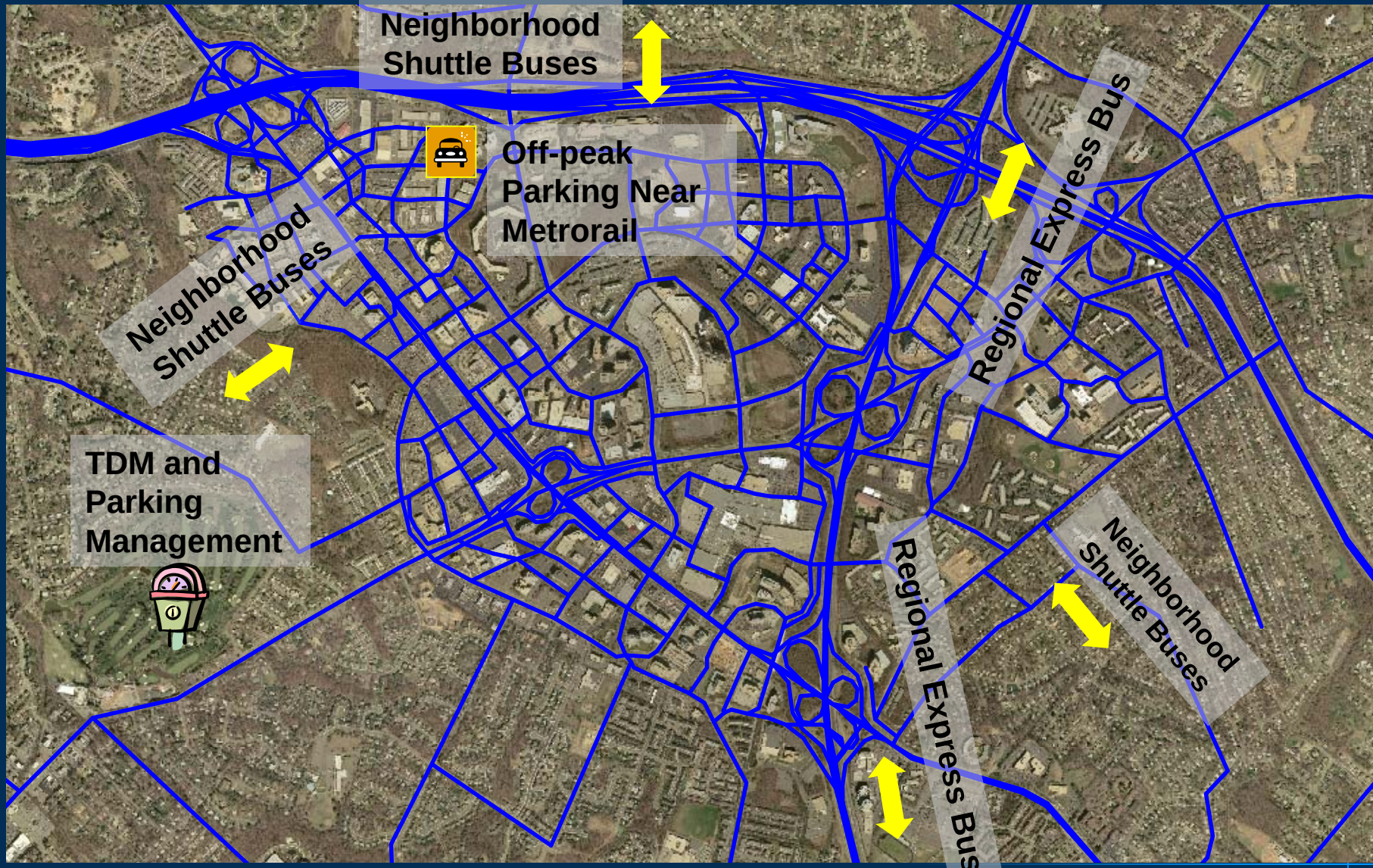
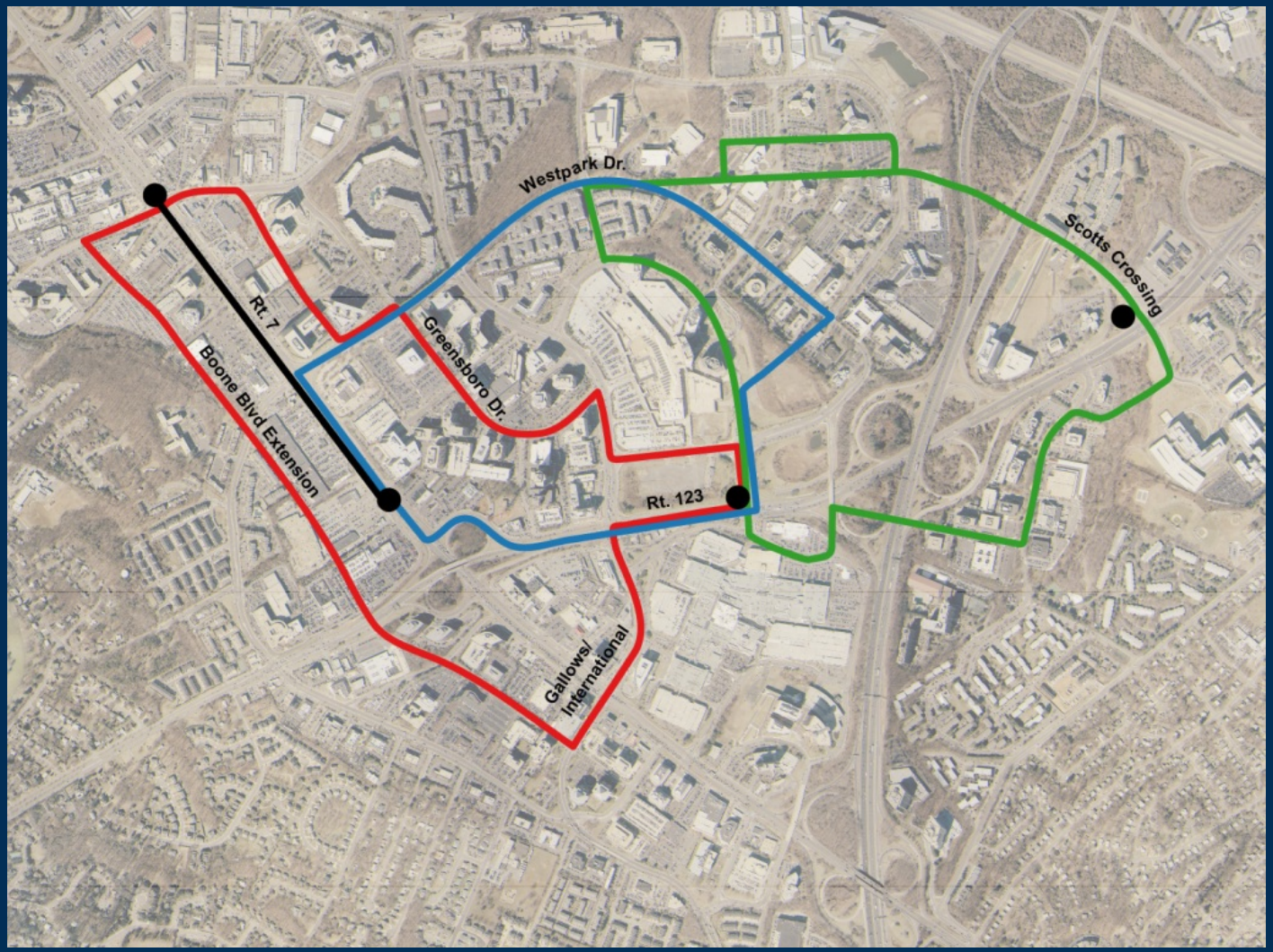
Prototypes and Networks
Network 1 – Transit



Prototypes and Networks
Network 1 – Transit Circulators (in Mixed Traffic)



(DRAFT CONCEPT FOR TESTING PURPOSES)

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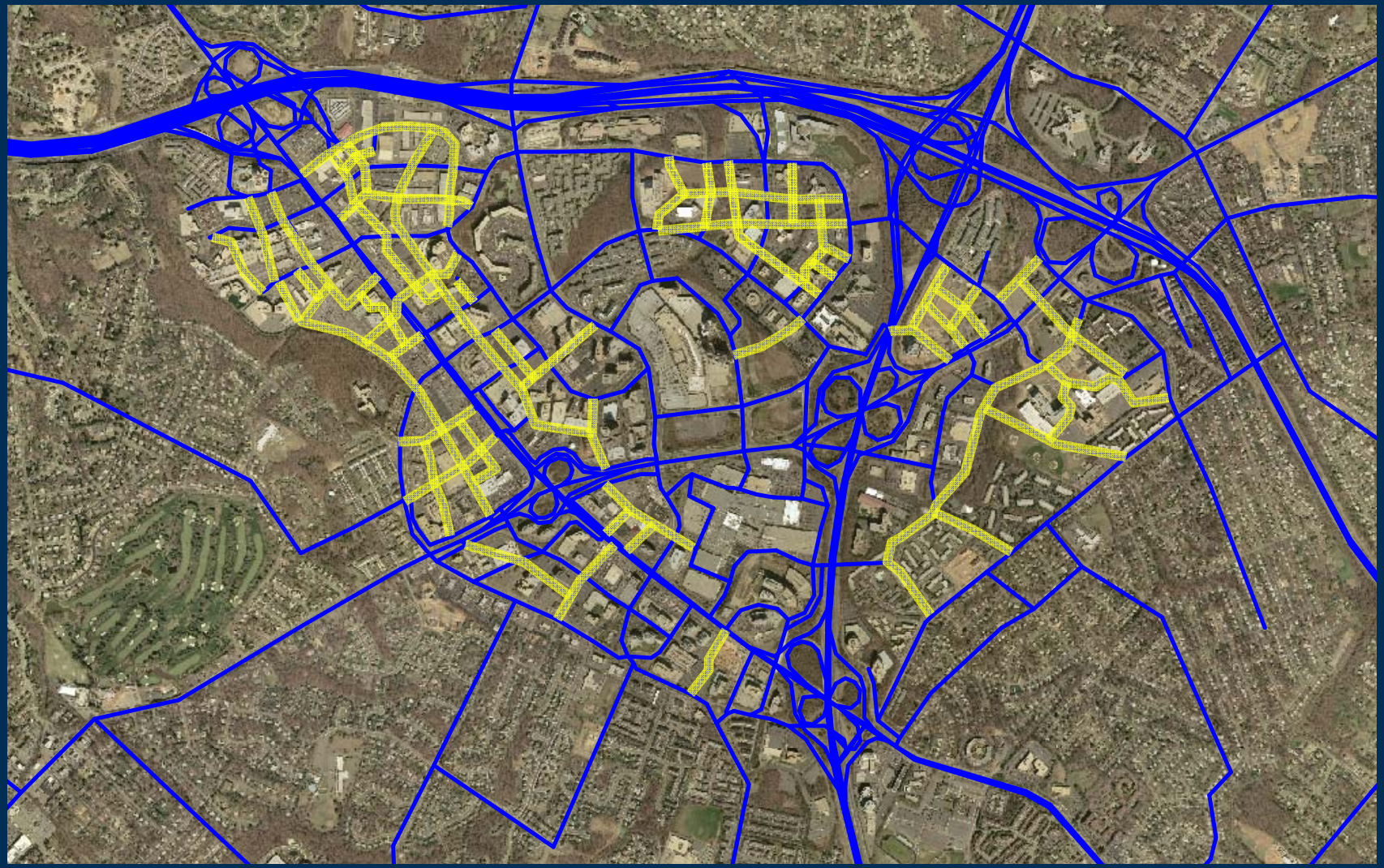
Prototypes and Networks
Network 2 – Grid of Streets



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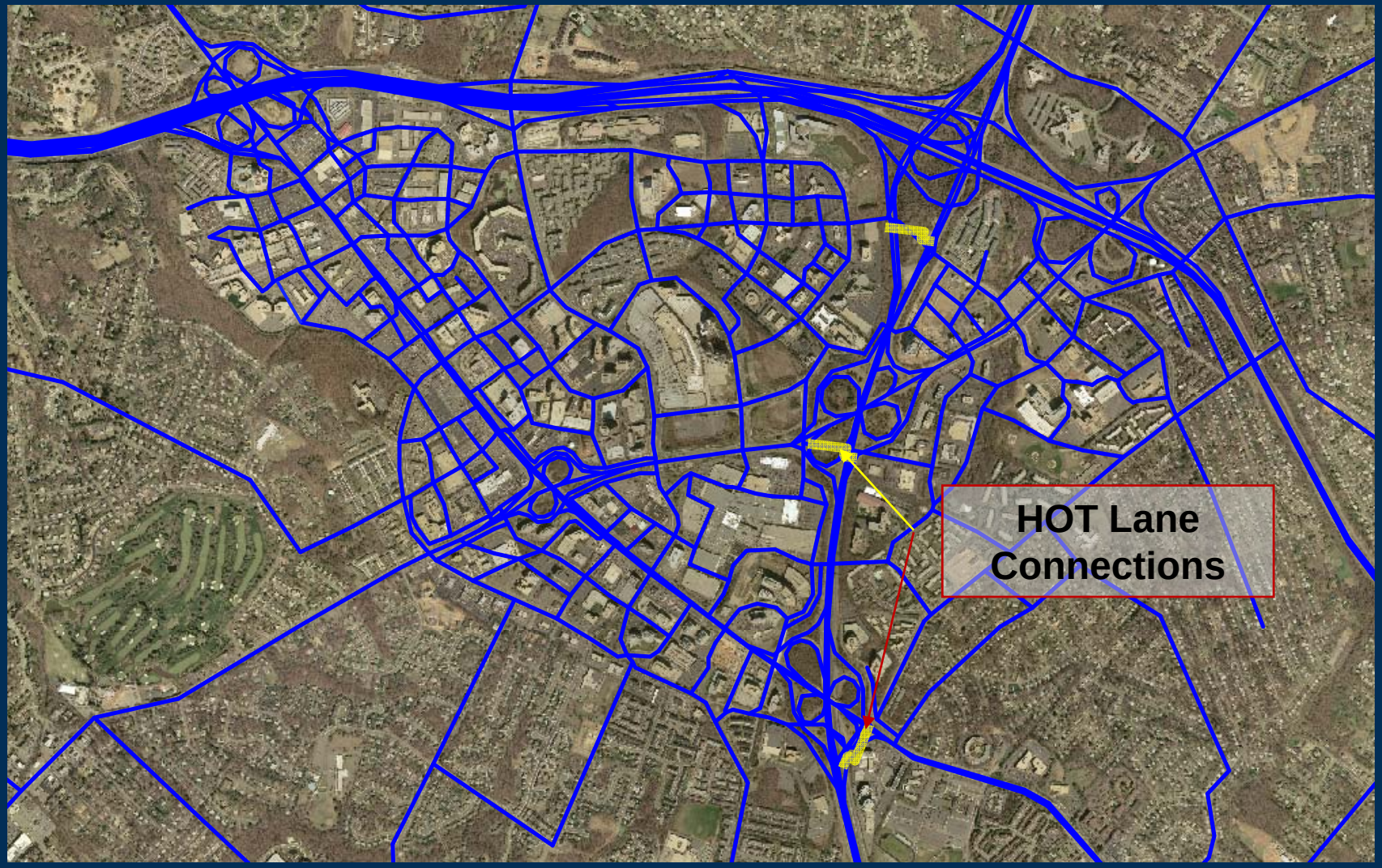
Prototypes and Networks
Network 2 – Ramps



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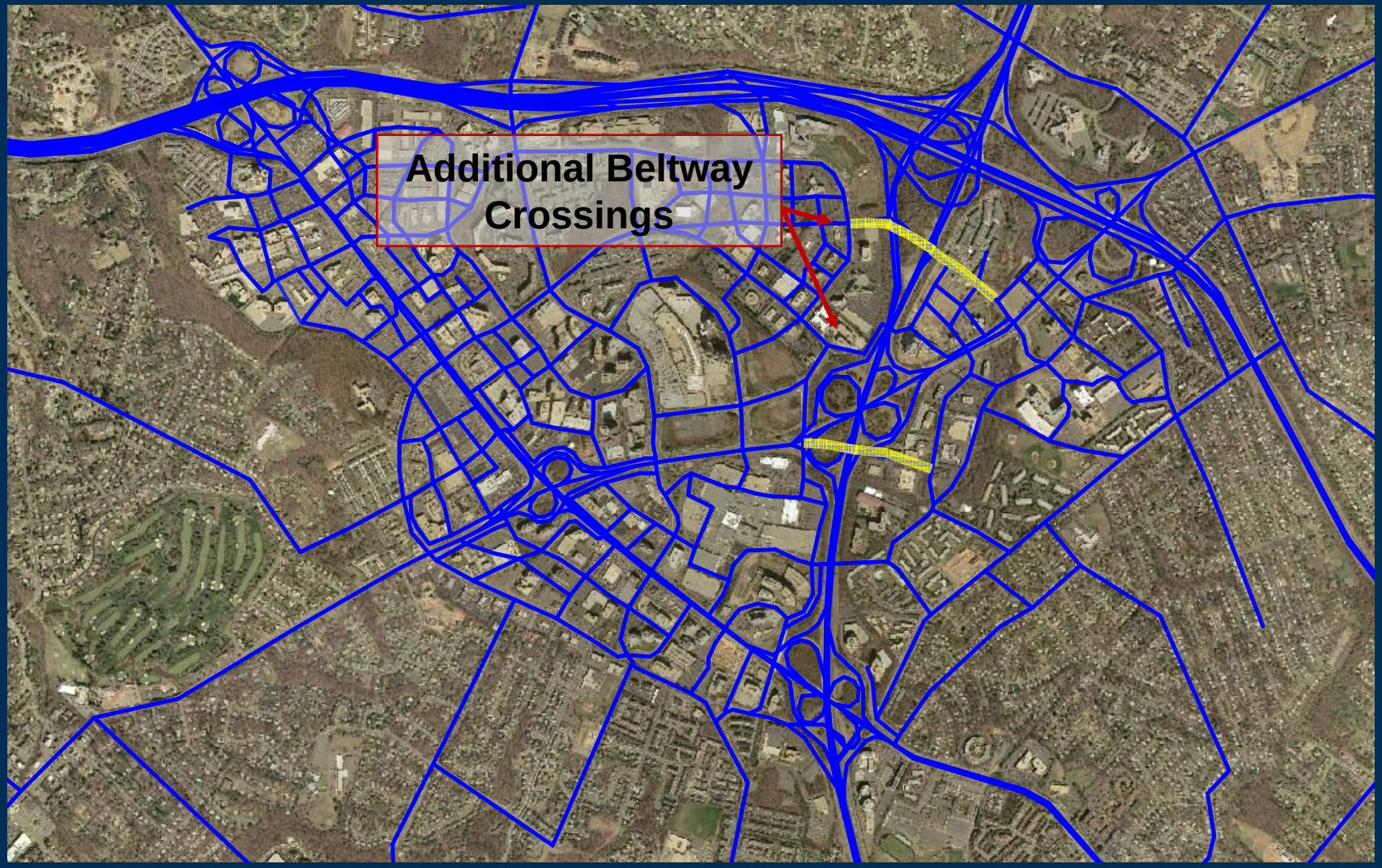
Prototypes and Networks
Network 2 – Crossings



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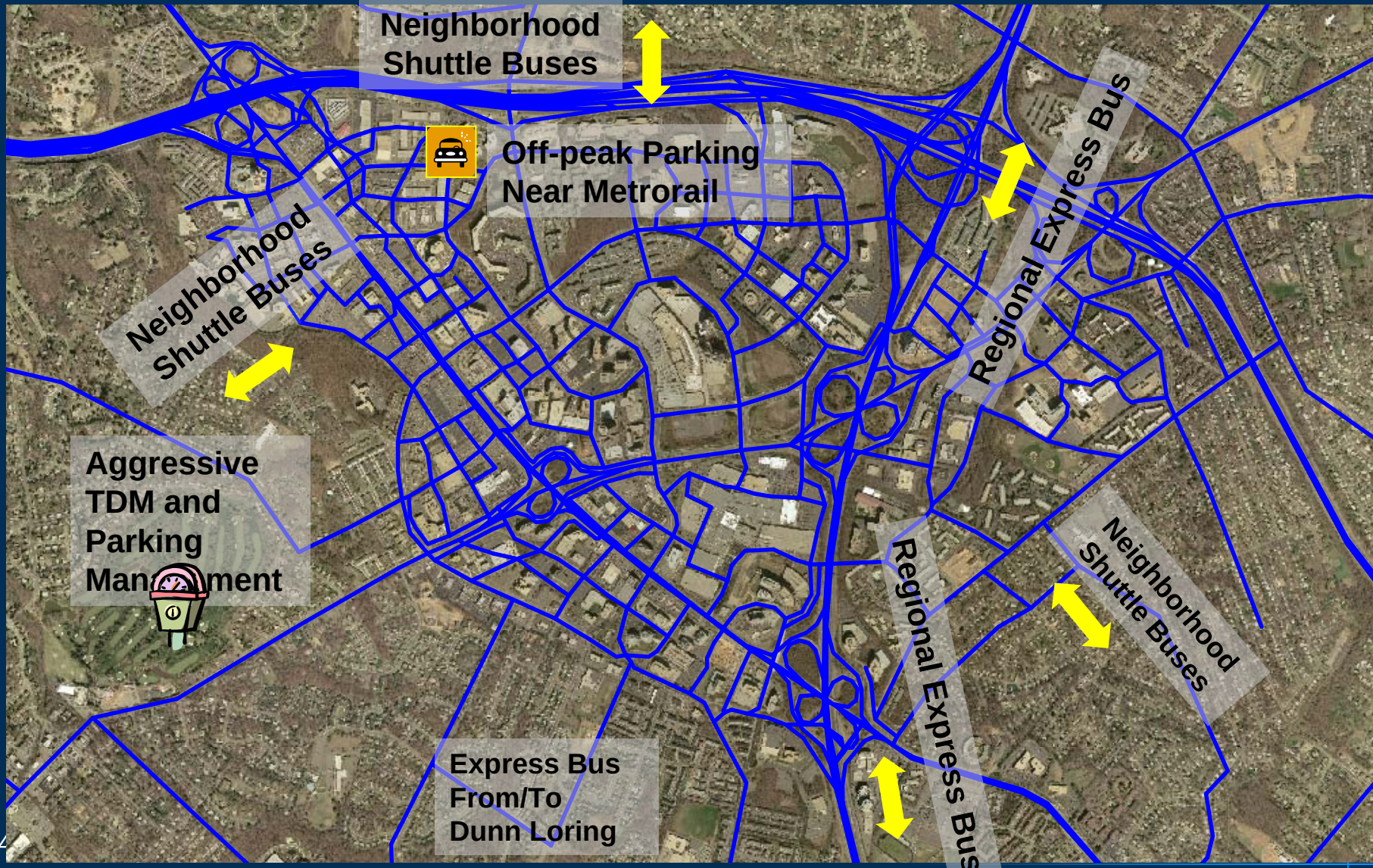
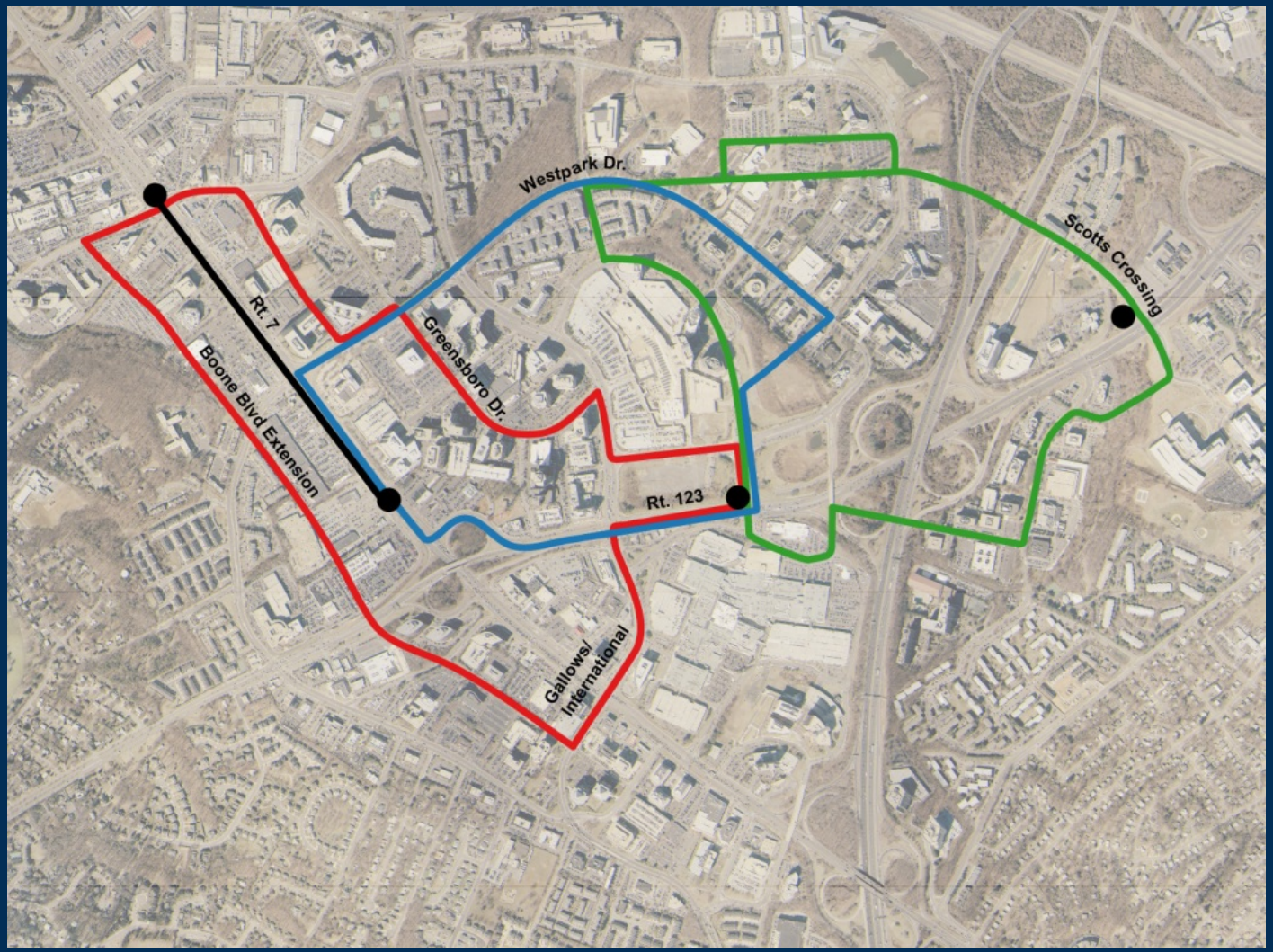
Prototypes and Networks
Network 2 – Transit



Prototypes and Networks
Network 2 – Transit Circulators (in Own Right-of-Way)



(DRAFT CONCEPT FOR TESTING PURPOSES)

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Prototypes and Networks
Households and Jobs

- **Relative to the Base…**
  - **Prototypes A and B have significantly improved Jobs to Housing ratios**
  - **Large increases in households (A - 123%, B – 202%)**
  - **Prototype B increases households significantly in the area served by the Circulators**

Prototypes and Networks
Households, Jobs, and J/H Ratio in Tysons

	HH	Jobs	J/H
2005	8,100	106,900	13.2
Base	16,300	161,500	9.9
A	36,300	159,000	4.4
B	50,000	202,800	4.1

HH = Households

J/H = Jobs to Housing Ratio

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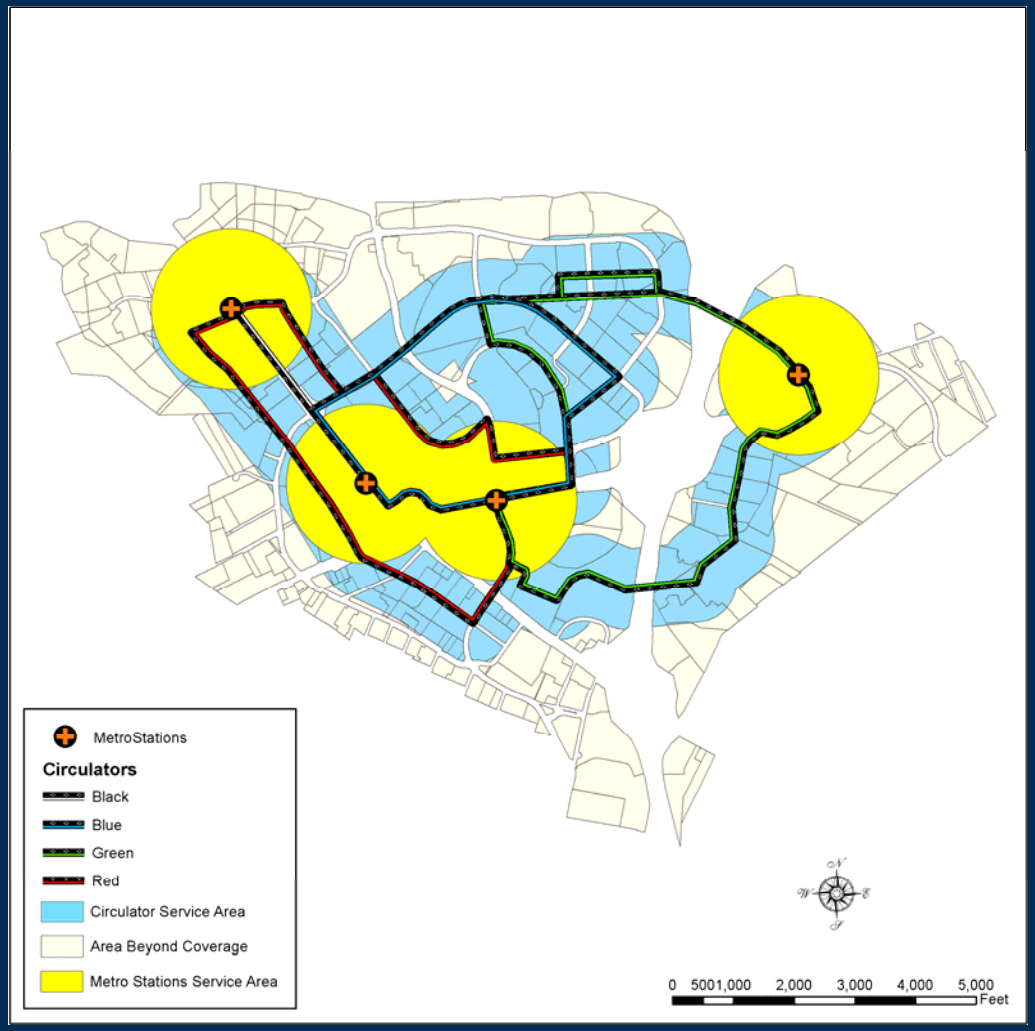
Prototypes and Networks
Analysis Geography



- Station Areas
  - Yellow
- Circulator Areas
  - Blue
- Other Area
  - Tan

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Prototypes and Networks
Base Land Use and Comparison with Base by Area

	Station Areas	Circulator Areas	Rest of Tysons	Total
	Households	Households	Households	Households
Base	7,500	5,900	2,900	16,300
A	+9,500	+6,200	+4,200	+19,900
B	+8,700	+17,500	+7,500	+33,700

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Prototypes and Networks
Base Land Use and Comparison with Base by Area

	Station Areas	Circulator Areas	Rest of Tysons	Total
	Jobs	Jobs	Jobs	Jobs
Base	60,300	65,100	36,100	163,000
A	+10,800	-9,300	-4,000	-2,500
B	+50,900	-6,700	-2,900	+41,300

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Analysis
Overview

- What's different about this analysis?
- Big picture findings
- Trip impacts
- Mobility impacts
- Community impacts (work underway!)

Analysis
What's Different about this Analysis?

- Predicted circulator impacts, and incorporated findings
- Analyzed micro-scale design impacts on walk/bike trips, and incorporated findings
- Estimated TDM impacts, and incorporated findings
- All these affect different types of trips and different geographies!

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Analysis Findings
The Big Picture

- **Relative to the Base…**
  - **Circulator, TDM and Grid increase transit, walk/bike trips substantially**
  - **Networks 1 and 2 provide mobility benefits, even with additional development**
  - **Impacts to regional transportation system and other community access points are being analyzed further**
- **Also**
  - **Transit share in station areas is significant**

Analysis Findings
The Big Picture

- **Relative to DC Core and Arlington Core…**
  - **Networks 1 and 2 appear to have lower levels of congestion overall**

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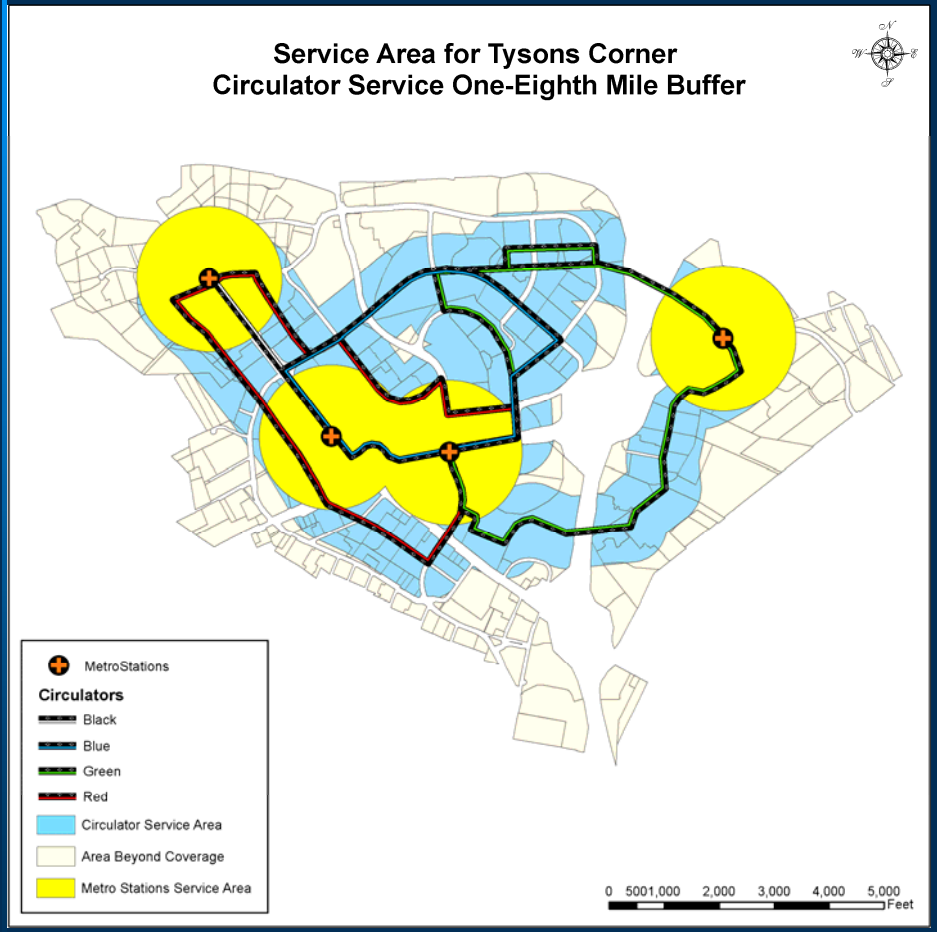
Analysis Findings
Circulator Analysis



- **A/1 Prototype/Network**
  - 19% of households, 20% of jobs w/in easy walk
  - Runs in mixed traffic
- **B/2 Prototype/Network**
  - 35% of households, 24% of jobs w/in easy walk
  - Moves on own right of way
  - Part of Tysons identity

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Analysis Findings
Circulator Analysis

- Analysis estimates additional transit captured
- Retail and other non-work trips targeted
- A/1: 6% daily additional transit capture
- B/2: 14% daily additional transit capture

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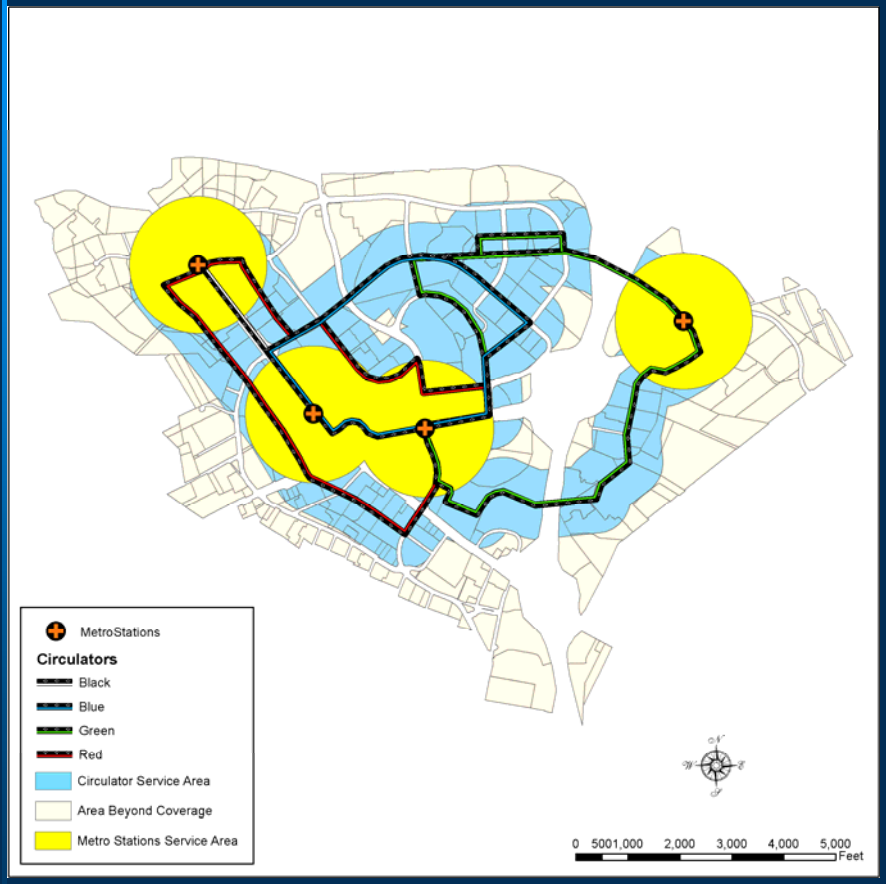
Analysis Findings
TDM Analysis

- **Expansion of Transportation Demand Management Program**
  - **Mandatory for new development**
  - **Transit coordinators**
  - **Carpool/Vanpool incentives**
  - **Transit subsidy**
  - **Guaranteed Ride Home**
  - **Parking management**
  - **Transit station – highest application of programs**

Analysis Findings
TDM Analysis (Trip Reductions)



- **Prototype A**
  - Station Areas - 11.4%
  - Circulator Areas – 4.4%
  - Other Tysons – 1.2%
- **Prototype B**
  - Station Areas – 10.4%
  - Circulator Areas – 4.5%
  - Other Tysons – 1.3%

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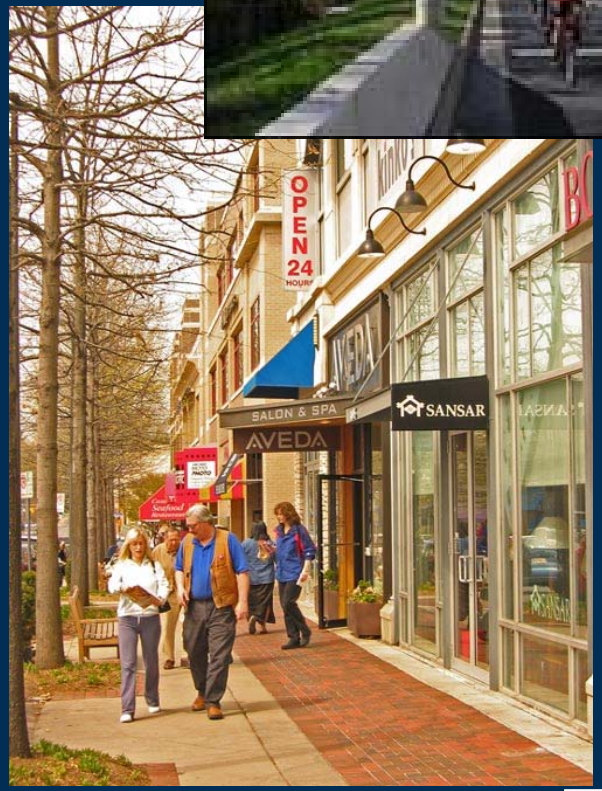
Analysis Findings
Urban Design Analysis

- Density
- Diversity
  - Greater mix improves opportunities for shorter travel
- Destinations
  - Greater access to region can reduce trip lengths
- Design
  - Network density
  - Sidewalk completeness
  - Route directness



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Analysis Findings
Trip Reduction Potential – Urban Design

Prototype/ Network	Station Areas	Circulator Area	Other
A/1	7%	6%	2%
B/2	8%	10%	5%

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Analysis Findings
Daily Work Trips From and To Residences

	Base	A	B
Total	34,800	72,200	99,300
Transit Share	25%	37% (29%)	36% (29%)
SOV Share	69%	58% (65%)	59% (65%)

(%) = Share BEFORE TDM, Circulator, Four Ds

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Analysis Findings
Daily Work Trips From and To Non-Residential Uses

	Base	A	B
Total	180,400	186,700	222,300
Transit Share	19%	29% (23%)	31% (24%)
SOV Share	72%	60% (66%)	59% (64%)

(%) = Share BEFORE TDM, Circulator, Four Ds

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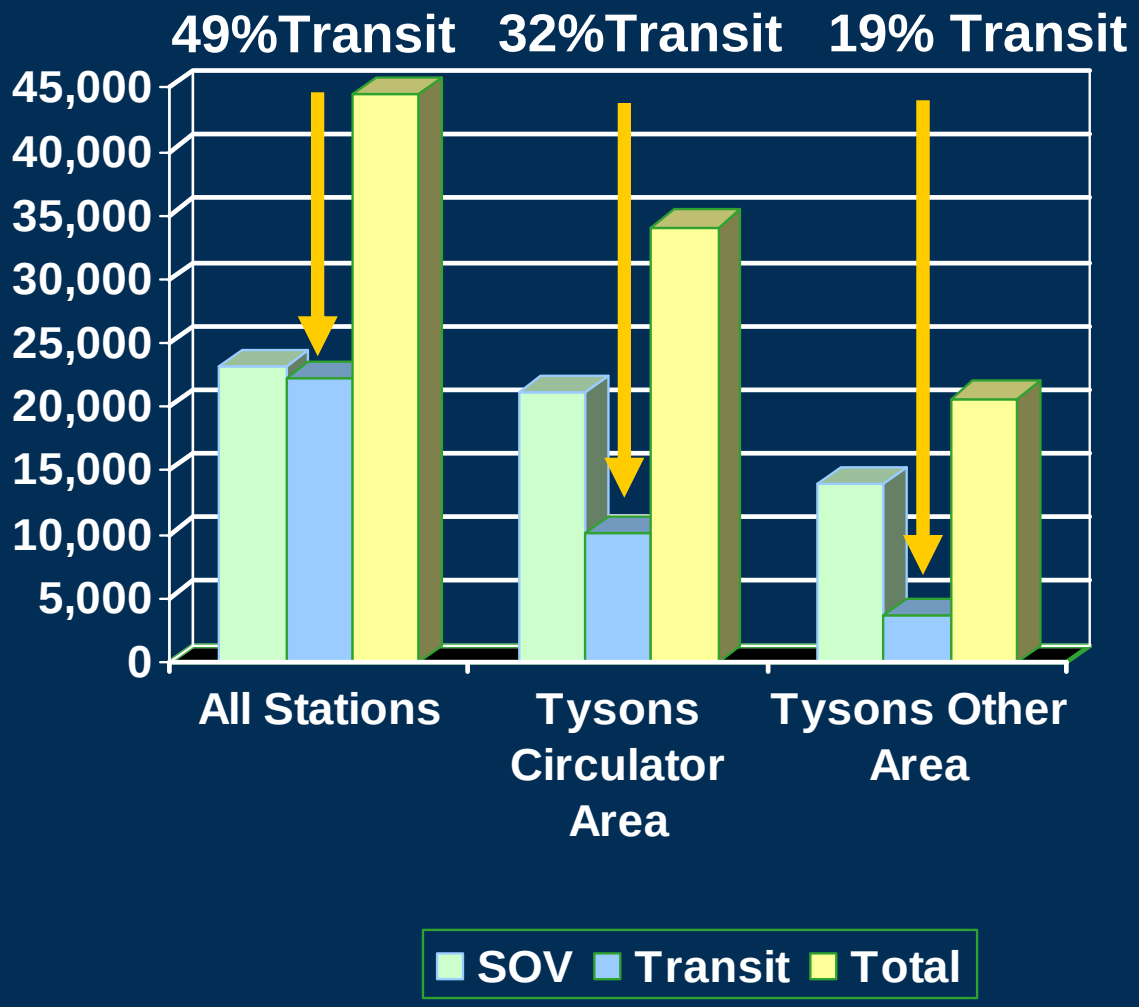
Analysis Findings (B/2)
Daily Work Trips From and To Residences



- Transit very competitive in station areas
- … and has a significant impact in circulator areas as well

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Analysis Findings
Percentage of Travel in Highly Congested Conditions

	2005	Base	A		B	
			A/1	A/2	B/1	B/2
AM	33%	40%	19%	20%	26%	26%
PM	48%	54%	42%	41%	44%	43%
Daily	27%	32%	22%	22%	24%	25%

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Analysis Findings
Percentage of Travel in Highly Congested Conditions (Comparison with Other Areas)

	DC Core	Arlington Core	A		B	
			A/1	A/2	B/1	B/2
AM	40%	45%	19%	20%	26%	26%
PM	54%	25%	42%	41%	44%	43%
Daily	38%	45%	22%	22%	24%	25%

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Work Underway
Community Impact Analysis

- For all scenarios, highest congestion levels appear to be at VA 7 and VA 123 cutlines

- **Baseline**
  - Has highest average congestion
  - 8 locations at mid-high congestion levels
- **A/1 - 8 locations at mid-high congestion levels**
- **A/2,B/1,B/2**
  - 7 locations at mid-high congestion levels

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Observations

- Network 1 and 2 – Compared to Base
  - Produce lower levels congestion
- Network 1 –
  - Appears to lower congestion levels
  - Reduces VA 7 congestion
- Network 2 –
  - Produces better conditions for non-motorized travel

Observations

- Grid's effectiveness is confirmed
- Circulator is an important component of transportation services and identity
- Ramps appear to be critical constraint
- Gateways need to be evaluated further

Next Steps

- Complete Measure of Effectiveness analysis
- Complete community impact analysis
- Complete analysis of costs
- Draft report and recommendations