Implementing a Multimodal Vision: An Update of Arterial Transportation Management in Arlington County, Virginia

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Abstract: Guided by the vision of safe and efficient multimodal access for its arterial streets, Arlington County, Virginia is implementing recommendations from its Arterial Transportation Management (ATM) Study, which developed measures, standards, criteria, and procedures for managing transportation modes along existing arterial streets.

The study which was undertaken in 2004 researched the state of the practice in arterial management and functional street classification, suggested a street typology overlay to enhance the traditional functional classification system, examined the County's future travel demand, and recommended a "toolbox" of possible ATM measures. The study also recommended concept plans with specific measures for 11 arterial corridors. The ATM toolbox, design standards, and concept plans were developed through an extensive community participation process. Through the work of the Citizen ATM Study Task Force, County staff, and the consultant team, the study provides Arlington citizens and County staff with a framework for multimodal arterial streets that will lead to "complete streets," i.e., streets that are complete in the context of their desired transportation modes and the land uses they serve. The study also provides a foundation for the County to continue addressing transportation management along Arlington's arterial corridors, through programming and implementation of near-term safety improvements, on-going maintenance and operations, and long-term capital projects.

The County has completed its first ATM construction project along Wilson Boulevard and is now in the design process for additional phases. This first project included provision of narrowed travel lanes, wider sidewalks, curb extensions, improved traffic signals, wider crosswalks, extended medians, landscaping, a trail connection, and bus shelters. This project sets in motion a series of additional improvements in which the recommendations of the ATM Study can be realized.

INTRODUCTION

Arlington is a culturally rich and diverse community near the Nation's Capital. Within a healthy Metropolitan region Arlington has many local activity centers that are surrounded by livable neighborhoods, ample open space, highly regarded public schools, and a mix of modern and convenient transportation infrastructure. The County has 12 miles of Metrorail system with 11 stations, Virginia Railway Express commuter rail service, Metrobus and local Arlington Transit bus service, more than 1100 lane miles of streets (958 lane miles owned and maintained by Arlington County and 177 lane miles owned and maintained by the Commonwealth of Virginia), two major interstate corridors (I-95 and I-66), an extensive sidewalk network, and more than 100 miles of bikeways connected into the regional trail system.

Purpose and Goal

Arlington conducted its Arterial Transportation Management (ATM) Study with the purpose of developing and recommending measures, standards, criteria, and procedures for managing transportation along arterial streets and recommending implementation of these measures along selected corridors in the County. This study was undertaken to assist the County in achieving the following **ATM goal**:

> *Enhance the safety and efficiency of travel by motorists, transit patrons, bicyclists, and pedestrians of all abilities through a balanced approach to the design and operation of an arterial street in context with its surrounding land use.*

Background

With an area of only 26 square miles, Arlington is one of the smallest counties in the nation—and one of the most urbanized. Mostly developed in the decades between 1925 and 1955 Arlington was initially being developed essentially as a bedroom community to Washington, D.C. and the Pentagon, with arterial or framework streets having been designed largely to meet the needs of vehicular traffic generated within Arlington and from through travelers. Beginning in the 1960's, Arlington focused its continued growth on redevelopment within its major transportation corridors. With more recent redevelopment centered on Metrorail transit stations and existing commercial areas, the County has taken the opportunity to rethink the design of the existing arterials streets and begin to implement measures that address all modes of transportation. These measures establish complete streets and look beyond curb-to-curb street function, to a more inclusive viewpoint of building-line-to-building-line. A regional location map is illustrated in Figure 1.

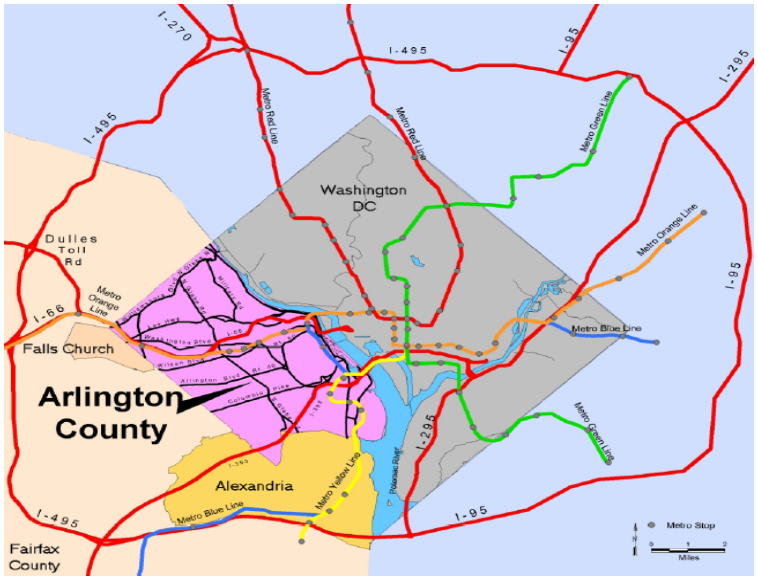

Figure 1 – Location Map of Arlington County in the Washington D.C. Metropolitan Area

Definitions

ATM Defined:

- **Arterial**: A street that primarily serves through traffic while also providing access to abutting properties and neighborhood streets; generally has traffic signals and speed limits below 40 miles per hour and can serve multiple community places
- **Transportation**: Moving people and goods through multiple travel modes including driving, public transit, bicycling, and walking
- **Management**: Designing and operating the public street to serve as a public space that addresses the needs of motorists, transit patrons, cyclists, and pedestrians of all abilities

ATM Process

Before implementation of the Wilson Boulevard project, a study was conducted and was led by a citizen task force appointed by the Arlington Transportation Commission and the ATM study was performed by a team of staff and consultants. The overall study process is summarized in Figure 2. The study researched the state of the ATM practice and the current thinking about street classification, examined future travel demand across the County, recommended a toolbox of ATM measures, and produced concept plans for eleven corridors in the County.

Citizen Participation

The study was guided by the County's citizens through their participation in a formal Task Force, guided by the Transportation Commission and County Board. The task Force held multiple meetings, workshops and study corridor walks. The ATM measures and concept plans for selected streets were developed through a community participation process and were intended to be applicable to arterial streets throughout Arlington. The planning process embraced improved traffic safety, enhanced pedestrian and transit access, and better bicycle mobility as its

primary goals. The process provided citizens and staff with a basis for creating arterial streets that are multimodal and enhance the communities they serve—streets that are referred to as complete streets. Community participation was central to the study, which served as a foundation for the update of Arlington's Master Transportation Plan.

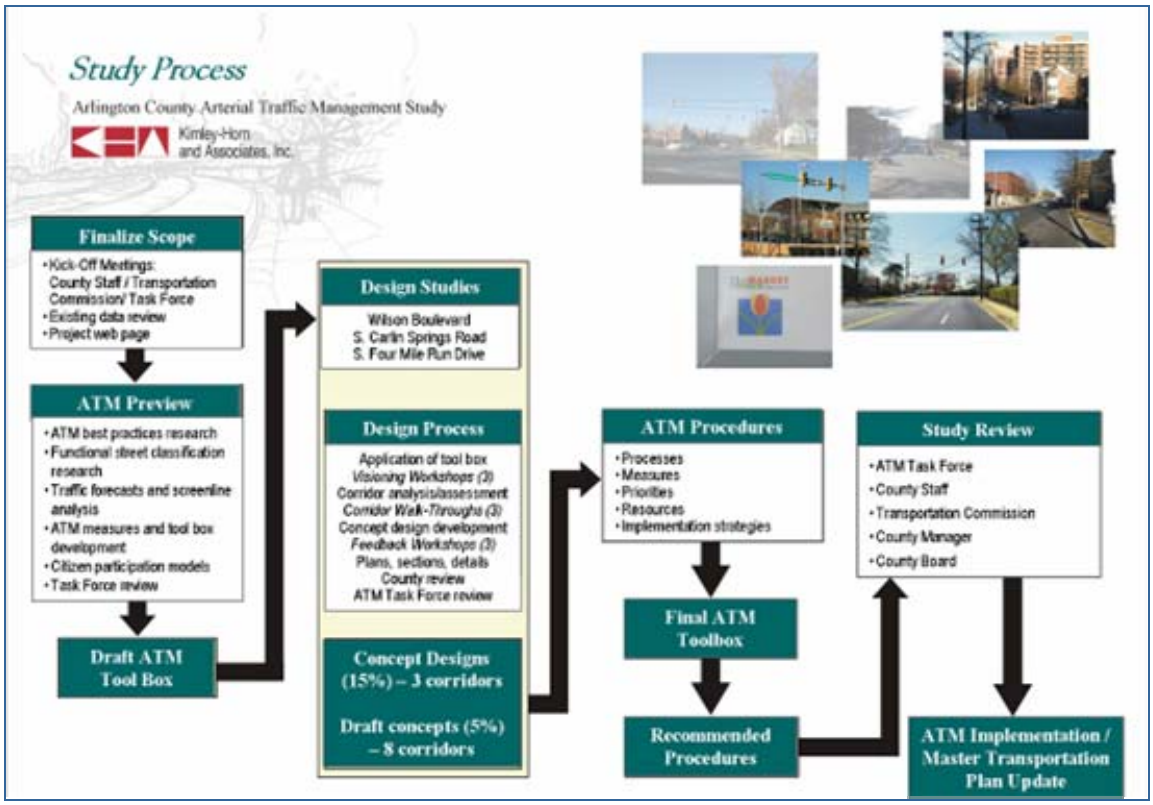

Figure 2 – ATM Process

STATE OF THE ATM PRACTICE

Arlington conducted the ATM Study to consider rebuilding some of its arterial streets so that they contribute more to Arlington's urban village concept and provide a better balance of space shared by all modes of travel. One of the study tasks was to prepare a summary of the "State of the Practice" in "arterial transportation management," which is not a universally known term. Several terms are used interchangeably throughout the United States to convey the same sets of ideas.

Arterial Traffic Management

The management of an arterial roadway involves a number of actions. Elements of traditional arterial traffic management include traffic signal improvements, advanced traffic signal control for more efficient vehicle progression, monitoring of traffic to provide faster response to incidents, real-time control of traffic signals or diversion of traffic to alternate routes, and management of access to driveways and side streets. These elements make up a subset of the larger scope of managing all transportation modes along an arterial corridor.

Rethinking Arterial Design

In many communities, residents and government officials are realizing the shortcomings of their primary streets. Those who want to walk or ride bicycles understand this first hand, that arterial streets have typically been designed for motorists. Long, straight, and wide, these thoroughfares promote auto mobility, but often do not support other day-to-day needs of urban environments. Many planners and engineers today, however, now consider streets to be outdoor living space — offering citizens an aesthetic design while allowing people to mingle as well travel through. As such, these streets deserve to be transformed into complete streets.

Designing for the Pedestrian

According to the Insurance Institute for Highway Safety, about 80,000 pedestrians are injured in motor vehicle crashes annually in the United States. Over the past decade, 4,700 to 6,000 pedestrians have been killed annually in traffic crashes. The frequency of pedestrian collisions can be reduced by improving roadway design through the following three broad categories: (1) separating pedestrians from vehicles by time and space, (2) increasing the visibility of pedestrians, and (3) reducing of vehicle speeds.

Design Philosophies

In the past decade, several design philosophies have emerged that are guiding the rethinking of arterial street design.

New Urbanism — Initiated by architects in the 1990s, new urbanists are at the center of a movement toward recreating walkable neighborhoods, people-oriented streets, and cities with buildings and urban design that encourage and support people-oriented (rather than car-oriented) streets.

Smart Growth — Term used throughout planning circles as an alternative to urban sprawl. In 2002, Arlington received a national award from the U.S. Environmental Protection Agency for smart growth initiatives.

Context Sensitive Design — Streets that are designed to complement their surrounding land use context in terms of function and form, in contrast to being designed using a manual of conventional design standards driven by the objective of eliminating vehicle congestion.

Urban Village — Term used in Arlington and elsewhere in the U.S. to identify a self-sustaining community within an urban setting.

Complete Streets – Through the research of the state of the ATM practice in the U.S. and discussions with Arlington staff and the ATM Study Task Force, the term “complete street” has emerged as one that Arlington has embraced as planning and implementation of ATM projects move forward. The complete street relates to the land uses served by the street and

signifies that the needs of all transportation modes are met within the street realm, in concert with the adjacent land uses served.

Except for interstate highways and some other limited-access roads that are under the jurisdiction of the Commonwealth, Arlington owns and maintains most of the street system within its borders. Local ownership facilitates the implementation of ATM recommendations that are based largely on the above design philosophies.

Concept of Street Typologies — Street Design for Adjacent Land Use

Redesigning arterials with the combined philosophies of urban villages, new urbanism, smart growth, and context sensitive design can lead to the following results:

- Streets designed to function within the context of adjacent land uses
- Streets that are multi-modal and emphasize different modes of transportation
- Streets that are walkable and livable
- Streets that are *complete* in their form and function

To communicate the goals and objectives of a redesign effort, the functional classification of the streets should be addressed. Options include:

- Revamping the traditional set of functional classifications that focus on design and operational characteristics primarily for the movement of vehicles
- Continuing (or slightly modifying) the current functional classifications and overlaying a set of street typologies that refine the classification, influence the programming process, and prioritize design elements by relating to adjacent land uses and their function for motorists, pedestrians, bicyclists, and transit users.

Possible Street Typologies

A set of possible street typologies for Arlington County that would define streets by relating to adjacent land use and their function for pedestrians, bicyclists, and transit users could include:

Main Street – a street that serves medium intensity retail and mixed land uses including neighborhood centers.

Mixed-Use Street – located in high-intensity mixed-use commercial, retail, and residential areas with substantial pedestrian activity.

Commercial Street (Regional and Local) – designed to balance traffic and mobility with land access - often located in lower intensity commercial surroundings.

Residential Street – can be local or arterial streets, provides multi-modal mobility with access to land use or collectors and emphasize walking, bicycling, and land use over mobility.

Civic Street or Government Street – designed to accommodate large volumes of vehicles with intersections handling larger peak periods due to the generation of traffic from civic, federal government, and related regional activity center.

Institutional Street – designed to accommodate large volumes of vehicles at intersections and those turning into driveways for school, hospitals, and related regional activity centers.

Park Street or Recreation Street – with the numerous parks in the County, especially along arterial streets, Arlington has the opportunity to define this typology by addressing the specific needs of the users of these recreational areas.

Conclusions on Street Typologies

All streets do not serve the same function. Each street serves a unique purpose, but grouping streets into functional classifications assists with establishing policy and planning, designing, and construction improvements. It was clear from the findings that Arlington citizens want multi-modal, livable streets within context of their land uses – complete streets.

Arterial Street Design as a Function of Place-Making

Many local or community activity centers and nearly all regional activity centers cluster along arterial streets. Many centers no longer offer the sense of "place" they once embodied, thanks to a loss of balance between space for movement and space for sitting and enjoying the atmosphere. An imbalance between space for driving and space for other modes of access to activity centers is a contributing factor. To regain a sense of "place" and contribute to the revitalization of a community's activity centers, arterials serving the area can be redesigned, rebuilt and managed with a different focus.

Multi-Function Arterials – Arterials can support revitalization of activity centers into community-friendly places by accommodating a variety of travel modes safely and conveniently. The key lies in reasonable design and operating speeds being adopted for vehicular traffic. An arterial can move considerable traffic at 25-to-30-mph speeds and also serve as a pleasant place to walk, bicycle, wait for a bus, or sit on nearby benches and street furniture.

Street Design as a Function of Character of Adjacent Uses – The process of change begins with a thorough understanding of the character of the area, existing land uses, and movement between sites, as well as what the future holds for the area. Streets can be redesigned to maintain the positive elements that exist for an area and support the goals for change.

Modal Orientation of Streets – Not all streets are created alike. The movement of pedestrians should take priority over vehicles on some streets while a parallel street may emphasize the movement of buses. With short block lengths, the network of streets can work together to support the diversity of community needs ranging from moving traffic to moving buses to providing great places for citizens to live, work, and play in a safe and appealing environment.

ANALYSIS OF ARLINGTON COUNTY TRAFFIC CONDITIONS

In addition to researching current ATM practices, the study conducted a screenline analyses of traffic proceeding north-south and east-west in Arlington with the purpose of gaining an understanding of whether or not reducing the capacity of an arterial street would affect parallel routes. The team also investigated overall trends in traffic growth throughout the County. The findings from the analysis of traffic conditions guided the development of ATM measures and the application of those measures during the corridor design studies.

Screenline Analyses

It has been shown in previous studies that measures to effectively re-balance the use of the public right-of-way to enhance non-motorized travel for a particular corridor may reduce vehicle-carrying capacity of the corridor. Such a reduction in capacity, especially during the morning and afternoon weekday commute periods, may raise concerns not only about congestion on that corridor, but also about potential diversion of traffic to other nearby corridors. Through a detailed analysis, the study team estimated the amount of excess capacity that exists for both north-south and east-west corridors in the County. The results of the analysis are shown in Figures 3 and 4.

Conclusions on Traffic Conditions

The screenline analyses showed that the number of vehicles forecasted to use most of the study streets will exceed the capacity of these streets during peak travel periods. That is, a reduction in vehicle capacity would likely have a spillover effect on other streets. The screenline analysis indicates that by the year 2025, little or no vehicle capacity will be available on parallel streets. The exceptions to this statement may include Metrorail and Interstate 395.

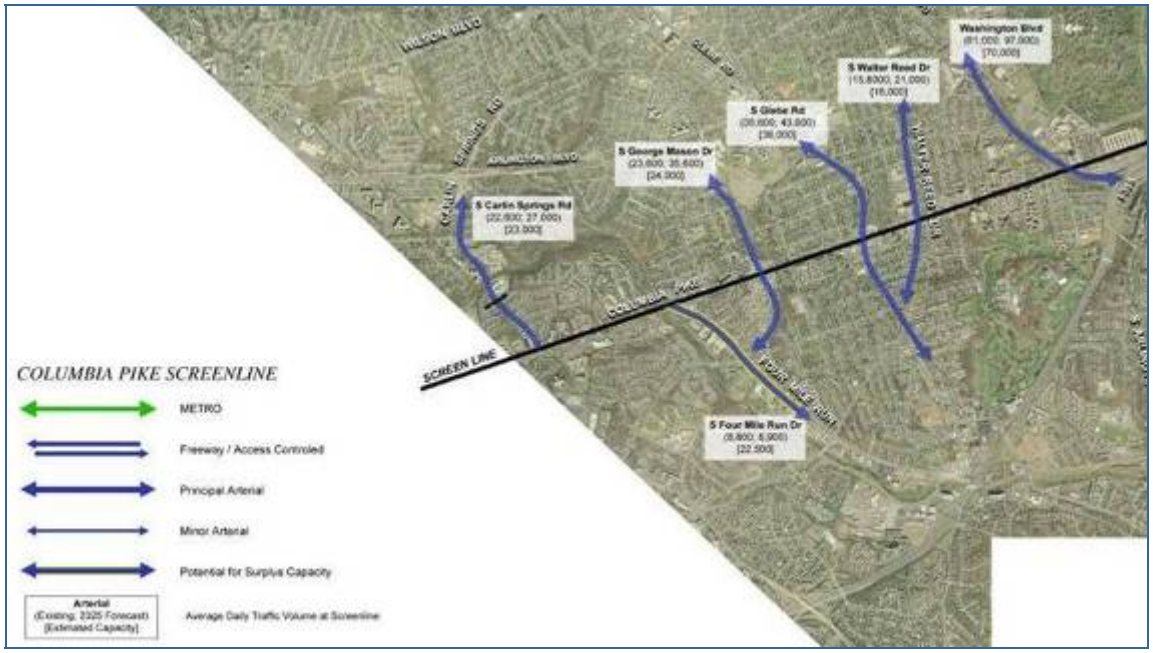

Figure 3 – Columbia Pike (North-South) Screenline Analysis Results

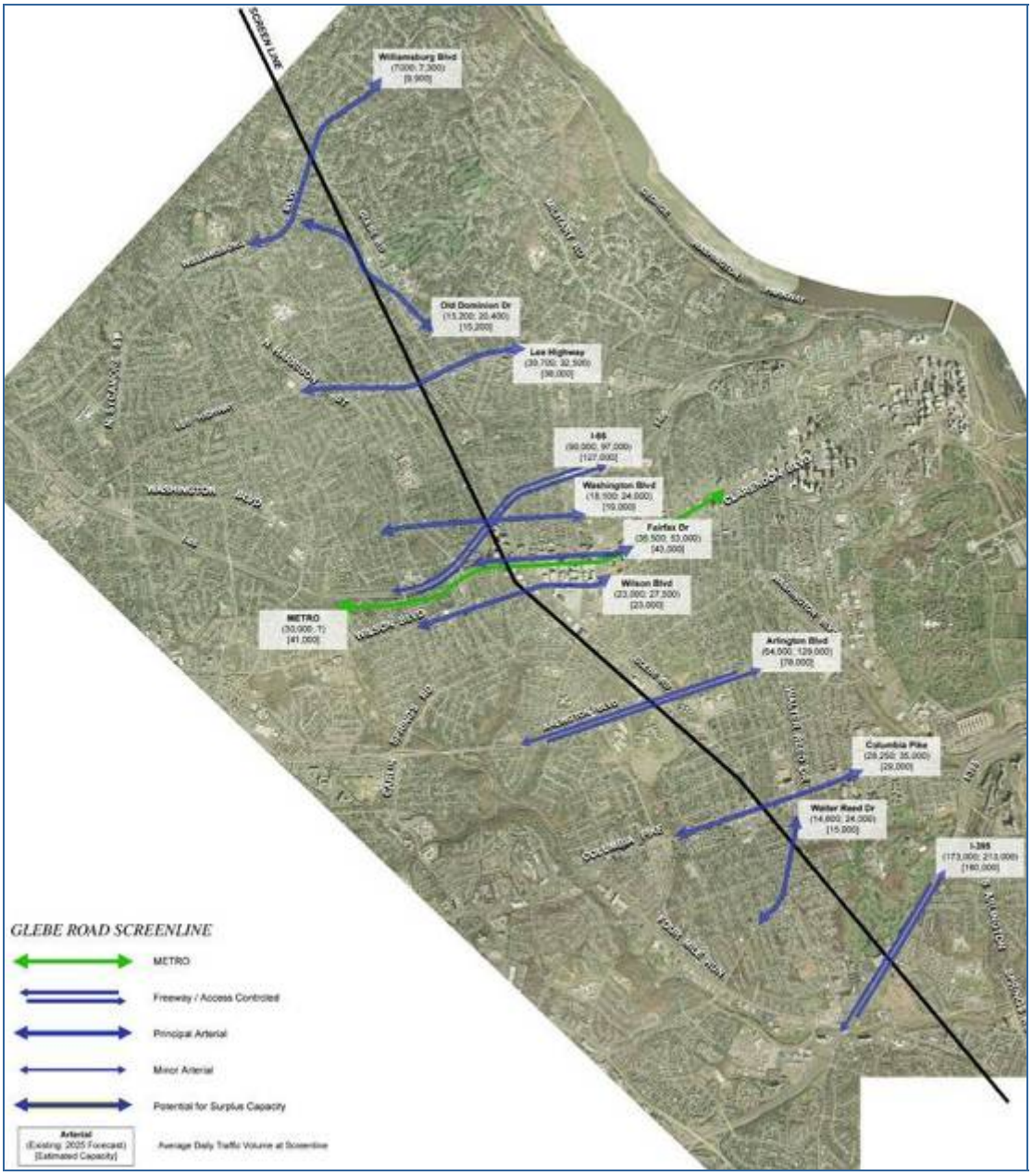

Figure 4 – Glebe Road (East-West) Screenline Analysis Results

With respect to the capacity on Arlington's streets, the study found that while traffic growth is projected to be relatively low, most arterial streets are currently at or near vehicle-carrying capacity during peak travel periods. Reducing the capacity of one arterial street may create traffic congestion, and related issues on another arterial. Planning for ATM implementation is therefore best done on a corridor basis, with measures that largely maintain vehicle capacity, unless excess capacity exists in that corridor.

ATM TOOLBOX

Based on findings from a world-wide survey of ATM-type practices, and given Arlington's multimodal transportation needs, the study team developed a "toolbox" of ATM measures. The objective was to provide measures that enhance the safety and efficiency of travel by pedestrians (of all abilities), bicyclists, transit users, and motorists through a balanced approach to the design and operation of an arterial roadway in context with its surrounding land use. A measure or a combination of measures can be applied at specific or periodic locations or along a corridor, within the street realm—streets, edges, and spaces between building facades. Applying ATM measures in this street realm can be done in concert with a particular street classification, with alternative classifications, or with street typology overlays. The street realm is illustrated in Figure 5.

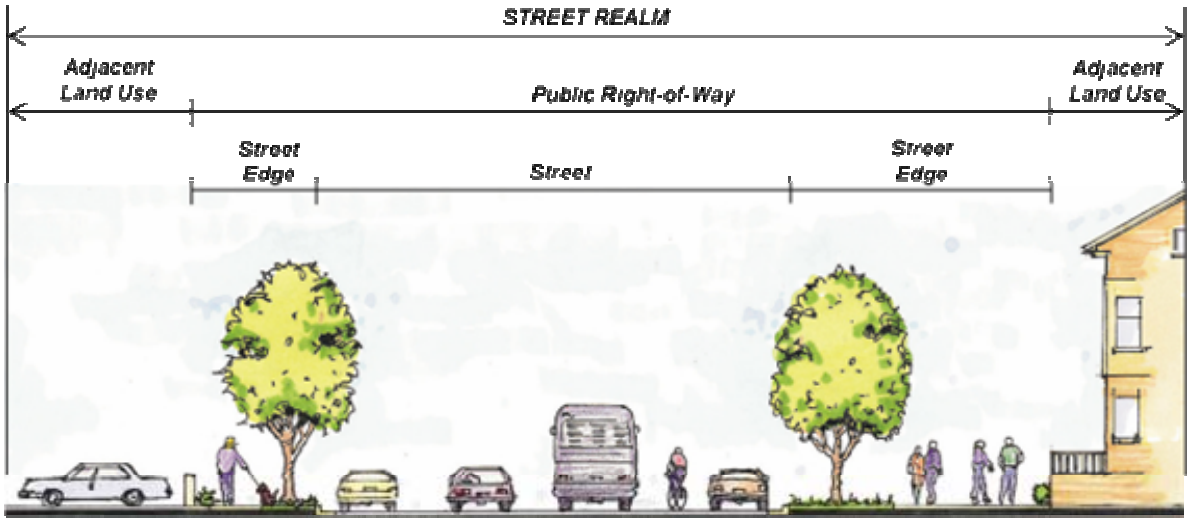

Figure 5 – The Street Realm

Arlington County's ATM Measures

Given the input from an expert panel assembled for this study, as well as the application of "state of the practice" research, the study team compiled and refined a comprehensive list of ATM measures through meetings with the ATM Study Task Force. This list was further refined through the application of ATM measures during the corridor design studies. The ATM measures developed for application in Arlington are listed below in three categories.

Figure 6 – Education/enforcement measure, Wilson Blvd

Education and Enforcement Measures

Like the example shown in Figure 6, education and enforcement ATM measures are those that educate the citizens and the traveling public and enforcement of the laws of

Arlington and the Commonwealth of Virginia such as speed limits, yielding to a pedestrian in a crosswalk, and turn restrictions. These measures include:

- Area-wide education
- Radar speed trailer
- Radar speed signs
- Law enforcement

Continuous Measures

Continuous ATM measures are those that can be applied along a corridor in a continuous path to manage the speed of vehicles or enhance the safety of pedestrians and bicyclists. See Figure 7. These measures include:

Figure 7 – Continuous ATM measures, Shirlington area

- Decrease in posted speed limits
- Modification of traffic signal timing
- Signal prioritization for transit
- On-street parking
- Bike lanes
- Reduction in width of travel lanes
- Median landscaping (aesthetics)
- Trees along roadway and/or in median
- Grass/landscaping strips
- Intelligent transportation systems (ITS) applications
- Varying pavement texture and color
- Edge and centerline pavement treatments
- Medians for pedestrian refuge
- Street and/or pedestrian lighting
- Reduction (or increase) in number of travel lanes
- Addition of left turn lanes
- Alternative lane configurations
- Wider sidewalks
- Wider planting/landscaped strips along roadway
- Drainage improvements in combination with ATM measures
- Transit only lane
- Manage access (curb cuts/driveways)
- Valley gutters with catch basins between parking and travel lanes
- Relocation of overhead wires to underground, removal of utility poles
- Regrading/realignment of roadway, sidewalks

Periodic measures

Periodic ATM measures are those applied in specific locations, such as at intersections and pedestrian crossings as shown in figure 8. These measures include:

Figure 8 – Periodic ATM measures

- Traffic calming/ATM signs
- Traffic calming pavement markings
- Ladder style crosswalks
- Addition of school zones
- "Rest on red" signal control (main travel way has red light until cars approach)
- Pedestrian only phase
- Pedestrian signals with countdown heads
- Leading pedestrian interval (allows pedestrians to walk first before parallel streets have green light)
- Channelized pedestrians crosswalks
- Speed activated signal control
- Perpendicular hash-marks at 3' spacing (rumble strips)
- Pedestrian facilities designed for persons of all abilities
- Intersections with improved line of sight for vehicles and pedestrians
- Nubs or bulb-outs at corners of intersections
- Reduction in radii of intersection corners
- Tree nubs or bulb-outs along roadway
- Varying pavement texture and color
- Colored pavement in bike / auto conflict areas
- "Queue jumper" lanes for buses to get ahead of traffic
- Landscaped median islands
- Pedestrian refuge islands
- Raised intersections (longer, gradual speed tables)
- Bus stop nubs, with ample intersection clearance
- Wormed islands in place of two-way turn lanes
- Roundabouts instead of signalized intersections

Conclusions on ATM Measures

An ATM toolbox of measures that can manage multimodal transportation along an arterial street was developed through a sound process of research and citizen participation. In developing the concept plans for selected arterial streets, the study team and task force agreed that applying the dozens of possible ATM measures is best done with a combination of measures that act together to achieve the desired effects; that is, to:

- Improve pedestrian safety and access,
- Provide safe bicycle access,
- Encourage use of transit, and
- Allow a slower but steady progression of traffic.

CORRIDOR DESIGN STUDIES

With the information from the analysis and findings from the research of the ATM state of the practice, functional classification considerations, traffic analyses, and the ATM toolbox, the study team conducted design studies for arterial corridors that represented a variety of transportation conditions and land use patterns in Arlington. The purpose of these design studies was three-fold:

- To test the draft set of ATM measures in a planning process as a means to refine the toolbox for use throughout Arlington;
- To model a planning process for specific corridors and develop concept designs that could lead to further design and eventual implementation of the ATM measures for all or part of those corridors; and
- To select one of the actual streets in the corridor design studies for implementation and begin construction. Wilson Boulevard from North George Mason Drive to North Frederick Street was selected as the initial project.

15% Concept Designs

As part of the ATM Study, eleven corridors in Arlington were examined. For the following three corridors, the study team completed 15% concept designs:

- Wilson Boulevard – from the Fairfax County Line to North George Mason Drive
- South Carlin Springs Road – from North Kensington Street to 7th Road South
- South Four Mile Run Drive – from Columbia Pike to Shirlington Road

For each of these three corridors, the study team conducted a citizen-participation process that included the following meetings:

- Visioning Workshops – evening meetings to gather input from citizens on the issues and long-term visions for the arterial roadway corridor
- Corridor Walk-Throughs – day-long walk along the corridor with citizens, County staff, and consultants
- Concept Plan Workshops – evening meetings to present findings of the analysis and the Concept Plans for the arterial, to obtain feedback from the citizens

For each of these three corridors, the following items were produced:

- Corridor Study Area Aerial Photos and Outline of Existing Conditions
- Figure of Existing Traffic Conditions
- 15% Concept Plans
- Corridor Photos and Conceptual Renderings
- Existing and Proposed Street Sections

5% Draft Concepts

For the following eight corridors, the study team compiled 5% Draft Concepts:

- North Harrison Street – from 26th Street North to Lee Highway
- South Arlington Ridge Road – from South 20th Street to South Glebe Road
- Columbia Pike – from South Courthouse Road to South Quinn Street
- Military Road – from North Glebe Road to Lorcom Lane
- North Sycamore Street – from Williamsburg Boulevard to North 16th Street
- North Washington Boulevard – from North George Mason Drive to Sycamore Street
- Walter Reed Drive – from 6th Street South to Columbia Pike
- Clarendon Boulevard – from North Fillmore Street to North Barton Street

For each of these eight corridors, the following items were produced:

- 5% Concept Plans
- Existing and Proposed Street Sections / Corridor Photos

Conclusions on Design Studies

The concept designs attempted to strike a balance between maintaining mobility for vehicles and enhancing safety and access for other modes. Thus, in developing the concept plans for selected arterial streets, it was found that applying ATM measures is best done in combination to achieve the desired effects—improve pedestrian safety and access; meet or exceed ADA requirements; provide safe bicycle access; encourage use of transit; and allow a slow but steady progression of traffic.

Designing projects using a combination of ATM measures has led to ATM design standards that Arlington may wish to adopt for selected arterials. These standards involve widths of travel lanes, curb extensions, curb return radii, parking lanes, bicycle lanes, sidewalks, enhanced crosswalks, landscaping, streetscape, medians, and pedestrian refuge islands.

Within the street space, balancing between the needs of pedestrians, bicyclists, transit users, and vehicles involves trade-offs. If acquisition of additional right-of-way is not feasible, citizens and designers may have to choose between widths of sidewalks and bicycle lanes or whether to have features such as: on-street parking, landscape strips and bicycle lanes. Emergency access must be ensured. Vehicle capacity at intersections (nodes) and between intersections (links) must be investigated. Reducing vehicle capacity may encourage vehicles to use alternative routes; however, if done in concert with improving access to transit, pedestrian and bicycle facilities, such capacity reduction over time may lead to less vehicle traffic demand.

Planning and making policy decisions involving the application of ATM measures should be made holistically on a corridor basis, considering the direction of travel through Arlington as a whole, and considering the finite amount of traffic capacity across the County.

RESULTS AND RECOMMENDATIONS

To test these best practices within Arlington, the County selected one of the study corridors and advanced it through the design, engineering and construction phases. Wilson Boulevard was selected to be the first pilot project. The ATM study included a 15% conceptual design for Wilson Boulevard from George Mason Drive to the County Line, a distance of nearly 1.5 miles. The corridor had all the right elements: an ADT of over 20,000, Metrobus and local ART bus service and significant pedestrian activity. However, the street was most recently improved in the early 1960s with minimal sidewalks, insufficient utility strips, poor streetscape and various substandard driveway aprons. With input from the residents and Transportation Commission, the County Board decided to advance this project in phases. The first one third mile of Wilson Boulevard was advanced and funded from George Mason Drive to North Frederick Street; the street design is in Figure 9.

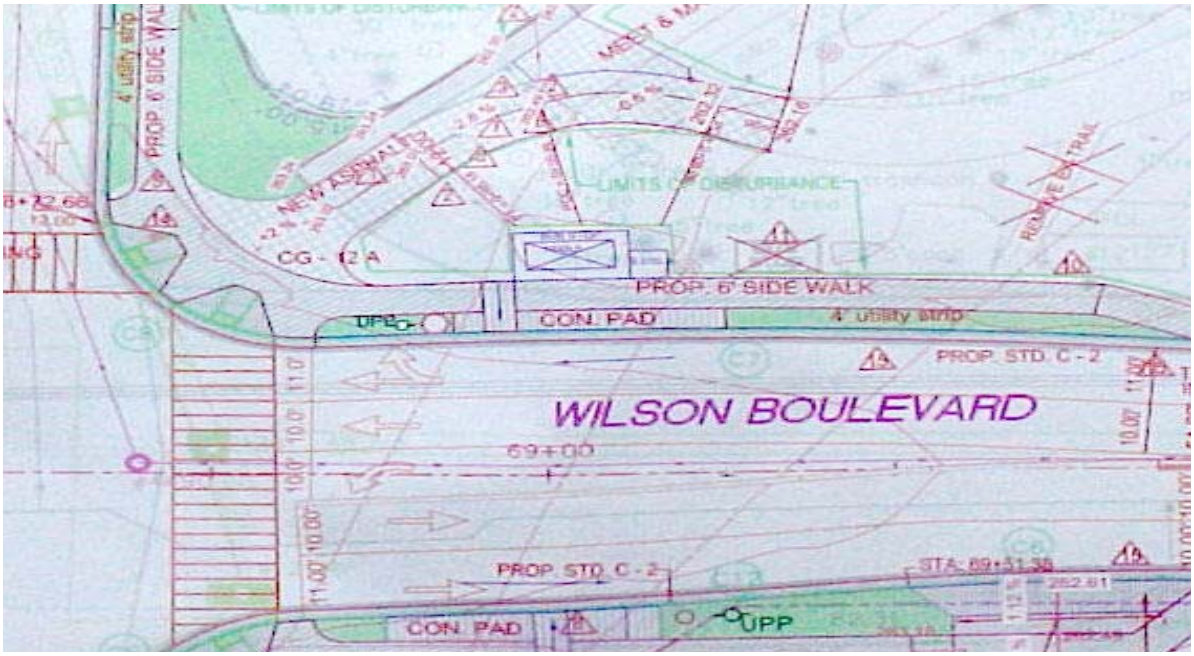

Figure 9 – Wilson Boulevard Design

ATM Funding

To implement the concept design as a pilot project for Wilson Boulevard the County Board approved one million dollars in capital bond funds for the initial ATM projects. This funding was approved on a pilot basis for the ATM program and specified that a project would be built. After the two-year bond cycle and the initial project was under construction the County Board made additional funds available for ATM projects. Now that Wilson Boulevard Phase 1 is complete, staff is proceeding with two other ATM projects: Four Mile Run Drive and Carlin Springs Road. These projects were included in the study as 15% design concepts. Staff is anticipating additional funding to advance these projects.

Implementation – First Step Toward Complete Streets

With the guidance from the ATM study and the 15% concept design for Wilson Boulevard, staff had the framework for a complete street. This first project included narrowed travel lanes, wider sidewalks, curb extensions, improved traffic signals, wider crosswalks, extended medians, landscaping, a trail connection, and a bus shelter. To facilitate the implementation, the project avoided acquisition of additional right-of-way or relocating any of the existing utilities. Going from a 15% design to construction was an involved process with residents and property owners. The signalized intersection of Wilson Boulevard and George Mason Drive is a complex intersection with over 40,000 vehicles traveling through the intersection every day, pedestrians, transit service and a regional trail that crosses it diagonally. The intersection worked quite well for auto travel but at the expense of all of the other modes. Originally, this intersection had a channelized right turn from eastbound Wilson Boulevard to southbound George Mason Drive. Within the design process it was decided to remove this free right turn and to stop the right turning vehicles at the traffic signal. A capacity analysis indicated that right turning vehicles here would be delayed slightly. Because the focus was on building a complete street, staff gave a priority to pedestrian safety in deciding to remove this free right turn. An illustration of before and after of the channelized right turn is illustrated in Figure 10.

Figure 10 – Before and After of Channelized Right Turn Removal

Residents and Property Owners Input

Staff concluded various design reviews with the local Civic Association, sharing 50%, 75%, 90% and final design and construction plans. This consensus building process gained the support of the residential community on every design element from placement of the bus shelters to the landscaping plan. The residential community wanted a clean, attractive and tree lined street. The adjacent property owners were a mix of national and local commercial retail business that were concerned about parking, driveway access and construction issues. The project manager met with all property owners or their representatives and discussed the project with the various retail tenants. Construction disruption was kept to a minimum. Driveway entrances were constructed in

sections and property owners/retail business had vehicle access at all times. The property owners embraced the project realizing they would benefit from improved sidewalks and an attractive streetscape. An illustration of the crosswalk is in Figure 11.

Figure 11 – New Pedestrian Crosswalk at Wilson Boulevard & North George Mason Drive

Construction – What We Learned

With a complete set of signed final engineering plans the project could now go to construction. The curb, gutter and sidewalk elements were assigned to one contractor, the traffic signals were assigned to another contractor and the utility relocation to a third contractor. The utility poles and guy wires were coordinated with the power company. With four separate contractors working in the same street section, staff decided to advance the utility work and have that element finished a week in advance of the actual street construction. The foundation was then poured for the new signal poles, and subsequently the street work began with the installation of the curb, gutter and sidewalk. When that phase reached 90% completion, the signal crew returned for their installation of the traffic signals. The power company could then make the various adjustments to poles and guy wires. Finally, after construction was complete, the landscaping could be scheduled for planting. Through this process we learned even the best set of plans needs various field adjustments and attention to details. After the intersection was completed and the trail connection was widened, it looked as if the trail was a fifth street coming into the intersection, so

a field adjustment was made to narrow the trail connection to 12 feet, band it with concrete and add a planted island to delineate the trail from the street, as showed in Figure 12. Most of the major issues that surfaced in the field were due to inaccurate survey and a fiber optic cable that was not located by the Miss Utility underground location service; this made numerous field adjustments necessary during construction.

Figure 12 – Trail Connection at Wilson Boulevard & North George Mason Drive

ATM Lessons Learned

- Given the lack of excess vehicle-carrying capacity during peak travel periods on Arlington's streets, ATM planning and implementation should be done on a corridor basis, with measures that do not significantly reduce vehicle capacity, unless excess capacity exists in that corridor.

- The tool box of ATM measures and the design standards refined during the ATM Study should be considered when responding to citizen requests, updating the County's Master Transportation Plan, and planning and designing capital improvements for arterial streets.

- Arlington citizens and staff should continue planning and design for selected arterial streets, starting with those streets that have the greatest need to become more complete in the context of their transportation modes and their land uses served.

- A checklist of items to determine whether or not an arterial is a "complete street" should be used to identify deficiencies and prioritize ATM projects for arterial streets.

- As Arlington chooses to implement ATM measures, various funding mechanisms should be considered, including safety improvement programs and the Capital Improvement Program (CIP) process, embracing citizen input and integrating ATM standards into infrastructure projects.

- From a policy standpoint, education of all Arlingtonians should continue. The goal would be to increase awareness of arterial street issues and encourage people to use non-automotive travel options when possible. The education should be strategic and combined with continued enforcement.

SUMMARY

With the ATM goal: Enhance the safety and efficiency of travel by motorists, transit patrons, bicyclists, and pedestrians of all abilities through a balanced approach to the design and operation of an arterial street in context with its surrounding land use. The initial study has developed into a framework for multimodal arterial streets that lead to "complete streets" in the context of Arlington's urban villages. Through the work of Arlington citizens, the Transportation Commission, county staff, and the consultant team, the study provided a foundation for Arlington to implement an actual pilot project to address multimodal transportation management and take the first step to transforming Wilson Boulevard to a complete street.

ACKNOWLEDGEMENTS

The effort has been guided by the members of the Arlington County Board and the Arlington Transportation Commission, many of whom participated in the public workshops and corridor walks. These members provided invaluable support to the ATM Task Force, County staff, and the Consultant Team of Kimley-Horn and Associates as the study developed ATM measures, concept designs and final recommendations for the reconstruction of Wilson Boulevard as the first pilot project.

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