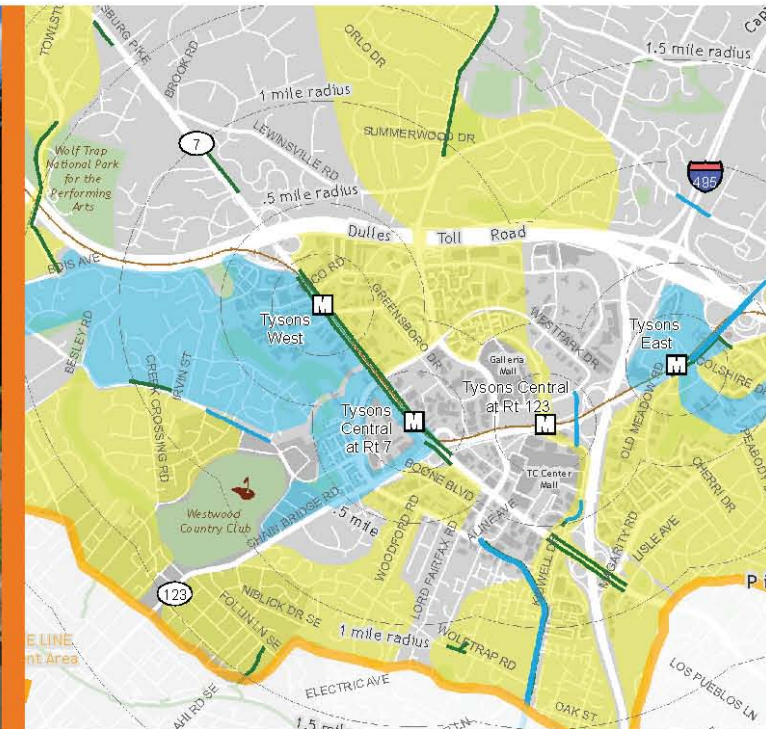


FAIRFAX COUNTY BICYCLE MASTER PLAN

PHASE 1: GREATER TYSONS CORNER AREA



Fairfax County Department of Transportation
April 2011

Fairfax County Bicycle Master Plan

Tysons Corner Bicycle Master Plan

prepared by

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Executive Summary

Tysons Corner is in the midst of a dramatic transformation from an auto-oriented suburban commercial area to a mixed-use urban downtown for Fairfax County. The development of four new transit stations, currently under construction as part of Metrorail's new Silver Line will provide the foundation for this shift, increasing transportation options, providing the framework for the redevelopment of property, and enhancing livability for residents, employers, employees, and visitors in Tysons Corner.

PROJECT PURPOSE AND OUTCOMES

The *Tysons Corner Bicycle Master Plan* provides a strategic and multidimensional approach for making bicycle travel a viable transportation alternative in and around Tysons. It provides detailed bicycle infrastructure recommendations to replace the conceptual bicycle network provided in the *Tysons Corner Urban Center Amendment of the Fairfax County Comprehensive Plan*, adopted in June 2010. The *Tysons Corner Bicycle Master Plan* is part one of a two-part bicycle transportation planning process initiated by the Fairfax County Department of Transportation (FCDOT). Part two will extend a similar bicycle planning effort to the rest of the County.

The Tysons Corner Bicycle Master Plan:

- Provides a long-term vision for a connected network of on-road bicycle facilities such as bicycle lanes and shared-lane markings and off-road facilities such as cycle tracks and shared use paths.
- Identifies the actions that must be undertaken on specific roads in Tysons Corner, in order to create this bicycle transportation network.
- Highlights both low-cost, immediate-action projects, and long-term major investments that will enhance bicycle access and connectivity both within Tysons Corner and its surrounding communities.
- Provides specific strategies to enhance safety for both cyclists and motorists.
- Provides a detailed implementation strategy that aligns the development of the bicycle network with planned transportation projects, including the Silver Line and private sector development.
- Identifies a targeted set of bike-related programs that will encourage more people to ride bicycles in Tysons Corner and in doing so, foster the development of a local bike culture.
- Recommends a series of policies to improve coordination while also encouraging all stakeholders to contribute to the long-term vision for bicycling in Tysons Corner.

Investing in bicycling infrastructure and programs is central to making Tysons Corner more livable. It will support transit use and help ensure that greater densities of development actually result in reduced levels of congestion. Serving as a major way to access the new Metrorail stations, it will enable the Fairfax community to maximize its return on investment in the Silver Line. Bicycling will also make an important contribution to the new vision for Tysons as a place where “People are engaged in their surroundings and a place where people want to be.”

BENEFITS

Comprehensive improvements to bicycle conditions and support programs will contribute the following community benefits:

- Enhanced livability and quality of life;
- More transportation options, lower transportation costs, increased transportation safety;
- Improved air quality, reduced traffic congestion;
- Expanded recreational opportunities for residents, employees and visitors;
- Improved personal fitness and community health;
- Increased socialization and civic interaction; and
- Enhanced public safety.

OUTREACH

The *Tysons Corner Bicycle Master Plan* was developed by the FCDOT Bicycle Program. Key elements of the planning process include the following:

- A Bicycle Advisory Committee (BAC) was established for the project to provide guidance and ongoing citizen and agency input throughout the development of this Plan.
- A public meeting was held in September 2010 to present and gather feedback on the draft bicycle network, bicycle access improvements to future Silver Line stations, and corridor and spot improvements. Feedback from a second public meeting held in February 2011, after the draft Plan was made available to the public is also incorporated into the final plan.
- Additional stakeholder input was gathered through one-on-one and small group meetings with a range of stakeholders.
- The project team engaged and gathered input from various committees throughout the development of this Plan, including the Tysons Metrorail Station Access Management Study (TMSAMS), Fairfax Transportation Advisory Commission (TAC), Fairfax County Trails and Sidewalks Committee and the Planning Commission’s Transportation Committee.

- The project team participated in a bicycle tour of Tysons Corner in October 2010 to supplement its understanding of existing biking conditions and to discuss proposed recommendations.

GOALS AND ACTIONS

Goal 1: Fully integrate bicycle improvements into the planning and development process in Tysons Corner. Biking will be fully incorporated into ongoing and planned Silver Line improvements, road projects, and private sector development.

Selected Actions

- Ensure completion of the bicycle facilities that are underway, planned, or budgeted for near-term implementation.
- Address bicycle parking issues (quantity, location, service type, security, and weather protection) at the new Silver Line Metrorail stations.
- Enable the emerging Tysons Corner Transportation Management Association (the Tysons Partnership) to play a leading role in implementing and coordinating encouragement programs, as well as supporting bicycle transportation infrastructure projects.
- Introduce developers that are working on near-term redevelopment projects to bicycle facility and program opportunities that can be proffered as part of their development program.
- Secure agreement from VDOT for context sensitive design of streets in Tysons Corner, including the application of urban street and lane width standards and urban intersection design standards. In addition, coordinate with VDOT regarding sidepath and ramp crossing design on arterial improvement projects and regarding the design of intersection retrofits to accommodate bicycle and pedestrian crossing movements and promote safety.
- In conjunction with developers and the business community, establish the first full service bicycle station in Tysons Corner.

Goal 2: Improve bicycle safety, access and connectivity to, from, through and within Tysons Corner. A connected network of on and off-road facilities will be developed over time, which will be supplemented by wayfinding and signage, intersection and access ramp improvements, integrated multimodal and intermodal services, and enhanced connections to schools, parks, and regional destinations. Improvements in the Tysons Corner area will include connections to other existing and planned bicycle facilities and routes throughout the county and in neighboring jurisdictions.

Selected Actions

- Complete on-street facility and trail networks within Tysons providing bicycle access to all areas of the core.
- Install signs for 16 bicycle routes to the Tysons Corner Silver Line Stations, and an interim alternative route (not using VA 123) between Vienna and McLean. Install a second round of Signed Bicycle Routes that extends the signed route system to the east, south, and west and provides wayfinding along some of the corridors receiving bicycle facilities in Phase 2.
- Plan, program, and construct a short list of new capital projects that will enhance safety and bicycle access to Tysons Corner.
- Upgrade bicycle level of service on Phase 1 signed bicycle routes by installing shared-lane markings (sharrows), striped bicycle lanes, climbing lanes, and improved accommodations for bicycles at intersections.
- Plan, program, and construct a set of bicycle safety-oriented striping/marking projects that will enhance cyclists' comfort and help motorists appropriately share the road.
- Focus on achieving a combination sidepath and service road route along VA 7 from VA 267 to Pimmit Drive; and if possible to Towlston Road in the North and Falls Church in the south.
- Initiate a Bicycle Safety Education Campaign targeted for the Fairfax communities just outside Tysons Corner and select public middle and high schools.
- Expand the on-street facility and trail networks surrounding Tysons Corner, including those in Idylwood, Dunn Loring, the Spring Hill Road area, and links to Vienna and McLean.
- Create additional connectivity on the outer fringes of greater Tysons Corner, with improved facilities to Meadowlark Gardens Regional Park, the Dunn Loring area, and northern McLean.

Goal 3: Foster the development of a bike culture in Tysons Corner. A coordinated series of education and encouragement programs, public-private partnerships, and integrated Transportation Demand Management (TDM) efforts will contribute to a Tysons Corner bike culture.

Selected Actions

- Launch a bicycle-sharing service in greater Tysons Corner. Expand the bicycle-sharing service in greater Tysons Corner, as demand increases with employment and residential population growth and the network of bicycle facilities expands.
- In conjunction with the bicycle-sharing service, initiate a “Bike-to-Lunch” program geared to getting employees to reduce midday car use and experience Tysons Corner by bicycle.
- Continue to grow the Bike-Friendly Employer program by increasing corporate membership and the quantity of bicycle parking in both public and private spaces.

Goal 4: Make bicycle travel a viable transportation choice and thus expand the numbers of, and variety of, people bicycling for transportation – including young and old, novice and experienced, and occasional and regular riders.

Selected Actions

- Provide a volunteer Bicycle-to-Transit Ambassadors program at Metrorail stations on select weekdays during the first spring the Silver Line is open.
- Launch *It's About Time!* – a bicycle commuting marketing campaign highlighting to prospective new bicycle commuters the time savings current Tysons bicycle commuters are experiencing as compared to motor vehicle or transit travel.
- Continue the Bike-to-Work Day activities in Tysons Corner, increase registered participants and consider moving the event location or hosting multiple locations.
- Within six months of opening the Silver Line (approximately June 2014), achieve a bike parking rate at the four Tysons Corner stations that is 80 percent of capacity.
- By 2014, double bicycle commuting rates to Tysons Corner over baseline counts (see Section 4.3 for data collection program details). By 2016, double bicycle commuting rates to Tysons Corner (over the 2013 bicycle counts; see Section 4.3). By 2019, double bicycle commuting rates to Tysons Corner (over 2016 rates).
- Document increased bicycle use for resident and employee circulation within the core of Tysons Corner, access to Silver Line stations, and resident trips out of Tysons Corner to job, school, recreation, and other attractions in nearby communities.
- Implement recommended trail system expansion and upgrades to support Safe Routes to School programs at schools.
- By 2030, achieve an overall five-percent bicycle trip mode share for all trips types, and a 3.5 percent bicycle share for access to rail transit trips.

POLICY RECOMMENDATIONS

Policy recommendations are provided for both Fairfax County and VDOT. The recommendations for Fairfax County range from bike parking requirements to requirements for bike accommodations on private roads that serve public access and through parking lots. The recommendations for VDOT include adoption of typical urban travel-lane widths, access management across sidepaths, and refining intersection design standards. The policy recommendations also highlight how Fairfax County can implement emerging bicycle treatments such as colored bike lanes and bike boxes and how it can incorporate bike transportation into ongoing TDM programs.

IMPLEMENTATION AND PHASING

Phase 1: 2011-2013. Begin with a set of relatively low-cost improvements that will “get the ball rolling” – such as establishing signed bike routes and installing shared-lane markings in many locations where the impact to motor vehicle traffic will be minimal and the benefit for cyclists will be significant. Focus on providing sufficient bike parking at the Silver Line stations, as well as convenient and comfortable bicycle access to and from the stations. Start encouragement programs by working through existing TDM requirements and partnerships with the Tysons Partnership, Fairfax Advocates for Better Bicycling (FABB), local employers, and existing bicycle commuters.

Phase 2: 2012-2016. As the core of Tysons Corner begins redeveloping, implement priority on-street, and off-street bicycle facilities. Improve bicycle access within and from the surrounding communities. Install high-tech Bicycle Sharing infrastructure and launch encouragement programs like “Bike-to-Lunch” and “Bicycle-Friendly Employer Awards.”

Phase 3: 2015-2019. Plan, and implement over time, major new crossings of the Beltway and Dulles Toll Road. Until the communities north, northeast, and east of Tysons Corner can access destinations in a more convenient and comfortable manner, their close proximity, and opportunity for biking to Tysons Corner will not be fully realized. Implement bicycle facilities in conjunction with development of new streets in the planned downtown grid as routine accommodations. As the residential population grows in the core of Tysons Corner, ensure that new trails are aligned and designed to serve both transportation and recreation, so that children and families can bicycle to school, the grocery store, and other services. Residential and commercial developers should also design bike-friendly buildings and sites and provide bicycle support facilities to make bicycle-use prominent, convenient, expandable, and ultimately commonplace.

Phase 4: 2020-2030. In later years, transform even major arterials like VA Route 7, International Boulevard, and VA Route 123 by adding bicycle facilities that are separated from the road for priority cycling, shared use paths for lesser skilled cyclists, and signalization that facilitates safe multimodal travel along and across these corridors.

MOVING FORWARD

Bicycling will play a key role in the future of Tysons Corner. Creating a usable network of on and off-road facilities, signed routes, and comfortable intersections, interchange crossings, and overpasses will improve access to transit. It will facilitate bike commuting, and make bicycling a viable choice for other utilitarian trips to and from Tysons Corner. It will encourage bicycle travel within, through, and around the core of Tysons, as well as throughout the greater Tysons area. In doing so, it will enhance livability and quality of life in Tysons Corner.

Successful implementation of this plan will extend the image of Tysons as a trend setter into the realm of bicycling, which will attract future knowledge-based workers while

also serving an important marketing function for potential future residents, visitors, and office tenants.

The *Tysons Corner Bicycle Master Plan* is a critical element in realizing the vision for Tysons outlined in the Comprehensive Plan. It presents a strategy for incorporating bicycling into ongoing and planned Silver Line improvements, road projects, and private sector development. This strategy will enable the County to capitalize on investments already made in the Silver Line, while also taking full advantage of upcoming opportunities.

1.0 Introduction

1.1 PROJECT BACKGROUND AND CONTEXT

Tysons Corner is in the midst of a dramatic transformation from an auto-oriented suburban commercial area to a mixed-use urban downtown for Fairfax County. The development of four new transit stations, currently under construction as part of Metrorail's new Silver Line will provide the foundation for this shift, increasing transportation options, providing the framework for the redevelopment of property, and enhancing livability for residents, employers, employees, and visitors in Tysons Corner.

The *Tysons Corner Bicycle Master Plan* (the Plan) provides a strategic and multidimensional approach for making bicycle travel a viable transportation alternative in and around Tysons. It provides detailed bicycle infrastructure recommendations to replace the conceptual bicycle network provided in the *Tysons Corner Urban Center Amendment* of the *Fairfax County Comprehensive Plan*, adopted in June 2010 (the *Comprehensive Plan Amendment*).

The Plan describes how bicycle planning and design can and must be integrated into all transportation improvements and private sector developments. It identifies and prioritizes both on- and off-road bicycle facilities and provides recommendations for bike parking and other support facilities. The Plan provides detailed policy recommendations to improve stakeholder and agency coordination and program recommendations to foster the development of a *bike culture* in Tysons Corner.

Along with creating more walkable environments, investing in bicycling infrastructure and programs is central to creating a more livable Tysons Corner. It will support transit use and help ensure that greater densities of development actually result in reduced levels of congestion. Serving as a major way to access the new Metrorail stations, it will enable the Fairfax community to maximize its return on investment in the Silver Line. Bicycling will also make an important contribution to the new vision for Tysons as a place where "People are engaged in their surroundings and a place where people want to be."¹

Comprehensive improvements to bicycle conditions and support programs in Tysons Corner will contribute to:

- Enhanced livability and quality of life;
- More transportation options, lower transportation costs, increased transportation safety;
- Improved air quality, reduced traffic congestion;
- Expanded recreational opportunities for residents, employees, and visitors;

¹ Tysons Corner Urban Center Amendment to the Fairfax County Comprehensive Plan.

- Improved personal fitness and community health;
- Increased socialization and civic interaction; and
- Enhanced public safety.

1.2 STUDY AREA OVERVIEW

The established study area for the *Tysons Corner Bicycle Master Plan* is roughly a three-mile radius around the center of Tysons Corner.² For bicycle transportation purposes, up to three miles is considered to be a reasonable travel distance. The boundary line for the *Tysons Corner Urban Center*, shaded in dark grey, and the larger study area is shown in Figure 1.1. The yellow lines on the map in Figure 1.1 represent the two and three-mile buffer around the urban center. Major roads in the study area include I-495 (Capital Beltway), VA Route 7, VA Route 123 and VA Route 267 (the Dulles Toll Road). Portions of the study area are included in Fairfax County’s Hunters Mill, Providence, and Dranesville Supervisor Districts.

Project Purpose

The *Tysons Corner Bicycle Master Plan* is part one of a two-part bicycle transportation planning process initiated by the Fairfax County Department of Transportation’s Bicycle Program. Part two will extend the same bicycle planning effort undertaken for Tysons Corner to the rest of the County. The reason for structuring the planning process in two parts was to ensure that bicycle transportation planning for Tysons Corner was completed in a timely fashion given the recent adoption of the *Tysons Corner Urban Center Comprehensive Plan Amendment*.³

The *Tysons Corner Bicycle Master Plan* (the Plan) provides detailed bicycle facility, policy and program recommendations that, when adopted, will supersede the bicycle transportation section of the 2010 *Comprehensive Plan Amendment*.

The Plan describes how bicycle policies and programs can and should be incorporated into all levels of land use and transportation planning and development. It addresses the role of bicycling as a means of access to transit, as a means of commuting to Tysons area jobs, and as a means of basic transportation within, around, and throughout greater Tysons Corner. It encourages safe and comfortable bicycling opportunities to and from schools and as a recreational activity.

² The study area boundary is considered rough because the remainder of the county will be addressed in a second phase of bicycle transportation planning (see Project Purpose above). Any roads or areas not fully addressed in this plan will be looked at again in the countywide context.

³ Concurrent to this bicycle transportation planning effort the County is also initiating study of pedestrian circulation, a vehicular circulator system, development of a street grid, and other mode-specific studies to ensure that future transportation investment and infrastructure fully supports the new vision for Tysons Corner.

Specifically, the *Tysons Corner Bicycle Master Plan*:

- Provides a long-term vision for a connected network of on-road bicycle facilities such as bicycle lanes and shared-lane markings and off-road facilities such as cycle tracks and shared use paths.
- Identifies the actions that must be undertaken on specific roads in Tysons Corner, in order to create this bicycle transportation network.
- Highlights both low-cost, immediate action projects, and long-term major investments that will enhance bicycle access and connectivity both within Tysons Corner and its surrounding communities.
- Provides specific strategies to enhance safety for both cyclists and motorists.
- Provides a detailed implementation strategy that aligns the development of the bicycle network with planned transportation projects, including the Silver Line and private sector development.
- Identifies a targeted set of bike-related programs that will encourage more people to ride bicycles in Tysons Corner and in doing so, foster the development of a local bike culture.
- Recommends a series of policies to improve coordination while also encouraging all stakeholders to contribute to the long-term vision for bicycling in Tysons Corner.

1.3 BICYCLE TRANSPORTATION GOALS

The *Tysons Corner Bicycle Master Plan* establishes the following four goals for bicycle transportation in Tysons Corner:

Fully integrate bicycle improvements into the planning and development process in Tysons Corner. Biking will be fully incorporated into ongoing and planned Silver Line improvements, road projects, and private sector development.

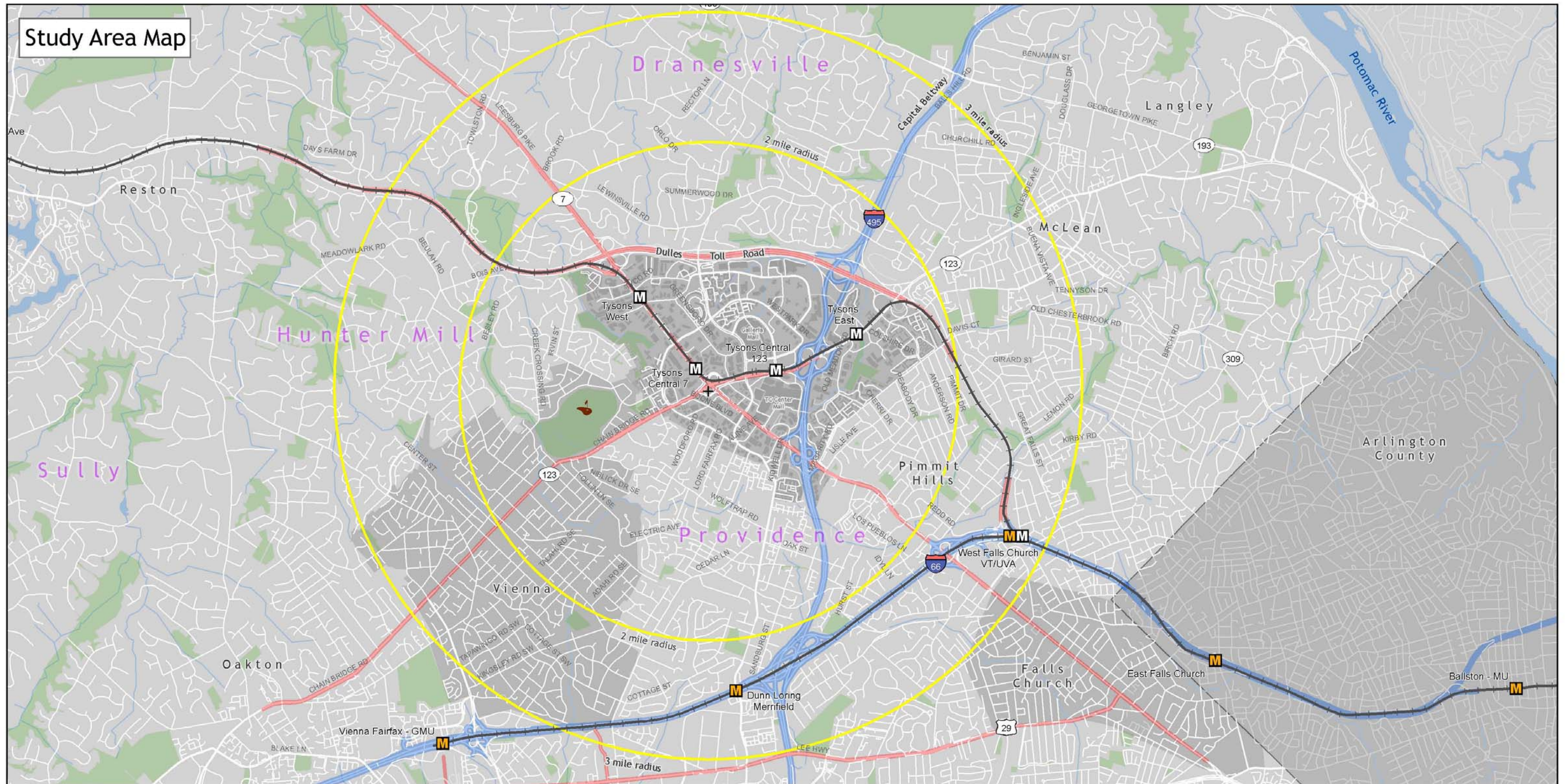
Improve bicycle safety, access, and connectivity to, from, through, and within Tysons Corner: A connected network of on and off-road facilities will be developed over time, which will be supplemented by wayfinding and signage, intersection and access ramp improvements, integrated multimodal and intermodal services, and enhanced connections to schools, parks, and regional destinations. Improvements in the Tysons Corner area will include connections to other existing and planned bicycle facilities and routes throughout the county and in neighboring jurisdictions.

Foster the development of a bike culture in Tysons Corner: A coordinated series of education and encouragement programs, public-private partnerships, and integrated Transportation Demand Management (TDM) efforts will contribute to a Tysons Corner bike culture.

Make bicycle travel a viable transportation choice and thus expand the number of, and variety of, people bicycling for transportation – including young and old, novice and experienced, and occasional and regular riders.

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Figure 1.1 Study Area Map



<p>Legend</p> <ul style="list-style-type: none"> Interstate Highway Major Road Study Area Supervisor District 		<p>0 0.5 1 2 Miles</p>		
<p>Fairfax County Department of Transportation</p> <h1>Tysons Corner Bicycle Master Plan</h1>		<p>April 2011</p>	<p>TOOLE DESIGN GROUP BOSTON MA • WASHINGTON DC • SEATTLE WA</p>	<p>CAMBRIDGE SYSTEMATICS</p>

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1.4 PLANNING PROCESS

The *Tysons Corner Bicycle Master Plan* is a project of the Fairfax County Department of Transportation, and is managed by the FCDOT Bicycle Program staff.

Fairfax County Department of Transportation Bicycle Program (FC Bicycle Program): In 2006, the Fairfax County Board of Supervisors approved the comprehensive bicycle initiative, a program committed to making Fairfax County bicycle friendly. Four primary components of this initiative include the following: a) creating a county bicycle route map; b) establishing a full-time staff position devoted to bicycle facility coordination, planning, and implementation; c) examining roads and streets that may accommodate on-road bike lanes with minimal reconstruction; and d) establishing a pilot program for an interconnected bicycling network.⁴ Bicycle Program staff played a key role providing information, coordination, and expertise throughout the planning process.

Bicycle Advisory Committee (BAC): A Bicycle Advisory Committee was established for the project to provide additional guidance and ongoing citizen and agency input throughout the development of this Plan. The BAC met five times over the course of six months and participated in all aspects of the planning process, from identifying project goals to suggesting revisions to the proposed bicycle network and phasing strategy. The Committee included representatives from Fairfax County Departments of Transportation, Planning and Zoning, and Parks and Recreation, Virginia Department of Transportation (VDOT), Tysons Metrorail Access Station Access Management Study (TMSAMS), the Washington Metropolitan Area Transit Authority (WMATA), Fairfax County Trails and Sidewalks Committee, Fairfax County Transportation Advisory Commission (TAC), the Vienna Trails Committee, Mid-Atlantic Off-Road Enthusiasts (MORE), Fairfax Advocates for Better Bicycling (FABB), local bicycle retailers, and representatives from the Fairfax County Board of Supervisors.

⁴ <http://www.fairfaxcounty.gov/fcdot/bike/>.

Bicycle Advisory Committee - February 2, 2011



Public Meetings: A public meeting was held in September 2010 to present and gather feedback on the draft bicycle network, bicycle access improvements to future Silver Line stations, and corridor and spot improvements. A final public meeting was conducted in February 2011. An on-line forum to gather public comment was provided to supplement input gathered at the public meeting and from the BAC and other stakeholders. The on-line forum was visited by approximately 500 people who logged over 100 specific comments between September and December 2010.⁵ The comments received on line are listed in Appendix B. Feedback from the public was the source of many of the ideas that have been incorporated into the recommendations in this Plan.

Stakeholder Interviews: Additional stakeholder input was gathered through one-on-one and small group meetings with a range of stakeholders, including private developers, large employers in the area, and various Fairfax County government representatives.

Coordination with Standing Committees: The project team engaged and gathered input from various committees throughout the development of this Plan, including the Tysons Metrorail Station Access Management Study (TMSAMS), Fairfax Transportation Advisory Commission (TAC), Fairfax County Trails and Sidewalks Committee, and the Planning Commission's Transportation Committee.

Bicycle Tour: The project team participated in a bicycle tour of Tysons Corner in October 2010 to supplement its understanding of existing biking conditions and to discuss proposed recommendations.

⁵ The on-line forum used is called *Community Walk*. It allows members of the public to make location specific comments that are shown on a Google Map.

1.5 OVERVIEW OF THE PLAN

The Plan is organized into the following sections:

- Section 2 provides an overview of the context for this planning effort, briefly describing existing and future conditions, and highlighting key issues, challenges, and needs.
- Section 3 highlights general recommendations and provides the framework for the phasing and implementation plan to follow.
- Sections 4 through 7 provide a detailed implementation strategy for the following time periods:
 - Phase 1: 2011-2013
 - Phase 2: 2012-2016
 - Phase 3: 2015-2019
 - Phase 4: 2020-2030
- Section 8 concludes and summarizes the plan and the transportation and community benefits of creating a bicycle-friendly Tysons Corner.

Detailed information such as a detailed transportation and development policy recommendations, a bicycle facility and design toolbox, full-size map sets, project and cost tables, and additional traffic and safety-related information is provided as appendices.

2.0 Planning Context

2.1 TYSONS CORNER TODAY

Tysons Corner is the primary center for retail and office activity in Fairfax County. If defined as a Central Business District (CBD), Tysons would rank as the 12th largest CBD in the United States. Tysons currently has one-quarter of all the office space in Fairfax County. There are millions of square feet of retail, including Tysons Corner Center and Tysons Galleria. According to the Vienna-Tysons Regional Chamber of Commerce (VTRCC), the 110,000 jobs located in the Tysons Corner area generated approximately \$300 million in tax revenue in 2009.

Tysons Corner, Fairfax County

While Tysons Corner serves as a major office and retail center, it functions as a typical suburban development. Major roads such as the Capital Beltway (I-495), VA Route 7 (Leesburg Pike), VA Route 123 (Chain Bridge Road), and VA Route 267 (the Dulles Toll Road) are congested with motor vehicle traffic, at times more than eight hours a day. Many of the largest office buildings are situated in campus like surroundings, with extensive surface parking. Car dealerships and large strip commercial developments with surface parking frontage are interspersed throughout the area. Roads and intersections have been designed to handle large traffic volumes at high speeds, creating an unfriendly environment for pedestrians and cyclists. Large super-blocks, disconnected curvilinear streets, grade separated interchanges, and barriers such as the Capital Beltway make it difficult to access or circulate within Tysons Corner by bicycle.

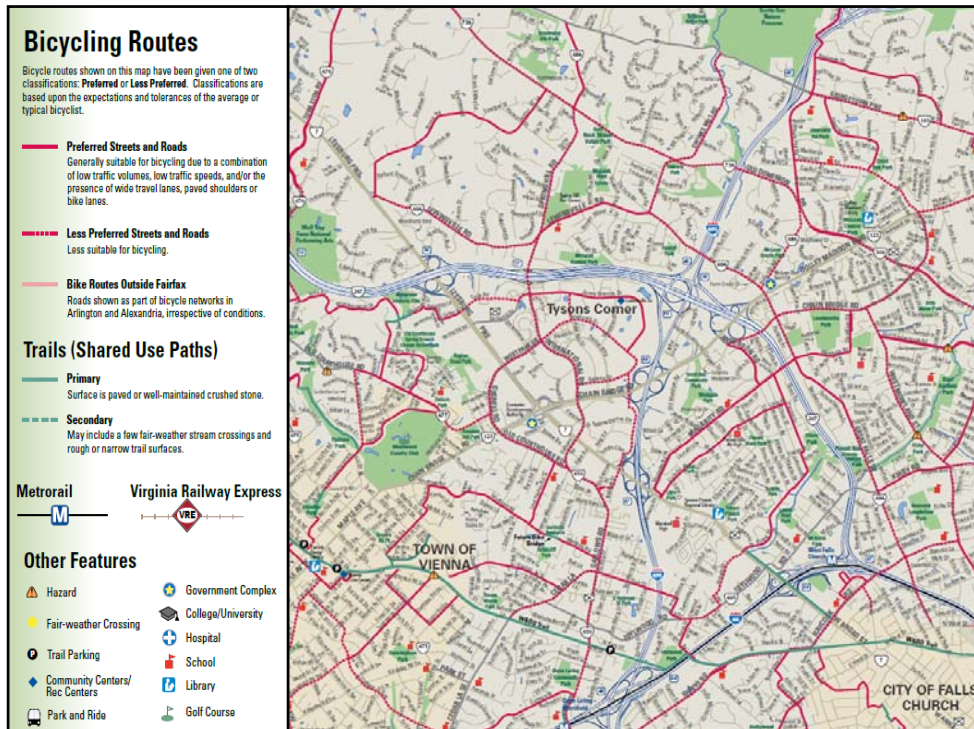
Some of the key issues and challenges facing bicyclists in Tysons Corner today include:

- Having to cross interchange ramps in order to cross the Capital Beltway and Dulles Toll Road.
- Discontinuous bicycle facilities resulting from incremental enhancements to the roadway network (e.g., often these enhancements are dependent on the pace of development).
- Finding viable routes into and out of Tysons, through Tysons, and within Tysons.
- Accessing existing Orange Line Metrorail stations and future Silver Line stations via routes that are direct, time-efficient, safe, and attractive to less-experienced cyclists.
- Finding safe and direct connections for egress trips from Metrorail stations to offices and shopping.
- Bicycling to and from a school, as a student, teacher, or staff person.

The Fairfax County Bike Map provides a baseline for understanding current bicycling conditions in the Tysons Corner area. Fairfax County conducted field data collection in 2006 and 2007 and utilized bicycle level of service (BLOS) analysis to assess arterial and collector roadways Countywide, including those in Tysons Corner. The Map identifies a

network of bike-friendly roadways, existing on-road bike lanes, and major paved trails that connect with residential areas, activity centers, transportation/transit facilities, and the adjacent jurisdiction’s bicycle networks. The portion of the Fairfax County Bike Map that covers the study area for this Plan is included in Figure 2.1.

Figure 2.1 Greater Tysons Corner Area of the Fairfax County Bike Map



Source: Fairfax County Bicycle Route Map, 2008.

2.2 PLANNED AND ONGOING PROJECTS

The introduction of the Silver Line to Tysons Corner is among the principal transportation investments Northern Virginia has made this decade. Four new Metrorail stations are scheduled to open in Tysons Corner in late 2013. Additionally, there are numerous ongoing and planned road improvement projects in the area, including VA Route 7 and the I-495 HOT Lanes. Private sector development also is transforming the urban landscape (see Figure 2.2 for locations of proposed development in the near term).

Where available, the site plans and or construction drawings for projects were reviewed to evaluate bicycle accommodations and determine if additional improvements will be needed.

Figure 2.2 Anticipated Tysons Corner Rezoning



Source: Fairfax County Department of Planning and Zoning, September 2010.

2.3 EXISTING BICYCLE FACILITIES

The Washington and Old Dominion (W&OD) Trail is the preeminent bicycle facility in the vicinity of Tysons Corner. Located just south of the core of Tysons, the trail provides direct connections to Tysons from Arlington in the east and Purcellville in Loudoun County.

While on-road bicycle facilities are infrequent, there are existing bike lanes on Ring Road, Gallows Road, Old Courthouse Road, and Westmoreland Street in McLean. An extension of the bicycle lanes on Gallows Road and new bicycle lanes on Lewinsville Road are planned for installation in 2011.

Both the Silver Line and Beltway HOT Lanes projects are constructing bicycle facilities and accommodations in a variety of locations, including the following:

- Sidepaths are being provided as part of the reconstruction of Route 7 from Tyco Road to approximately the VA 123 overpass.⁶

⁶ It should be noted that these sidepaths may not meet existing AASHTO standards with regard to width for shared use space in an urban environment, buffer from the adjacent road, or location of vertical impediments, such as utility poles and street trees.

- Sidepaths on each side of VA Route 7 are being provided on the new bridges over the Beltway.
- Bike lanes or wide curb lanes are being provided on new bridges, including the Lewinsville Road, Oak Street, and Idylwood Road bridges over the Beltway, and the Westpark Drive bridge over VA 123.

Additionally, a number of intersections in the Tysons Corner area will be upgraded for pedestrians.

A map showing bicycle accommodations that exist and are under construction (2010-2012) is provided in Section 4, Figure 4.1.

2.4 POLICIES AND REGULATIONS

Existing bicycle-related policies are an important element of current conditions in Tysons Corner. A brief list of key policies and their past and current impact on the bicycling environment follows:

- The Countywide Trails Plan supports the steady development of a recreational trail system. Transportation-related features of this plan include the requirement to provide shared use sidepaths on one or both sides of all major and minor arterials.
- The Public Facilities Manual includes provisions for multi-use trails and other facilities.
- There are bicycle elements included in the county's proffer lists provided to private developers by Fairfax County. A recommended Bicycle Proffer Checklist is provided in Appendix B.
- There are bicycle-related Transportation Demand Management (TDM) strategies available to fulfill TDM-related commitments.

While these policies have led to the development of some valuable bicycle infrastructure, more will be needed to make bicycling a viable transportation option in the future Tysons Corner.

2.5 TYSONS CORNER IN THE FUTURE

As noted, Tysons Corner is in the midst of a significant transformation. What exists today will bear little resemblance to Tysons Corner in 10, 20, and 30 years. The June 2010 Tysons Corner Urban Center Amendment to the County *Comprehensive Plan* presents a new vision for the future of Tysons Corner. Along with other studies related to this plan amendment, the *Tysons Corner Bicycle Master Plan* supports and advances the new vision. The following plans and studies contribute to this new vision and provided information that was central for development of this Plan. For further detail about these plans and studies and how they relate to bicycling, see Appendix A.

Plans and Studies

Completed Plans and Reports

- Tysons Corner Urban Center amendment to the Fairfax County Comprehensive Plan (2010)
- Metrorail Bicycle and Pedestrian Access Improvements Study (2010)
- VDOT Bicycle Policy Plan (2010)
- Section 527 Report (2009)
- 2030 National Capital Region Transportation Planning Board Financially Constrained Long-Range Transportation Plan (2009)
- Fairfax County Transportation Plan (2006)
- Fairfax County Countywide Trails Plan (2002)

Citizen-Based Planning Documents

- McLean Pedestrian Task Force Pedestrian and Bicycle Recommendations (2009)
- Tysons Bicycle Plan, Fairfax Advocates for Better Bicycling (2008)

Ongoing and Upcoming Studies

- Tysons Metrorail Station Access Management Study (TMSAMS) (Ongoing)
- Grid of Streets Study (2011)
- Tysons Corner Circulator Study (2011)

Land Use and Development Forecasts

The Tysons Corner Urban Center amendment to the Comprehensive Plan makes clear that new development and redevelopment in Tysons Corner will result in significant growth in population and employment above and beyond previous growth forecasts. Over 54,000 residents are expected to live in Tysons Corner by 2030, compared to 17,000 in 2010. The number of jobs is expected to increase from 105,000 to 159,000 by 2030. The Comprehensive Plan amendment focuses on redevelopment activities through 2030, while establishing a framework for growth through the year 2050. The 2030 growth forecasts are presented in Table 2.1. Figure 2.2 presents an example summary of near-term development proposals in Tysons Corner anticipated by Fairfax County Department of Planning and Zoning.

Table 2.1 Existing and Forecast Population and Employment within Tysons Corner

Scenario	Population	Employment
2010	17,000	105,000
2030 (2010 Comprehensive Plan Amendment)	54,000	159,000

The development mix associated with the population and employment growth forecasts will result in a ratio of four jobs for every household in Tysons Corner, a significant improvement over the 2010 ratio of approximately 13 jobs for every household. A greater diversity of uses throughout Tysons Corner will promote biking and walking by providing more people with the opportunity to live near their jobs and other day-to-day destinations. Facilities recommended in this Plan will provide a support system for new and existing residents, employees working in Tysons Corner, and for people of all ages who choose to travel by bicycle.

The Future Transportation Network

In 2010, the majority of people traveling to, from, within, and through Tysons Corner do so using private automobiles.⁷ The long-term vision for the transportation system in Tysons Corner focuses on providing travel choices through a balanced and interconnected multimodal system. The extension of Metrorail will help create a high-capacity, premium multimodal transportation network. In the *Comprehensive Plan Amendment*, the transformation of the transportation system is achieved through the following actions or shifts:

- Transformation of the existing superblock street grid into a system of smaller connected streets to provide alternative routes for traffic flow and bicycle and pedestrian trips.
- Streets should become “complete streets”, designed to create a sense of place and promote biking and walking.
- The transit system will serve regional trips with Metrorail and buses to and through Tysons Corner.
- For trips within Tysons Corner, a Circulator System that allows frequent, quick, and inexpensive movement as well as easy connections to regional transit systems is needed.
- A neighborhood feeder bus network should connect nearby communities to Tysons Corner.
- Enhancements to the roadway network, such as a grid of streets, improved Beltway crossings, additional connections to the Dulles Toll Road, and state of the art traffic management systems.”⁸

This Plan builds on the *Comprehensive Plan Amendment* by recommending specific improvements that will create a network of bikeways for daily use. It offers the bicycle accommodation component for creating “complete streets.” It will also guide development of on-street and off-street bicycle facilities that will connect the surrounding communities to Tysons Corner and its new Metrorail stations.

⁷ Per the 2000 Census, 86 percent of trips with a start or end in Tysons Corner are in single occupant vehicles. An additional 9 percent of trips are in carpools.

⁸ Fairfax County Comprehensive Plan (Amendment) for Tysons Corner.

2.6 THE ROLE OF BICYCLING IN TYSONS CORNER

With a new vision for Tysons Corner, there is an opportunity for bicycle transportation to play a key role in serving three major types of trips:

- Access to transit trips, to Metrorail and various bus services (typically 0.5-2.5 miles);
- Bicycle commuting to and from Tysons Corner (0.5-10.0+ miles); and
- Circulation within Tysons Corner and nearby communities, including trips passing through Tysons, such as between Vienna and McLean (0.5-5.0 miles).

To assess the real potential for the bicycle to meet these various transportation needs, it is instructive to understand the dynamics of today's transportation activity, as well as forecasts for the future.⁹

Today's Travel Picture

In 2005, the residents-to-employees ratio is unbalanced – 17,000 residents in Tysons Corner compared to 105,000 jobs (located in offices, malls and other businesses). The 105,000 jobs, and related business activity, generated about 66,000 inbound morning peak period vehicular trips in 2005. The outbound traffic in the evening peak period was 85,500 vehicles. For all motorized trips, in 2005, 86 percent were single occupant vehicles, nine percent were in carpools, and five percent were on public transit. During the peak periods, the vehicular travel demand resulted in significant congestion on the major routes providing access to Tysons Corner, which continues today.

Tomorrow's Travel Picture

As has been noted, by 2030 the residential and employment levels are expected to increase significantly. This planned growth is expected to increase the total volume of daily motorized trips into, out of, and within Tysons Corner by 45 percent, between 2010 and 2030. By 2030, this growth equates to an additional 213,900 auto or transit trips per day.

The expansion of the roadway network associated with future population and employment growth will lead to significant growth in traffic volumes on major arteries. Total daily traffic volumes entering Tysons Corner in the morning peak period (7-10 a.m.) are projected to increase to 77,000 by 2030; outbound traffic in the evening peak period (4-7 p.m.) will increase to 97,000.

A modest level of relief in the 2030 travel picture is that the increased development density, and mixed use growth plan called for in the updated Comprehensive Plan will result in

⁹ Existing conditions (based on 2005 land use and transportation characteristics) and the 2030 land use forecast and transportation network were assessed using the Transportation Planning Board's (TPB) regional travel demand model. The TPB is the transportation planning arm of the Washington Metropolitan Area Council of Governments (MWCOC).

more short trips. As a result the non-motorized (biking and walking) travel mode share for commute trips is forecast to increase from 2.2 percent in 2005 to 7.1 percent by 2030.¹⁰

The projected non-motorized activity in the TPB travel demand model is based on the assumption that higher density land uses tend to be accompanied by transportation facilities and an urban design pattern that supports bicycling and walking trips. While this may be a safe assumption for an established urban area, it is a stretch for an area such as Tysons, which is in the process of transforming itself from a suburban to an urban area. Without the expanded bicycle network recommended in this Plan, it is unlikely that Tysons will reach or exceed the forecasted mode split by 2030. In this scenario, it is also possible that the mode shift and associated congestion-related benefits predicted to come as a result of the Silver Line would also not be fully realized.

Role for Bicycling in the Multimodal Transportation System

Based on this analysis of forecasted travel conditions, it is clear that bicycling can play a key role among a set of multimodal travel options that are needed in Tysons. Three basic types of bicycle trips characterize this role: 1) access to transit trips, 2) commuting and other utilitarian trips to and from Tysons Corner, and 3) bicycle travel within, through, and around the core of Tysons, as well as throughout the greater Tysons area.

Bicycle Access to Silver Line Stations

An important part of the overall transportation forecast, is the prediction that by 2030 daily boardings at the four Tysons Metrorail Stations will total 29,200; providing a significant alternative to driving for regional trips. However, because no motor vehicle parking will be provided at the new stations (except for limited kiss-and-ride parking at Tysons West and Tysons East), gaining access to the stations by walking, biking, bus, or drop-off is essential to realize this prediction.

As a result, conditions for bicycle access to the stations are a critical concern. Bicycle access to Metrorail is important because it has certain advantages over other options:

- Congestion relief—automobile drop trips will create up to four additional auto trips per day.
- Time savings—bicycle access to the rail stations is faster than walking.
- Increases the number of people served by non-polluting modes—the range of a bicycle as compared to walking enables a rail station to serve a much wider area.
- Reliability and convenience—as compared to taking a bus, circulator, or shuttle, it eliminates the time taken to walk to a bus stop and wait for the bus. It also eliminates the chance that the bus service is delayed in traffic and relieves the traveler

¹⁰Transportation Planning Board, 2010. 2030 model outputs based on MWCOGs Cooperative Land Use Forecast Round 7.2a which considers population and employment projections from the Tysons Corner Comprehensive Plan amendment.

from the need to coordinate their departure time with the bus schedule— one’s bike is ready when you are.

For bicycle access to be both viable and comfortable, two elements of infrastructure need to be present: 1) a safe, direct, and convenient bicycle-friendly route to the station, and 2) secure, weather protected bicycle parking at the station.

Access Routes to Metrorail

As a part of this Plan, extensive study was conducted to identify near-term and long-term bicycle access routes to the new Silver Line stations. These routes were evaluated to determine how viable and comfortable they might be when Metro opens, what might be done to increase their bicycle-friendly features, and within which implementation phase those improvements should be made.

To understand who might be served by a bicycle-friendly route to a station, and who will have a less attractive or “impossible” route to a station, a bicycle shed analysis was conducted. Based on existing barriers, street connectivity, and arterial crossing accommodations, bicycle catchment areas (or sheds) were delineated for each of the four stations.¹¹ Further, the bicycle routes serving these sheds were evaluated for baseline bicycle functionality as well as bicycle-friendliness. Figure 2.3 shows functional sheds that were graded at two levels of bicycling comfort: 1) comfortable for most casual cyclists, and 2) comfortable for most experienced cyclists.

The conclusion revealed by this analysis is that, without additional infrastructure improvements, within a two-mile radius of each station there are very few areas, and thus people, that will be served by a bicycle-friendly route when the Silver Line opens in late 2013. Moreover, many of these routes that could be usable today are comfortable only for more experienced cyclists, which typically make up 5-10 percent of the potential cycling public.

The challenge is to increase the number of neighborhoods where even the casual cyclist would feel comfortable bicycling to Metrorail. In response to this challenge, this Plan makes recommendations for specific improvements to develop multiple bicycle-friendly routes to the Metrorail stations.¹² Without bicycle access improvements to Metro, the potential for the Silver Line stations to serve their 2030-estimated 29,000 daily trips will be significantly restricted.

¹¹A bicycle shed is like a watershed, it represents the land area from which cyclists are likely to “drain” to a rail station.

¹²While these routes will be improved with Metrorail access in mind, it should be noted that the improvements will make bicycling to other locations in the core of Tysons better as well.

Methodology for the Bike Shed Analysis

To establish bicycle catchment areas (or sheds) for Silver Line stations, the maximum distance for a bicycle trip to a station has been set at 2.5 miles. Given the general terrain of the Tysons area and inclination of less experienced cyclists it is assumed that most travelers would not consider a bicycle trip to Metro from a longer distance. Areas within 2.5 miles of a future Silver Line station but at least as close to an Orange Line station have been removed from the Silver Line catchment areas.

The resulting polygon can be understood as the area from which it might be considered realistic for the general public to bicycle to the Silver Line. Within this overall area specific bicycle sheds relating to one of the four Tysons stations have been identified and evaluated for bicycling comfort:

- The sheds marked in blue, generally have favorable conditions for bicycling, even for a casual rider. They are also not too distant from the stations. None-the-less, even these areas may include a single challenging crossing of an arterial, however basic pedestrian crossing accommodations are expected to be in place by 2014;
- The sheds marked in yellow, generally have viable, but more challenging bicycling conditions; conditions that would deter most casual cyclists from riding, but would be tolerable for many experienced cyclists. However, these areas, too, typically include 1-3 spot locations/intersections that may be difficult to navigate and do not have bicycle-specific accommodations
- The areas that are gray are areas from which it is difficult for most, even experienced cyclists to cycle to a Silver Line station. In some areas it is in fact not possible to make this trip by bicycle. This is based on an evaluation of expected 2014 conditions. However, looking at the glass as half full rather than half empty the gray area highlights communities of people that could be linked to the Silver Line by bicycle if improvements are made.

Bicycle Parking at Silver Line Stations

In February 2011, the WMATA Board adopted a goal that by 2030 3.5 percent of morning peak trips to Metrorail stations should be by bicycle. Table 2.2 summarizes the existing plans for bicycle parking at the four Tysons Silver Line stations and how the planned parking capacity compares to what is needed to achieve this goal.

Based on current ridership projections, the application of proposed WMATA bicycle access goals does not suggest that additional bicycle parking (above what is currently planned for) will be needed until sometime after 2020. However, this also presumes that the Tysons Silver Line stations will be average (among all stations in the system) at attracting bicycle trips.

Based on the improvements recommended in this plan, by 2020, the Tysons stations should be above average in their morning peak period access mode share by bicycle, perhaps among the top 25 of all Metrorail stations. In 2007, the Dunn Loring station had a 2.0 percent bicycle access mode share in the a.m. peak, which generated a daily need for 60 bicycle parking spaces. Given WMATA's goals and the performance of the Dunn

Loring station it seems reasonable to expect a 2.0 percent access mode share for the Tysons Silver Line stations in 2014. It follows that a 3.5 percent mode share could be expected in 2020, and a 4.5 percent mode share in 2030. While currently planned bike parking capacity may be adequate for system opening in 2013-2014, additional capacity will likely be needed before 2020. Table 2.2 compares existing parking capacity to WMATA goals for an average station and the scenario proposed above.

Table 2.2 Projected Tysons Corner Silver Line Metrorail Station Characteristics

Silver Line Metrorail	2014	2020	2030
Daily Boardings	16,300 ¹³	22,000 ¹⁴	29,200 ¹⁵
A.M. Peak ~ 1/3 of Daily Boardings	5,379	7260	9,636
Percent of a.m. Peak Station Access Trips by Bicycle ¹⁶	1.3 percent ¹⁷	2.1 percent	3.5 percent
		WMATA Goal	WMATA Goal
Projected Bike Parking Capacity Needed	70 spaces	152 spaces	338 spaces
Tysons Corner Bicycle Master Plan Goals	2.0 percent	3.5 percent	4.5 percent
Capacity Needed to Meet Goal	108	254	434
Capacity Planned as of 2010	236	236	236

Sources: Various, see footnotes.

In addition to the number of bicycle parking spaces provided, it is important to consider the location and quality of the parking. The current station layouts (January 2011) do not provide for covered bicycle parking racks, and in some cases the location of racks and lockers should be improved. Detailed recommendations regarding the provision of bicycle parking at the new Silver Line stations are provided in Section 4.

¹³The daily station boardings reported in the 2004 FEIS represented year 2011 station activity. For the purposes of this analysis, the daily boardings in Tysons Corner in the first full year that Phase 1 is open (2014) is assumed to be the same as the FEIS 2011 forecast.

¹⁴2007 Station Access and Design Study. The 2020 value represents a ridership forecast based on the Silver Line being fully extended to Dulles Airport. This forecast is based on forecasted development densities that are more consistent with the 2010 Comprehensive Plan amendment, than the 2004 FEIS forecast baselines.

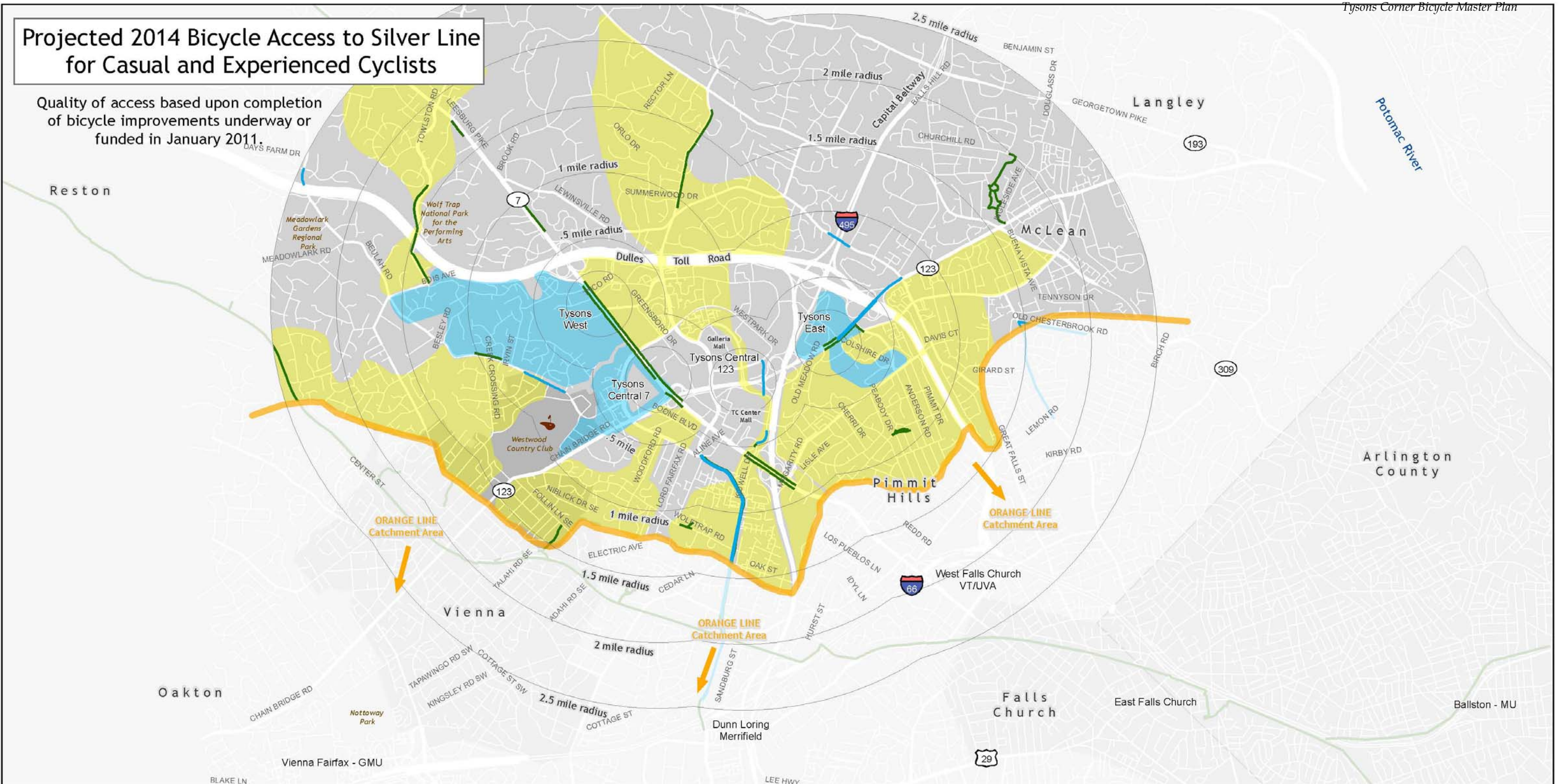
¹⁵More recent, unpublished analysis using the 2010 TPB transportation model, which includes land use projections for Tysons Corner consistent with the 2010 Comprehensive Plan amendment, forecasts up to 29,200 daily boardings in Tysons Corner by 2030.

¹⁶Metrorail Bicycle and Pedestrian Access Improvements Study (October 2010)

¹⁷The 2014 system average is based upon a 0.7 percent system average calculated for 2010 in the study cited in footnote 9 above, and reaching the 2.1 percent goal by 2020.

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Figure 2.3 Analysis of Bicycle Access Conditions for Four Future Silver Line Stations in Tysons Corner



Projected 2014 Bicycle Access to Silver Line for Casual and Experienced Cyclists

Quality of access based upon completion of bicycle improvements underway or funded in January 2011.

- On-Road Bicycle Facility (Existing, Under Construction, and Planned)
- Trails (Existing, Under Construction, and Planned)
- Comfortable for most Casual Cyclists
- Comfortable for most Experienced Cyclists

Fairfax County Department of Transportation

Tysons Corner Bicycle Master Plan

April 2011

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Bicycle Commuting to Tysons Corner

Bicycle commuting to an expanding set of employment opportunities in Tysons Corner represents a significant opportunity to convert motorized commutes to zero emission trips. The demand for commuting by bicycle will increase in Tysons, because traffic congestion, auto-based commute costs (fuel, parking), and total employment are all forecasted to go up.

Existing Conditions

In 2005, based on U.S. Census information and Transportation Planning Board (TPB) transportation model data, the combined bicycling and walking mode share for all commute trips with a start or end in Tysons Corner was 2.2 percent. National trends for urban areas with similar population densities suggest that 15 percent of the total combined bicycling and walking mode share is bicycling.¹⁸ Based on this assumption, for all trips with a start or end in Tysons Corner in 2005, 0.34 percent were by bike and 1.87 percent were pedestrian. While these percentages are small, given a total of 128,500 total daily commute trips in and out of Tysons Corner in 2005, this translated into 440 daily bike commute trips.

Review of these numbers by those who know Tysons Corner suggests that they may be high. As a reference, the average bike to work mode share in the Washington D.C. metropolitan area based on 2007/2008 TPB household travel survey is 0.54 percent. Because Tysons currently is comparable to or less bicycle-friendly than typical urban/suburban employment centers in the D.C. region, actual bicycle commuting rates are probably less than the 0.34 percent reported through the transportation model.

Future Conditions

As previously discussed, compared to 2005, by 2030 the residential population in Tysons Corner is forecast to more than triple and employment is forecast to increase by 50 percent. This growth increases the projected daily commute trips to and from Tysons to 233,300. Based on this growth, the combined bicycling and walking mode share of all commute trips to and from Tysons Corner is forecast to increase to 7.1 percent by 2030. If 15 percent of these trips are on bicycles (see above), the result is a total of 2,520 daily bicycle commute trips to and from Tysons Corner in 2030. Table 2.3 presents a summary of the 2005 and 2030 data, including ranges of total bike mode share and total trip volumes.

¹⁸ The 2001 National Household Travel Survey found that in urban areas with densities higher than 2,000 persons per square mile (suburban/urban residential), bike commuting represents around 15 percent of all non-motorized commute trips.

Table 2.3 Tysons Corner Existing and Future Bicycle Commute Mode Shares
(Based on an Average Weekday)

Scenario	Total Commute Person Trips	Total Commute Bike and Walk Trips	Total Commute Bike Trips ^a	Bike Commute Mode Share
2005	128,500	2,900	220-440	0.17-0.34%
2030 (2010 Comprehensive Plan Amendment)	233,300	16,600	1,260-2,520	0.54-1.08%

^a The low end of the range represents a value 50 percent less than the high end as estimated in the above discussion. This would suggest that bicycling trips are approximately 10 percent of all non-motorized commute trips in Tysons.

Benefits of the Plan for Commute Trips to and from Tysons

The expanded bicycle network recommended in this Plan will help accommodate the growing travel demand between Northern Virginia homes and Tysons Corner jobs. While this plan focuses on the facility needs within roughly a three-mile buffer of Tysons Corner, the reality is that many bike commute trips will start from areas further than three miles away. Additional bicycle planning work in 2011 (Fairfax Countywide Bicycle Plan) will ensure that these longer bicycling connections are made, even to neighboring jurisdictions such as Arlington, Alexandria, and Loudoun County.

Bicycle Circulation Within and Around Tysons Corner

Because of the additional 37,000 persons expected to be living in Tysons by 2030, the greatest opportunity for more bicycle use will be among these residents living in a densely developed, mixed use setting.

Existing Conditions

The existing mismatch in population and employment in Tysons Corner, combined with a number of barriers or hazards for bicyclists accessing Tysons, results in suppressed demand for bicycle trips. In addition, because the majority of workers in Tysons access their jobs by a vehicle trip, there is minimal opportunity to use a bicycle for midday trips for lunch, errands, or appointments within Tysons. Finally, Tysons is at the crossroads of a number of major transportation thoroughfares in Fairfax County. As these facilities currently operate (VA Route 7 and VA Route 123), traveling through Tysons Corner on bicycle between Vienna and McLean, for example, is challenging.

Future Conditions

As Tysons Corner redevelops, TPBs transportation model reveals that increased density and mix of uses in Tysons results in closer trip origins and destinations, thus decreasing the rate of growth in demand for vehicle trips. Table 2.4 presents the change in motorized vehicle-based trip types between 2005 and 2030, noting that the “trips not originating from home” shows the smallest percent increase (23 percent). An employment center generates a considerable number of daytime trips that originate at work, not at home, for example, going out to lunch, running errands on a break, going to a doctor’s appointment. These trips present a great opportunity for shifting from motor vehicle to bicycle.

Table 2.4 Tysons Corner Total Daily Motorized Trips
All Trips

Scenario	Commute to Work Trips	All Other Trips From Home	Trips Not Originating From Home	Total Trips
2005	111,400	152,540	207,310	471,250
2010 Comprehensive Plan Amendment (2030)	186,630	242,190	255,620	684,440

The new residents in Tysons Corner will create travel demand (see Table 2.4), not only for commute trips to jobs in the Tysons core and greater Tysons area, but trips to school, shopping, running errands, to recreation, etc. With mixed-use development and public facilities close at hand, many of these trips will be less than three miles and can easily be made by bicycle.

Benefits of the Plan for Circulation Within and Around Tysons

The expanded bicycle network recommended in this Plan will help accommodate the new travel demand between existing and new households in and around Tysons Corner to service, shopping, and entertainment within Tysons. In addition, it will help accommodate trips by employees within Tysons Corner to services, other attractions, and other businesses in the area. The Plan will also focus attention on providing direct routes that transect Tysons, eliminating the key barriers in Tysons for longer distance through bicycle trips.

Conclusion

Based on the forecasts for significantly increased transportation activity in Tysons Corner, the goals set to reduce the role of single occupant auto (SOV) trips in meeting transportation needs, and the shift in trip types expected to include many more internal circulation trips, it is clear that bicycling can and should play a critical role in providing a diverse set of travel options. The types of trips for which bicycling is most suited include:

- Daily and periodic access to transit, especially Metrorail, as well as egress from rail transit to Tysons locations to which it is too far to walk.
- Daily and seasonal bicycle commuting to and from Tysons, primarily from origins within three miles, but also for longer commutes via the W&OD Trail.
- Circulation within Tysons and nearby communities; this role is expected to expand as residential population increases and new development increases the mix of land uses that will generate these types of trips.

The expanded bicycle network recommended in this Plan will help accommodate the new travel demand from the mixed office and residential redevelopment of Tysons Corner and also foster additional mode shifts from all motorized trips. The following section outlines the process undertaken in order to identify this bicycle network.

3.0 Planning Approach and Process

Section 3 describes the planning approach and process used to develop the recommendations and implementation strategies, which are presented in Sections 4-7. This section begins with a brief summary of the planning process used to develop recommendations, followed by a summary analysis of existing conditions and key challenges for creating a bicycle transportation network in Tysons Corner.

A description of the recommended bicycle transportation network is provided, including the criteria used to select network streets and trails, and an abbreviated bicycle facility “toolbox,” which highlights the types of facilities that will comprise the bicycle network. A more extensive toolbox is provided in Appendix D. The section includes a summary of roadway design and land development policies that will be needed to support implementation of the recommended facilities. The role of bicycle safety education, encouragement, and marketing programs also is discussed.

The section closes with an explanation of the implementation timeframes and the overall implementation strategy. This discussion will provide the broader context for the more detailed discussion of implementation in each phase. Taken together, the framework outlined in this section explains how the Plan’s goals and objectives, presented in Section 1, will be achieved.

3.1 NETWORK PLANNING APPROACH

A feature element of this Plan is the identification of a physical network of bicycle facilities and signed bicycle routes throughout Tysons Corner. This network includes trails and bicycle lanes, intersection improvements, highway overpasses, bicycle access improvements, and a range of other facilities that will make bicycling more convenient and safer. It will make bicycling in Tysons Corner a more realistic travel option.

The bicycle facilities recommended for specific locations are a direct response to existing conditions and user needs along various roads in the area. They also are based on national standards and guidelines, proven best practices, use of emerging designs and technologies, and the experiences of other jurisdictions in the Washington D.C. metropolitan region.

The analytical process used to identify the recommended network integrates local knowledge, engineering judgment, and input received through the BAC, stakeholders, the public, and others. A broad discussion of existing conditions is provided below, followed by a presentation of the types of facilities selected to address the issues and opportunities uncovered as part of the existing conditions analysis.

3.2 BICYCLING IN TYSONS CORNER TODAY

Roadway Characteristics

The character of existing streets and roadways in Tysons Corner was evaluated to determine how conditions are affecting today's cyclists, as well as prospective future cyclists. Road characteristics that were evaluated during the field analysis phase of the project included the number of travel lanes, presence and configuration of turn lanes, lane widths, total road width (or right-of-way width), observed traffic volumes and speeds, posted speed limit, and presence of on-street parking.



Source: Toole Design Group, 2010

Arterial roadways and collector streets in and around Tysons Corner are characterized by high-traffic volumes, and at times high speeds. However, it also is the case that on the major arterials traffic is frequently at a standstill due to congestion. Many roads have multiple through lanes and turn lanes, which are generally 11-13 feet wide. The total widths of roads from curb to curb are highly variable. Wide arterials such as VA Route 7 have limited access sections of road and/or parallel service roads on one or both sides, and posted speed limits of 40-50 mph.

At major intersections additional traffic lanes are typically provided for left and/or right turns, sometimes double lefts or rights. Free-flow, right-turn slip lanes are common, as are right (or left) turn and through option lanes. As a result, intersections are very wide and cyclists must contend with motorists turning right and left across their path. Tysons Corner is bounded on two of three sides by limited access highways, including six major interchanges; four of which feature predominantly high-speed free-flow exit and entrance ramps.



Source: Toole Design Group, 2010

These and other factors make the majority of arterial and collector roadways in Tysons Corner highly uncomfortable for cyclists today and an unattractive choice for those who might want to bicycle in the future.

Local streets, both residential and commercial, are often more bicycle-friendly, but they tend to be discontinuous and circuitous. As such, they can be hard to navigate without the aid of an accurate map or GPS system. As a result, their current value for bicycle travel is

somewhat limited. However, a number of these local streets have hidden value that is, as yet, unused. This Plan proposes actions to overcome the minor challenges of bicycling on these streets and open up greater access for cyclists. Further, a bright spot in the local street system is that a number of residential subdivisions currently are connected by paths or sidewalks providing links between abutting cul-de-sacs.

Trail Characteristics

The W&OD Trail functions as a bicycle highway. It is level, relatively wide, and has few at-grade crossings. For bicycle transportation, it is highly efficient, costing even the average cyclist only 30 minutes for a 7.5-mile trip. The W&OD Trail also has fairly frequent access points to the adjacent street system. But, at its closest point, it is more than a mile from the center of Tysons Corner, so it provides only indirect access.

Other park trails like those in the Wolf Trap Creek Stream Valley Park are relatively narrow, hard to find, and the surface quality is often poor. Many of the sidepaths along main roads also are narrow, overgrown with vegetation, and discontinuous. Most sidewalks are narrow as well (four feet) and of limited value for bicycle transportation.¹⁹ Outside of the W&OD Trail and a few key connector paths, the trail system in and around Tysons Corner is generally not favored by cyclists making utilitarian trips.

Existing Bicycle Facilities and Facilities that are Under Construction, Planned, or Funded

In addition to the trails discussed above, a few on-road bicycle facilities exist in the greater Tysons Corner area. There are existing bicycle lanes on portions of Gallows Road, Old Courthouse Road, Ring Road, and Westmoreland Avenue, and more are funded and awaiting implementation.

It is difficult to characterize the full extent of the design standards and features being used on some of the bicycle and pedestrian improvements being constructed in conjunction with the Silver Line and HOT lane projects. For example, Silver Line station plans have called for the closing of at-grade pedestrian and bicycle access across VA Route 123 at Tysons Boulevard, because Metro access will include a pedestrian overpass. However, the overpass will be difficult for cyclists to use, and will be closed to all traffic when Metrorail is not operating. As a result, some of these intersections may need additional pedestrian and bicycle crossing accommodations even after completion of ongoing Metrorail or HOT lane-related construction.



Source: Fairfax County DOT

¹⁹At intersections, many sidewalks do not have all of the necessary curb ramps for wheeled vehicles to make safe passage.

A major benefit for cyclists in the transportation projects underway in 2010-2011 are the bridge improvements that are being made on Oak Street, Lewinsville Road, Idylwood Road, and Westpark Drive, which include bike lanes, shoulders, or wide outside lanes.

Barriers to Bicycle Travel

The existence of major barriers may be the biggest challenge in making Tysons Corner accessible by bicycle. These barriers make some otherwise easy bicycle trips impossible, highly circuitous, unsafe, or even illegal. They are a major deterrent for many people who would like to bicycle. Many of these barriers will be costly to overcome; others can only be mitigated over time as the built environment changes. A list of general barrier types found in Tysons Corner is provided below.



Source: Toole Design Group, 2010



Source: Toole Design Group, 2010

- Limited access highway crossings with multiple high-speed interchange ramps and merges.
- Wide arterials with medians and minimal minor street crossings, which create a barrier almost as daunting as a limited access highway.
- Topography and environmentally challenged stream valleys surrounded by suburban subdivisions that limit the potential for stream valley trails to serve bicycle transportation.
- Subdivisions adjacent to Tysons Corner that, by design, do not connect in any way with the Tysons Corner commercial areas.
- Streets on private property that serve public travel purposes, such as at shopping malls, office complexes, and in Homeowner Association (HOA)-controlled subdivisions.
- Large development blocks, with buildings surrounded by surface parking lots.

Input from the BAC and other stakeholders, along with a field analysis, helped the project team identify the most detrimental barriers in the existing bicycle network.

3.3 CRITERIA FOR CREATING A NETWORK

As has been noted, the recommended bicycle network is designed to meet the needs of people already riding as well as the needs of potential and future cyclists. The BAC placed a high value on developing a network that over the long run will allow children and senior cyclists, novice and experienced cyclists, regular and occasional commuters; students, visitors, tourists, and recreational riders to all feel comfortable and welcome to bicycle in Tysons Corner.²⁰

As the bicycling population grows in Tysons Corner, it is important to recognize that some cyclists will only venture onto busier roads if they are provided with a facility that clearly delineates space in which they can operate or offers a significant degree of separation from traffic. Some cyclists will avoid roadways with high speeds and heavy volumes, regardless of the accommodations. Some will seek only quiet local streets, and some experienced cyclists will actually prefer arterials because their traffic is given priority at minor intersections and they provide the most direct route to their destination.

To address the goal of comfort for all cyclists, this plan recommends both improving arterial and collector roadways to accommodate bicycles, and providing trails, sidepaths, and parallel routes along local streets.

Streets and trails were selected for inclusion in the recommended bicycle transportation network to create direct, convenient, and logical connections throughout the greater Tysons Corner area. The network includes streets and trails that cyclists currently use as well as roads they would like to use. In order to understand existing and desired bicycle travel patterns, the project team observed bicycle movements, met with local bicycle commuters, conducted a ride with area cyclists, and gathered feedback from the general public in-person and via an interactive web-based mapping tool.

The network is intended to encourage maximum use and comfort, while fostering safe and responsible riding. While bicycling is legal and should be facilitated on all public streets and roads (other than limited access highways) this Plan establishes route development priorities to guide decisions about the types of roadway and trail improvements that are recommended; and their timing and funding. The routes selected for the recommended Bicycle Transportation Network were chosen using the following criteria:

- Recommended routes were identified to facilitate bicycle access to important destinations. Improvements are recommended where they will benefit the greatest numbers of people.

²⁰The BAC coined the phrase “from seven to seventy” to suggest that in the long run all potential riders should feel comfortable and welcome to bicycle in Tysons Corner.



Source: Toole Design Group, 2010



Source: Toole Design Group, 2010

- Where direct, convenient, and logical connections require using roads that have poor bicycling conditions today, appropriate facility upgrades are recommended (such as bicycle lanes, shared-lane markings, climbing lanes, sidepaths, or cycle tracks) to create better bicycling conditions in the future.
- Where parallel routes are equally direct and convenient the most bicycle-friendly route was typically selected for the network and the cost of upgrading an unfriendly roadway is avoided.
- In a number of corridors, such as along Leesburg Pike, and portions of International Drive, less costly, but lower quality facilities are recommended in the near term (Phase 1, 2 or 3), and higher quality facilities are recommended in the long-term (Phase 4).
- Additionally, some corridors have recommendations for both on-road and off-road facilities, such as portions of VA Route 123, to ensure that these routes offer appropriate options for all types of cyclists.
- Signed Bicycle Routes are an important part of the proposed bicycle network. While, they are not considered bicycle facilities per se (because the existence of wayfinding guidance signs does not affect the cyclist's level of comfort in relation to motor vehicle traffic) they make a significant contribution that will be useful for new cyclists.
- Wayfinding signs are effective at helping cyclists find and follow routes that may be preferred for cycling due to any number of bicycle friendly conditions, such as lower traffic volumes and/or speeds, fewer or less severe hills, or guidance to the best intersections for crossing major arterials.
- In Tysons Corner, many preferred bicycle routes are not well known, are hard to find on a map, and can be difficult to follow in the field; the signed routes will increase cyclists' confidence in unfamiliar neighborhoods and enable new cyclists to have a successful and enjoyable experience on their first outing.

- In addition to directional guidance, signed bicycle routes will always include destination and distance information, and as such they will be useful for cyclists in combination with any bicycle facility as well as on streets that have no bicycle facilities.

3.4 SUMMARY OF FACILITY AND ACTION RECOMMENDATIONS

The bicycle facilities recommended in this Plan range from on-road bike lanes and shared-lane markings, to off-road cycle tracks, shared use paths, and multi-use trails. They will be supplemented by intersection and interchange crossing accommodations, wayfinding signage, and other types of bicycle accommodations. A select set of these facilities are shown graphically and discussed briefly in Figure 3.1 on the following pages.

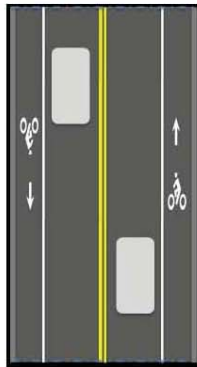
A range of actions will be needed in order to create the bicycle network identified in this Plan. These actions account for the type of facility being installed, as well as the character and existing condition of each individual road. In some cases, bicycle facilities can be implemented by simply adding pavement markings on the road, while in other cases, existing lanes may need to be narrowed or eliminated or the entire roadway may need to be widened.

For more detailed information about bicycle facility types, design options, and implementation actions see Appendix D.

Figure 3.1 Bicycle Facility Toolbox

Bicycle Facility and Accommodation Toolbox

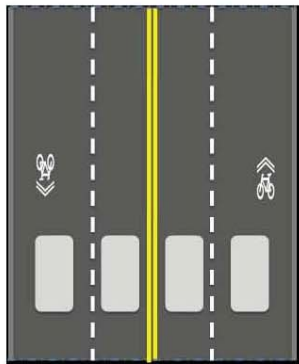
Bike Lane



A bike lane is a pavement marking that designates a portion of a roadway for the preferential or exclusive use of bicycles. Bike lane markings are dashed where vehicles are allowed to cross the bike lane, such as for right turns or at bus stops. Bike lanes are recommended on two-way arterial and collector streets where there is enough width to accommodate a bike lane in both directions, and on one-way streets where there is enough width for a single bike lane.

Sample Locations: Jones Branch Drive, Spring Hill Road, Old Courthouse Road

Shared Lane Markings- 4 Lane Street



Shared lane markings (sharrows) are used on roadways where bicyclists and motor vehicles must share the same travel lane. The sharrow helps position bicyclists in the most appropriate location to ride. It also provides a visual cue to motorists that bicyclists have a right to use the street. On a four lane street, sharrows should be placed in the outside lane. If the outside travel lane is too narrow for a motorist to comfortably pass a cyclist while staying within the travel lane (generally less than 13 feet) the sharrow marking may be centered in the lane. This encourages cyclists to “take the lane,” and encourages motorists to use the left lane to pass. In a 12-14 foot lane, the marking may be offset from the curb by 4 feet. For 10-12 foot lanes, the BIKES MAY USE FULL LANE SIGN is recommended in Tyson’s, because drivers are not used to sharing the road with cyclists and may not provide comfortable clearance when passing. Sharrows are not appropriate on streets with speed limits greater than 35 mph.

Sample Location: Tyco Road

Sidepath

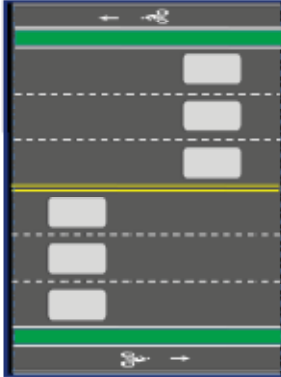


A sidepath is a shared-use path located adjacent to roadway. It is designed for use by bicyclists and pedestrians and each may travel in either direction. Sidepaths are sometimes created by designating a wide sidewalk for shared use; or they may be a segment of a longer trail or network of trails. Sidepath are sometimes provided to facilitate connections to on- and off-street bicycle facilities. A sidepath is not generally a substitute for on-road bicycle facilities, but may be considered in constrained conditions, or in addition to on-road facilities. Sidepaths may not be appropriate in areas of high pedestrian activity unless there is space to successfully manage conflicts.

Sample Locations: Route 123, Route 7 NW of Tysons Corner

Bicycle Facility and Accommodation Toolbox

Cycletrack



A cycletrack is a bicycle facility that is physically separated from both the roadway and the sidewalk. A cycletrack may be constructed at the roadway level using roadway space, or at the sidewalk level using space adjacent to the road. Cycletracks separate bicyclists from motor vehicle traffic using a variety of methods, including curbs, raised concrete medians, bollards, on-street parking, large planting pots/boxes, landscaped buffers (trees and lawn) or other methods. Cycletracks designed to be level with the sidewalk should provide a vertical separation between bicyclists and pedestrians, as well as a different surface treatment to delineate the bicycle from the pedestrian space. Cycletracks can be one way for bicycles on each side of a two-way road, or two-way, and installed on one or both sides of the road. Cycletracks provide cyclists with a higher level of comfort relative to motor vehicle traffic, and are typically used on large multi-lane arterials where higher vehicle speeds exist. They may also be appropriate on high-volume but low-speed streets such as in a commercial downtown.

Sample Locations: Route 1, International Boulevard

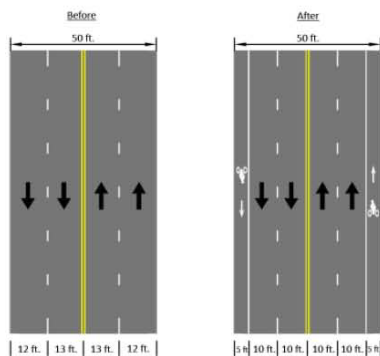
Signed Bike Route



Signed bike routes provide distance and directional information as a wayfinding aid for bicyclists. Signed routes may be established on streets, trails or any combination of facility types that offer a continuous bicycling environment. Signs offer cyclists information about alternative routes and accessible destinations from their current location. They also can be used to suggest the types of conditions cyclists can expect on a route by referencing trails or roadways by name. Signed routes provide new cyclists greater confidence when they are exploring utilitarian cycling for the first time or when they are in unfamiliar territory. Signed routes can also prevent cyclists from getting lost in residential areas with curvilinear street layouts and few through streets.

Sample Location: Northbound on Gallows Road at Kidwell Drive

Lane Diet



A lane diet narrows the width of existing motor vehicle travel lane(s) and redistributes that space for bike lanes or other bikeway improvements. In some situations, a lane diet may be recommended for installation of shared lane markings. For example, a four lane road with 12 foot travel lanes can be restriped with 10 foot interior lanes and 14 foot wide outside lanes where the shared lane marking can be placed.

Sample Locations: Jones Branch Drive, Tysons Blvd

On-Road Actions

- Add striping/marking: A bicycle facility can be provided by simply adding pavement markings on the road.
- Lane diet: Narrow the width of existing motor-vehicle travel lane(s) to free up space within the existing road to provide a bicycle facility.
- Road diet: Eliminate a travel lane(s) in order to provide a bicycle facility within the existing width of the road.
- Remove parking: Free up space to provide a bicycle facility by eliminating on-street parking.
- Pave shoulder: Widen the existing road slightly by paving the existing shoulder or existing right-of-way immediately next to the road.
- Widen road: The appropriate bicycle facility can be provided only by widening the existing footprint of the road.

Off-Road Actions

- Easement: Obtain the legal right to provide public access through a privately-owned property.
- Realign: Move an existing trail slightly so that it provides more convenient and direct access.
- Pave: Overlay pavement on top of an existing soft surface trail in order to improve bicycle accommodations.
- Rehabilitate existing: Improve an existing paved trail to enhance surface quality and address issues such as cracks and heaving.
- Widen sidewalk: Make an existing sidewalk wider so that it can safely accommodate two-way bicycle and pedestrian travel.
- Construct: Build a multi-use trail in an area where there currently is no trail available.
- Construct with road project: Build a multi-use trail, sidepath, or cycle track as a part of a larger road project.

3.5 POLICY AND PROGRAM RECOMMENDATIONS

Policy recommendations are provided for both Fairfax County and VDOT and are presented in detail in Sections 4-7. The recommendations for Fairfax County range from bike parking requirements for private developments to requirements for bicycle accommodations on private roads that serve public access. Inclusion of bicycle encouragement activities among the options in Transportation Demand Management (TDM) requirements also is key. To implement bicycle infrastructure and encouragement activities as TDM measures they must be coordinated with other TDM activities, such as those that

regulate vehicular parking supply, and they are best implemented by the designated Transportation Management Association (TMA) for the Tysons area.

The recommendations for VDOT include adoption of typical urban travel-lane widths, access management across sidepaths, and refining intersection design standards. The policy recommendations also highlight how Fairfax County can implement emerging bicycle treatments such as colored bike lanes and bike boxes.

The program recommendations also are presented throughout Sections 4-7. They include recommendations for encouragement and marketing through initiatives like a Bike-to-Metro Ambassadors Program and a Bike-to-Lunch campaign. They also include recommendations for a Bicycle-Friendly Employers program, full-service bicycle stations, and a bike sharing service, like the one started in Arlington, VA and the District of Columbia in 2010. Bicycle safety education programs such as Safe Routes to School and those directed toward motorists also are recommended.

A more detailed discussion of specific policy and program recommendations is provided in each of the implementation Sections that follow (Sections 4-7). A detailed set of policy recommendations for Fairfax County is provided in Appendix E; a detailed set of policy recommendations for VDOT is provided in Appendix F; and a full list of encouragement and education program recommendations is provided in Appendix G.

3.6 RECOMMENDED PHASING

The recommendations provided in the following sections are outlined as follows:

Section 4 highlights recommendations for Phase 1, which covers 2011 to 2013.²¹ These projects and programs have been set to coincide with the opening of the Silver Line Metrorail service in Tysons Corner in late 2013.

Section 5 highlights recommendations for Phase 2, which covers 2012 to 2016. The overlapping of years with Phase 1 is intentional. Some of these projects may be able to be completed before the opening of the Silver Line; however, they are dependent on a host of factors that are hard to predict, such as the pace of private development, levels of funding available in public transportation budgets, and policy questions related to existing and future roadway design standards.

²¹ Section 4 also includes recommendations for the Town of Vienna, which is responsible for implementing bicycle facilities on its own streets, and for coordinating with VDOT regarding state roads within Vienna. Fairfax County has no transportation planning authority or responsibility in the Town of Vienna. As a result the recommended bicycle improvements identified in this plan are shown to help the reader understand what may be desirable within Vienna to ensure the continuity of bicycle accommodations through the town. Tysons-related bicycle travel to, from, and through Vienna will be desired by the bicycling public.

Section 6 highlights recommendations for Phase 3, which covers 2015 to 2019. These projects are more complex and require resources and funding that will need to be spread out over multiple years.

Section 7 highlights recommendations from Phase 4, which covers 2020 to 2030. These projects include the higher-cost facilities such as new crossings of limited access roads and cycle tracks along major arterials.

3.7 IMPLEMENTATION STRATEGY

This Plan offers a strategic approach to the process of transforming Tysons Corner into a bicycle-friendly place. The approach acknowledges that achieving the goal will be a significant challenge. It will require changes to both private and public elements of the built environment. It will also require a change in the culture, from one that revolves around the motor vehicle to one that truly embraces multimodal transportation. As a result of these needed changes in the built environment and culture, achieving the goal will take time.

This Plan is meant to inform transportation decision-makers and in doing so, contribute to making this change a reality. It outlines an aggressive but realistic approach where the construction of physical facilities and the introduction of encouragement programs are closely coordinated. Implementing this approach will ensure that considerations for bicycle travel are integrated into every aspect of change occurring in Tysons Corner – private redevelopment, the creation of a new “grid of streets,” siting of public facilities, and development of parks and greenways.

The approach also incorporates and informs the design of all types of transportation facilities, from streets and intersections to transit stations, centers, and services, including a future circulator. It also includes some discussion of the design of pedestrian travel ways, design of limited access highway interchanges, and ramp and grade separated structures.

This general strategy outlined in phase can be summarized as follows:

Phase 1: 2011-2013

- Begin with a set of relatively low-cost improvements that will “get the ball rolling” – such as establishing signed bike routes and installing shared-lane markings (sharrows) in many locations where the impact to motor vehicle traffic will be minimal and the benefit for cyclists will be significant. Focus on providing sufficient bike parking at the Silver Line stations, as well as convenient and comfortable bicycle access to and from the stations.
- Start encouragement programs by working through existing Transportation Demand Management requirements and partnerships with the Tysons Partnership (future TMA), Fairfax Advocates for Better Bicycling (FABB), local employers, and existing bicycle commuters. Focus near-term bicycle-use promotion and route improvements on creating better access to and from the new Silver Line stations.

Phase 2: 2012-2016

- As the core of Tysons Corner begins redeveloping, implement priority on-street, and off-street bicycle facilities. Improve bicycle access within and from the surrounding communities. Install high-tech Bicycle Sharing infrastructure and launch encouragement programs like “Bike-to-Lunch” and “Bicycle-Friendly Employer Awards.”

Readers Note

Each implementation section includes a corresponding map and summary table of all improvements recommended in the respective phase. A detailed list of each individual improvement is provided in Appendix I.

Phase 3: 2015-2019

- Plan, and implement over time, major new crossings of the Beltway and Dulles Toll Road. Until the communities north, northeast, and east of Tysons Corner can access destinations in a more convenient and comfortable manner, their close proximity, and opportunity for biking to Tysons Corner will not be fully realized.
- As routine accommodations, implement bicycle facilities in conjunction with development of new streets in the planned downtown grid. As the residential population grows in the core of Tysons Corner, ensure that new trails are aligned and designed to serve both transportation and recreation, so that children and families can bicycle to school, the grocery store, and other services. Residential and commercial developers should also design bike-friendly buildings and sites and provide bicycle support facilities to make bicycle-use prominent, convenient, expandable, and ultimately commonplace.

Phase 4: 2020-2030

- In later years, transform even major arterials like VA Route 7, International Boulevard, and VA Route 123 by adding bicycle facilities that are separated from the road for priority cycling, shared use paths for lesser skilled cyclists, and signalization that facilitates safe multimodal travel along and across these corridors.

3.8 PERFORMANCE MEASURES

Establishing performance measures is an effective way of monitoring the progress of Plan implementation and can be used to determine if the Plan is effectively achieving its goals. While performance measures will be considered and addressed in more detail in the second phase of the Countywide Bicycle Plan, the following approach provides initial guidance for the Tysons area.

The primary performance measure is the increase in number of cyclists counted in the annual Tysons area bicycle count program, which is described in Section 4 (Phase 1). Other measures also relate directly to the programs proposed for implementation in Phases 1 and 2, including the following:

- Number of employers in the Bicycle-Friendly Employer Program;
- Number of bicycle parking spaces created;
- Number of bicycle racks and lockers at Metrorail stations that are used on a peak usage day in May;
- Number of people using the Bicycle Sharing Service;
- Number of participants in Bike-to-Work Day Activities;
- Number of business and consumer participants in the Bike-to-Lunch Program; and
- Number of employees or employee groups participating in the social networking services.

The authority to carryout actions that implement this plan are not centralized under one agency or even one level of government. Transportation facilities are owned and maintained by varying levels of government and private landowners. Likewise, funding and construction of new facilities may be provided by both public and private sources. A host of other agencies will be involved in various other aspects of plan implementation. For this reason, the most universal set of performance measures to measure progress in Tysons are the facility type mileages and improvement location counts provided in a summary table at the end of each implementation phase section (Sections 4-7).

On an annual or biannual basis, it may be desirable for the leadership of the FCDOT, Tysons Partnership, VDOT, and FABB to meet, discuss, and document the progress that has been made – performance measurement provides a useful platform for such a discussion. Similarly, at the close of a Phase, a more substantial assessment can be made. Results can easily be shared with the public on appropriate web sites.

3.9 ON-LINE MAPS GUIDANCE

Electronic versions of the Plan implementation and summary maps are posted on the Fairfax County DOT project web site at:

http://www.fairfaxcounty.gov/fcdot/bike/county_bike_master_plan.htm.

These maps are posted as Adobe.pdf files at a 34” x 44” size to allow detailed viewing and printing at different sizes of all plan recommendations.

The eight on-line maps provide high-resolution versions of Figures 4.1, 5.1, 6.1, and 7.1 included in this document as well as additional summary maps of the complete recommended on and off-road network in Tysons Corner. The list of maps is presented below and the purpose of each are included in Figure 3.2 on the following page:

Map A: Implementation Phasing Plan, Existing and Phase 1;

Map B: Implementation Phasing Plan, Phase 2;

Map C: Implementation Phasing Plan, Phase 3;

Map D: Implementation Phasing Plan, Phase 4;

Map E: Planned Bicycle Facility Network, Phase 4 Buildout;
Map F: Combined Bicycle Network and Signed Route System;
Map G: Signed Bike Route Plan, By Phase; and
Map H: Proposed Implementation Actions.

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IMPLEMENTATION PHASING PLAN MAPS (PHASE I- 4)



This map shows existing on and off-road bike facilities and the bike facilities that are recommended in Phase I, which covers the years 2011 to 2013.



This map shows the on and off-road bike facilities that are recommended in Phase 2, which covers the years 2012 to 2016.



This map shows the on and off-road bike facilities that are recommended in Phase 3, which covers the years 2016 to 2020.

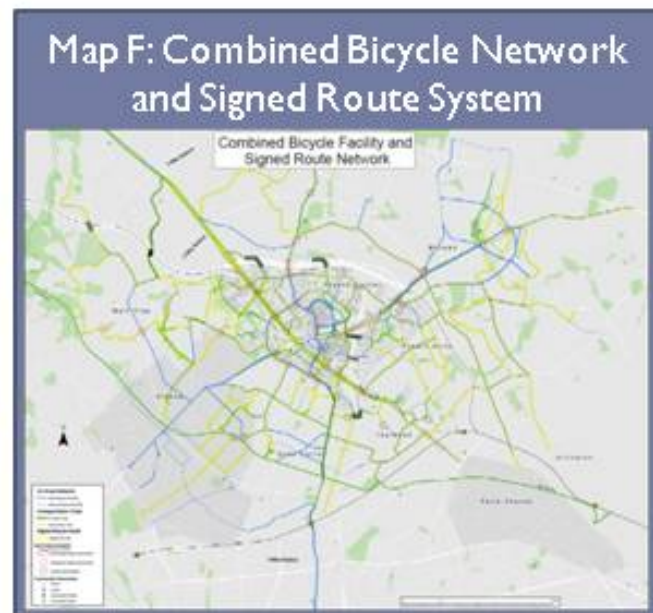


This map shows the on and off-road bike facilities that are recommended in Phase 4, which covers the years 2020 to 2030.

TYSONS CORNER BICYCLE MASTER PLAN SUMMARY MAPS



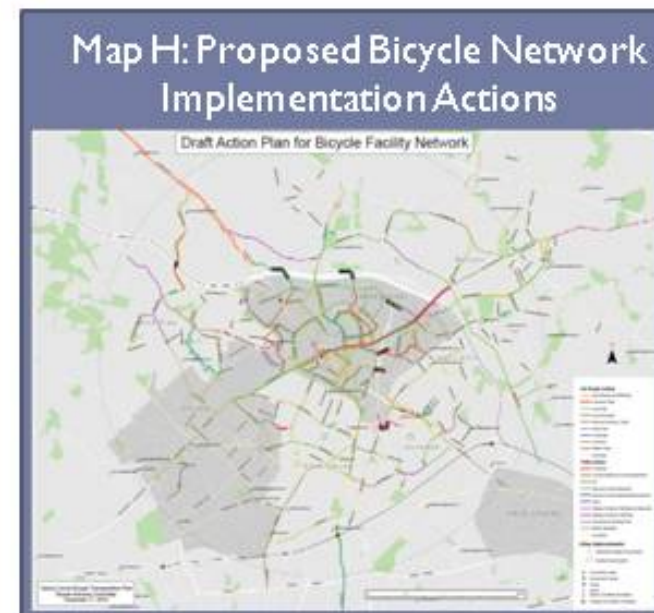
This map shows the full build out of all on and off-road bike facility recommendations. This map shows the ultimate recommended facility on every segment of the bike network.



This map shows the full build out of all on and off-road bike facility recommendations along with the full signed route network recommended in this plan.



This map highlights how the signed route network will be developed over time. All signed routes will be completed in the first three phases of the implementation plan, which cover the years 2011-2019.



This map shows the required action along each segment of the future bike network in order to create the recommended bike facility.

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3.10 CONCLUSIONS

Successful implementation of the recommendations in the following sections will require a great deal of coordination. The process for updating the Comprehensive Plan and planning for and constructing the Silver Line through the heart of Tysons Corner can serve as examples for this coordination. Implementing the recommendations will require a concerted effort from Fairfax County, VDOT, Metropolitan Washington Airports Authority (MWAA), WMATA, the Town of Vienna, bicycle advocates, and other stakeholders.

The recommendations in the following sections are meant to inform and set the stage for this coordination. They can help fulfill an emerging new vision of Tysons Corner, where bicycling supports and reinforces transit use and plays a vital role on its own by making travel to and from, within, through, and around the new Tysons Corner an enjoyable and efficient experience.

4.0 Implementing Phase 1 (2011-2013)

4.1 STRATEGY: GOALS AND OBJECTIVES

The timeframe for Phase 1 coincides with the planned opening of the Silver Line Metrorail service in Tysons Corner in late 2013. Bringing Metrorail to Tysons Corner is the largest single transportation investment (\$2.6 billion, in 2010 dollars) that Northern Virginia will make this decade. It will contribute to a comprehensive shift from a suburban auto-oriented transportation network, to a multimodal system with a wide range of transportation choices.

The most effective way to ensure that bicycling is fully integrated during the transformation of Tysons Corner is to ensure that the community understands its critical role in providing access to the Silver Line stations. No motor vehicle parking will be provided at the four Tysons Corner stations except for limited kiss-and-ride spaces at Tysons East and Tysons West stations. Walking access is and will continue to be limited due to the suburban nature of existing development. As such, the bicycle is key to expanding the catchment area of the new stations, and to meeting transit users' need to save time and money when choosing to travel by Metrorail.

With this strategy in mind, Phase 1 of this Plan is intended to make significant progress toward three of the Plan's four main goals. Figure 4.1 provides a map of physical improvements, including those that are: 1) existing, 2) under construction, 3) planned and funded, or 4) proposed for Phase 1 by this Plan. Specific objectives for Phase 1, in the areas of policy, program, and infrastructure, are identified below under the corresponding goal:

GOAL: Fully integrate bicycle transportation improvements into the planning and development process in Tysons Corner.

- Address bicycle parking issues (quantity, location, service type, security, and weather protection) at the new Silver Line Metrorail stations.
- Enable the emerging Tysons Corner Transportation Management Association (the Tysons Partnership) to play a leading role in implementing and coordinating encouragement programs, as well as supporting bicycle transportation infrastructure projects. As of January 2011, the County, Tysons Partnership, and TYTRANS are developing a new institutional framework for implementing and managing TDM activities in Tysons Corner.
- Introduce developers that are working on near-term redevelopment projects to bicycle facility and program opportunities that can be proffered as part of their development program.

- Secure agreement from VDOT for context sensitive design of streets in Tysons Corner, including the application of urban street and lane width standards and urban intersection design standards.
- Ensure completion of the bicycle facilities that are underway, planned, or budgeted for near-term implementation.

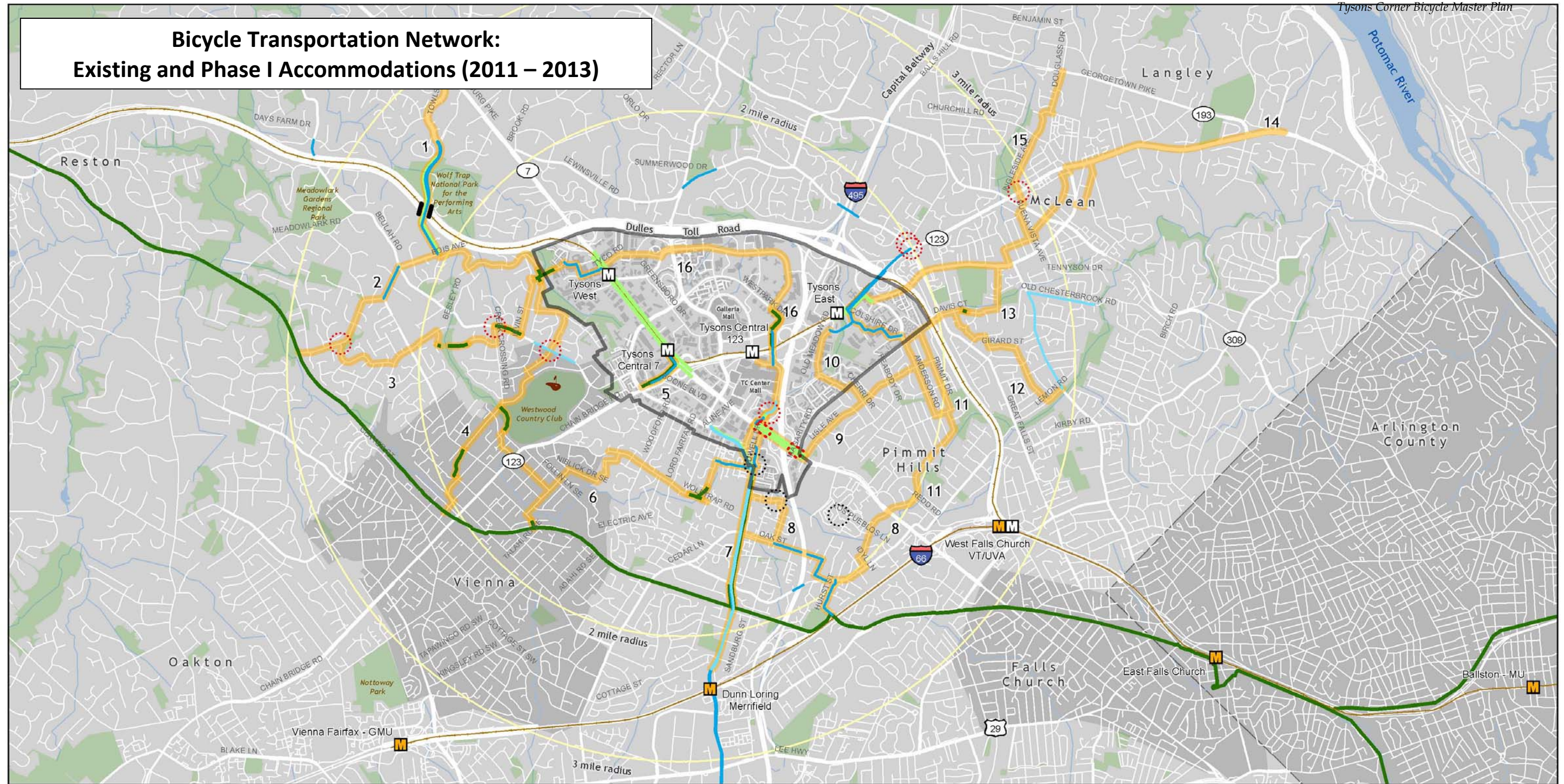
GOAL: Improve bicycle travel safety, access, and connectivity to, from, through, and within Tysons Corner.

- Install signs for 16 bicycle routes to the Tysons Corner Silver Line Stations, and an interim alternative route (not using VA Route 123) between Vienna and McLean.
- Plan, program, and construct a short list of new capital projects that will enhance safety and bicycle access to Tysons Corner.

GOAL: Increase the numbers of people bicycling for transportation by making it a viable choice for a wide range of cyclists – young and old, novice and experienced, occasional and regular.

- Provide a volunteer Bicycle-to-Transit Ambassadors program at Metrorail stations on select weekdays during the first spring the Silver Line is open.
- Launch *It's About Time!* – a bicycle commuting marketing campaign highlighting to prospective new bicycle commuters the time savings current Tysons bicycle commuters are experiencing as compared to motor vehicle or transit travel.
- Establish a Bike-Friendly Employer program with at least six corporate members by 2013.
- Continue the Bike-to-Work Day activities in Tysons Corner; increase registered participants and consider moving the event location or hosting multiple locations.
- Within six months of opening the Silver Line (approximately June 2014), achieve a bike parking rate at the four Tysons Corner stations that is 80 percent of capacity.
- By 2014, double bicycle commuting rates to Tysons Corner over baseline counts (see Section 4.3 for data collection program details).

Figure 4.1 Phase 1 Recommendations Map



**Bicycle Transportation Network:
Existing and Phase I Accommodations (2011 – 2013)**

<p>Existing</p> <ul style="list-style-type: none"> On-Road Bicycle Facility Trails (W & OD and Other Selected Paths) 	<p>Phase 1</p> <ul style="list-style-type: none"> On-Road Bicycle Facility Trail Construction or Upgrade Signed Bicycle Route Route Number (corresponds to Table 4.3) 	<ul style="list-style-type: none"> Intersection Improvement Interchange Crossing Improvement Spot Access Improvement New Bicycle/Pedestrian Overpass 	<p>0 0.5 1 2 Miles</p>	<p>TooleDesignGroup BOSTON MA • WASHINGTON DC • SEATTLE WA</p> <p>CAMBRIDGE SYSTEMATICS</p>
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4.2 POLICIES

Establishing and coordinating bicycle-friendly policy within implementing agencies will be an essential foundation for developing the Tysons Corner bicycle network and support programs.

In 2011, the policies at most implementing agencies are generally supportive of bicycling; however, the Tysons Corner Bicycle Plan recommends several ways in which policies could be adapted to ensure implementation of high-quality bicycle facilities.

All of the policy recommendations are based upon achieving the vision for Tysons Corner set forth by the Tysons Corner Urban Center Comprehensive Plan Amendment (No. 2007-23), to create a downtown for Fairfax County. To achieve this vision the Amendment specifies key policy goals:

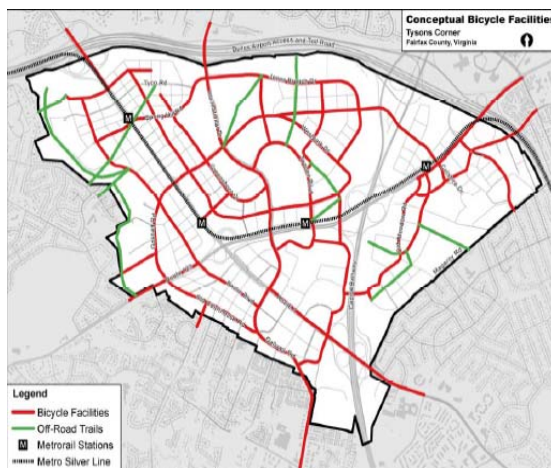
An overall Level of Service (LOS) ‘E’ goal is expected for the street network in Tysons Corner...A high-level of service should be maintained for pedestrians and cyclists, including safety and security, direct pathways, reasonable grades, and minimized delays at intersections. Within Transit-Oriented Development areas, preference should be given to the maintenance of a high-level of service for transit, cyclists, and pedestrians.

To achieve this goal for the bicycling mode, this Plan provides additional policy recommendations in two primary areas: 1) Fairfax County zoning and development review policy, and 2) VDOT roadway design and operations.

Updating the Bicycle Transportation Section of the Tysons Corner Urban Center Comprehensive Plan Amendment

The Plan affirms, fills gaps, clarifies, and elaborates on the bicycle transportation provisions identified in the Comprehensive Plan Amendment (see Figure 4.2).

Figure 4.2 Conceptual Bicycle Facilities in the Tysons Corner Comprehensive Plan Amendment

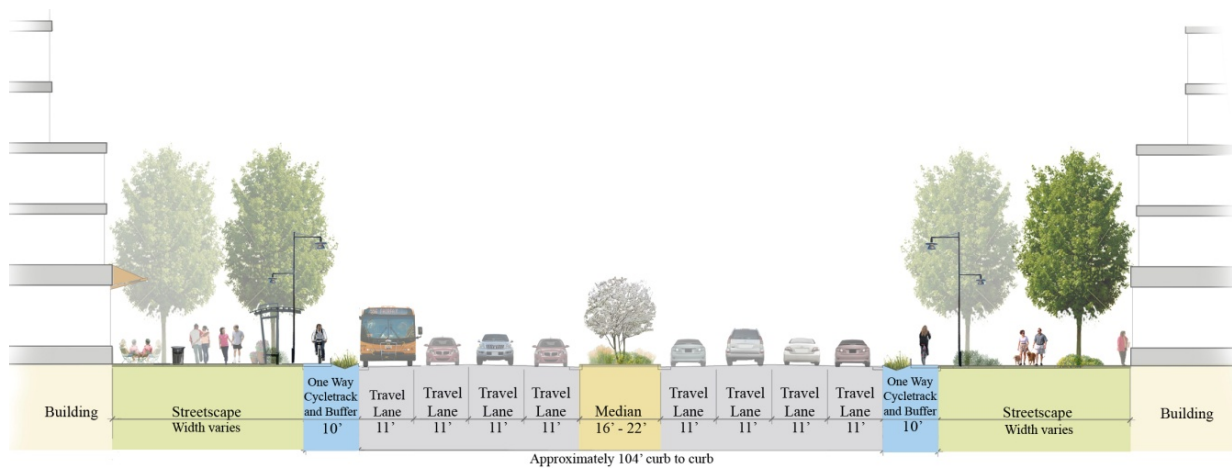


Source: Fairfax County Comprehensive Plan – Tysons Corner Urban Center Amendment, 2010.

The list below outlines six key areas where updated recommendations are provided. Additional detail is provided in Appendix I.

- Updated Boulevard cross-sections that include bicycle facilities, including near-term and long-term facility recommendations (see Figure 4.3).
- Updated the network of roadways that will have bicycle lanes due to their functional classification as Avenues or Collectors. This Plan affirms the *Comprehensive Plan Amendment's* approach that all Avenues and Collectors should have standard bicycle lanes. Moreover, it recommends that some streets classified as local may need bicycle lanes as well, or wider (11-13 foot) travel lanes within which the shared-lane marking can be placed.
- Provided recommendations to consider in the Grid of Streets study to improve functionality of a southern section of the grid for bicycle access to and from Tysons Corner.
- Expanded recommendations for the Trail Network, refined trail alignments, and inclusion of key trails as components of the grid of streets.
- Provided recommendations for consideration of alternate and additional grade separated crossings of the Beltway and Dulles Toll Road.
- Carried forward the bicycle parking recommendations until a set of Countywide bicycle parking regulations can be incorporated into zoning and development regulations.

Figure 4.3 Recommended Modification of the Boulevard Section



This cross section includes 5-foot one-way cycletracks and 5-foot vegetated drainage filtration areas as buffers between the cycletrack and motor vehicles (a total of 125 feet curb to curb. If two-way cycletracks are desired an additional 5 feet of space needs to be reserved in the right-of-way for 10-foot pavement widths on each side.

It is assumed that upon Board adoption of this Plan, the bicycle transportation provisions of the Comprehensive Plan Amendment are considered amended by those of this Plan.

Additional changes in Fairfax County zoning and development review regulations are provided in Appendix E. They address issues such as bicycle parking, proffers, relationship between provision of bicycle facilities and addressing traffic impacts of development projects, use of easements to provide trails across private property, and various issues related to providing bicycle access to public areas of private developments.

VDOT Roadway Design and Operation Policy

In addition to the Comprehensive Plan's policies regarding modal priorities, VDOT's State Bicycle Policy Plan, currently under review, identifies strategies for more fully integrating pedestrians and bicyclists into VDOT's daily business. It highlights ways to effectively implement one of the more progressive state-level bicycle and pedestrian policies in the country so that the agency's day-to-day practice reflects the policy objectives.

In 2004, the Commonwealth Transportation Board (CTB) adopted the *Policy for Integrating Bicycle and Pedestrian Accommodations*. The policy provides the framework through which VDOT accommodates bicyclists and pedestrians in the funding, planning, design, construction, operation, and maintenance of Virginia's transportation network.

The State Bicycle Policy Plan establishes a vision for the future of bicycling in the Commonwealth. It provides recommendations to ensure that the bicycle element of the policy is applied consistently, appropriately, and cost-effectively. The specific recommendations detailed in Appendix F are consistent with the recommendations included in the State Bicycle Policy Plan.

In Phase 1, VDOT roadway design and operational policies and practices (as applied in greater Tysons Corner) should be modified in the following areas: 1) allow 10-foot travel-lane widths for street classifications below Boulevard, 2) use of regulatory, caution and warning signs related to bicyclist and motorist safety, 3) intersection and interchange design, 4) shared use path and sidepath design standards, 5) improved maintenance of on-street and off-street facilities, and 6) provision of reasonable and safe bicycle detours during utility repair, roadway improvement and land development projects, and improved patching after utility work conducted in the roadway right-of-way.

Trail Design and Management Policy

The trail component of the bicycle network in Tysons is important, especially because trails serve less confident cyclists. However, for trails to function effectively for transportation they must be designed, managed, and maintained to standards that are higher than those currently in force. For example, lighting may be needed so that bicycle commuters can get home after dark (5 p.m. in November). Changing standards will affect the budgets and practices of a variety of park and transportation agencies, including the Town of Vienna; however it is not necessary or appropriate for every trail to be managed for transportation usage.

To address issues such as lighting, permitting park trail use after dark, public safety, snow removal, and regular sweeping, the FCDOT bicycle program staff should engage trail management agencies in a discussion that will lead to a pilot project. It is recommended

that a plan be developed for managing a select set of trails in the Tysons area for transportation use, as a test case. Development of this plan should involve representatives of the Tysons Partnership, Fairfax County Department of Transportation, the Fairfax County Park Authority, the Northern Virginia Regional Park Authority, the Town of Vienna, and the Virginia Department of Transportation. See Appendix E for additional details.

4.3 PROGRAMS

Encouragement

It is critical that the lead Transportation Management Association (TMA) for Tysons Corner is also the lead entity for the management and coordination of most bicycle transportation encouragement and safety education programs. This will ensure that bicycle-related Transportation Demand Management (TDM) activities are effectively integrated with other TDM initiatives and the TDM-related proffers made by developers.

As this plan was being developed (fall 2010-winter 2011) it appeared that the Tysons Partnership was going to become the TMA for Tysons Corner. It is highly recommended that the Partnership take a leadership role regarding bicycle encouragement and education programming and bicycle parking. It is further recommended that they seek funding for bicycle transportation initiatives, hire staff, and consider partnering/contracting with experienced local or regional bicycling organizations and businesses for services.

Program initiatives suggested for Phase 1 include the following:

- Use the League of American Bicyclists *Bicycle-Friendly Employer Program* to encourage employers and property managers to provide employees secure bike parking, availability of showers and changing facilities, incentives to commute by bicycle, etc.²²
- In partnership with FABB and WABA, create a volunteer *Bicycle-to-Transit Ambassadors program* at Metrorail stations on select weekdays during the first spring the Silver Line is open. Such a program would entail volunteer cyclists staffing information tables at the Silver Line stations once a week during the first spring the system is open. Face to face contact with another cyclist who commutes can be the most influential factor in a person's decision to bicycle.
- Information about routes, safety, time savings, and health benefits can be provided, as well as how to use the bicycle parking at the station, how to put your bicycle on a bus, and how to rent a bike locker. Arranging commuter companions or mentors is another service that can be provided to help new cyclists.²³

²²<http://www.bikeleague.org/programs/bicyclefriendlyamerica/bicyclefriendlybusiness/>.

²³ <http://alexandriava.gov/localmotion/info/default.aspx?id=11992> and <http://bicyclingambassadors.org/>.

- Launch a bicycle commuting encouragement program called “*It’s About Time!*”. Over the course of this planning process, many of the cyclists who commute to Tysons in 2010 stated that time savings (and reliability of the daily commute time expenditure) is the reason they choose bicycling over driving or taking transit. Congestion on routes to Tysons from both the east and west is common. Using the W&OD trail, and other connecting trails, bicycle commuters from as far away as the District of Columbia and Ashburn, Virginia described their time shavings over other travel alternatives available to them. This is a little known fact which if publicized might make biking more appealing to many other Tysons commuters.
- To support the *It’s About Time!* campaign, create a map of the greater Tysons area with “bicycle commuting times for the most time-efficient bicycle commuter routes to Tysons Corner offices. The map could be produced in various forms (paper, a printable map on the Internet, on signs at key gateways to Tysons, or on a bandana as a promotional giveaway).
- Create an Internet-based “social” network among employee-based bicycle clubs, bicycle commuting support groups, and individual bicycle commuters to publicize commuting testimonials; share information and tips, provide bicycle travel advisories, advertise programs and events, and publicize progress made to increase the numbers of people bicycling in Tysons. A number of employers in Tysons Corner already have active groups with in-house leadership.
- Continue the *Bike-to-Work Day Pit Stop* in Tysons Corner, which is currently sponsored by Booz Allen Hamilton. Consider new advertising strategies that might increase the numbers of registered participants. It may be useful to consider moving the event location to a location that is more central to or accessible to Tysons area cyclists, or trying to involve more stakeholders and hosting multiple “Pit Stop” locations and “Convoys”.

Because of the increasing numbers of Spanish speaking people in the Tysons area (especially among service and construction workers) every effort should be made to provide communications about encouragement and safety education programs in Spanish. Due to fast changing demographic characteristics, translations into other languages may be needed for some programs.

Ongoing Tysons Corner Bicycle Advisory Committee

To provide ongoing guidance regarding plan implementation and program development it is recommended that a bicycle or bicycle and pedestrian advisory committee be established in association with the Tysons Partnership or other organization empowered to be the TMA.

Safe Routes to School

As of January 2011, dialogue has begun between various Safe Routes to School (SRTS) advocates and the Fairfax County Public Schools. Like school districts around the U.S., Fairfax schools are eligible to apply for Federal Safe Routes to School funding through the Virginia department of transportation (VDOT). This funding can be used for bicycle

or pedestrian infrastructure improvements, operational improvements, or safety education and/or encouragement programs at elementary or middle schools, including private schools.

Local schools (administrators, teachers, and parents) in the Tysons Corner area can initiate local safe routes to school (SRTS) programs based on their own sense of need to improve bicycle and pedestrian safety for students or to encourage more kids to bicycle or walk to school. The planning process for this Plan did not systematically identify and evaluate safe routes to school needs in the study area. However, various needs were identified in the analysis process or pointed out by BAC members and the public.

Near-term initiation of SRTS programs in Tysons area schools will contribute significantly to a more bicycle and pedestrian safety savvy residents and employees in Tysons in the long-term.

Law Enforcement

As cycling increases during Phase 1 and 2, enforcement of bicycling laws will become increasingly important. During Phase 1, the FCDOT Bicycle Program staff and other bicycling interest groups should engage the Fairfax County and Town of Vienna police departments in a dialogue about bicycle law enforcement. As redevelopment of Tysons progresses and more cyclists and pedestrians are using the public realm, bicycle-mounted police patrols may be an effective approach to general law enforcement.

Bicycle Counts

It is recommended that the Fairfax County DOT Bicycle Program establish an annual bicycle counting program. Other jurisdictions in the region recruit volunteers to assist with data collection; FCDOT may want to partner with FABB or WABA to get assistance recruiting volunteers.

This counting program will establish baseline usage levels from which progress can be measured over time. Because Tysons Corner is two-thirds enclosed by limited access highways, it is likely that 90 percent or more of existing bicyclists traveling in and out of Tysons Corner can be counted at eight points of entry/exit, including:

1. Spring Hill Road and 267;
2. Dolley Madison Boulevard and Lewinsville Road;
3. Chain Bridge Road and Anderson Road;
4. VA Route 7 and the Beltway;
5. Gallows Road at Old Gallows Road;
6. Chain Bridge Road at Gosnell Road;
7. Old Courthouse Road at Gallows Road; and
8. Ashgrove Lane.

FCDOT Bicycle Program Staff

To effectively implement this plan, it is likely that the Bicycle Program will need an additional staff person. This will be especially important during Phases 1 and 2 when many new initiatives must be started, coordination patterns established, and facilities designed and implemented.

4.4 PHYSICAL IMPROVEMENTS

The physical improvements recommended in Phase 1 are summarized in Table 4.1 below and shown in Figure 4.1.

Table 4.1 Phase 1 Recommendations Summary

Improvement Category	Recommendations (Miles or Number of Improvements)
On-Road Bike Facility	11.6 miles
Off-Road Bike Facility	5.0 miles
Signed Bike Route	41.1 miles
Intersection Improvement	7 total
Interchange Improvement	2 total
Access Improvement	3 total
Bridge Improvement	1 total

As of January 2011, many of the physical improvements slated for Phase 1 are under construction, as they are associated with either the Silver Line or Beltway HOT Lanes projects. Other facilities are planned and either partially or fully funded. For a complete list of Phase 1 improvements see Appendix I.²⁴

In addition to the projects already planned or under construction, this Plan recommends additional projects for Phase 1, to enhance or complete connectivity to the Silver Line Metrorail stations. These projects are described below. They are relatively low-cost and achievable in a three-year timeframe – January 2011 to December 2013.

On-Street Improvements

A list of the most important Phase 1 on-street improvements recommended by this Plan is provided in Table 4.2.

²⁴ For a list of improvements by Facility Type, see Appendix I.

Table 4.2 New On-Street Improvements Recommended in Phase 1

Street Names	Bikeway Facility Type	Length in miles
Ashgrove Lane and Westwood Center Drive	Sharrow	0.3
Colshire Drive and Colshire Meadow Drive	Sharrow and Climbing Lane	0.4
Oak, Providence, and Helena Streets	Sharrow	0.5
Hurst Street	Sharrow	0.3
Idylwood Road Bridge over the Beltway	Sharrow	0.1
Merry Oaks and Kidwell Drive	Sharrow	0.5
Trap Road	Sharrow	1.3
Beulah Road	Paved Shoulder	0.3
Clarks Crossing Road	Safety Signage	0.5

Due to the lack of lead time in planning for Phase 1 improvements, many on-street improvements are slated for Phase 2 and appear on the Phase 2 map.²⁵ However, it is likely that a number of these streets where bike lanes are recommended in Phase 2, will have shared-lane markings (sharrows) installed in Phase 1, as an interim improvement. These streets include: Jones Branch Drive, Westpark Drive, portions of Greensboro Drive, and Kidwell Drive. Additional locations for shared-lane markings should be considered on a case-by-case basis.

Intersection and Interchange Improvements

Phase 1 includes three already-planned intersection upgrades:

- Lewinsville Road and Balls Hill Road;
- Dolley Madison Boulevard and Lewinsville Road; and
- Dolley Madison Boulevard and Ingleside Road.

Two interchange upgrades are planned as a part of the I-495 HOT Lanes project:

- VA 7 and I-495 (West); and
- VA 7 and I-495 (East).

Because all of these improvements were planned prior to the Comprehensive Plan Amendment, it will be important to coordinate closely with VDOT regarding the design of these crossings.

In addition to these already-planned intersection and interchange upgrades, four more intersections are recommended for improvement in Phase 1:

²⁵ It should be noted that Phase 2 begins in 2012, and overlaps two years with Phase 1.

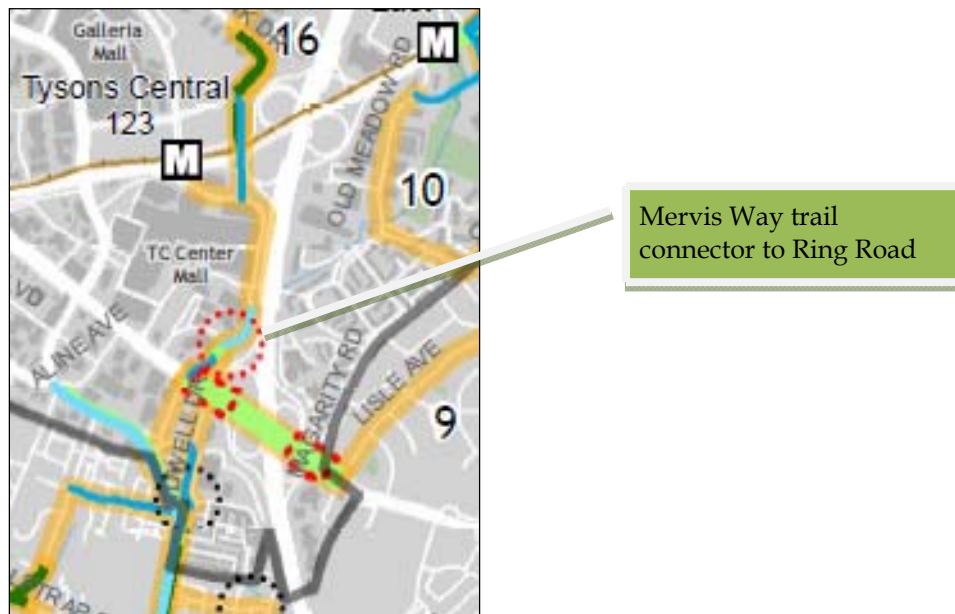
- Old Courthouse Road and Westwood Drive;
- Clarks Crossing Road and Percussion Way;
- Old Courthouse Road and Creek Crossing Road; and
- Towers Crescent Drive and Ring Road.

Trail Construction

Two small trail construction projects are key to providing safe and adequate bicycle access to the Silver Line at the Tysons Central 123 and Tysons East Metrorail stations.

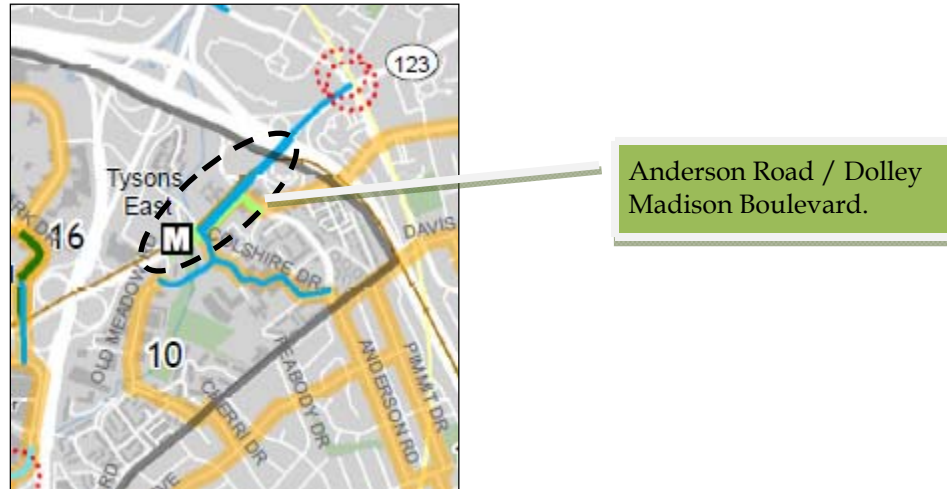
At Mervis Way, a short-trail segment is needed to connect to Ring Road, completing the path to Metro opened up by the VA Route 7 Beltway overpass improvements. This improvement, as shown in Figure 4.4, provides access for Pimmit Hills and Idylwood neighborhoods to the Tysons Central 123 Metrorail Station.

Figure 4.4 Mervis Way Trail Connection



Along one block of Anderson Road and along Dolley Madison Boulevard, the sidewalk needs to be widened to create a sidepath to the Tysons East Station (Figure 4.5). This will be the first and most critical improvement that will enable cyclists from the McLean and Langley areas to access the Silver Line without having to pass through the Dulles Toll Road interchange at Dolley Madison Boulevard.

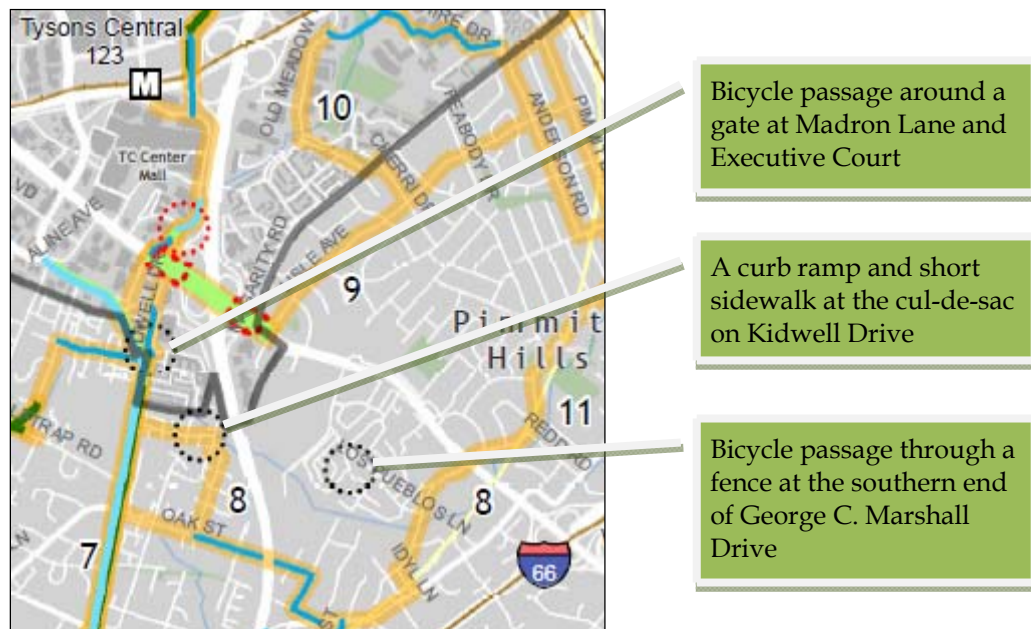
Figure 4.5 Anderson Road/Dolley Madison Boulevard Sidepath



Spot Access Improvements

Three spot access improvements would extend the catchment area of the Tysons Central 123 station considerably to the south and east (see Figure 4.6). These projects will require coordination with relevant property owners or Homeowner Associations, and may involve a small amount of construction.

Figure 4.6 Three Spot Access Improvements



Signed Bicycle Routes

Due to their relatively low-implementation cost, 42 miles of signed bicycle routes are recommended in Phase 1. This route system will be one of the most significant new components of the bicycle network.

These routes are specifically laid out to take advantage of streets and trails that are generally bicycle-friendly without requiring further improvement (such as bike lanes or sharrows), and to provide wayfinding guidance to Tysons Corner Silver Line Metrorail stations. They also take advantage of improvements expected to be completed in Phase 1, and some key linkages where the sharrows can be added a low cost.

Because guidance between Tysons Corner and the W&OD Trail was identified by the Bicycle Advisory Committee as a high-priority, many of the Phase 1 routes connect the W&OD Trail with Silver Line stations. The signed routes will use on-street and trail accommodations and provide directional and distance information geared to the cyclist. Table 4.3 below lists the routes recommended for signage in Phase 1. To identify the location of each route, match the number in the table below with the corresponding number on the map in Figure 4.1.

Table 4.3 Phase 1 Signed Routes

No.	Community Served	Silver Line Station Served
1	Towlston/Wolf Trap Area; The Trails	Tysons West
2	Alternate Route From W&OD Trail to Tysons West Metrorail Station	Tysons West
3	Neighborhoods West of Vienna	Tysons West
4	Vienna And Those Proximate to the W&OD Trail	Tysons West
5	Short Route Serving the Residential Neighborhoods Along VA 123, South of Gosnell Road	Tysons Central 7
6	Town of Vienna	Tysons Central 123
7	Many Neighborhoods to the South and East	Tysons Central 123
8	Residential Community Immediately South Of Gosnell and Along Maple Avenue	Tysons Central 7
9	Pimmit Hills	Tysons Central 123
10	Pimmit Hills	Tysons East
11	Pimmit Hills	Tysons East
12	Chesterbrook Gardens; Devon Park	Tysons East
13	Lewinsville Heights, Mclean High School	Tysons East
14	Langley And Mclean-CBD	Tysons East
15	Mclean Neighborhoods Along Dead Run	Tysons East
16	NE Core Of Tysons Corner	Links Tysons Central 123 with Tysons West
17	An Alternate To VA 123 Linking Vienna And Mclean (Uses Routes 6, 9, 11, 13, and 14)	Vienna and McLean

Alternates to VA Route 123

Signed route #17 (listed in Table 4.3 and shown in Figure 4.1) provides an interim route between Vienna and McLean. Additionally, use of bicycle-on-bus services can function as an alternative to bicycling along VA Route 123. All Metro and Fairfax Connector (FC) buses are equipped to carry two bicycles, at no extra charge. However, for this to serve cyclists effectively, a new route (Metrobus or Fairfax County bus) with short headways will need to be established that goes from McLean to Vienna without leaving VA Route 123 for local stops in Tysons Corner. If new buses were purchased to serve this route, it is possible that an interior seat configuration can be used to allow for transport of two additional bicycles inside the bus.

Coordination

Coordination may be as important for the success of Phase 1 as the policy and program objectives discussed earlier. As the lead agency for plan implementation the Fairfax County Department of Transportation (FCDOT) Bicycle Program staff will need to coordinate with the following entities:

- Virginia Department of Transportation (VDOT);
- Metropolitan Washington Airports Authority (MWAA; constructing the Silver Line);
- Washington Metropolitan Area Transit Authority (WMATA; operators of the Silver Line);
- Developers, including the Macerich Corporation, Georgelas Group; Lerner Enterprises, the West Group (and others who may advance their development plans in the near future);
- Property Owners, Building Managers, Employers, Employee Bicycle Interest Groups;
- Town of Vienna;
- Fairfax Advocates for Better Bicycling (FABB);
- Board of Supervisors' staff;
- Various Homeowner Associations (HOAs);
- Other County Agencies: Park Authority and Department of Planning and Zoning; and
- Northern Virginia Regional Park Authority (NVRPA; regarding signs on the W&OD Trail).

VDOT

Coordination with VDOT is beneficial in three primary ways: coordination of roadway design policy (as discussed previously), completion of various roadway and bicycle and pedestrian improvements currently under construction, and installation of the Signed Bike Routes.

A key issue will be ensuring that the bicycle accommodations across the ramps at Leesburg Pike (VA Route 7) and the Beltway (I-495) interchange are designed to maximize safety and convenience for cyclists. Also, the intersections at either end of this bridge (Lisle Avenue/Ramada Road to the east; Old Gallows Road/Mervis Way to the west) should provide well-designed bicycle accommodations and transitions to the roadway, sidewalks and/or service roads that are just beyond the project limits (these improvements correspond to the red rectangles on the Phase 1 map in Figure 4.3).

MWAA and WMATA

Coordination with the Metropolitan Washington Airports Authority (MWAA) and WMATA is important to address the question of bicycle parking at the new Silver Line Metrorail stations.

As of January 2010, the Metrorail station drawings indicate that a total 166 bicycle racks and 70 rental lockers will be distributed across the four Tysons stations. It does not appear that any of the racks as currently located on station property will be sheltered from rain or snow.

Bicycle Parking At Metrorail Stations

The following bicycle parking guidelines should be used to complete a more detailed analysis of the current Silver Line station site plans with regard to rack and locker locations:

- All racks should be covered, either by location under the overhead rail superstructure, by stand-alone canopies (such as modified bus shelters), or by locating them within the mezzanine or other indoor lobby areas.
- Consider locating racks in mezzanine areas, which will provide high security parking at the lowest possible cost.
- In the early years of Metrorail service in Tysons, residential population in the core of Tysons will remain lower than that in the surrounding communities. If racks are not located in the mezzanines, which are equally convenient to customers regardless of which station entrance they use, the quantity of racks per station should not be split 50/50 among the two station entrances. They should be split two-thirds/one-third with the larger number located at the south entrances, which are generally the entrances that will be closest to the approach route of most cyclists, who will be coming from the surrounding communities.
- Lockers probably should be split 50/50, as they will be used by cyclists for both bicycle access trips to the station and egress trips from the station to Tysons area destinations.
- The provision of bicycle parking at the Tysons Central 123 station is of particular concern. A small number of racks are provided at the north entrance. The south entrance is going to have a small footprint and be isolated by busy roads on all sides. Coordination with the Tysons Corner Mall should continue to explore the optimum location for bicycle parking at this station, which if not located in the station

mezzanine, maybe on outdoor Mall property that functions as “public space” for its existing and new developments.

Continued coordination with MWAA and WMATA should also determine if a different type of locker system can be used. Existing technology in various locations in the U.S. allows access to a bicycle locker with a “swipe card.” While a small fee is charged (pennies per hour), this type of locker would relieve both the cyclist and WMATA from long-term rental agreements and key transfers, which require “too much” planning ahead for quick trip to Metrorail.

In early 2011, WMATA is conducting a detailed bicycle parking assessment study and is considering expansion of its range of bike parking options provided at rail stations. Plans for the Silver Line Metrorail stations should be coordinated with this study.

Signed Bike Route Coordination

Implementation of the Signed Bike Routes will require coordination with a host of property owners, including VDOT, property and roadway owners in the core of Tysons, HOAs, the NVRPA regarding signs on the W&OD Trail, and the Town of Vienna.

A number of routes to Tysons pass through Vienna which has existing signed bicycle routes. The new routes recommended in this plan traverse the Town of Vienna, which owns and controls its streets. These routes are designed to serve the residents of Vienna as well as cyclists that use the W&OD Trail and pass through Vienna. For the recommended bike route system to be most useful, coordination with the Town and the local bicycle committee is key.

Bicycle Advocacy Groups

FABB, TYTRAN, the Tysons Partnership, and the bicycle interest groups at major employers will be important partners for many Phase 1 activities, including conducting the baseline bicycle counts and organizing the encouragement programs that are recommended.

4.5 COST AND FUNDING

The improvements that are recommended in Phase 1 are relatively low-cost activities such as establishing signed bike routes and installing shared-lane markings (sharrows). Phase 1 locations for bicycle-lane installation and shared-lane marking were selected because the impact to motor vehicle traffic will be minimal and the benefit for cyclists will be significant. A summary of the estimated cost of implementing the recommended Phase 1 physical improvements is included in Table 4.4. A portion of the Off-Road Bike Facility projects are funded, partially funded, or will be completed as a result of approved development agreements. Appendix I provides detailed project lists by street name and Appendix J details the assumptions and cost factors that used to develop the cost estimates.

Table 4.4 Phase 1 Recommendations: Implementation Cost Summary

Improvement Category	Recommendations (Miles or Number of Improvements)	Total Cost (2010 dollars)
On-Road Bike Facility	11.6 miles	\$1,256,000
Off-Road Bike Facility	5.0 miles	\$3,366,500 (partially funded)
Signed Bike Route	41.8 miles	\$83,600
Intersection Improvement	7 total	Variable
Interchange Improvement	2 total	Variable
Access Improvement	3 total	\$10,000 – \$50,000 each
Bridge Improvement	1 total	Funded

4.6 CONCLUSION

The focus of Phase 1 is to provide convenient and comfortable bicycle access to and from the new Silver Line stations and sufficient bike parking at the stations. To supplement these physical improvements, there will be a coordinated set of encouragement programs that bring together Transportation Demand Management requirements and partnerships with the Tysons Partnership (future Tysons TMA), FABB, local employers, and existing bicycle commuters. This will begin to build momentum for the more significant improvements to be implemented in Phase 2, as described in the following section.

5.0 Implementing Phase 2 (2012-2016)

5.1 STRATEGY: GOALS AND OBJECTIVES

The objective of Phase 2 is to make the roadways in Tysons Corner noticeably more bicycle-friendly, so that users of all transportation modes begin to recognize routine bicycle accommodations. Phase 2 intentionally overlaps Phase 1 and continues through 2016, the projected third year of Metrorail operations.

Phase 2 is a mix of activities, including: a) improvements that will be done in conjunction with roadway improvements already in VDOT's plans, b) relatively low-cost bicycle facilities that can be added to existing roadways within and surrounding Tysons Corner with minimal impact to motor vehicle traffic, c) a set of safety improvements at intersections associated with the on-street bicycle facilities and interchanges associated with planned sidepath construction, and d) the highest priority trail projects. Many of these improvements are in close proximity of the properties expected to be developed or redeveloped in the 2012-2016 timeframe.

Specific objectives for Phase 2 support achievement of the following Plan goals:

GOAL: Fully integrate bicycle transportation improvements into the planning and development process in Tysons Corner.

- Coordinate closely with developers that are working on near-term redevelopment projects to ensure high-quality design of bicycle facilities that they fund and/or construct as developer contributions.
- Coordinate with VDOT regarding sidepath and ramp crossing design on VDOT arterial improvement projects.
- Coordinate with VDOT regarding design of intersection retrofits to accommodate bicycle and pedestrian crossing movements and promote safety.

GOAL: Improve bicycle travel safety, access and connectivity to, from, through and within Tysons Corner.

- Upgrade bicycle level of service on Phase 1 signed bicycle routes by installing shared-lane markings (sharrows), striped bicycle lanes, climbing lanes, and improved accommodations for bicycles at intersections.
- Install a second round of Signed Bicycle Routes that extends the signed route system to the east, south and west and provides wayfinding along some of the corridors receiving bicycle facilities in Phase 2.
- Plan, program, and construct a set of bicycle safety-oriented striping/markings projects that will enhance cyclists' comfort and help motorists appropriately share the road.

- Focus on achieving a combination sidepath and service road route along VA 7 from VA 267 to Pimmit Drive; and if possible to Towlston Road in the North and Falls Church in the south.
- By 2014 begin a Bicycle Safety Education Campaign targeted for the Fairfax communities just outside Tysons Corner and select public middle and high schools.

GOAL: Foster the development of a “bike culture” in Tysons Corner.

- In 2015 launch a bicycle-sharing service in greater Tysons Corner.
- In conjunction with the bicycle-sharing service, initiate a “Bike-to-Lunch” program geared to getting employees to reduce midday car use and experience Tysons Corner by bicycle.
- Young, old, and novice cyclists, especially, will be served by the sidepath and service road route along Leesburg Pike (VA Route 7), as well as the on-street facilities installed along the signed bike routes established in Phase 1.
- Continue to grow the Bike-Friendly Employer program by doubling corporate membership and doubling the quantity of bicycle parking in both public and private space.

GOAL: Increase the number of people bicycling for transportation by making it a viable choice for a wide range of cyclists – young and old, novice and experienced, and occasional and regular.

- By 2016, double bicycle commuting rates to Tysons Corner (over the 2013 bicycle counts; see Section 4.3).
- Continue the encouragement programs begun in Phase 1.

5.2 POLICIES

It is recommended that most policy changes are accomplished in Phase 1. Phase 2 policy issues will include any of those remaining from Phase 1 and possibly adopting some of the emerging bicycle accommodation facilities such as bicycle boxes, colored bicycle lanes, and shared-lane markings in a colored lane.

5.3 PROGRAMS

Ongoing Encouragement Programs

In Phase 2, the TMA for Tysons Corner should continue to grow the bicycle encouragement programs initiated in Phase 1. As envisioned in 2010, the Tysons Partnership may provide the most effective way to ensure that these programs continue and maintain strong local participation and control:

- Bike-to-Metro Ambassadors;
- “It’s About Time!” Bicycle Commuter Encouragement Program;

- Bicycle-Friendly Employer Program;
- On-line Bicycle Commuter Network for cyclists; and
- Bike-to-Work Day activities.

New Programs

Phase 1 and 2 development of the physical bicycle network will provide a foundation for three programs recommended for initiation in Phase 2: a) a *Bicycle Safety Education Program*, b) a *Shared Bicycle Program*, and c) a *Bike-to-Lunch Program*. The Tysons Partnership is likely to be the best entity to take the lead with the Shared Bicycle and Bike-to-Lunch programs. A variety of leadership approaches may prove effective for the Bicycle Safety Education program. Each of these programs are described below.

Bicycle Safety Education Program

Cyclist and pedestrian safety education is recommended in Phase 2 given the potential for conflict between motorists and cyclists. Higher levels of cycling in Tysons Corner will be seen by motorists as a change in the transportation environment. Many may not be familiar with bicycle lanes or understand the shared-lane marking.

Due to the location of affordable housing near Tysons Corner, many of the service workers with jobs in the core walk and bicycle along VA Route 7 from Pimmit Hills and Idylwood to various locations in Tysons. In recent years, crashes involving bicyclists and pedestrians along Leesburg Pike at the Beltway interchange, illustrate the safety issues related to the needs of this constituency and its only travel path between work and home. Additionally, the expanded opportunities for bicycling resulting from implementing this plan will bring out new cyclists; some of whom may not have had much education in the area of bicycle safety.

To address these safety education needs pedestrian and bicyclist safety along the sidepaths, service road bikeways and ramp crossings proposed for VA Route 7 and portions of VA Route 123 is paramount. While necessary as interim facilities, these types of accommodations are less than ideal for cyclists. They require crossing driveways, two-way cycling through intersections and crosswalks, and crossing free-flow motor vehicle traffic merging off and on expressway ramps—all of which are a challenge. Nighttime use makes it that much more challenging.

Inexperienced and new cyclists can easily assume that because a sidepath keeps them away from moving traffic that these facilities are inherently safer than bicycling in the street. However, because of the dynamics of sidepath crossings and mixing with pedestrians, they actually demand more attention to safety and a greater degree of scanning for potential traffic conflicts.

Education of cyclists who will regularly use these sidepaths should be focused as follows: 1) through bicycle safety education in select middle and high schools in the area, and 2) through employee and neighborhood-based education and outreach, such as door hangers and flyers passed out at grocery stores; information distributed through homeowner associations, civic groups, and neighborhood listservs; and information

provided to service workers by their employers.²⁶ This education effort should also target motorists with messages delivered in the roadway environment, using special banners, variable message signs, and alerts to new bicycle facilities when they are installed on particular roadways.

Shared Bicycle Program

The District of Columbia and Arlington, Virginia have launched an extensive shared bicycle service. This service provides bicycles that are parked on the street and available to program members (options include signing up for a daily, weekly, monthly or annual membership). Short trips (30 minutes or about four to five miles) are free and a small fee is charged for additional time. This service is most successful in downtown or downtown-like environments that are too large for walk trips to meet all travel in among a well distributed mix of land uses.

While Tysons Corner has a suburban transportation and development structure, it does have a diverse mix of uses, including commercial and office employment, residential areas, places to eat, shop, exercise and run errands. However, the pedestrian environment is not consistently friendly and the suburban layout means that many origins and destinations are separated by distances longer than can be reached in an easy walk.

The shared bicycle is perfect for these types of trips within, to, and from Tysons Corner. It may also be very useful for trips to and from the new Silver Line stations. However, it will not be successful until a set of bicycle facilities are implemented, so for this reason it should be scheduled for implementation in the later years of Phase 2.

Bike-to-Lunch Initiative

The bike-to-lunch initiative is an encouragement program that can be undertaken when Shared Bicycle services are in place. The idea is that restaurants in Tysons Corner offer a lunch-time discount (or free item) for bicycling to the lunch spot. They will be encouraging “green” travel and may attract more customers. This promotion will directly encourage lunchtime use of the Shared Bicycle system, which might otherwise be a low-use period. It will also expose many people to bicycling without requiring them to begin by making a major commitment to biking to work. It should also help the thousands of office employees in Tysons Corner associate bicycling with having fun, getting some exercise, and enjoying their free time during the work week.

Bicycle Counts

Annual bicycle counts should be continued. Expansion of the counting locations or expansion of the hours may be considered, depending upon available resources.

²⁶ Specifically Kilmer, Longfellow, and Thoreau Middle Schools; Marshall, McLean, and Madison High Schools. In time, education efforts can be shifted from the high schools to the elementary schools.

Another option would be to conduct counts twice yearly by selecting an additional data gathering period.

5.4 PHYSICAL IMPROVEMENTS

Phase 2 includes 25 miles of on-street facility installation and 10.7 miles of new trail construction or upgrades to existing trails. (See Table 5.1 at the end of this section for a summary of Phase 2 recommendations and Figure 5.1 for the Phase 2 map). The improvements recommended for Phase 2 can be characterized as follows:

- Many of these facilities are tied to VDOT planned projects, such as along Leesburg Pike. It is possible that funding restrictions could bump the associated roadway and bridge projects into the Phase 3 timeframe.
- The shared-lane marking and bike-lane improvements in Phase 2 can be accomplished with minimal impacts to existing traffic.
- There are many intersection improvements (16) and interchange improvements (8) in this phase because the streets passing through these intersections are slated for Phase 2 bicycle facilities. The BAC has made it a priority to improve intersections in conjunction with street segments because the cyclist's greatest need in Tysons is dealing with busy arterial crossings.
- It is expected that over the five-year Phase 2 timeframe, some of the improvements will be implemented by or in conjunction with new or redevelopment projects undertaken by the private sector.

A detailed list of all Phase 2 improvements is provided in Appendix I.

On-Street Improvements

Highlights of Phase 2 on-street improvements include bicycle lanes on a variety of roadways within Tysons Corner and leading to the Silver Line stations. The following is a short list of important bicycle-lane improvements:

- Jones Branch Road;
- Old Courthouse Road;
- Woodford Road, Aline Avenue, Kidwell Drive, and portions of Ring Road;
- Old Meadow Road, Anderson Road, and Chain Bridge Road near Tysons East station; and
- Spring Hill Road and Lewinsville Road in the area north of the Dulles Toll Road.

Intersections and Interchanges

The improvements in the following list are divided into three categories:

- Five intersections/interchanges already are in the planning queue for bicycle and pedestrian upgrades, or are related to planned sidepath projects (however, they may or may not be fully funded):
 - Leesburg Pike (VA Route 7) and Lisle Avenue/Ramada Road;
 - East and West sides of the Interchange at Leesburg Pike (VA Route 7) and the Dulles Toll Road (VA Route 267) [note: a median path proposed in this Plan would eliminate at-grade crossings of ramps through this interchange];
 - Interchange at Dolley Madison Boulevard (VA Route 123) and the Dulles Toll Road (VA Route 267);
 - Interchange of Chain Bridge Road (VA Route 123) and I-495; and
 - East and West sides of the Interchange of Leesburg Pike (VA Route 7) and I-66.
- Three intersection improvements are anticipated to be relatively simple and low-cost:
 - Chain Bridge Road and Anderson Road;
 - Beulah Road and Creek Crossing Road; and
 - Aline Avenue/Old Courthouse/Gallows Road.
- Fifteen additional intersections/interchange locations are proposed by this Plan for upgrades to improve bicycle safety and access to Tysons Corner in general and/or Silver Line Metrorail stations:

Tysons Corner from the north

- Lewinsville Road and Spring Hill Road
- Interchange at Dulles Toll Road (VA Route 267) and Spring Hill Road
- Spring Hill Road/International Drive/Jones Branch Road
- Westpark Dr and Greensboro Dr
- Westpark Dr. and International Drive

Tysons West station

- Wolf Trap Creek Trail crossing of Old Courthouse Road at Besley Road
- Beulah Rd and Old Courthouse Rd
- Leesburg Pike (VA Route 7) and Tyco Road
- Leesburg Pike (VA Route 7) and Spring Hill Road

Tysons Central 7 station

- Boone Boulevard and Chain Bridge Road (VA Route 123)
- Chain Bridge Rd and Old Courthouse Rd
- Woodford Road and Old Courthouse Road

Tysons Central 123 station

- Madrillon Road and Gallows Road
- Leesburg Pike (VA Route 7) and Fashion Boulevard
- Dolly Madison Boulevard (VA Route 123) and I-495

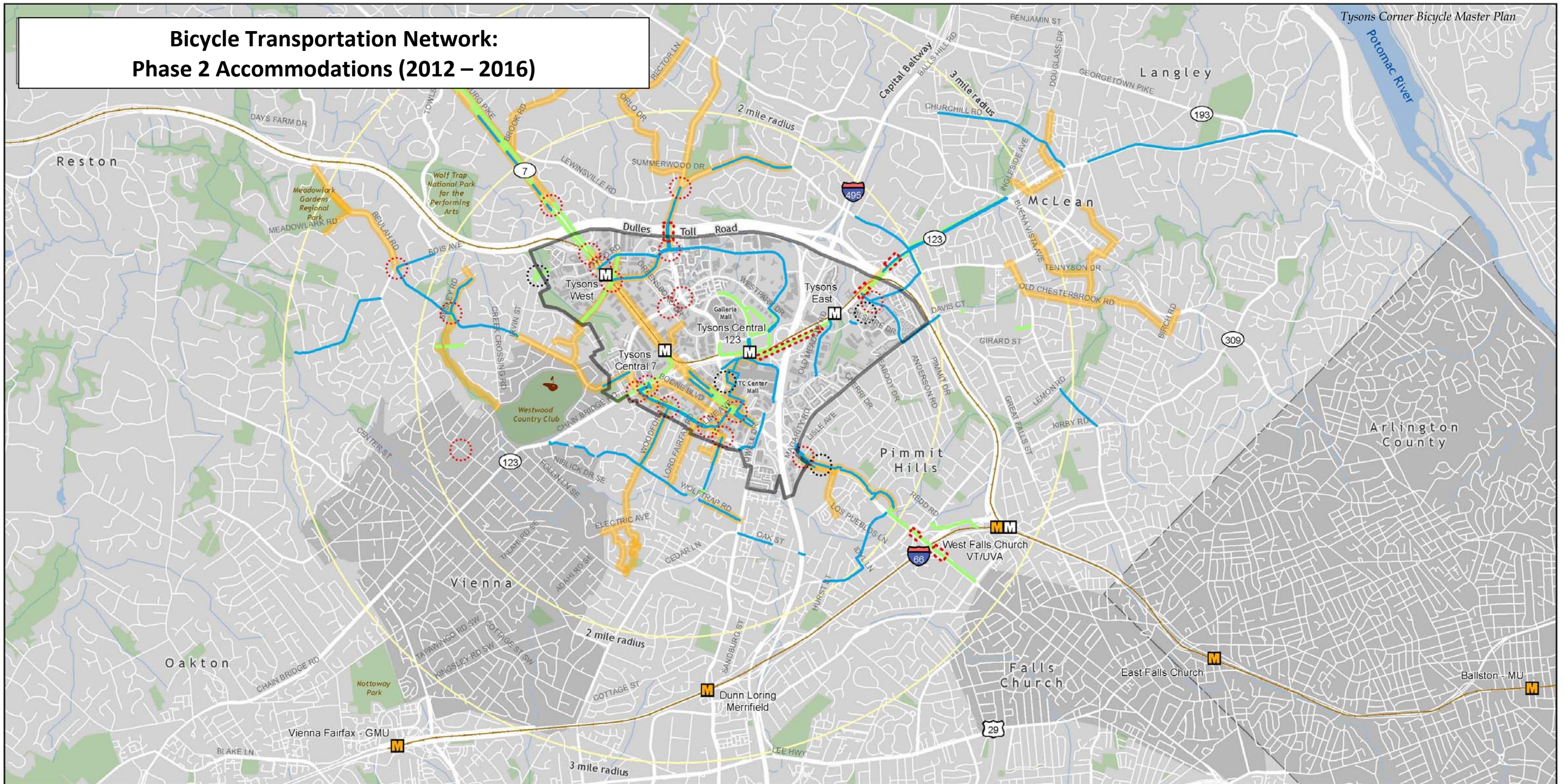
Improvements to the at-grade crossings at Silver Line stations are included in the Silver Line project. However, each station also includes a grade separated skyway across its adjacent arterial (VA Route 123 or VA Route 7).

It is important to note that bicyclists (or pedestrians) will not be able to use these skyways when the Metro system is closed, therefore high-quality, at-grade crossings will remain an important priority even where grade-separated passage is provided.

Note: Pedestrian improvements are included because the design of bicycle improvements at intersections and interchanges requires consideration of pedestrian needs and accommodations as well.

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Figure 5.1 Phase 2 Recommendations Map



**Bicycle Transportation Network:
Phase 2 Accommodations (2012 – 2016)**

Phase 2

- On-Road Bicycle Facility
- Trail Construction or Upgrade
- Signed Bicycle Route
- Spot Access Improvement
- Intersection Improvement
- Interchange Crossing Improvement
- New Bicycle/Pedestrian Overpass

0 0.5 1 2 Miles



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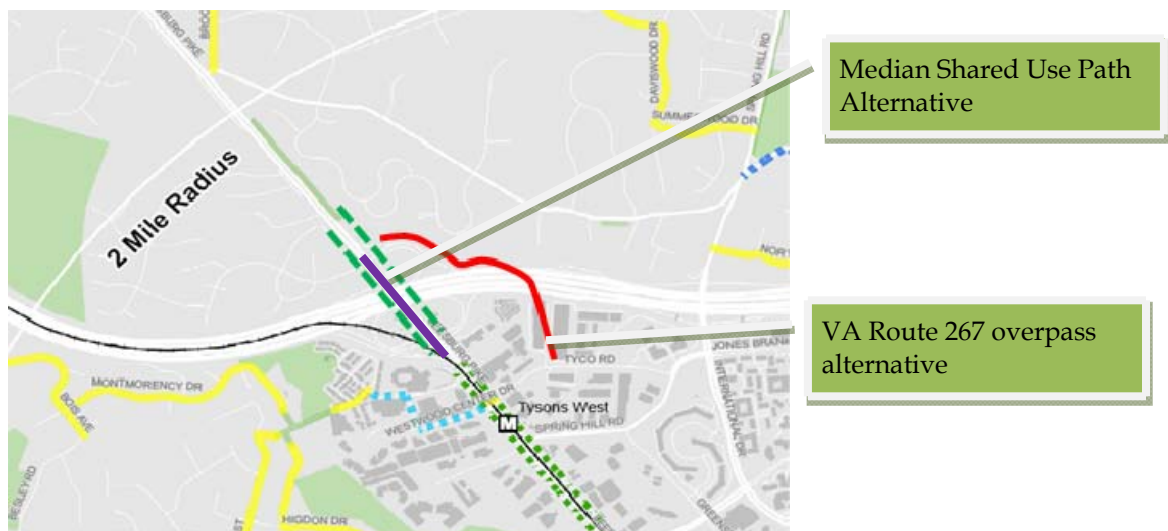
Overpasses

Current County and VDOT plans call for developing 10-foot wide shared use paths on each side of Leesburg Pike (VA Route 7) where it passes over the Dulles Toll Road (VA Route 267). In the next five years, it is anticipated that the Leesburg Pike bridge over VA Route 267 will be rehabilitated or replaced. In conjunction with providing sidepaths on the new bridge structure, at-grade path crossings of each of the entrance and exit ramps are planned.

While this approach to bicycle and pedestrian accommodation is an improvement over the existing conditions (no bicycle or pedestrian accommodations of any kind), at-grade path crossings of high-volume, free-flow entrance and exit ramps are unlikely to generate a significant number of users. It is recommended that bicycle and pedestrian passage across the bridge be provided in the median. While partially completed engineering work may need to be altered, the costs of a single 14-foot pathway placed between the eastbound and westbound lanes is not likely to exceed the costs of the currently planned approach, and it will provide a much higher grade facility for bicyclists and pedestrians (see purple line in Figure 5.2)

Another alternative to consider would be to combine an overpass with a possible new on-ramp to the Toll Road located just east of the current interchange. It would connect to Tysons corner at Greensboro Extended (red line in Figure 5.2, also see the Phase 4 Recommendations Map: Figure 7.1).

Figure 5.2 Median Path Alternative to Sidepaths Across the VA 267/VA Route 7 Interchange Ramps



Bicycle Passage on VA Route 7 and 123

There is universal agreement within the bicycling community that these two major arterials are extremely challenging for cyclists and most cyclists avoid these routes

whenever possible. However, if a person would like to bicycle between McLean and Vienna, there is no more direct route than VA Route 123.

Leesburg Pike (VA Route 7) has many destinations fronting this arterial corridor, but there are no parallel roads that offer similar access. The sidewalks, sidepaths, and service roads in existence today are discontinuous, narrow, and not configured effectively for bicycle access. Building on the improvements included in the Silver Line project, a useful interim route along major portions of VA Route 7 is recommended in Phase 2, by linking and improving service roads, sidewalks and intersections.²⁷

VA Route 7-Leesburg Pike (Interim Improvements)

- It is recommended that the VA Route 7 service roads and sidewalks between the VA Route 123 overpass and the Beltway be upgraded on both sides of the street to create bicycle access along Leesburg Pike and to the many destinations in this segment. This improvement will link the Phase 1 improvements north of VA Route 123 with the Beltway crossing sidepaths constructed as part of the HOT Lanes project.
- It is recommended that south of the VA Route 7 Beltway crossing, the service road on the north/east side of VA Route 7 be improved to allow two-way bicycle movements as far south and east as Pimmit Drive.
- If funding allows, the existing sidewalk should be widened to a sidepath as far as Haycock Road on the edge of Falls Church (near the West Falls Church Metrorail station).

Route 123 Dolley Madison Boulevard/Chain Bridge Road

- Supplemental funding should continue to be sought for completing a sidepath under the Beltway along VA Route 123.
- The location of the Silver Line piers near the interchange of VA Route 123 and VA Route 267 makes it difficult to continue the sidepath on the north side of Dolley Madison Boulevard (VA Route 123) in McLean to the Tysons East station at Scotts Crossing Road. While not optimal, this plan supports locating that sidepath on the south side of VA Route 123 from Lewinsville Road to the Tysons East station. Phase 1 includes a modest paved shoulder in this section for cyclists that prefer to use the roadway.
- East of Lewinsville Road, buffered bicycle lanes on Dolley Madison Boulevard and rehabilitation of the existing sidepath on the north side of the Boulevard will extend bicycle access to the McLean commercial center and the civic center at McLean Central Park.

²⁷The long term recommendations for this corridor call for cycletracks (see Section 7, Phase 4 Implementation Plan).

Trail Construction

Phase 2 has a total of 10.7 miles of trail projects. Two of these projects are particularly critical to the center of Tysons Corner:

- A shared use path along the Virginia Power easement from Vesper Street to the Tysons West Silver Line station will link the entire west side of Vienna to Tysons Corner and the Silver Line, while avoiding the use of VA Route 123 (Maple Avenue/Chain Bridge Road)
- A shared use path along Tysons Boulevard from Park to the Tysons Central 123 Metrorail station, and related spurs will provide the residential community north of the Galleria off-street bicycle and pedestrian access to the Silver Line. This path would provide access that is direct, minimizes hills, and allows cyclists to avoid using International Drive or Tysons Boulevard, which are large, high-speed streets and are not slated for improvement until later phases.

Both of these projects are closely related to plan developments in their respective part of Tysons Corner and could be included in a proffer package from these developers.

Spot Access Improvements

- Four simple spot access improvements will improve access to Metrorail and improve safety and convenience of bicycle travel along VA Route 7. These projects will require coordination with relevant property owners or civic associations and will involve a small amount of construction.
- A linkage of two sections of the Route 7 service road just south of Lisle Avenue. This will connect the southern portion of the Pimmit Hills neighborhood to the new bicycle passage across the Beltway along the Leesburg Pike.
- An improved transition trail and crossing from International Drive at Fletcher Street to the Ring Road that makes a circuit around the Tysons Corner Center (Tysons 1). This will be part of a bicycle link from the unincorporated residential area between VA 123 and Gallows Road to the Tysons Center 123 station.
- A short linkage should be provided between Colshire Drive and Ambergate Place. While this linkage will be used primarily by pedestrians, increased use of this existing informal cut-through is expected after the Silver Line opens.
- Pavement rehabilitation and stabilization, lighting, and a new access gate at the Ashgrove Lane Connector.

Signed Bike Routes

In Phase 2, there are 30 miles of signed bicycle routes slated for addition to the network. Many of these routes coincide with installation of facilities and trails such as along VA Route 7 and in the core of Tysons Corner. Others are extensions of the Phase 1 routes to additional neighborhoods surrounding Tysons Corner, including those in the following areas:

- West of Tysons near to the Meadowlark Gardens Regional Park and Wolf Trap;
- North of Tysons along Spring Hill, Lewinsville and Brook Roads;
- East of Tysons in McLean; and
- South of Tysons in the residential community between Old Courthouse Road and the W&OD Trail.

Coordination

Coordination will continue to be important during Phase 2 implementation of the Plan. Key agencies and areas of coordination include the following:

- Virginia Department of Transportation (VDOT) regarding installation of bicycle lanes, shares-lane markings, intersection improvements, passage through interchanges, and development of a continuous interim bike route along Leesburg Pike;
- Developers, including the Macerich Corporation, Georgelas Group, Lerner Enterprises, Cityline Partners LLC, and others who may advance their development plans in the near future regarding trail development, on-street facilities surrounding their developments, and on-street improvements on private streets;
- The Tysons Partnership (likely to be the future TMA), property owners, building managers, employers, and employee-based bicycle interest groups regarding the implementation of the Shared Bicycle Program and Bike-to-Lunch Initiative;
- Fairfax Advocates for Better Bicycling (FABB), the Washington Area Bicyclist Association (WABA), and the Fairfax County Public Schools (FCPS) regarding the Bicycle Safety Education program;
- Town of Vienna;
- Management and expansion of bicycle parking at Silver Line station will need to be coordinated with the Washington Metropolitan Area Transit Authority (WMATA);
- Board of Supervisors' staff;
- Various Homeowner Associations (HOAs); and
- Other County agencies, including the Park Authority and Department of Planning and Zoning.

5.5 COST AND FUNDING

A summary of the estimated cost of implementing the recommended Phase 2 physical improvements is included in Table 5.1 below. A portion of the off-road bike facility projects are funded, partially funded, or will be completed as a result of approved roadway projects or development agreements. Appendix I provides detailed project lists by street name and Appendix J details the assumptions and cost factors that used to develop the cost estimates.

Table 5.1 Phase 2 Recommendations: Implementation Cost Summary

Improvement Category	Recommendations (Miles or Number of Improvements)	Total Cost (2010 dollars)
On-Road Bike Facility	24.7 miles	\$5,834,000
Off-Road Bike Facility	10.7 miles	\$18,817,500
Signed Bike Route	30.0 miles	\$60,000
Intersection Improvement	19 total	Variable
Interchange Improvement	6 total	Variable
Access Improvement	4 total	\$10,000 – \$50,000 each
Bridge Improvement	0 total	NA

5.6 CONCLUSION

The focus of Phase 2 is to begin to incorporate bicycle improvements into the planning, design, and development process in Tysons Corner. As the area begins redeveloping, priority on-street and off-street bicycle facilities will be implemented. Bicycle access within and from the surrounding communities will also be improved. Additionally, in Phase 2, user-friendly bicycle sharing infrastructure will be installed and encouragement programs like “Bike-to-Lunch” and “Bicycle-Friendly Employer Awards” will be launched. These will provide a strong foundation for the more significant improvements planned for Phase 3, as described in the following section.

6.0 Implementing Phase 3 (2015-2019)

6.1 STRATEGY: GOALS AND OBJECTIVES

There are two years of overlap between Phases 2 and 3 to account for the lead time required for project development of more expansive infrastructure recommendations in Phase 3.

Phase 3 bicycle improvements will largely complete the bicycle circulation network within the core of Tysons Corner, as well as the network for accessing the Tysons Corner core from Wolf Trap, Vienna, McLean, Pimmit Hills, and other surrounding communities.

Phase 3 includes projects that will be done in conjunction with redevelopment projects in the core of Tysons Corner. It will include bicycle facility upgrades on key routes surrounding Tysons Corner, as well as a second round of priority trail projects. Phase 3 includes significant expansion of the bike-lane network and safety improvements for the more challenging intersections in the Tysons Corner core. Specific objectives for Phase 3 support achievement of the following Plan goals:

GOAL: Improve bicycle travel safety, access and connectivity to, from, through, and within Tysons Corner.

- Complete on-street facility and trail networks within Tysons providing bicycle access to all areas of the core.
- Expand the on-street facility and trail networks surrounding Tysons Corner, including those in Idylwood, Dunn Loring, the Spring Hill Road area, and links to Vienna and McLean. Also includes a third round of Signed Bicycle Routes.

GOAL: Foster the development of a “bike culture” in Tysons Corner.

- Expand the bicycle-sharing service in greater Tysons Corner, as demand increases with employment and residential population growth, and the network of bicycle facilities expands.
- Continue to grow the Bike-Friendly Employer program by doubling corporate membership and doubling the quantity of bicycle parking provided in both public and private space.

GOAL: Increase the number of people bicycling for transportation by making it a viable choice for a wide range of cyclists – young and old, novice and experienced, and occasional and regular.

- By 2019, double bicycle commuting rates to Tysons Corner (over 2016 rates).
- Document increased bicycle use for resident and employee circulation within the core of Tysons Corner, access to Silver Line stations, and resident trips out of Tysons Corner to job, school, recreation, and other attractions in nearby communities.

- Implement recommended trail system expansion and upgrades to support Safe Routes to School programs at schools such as Westbriar ES, Westgate ES, Spring Hill ES, and the Pimmit Hills Library.

6.2 POLICIES

There are no policy actions recommended for Phase 3.

6.3 PROGRAMS

Safe Routes to School Programs at the Elementary Level

Phase 3 may be the most appropriate time to initiate a comprehensive Safe Routes to School programs in the elementary schools. During this timeframe, safety education and encouragement programs can be combined with infrastructure improvements that will facilitate access to the schools, for example trails near Westbriar and Westgate Elementary Schools.

Bicycle Parking

Also, in this timeframe the overall increase in bicycle-friendly infrastructure combined with new trail access to two of the Silver Line Stations, is likely to increase the need for bicycle parking capacity at the Tysons East and Tysons Central 7 stations. Moreover, the increase in residential population within the core and ease of access from the surrounding communities will increase demand for bicycle parking at shopping centers and job sites.

A timely and highly responsive program for increasing the overall supply of bike parking as well as the diversity of equipment will be needed. Short-term, weather-protected parking will be needed in many locations. On-demand high-security parking will also be needed for people who use a bicycle in Tysons frequently, but not necessarily every day. A web-based program may be the most efficient way for bicyclists, property owners and managers, and retail establishments to identify capacity expansion needs and proposed locations. Having a single, centralized procurement and installation administration will ensure that new equipment is installed in a timely manner and sited properly in public or semipublic space. It may be most effective for an organization such as the Tysons Partnership, which is operated by the local property owners and managers to provide this service for themselves, their employees, and their visitors.

6.4 PHYSICAL IMPROVEMENTS

The physical improvements recommended in Phase 3 are summarized in Table 6.1 at the end of this section and shown in Figure 6.1. More detailed information about these recommendations, as well as the Phase 3 signed bike routes is provided in Appendix I.

On-Street Improvements

Improvements slated for Phase 3 are a combination of those that are of lower priority and those that may have greater impact on motor vehicle traffic. For example installing bicycle lanes along Great Falls Street, Electric Avenue, and a portion of Beulah Road, is slated for Phase 3 because existing road widths on these street segments currently provide reasonable accommodations for cyclists.

Other bike lanes, such as those on Chain Bridge Road/Maple Avenue in Vienna, and Chain Bridge Road in McLean, Gosnell Road, Tysons Boulevard, and Galleria Drive may have greater impacts on motor vehicle traffic. Pursuing these projects in a later phase may enable them to be implemented as part of redevelopment projects in these areas. It will also provide time for further study if it is deemed necessary.

Intersection Improvements

Three important intersections in the heart of Tysons Corner should be addressed in conjunction with installation of on-street bicycle facilities on the roadways that pass through them:

- VA Route 7 and International Drive;
- VA Route 123 and International Drive; and
- Gosnell Road/Westpark Drive and VA Route 7.

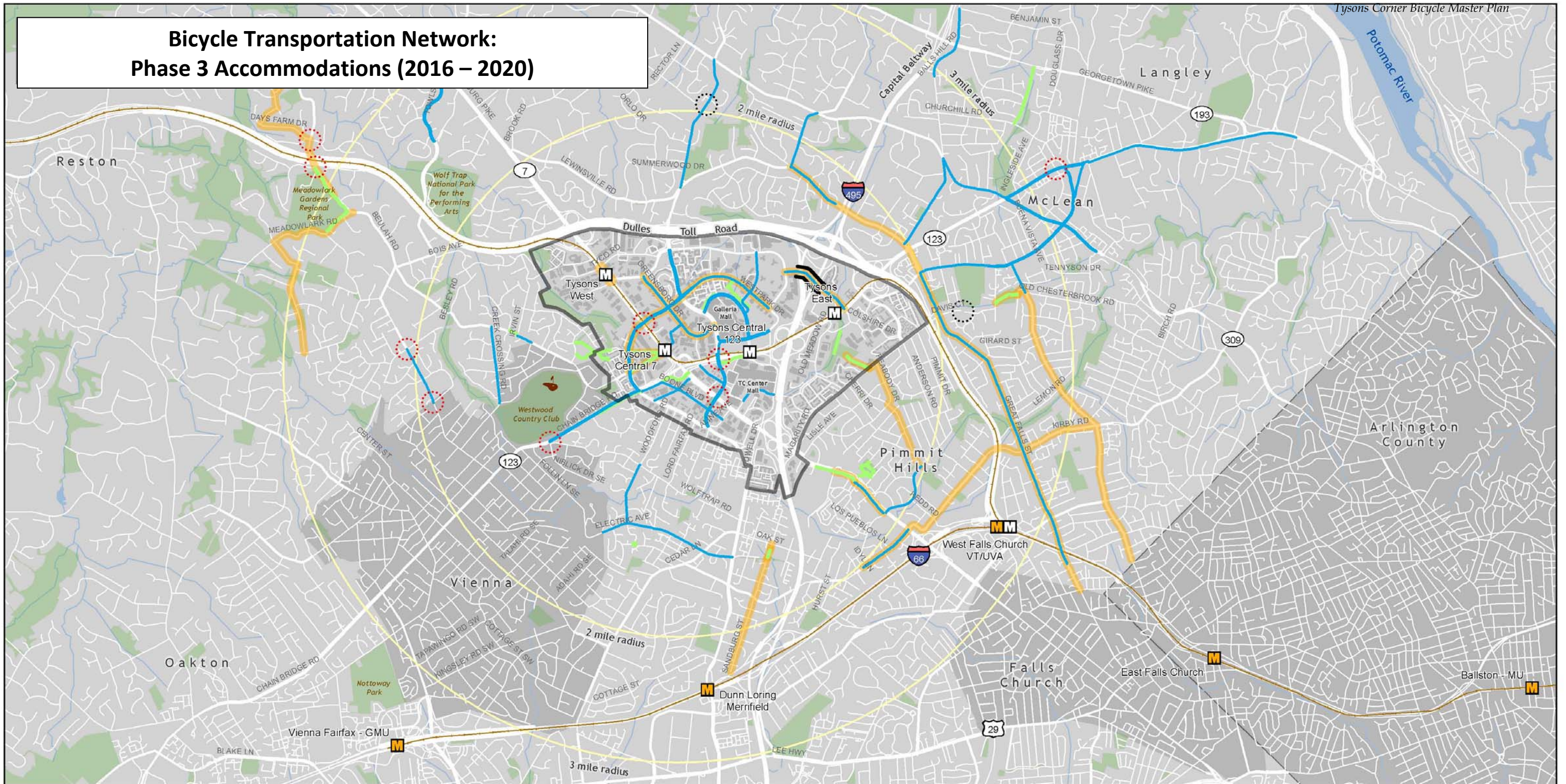
Six additional intersection improvements also are slated for Phase 3 (see the map in Figure 6.1).



Source: Toole Design Group, 2010

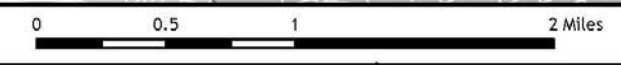
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Figure 6.1 Phase 3 Recommendations Map



Phase 3

- On-Road Bicycle Facility
- Trail Construction or Upgrade
- Signed Bicycle Route
- Intersection Improvement
- Interchange Crossing Improvement
- Spot Access Improvement
- New Bicycle/Pedestrian Overpass



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Overpasses

The lack of convenient crossings of the Beltway and Dulles Toll Road has been identified as a major barrier to bicycle access to and within Tysons Corner. Even with improvements, cycling through an expressway interchange is not an attractive proposition even if the best possible crossing accommodations have been provided.

Phase 3 includes a planned crossing using Scotts Crossing Road and the HOT Lanes access bridge being constructed as part of the HOT Lanes project. The bridge would be extended east and bicycle lanes and sidewalks would be provided on the bridge. While this crossing will improve access to Tysons, additional crossings should be considered.

While they appear on the Phase 4 map in Section 7 (Figure 7.1), a number of additional bicycle/pedestrian overpasses are recommended in this plan, including the following:

- Over the Beltway at the Westpark Drive HOT Lanes entrance/exit ramps;
- Over the Beltway at Marshall High School;
- Over the Dulles Toll Road at Park Street in conjunction with a possible westbound Toll Road entrance ramp;
- Over the Dulles Toll Road at Greensboro Extended, in conjunction with a possible westbound Toll Road entrance ramp (discussed in previous section); and
- A possible vehicular crossing of the Beltway just north of the VA Route 7 crossing, which would include bicycle and pedestrian accommodations.

All of these crossings may not be needed. However, by the time Phase 3 begins the County should be studying a number of these crossings. To serve bicyclists and to complement the connectivity of the bicycle facility network recommended in this plan, the following recommendations about additional grade separated crossings are provided:

- When located away from highway crossings, a bicycle and pedestrian bridge can be designed and located in such a way as to make it a stand-out architectural feature of Tysons Corner which contributes to the overall urban design.
- Where possible at highway interchanges, consider locating bicycle and pedestrian passageways over the highway in the median, between the two directions of motor vehicle travel. Transitions back to the outside of the highway can be facilitated at the intersections on either side of the crossing.
- While underpasses are more conducive to efficient bicycle travel, it is unlikely that an underpass would be a preferred option at the highway crossings identified above, due to their extremely long-distance and higher-cost of construction. Underpasses should be considered if topography and crossing distances are favorable to this design approach.
- If crossing #1 is found to be feasible and desirable, it may be prudent to refrain from investing in planned sidepath facilities through the Beltway/VA Route 123 interchange near this crossing. It is recommended that the cost of at-grade passage be combined with other funding and invested in a high-quality grade separation.

- The crossing at Marshall High School has significant safe-routes-to-school benefits and would provide traffic-safe passage connecting the two divided school catchment areas as well as their surrounding neighborhoods.
- The crossing of the Beltway just north of the VA Route 7 overpass in the Comprehensive Plan Amendment appears to be located in an area that would present many engineering challenges as well as result in steep grades for the approach on the Pimmit Hills side.
- The crossing at the Westpark Drive HOT Lanes interchange would be able to connect people east of the Beltway directly to both Malls and the heart of Tysons. It would be an efficient link for both pedestrians and bicyclists. A crossing at this location should be designed to minimize usage of developable property and be integrated into the building design of any redevelopment that takes place on the west side of the Beltway. A stair and elevator could be provided at the end of Old Meadow Drive, in conjunction with redevelopment. If possible, the ramp access should be aligned adjacent to the Beltway off-ramp (as shown on Map D).

Trail Construction

Phase 3 includes 5.6 miles of trail improvements. Some of the most important Phase 3 trail projects are described below.

- A shared use path along VA Route 123 in the center of Tysons, connecting the Tysons Central 123 station with Boone Boulevard. This trail, combined with on road improvements on a section of the Chain Bridge Road Service Road, will complete a parallel route along 123 between McLean and Vienna.
- A shared use path will link the Westbriar Elementary School to Tysons using Raglan Road and a new segment of trail to the Tysons Central 7 stations. A number of routing options are shown on the map; however, it is likely that only one complete connection would need to be completed.
- A shared use path will link the Westgate Elementary School to the Tysons East station in the Scotts Run Stream Valley Park.
- A shared use path will provide a connection through the McLean High School Community Park. This path will open up a direct bike route to Tysons Corner and the Tysons East Silver Line station to the communities along Old Chesterbrook Road.

The first three of these projects are closely related to expected redevelopment in their respective part of Tysons Corner and could be included in proffer packages from developers.

Spot Access Improvements

Two simple spot access improvements are recommended in Phase 3. The Davis Court-Westbury link is passable today, but the curb ramps should be upgraded. A second spot access improvement would address the continuity of the sidepath along Spring Hill Road, north of Spring Hill District Park.

Signed Bike Routes

Phase 3 adds 18.6 miles of signed bicycle routes to the network. These routes will expand the signed route system along streets that receive facilities in Phase 3. See the map in Figure 6.1 for details.



Source: Toole Design Group, 2010

Coordination

In Phase 3, coordination among stakeholder groups will continue to be important to successful implementation. Partner agencies that will remain key include VDOT, developers, TYTRAN, WMATA, and the Town of Vienna. Working with the Fairfax County Park Authority on the trail projects and the Fairfax County Public Schools on Safe Routes to School programs will be new coordination efforts in this phase. FABB and the McLean Area Bicycle and Pedestrian Committee can continue to play a key role in engaging the local community and maintaining ongoing public support for plan implementation. Because Phase 3 includes a number of both on-street and off-street improvements in the McLean area, the Supervisor's Office for this community should continue to ensure community involvement in the rollout of projects.

6.5 COST AND FUNDING

A summary of the estimated cost of implementing the recommended Phase 3 physical improvements is included in Table 6.1 below. Appendix I provides detailed project lists by street name and Appendix J details the assumptions and cost factors that used to develop the cost estimates.

Table 6.1 Phase 3 Recommendations: Implementation Cost Summary

Improvement Category	Recommendations (Miles or Number of Improvements)	Total Cost (2010 dollars)
On-Road Bike Facility	31.3 miles	\$5,176,597
Off-Road Bike Facility	5.5 miles	\$8,093,500
Signed Bike Route	18.6 miles	\$37,200
Intersection Improvement	9 total	Variable
Interchange Improvement	0 total	NA
Access Improvement	2 total	\$10,000 – \$50,000 each
Bridge Improvement	0 total	NA

6.6 CONCLUSION

A feature recommendation in Phase 3 is to plan for, and implement over time, one or more major new crossings of the Beltway and Dulles Toll Road. These crossings would improve access for the communities north, northeast, and east of Tysons Corner. Phase 3 on-street and trail facilities will be provided in conjunction with development of new streets in the planned downtown grid, and will serve a growing residential population in the core of Tysons Corner.

During Phase 3, new trails will be provided that are aligned and designed to serve both transportation and recreation. Residential and commercial developers will be fully engaged in designing bike-friendly developments and providing bicycle support facilities to make bicycle-use prominent, convenient, expandable, and ultimately commonplace. In doing so bicycling will be fully established in the physical environment and culture in Tysons Corner, setting the stage for the long-term vision for bicycling in Tysons, as described in the following section.

7.0 Implementing Phase 4 (2020-2030)

7.1 STRATEGY: GOALS AND OBJECTIVES

The improvements slated for the 10-year timeframe in Phase 4 include projects that are more costly and projects for which the timeframe and opportunity is difficult to predict. Some projects may be able to happen prior to 2020, others may not happen until after 2030.

Phase 4 bicycle improvements include four major infrastructure initiatives:

- Providing off-road bicycle and pedestrian overpasses across the Beltway and Dulles Toll Road;
- Constructing dedicated bicycle facilities, in the form of cycletracks along Leesburg Pike, International Drive and portions of VA Route 123;
- Constructing new and upgraded trails especially in the headwaters of Wolf Trap Creek; and
- Constructing bicycle lanes or paved shoulders along VDOT roadways that are in constrained rights-of-way or roadside environments. These projects may require roadway widening, major engineering for stormwater drainage, or be in areas with high-value residential properties.

Many Phase 4 projects should be implemented in conjunction with redevelopment projects in the core of Tysons Corner. Phase 4 objectives support achievement of the Plan goals as follows:

GOAL: Fully integrate bicycle transportation improvements into the planning and development process in Tysons Corner.

- Bicycle accommodations are routine components of new streets constructed to create a grid of streets in the downtown core.
- VDOT will begin use of treatments that are considered experimental today, but will likely be standard procedure by 2020.
- In conjunction with developers and the business community establish the first full service bicycle station.

GOAL: Improve bicycle travel safety, access and connectivity to, from, through, and within Tysons Corner.

- The safety of bicycling on the Boulevard class of roads and International Drive is increased by using the optimal facilities designed to be compatible with these types of streets.

- Create additional connectivity on the outer fringes of greater Tysons Corner, with improved facilities to Meadowlark Gardens Regional Park, the Dunn Loring area, and northern McLean.

GOAL: Foster the development of a “bike culture” in Tysons Corner.

- Expand the bicycle-sharing service in greater Tysons Corner as demand increases with employment and residential population growth and bicycle facilities expand.
- Continue to grow the Bike-Friendly Employer program by again doubling corporate membership and doubling the quantity of bicycle parking in both public and private space.

GOAL: Increase the number of people bicycling for transportation by making it a viable choice for a wide range of cyclists – young and old, novice and experienced, and occasional and regular.

- By 2030, achieve an overall five percent mode split for bicycling for all trips, and a 3.5 percent bicycle share for access to rail transit trips.
- Continue to document increased bicycle use for resident and employee circulation within the core of Tysons Corner, access to Silver Line stations, and resident trips out of Tysons Corner to job, school, recreation, and other attractions in nearby communities.
- Trail system expansion and upgrades will support Safe Routes to School programs at elementary schools such as Wolf Trap, Westbriar, and Spring Hill elementary schools, and Joyce Kilmer Middle School. The proposed Beltway overpass south of VA Route 7 will allow Marshall High students living west of the Beltway to walk or bicycle to school and Joyce Kilmer Middle School students living east of the Beltway to walk or bicycle to their school.

7.2 PROGRAMS

Advanced Bicycle Parking Systems

Bicycle parking needs are expected to grow steadily throughout all phases of plan implementation. By 2020 it is likely that another generation of new bicycle parking technologies will be available which will increase convenience, weather protection, and security. The one-stop bicycle parking program recommended in Phase 3 will continue to be important to ensure that Tysons remains current with changing parking needs and changing equipment trends.

If a full-service bicycle station has not already been created, it will likely be needed by 2020. Bike stations are essentially “retail” outlets for bicycle transportation. They offer high-security bicycle storage; bicycle rental; sale of equipment and accessories; food and drink sales; bicycle repair; information and advice; an office for bicycle mounted police; and any other services that cyclists may need. Bike stations are typically located at rail stations, where provision of bike parking for egress trips is a major service need.

In Tysons Corner, the first bicycle station is recommended for the Tysons West Silver Line station, and could be located in ground level space in the new development already planned

for this station. Bike stations are best if operated by an experienced bicycle retailer, however due to their need for a portion of the most valuable street level retail space, they likely need public subsidy to get started. If additional storage or bicycle repair space is needed it should be provided at a second but nearby location that has less expensive rent.

7.3 PHYSICAL IMPROVEMENTS

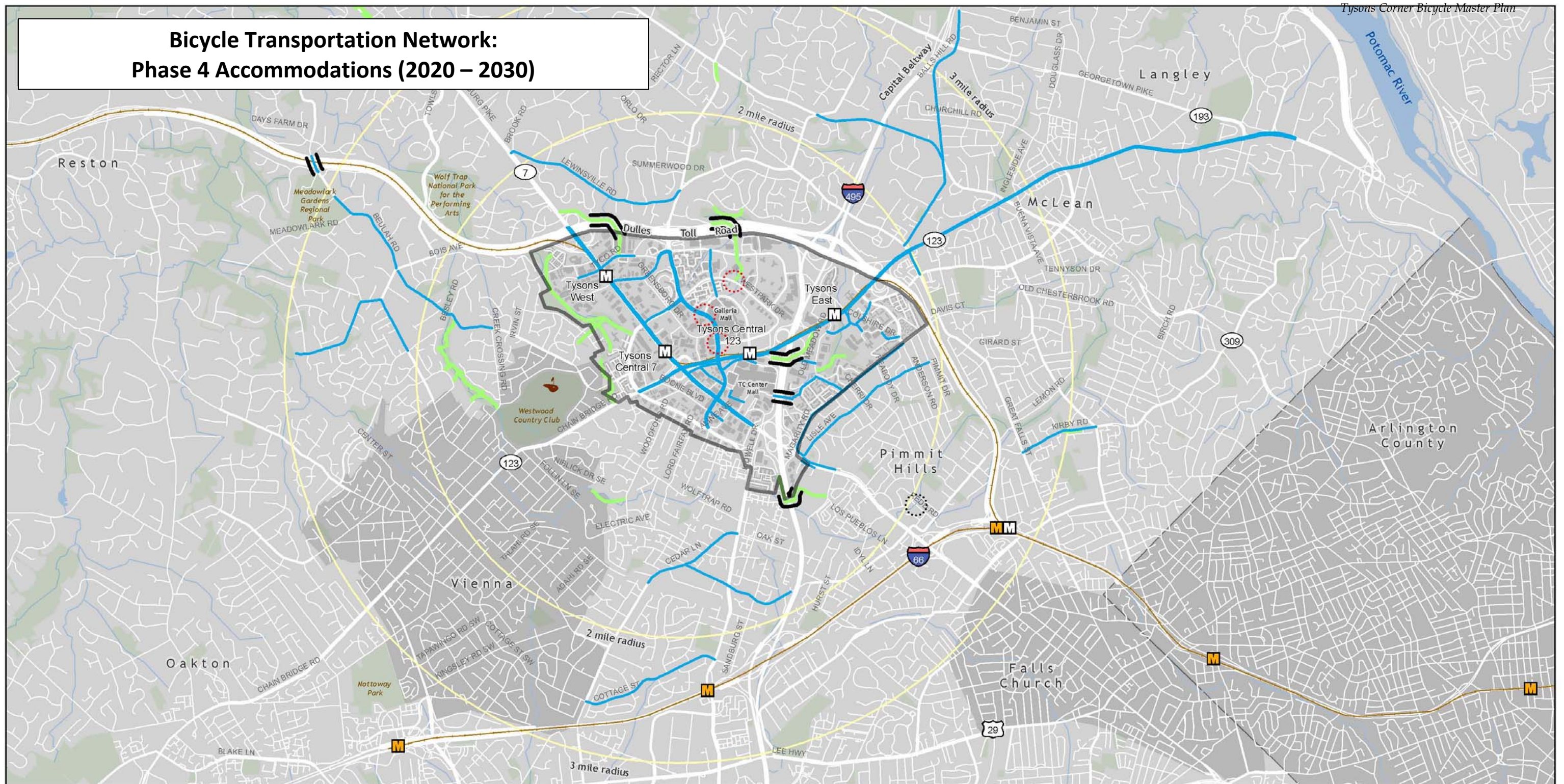
The physical improvements recommended in Phase 4 are summarized in Table 7.1. There are no signed bicycle route extensions slated for Phase 4. More detailed information about these recommendations is provided in Appendix I.

On-Street Improvements

Constructing cycletracks along Leesburg Pike (VA Route 7), International Drive, and portions of VA Route 123 will replace interim facilities (or no facility) along these arterials, making these boulevards *complete streets*. Even less experienced cyclists will feel comfortable using these facilities because of the separation that cycletracks provide from vehicular traffic. The facilities offer safety benefits that include relief from having to mix with pedestrians on sidepaths and more visibility at intersections by being part of the roadway's traffic flow. The interim sidepath facilities can be reclaimed fully as sidewalks, which will be more appropriate fronting the high-rise commercial buildings planned for the corridor. The service roads can provide the right-of-way in which the cycle tracks can be built.

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Figure 7.1 Phase 4 Recommendations Map



**Bicycle Transportation Network:
Phase 4 Accommodations (2020 – 2030)**

- Phase 4**
- On-Road Bicycle Facility
 - Trail Construction or Upgrade
 - Intersection Improvement
 - Interchange Crossing Improvement
 - Spot Access Improvement
 - New Bicycle/Pedestrian Overpass

0 0.5 1 2 Miles



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Rationale for Scheduling Select Road Improvements for Phase 4

On a variety of roads with a constrained roadside environment, bicycle lanes or paved shoulders must be added to existing two-lane cross sections. Due to their length or complexity, these projects are likely to be more costly and more difficult to implement. A partial list follows:

- Two sections of Beulah Road that will provide bicycle access and safety on the route to Meadowlark Gardens Regional Park;
- The western section of Lewinsville Road;
- Cedar Lane near the W&OD trail;
- A portion of Idylwood Road;
- Balls Hill Road; and
- Magarity Road.

A second set of Phase 4 on-street improvements include those which are the lowest priority improvements because existing bicycling conditions on these roads is very good, even without further improvement. During Phase 4, the need for these facilities can be reevaluated. These streets include the following:

- Lisle Avenue;
- Cottage Street; and
- Watson Street.

The third set of Phase 4 on-street improvements are streets that are slated for Shared Lane Markings in earlier phases and Bicycle Lanes as a Phase 4 upgrade. These include:

- Spring Hill Road; and
- Portions of Balls Hill Road.

Intersections and Interchanges

Four intersections along International Drive will deserve special attention: Galleria Drive, Greensboro Drive, Tysons Boulevard, and Westpark Drive. Prior to Phase 4, there are no facility recommendations in the Plan for this section of International Drive. As a result, when cycle tracks are installed, corridor reconstruction will be required at free flow entry and exit lanes and median divided double left turns.

In Phase 4, it is likely that many new streets will be built as a part of the expanded downtown grid of streets. As a result, any number of additional intersections may need further consideration for bicycle and pedestrian safety improvements in Phase 4.

Overpasses

Phase 3 provided a detailed discussion of five potential locations for overpasses of the Capital Beltway or the Dulles Toll Road. These locations are shown on the Phase 4 map, Figure 7.1.

It is recommended that early in Phase 4 at least one of these overpasses is constructed. The three overpasses with the most merit for serving bicyclists and pedestrians and connecting the surrounding community include the following:

- The overpass near Marshall High School;
- The overpass between Old Meadow Road and Westpark Drive, near the HOT Lane ramps; and
- An overpass in the median of VA Route 7 at the Toll Road interchange (to be constructed in conjunction with the planned highway bridge replacement).

Trail Construction

Phase 4 recommends approximately 9 miles of new trail construction and trail upgrades. Primary among these are the following:

- Upgrading the entire Wolf Trap Creek trail system with wider paved surfaces and improved points of access;
- Developing a trail along the Old Courthouse Spring Branch that connects Freedom Hill Park with the Ashgrove Lane historic properties. Where an extension of Boone Boulevard is planned, it may be appropriate to locate the paved shared use path away from the stream, but on the west side of the new Boone Boulevard. A hiking path could be developed closer to the stream, thus limiting the negative impacts on this remaining sliver of forest in the Tysons area;
- The Scotts Run trail system should be extended to connect to a new bicycle and pedestrian overpass over the Beltway (described above); and
- A trail link from Niblick Drive SE to Woodford Road along the upper Wolf Trap Creek stream valley park land. It may be possible to continue a greenway trail through a combination of public and private land as far up stream as Madrillon Road which will be a link into Tysons Corner.

Spot Access Improvements

One spot access improvement is slated for Phase 4 – a small bridge over the Pimmit Run at Redd Road. This bridge will link Pimmit Drive and the Pimmit Hills neighborhood to Idylwood Road and a future trail link to the West Falls Church Metrorail station. WMATA is beginning an engineering feasibility study of the back entrance to this station in 2011. It is possible that the need for the stream crossing will become relevant in the Phase 3 timeframe.

Signed Bicycle Routes

No signed bicycle routes are slated for Phase 4.

The Grid of Streets Study

Figure 7.2 illustrates a revised Conceptual Bicycle Network for the core of Tysons Corner. This network includes the Phase 4 buildout identified in this plan (see Figure 7.1) as well as on-street bicycle facilities on new streets in a proposed grid (see detail in Appendix A). The Comprehensive Plan amendment calls for bicycle lanes on all Avenues and Collectors in the core of Tysons. Figure 7.1 recommends cycletracks for the Boulevards and affirms bicycle lanes on Avenues and Collectors. This Plan also recommends a variety of on-street treatments for select local roads, because of the role that they play in the overall bicycle network.

Coordination

In Phase 4, coordination among stakeholder groups will continue to be important to successful implementation. Working with the Fairfax County Park Authority on the trail projects and the Fairfax County Public Schools on Safe Routes to School programs will need to continue in Phase 4. FABB and the McLean Area Bicycle and Pedestrian Committee can continue to play a key role in engaging the local community and maintaining ongoing public support for plan implementation.

7.4 COST AND FUNDING

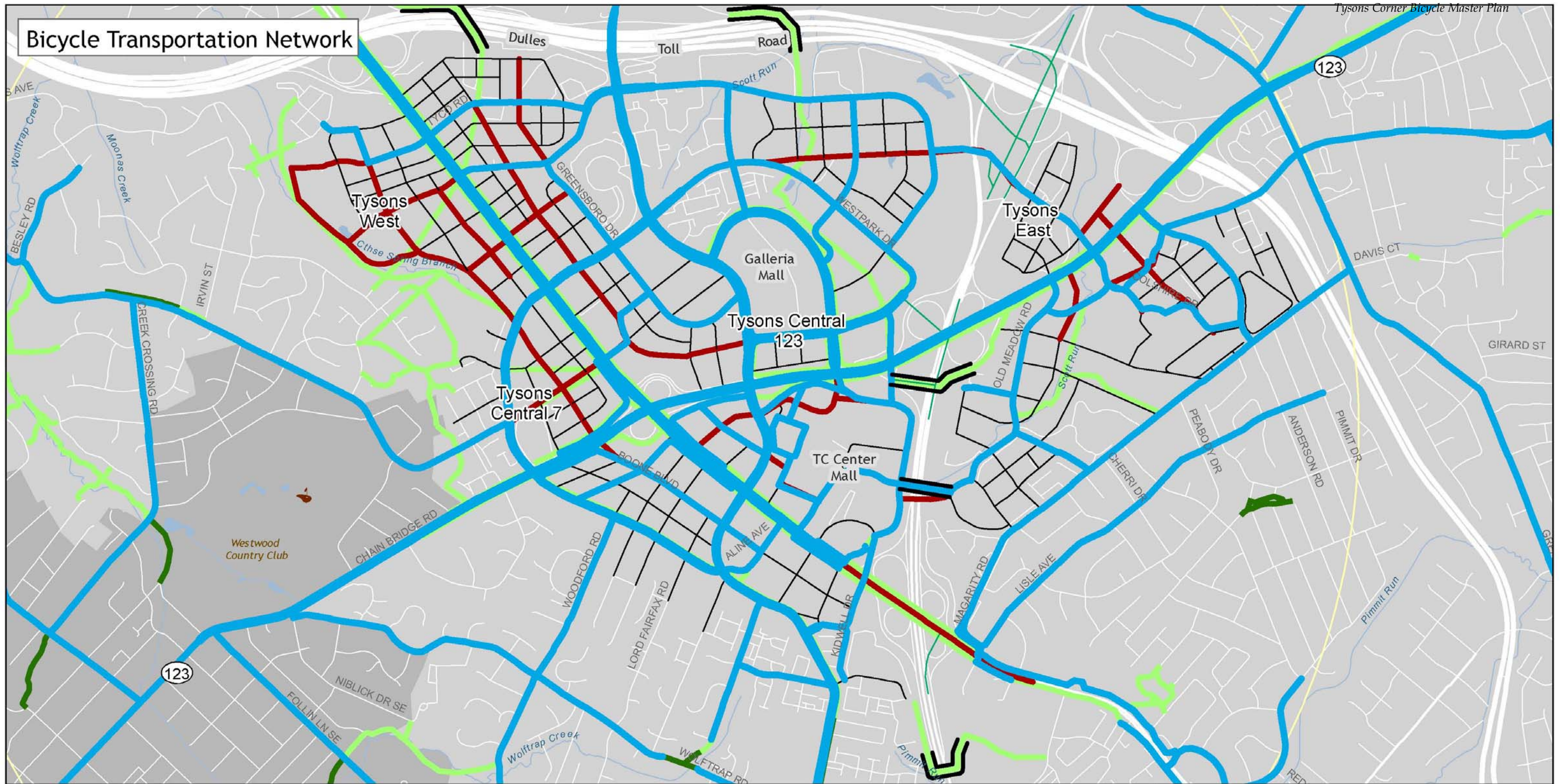
A summary of the estimated cost of implementing the recommended Phase 4 physical improvements is included in Table 7.1 below. Also included are the estimated costs (in today's dollars) of the long-term facilities slated for a number of major arterials; including bicycle lanes and cycle tracks, many of which will require major rethinking of how wide these rights-of-way need to be and how the space should be allocated among all the modes of travel. Appendix I provides detailed project lists by street name and Appendix J details the assumptions and cost factors that used to develop the cost estimates.

Table 7.1 Phase 4 and Long-Range Recommendations: Implementation Cost Summary

Improvement Category	Recommendations (Miles or Number of Improvements)	Total Cost (2010 dollars)
On-Road Bike Facility (Phase 4)	8.4 miles	\$1,408,600
Off-Road Bike Facility (Phase 4)	8.7 miles	\$14,868,000
Long-Term Facilities (on-road and off-road)	28.2 miles	82,813,220
Signed Bike Route	0.0 miles	NA
Intersection Improvement	3 total	Variable
Interchange Improvement	0 total	NA
Access Improvement	1 total	\$100,000
Bridge Improvement	3 total of 6 possible	Variable

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Figure 7.2 Bicycle Network in the Core of Tysons, Including the Grid of Streets



Tysons Corner Bicycle Master Plan

Bicycle Transportation Network

Long Term Bicycle Network (Phases 1 - 4)

On-Road Bicycle Facility (Cycle Track, Bike Lane, Shared Lane Marking, Paved Shoulder)

— Tysons Bicycle Master Plan (Existing, Planned & Proposed)

Proposed Grid of Streets (TC Comp Plan 2010)

— On-Street Bicycle Facilities (Bike Lanes & Unspecified)

— Local Street (Shared Roadway)

— Potential Bicycle/Pedestrian Overpass

Shared Use Paths (Off Road)

— Existing Trails

— Trails & Sidepaths (Planned, Proposed & Upgraded)

April 2011

0 0.15 0.3 0.6 Miles



Fairfax County Department of Transportation

Tysons Corner Bicycle Master Plan

Toole Design Group
BOSTON MA • WASHINGTON DC • SEATTLE WA

CAMBRIDGE SYSTEMATICS

*Paved Shoulder minimum of 3 feet. Shared Roadway - No special striping or marking

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7.5 CONCLUSION

The focus in Phase 4 is to transform even major arterials like VA Route 7, International Drive, and VA Route 123 by adding bicycle facilities that are separated from the road for priority cycling, shared use paths for lesser skilled cyclists, and signalization that facilitates safe multimodal travel along and across these corridors.

8.0 Conclusion

The Tysons Corner Bicycle Master Plan provides a strategic approach for making bicycle travel a viable transportation alternative, and for expanding upon the vision outlined in the Tysons Corner Urban Center Amendment to the Fairfax County Comprehensive Plan. The Plan describes how facility planning, bicycle design, and construction will be integrated into ongoing and planned road and transit improvements and private sector development.

A interconnected on- and off-road bicycle network and high-quality bike parking will support and reinforce transit use and emerging transportation and land use patterns in Tysons Corner. It will enlarge the catchment area for the Metrorail stations. In so doing, it will enable public agencies to maximize the return on their investment in the Silver Line. The detailed policy recommendations will improve agency and private sector coordination and the program recommendations will foster the development of a bike culture in Tysons Corner.

As these changes occur, residents, employers, employees, and visitors will enjoy a range of direct and indirect benefits²⁸, including:

- **Traveling by Bicycle.** Full implementation of the Plan will result in an additional 85 miles of on-road bicycle facilities by 2030. The 44 miles of new bike lanes, buffered lanes, climbing lanes, and cycletracks will nearly triple the amount of on-road bicycle facilities in Tysons today. These facilities will improve connections to and from the W&OD trail and enhance connectivity throughout Tysons.
- **Traveling by Transit.** The Plan creates safe and direct links from residential communities to and from the Metrorail stations, and from Metrorail stations to employment centers and other destinations throughout Tysons Corner. This will be especially critical given that no park-and-ride parking will be provided at the four new Metrorail stations in Tysons.
- **Traveling by Automobile.** The recommendations in this Plan carefully consider potential impacts to automobile mobility. The majority of actions recommended will not diminish motor vehicle capacity on a roadway. Moreover, the Comprehensive Plan Amendment calls for revised expectations regarding motor vehicle level of service from the typical LOS B-F for suburban areas, to the typical LOS E for downtown settings.
- **Safety.** It is difficult to travel by bicycle today in Tysons. The four implementation phases of the Plan, in coordination with the implementation of the Fairfax County Comprehensive plan, will improve Tysons Corner from a “car only” environment to a true bicycle and pedestrian friendly urban place with a variety of multimodal transportation options. This will make it safer and more comfortable for all transportation modes.

²⁸ Additional details of benefits are listed in Appendix K.

- **Air Quality.** The bicycle facilities, programs, and policies recommended in this plan are expected to result in increased levels of bicycling, with some of these new bicycle trips replacing vehicle trips. This mode shift will help reduce congestion and associated road maintenance costs, contribute to goals of reducing energy consumption, and improve air quality. This will benefit bicyclists and non-bicyclists alike.

Given the pace and scale of change that is coming to Tysons, there is a momentous opportunity to transform the area into a more livable place. A connected bicycle network and a vibrant bike culture will make an important contribution to this change. The Tysons Corner Urban Center Amendment provides the vision for the future of Tysons Corner. This Plan builds on the vision, providing specific recommendations for physical improvements and a strategic phased implementation plan.

The successful implementation of this Plan will require a sustained commitment to integrating bicycle needs into ongoing and planned projects. This commitment will be demonstrated by planning and design decisions, both small and large, made over time. It will require coordination between the public and private sector, as well significant investments of time, resources, and money from all stakeholders. These investments are hugely cost efficient, as they will contribute to sustained economic growth in Tysons Corner and will make Tysons Corner a place where “People are engaged in their surroundings and a place where people want to be.”

Appendices

- A. Plans and Studies Reviewed
- B. Summary of Public Comments Gathered On-Line
- C. Bicycle Transportation Proffer Checklist
- D. Bicycle Facility and Action Toolbox
- E. Fairfax County Zoning and Development Review Policy
- F. Policy Recommendation for VDOT Roadway Design and Operations
- G. Encouragement and Safety Education Program Recommendations
- H. Specific Recommendations Related to the Tysons Corner Comprehensive Plan Amendment
- I. Project Lists and Cost Estimates by Phase
- J. Cost Estimates: Assumptions and Methodology
- K. Potential Impacts of the Proposed Bicycle Facilities

A. Plans and Studies Reviewed

Tysons Corner Urban Center amendment to the Fairfax County Comprehensive Plan: The amendment provides a history of Tysons Corner and a vision for the future of Tysons. In order to implement the vision, the plan identifies recommendations for five issue areas, including Land Use, Transportation, Environmental Stewardship, Public Facilities, and Urban Design. Recommendations in this Plan are inspired by and reflect the vision of those in the Comprehensive Plan amendment.

Section 527 Report: The Section 527 legislation is intended to improve how land use and transportation planning decisions are coordinated throughout Virginia. It establishes standardized methodologies (definitions, analytical methods, etc.), for analyzing transportation impacts and providing that information to citizens and policy-makers. Section 527 establishes procedures for local submission of proposals that will affect the state-controlled transportation network to the Virginia Department of Transportation (VDOT) for review and comment. The 2009 Section 527 submission for the Fairfax County Comprehensive Plan Amendment contains information about the changes in land use, urban design, road and transit networks in Tysons Corner, and the impacts of those changes given planning horizons of 2030 and 2050. VDOT reviewed the submission and issued a report which includes recommendations for monitoring and responding to impacts. The report includes a discussion of bicycle project impacts, which were used to inform this Plan.

Grid of Streets Study: The Fairfax County Planning Commission has determined that a “grid of streets” is critical to support planned densities of residential and commercial development in Tysons Corner. According to the Fairfax County Planning Commission, the current road network ‘superblock structure’ needs to be transformed into an urban street grid with a smaller block form. It is anticipated that the new grid will be implemented concurrent with redevelopment. The Tysons Corner Bicycle Plan anticipates the development of the “grid of streets” in Tysons Corner, and makes policy recommendations as to the form and function of these streets in the Tysons Corner bicycle network.

Tysons Corner Circulator Study: Fairfax County is planning to undertake the Circulator Study in 2011-2012 to assess potential vehicle technology, routes, stop and station design, ridership and other issues.

Fairfax County Countywide Trails Plan: The Countywide Trail Plan is part of the county’s Comprehensive Plan. In 2002, a map was developed depicting countywide trails. A map also was developed to identify deficiencies. In developing the Tysons Corner Bicycle Plan, these maps were consulted to identify deficient links in and around Tysons Corner.

Tysons Metrorail Station Access Management Study (TMSAMS): TMSAMS operates under the guidance of the Stakeholder Advisory Group. TMSAMS engages the public in identifying and prioritizing projects that provide multimodal access to the four new

Metrorail Stations in Tysons Corner. TMSAMS representatives participated in the BAC to inform this Plan. In addition, the project team presented and facilitated discussion at numerous TMSAMS meetings.

VDOT Bicycle Policy Plan: The Bicycle Policy Plan was developed by VDOT to establish a framework through which VDOT accommodates cyclists in the funding, planning, design, construction, operation, and maintenance of Virginia's transportation network. The purpose of the Bicycle Policy Plan is to establish a vision for the future of bicycling in the Commonwealth and to advance bicycle policy consistently, appropriately, and cost-effectively. The VDOT Bicycle Policy Plan provides a clear understanding of VDOT's policies for providing support of bicycling, accommodating, planning and engineering bicycle facilities, coordinating with other agencies, communities and groups to develop bicycle facilities. Technical standards and recommendations for improvements provided in the Policy Plan informed the recommendations in this Plan.

Tysons Bicycle Plan, Fairfax Advocates for Better Bicycling (FABB): The Tysons Bicycle Plan was developed by FABB in 2008. It identifies goals for bicycling in Tysons Corner as well as an overview of existing conditions. It identifies a series of recommended connections to allow bicycle access to Tysons Corner. It identifies recommended road, trail, and transit improvements. In addition, it recommends support facilities, as well as a series of education and encouragement programs targeted to employees, residents and visitors. These recommendations have been incorporated into the recommendations in this Plan.

McLean Pedestrian Task Force Pedestrian and Bicycle Recommendations: The McLean Pedestrian Task Force developed a report in 2009 outlining pedestrian and bicycle safety and access issues in and around the McLean area. While much of the report is focused on Downtown McLean, it includes specific bicycle recommendations for many areas that overlap the study area for this Plan. These recommendations were reviewed and assessed as part of the development of this Plan.

Fairfax County Transportation Plan: The Fairfax County Transportation Plan identifies enhanced public transportation corridors, new and improved roads, highway overpasses, interchange improvements and other projects that will impact bicycling in Tysons Corner.

2030 National Capital Region Transportation Planning Board (TPB) Financially Constrained Long-Range Transportation Plan (LRTP): The LRTP identifies all regionally significant transportation projects and programs that are planned in the Washington metropolitan area between 2010 and 2040. Over 750 projects currently are included, ranging from simple highway landscaping to billion-dollar highway and transit projects. The projects and programs that go into the LRTP are developed cooperatively by local governments and agencies represented on the National Capital Region Transportation Planning Board (TPB). The LRTP provides an opportunity for bicycle facility projects to coordinate with other planned and proposed projects. This coordination occurs in the process of planning for which roads and transit facilities will be appropriate for bicycle accommodations. It also facilitates Federal and state funding opportunities by introducing bicycle facilities as mitigation projects for highway expansion or as transportation emission reduction measures.

B. Summary of Public Comments Gathered On-Line

Web-Based Interactive Map Comments

A web-based interactive map was created as part of the Tysons Corner Bicycle Master Plan to supplement feedback gathered at the public meeting, through stakeholder interviews, and from the Bicycle Advisory Committee. Members of the public were encouraged to add markers, paths, and descriptive comments to the map in 12 preselected category areas.

Between September 2010 and January 2011, 102 markers and 51 paths were added. The map was viewed 542 times. Table B.1 below shows the category areas and the number of markers assigned to each. This information has been incorporated into the maps and recommendations throughout the Tyson Corner Bicycle Master Plan.

Table B.1 Interactive Map Categories and Number of Markers

Category	Number of Markers
Important destination for bicyclists	14
Difficult intersection to navigate by bike	12
Bike route you use regularly	17
Location where you bike on the sidewalk to avoid traffic	7
Hazard	4
On-road bike facility needed	18

Meeting Notes - Public Meeting #1 September 30, 2010, 7:00PM-9:00PM

Meeting Attendees

Public: Jim McGlone, Jeff Anderson, Bob MsCahill, Roger Normand, Paul Mason Kohlenberger, Frank Tone, John Barrow, Penny Firth, Greg Griswold, Susan Stillman, Alan Douglas, Stephen Willis, Mary Cassidy-Anger, J.J. Madden, Tracy Strunk, Suzanne Lin, Fionella Quinn, Paul David, Dennis Frew, Alan Young, Kerie Hitt, Jeff Palmer, John Hamilton, Bruce Wright, Ray Duda, Mark Thomas, Rich Saunders, Chris French, John Vrankovich, Hunter McCleary, Frank Boyle, Enrique Lara, Kathie Westphely. Client Team: Jeff Hermann (FC), Charlie Strunk (FC). Consultant Team: Dan Goodman (TDG), Bob Patten (TDG), David Jackson (CS), Stacy Cook (CS).

Meeting Summary

A presentation was provided highlighting the planning process, preliminary recommendations, and next steps. During and after the presentation, there was a question/answer and discussion session, followed by breakout group discussions focusing on the following topics:

- Draft bicycle network
- Bicycle access to the future Silver Line stations in Tysons Corner
- Corridor/spot improvements

After the breakout sessions, the group reconvened to discuss lessons learned, next steps, and final questions.

Discussion Points

General

- There was a suggestion that curb-separated bike lanes should be considered.
- Many attendees expressed concern about access to Tysons Corner. Many bicyclists see getting into and out of Tysons as the greatest challenge, more so than biking within Tysons.
- Connectivity is a critical issue. It is important that the proposed bicycle facilities link where people want to go (e.g., connect neighborhoods to schools, employment, community features, shopping, etc.).
- Several attendees asked about the concept of the three-mile buffer and wondered whether recommendations from the Tysons specific plan will address needs in the broader area. There was a discussion of how the Fairfax County Bike Master Plan will build on and support the Tysons plan. The general concern is that even if there is a high-quality bike network in Tysons, it will only reach full potential if access to and from Tysons is improved.
- There is a need to incorporate and account for street trees and impervious surface requirements in the planning process. New tree box technology should be considered.

International Boulevard, VA Route 7, and other Spot Improvements

- Participants noted that International Boulevard would be a viable route (especially when bike facilities are added) to connect communities to the north and south of Tysons. It would also provide connections to a variety of features within Tysons. Safe bicycle passage across/along the major highway barriers was cited as a critical challenge.
- The main concern for this route and the immediate area surrounding International Boulevard was in regards to school children, and safe routes to school. Questions asked included the following:

- Where do the school kids go that are living in Tysons, especially in the apartments near International Boulevard?
- Can we focus on Tysons bike routes that foster connections to schools?
- Can this route connect over/under VA Route 267 to the school to the north? Will the bike/pedestrian bridge over VA Route 267 be possible?
- Several comments were made about the challenges of intersections and safety in the corridor.
- Attendees noted that while International Boulevard may have favorable traffic conditions for a lane or road diet today, future development will increase volumes on this facility. Data showing future development locations and traffic forecasts should be incorporated.
- Some sections of International Boulevard have significant landscaped areas (for example in front of the mall) that could potentially be utilized for a trail/cycle track. Most of this area is likely outside of the International Boulevard right-of-way. This will need to be confirmed with the County and VDOT.
- A citizen's concern was expressed about the ability to cross the beltway near John Marshall High School on VA Route 7. The residents on one side of the beltway are bussed to schools on the other side of the Beltway. A facility crossing the beltway that is suitable for children is desired.

Silver Line Station Access

- As a way of addressing the barrier created by the I-495/VA Route 123 interchange, special bus service was suggested that would create a "bus bridge" through the interchange. It could go from Tysons East station to Tysons Center 123 station.
- Another option is the peddle-powered Bike Monorail. A question of how users would transport their own bike was raised: <http://inhabitat.com/2010/09/27/google-invests-in-shweebs-peddle-powered-bike-monorail/>
- Attendees from the Forestry Department asked that we make sure that the plan references the Tree Action Plan adopted by Fairfax County. It calls for street trees and trees along trail corridors to be planted in conjunction with facility construction.
- It is important to talk about the fact that there will be new residential development in Tysons, and where it will be. Maps should show how facility improvements will relate to the new residential areas, and thus serve future residents.
- Attendees from Pimmit Hills were very concerned that the neighborhood not be cut off from Tysons Corner, like it is today. Connections between the neighborhood and the Silver Line Stations should be preserved and enhanced. West Falls Church is virtually inaccessible by bicycle or walking from Pimmit Hills because of the VA Route 7 and I-66 interchange.

- The proposed trail along Scotts Run from Westgate Park to the Tysons East Silver Line Station is very important.
- School catchment area boundaries were discussed. These have been researched by the consultant team and they are being factored into the plan. Kids who live near Scotts Crossing Road go to Westgate Elementary School on Magarity Road.
- The Fairfax County Planning and Zoning office is trying to get a public access easement on Colshire Drive through the office park that links Dartford Drive with VA Route 123. This is a key route for McLean neighborhoods to access the Silver Line Station.

Draft Bicycle Network Recommendations

- A comment was made about Mill Road access from the W&OD trail to the neighborhood to the north, as a first step in connecting the W&OD trail to Tysons.
- A comment was made about access from the neighborhoods southwest of Tysons into Tysons via a utility underpass on southwest side of Tysons.
- It was noted that a strategy of bike bridges/grade separation at critical crossings was not mentioned in the presentation as a viable strategy. Route 123 and Route 7 were noted as examples of where this could work. Recent project examples in the region and implementation costs should be considered.
- Proposed and potential additional connections to the W&OD Trail were discussed. Attendees stressed the importance of improving connections between the trail and the heart of Tysons.
- The role of transit in improving access to and from Tysons was discussed. The idea of a transit center in Vienna that brings bicyclists into Tysons was mentioned, but attendees questioned whether bicyclists would utilize the service rather than ride directly to their destination.
- The opportunity to provide curb-separated bike lanes were raised and discussed.
- Additional signed routes were suggested.
- Proposed improvements on VA Route 7, VA Route 123, International Boulevard, and along a power line easement near the Tysons West station were discussed.
- The intersection of Westwood Drive and Old Courthouse Road was discussed and proposed improvements were noted.

C. Bicycle Transportation Proffer Checklist

(Working Draft not approved by the FC Department of Planning and Zoning)

Table C.1 Bicycle Transportation Proffer Checklist

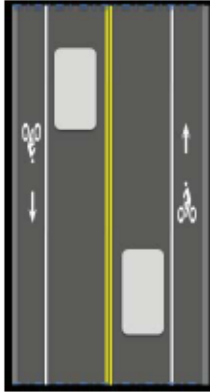
Check if Applicable	Proffer Item	Description
	Installation of planned bicycle facilities adjacent to and/or through development.	General
	Installation of planned bicycle facilities on streets or at intersections where traffic impacts are being mitigated.	Facilities
	Completion of partially completed bicycle facilities within a ½ mile of development.	
	Bicycle parking type, quantity, and location provided consistent with the <i>Fairfax County Policy and Guidelines for Bicycle Parking</i> , or interim guidelines provided in the <i>Tysons Corner Bicycle Master Plan</i> .	Bike Parking
	Space provided for a commercial bicycle station operation.	
	Space provided for future bicycle sharing operations.	
	Trails provided as a recreational contribution.	
	Trails provided as a transportation contribution.	
	Bicycle facilities used to reduce required mitigation of traffic impacts. <i>Note: The comprehensive plan states: “Impact studies within TOD areas should quantify the level of service for all applicable modes (vehicular, transit, pedestrians, and cyclists) by applying up-to-date, standard techniques. Accepted Bicycle Level of Service models and calculators are available for on-street bicycle travel and travel on shared use paths (multi-use trails).</i>	Trails
	Bicycle and pedestrian detours provided adjacent to and around development project during construction.	

Check if Applicable	Proffer Item	Description
		<p>Bicycle access provided through parking lots and driveways. <i>Note: Providing public bicycle accommodations through select private parking lots is critical to improving bicycle access along high-speed, multilane, congested arterials where private streets and parking lots provide alternative circulation routes for motorists.</i></p> <p>Bicycle accommodations provided on private roads that serve public access purposes.</p> <p>Easement on private property provided for public access, trails, public bicycle parking, or other bicycle facilities to maximize the connectivity and continuity of the bicycle network.</p> <p>Contribution to bicycle safety education, encouragement, or evaluation programs recommended in the <i>Tysons Corner Bicycle Master Plan</i>.</p> <p>Additional contribution to the physical bicycle network recommended in the <i>Tysons Corner Bicycle Master Plan</i>.</p> <p>Additional contribution to the overall goals and objectives outlined in the <i>Tysons Corner Bicycle Master Plan</i>.</p>

D. Bicycle Facility and Action Toolbox

Bicycle Facility and Accommodation Toolbox

Bike Lane



A bike lane is a pavement marking that designates a portion of a roadway for the preferential or exclusive use of bicycles. Bike lane markings are dashed where vehicles are allowed to cross the bike lane, such as for right turns or at bus stops. Bike lanes are recommended on two-way arterial and collector streets where there is enough width to accommodate a bike lane in both directions, and on one-way streets where there is enough width for a single bike lane.

Sample Locations: Jones Branch Drive, Spring Hill Road, Old Courthouse Road

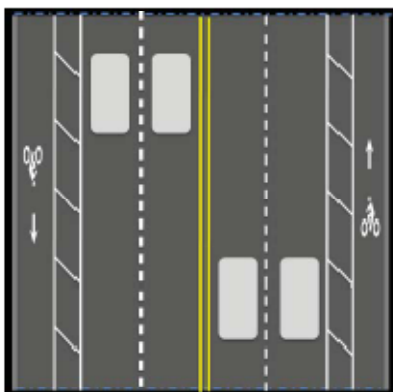
Bike Lane with Door Zone Markings



Diagonal lines within the bicycle lane may be utilized to guide bicyclists away from the space where the doors of parked vehicles may open, which is also known as the "door zone." In dense urban areas with narrow streets, the potential of being "doored" is one of the cyclist's greatest concerns. This treatment may be important to use on the avenue and collector streets with on-street parking.

Sample Locations: Boone Boulevard, new streets in the downtown grid

Buffered Bike Lane

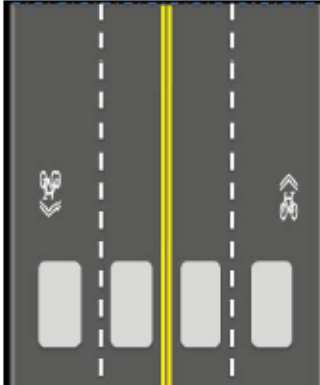


Buffered bike lanes are created by striping a buffer zone between a bike lane and the adjacent travel lane. Buffered bicycle lanes should be considered at locations where there is excess pavement width or where adjacent traffic speeds are above 35 mph.

Sample Locations: Dolly Madison Boulevard, Great Falls Street

Bicycle Facility and Accommodation Toolbox

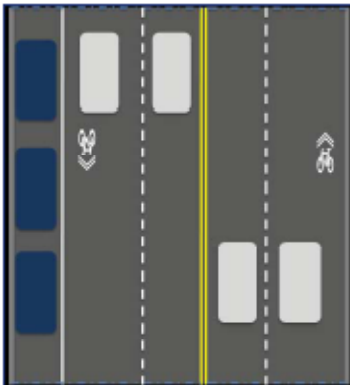
Shared Lane Markings- 4 Lane Street



Shared lane markings (sharrows) are used on roadways where bicyclists and motor vehicles must share the same travel lane. The sharrow helps position bicyclists in the most appropriate location to ride. It also provides a visual cue to motorists that bicyclists have a right to use the street. On a four lane street, sharrows should be placed in the outside lane. If the outside travel lane is too narrow for a motorist to comfortably pass a cyclist while staying within the travel lane (generally less than 13 feet) the sharrow marking may be centered in the lane. This encourages cyclists to “take the lane,” and encourages motorists to use the left lane to pass. In a 12-14 foot lane, the marking may be offset from the curb by 4 feet. For 10-12 foot lanes, the BIKES MAY USE FULL LANE SIGN is recommended in Tyson’s, because drivers are not used to sharing the road with cyclists and may not provide comfortable clearance when passing. Sharrows are not appropriate on streets with speed limits greater than 35 mph.

Sample Location: Tyco Road

Shared Lane Markings- Wide Outside Lane



Wide outside travel lanes are typically designed to be 13-15 feet wide. This width allows most motor vehicles to pass cyclists within the travel lane. Shared lane markings (sharrows) should be provided within the wide outside lane, offset 11 feet from the curb when parking is present, and 4 feet from the curb when parking is not present. Sharrows in wide outside lanes can be used to connect gaps between other bicycle facilities, such as a narrow section of roadway between road segments with bicycle lanes.

Sample Locations: Gallows Road, Idylwood Road Bridge

Shared Lane Markings- Residential



Shared lane markings (sharrows) may also be used on residential streets to designate bicycle facilities where there is not sufficient width for bike lanes. Studies have shown that sharrows direct bicyclists away from the “door zone” of parked cars, alert motorists of appropriate bicyclist positioning and encourage safe passing of bicyclists by motorists.

Sample Locations: Lisle Avenue, Oak Street

Bicycle Facility and Accommodation Toolbox

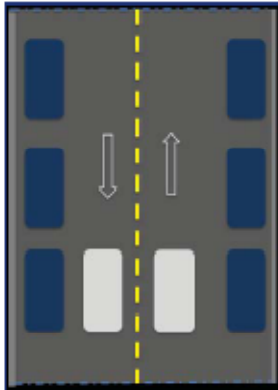
Climbing Lane



A climbing lane is a bikeway design for a two-way street that has a steep slope and insufficient width to permit bike lanes in both directions. A bike lane (climbing lane) is provided in the uphill direction to accommodate slow moving bicyclists and a shared lane marking is provided in the downhill direction, where bicyclists can typically travel at speeds close to motor vehicles.

Sample Locations: Greensboro Drive, Creek Crossing Road, Westpark Drive

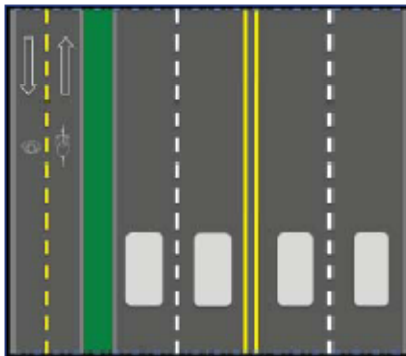
Shared Roadway



A shared roadway consists of a low volume, low speed street that is compatible with bicycling without any striping, marking or geometric change to the roadway. Bicycle route signs are often used on shared roadways especially where a through route may be hard to find due to the configuration of neighborhood streets. Shared roadways are typically residential streets but can also be in commercial or institutional areas. Park roads can also often operate as shared roadways.

Sample Locations: Davis Court, Percussion Way, Rupert Street, Madrillon Road

Sidepath

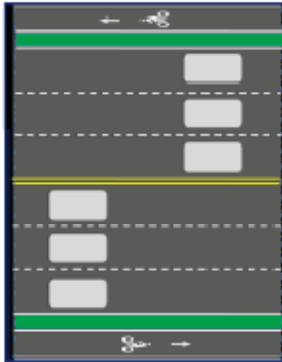


A sidepath is a shared-use path located adjacent to roadway. It is designed for use by bicyclists and pedestrians and each may travel in either direction. Sidepaths are sometimes created by designating a wide sidewalk for shared use; or they may be a segment of a longer trail or network of trails. Sidepaths are sometimes provided to facilitate connections to on- and off-street bicycle facilities. A sidepath is not generally a substitute for on-road bicycle facilities, but may be considered in constrained conditions, or in addition to on-road facilities. Sidepaths may not be appropriate in areas of high pedestrian activity unless there is space to successfully manage conflicts.

Sample Locations: Route 123, Route 7 NW of Tysons Corner

Bicycle Facility and Accommodation Toolbox

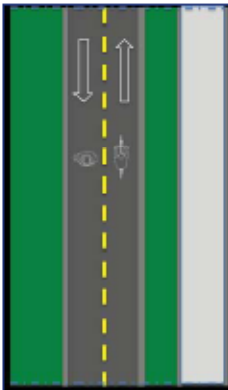
Cycletrack



A cycletrack is a bicycle facility that is physically separated from both the roadway and the sidewalk. A cycletrack may be constructed at the roadway level using roadway space, or at the sidewalk level using space adjacent to the road. Cycletracks separate bicyclists from motor vehicle traffic using a variety of methods, including curbs, raised concrete medians, bollards, on-street parking, large planting pots/boxes, landscaped buffers (trees and lawn) or other methods. Cycletracks designed to be level with the sidewalk should provide a vertical separation between bicyclists and pedestrians, as well as a different surface treatment to delineate the bicycle from the pedestrian space. Cycletracks can be one way for bicycles on each side of a two-way road, or two-way, and installed on one or both sides of the road. Cycletracks provide cyclists with a higher level of comfort relative to motor vehicle traffic, and are typically used on large multi-lane arterials where higher vehicle speeds exist. They may also be appropriate on high-volume but low-speed streets such as in a commercial downtown.

Sample Locations: Route 7, International Boulevard

Trail or Shared Use Path



A trail or shared-use path is an off-street bicycle and pedestrian facility that is physically separated from motor vehicle traffic. Typically trails are located in an independent right-of-way such as in a park, stream valley greenway, along a utility corridor, or an abandoned railroad corridor. Shared-use paths are used by other non-motorized users including pedestrians, skaters, wheelchair users, joggers, and sometimes equestrians.

Sample Location: WO&D Trail

Signed Bike Route

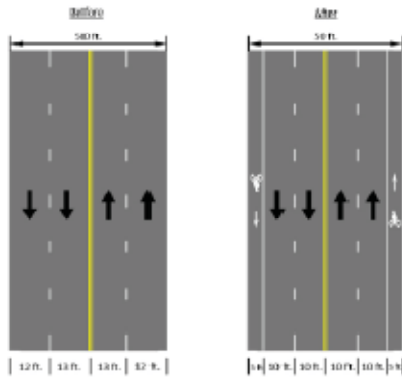


Signed bike routes provide distance and directional information as a wayfinding aid for bicyclists. Signed routes may be established on streets, trails or any combination of facility types that offer a continuous bicycling environment. Signs offer cyclists information about alternative routes and accessible destinations from their current location. They also can be used to suggest the types of conditions cyclists can expect on a route by referencing trails or roadways by name. Signed routes provide new cyclists greater confidence when they are exploring utilitarian cycling for the first time or when they are in unfamiliar territory. Signed routes can also prevent cyclists from getting lost in residential areas with curvilinear street layouts and few through streets.

Sample Location: Northbound on Gallows Road at Kidwell Drive

Bicycle Facility and Accommodation Toolbox

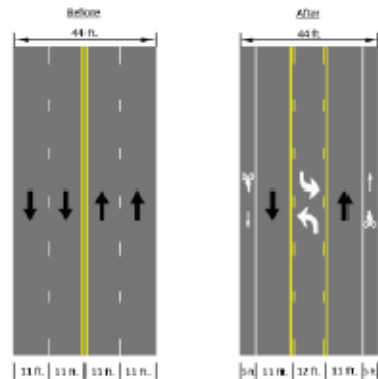
Lane Diet



A lane diet narrows the width of existing motor vehicle travel lane(s) and redistributes that space for bike lanes or other bikeway improvements. In some situations, a lane diet may be recommended for installation of shared lane markings. For example, a four lane road with 12 foot travel lanes can be restriped with 10 foot interior lanes and 14 foot wide outside lanes where the shared lane marking can be placed.

Sample Locations: Jones Branch Drive, Tysons Blvd

Road Diet



A road diet eliminates one or two travel lanes in order to provide a bicycle lane, or a buffered bicycle lane, within the existing width of the road. Typically, a center turn lane is provided for left-turn movements. In many situations, the resulting three-lane cross section functions more efficiently for motor vehicle traffic (and with fewer crashes) as well as allowing for bicycle lanes.

Sample Location: Old Meadow Road

Spot Access Improvement

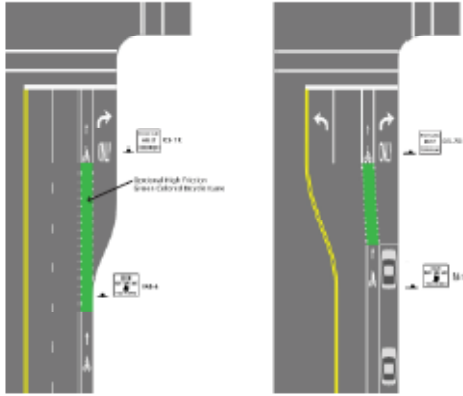


A spot bicycle access improvement is a relatively simple and low-cost solution for a location where bicycle access is blocked by a gate, fence, stream or lack of a paved path. The solution may require one or more of a variety of actions to create access, such as replacing a gate with bollards, installing a curb ramp, building a small bridge, or paving an unpaved path.

Sample Locations: Davis Court Cul de Sac Link, Madron Lane Passage, Kidwell Drive Trail Link

Bicycle Facility and Accommodation Toolbox

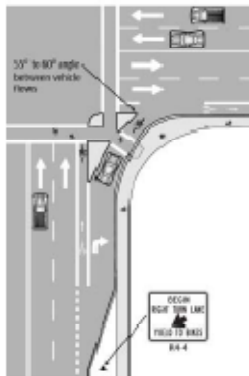
Right Turn Only Lane - Urban Intersection



At all urban intersections with a right turn only lane, the bicycle lane should always be to the left of the turn lane. Typical treatments for right turn only lanes include: dashed bicycle lane lines for the transition from right to left of the vehicular turn lane, high-friction green paint in the transition area, and BEGIN RIGHT TURN LANE YIELD TO BIKES (R3-7R), and RIGHT TURN ONLY (R4-4) MUTCD signs installed according to MUTCD standards. Note that engineering judgment and context-sensitive design approaches are required since every intersection is different.

Sample Location: Westmoreland Street at Chain Bridge Road

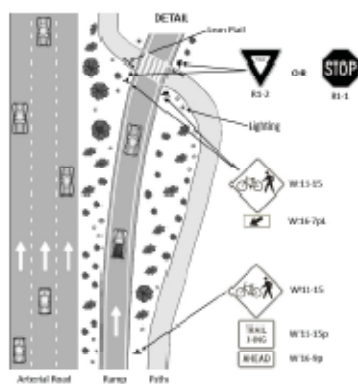
Right Turn Only Lane - With Crossing Islands



Many intersections in Tysons Corner have a channelized right turn lane on approaches. This design can be made both bicycle- and pedestrian-friendly by using the following key design features: provide a maximum right turn lane width of 16 feet, 14 feet recommended; stripe a lane between the curbs at 11 or 12 feet-in-width; provide a 55-60 degree angle between vehicle flows, rather than the typical 35-45 degree; and do not provide a dedicated receiving lane.

Sample Locations: Tysons Blvd and Galleria Drive, Leesburg Pike and Gallows Rd/International Drive

Shared-Use Path Crossing of Expressway On-Ramp

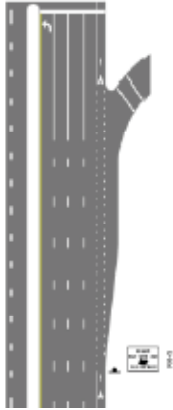


Shared-use path crossings at on-ramps present a greater number of potential conflicts (4) than a bike lane crossing (1) because of bi-directional travel on the path which serves both pedestrians and bicyclists. A stop condition is appropriate for trail users, however for a cyclist, stopping always means starting again; identifying a sufficient gap in 60 mph traffic while at the same time preparing to start from a stop is unsettling because there is little margin for error. A railing should be provided on both path approaches to allow the cyclist to come to a stop while keeping both feet on the pedals and thus prepared for a quicker start.

Sample Locations: Leesburg Pike and Capital Beltway, Leesburg Pike and Dulles Toll Road

Bicycle Facility and Accommodation Toolbox

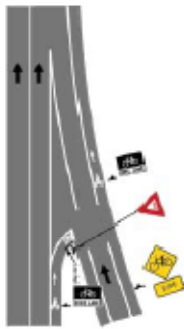
Bike Lane Crossing of Expressway On-Ramp



Bicycle lanes can be striped through an arterial exit to an expressway on-ramp. Important design considerations include the following: develop a right-turn lane prior to the point where the ramp diverges from the arterial road; always place the bicycle lane to the left of the right-turn lane; place the R4-4 BEGIN RIGHT TURN LANE YIELD TO BIKES at the beginning of the diverge area. In places where motor vehicle speeds are high and sidewalks are present, bicyclists should be given the option to exit onto the sidewalk and to proceed through the interchange along the pedestrian route.

Sample Locations: Dolley Madison Boulevard and Dulles Toll Road, Spring Hill Road and Dulles Toll Road

Bike Lane Crossing of Expressway Off-Ramp



Bicycle lanes can be designed to align the cyclist to cross an exit ramp at a right angle in order to improve sight distance and encourage slower speeds. A yield or stop condition is provided for the cyclist, who must identify a sufficient gap in motor vehicle traffic to safely cross the ramp. Advance warning signs of a bicycle lane crossing should be provided for exiting motorists who are likely to be traveling at high speeds. A railing can be provided to allow the cyclist to come to a stop while keeping both feet on the pedals and thus be prepared for a quicker start.

Sample Location: Dolley Madison Blvd and Dulles Toll Road

Expressway Overpass



Overpasses of major highways eliminate bicycle interaction with motor vehicle traffic and offer grade-separated crossings. Overpasses often provide a preferred alternative to crossing through an expressway interchange where there may be up to four or more locations (on each side of the arterial) where bicyclists will need to cross free-flowing entrance and exit traffic. This task is daunting for most people, and even well-designed at-grade ramp crossings are a deterrent to bicycle use in such cases.

Sample Locations: Capital Beltway Crossing near Marshall High School, Dulles Toll Road Overpass from Leesboro Pike to Greensboro Drive

E. Fairfax County Policy Recommendations: Zoning, Development Review and Trail Management

To set the stage for redevelopment that fully supports creation of a bicycle-friendly Tysons Corner, the following policy changes are recommended for detailed development and County adoption in Phase 1:

- Fairfax County should update its list of recommended proffers from developers in Tysons Corner to include the following:
 - Trails as both a recreational and transportation contribution;
 - Space for a commercial bicycle station operation;
 - Space for future bicycle sharing operations; and
 - Completion of partially completed bicycle facilities within a half mile of their development.
- Fairfax County and VDOT should determine how the provision of planned bicycle facilities can be used to replace a portion of the requirements placed on developers to mitigate the traffic impacts of their projects. The Comprehensive Plan states: *“Impact studies within TOD areas should quantify the level of service for all applicable modes (vehicular, transit, pedestrians, and cyclists) by applying up-to-date, standard techniques.*
 - Accepted Bicycle Level of Service models and calculators are available for on street bicycle travel and travel on shared use paths (multi-use trails).
- Required contributions toward the bicycle transportation network should include the following:
 - Installation of planned bicycle facilities adjacent to and/or through their development; and
 - Installation of planned bicycle facilities on streets or at intersections where traffic impacts of the development are being mitigated.
- Bicycle and pedestrian detours must be provided adjacent to and around all land development projects.
- Fairfax County should explore how it can share the burden with private property owners (multifamily and commercial) to provide bicycle access through parking lots

and driveways that can be used for motorized public access independent of use related to the business. Options to consider include:

- Providing public bicycle accommodations through select private parking lots is critical to improving bicycle access along high-speed, multilane, congested arterials where private streets and parking lots provide alternative circulation routes for motorists; and
- Fairfax County should determine if bicycle accommodations can be required of private commercial property owners who provide private roads that serve public access purposes.
- Fairfax County should negotiate easements with private property owners in Tysons Corner for public access, trails, public bicycle parking or other bicycle facilities as is needed to maximize the connectivity and continuity of the bicycle network.
- Fairfax County should develop a plan for managing a select set of trails for transportation use; which would mean a higher level of maintenance and permission of nighttime use. Development of this plan should involve representatives of the Tysons Partnership, Fairfax County Department of Transportation, the Fairfax County Park Authority, the Northern Virginia Regional Park Authority, the Town of Vienna and the Virginia Department of Transportation.
 - The Tysons Corner area should be used as a test case where a select set of transportation trails and trail sections can be identified for application of maintenance and management practices that will offer a higher level of service for cyclists and other trail users.
 - A higher level of service should include the following:
 - » Providing lighting to enable trails to be open and safely used before dawn and after dusk, especially in fall, winter, and spring months;
 - » Providing snow removal to enable trails to be safe and passable within a few days after a winter storm;
 - » Providing reflective edge striping and ensuring that all potential obstructions (such as bollards) have reflective material on them;
 - » Requiring cyclists to use head- and taillights when using the trail after dark; as well as appropriate reflective clothing; and
 - » After two years of operation, an evaluation of the effort should be conducted. It would look at use, user satisfaction, costs, etc.

F. Policy Recommendations for Virginia Department of Transportation (VDOT) Roadway Design and Operations

In addition to the Comprehensive Plan's policies regarding modal priorities, in 2004, the Commonwealth Transportation Board (CTB) adopted the *Policy for Integrating Bicycle and Pedestrian Accommodations*. The policy provides the framework through which VDOT accommodates bicyclists and pedestrians in the funding, planning, design, construction, operation, and maintenance of Virginia's transportation network.

To provide more detail for the agency in implementing this policy VDOT developed a State Bicycle Policy Plan, which is currently under agency review. This bicycle-specific policy implementation plan identifies strategies for more fully integrating bicyclists into VDOT's daily business. It provides recommendations to ensure that the bicycle element of the policy is applied consistently, appropriately, and cost-effectively. The recommendations below are consistent with the recommendations included in the State Bicycle Policy Plan. In Phase 1, VDOT roadway design policies and guidance should be clarified to achieve the following design objectives in Tysons Corner:

- Where necessary to enable the installation of bicycle lanes, 10-foot travel lane widths should be allowed on street classifications below Boulevard (e.g., Major Arterials).²⁹ Many of the bicycle lanes recommended in this plan may require the use of 10-foot travel lane widths. (Roadways with significant volumes of buses and trucks may need to retain minimum 11-foot travel lanes.) Use and safety of 10-foot travel lanes are discussed in detail in Appendix C of the State Bicycle Policy Plan.
- A few segments of roadway in the Tysons area have hills and curves that impact bicycle safety, such as Clark Crossing Road and the western portions of Old Courthouse Road. These roads typically do not have paved shoulders or if shoulders are present they are narrow and/or discontinuous. Roads where slow moving cyclists, who are out of view of the motorist due to minimal sight distances, should have motorist warning signs posted to alert them of the potential to come up behind a cyclist in the travel lane with minimal time to react. Standard motorist warning signs of sharp curves and reduced speed limits can be used. Also the

²⁹In 2010 VDOT is reviewing a draft statewide bicycle accommodation policy which recommends that VDOT adopt such a policy.

- bicycle warning diamond with a custom subplate such as “Cyclists in Lane” could be used.
- The “Bikes May Use Full Lane” may also be used to alert all road users that for safety, the cyclist may be in the center of the travel lane.
 - VDOT’s two-foot paved shoulder program should be applied to roads that are important in the Tysons (and countywide) bicycle network. Where this is done, 11-foot travel lanes should be reduced to 10 feet, to allow for a three-foot striped shoulder.
 - Posted speed limits should be reviewed and adjustments considered. The rural roads just outside the core of Tysons have become well populated residential streets. To improve bicycle safety in providing access to Tysons, 35 mile per hour (or higher) speed limits should be re-evaluated. Where roadways are only 20-24 feet wide with no paved shoulders, hills are present, and sight distances are poor, consideration should be given to dropping speed limits to levels that are compatible with bicyclists and motorists sharing the same travel lanes. Special attention should be paid to areas around schools.
 - Where shared lane markings are placed in 10-foot travel lanes, they should be placed in the middle of the travel lane and the “Bikes May Use Full Lane” sign
 - Intersection design is a major concern regarding cyclists’ safety. By policy, as intersections in Tysons are reconstructed along with developments, channelized right turn lanes will be eliminated. Prior to these actions, if bicycle facilities are installed on existing roadways, existing intersections will need to be addressed short of reconstruction. The specific design guidelines described below should be useful. These and other intersection improvements are discussed in detail in Appendix A of the State Bicycle Policy Plan.
 - Free-flow right turn slip lanes can be dangerous to cyclists. However, right turn slip lanes can be made safer and even helpful for cyclists if the following design criteria are used:
 - Where bike lanes lead up to the intersection, provide a generous crossover area by using the dashed bike lane markings that allow cyclists to merge left to continue straight through at the intersection. Cities such as Cambridge, Massachusetts have used colored bicycle lanes in these situations, to make it clear that right turning motorists need to yield to cyclists who desire to go straight.
 - Reduce the angle of the right turn lane’s approach to the crossing road, so that motorists must take the turn at a lower speed.
 - Do not provide a dedicated receiving lane; turning motorists will use more caution if they are required to merge into a lane that may have traffic in it.
 - Provide dedicated right turn lanes where possible, and through bicycle lanes on the left of the right-turn lane.

- Minimize or eliminate the use of combined through and turn lanes. These lanes give motorists the option of turning or staying straight, which makes it impossible for the cyclist to predict what the motorist may do, and thus they cannot position themselves safely in the lane. Where these types of lanes must be used, provide the “Bikes May Use Full Lane” sign.
- Provide in-pavement or video bicycle detection at critical signalized crossings that are actuated only when cross traffic is present.
- Provide countdown pedestrian signal heads at all intersections. Where approach streets include bicycle facilities, retrofit intersection crossings to include pedestrian crosswalks on all legs of the intersection. Consider using special crosswalk striping patterns for shared use path crossings of roadways.
- Use special bicycle signals and leading bicycle intervals where the safest and most efficient way to move bicyclists through an intersection is to provide them their own dedicated phase. Washington, D.C. installed such signals in 2010 and they are common throughout Europe.
- Install median refuge islands where possible.
- Adopt design standards for sidepaths adjacent to commercial and multifamily land uses that require the following:
 - A 5-foot vegetated buffer between the path and the road
 - 10-12 foot wide paths in the Tysons Corner area
 - Paths on both sides of a roadway (unless adjacent land uses make it unnecessary)
 - Upgraded design of crossings at intersections
 - Use the trail pavement surface across driveways and stop or yield controls for motor traffic. Safety signs should alert drivers approaching from both the driveway and street to look both ways for bicyclists.
- VDOT should make provisions to improve maintenance of on-street and off-street bicycle facilities.
- In conjunction with the Tysons Partnership, provisions for sweeping of roadways with bicycle lanes and sharrows should be made. Regular sweeping should begin in 2014 or 2015.
- Beginning sooner, VDOT should regularly mow lawns and trim vegetation along sidepaths in Tysons Corner to ensure longer pavement life and safe use by cyclists. Sidepaths should also be swept after mowing, and in the spring after the snow season ends.
- Snow clearing is also an issue. Snow should not be plowed and piled on sidewalks and sidepaths, nor in bicycle lanes. A set of priority paths and sidewalks that provide access to the Silver Line station should be cleared of snow along with the arterial street system. To address responsibilities, resources and practices FCDOT,

VDOT and the Tysons Partnership will need to coordinate and perhaps enter into special maintenance agreements.

- VDOT should require all roadway improvement projects, and utility projects on VDOT-owned facilities to provide appropriate and safe detours throughout the entire project period. This is extremely important given the level of roadway investment that is planned in Tysons Corner and the long timeframe for implementation. Utility patches and other pavement repairs should be to standards that will be safe and comfortable for bicyclists.

G. Encouragement and Safety Education Program Recommendations

ORGANIZATION AND LEADERSHIP

It is critical that the lead Transportation Management Association (TMA) for Tysons Corner is also the lead entity for the management and coordination of most bicycle transportation encouragement and safety education programs. This will ensure that bicycle-related Transportation Demand Management (TDM) activities are effectively integrated with other TDM initiatives and the TDM-related proffers made by developers.

As this Plan was being developed (fall 2010 to winter 2011) it appeared that the Tysons Partnership was going to become the TMA for Tysons Corner. It is highly recommended that the Partnership take a leadership role regarding bicycle encouragement and education programming and bicycle parking. It is further recommended that they seek funding for bicycle transportation initiatives, hire staff and consider partnering/contracting with experienced local or regional bicycling organizations and businesses for services.

Ongoing Tysons Corner Bicycle Advisory Committee

To provide ongoing guidance regarding plan implementation and program development it is recommended that a bicycle or bicycle and pedestrian advisory committee be established in association with the Tysons Partnership or other organization empowered to be the TMA.

MULTILINGUAL MATERIALS FOR ENCOURAGEMENT AND SAFETY EDUCATION PROGRAMS (PHASE 1-4)

Because of the increasing numbers of Spanish speaking people in the Tysons area (especially among service and construction workers) every effort should be made to provide communications about encouragement and safety education programs in Spanish. Due to fast changing demographic characteristics, translations into other languages may be needed for some programs. Perhaps there is a local company who could donate their services, or a foreign language teacher/class at Marshall High School could contribute as volunteers.

ENCOURAGEMENT

Program initiatives suggested for Phase 1 and Phase 2 include the following:

Bicycle-Friendly Employer Program (Phase 1 and ongoing)

Use the League of American Bicyclists *Bicycle-Friendly Employer Program* to encourage employers and property managers to provide employees secure bike parking, availability of showers and changing facilities, incentives to commute by bicycle, etc.³⁰

Bicycle-to-Transit Ambassadors (Phase 1 and 2)

In partnership with FABB and WABA, create a volunteer *Bicycle-to-Transit Ambassadors program* at Metrorail stations on select weekdays during the first spring the Silver Line is open. Such a program would entail volunteer cyclists staffing information tables at the Silver Line stations once a week during the first spring the system is open. Face to face contact with another cyclist who commutes can be the most influential factor in a person's decision to bicycle. Information about routes, safety, time savings and health benefits can be provided, as well as how to use the bicycle parking at the station, how to put your bicycle on a bus, and how to rent a bike locker. Arranging commuter companions or mentors is another service that can be provided to help new cyclists.³¹

It's About Time Commuter Campaign (Phase 1 and ongoing)

Launch a bicycle commuting encouragement program called "*It's About Time!*" Over the course of this planning process, many of the cyclists who commute to Tysons in 2010 stated that time savings (and reliability of the daily commute time expenditure) is the reason they choose bicycling over driving or taking transit. Congestion on routes to Tysons from both the east and west is common. Using the W&OD trail, and other connecting trails, bicycle commuters from as far away as the District of Columbia and Ashburn, Virginia described their time shavings over other travel alternatives available to them. This is a little known fact which if publicized might make biking more appealing to many other Tysons commuters.

To support the *It's About Time!* campaign, create a map of the greater Tysons area with "bicycle commuting times for the most time-efficient bicycle commuter routes to Tysons Corner offices. The map could be produced in various forms (paper, a printable map on the Internet, on signs at key gateways to Tysons, or on a bandana as a promotional giveaway).

³⁰<http://www.bikeleague.org/programs/bicyclefriendlyamerica/bicyclefriendlybusiness/>.

³¹ <http://alexandriava.gov/localmotion/info/default.aspx?id=11992> and
<http://bicyclingambassadors.org/>.

Social Networking (Phase 1 and ongoing)

Create an Internet-based “social” network among employee-based bicycle clubs, bicycle commuting support groups, and individual bicycle commuters to publicize commuting testimonials; share information and tips, provide bicycle travel advisories, advertise programs and events and publicize progress made to increase the numbers of people bicycling in Tysons. A number of employers in Tysons Corner already have active groups with in-house leadership.

Bike to Work Day Activities (Phase 1 and ongoing)

Continue the *Bike-to-Work Day Pit Stop* in Tysons Corner, which is currently sponsored by Booz Allen Hamilton. Consider new advertising strategies that might increase the numbers of registered participants. It may be useful to consider moving the event location to a location that is more central to or accessible to Tysons area cyclists, or trying to involve more stakeholders and hosting multiple “Pit Stop” locations and “Convoys”.

Shared Bicycle Program (Phase 2 and ongoing)

The District of Columbia and Arlington, Virginia have launched an extensive shared bicycle service. These are bicycles that are parked on the street and available free to the public for short trips (30 minutes or about 4-5 miles); a small annual membership fee is charged upon first-time use. This service is most successful in a downtown or downtown-like environment that is too large for walk trips to meet all travel needs among a well distributed mix of land uses. While Tysons Corner has a suburban transportation and development structure, it does have a diverse mix of uses across commercial and office employment, residential areas, places to eat, shop, exercise and run errands. However, the pedestrian environment is not consistently friendly and the suburban layout means that many origins and destinations are separated by distances longer than can be reached in an easy walk.

The shared bicycle is perfect for these types of trips within and to and from Tysons Corner. It may also be very useful for trips to and from the new Silver Line stations. However, it will not be successful until a set of bicycle facilities are implemented, so for this reason it should be scheduled for implementation in the later years of Phase 2.

Bike-to-Lunch Initiative (Phase 2)

This is an encouragement program that can be undertaken when shared bicycle services are in place. The idea is that restaurants in Tysons Corner offer a lunchtime discount (or free item) for bicycling to the lunch spot. They will be encouraging “green” travel and may attract more customers. This promotion will directly encourage lunchtime use of the shared bicycle system, which might otherwise be a low-use period. It will also expose many people to bicycling without requiring them to begin by making a major commitment to biking to work. It should also help the thousands of office employees in Tysons Corner associate bicycling with having fun, getting some exercise, and enjoying their free time during the work week.

Student Commuter Benefit

Transit and bicycling commuter benefits can be provided through employers to employees, at the employers' choice to participate in the program. Perhaps a source of funding could be identified to provide 16-18 year old high school students a monthly \$20 benefit if they ride their bicycle to school 50 percent of the time. Experimenting with such a program at one school would enable the idea to be tested. While increasing student fitness, it might also ease congestion around schools and pressure on school parking lots.

Bicycle Parking Programs

Bicycle Parking At Metrorail Stations (Phases 1-4)

The following bicycle parking guidelines should be used to complete a more detailed analysis of the current Silver Line station site plans with regard to rack and locker locations.

- All racks should be covered, either by location under the overhead rail superstructure, by stand-alone canopies (such as modified bus shelters), or by locating them within the mezzanine or other indoor lobby areas.
- Consider locating racks in mezzanine areas, which will provide high-security parking at the lowest possible cost.
- In the early years of Metrorail service in Tysons, residential population in the core of Tysons will remain lower than that in the surrounding communities. If racks are not located in the mezzanines, which are equally convenient to customers regardless of which station entrance they use, the quantity of racks per station should not be split 50/50 among the two station entrances. They should be split two-thirds/one-third with the larger number located at the south entrances, which are generally the entrances that will be closest to the approach route of most cyclists, who will be coming from the surrounding communities.
- Lockers, on the other hand, probably should be split 50/50, as they will be used by cyclists for both bicycle access trips to the station and egress trips from the station to Tysons area destinations.

The provision of bicycle parking at the Tysons Central 123 station is of particular concern. A small number of racks are provided at the north entrance. The south entrance is going to have a small footprint and be isolated by busy roads on all sides. Coordination with the Tysons Corner Mall should continue to explore the optimum location for bicycle parking at this station, which if not located in the station mezzanine, maybe on outdoor Mall property that functions as "public space" for its existing and new developments.

One-Stop-Shop Bicycle Parking Installation Program (Phase 3 and ongoing)

Also, in this timeframe the overall increase in bicycle-friendly infrastructure combined with new trail access to two of the Silver Line stations, is likely to increase the need for

bicycle parking capacity at the Tysons East and Tysons Central 7 stations. Moreover, the increase in residential population within the core and ease of access from the surrounding communities will increase demand for bicycle parking at shopping centers and job sites. A timely and highly responsive program for increasing the overall supply of bike parking as well as the diversity of equipment will be needed. Short-term, weather protected parking will be needed in many locations, on-demand high-security parking will also be need for people who use a bicycle in Tysons frequently, but not necessarily every day. A web-based program may be the most efficient way for bicyclists, property owners and managers, and retail establishments to identify capacity expansion needs and proposed locations. Having a single, centralized procurement and installation administration will ensure that new equipment is installed in a timely manner and sited properly in public or semipublic space.

Advanced Bicycle Parking Systems (Phase 4 and ongoing)

Bicycle parking needs are expected to grow steadily throughout all phases of plan implementation. By 2020 it is likely that another generation of new bicycle parking technologies will be available which will increase convenience, weather protection, and security. The one-stop bicycle parking program recommended in Phase 3 will continue to be important to ensure that Tysons remains current with changing parking needs and changing equipment trends.

If a full-service bicycle station has not already been created, it will likely be needed by 2020. Bike stations are essentially “retail” outlets for bicycle transportation. They offer high-security bicycle storage, bicycle rental, sale of equipment and accessories, food and drink sales, bicycle repair, information, and advice, an office for bicycle mounted police, and any other services that cyclists may need. Bike stations are typically located at rail stations, where provision of bike parking for egress trips is a major service need.

In Tysons Corner, the first bicycle station is recommended for the Tysons West Silver Line station, and could be located in ground-level space in the new development already planned for this station. Bike stations are best if operated by an experienced bicycle retailer, however due to their need for a portion of the most valuable street-level retail space, they likely need public subsidy to get started. If additional storage or bicycle repair space is needed it should be provided at a second but nearby location that has less expensive rent.

Safety Education

Safe Routes to School (Phase 1)

As of January 2011, dialogue has begun between various safe routes to school advocates and the Fairfax County Public Schools. Like school districts around the U.S., Fairfax schools are eligible to apply for Federal safe routes to school funding through the state department of transportation (VDOT). This funding can be used for bicycle or pedestrian infrastructure improvements, operational improvements, safety education and/or encouragement programs at elementary or middle schools, including private schools.

Local schools (administrators, teachers and parents) in the Tysons Corner area can initiate local Safe Routes To School (SRTS) programs based on their own sense of need to improve bicycle and pedestrian safety for students or to encourage more kids to bicycle or walk to school. The planning process for this Plan did not systematically identify and evaluate safe routes to school needs in the study area. None-the-less, various needs were identified in the analysis process or pointed out by Bicycle Advisory Committee members or members of the public. Schools with safety and access issues include, but are not limited to the following: Wolftrap Elementary, Spring Hill Road Elementary and Joyce Kilmer Middle School.

Near-term initiation of SRTS programs in Tysons area schools will contribute significantly to a more bicycle and pedestrian safety savvy citizenry in Tysons in the long-term.

Bicycle Safety Education Program (Phase 2 and ongoing)

Cyclist and pedestrian safety education is recommended in Phase 2 given the potential for conflict between motorists and cyclists. Higher levels of cycling in Tysons Corner will be seen by motorists as a change in the transportation environment. Many may not be familiar with bicycle lanes or understand the shared lane marking.

Due to the location of affordable housing near Tysons Corner, many of the service workers with jobs in the Core, walk and bicycle along Route 7 from Pimmit Hills and Idylwood to various locations in Tysons. In recent years, a number of pedestrian and bicycle crashes along Leesburg Pike at the Beltway interchange, illustrate the safety issues related to the needs of this constituency and its only travel path between work and home. Additionally, the expanded opportunities for bicycling resulting from implementing this plan will bring out new cyclists; some of whom may not have had much education in the area of bicycle safety.

To address these safety education needs pedestrian and bicyclist safety along the sidepaths, service road bikeways and ramp crossings proposed for Route 7 and portions of Route 123 is paramount. While necessary as interim facilities, these types of accommodations are less than ideal for cyclists. They require crossing driveways, two-way cycling through intersections and crosswalks, and crossing free-flow motor vehicle traffic merging off and on expressway ramps—all of which are a challenge. Nighttime use makes it that much more challenging.

Inexperienced and new cyclists can easily assume that because a sidepath keeps them away from moving traffic that these facilities are inherently safer than bicycling in the street. However, because of the dynamics of sidepath crossings, and mixing with pedestrians, they actually demand more attention to safety and a greater degree of scanning for potential traffic conflicts.

Education of cyclists who will regularly use these sidepaths should be focused as follows: 1) through bicycle safety education in select middle and high schools in the area, and 2) through employee and neighborhood-based education and outreach, such as door hangers and flyers passed out at grocery stores, information distributed through homeowner associations, civic groups, and neighborhood listservs; and information

provided to service workers by their employers.³² This education effort should also target motorists with messages delivered in the roadway environment, using special banners, variable message signs, and alerts to new bicycle facilities when they are installed on particular roadways.

Safe Routes to School Programs at the Elementary Level (*Phase 3 and ongoing*)

Phase 3 may be the most appropriate time to initiate a comprehensive Safe Routes to School program in the elementary schools. During this timeframe, safety education and encouragement programs can be combined with infrastructure improvements that will facilitate access to the schools, for example trails near Westbriar and Westgate Elementary Schools.

Law Enforcement (*Phase 1 and 2*)

As cycling increases during Phase 1 and 2 years, enforcement of bicycling laws will become increasingly important. During Phase 1, the FCDOT Bicycle Program staff and other bicycling interest groups should engage the Fairfax County and Town of Vienna police departments in a dialogue about bicycle law enforcement. As redevelopment of Tysons progresses, and more cyclists and pedestrians are using the public realm, bicycle mounted police patrols may be an effective approach to general law enforcement.

Evaluation

Bicycle Counts (Phase 1 and ongoing)

It is recommended that the Fairfax County DOT Bicycle Program in conjunction with FABB and WABA establish an annual bicycle counting program. This will serve to establish baseline usage levels from which progress can be measured over time. Because Tysons Corner is two-thirds enclosed by limited access highways, it is likely that 90 percent or more of existing bicyclists traveling in and out of Tysons Corner can be counted at eight points of entry/exit, including:

1. Spring Hill Road and VA Route 267
2. Dolley Madison Boulevard and Lewinsville Road
3. Chain Bridge Road and Anderson Road
4. VA Route 7 and the Beltway
5. Gallows Road at Old Gallows Road
6. Chain Bridge Road at Gosnell Road

³² Kilmer, Longfellow and Thoreau Middle Schools; Marshall, McLean and Madison High Schools. In time, education efforts can be shifted from the High Schools to the Elementary Schools.

7. Old Courthouse Road at Gallows Road

8. Ashgrove Lane

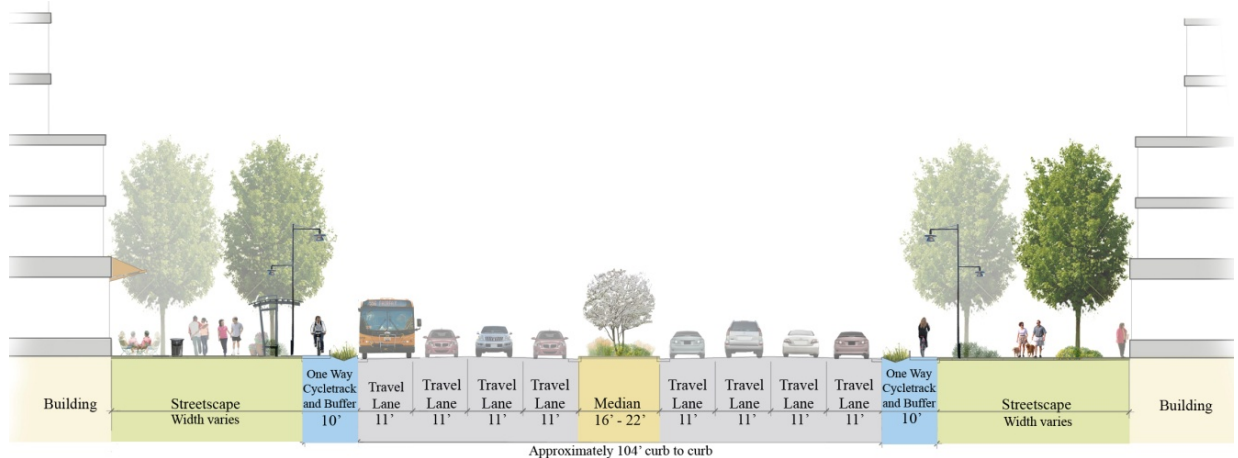
Annual bicycle counts should be continued. Expansion of the counting locations or expansion of the hours may be considered, depending upon available resources. Another option would be to conduct counts twice yearly by selecting an additional data gathering period.

H. Specific Recommendations Related to the Tysons Corner Comprehensive Plan Amendment (June 2010)

Updates to the Tysons Corner Urban Center Comprehensive Plan Amendment

The following recommendations fill gaps, clarify and elaborate on the bicycle transportation provisions identified in the Tysons Corner Urban Center Comprehensive Plan Amendment. Six key areas that need updated recommendations are listed below:

Updated Boulevard cross-sections that include bicycle facilities: Near-term and long-term bicycle facility recommendations are provided (see section below).



Updating the network of roadways that will have bicycle lanes due to their functional classification as Avenues or Collectors (see Figure 7.2)

Recommendations to consider in the Grid of Streets study to improve functionality of a southern section of the grid for bicycle access to and from Tysons Corner.

- At the north end, Woodford Road should be continued north to Leesburg Pike and cross to link with a service road along side VA Route 123. It would replace a part of Howard Road.
- At the north end, Lord Fairfax Road should be continued across Old Courthouse Road to Boone Boulevard.

- Address the need for Aline Avenue to line up with Fashion Boulevard at the crossing of Leesburg Pike. This is a critical disruption of the proposed grid that needs to be fixed.
- Even though it is diagonal to the proposed grid, include the proposed trail along the powerline corridor as a street in the grid. Use this corridor to create natural boundaries to development blocks. Other non-motorized streets will need to be considered as well, for example from the end of Raglan Road at Gosnell Road, directly to the Tysons Corner Central 7 Metrorail station.
- Modify the VA Route 123 intersection with Tysons Boulevard to allow bicycles to pass straight across VA Route 123 in both directions as pedestrians. Provide pedestrian crosswalks on both sides of Tysons Boulevard.
- Fully integrate the Ring Road around the Tysons Center Mall into the grid and set of public travel ways. Consider some re-alignments on the west side of the mall.
- Rename many of the roadways in Tysons Corner. The terms Drive and Road should be eliminated from the lexicon, as they are not street types that appear in downtown areas. The streets should be called for their new functional classification, i.e., Boulevards should be Boulevards, Avenues...Avenues, etc. Street names should not carry through major intersections on legs that are perpendicular of each other, i.e., Spring Hill Road at International Drive turns to the west. This is counter intuitive and makes wayfinding very difficult.
- There will be a need to have the grid of streets integrate with the surrounding community on the south side of Tysons. Where residential communities need to be protected from increased traffic and cut-through traffic, use landscaping islands to limit entry for motor vehicles and retain bicycle and pedestrian access. Do not offset the minor streets at the arterial, as this makes it extremely difficult for bicyclists and pedestrians to cross.
- Expanded recommendations for the trail network, refined trail alignments and inclusion of key trails as components of the “grid of streets” (see Map F available on line, and Figure 7.2 in this document).
- Recommendations for consideration of alternate and additional grade separated crossings of the Beltway and Dulles Toll Road (See Figure 7.1).

For bicycle parking requirements-adopt the *Fairfax County Policy and Guidelines for Bicycle Parking*, which currently is under development by FCDOT staff. In the interim, the bicycle parking provisions provided in *Comprehensive Plan Amendment* should be followed. They are restated here:

- **Short-Term Bicycle Parking:** Emphasizes convenience and accessibility, providing parking for visitors, shoppers, and guests. Short-term parking typically constitutes bicycle racks that are adjacent to primary entrances at libraries, municipal buildings, schools, and retail centers and are intended for site users. Racks should preferably be protected by the elements, and be highly visible.

- **Long-Term Bicycle Parking:** Provides not only convenience but security. This type of bicycle parking accommodates employees and residents where parking duration is typically longer than a few hours. Parking amenities include bike lockers, bike cages, and bike rooms. These facilities should be conveniently located and offer fully enclosed and locked storage.
- Bicycle Parking Ratios for Urban Mixed Use Centers
- **Multifamily:** One space for every 5 residential units and 1 visitor space for every 25 residential units or to the satisfaction of the Director of Transportation. Minimum is 2 spaces.
- **Commercial-Retail:** One employee space per 10,000 sq. ft. and 1 visitor space per 5,000 sq. ft. or to the satisfaction of the Director of Transportation. Minimum is 2 spaces.
- **Office:** One employee space per 7,500 sq. ft. and 1 visitor space per 20,000 sq. ft., or to the satisfaction of the Director of Transportation. Minimum is 2 spaces.
- In addition to this guidance, it should be noted that inverted-U standard bicycle parking racks are highly recommended. Artistic racks may also be used. Racks should be powder-or plastic-coated so they do not scratch the bicycle. Racks should support the bicycle in two locations along the frame (providing wheel support is not sufficient), and allow for a standard U-lock to be used to secure the bicycle. What are known as “school racks,” “wave racks,” and other types of racks that do not meet these guidelines should not be used.

Racks should be located as close as possible to the building entrance, without causing blockage of pedestrian space or making a pedestrian travel way impassible for a person with a physical disability. Racks or lockers provided for employee use should be located near an entrance that is both convenient and secure. It may be best to consult with employees who bicycle to work to determine which entrance is preferred.

I. Project Lists and Cost Estimates by Phase

Phase 1: On Road Projects

Street Name	Bike Lane	Climbing Lane	Paved Shoulder	Sharrow	Total Miles (Rounded)	Total Cost
ASHGROVE HOUSE LN				0.03	0.03	\$60
ASHGROVE LN				0.07	0.07	\$140
BEULAH RD			0.27		0.27	\$1,215,000
CHAIN BRIDGE RD SERVICE RD				0.24	0.24	\$480
COLSHIRE DR		0.1		0.14	0.24	\$2,555
COLSHIRE MEADOW DR				0.2	0.2	\$400
DARTFORD DR				0.08	0.08	\$160
DOLLEY MADISON BLVD			1.09		1.09	\$0
GALLOWS RD	2.73			2.38	5.11	\$4,760
HELENA DR				0.1	0.1	\$200
HURST ST				0.22	0.22	\$440
IDYLWOOD RD				0.09	0.09	\$180
KIDWELL DR				0.16	0.16	\$320
LEESBURG PIKE SERVICE RD				0.14	0.14	\$280
LEWINSVILLE RD	0.47				0.47	\$24,360
MERRY OAKS LN				0.27	0.27	\$540
MERVIS WAY	0.08				0.08	\$1,392
OAK ST				0.33	0.33	\$660
PROVIDENCE ST				0.13	0.13	\$260
SHERATON TYSONS DR				0.1	0.1	\$200
TRAP RD				1.42	1.42	\$2,840
VIRGINIA LN				0.08	0.08	\$160
WESTPARK DR	0.26				0.26	\$0
WESTWOOD CENTER DR				0.17	0.17	\$340
(blank)				0.3	0.3	\$600
Grand Total	3.54	0.1	1.36	6.65	11.65	\$1,256,327

Phase 1: Off Road Projects

Facility	Construct	Rehab Existing	Under Construction	Widen Sidewalk	Total Miles (Rounded)	Total Cost
Dolly Madison Blvd Sidepath				0.25	0.25	\$500,000
Underway				0.25	0.25	\$500,000
Gallows Rd Sidepath		0.53			0.53	\$26,500
Existing		0.53			0.53	\$26,500
Mervis Way Connector	0.04				0.04	\$80,000
Planned	0.04				0.04	\$80,000
Route 7 Sidepath	0.3		2.84	0.03	3.17	\$660,000
Underway	0.3		2.84	0.03	3.17	\$660,000
Tysons East Metro Connector				0.26	0.26	\$520,000
Existing				0.26	0.26	\$520,000
Grand Total	1.22	0.53	2.84	0.54	5.0	\$3,366,500

Phase 1: Intersection Improvements

Description	Status
Old Courthouse Rd and Westwood Dr	Proposed
Lewinsville Rd and Balls Hill Rd	Planned
Dolley Madison Blvd and Lewinsville Rd	Planned
Dolley Madison Blvd and Ingleside Ave	Planned
Clarks Crossing Rd and Percussion Way	Proposed
Old Courthouse Rd and Creek Crossing Rd	Proposed
Towers Crescent Dr and Shoptysons Blvd	Proposed

Phase 1: Interchange Improvements

Description	Status
VA Route 7 and I-495 (West)	Underway
VA Route 7 and I-495 (East)	Underway

Phase 1 Access Improvements

Name	Status	Action
G.C. Marshall Dr Access	Proposed	Remove fence; replace with new access control.
Kidwell Dr Link	Proposed	Curb ramp and short path section.
Madron Lane Passage	Proposed	New access control.

Phase 1 Bicycle/Pedestrian Overpass

Name	Status	Facility Type
Wolf Trap Road Trail	Underway	Off Road
Overpass of Dulles Toll Road		

Note: Due to significant variation in potential bridge costs, and considerable differences in the potential bridge locations, cost estimates for the bridge options are not provided. Additionally, most of the potential bridge locations require a significant length of grade-level trail or on-street facilities leading to the approaches at each end. Because these costs would not be incurred unless the bridge option was selected, they too have not been included in the off-road or on-road cost estimates.

Phase 2: On Road Projects

Street Name	Add Safety Signage	Bike Lane	Buffered Bike Lane	Climbing Lane	Paved Shoulder	Sharrows	Total \ Miles (Rounded)	Total Cost
ALINE AVE		0.23					0.23	\$20,010
ANDERSON RD		0.43				0.09	0.52	\$37,590
BESLEY RD						0.32	0.32	\$640
BOONE BLVD						0.06	0.06	\$120
CHAIN BRIDGE RD		0.62					0.62	\$976,494
CHURCHILL RD		0.57				0.53	1.1	\$22,948
CLARKS CROSSING RD	0.87						0.87	\$1,740
COLSHIRE DR				0.05			0.05	\$1,138
DOLLEY MADISON BLVD		0.25	1.67		1.62		3.54	\$1,402,815
FASHION BLVD		0.09					0.09	\$1,566
GALLOWS BRANCH RD		0.07					0.07	\$6,090
GREAT FALLS ST						0.21	0.21	\$420
HOWARD AVE		0.08					0.08	\$1,392
IDYL LN				0.09			0.09	\$2,048
IDYLWOOD RD		0.34					0.34	\$1,530,000
JONES BRANCH DR		1.41					1.41	\$122,670
KIDWELL DR		0.28					0.28	\$24,360
LEESBURG PIKE		0.06					0.06	\$5,220
LEESBURG PIKE SERVICE RD						1.29	1.29	\$2,580
LEWINSVILLE RD		1.11					1.11	\$96,570
MADRILLON RD						0.42	0.42	\$840

*Tysons Corner Bicycle Master Plan
Appendix I*

Street Name	Add Safety Signage	Bike Lane	Buffered Bike Lane	Climbing Lane	Paved Shoulder	Sharrow	Total \ Miles (Rounded)	Total Cost
MAGARITY RD		0.34				0.3	0.64	\$634,080
NIBLICK DR SE						0.01	0.01	\$20
OAK ST		0.3					0.3	\$50,616
OLD COURTHOUSE RD	0.91	1.62					2.53	\$623,618
OLD COURTHOUSE RD NB RAMP TO TRAP RD EB		0.03					0.03	\$2,610
OLD GALLOWS RD		0.08					0.08	\$6,960
OLD MEADOW RD		0.47					0.47	\$90,240
PARKING LOT						0.01	0.01	\$20
PATTERSON RD						0.14	0.14	\$280
PEACH ORCHARD DR						0.13	0.13	\$260
PIMMIT DR				0.43			0.43	\$9,783
RAMADA RD						0.02	0.02	\$40
RING RD				0.05			0.05	\$1,138
SPRING HILL RD		0.74				0.67	1.41	\$65,720
STANBRIDGE PL						0.05	0.05	\$100
TRAP RD				0.28			0.28	\$6,370
TYCO RD						0.46	0.46	\$10,370
TYSONS BLVD		0.22					0.22	\$3,828
TYSONS CORNER CTR		0.2		0.26		0.28	0.74	\$19,003
WESTMORELAND ST				0.4			0.4	\$9,100
WESTPARK DR		0.31					0.31	\$26,970
WESTWOOD CENTER DR						0.01	0.01	\$20
WOLFTRAP RD		0.36				0.79	1.15	\$7,844
WOLFTRAP RD SE						0.3	0.3	\$600
WOODFORD RD		0.25				0.25	0.5	\$4,850
(blank)						1.33	1.33	\$2,660
Grand Total	1.78	10.46	1.67	1.56	1.62	7.67	24.76	\$5,834,349

Phase 2: Off Road Projects

Facility	Construct	Easement	Pave	Realign	Rehab Existing	Widen Sidewalk	Total Miles (Rounded)	Total Cost
Aline Connector	0.04						0.04	\$80,000
Proposed	0.04						0.04	\$80,000
Ambergate and Choleshire Connector	0.01						0.01	\$20,000
Proposed	0.01						0.01	\$20,000
Ashgrove Connector					0.24		0.24	\$12,000
Existing					0.24		0.24	\$12,000
Davis Ct Connector					0.03		0.03	\$1,500
Existing					0.03		0.03	\$1,500
Dolly Madison Blvd Sidepath	1.14				0.79		1.93	\$2,319,500
Existing					0.79		0.79	\$39,500
Planned	1.14						1.14	\$2,280,000
Idylwood Connector	0.41						0.41	\$820,000
Proposed	0.41						0.41	\$820,000
Jones Branch Trail	0.73						0.73	\$1,460,000
Planned	0.51						0.51	\$1,020,000
Proposed	0.22						0.22	\$440,000
Leesburg Pike and Chain Bridge Rd Connector						0.44	0.44	\$880,000
Existing						0.44	0.44	\$880,000
Leesburg Pike Service Rd	0.01						0.01	\$20,000
Proposed	0.01						0.01	\$20,000
Leesburg Pike Sidepath	2.48						2.48	\$4,960,000
Planned	2.48						2.48	\$4,960,000
Madrillon Rd Connector			0.06				0.06	\$3,000
Existing			0.06				0.06	\$3,000
McLean High						0.13	0.13	\$260,000

Facility	Construct	Easement	Pave	Realign	Rehab Existing	Widen Sidewalk	Total Miles (Rounded)	Total Cost
School Connector								
Existing						0.13	0.13	\$260,000
Old Courthouse Rd Sidepath						0.65	0.65	\$1,300,000
Existing						0.65	0.65	\$1,300,000
Pimmit Drive Connector						0.06	0.06	\$120,000
Proposed						0.06	0.06	\$120,000
Power Line Trail	0.62						0.62	\$1,240,000
Planned	0.62						0.62	\$1,240,000
Route 7 Sidepath						1.35	1.35	\$2,700,000
Existing						0.85	0.85	\$1,700,000
Proposed						0.5	0.5	\$1,000,000
Service Road Sidepath						0.19	0.19	\$380,000
Existing						0.19	0.19	\$380,000
Tysons Central 123 Trail System	1.06						1.06	\$2,120,000
Planned	0.39						0.39	\$780,000
Proposed	0.67						0.67	\$1,340,000
Wolf Trap Stream Valley Park Trail System		0.18			0.03		0.21	\$1,500
Existing		0.18			0.03		0.21	\$1,500
Wolf Trap Trail Extension				0.06			0.06	\$120,000
Proposed				0.06			0.06	\$120,000
Grand Total	6.5	0.18	0.06	0.06	1.09	2.82	10.71	\$18,817,500

Phase 2: Intersection Improvements

Description	Status
Rt 7 and Tyco Rd	Proposed
Rt 7 and Spring Hill Rd	Proposed
Old Courthouse Rd and Besley Rd	Proposed
Chain Bridge Rd Just East of Old Courthouse Rd	Proposed
International Dr and Westpark Dr	Proposed
International Dr and Jones Branch Dr	Proposed
Spring Hill Rd and Lewinsville Rd	Proposed
Old Courthouse Rd and Woodford Rd	Proposed
Old Courthouse Rd and Aline Road	Proposed
Gallows Rd and Madrillon Rd	Proposed
Rt 7 and Fashion Blvd	Proposed
Rt 7 and Ramada Rd	Planned
Anderson Rd just South of Chain Bridge Rd	Proposed
Westpark Dr and Greensboro Dr	Proposed
Chain Bridge Rd and Old Courthouse Rd	Proposed
Beulah Rd and Old Courthouse Rd	Proposed
Rt 7 and Rt 267 (North)	Planned
Rt 7 and Rt 267 (South)	Planned
Beulah Rd NE and Creek Crossing Rd	Proposed

Phase 2: Interchange Improvements

Description	Status
Dolly Madison Blvd and Dulles Toll Rd (North)	Planned
Dolly Madison Blvd and Dulles Toll Rd (South)	Planned
Rt 7 and I-66 (West)	Proposed
Rt 7 and I-66 (East)	Proposed
Spring Hill Rd and Dulles Toll Rd	Proposed
Dolly Madison Blvd and I-495	Proposed

Phase 2: Access Improvements

Name	Status	Action
Colshire Dr Link	Proposed	Construct trail link and curb ramps.
Tysons Corner Center Mall	Proposed	Work w/ Developer – install crosswalk and safety sign.
Leesburg Pike Service Rd Deadend	Proposed	Short section of path; modify landscaping.
Ashgrove Lane Connector	Proposed	Shore up trail treadway from erosion; modify gate.

Phase 2: Bicycle/Pedestrian Overpass Options

Name	Status	Facility Type
Toll Road Overpass at Leesburg Pike – Median Trail	Planned/Proposed	Off Road

Note: Due to significant variation in potential bridge costs, and considerable differences in the potential bridge locations, cost estimates for the bridge options are not provided. Additionally, most of the potential bridge locations require a significant length of grade-level trail or on-street facilities leading to the approaches at each end. Because these costs would not be incurred unless the bridge option was selected, they too have not been included in the off-road or on-road cost estimates.

Phase 3: On Road Projects

Street Name	Buffered			Paved Shoulder	Shared Road	Sharrows	Total Miles (Rounded)	Total Cost
	Bike Lane	Bike Lane	Climbing Lane					
BALLS HILL RD					0.01	1.33	1.34	\$2,660
BEULAH RD	0.43						0.43	\$7,482
BEULAH RD NE	0.03						0.03	\$522
BOONE BLVD	0.27					0.35	0.62	\$5,398
CHAIN BRIDGE RD	3.75					0.29	4.04	\$270,976
CHAIN BRIDGE RD SERVICE RD						0.08	0.08	\$160
CHURCHILL RD						0.08	0.08	\$160
CREEK CROSSING RD	0.26		0.29				0.55	\$25,433
CREEK CROSSING RD NE	0.09						0.09	\$7,830
DOLLEY MADISON BLVD	1.35			1.61			2.96	\$262,836
DOMINION HEIGHTS CT						0.02	0.02	\$40
ELECTRIC AVE	0.75					0.31	1.06	\$65,870
FASHION BLVD	0.27						0.27	\$4,698

Street Name	Buffered			Paved Shoulder	Shared Road	Sharrows	Total Miles (Rounded)	Total Cost
	Bike Lane	Bike Lane	Climbing Lane					
FLETCHER ST						0.05	0.05	\$100
GALLERIA DR	0.82						0.82	\$71,340
GALLOWS RD						0.5	0.5	\$1,000
GOSNELL RD	1.01						1.01	\$74,646
GREAT FALLS ST	1.69	0.55	0.31				2.55	\$217,794
GREENSBORO DR	0.48		0.29				0.77	\$48,358
HOWARD AVE	0.32						0.32	\$5,568
IDYLWOOD RD			0.45				0.45	\$10,238
INTERNATIONAL DR			0.36			1.12	1.48	\$10,430
LEESBURG PIKE SERVICE RD						0.3	0.3	\$600
LEWINSVILLE RD	0.45						0.45	\$2,025,000
MAPLE AVE E	0.2						0.2	\$17,400
OLD CHAIN BRIDGE RD	0.01					0.38	0.39	\$1,630
OLD COURTHOUSE RD	0.15					0.12	0.27	\$4,242
OLD DOMINION DR	2.17						2.17	\$188,790
PIMMIT DR						0.51	0.51	\$11,730
SOLUTIONS DR						0.1	0.1	\$200
Solutions Drive Extended			0.16				0.16	\$1,552
SPRING HILL RD	0.34					0.7	1.04	\$66,680
SWINKS MILL RD			0.48				0.48	\$10,920
TOWLSTON RD						1.14	1.14	\$2,280
TYSONS BLVD	1.26						1.26	\$109,620
WATSON ST						0.18	0.18	\$360
WESTBRANCH DR	0.31		0.21				0.52	\$31,748
WESTMORELAND ST	0.24						0.24	\$20,880
WESTPARK DR	1.14					0.46	1.6	\$100,100
WOODFORD RD	0.22					0.25	0.47	\$4,328
Grand Total	18.58	0.55	2.55	1.61	0.01	8.27	31.3	\$5,176,597

Phase 3: Off Road Projects

Facility	Construct	Easement	Pave	Rehab Existing	Widen Sidewalk	Total Miles (Rounded)	Total Cost
Chain Bridge Road Sidepath	0.89					0.89	\$1,780,000
Planned	0.38					0.38	\$760,000
Proposed	0.51					0.51	\$1,020,000
Gallows Rd Sidepath					0.21	0.21	\$420,000
Existing					0.21	0.21	\$420,000
Georgetown Pike Connector	0.48					0.48	\$960,000
Planned	0.48					0.48	\$960,000
Idylwood Connector		0.06				0.06	\$0
Existing		0.06				0.06	\$0
Jones Branch Trail	0.46					0.46	\$920,000
Planned	0.46					0.46	\$920,000
Leesburg Pike Service Rd	0.34					0.34	\$680,000
Proposed	0.34					0.34	\$680,000
McLean Community Park Connector			0.21			0.21	\$10,500
Existing			0.21			0.21	\$10,500
Meadowlark Rd Trail			0.65			0.65	\$32,500
(blank)			0.65			0.65	\$32,500
Old Courthouse Sidepath	0.08					0.08	\$160,000
Proposed	0.08					0.08	\$160,000
Pimmit Library Trail System				0.51		0.51	\$25,500
Existing				0.51		0.51	\$25,500
Sandburg St Connector	0.08					0.08	\$160,000
Proposed	0.08					0.08	\$160,000
Scotts Run Trail System	0.4					0.4	\$800,000
Planned	0.4					0.4	\$800,000
Westbriar Elementary School Connector	0.51			0.1		0.61	\$1,025,000
Existing				0.1		0.1	\$5,000
Proposed	0.51					0.51	\$1,020,000
Tysons Central at 7 Metro Connector	0.56					0.56	\$1,120,000
Proposed	0.56					0.56	\$1,120,000
Grand Total	3.8	0.06	0.86	0.61	0.21	5.54	\$8,093,500

Phase 3: Intersection Improvements

Description	Status
Beulah Rd and Abbotsford Dr	Proposed
Rt 7 and Westpark Dr	Proposed
Rt 7 and International Dr	Proposed
Dolley Madison Blvd and Beverly Rd	Proposed
Chain Bridge Rd and International Dr	Proposed
Chain Bridge Rd and Niblick Dr	Proposed
Beulah Rd and Cinnamon Creek Dr	Proposed
Beulah Rd and Lozano Dr	Proposed
Beulah Rd and John Marshall Dr	Proposed

Phase 3: Interchange Improvements

(none)

Phase 3: Access Improvements

Name	Status	Action
Davis Ct Link	Existing	Add new curb ramps, adjust storm drainage inlet.
Spring Hill Rd Sidepath	Planned	Eliminate property owner's blockage of existing sidepath.

Phase 3: Bicycle/Pedestrian Overpass Options

Name	Status	Facility Type
Scotts Crossing Rd	Proposed	On Road

Note: Due to significant variation in potential bridge costs, and considerable differences in the potential bridge locations, cost estimates for the bridge options are not provided. Additionally, most of the potential bridge locations require a significant length of grade-level trail or on-street facilities leading to the approaches at each end. Because these costs would not be incurred unless the bridge option was selected, they too have not been included in the off-road or on-road cost estimates.

Phase 4: On Road Projects

Street Name	Bike Lane	Climbing Lane	Cycletrack	Paved Shoulder	Sharrow	Total Miles (Rounded)	Total Cost
BEULAH RD	0.13			1.2		1.33	\$5,985,000
CEDAR LN					0.79	0.79	\$1,580
CHAIN BRIDGE RD SERVICE RD	0.14					0.14	\$5,376

Street Name	Bike Lane	Climbing Lane	Cycletrack	Paved Shoulder	Sharrow	Total Miles (Rounded)	Total Cost
COTTAGE ST	1.08					1.08	\$18,792
IDYLWOOD RD					0.37	0.37	\$2,840
INTERNATIONAL DR			1.08			1.08	\$2,160,000
KIRBY RD	0.42				0.18	0.6	\$36,900
LEESBURG PIKE SERVICE RD	0.09					0.09	\$3,456
LEWINSVILLE RD	1.43					1.43	\$6,435,000
LISLE AVE		0.25			0.96	1.21	\$9,595
OLD MEADOW RD		0.19				0.19	\$1,843
WILSON LN	0.07					0.07	\$6,090
WILSON LN BRIDGE	0.14					0.14	\$630,000
(Unknown name)		0.14				0.14	\$4,298
Grand Total	3.5	0.58	1.08	1.2	2.3	8.46	\$14,085,770

Phase 4: Off Road Projects

Facility	Construct	Construct w/ Road Project	Realign	Rehab Existing	Widen Sidewalk	Total Miles (Rounded)	Total Cost
Courthouse Spring Branch Trail System			2.05			2.05	\$4,100,000
Planned			2.05			2.05	\$4,100,000
Jones Branch Trail	0.24					0.24	\$480,000
Planned	0.24					0.24	\$480,000
Kirby Rd Sidepath					0.15	0.15	\$300,000
Proposed					0.15	0.15	\$300,000
Leesburg Pike Sidepath	2.75					2.75	\$5,500,000
Planned	2.75					2.75	\$5,500,000
Macbeth St Connector	0.33					0.33	\$660,000
Proposed	0.33					0.33	\$660,000
Scotts Run Trail System	0.29					0.29	\$580,000
Planned	0.29					0.29	\$580,000
Spring Hill Rd Sidepath	0.15					0.15	\$300,000
Proposed	0.15					0.15	\$300,000
Wolf Trap Creek Trail	0.29					0.29	\$580,000

Proposed	0.29					0.29	\$580,000
Wolf Trap Stream Valley Park Trail System			1.36			1.36	\$68,000
Existing			1.36			1.36	\$68,000
Grand Total	5.1	1.1	2.05	1.36	0.15	8.4	\$14,868,000

Phase 4: Intersection Improvements

Description	Status
International Dr and Galleria Dr	Proposed
International Dr and Tysons Blvd	Proposed
Westpark Dr midblock trail crossing	Proposed

Phase 4: Interchange Improvements

(none)

Phase 4: Access Improvements

Name	Status	Action
Redd Road Trail Bridge	Proposed	Install trail bridge over stream to connect two cul-de-sacs

Phase 4: Bicycle/Pedestrian Overpass Options

Name	Status	Facility Type
Beulah Rd	Proposed	On Road or Off Road
Wilson Lane – Tysons Corner Mall Connector	Proposed	On Road
Toll Road Overpass at Greensboro Extended (w/potential entrance ramp)	Proposed	Off Road
Toll Road Overpass at McLean Hamlet Park (w/potential entrance ramp)	Proposed	Off Road
Marshall High School Overpass	Proposed	Off Road
Old Meadow Lane – Tysons Corner Mall Connector	Proposed	Off Road

Note: Due to significant variation in potential bridge costs, and considerable differences in the potential bridge locations, cost estimates for the bridge options are not provided. Additionally, most of the potential bridge locations require a significant length of grade-level trail or on-street facilities leading to the approaches at each end. Because these costs would not be incurred unless the bridge option was selected, they too have not been included in the off-road or on-road cost estimates.

Long-Term Facilities

Street Name	Bike Lane	Buffered Bike Lane	Climbing Lane	Cycletrack	Paved Shoulder	Total Miles (Rounded)	Total Cost
AMBERGATE PL	0.09					0.09	\$8,029
BALLS HILL RD	1.96					1.96	\$5,644,560
BOONE BLVD	0.12					0.12	\$10,812
CHAIN BRIDGE RD		1.15		0.18	1.12	2.44	\$10,981,579
CHOLESHIRE DR	0.11					0.11	\$9,309
CLARKS CROSSING RD			0.87			0.87	\$8,445
COLSHIRE DR	0.24					0.24	\$20,745
COLSHIRE MEADOW DR	0.20					0.20	\$17,776
DARTFORD DR	0.08					0.08	\$7,036
DOLLEY MADISON BLVD	0.28			7.63	0.68	8.60	\$37,447,061
FLETCHER ST	0.05					0.05	\$4,514
GALLOWS RD				0.51		0.51	\$1,012,861
GREAT FALLS ST	0.21					0.21	\$925,639
HOLLY RIDGE DR	0.21					0.21	\$18,374
IDYLWOOD RD	0.53					0.53	\$55,651
INTERNATIONAL DR				1.49		1.49	\$2,985,665
LEESBURG PIKE				4.14		4.14	\$8,281,045
LEESBURG PIKE SERVICE RD				0.15		0.15	\$296,912
MAGARITY RD	1.23					1.23	\$5,528,535
OLD COURTHOUSE RD	0.39				0.52	0.91	\$4,076,856
OLD DOMINION DR	1.07					1.07	\$4,819,725
PARK RUN DR			0.36			0.36	\$3,478
SPRING HILL RD	0.65					0.65	\$56,608
TYCO RD	0.30					0.30	\$25,727
TYSONS CORNER CTR	0.28					0.28	\$24,676
WATSON ST	0.18					0.18	\$15,246

Street Name	Bike Lane	Buffered Bike Lane	Climbing Lane	Cycletrack	Paved Shoulder	Total Miles (Rounded)	Total Cost
WESTPARK DR	0.46					0.46	\$40,017
WESTWOOD CENTER DR	0.18					0.18	\$15,505
Unknown Name	0.31			0.22		0.53	\$470,834
Grand Total	9.13	1.15	1.23	14.32	2.32	28.14	\$82,813,220

J. Cost Estimate Methodology

Fairfax County developed planning-cost estimates by identifying pay items and establishing rough per-mile quantities. Cost estimates are based on 2010 dollars and were assigned based on project costs from previous projects in Fairfax County. The costs are intended to be general and used for long-range planning purposes. They do not account for inflation. Construction costs will vary based on the ultimate project scope (i.e., combination with other projects) and economic conditions at the time of construction.

In general, the following assumptions apply, however a table follows, which includes select exceptions and specific cost per-mile multipliers for each facility/action combination:

- The costs shown reflect cost associated with construction of the particular bicycle or pedestrian facility indicated. The costs shown do not reflect other costs that may be associated with a larger project.
- A contingency is applied to the cost for each item of approximately 25 percent of construction cost.
- Preliminary engineering and design costs are approximated at 15 percent of total construction cost.
- Maintenance of Traffic costs are approximated at 5 percent of total construction cost.
- The planning estimates do not include costs for substantial right-of-way acquisition (unless noted), lighting, significant changes in vehicular traffic patterns, or future facility maintenance.
- Eradication cost is assumed to be \$4 per linear foot (one mile is \$21,000) and paint cost is assumed to be \$.50 per linear foot (one mile is \$3,000).
- Cost estimates do not include access, interchange, intersection or bridge improvements given the unique character and broad potential range of costs for these improvements.

Detailed Assumptions for Cost Estimates

Facility/Action Combination	Cost Per Mile	Notes
Signage		
Add Signage	\$2,000	Includes all sign types
Bike Lane		
Add Bikeway w/ RD Reconstruction	\$4,500,000	ROW included. Note that over 50 percent of the new bike lanes will likely only cost Fairfax County the striping amount as VDOT's repaving schedule will likely incorporate the rest of the repaving cost.
Add Striping and Marking	\$17,400	
Construct	\$4,500,000	See above.
Lane Diet	\$87,000	
Pave Shoulder	\$105,000	Assumes a 2-foot paved shoulder (\$20 a linear foot)
Remove Parking 1 Side	\$38,400	
Road Diet	\$192,000	
Widen Road	\$4,500,000	ROW included.
Buffered Bike Lane		
Lane Diet	\$64,500	Assumes the cost of bike lane plus \$21,000 per mile (\$4 per foot for hash striping)
Climbing Lane		
Add Striping and Marking	\$9,700	Assume half of the cost of a bike lane plus half of the cost of shared lane markings.
Lane Diet	\$22,750	
Remove Parking 1 Side	\$30,700	
Cycletrack		
Construct	\$2,000,000	
Paved Shoulder		
Pave Shoulder	\$105,000	
Widen Road	\$4,500,000	
Sharrow		
Add Striping and Marking	\$2,000	Assumes \$200 per stencil and 10 stencils per mile.
Lane Diet	\$23,000	
Remove Parking 1 Side	\$23,000	
Multi-Use Trails		
New, realigned, reconstructed, widened, etc.	\$2,000,000	
Simple resurfacing of existing trail	\$50,000	

K. Potential Impacts of the Proposed Bicycle Facilities

The four phases of the Tysons Corner Bicycle Master Plan (the Plan) include a broad set of recommendations for physical improvements that will enhance roadways, transit facilities, greenways, or right-of-way in and adjacent to Tysons Corner. When developing recommendations for the Plan, the Fairfax County DOT considered the possible implications or impacts that the recommended improvements and programs may have on areas of concern such as:

- The convenience of travel across multiple modes (defined by measures of accessibility to destinations and overall travel mobility);
- The safety of cyclists, pedestrians, and drivers;
- Public and private property and rights-of-way (ROW); and
- Air quality and the natural environment.

This section addresses how the bicycle network improvements and programs affect these areas of interest.

MOBILITY

Traveling by Bicycle

The Bicycle Plan makes many recommendations for bicycle facilities that will help to increase connectivity, comfort, and safety for people who choose to travel by bicycle. Full deployment of the Plan within the area approximately 3 miles from Tysons Corner will result in an additional 85 miles of on-road facilities by 2030. Of the on-road facilities, bike lanes, buffered lanes, climbing lanes, or cycletracks represent 44 miles. This represents almost a tripling of total on-road bicycle facility mileage in the area and provides multiple direct connections into the W&OD trail and a proposed additional 30 miles of shared use paths/off-road facilities.

Based on 2005 population in Tysons Corner and the surrounding area, there are 0.04 miles of on-road bicycle facilities for every 1,000 people. By 2030, with projected population growth and broad network expansion as identified in this plan, the density increases to 0.9 miles per 1,000 people.

Traveling by Transit

The Plan not only identifies improvements and programs that will provide the opportunity for biking to be a preferred and reliable form of transportation, but it also creates safe and direct links from residential communities to the Metrorail stations, and

from Metrorail stations to prominent destinations throughout Tysons Corner. The Plan encourages integrating bicycle facilities with buses and bus stops, by recommending improvements that would link to bus routes, supporting bicycle racks on buses, and providing quality bicycle parking at bus stops as well as at Metrorail stations.

Traveling on the Roadways

When developing the Plan, impacts to automobile mobility was considered, as many recommended bicycle improvements are on existing Tysons Corner roadways. Actions taken to accommodate bicycle improvements fall into two general categories – those which diminish capacity (reduce the number of vehicles which can travel a roadway over a particular time period) and those that do not. In the Plan, the majority of actions recommended to develop improvements are those that do not typically diminish vehicle throughput on a roadway, these include adding shared lane markings to roadways and implementing lane diets that include restriping the travel lanes to provide bicycle lanes or wide outside lanes that have shared lane markings in them.

Actions that can diminish motor vehicle capacity include road diets, which involve removal of one or two travel lanes in order to add bicycle lanes. In many cases, prior to implementation of a road diet, a study will be conducted to ensure that the action taken is appropriate for traffic operations and safety as well as the safety of the bicyclist.

Developing a bicycle network in Tysons Corner will also have a positive impact on roadway congestion in the area whether the road has a planned bicycle facility or not. Based on a combination of socioeconomic and travel data from the 2000 Census, 2001 National Household Travel Survey, and MWCOG's regional travel demand model, ranges of estimates on the current number of bicycle trips and anticipated future number of bicycle trips can be made. On an average work day, in 2005 there are 400 to 500 bike-to-work trips with a production or attraction in and around Tysons Corner. Based on population and employment growth in Tysons Corner and full build-out of the planned bicycle network this could increase to 5,700 to 6,300 bike-to-work trips per day by 2030. This does not include increased bike-to-transit-to-work trips.

The resulting reduction in vehicle trips from this mode shift may decrease congestion in specific intersection locations in the peakperiods. The potential also exists for reductions in off-peakperiods, although these impacts on congestion are anticipated to be minor.

SAFETY

The recommendations for Tysons Corner bicycle facilities have been made with safety in mind. The safest and best routes have been chosen, matched with the appropriate facilities based on roadway geometry, speeds and traffic volumes to be phased in over time on those routes. Certain routes may not be considered adequately safe for bicycling without the recommended improvements. Despite best efforts to address safety, not all safety concerns for each improvement can be addressed directly in the Bicycle Plan. At the time of implementation, details about engineering/design, enforcement, evaluation, education and encouragement will need to be given full attention. Fairfax County planners and engineers prioritize safety when considering any transportation improvement, this will continue to be true when considering implementation of the recommendations of the Plan.

Challenges to Safety

Highway Interchanges

Safely traveling in and out of Tysons Corner was a prime concern voiced by both the attendees of public meetings and the BAC. As Tysons Corner is bisected by several major, high-speed, high-volume roadways, including I-495, Dulles Toll Road (VA Route 267), Leesburg Pike (VA Route 7), and Dolley Madison Boulevard (VA Route 123); providing safe routes to cross these roadways is especially critical. Highway interchanges are a particular barrier and challenge for cyclists, because the crossings are long, the motor vehicles are traveling at high speeds, and there are typically not stop controls at the ramps. This environment greatly increases the chance for bicyclist/vehicle conflict. Most improvements to create safe passage for cyclists pose challenges by either impacting vehicle flow (by stopping traffic to allow for crossing) or are costly (such as construction of grade separated crossings).

Difficult Intersections

High-volume roadways with difficult intersection crossings need to be addressed for safety. There are numerous best practices for intersection engineering and design which accommodate bicycles. However, there are a limited number of improvements which can be implemented at a given time due to funding, and it may be necessary to impact traffic flow and/or adjust signal timing in order to improve bicycle safety.

A full list of intersections and interchanges recommended for improvement is provided in Appendix I.

Driveways

Corridors where cyclists may choose to use sidewalks or sidepaths typically have frequent driveways and crossings of minor streets. Combined with high-peakperiod traffic volumes and turning movements driveways can be dangerous for cyclists. This potential vehicle/bicyclist conflict is minimized to the extent possible in the Bicycle Plan through recommended yield or stop signage at driveway entrances and exits for motorists.

On Street Parking

While on-street parking supports ground-level retail, promotes pedestrian activity on sidewalks, and contributes to lower motor vehicle speeds, it can present hazards for cyclists. Frequent parking turnover increases the potential for vehicle/bicycle collisions as cars move in and out of parking spaces across the bicycling space. Also, the opening of driver-side car doors presents a danger to cyclists on the right edge of the travel lane. In settings where cyclists are going downhill, bicycling in the door zone is particularly dangerous because a bicyclist cannot stop in time to avoid a suddenly opened door.

Across the U.S., new design guidelines are being implemented for bicycle lane design and shared lane markings placement that ensures sufficient buffer distance from on-street parking. These designs have been included as part of this plan. For example, in situations where roadway space is tight and shared lane markings are the recommended bicycle treatment, the shared lane marking symbol should be located in the middle of

the shared travel lane, so cyclists are encouraged to ride away from the door zone. In addition, this encourages motorists to respect cyclists' rights to the entire lane if needed as allowed by Virginia traffic law.

RIGHT-OF-WAY

The Plan recommends improvements that may occur on public or private right-of-way. Any changes to the public right-of-way will be given careful consideration by the agencies involved in implementing bicycle facilities. Improvements to the private right-of-way are recommendations only, to develop the optimum bicycle network based on predicted land use patterns. These may be altered slightly depending on development design and construction.

Most improvements recommended for public right-of-way will be discussed and negotiated by the Virginia DOT or Fairfax County DOT. In cases where additional right-of-way is required, these negotiations will include developers and/or current property owners. Additionally, there are some recommendations for private right-of-way that may require working together with homeowner associations or private property owners to allow for small but important network connections to be made, such as passage through a church or store parking lot to connect bicycle facilities. In more significant needs for a connection through a private parcel, negotiations regarding a permanent easement may be required.

AIR QUALITY AND THE ENVIRONMENT

Air Quality

Another benefit of investing in the recommended bicycle facilities is that each additional trip made by bicycle likely results in one less vehicle trip, which helps to reduce congestion and road maintenance costs, and improve air quality.

The most significant impact is expected for commute trips, where the mode shift resulting from implementation of the bicycle plan will pull vehicle trips (either existing drive alone or carpool trips) off of the congested a.m. and p.m. peak roadway networks. The primary focus area of the commute mode shift is within 3 miles of Tysons Corner.

Other vehicle trip reductions are likely for home to school trips, home to shopping trips and non-home based work trips (i.e., running errands during lunchtime from work or traveling to work-related meetings). The bicycle plan's proposed network and associated policies also help encourage bicycling as a preferred travel option for these trips.

Table 4 in Section 2 presents the motorized trip mode shares for all trips with a start or end in the three-mile Tysons Corner buffer area. In 2030 with assumed long-range redevelopment and investment in transportation, 52 percent of all trips are drive alone, 45 percent are carpools, and 3 percent is transit. The primary change from 2005 travel characteristics is a shift of 5 percent of drive alone trips to carpools and transit.

When looking only at commute trips, 2005 conditions reflect that 79 percent of trips are drive alone, decreasing to 69 percent by 2030. The 10 percent reduction in drive alone mode share predominantly goes to transit by 2030 as a result of build out of the Silver

Line Metrorail. The critical question is: what additional share of drive-alone trips may shift to biking or biking to transit with implementation of the bicycle plan?

There are two options for estimating a range of total daily bicycle commute trips in 2030. Option 1 is based off of the change in population density and connects this to average weekly bicycle trip rates per capita as reported in the 2001 National Household Travel Survey. Option 2 is based off findings from a 2003 research report “Bicycle Commuting and Facilities in Major U.S. Cities” that surveys 42 cities in the U.S. and uses data on population density and bicycle network density to approximate how changes in network density at different ranges of density impact total bicycle commute trips.³³

The results of using these two methods estimates that on a daily basis, in 2030 up to 5,700 to 6,300 daily commute trips could be completed solely by a bicycle. Based on the following assumptions:

- An average trip length of three miles;
- 250 work days annually; and
- Frequent users will ride to work at least three days a week,

the total annual Vehicle Miles Traveled (VMT) reduction in 2030 within the three-mile Tysons Corner area ranges from 1.43 to 1.71 million vehicle miles.

When accounting for all trip types, the annual VMT reduction in 2030 could be as high as 3.61 million vehicle miles, equivalent to 7,100 daily bicycle trips. Depending on average speeds and vehicle data, reduction in criteria pollutant emissions resulting from the annual and daily change in VMT can be estimated.

Assuming an average-per-mile emissions rate of 250 grams CO₂ per mile (consistent with the final rule for light-duty vehicle model years 2012-2016 CAFE standard), in 2030 total CO₂ emissions reduced would range from 3,100 to 7,900 lbs (1.6 to 4.0 tons of CO₂).³⁴

Watersheds

The recommended improvements in the Plan have a very minimal effect on the amount of impervious surface area in Tysons Corner. Most improvements would simply include restriping or repaving of an existing hard surface. For example, many improvements entail adding marking or striping to existing roadways, or improving shoulders, but do not expand the paved surface of roadways. The most probable contribution the Plan may make to increase the impervious surface area in Tysons Corner would be cycletracks proposed parallel to existing roadway corridors and the proposed paths in several parks, where some grass, dirt, or gravel may be replaced with a hard-surface bicycle path.

³³ Dill, J., and T. Carr (2003). “Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them – Another Look.” *Transportation Research Record* No. 1828, National Academy of Sciences, Washington, D.C.

³⁴<http://www.nhtsa.gov/Laws+&+Regulations/CAFE+Fuel+Economy/Model+Years+2012-2016:+Final+Rule>