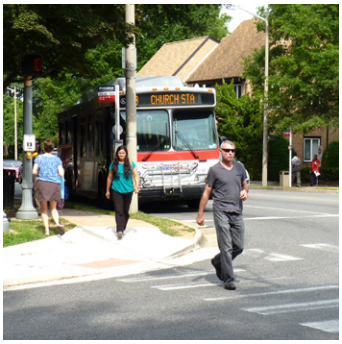

CITY OF FALLS CHURCH

Transit-Oriented Design within and Beyond the Quarter-Mile

Prepared by

FOURSQUARE INTEGRATED TRANSPORTATION PLANNING

June 30, 2013

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INTRODUCTION

The City of Falls Church, long-recognized as a tight-knit community with a high quality of life, is currently implementing its vision of a 21st century community. The Falls Church Comprehensive Plan (2005) states that the City recognizes itself as an "urban village with a balance of uses," while identifying the need to preserve and enhance Falls Church as a "vibrant and lively enclave in Northern Virginia." It established the following vision for transportation in the City of Falls Church:

> "All areas of the City will be highly accessible both internally and from the region via a range of public and private transportation alternatives, complementing the most common choice of transportation, the automobile. Neighborhoods, shopping, recreation, and schools will be linked in a variety of ways including public transit, pedestrian paths, and bikeways. This choice of modes of transport will contribute to the region's efforts to improve air quality."
>
> *City of Falls Church Comprehensive Plan (2005)*

To help meet its transportation vision, while preserving the character of "The Little City" as new commercial and mixed-use projects emerge, Falls Church requested technical assistance to create a Transportation Demand Management program through the National Capital Region Transportation Planning Boards (TPB) Transportation-Land Use Connections (TLC) program. The TPB established this program to assist local governments in improving transportation and land use coordination.

Transportation Demand Management (TDM) is a set of tools and policies that are employed to increase the use of transportation options to driving alone, including transit, carpool/vanpool, bike, and walk. TDM is not the provision of transit service or any type of transportation infrastructure, but seeks to maximize existing investments in alternative modes. This plan provides the City with a TDM Strategies Toolbox for reducing the number and proportion of trips to, from and within the City that occur in single-occupant vehicles (SOVs), and to increase the availability of information and use of transportation options by City of Falls Church workers, residents, and visitors. It also includes a proposed framework for the incorporation of TDM in the site plans process. Through the application of TDM, the City aims to maximize its existing transit investments and compact, walkable nature.

Falls Church is also seeking to capitalize on its proximity to two Metrorail Stations, East Falls Church and West Falls Church, to implement TDM measures that enable the extension of transit-oriented, mixed-use development beyond the traditional quarter-mile radius from a rail station employed in transit-oriented development (TOD) planning. The City is currently in the midst of a small area planning process for its Washington Street Corridor, with the center of this corridor at Washington Street and Broad Street (VA-7) being located 0.8 miles from East Falls Church Metrorail Station. This planning process also incorporates a focus on the Washington Street Corridor, and specific strategies for linking this corridor with the East Falls Church Metrorail Station.

The Little City

CITY OF FALLS CHURCH

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1 OVERVIEW

INTRODUCTION

The City of Falls Church is 2.2 square miles, with 12,332 residents[1] and 8,903 jobs[2]. Located just outside the City limits are two Metrorail stations that have the City's name: East Falls Church and West Falls Church. The regional Washington and Old Dominion (W&OD) off-road bicycle and pedestrian trail transects the City, and several high-capacity regional Metrobus routes (including the 2A/B/C/G, 3A/B and 28A/X) travel through Falls Church.

In Falls Church, as is common through the Washington, DC metropolitan area, traffic congestion is a serious impediment to welcoming new businesses and residents to the community. The City is investing in the provision of transportation options to help reduce congestion in the City and provide choices for people who live and work in the City. Falls Church has plans for the development of an intermodal transit facility at Hillwood Street and Washington Street, and is participating in a multi-jurisdictional Alternatives Analysis that is exploring the possibilities for high capacity transit service on VA-7 (Broad Street). The City is also planning to implement bicycle and pedestrian improvements in the coming years.

Commercial development in Falls Church is predominately small, low-rise office and light industrial buildings originally developed in the 1950s, 1960s, and 1970s, with parking abundant at some and sorely limited at others. Much of the office stock in the City is Class C, which is not desirable for many of the Washington, DC area's employers. Falls Church is interested in facilitating the revitalization of the commercial corridors, both to create a "complete" community where citizens can "live, work, and play," and to foster the economic development that is needed to support critical City services for residents.

The Comprehensive Plan identified three primary "opportunity areas" for redevelopment within the City:

- The West Broad Corridor
- The intersection of Washington and Broad Streets
- The Washington Street Corridor

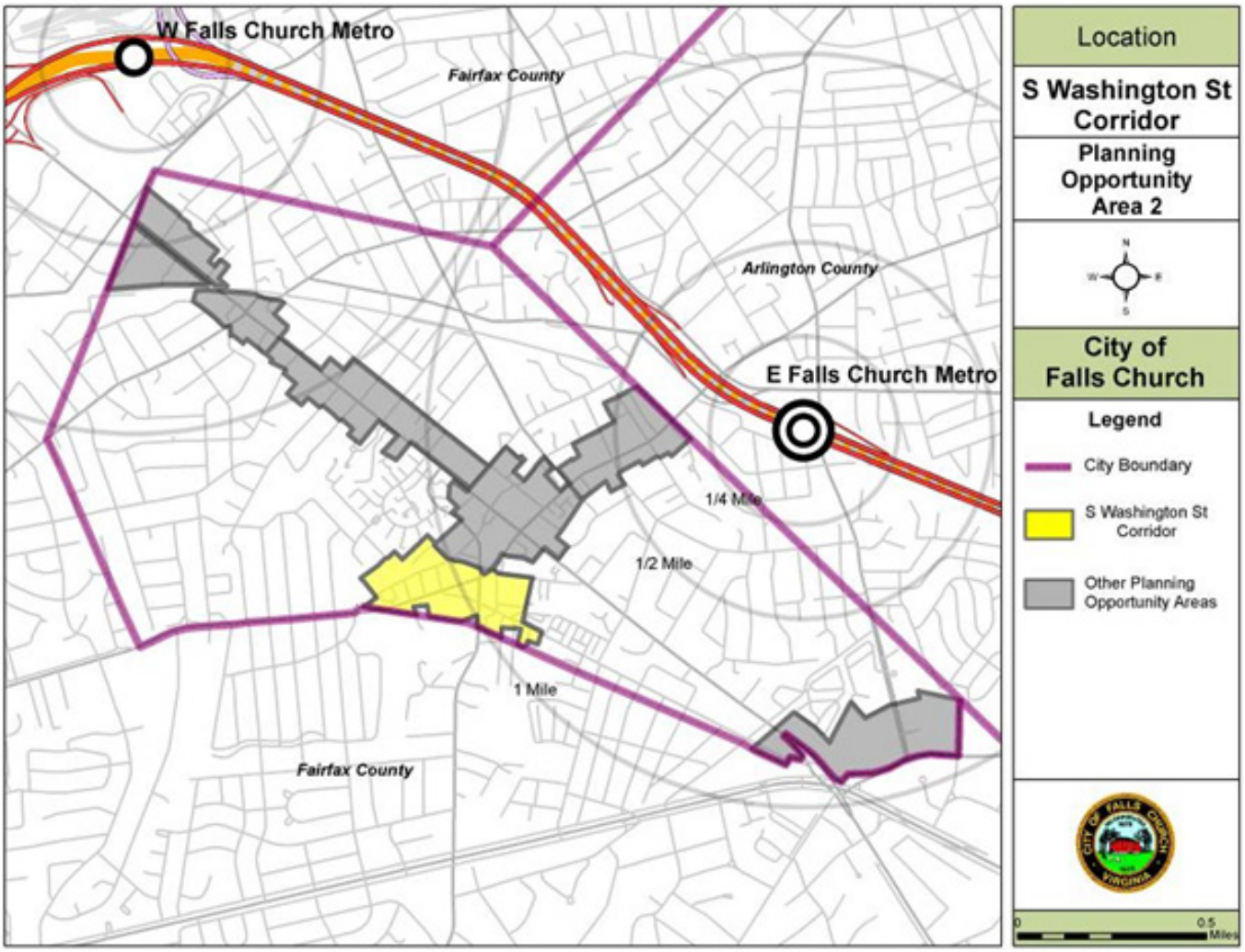
Falls Church is currently working on a series of Small Area Plans (SAP) for the Washington Street Corridor. The City completed the North Washington Street SAP in 2012 and is currently working on a Small Area Plan for South Washington Street. Following this plan, a third small area plan will be developed for planning opportunity Area 3, the "Center City" Plan, which is for the central section of the Washington Street Corridor at Washington Street and Broad Street. The North Washington Street SAP, with its focus on intensive commercial development that will lead to greater economic development, is a model for the South Washington and Central Washington SAPs.

W&OD Trail in Falls Church

Massing Model of Washington Street at Hillwood Street

Some redevelopment activity has already occurred. Within the City's two square miles, there are currently three development projects under review: one is an office project at Washington Street and Columbia Street; another is a mixed use development at Broad Street and Little Falls Road that includes 282 residential multi-family units and the City's second grocery store (a Harris Teeter); and the third is a 224-unit residential building with ground floor retail located in the South Washington Street area.

Figure 1: Planning Opportunity Areas in Falls Church



TDM IN THE FALLS CHURCH COMPREHENSIVE PLAN

The City of Falls Church Comprehensive Plan, Chapter 7: Transportation, includes the application of transportation demand management techniques as a key strategy for reducing traffic within and through the City. According to the Comprehensive Plan, TDM techniques are needed to address the fact "that increasing road capacity over the years has allowed roads to move more automobiles, but not necessarily more persons." Among the TDM techniques aimed at reducing the use of single-occupancy vehicles use and decreasing their associated congestion and pollution listed in the comprehensive plan are improved pedestrian connections, increases in transportation services including bus service tailored to the needs of suburban commuters, telecommuting, compressed work schedules, and strategies that increase the use of mass transit, carpooling, walking, bicycle use, and high occupancy vehicle (HOV) lanes on interstates.

The Comprehensive Plan's discussion of TDM techniques note that although the City has two Metrorail Stations, East Falls Church and West Falls Church, located in close proximity, that many of the City's and surrounding area residents do not work in areas that are served by Metrorail. Parking is also at capacity at East Falls Church.

> "Traveling from the City to locations outside of the City by automobile will remain a challenge. Therefore public transit and non-automotive options for travel will remain extremely important to the City's residents. The City should also pursue Transportation

Demand Management Techniques to reduce traffic demand, particularly during peak travel periods."

City of Falls Church Comprehensive Plan, Chapter 7: Transportation

The Comprehensive Plan calls for the development and implementation of a transportation demand management plan for City employees and for other businesses and organizations within the City, as Required Action associated with the Transportation Chapter's *Goal 6: Encourage the Use of Non-automotive Modes of Transportation within the City and to the Region*. This plan was developed to provide a toolbox of TDM strategies that the City can apply, both programmatic measures as well as TDM measures that can be applied during the development process, to fulfill this Required Action as listed in the Comprehensive Plan.

BENEFITS OF TDM

Implementing a TDM program that reduces vehicle trips, particularly single-occupancy vehicle trips, provides tangible benefits to City residents, workers, local government, employers, and developers.

Nationally, transportation comprises 28 percent of all greenhouse gas emissions, according to the Environmental Protection Agency.[3] Reductions in the use of automobiles, particularly single occupancy vehicles, will both reduce carbon emissions associated with global warming and improve local air quality. The World Health Organization has identified air pollution as major environmental health risk, associated with lung cancer, respiratory disease, and heart disease.[4] Studies have shown that air pollution caused by traffic has a particularly negative impact on the health of children and teenagers; a major review of over 700 studies from around the world found that air pollution generated by traffic is associated with the onset of childhood asthma and asthma attacks in children. This study also found that living near major highways and bus roads causes impaired lung function, premature death and death from cardiovascular diseases, and cardiovascular morbidity.[5] The Washington metropolitan region is a federally designated non-attainment area for two pollutants, ground-level ozone and particle matter (PM) 2.5 according to federal health standards.[6] By reducing traffic to and within the City of Falls Church, local air quality will be improved, having a positive impact both on public health and the environment.

Reducing vehicle trips within and to the City also addresses on the of the top quality of life issues in the Washington, DC metropolitan region: traffic congestion. Texas A&M Transportation Institute's 2012 Urban Mobility Report ranked the region's first in the nation for annual hours of traffic delay due to congestion.[7] In a 2009 constituent survey conducted by Delegate Jim Scott, representing Virginia House of 53rd District which encompasses all of the City of Falls Church and parts of neighboring Fairfax County, 72 percent of the 600 respondents listed traffic congestion was one of the top two issues facing the area. No other issue even came close to traffic congestion. Clearly, traffic congestion is impacting the quality of life in the City of Falls Church and surrounding communities.

Implementing TDM is one of the most cost-effective and economically beneficial transportation investments that can be made. TDM reduces the cost of transportation for the user, as utilizing alternative forms of transportation such as transit, cycling, walking, and ridesharing are generally less costly than driving alone. These savings can be quite significant considering that the average American household spends 19 percent of the annual income on transportation,[8] while the average cost of owning and operating a vehicle (assuming 15,000 vehicle miles per year), is nearly $9,000 (excluding any loan payments or leasing costs).[9]

Cost-benefit analyses, many completed with the TDM-specific TRIMMS™[10] model, generally produce very favorable results.[11] Compared with transportation capital or operations investments, such as roadway expansions or new transit service, TDM can meet the same demand for personal mobility at a far lower cost per trip. In one comparasion of the cost of investing in new light rail service versus TDM in the Los Angeles area, the cost per vehicle trip reduced via light rail ranged from $9.60 to $10.76 per trip, while the cost of reducing the same trip using a ridesharing program was just $3.62. TDM is also one of the most cost-effective strategies for reducing vehicle emissions.[12]

TDM has a measurable impact on traffic congestion reduction. In Fiscal Year 2011, Arlington County's Commuter Services Bureau reduced 37,000 vehcile trips on I-395 and I-66 during the three hours of rush hour.[13] Studies in Washington State have found that congestion in the Seattle area's I-5 corridor (measured in lane miles of congestion), would increase in their four-hour rush hour by 23 percent in the morning and 44 percent in the afternoon without the state's investment in TDM

programs. TDM's ability to reduce congestion reduces traveler delay, increasing worker productivity and quality of life.[14]

As the City and the surrounding areas continue to grow, the needs to limit the traffic impacts is paramount. Neighboring Arlington County has seen a phenomenal amount of development in recent decades; adding 6.3 million square feet of office, close to a million square feet of office, nearly 11,000 multifamily housing units, and over 1,000 hotel rooms between 1996 and 2009. During the same period, traffic volumes actually fell on some of Arlington's major thoroughfares, including Lee Highway and Glebe Road. Office and residential development along the Rossyln-Ballston Metrorail corridor grew by 17.5% and 21.5% respectively between 1997 and 2004, while traffic along the corridor only grew by 2.3% in this same period. Arlington County has successfully accommodated all of this growth, *without increasing traffic*, and while maintaining one of Northern Virginia's lowest property tax rates and highest levels of public services.[15] While Falls Church is different from Arlington – it is a much smaller community and its commercial centers along the Washington Street Corridor and Broad Street are located further from Metrorail Stations – the Arlington experience does provide an example of how transit-oriented, livable communities can continue to grow and economically prosper, while limiting the transportation impacts of growth.

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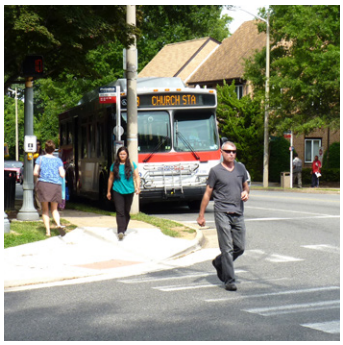

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GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

CHAPTER 2: GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

In any plan, it is important to establish the purpose, goals and objectives at the outset to ensure that the recommendations in the plan will help achieve the plan's intent. As part of the "Transportation Visioning" process for this plan, goals, objectives, and performance measures were created to inform the development of a TDM program in Falls Church and to provide a framework for program evaluation.

Goals are broad statements of what the agency hopes to achieve and are qualitative in nature. Objectives, each tied with a specific goal, are specific, measurable statements of what will be done to achieve goals. Objectives must also be realistic and achievable to be truly useful. Performance measures are typically quantitative in nature and provide a sense of the impact or outcomes of a program. While it can be methodologically difficult to determine the overall impact of a TDM program on changes in usage of the transportation system apart from major factors such as an increase in transit service or new infrastructure, there are a few performance measures which can be customized to measure the impacts of the TDM program itself. Other measures, such as transportation mode splits, provide an overall understanding of how the TDM program is performing in concert with other transportation investments and services available in the community.

GOALS AND OBJECTIVES DEVELOPMENT

On February 12th, 2013, a workshop was held to develop Falls Church's TDM goals and objectives with a number of key staff members at the City of Falls Church, including: the City Manager Mr. Wyatt Shields; Assistant City Manager Ms. Cindy Mester; Development Services General Manager Mr. James Synder; Director of Public Works Mr. William Hicks; Economic Development Director Mr. Richard Goff; and Transportation Program Manager Ms. Wendy Block Sanford. Prior to this workshop, staff were provided with a summary of existing Falls Church transportation plans and relevant regional TDM plans and their goals and objectives (available in Appendix A). The goals articulated in these plans were used to guide the development of the City's TDM goals and objectives, with the City's overarching transportation vision serving as their foundation.

This workshop began with a general overview of TDM strategies, and was followed by an in-depth discussion of existing transportation assets and challenges in the City of Falls Church for residents and for individuals working or visiting the City. The use of TDM strategies to encourage new development that is compatible with the City's conception of itself as an urban village with a balance of uses was a focal point of discussion. Maintaining the unique character and livability of Falls Church necessitates that the City seek to minimize the transportation impacts associated with new development.

The shifting nature of transportation demand was also considered. Younger adults have a demonstrated preference for driving less and lower rates of car ownership, while the demand for new mobility options among seniors is growing as the baby boomer generation begins to enter older adulthood. Individuals at all stages of life, in families and in single-person households, benefit from the lower transportation costs, improved mobility, and health and environmental benefits that the access to transportation options provides.

City staff emphasized that there are many environmentally conscious residents in Falls Church, and that the City has been actively working with residents to advance a number of sustainable living initiatives. TDM programs that make

GREEN PROGRAMS IN THE CITY

The City of Falls Church has a strong commitment to environmental harmony, as set forth in the Council Vision:

The people of Falls Church believe protecting and nurturing a healthy natural environment is one of their highest callings. The City's public and private development reflect this belief in tangible ways. Parks, open spaces, and clean waterways are valued as recreational, ecological, and economic resources. Environmentally friendly residential and commercial buildings throughout the City incorporate nationally accepted benchmarks for the design, construction, and operation of high performance green buildings. The City integrates sustainability into all of its operations, including a strong emphasis on reducing dependence on fossil fuels.

Excerpted from the City of Falls Church Website, Green Programs in the City, available online at: http://www.fallschurchva.gov/content/green/default.aspx?cnlid=4961, as of June 30, 2013.

it easier for residents, workers, and visitors to access transportation options provide significant environmental benefits, and these benefits need to be clearly defined and communicated to the Falls Church community.

Finally, the staff identified the need to focus on the core of TDM, providing high-quality information about transportation options available and their benefits, to workers, residents, as an integral goal of a Falls Church TDM Program. Making sure that outreach is addresses the transportation needs of all community members, individuals working in Falls Church, and those visiting Falls Church will be a key aspect of creating a successful TDM program.

OVERARCHING TDM GOAL AND PERFORMANCE TARGETS

City staff expressed a desire to have an overarching TDM goal that is in keeping with the format of the Goals and strategies listed in the City's Comprehensive Plan. TDM is currently a strategy in the Comprehensive Plan's Goal 6: Encourage the use of non-automotive modes of transportation within the City and to the region. To focus more explicitly on the role of TDM on increasing the use of non-automotive modes of transportation within the City, this goal was modified, and two associated performance targets (also included in the performance measures for the TDM program) that will help the City understand when the goal has been met, were developed.

Goal: Utilize transportation demand management within the development process and beyond to increase the use of transportation alternatives to driving alone within and to the City.

The performance targets were established as realistic targets for SOV commute mode use reduction on an evaluation of the current mode split data obtained from the U.S. Census Bureau's American Community Survey. As shown in Figure 2, 63 percent of City of Falls Church residents drive alone to works. Figure 3 shows that 74 percent of people who work in the City of Falls Church drive alone to work. Progress towards meeting the objectives can be easily evaluated using the American Community Survey on an ongoing basis.

Nationally, 76 percent of all workers commute in a single-occupancy vehicle, and just 5 percent of workers use public transportation to reach their place of employment.[16] The City of Falls Church non-SOV commute mode share for residents is today higher than the national average, and this likely reflects the greater availability of transit, particularly Metrorail, near the City. The 2012 Metrorail Passenger Survey revealed that in the morning peak period, a time when the vast majority of riders are commuters, that over 1,100 people entering the system identified themselves as City of Falls Church residents. This is a significant number given just over 6,300 city residents over the age of 16 are in the workforce.[17]

2030 PERFORMANCE TARGETS

- Achieve a commute mode share of 50 percent non-single occupancy vehicle (SOV) by the year 2030 for City of Falls Church residents.
- Achieve a commute mode share of 40 percent non-SOV by the year 2030 for City of Falls Church workers.

Figure 2: City of Falls Church Residents – Commute Mode to Work

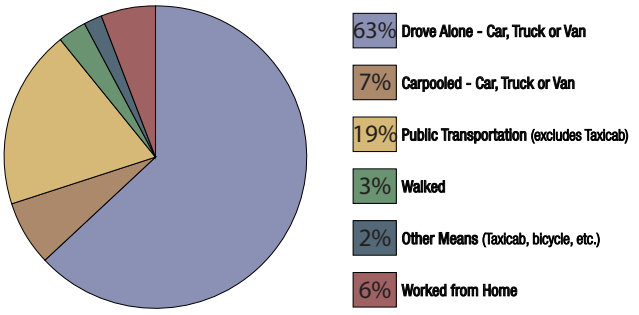
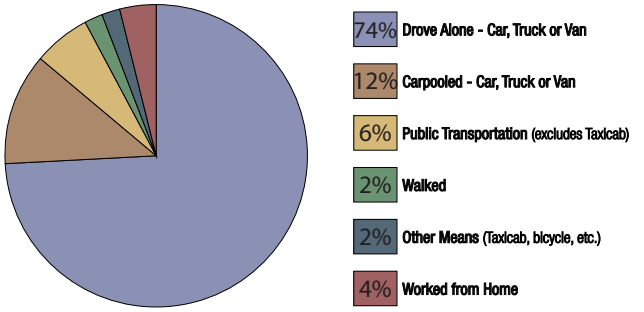


Figure 3: of Falls Church Workers – Commute Mode to Work



Data Source: U.S. Census Bureau, American Community Survey, 2011, 5-year estimates

DETAILED TDM GOALS AND OBJECTIVES

Goals and objectives were also developed for specifically to guide the implementation of a TDM program in the City of Falls Church. These goals focus on the relationship between preserving the City's character and livability and increasing its environmental sustainability, through implementation of transportation demand management.

Goal 1

Preserve the character and livability of "The Little City" while enhancing economic vitality by limiting the negative transportation impacts of growth.

Objectives

- Create transportation programs and policies that partner with developers to enable mixed-use, but appropriately sized, commercial and retail development along Falls Church's main corridors.
- As the City experiences economic growth, mitigate the impact of additional traffic and parking needs with transportation solutions that are tailored to the unique characteristics and compact size of the community.
- Make Falls Church a community that can effectively serve residents who choose to live as single-car or zero-car households.

Goal 2

Leverage transportation to help achieve the City of Falls Church's Green Program's Vision to become model for healthy and environmentally sustainable living.

Objectives

- Minimize the environmental impacts of travel through a reduction in vehicles miles traveled to and within the City.
- Reduce the number of single occupancy vehicle commute trips made to and from the City of Falls Church while increasing the share of commuters who use transit, walk, bike, and carpool/ vanpool.
- Promote active modes of transportation, such as biking and walking, as safe, convenient and healthy options for travel within the City of Falls Church.

Goal 3

Foster an appreciation for and awareness of transportation options within Falls Church through public outreach, information, and education.

Objectives

- Ensure that the social, environmental, and economic benefits of transportation options are well known to residents, workers, and visitors and decision makers.
- Ensure that the outreach and information meets the needs of individuals at all stages of life, including youth, single adults, families, and senior citizens.
- Ensure that targeted outreach is provided to specific populations, e.g., individuals working in Falls Church, service sector workers or limited English proficiency populations.

TDM PROGRAM PERFORMANCE MEASURES

The TDM performance measures listed in the table below are designed to capture the effectiveness of the Falls Church TDM program in meeting the goals and objectives established in this plan. The measures are intended to be reported on a monthly and annual basis using readily available data.

Table 1: TDM Program Performance Measures

Goal	Performance Measure	Data Source	Data Availability
Goal 1 Preserve the character and livability of "The Little City" while enhancing economic vitality by limiting the negative transportation impacts of growth.	Parking space utilization in buildings with TDM Site Plan conditions	The provision of this information would need to be required in the Site Plan condition process.	To be determined.
	Annual pedestrian and bicycle counts on the City's major commercial corridors, Broad Street and Washington Street	This could be done using volunteer labor, including students, or volunteers from bicycle advocacy and other community groups.	Annual Updates
	Percentage of zero and one-car households in Falls Church	American Community Survey, Five-Year Estimates	Annual Updates
Goal 2 Leverage transportation to help achieve the City of Falls Church's Green Program's Vision to become model for healthy and environmentally sustainable living.	Vehicle Trips and Vehicle Miles Traveled reductions that can be attributed to TDM Program	TDM Program internal calculation, calculation methodology currently in-use in the DC region	Annual Updates
	Greenhouse Gas reductions that can be attributed to TDM Program	TDM Program internal calculation, calculation methodology currently in-use in the DC region	Annual Updates
	Drive Alone Commute Mode Share for Falls Church Residents and Workers	American Community Survey, 5-Year Estimates	Annual Updates
Goal 3 Foster an appreciation for transportation options within Falls Church through public outreach, information, and education.	Number/Percent of employers working with Falls Church TDM program	TDM Program internal data	Monthly Updates
	Number of multi-family residential and commercial buildings working with Falls Church TDM program	TDM Program internal data	Monthly Updates
	Number of external partners (community groups, homeowners associations, schools) working with Falls Church TDM program	TDM Program internal data	Monthly Updates

To ascertain the starting point for the implementation of TDM in the City of Falls Church, baseline values for the non-programmatic performance measures, which are readily available U.S. Census Bureau data, were prepared.

Table 2: Baseline Performance Measures

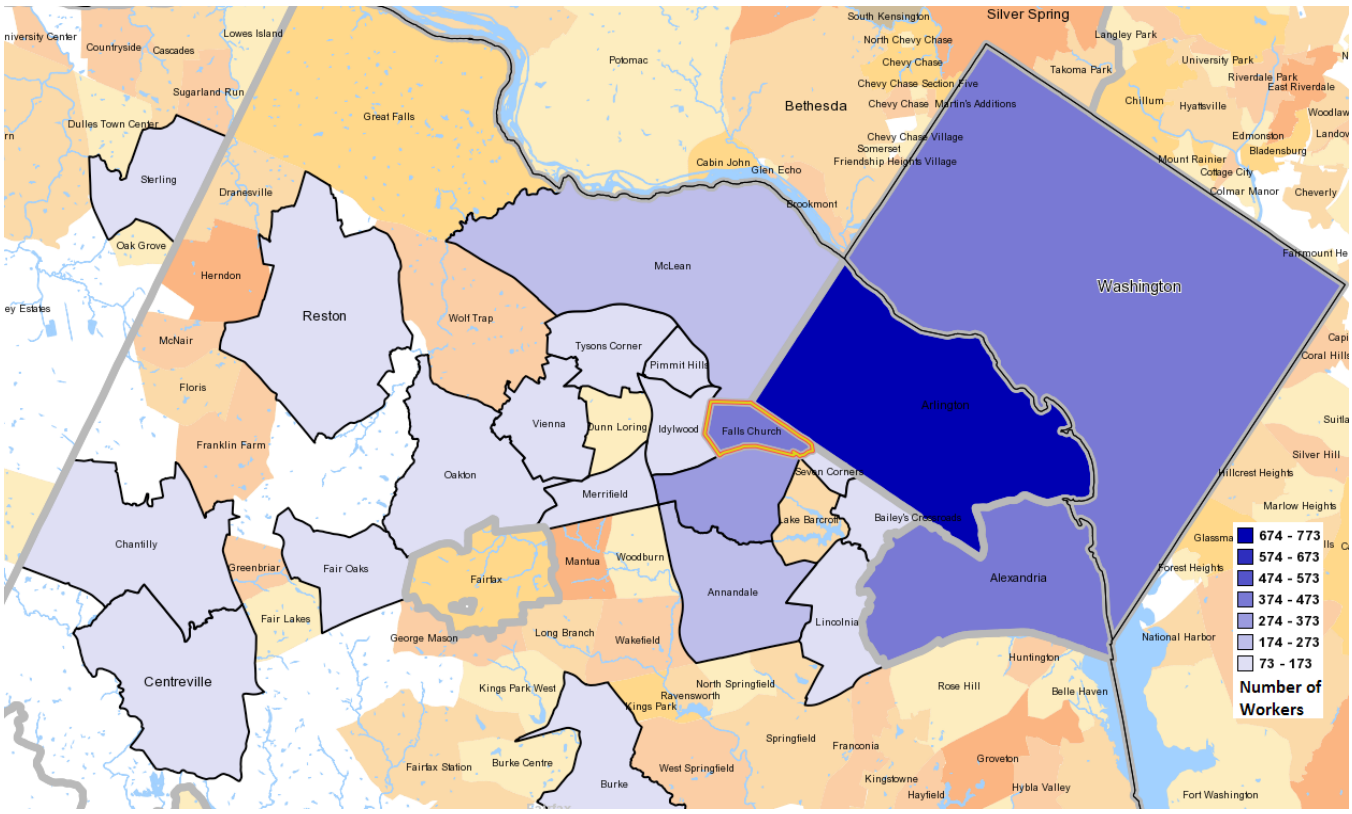
Performance Measure	Baseline Value	Percentage	Margin of Error
Percentage of Zero and One-Car Households in Falls Church	2,097	33%	Not applicable
No Vehicle Available	328	5%	+/-147
1 Vehicle Available	1,769	28%	+/-238
2 Vehicles Available	2,601	41%	+/-347
3 or More Vehicles Available	1,642	26%	+/-291
Drive Alone Commute Mode Share for Falls Church Residents and Workers			
Residents - Drove Alone	4,004	63%	+/-281
Workers – Drove Alone	6,962	74%	+/-515

Data Source: American Community Survey, 2007-2011, 5-year estimates

Today, 5 percent of households in Falls Church do not have a vehicle, but 28 percent have only a single vehicle. Taken together, a third of a Falls Church households today have zero or one vehicle. This figure is actually lower than the United States as a whole, where 42 percent of households have zero or one vehicle. While in Falls Church 26 percent of households have three or more vehicles, across the entire United States just 20 percent of households have three or more vehicles. In the Washington, DC metropolitan area,[18] 10 percent of households do not have a vehicle available, while 33 percent of households have just one car. Taken together, the regional figure of 43 percent of households that have access to zero or one car, is ten percentage points than the 33 percent of Falls Church households with access to no or just one car. As the City of Falls Church continues to achieve its vision for of an "urban village with a balance of uses" per the Comprehensive Plan vision, the percentage of households in the city with access to zero or one vehicle should move towards the regional and national percentages.

In terms of factors impacting drive alone commute mode share, there are several facts about the City's workforce that are favorable towards efforts to increase the use of transit and ridesharing to work in the City, and therefore reducing commute-related traffic. Data from the U.S. Census Bureau, Longitudinal Employer-Household Dynamics database shows that while just five percent of individuals who work in Falls Church also live in Falls Church, over half (52 percent) of people who work in Falls Church live within ten miles of the City. These workers are dispersed but there are clusters in their residential locations, which offers potential for ridesharing and potentially higher usage of existing or new transit services. As shown in the figure below, most of the City's workforce is concentrated in the jurisdictions closest to Falls Church; 64 percent of people who work in Falls Church live in either Fairfax County, Arlington County, the City of Alexandria, Washington, DC, or in the City itself.

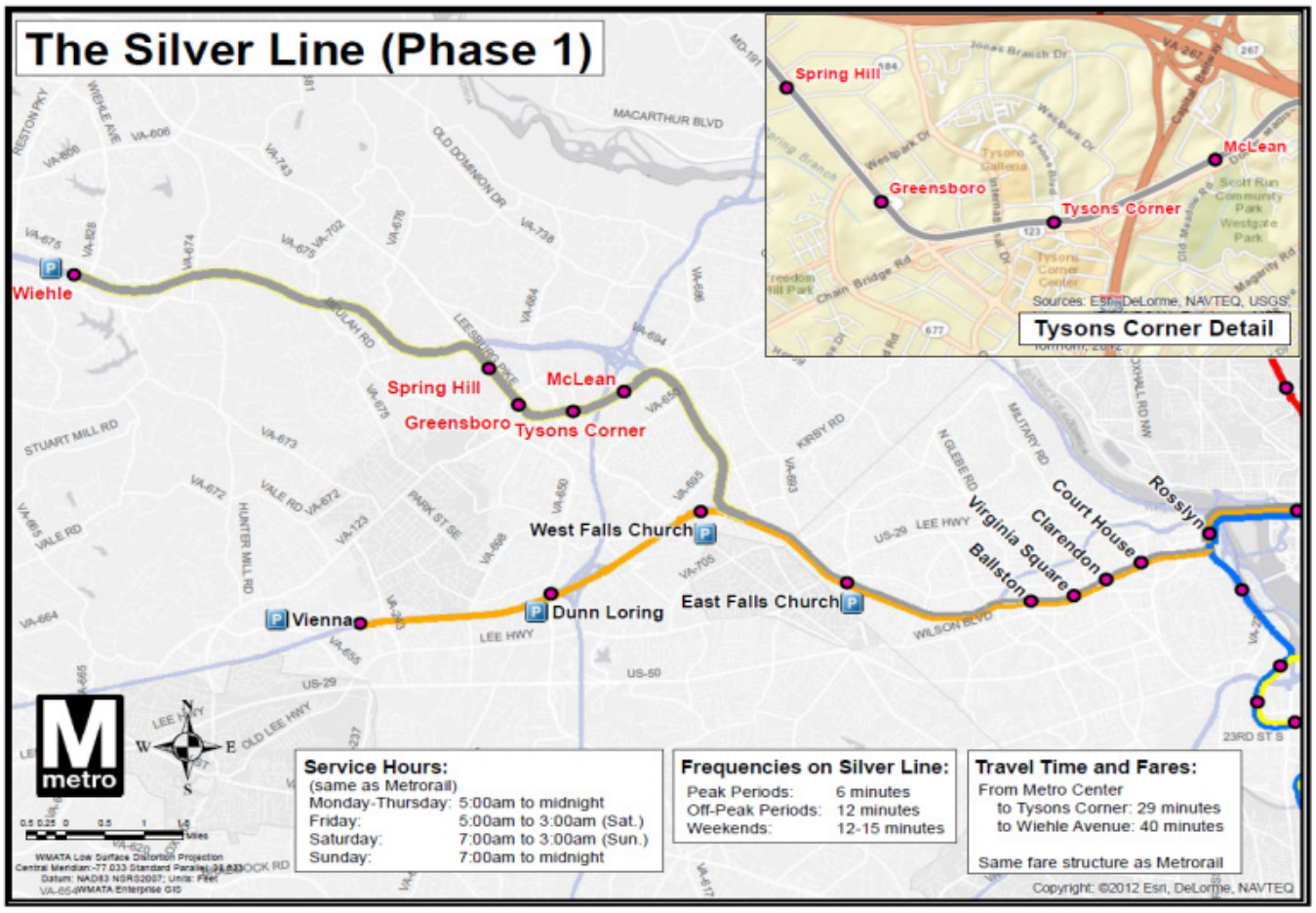
Figure 4: Where People Who Work in the City of Falls Church Live



Map Data Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics database, OnTheMap, 2011 Primary Jobs.

The Silver Line Extension to the Metrorail System, scheduled to open in January 2014, will connect Falls Church via Metrorail to Tysons Corner and Reston. According to 2011 LEHD data, nearly 600 residents of Falls Church work in Tysons Corner or Reston,[19] which is nine percent of the City residents in the workforce. These are residents who formerly had limited options to commute to work. With the opening of the Silver Line, and the redevelopment of Tysons Corner into a more walkable, transit-accessible community, there is an opportunity for the City's TDM program to promote the use of Metrorail for commute trips to these regional activity centers.

Figure 5: Silver Line (Phase 1) Metrorail Extension



Map Data Source: PlanitMetro.com

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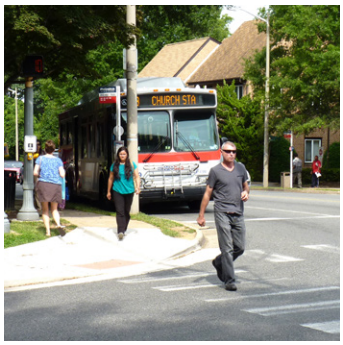

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TDM STRATEGIES TOOLBOX

CHAPTER 3: TDM STRATEGIES TOOLBOX

City of Falls Church residents, workers, and visitors can benefit from a variety of TDM policies, programs, and services. This section outlines a toolbox of strategies that the City can employ to meet the goal of reducing single occupancy vehicle trips, and maximize the use of existing transportation infrastructure and alternative modes. Table 3 is a summary of the TDM Strategies Toolbox, and the following sections describe each of the strategies in detail, and how they may work in Falls Church. Detailed descriptions of each of the toolbox strategies in Table 3 follow it.

Table 3: City of Falls Church TDM Program Strategies Toolbox

TDM Market(s)	TDM Strategy	Strategy Description	Implementation Priority
Developer	Site Plan Policy	A policy that provides developers with a set of potential TDM conditions that can be applied during the site plans process.	Near-Term
Employers	Employer Services Program	Employer services programs work with employers to provide a transit benefit programs, and other services such as personalized commute planners.	Near-Term
Employers	Travel Surveys	Annual employer commute surveys as part of an employer services program.	Near-Term
Employers	Employee Transportation Coordinators	Trained on-site volunteers or assigned Employee Transportation Coordinators assist fellow employees with planning their commutes and promote the use of transit, bicycling, and walking within the City.	Mid-Term
Employers	Telework Promotion	Promote the use of Telework, and existing programs such Telework!VA, to Falls Church companies.	Near-Term
Employers and Residents	Bicycle Education	Cost-effective bicycle education classes at times that are convenient for residents and workers.	Mid-Term
Residents	Walkabouts	Volunteer-led walking tours of local neighborhoods that highlight local historical landmarks and population destinations, and also show residents the high quality walking routes that they can use for travel within the City.	Near-Term
Residents	Satisfaction Surveys	Periodically survey residents to ascertain their level of satisfaction with the local area transportation system, and how they use the City's transportation infrastructure and services.	Long-Term
Residents	Ciclovia	A car-free event that celebrates the use of the streets by alternative modes of transportation.	Long-Term
Visitor	Concierge Training	Provide training on local transit options as well as transit passes bulk purchase options for hotel concierges.	Mid-Term
Comprehensive	Static Transit Information	Targeted transit information that meets the needs of specific populations: workers (commute planners), residents (City-specific bus maps), and visitors (landmark maps).	Near-Term
Comprehensive	Real-Time Transit Information	Real-time transit information screens or mobile applications that display location specific real-time transit information.	Long-Term
Comprehensive	Ridesharing	Facilitate ridesharing through the promotion of existing ridematching databases or the use of a commercial dynamic ridematching application.	Mid-Term
Comprehensive	Carsharing	Attract a private carsharing vendor to provide carsharing vehicles for use within the City of Falls Church.	Mid-Term
Comprehensive	Bikesharing	Bikesharing programs provide short-term bicycle rentals with low membership fees and typically no usage fees for rides under 30 minutes.	Mid-Term
Comprehensive	Parking Strategies	Strategies that ensure that there is the right-sized supply of parking to meet existing demand.	Long-Term

The TDM Strategies Toolbox is structured by the four TDM market segments that the strategies are designed to serve:

TDM MARKET SEGMENTS

Several toolbox strategies are listed as "comprehensive" which indicates that either the are city-wide TDM services (such as carsharing or bikesharing) or that they are a strategy that can be applied to multiple markets, although in application each of these would be implemented in a way that is targeted to a specific market. An example of the latter would be the provision of transit information, a foundational element of transportation demand management, but something that can be tailored to meet the unique needs of residents, workers, and visitors. Each strategy described is also rated by its implementation priority – near-term, mid-term, and long-term. Near-term covers the next three-year period, Fiscal Year (FY) 2014 to FY2016, mid-term covers the years FY2017 to FY2019 and long-term includes the period from FY2020 onwards.

TDM AND THE DEVELOPMENT PROCESS

Incorporating TDM conditions in the development process is the foundation of a successful comprehensive public sector TDM program. A TDM Site Plans policy acknowledges the impact of development on a community's existing transportation infrastructure and puts the onus of demand management on the developer and new tenants rather than on the jurisdiction. In this way, TDM for Site Plans mitigates the travel outcome of new development before the impact is felt.

Best Practices in Linking TDM and Development

The TDM Site Plan policy that is proposed for the City of Falls Church is based on the successes of similar programs in Arlington County, VA, City of Alexandria, VA, Fairfax County, VA, Cambridge, MA, and Contra Costa County, CA. A summary of each TDM for development program, how it works and where available how successful it has been in limiting the transportation impact of new development, is found in the succeeding paragraphs.

City of Alexandria – Transportation Management Plan Special Use Permit (TMPSUP) Program

In 1987, the City of Alexandria implemented a Transportation Management Plan Special Use Permit (TMPSUP) Program to limit increases in traffic congestion without limiting new development. The Program, which is codified in the City's Zoning Ordinance, requires any development project exceeding a designated size to submit a special use permit application, traffic impact analysis and a transportation management plan (TMP). Table 4 identifies the minimum size for various types of development projects that will trigger the TMPSUP Program.

Table 4: Development Specifications that Trigger a Special Use Permit

Land Use Type	Minimum Size
Office	50,000 or more square feet of usable space
Retail	40,000 or more square feet of usable retail space
Industrial	150,000 or more square feet of usable industrial space
Residential	250 or more dwelling units
Mixed-Use	Any combination of space including one or more of the foregoing uses, at the size applicable to that use. If the threshold is satisfied in any of the uses, the TMP must be prepared for all uses present in the project.

The TMP is required to outline the TDM strategies the project owner/tenants will implement to reduce vehicle trips over the lifespan of the project. The City must approve the TMP before the development receives a building permit. Once the building is occupied, the owner/tenant is required to carry out an annual commuter survey to report on the mode share resulting from the site and annual report summarizing the efforts and accomplishments of the TMP. The program requires an on-site transportation management coordinator and dedicated program funding set aside in a separate account that belongs to

Source: kingstreet.com

the TMP holder. However, the City can claim the money if the owner/tenant fails to carry out the TDM strategies proposed in the TMP. The TMP is conveyed with perpetuity of the land and the plan must be communicated through the purchase/lease agreement with any tenants or new owners of the property.

As of 2011, 80 TMPs had been prepared, 53 of which were active. The TMP is required to include a combination of some or all of the following TDM strategies:[20]

- Ridesharing incentive programs
- Carsharing incentive programs, which typically includes registration fees for Carsharing
- Public transit incentive programs, including:
  - Providing shuttle services connecting to public transit stops
  - Subsidizing transit services
  - Constructing transit shelters and amenities
  - Constructing transit stations and related facilities
  - Dedicating land for transit facilities
  - Providing transit fare media subsidies and marketing programs
- Funding for recommended improvements in public transit
- Bicycle and pedestrian incentive measures
- Telecommuting, variable work schedules and flex time programs
- Parking restrictions including parking fees, time and other access restrictions and programs to support and encourage the utilization of alternative transportation modes

Alexandria's TMPSUP Program is one of the oldest and most established programs in the county. The program continues to evolve over time and specifically, in the past five years, has focused more on setting SOV mode share targets for each projects and establishing quantifiable performance measures.

The key "best practice" takeaways from this program include:

- Requires a designated transportation coordinator to implement the TMP
- Requires monitoring and compliance with repercussions for non-compliance
- Requires program funding set aside in a designated fund
- Program is specifically tied to trip reduction and traffic mitigation in the City
- City of Alexandria has a staff person who monitors all TMPs in the program
- Program is mandatory for all projects over a certain size

Fairfax County – TDM Proffers[21]

Fairfax County Department of Planning and Zoning administers a proffer program, whereby the County works with developers on a case by case basis to determine the amount of cash contributions the developer will make to offset the impact of the development. The proffers program requires developers to set aside a certain amount of funding based on the size of the project into four separate funds. The County then gives the developer/tenant complete flexibility in choosing the TDM strategies that will be implemented as part of the program.

Under Fairfax's proffer program, if Virginia DOT requires a Traffic Impact Assessment due to the size of the proposed

Source: www.awesomedc.com

development, then Fairfax County automatically requires the developer to negotiate proffers with the County. The program is structured through monetary contributions from the developer into four separate funds as shown in Table 8; incentive fund, remedy fund, penalty fund, and transportation management association contribution. The level of funding is determined based on the estimated number of trips that will be generated by the project, the location of the project within the county (Tysons Corner has greater funding requirements), and proximity to transit. The County and the developer work together to set the vehicle trip reduction goals that the project will aim to achieve. Tables 5 and 6 indicate the parameters of the trip reduction targets that the developer negotiates with the County for office developments and residential developments, respectively.

As Table 5 and 6 suggest, trip reduction goals to be achieved through TDM measures are much stronger in areas with a high level of transit service and high level of urban accessibility. Accordingly, the County requires the developer to set aside a certain level of funding based on

Table 5: Percent Reduction from Institute of Transportation Engineers (ITE)Trip Generation Rates for Office[22]

Level of Transit Service	Urban Center	High	Moderate and Low
Baseline	Up to 35%	25%	20%
With TDM	45 – 65%	34 - 45%	25 - 35%

Table 6: Percent Reduction from ITE Trip Generation Rates for Residential

Level of Transit Service	Urban Center	High		Moderate and Low	
Level of Urban Accessibility		High	Low	High	Low
Baseline	Up to 35%	25%	20%	15%	10%
With TDM	45-65%	35-45%	25-35%	20-25%	15-20%

Table 7: Fairfax County TDM Proffer Requirements

Transit Accessibility	>250 trips/hour	100-249 trips/hour	<100 trips/hour
Urban Center	Full	Full	Full
High Transit	Full	Full	Light
Moderate Transit	Full	Light	Marketing
Low Transit	Light	Light	Marketing

Table 8: Fairfax County TDM Proffer Program Funds

Fund	Description	Tysons	Outside Tysons
Incentive Fund	One-time payment to fund TDM related conditions at the development site.	1-2 cents/ sqft	Varies by distance to rail
Remedy Fund	Developer establishes this fund upfront and the tenant can draw on it to establish TDM Programs in the case that they are not able to meet their trip reduction goals. However, if the tenant meets stabilization consistently for several years, then the County will release the Remedy Fund to the tenant. The amount the tenant is able to release from the fund depends on the rate at which their goal is met. If the tenant is able to achieve their trip reduction target by 100 percent for three years then they are eligible to receive 100 percent of the fund back.	20 cents/sqft - Commercial; 10 cents/ sqft - Residential	10 cents/sqft – Commercial; 5 cents/sqft - Residential
Penalty Fund	If the developer/tenant does not meet their trip reduction targets then a portion of this fund is released to the County and the remainder must be used by the developer toward TDM.	5 cents/sqft	Not Required
Transportation Management Association Contribution	Developer/tenant is required to pay into an existing Transportation Management Association (TMA) fund to support TDM programs in the area.	10 cents/sqft - Commercial; 5 cents/ sqft - Residential	Not Required

the location of the development project within the county to ensure that the agreed upon goals are met. Then, based on the trip generation rates and the level of transit access at the development site, the County determines whether the developer will be responsible for the full TDM proffer program or only a paired down version of it. Table 7 provides the matrix the County uses in designating the program requirements.

The full TDM proffer requirement includes goals, programs, and enforcement mechanisms; TDM Light includes goals, fewer on-site TDM programs, and reduced monitoring requirements; and marketing only includes only the marketing of existing TDM resources in Fairfax County. Specifically, the Full TDM Program requires an annual survey and TDM report on the building's progress in meeting its trip reduction targets, the developer is also required to pay into four funds which guarantee compliance with the stated goals. The funds are designed to establish both incentives and penalties for the developer to ensure goals are met. The Light TDM Program only requires contributions to the Incentive Fund but not towards the other funds. Given the redevelopment of Tysons through the addition of four new Metrorail Silver Line stations opening in 2014, the County established separate Tysons fund requirements.

During the rezoning process, the developer is required to designate a transportation coordinator and to submit a TDM work plan. At this point the developer can either submit a TDM Plan (visioning document) or a TDM Work Plan (specific plan that includes dates and budgets). Compliance with the program goals and trip reduction targets are measured as part of the annual commuter survey and annual TDM report. Reporting is based on trip counts and the annual commute survey. Any development in Tysons Corner is required to gather trip count data annually.

The key "best practice" takeaways from this program include:

- Flexible program
- Cash contributions can support county-run TDM programs, especially established programs like employer TDM for commute trip reduction
- Takes into consideration the varying urbanization and level of transit access within the county; works with the development sites based on these factors instead of using a one-size fits all approach
- The Fairfax TDM proffer program illustrates how a jurisdiction can structure TDM requirements and enforcement without operating full-scale in-house TDM programs

Arlington County 1990 Transportation Demand Management Policy

Arlington County TDM for Site Plan Policy aims to reduce peak hour travel by reducing single occupant vehicle trips. The policy framework is based on a matrix that recommends specific TDM strategies determined by the transportation and land use characteristics of the proposed development site.

All proposed development is categorized into four different groups depending on whether the development is consistent with the General Land Use Plan and whether the development site is located within an area with a forecasted traffic congestion problem. The county's Transportation Demand Management Matrix includes 48 TDM strategies listed across four land use categories. The land use category and projected traffic impact of the development determine the set of TDM strategies they are required to implement. The developer is then required to pay an annual fee for monitoring and compliance which is determined by the size of the development.

The county and the developer select the TDM measures that will be included in the development based on the matrix. The agreed upon strategies are then adopted by the County Board along with the site plan, as part of the development review process. Site Plan Development Proposals are administered and processed by the Arlington County Department of Community Planning, Housing and Development.

TDM Strategies that are commonly used in Arlington County for site plans include the following:

Source: http://www.allegiantagents.com

- Implement ridesharing and transit marketing (i.e. display case or kiosk)
- Provide an on-site TDM coordinator
- Administer an Employee Transportation Survey
- Provide preferential parking for vanpools and carpools
- Implement flextime or telework program in lease agreement
- Host a transportation fair
- Host Bike to Work Week event
- Install bicycle racks, storage, and lockers
- Install shower facilities for bicycle commuters
- Provide tax-free transit benefit such as SmartBenefits
- Provide a parking cash out program
- Provide a supplemental Guaranteed Ride Home Programs
- Provide on-site ridematching for carpools and vanpools

The key "best practice" takeaways from this program include:

- Tie the intensity of TDM requirements to the regional travel demand model and require stricter TDM strategies in areas with higher forecasted congestion
- Tie TDM requirements to the long range land use plan
- Create a flexible program that allows the developer and county to decide on a suite of TDM measures appropriate for each given project
- Require funding for monitoring and compliance

Parking and Transportation Demand Management Ordinance, Cambridge, MA

The City of Cambridge has had a TDM ordinance since 1998, which was created in response to community concerns over congestion. Participation in the program is prompted when the owner of a non-residential property proposes to add parking above the registered number. There are two levels of participation. A development is considered a Small Project Parking and TDM (PTDM) Plan if total parking requirement is between 5 and 19 spaces. A development is considered a Large Project PTDM Plan if the total parking required is 20 spaces or more. A Small Project is required to fulfill three TDM/trip reduction measures and is not required to carry out monitoring requirements.

A Large Project is required to meet the following:

- Single Occupancy Vehicle mode-share commitment (generally set at 10 percent below 1990 Census Data, the environmental baseline for PTDM projects)
- Annual monitoring and reporting
  - Employee and/or patron survey, including SOV rate
  - Biennial counts of car and bike parking occupancy and driveway ins/outs
  - Status of TDM measures
- Membership in a Transportation Management Association (TMA)
- Market-rate parking fees
- Employee transportation accounts
- On-site transportation coordinator
- Commuter awareness events
- Shuttles to transit
- Transit shelters
- Bike stations
- Telecommute programs

The TDM plan typically includes a monitoring component like an employee commute survey and parking counts. The City PTDM Planning Officer is responsible for producing an annual report on each site plan in the PTDM Program evaluating the program's overall performance. Any project that is not in compliance is fined per parking space for every day it is out of compliance. Program participants fund their own mitigation activities and are

http://www.metrorealtycorp.com

not required to contribute to the overall cost of program administration.

A Small Project must implement three unique TDM measures from a toolbox of options as a one-time implementation with no required monitoring or performance targets. Measures that are typically implemented include:

- Subsidized transit passes
- Information kiosks
- Bike racks
- Bike amenities (i.e., showers and lockers)
- Carsharing spaces
- Guaranteed ride home program

The key "best practice" takeaways from this program include:

- The TDM policy is linked to the city's Parking Policy
- Project performance and implementation is monitored and evaluated annually
- Penalty for non-compliance
- Program enables the City to maintain an ongoing parking inventory
- Sets a performance target (10 percent below 1990 SOV commuting levels)

Contra Costa County, CA Transportation Demand Management Ordinance Guide

Contra Costa's TDM Ordinance aims to encourage developers to reduce the number of motor vehicle trips generated by a new development project. The Ordinance supports the transportation goals articulated in the County General Plan. TDM programs for developments aim to achieve the following outcomes:

- Reduce the frequency and distance of auto trip making
- Spread peak-hour trip making to off-peak time periods
- Shift trips towards the use of environmentally friendly and non-motorized modes of transportation
- Provide technological solutions to reduce the environmental impacts of vehicular traffic, such as provision of charging stations to encourage the use of electric/hybrid vehicles, and provision of real-time or interactive information on bus services

Source: www.co.contra-costa.ca.us

Both residential projects and non-residential projects over a certain size are required to submit a TDM plan. Any residential development containing 13 or more dwelling units that must be approved through a public process and has not received a final approval is required to submit a TDM plan. Any non-residential project or mixed-use development application that must be approved through a public hearing process and has not received final approval must also submit a TDM plan. Non-residential projects also include an application to expand an existing office or industrial structure that has at least 5,000 square feet of gross floor area, by 25 percent or more of the structure's gross floor area.

As part of the residential component of the TDM Program, a developer is required to notify each buyer or renter of all public transit, ridesharing and non-motorized options in the vicinity of the development along with a map of all improvements that the developer made to improve access to area transportation options (e.g., a bus shelter or bus stop).

The following TDM strategies are available as residential development strategies as stipulated in the Contra Costa, TDM Ordinance:

Residential Building Design

- On-Site Amenities
  - Information kiosks including cycling maps, transit routes and schedules, shuttle service, etc.
  - Bicycle racks, secure bicycle lockers, bicycle cages
  - On-site transit pass sales
- On-Site Vehicle Parking
  - Construct and maintain a park and ride lot
  - Locate parking on the side and/or back of buildings

- Cycling facilities
- Pedestrian facilities
- Transit facilities

Residential Building Occupancy

- On-site parking operation
- Cycling initiatives
- Walking initiatives
- Public transit initiatives
- Rideshare initiatives
- TDM coordinator
- Home-based work

The following TDM measures can be employed as part of a non-residential development as stipulated in the Contra Costa TDM Ordinance:

Non-Residential Building Design

- On-site amenities (customized depending on the size and type of the development)
  - On-site cafeteria
  - On-site transit pass sales
  - Car rental or car share service
- On-site vehicular parking
  - Establishing user fees for on-site parking
  - Designate premium parking spaces for carpools and vanpools
  - Place on-site parking on the side and/or back of the buildings
- Cycling facilities
  - Provide secure short- and long-term bicycle parking
  - Provide showers, change facilities, and clothes lockers at convenient location within the building
  - Ensure safe and convenient access and movements of cyclist within development sites
- Pedestrian facilities
  - Minimize walking distances along the internal street/path network to provide convenient connections
  - Give priority to establishing and maintaining pedestrian facilities such as sidewalks, crosswalks, and pedestrian lighting
- Transit facilities
  - Provide safe and direct site access to the public streets where transit services are provided
  - Establish an on-site information kiosk where information on transit routes, schedules, and fares can be provided
- Rideshare facilities

Non-Residential Building Occupancy

- On-site parking operation
- Cycling, walking, ridesharing, and public transit initiatives
- Flexible work schedules and telecommuting
- TDM coordinator

After a TDM Plan has been approved, the developer has six months after the certificate of occupancy is granted to confirm the installation of facilities and site amenities that fulfill the TDM requirements. If a project receives a reduction in parking requirements as a result of an aggressive TDM policy, then the project owner must seek renewal of the TDM Program for time periods specified by the County.

The key "best practice" takeaways from this program include:

- The program is linked to the transportation goals specified in the County's Comprehensive Plan
- The program is geared towards large scale suburban development with an emphasis on infrastructure and amenity provision
- Flexible program that allows developer and County to decide on suite of TDM measures appropriate for each given project
- Includes a monitoring and evaluation component, although not specifically required

Recommendations for the City of Falls Church

Figure 6 describes the foundation for a proposed TDM Site Plan Program for Falls Church. Falls Church's TDM for Site Plans program should include marketing and support, alternative commute services, financial incentives and other infrastructure and policy components. These site plan conditions should be implemented along with

Figure 6: Elements of a TDM for Site Plans Policy

PARKING MANAGEMENT AND PRICING

Support, Promotion, Information

- Transportation Fairs
- Bike to Work Day
- Employer designated transportation coordinator
- Information dissimination
- Real-time transit displays
- Locate/operate a transit store
- Monitoring and compliance

Alternative Commute Services

- Realtime ridematching
- Vanpool and Carpool ridematching
- Carsharing
- Bicyle and pedestrian facilities
- Cash contributions to localled subsidized transit

Financial Incentives

- Vanpool/carpool subsidy
- Carsharing registration
- Parking cashout
- SmartBenefits Program
- Fare media subsidy

Infrastructure and Policy

- Unbundle parking leases
- Pedestrian improvements on-site
- Connections to Metro
- Electric vehicle charging station
- Shared parking
- Lease agreements

parking measures, such as shared parking or designated ridesharing parking spaces, to ensure an appropriate supply of market-rate parking in the commercial areas of the City. The program would recognize that each development is unique and requirements would be based on the size of the proposed development and the location of the development within Falls Church. Regardless any project meeting a designated size limit would be required to produce a TDM Plan outlining the steps that the building owner/tenants will take to reduce vehicle trips.

There were many best practices found through this peer review of some of the top TDM for Development programs in Northern Virginia and around the nation. This plan recommends several key findings from these be considered as the City of Falls Church develops its own TDM for Site Plans program structure:

- Tie TDM goals to transportation goals outlined in the Comprehensive Plan, particularly this City's Comprehensive Plan's Transportation Goal 6: Encourage the use of non-automotive modes of transportation within the City and to the region
- Utilize the baseline measures developed for SOV commuting, and development-level mode split and parking utilization information, to assess the effectiveness of the TDM for Site Plans program on an ongoing basis
- Maintain flexibility so that each unique development can build a TDM program specific to the needs of its site and tenants
- Require program measurement, reporting and enforcement on an annual basis.
- Require that the developer/tenant make cash contributions to the City for compliance and monitoring
- Require a TDM plan for any project over a specified square footage
- Require TDM for site plans for both residential and non-residential development projects

EMPLOYER SERVICES

A successful TDM program cannot just focus on residents, but must also serve the nearly 9,000 people employed in the City of Falls Church. Falls Church's employment base is a major driver of the community's economic vitality, bringing in crucial tax revenue as well as jobs. Yet the City's working population also adds to local congestion and parking demands. TDM programs can step in and reduce the impacts caused by workers traveling to Falls Church. Employer Services TDM can be highly effective; workers

tend to have predictable and routine travel patterns around which TDM strategies can be tailored.

> "The City should be proactive in encouraging and possibly considering incentivizing its employees, residents, and private business employees to use flexible work schedules, to telecommute when possible, to and carpool. It should also continue to work with developers to offer adequate bicycle storage and employee changing facilities."
>
> *City of Falls Church Comprehensive Plan, Chapter 7: Transportation, Transportation Demand Management Techniques*

A TDM program can provide a wide range of services to employers, many of which are specifically targeted to the needs of employers in the community. In other communities in Northern Virginia, TDM services ranging from assistance in commute trip planning for a company's workforce to assistance implementing transit incentive programs or subsidies, are offered at no cost to employers.

Common Employer Services TDM Strategies

Many Employer Services programs use a set of practices and strategies that are relatively standard within the TDM industry. Among the most common Employer Services TDM strategies used are:

- Provide on-site transit benefits
- Conduct confidential travel surveys of employees to better understand their travel needs
- Offer ridematching support for carpooling, ridesharing, or vanpools.
- Promote on-site transportation alternatives such as transit, biking, walking and carpooling to work
- Train an Employee Transportation Coordinator to assist employees with commute planning
- Provide transit schedule, route, and Park and Ride information
- Help companies assess parking options
- Advise on the set-up of a teleworking program
- Implement a parking cash-out policy that offers employees the cash equivalent of the cost of their parking space

Falls Church's TDM program can work with employers to provide them and their workers the information and support they need to utilize all the transportation options available. For example, the TDM program can help employers set up a SmartsBenefit program for employees. SmartBenefits allows employees to receive tax-free transportation benefits from their employers. The benefit is valid on any public transit system and in vanpools. The program is simple to administer, low cost to employers, and provides an additional amenity to employees. The City can even set up or join an existing match program, where eligible employers are reimbursed up to 50 percent of the cost of providing transit benefits to employees.

Commute Information for Workers

Providing commute information to workers in Falls Church is a high-impact and low-cost TDM strategy. A study conducted in Fairfax County found that support, promotion, and information about transportation options caused up to a 5% reduction in vehicle miles traveled.[23] The majority of commuters into Falls Church travel under 10 miles to work, so travel distances are well suited to be served by public transportation or cycling.

A citywide TDM program can reach out to workers in numerous ways:

- Web presence and available TDM information over the phone
- Provide maps, transit schedules, and information on transportation options at workplaces
- Help publicize Commuter Connection's Guaranteed Ride Home program
- Bring the Mobile Commuter Store® to Falls Church, allowing employees to purchase transit fares and get transportation advice from Commuter Store® staff.

Figure 7: Arlington County's Mobile Commuter Store
Source: Arlington County, 2012

Workday Bicycle Education Program

With Falls Church's excellent access to the region's trail network, including the regional Washington and Old Dominion (W&OD) trail, cycling is a great transportation alternative for commuters coming into the City. More than half of commute trips to the City are under 10 miles and within the range of a convenient bike commute. Bicycle education programs are a great way to get people more comfortable with cycling, helping to shift people from their cars to an active, pollution-free mode of travel. Falls Church can piggy-back off of existing programs to reach out to local workers. The Washington Area Bicycle Association (WABA) offers a number of education programs that Falls Church could promote, including:

- **Commuter seminars** hosted at businesses that teach people the basics of commuter cycling such as bicycle choice, clothing, how to store cargo, bike parking, safety, and foul-weather riding.
- A locally sponsored **Confident City Cycling** session. The Confident City Cycling program is a three hour training hosted by WABA that aims to provide everyone from novice to experienced cyclists the information they need to bike confidently. The training session covers a wide range of topics such as bicycle selection and how to ride in mixed traffic.
- WABA has a **Learn to Ride** program aimed at teaching adults new to cycling how to ride a bike.
- WABA helps organize **Group Rides** across the region that are a great way to build confidence among cyclists, and teach them the rules of road in the comfort of riding in large groups.

Figure 8: Confident City Cyclist Program
Source: WABA, 2012

> "The bicycle is a low cost, energy-efficient, and environmentally sensitive alternative to the automobile. The City and the region should do everything possible to promote safe bicycle transportation, especially for peak hour commuting purposes. Bicycle trails in Northern Virginia are extensive and provide the means for convenient commuting into the District of Columbia and from suburb to suburb."
>
> *City of Falls Church Comprehensive Plan, Chapter 7: Transportation, Transportation Demand Management Techniques*

Workplace Certification Program

Transportation is an important component in a business's environmental footprint. If companies take into account their employees' commutes, transportation to and from work can make up a significant share of carbon emissions. TDM strategies should become part of a company's environmental toolkit, just as waste management and energy efficiency improvements already are. One way to promote TDM in the workplace is to recognize companies that work with employees to reduce single-occupancy vehicle trips to work. Falls Church could create a program that awards companies that incorporate various best practices in sustainability, including providing high quality employee TDM.

Telework Promotion

Telework, or remotely working from home or a co-working space, in-lieu of commuting to and work from the office full-time or part-time, has become increasingly popular over the past decade. Promoting the adoption of telework policies by companies, and the use of telework by employees of companies that have these telework policies, can be a win-win for both companies and their employees. Many employees value having the ability to telework, be it on a regular or occasional basis, and that in turn can lead to higher job satisfaction. Virginia operates a statewide telework promotion program called Telework!VA, a one-stop resource for companies, individuals, and government agencies seeking to implement high-quality telework programs.

RESIDENT SERVICES

Nationally, less than 20 percent of all trips are commute trips, meaning that the vast majority of trips made are for shopping and other errands, entertainment, trips to school,


Multi-Resident Zone

to visit friends and family, and other personal reasons.[24] A TDM program that focuses only on providing resources to reduce commute trips will be limited in its effectiveness. Transportation demand management services aimed at residents, raning from providing transportation information focused on the needs of residents to working with senior services to address the mobility needs of seniors to working with the school system on Safe Routes to School programs, all play a role in increasing residents' use of bicycling, walking, and transit for their transportation needs.

Information

Producing targeted information that addresses the travel needs of residents both within and beyond the City of Falls Church, is a basic TDM strategy that can provide a tangible impact on vehicle trip reduction. This information may include transit maps, multi-use trail information, or suggested bicycle or walking routes within the city that can be provided in a variety of printed and online formats. Making information available in both printed and online formats will allow the City to reach a wider audience of residents.

Providing transit maps or access to web-based applications that focus only on the local area and clearly explain only the transit nearby transit options, will make it simple to understand how to travel within the City; traditional transit maps typically show all bus and rail options over a larger area, and can be hard to interpret. Transit maps that focus on services that facilitate travel within the local area, and use interpretive elements such as pictures of local landmarks, provide the potential transit user with a clear sense of their transit options very quickly. Maps and other information can also be prepared that focus on getting from Falls Church to locations outside of the City accessible via transit, including how to get to the East Falls Church and West Falls Church Metrorail Stations by transit, traveling via bus to Bailey's Crossroads, Skyline, and other locations in Fairfax County, as well as the City of Alexandria. Timetable information may also be incorporated in these local-area transit maps.

In a region as diverse as the Washington, DC metropolitan area, it is not uncommon to provide transportation information in languages other than English. According to the U.S. Census American Community Survey, 20 percent of Falls Church residents are foreign-born, 25 percent speak a language other than English at home, and 6 percent of these residents speak English less than "very well." Providing local area transit maps and other transportation information in languages other than English will likely increase the effectiveness of efforts to provide TDM services to the resident population.

Disseminating informational materials developed can be done in a variety of ways. Information can be made available though displays in public facilities frequented by residents, such as community recreation centers and libraries, as well as with retail partners and multi-family buildings. In several cities around the country, including Chicago, IL and Arlington, VA and the District of Columbia have partnered with local retail to install low-cost real-time transit arrival information screens in their establishments. Transit Screens developed for the Washington, DC metropolitan area can display not only Metrorail and Metrobus real-time arrival information, but the availability of nearby Capital Bikeshare bikes and docks as well.[25]

In addition to making information available at public facilities, front-line public sector staff can be trained in the local transportation options and available to answer resident questions about how to use the local transit system, and biking and walking options. Alternatively, a City transportation planner or another staff member can take on the role of helping residents with transportation questions.

The City can also utilize partnerships with other public service providers to make available transportation information and answer transportation related questions of the populations that they serve. For example, TDM materials can be developed that specifically address the transportation needs of seniors, and the City transportation staff can work with the Falls Church Senior Center to develop and disseminate this information. A similar partnership with the City's Housing and Human Services Department may provide the transportation planning staff with greater insight into the transportation

needs of the populations that they work with and assist in the development of targeted TDM services and transportation information.

Safe Routes/Youth-Oriented Curriculum Updates

The City prepared a Safe Routes to School Travel Plan on behalf of the Falls Church City Public Schools (FCCPS) for all four public schools (grades K-12) located within the City.[26] The plan was endorsed by the Falls Church City Council in 2011, and the City has since obtained funding from the Virginia Department of Transportation to implement three infrastructure improvements identified in the plan. The plan also outlines the existing conditions, barriers to walking and biking, and provides an action plan for improving walking and biking conditions to the schools. The City's TDM efforts should include providing continued support to FCCPS in the continued implementation of strategies to increase walking and biking to the City's schools. Encouraging walking and biking to school reduces traffic on city streets during the peak travel periods, and it helps children and their parents become familiar with safe and convenient routes for walking and biking within the City that they may use for other trips in addition to providing the City's youth with an opportunity for exercise.

Walking Tours/Walkabouts

Walking tours, sometimes called Walkabouts, familiarize residents and other interested individuals with easy and convenient ways to walk to destinations within their neighborhoods. Walking tours can be centered around themes, such as historic neighborhood tours, playground tours, or entertainment spot tours, that make it fun for residents of all ages to participate. Walking tour maps can be provided to participants to keep, and made available for others that may wish to do a self-guided walking tour. Enlisting the help of volunteers, such as residents knowledgeable about the City's history, non-profit or other groups supporting the City's retail establishments or other groups appropriate to a themed walk, can decrease the effort required on the part of City staff to prepare and lead these events.

Bicycle Education

Opportunities to provide bicycle education, ranging from classes on how to ride a bike for adults, children, and children with special needs, to confident city cycling courses for those uncomfortable with riding on city streets, to more advanced bike tours, are available through several non-profit organizations in the Washington, D.C. area. The Washington Area Bicycle Association classes available for workplaces and for use in conjunction with employer services programs, are also available to jurisdictions through the region for a fee. Many youth-related organizations such as Parent Teacher Associations and other local parents groups organize bicycle rodeos and learn to ride days for children.

Ciclovia

Ciclovia, or open streets, is an event where a street is temporarily closed to traffic to allow for a community celebration, biking, and walking, and often programmed activities such as group exercise or dance and art performances. These events typically occur at off-peak travel times, for example on a Sunday morning, to minimize the traffic impact. The Ciclovia concept originated in Bogota, Columbia, and has since spread to many countries around the world. In the United States there have been Ciclovia type events held regularly in cities such as Portland, OR (Sunday Parkways), Los Angeles, CA (CicLAvia), New York City (Summer Streets), among several major and mid-sized American cities. A Ciclovia may be organized in conjunction with a regular event, such as city's Farmer's Market or Memorial Day parade, or may be independently organized. Ciclovias typically take place in the Spring, Summer, or early Fall.

Ciclovia is a more advanced TDM strategy that requires planning and commitment of staff time and other resources. Ideally, a Ciclovia may be implemented in conjunction with non-profit organizations, citizen associations, or other interested groups and volunteers in the City. Organizing a Ciclovia is likely best undertaken after the City has established a basic TDM program.

Coclovia Event
Source: www.cambio.com.co

VISITOR SERVICES

There is a role for TDM in the tourism industry, helping visitors navigate the city and access transportation options that means they can leave their car in the garage or even travel car-free on their next visit. The Washington, D.C. metropolitan area is the seventh largest tourist market in the nation, with over 1.8 million visitors to the region annually, many of these tourists are unfamiliar with the city and its transportation options.[27]

Washington, D.C. Metro Area Visitor Services Programs

There are examples of successful TDM strategies already in practice in the Washington, D.C. metro area. The District of Columbia's TDM program works directly with event planners who are planning major events or conferences to make sure out-of-town visitors are aware of all the transportation options available to them. Arlington County, VA works directly with hotel management and staff to ensure that out-of-town visitors have access to information and the guidance of well-informed hotel staff.

Arlington, VA [28]

Arlington Transportation Partners (ATP) works with hotels in Arlington County to reach out to visitors and tourists who are unfamiliar with the area and who require additional information to navigate the area. ATP works with all 43 hotels in Arlington County, which serve business travelers and families visiting the Washington, D.C. area. The County TDM agency has built relationships with each hotel and works directly with management and staff to provide transportation information to county visitors. ATP offers the following services to visitors:

- Farecards through CommuterDirect.com: Through ATP, hotel staff can purchase fare media, including Metro farecards, SmarTrip cards, and MARC or VRE commuter rail tickets for individuals or in bulk for conference or team meetings. SmarTrip cards and fare media are ready for visitors on-site upon arrival.
- Brochures: ATP provides brochures about all transportation services in Arlington.
- Information Displays: ATP provides kiosks for brochures and transit schedules, bulletin boards, and maps of transit routes, bike lanes, and walking trails. ATP has five standard information displays that vary by the size of the display and the quantity of information provided.
- Concierge Training: ATP offers customized training program and resource guide for concierge or desk attendants to help guests navigate Arlington and Washington, D.C. without a car.
- Transit Benefit Program: ATP assists hotels in understanding and providing transit benefit programs to hotel employees.

Washington, D.C.[29]

GoDCgo, the District's TDM program, offers event planners a resource guide to TDM in the metro area. The guide provides people planning large events and conferences in the District with a checklist and list of links including trip planning tools and information on all modes of transportation. GoDCgo also provides consultations with event planners to help customize a transportation plan for specific events, including bulk transit fare media purchases and SmarTrip cards. Additionally, goDCgo's marketing team will provide copy for an event's website, social media outlets, and promotional materials free of charge.

Tourist-Market Focused Transportation Materials

The development of brochures and other materials aimed to provide transportation information to the tourist market should be oriented to allowing visitors unfamiliar with the City of Falls Church to be able to quickly understand how to travel within the City, and to key destinations such as Metrorail Stations.

VIA Metropolitan Transit in San Antonio, TX operates Downtown Streetcar, a rubber-tire streetcar downtown circulator service, for the primary purpose of providing visitor transportation between key downtown tourist attractions. Unlike VIA's regular service, the downtown routes are known by colors and not the numbered route designations used throughout the rest of the system. The figure below is the map that VIA uses to orient the visitors to the Downtown Streetcar service. The use of color and the way that the tourist attractions are highlighted with pictures helps visitors unfamiliar with downtown San Antonio quickly understand how they can use the service to travel.

The City can also take a virtual approach to providing transit information tailored to an individual's location and transportation needs. GoDCGo provides an interactive map that allows users to select the transit modes they wish to see in relation to an individual's desired origin

Figure 9: Map of San Antonio's Downtown Circulator Service

and destination. New apps, such as Transit Near Me, developed by Arlington County's Mobility Lab, also allow users to understand the transit options available near their location.

Visitor Services in the City of Falls Church

There are several simple, cost-effective steps that can encourage visitors to walk, bike, or take transit during their stay in the City. The City can take an approach similar to VIA Metropolitan Transit, GoDCGo, and other transportation organizations that serve tourist markets in the development of materials for visitor services and for other markets. Developing maps that highlight only those Metrobus routes that provide access to the Metrorail stations, as well as the relative location of tourist sites within the City limits, would provide visitors with a quick way of ascertaining which bus routes they can use to meet their individual needs. Walkabout maps and bike maps, developed primarily for residents and workers, may also be provided to hotels to encourage visitors to walk to key destinations within the City.

Some suggested next steps for implementing visitor services in the City include:

1. Establish a point-of-contact with the concierge staff of hotels located within the City of Falls Church. Through this contact, information can be provided about the availability of bulk fare purchase discounts available through CommuterDirect.com, and a connection to an employer services program that can provide assistance with implementing a transit benefit program for hotel employees. Given the compact size of the City, and the small number of hotels and motels, this task should be able to be accomplished with existing transportation staff and interns.

2. Convene a meeting of hotel, entertainment, and tourist organizations in the City to understand the transportation needs of their patrons.

3. Provide brochures on transportation options, including bus maps and schedules targeted to those routes that provide service to East Falls Church and West Falls Church Metrorail Stations and other origin points outside the City, to hotels and other entertainment and tourist venues frequented by visitors.

4. Provide local area maps of the City of Falls Church that identify local landmarks, suggested walking routes or a suggested walking tour, and the a City bike map.

The City may wish to add Visitor Services to its overall TDM program after it has implemented Employer and Residential TDM services to take advantage of similar materials developed for these programs, and the synergies between employer, residential, and visitor TDM strategies.

COMPREHENSIVE TDM STRATEGIES

Bikesharing

Bikesharing has emerged as a potential and impactful tool for TDM. Over the last three years, Capital Bikeshare has grown into the nation's largest bikesharing system, carrying more than 10,000 riders per day, the equivalent of the ridership on Arlington's ART bus system. Capital Bikeshare stations are located in Washington, D.C., Arlington County, the City of Alexandria and Montgomery County; the University of Maryland is planning to join the system in the near future.

Bikeshare can bring numerous benefits to a community like Falls Church. The service can provide a crucial last mile connection between Falls Church and the East Falls Church Metrorail station. Most major trip generators in Falls Church are within a mile and a half of the Metrorail station, the ideal distance for bikesharing. Falls Church is also located on the W&OD trail which connects to a growing cluster of bikeshare stations in Arlington.

Source: www.bikearlington.com

Beyond better connecting Falls Church to its neighbors, bikeshare has the potential of improving mobility within the community. Bikeshare is ideally suited for a community like Falls Church and provides an additional mobility option for those trips just too long to walk but within easy reach by bike. Ridership surveys of Capital Bikeshare users in D.C. and Arlington have found that bikeshare can contribute to reduced automobile usage. Thirty-eight percent of Capital Bikeshare Annual Member Survey respondents who own a car indicated that they drive less since joining the program, for an average annual reduction of 523 vehicle miles. Capital Bikeshare members report saving on average over $800 dollars a year in travel costs by joining Capital Bikeshare.

Bikeshare can be incorporated into the site plan review process as a potential tool to reduce vehicle trips. While no study has been completed that quantifies the SOV reductions attributed to co-locating a bikeshare station with a new development, the results of Capital Bikeshare Annual Member Survey, and other surveys conducted by peer systems, indicate that bikeshare does reduce members' vehicle miles traveled. Bikeshare provides a number of ancillary benefits to new development; studies have shown a positive relationship between proximity to bikeshare and retail sales.

Carsharing

Carsharing is an important mobility innovation that makes possible short-term vehicle rentals through private companies. Carsharing provides zero and one-car households with added mobility and in some cases provides households the opportunity to sell or put off the purchase of an additional family vehicle. Zipcar is now the largest carsharing operator in the country and is present in the Washington, D.C. metropolitan area. Car2Go, an Austin-based one-way carsharing company launched a District of Columbia-based program in 2012.[30] Peer-to-peer carsharing is also expanding into the Washington, D.C market via private provider RelayRides.[31]

There are two primary ways that a municipality can provide support to carsharing companies and encourage them to begin operating in their jurisdiction. The first is by providing on-street parking to a carsharing operator for

free or reduced price. The second is by requiring private developers to provide reserved parking for carshare vehicles above and beyond what the development codes require they construct. Many cities work with developers directly, on an ad-hoc basis to reduce parking requirements when dedicated parking spaces are set aside for a carsharing vehicle. A few cities have codified carsharing requirements in their zoning codes.

Carsharing Best Practices

The following examples show successful public sector-based strategies for encouraging carsharing.

San Francisco, CA[32]

In April 2008, Section 166 of the Planning Code was amended so that newly constructed residential projects or existing buildings converted to residential uses, carshare parking must be provided as follows:

- 0-49 units; zero carshare spaces
- 50-200 units; 1 carshare space
- 201 or more units; 1 plus 1 for every 200 dwelling units over 200

Parking spaces must be made available free of charge to certified carsharing organizations. When instated, there were no enforcement mechanisms for ensuring that developers are complying with requirements. If the developer does not provide public access to the parking garage, then they typically are required to guarantee a certain level of revenue each month.

Philadelphia, PA[33]

The city designated on-street parking spaces for not-for-profit car share organizations, and requires the organizations to pay a $150 annual fee per space. For-profit carsharing companies are not eligible for these spaces. However, it is not clear if the parking policy is still in place now that the city's non-profit carsharing vendor, Philly CarShare, has been purchased by private rental car firm Enterprise.


Carsharing

Washington, D.C.[34]

In 2010, the District Department of Transportation (DDOT) put out to bid 84 curbside parking spaces distributed evenly throughout the District. The spaces were leased to the highest bidder who paid close to $300,000 for all 84 spaces, with an average cost per space of $3,485 per year. DDOT was able to lease the curbside spaces because carsharing already had a strong presence in the District. Zipcar alone has 60,000 members in the Washington, D.C. metropolitan area.

Like the District of Columbia, when many cities began providing free and reduced cost parking the carsharing market was a mix of private operators and local non-profit operators, and free parking was provided only to non-profit operators. Today, most local non-profit operators have been bought out by large rental car companies (with Enterprise, Hertz, and Daimler Chrysler owning the largest share of carshare operations in the country). While few non-profit carsharing operators remain, providing reduced cost parking to a for-profit operator is a proven, effective way to encourage an carsharing company to expand into new jurisdictions.

Parking Strategies

Municipalities can help manage congestion and promote economic vitality through parking management, particularly in the planning stages of new development. The City of Falls Church can work with developers to balance the overall supply of parking with the changing needs of the community. The City of Falls Church Comprehensive Plan suggests that there is an undersupply of parking in the downtown area and that there is an opportunity in new development projects to optimize parking facilities. Building the right supply of parking, will both facilitate the redevelopment of the city's commercial corridors and will also play a role in protecting parking in residential neighborhoods.

Ensuring that the right amount of parking, not an undersupply or oversupply, is provided with each new development can be achieved through the development process, active parking management and pricing mechanisms. Table 10 provides an overview of various strategies that can be used by local jurisdictions to optimize the supply of parking available.

Parking Management for Economic Vitality

The parking strategies listed in Table 9 have all been implemented successfully in cities and counties of varying sizes. Typically strategies are bundled together in a parking program focused on reducing traffic congestion, increase accessibility and economic vitality in a community. The following section explains each strategy and provides examples of communities that have successfully implemented them. This is by no means an exhaustive list but provides a sample of strategies that would be appropriate for the City of Falls Church, VA.

Bicycle Parking and Facilities

Many cities now realize that in order to facilitate true transportation options, that they must provide similar accommodations for all modes. Some cities created bicycle parking in proportion to the requirements for vehicle parking in an effort to provide equal facilities across the modes.

Implementation Examples

- **New York, NY** Secure bicycle parking is required for new residential, community facility, and commercial uses. The amount of spaces required is based on dwelling units, floor area, or vehicle spaces, depending on use.[35]
- **Chapel Hill, NC** A minimum number of spaces at bicycle racks are required for new development calculated based on the use and size of the development.[36]

Designated Parking for Carshare Vehicles

Designated parking for carshare vehicles ensures space for carsharing where it would otherwise be cost-prohibitive while providing carsharing users with reliable access to carshare vehicles.

Table 9: Overview of Parking Strategies

Parking Strategies	Currently Utilized in Falls Church
Bicycle Parking and Facilities	X
Designated parking for Carsharing vehicles	
In Lieu Fee	
Parking Database and Active Management	
Parking Management District	
Parking Maximum	
Residential Parking Permit	X
Shared Parking	
Unbundled Parking	X
Variable Priced/Performance Based Parking	

Implementation Examples

- **Washington, D.C.** While not yet codified, the D.C. Office of Planning has proposed the following revision to the Zoning Code: new parking facilities with 50 spaces are to provide one carsharing space, with another for every additional 100 spaces. Each space is to be provided rent-free to a Carsharing service.[37]
- **Arlington County, VA** Includes provision of off-street carsharing parking as part of negotiated TDM plan for new developments. Development projects participate in the TDM site plan review process in exchange for a density bonus.[38]
- **San Francisco, CA** Since April 2008, newly constructed residential projects or existing buildings converted to residential uses, must provide parking spaces free of charge to carsharing organizations. The requirement is only applicable to projects building 50 or more units. A project building 50 to 200 units must provide one car share parking space, a project building 201 or more units must provide one parking space plus one more parking space for every 200 dwelling units over the initial 200.[39]
- **Vancouver, BC** Parking requirements are reduced if the developer designates parking spaces for carshare vehicles.[40]

In Lieu Fee

An in lieu fee is a development provision in which the developer can pay the local municipality a fee instead of constructing and maintaining parking on site. Such a policy enables a developer to build on hard-to-develop

sites, enables the municipality to construct centrally managed and priced structured parking, and encourages "park once" policies that encourage drivers to park at one location and complete trips within the local area by bike, walk, or bus. In lieu fees are often used as a part of a Parking Management District.

Implementation Examples

- **Pasadena, CA** A developer may pay a fee to the city instead of providing requiring parking.[41]
- **Arlington County, VA** The county manager sets a one-time fee (based on the relative cost of building structured parking and adjusted annually) that developers can pay if they opt out of providing parking.[42]
- **Montgomery County, MD** The County uses in lieu parking fees to fund centralized parking structures within the county's four Parking Management Districts.[43]
- **Seattle, WA** A developer can pay the city in lieu of providing parking. The payments may be used to fund a long-term public parking structure in the designated area.[44]

Parking Database and Active Management

Many cities do not prioritize data collection and management when it comes to keeping record of parking supply. A database of on-street and off-street parking enables the municipality to better understand current and future demand for parking at the block level. This database can also be made available to the public through web-based applications, or through static maps, that display the availability of parking for residents and visitors.

Advanced parking technology that uses sensors and smart meters can even be implemented that provide real-time information on parking availability and pricing for the consumer. While advanced parking technology may be cost prohibitive for a jurisdiction the size of the City of Falls Church today, in the mid- to long-term this technology is likely to become more mainstream and less costly.

Implementation Examples

- **Seattle, WA** The City of Seattle maintains a database of on-street and off-street visitor parking within the Central City. The database is used in coordination with TDM measures to reduce congestion.
- **San Francisco, CA** The San Francisco Municipal Transportation Agency's *SFpark* program seeks to optimize the use of the agency's public parking garages through combining the use of sensors in vehicle spaces to detect when they are in use, advanced parking meters, and dynamic pricing, along with mobile phone and web applications that provide users with real-time information on the availability and price of public parking.[45]
- **Washington Metropolitan Area Transit Authority (WMATA)** WMATA's real-time parking information pilot project at the Fort Totten Metrorail Station Kiss and Ride is one of the first applications of real-time parking information in the Washington, D.C. metropolitan area. The system uses sensors in the pavement to provide real-time parking information on the availability of Kiss and Ride spaces to WMATA patrons via a website.[46]

Parking Management District (PMD)

A Parking Management District typically overlays a central business district and allows for a shared pool of parking that benefits all uses within the district. PMDs combine a number of previously referenced parking strategies including in lieu fees, shared parking and the "park once" concept. PMDs allow the public sector to centrally control parking supply and pricing. The municipality provides centralized parking in structured off-site locations throughout the district, which is available to all businesses, residents and visitors at a price set by the municipality. Parking facilities are funded through a municipality-assesed property value (Ad Valorem) tax along with meter and parking garage revenues. PMDs make it possible to develop small-lot and infill sites that are typical of older downtowns by allowing the developer to provide in lieu fees instead of providing a surface lot or structured parking.

Implementation Examples

- **Montgomery County, MD**[47] The County has had a formal PMD program since 1974. Today there are four districts that provide over 20,000 public parking spaces. Each PMD has its own fund separate from the County's general fund. PMD is funded through parking receipts, in lieu fees, enforcement revenue and income from investments. Minimum parking requirements do not need to be met on site. The owner/developer can provide fewer spaces and pay an Ad Valorem tax within these areas. The program encourages workers and visitors to park once in a central facility and walk between destinations in the district.

Parking Maximums

Parking maximums limit the number of parking spaces that a developer may build. Parking maximums have become more popular over the last 20 years in downtowns and in central business districts. Maximums reduce the risk of underutilized surface lots and the number of curb cuts in vibrant downtown districts. A parking maximum is often coupled with a parking minimum but some communities provide only the maximum.

Implementation Examples

- **Chapel Hill, NC** The Town Zoning Code includes both a minimum and maximum number of parking spaces allowed for most uses along with a minimum number of bicycle parking required. If a proposed use is not included in the zoning code, then the Town Manager is to determine the final requirements.[48]
- **Portland, OR** Portland's maximum parking ratios vary based on the location and land use. Areas that are zoned for more intense development have lower maximums as do areas that are proximate to high frequency transit.[49]

Residential Parking Permits

Protecting existing residential parking and residential neighborhoods from non-residential parking is key to preserving the quality of life enjoyed by the City's residents. The City of Falls Church currently has an active residential parking permit program. Parking permits are available for free from the City's police department. Each household within an area with residential parking restrictions can receive up to two free visitor parking permits. Delivery vehicles are exempt from needing a visitor parking permit.

Residential Parking Permits Streets in the City of Falls Church

- Birch Street
- East Jefferson Street
- Forest Drive (200-316)
- Lawton Street
- North 11th Street (610-700)
- North 26th Street (6933-6937)
- North Sycamore Street (1100-block)
- North Underwood Street
- South Lee Street (100-198)
- South Oak Street (107-119)
- Van Buren Street (400-500 block)
- West George Mason Road
- West Greenway Boulevard
- W. Marshall Street (110-204)

Falls Church's Residential Parking program is resident driven. Not all residential streets in the City participate in the program; the creation of a new residential parking area must be requested by a resident living within the area, and the creation of the residential parking permit area must be approved by 75 percent of all households living within the proposed boundaries. Any modification to the residential parking area must also be approved by 75 percent of households within the parking area.

The City should continue its residential parking program, including continuing active enforcement of residential parking restrictions, as redevelopment occurs in its commercial corridors.

Shared Parking

Shared parking allows multiple sites to share one parking facility. The concept is predicated on the idea that different types of businesses have peak parking demands during different time periods. An office building that is adjacent to a residential building could share a single parking facility and accommodate the parking needs of both sites with a reduced number of spaces. Shared parking can be implemented through agreements between individual property owners or through local zoning ordinances. Shared parking must be approved by the city through a legally binding agreement.

Implementation Examples

- **Arlington County, VA** Sites that are over 20,000 square feet in land area and located within 0.75 miles of each other may provide shared parking through a legally binding agreement.[50]
- **Washington, D.C.** The D.C. Office of Planning recommends that two or more non-residential uses within 400 feet of existing or proposed parking may share required parking. The District requires a legally binding agreement between the owners that lasts for a minimum of ten years. The District also requires a parking study to show no negative impact.[51]
- **Montgomery County, MD** Shared parking is allowed when the site or building is under the same ownership or under a joint use agreement and is used for two or more purposes. The uses served by the parking arrangement must be within a 500 foot walking distance of the shared parking facility.[52]

Unbundle the Cost of Parking from Land Costs/Rents

Unbundling parking separates the cost of renting or owning housing from the cost of renting or owning parking. This strategy is typically used in urban residential or mixed-use developments. The developer still constructs the required amount of parking but sells or rents the parking separate from the residential unit. Unbundling parking can be a means of attracting one- or no-car households and provides an incentive for residents to reduce their parking needs.

Implementation Examples

- **San Francisco, CA** Unbundling parking has been successfully integrated into the City of San Francisco's zoning code. Any new construction or new building conversion with 10 or more residential units must separate the cost of parking from the cost of housing.[53]

Variable Market Rate Parking

Also called demand-responsive pricing, variable rate pricing is when on-street, metered parking is programmed to respond to market demand based on the location of the meter and the time of day. The price of parking is set to ensure 85 percent occupancy during most periods of the day. For example, rates are highest in the downtown business district during business hours. Variable rate pricing is typically done in large cities but could be carried out in a smaller town under the auspices of a Parking Management District.

Implementation Examples

- **Chicago, IL** In 2009, the City of Chicago contracted out all on-street parking to a private firm that will maintain and operate the parking meters for the next 75 years. The private company designated three zones in the city and priced meters based on the zone. The rates vary based on time of day and zone. While Chicago was one of the earlier models for variable rate pricing, it has been criticized for using a private firm that keeps the profits from the increased parking rates. Most cities set up a parking benefit structure where any increase in revenue from parking is reinvested back into local transportation improvements, including transit and bicycle infrastructure.[54]
- **Seattle, WA** In 2012, the City of Seattle implemented a variable rate pricing structure for on-street parking that caries by block and time of day.[55]

Source: http://blog.seattlepi.com

Parking Strategies for the City of Falls Church

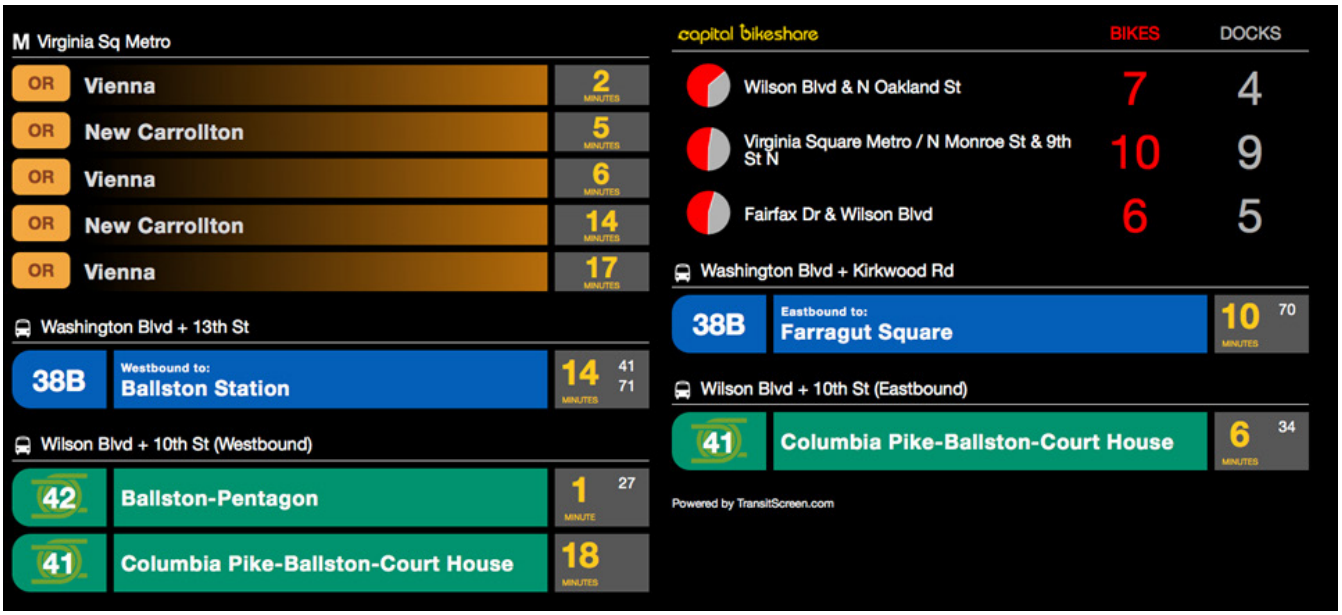
The parking strategies presented in this section represent various parking strategies implemented by jurisdictions around the United States, and it is not suggested that all of these strategies will be a good fit for the City of Falls Church. The City currently does not have any public parking that is priced, therefore many of the strategies that involve priced parking are not necessarily appropriate for the City at this time.

In the short-term, the City should focus on strategies to right-size the parking supply to parking demand and protecting residential parking while redevelopment occurs in its commercial corridors. To understand the demand for parking, creating a parking inventory and undertaking a formal parking study may be necessary. Given the differing rates of utilization of parking across the City, with some lots consistently full while others relatively unused, initiating a recognizable shared parking program may also be an early first-step towards addressing the availability of parking in the City.

Real-Time and Static Transit Information and Marketing

Providing accurate and easily-accessible information is an essential part of encouraging transit use and non-SOV modes. This includes the provision of both traditional transit information, in the form of providing transit maps and timetables, as well as real-time information. Ensuring the wide dissemination of static transit information is a central element of transportation demand management. This can be done through the creation of innovative transit marketing materials, marketing materials based on the needs of a specific segment of the population

Figure 10: TransitScreen Display



Source: http://transitscreen.com/

(e.g., residents or workers), and just ensuring that basic transit information is available in public places, in retail establishments, and at transit stops as appropriate.

Increasingly public sector agencies and private entities are stepping in to help facilitate the transfer of information between transit agencies and their clients. The following two examples demonstrate both a bottom up and a top down strategy for facilitating the dissemination of real time transit information to both the general public and to targeted audiences.

Arlington, VA

Mobility Lab, a program of Arlington County, VA, developed and actively markets and sells TransitScreen, a real-time transportation information display. TransitScreen provide real-time travel information on all nearby transit services including Metrorail and Metrobus, Capital Bikeshare, DC Circulator, Arlington Transit, and other local transit providers. The screens are customizable and can be displayed on a tablet or a flat screen TV. The screens have been successfully implemented in retail stores, residential apartment building lobbies and commercial properties. A number of business improvement districts in the D.C. area have also successfully installed TransitScreen outdoors in high volume corridors and near transit centers. An upfront software license starts at $1,999 per screen. Monthly management fees start at $50, but can be waived on an ad-supported TransitScreen.

Metropolitan Transportation Commission (MTC)/ 511.org[56]

The regional transportation planning agency in the San Francisco Bay Area is currently coordinating a regional real-time transit information system. The Bay Area has over 20 transit agencies operating in the region all with different data structures and reporting formats. As part of their coordination effort, transit agencies will send MTC/511 their real time transit arrival and departure predictions which will be made available through mobile applications, the 511 website, and standardized real-time transit information that will be placed at 21 key transit hubs in the region through the Hub Signage Program (HSP). While the program is still in the planning process, the hub screens will be 45" monitors that are suitable for indoor/outdoor display. The HSP includes a $10 million capital investment from MTC with operation, maintenance and replacement costs split between MTC and the transit agencies.

Ridesharing

Ridesharing, the act of sharing a car ride typically (although not exclusively) for commute purposes, is the activity perhaps most closely associated with Transportation Demand Management. Ridesharing can occur in several forms, including traditional carpooling, dynamic carpooling (also referred to as dynamic ridematching), and vanpooling. Carpools are typically groups of up to four people that share a ride. The Washington, D.C. region

is home to a particular phenomenon of carpooling known as slugging, where carpools are formed in the moment based on riders and drivers congregating at known locations.

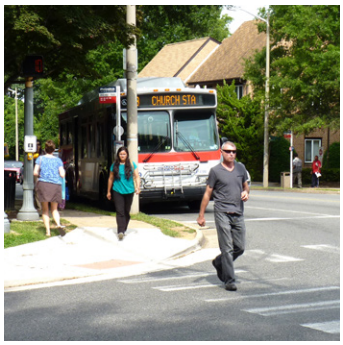
Vanpools are groups of 5 to 15 individuals that share a van, typically either a van is leased from a vanpool company or or seats or sold on van that is privately operated, for their commute to work. Vanpools operate on set schedules and typically leave from Park and Rides or other central locations and make just one to two destination stops. The Washington, D.C. metropolitan region is one of the largest vanpool markets in the country, with the majority of vanpools being formed coming from the southern parts of the region, including Prince William County, Stafford County, and the City of Fredericksburg.[57] In October 2013, a new Northern Virginia vanpool program, the Vanpool Alliance, began operating as a partnership of the Fredericksburg Area Metropolitan Planning Organization, the Potomac and Rappahannock Transportation Commission, and the Northern Virginia Transportation Commission that will provide financial incentives to individuals to join vanpools.

Ridesharing begins with ridematching, or matching two or more individuals for the purpose of sharing a trip. This can be accomplished through workplace-based transportation coordinators, through the use of private ridematching applications, including a number of dynamic ridematching applications, or through the use of governmental ridematching database. The Commuter Connections ridematching database is available for the use of all residents of the region who are seeking to share a ride to work, and contains information both on individuals seeking to carpool as well as those operating vanpools. Commuter Connections is a regional network of transportation organizations coordinated by the Metropolitan Washington Council of Governments.

Currently, 12 percent of people who work in the City of Falls Church carpool or vanpool to work, while 7 percent of residents rideshare for their commute.[58] The City of Falls Church can support the formation of carpools and vanpools by individuals working in the city by designating carpool and vanpool parking spaces, either through shared parking agreements or through the development review process and by providing access to an employer services program for the businesses currently located in the City. The City may also wish to promote the newly formed Vanpool Alliance to facilitate the dissemination of information on these new benefits.

COMMUTER CONNECTIONS®
A SMARTER WAY TO WORK

Source: Metropolitan Washington Council of Governments



4 WASHINGTON CORRIDOR STRATEGIES

CHAPTER 4: WASHINGTON CORRIDOR STRATEGIES

The City of Falls Church has identified the Washington Street Corridor (U.S. Route 29) as a key planning area anchoring the City's commercial redevelopment. The City commissioned three Small Area Plans (SAP)) for the three identified Planning Opportunity Areas (POAs) in the Washington Street Corridor to guide future development. The Falls Church City Council has approved the North Washington Street SAP and the South Washington Street SAP; work recently began on the City Center Small Area Plan.

Overall, both approved plans encourage the same elements as the TDM recommendations discussed in this document. There is a general focus on increasing the multimodal access to and within Falls Church. The City has identified important bicycle and pedestrian connections and amenities that need to be enhanced and recommend reducing off-street parking. Many of the goals outlined in the SAPs can be incorporated into the City's TDM site plan policy and can be paid for in part by developer contributions. However, as is evident in the SAPs, there are inconsistencies in the existing infrastructure along the North Washington Street corridor versus the South Washington Street corridor and varying levels of developer interest in the different sections of the corridor.

This chapter is focused on examining options for using Transportation Demand Management techniques to facilitate transit-oriented development in the Washington Street Corridor extending from the East Falls Church Metrorail Station, beyond the quarter-mile radius that is traditionally accepted as a boundary for such development. Following an overview of the objectives of the two approved small area plans for the Washington Street Corridor, two specific corridor-level strategies are assessed for the their applicability to the Washington Street Corridor: a local area circulator to facilitate transportation within the corridor and to the Metrorail station, and the implementation of a TDM for Site Plans policy specifically for the mixed-use Washington Street Corridor, with the possibility of its application on the Broad Street (VA-7) corridor as well.

WASHINGTON STREET CORRIDOR SMALL AREA PLANNING PROCESS

The three Planning Opportunity Areas(POAa) that comprise the Washington Street Corridor each have unique characteristics, and transportation goals have been developed for the North Washington Street and South Washington Street Small Area Plans within the context of each area, and its distance from the East Falls Church Metrorail Station.

North Washington Street Planning Opportunity Area (POA)

The north side of the corridor is closest to the East Falls Church Metrorail Station and provides an important connection to the Washington and Old Dominion (W&OD) trail. It is crucial that this POA connect people to both of these facilities. The North Washington Street corridor has an approved streetscape plan that requires 10 foot wide sidewalks and other streetscape amenities. These requirements will need to be incorporated into the City's site plan policy.

Figure 11: North Washington Street Planning Opportunity Area

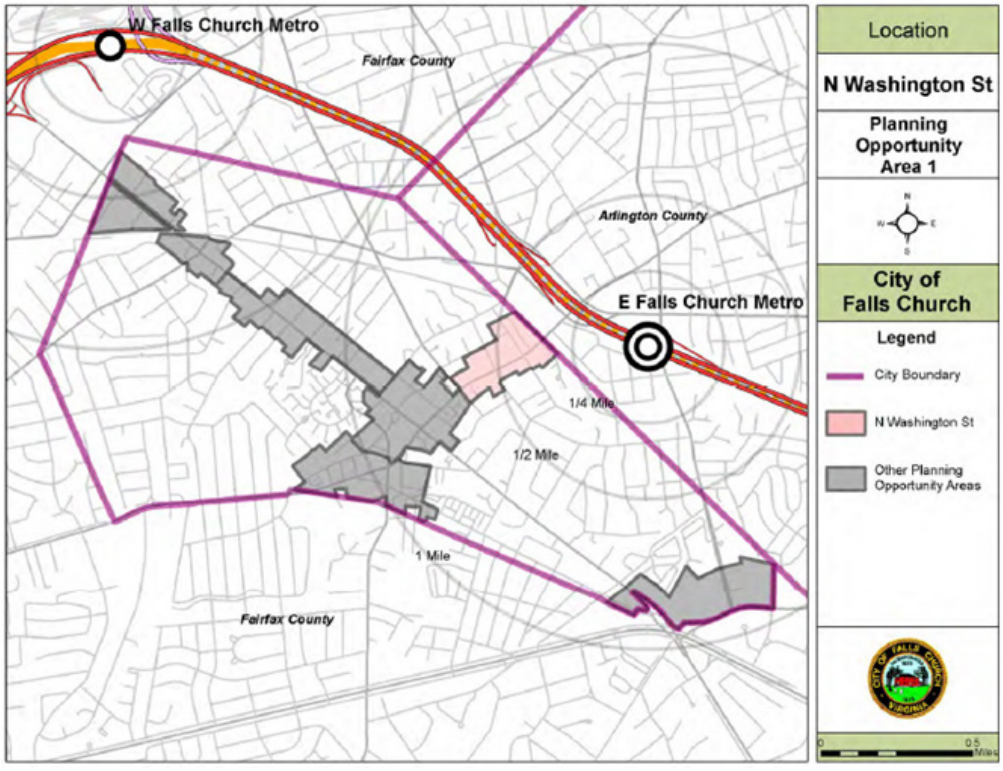


Figure 12: South Washington Street Planning Opportunity Area

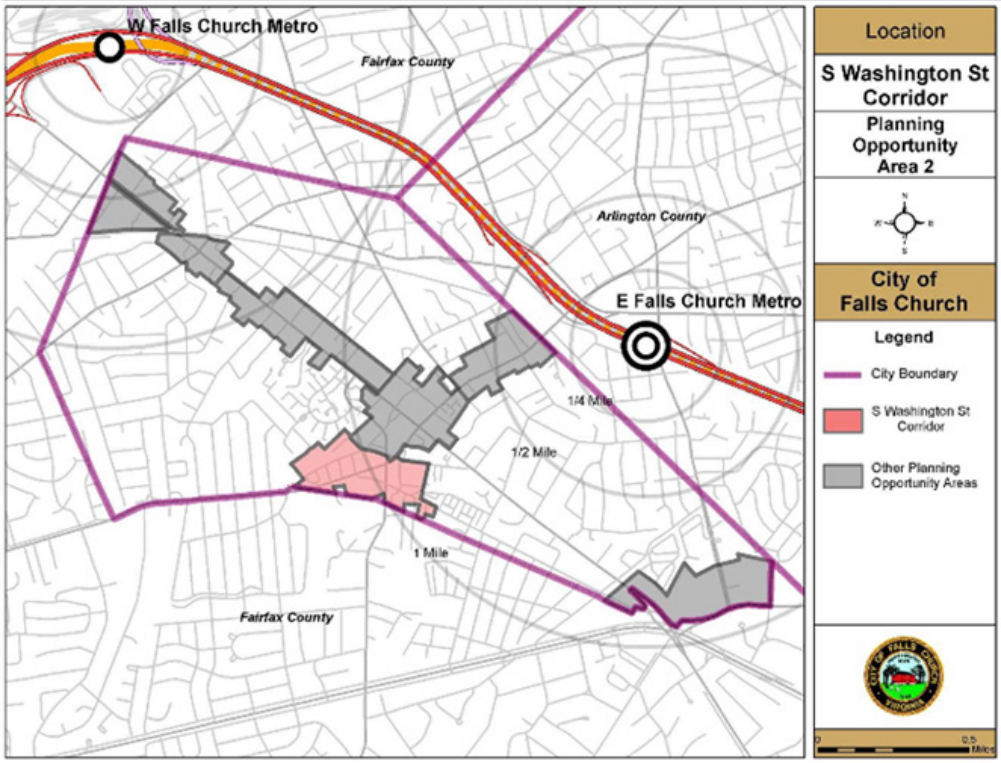
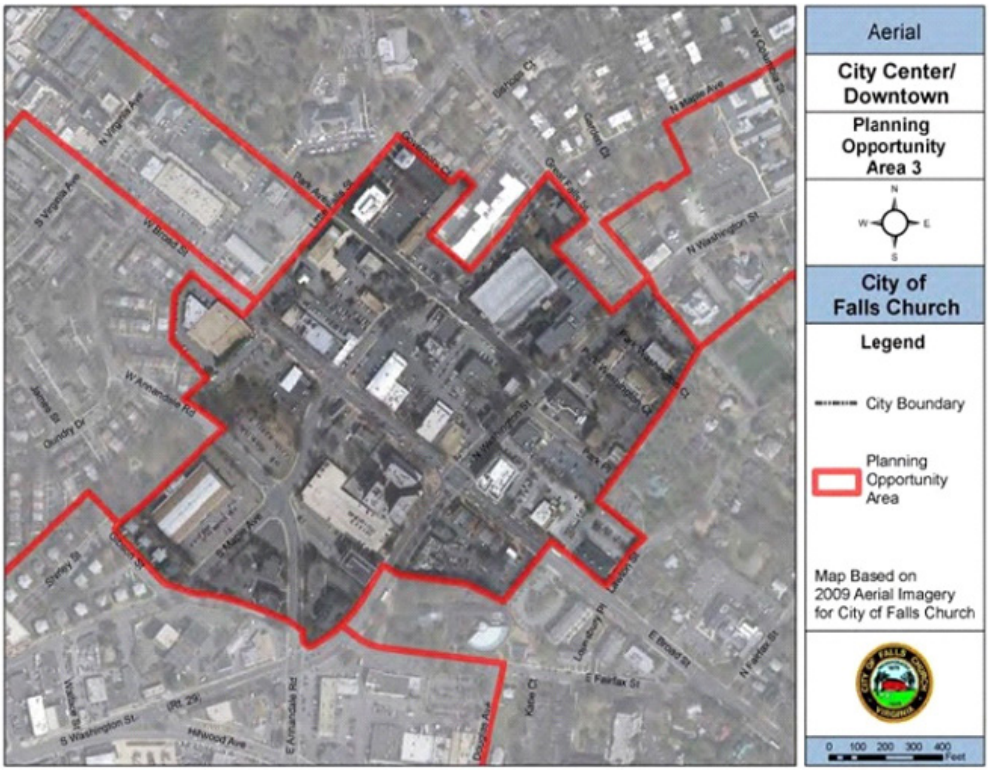


Figure 13: Center City / Downtown Planning Opportunity Area



The transportation goals outlined in the North Washington Street POA are as follows:

- Improve pedestrian and bicycle connections within the POA and from the POA to the W&OD Trail.
- Maximize use and access to the East Falls Church Metrorail Station.
- Implement Phase 1 of bikeshare.
- Construct the North Washington Street streetscape.
- Create safe pedestrian and bicycle crossings at key intersections.
- Create seamless modal transfers (e.g., bus to foot and bike to foot) through the provision of safe, attractive and easily identifiable facilities.
- Improve bus stop facilities.
- Reduce off-street parking demand in mixed-use areas.
- Create shared structured or underground parking facilities.
- Coordinate with WMATA and Arlington County on the development plans for the western entrance of the East Falls Church Metrorail Station, as well as subsequent plans for additional bus service and bicycle facilities to serve the station.

South Washington Street Planning Opportunity Area (POA)

This POA is considered the gateway to the City of Falls Church. There is less developer interest but also less existing infrastructure along the South Washington Corridor. The City is hoping to catalyze development along this part of Washington Street by constructing an Intermodal Transit Plaza to serve as a gateway for the area. The Transit Plaza will serve as the foundation for the City's transit-oriented development. There is currently an oversupply of surface parking lots along the South Washington Street Corridor, which suggests any parking policy the City adopts will be key in reshaping this area.


High Density Residential

The goals outlined in the SAP are as follows:

- Increase walkability by improving the sidewalk network and streetscape features and by promoting pedestrian oriented redevelopment
- Improve pedestrian, bicycle, public transit, and automobile connections to the City Center POA and the East Falls Church Metro Station
- Construct an Intermodal Transit Plaza as a gateway for the area. Make it a focus of Transit-Oriented Development, pedestrian, and bicycle activity.
- Promote centralized and consolidated parking structures that allow for shared spaces, and that provide parking for bicycles and carshare.

Center City Planning Opportunity Area (POA)

A kickoff meeting for the development of the small area plan for the Center City Planning Opportunity Area was held on June 1, 2013. The Center City POA is centered around the intersection of South Washington Street with Broad Street (VA-7). This is the commercial center of the City and the land use is predominantly commercial and retail. Many independent restaurants and small retail establishments, and the State Theater, a regional entertainment destination, are located in this area. The kickoff presentation identified unmanaged, unshared parking as an existing transportation issue and suggested that this small area plan will examine the implementation of shared parking garages, new bus shelters, bikeshare, and enhanced pedestrian connections to facilitate movement of people within and to Center City. The presentation also mentioned the possibility of a frequent shuttle to the East Falls Church Metrorail Station.

EMPLOYMENT IN THE WASHINGTON STREET CORRIDOR

In undertaking an analysis of the potential for a TDM for Site Plans policy and a Circulator service to work well in the Washington Street Corridor, the corridor's role as a place of employment was analyzed. As shown in Figure 14, the largest concentration of employment in the City by far is in the Washington Street Corridor, and in the area of Broad Street closest to the corridor.

Many TDM Programs begin by providing information on non-SOV options for the commute to work through employer-based TDM programs, as the commute is a trip

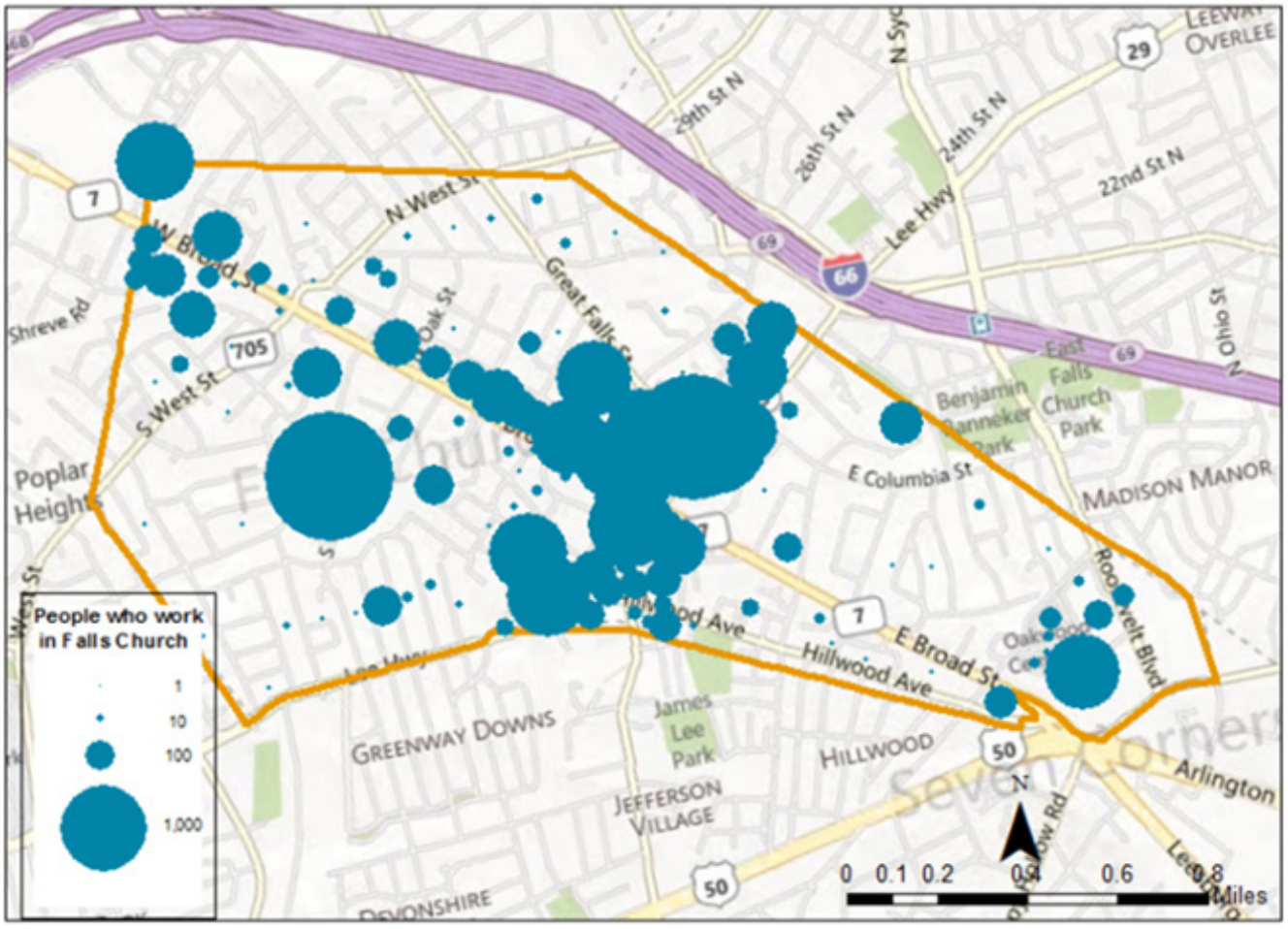
that taken every workday with a predictable travel time and mode by much of the working population. A change in commute mode from SOV to ridesharing, transit, walking or biking will provide a sustained impact on overall SOV trip reduction. The concentration of employment in the Washington Street corridor may increase the likelihood of the success of strategies to promote the use of non-SOV modes and other TDM strategies in this corridor, particularly if they are undertaken in concert with an ongoing employer services TDM program.

FEASIBILITY OF A FALLS CHURCH NEIGHBORHOOD CIRCULATOR

The intersection of Broad Street (VA-7) and Washington Street lies just 1.1 miles from the East Falls Street Metro, a quick bus, bike, or car ride away, but generally just beyond what would be considered a convenient walk. Developing a circulator between the City center and the Metro could provide that critical last mile link. In other cities, high-frequency and easy to understand circulator service has attracted choice riders, riders who either have a car or the means to own one.[59] While the congestion reduction impacts of individual bus services are hard to measure, VMT reductions have been attributed to increased bus service in places like Falls Church, such as small downtowns and college campuses.[60]

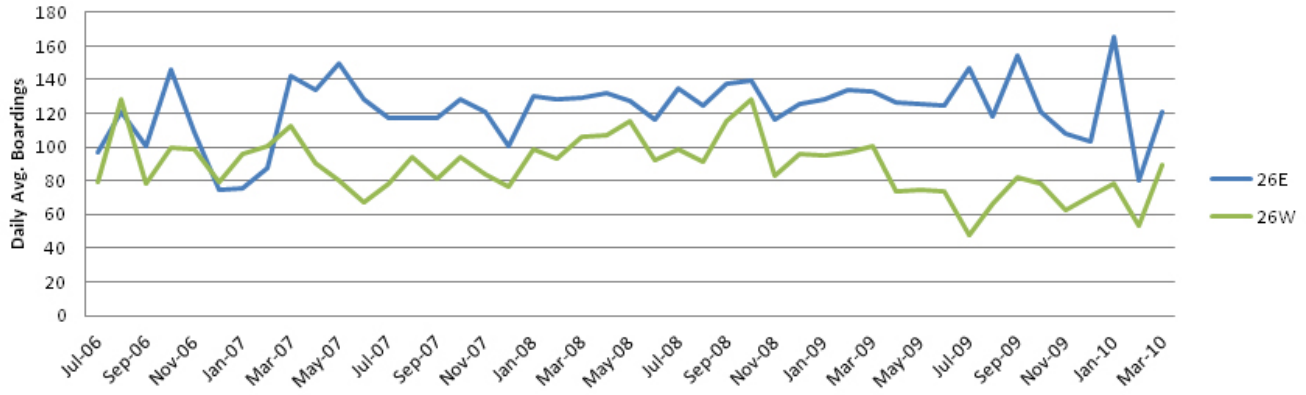
In Falls Church, high frequency bus service can only be supported through continued development in the City's core. This creates a dilemma: transit service is dependent on higher densities in the City core but those densities will partially rely on the availability of transit service. A circulator service to can succeed only if it is phased in concurrently with new development.

Figure 14: Employment in the City of Falls Church



Data Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics database, OnTheMap, 2011 Primary Jobs

Figure 15: George Ridership (July 2006 – March 2010)

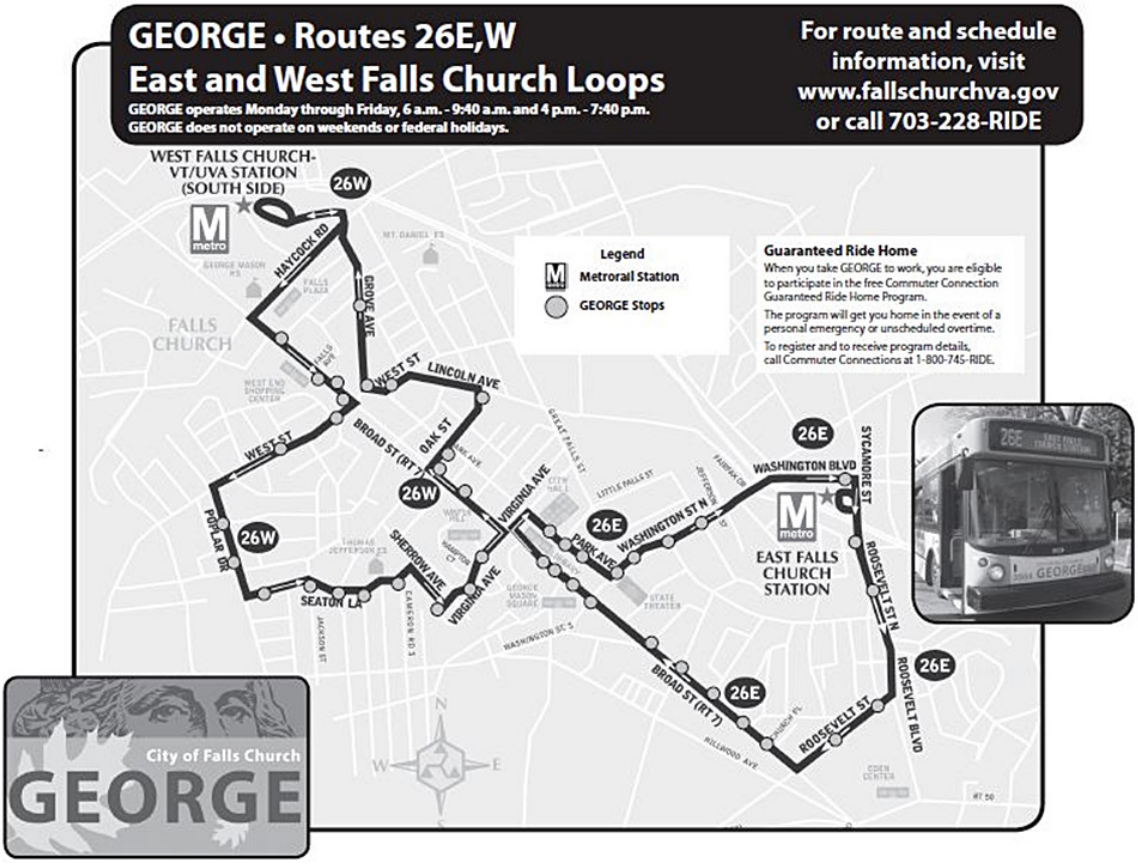


Background - George Bus Service

The evaluation of potential circulator service in the City of Falls Church began with an analysis of the George bus service that operated between 2004 and 2010. George operated two routes: the 26E which ran as a loop between the City's center and East Falls Church Metro, and the 26W, which ran as a loop from the City's center to the West Falls Church Metro. George buses operated only during the weekday AM and PM peak periods, with buses running roughly every 30 minutes. Between 2006 and 2010 ridership was stable and averaged 122 boardings per day on the 26E and 89 boardings per day on the 26W.

The George bus service never attracted enough ridership to seriously impact congestion or parking pressures in Falls Church. The service had two limitations. First, George buses operated on circuitous routes that increased travel times and made the routing hard to understand. Second, George buses ran on a very limited schedule and were only a convenient option for daily commute trips to the Metro stations. In 2010 the bus service was canceled due to a lack of funding.

Figure 16: George Bus Service



Current Bus Service

Metrobus operates the following bus services that connect the Broad Street and Washington Street corridors to the Metro system:

- **2A/B/C/G:** Weekday and weekend service along Washington Street with buses running every 20 minutes during the peak and every 30 minutes during the midday off-peak.
- **3A/3B:** Weekday and weekend service along Washington Street (3A and 3B) and West Broad Street (3B) with peak headways of approximately 15 – 20 minutes and off-peak headways of 30 minutes.
- **28A:** Weekday and weekend bus service operated at 30 minute headways during the weekday. 28X: Metro Extra service providing limited stop service along Broad Street during peak periods. Buses run approximately every 15 minutes.

In the first quarter of 2013 there were an average of 425 daily boardings between Maple Street and the City border with Arlington County along Washington Street.

Description of Routing Alternatives

The George service's major weakness was that in trying to serve the largest portion of the City as possible, it failed to serve any part of the city particularly well. The circuitous routing was confusing to potential, and made trips uncompetitive with other modes. For this study, three route alternatives were identified for the potential re-impelementation of circulator servie in Falls Church. These alternatives all try to keep travel times to a minimum and routing simple, while providing major nodes in the city with a quick link to the Metrorail system. The first alternative would provide a quick and short link between the center of Falls Church and East Falls Church Metro. The second alternative would travel along the two main corridors in the City and allow for connections to both West Falls Church and East Falls Church. Finally, the third alternative would connect the East Falls Church Metro to the Eden Center and Washington Street.

Alternative A: Washington Street Circulator

The first alternative focuses nearly exclusively on the portions of Falls Church with existing and planned Small Area Plans (SAPs). This alternative would run a bus along Washington Street from East Falls Church Metro station to Tinner Hill Road, where buses will loop around through Maple Avenue and Annandale Road to reach West Broad Street and City Hall before returning to Washington Street and East Falls Church Metrorail Station. The entire loop is 3.14 miles long and would take an estimated 15 minutes to complete. Approximately one-third of Falls Church

Figure 17: Existing Metrobus Service in the City of Falls Church

Graphic Source: www.wmata.com

would be within a quarter mile of the route (a five minute walk), including nearly all the portions of the city slated for future mixed use development and higher density residential development.

Alternative A was designed to serve the areas with the highest concentration of new development in the City. By keeping the route relatively short, the shuttle can operate at fairly high frequencies. Deviations onto neighborhood streets have been avoided so to keep the route simple to operate and easy to understand from the riders perspective.

Alternative B:
East Falls Church to West Falls Church Metro Station

Alternative B would serve the two commercial corridors in the City of Falls Church, West Broad Street and Washington Street. The route would run from East Falls Church Metrorail Station south along Washington Street, turn on Tinner Hill Road to Maple Avenue and head north until Broad Street, where the bus would turn left and travel along Broad Street until reaching the West Falls Church Metro. This alternative is the longest of the three route options and buses would take 31 minutes to complete the 6.7 mile roundtrip from East Falls Church Metrorail Station. Alternative B closely matches the alignment of the 3B bus in Falls Church.

The route would allow not only for circulation between major nodes of development in Falls Church and the metrorail station, but allow for trips within the City. For example, residents along Washington Street could ride the bus to commercial development clustered on the far west side of Broad Street, near the West Falls Church Metrorail Station. About half of the City would be within a quarter mile of the route, including nearly all major commercial, mixed use, and higher-density residential development.

There are a few downsides to Alternative B. As the route is the longest, it will require the most revenue hours to operate at a given frequency compared to the other

Figure 18: Alternatives for Washington Street Circulator Bus Service (Overlaid on Future Land Use)

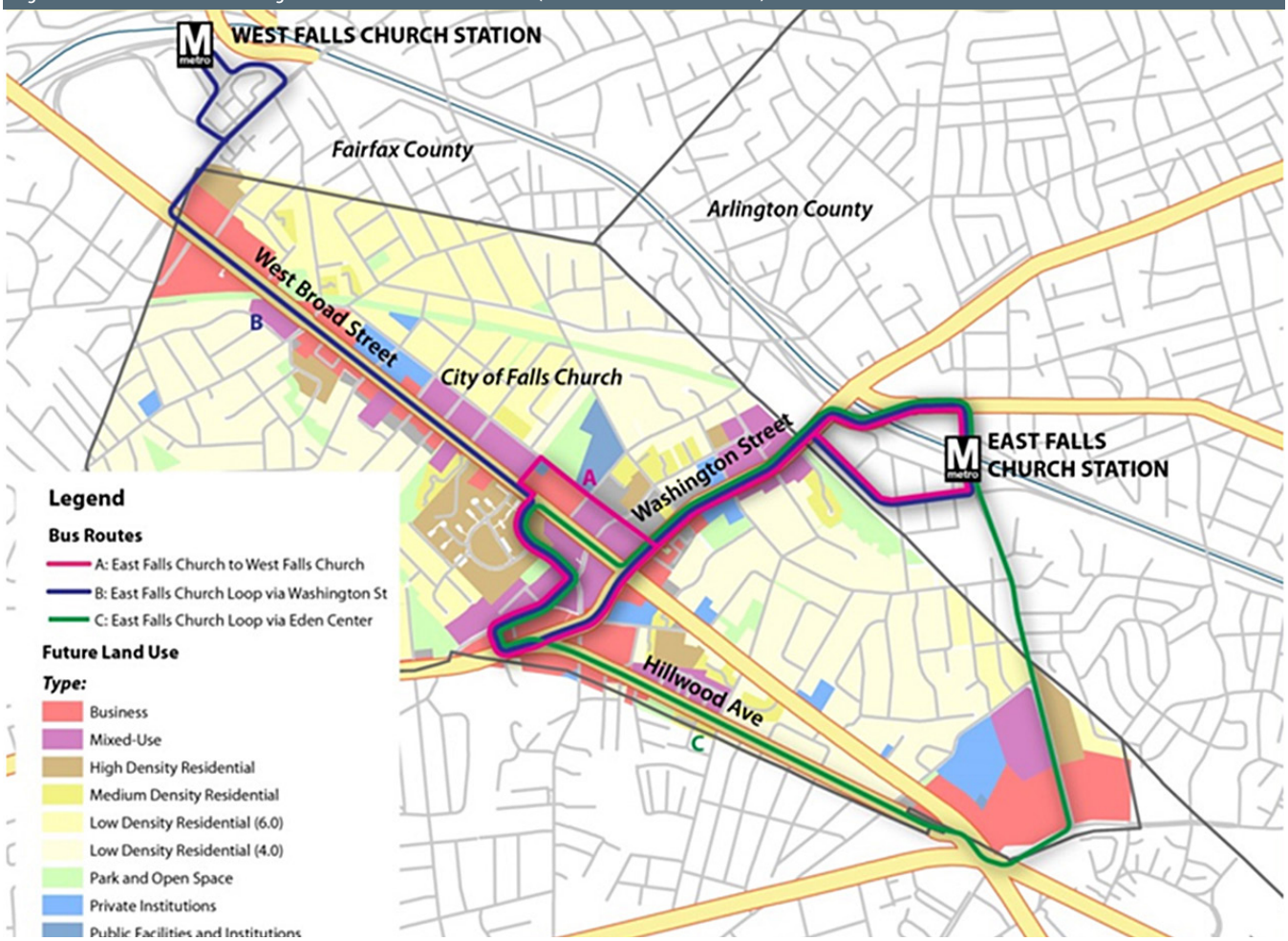


Table 10: Overview of Route Alternatives

Route	Length	Travel Time	Benefits	Drawbacks
Alternative A	3.14	15 min	Short route affordable to operate at higher frequencies	Serves the smallest percentage of the city
			Simple routing that is easy for the public to understand	Not useful for trips between destinations in the City
			Offers quick connect between FC center and Metro	
Alternative B	6.7	31 min	Serves both Broad Street and Washington Street	Long distance and travel time will make route more costly to operate / may make higher frequency service infeasible
			Simple routing easy for the public to understand	Routing along Route 7 may contribute to delays
			Allows for intra-city trips as well as trips to the Metro	Potentially not enough demand to support additional service on West Broad Street
Alternative C	4.3	20 min	Short route affordable to operate at higher frequencies	Loop route will make trips from the Metro to Washington Street less convenient than other routes
			Will serve the Eden Center, a regional destination	Will not connect east side of Falls Church to destination on West Broad Street
			Overlaps the least with existing bus service	

alternatives. Additionally, West Broad Street (VA-7) is one of the most congested corridors in Northern Virginia, and buses may suffer from delays due to traffic. Finally, the old George 26W route, which operated from the center of Falls Church west to West Falls Church Metrorail Station, experienced low ridership compared to the 26E, suggesting that there might not be much need for additional bus service along Broad Street

Alternative C: East Falls Church via Eden Center and Washington Street

Alternative C is the closest to resembling the George 26E. The route would travel from East Falls Church Metrorail Station south along Roosevelt Avenue to the Eden Center before turning west and traveling on Hillwood Avenue to Maple Avenue and Washington Street. The route would provide a quick link between planned development along Washington Street and the East Falls Church Metrorail Station, while also connecting one of Falls Church's most popular destinations, the Eden Center, with the metrorail station and the City's center.

The route, like Alternative A, is relatively short and allows for the quick turnaround of buses. The 4.3 mile loop would take 20 minutes to travel the full loop and would serve 47 percent of the City's area, including the high density development existing and planned for Washington Street and Roosevelt Avenue. The one drawback of Alternative C is that at lower headways, the route would not be time competitive with walking or biking for trips from East Falls Church Metrorail Station to the intersection of Broad Street and Washington Street; passengers would have to wait for the bus and then travel for over 12 minutes to reach an intersection that is only a 20 minute walk from the Metrorail station.

Schedule and Frequency

For the service to become a realistic alternative to car ownership, the circulator service must provide some weekend and off-peak service in addition to peak hour service. High frequency service is necessary to attract choice riders,[61] people who otherwise would choose to drive if bus service was not convenient. The majority of Falls Church's population likely falls into this group. The chosen alternative will also impact the schedule as shorter routes can be serviced by higher frequencies for less cost than longer routes.

Schedule Scenarios and Cost

In order to estimate the cost of operating a circulator service, three schedule scenarios were created; all three assume 30 minute headways during the weekends and a span of 6am to 10pm on weekdays and 8am to 8pm on weekends, with the peak period running from 6am-9am in the morning and 3pm to 7pm in the evening:

- Scenario One: 10 minute headways during the peak, 15 minute headways during the off-peak
- Scenario Two: 10 minute headways during the peak, 30 minute headways during the off-peak
- Scenario Three: 15 minute headways during the peak, 30 minute headways during the off-peak

Table 11 illustrates the estimated annual subsidy required for each of the three scenarios:

Table 11: Estimated Annual Operating Costs			
	Alternative A	Alternative B	Alternative C
Scenario 1	$912,000	$1,601,000	$1,086,000
Scenario 2	$689,000	$1,378,000	$862,000
Scenario 3	$689,000	$1,204,000	$689,000

Ridership

Estimated ridership for the three circulator alternatives is difficult as they will be serving largely future development that does not exist today. The relatively low ridership on existing Metrobus routes along the corridor is due to low densities and the poor visibility of transit services along Washington Street. Sketch level ridership estimates based on current boardings per mile along the corridor show that each alternative will achieve approximately 300 to 400 riders per day. At these ridership levels the cost per trip will range from $7 to $10.[62]

Table 12: Washington Street Circulator Estimated Annual Ridership (Current Development)			
	Alternative A	Alternative B	Alternative C
Scenario 1	106,000	169,000	149,000
Scenario 2	80,000	145,000	118,000
Scenario 3	80,000	127,000	94,000

It remains unclear whether demand exists for fixed use bus service along Washington Street, especially during off-peak periods. While residents and businesses will need improved transportation connections to the Metro and other destinations in order to forego driving, the overall travel demand on the corridor may be too low to justify the cost of fixed route bus over what is currently provided by Metrobus. Washington Street presently features over six buses an hour during the peak period in either direction, and four buses an hour during off-peak periods. With the existing high-level of bus service, other TDM services may be more effective at reducing VMT along the Washington Street corridor, including carsharing, taxi bus and the marketing of existing service.

Bus Service

Alternatives to Traditional Fixed Route Service

Some cities have utilized taxi bus service to fill in gaps in the existing transit service. A taxi bus service uses regular taxis to travel along a fixed route. Riders pay standard transit fares and must alight at designated stops. Taxi bus service may be more cost-effective during off-peak and late night periods when riders still need a reliable way to get home but total demand is too low to justify bus service.

The Washington Street corridor already enjoys fairly frequent bus service during most periods of the day but ridership is less than 500 boardings a weekday. A major impediment to use may be that residents either feel that bus service is confusing or unappealing. Improved rider information, upgraded bus shelters, and a targeted marketing campaign may help bring more riders to existing bus service along the corridor.

IMPLEMENTING TDM FOR SITE PLANS IN THE CITY OF FALLS CHURCH

The outline of the TDM for Site Plans program for the City of Falls Church described in this section is intended to provide a starting point for determining the framework for TDM site plan conditions. The City may choose to refine this framework further, prior to any possible formal adoption a TDM for Site Plans Program.. There are two types of TDM for Site Plans programs proposed: a Full TDM program for larger development projects with structured monitoring and evaluation requirements, and a TDM Light program that allows for TDM infrastructure and programs without the reporting requirements to encourage TDM in smaller scale development projects. The City of Falls Church's TDM for Site Plans Program may be structured in such a way that any development on the Washington Street Corridor (Planning Opportunity Areas 1, 2, and 3) and the Broad Street Corridor (VA-7) would be subject to participate in the TDM for Site Plans Program.

Full TDM Program

If the proposed development within one of the two corridors meets the minimum threshold size outlined in Table 13, then the developer would be required to follow the steps as outlined. Any development proposal that meets the threshold size in Table 14 would be subject to

the Full TDM Program. These developments would also required to submit a Traffic Impact Analysis (TIA) to the City to estimate the impact of the proposed development on local area traffic.

Table 13: Thresholds for the Full TDM Program

Land Use Type	Minimum Size
Office	50,000 or more square feet of usable space
Retail	40,000 or more square feet of usable retail space
Industrial	150,000 or more square feet of usable industrial space
Residential	200 or more dwelling units
Mixed-Use	40,000 or more square feet of any combination of usable space including one or more of the previous uses, at the size applicable to that use.

Once the development has entered into the TDM Program, the developer/tenant would be required to produce a customized set of the following items after consultation with the City:

- Set non-SOV mode share goals, based on results from the TIA
- Identify TDM strategies that the developer will be responsible for incorporating into the development process and identify ongoing funding obligations:
  - Infrastructure
    - On-Site improvements, such as:
      - Bicycle racks
      - Bus stop/shelter with real time passenger information
      - Sidewalks
      - Capital Bikeshare capital costs
      - Carshare parking
    - Off-Site improvements, which are one-time contributions required pending the results of the TIA:
      - Intersection improvements
      - Roadway improvements, including any potential bicycle and pedestrian improvements leading to the development site
  - Transit Operating
    - Cash contributions to fund local transit service as determined by the City of Falls Church. Transit operating contributions may contribute to one or more of the following: WMATA subsidy, Capital Bikeshare operating costs, or any other locally-operated transit service.
  - Tenant TDM Services (Information and Incentives)
    - Information and services that the tenant/owner provides including an on-site transportation coordinator who is responsible for carrying out the TDM programs. Strategies include working with an employer TDM program, establishing a residential TDM, information displays, transit screens, unbundle parking (lease agreement), providing free or reduced cost transit passes, and parking cash outs.
- Identify a transportation coordinator on-site post-occupancy
- Produce a Transportation Management Plan (TMP)
- Participate in an annual travel survey to estimate the building site's mode share
- Produce an annual report citing the results of the annual travel survey for the first three years after building occupancy
- The developer is required to set aside cash contributions for two funds[63] each year for the first fifteen years that a building is occupied. Cash contributions serve an essential function as an enforcement mechanism for the site plan policy. Based on interviews with neighboring jurisdictions, it is recommended that the City of Falls Church require developers to set aside funds in advance to bridge the gap between non-SOV mode share goals established in the TMP by the developer and the actions of the building owners and/or tenants. Setting aside both an operating and a penalty fund ensures the TMP goals are met. The funds are set aside as a guarantee by the developer and do not require administrative or management time on the part of City staff.
  - Operating Fund – this escrow account is used to fund the transit operating costs and to fund the costs associated with tenant TDM.
    - $0.10 per square foot of development
  - Penalty Fund - this escrow account is set aside in case the tenant/owner is not able to meet the non-SOV goals established in the TMP. If the tenant/owner meets the non-SOV goals set in the TMP for three consecutive years, then they are eligible to cash in the penalty fund. If they do not meet the goals set in the TMP during the first three years, then the tenant/owner is required to use a portion of the penalty fund towards additional TDM activities.
    - $0.05 per square foot of residential space
    - $0.10 per square foot of office space

Table 14: Total Estimated TDM Cash Contributions ($0.10 per square foot of development space)

	Current Total Bld Sqft	Current FAR	Total Bld Sqft 2.5 FAR	35% of 2.5 FAR	45% of 2.5 FAR	55% of 2.5 FAR
North Washington Street	545,571	0.47	3,315,796	$116,053	$149,211	$182,369
City Center/Downtown	920,882	0.45	5,156,907	$180,492	$232,061	$283,630
South Washington Street	920,195	0.49	4,720,058	$165,202	$212,403	$259,603
Total	**2,386,648**		**13,192,761**	**$461,747**	**$593,675**	**$725,602**
Transit Operating Share				$230,874	$296,838	$362,801

Table 14 provides an illustration of the potential TDM contributions that Falls Church could expect from each corridor based on the recommended level of funding. It estimates the total potential building square footage for each of the Washington Street Corridor POAs based on a floor area ratio of 2.5, and the associated amount of total TDM operating fund contributions. The entire operating fund for each development project would be split evenly between the transit operating contribution and the development's own tenant TDM program. As shown in Table 14, if 45 percent of the North Washington Street Corridor were redeveloped, under an operating fund contribution of $0.10 fee per square foot of space, at total of $149,211 would be available for both transit operating and tenant TDM.

TDM Light Program for Small Development Projects

Any development that is located within one of the two corridors and is at least 10,000 square feet, but smaller than the thresholds established in Table 13 would be eligible to participate in the TDM Light Program. This modified program allows the developer to negotiate with the City to incorporate on-site and off-site TDM improvements, contributions towards transit operations, and/or the provision of tenant TDM services. These TDM services can be negotiated on an ad-hoc basis in exchange for adjustments to the project's minimum parking requirement. The total expenditures dedicated to TDM infrastructure, programs, and services should be equal to or greater than the cost of parking deferred through estimated adjustments.

The TDM Light Program does not require a TMP or performance measurement, reporting, or dedicated funding. The program would be intended to encourage developers to invest in an array of TDM elements to support and encourage the use of transit, bicycling, walking, and ridesharing among potential tenants and visitors. This is in direct support of the City of Falls Church's non-SOV mode share goals for both residents and workers.

Linking TDM Conditions with Transportation Impacts

As the Washington Street Corridor transitions into a mixed-use transit-oriented development, the use of walking, biking and transit for trips within and to the City is likely to increase. The City can facilitate this transition while proactively taking steps to limit the impact of development-related traffic by planning for the appropriate mix of transportation facilities at the site level. Providing the right amount of parking, not too much or too little, is also key to ensuring the economic viability of the Washington Street corridor and the city's commercial and retail businesses, while preserving and enhancing the unique "Little City" character of the City of Falls Church by seeking to limit traffic impacts. By ensuring that each development isn't building an excess of parking spaces that may go unused, funds that developers would have spent developing parking may otherwise be utilized through the TDM for Site Plans process for other transportation infrastructure and TDM activities. As will be discussed in Chapter 5, providing the right type of infrastructure (e.g., sidewalks, bus shelters, bike racks or bikeshare) is very important to ensuring that TDM activities are successful and their goal in reducing the use of single-occupancy vehicles is achieved.

An exercise was undertaken to estimate the value of the parking that would be built using traditional trip and parking generation models, versus trip and parking generation models for mixed-use developments, using the characteristics of actual mixed-use development in the City of Falls Church today. The value of the parking that would be built under a traditional parking model that was in excess of the number of space required in the mixed-use model was calculated to determine the monetary value of parking provided that may otherwise have been applied to other types of transportation improvements or TDM initiatives.

The Institute of Transportation Engineers (ITE) Trip Generation Manual, which has been traditionally used

to develop trip generation rates, is primarily focused on single-use developments. The Mixed-Use Development (MXD) Trip Generation tool, a spreadsheet model developed under the U.S. Environmental Protection Agency (EPA), adjusts the ITE trip generation rates for the surrounding land use context, and then makes use of another model, the MXD Parking Generation model. This was used to estimate both the trips generated by new development and any adjustments to the parking calculations based on the trip generations rates. The MXD Trip Generation tool produces a precise estimate of vehicle trips generated by a new development using inputs on the existing surrounding land use, transit access, development size and type of development. The tool was developed based on data from 239 nationwide mixed-use developments and has been validated using traffic counts at 28 other mixed-use developments in various parts of the country. The sample represents a wide range of densities, land use mixes, and development scales.[64]

The following case study shows the potential for how the City could have used alternative trip and parking generation models to reducethe parking requirements for an existing development, The Byron. A suite of TDM programs that could have been implemented in lieu of the required parking are also outlined.

Case Study: The Byron Development

To illustrate the proposal to allow small scale, mixed-use development (less than the 40,000 square foot threshold listed in Table 13) to negotiate TDM incentives in lieu of parking spaces, we have evaluated the potential for reducing parking for The Byron development, which was completed in 2006. The mixed-use project was built with 90 residential units, 8,000 square feet of office and 9,000 square feet of retail space. According to ITE Parking Generation Rates, the project requires 267 parking spaces. Those model results were adjusted by the MXD Trip Generation Model, developed by Fehr and Peers, which estimates the number of trips projected to be generated from a development based on area land use, employment and transit access. The MXD Parking Generation Model[65] developed by University of Utah, Fregonese and Associates, and the U.S. EPA.was then used to estimate the parking needed at The Byron.

Figure 19 shows the output of the MXD Trip Generation Models. According to the model, given the local land use and transportation factors in Falls Church that the Byron actually generates 20 percent fewer trips than ITE would estimate.

The mixed-use development parking demand model[67] uses the following assumptions to convert the daily trip generation rates produced in the spreadsheet (listed in Figure 19) model to peak hour parking generation rates:

- 50 percent of all external walk trips (estimated) would originate outside of the development (these trips reduce parking demand while the other half originating on-site would not affect parking demand)
- 100 percent of the external walk trips occurred in the peak hour
- 100 percent of the external transit trips occurred in the peak hour

Figure 19: Results of MXD Trip Generation Output[66]

MIXED USE TRIP GENERATION MODEL V4 - RESULTS FEHR PEERS

MODEL APPLICATION - ALL TRIPS

	Daily				AM Peak Hour				PM Peak Hour			
	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total
Baseline # of External Trips (ITE Model)	631	1101	563	2295	65	45	6	115	98	103	68	269
% External Trip Reduction (predicted by MXD Model)												
Internal Capture	3.99%	1.70%	1.64%	2.31%	3.99%	1.70%	1.64%	2.98%	3.99%	1.70%	1.64%	2.52%
Walking External	2.12%	28.03%	7.16%	15.87%	2.12%	28.03%	7.16%	12.58%	2.12%	28.03%	7.16%	13.38%
Transit External	2.43%	2.01%	3.11%	2.40%	2.43%	2.01%	3.11%	2.30%	2.43%	2.01%	3.11%	2.45%
# of Trips Reduced (predicted by MXD Model)												
Internal Capture	25	19	9	53	3	1	0	3	4	2	1	7
Walking External	13	303	40	356	1	12	0	14	2	28	5	35
Transit External	15	22	17	54	2	1	0	3	2	2	2	6
MXD Model # of Vehicle Trips	**578**	**757**	**497**	**1832**	**59**	**31**	**5**	**95**	**90**	**71**	**60**	**221**

Results	External Vehicle Trips					Total Trips Reduced			
	Baseline	Adjusted	Reduction %			HBW	HBO	NHB	Total
Daily	2,295	1,832	20%		Daily	53	344	66	463
AM Peak Hour	115	95	17%		AM Peak Hour	5	14	1	20
PM Peak Hour	269	221	18%		PM Peak Hour	8	32	8	48

Using the MXD Parking Model it is estimated that the developer could have reduced their parking requirements by 13 spaces, for a total of 253 spaces, from the ITE projection of 267 needed parking spaces. This figure is very close to the actual number of parking spaces built at The Byron, 250.

Given that a general estimate of above ground structured parking is $15,000 per space,[68] the developer could use the $201,596, the cost of these additional 13 parking spaces, toward TDM measures and site-level infrastructure improvements instead.[69] The following table shows a suite of TDM measures that could be supported through the funds saved on parking spaces avoided.

The example of The Byron shows that the mixed-use trip generation model and parking generation model may reduce the parking only slightly in terms of overall numbers. However, these reductions nonetheless can have a significant fiscal impact on funding for transportation infrastructure and TDM initiatives that encourage non-SOV travel. Since The Byron is an existing development, the City may wish to do field work at The Byron to ascertain how close the ITE parking rate estimates and the MXD parking rate estimates are to reality at the development. As Falls Church continues to mature into a more walkable community, the surrounding land uses will provide an even more supportive context for walking, biking, and taking transit. Future developments may benefit from using the MXD trip generation model that incorporates the surrounding land use context and may lead to the City being able to reliably reduce parking further.

The contributions and TDM conditions associated with the TDM for Site Plans policy may serve to reduce the overall cost of development in the City of Falls Church. For example, under the proposed site plans policy, a 50,000 square foot office development would incure $5,000 in transit operating contributions and $5,000 in penalty fund contributions. A total of $10,000 in annual TDM contributions is less than the cost of a single above-ground parking space. Implemeting TDM will meet the transportation needs of future residents and workers while reducing the need for building expensive parking. By reducing the cost development, the City of Falls Church can increase its attractiveness as a community that is attractive for development, including commercial development that will expand the City's tax base.

Understanding the Role of TDM in Trip Generation and Parking Generation

The MXD Trip Generation tool does not account for the impact of specific TDM programs and measures on trip reduction. The linkage between TDM, trip generation, and parking generation is a topic that remains understood only at a broad level. While there are many successful examples of TDM for Site Plans programs in Northern Virginia and across the country that have reduced SOV use at the building level, the relationship between the reduction in SOV use and overall trip generation rates and the associated parking generation rates at the building level is not something that has been comprehensively studied to-date. The research on these topics is not yet mature enough to draw a direct relationship to the types of TDM initiatives applied and trip and parking reductions. However, on a theoretical basis, the City can utilize the trip reduction estimates produced by the Federal Highway Administration (FHWA) as a general guide to determining how TDM programs implemented at the site-level may reduce trips generated, and subsequently reduce the need for parking.

Table 16, reproduced from the FHWA's definitive

Table 15: Potential TDM Measures for The Byron

TDM Measure	Estimated Cost
Capital Bikeshare Station[70]	$50,000
Capital Bikeshare (annual operating costs)[71]	$19,000
11 space bike rack [72]	$600
Bus stop with shelter	$15,000 - $20,000 (plus installation)
Real-time bus displays (software license)[73]	$2,000 per screen (monthly maintenance and service fee optional with ad-supported TransitScreens). TV screen is additional.
Streetlight[74]	$6,600 per unit
Bicycle Lane[75]	$5,000 - $50,000 per mile (varies based on condition of pavement and need to adjust signal timing)
Concrete curbs and sidewalks[76]	$15 per linear foot and $11 per square foot for walkways
Transit fare Subsidy[77]	$100/per resident per month

Table 16: National Evidence on TDM Program Impacts Vehicle Trip Reduction from Background Conditions[78]

TDM Program or Strategy	High Transit	Moderate Transit	Low Transit
Support, Promotion, Information	3-5%	1-3%	<1%
Alternative Commute Services	5-10%	5-10%	1-3%
Financial Incentives	10-20%	5-15%	1-5%
Combined Strategies			
With Free Parking	15-20%	10-15%	3-7%
With Paid Parking	25-30%	15-20%	N/A

Table Source: U.S. Department of Transportation Federal Highway Administration, Integrating Demand Management into the Transportation Planning Process: A Desk Reference

Integrating Demand Management into the Transportation Planning Process: A Desk Reference, illustrates how TDM strategies will be more effective in localities with high to medium levels of transit service. The City of Falls Church would likely be described as having moderate transit service.

It is **not recommended** that these figures be taken directly and applied during the Site Plans for Development process, but rather that they be used as a general guide in context with the type of TDM conditions being provided, the extent to which they will be provided, and the experiences of existing developments within the City of Falls Church. As the City moves forward with developing a deeper, local understanding will emerge of trip generation and the associated parking needs, and the effectiveness of TDM conditions currently in-place at Falls Church developments, a clearer understanding of the impact of building-level TDM on trips generated and parking needed.

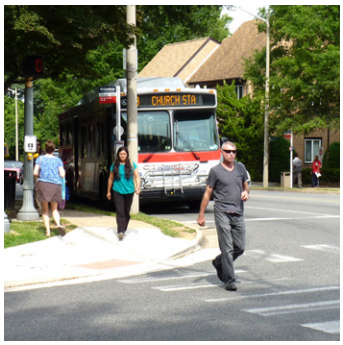
While the direct relationship between the effectiveness of TDM conditions and the amount of parking that is needed at the individual development level is still a topic of research, Table 6 clearly shows the relationship between the availability of free parking versus priced parking and its impact on the effectiveness of TDM strategies. Information from peer programs reviewed for this study and national studies on overall TDM programs[79] provide perspective on the importance of parking pricing management, and the provision of infrastructure for transportation modes other than the automobile. The following set of general "lessons learned" may also be considered during the development of TDM for Site Plans conditions:

- **Pricing influences travel choices** – Pricing for SOV parking has consistently proven to increase the use of non-SOV modes. This shift is most noticeable in areas with alternative transportation options available.
- **Time savings influences travel choices** – People respond to alternative modes more favorably when they offer time savings (e.g., HOV lanes) compared to the same mode without the added benefit of time savings (e.g., vanpools or carpools)
- **Parking availability influences travel choices** – Parking supply management in addition to market rate parking can reduce vehicle trips and shift the time of day that vehicle trips are made. Travel demand can be influenced by varying the cost of parking throughout the day by charging more during peak periods and by varying the price of parking for short-term versus long-term parking.
- **Bundling complementary TDM strategies creates the greatest impact** – Providing incentives for alternative modes or disincentives for SOV travel are most effective when there are good alternatives available (e.g., high transit level of service, existing vanpools and carpool matching services, and pedestrian and bicycle facilities). Combining a number of different TDM strategies into one program, will create the greatest impact.
- **Municipal or regional coordination is key** – A local or regional coordinating agency, such as a TMA or other interagency working group can help coordinate public and private sector TDM services within a region.

TDM for Site Plans Recommendations Summary

The City of Falls Church will benefit from a dual TDM site plan policy that places structured goal-setting, reporting and monitoring requirements on large projects and that incentivizes smaller mixed-use developments to invest in TDM measures both on- and off-site. Large developments above the minimum threshold size identified for the Full TDM Program result in additional local traffic for residents, workers, and shoppers. A structured TDM policy that includes a funding component, monitoring and incentives for compliance (and penalties for non-compliance) makes each new development responsible for the trip generation associated with the project. At the same time, the TDM Light Program offers incentives for smaller mixed-use projects to include TDM measures in the projects to help off-set auto trips associated with the project.

The outline of the TDM for Site Plans programs described in this section is intended to provide a *framework* for determining TDM site plan conditions. The City may choose to refine this framework further, prior to any possible formal adoption a TDM for Site Plans Program.



5 INFRASTRUCTURE AND IMPLEMENATION

CHAPTER 5: INFRASTRUCTURE AND IMPLEMENTATION

The role of the availability of transit, pedestrian, and bicycle infrastructure, and the funding and staffing needs related to the implementation of effective TDM program is a concern faced by any jurisdiction considering starting its own TDM program. Given the compact nature of the City of Falls Church, and its limited resources, there is a need to implement TDM services in the most cost effective manner possible.

THE ROLE OF INFRASTRUCTURE IN TDM

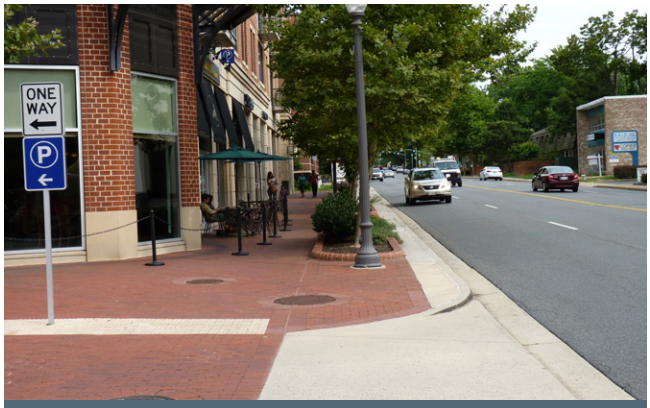
While TDM programs largely focus on *promoting* the alternative transportation options already available, infrastructure can be a major component of a community's TDM strategies. Infrastructure investments like bicycle and pedestrian facilities, new transit shelters, or bikeshare, bolster the appeal and usability of alternative modes. In suburban communities like Falls Church that have seen a great deal of automobile-oriented development over the last 50 years, critical investments in infrastructure can make walking, biking or taking transit more feasible and appealing to a wider portion of the population. Investments that even lead to small shift of users from their vehicles can have major impacts on congestion and the availability of parking.

Pedestrian Facilities

Falls Church has the structure to be a world-class walkable community. The city's small size, interconnected network of streets, and vibrant commercial areas in easy reach of most of the population, all help make cycling and walking a competitive alternative for local trips. Research shows that controlling for amenities like sidewalks and marked crosswalks, the street layout of a community has a major impact on walking and biking rates. A study in Austin, Texas found that neighborhoods with an interconnected street grid (like Falls Church) have walking rates five times greater than neighborhoods based on a cul-de-sac and arterial suburban pattern of development.[80]

Critical infrastructure investments can help increase the city's rate of walking, and build off of the Falls Church's strengths as a compact, multi-use community. Common types of pedestrian investments include:

- Paved sidewalks
- Crosswalks
- Pedestrian zones/plazas
- Off-street paths and trails
- Americans with Disabilities Act compliant curb ramps



Sidewalk and Curb Cut Treatment

For the most part, these pedestrian improvements are some of the lowest costs transportation investments a community can make and have significant benefits. Improved pedestrian facilities encourage walking for short trips, reduce driving and parking demand, provide opportunities for exercise, and give those unable to drive (such as the elderly, handicapped, and young) greater mobility options. A large three county study in the San Francisco Bay Area found that walking rates increased anywhere from 46 percent to 400 percent on local sidewalks after sidewalk improvements were completed.[81] Sidewalks also impact user safety; a study by the Federal Highway Administration found that sidewalks can reduce pedestrian accidents by up to 88 percent[82] by taking pedestrians out of moving traffic.

The availability of pedestrian infrastructure also closely impacts the use of other modes. A study in Montgomery County, MD, found that the availability of sidewalks helped

Crosswalk in School Zone

determine whether riders accessing Metrorail stations drove or walked.[83] Nationwide 16 percent of pedestrian trips are in order to access transit, an impressive statistic considering that transit trips account for around 1 percent of commute trips nationally. In Falls Church, where the transit mode share exceeds 18 percent, the proportion of pedestrian trips to access transit may be much higher.

Bicycle Facilities

Like with pedestrian infrastructure, there is a growing body of research that shows the link between bicycle usage and the availability of cycling infrastructure. Over the last decade cities across the country have made significant investments in improved bicycle facilities, including infrastructure such as:

- Bike lanes
- Cycle tracks[84]
- Bicycle boulevards and marked on-street routes[85]
- Point of destination facilities (e.g., bicycle racks, secure bike storage, and even shower facilities)

A number of studies have shown that bicycle lanes lead to higher biking rates. A study of four North American cities found that bike traffic increased on average 46%[86] after the introduction of a bike lane on a road. In a separate study in Minneapolis, the introduction of bike lanes led to a 1.5%[87] shift in corridor commute trips toward cycling. A 90 city study found that for every 10% increase in bicycle lane miles there is a corresponding 2.5% in bicycle commuters.[88]

Bike lanes are not the only type of effective bicycle infrastructure; a study in Palo Alta found that streets that were transformed into bicycle boulevards saw an 85% to 95% increase in cycling.[89] In Austin, Texas the development of a signed citywide network of bike routes corresponded with a 25% increase in cycling.[90] Studies have shown that even the availability of amenities such as bike racks have a positive effect on cycling rates.

Transit Infrastructure

Investments in improved public transit, through both better service and improved facilities, can have a disproportionate effect on reducing congestion and improving transit usage. Research has shown that improved transit service can have the greatest impact in places like Falls Church- middle and high income communities where the majority of transit riders have the option to drive and existing transit frequencies are 30 minutes or worse.[91] Generally for every 1 percent increase in service, ridership grows between 0.5 percent to over 1 percent.[92]

Upgraded facilities, like new bus shelters and transit signage, can play a major role in promoting public transportation usage. A major barrier to using transit is a lack of familiarity with the system, including stop locations, schedules and fares. Improved signage can increase the profile of existing transit services and make using transit less daunting for infrequent users. Upgraded stop facilities, even simple covered bus shelters, provide benefit to frequent and infrequent riders by sheltering passengers from inclement weather, and providing highly visible infrastructure that denotes the stop. The impact of improved amenities is difficult to quantify for a transit system; in one theoretical study of a 300-bus transit system, participant preferences showed that for every $450,000 spent on passenger amenities, ridership increased between 1.5 percent to 3 percent. Since the study was conducted on a region-wide level, a much smaller investment in Falls Church could cause a similar increase in transit usage.[93]

Bike Path and Crossing

Bus Stop

Overall, investing to improved public transportation, be it more frequent service or higher quality amenities, has a value for all people traveling, even those driving. A study of the congestion impacts of transit strikes found that for every transit passenger mile (one passenger traveling one mile on transit), there was an overall reduction in congestion valued at $1.20 to $4.20 during peak travel periods.[94] According to those savings, an increase of just 100 peak-hour passenger miles in Falls Church would be valued at up to $100,000 a year in congestion savings.

IMPLEMENTING A CITY OF FALLS CHURCH TDM PROGRAM

In a small jurisdiction such as the City of Falls Church, the administration of a new program may appear to be a task that would be too resource intensive to feasibly accomplish. However, there are a number of strategies that the City can pursue to implement a quality TDM program incorporating many of the elements discussed in this plan *without* adding an excessive amount of new work for current staff or present a significant new budget expense.

Some the TDM strategies discussed in this plan can be accomplished through the following means.

TDM for Site Plans Administration and Enforcement

While the development and approval of a TDM for Site Plans Policy would not require financial or staff time resources beyond what can be accomplished by existing staff, the administration and enforcement of a TDM for Site Plans Policy would require additional staff or resources beyond what is available today to be truly effective. Enforcement activities include participating in the development of TDM conditions, assisting the developer with complying with the agreed upon TDM conditions and creation of the escrow accounts, ensuring that TMPs are submitted, monitoring the progress towards meeting site-level TDM goals, and working to facilitate the coordination of marketing, outreach and implementation with other TDM initiatives, as applicable. The cost of the administration of this program may be incorporated as a part of the TDM conditions agreed upon in the site plan itself. Compliance with the TDM conditions must also be monitored on an ongoing basis. If compliance by developers and with the TDM policies are not met, then the TDM for Site Plans program may not succeed.

Several options should be considered as the City of Falls Church considers a TDM for Site Plans program, including: the use of current Falls Church staff; utilizing the staff of a neighboring jurisdiction with an existing site plans program to perform the work in Falls Church through an inter-jurisdictional agreement; and creating a Transportation Management Association (TMA) that would manage this and possibly other TDM programs. There are advantages and disadvantages for each administrative option to be considered.

Utilize Current Falls Church Staff

This option could involve the use of one Falls Church City employee or could spread the responsibilities between several employees. Having one person responsible for the TDM program would be preferred, at least in terms of consistency; however, sharing the work has its benefits, as more than one person would be invested in the TDM process. Regular progress meetings could facilitate creativity in continued program development and help to find efficiencies in administering the program. The ability for this option to work would need to be considered in relationship to current employee workloads.

Staff Advantages

- Minimize TDM program set up time
- Minimize administrative costs
- Easier to monitor the program

Staff Disadvantages

- Risk of overloading current employee(s) workload
- Limits the expansion of the TDM program

Transportation Management Association (TMA)

A TMA is a public-private initiative that operates as a not-for-profit, membership organization that is comprised of local governments, employers, and other local area organizations and stakeholders that provide transportation services within a local area. TMAs have successfully developed and administered TDM projects across the country, as well as within the Washington, DC metropolitan region. The TMA would be responsible for the administration of the TDM policies and compliance assurance through enforcement, along with promoting alternative transportation options that would affect transit routes, transportation movements, mode choice, parking, and development.

TMA Advantages

- Utilize existing agency with TDM experience
- Does not distress City employee workload
- Access to additional TMA programs that enhance transit and development for a community

TMA Disadvantages

- Cost prohibitive
- Loss of program control and monitoring

To establish a TMA, the City of Falls Church would have to enter into a contract of agreement to become TMA members, which could include a membership fee or in kind service (e.g., office space, meeting facilities, administrative duties, etc.). In addition to the cost of having a TMA employee responsible for the project, the TMA would charge overhead costs.

The City of Falls Church itself is likely too small both in terms of employer base and financial resources to support a TMA in the City alone. There are a couple ways that Falls Church could approach joining a TMA, which includes approaching an existing TMA (e.g., Tysons Transportation Association, Inc.) or encouraging Fairfax County to start a new TMA in the Falls Church and adjoining areas on Route 7 from Seven Corners through Skyline. Fairfax County has recent experience in establishing new TMAs.

Establishing a new TMA in conjunction with adjoining jurisdictions will increase the level of investment and collaboration with other jurisdictional partners, area organizations, corporations and developers, and residents alike in the transit future of the region. A TMA will be able to approach the community as a whole, including organizations and individuals, in an effort to improve the transit and transportation conditions within the region, assuring the viability of the transit future for both industry and persons alike.

Inter-Jurisdictional Agreement

A neighboring jurisdiction that currently administers and monitors its own TDM programs may be willing to perform these tasks for Falls Church, for a fee. The City of Falls Church would need to create an inter-jurisdictional agreement that would determine the fee for another jurisdiction to administer a TDM for Site Plans program.

Inter-Jurisdictional Advantages

- Easy to set up
- Reliance on an organization that has successfully administered TDM programs
- Expansion of available TDM resources

Inter-Jurisdictional Disadvantages

- Unknown cost
- Loss of direct, ongoing program control and monitoring

While the terms of the agreement between Falls Church and another jurisdiction would need to be worked out, it would not be unreasonable to assume that the cost of this service would include the cost of a set number of hours per month that would include the monitoring and administration of the program, along with overhead costs and any travel costs that may occur. Arlington County has an active site plans program with more than 120 active sites. Three full-time staff members manage the site plans program, which includes active enforcement of TDM conditions. Staff working in this program estimate that they spend between 20 and 45 hours per site, per year (including local travel time) ensuring compliance with the TDM conditions.

Arlington County also includes the cost of annual site plans enforcement activities in their TDM site plans conditions. In addition to other TDM conditions and transit operating contributions, developments in Arlington provide between nearly $1,700 and $17,000 per year for monitoring and compliance activities. The monitoring and compliance annual fee is determined based on the size of the development and the forecasted traffic impact. The City may wish to add the funding need to finance site plans TDM conditions enforcement into the TDM for Site Plans Policy.

Employer Services

It is unlikely that the City of Falls Church could implement an employer services program with existing staff, nor is it necessary given the size of the City's employer base. As a result, this plan recommends that the City of Falls Church seek to partner with a neighboring jurisdiction that has an active employer services program to provide TDM programs to City of Falls Church businesses and workers.

There is a strong possibility that the City will be able to reach a no-cost or low-cost agreement with a neighboring jurisdiction to provide an employer services program. Given the fact that only 5 percent of the individuals working in the City also live in the City but that over half of those working in the City live within 10 miles,[95] a neighboring jurisdiction may wish to provide these services to City of Falls Church workers and businesses to provide services to their own residents, and decrease traffic and congestion in their own jurisdiction as well as the City's. Several smaller jursidictions in Northern Virginia already receive no-cost employer services TDM assistance from larger jursidictions.

Funding and Staffing TDM Programs and Materials

Funding to develop TDM programs and materials, including transit information and marketing materials specific to the needs of residents, workers and visitors in the City of Falls Church may be obtained through a variety of means. Much of the work associated with developing and distributing TDM materials and marketing can be accomplished by existing staff, and some smaller programs may also be outsourced to non-profit and other juridisctional partners. However, the City may benefit from more active marketing and coordination of TDM activities that a part-time staff member may provide.

Funding

One of the most common forms of funding for Transportation Demand Management in Virginia is the Virginia Department of Rail and Public Transportation's (DPRT) TDM specific and eligible grants. Historically $4 million in TDM grant funding has been available for DRPT to disburse statewide, however, this amount is projected to increase in the FY2015 funding cycle (applications due February 1, 2015). DRPT offers grants for the operation of TDM programs and grants for special projects or purposes (e.g., the development of TDM materials, or a one-time program such as cycling education). The grants that are available for TDM purposes through DRPT include: TDM Operating Assistance, Technical Assistance, Transportation Project Management, and Demonstration Project Assistance. The City would need to provide a 20 percent local match for these grants.

The Virginia Department of Transportation (VDOT) also offers TDM funding assistance. One of the most common ways of funding TDM activities nationally is the federal Congestion Mitigation and Air Quality (CMAQ) grant, which is available at the state level and is also distributed at the regional level. CMAQ also requires a 20 percent local match. The City of Falls Church may wish to discuss any interest in using these funding sources for new TDM initiatives with regional groups, VDOT, and DPRT. Continued discussions with regional partners may also lead to finding new ways of sharing resources, as some neighboring jurisdictions may also be able to provide Falls Church with material templates, materials, or even some TDM services at a low-cost or no-cost. Pursing regional collaborations where possible may benefit the City both from the fiscal standpoint, as well as through deepening cross-jurisdictional coordination on transportation issues.

Other sources of funding for TDM in the City may include contributions from business organizations, charitable grant funding, or in-kind resources made available through the use of volunteers or other donated services. Adding TDM messaging to existing programs or initiatives, including any future City of Falls Church Green Initiatives, should also be considered as a low-cost way of maximizing resources. In refining the TDM for Site Plans Policy, the City may wish to consider adding contributions for a local match for TDM grants to the Transit Operating category.

Staffing

Beyond TDM for Site Plans and Employer Services, the TDM Strategies described in this plan can be implemented in one of three ways: utilizing existing staff, through outsourced (contracted) implementation, or through the addition of a new TDM-focused position to the City's transportation staff.

A new staff position, if needed, would likely be part-time, and could potentially be combined with other transportation or planning related duties. Funding for the new staff position may be sought through state and regional grant sources that require a local match (typically 20 percent of the value of funds requested). While grant-funded positions are not permanent, in the next year additional TDM funding is anticipated at the state-level and new initaitives may therefore be more attractive. The dollar value associated with the provision of benefits can typically be used as a part of that local match, making it less costly to add a position. Assuming that a new part-time TDM-focused positon created was targeted towards a mid-level professional, the City would likely need to spend less than $10,000 in local match, assuming the position is funded at $50,000, *including benefits*. If the City chose to pursue grant funding for a full-time TDM position it is likely that around $20,000 in local match for benefits would be needed, assuming the position is funded at

Table 17: TDM Strategy Implementation Options

TDM Strategy	Implementation Options
Parking Strategies	Existing staff should oversee a comprehensive parking study and the implementation of any follow-on parking strategies to ensure that future development has the optimum amount of parking.
Static Transit Information and Marketing	The City can seek a grant to develop these materials and distribute them using existing staff or volunteers. Alternatively, the City may wish to include the development and distribution of custom, Falls Church specific transit materials in a comprehensive TDM marketing campaign to be undertaken by a contractor.
Real-Time Transit Information	The City can include the provision of real-time transit information screens in site plan TDM conditions, obtain grants to place real-time transit arrival screens in public buildings and places of business, encourage businesses to purchase low-cost versions of real-time arrival screens, and work with regional transit providers and shelter owners to faciltitate the inclusion of real-time transit arrival screens in existing transit infrastructure.
Ridesharing	Existing staff can work to promote the regional ridesharing database, Commuter Connections, and work to educate residents, businesses, and workers, on the availiblity of other ridersharing (including dynamic ridesharing) options available in the private marketplace. Reserved ridesharing
Carsharing	Existing staff can work to attract private carsharing vendors to the City, and work through the site plans process to ensure that designated carsharing spaces are included in new developments.
Bikesharing	Funding for bikesharing stations (capital and operating) can be sought through the Site Plans Process, as well as other transportation grants from state and regional sources. Planning for and managing the implementation of bikesharing can be accomplished through the use of a private contractor or as a part of the job of an additional part-time TDM staff member.
TeleworkVA!	Existing staff can use materials developed by Virginia's TeleworkVA! Campaign in local outreach, or the promotion of telework marketing can be included in an overall marketing campaign.
Bicycle Education	Bicycle Education is best completed by an outside vendor or contractor. Grant funding, funding from businsess or business groups, or other private funding may be used to pay for the cost of bicycle education classes made available for free to residents and workers.
Walkabouts	Materials for Walkabouts may be developed through grant funding, but the Walkabouts themselves may be conducted by local historians and other Walkabout theme experts who are volunteers or city staff.
Resident Satisifaction Surveys	Grant funding or other funding will be needed to hire a qualified survey firm to conduct a stastistically valid resident transportation statisfaction survey.
Ciclovia	Ciclovia can be conducted as a volunteer-led activity with private sposnors, or the City can seek grant or other funding to hold a Ciclovia event that is City-sponsored.
Concierge Training	Concierage training can be done by existing staff on a periodic (semi-annual basis), and may include the provision of local transit matierals (schedules, Falls Church specific walking, biking and transit information) as available.

$100,000, *including benefits*. The City may also consider adding site plans enforcement to the responsibilities of an additional position, instead of adding site plans enforcement responsibilities to existing staff, if there is a desire to consider adding a staff position.

Marketing TDM

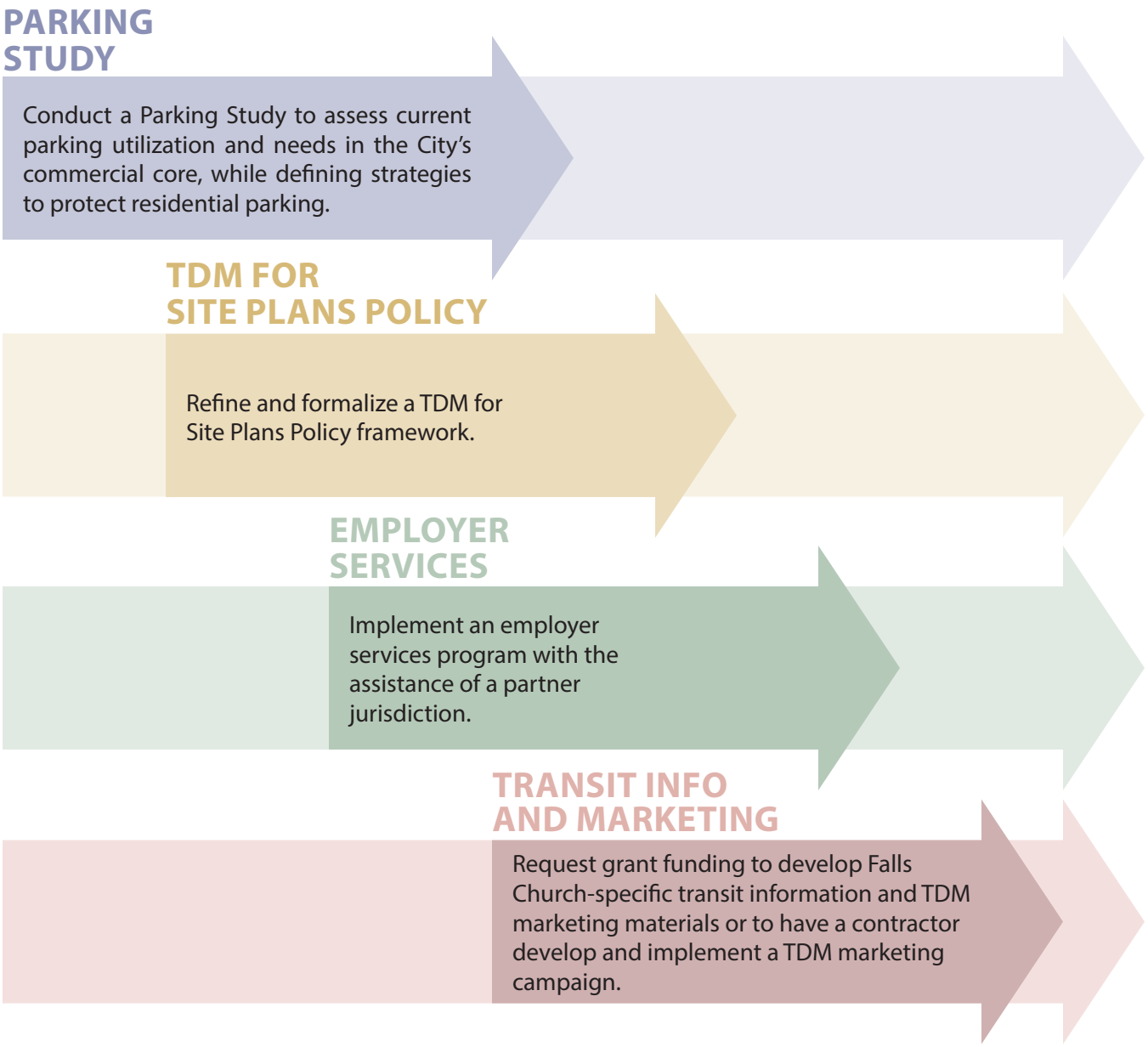
Marketing TDM full-time can be implemented in more than a single way, for example, existing staff may be able to procure TDM and local transit information and distribute it, but this information and materials may also be wrapped into a comprehensive marketing campaign that is undertaken by a transportation marketing firm.

Table 17 provides an overview of the options for implementing the strategies in the TDM Strategies Toolbox. This table isn't intended to be an exhaustive review of implementation approaches , but instead a starting point for the discussion on TDM implementation in the City.

Next Steps

A number of potential TDM strategies, policies and programs have been recommended throughout this plan. Developing a comprehensive TDM program takes a number of years, no matter the size of the jursidiciton or the availability of resources. In the near-term, across calendar years 2014 and 2015, the City of Falls Church should focus on the "building blocks" of a comprehensive TDM program (Figure 18). These improvements include strategies that create an environment that provides

Figure 20: Near-Term Implementation Actions, 2014-2015



the physical infrastructure and environment, and the programmatic support that facilitates the use of transit, bicycling and walking for more trips.

Parking

Given the role the supply of parking plays both in mode choice and in the cost of development, the City should begin with a study to understand the current parking utilization and needs in the City's commercial corridors. A comprehensive set of parking strategies will ensure that businesses have enough parking to attract customers, and that developers are not building an excess of parking that increases the cost of development and unnecessarily uses funds for parking that may have been better spent on other forms of transportation infrastructure. The parking study must also address the parking needs of existing residents, to ensure that residential parking and mobility are effectively preserved as new development occurs in commercial corridors.

A deeper understanding of parking needs within the City will inform the finalization of the TDM for Site Plans Policy, including a better definition of the relationship between parking and TDM strategies within the policy. A comprehensive parking study, along with a formalized TDM for Site Plans policy, will ensure that the built environment is conducive to multi-modal travel and the implementation of effective TDM measures.

Employer Services and Transit Info and Marketing

Employer Services is one of the most effective programmatic TDM strategies that can be implemented, and as it can likely be accomplished at little cost to the City is recommended for implementation as soon as possible. The development of basic transit, cycling and walking promotional information that is specific to the needs of City of Falls Church workers, residents and visitors is another basic programmatic strategy that can be implemented without the need for additional staff . Grant funding should be sought in through the FY2015 grant funding cycle for the development of these materials, as well as any associated marketing campaign elements that the City wishes to pursue at this time.

Beyond these first steps, the City can reference the Implementation Priority as listed in the TDM Strategies Toolbox (Table 3). In general, the strategies that are easier to implement and less resource intenstive are listed for near-term and mid-term implementation. However, the implementation priority can be subject to change depdending on the specific transportation needs identified and available resources at any given point. The City of Falls Church should seek to find creative ways of implementing TDM programs that limit the ongoing fiscal impact to the City, while achieving the goal of limiting SOV use and preserving the quality of life that defines The Little City.

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