

Transportation

LOB #382:

CAPITAL PROJECTS, TRAFFIC ENGINEERING AND TRANSPORTATION DESIGN

Purpose

The purpose of this LOB is to promote, facilitate, implement, and influence the development of a multimodal transportation system for the residents of Fairfax County that is balanced in terms of modes, efficiencies, costs, impacts, safety and service, and is in keeping with the public service policies and priorities established by the Board via the adopted Capital Improvement Plan (CIP) and Transportation Project Priorities (TPP). In addition, it is the goal of this LOB to review, design, manage and implement transit and transportation capital improvement projects and to respond to issues and problems concerning traffic operations and parking while improving mobility and safety of all modes of transportation. This LOB also performs right-of-way and environmental analyses, addresses utility issues, and assists and supports other Departments and outside Agencies, including the Office of Community Revitalization, the Fairfax County Park Authority, the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (VDRPT), Federal Transit Authority (FTA), Washington Metropolitan Area Transit Authority (WMATA), Metropolitan Washington Airports Authority (MWAA), and the Federal Highway Administration (FHWA) in the implementation of transportation projects that promote economic development, recreation, and revitalization. Additional duties include:

- Coordinating projects scopes and shepherding projects through the implementation process;
- Identifying, investigating, and responding to citizen requests concerning parking, traffic calming, and traffic engineering and operations;
- Managing projects through all phases, including development, design, right-of-way, utility relocations, construction, and VDOT acceptance;
- Working with other agencies to improve the implementation process; and
- Developing and implementing projects of various size, complexity, and cost, from bus stops and walkway improvements to multi-million dollar improvements like the Dulles Rail Project and the I-66 Corridor Improvements.

Description

The Capital Projects and Traffic Engineering Division (CPTED), Transportation Design Division (TDD), and Special Projects Division (SPD) are responsible for planning, developing, managing, and implementing multi-modal transportation improvements throughout the County and region from concept development through completion of construction; as well as reviewing and monitoring transit and transportation capital improvement projects managed by other agencies including MWAA, WMATA, FTA, VDOT, FHWA, and VDRPT. These projects include Federal, State, and/or regional projects within Fairfax County, such as those funded by VDOT and VDRPT, the Silver Line transit project funded by a Special Tax District and credit assistance from the Transportation Infrastructure Finance and Innovation Act (TIFIA) from the U.S. Department of Transportation, as well as those funded by grants, proffers, the Northern Virginia Transportation Authority (NVTA), or the County.

Projects are followed from initial prioritization through scoping, right-of-way and environmental analysis, preliminary and final design, land acquisition, utility relocation, construction, and, in some cases, post-construction. Particular emphasis is placed on ensuring that the needs of Fairfax County citizens are fully addressed in the areas of traffic safety, capacity, operational issues, costs, and impacts to the public and the environment.

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CPTED develops project scopes and reviews and monitors all transportation capital project plans funded by the public sector, for conformance with County, State and Federal regulations, and for conformance with the County's Comprehensive Plan. Projects reviewed, monitored, managed and implemented by CPTED staff include facilities such as park-and-ride lots, transit transfer centers, highway widening projects, bus stop safety and accessibility improvements, traffic calming, multi-modal facilities promoting bicycle and pedestrian travel, and spot roadway safety and capacity improvements. Projects are reviewed for conformance with Board policies and priorities and applicable Codes and Ordinances, and for compliance with appropriate state and federal engineering criteria and standards. Staff members also take a lead role in coordinating many public sector transportation projects with adjacent private development projects. This Division serves as the County's primary information center for all public sector-financed transportation projects. A substantial portion of the Division's workload is involved in customer service and responding to inquiries and issues related to transportation projects from Board members and County residents via telephone calls, letters, email, or in person.

The Traffic Engineering program area under this LOB includes several special programs managed by the Department, including:

- Residential Permit Parking District (RPPD) Program;
- residential cut-through traffic restriction;
- traffic calming;
- \$200 fine for speeding;
- secondary road through truck traffic restriction;
- multi-way stop program; and
- watch for children signage.

Traffic Engineering staff also respond to requests from the Board and citizens to review traffic engineering problems and analyze potential solutions for those problems, in addition to reviewing traffic bottlenecks and hazardous locations; identifying corridors suitable for on-road bicycle lanes; and reviewing traffic signals or corridors for improvements.

Following initial scoping, concept development and prioritization of projects by CPTED, TDD is responsible for managing and implementing county funded multi-modal transportation capital improvement projects. In addition, TDD manages and implements projects funded by Federal and/or State Grants. The division is responsible for managing projects through the design phase and tracking construction progress. The design phase includes the preparation of detailed plans and specifications (either by in-house staff or consultant contracts), acquisition of necessary land rights, securing permits, and obtaining regulatory agency approvals. Projects are monitored through completion of construction and final acceptance by the County and/or VDOT. Transportation capital improvement projects managed by the division are generally grouped into four primary categories: Roadway improvements, Pedestrian and Bicycle Improvements, Bus Stop Safety and Accessibility Improvements, and Other/Miscellaneous improvements.

- Roadway improvements managed by TDD include construction of spot roadway and safety improvements such as adding or modifying turn lanes at intersections, roadway realignments to improve safety, and major roadway widening projects.
- Pedestrian and Bicycle improvements include: construction of new sidewalks and trails, installation of pedestrian signalization and crosswalks to improve safety at intersections, and construction of new or improved on-road and off-road bike lanes and trails.
- The Bus Stop Safety and Accessibility improvement program includes upgrading, modifying and constructing improvements to new and existing bus stops throughout the County to improve pedestrian safety and accessibility, which in turn promotes transit ridership and alternatives to the use of the single occupant vehicles. All bus stop improvements must be designed and constructed in accordance with the Americans with Disabilities Act (ADA). These improvements are made to Metrobus and FAIRFAX CONNECTOR bus stops.

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- Other/miscellaneous capital improvement projects include, but are not limited to streetscape improvements, utility undergrounding, installation of wayfinding signage, and transit projects such as transit centers, and Park & Ride lots. These projects are typically initiated by other County agencies or departments and then transferred to TDD for implementation, because of its technical expertise. Funding for these types of projects are provided via other department budgets, bonds, federal and/or state grants.
- In addition, TDD manages and implements transportation enhancement projects that promote economic development in revitalization areas. TDD also provides technical support to other divisions within FCDOT and other county departments and agencies for the planning, scoping, prioritization, and review of transportation capital improvement projects whether or not they are implemented by FCDOT or some other public or private department or agency.

The Special Projects Division (SPD) of the Fairfax County Department of Transportation manages and coordinates the design and construction of the Silver Line Project. The Division works with MWAA, the Commonwealth of Virginia, Loudoun County, NVTA, WMATA, DRPT, and other Fairfax County agencies on this \$5.9B, 23-mile extension of the WMATA heavy rail system. The Division also manages the Phase 1 and 2 Dulles Rail Special Tax Districts that provide \$770M in funding for the County's approximate \$1.0B share of the project. The Division is also responsible for coordinating the Silver Line project with adjacent jurisdictions to include the Town of Herndon and Loudoun County. SPD reviews all project designs plans, conducts construction inspections, monitors project budgets, and coordinates and seeks the required land use approval from the County in coordination with adjacent landowners and MWAA. The Division also works closely with the Department of Public Works and Environmental Services on the design and construction of two parking garages that are part of the project but are being funded and constructed by the County.

Benefits

This LOB is responsible for developing a multimodal transportation system for the residents of Fairfax County that considers costs, impacts, safety and service. In addition, it responds to issues and problems concerning traffic operations and parking while improving mobility and safety of all modes of transportation. This LOB also performs right-of-way and environmental analyses, and assists and supports other departments and outside agencies in the implementation of transportation projects.

The Department works closely with the community to develop and implement projects that will help create a sense of place, provide connections to businesses, natural and historic resources, and recreation, and enhance the quality of life. Multimodal projects including roadways, transit, bicycle and pedestrian facilities, and bus stop accessibility, are designed to provide timely, safe, and convenient travel.

Mandates

This LOB is State-mandated and approximately 20-25 percent of this LOB's resources are used to satisfy the mandates. The specific federal or state codes and a brief description of the codes are listed below.

- Laws governing parking and traffic management programs are contained in the Virginia Code Title 46.2, Chapters 8 and 12 and in sections 82-5-37 and 82-5A of the [Fairfax County Code](#).
- The Cut-Through Traffic Program is conducted in accordance with the 1989 Virginia Department of Transportation Cut-Through Traffic Policy.
- Virginia Code §§ 15.2-2272, 33.2-909: The local governing body must hold public hearings before vacating or abandoning public rights-of-way.
- State law provides for County participation with VDOT in development of the Secondary Road Program Budget and the Six-Year Program (Virginia Transportation Department Program) (Virginia Code §§ 33.2-331; 33.2-357).

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- Virginia Code § 33.2-332 requires the Board of Supervisors, in cooperation with VDOT, to adopt a Six-Year Plan for the County, and to officially update it at least every two years. It also requires similar adoption and annual update of the Secondary Road Construction Budget.
- Virginia Code § 33.2-357 requires counties that participate in VDOT's Revenue Sharing Program to request funding by resolution of the local governing body and provide matching funds. Other funding and programming activities are mandated by the Board to ensure that the County receives its fair share of available funds, and that funds are allocated to County priorities.
- Virginia Code §§ 15.2-2223, 15.2-2224, 15.2-2230, 15.2-2232 requiring the adoption of a Comprehensive Plan and its review every five years. The County reviews the Transportation component of the Plan annually.

Trends and Challenges

Much of the Washington metropolitan area's existing transportation network was originally established to serve commuting trips between the suburbs and the downtown core of Washington D.C. Over time, a significant amount of employment has developed away from the traditional core, resulting in a substantial increase in suburb-to-suburb work trips. These trips are challenging to serve with traditional transit modes and adequate expansion of road networks is often financially infeasible. The region's severe congestion impacts economic development, causing some businesses to leave the region. The strong economic growth and steady increases in state and local tax revenues enjoyed by Fairfax County and the region in recent years could be jeopardized in the long run by business relocations.

Several recently approved sources are responsible for much of the County capital project funding for transportation.

- HB 2313, passed by the Virginia General Assembly in 2013, increased statewide transportation funding by \$4 billion over the next six fiscal years.
- HB 2 (passed by the General Assembly in 2014) and the Commonwealth Transportation Board (CTB) policy adopted June 17, 2015, develop a new method of allocating limited tax dollars to the right projects to meet the most critical transportation needs in Virginia. FCDOT prioritizes projects for funding by the CTB in the Six Year Plan, based on criteria developed by the CTB. The first applications under the HB2 criteria were submitted by the County to VDOT in September 2015, following the Board's endorsement.
- In November 2014, Fairfax County voters approved a Transportation Bond Referendum to provide additional transportation funding. The projects identified for bond financing were selected through an extensive public process. Based on community input, FCDOT developed a list of priority projects. On January 28, 2014, the Board of Supervisors approved \$1.4 billion in new multimodal transportation projects to be implemented through FY 2020, as funding is made available. These projects will be funded by several revenue sources, including the 2014 bond funds.

The 2014 bond referendum focused primarily on funding spot roadway, pedestrian and bicycle projects. Of the \$100 million proposed bond, approximately \$16 million would be spent on roadway spot improvements across the county. \$78 million would fund pedestrian projects and \$6 million would fund bicycle projects that enhance safety, provide connectivity and provide improved access to schools, activity centers and public transit facilities. CPTED and TDD are now implementing the first 2014 bond projects.

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Resources

Category	FY 2014 Actual	FY 2015 Actual	FY 2016 Adopted
LOB #382: Capital Projects, Traffic Engineering and Transportation Design			
FUNDING			
<u>Expenditures:</u>			
Compensation	\$3,760,431	\$4,216,551	\$3,252,260
Benefits	234,119	324,263	0
Operating Expenses	227,597	138,552	151,780
Work Performed for Others	(1,513,467)	(1,642,502)	(1,259,035)
Capital Projects	11,026,469	43,156,969	0
Total Expenditures	\$13,735,149	\$46,193,833	\$2,145,005
General Fund Expenditures	\$1,831,038	\$1,814,618	\$2,145,005
Total Revenue	\$36,611,319	\$64,377,375	\$90,374,707
General Fund Revenue	\$14,505	\$14,590	\$17,000
POSITIONS			
Authorized Positions/Full-Time Equivalents (FTEs)			
<u>Positions:</u>			
Regular	72 / 72	78 / 78	91 / 91
Total Positions	72 / 72	78 / 78	91 / 91

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Metrics

Metric Indicator	FY 2013 Actual	FY 2014 Actual	FY 2015 Actual	FY 2016 Estimate	FY 2017 Estimate
Total Active Projects (All Types)	203	193	168	234	226
Total FY Cost (All Program Types)	\$29,487,791	\$31,133,114	\$50,185,330	\$50,800,000	\$50,825,000
Total FY Const. Cost (All Program Types)	\$17,312,246	\$18,943,879	\$34,480,080	\$34,250,000	\$32,500,000
Total FY Design Cost (All Program Types)	\$6,631,503	\$7,992,295	\$7,972,681	\$9,325,000	\$10,425,000
# of Completed Projects By Type:					
Roadway Improvements	1	5	2	2	5
Pedestrian/Bicycle Improvements	17	16	14	20	25
Bus Stops Safety/Shelters	68	40	85	75	75
Other/Miscellaneous Projects	2	1	3	2	2
# Project Management Staff Assigned (FTE positions in TDD)	12.08	13.16	15.82	16.71	19.00
Traffic Calming Studies	60	59	65	60	60
# of Project Scopes Developed	N/A	N/A	59	62	48
# Active Projects / PM FTE	17	15	11	14	12
Total Cost / PM FTE	\$2,441,042	\$2,365,738	\$3,172,271	\$3,040,096	\$2,675,000
Total Const. \$/ PM FTE	\$1,433,133	\$1,439,504	\$2,179,525	\$2,049,671	\$1,710,526
Total Design \$/ PM FTE	\$548,965	\$607,317	\$503,962	\$558,049	\$548,684
Roadway Improvements Efficiency:					
Construction Cost as a Percent of Total Cost	69.28%	78.10%	78.96%	76.57%	72.64%
Design Cost as a Percent of Total Cost	12.06%	11.43%	6.71%	10.41%	12.83%
Pedestrian/Sidewalk/Trail Efficiency:					
Construction Cost as a Percent of Total Cost	31.07%	34.12%	43.29%	50.00%	48.19%
Design Cost as a Percent of Total Cost	44.30%	47.18%	37.99%	33.33%	33.73%
Bus Stop Safety/Shelter Efficiency:					
Construction Cost as a Percent of Total Cost	49.39%	15.54%	54.07%	56.34%	60.61%
Design Cost as a Percent of Total Cost	46.65%	70.16%	28.62%	28.17%	24.24%
Cumulative Total Cost (Since FY 2008)	\$7,430,002	\$9,051,624	\$10,817,192	\$12,592,192	\$14,242,192
Cumulative Total Sites Completed (Since FY 2008)	255	295	380	455	530
Cum. Cost/Cum. Completed Site (Since FY 2008)	\$29,137	\$30,683	\$28,466	\$27,675	\$26,872

Outputs:

Total Active Projects notes the total number of projects within the CPTED and TDD Division, which were in design, land acquisition or construction during the referenced fiscal year. The current Six Year Plan proposes a larger volume of projects for the department compared with prior fiscal years. The total number of active projects and the average number and cost of projects per PM include only TDD projects on which survey or design is underway. Active projects do not include projects which are still being scoped by CPTED or are scheduled for scoping. Averages per PM reflect additional anticipated staff. As CPTED develops new scopes each year, these projects will be added to the next year's total number of active projects. They are not included in the future year estimates for total active projects because project costs have not been estimated and thus the average per PMs would be inaccurate.

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Total FY Cost indicates the total cost incurred for all projects, including management, design, land acquisition, utility relocation, and construction costs. A separate indicator was not specifically provided for utility and land acquisition costs. Total costs for the department are expected to increase due to the increase in projected workload. Total FY Const. Cost indicates construction cost only and Total FY Design Cost indicates design cost only.

The # of Completed Projects by Type indicates the number of projects managed and implemented by CPTED and TDD by project type.

- Roadway improvements include projects such as road widenings and turn lanes
- Pedestrian and bicycle improvements include sidewalks, trails, crosswalks, and pedestrian signals
- Bus Stops Safety/Shelters include bus shelters, ADA compliant loading pads, and pedestrian walkway enhancements
- Other/miscellaneous projects include, but are not limited to, streetscape improvements, utility undergrounding, and installation of wayfinding signage. These projects are typically initiated by other County agencies or departments and then transferred to TDD for implementation, because of its technical expertise.

Projects are grouped by type, however, the scale of projects within each indicator is not consistent and can vary from a small pedestrian enhancement to a large trail project with structures.

Project Management Staff Assigned indicates the number of staff assigned to CPTED and TDD. This illustrates the division's continued steady growth as project volume and complexity increases.

Traffic Calming Studies indicates the collection of traffic data, specifically speed of traffic and volume. This data is used to determine whether candidate roads qualify for the Residential Traffic Administration Programs. CPTED collect this information when a concern regarding traffic activity on residential streets is conveyed to the Department from the District's Supervisors' office. The locations of concern are determined by the concerned community members. The number of studies completed each year is dependent on the requests received from the community.

of Project Scopes Developed indicates how many scopes were developed by Capital Projects staff. The Capital Projects Section in CPTED has developed a more formal procedure for scoping new projects, developed to coincide with the implementation of the County's Transportation Priority Projects (TPP) in 2014. CPTED developed an estimate of available staffing and funding, then used that data to develop estimated timelines to begin and complete the 220 new projects associated with the TPP. The number of scopes developed each year varies, and is dependent on staffing and funding levels. In the first two years, FY 2015 and FY 2016, CPTED staff scoped more projects but some were of a less complex nature. As the TPP program continues, projects will become increasingly complex; therefore, less scopes may be developed than in the earlier years of the program. In addition, as FCDOT updates the TPP, additional projects may be added. Requests continue to be received for additional projects from other sources, such as District Supervisors, or from other funding programs, such as the Tysons project funding.

Designs are multi-year activities and as projects advance to design, the initial scoping process should diminish. CPTED is partnering with VDOT to deliver a number of projects. To date, VDOT has agreed to administer 14 large-scale highway projects on interstate or primary roads, and an additional 14 pedestrian traffic signal improvement projects.

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Efficiencies/Effectiveness:

Active Projects / PM FTE is the number of active projects per TDD Project Management personnel. Although the number of projects is expected to decrease per engineer from FY 2014, the average cost per project will increase. This reflects the expected increase in complexity of projects in future fiscal years.

Total Cost / PM FTE is the average project cost per Project Manager. This includes costs from all aspects of project development including design, land acquisition, utilities, and construction.

Total Const. \$ / PM FTE is the average FY construction cost per Project Manager.

Total Design \$ / PM FTE is the average FY Design cost per Project Manager. The consistent expenditure of design costs per Project Manager indicates that project management resources have been budgeted at a level to meet the goals of the 6 Year Plan. Drastically increased design costs per project manager in future fiscal years, would indicate that resources are not available at a level consistent with past performance to meet the goals of the plan.

Efficiency metrics for Roadway, Pedestrian, and Bus Stop projects indicate the construction and design costs as a percentage of the total costs. Costs for design and land acquisition are not included due to the large variation of impacts to a project for these aspects of the project development process.

Efficiency metrics for Roadway Projects and Pedestrian projects indicate that design costs for projects have remained consistent for the prior three fiscal years. This trend is expected to continue through FY 2017. The design costs for Pedestrian and Bus Projects are higher compared with Roadway projects. This is expected as roadway projects typically have greater construction costs than pedestrian and bus projects, but all project types have comparable design durations.

Efficiency metrics for bus stops include the cumulative total costs for the bus stop program each year since 2008, the cumulative total sites completed each year, and the cumulative total costs per site. The ratio of cumulative total costs to cumulative completed sites decreases each year, indicating an increase in this program's efficiency. The number of projects in the design and construction phase can vary from year to year in this program which can drastically change the percentage of funds spent on design. In FY 2014, there were many more projects in the design phase which results in a high design cost percentage. Due to the design efforts in FY 2014, many more projects were constructed in FY 2015 which results in a lower design percentage.

Year-to-year comparisons of the efficiency metrics do not accurately reflect the different scales and complexities of various projects, nor the typical project duration of two to three years.