Chapter 527 Submittal for Fairfax County Comprehensive Plan Amendment

TYSONS CORNER URBAN CENTER

submitted to:

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1.0 Introduction and Background

Tysons Corner is a 1,700 acre area located in northeastern Fairfax County, about halfway between downtown Washington, D.C. and Dulles International Airport. It is located at the confluence of Interstate 495 (the Capital Beltway) with the Dulles Airport Access and Toll Roads, Route 7 and Route 123. Tysons Corner is roughly triangular in shape and contains the highest natural elevations n Fairfax County. It is bounded on the southeastern side by Magarity Road and on the southwestern side generally by the limit of commercial development along Gallows and Old Courthouse Roads and the natural areas of Old Courthouse Stream Branch. The residential areas on the western side of Gosnell Road flanking Old Courthouse Road are also part of the Tysons Corner area. The Dulles Airport Access and Toll Roads form the northern boundary of Tysons. The map below shows the boundaries of the Tysons Corner study area, the boundaries of eight individual districts as defined in the proposed Comprehensive Plan Amendment, and the location of the four new Metrorail stations.

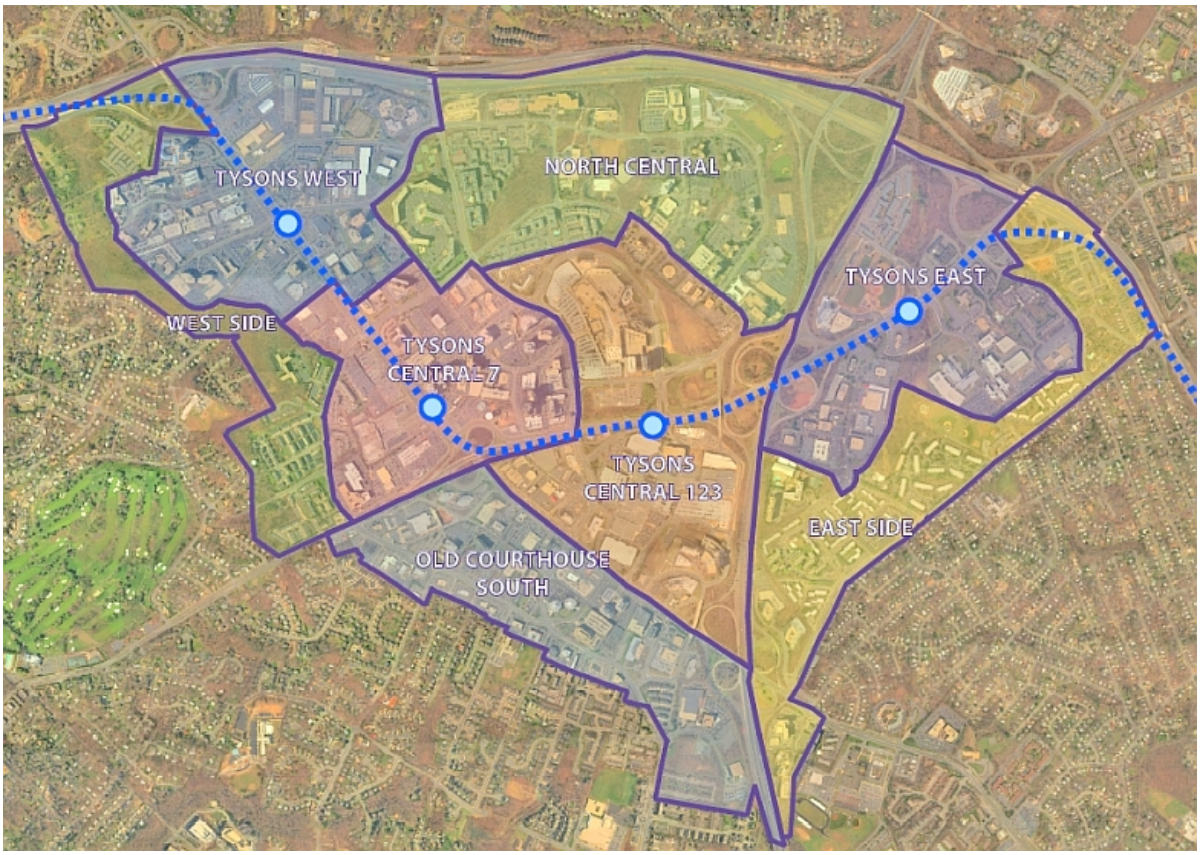


Figure 1.1 The Tysons Corner Study Area

The residential communities surrounding Tysons Corner, which include McLean, Vienna and Falls Church, help to make Tysons Corner a good business location. These communities provide a wide range of housing types and a relatively large supply of housing near Tysons' employers. The communities surrounding Tysons also have many outstanding features, such as excellent public schools and one of the best educated and highly trained labor pools in the nation.

As Tysons Corner has grown and evolved, Fairfax County has from time to time updated the County's Comprehensive Plan to articulate the vision for the area. The first Tysons Corner plan resulting from a special study of the area was adopted in 1978. A major revision of this plan was adopted in 1994, after multi-year planning effort. A key feature of the 1994 Plan was the location of three Metrorail stations in Tysons Corner. Over the course of the next decade, many worked tirelessly to advance the Metrorail project. The Dulles Metrorail Project, with four Metrorail stations in Tysons Corner, is currently under construction.

In order to prepare for the opening of the stations in Tysons, the Fairfax County Board of Supervisors established the Tysons Land Use Task Force in May of 2005. Consisting of 36 members, representing a wide range of community interests, the Board described the Task Force's mission to update the 1994 Comprehensive Plan as follows:

1. Better facilitate transit-oriented development (TOD);
2. Enhance pedestrian connections throughout Tysons;
3. Increase the residential component of the density mix;
4. Improve the functionality of Tysons; and
5. Provide for amenities and aesthetics in Tysons, such as public spaces, public art, parks, etc.

The Board also directed the Task Force to engage in extensive public outreach to involve and incorporate the views and concerns of surrounding communities, citizen groups, smart growth advocates, businesses, employees, environmentalists and other special interests, in addition to landowners and developers. The Task Force addressed these directives with the production of the Transforming Tysons Vision and Area Wide Recommendations which were presented to the Board of Supervisors in September of 2008. The Board received the Task Force's Area Wide Recommendations report and referred it to the Planning Commission and county staff for the development of detailed Comprehensive Plan text.

Over the course of the last 14 months County staff has worked with the Planning Commission Tysons Committee and others to produce new Plan text. As directed by the Board, the Plan text is being guided by the Task Force's recommendations. However, the Board also asked that the Plan be informed by a thorough analysis of transportation impacts, public facility needs, anticipated costs and revenues, and population and employment forecasts. In addition, the Plan is being guided by comments from the Planning Commission's Tysons Committee, the Task Force's Draft Review Committee, and members of the community at large. An initial draft of the Plan text was produced in February 2009, and a second draft was released in September 2009. The second draft is attached to this Chapter 527 submission, but will be replaced by the final draft in mid-January 2010.

Highlights of the Proposed Comprehensive Plan for Tysons are below:

- **Urban, Mixed-Used Development –** The Plan envisions Tysons Corner as Fairfax County's "downtown." High-density development is focused within ½ mile around the four future Metro stations.
- **High-Density Development in Walking Distance to Metro –** Within 1/2 mile of the four Metro stations, the Plan calls for an overall level of intensity that is 70% higher than what is currently built in the Rosslyn-Ballston corridor and 25% higher than the future plans for that area. About three-quarters of Tysons' development will be within a ten minute walk of a Metro station.
- **Pedestrian and Bicycle Friendly Streets –** The Plan calls for an urban street grid throughout Tysons, breaking up the existing super-blocks into dozens of smaller blocks. This "grid of streets" will allow pedestrians and bicyclists to easily make their way across the area, as well as move some vehicle traffic off of the major streets. The Plan also removes three road interchanges from the 1994 Tysons Plan that would hinder pedestrian accessibility.
- **Increasing Transit Trips, Decreasing Car Trips –** The Plan greatly reduces car trips and greatly increases transit trips.
- **Substantial Reduction in Vehicle Trips –** Due to the urban nature of the vision for Tysons, the Plan aims to reduce the number of vehicle trips typically generated by new development by as much as 65% for developments closest to the rail stations. This will be accomplished by encouraging the transit, bicycles, walking, and carpools and by using a variety of transportation demand management techniques, including a significant reduction in available parking.
- **Multiple Public Transit Options –** The Plan incorporates a robust transit system that includes Metrorail, express buses, circulators, local and feeder buses, and multimodal transportation hubs. It aims to increase transit ridership from 3% of today's work trips to 31%, a level that is higher than what is being achieved in the Rosslyn-Ballston corridor.
- **Affordable Housing, Green Buildings, and Open Space –** The Plan provides more housing, including affordable housing, green building, and a network of parks and open space.
- **Affordable and Workforce Housing** – The Plan provides incentives to achieve 20% affordable and workforce housing near Metro stations. This is significantly higher than the current countywide goal of 12%.
- **Green Buildings –** The Plan requires all new buildings to achieve LEED Silver certification. Incentives also are offered to encourage achievement of LEED Gold and Platinum levels.
- **Urban Parks and Open Space –** The Plan calls for a diversity of urban parks, plazas, open spaces, and recreational facilities. These will be connected by a "greenway," a network of paths for pedestrians and bicyclists.
- **Gradual Development Over the Next 40 Years –** Tysons won't change overnight. The transformation from a suburban edge city to a series of walkable urban neighborhoods is expected to take 40 years to occur.

- **Building Infrastructure in Tandem with Development –** The Plan incorporates measures to ensure that needed public facilities and transportation improvements are constructed concurrently with new development.
- **New Public Facilities and Infrastructure –** A number of public facilities and infrastructure improvements will be necessary to accommodate the growth planned for Tysons. These include schools, parks, fire stations, arts facilities, a library, and transportation improvements that better connect Tysons to the rest of the region, such as increases in Metrorail capacity and additional access points to the Dulles Toll Road.

Analytical Framework for the Plan

In order to interpret this submission, it is important to understand how this Plan is structured. Although the Plan describes a vision for Tysons Corner that is only possible to occur over a lengthy time horizon (approximately 40 years), the primary transportation analysis for this submission is based on the forecasted 2030 land use. This is consistent with other regional planning and forecasting and provides a more reasonable planning framework than a longer term forecast.

In order to evaluate the longer term transportation needs for this Plan, a 2050 Analysis was conducted. The purpose of the 2050 Analysis was to estimate the level of demand and the corresponding mode shares required assuming that the road network assumed in the 2030 analysis could not be further expanded. These forecasts were used to inform the Plan text and to develop the required mode shift for Tysons Corner to grow beyond the 2030 forecasted levels. This analysis is included as an attachment to this submission.

Other attachments to this report supplement it and provide additional background:

Attachment A: Proposed Comprehensive Plan Amendment for Tysons (Transportation Chapter)
Attachment B: Modeling Methodology
Attachment C: Neighborhood Traffic Impact Analysis

2.0 Land Use Inputs

This section describes the philosophy of the proposed land use plan and the land use inputs for the transportation analysis of the proposed Comprehensive Plan Amendment.

2.1 Land Use Concept in Proposed Plan

The recommended pattern of land use in Tysons Corner focuses growth within walking distance of Metrorail stations. Intensities will be highest in areas with the closest proximity to the stations tapering down to transition to mid and lower density areas in the Non-TOD Districts. Most areas within Tysons will include a mix of uses, with most of the retail and office uses concentrated within 1/4 mile from the stations. The Conceptual Land Use Pattern is shown in the map below.

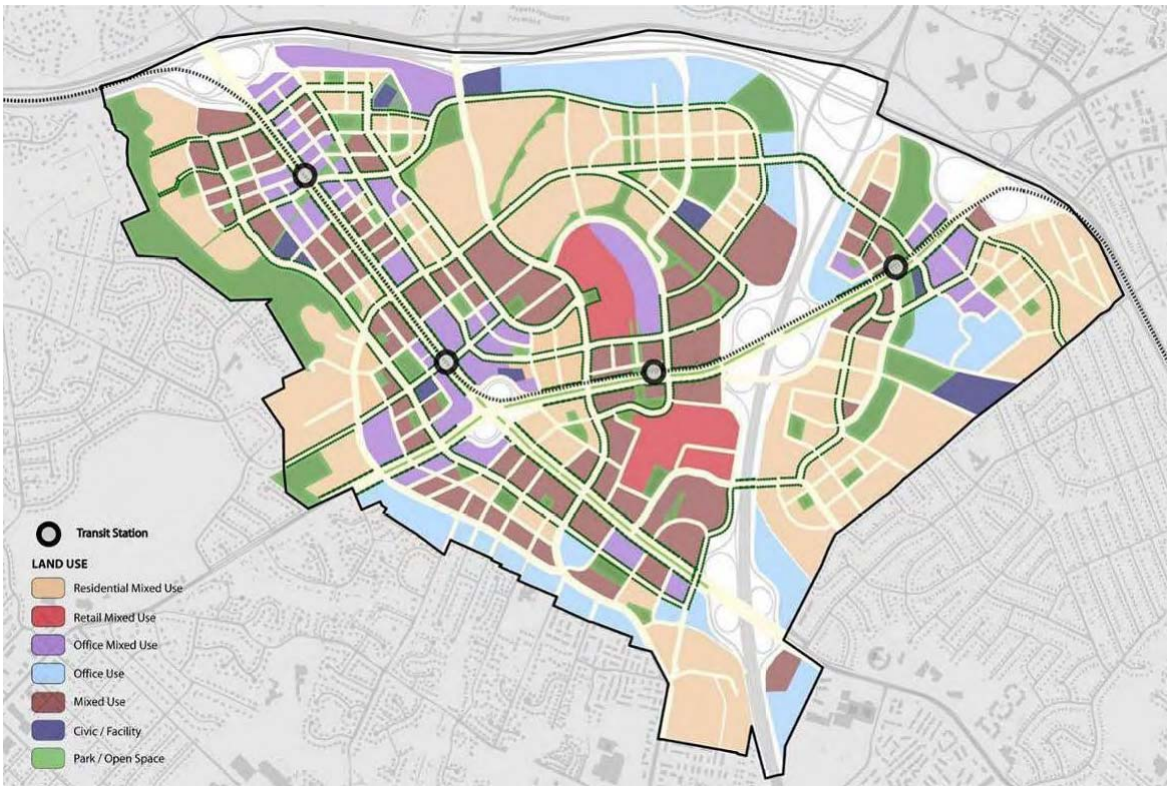


Figure 2.1 Conceptual Land Use Patterns

The four TOD Districts, encompassing the areas within 1/2 mile of each Metrorail station, are planned for about 75% of all development in Tysons. The four Non-TOD Districts include some areas planned to redevelop as walkable urban neighborhoods, though at a lower intensity than the areas closer to the stations. The Non-TOD Districts also contain areas at their edges that should maintain their existing characters, uses, and intensities due to their proximity to stable residential neighborhoods outside of Tysons. The urban grid of streets and the parks and open space network will be integrated into the land use fabric. Recommended civic uses, public gathering places, and public facilities will be located throughout Tysons to create a full service community.

In the future, most areas of Tysons should have a mix of land uses. This mix will include many of the same land uses that existed in Tysons in 2009, such as residences, offices, retail stores, hotels, and public facilities. However, the land use concept promotes the redevelopment of uses such as car dealerships and strip retail centers into more efficient, higher intensity land uses. It is envisioned that retail and service uses, car dealerships, and compatible industrial businesses would be incorporated into new mixed use buildings.

Providing a mix of uses, either vertically (in the same building) or horizontally (within a distance of two to three blocks), will reduce the separation among residents, workers, and services, encouraging people to walk rather than drive to fulfill many of their daily needs. People will be able to engage in routine errands, and find restaurants, entertainment, and shopping all within walking distance of their homes, offices and transit. Ground floor retail and convenience services will be essential for residential neighborhoods.

A key ingredient for transforming Tysons is to use intensity strategically to maximize the benefits of Metrorail and transit and create sustainable, walkable urban environments. This is consistent with the County's policy on transit-oriented developments. Intensity can also be an important economic tool by allowing sufficient incentive to encourage the redevelopment of auto-dependent uses, thereby strengthening Tysons' status as Fairfax County's Urban Center.

The land use concept for Tysons links intensity to transit accessibility based on how far most people are willing to walk to and from transit. Expressed as floor area ratio (FAR), the proposed levels of intensity are primarily based on distance from Metrorail stations. Development is planned to be most intense in the areas nearest the stations and least intense at the edges.

In the four TOD Districts, the highest intensities will be allowed in areas within 1/8 mile of a Metro station entrance, a distance roughly equivalent to one or two city blocks or a three minute walk. Intensities then decrease at distances of 1/4 and 1/2 mile from each station. This reflects the fact that transit ridership decreases as the walking distance to the station increases. In order to achieve the recommended intensity, a pedestrian-friendly environment should be established from the closest station entrance to the buildings within a development proposal. The recommended intensity is also contingent on achieving the land use mix planned for a project's site. The table below shows the recommended intensities allowed under the redevelopment option for each distance tier in the TOD Districts.

Table 2.1 Intensity Recommendations for TOD Districts

Distance from Metro	Recommended FAR
0 - 1/8 mile	4.75
1/8 - 1/4 mile	2.75
1/4 - 1/2 mile	2.0

Non-TOD District Intensity

Large portions of the Non-TOD Districts are planned for increased intensity to encourage the creation of urban residential neighborhoods. Some portions of Non-TOD Districts, including neighborhoods at the edge of Tysons and stable residential developments like the Rotonda, are not planned for redevelopment. Specific guidance for these areas can be found in the District Recommendations.

2.2 Inputs to Transportation Model

For the transportation analysis, the land use concepts in the proposed Comprehensive Plan Amendment have been converted into population and employment figures by Traffic Analysis subzones. In the Comprehensive Plan scenario, the 2030 MWCOG Round 7.1 land use was used within Tysons Corner. For the scenario representing the Comprehensive Plan amendment in 2030, the 2030 GMU High Forecast land use was used. The 2030 GMU High Forecast scenario is a picture of what land use could be in place in Tysons Corner by the year 2030 based on the vision presented by the Task Force and GMU's assessment of market absorption. GMU developed forecasts for Tysons Corner at a low, intermediate, and high level and incorporated the extension of Metrorail through Tysons Corner. The high-level forecast was selected for this analysis to be conservative in comparison against the current Comprehensive Plan for 2030.

The GMU High scenario focuses development in transit-oriented development (TOD) areas surrounding the Metrorail stations. Tables 2.2 through 2.4 present summary information for each set of land use assumptions. Figures 2.2 through 2.7 show the population and employment density in 2030 GMU High scenario and 2030 Comp Plan scenario and the differences in density by Traffic Analysis sub-zones.

Table 2.2 Population and Employment within Tysons Corner for Land Use Scenarios

Scenario	Population	Employment
2005	16,000	103,000
Current Comprehensive Plan	41,000	139,000
2030 GMU High (Proposed Comprehensive Plan)	54,000	159,000

Table 2.3 Employment within Tysons Corner – TOD, Non-TOD Areas

Scenario	TOD		Non-TOD	
	Employment	Percent	Employment	Percent
2005	53,000	51%	50,000	49%
Current Comprehensive Plan	61,000	44%	78,000	56%
2030 GMU High (Proposed Comprehensive Plan)	105,000	66%	54,000	34%

Table 2.4 Population within Tysons Corner – TOD, Non-TOD Areas

Scenario	TOD		Non-TOD	
	Population	Percent	Population	Percent
2005	2,000	12%	14,000	88%
Current Comprehensive Plan	16,000	39%	25,000	61%
2030 GMU High (Proposed Comprehensive Plan)	29,000	54%	25,000	46%

Figure 2.2 2030 Comp Plan Population Density

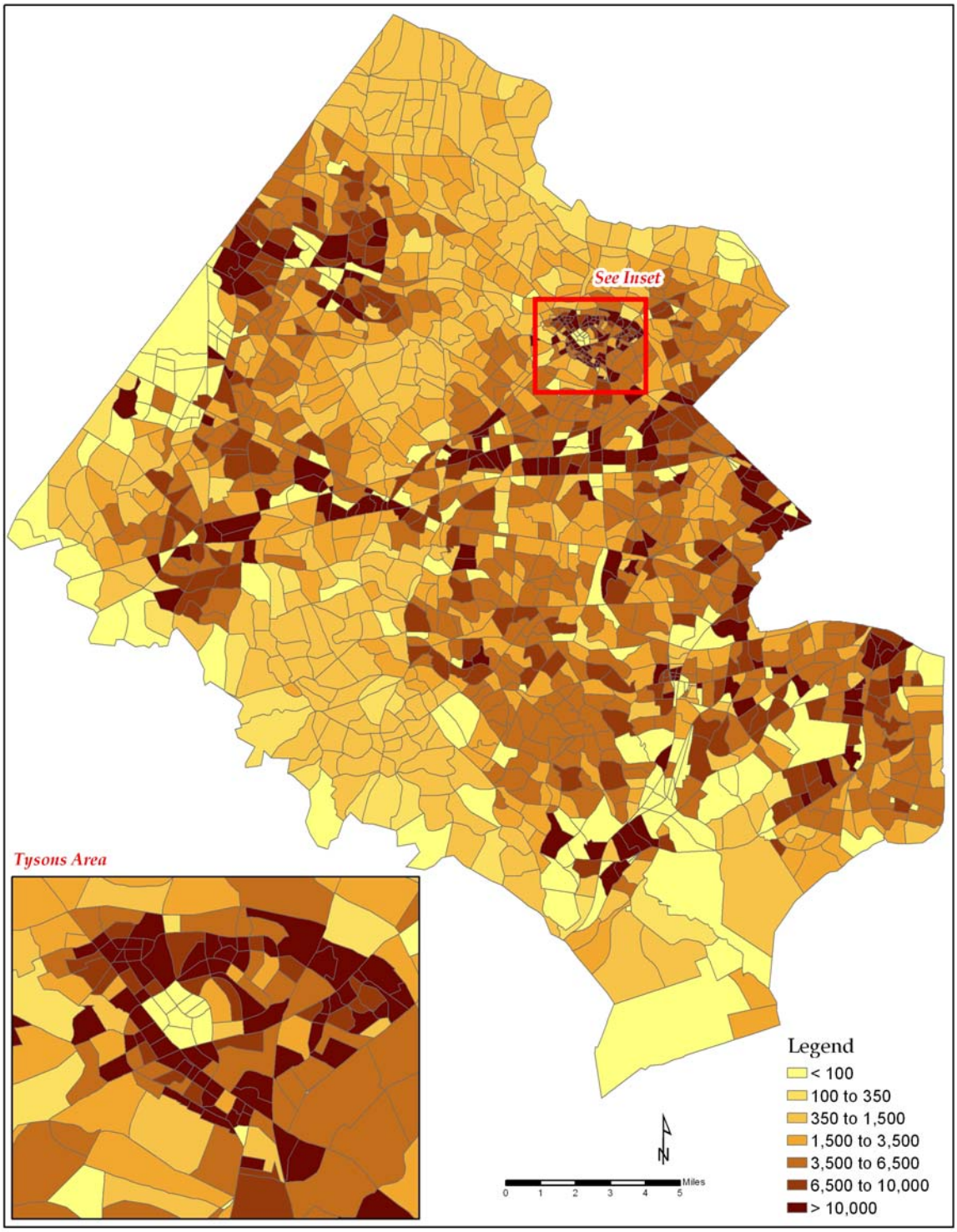


Figure 2.3 2030 Comp Plan Employment Density

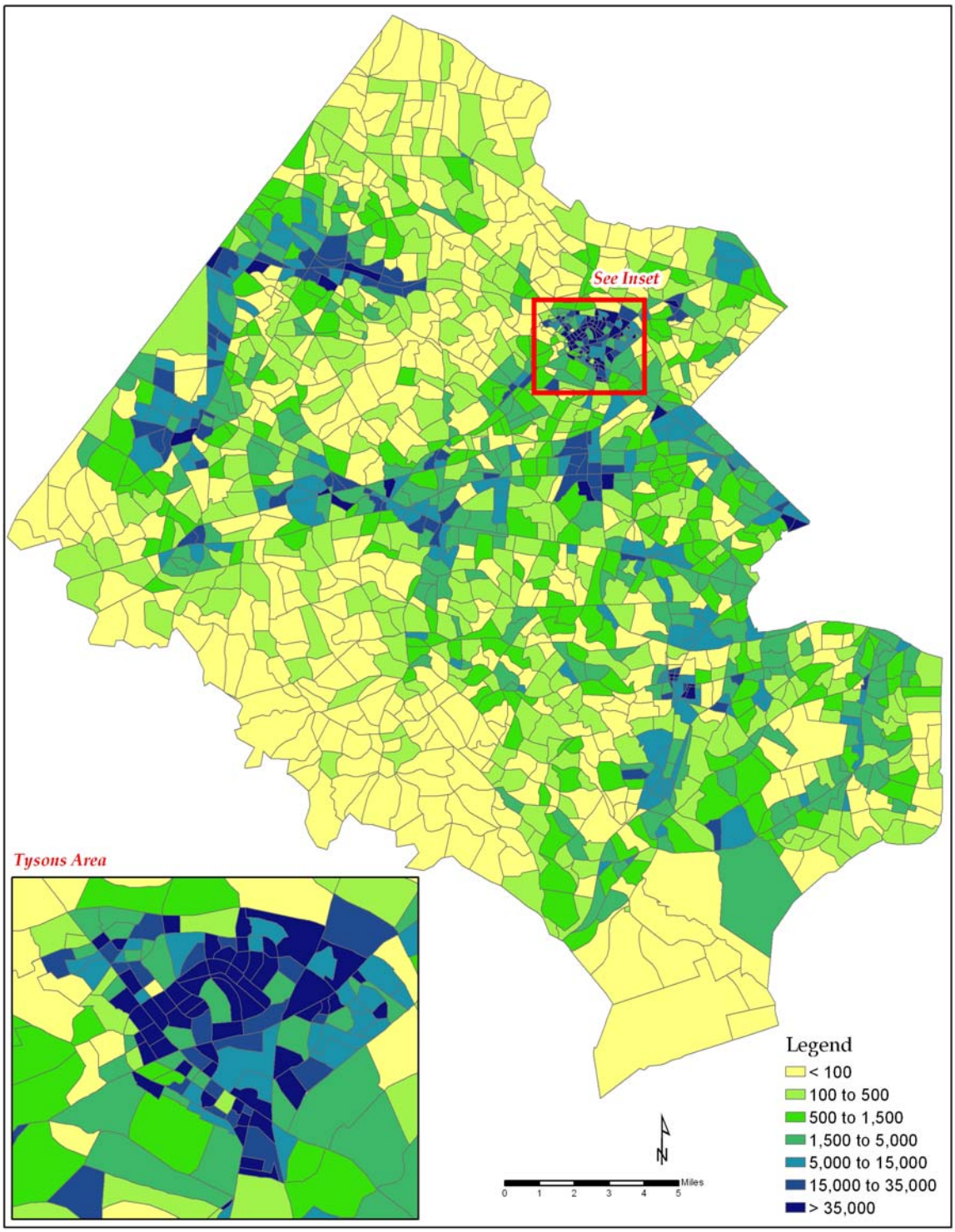


Figure 2.4 2030 GMU High Population Density

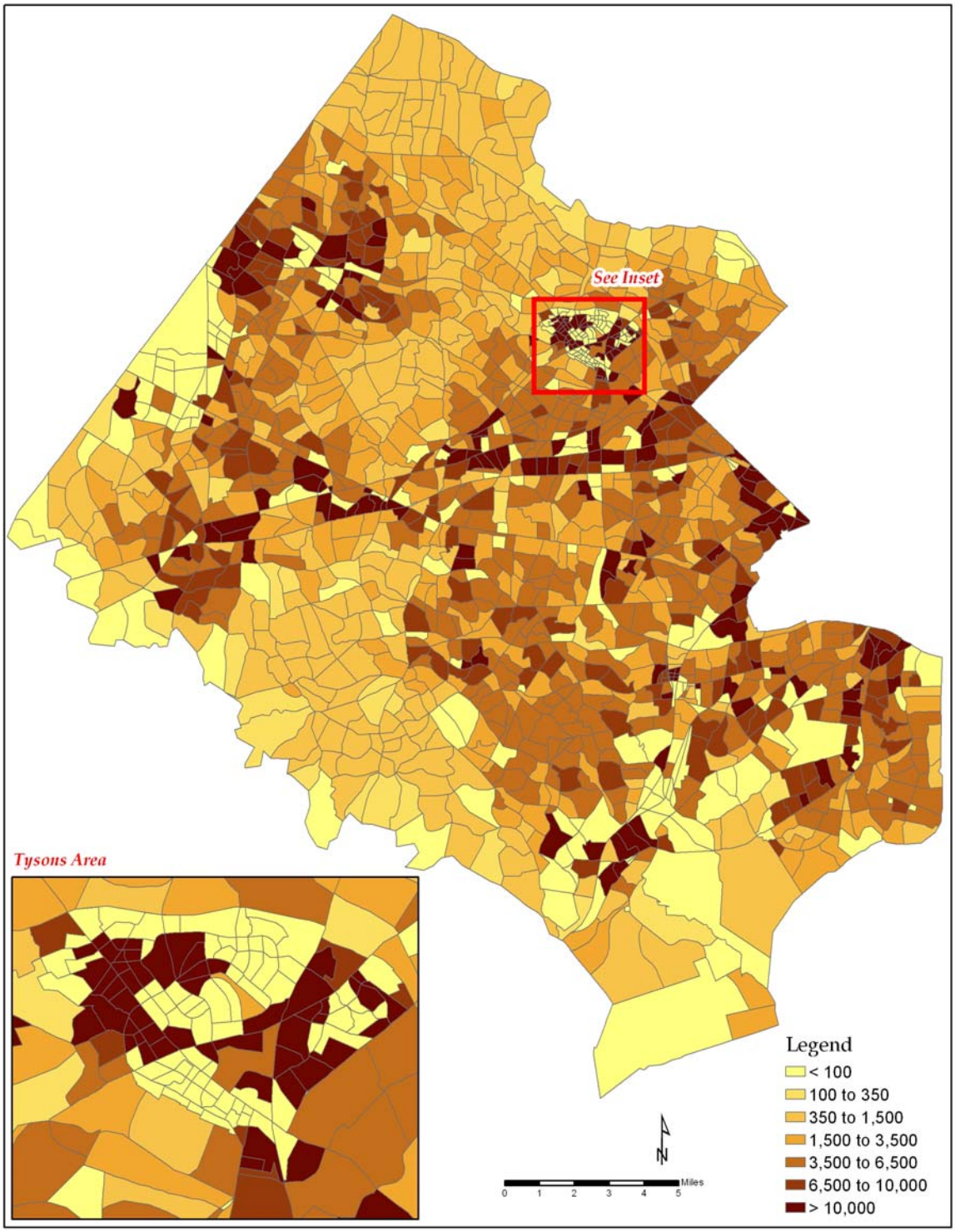


Figure 2.5 2030 GMU High Employment Density

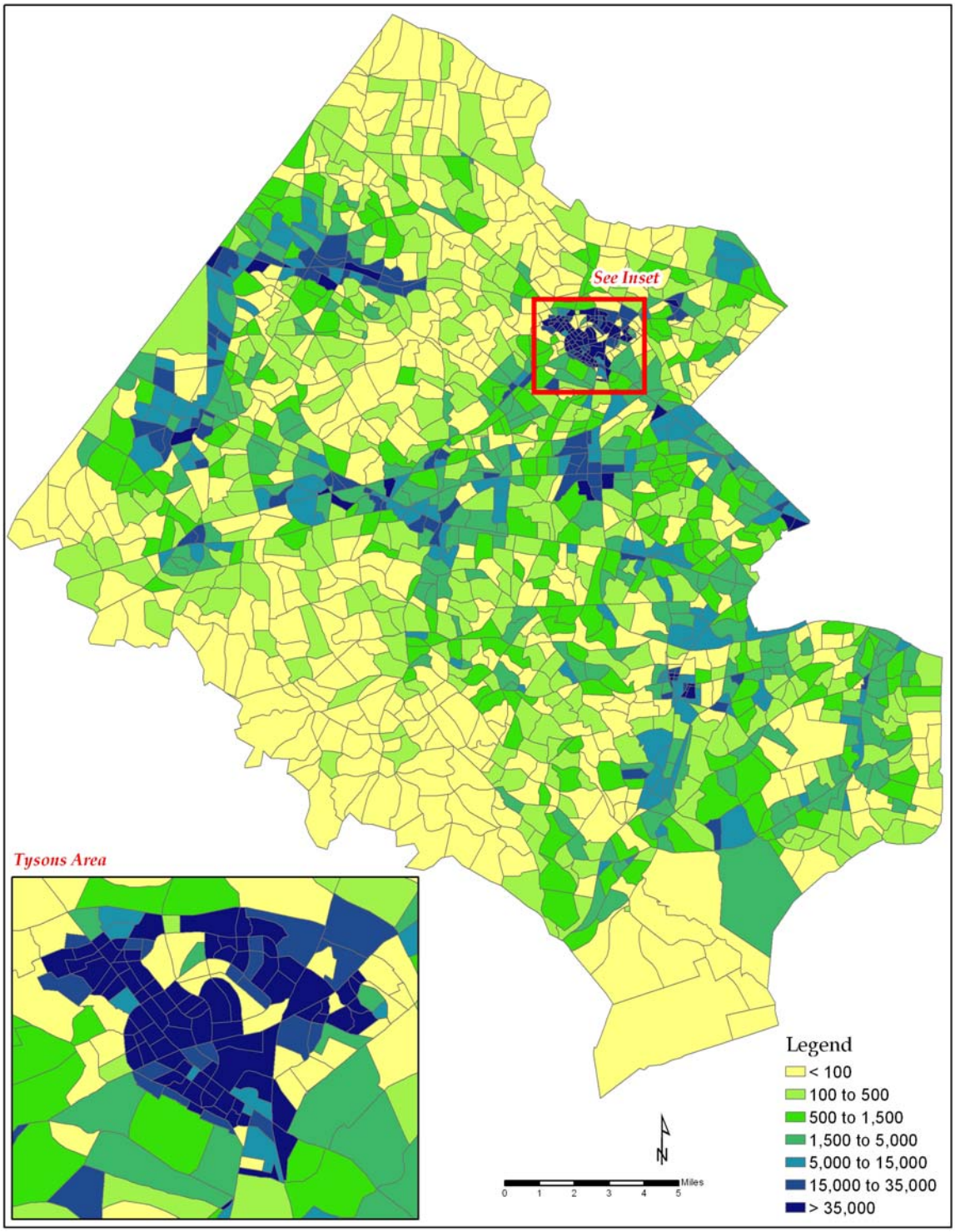


Figure 2.6 Difference between Comp Plan and GMU High Population Density

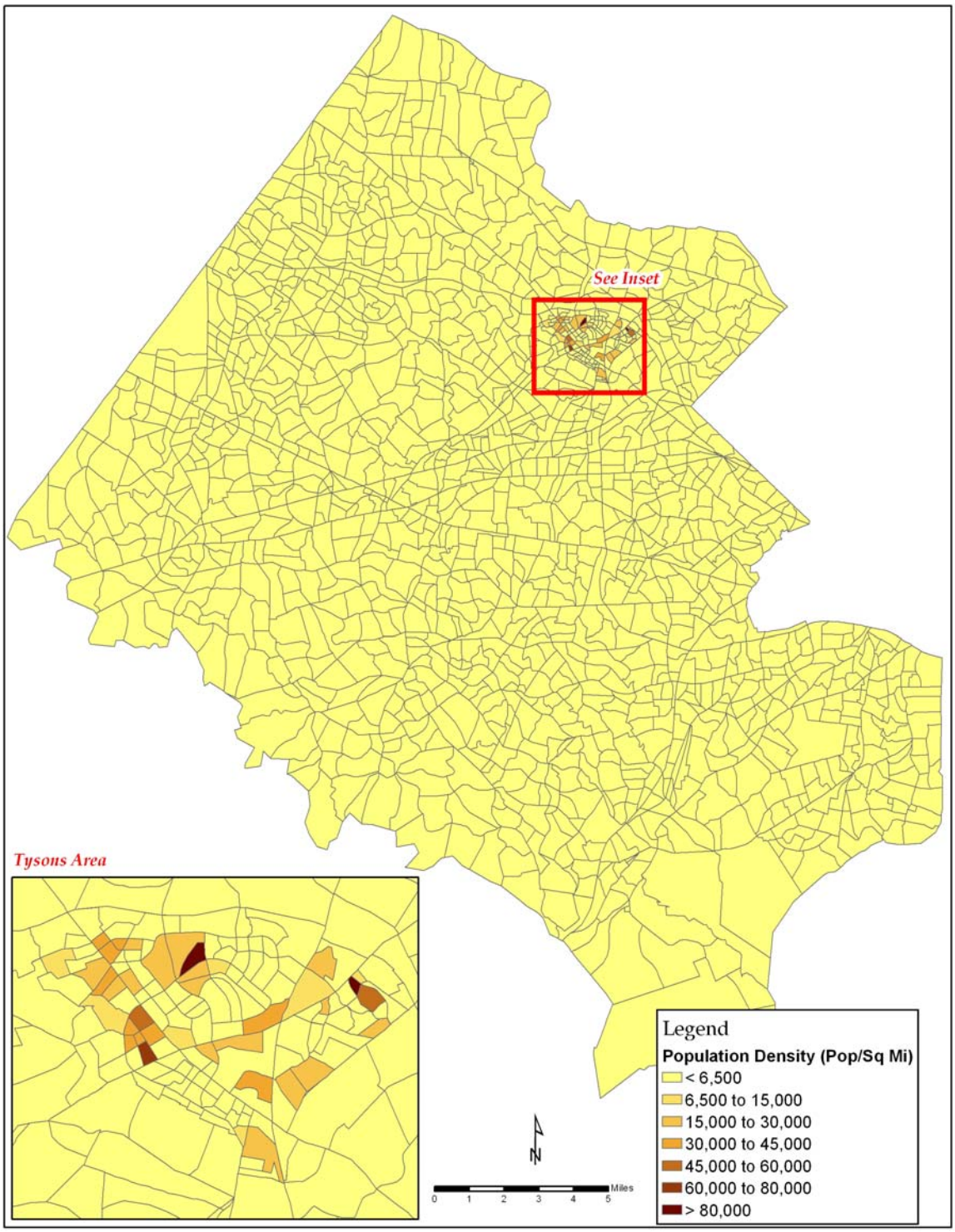
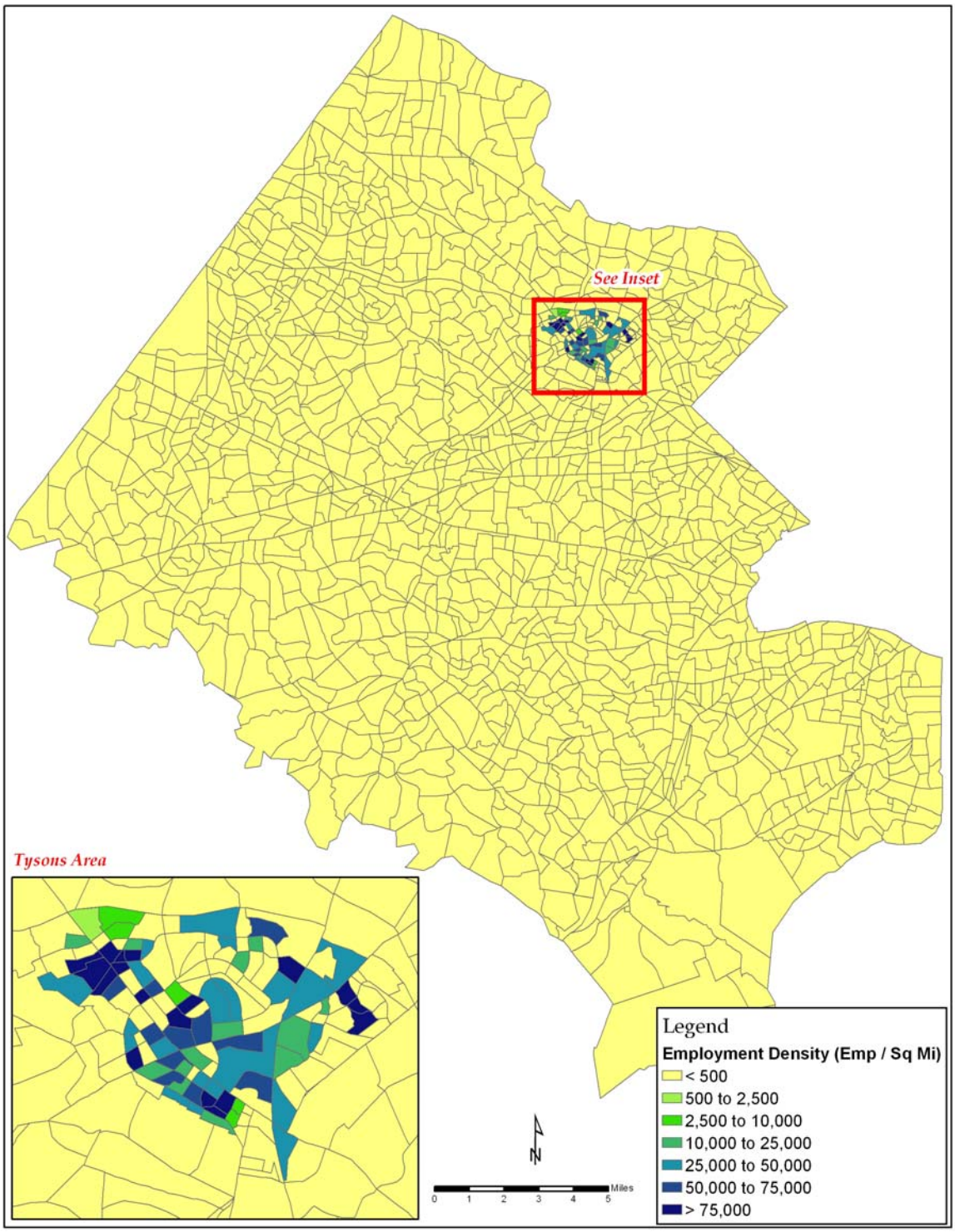


Figure 2.7 Difference between Comp Plan and GMU High Employment Density



Chapter 3: Urban Design

3.1 Urban Design Strategy

Urban design is the discipline that guides the appearance, arrangement, and functional elements of the physical environment, with a particular emphasis on public spaces. An urban environment is comprised of many elements; including streets, blocks, open spaces, pedestrian areas, and buildings. The urban design strategy of the proposed Comprehensive Plan Amendment provides guidance for each of these elements, with a particular emphasis on creating a high-quality urban environment that is walkable and pedestrian-friendly. It contains guidance for these key transportation elements: the pedestrian realm, the bicycle network and the grid of streets.

The pedestrian realm consists of publicly accessible places where people circulate on foot. Sidewalks connect pedestrians to parks, plazas, trails, and other public places. The pedestrian realm is the most visible space within the urban environment. It should be continuous but can vary in its character depending upon adjacent uses and the scale of the street.

The pedestrian realm also includes building facades, areas that can offer shelter from sun and rain through canopies and awnings, outdoor seating areas, commercial displays, and landscaping. Color, texture, signage, and variations in activity can provide visual interest for both pedestrians and motorists. Other elements that enhance the aesthetics and functionality of the pedestrian realm include bicycle racks, benches, bus shelters, and lighting.

The Tysons Corner Urban Center Plan affords an opportunity to make Tysons Corner a bicycle friendly community through strategic urban design. New streets will be designed and older streets retro-fitted to better accommodate bicycles. Transit options will become bike friendly with the addition of buses equipped with bicycle racks. Ample safe, secure, and convenient bicycle parking will be installed. Comprehensive wayfinding signage will provide guidance and information about destinations and paths, while a network of interconnected shared use paths, interfacing with an on-road bike network, will establish a cohesive and connected transportation environment conducive to bicycling.

Tysons currently consists of large superblocks with a relatively small number of streets. This places excessive reliance on the street network to move vehicle traffic while the large block sizes inhibit transit use, pedestrian and bicycle movement. Research and experience indicates that in areas with a fine grid of streets and a mix of land uses, people use transit more and make fewer auto trips than their neighbors in typical suburbs. A grid of streets disperses vehicle traffic and improves mobility for pedestrians and bicyclists. Smaller block sizes improve walkability by creating convenient and short walk distances. A perfect grid is unlikely in Tysons Corner due to the alignment of existing roads and topographical constraints. However, where possible, a grid of streets is being planned. The following text and accompanying cross sections describe the different types of street classifications that will form a grid in Tysons.

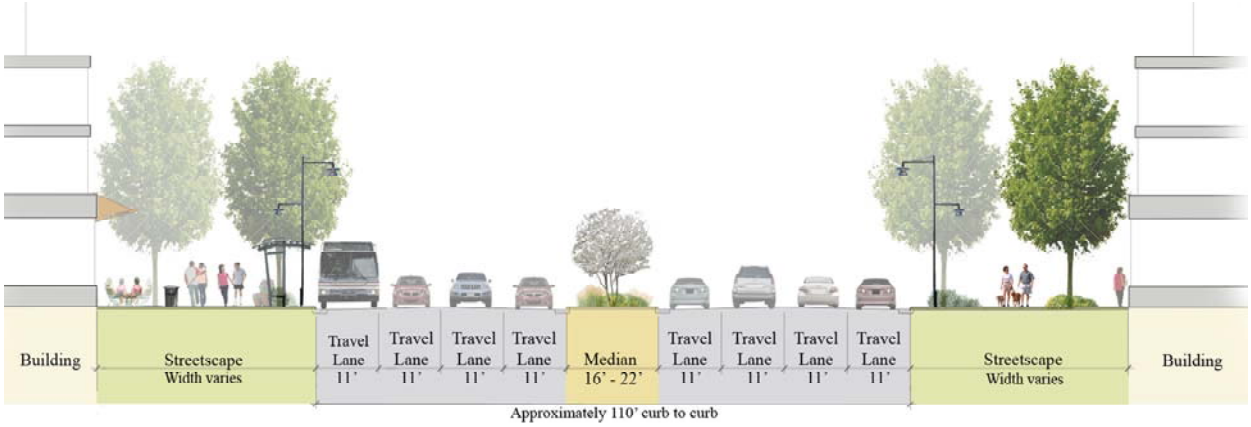
3.2 Street Cross Sections

Boulevards (Primary Arterials)

Boulevards will be the most important multi-modal connectors and thoroughfares within Tysons. In addition to carrying the largest volume of automobile traffic, they also have the ability to accommodate the Metrorail, circulator, bus, bicycle, and pedestrian modes within their rights-of-way. Route 7 and Route 123 are both boulevards (major arterials).

Boulevards may have three to four travel lanes in each direction. Medians are necessary to provide a pedestrian refuge, rights-of-way for turn lanes and/or to accommodate Metrorail on portions of Routes 7 and 123. In addition, boulevards will have wide sidewalks with street trees on each side. Some portions of boulevards may include shared or dedicated lanes for the circulator system.

Figure 3.1
Boulevard Section with Landscaped Median



Note: The outside lane in the Boulevard Street Section may be used for on-street parking where applicable.

Boulevard cross section dimensions:

- The desirable width of the median is 20 feet to allow safe pedestrian refuge.
- 24 foot median (36 feet at stops) to accommodate the Circulator.
- 3 to 4 lanes per direction (11 feet for each lane).
- Refer to the Urban Design Recommendations for guidance on the streetscape.

Typical street cross sections are depicted. Although dimensions are noted, final street design will require accommodation of all applicable road design infrastructure. Additionally, final street designs may vary as necessary to address other design and engineering goals and requirements.

Avenues (Minor Arterials)

Avenues within Tysons can play a role in taking the pressure off the boulevards by diverting vehicular traffic from the boulevards to the avenues. Portions of avenues may also accommodate circulators and provide desirable addresses to new business and residential development. Boone Boulevard, Greensboro Drive and Westpark Drive are examples of avenues. These streets may generally have two travel lanes in each direction, on-street parking, wide sidewalks, and bike lanes. Medians are not preferred but may be necessary depending on design, safety, operation, and capacity considerations.

Additionally, avenues extend into the interior of Tysons, connecting residential and employment areas. Uses and character of avenues will range from transit oriented mixed-use with street level retail within the station areas, to neighborhood residential within non-station areas like East Side and North Central. Many portions of the avenues could also accommodate circulators on shared or dedicated lanes.

Figure 3.2
Avenue Section with Landscaped Median

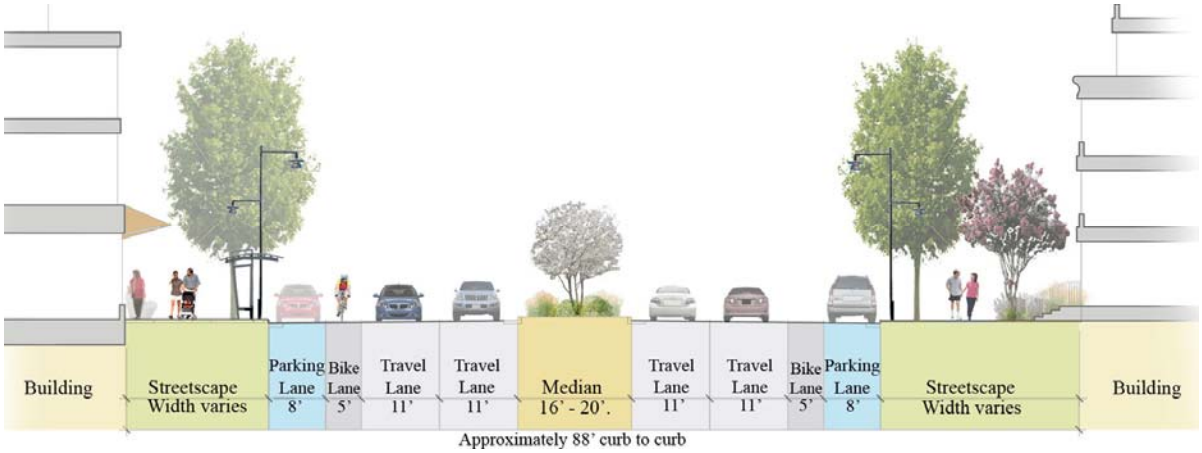


Figure 3.3
Avenue Section with Circulator

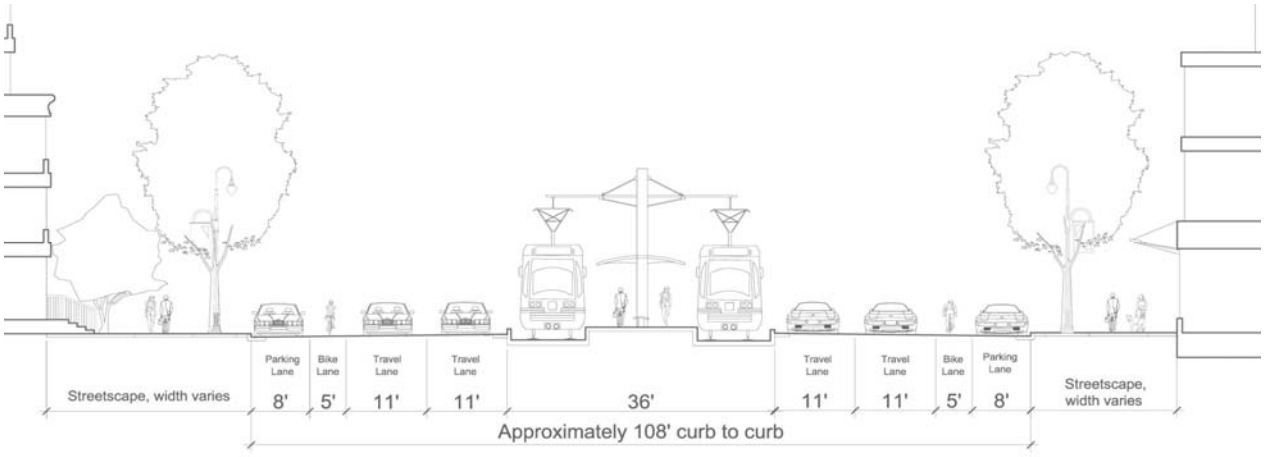
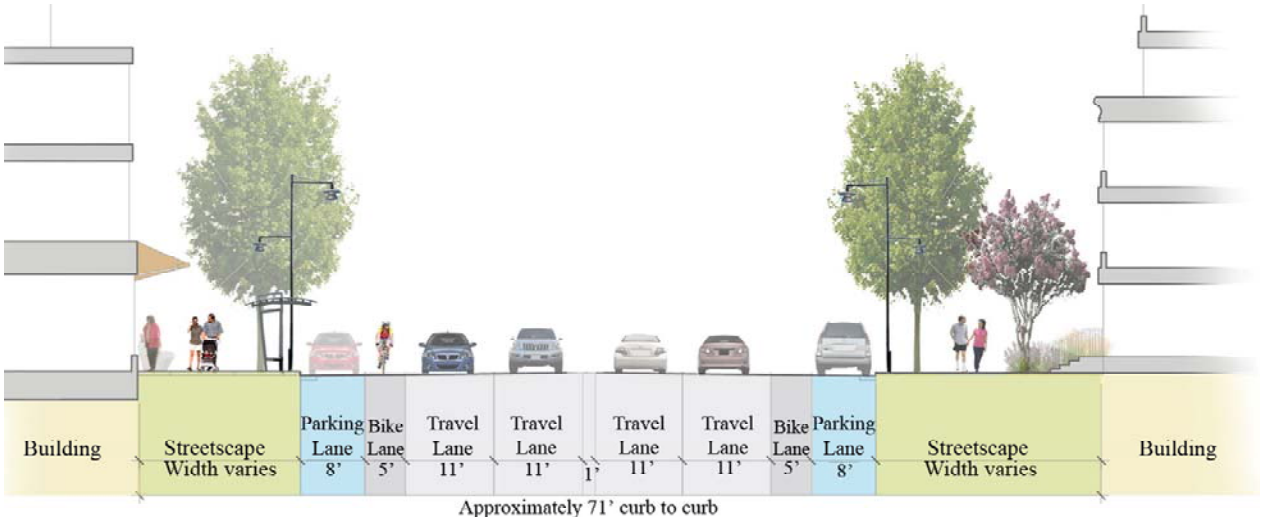


Figure 3.4
Avenue Section with No Median



Avenue cross section dimensions:

- The desirable width of the median, if provided, is 20 feet to allow safe pedestrian refuge.
- 24 foot median (36 feet at stops) to accommodate the Circulator where applicable.
- 2 or 3 travel lanes per direction (11 feet minimum for each lane).
- On-street parallel parking is recommended. This parking may be prohibited during peak periods to address traffic capacity needs on some streets.
- 8 feet for on-street parallel parking per direction.
- 5 foot on-road dedicated bike lane per direction.
- Refer to the Urban Design Recommendations for guidance on the streetscape.

Typical street cross sections are depicted. Although dimensions are noted, final street design will require accommodation of all applicable road design infrastructure. Additionally, final street designs may vary as necessary to address other design and engineering goals and requirements.

Collector Streets (Collector)

Collector streets within Tysons will connect local streets, with slow-moving traffic, to higher speed facilities like avenues and boulevards. Collector streets typically have one or two travel lanes in each direction. They are slow-moving lanes with traffic calming elements such as bulbouts at intersections, frequent pedestrian crossings, parallel on-street parking, bike lanes and wide sidewalks to maximize walkability. Medians are not preferred but may be necessary to provide pedestrian refuge, turn lanes or rights-of-way for the circulator.

Figure 3.5
Collector Street Section with Landscaped Median

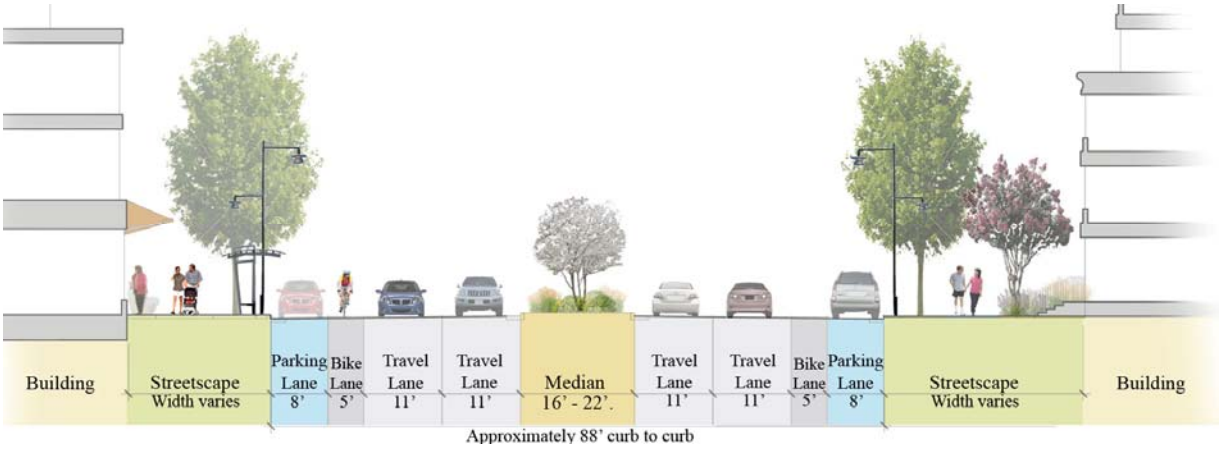


Figure 3.6
Collector Street Section with Circulator

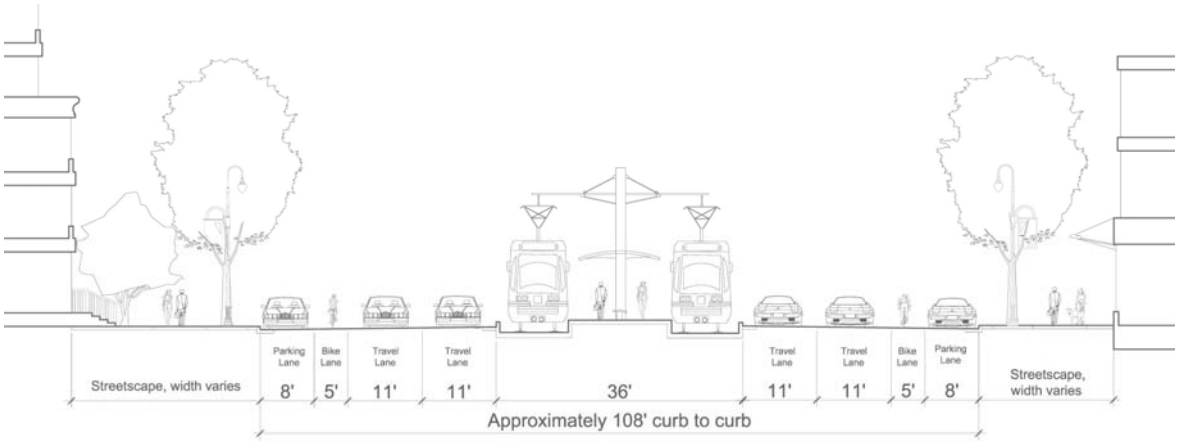
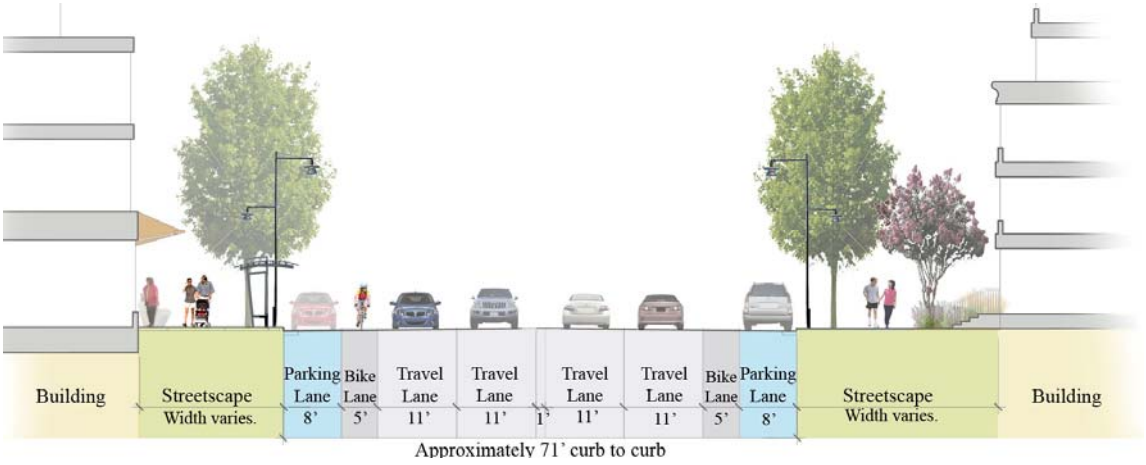


Figure 3.7
Collector Street Section with No Median



Collector Street cross section dimensions:

- The desirable width of the median, if provided, is 20 feet to allow safe pedestrian refuge.
- 24 foot median (36 feet for stops) to accommodate the Circulator where applicable.
- 2 travel lanes per direction (11 feet minimum for each lane); 1 travel lane per direction under certain circumstances.
- 8 feet for on-street parallel parking per direction.
- 5 foot on-road dedicated bike lane per direction.
- Refer to the Urban Design Recommendations for guidance on the streetscape.

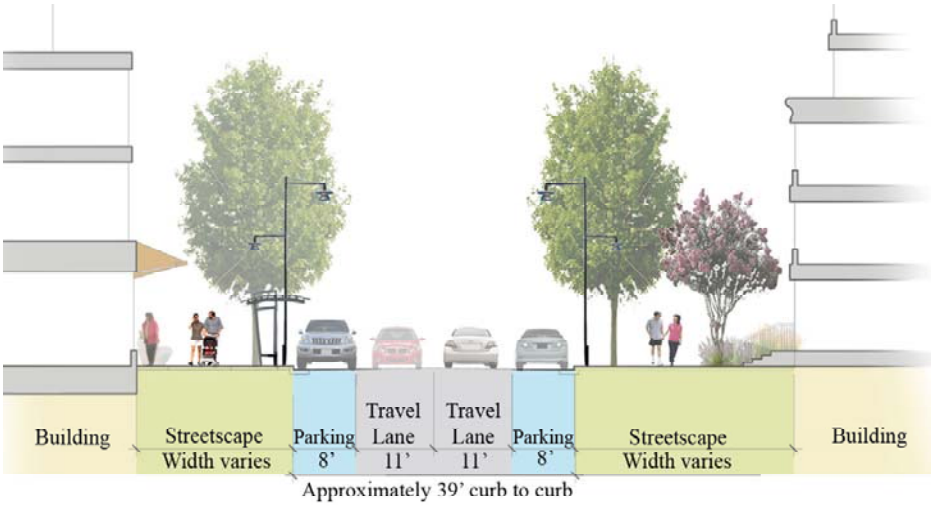
Typical street cross sections are depicted. Although dimensions are noted, final street design will require accommodation of all applicable road design infrastructure. Additionally, final street designs may vary as necessary to address other design and engineering goals and requirements.

Local Streets (Local)

Local streets will generally be the lowest volume streets within Tysons and will carry slow-moving traffic. Medians should not be considered. They will serve residential and/or employment uses on either side with entrances and windows opening on the sidewalks.

Local street sections are generally narrow, with one lane in either direction, and are flanked by on-street parking on both sides. Due to low vehicle speeds, bicycles may be accommodated in the travel lane rather than in a dedicated bicycle lane.

Figure 3.8
Local Street Section



Local Street cross section dimensions:

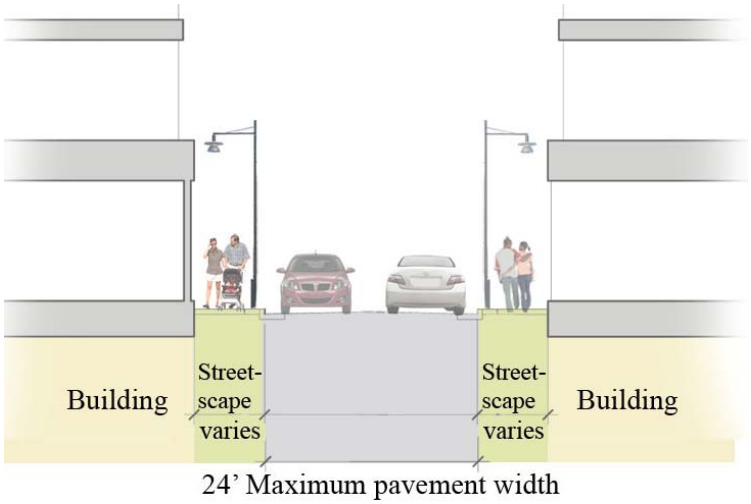
- No medians should be considered.
- 1 travel lane per direction.
- 10 feet lane widths may be considered for residential streets.
- 8 foot on-street parking per direction.
- Local streets are low speed facilities that may not require bike lanes.
- Refer to the Urban Design Recommendations for guidance on the streetscape.

Typical street cross sections are depicted. Although dimensions are noted, final street design will require accommodation of all applicable road design infrastructure. Additionally, final street designs may vary as necessary to address other design and engineering goals and requirements.

Service Streets (No Functional Classification)

Service streets are very low speed, generally privately maintained facilities that typically run between buildings to provide access to parking garage entrances, loading and refuse containment areas. Connections to local streets and collectors are encouraged. Service alleys should be designed to maximize functionality for service vehicles. Allowances should be made for pedestrian access as needed.

Figure 3.9
Service Street Section



Service Street cross section dimensions:

- No medians should be considered.
- 1 travel lane per direction.
- Street widths should accommodate expected service vehicles.
- Parking and bus access is not anticipated.
- Landscaping should not conflict with large vehicle movements.
- Mountable curbs should be considered.
- Refer to the Urban Design Recommendations for guidance on the streetscape.

Typical street cross sections are depicted. Although dimensions are noted, final street design will require accommodation of all applicable road design infrastructure. Additionally, final street designs may vary as necessary to address other design and engineering goals and requirements.

Chapter 4: Transportation System Inputs

4.1 Road Network

4.1.1 2005 Road Network

Figure 4.1 shows the 2005 Tysons Corner road network as representative of the existing transportation network. Metrorail service is not available to the study area, but Fairfax Connector and Metrobus services provide regional transit connectivity. Particularly noteworthy is frequent peak-period bus service available to a large portion of the Study Area from park-and-ride facilities along the Dulles Toll Road Corridor to the West Park Transit Center and from the West Fall Church Metrorail station.

Figure 4.1 2005 Tysons Corner Road Network

Note:
This figure depicts the modeled network for 2005 and does not include all streets within Tysons Corner. The modeled network includes all expressways, major and minor arterials, collectors, and some local streets, as shown in the figure.

4.1.2 Current Comprehensive Plan Network

The current Comprehensive Plan road network is shown in Figure 4.2. New roadway elements added over the 2005 network are depicted in red, roadway widening projects are shown in green and the HOT lanes project is shown in pink. This depiction of the network includes all elements which are included in the 2030 MWCOG CLRP, as well as additional elements not found in the CLRP.

Elements from the CLRP include:

- Constructing High-Occupancy/Toll Lanes (HOT) lanes on I-495;
- Widening the Dulles Airport Access Road from four to six lanes;
- Widening VA Route 7 between the Dulles Toll Road and I-495 from six to eight lanes, and from four to six lanes between the Dulles Toll Road and the Loudoun County Line;
- Widening VA Route 123 between Old Courthouse Road and VA Route 7 from four to six lanes and between VA Route 7 and I-495 from six lanes to eight lanes;
- Widening International Drive between VA Route 7 and VA Route 123 from four to six lanes;
- Widening Spring Hill Road between VA Route 7 and International Drive from two lanes to four lanes;
- Widening Magarity Road between VA Route 7 and Great Falls Street from two lanes to four lanes;
- Improving intersections throughout Tysons Corner (including VA Route 7 at Westpark Drive and International Drive at VA Route 7 and VA Route 123);
- Reconstructing the interchange of I-66 and I-495; and
- Improving interchange of VA Route 123 and Dulles Airport Access Road.

Elements in the current Comprehensive Plan network that are beyond the current CLRP include the extensions of Boone Boulevard and Greensboro Drive.

Figure 4.2 Current Comprehensive Plan Tysons Corner Road Network

Note:
This figure depicts the modeled network and does not include all streets within Tysons Corner. The added capacity that is created by adding lanes to existing roadways is shown in green. New roadway elements are shown in red and the HOT lanes project is shown in pink.

4.1.3 Recommended 2030 Comprehensive Plan Network

Transportation modeling analysis of land use scenarios prior to the detailed (Phase III) analysis (see section 5.3) provided the following results:

- Entrances to Tysons are limited and therefore have capacity problems, and;
- More internal streets (a grid where possible) effectively distributes traffic within Tysons.

The Phase III transportation modeling analysis tested a network that contained a grid of streets, additional entrances to and from Tysons and additional grade separations on Virginia Route 123 and Virginia Route 7 within Tysons. This analysis provided the following results:

- Additional entrances assisted in accommodating traffic to and from Tysons.
- Internal streets (a grid where possible) continued to effectively distribute traffic within Tysons.
- Grade separations on Virginia Route 123 and Virginia Route 7 resulted in limited improvement in traffic flow and increased through traffic.

The Recommended 2030 Comprehensive Plan Network is shown in Figure 4.3. This network contains the following improvements not included in the existing ("old") Comprehensive Plan network:

- Ramps connecting the Boone Blvd Extension to westbound Dulles Toll Road and eastbound Dulles Toll Road to Boone Blvd Extension;
- Ramp connecting the Greensboro Drive Extension to westbound Dulles Toll Road;
- Ramps connecting Jones Branch Drive to westbound Dulles Toll Road and eastbound Dulles Toll Road to Jones Branch Drive;
- Widen I-495 (Outer Loop) between Rt.7 and I-66 by one lane;
- Grid west of Westpark Drive;
- Grid bounded by Gosnell Rd, Rt.7 and Rt.123;
- Grid connections to Greensboro Drive;
- Grid of streets east of I495, including connection across I-495 to Jones Branch Drive;
- Collector-distributor roads along the Dulles Toll Road from the Greensboro Drive extension to Hunter Mill Rd.

The Recommended 2030 Comprehensive Plan Network excludes the following elements contained in the existing Comprehensive Plan Network:

- An interchange at Virginia Route 123 and International Drive.
- An interchange at Virginia Route 7 and International Drive.
- An interchange at Virginia Route 7 and Westpark Dr/Gosnell Rd.

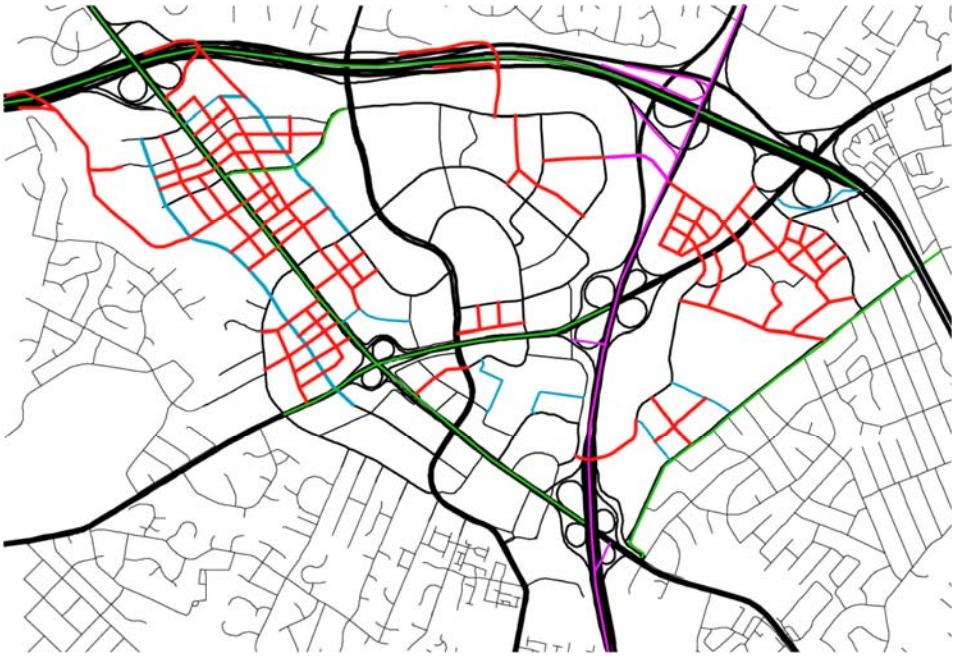


Figure 4.3 Recommended 2030 Comprehensive Plan Network

Note:
This figure depicts the modeled network and does not include all streets within Tysons Corner. The added capacity that is created by adding lanes to existing roadways is shown in green. Roadway elements shown in blue are improvements included in the Comprehensive Plan beyond the 2005 network and roadway elements shown in red are Recommended 2030 network improvements.

4.1.4 Network Assumptions

Speeds:
Network speeds are a function of the demand. An equation similar to the BPR curves is used to calculate the speed as the demand changes.

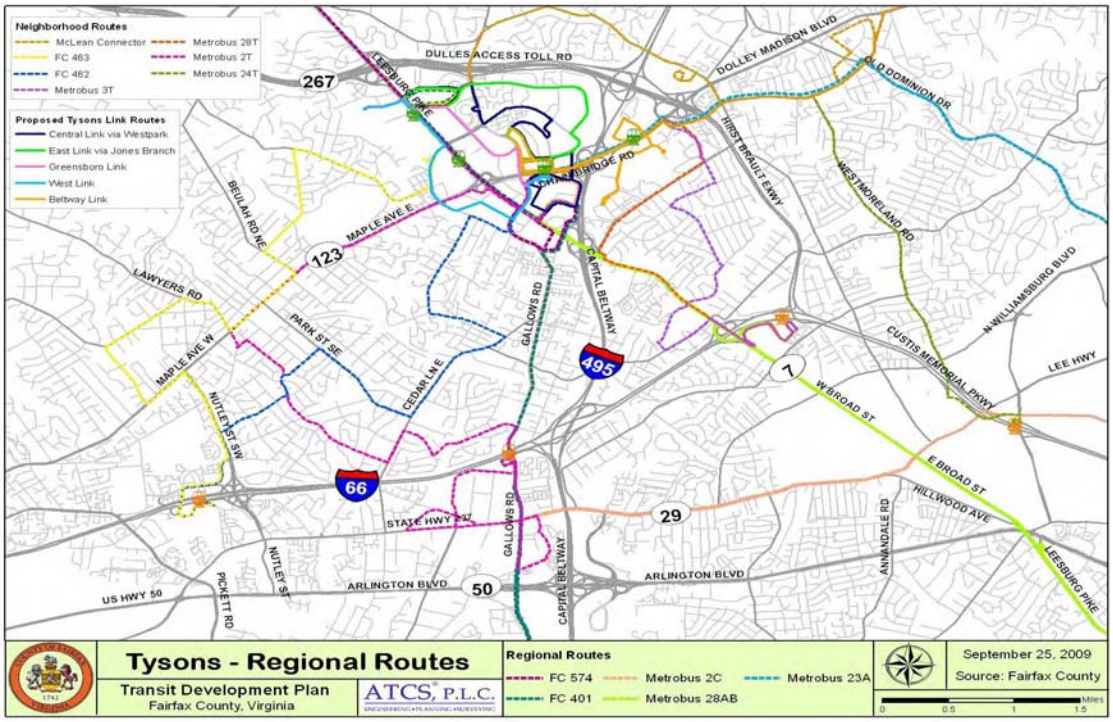
Capacity:
The Fairfax County assignment on the subzone network works off of intersection delay. This feature has an advantage over the MWCOG assignment. Therefore all non-freeway links in the network that are located inside Fairfax County are coded with a maximum capacity of 1,800 vphpl per hour of green. The approach links directly into the intersection node are then recalculated for a capacity based on the demand on all the links entering the node. This only effects links directly attached to the intersection node. The delay and corresponding capacities are based on calculations from the HCM.

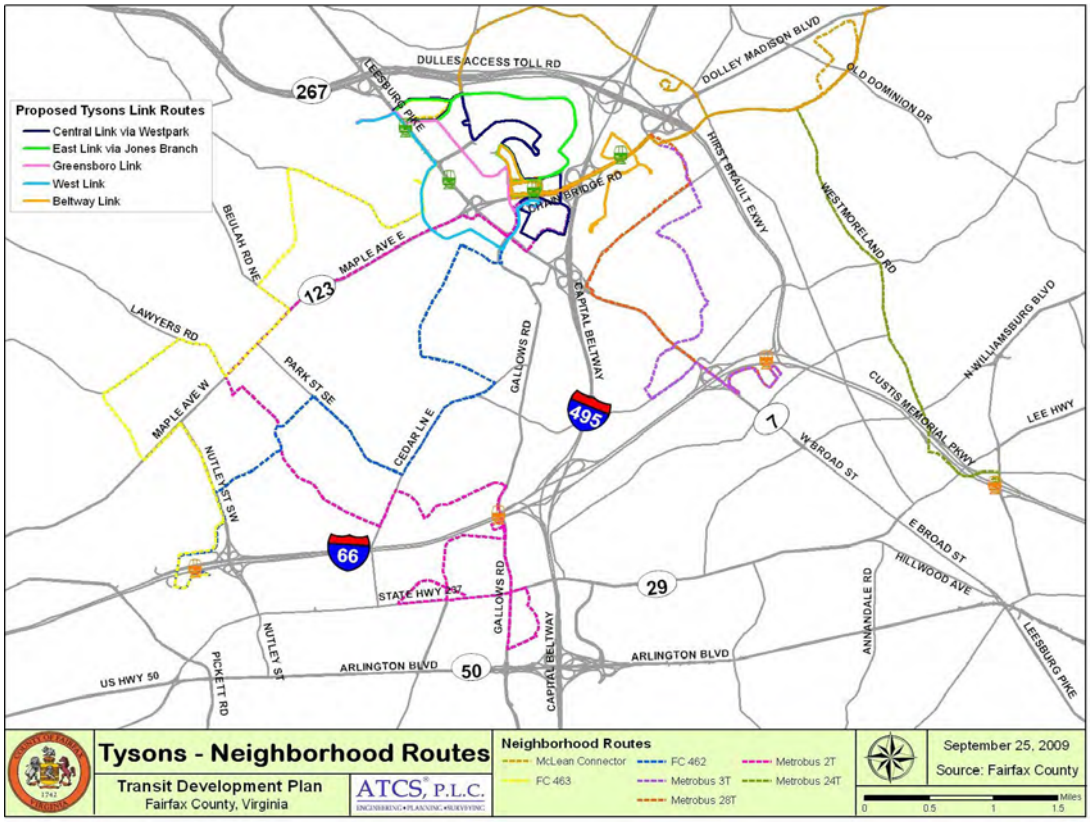
4.2 Transit Network

4.2.1 Current Comprehensive Plan

The transit network used in the MWCOG regional Constrained Long-Range Plan (CLRP) served as the basis for the transit network tested for the current Comprehensive Plan. This transit network is a reasonable view of what is currently expected to be in place in the Tysons Corner area and the region by the year 2030. Clearly the most significant transit improvement in the CLRP is the construction of the Dulles Metrorail Project (Silver Line), including the four Metrorail stations in Tysons Corner. The CLRP includes bus routes connecting Tysons Corner to the surrounding areas, such as McLean, Vienna, Dunn-Loring, and Falls Church, as well regional buses. The regional and neighborhood bus routes provide connectivity to many destinations in the region, along with the Silver Metrorail line.

In order to plan future bus service in a strategic manner, the County has developed a 10-year Transit Development Plan, which is currently in draft form for public review. This TDP represents a comprehensive and focused examination of future bus service needs in Fairfax County. In order to plan for the opening of the Metrorail Silver line, the TDP includes more in-depth service planning for bus routes serving Tysons Corner. Although the specific routes may vary from those coded in the CLRP bus network, an extensive review of the differences between the transit service in the CLRP and the draft TDP revealed that the overall amount of transit service is approximately the same. Bus service recommendations for regional routes and neighborhood routes from the draft TDP are shown on the next page.

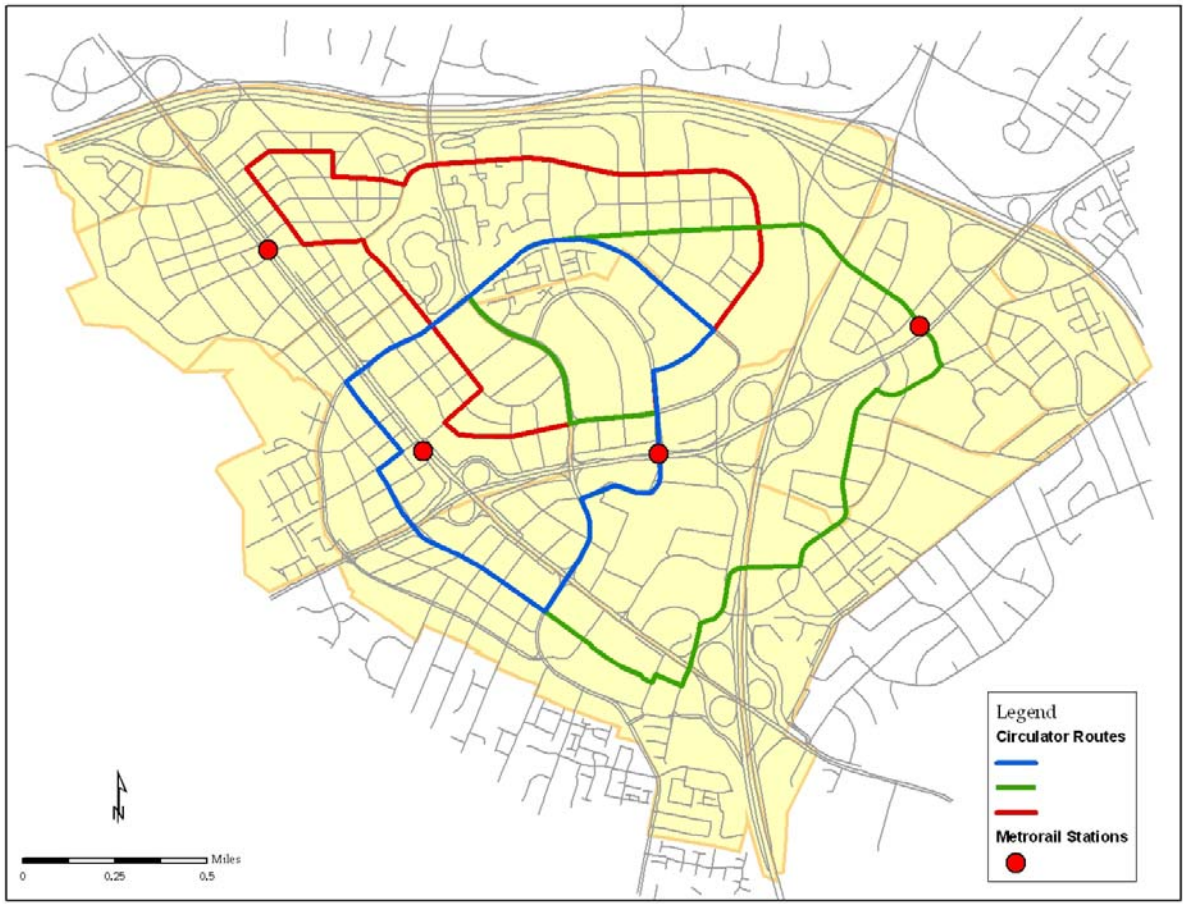

Neighborhood Routes
McLean Connector
FC 463
FC 462
Metrobus 3T
Metrobus 28T
Metrobus 2T
Metrobus 24T
Proposed Tysons Link Routes
Central Link via Westpark
East Link via Jones Branch
Greensboro Link
West Link
Beltway Link
DULLES ACCESS TOLL RD
DOLLEY MADISON BLVD
OLD DOMINION DR
LEESBURG PIKE
267
CHAIN BRIDGE RD
DIRST BRAULT EXWY
WESTMORELAND RD
BEULAH RD NE
MAPLE AVE E
123
LAWYERS RD
CAPITAL BELTWAY
GALLOWS RD
N WILLIAMSBURG BLVD
PARK ST SE
MAPLE AVE W
CEDAR LN E
495
CUSTIS MEMORIAL PKWY
LEE HWY
7
W BROAD ST
NUTLEY ST SW
E BROAD ST
66
HILLWOOD AVE
29
STATE HWY 237
ANNANDALE RD
NUTLEY ST
ARLINGTON BLVD
50
US HWY 50
PICKETT RD
Tysons - Regional Routes
Transit Development Plan
Fairfax County, Virginia
ATCS, P.L.C.
Regional Routes
FC 574
FC 401
Metrobus 2C
Metrobus 28AB
Metrobus 23A
September 25, 2009
Source: Fairfax County
Miles
0
0.5
1
1.5


Proposed Tysons Link Routes
Central Link via Westpark
East Link via Jones Branch
Greensboro Link
West Link
Beltway Link
DULLES ACCESS TOLL RD
DOLLEY MADISON BLVD
OLD DOMINION DR
LEESBURG PIKE
267
CHAIN BRIDGE RD
DIRST BRAULT EXWY
WESTMORELAND RD
BEULAH RD NE
MAPLE AVE E
123
LAWYERS RD
CAPITAL BELTWAY
GALLOWS RD
N WILLIAMSBURG BLVD
PARK ST SE
MAPLE AVE W
CEDAR LN E
495
CUSTIS MEMORIAL PKWY
LEE HWY
7
W BROAD ST
NUTLEY ST SW
E BROAD ST
66
HILLWOOD AVE
29
STATE HWY 237
ANNANDALE RD
NUTLEY ST
ARLINGTON BLVD
50
US HWY 50
PICKETT RD
Tysons - Neighborhood Routes
Transit Development Plan
Fairfax County, Virginia
ATCS, P.L.C.
Neighborhood Routes
McLean Connector
FC 463
FC 462
Metrobus 3T
Metrobus 28T
Metrobus 2T
Metrobus 24T
September 25, 2009
Source: Fairfax County
Miles
0
0.5
1
1.5

4.2.2 Proposed Comprehensive Plan

The transit network evaluated for the proposed Comprehensive Plan Amendment includes all services included in the Constrained Long Range Plan. In addition, it includes transit circulator routes within Tysons Corner to facilitate internal transit use, as shown in Figure 4.4. The transit circulators were coded with preferential characteristics, which included a speed that assumed traveling on its own right-of-way for half of the route and bus stops every quarter mile. The transit circulator frequency was six-minute headways, which is a high enough level of service that riders do not need to rely on a bus schedule. The transit circulator routes are preliminary to support the travel demand forecasting and have not undergone a thorough analysis of future transit demand, operational effectiveness, or other necessary analyses which would lead to designation of specific alignments.

Figure 4.4 Preliminary Circulator Routes



Note: Routes are preliminary and have not undergone operational analyses. Operational characteristics modeled included transit priority, quarter-mile bus stop spacing, and a six-minute service frequency.

Chapter 5: Transportation Impact Analysis and Needs Assessment

5.1 Overview of Technical Analysis

5.2.1 Background to Overview of Technical Analysis

The backbone of the transportation impact analysis and associated needs assessment is the transportation modeling analysis. The modeling analysis is a traditional 4-step process of trip generation, trip distribution, modal split, and assignment. The modeling analysis was used to:

- test the performance of alternative land us strategies;
- determine how alternative transportation highway and transit networks and associated transportation demand management programs performed, and identify problem locations (needs);
- provide input for the following additional analyses: the 2050 Sketch Planning Analysis; the analysis of the traffic impact on surrounding neighborhoods (the Neighborhood Study); the Phasing Analysis which was conducted to determine the priority order of transportation infrastructure and program needs over time.

5.2.2 Transportation Modeling Analysis

The analysis of land use and transportation network alternatives has been undertaken in three phases. The three phases have each been comprised of a scenario analysis, involving community workshops for the first two phases. In the first phase, a round of community workshops in July 2007 looked at three land use scenarios, one focusing on employment, one focusing on housing, and one increasing both employment and housing. Transportation network elements included the Metrorail extension, additional transit, a grid of streets, HOT lanes connections and an additional Dulles Toll Road Ramp, and Beltway crossings. In this first analysis phase, it was determined that the grid of streets performed an important function, access into and out of Tysons Corner needed to be improved, the housing-focused scenario resulted in the least amount of congestion increase, and the mixed scenario focusing on both housing and employment had 60 percent more congestion than the existing Comprehensive Plan as measured by hours of LOS "F" travel in the Tysons Corner area.

The second analysis phase, with community workshops in February 2008, included two land use scenarios, which were similar to those in the first phase, and two transportation networks. The first network included more roadway elements such as grade separations and highway ramps, and the second network included a circulator in a dedicated right-of-way. From this phase of the analysis, it was learned that the residential component captured a substantial amount of trips, reducing trips from outside of Tysons Corner, the network which included more roadway

elements drew more vehicle trips into Tysons, and both scenarios resulted in a higher level of transit use than the existing Comprehensive Plan. Using the findings from this analysis phase, the Tysons Corner Task Force developed a preferred land use scenario and transportation network, presented in the PB Placemaking report prepared for the Tysons Corner Task Force, "Transforming Tysons Vision and Areawide Recommendations."

The third analysis phase (2030 Land Use Scenario Analysis) evaluated seven different combinations of land use and transportation networks, which incorporated the work of the previous analysis phases. The results from the third analysis phase inform the development of the Tysons amendment of the Fairfax County Comprehensive Plan. The results of this analysis are presented in section 5.3 of this report.

5.2 Modeling Process

Appendix B of this report provides a description of the transportation modeling framework used for this work. In summary, the travel demand forecasting utilized the Fairfax County subarea highway assignment model, which currently incorporates the regionally adopted MWCOG model version at the time the study began (Version 2.1D#50). To better model the transit and mode choice options the WMATA Post-Processor Mode Choice Model, which includes a nested logit mode choice model to provide transit submode and mode of access information, was used and the resulting trip tables applied in the highway assignment.

5.3 2030 Land Use Scenario Analysis (Phase III Analysis)

5.3.1 Land Use Inputs

The seven tested scenarios include use of the following six land use inputs combined with appropriate transportation networks: 1) 2005, 2) 2030 Comprehensive Plan, 3) 2030 George Mason University (GMU) High Forecast, 4) 2040 (Prototype A), 5) 2050 (Prototype B), and 6) Task Force Preferred (TFP). The scenarios that were tested represented a range of land use and transportation changes that could happen over time.

The 2005 and 2030 Comprehensive Plan scenarios utilized the MWCOG Round 7.1 land use forecasts to capture the existing and baseline conditions. For the scenarios testing alternative futures, the starting point was the Tysons Corner TFP land use, developed after the previous analysis phase. Analyses performed by GMU suggest that the TFP land use inputs represent a potential time horizon beyond 2050, representing long term potential in Tysons Corner. The Prototype A and B scenarios which were analyzed in the second analysis phase were deemed indicative of land use development that could occur in the 2040 and 2050 timeframes, respectively. It was, therefore, desired to carry these forward for the third analysis phase.

5.3.2 2030 Impact and Needs Assessment – Regional Highways

This section details the evaluation of the transportation system's current and projected performance and conditions. The regional impact analysis task of the Tysons Corner Transportation and Urban Design Study used selected prior model runs to analyze the impacts of the proposed Tysons Corner Comprehensive Plan proposals on state-owned highways around Tysons Corner. This analysis is intended to also support VDOT's review of comprehensive plan changes for the Tysons Corner Study Area. The regional impact analysis focused on facilities of regional significance that provide access in, out, and around Tysons Corner, as shown in Figure 5.1. In addition to the gateway points, two points on VA Route 7 and VA Route 123 inside Tysons Corner were analyzed to determine the impact within Tysons Corner. Additional analysis was done within Tysons Corner, to ensure that the internal transportation system would support the additional land use. This includes many mitigation efforts including the grid of streets, additional ramps, and other elements. Additionally, the analysis presented in this document does not take into account new travel demand management (TDM) strategies, which have the potential to further reduce vehicle trips generated by development in Tysons Corner.

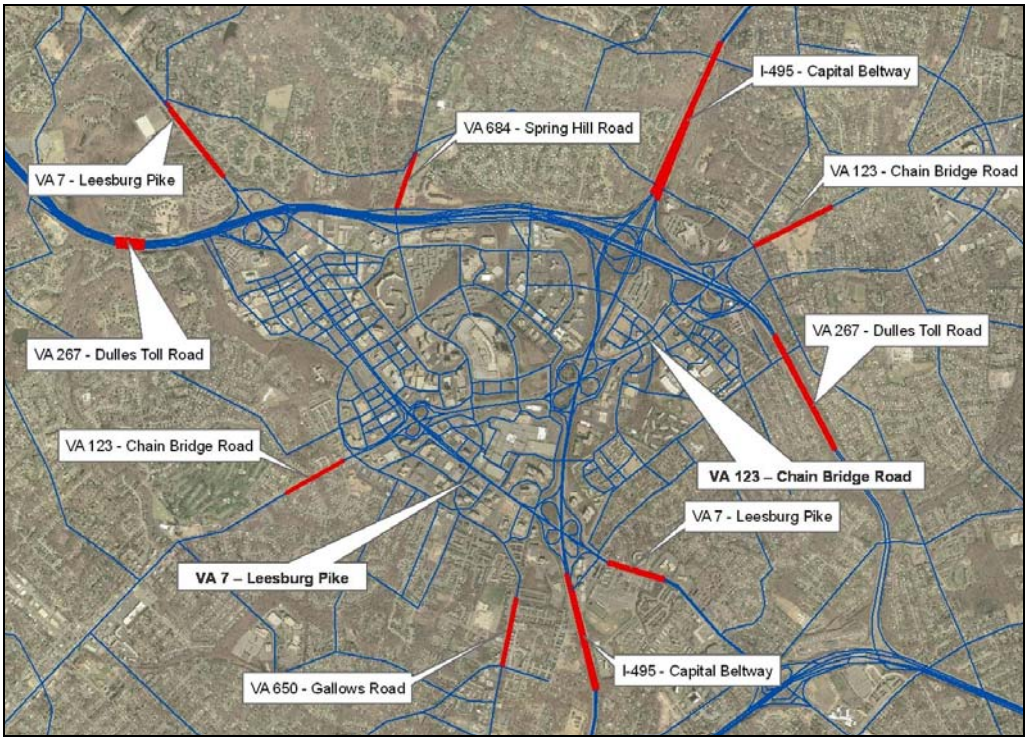


Figure 5.1 Key Locations for Impact Analysis of Highways

The results from the current Comprehensive Plan scenario were reviewed to determine the performance of the highway network at key locations shown in Figure 5.1 to verify the need for the improvements identified in the Recommended 2030 Network. These improvements were tested through the process of exploring differences in utilization among the subject facilities.

The approach used for this analysis was to first identify key locations on the facilities to use for the analysis (highlighted in Figure 5.1). Next, measures of effectiveness (MOEs) at these key locations were identified. This was done by examining the full traffic assignment for the selected land use scenarios (current Comprehensive Plan at 2030 level and proposed Tysons Comprehensive Plan at 2030 level), as well as examining the use of the facilities with a select link analysis.

The Recommended 2030 Network represents the product of identifying problem locations in the Recommended 2030 network and incorporating possible mitigation measures. The following MOEs were developed in the regional impact analysis:

- Peak hour volume and volume per lane for the facilities for morning and evening by direction;
- Change in volume to capacity ratio and link LOS by morning and evening peak hour by direction;
- Change in model travel time by time period;
- Change in model vehicle hours of delay by time period;
- Mode split results for trips destined to Tysons Corner (work and non-work); and
- Percentage of traffic traveling to and from Tysons Corner versus elsewhere.

These MOEs demonstrate the effectiveness of the possible mitigation measures that are represented in the 2030 Recommended Network and tested in the scenario analysis, such as the introduction of a grid of streets and additional ramps.

Table 5.1 and Table 5.2 present the peak hour volumes for each facility for the morning and evening peak period, respectively. Table 5.3 and Table 5.4 present the peak hour volumes per lane for each facility for the morning and evening peak period, respectively. The counts were adjusted based on the growth of the peak period model assignments. Since the refinements were solely based on the peak period results of the model they may somewhat over- or understate the traffic on each facility.

With the proposed Comprehensive Plan at 2030 and the Recommended 2030 Network for the morning peak hour there is a two percent decrease in total traffic for the sum of the locations shown in Figure 5.1, and a one percent decrease for the evening peak hour. There are, of course, volume changes at the individual locations.

In the morning peak hour forecasts, the largest change is forecast at the Spring Hill Road location north of VA 267, which shows a 23 percent increase in vehicles in the southbound direction and a 10 percent increase in the northbound direction. At this location, this facility is only one lane in each direction. The increase in the northbound (off-peak) direction is only 30 vehicles over the current Comprehensive Plan forecast, and therefore no significant impact is concluded. In the southbound (peak) direction, the increase of 235 vehicles for could be considered significant. This link primarily serves the communities north of the study area and through traffic is limited.

Table 5.1 Forecast Morning Peak Hour Volumes by Facility (vph)

Facility	Direction	Counts	Current Comprehensive Plan (2030)	Proposed Comprehensive Plan (2030)	Percent Change
VA 7 - West of Tysons	EB	2,504	2,930	2,295	-22%
	WB	1,205	1,385	1,130	-18%
Spring Hill Road	NB	346	285	315	10%
	SB	723	765	1,000	23%
I-495 - North of Tysons (GP)	NB	8,217	7,870	7,660	-3%
	SB	7,315	7,010	6,820	-3%
VA 123 - East of Tysons	EB	2,162	2,185	2,140	-2%
	WB	1,654	1,960	2,100	7%
VA 267 - East of Tysons (GP)	EB	2,793	1,070	1,030	-3%
	WB	2,553	980	1,110	14%
VA 7 - East of Tysons	EB	1,444	1,960	2,045	4%
	WB	1,946	2,100	2,300	10%
I-495 - South of Tysons (GP)	NB	8,226	8,070	8,060	0%
	SB	6,355	6,810	6,670	-2%
Gallows Road	NB	2,384	3,460	3,475	0%
	SB	857	775	855	10%
VA 123 - West of Tysons	EB	1,938	1,695	1,750	3%
	WB	533	435	475	9%
VA 267 - West of Tysons (GP)	EB	6,538	6,040	6,750	12%
	WB	4,742	5,580	5,340	-4%
VA 7 – Within Tysons	EB	1,649	2,150	1,780	-17%
	WB	3,013	1,400	2,520	80%
VA 123 - Within Tysons	EB	1,705	1,620	670	-59%
	WB	2,748	2,310	1,240	-46%
Total		**73,549**	**84,610**	**82,670**	**-2%**

Table 5.2 Forecast Evening Peak Hour Volumes by Facility (vph)

Facility	Direction	Counts	Current Comprehensive Plan (2030)	Proposed Comprehensive Plan (2030)	Percent Change
VA 7 - West of Tysons	EB	1,529	1,675	1,220	-27%
	WB	2,495	2,750	2,465	-10%
Spring Hill Road	NB	869	860	1,000	16%
	SB	413	270	470	74%
I-495 - North of Tysons (GP)	NB	6,626	6,310	6,340	0%
	SB	5,532	5,110	4,810	-6%
VA 123 - East of Tysons	EB	2,346	2,390	2,540	6%
	WB	2,198	2,220	2,170	-2%
VA 267 - East of Tysons (GP)	EB	1,094	1,057	1,150	9%
	WB	1,904	2,175	2,210	2%
VA 7 - East of Tysons	EB	2,658	3,560	3,155	-11%
	WB	1,654	2,190	2,165	-1%
I-495 - South of Tysons (GP)	NB	6,619	6,620	7,030	6%
	SB	7,385	7,240	7,180	-1%
Gallows Road	NB	1,239	1,780	1,795	1%
	SB	2,148	1,810	2,030	12%
VA 123 - West of Tysons	EB	1,010	580	750	29%
	WB	1,573	1,510	1,580	5%
VA 267 - West of Tysons (GP)	EB	4,758	5,210	5,260	1%
	WB	6,369	6,370	7,190	13%
VA 7 – Within Tysons	EB	2,399	1,800	2,810	56%
	WB	2,109	1,130	1,900	69%
VA 123 - Within Tysons	EB	2,443	2,540	1,050	-59%
	WB	2,857	2,500	720	-71%
Total		**70,226**	**69,640**	**68,990**	**-1%**

Table 5.3 Forecast Morning Peak Hour Volumes per Lane by Facility (vphpl)

Facility	Direction	Counts	Current Comprehensive Plan (2030)	Proposed Comprehensive Plan (2030)	Absolute Change
VA 7 - West of Tysons	EB	1,252	1,465	1,150	-315
	WB	402	460	380	-80
Spring Hill Road	NB	346	285	315	30
	SB	723	765	1000	235
I-495 - North of Tysons (GP)	NB	2,054	1,970	1,910	-60
	SB	1,829	1,750	1,700	-50
VA 123 - East of Tysons	EB	1,081	1,090	1,070	-20
	WB	827	980	1,050	70
VA 267 - East of Tysons (GP)	EB	1,397	530	520	-10
	WB	1,277	490	560	70
VA 7 - East of Tysons	EB	481	650	680	30
	WB	649	700	770	70
I-495 - South of Tysons (GP)	NB	2,057	2,020	2,020	0
	SB	1,589	1,700	1,670	-30
Gallows Road	NB	795	1,150	1,160	10
	SB	286	260	290	30
VA 123 - West of Tysons	EB	969	850	875	25
	WB	267	220	240	20
VA 267 - West of Tysons (GP)	EB	1,634	1,510	1,690	180
	WB	1,581	1,860	1,780	-80
VA 7 – Within Tysons	EB	412	540	450	-90
	WB	753	350	630	280
VA 123 - Within Tysons	EB	426	410	170	-240
	WB	687	580	310	-270

Table 5.4 Forecast Evening Peak Hour Volumes per Lane by Facility (vphpl)

Facility	Direction	Counts	Current Comprehensive Plan (2030)	Proposed Comprehensive Plan (2030)	Absolute Change
VA 7 - West of Tysons	EB	765	840	610	-230
	WB	832	920	820	-100
Spring Hill Road	NB	869	860	1,000	140
	SB	413	270	470	200
I-495 - North of Tysons (GP)	NB	1,657	1,580	1,580	0
	SB	1,383	1,280	1,200	-80
VA 123 - East of Tysons	EB	1,173	1,200	1,270	70
	WB	1,099	1,110	1,090	-20
VA 267 - East of Tysons (GP)	EB	547	530	580	50
	WB	952	1,090	1,100	10
VA 7 - East of Tysons	EB	886	1,190	1,050	-140
	WB	551	730	720	-10
I-495 - South of Tysons (GP)	NB	1,655	1,650	1,760	110
	SB	1,846	1,810	1,800	-10
Gallows Road	NB	413	590	600	10
	SB	716	600	680	80
VA 123 - West of Tysons	EB	505	290	380	90
	WB	787	760	790	30
VA 267 - West of Tysons (GP)	EB	1,586	1,740	1,760	20
	WB	1,592	1,590	1,800	210
VA 7 – Within Tysons	EB	600	450	700	250
	WB	527	280	480	200
VA 123 - Within Tysons	EB	611	640	260	-380
	WB	714	620	180	-440

VA 267 inside the Beltway shows a 14 percent increase over the current Comprehensive Plan in the westbound direction in the morning peak hour (approximately 70 vehicles per hour per lane). Given the high capacity of this highway facility the additional vehicles should not have a significant impact. Moreover, the forecast volume is lower than the count today; clearly, directly related to the extension of Metrorail through Tysons Corner.

Gallows Road shows a 10 percent increase over the current Comprehensive Plan forecast in the southbound direction for the morning peak hour. This is the off peak direction at this time of day

and the additional 27 vehicles per hour per lane is not significant. The forecast for this link under the GMU High scenario is equivalent to the existing count.

VA 267 west of Tysons Corner shows an increase of 12 percent over the current Comprehensive Plan Forecast for the morning peak hour. This is in the peak direction and results in approximately 175 vehicles per hour per lane. Given the capacity of this facility it should not have a significant impact as compared to the current Comprehensive Plan forecasted volume.

The forecasts for the evening peak hour show similar patterns. For Spring Hill Road north of VA 267 there is an increase of approximately 200 vehicles per hour but in the off-peak direction and the total volume is well under capacity. This increase is reflective of the change in land use under the proposed Comprehensive Plan scenario and the mix and intensity of households, retail, and jobs. There is a 16 percent increase in the peak direction for the evening peak hour, which results in additional 140 vehicles per hour. Again, as in the morning peak, this is facility serves the surrounding communities and local traffic. The cordon analysis confirms there are other gateways and approaches that improve under the proposed Comprehensive Plan scenario that might help mitigate the congestion on this approach.

In the evening peak hour VA 267 west of Tysons Corner shows an increase of 13 percent in the peak direction, but this results in only an additional approximately 200 vehicles per lane per hour. The facility is approaching capacity at this link with approximately 1,800 vehicles per hour per lane. Some of the issue here is the loss of a lane for HOV operations in the peak direction during the peak period, but the importance of the HOV facility may balance the added non-HOV demand.

Overall, the analysis shows that the 2030 Recommended Network adequately serves the proposed 2030 Comprehensive Plan land use. None of the facilities show an overwhelming need for additional lanes based on the change in vehicles per hour per lane between the proposed 2030 Comprehensive Plan scenario (which includes the Recommended 2030 Network) and the current Comprehensive Plan scenario.

A number of factors explain the relatively small change in traffic flow forecast between the current Comprehensive Plan and the proposed Comprehensive Plan land use, including:

- The additional transit infrastructure and services provided to and within Tysons Corner under the proposed Comprehensive Plan scenario encourage transit usage;
- The TOD focus of the proposed Comprehensive Plan land use better leverages the transit infrastructure and service improvements as compared with the existing Comprehensive Plan;
- There is a better balance of jobs versus households under the proposed Comprehensive Plan land use forecast which leads to more internal-to-internal commuting trips within Tysons Corner versus external-to-internal commuting trips; and
- There is improved roadway connectivity and additional roadway facilities present in the Recommended 2030 Network as compared with the current Comprehensive Plan roadway network.

Table 5.5 shows the change in the volume/capacity ratios and level of service (LOS) for the studied facilities. The LOS for each facility is calculated based on volume to capacity ratio and

does not take into account intersection delay. Including intersection delay would decrease the LOS on the facilities shown.

Table 5.5 Change in V/C and LOS by Peak Hour

		Changes in V/C		Changes in LOS	
	Direction	**AM**	**PM**	**AM**	**PM**
VA 7 – West of Tysons	EB	-22%	-27%	D to C	B
	WB	-18%	-10%	B to A	C
Spring Hill Road	NB	-6%	12%	C	E
	SB	-7%	67%	E	C to D
I-495 – North of Tysons	NB	-3%	0%	E	D
	SB	-3%	-6%	E to D	C
VA 123 – East of Tysons	EB	-2%	6%	C	D
	WB	7%	-2%	C	C
VA 267 – East of Tysons	EB	-19%	-9%	C	B
	WB	-4%	-15%	C to B	C
VA 7 – East of Tysons	EB	4%	-11%	B	D
	WB	10%	-1%	B to C	B
I-495 – South of Tysons	NB	-12%	-7%	F	E
	SB	-2%	-1%	D	E
Gallows Road	NB	0%	1%	E	D
	SB	10%	12%	A to B	E
VA 123 – West of Tysons	EB	7%	34%	C	A
	WB	20%	15%	A	B to C
VA 267 – West of Tysons	EB	12%	1%	D	C
	WB	-4%	13%	C	D to E
VA 7 – Within Tysons	EB	-17%	56%	A to B	B to C
	WB	80%	69%	B to C	A to B
VA 123 - Within Tysons	EB	-58%	-58%	B to C	C to B
	WB	-56%	-76%	B	C to A

Differences in travel times from the model along the selected facilities can be found in Table 5.6. These travel times represent the differences in modeled travel time from a point on one side of Tysons Corner to a point on the other side of Tysons Corner (both outside of Tysons Corner itself). These travel times do not represent actual travel times through Tysons Corner, as the model is not calibrated for travel time, and therefore should only be examined on the basis of change. The maximum change in travel time over all the facilities was approximately five minutes while the minimum was no change. I-495 is the only facility which shows an improvement in travel time, with widely varying increases in travel times across the other facilities.

Table 5.6 Change in Travel Time through Tysons Corner by Facility (Percentage and Absolute Minutes)

	Morning		**Evening**		**Off-Peak**	
	Percent Change	Time Change	Percent Change	Time Change	Percent Change	Time Change
VA 7 – Westbound	29%	4 min	10%	2 min	15%	2 min
VA 7 – Eastbound	18%	3 min	25%	4 min	21%	3 min
Spring Hill Road to Gallows Road	28%	3 min	14%	2 min	19%	2 min
Gallows Road to Spring Hill Road	25%	3 min	19%	3 min	23%	3 min
I-495 – Southbound	-19%	-2 min	-5%	-1 min	-12%	-1 min
I-495 – Northbound	-17%	-3 min	-5%	-1 min	-27%	-3 min
VA 123 – Westbound	9%	1 min	12%	1 min	15%	1 min
VA 123 – Eastbound	11%	1 min	16%	2 min	13%	1 min
VA 267 – Westbound	0%	0 min	46%	2 min	6%	< 1 min
VA 267 – Eastbound	9%	< 1 min	11%	1 min	0%	0 min

Table 5.7 shows the change in vehicle hours of delay by facility, from the current 2030 Comprehensive Plan to the proposed 2030 Comprehensive Plan scenario. This measures the increase in time to travel that specific link over the free-flow time which is then multiplied by the total number of vehicles traveling the link. Most of the facilities did not have a large increase in delay, or a decrease, as in the case of I-495 and VA 267 east of Tysons Corner. Spring Hill Road, VA 123, and VA 267 west of Tysons Corner are the facilities which experience the greatest increases in vehicle hours of delay.

Table 5.7 Percent and Absolute Change in Vehicle Hours of Delay for the Peak Hour by Facility (current 2030 Comprehensive Plan to the proposed 2030 Comprehensive Plan scenario)

	Percent Change	**Absolute Change**
VA 7 – West of Tysons	-26%	-3.8 hours
Spring Hill Road	79%	5.9 hours
I-495 – North of Tysons	-25%	-113.7 hours
VA 123 – East of Tysons	6%	4.9 hours
VA 267 – East of Tysons	-51%	-0.5 hours
VA 7 – East of Tysons	13%	3.3 hours
I-495 – South of Tysons	-14%	-96.3 hours
Gallows Road	65%	51.5 hours
VA 123 – West of Tysons	79%	14.7 hours
VA 267 – West of Tysons	99%	12.9 hours

Table 5.8 details the percentages of trips that are within Tysons Corner, originate in Tysons Corner, or are destined for Tysons Corner. From this table it can be seen that the proposed 2030 Comprehensive Plan has higher proportions of traffic generated internally and destined elsewhere. In contrast, the current Comprehensive Plan attracts more traffic to Tysons Corner.

Table 5.8 Total Daily Motorized (Automobile and Transit) Person Trips with Origin And/Or Destination in Tysons Corner for All Trip Purposes

	Current Comprehensive Plan (2030)	Proposed Comprehensive Plan (2030)
Within Tysons	13%	17%
Originating in Tysons	22%	28%
Destined for Tysons	65%	56%

Merge Analysis of Ramps Connecting Tysons to the Dulles Toll Road and I-495

Inside Tysons, the grid of streets provides alternative vehicle paths which divert traffic away from Rt. 7 and to a lesser degree, away from Rt. 123. Because of this and other diversions, the roads inside Tysons perform relatively well as indicated in the previous section of this report. However, the number of entrance and exit points to and from Tysons are limited by:

- the Dulles Toll Road (DTR) and I-495 (the Beltway) both of which serve as a barrier;
- the difficulty and severe limitations associated with expanding the capacity of existing major arterials (Rt. 7 and Rt. 123) beyond improvements already included in the County's Comprehensive Plan prior to this plan amendment.

Because of this limitation, entry and exit points to and from Tysons have an elevated level of importance and a requirement for these points to function as effectively as possible. The existing DTR interchanges at Rt. 7 and Spring Hill Road will not be able to accommodate the 2030 estimated traffic volumes. For this reason, additional ramp locations were included in the 2030 Comp Plan network by extending Boone Blvd. and Greensboro Drive to the DTR.

In and around Tysons the evening peak period is more congested than the morning peak period. A merge capacity analysis was therefore performed for the evening peak at the on-ramps to westbound Dulles Toll Road (the peak direction) and the on-ramps to the Outer Loop of I-495 (the peak direction). The application of the HCM freeway merge analysis shows that merging failed at two locations. Table 5.9 below shows the relevant volumes for the merge analysis at the two ramp merges that fail.

Table 5.9 2030 Merge Analysis of Ramps Connecting Tysons to the Dulles Toll Road and I-495

Location	2030 Ramp Volume for Proposed Comp Plan	2030 Freeway Volume for Proposed Comp Plan	Freeway Number of Lanes	2030 LOS at Merge	2030 LOS at Merge After Mitigation
On-ramp from proposed Boone Blvd. extension to WB DTR	1,040	6,390	3	F	D
On-ramp from Rt. 7 to SB I-495	2,430	6,450	4	F	C

Both locations fail. Because of the importance of these ramps operating as effectively as possible, it is necessary to mitigate the problem merges. Because of the close spacing of the on-ramps on the DTR, it is recommended that collector-distributor (CD) lanes be added in both the WB and EB directions. Further capacity analysis shows that the CD lanes need to continue to a point west of the Hunter Mill Rd interchange. At this location the merge of the CD traffic into the general purpose lanes of the DTR will operate at LOS D as indicated in Table 5.9.

A similar analysis and mitigation process was performed for the on-ramps from Rt. 123 and the Outer Loop of I-495. At this location, the merge failed as indicated in Table 5.9. It is recommended that a CD lane be added to the Outer Loop between the Rt. 7 interchange and I-66. With the addition of this CD lane, the merge improves to LOS C as indicated in Table 5.9.

5.3.3 2030 Impact and Needs Assessment – Highways Within Tysons

For the congested vehicle miles of travel, the proposed Comprehensive Plan Land Use (the 2030 GMU High Modified scenario) has the same amount of congested vehicle miles as the current Comprehensive Plan. The congested vehicle miles of travel for these two scenarios are 18 percent higher when compared to the 2005 vehicle miles of travel as shown in Figure 5.2 below.

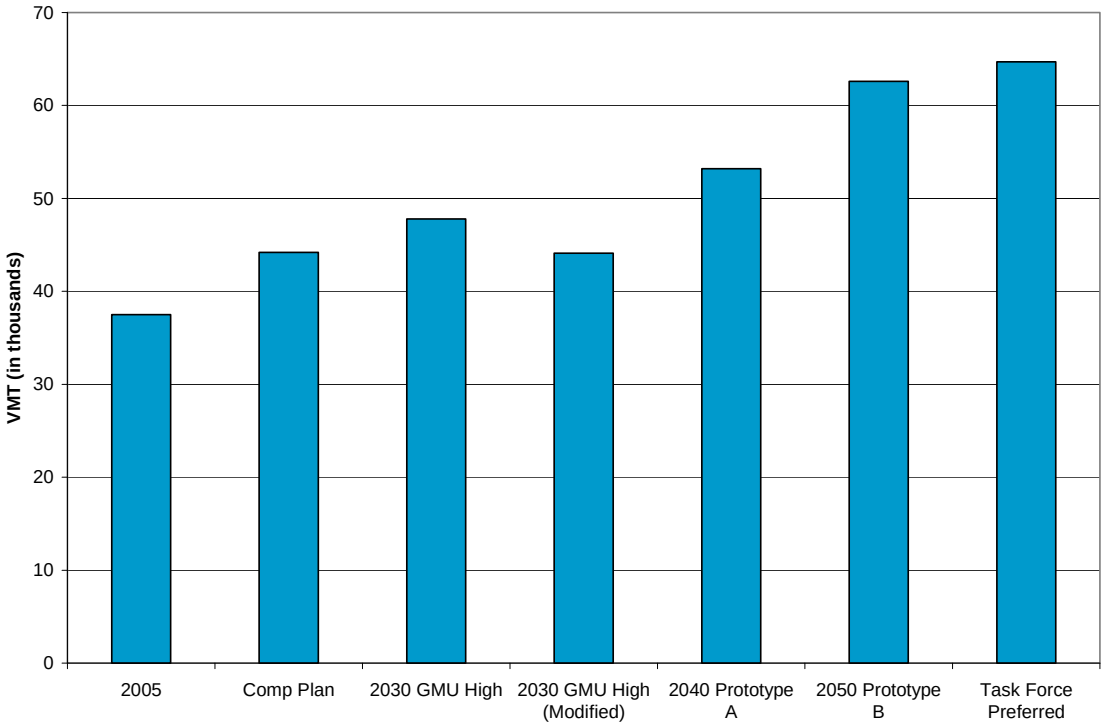


Figure 5.2 Congested Vehicle Miles of Travel Within Tysons Corner (LOS F)

5.3.4 2030 Impact and Needs Assessment – Impact on Surrounding Communities

An assessment of the traffic impact of the proposed Comprehensive Plan on neighborhoods along the periphery of Tysons was conducted. Working with the elected representative's local communities, FCDOT selected nineteen (19) intersections for assessment in this study. The major corridors in the study area are Leesburg Pike (Route 7, Lewinsville Road/Great Falls Road, Gallows Road, Maple Avenue/Chain Bridge Road/Dolley Madison Blvd (Route 123), and Georgetown Pike.

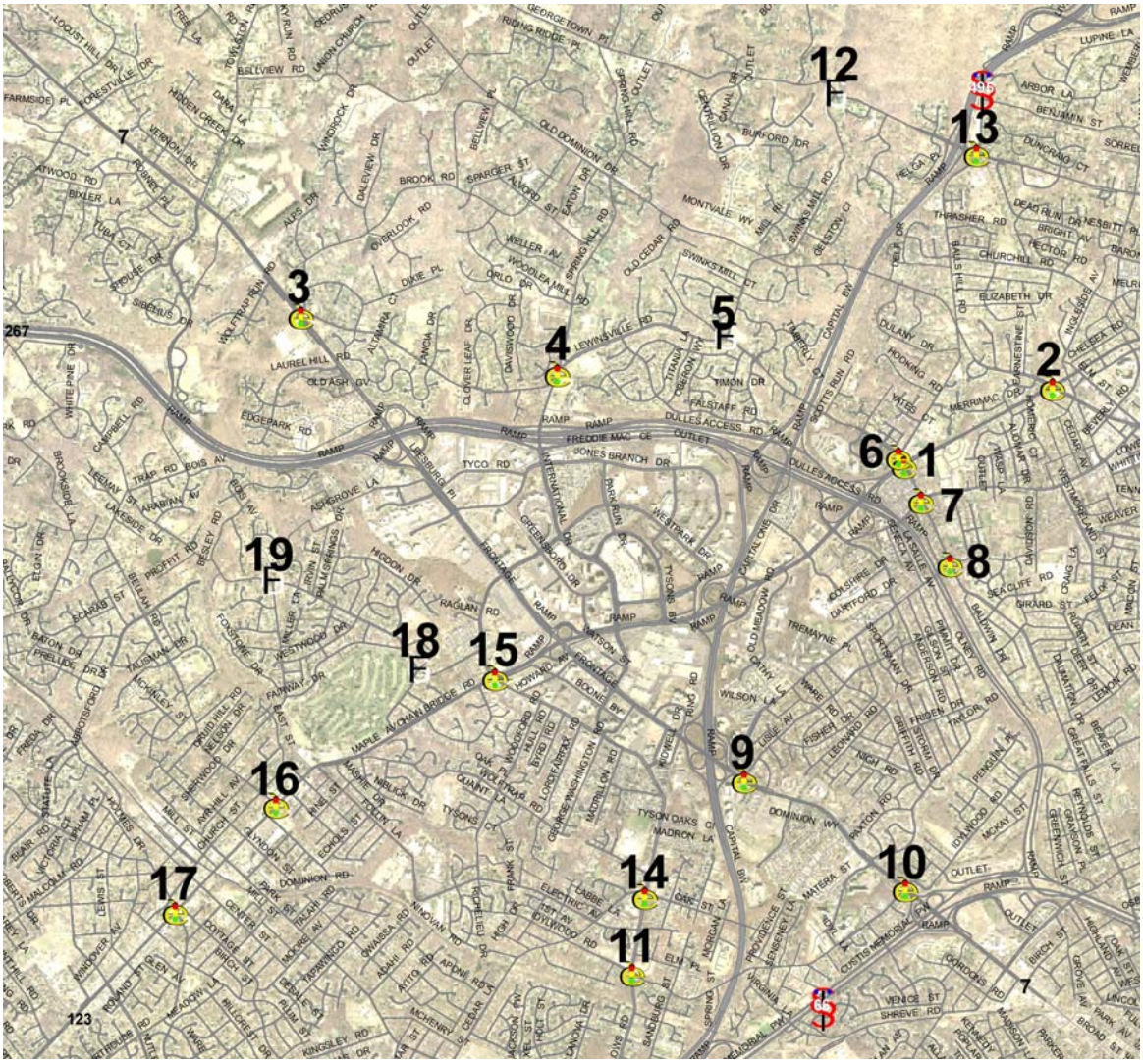


Figure 5.3 Location of intersections analyzed as part of the Neighborhood Impact Analysis

Two study scenarios were considered for this project: the current Comprehensive Plan and the proposed Comprehensive Plan for Tysons. Using growth rates obtained from the modeling analysis, the average growth rates for each roadway link was obtained by applying the NCHRP refinement method. The volumes were derived using WinTurns software program to achieve year 2030 turning movement counts at all the intersections under both study scenarios. Currently, eight (8) intersections in the study area operate at acceptable levels of service (defined in this report as LOS D or better) under existing year 2008 conditions (AM and/or PM peak hours). Under future conditions, five (5) existing intersections are projected to operate at acceptable levels of service under both current Comp Plan and proposed Comp Plan scenarios.

For the failing intersections (operating at LOS E and LOS F), mitigation measures such as changes in lane configurations and signal timing /traffic control to achieve acceptable levels of service, were identified for each applicable scenario. The results of the analysis are presented in Table 5.10 below.

Table 5.10 Summary of Intersection Capacity Analyses

Intersection	2008 Existing		2030 Comp Plan - No Imp.		2030 Comp Plan - Pro. Imp.		2030 GMU High Plan - No Imp.		2030 GMU High Plan - Pro. Imp	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Int 1: Great Falls & Dolley Madison Blvd	D	E	D	E	D	D	D	E	D	D
Int 2: Old Dominion Dr & Dolley Madison Blvd	E	D	E	D	E	D	E	D	E	D
Int 3: Leesburg Pike & Lewinsville Road	C	E	C	F	C	D	D	F	C	D
Int 4: Spring Hill Rd & Lewinsville Road	D	E	F	F	D	D	E	F	D	D
Int 5: Swinks Mill Rd & Lewinsville Road *	-	-	-	-	-	-	-	-	-	-
Int 6: Great Falls St & Balls Hill Road	B	A	B	A	-	-	B	A	-	-
Int 7: Great Falls St & Chain Bridge Road	D	E	D	F	C	D	D	E	C	D
Int 8: Great Falls St & Magarity Road	B	C	B	B	-	-	B	C	-	-
Int 9: Leesburg Pike & Lisle Avenue	D	D	E	F	D	D	F	F	D	D
Int 10: Leesburg Pike & Idylwood Rd	E	D	F	F	D	D	F	F	D	D
Int 11: Gallows Rd & Idylwood Rd	D	C	F	D	D	D	F	E	D	D
Int 12: Georgetown Pk & Swinks Mill Rd *	-	F	F	F	D	D	F	F	C	D
Int 13: Georgetown Pk & Balls Hill Rd	C	C	C	C	-	-	C	C	-	-
Int 14: Gallows Rd & Cedar Lane	D	C	F	C	D	C	F	C	D	C
Int 15: Old Courthouse Rd & Chain Bridge Rd	F	E	E	F	E	E	F	F	E	D
Int 16: Beulah Rd & Maple Ave	C	F	C	F	C	D	C	F	C	D
Int 17: Lawyers Rd & Maple Ave	F	F	F	F	E	D	F	F	E	E
Int 18: Westbriar Dr & Old Courthouse Rd *	-	F	F	F	C	D	-	F	B	B
Int 19: Creek Crossing Rd & Old Courthouse Rd *	-	-	-	-			-	-		
Operating at LOS E or F	4	9	10	11	3	1	9	12	3	1
Operating at LOS E or F during AM and/or PM Peak	11		14		3		14		3	
Operating at LOS D during both AM and PM Peak	8		5		16		5		16	
Total No. of Intersections	19		19		19		19		19	

The cost involved in implementing the improvements necessary to mitigate the proposed Tysons Comprehensive Plan land use traffic was estimated to be $14 million.

5.4 Transit Needs Assessment

5.4.1 Transit Development Plan Overview

Recommendations for bus service for Tysons Corner are contained in the County's Transit Development Plan (TDP), currently in draft form for public review. The TDP is a 10 year plan to improve bus service Countywide. Conducted over the course of the last two years, the TDP is a comprehensive review of bus service in the County with detailed recommendations for new and modified routes. A particular focus of the study was for bus service within Tysons Corner.

These recommendations are based the opening of the Metrorail Silver line and on projected employment and residential patterns and are designed to be implemented between the opening of Phase 1 of the Metrorail Silver line and 2020. There are several types of recommended service changes described below: express bus; restructured regional routes; neighborhood/local routes; and internal circulators.

5.4.2 Express Bus Recommendations

The construction of the new HOT Lanes along the Capital Beltway (I-495) between Springfield and the Dulles Toll Road and on I-95 and I-395 provides an opportunity to establish cross county express BRT services connecting South County and North County communities. The 14-mile long I-495 HOT Lanes are currently under construction with an expected completion in 2013 and will provide two lanes in each direction. The construction of the I-95/I-395 HOT lanes is due to begin in 2010 and will provide two reversible lanes to serve peak HOV traffic.

Three routes are recommended to operate peak periods at 15 minute headways as follows:

Lorton – Tysons: This route would provide peak period express service connecting Lorton with Tysons Corner via the Franconia-Springfield Metro Station. Lorton is a fast growing area that should generate significant ridership for commuting to growing employment opportunities in Tysons. This route would begin at the Sydenstricker Park and Ride and follow the alignment of the proposed new route 309 until the I-95 entrance ramp. Reverse peak trips which otherwise would deadhead on this route would provide revenue service to the Engineering Proving Ground (EPG), providing access to the new NGA campus for people who currently reside in northern Fairfax County and the Tysons Corner area. Upon serving the NGA, this route would continue to the Sydenstricker Park & Ride via Rolling Road and the Fairfax County Parkway. The route would also complement Fairfax Connector 401, which would continue to provide local service.

Tysons – Ft. Belvoir: This route would provide an opportunity for easy access to Springfield and Ft. Belvoir by providing a direct and fast transit option for North County residents that work at Fort Belvoir. Secondarily, it would provide additional capacity for Springfield area residents traveling to the Tysons area supplementing the Lorton route.

Burke Center – Tysons: This route would provide express bus service from the Braddock District to Tysons connecting the Braddock residential communities with the Tyson area employment

opportunities. Burke Centre is a residential area with many employees forecast to work in the Tysons area. There is no current transit connection between these parts of the county. This route would also serve a proposed park and ride lot to be constructed on Braddock Road between Rolling Road and Burke Lake Road. This route would provide weekday service from Burke Centre Park-and-Ride to the future Tysons Central station via Guinea Road, Braddock Road and I-495 HOT Lanes.

5.4.3 Restructured Regional Routes

The Metrorail extension from West Falls Church to Dulles Airport via Tysons Corner and the Dulles Toll Road is one of the largest infrastructure projects in Fairfax County. The new line, to be built in two phases, will have far-reaching implications for bus service in the northern part of Fairfax County. Restructuring of bus service in the Silver Line corridor is necessary to accommodate and complement the rail extension. Routes recommended for restructuring are listed below. Details can be found in the TDP.

Metrobus Route 2C
Metrobus Route 2T
Metrobus Route 3T
Metrobus Route 5A
Metrobus Route 15KL
Metrobus Route 23A
Metrobus Route 24T
Metrobus Route 28AB
Metrobus Route 28T
Fairfax Connector 462
Fairfax Connector 463
Fairfax Connector 574

5.4.4 Neighborhood/Local Routes

Several of the restructured routes above will result in shorter routes that connect Tysons Corner to adjoining communities. One new neighborhood/local route is recommended: the McLean Connector.

Two separate alignments for this route are envisioned, one for peak periods and one for midday/evening service and possible weekend service. The peak service would link the CIA facility to central McLean, Tysons East Metrorail station, Lewinsville Road, and Tysons West Metrorail. The off-peak service would be more limited in coverage, linking central McLean to Tysons Corner, with a western terminal at Tysons Center 123 station.

During the morning peak period, the route would begin at Tysons East Metrorail and head eastbound on Chain Bridge Road. Joining VA-123, the eastbound trip would terminate at the CIA facility. The bus would then turn around and retrace its route to Tysons East. Next, it would follow Lewinsville Road around Tysons Corner to Spring Hill Rd, terminating at Tysons West in order to cover the territory not served by the new streamlined 24T. In the afternoon peak, the

pattern would be reversed. This proposed routing of the McLean Connector would be instead of the F4 shuttle listed in the Tysons TMP.

During off-peak periods, an alignment similar to that recommended in the Tysons TMP would be operated. The route would begin at Tysons Corner Center or Tysons Central 123 Metrorail (to be determined in the Tysons planning task of the TDP). It would follow Chain Bridge Road to the east, serving central McLean and then turn left on Fleetwood. The route would follow Fleetwood to Elm Street and turn left and then right on Beverly. At the end of Beverly, the route would turn left on Ingleside and then right on Chain Bridge to return to Tysons Corner. For both peak and off-peak service, an enhanced bus shelter, with excellent pedestrian access, bicycle parking and possibly commuter parking oriented to McLean residents should be located along the route, likely along Chain Bridge Road, to serve as a focus of bus service in downtown McLean.

5.4.5 Internal Circulators

To complement the rail service, an initial service concept for internal circulation routes in Tysons Corner has been developed. In order to keep the routes short and as direct as possible, the "Tysons Link" service consists of five routes, described below. Previous circulation plans for Tysons had used one or two routes with a loop structure to cover the many trip generators in the area. To explore the longer term concept of a Circulator within dedicated right-of-way. Possibly on a fixed-guide way, developed by the Tysons Task Force, the County will conduct a separate Circulator study

Each of these five routes was designed to connect areas of employment and residences with two Silver Line stations and shopping and eating establishments. All routes serve the Tysons Central 123 station, four of them also serve Tysons West, and one also serves Tysons East.

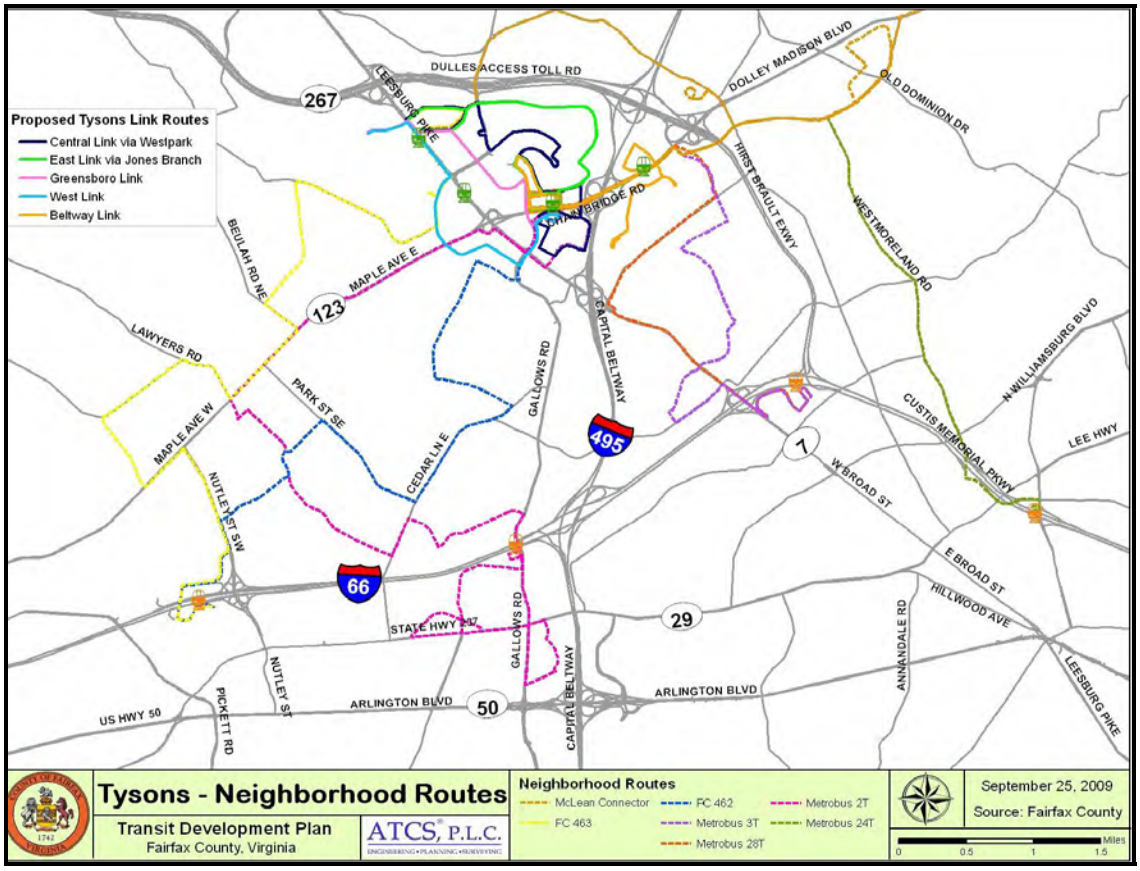
The Beltway Link (orange on maps) serves the area inside the Capital Beltway, including the Capital One complex, Old Meadow Road, Colshire, and Tysons East station. It links these areas to Tysons Central 123 via Dolley Madison Drive and during lunchtime will circulate through the Galleria at Tysons II.

The East Link (green on maps) serves Jones Branch and the eastern edge of Westpark Drive, connecting employment and the Hilton hotel with the Galleria at Tysons II. It runs between Tysons West and Tysons Central 123, and also would make the lunchtime loop through the Galleria.

The Central Link (navy blue on maps) serves residential areas such as the Rotonda and housing along Westpark Drive and then operates through the heart of the Galleria (using the mall road as the current Tysons Connector (free Lunch Shuttle) does and then a loop through Tysons Corner Center.

The Greensboro Link (pink on maps) operates between Tysons West and Tysons Central 123, and connects the employment along Greensboro Drive to Tysons Corner Center and Westwood Center Drive.

Finally, the West Link (aqua blue on maps) operates along VA 7, Gosnell, Old Courthouse, Boone, and Gallows to provide access to buildings along VA 7 and areas to the west. It connects Tysons West and Tysons Central 123, and also serves Westwood Center Drive.



5.4.6 2020 to 2030 Transit Recommendations

From 2020 to 2030, the bus services described above would be improved by operating more frequently and with improved spans of service. In particular, the express bus routes operating on the HOT lanes would be improved by expanding service to off-peak periods and by operating more frequent service if warranted by demand. Additional express bus service would be added in the I-66 corridor.

5.5 2050 Land Use Scenario Analysis (Sketch Planning Analysis)

5.5.1 Background to the Sketch Planning Analysis

The results of the 2030 proposed Comprehensive Plan Scenario Analysis show that the problem locations on the highway network can be found at traffic merge points at the Dulles Toll Road (DTR) and I-495 during the evening peak. Recommended mitigation measures for these problem locations are the addition of collector-distributor (CD) lanes along the Dulles Toll Road west of the Virginia Route 7 interchange and the provision of an additional CD lane along the Outer Loop between the Virginia Route 7 interchange and the I-66 interchange. With these improvements, the DTR corridor (including the Dulles Access Road) will have a total of 16 or 18 lanes depending if one or two CD lanes per direction is provided. The provision of the CD lanes will be a challenge because of right-of-way issues. Considering this, further expansion of the DTR is unlikely. The I-495 corridor will have 13 lanes with the provision of the additional lane on the Outer Loop. Right-of-way for this additional lane is also a challenge and therefore it is reasonable to assume that the provision of further lanes along I-495 in the vicinity of Tysons will be unlikely beyond the additional HOT lanes and the CD lane.

There are also limitations applicable to the arterials serving Tysons. The proposed 2030 Comprehensive Plan Network contains capacity improvements (additional lanes) for nearly all the arterials. There are significant limitations to the available right-of-way along these arterials and further expansion beyond those already included in the proposed 2030 Comprehensive Plan Network does not seem possible.

Considering the limitations in providing additional highway capacity beyond what is included in the Recommended 2030 Comprehensive Plan Network, the transportation infrastructure and programs that are required to accommodate the 113 million square feet of development for Tysons by 2050 are therefore assumed to focus on the provision of additional transit infrastructure as well as additional TDM measures. These measures are required to keep vehicle trips reasonably constant at the 2030 level.

5.5.1 The Required Transit Modal Split

The process that was applied for this analysis was to hold the cordon vehicle volumes at the demand level associated with the proposed 2030 Comprehensive Plan land use intensity, and shift the additional single-occupancy vehicle (SOV) person trips to transit. Given the assumption that the proposed 2030 Comprehensive Plan Network can handle the demand generated from the proposed 2030 Comprehensive Plan land use intensity, the required transit mode share was determined for the proposed 2050 Comprehensive Plan land use intensity.

It was assumed that the number of high occupancy vehicle (HOV) trips would stay constant, and that additional transit trips would need to shift from SOV. The projected transit modal share for

2030 and the required modal share for 2050 are shown in Table 5.11 for the evening peak. The required model share is based on the evening peak because it is the most congested period.

Table 5.11 Required Evening Peak Period Transit Modal Share

Land Use Alternative	Intensity (total GFA, sq. ft.)	Projected Transit Modal Share	Required Transit Modal Share
Proposed Comprehensive Plan , 2030 Land Use Intensity	84 million	22%	N/A
Proposed Comprehensive Plan , 2050 Land Use Intensity	113 million	23%	35%

5.5.2 Measures to Increase Transit Modal Split to the Required 2050 Level

Strategy 1: Enhanced TDM

With the enhanced TDM strategies (enhanced over and above what was assumed for the 2030 analysis) an additional reduction of four percent of vehicle trips can be expected. The reduction was taken from the SOV trips because most of the enhanced TDM strategies encourage shared ride and transit use. Because the TDM trip reductions were taken off of the SOV trips, the HOV mode share increased relative to the original modes share, despite the number of HOV trips being held constant. This is a conservative assumption, as TDM strategies encourage HOV use, and so the number of HOV trips could actually increase resulting in an even higher mode share figure.

The mode shifts that result from the enhanced TDM measures can be found in Table 5.12. As can be seen from Table 5.12, the required transit modal split for 2050 has decreased to 31% due to the enhanced TDM measures. The specific TDM measures can be found in Table 5.13.

Table 5.12 Evening Peak Period Transit Modal Share With Enhanced TDM Measures

Land Use Alternative	Intensity (total GFA, sq. ft.)	Projected Transit Modal Share	Required Transit Modal Share
Proposed Comprehensive Plan , 2030 Land Use Intensity	84 million	22%	N/A
Proposed Comprehensive Plan , 2050 Land Use Intensity	113 million	23%	31%

Table 5.13 Tysons Corner Enhanced Travel Demand Management Strategies

Strategy	Variable	Four Station Districts, North Central, and Old Courthouse	Northwest and Eastside
Carpool	Current Program Level	Low = Carpool information activities (tied in with areawide matching), and a 1/4 time transportation coordinator.	Low = Carpool information activities (tied in with areawide matching), and a 1/4 time transportation coordinator.
	Enhanced Program Level	Medium/High = In-house carpool matching and information services, plus preferential parking for carpools, and a 1/2 time coordinator.	Medium/High = In-house carpool matching and information services, plus preferential parking for carpools, and a 1/2 time coordinator.
	Employer Participation	Mandatory for new development	Voluntary
Vanpool	Current Program Level	Low = Vanpool information activities (tied in with areawide vanpool matching and/or third-party vanpool programs), plus 1/4 time transportation coordinator.	Low = Vanpool information activities (tied in with areawide vanpool matching and/or third-party vanpool programs), plus 1/4 time transportation coordinator.
	Enhanced Program Level	Medium/High = In-house vanpool matching services, vanpool development and operating assistance, plus a 1/2 time coordinator.	Medium/High = In-house vanpool matching services, vanpool development and operating assistance, plus a 1/2 time coordinator.
	Employer Participation	Mandatory for new development	Voluntary
Transit	Current Program Level	Low = Transit information center plus 1/4 time transportation coordinator.	Low = Transit information center plus 1/4 time transportation coordinator.
	Enhanced Program Level	Medium/High = Transit information center and a policy of work hours flexibility, on-site bus pass sales, plus a 1/2 time transportation coordinator.	Medium/High = Transit information center and a policy of work hours flexibility, on-site bus pass sales, plus a 1/2 time transportation coordinator.
	Employer Participation	Mandatory for new development	Voluntary
Vanpool Preferential Parking – Enhanced Program Level	Walk Time Reduction	1 minute	1 minute
	Employer Participation	Mandatory for new development	Voluntary
Telecommuting – Enhanced Program Level	% Eligible	17% of total office employment	17% of total office employment
	Employer Participation	Mandatory for new development	Voluntary
	Ave # of days/week	1	1
Alt. Work Schedules (9/80 work week and flextime) – Enhanced Program Level	% Eligible	17% of total office employment	17% of total office employment
	Employer Participation	Mandatory for new development	Voluntary
	Max % of trips shifted from peak	14% (from COMMUTER model)	14% (from COMMUTER model)

Strategy 2: Additional Lower Cost Transit Services

To determine the best markets for transit service to and from Tysons Corner, a review of the origins of all daily vehicle trips destined for and originating in Tysons Corner was performed. Figures 5.4 and 5.6 show the trip densities for person trips using SOV or HOV produced in and attracted to Tysons Corner for the proposed Comprehensive Plan. Figures 5.5 and 5.7 show all transit trips (including bus and rail) produced in and attracted to Tysons Corner, to determine current transit markets that could be improved and to help identify possible markets not served.

Figures 5.4 and 5.5 provide data to support identification of where potential transit markets to serve trips produced in Tysons Corner could be located. Figure 5.4 shows the location of attractions for proposed Comprehensive Plan automobile trips (SOV and HOV) that are produced in Tysons Corner, with the blue-shaded areas showing zones that have enough vehicle trips to potentially support bus improvements, additional bus service, and rail service.

Figure 5.5 shows the proposed Comprehensive Plan transit trips, which indicates areas that could support bus or rail service improvements. The strongest existing transit markets are shown to be in the Tysons Corner study area itself and areas served by Metrorail, including the Rosslyn-Ballston corridor, the Reston-Herndon area, and the D.C. core. Looking at Figure 5.5 along with Figure 5.4 suggests that Dunn Loring/Merrifield, Falls Church, McLean, and Springfield are possible under-served markets for transit service from Tysons Corner.

The location of productions for trips attracted to Tysons Corner are shown in Figures 5.6 and 5.7 (automobile trips and transit trips, respectively). These origins are the most desirable to capture with transit as they are most directly related to the transit capture shares provided in Table 5.12. However, it is apparent from a review of Figure 5.6 that they are more dispersed than the secondary employment centers are. Comparing Figure 5.6 with Figure 5.7 suggests that there is some potential to improve transit capture to Tysons Corner through additional service from the areas of Annandale, Dunn Loring/Merrifield, Fair Oaks, Herndon, McLean, Reston, and Vienna.

The analysis identified some apparent potential markets for enhanced transit service. Increased levels of congestion and aggressive parking management coupled with improved direct transit service and transit-supportive policies could result in additional transit capture beyond that in the original model runs for the proposed Comprehensive Plan.

In summary, the following additional transit services and facilities supporting transit services are recommended as lower cost elements that will increase transit modal split by an average of 3% based on available data:

- Neighborhood feeder buses (Dulles Toll Road)
- Enhanced express buses, BRT (I-66, Beltway)
- Additional park-and-ride capacity (various locations)

The mode shifts that result from the enhanced lower cost transit services can be found in Table 5.14. As can be seen, the new projected transit modal share is not at the required level of 31%.

Figure 5.4 Trip Attractions for the proposed Comprehensive Plan Automobile-Based Person Trips Produced in Tysons Corner per Square Mile (SOV and HOV)

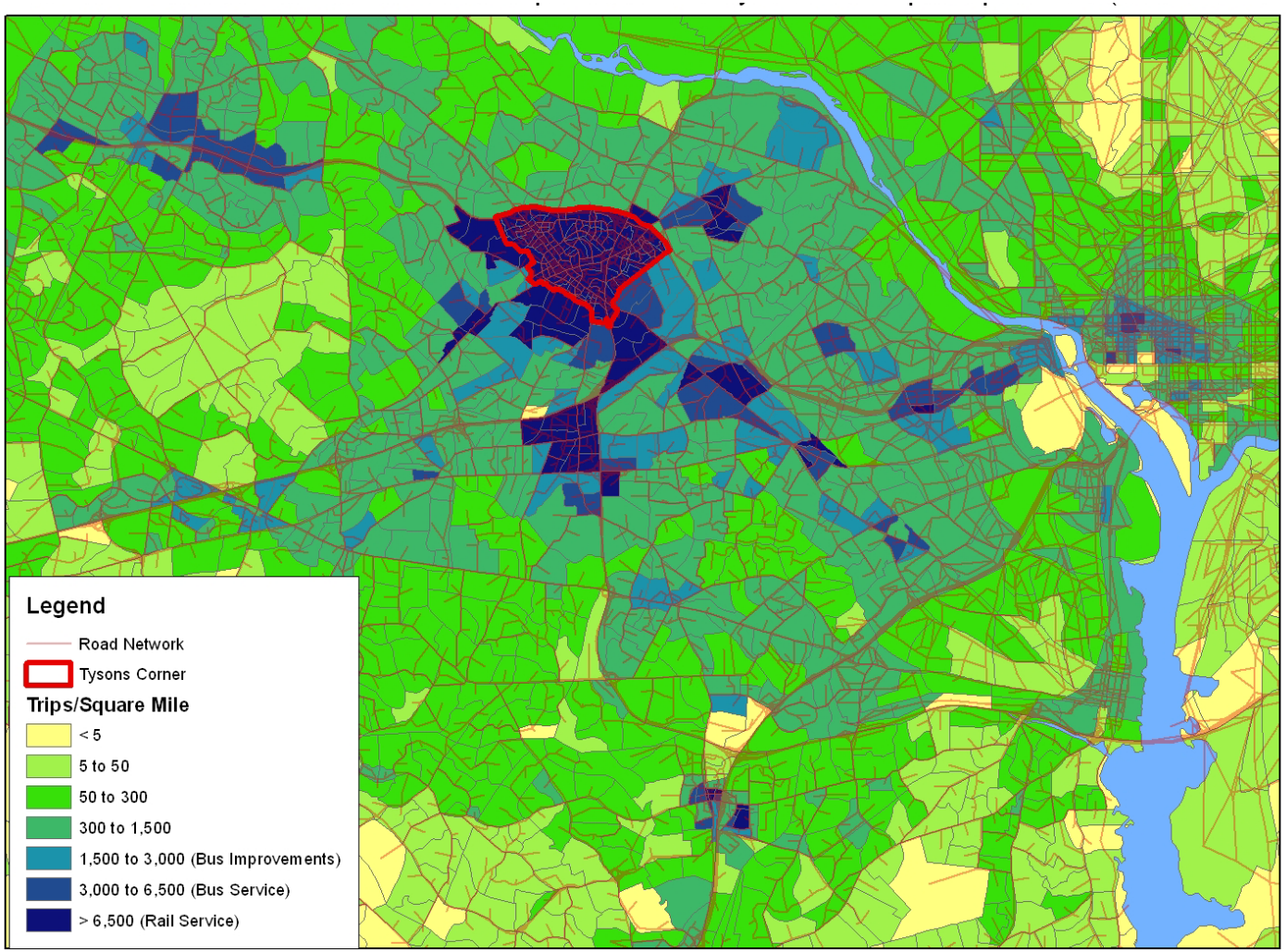


Figure 5.5 Trip Attractions for proposed Comprehensive Plan Transit Person Trips Produced in Tysons Corner per Square Mile (Bus and Rail)

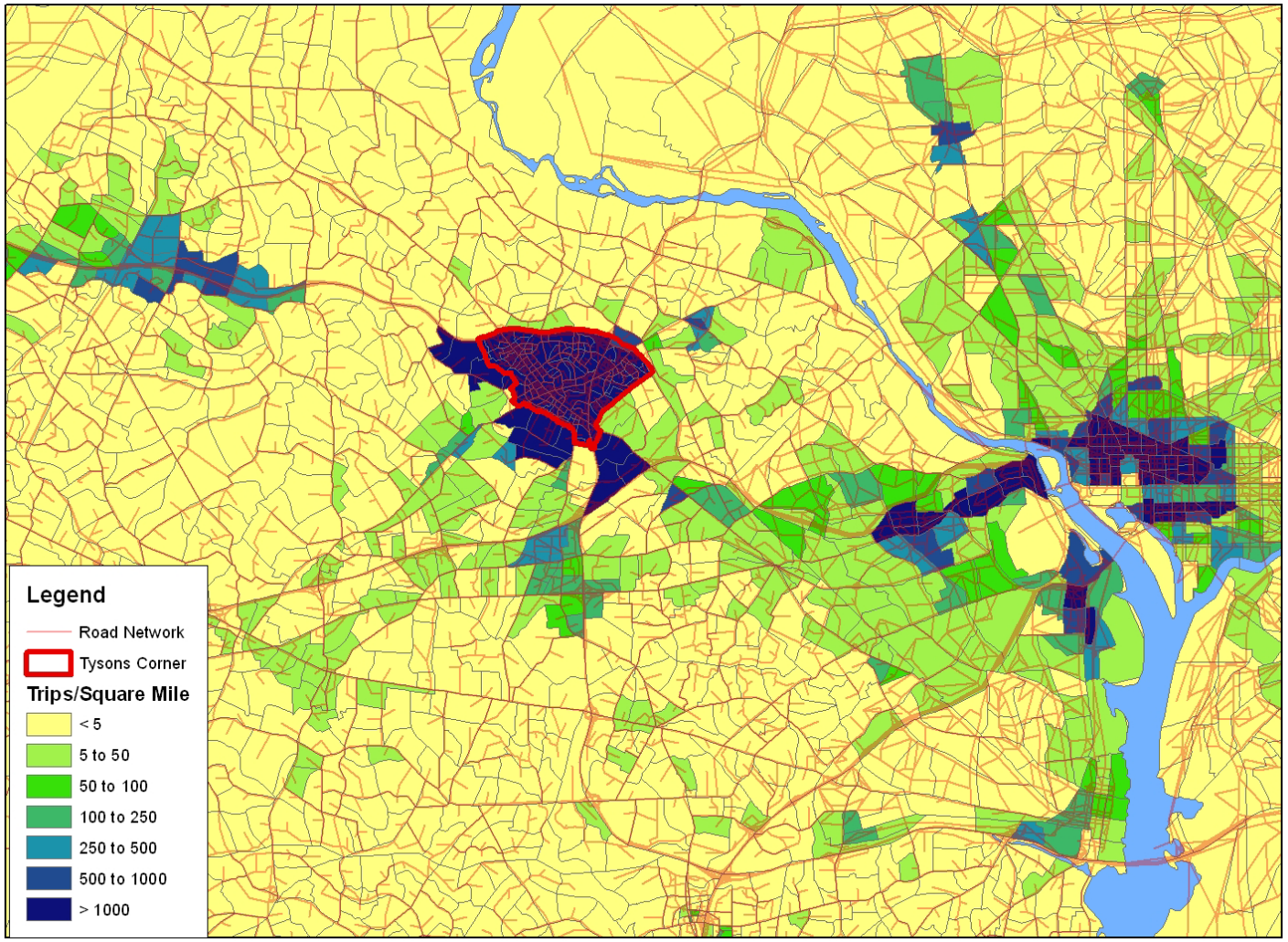


Figure 5.6 Trip Productions for proposed Comprehensive Plan Automobile-Based Person Trips Attracted to Tysons Corner per Square Mile (SOV and HOV)

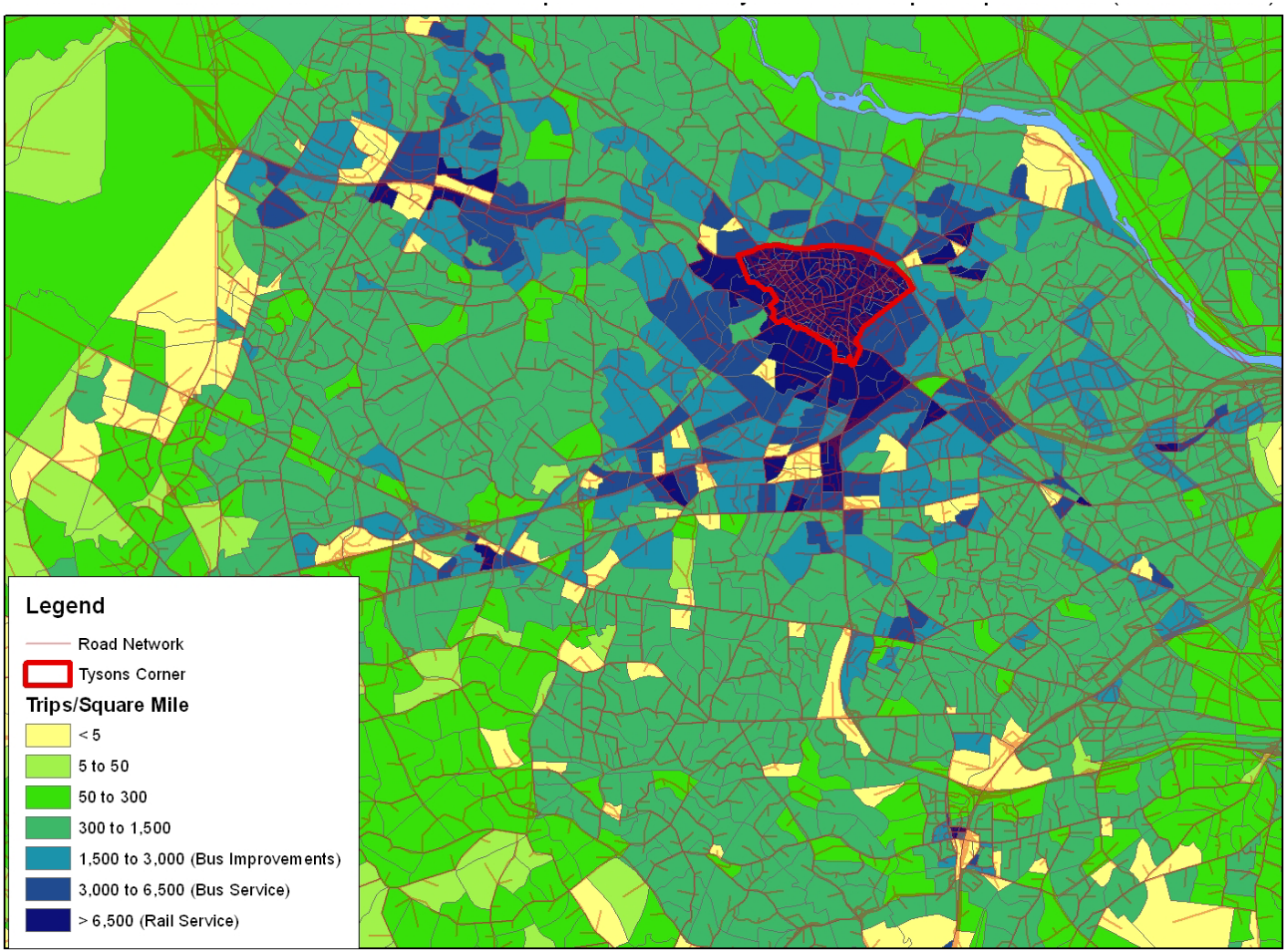


Figure 5.7 Trip Productions for proposed Comprehensive Plan Transit Person Trips Attracted to Tysons Corner per Square Mile (Bus and Rail)

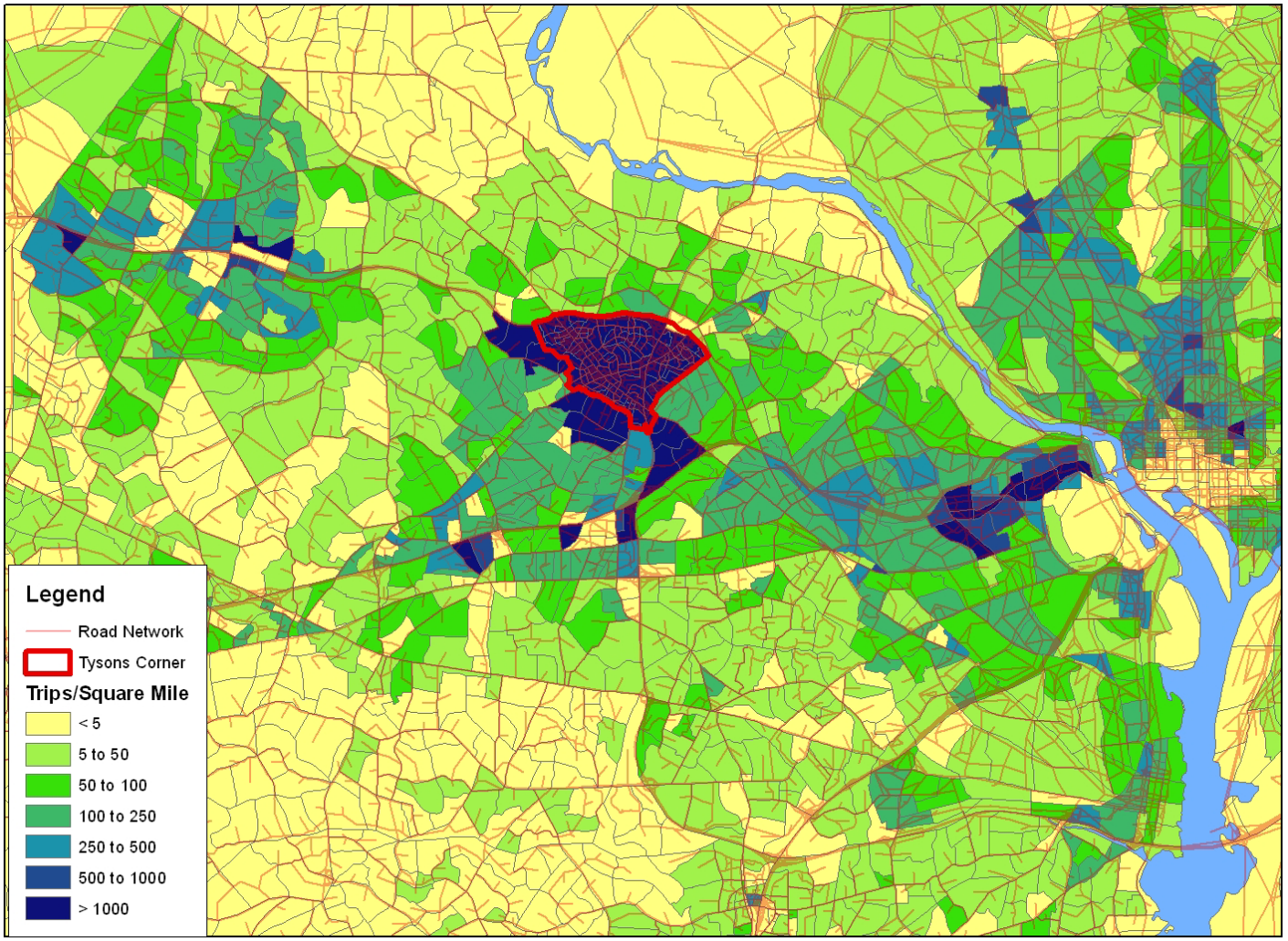


Table 5.14 Evening Peak Period Transit Modal Share With Enhanced TDM Measures and With Lower Cost Transit Improvements

Land Use Alternative	Intensity (total GFA, sq. ft.)	Projected Transit Modal Share	Required Transit Modal Share
Proposed Comprehensive Plan , 2030 Land Use Intensity	84 million	22%	N/A
Proposed Comprehensive Plan , 2050 Land Use Intensity	113 million	25%	31%

Strategy 3: Additional High Quality Transit Services

The previous section (Strategy 2) provided information on where the most effective locations are for improved transit services. These locations will all be served by local bus or express bus or BRT, as well as additional feeder services to Metrorail stations and increased park-and-ride facilities. However, the transit modal share needs to increase by at least 6% to meet to required meet the required level of modal split.

To be able to increase the modal split beyond the 25% in Table 5.14 higher quality transit that results in additional TOD with increased TOD to TOD commuting is a probable strategy. Experience has shown that Metrorail stations can attract significant TOD development with resulting modal shares that are higher than those achieved by express bus and BRT. The following is an example:

The first comparison area reviewed was Bethesda, Maryland, which contained three corridors of interest. As shown in Figure A.1, the three corridors were selected: MD-185 Connecticut Avenue, MD-190 River Road, and MD-355 Wisconsin Avenue. The transit service intensity is different in each corridor: MD-185 corridor has robust bus service, the MD-355 corridor is paralleled by the Metrorail Red Line, and MD 190 has limited bus service. Similarly, the development intensity in each corridor varies in a similar manner: MD-355 has the highest intensity, followed by MD-185 and then MD-190. For each corridor, the 2000 CTPP mode share for daily home-based work trips and the modeled 2030 Comprehensive Plan daily all trip purpose mode share were summarized and these are shown on Figure 5.8.

The MD 355 corridor has the highest transit mode share, with 20 percent for 2000 home-based work trips and 23 percent for 2030 all-purpose trips. The 2030 daily all trip purpose mode share was approximately five percentage points higher for the MD-355 corridor as compared with the MD-185 corridor, suggesting the influence of higher quality transit service and intensified development density. Similarly, the 2030 daily all trip purpose mode share was much higher for the MD-185 corridor as compared with the MD-190 corridor.

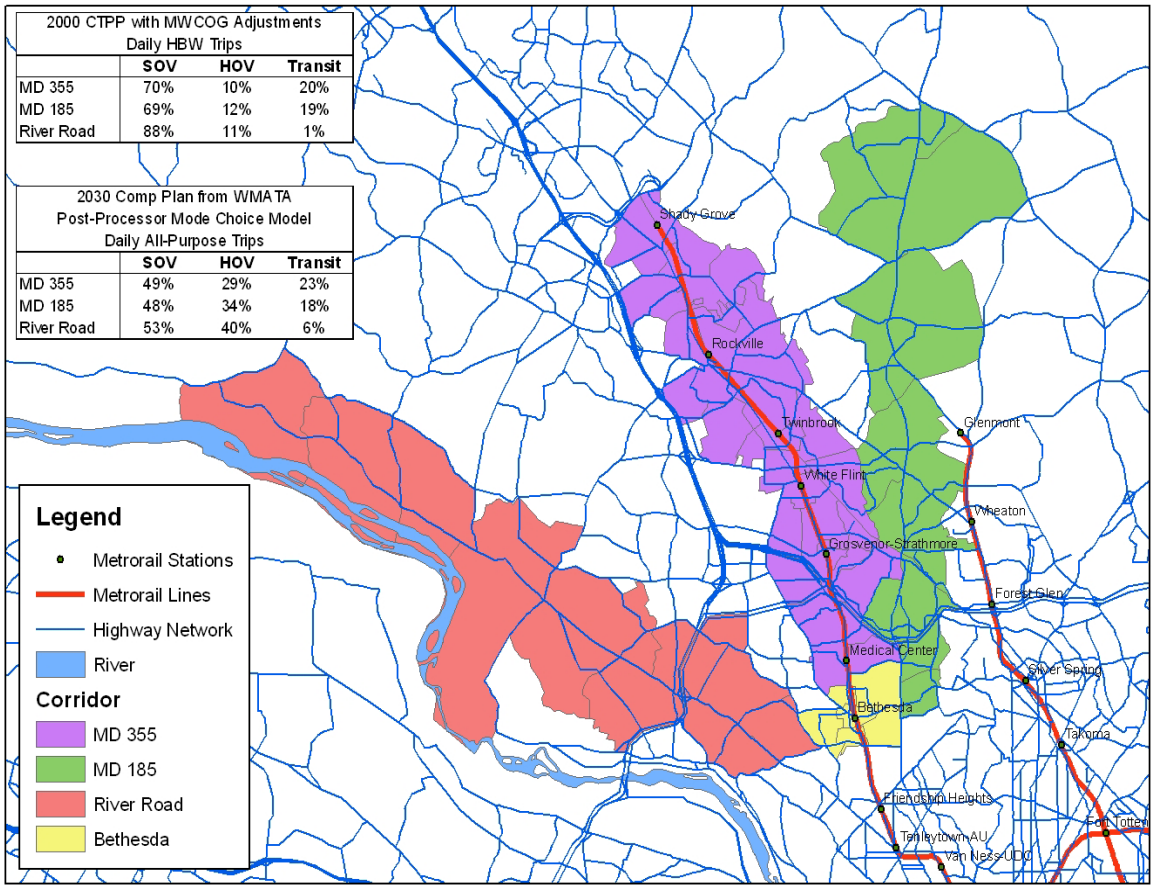


Figure 5.8 Comparison Corridors

The second comparison area reviewed was the Rosslyn-Ballston corridor. The primary interest was in looking at the potential for transit-oriented development (TOD) to lead to increased transit mode shares. A case study developed for TCRP Report 95, Chapter 17, Traveler Response to Transit-Oriented Development, examined Metrorail station entries at three major TOD stations, Rosslyn, Court House, and Ballston at two points in time. Over the 16 years from 1990 to 2006, station boardings at these three locations grew 28.5 percent over 16 years, from 28,400 to 36,500. Over this same period, the station boardings at the 34 Metrorail stations which were open as of 1980 grew 10 percent. Thus, the transit ridership for these three TOD stations grew more than twice as quickly.

These are two local examples of the benefit of a combination of Metrorail and TOD development and the resulting higher level of transit use. Therefore to achieve the required level of transit service in Table 5.14, it is recommended that at least two additional high quality transit corridors with TOD development should serve Tysons. Considering the location of productions and attraction of trips, a possible corridor could be the extension of the Orange Metrorail line along I-66.

5.6 Phasing Analysis

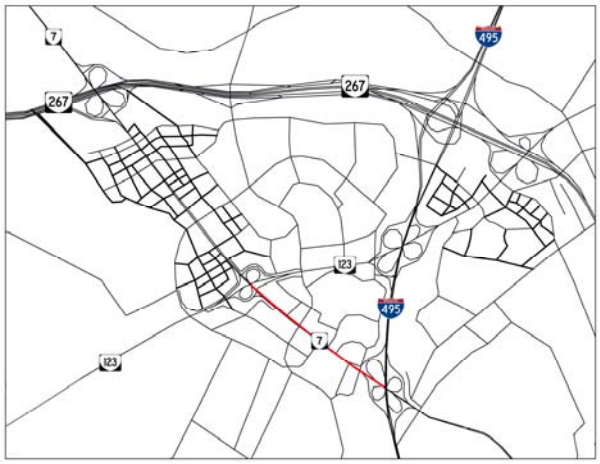
5.6.1 Introduction and Background

To maintain a balance between land use and transportation over time, a phasing analysis was performed to determine when specific improvements are required. In general terms, the estimated 2020 intensity of land use for Tysons was applied to the base (2005 updated to 2009) network. Improvements were identified and added to the base network then the proposed 2030 Comprehensive Plan Land Use was applied to the modified base network to determine further improvements.

5.6.2 Results of the Phasing Analysis: Improvements from 2010 to 2020

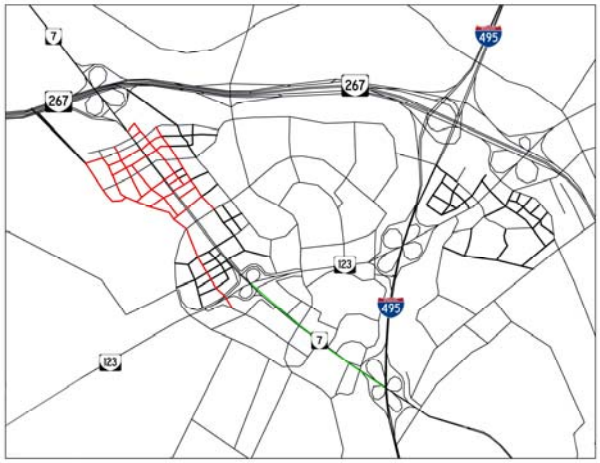
Note: in the graphics below, red indicates a new improvement and green a prior improvement. Improvements are shown in order of priority.

Rt.7 Widening from Rt.123 to I-495



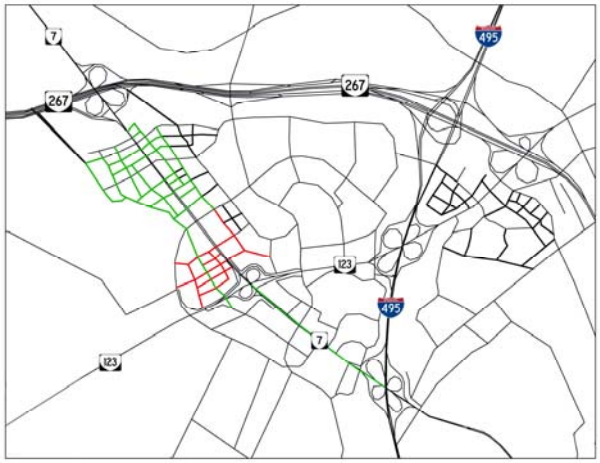
- Improves automobile and non-rail transit access into the study area from the east and from I-495.

Boone Blvd Extension and Grid West of Westpark Drive



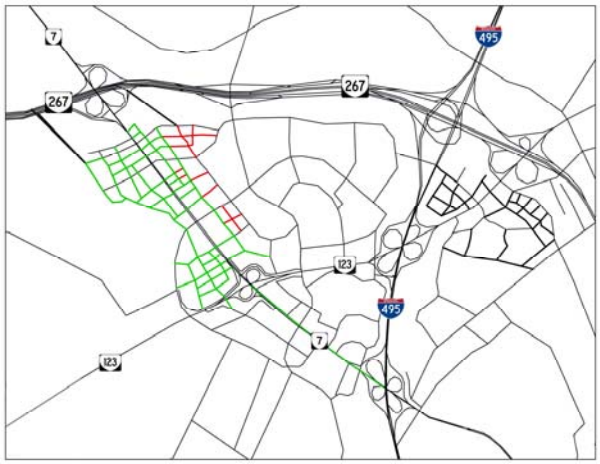
- Provides alternatives to Rt.7.
- Supports the land use intensities and proposed densities around two Metro stations.
- Increases automobile, pedestrian and bicycle connectivity.

Grid East of Westpark Drive



- Expands on the connectivity between Boone Blvd and other major arterials like Rt.7 and Rt.123.
- A key element required to accommodate more mixed-use, urban densities.
- Improves pedestrian and bicycle connectivity and safety.

Greensboro Drive Extension and Grid

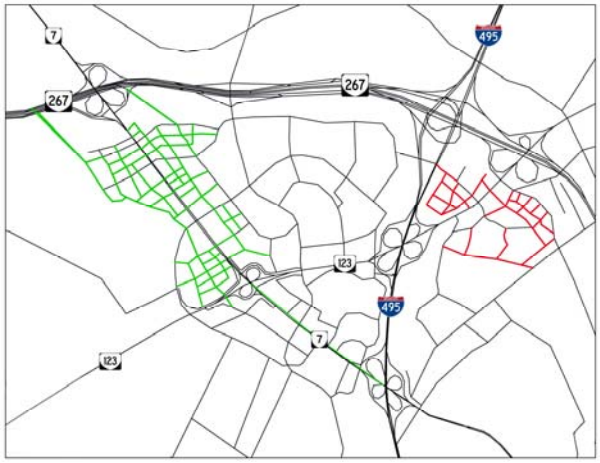


- Provides alternatives to Rt.7.
- Supports the land use intensities and proposed densities around two Metro stations.
- Increases automobile, pedestrian and bicycle connectivity.

Ramps to Boone Blvd and Greensboro Drive

- Provides greatest improvements to automobile and non-rail transit accessibility into the study area.
- Provides additional access to the internal grid of streets.

Grid of Streets Along Rt.123, Connection Across I-495



- Relieves I-495 crossings.
- Provides alternatives to Rt.123.
- Supports land use intensities and proposed densities around a Metro station.
- Improves pedestrian and bicycle connectivity and safety.

5.6.2 Results of the Phasing Analysis: Improvements from 2020 to 2030

Rt.123 Widening from Old Courthouse Road to I-495

- Eases traffic flow to and from I-495 to the core of the study area.
- Allows additional capacity to access the grid.

Widen Magarity Road

- Improves automobile and non-rail transit access for residents into core areas.

Widen Gallows Road

- Provides additional capacity to serve as an alternative to parallel routes like I-495.
- Increases automobile and non-rail transit capacity between Tysons and Merrifield.
- Provides a bike lane for improved bicycle access to Tysons.

Additional Beltway Lane from Rt.7 to I-66

- Mitigates congestion at the merge of traffic from Rt.7 (eastbound) to the I-495 (Outer Loop).

Chapter 6: Recommendations

6.1 Recommended Highway, Transit and Other Improvements

In order to maintain an acceptable level of accessibility in and around Tysons Corner as development occurs over time, it is essential to keep a balance between land use and transportation. To maintain this balance, the increase in development in Tysons should be coordinated with the provision of transportation infrastructure and programs to reduce vehicular trips. Considerable analysis was conducted to determine the need for specific transportation programs and infrastructure for a specific level of development in Tysons Corner. Table 6.1 provides the proposed transportation infrastructure and programs as they relate to the level of development in Tysons Corner.

Table 6.1 Transportation Infrastructure and Programs as they Relate to the Level of Development in Tysons Corner

Type of Transportation Program or Infrastructure Project	Description of Transportation Program or Infrastructure Project	Area Served by Improvement
Required Transportation Improvements at the Opening of a Metrorail Line to Wiehle Avenue and HOT Lanes on the Beltway (2013) to Accommodate More than 44 Million sq. ft. of Development		
Rail Transit Routes	Complete Phase I of Metrorail Silver Line Phase I	Tysons-wide/Countywide
Bus transit routes	Neighborhood bus routes; circulator bus routes serving Metrorail stations; express bus routes on I-66 and I-95/I-495	Tysons-wide/Countywide
Sidewalks	Sidewalks to provide connections to developments within walking distance of rail stations	District
Roads – Arterials Widening	Complete widening of Rt. 7 to 8 lanes from the Dulles Toll Road to Rt. 123	Tysons-wide
Roads – Freeway Widening	Widen I-495 from 8 to 12 lanes to provide 4 HOT lanes between the Springfield Interchange and the American Legion Bridge	Tysons-wide/Countywide
Roads – Freeway Ramp	HOT ramp connecting to Jones Branch Drive	Tysons-wide
Roads – Freeway Ramp	HOT ramp connecting to the Westpark Bridge	Tysons-wide
Roads – Freeway Ramp	HOT ramp connecting to Rt. 7	Tysons-wide
TDM	Application of aggressive TDM measures (e.g. 45% reduction in vehicle trips for an office development within 1/8 mile of a Metrorail station)	District
Required Additional Transportation Improvements to Accommodate 60 Million sq. ft. of Development (2013 - 2020)		
Rail Transit Routes	Completion of Phase II of Metrorail Silver Line (from Wiehle Avenue to West of Dulles Airport with three stations in Fairfax County)	Tysons-wide/Countywide
Bus Transit Routes	Further improvements to neighborhood bus routes; circulator bus routes serving Metrorail stations; express bus routes on I-66 and I-95/I-495	Tysons-wide/Countywide
Roads – Arterial Widening	Widen Rt. 7 from Rt. 123 to I-495	Tysons-wide
Roads – Arterial Extension	Extend Boone Boulevard from Boone Boulevard to Northern Neck Drive	Tysons-wide

Roads – Grid of Streets	Grid west of Westpark Drive	District
Roads – Grid of Streets	Grid bounded by Gosnell Rd., Rt. 7, and Rt. 123	District
Roads – Arterial Extension	Extend Greensboro Drive from Spring Hill Road to Tyco Road	District
Roads – Grid of Streets	Grid connections to Greensboro Drive	District
Roads – Freeway Ramp	Ramp connecting Greensboro Drive extension to westbound Dulles Toll Road	Tysons-wide
Roads – Freeway Ramps	Ramps connecting Boone Blvd. extension to westbound Dulles Toll Road and eastbound Dulles Toll Road to Boone Blvd. extension.	Tysons-wide
Roads – Freeway Widening	Collector – distributor roads along the Dulles Toll Road from Greensboro Drive extension to Hunter Mill Rd.	Tysons-wide
Roads – Grid of Streets	Grid of streets east of I-495	District
Roads – Connecting Ramp	Ramp connecting Jones Branch Drive to Scotts Crossing Road	Tysons-wide
TDM	Application of aggressive TDM measures (e.g. 45% reduction in vehicle trips for an office development within 1/8 mile of a Metrorail station)	District
Required Additional Transportation Improvements to Accommodate 84 Million sq. ft. of Development (2020 - 2030)		
Bus Transit Routes	Further improvements to neighborhood bus routes; circulator bus routes serving Metrorail stations; BRT routes on I-66 and I-95/I-495	Tysons-wide/Countywide
Roads – Grid of Streets	Substantial sections of the grid of streets	District
Roads – Arterials Widening	Widen VA 123 to 8 lanes from Rt. 7 to I-495	Tysons-wide
Roads – Arterial Widening	Widen VA 123 from 4 to 6 lanes between Rt. 7 and Old Courthouse Road	Tysons-wide
Roads – Arterial Widening	Widen Rt 7 from 4 to 6 lanes between I-495 and the City of Falls Church	Tysons-wide
Roads – Collector Safety Improvement	Improve and enhance the safety of Old Courthouse Road from the Town of Vienna to Gosnell Road	District
Roads – Collector Widening	Widen Magarity Road from 2 to 4 lanes from Great Falls Street to Rt. 7	Tysons-wide
Roads – Arterials Widening	Widen Gallows Road from 4 to 6 lanes from Rt. 7 to I-495	Tysons-wide
Roads – Interchange Improvements	Rt. 7 at the Dulles Toll Road	Tysons-wide
Roads – Connecting Road	Beltway crossing connecting the Tysons Corner Center area to Old Meadow (limited to transit, pedestrians and bicyclists)	Tysons-wide
Roads – Freeway Ramps	Ramps connecting Jones Branch Drive to westbound Dulles Toll Road and eastbound Dulles Toll Road to Jones Branch Drive.	Tysons-wide
Roads – Freeway Widening	Widen I-495 (Outer Loop) between Rt. 7 and I-66 by one lane	Tysons-wide
TDM	Application of aggressive TDM measures (e.g. 55% reduction in vehicle trips for an office development within 1/8 mile of a Metrorail station)	District
Required Additional Transportation Improvements to Accommodate 113 Million sq. ft. of Development (2030 - 2050)		
Improved Transit	Additional BRT routes, other supporting services including park-and-ride, feeder bus routes to rail stations	Tysons-wide/Countywide
High Speed Transit Corridors	At least two additional high speed transit corridors with substantial TOD development: Orange Line Metrorail extension and an additional rail extension	Tysons-wide/Countywide
Roads – Grid of Streets	Completion of the grid of streets	District
TDM	Application of more aggressive TDM measures (e.g. 65% reduction in vehicle trips for an office development within 1/8 mile of a Metrorail station)	District

6.2 Cost Estimates

Cost estimates have been prepared for the roadway and transit improvements recommended in the current Comprehensive Plan and in this proposed Comprehensive Plan Amendment and are shown below. For roadways, these costs are estimated at $1.48 billion over the next 20 years consisting of:

- In Current and Proposed Comprehensive Plan	$373,000,000
- Grid of Streets (by 2030)	$742,000,000
- Additional Roadways in Proposed Plan	$369,000,000
TOTAL	$1,484,000,000

There are some important items to keep in mind in interpreting these cost estimates. Construction of the grid is expected to take place as redevelopment occurs in Tysons Corner. It is anticipated that the vast majority of the cost, including right-of-way cost, for constructing the future grid of streets in Tysons Corner will be provided by the private sector. Cost estimates include right-of-way, preliminary engineering and design and are in 2009 dollars. A major component, particularly for the grid, of the total cost is the cost of right-of-way.

6.2.1 Current Comprehensive Plan

Table 6.2 Current Comprehensive Plan (Roadways)

Extend Boone Blvd west from Rt. 123 to Ashgrove Lane	$99,000,000
Extend Greensboro Drive west from Spring Hill Road to Rt. 7	$46,000,000
Widen Gallows Road from 4-6 lanes from Rt. 7 to Prosperity Avenue (2.56 miles)	$68,000,000
Widen Leesburg Pike (Route 7) to 6 lanes between the Capital Beltway and I-66	$43,000,000
Widen Chain Bridge Road (Route 123) to 6 lanes from Old Courthouse Road to Route 7	$21,000,000
Widen Chain Bridge Road (Route 123) to 8 lanes between Route 7 and the Capital Beltway	$27,000,000
Widen Magarity Road to 4 lanes between Lisle/Route 7 and Great Falls Street	$40,000,000
Widen Leesburg Pike (Route 7) to 8 lanes between Chain Bridge Road (Route 123) and I-495 (0.91 miles)	$29,000,000
New interchange at Rt. 7 and Westpark Drive/Gosnell Road (REMOVED)	($80,000,000)
New interchange at Rt. 7 and Gallows Road/International Drive (REMOVED)	($80,000,000)
New interchange at Rt. 123 and International Drive (REMOVED)	($80,000,000)
Total Adjusted Comprehensive Plan Road Costs	**$373,000,000**

6.2.2 Proposed Comprehensive Plan

Grid of Streets: $742,000,000

Table 6.3 Additional Projects Beyond Current Comprehensive Plan

5C-I-495 Overpass at Tysons Corner Center	$16,000,000
Extension of HOT ramp to inside I-495	$16,000,000
1D-Dulles Toll Road to Boone Blvd Extension	$59,000,000
3B-Dulles Toll Road to Jones Branch Drive	$33,000,000
2B-Dulles Toll Road to Greensboro Drive	$24,000,000
I-495 Additional Lane (Outer Loop between Rt. 7 and I-66)	$63,000,000
Dulles Toll Road Westbound Collector/Distributor	$105,000,000
Dulles Toll Road Eastbound Collector/Distributor	$53,000,000
Total	**$369,000,000**

6.2.3 Transit Projects

The cost of the bus service recommendations in the draft Transit Development Plan for Tysons Corner was estimated and an estimate was made of the current transit operating cost for bus services related to Tysons Corner. Based on these estimates, the net additional annual operating cost for Tysons bus service is estimated at approximately $12 million per year.

6.3 Recommended Transportation Strategy for Tysons

6.3.1 Background

There is a desire to transform Tysons into a higher density, more livable, walkable center while maintaining a high level of accessibility. In order to do this, there is a need to provide a balanced transportation system that:

- provides attractive public transportation connections;
- moves people within Tysons via an enhanced connected network of walkable streets, bike lanes, and a robust transit network, and
- moves automobile traffic more efficiently to, from, and within Tysons.

In order for Tysons to develop successfully while maintaining a balance between land use and transportation, a number of strategies have been developed to make this possible. These strategies have been developed through a significant amount of analysis and are described in the next sections.

6.3.2 Transit Goals

To support the level of development at the Comprehensive plan level for Tysons Corner, it is necessary for transit to achieve a 31% mode share (mode share is defined as the percentage of person trips that use a specific mode of transportation) of all person trips to, from and within Tysons Corner during peak periods. As the level of development in Tysons increases, the transit mode share should increase, as shown in Table 6.4, so that a 31% transit mode share can be achieved at the Comprehensive Plan level.

Table 6.4 Transit Mode Share at Increasing Levels of Development

Development Levels (total GFA, sq. ft.) and forecast timeframe	**Required Transit Mode Share During Peak Periods (person trips, all trip purposes, to and from Tysons Corner)**		
	TOD Areas	Non-TOD Areas	All of Tysons
84 million (2030)	25%	13%	22%
96 million (2040)	29%	15%	25%
113 million (2050)(Comprehensive Plan Level)	36%	18%	31%

Note: The required transit mode shares specified in this table are included as a strategy to meet a target automobile trip reduction level to be achieved through transportation demand management.

To be able to achieve the increase in transit use as indicated in Table 6.4, the following transit services should be provided for Tysons Corner. The projected timing of these improvements is listed in Table 6.1.

a. The extension of Metrorail to the Dulles Corridor with four stations located in Tysons Corner
b. Express bus/BRT routes on I-66, I-95/I-495 and Leesburg Pike
c. A circulator system serving Tysons
d. Expanded local bus service
e. Additional BRT routes and other supporting services including park-and-ride and feeder bus routes to rail stations.
f. At least two additional high speed transit corridors with substantial TOD development; for example, a more direct connection to a future Orange Line extension and a Beltway rail line to Montgomery County, both having TOD at their stations.

6.3.3 Circulator System

In order to increase the use of Metrorail for trips to, from and within Tysons, it is essential to provide a system of transit circulators. The circulators therefore will have two main functions:

1. To provide quick and convenient access for Metrorail passengers to and from locations within Tysons that are beyond walking distance from the Metrorail stations.
2. To provide a quick and convenient way to travel within Tysons.

A system of circulator routes is proposed to connect most of Tysons, specifically the North Central, East Side and Old Courthouse Districts, with the four Metrorail stations and other districts in Tysons. To facilitate use of the circulator system, it must be integrated with all other transit serving the greater Tysons area and be accessible, frequent, and convenient for users. In order to accomplish this goal, the circulators should operate in their own, dedicated right-of-way. The first phase of the circulator system, serving the Metrorail stations immediately after opening, will likely be bus service operating in mixed traffic on existing rights-of-way.

Over the long term the circulator system may evolve through several phases, transitioning from buses operating in mixed traffic to buses operating on exclusive rights-of-way to, when feasible, a fixed guideway operating on exclusive rights-of-way. A storage and maintenance facility within Tysons will be necessary to support a fixed-guideway system. The ultimate alignment will likely change based upon the results of the Circulator Study and other factors, such as the availability of the necessary rights-of-way.

6.3.4 Multimodal Transportation Hubs

Multimodal Transportation Hubs, strategically placed close to Metrorail and circulator stations and/or other retail, employment and residential centers, are needed to allow flexibility in trip making within Tysons. These hubs should provide the following:

- Alternative modes for transit users to reach final destinations that are beyond walking distance from transit stations.
- The ability of Tysons residents and workers to travel within Tysons and beyond without the need to own or use a private vehicle.

A multimodal transportation hub is envisioned to be a retail service providing alternative modes of transportation and transportation services including:

- Transit (rail and/or bus)
- Bike sharing
- Car sharing
- Other personal transportation devices
- Taxis

6.3.5 The Grid of Streets

Tysons currently consists of large superblocks with a relatively small number of streets. This places excessive reliance on the street system to move vehicle traffic, and the large block size inhibits transit use, pedestrian and bicycle movement. A grid of streets with smaller block sizes is typical in urban areas. It disperses vehicle traffic and improves mobility for pedestrians and bicyclists. A smaller block size will make a more walkable Tysons by creating convenient and short walk distances. A grid of streets concept is shown in Figure 6.1. A perfect grid is unlikely in Tysons Corner due to the alignment of existing roads and topographical constraints. However, where possible, a grid of streets should be planned.

In planning the grid of streets, the following will be taken into consideration:

- Maximize continuity within the grid of streets.
- Avoid intersections with an acute angle, awkward dog legs, and intersections with more than four legs.
- Provide good pedestrian access to Metro stations.
- Block sizes should generally be within a 400 foot to 600 foot range with a maximum perimeter length of 2,000 feet.
- Any block longer than 600 feet should contain a mid-block pedestrian connection.
- Block faces along Route 7 and Route 123 should ideally be 600 feet.
- Where possible, even spacing between intersections should be maintained.

With the provisions described above, the street network in Tysons Corner will be enhanced and will provide for greater network density and more direct connections between various locations, as well as better accommodating both cars and pedestrians. This network will contain more secondary (i.e., local and collector) streets, providing more choices for connectivity than the existing arterial network. Research and experience indicates that in areas with a fine grid of streets and a mix of land uses, people use transit more and make fewer auto trips than their neighbors in typical suburbs.

The grid of streets will be supported by a street hierarchy that allows different types of trips to use different streets. People wishing to travel across Tysons can choose to use a major arterial, such as Route 7. Others who only need to travel a couple of blocks will have a choice to travel on a smaller street within the grid of streets.

Although Fairfax County has in the past used the traditional nomenclature of major arterial, minor arterial, collector and local streets to functionally classify streets and highways, a parallel, urban design oriented nomenclature is also used for classification purposes in this text. Table 6.5 provides a cross-reference between the two classification schemes.

Table 6.5 Cross-Reference Between Traditional Highway Functional Classification Terms and Urban Design Oriented Functional Classification Terms

Highway Functional Classification	Urban Design Functional Classification
Primary Arterial	Boulevard
Minor Arterial	Avenue
Collector	Collector
Local	Local Street

Note: The cross-references shown in the table above are general in nature. Some variations may occur.

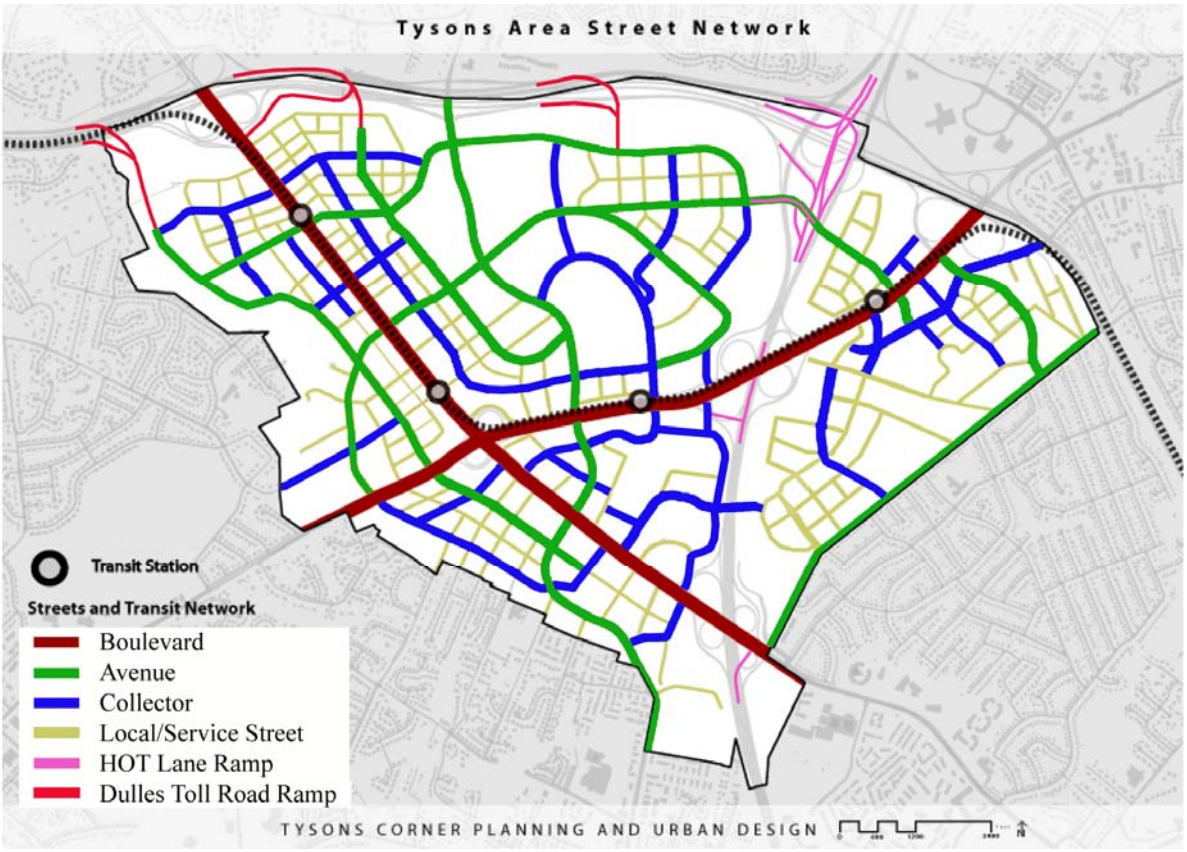


Figure 6.1 The Conceptual Grid of Streets

6.3.6 Road Improvements

The road improvements as provided in Table 6.1 are an important component of the overall transportation strategy for Tysons.

6.3.7 Transportation Demand Management

Transportation Demand Management (TDM) refers to a variety of strategies aimed at reducing the demand on the transportation system, particularly to reducing single occupant vehicles during peak periods, and expanding the choices available to residents, employees, shoppers and visitors, The result is more efficient use of the existing transportation system. Transportation Demand Management is proposed to be a critical component of this Plan. Traffic must be minimized to decrease congestion within Tysons, to create livable and walkable spaces, and to minimize the effects of traffic on neighboring communities.

When the four Metrorail stations open in Tysons and denser mixed-use transit-oriented development is constructed surrounding the stations, a substantial percentage of travelers are

expected to commute via Metrorail without any TDM programs in place. This development pattern will also reduce the need for driving trips because jobs, housing, shopping, recreational and cultural opportunities will be close at hand and accessible by walking or a short transit ride.

A broad, systematic, and integrated program of TDM strategies throughout Tysons can further reduce peak period single occupancy vehicle trips, as well as increase the percentage of travelers using transit and non-vehicular modes of transportation. TDM programs are proposed to embrace the latest information technology techniques to encourage teleworking, provide sufficient information to enable commuters and other trip makers to choose travel modes and travel times, or decide if travel is actually necessary at that time.

1. TDM implementation plans which would include at least the following:
    a. evaluations of potential TDM measures
    b. listing of TDM measures to be provided
    c. listing of alternate TDM measures which may be provided
    d. phased trip reduction goals
    e. implementation budgets
    f. monitoring arrangements and associated remedial and contingency funds. The remedial fund is to be used if TDM goals are not met and the contingency fund is used if unanticipated changes in travel behavior (Tysons-wide) result in an increase in the TDM trip reduction goals. Please see the TDM Monitoring section.

2. Commitments to ensure Transportation Demand Management efforts are successful. These may include parking plans that reduce parking ratios before latter phases are constructed, phasing plans that tie future development to recording successful vehicle trip reductions, remedy funds to improve TDM program delivery, and penalties to deter non-compliance.

The recommended TDM trip reductions of traffic generation estimates provided by the Institute of Transportation Engineers (ITE) are shown in Table 6.6.

Table 6.6 Recommended TDM Vehicle Trip Reduction Goals

Development levels in total square feet (with corresponding forecast year)	TDM Vehicle Trip Reduction Goals, Commercial and Residential Development (Percentage Reduction from ITE Rates)			
	TOD Locations			Non-TOD Locations (more than 1/2 mile from station)
	0 to 1/8 Mile from Station	1/8 to 1/4 Mile from Station	1/4 to 1/2 Mile from Station	
2010 to 2020	45%	35%	30%	25%
84 million (2030)	55%	45%	40%	35%
96 million (2040)	60%	50%	45%	40%
113 million (2050) (Comprehensive Plan Level)	65%	55%	50%	45%

TDM programs will only work where parking is not over-supplied, and will be most effective where parking costs are charged directly to users. TDM programs are expected to be coordinated with parking reductions and/or management programs.

6.3.8 Parking Management

A change in philosophy of regulating parking is needed to put Tysons on the forefront of sustainable growth. Parking in the TOD Districts will follow the experience of successful TOD areas around the country by limiting the amount of parking required near rail stations. In the Non-TOD Districts, reductions from conventional parking ratios are required to achieve Tysons-wide trip reduction goals.

Proposed changes to parking requirements include elimination of minimum parking requirements for all non-residential uses within 1/2 mile of rail stations and reduction of minimum parking requirements all uses outside of TOD Districts. To ensure that adequate parking is provided, a parking plan will be required with all development applications in TOD Districts. To avoid oversupply of parking, maximum parking requirements are proposed for all areas and shared parking will be encouraged. Proposed parking rates are indicated in Table 6.7.

Table 6.7 Parking Ratios for Tysons Corner

Parking Spaces Per Unit or Spaces Per 1,000 sq. ft.									
Use	Previous (2009)	< 1/8 mile Metro Station		1/8 - 1/4 mile Metro Station		1/4 - 1/2 mile Metro Station		Non-TOD	
	Min.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Townhouse	2.7	1.75	2.2	1.75	2.2	2.0	2.5	2.0	2.7
Multifamily:									
0-1 bedroom	1.6	1.0	1.3	1.0	1.3	1.1	1.4	1.1	1.4
2 bedroom	1.6	1.0	1.6	1.0	1.6	1.35	1.7	1.35	1.7
3+ bedroom	1.6	1.0	1.9	1.0	1.9	1.6	2.0	1.6	2.0
Office	2.6	none	1.6	none	2.0	none	2.2	2.0	2.4

As the Tysons Corner area is developed, and the land use and transportation infrastructure matures, parking requirements are expected to be re-examined to determine if they are adequate for the changing conditions. Rather than supplying parking for each individual use, parking is proposed to be treated as a common resource for multiple uses. Implementing this practice will reap many advantages in creating a more walkable environment. Providing transit service, an effective mix of uses, and an appropriate network of sidewalks will reduce automobile use and, consequently, the need to provide parking.

6.3.9 Information and Communications Technology and Intelligent Transportation Systems

The application of Information and Communications Technology (ICT) in Tysons Corner has the potential to decrease congestion, increase safety, make trip making more convenient, reduce emissions and improve trip-making decisions. More specifically the following are examples of goals for the application of ICT at Tysons:

- Electronic information infrastructure that works in concert with physical infrastructure to maximize the efficiency and utility of the system, encouraging modal integration and consumer choice.
- Real-time information for operators and users of the transportation system to help contain congestion and increase the effective capacity of the system while reducing the need for new construction.
- Facilities, technology and information that help reduce energy consumption and negative environmental impact.

ICT can be used not only to monitor and mitigate traffic congestion, but also to enhance emergency services in Tysons Corner. Through the use of street sensors, signal control transmitters and video surveillance cameras, real-time traffic management can take place. GPS and other technology can also help public safety personnel respond to incidents in a timely manner.

As part of ICT, intelligent transportation systems (ITS) will be applied to the fullest extent possible. Main components of ITS include:

- Traffic management systems. These systems make use of information collected by traffic surveillance devices to smooth the flow of traffic along travel corridors. They also disseminate important information about travel conditions to travelers.
- Crash prevention and safety systems detect unsafe conditions and provide warnings to travelers to take action to avoid crashes.
- Roadway operations and maintenance focus on integrated management of maintenance fleets, specialized service vehicles, hazardous road conditions remediation, and work zone mobility and safety.
- Transit ITS services include surveillance and communications, such as automated vehicle location (AVL) systems, computer-aided dispatch (CAD) systems, and remote vehicle and facility surveillance cameras, which enable increases in operational efficiency, safety, and security.

- Emergency management applications include hazardous materials management, the deployment of emergency medical services, and large and small-scale emergency response and evacuation operations.
- Electronic payment and pricing systems employ various communication and electronic technologies to facilitate commerce between travelers and transportation agencies.
- Traveler information applications use a variety of technologies to allow users to make more informed decisions regarding trip departures, routes, and mode of travel.

New developments should contain the necessary ICT infrastructure to enhance the following activities to the fullest extent:

- Telework, teleconferencing, and related strategies to reduce vehicular trips.
- Advanced traveler information to increase the efficiency and effectiveness of decisions on when to travel, how to travel, where to travel, and whether to travel at all.

To ensure a high level of safety, to minimize breakdowns, to maintain a clean and attractive environment and to monitor systems to optimize efficiency and effectiveness, a traffic management maintenance entity should be established for Tysons Corner. Such an entity should be responsible for at least the following:

- Traffic monitoring and incident management.
- Streetscape monitoring and maintenance where necessary.

6.3.10 Monitoring System

Vehicle Trips and Delay (demand)

Maintaining a balance between land use and transportation is dependent on a number of factors as indicated above. The necessary transportation infrastructure, modal split levels, and vehicle trip reduction levels to maintain this balance have been determined by means of extensive analyses. Analyses are based on known conditions at the time of writing this document. However, these conditions include human behavior and a number of exogenous factors. These conditions might change in the future which could result in unforeseen changes in trip-making behavior. For this reason, it is considered essential to monitor the amount of vehicles entering Tysons over time as well as the associated delay due to congestion. The growth in vehicle trips over time will determine if there is a deviation from the estimated growth in vehicle trips on which the strategies listed above are based. Monitoring should therefore include the following:

1. Vehicles entering Tysons will be counted at a number of locations to enable the accurate detection of deviations from vehicle growth estimates.
2. Delay at a sample number of intersections and at traffic merge locations to determine if there is a significant increase in over time.

Transportation Infrastructure and Programs (supply)

The provision of transportation infrastructure and programs should be provided according to the schedule in Table 6.1. Due to unforeseen circumstances, the provision of transportation infrastructure and/or programs might differ from the schedule in Table 6.1. The funding of transportation infrastructure and programs should be assessed to update the schedule.

The monitoring of the demand side and supply side should provide an assessment of conditions and an updated projection of future conditions in terms of maintaining a balance between land use and transportation. The early identification of future deviations from the planned schedule provides an opportunity to react in a timely manner to allow the necessary adjustments to be made to avoid a significant imbalance between land use and transportation. Possible corrective measures are:

- The use of a TDM Remedial and Contingency Fund to increase TDM activities.
- An increase and/or new transportation facility user charges.
- Congestion pricing.

It might be desirable to establish a monitoring agency to conduct the continuous monitoring and reporting of vehicle trips.

6.3.11 Residential Development

The proposed Comprehensive Plan for Tysons provides for the residential population to increase from 16,000 to 54,000 by 2030. This increase was assumed in the transportation modeling analysis. Considering that residents in Tysons will reduce the number of external-internal vehicle trips during the morning peak and internal-external trips during the evening peak, it is essential that the residential development takes place as planned.

The growth in the residential population is an important transportation strategy for Tysons.

Attachment A

Proposed Comprehensive Plan Amendment for Tysons Corner (Transportation Section)

Attachment B

Modeling Methodology

Attachment C

Neighborhood Traffic Impact Analysis