

Tyson's Circulator Study: Process and Preliminary Results Summary

March 2012

Background:

1. The Comprehensive Plan for the Tysons Corner Urban Center calls for a System of Circulators in Tysons Corner to:
 - A. Provide quick and convenient access for Metrorail passengers to and from locations within Tysons but beyond walking distance from the Metrorail Stations, and
 - B. To provide a quick and convenient way to travel within Tysons.
2. To support this and many other goals outlined in the Comprehensive Plan, the Board of Supervisors adopted a list of 17 follow-on motions along with the adoption of the plan. Follow-on motion 11 specifically pertains to the Circulator Study and directs staff to “issue an RFP for the circulator study” and to “bring the results of that study to a future Board Transportation Committee Meeting for discussion”.
3. An RFP for the Circulator Study was issued in December of 2010 and the contract was awarded to a team lead by AECOM in March of 2011.

Steps Completed:

1. Developed Goals and Objectives for the study
2. Network Development Process
3. Network Evaluation Process - Detailed Evaluation

Goals and Objectives

- Goal 1: The Circulator will support the comprehensive plan vision to transform Tysons into a walkable transit oriented urban environment.
- Goal 2: The Circulator will provide high quality transit that will contribute to a reduction in auto dependence and an increase in the transit share of total trips.
- Goal 3: The Circulator will support a multimodal transportation network within Tysons and provide a convenient link to the regional network.
- Goal 4: The Circulator will be constructed and operated in a cost effective manner.

Goals and Objectives

Goal 1: The Circulator will support the comprehensive plan vision to transform Tysons into a walkable transit oriented urban environment.

Objectives:

- 1.1 Develop a system that is sensitive to and incorporates the urban design principles and elements provided in the comprehensive plan for all aspects of the Circulator.
- 1.2 Develop a system that enhances walkability in Tysons by reducing the dominance of auto travel, while not hindering pedestrian movements.
- 1.3 Develop a system that supports the land use goals outlined in the comprehensive plan.

Goals and Objectives

Goal 2: The Circulator will provide high quality transit that will contribute to a reduction in auto dependence and an increase in the transit share of total trips.

Objectives:

- 2.1 Provide efficient, reliable, fast, and high-frequency service that is competitive with automobile travel.
- 2.2 Provide dedicated transit right-of-way if required and appropriate.
- 2.3 Utilize a mix of modes as appropriate.
- 2.4 Attract new transit riders and increase transit mode share for commuters and internal trips within Tysons.
- 2.5 Provide convenient access to a variety of high trip generating destinations to serve commuters as well as workers and residents.
- 2.6 Provide coverage to serve the most important destinations in Tysons while maintaining service efficiency and directness of travel.

Goals and Objectives

Goal 3: The Circulator will support a multimodal transportation network within Tysons and provide a convenient link to the regional network.

Objectives:

- 3.1 Provide simple, convenient, and coordinated connections with Metrorail, HOT lanes, BRT/Express bus service, and local bus service.
- 3.2 Develop a system that allows for phased implementation of routes and modes that works within the transportation and development context of Tysons.
- 3.3 Provide a system that ensures the safety and security of the passengers as well as pedestrians, bicyclists, and automobile users.

Goals and Objectives

Goal 4: The Circulator will be constructed and operated in a cost effective manner.

Objectives:

- 4.1 Maximize ridership and return on capital investment by taking into consideration all capital costs in the determination of initial and final mode.
- 4.2 Achieve a high operating performance for interim and final Circulator mode(s) and route(s) by taking into consideration all operating costs associated with different options.
- 4.3 Provide service at a fare that balances the need for financial sustainability with other project objectives.

Network Development Process

- Developed five preliminary networks utilizing Circulator Planning Objectives and Route Design Principles as development framework:
 - Design based on 2050 forecasted conditions
 - Networks were built up based on individual circulator routes that were combined into networks
 - Planning Objectives Utilized in Route Design
 - Route Design Principles
 - Preliminary Networks Developed

Network Development Process (cont.)

- Planning Objectives Utilized in Route Design :
 - Provide efficient, reliable, and high frequency service that is competitive with automobile travel.
 - Attract new transit riders and increase use of transit for commuters and internal trips within Tysons .
 - Provide convenient access to a variety of high trip generating destinations to service commuters and internal trips.
 - Provide coverage to serve the most important destinations in Tysons, while maintaining service efficiency and directness of travel.
 - Provide simple, convenient, and coordinated connections with Metrorail, HOT lanes, BRT/Express bus service, and local bus service.

Network Development Process (cont.)

- Route Design Principles:
 - Keep the system as easy to understand as possible
 - Maintain consistent routing at all times throughout the day
 - Minimize total number of routes in the Circulator system
 - Find optimal balance between route directness and coverage
 - Minimize duplication of Circulator route mileage
 - Minimize use of busiest through roadways
(preferably by use of Avenues and Collectors)
 - Utilize both existing and future roadways

Network Development Process (cont.)

- 5 Preliminary Networks Developed – Two Moved Forward for More Detailed Evaluation:
 - **Network #1:** Three route network
 - Routes complement each other with each playing a distinct purpose
 - **Network #2:** Four route network
 - Designed with a route focus on Tysons Central
 - **Network #3:** Four route network:
 - Comparable to Network #1, but with the addition of a loop route to connect Jones Branch corridor to Tysons Central area
 - **Network #4:** Two route network
 - Attempts to provide as much coverage as possible with two routes – focus is on those areas beyond a short walk from Silver Line stations and not on internal trips
 - **Network #5:** Five route network
 - Comparable to Network #2, but with two routes replacing the West Loop to increase directness and replace potential passenger confusion resulting from a loop service.

Network Development Process (cont.)

- Preliminary networks evaluated based on evaluation framework utilizing available data (2050 conditions):
 - Evaluation Framework:
 - Trip productions within $\frac{1}{4}$ mile of network
 - System coverage of productions
 - Productions per mile of network
 - Trip attractions within $\frac{1}{4}$ mile of network
 - System coverage of attractions
 - Attractions per mile of network
 - Two networks selected for more detailed evaluation based on above factors
- **Productions are trips generated by residential uses within Tysons Corner.**
- **Attractions are trips generated by non-residential uses within Tysons Corner.**

Network Development Framework: Preliminary Evaluation Results

Criterion	Network #1	Network #2	Network #3	Network #4	Network #5
Productions within ¼ mile of network	391,600	409,100	392,750	361,100	404,300
System coverage of productions	90%	94%	90%	83%	92%
Productions per mile of network	45,500	39,900	34,700	53,700	37,300
Attractions within ¼ mile of network	587,800	605,300	591,300	538,800	605,300
System coverage of attractions	92%	95%	92%	84%	95%
Attractions per mile of network	68,300	59,000	52,200	80,200	55,800
Total System One-way mileage	8.60	10.25	11.32	6.72	10.84

Planned Neighborhood Bus Service Beyond the Circulator

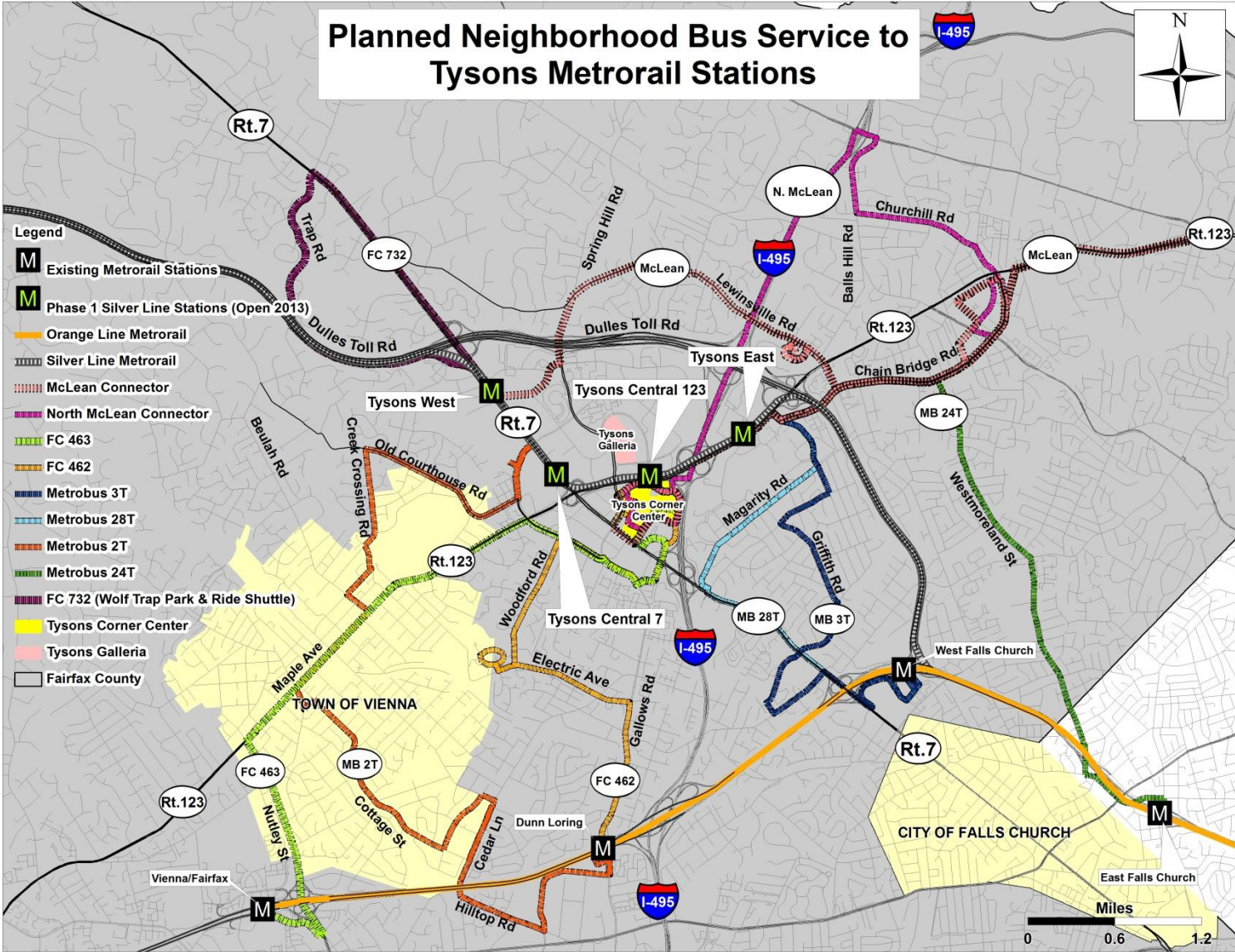
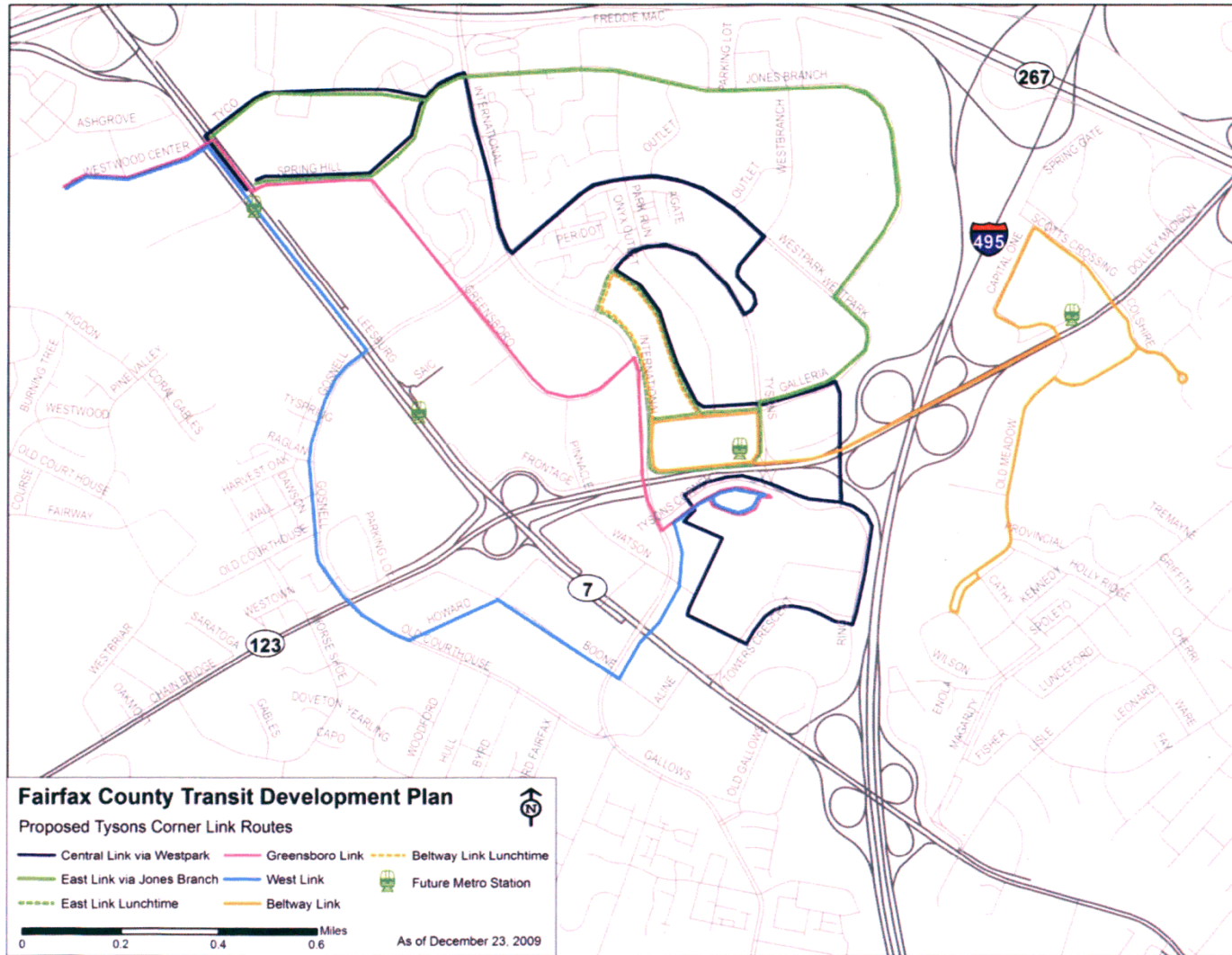
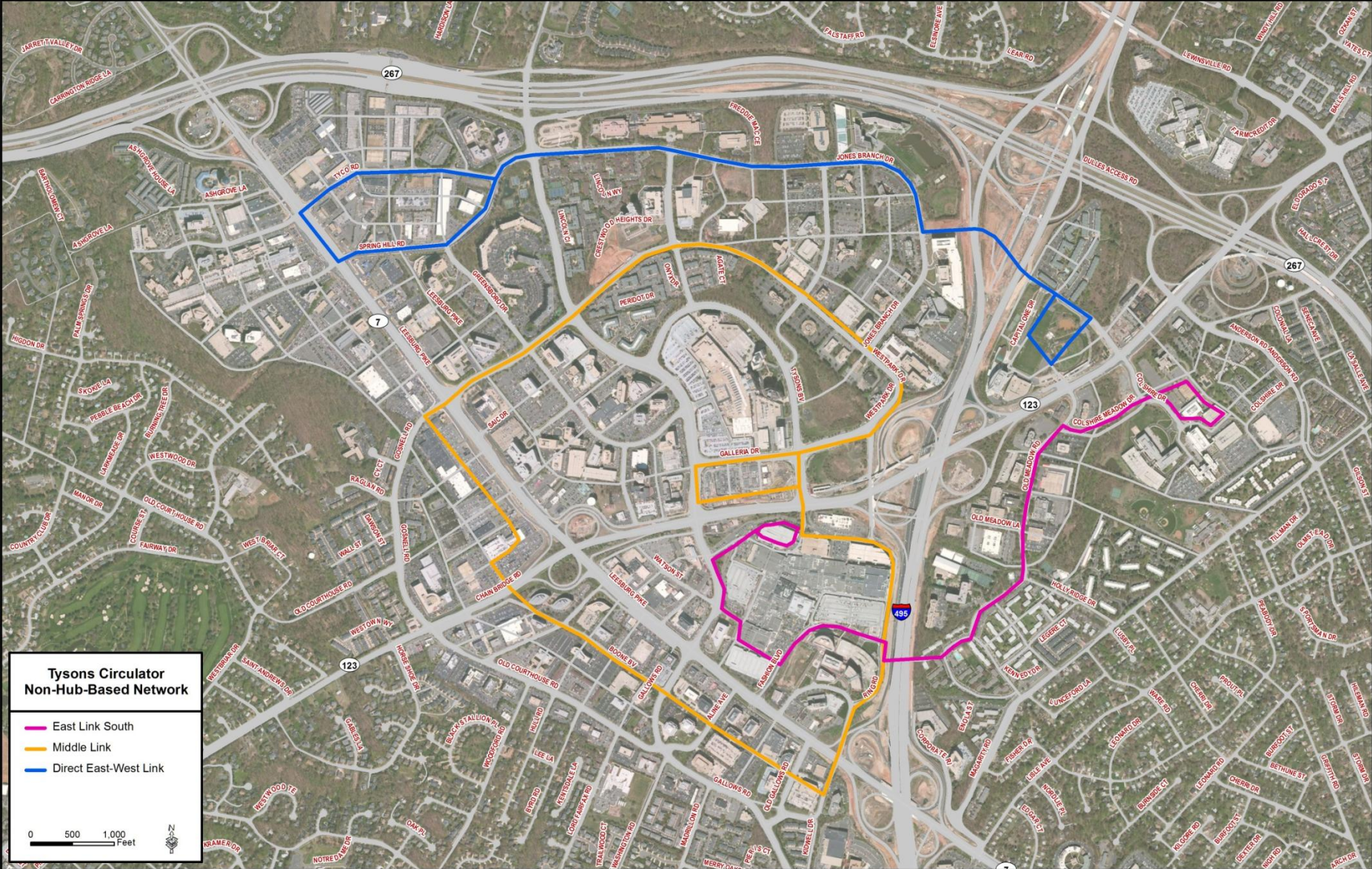


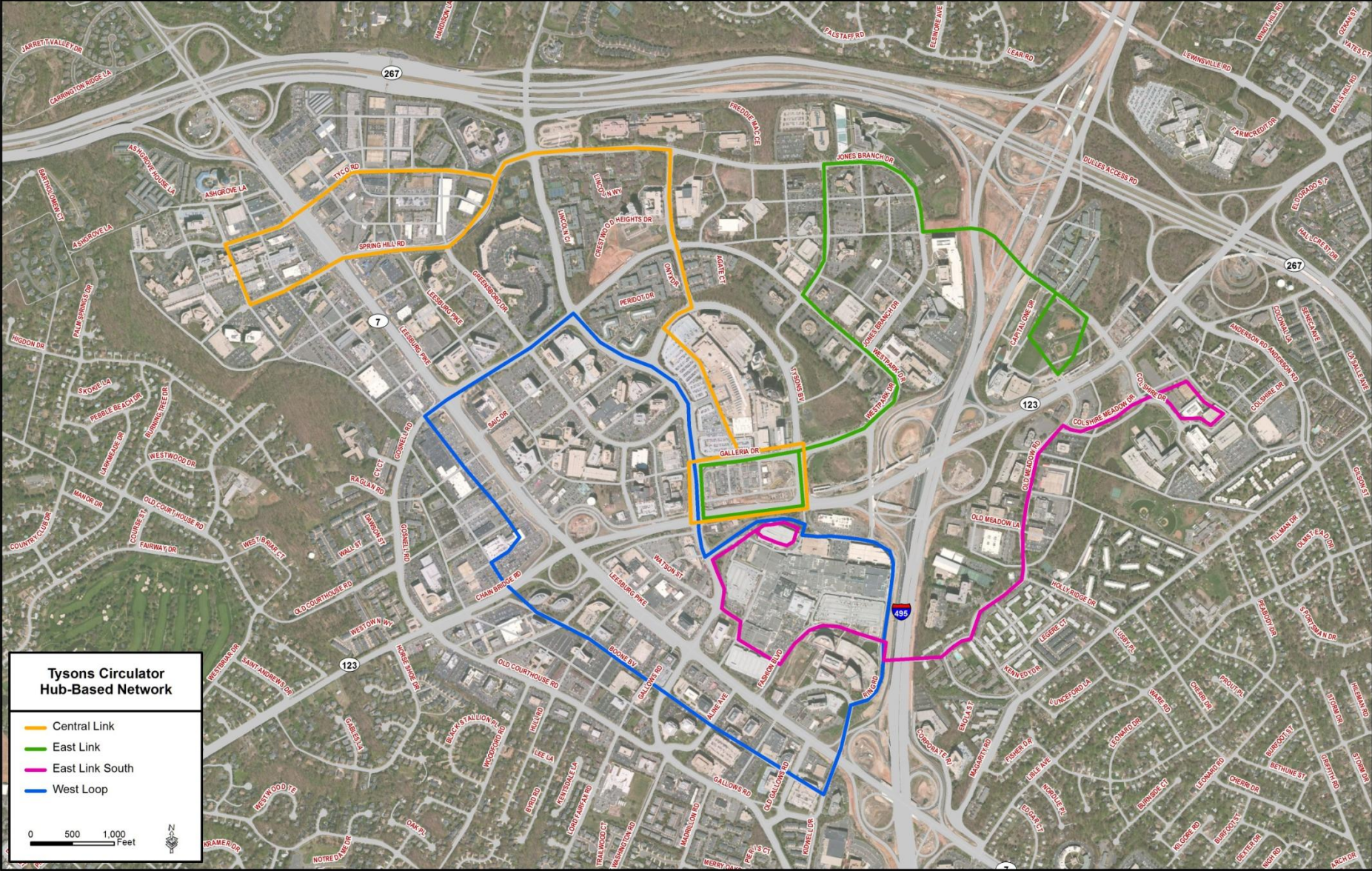
Figure 7.21: Proposed Tysons Link Routes (Zoom View)



Network #1: Three Route Network

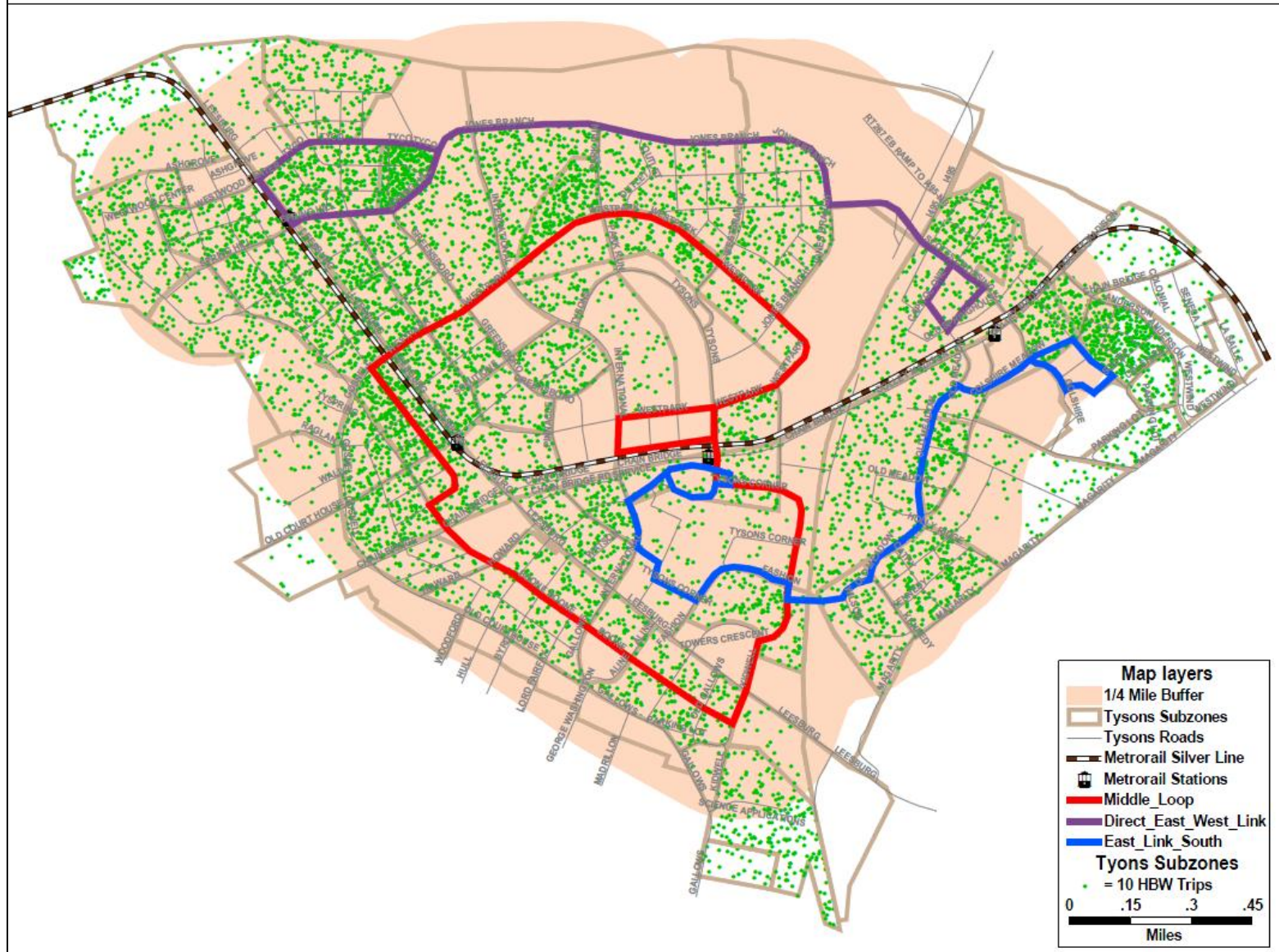


Network #2: Four Route Network



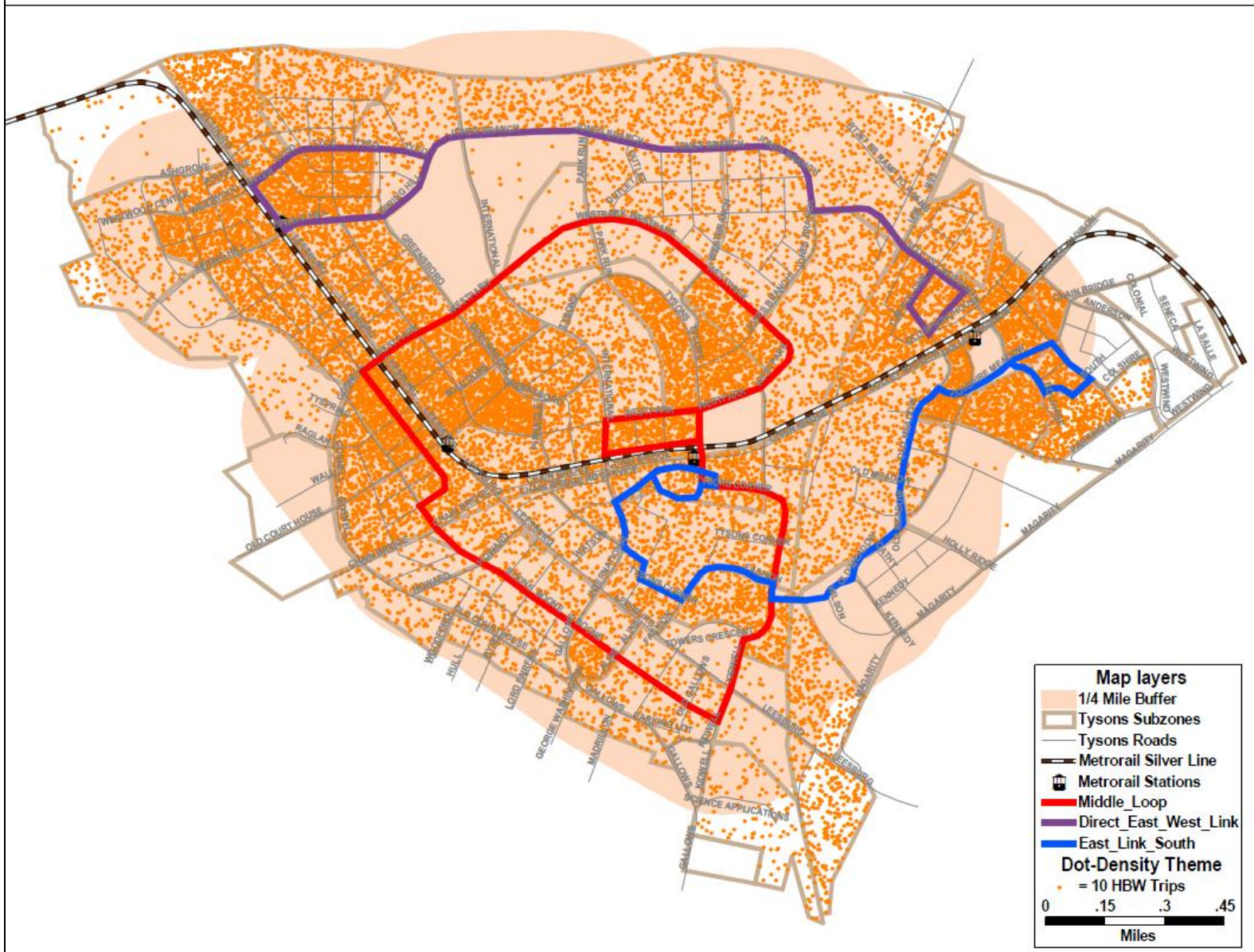
Trip Production Map – Network # 1 (Three Route Network)

Year 2050 Tysons Corner Home-Based Work Production Trips By Subzone - 1/4 Mile Buffer Around Rail Stations And All Links



Trip Attraction Map – Network # 1 (Three Route Network)

Year 2050 Tysons Corner Home-Based Work Attraction Trips By Subzone - 1/4 Mile Buffer Around Rail Stations And All Links



Network Evaluation

- Ridership Forecasts
 - Used regional model adjusted for 2050 conditions
 - Depend on four variables:
 - Mode
 - Service frequency
 - Parking Cost
 - Circulator fare
 - Speeds

Ridership Results

Scenario 1 Results

Network	Total Ridership (Daily)	Transfer from Metrorail	Non - Metrorail Riders
Network #1	17,575	6,195	11,380
Network #2	16,463	7,355	9,108

Scenario 2 Results

Network	Total Ridership (Daily)	Transfer from Metrorail	Non - Metrorail Riders
Network #1	31,746	12,323	19,423
Network #2	33,310	14,362	18,948

Ridership Results (cont.)

Weekday Boardings Per Revenue Hour

Scenario/Network	Daily Boardings	Daily Revenue Hours	Boardings per Revenue Hour
Scenario #1			
Network #1	17,575	258	68.12
Network #2	16,463	303	54.33
Scenario #2			
Network #1	31,746	398	79.76
Network #2	33,310	462	72.10

Network Evaluation Process (cont.)

- Other factors to be evaluated:
 - Circulator travel time between select origin/destination pairs
 - Transit mode share and changes in mode share
 - Variability of run times
 - Percentage of jobs, retail, residential within $\frac{1}{4}$ mile of network
 - Number of locations of auto/rail intersection
 - Weekday boardings per revenue hour
 - Operating cost per rider
 - Capital cost per rider
 - Daily weekday ridership

Study Schedule

Completion: Spring 2012

Tasks 1-4 – substantially complete

Remaining Tasks:

Desired Mode – bus, streetcar/light rail/other (Task 5)

Ultimate Alignment of Circulator Routes (2050) (Task 6a)

Guidelines for Interim Circulator Routes (Task 6b)

Evolution of Modes (Task 7)

Refined Demand Estimate (Task 8)

Public Meeting (Task 10)

Final Report (Task 11)