



▶ STREET CLASSIFICATION



▶ NEIGHBORHOOD PROTECTION



▶ SAFETY

City of Alexandria Comprehensive Transportation Master Plan

Streets

THE CITY WILL INCREASE THE NUMBER OF PEOPLE WHO TRAVEL IN THE CITY BY MASS TRANSIT, BICYCLE OR WALKING AND BECOME LESS AUTO DEPENDENT

-City Strategic Plan 2004-2015

Introduction

The streets of Alexandria represent the largest public resource within the City. Predominately urban in nature, the City of Alexandria must capitalize on its history as a walkable urban environment, and must ensure that future plans and development serve all modes of travel in a safe, efficient and context sensitive manner. City streets serve many functions providing citizens the ability to walk down the sidewalk to grab a cup of coffee, speak with their neighbors, walk their children to school, or bicycle to work.



Traditionally, decisions about streets have focused on how to accommodate the automobile. The City is changing this focus to ensure that City streets serve everyone, whether young or old, motorist or bicyclist, walker or wheelchair user, transit user or shopkeeper. Overall, this transportation plan update addresses City streets as a shared resource—outlining actions and strategies that incorporate equal consideration of the street’s travel area, pedestrian area and adjacent land uses into the transportation decision making process, with the overall goal of creating multimodal corridors that protect and enhance the character of the City and its diverse neighborhoods.

The City of Alexandria’s policy regarding its street network is targeted toward providing mobility for all users and alternatives to the private automobile. Decisions regarding development and redevelopment must conform to the future transportation vision of the City, taking into consideration the following: future development and redevelopment plans should not preclude the implementation of dedicated transit lanes and focus on street improvements that improve the efficiency of traffic circulation, building access, pedestrian safety and congestion reduction; consideration will be taken to include dedicated bicycle lanes within the travelway of streets as identified in the bicycle and pedestrian facilities update maps; all improvements to roadways will include improvements to infrastructure that focus on enhancing safety and accessibility for all users, regardless of age or ability.

What’s Different about this Plan for Streets?

- ◆ Focus on integrated solutions for connectivity, providing mobility and access to all modes of transportation
- ◆ Development of a comprehensive, integrated, connected network that accommodates all users
- ◆ Recognizes the need for flexibility: that all streets are different, serving differing functions, priorities and user needs
- ◆ Focus on the application and development of context sensitive solutions that guide and complement street function

This streets section of the plan specifically addresses approaches to ensuring that streets are designed to safely accommodate all modes of travel and includes a general overview of the role of neighborhood protection techniques and travel demand management in ensuring the safety of City streets and community character. In addition, it outlines a number of actions and strategies to be carried out by the City in order to successfully manage the City street system. This section completes the first step in the update of the City's street classification system.

The second component of the City's plan for streets will be the development of multimodal corridor design guidelines — this effort, to be initiated immediately upon completion of this plan, focuses on bringing together the multiple departments and disciplines that utilize and influence development within the City, including but not limited to Transportation & Environmental Services and Planning and Zoning. Collectively, the City will develop corridor design guidelines that comprehensively address the interface of transportation and land use and focus on context sensitive designs, accessibility and complete streets. This will be developed as the City's "Complete Streets" policy and will guide the decision making process for future development and redevelopment.

Collectively these two components of the City Street Classification System will focus on the ability of streets to safely accommodate all modes of travel with a focus on the following four key elements:

- ◆ Emphasis on reducing the size of larger blocks through the redevelopment site planning process
- ◆ Focus on creation of a street-grid where possible that reduces the traffic load on arterial streets, resulting in reduced travel distances to destinations, reduced vehicle miles and creating more direct access to services.
- ◆ Focus on locating building vehicular access points for new development and redevelopment on side street frontage or alleys where feasible.
- ◆ The application of traffic calming and street redesign to address cut-through traffic concerns.

Street Classification

Functional classification has commonly been mistaken as a determinate for traffic volume, road size, urban design, land use and various other features. These elements represent the form of a roadway but not its function. Function is best defined by connectivity (Movement from point A to point B), without connectivity, neither mobility nor access can be served. Roadways that provide the greatest reach of connectivity are the highest level facilities. The functional classification system of the past did not necessarily reflect the function of roadways, and in many cases focused on measures such as traffic, volume, width and speed.

All streets within a City's transportation network serve a particular function. These functions can vary from providing access to a person's home to providing residents the ease of accessibility in traveling outside the City to reach their destination. The functional classification is important for the City to qualify for state and federal transportation funds.

There are five categories of functional classification that are generally recognized by the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT). The City of Alexandria adopted a classification system that is slightly different, but its characteristics are generally the same. The classifications of the City of Alexandria's streets are defined on the following page.

Street Classification

Controlled Access Facilities (FHWA General Classification) - Expressway (City of Alexandria)

Controlled access facilities and expressways are intended to complement the arterial street system by providing for movement of very high volumes of people and goods over long distances, typically trips of three miles or more. Expressways do not provide direct access to adjacent properties. They form a closed continuous transportation system between principal traffic generators and attractors. Expressways connect with crossings of major geographical barriers. The interstate system, freeways, expressways, and parkways are classified as controlled access facilities or, in Alexandria's classification as expressways. Examples of this type of facility include I-395 (Shirley Highway), I-95 (Capital Beltway), and the George Washington Memorial Parkway (north of Slater's Lane).

Primary Arterial - Arterials

Arterials serve the main travel corridors by connecting secondary traffic generators and mixed uses such as regional commercial, residential and employment centers with other high level street resources. Arterials provide access to adjacent properties and have limited preference at signals.

Arterials serve as the primary links to the City's portals (interchanges, Metro Stations, Smart Stations and major routes crossing City boundaries) and are intended to provide those who work or live within and visit Alexandria with general mobility and access to the greater Washington Metropolitan Area. Access is provided to adjacent land on a limited basis; however, most traffic is limited to through movements, particularly during the peak hours. Preferential signalization, signal progression, and linear continuity are essential for these streets. Arterials may provide dedicated transit lanes, providing for the efficient and congestion free movement of transit services within dedicated transit lanes. Examples of arterials include Duke Street (Virginia Route 236 from western City limits to Henry Street), King Street (Virginia Route 7), Quaker Lane, Seminary Road, U.S. Route 1 through the City (Jefferson Davis Highway, Patrick Street, and Henry Street), Eisenhower Avenues, Van Dorn Street, and Washington Street (Slater's Lane to I-95).

Secondary Arterial - Primary Collectors

Primary Collectors serve less concentrated areas such as neighborhood shopping centers, mixed use hubs, high schools. Primary collectors usually carry a mix of local and travel and visitor/tourist related travel and link arterials with other facilities. These roadways serve the function of intra-city movement of people via automobile, transit connector services such as DASH, bicycle and by foot. Primary collectors may provide some local traffic with property access, provide access to adjacent properties.

Examples of local primary collectors include Braddock Road (from Beauregard Street to Commonwealth Avenue), Commonwealth Avenue (from King Street to Reed Avenue), and East and West Glebe Road.

Collector Street - Residential Collectors

Residential Collectors provide direct service to residential areas, local parks, neighborhoods, businesses and schools by distributing traffic to and from local streets and routing it to higher classified facilities. Trips are relatively short with a lower percentage of non-residential trips.

Examples of residential collector streets include Cameron Street (from St. Asaph Street to King Street), Prince Street (from Reinekers Lane to St. Asaph Street), Russell Road (from West Glebe Road to King Street), Chambliss Street, Sanger Avenue, Taney Avenue (From Van Dorn Street to N. Jordan Street), and Old Dominion Boulevard.

Local or Residential Street - Local Street

The primary purpose of local streets is to provide direct access to individual homes, mixed use shopping and businesses areas, and similar traffic destinations that do not have direct access from higher classified facilities. Local streets provide access to each parcel of land either directly or through alleys, providing access for productive use of property. Local traffic should be encouraged while cut through traffic should be limited and discouraged. These streets connect local properties to collector streets and, in turn, to higher classified facilities.

Neighborhood Protection

There are several interrelated components of neighborhood protection that play a critical role in preserving neighborhood character and increasing the safety of City streets. These factors include wayfinding, streetscaping, traffic calming, access management, intelligent transportation systems (ITS) and signalization.

Wayfinding & Streetscaping

Wayfinding can be defined as how people understand and find their way through an environment². The City of Alexandria's pattern of streets, buildings, transportation facilities, parking areas, attractions and amenities must be clearly understood by residents. There are four primary principles of wayfinding:

architectural clues; lighting; sight lines and signage³. Each of these components play an important role in how Alexandrians, tourists and commuters navigate through the City, thus creating or alleviating movements that may disrupt traffic flow.

The integration of successful wayfinding and streetscaping policies and programs into the development process is a key practice involved in creating a liveable community that is safe and promotes healthy, active lifestyles through sustainable transportation alternatives. Amenities such as street furniture, trash receptacles, street trees and other landscaping help contribute to a pleasing environment. In addition to providing an attractive experience for pedestrians the appropriate use of landscaping in medians and at curbside can contribute to a decrease in traffic speeds along certain streets. Streetscape features serve pedestrian and outdoor activities, as well as provide lighting and signs for motor vehicle drivers. Streetscape features are the elements that furnish the street environment and enhance community livability⁴.

Traffic Calming

A primary concern, expressed by many Alexandria residents, is the impact of vehicular traffic on their neighborhoods. Commuters without an Alexandria destination should be encouraged to use the freeways or transit. They should be discouraged from traveling on local streets that traverse neighborhoods. According to the 1992 Plan, the City has taken this position as a stated policy. In many areas of Alexandria, measures have been instituted to discourage or prohibit through-traffic from using streets that connect between arterials. Implementation of these measures must be continued as a coordinated effort between City staff and the neighborhoods affected by commuter traffic.

The City of Alexandria's Neighborhood Traffic Calming Program (NTCP) incorporates education, enforcement and engineered street design into protecting the quality of life in City neighborhoods. The City has developed the NTCP to provide residents with the opportunity to raise neighborhood traffic concerns and to participate in the selection of strategies that promote safe and pleasant conditions for residents, pedestrians, bicyclists and motorists in City neighborhoods.

A variety of traffic calming measures can be used to slow traffic and make streets safer for pedestrians and bicyclists including speed cushions, bulb-outs, chicanes and bike lanes. A list of traffic calming measures that the City uses as part of its NTCP is included in the Appendix.



Neighborhood Protection

Goals of the Neighborhood Traffic Calming Program

1. Provide protection to residential neighborhoods from traffic operating at excessive speeds and excessive volumes of traffic.
2. Keep neighborhood street use, to the greatest extent possible, within the classification defined in the transportation chapter of the Master Plan (i.e. local streets, residential collectors, primary collectors).
3. Increase access, safety, comfort and convenience for pedestrians and bicyclists by changing the culture of neighborhood street use from “cars first” to “people first.”
4. Base the expenditure of public resources on need.
5. Foster a collaborative working relationship between the City staff and neighborhood residents in the development of traffic calming measures.

Access Management

Access management is defined as the control of driveways and intersections to maintain safety at a roadway's full traffic carrying capacity. An effective access management program will encourage smooth and safe traffic flow on the City's arterial and collector roadways and will help the City avoid some of the traffic problems caused by uncontrolled strip development.

Access design characteristics that directly impact roadway traffic flow and safety include location and design of access drives and side roads as well as location of signals, medians, and turn lanes. Effective access management includes a comprehensive package of both physical design plans for improving roadway function and local planning programs and development regulations to control access by future development onto a roadway system.

The benefits of utilizing access management in preserving and enhancing a roadway system are threefold:

1. Access management supports a safe and effective relationship between the local transportation system and land use. It can ensure that traffic can reach local development smoothly and safely and that traffic generated by local development can be accommodated on the roadway without exacerbating congestion and/or crashes. In this manner, effective access management can reduce the need for roadway widening and other costly upgrades.
2. Access management often promotes the goals and objectives of a local plan of development for the future of a community. Those related goals generally include supporting desired future development patterns with appropriate infrastructure and enhancing the streetscape. For example, where the plan of development calls for more retail business in specific locations, an access management plan can help to ensure that roads and future driveways are planned to best accommodate the increased traffic.
3. Access management helps maintain the safety and capacity of arterial and collector roadways. In this way it can also minimize conflicts between pedestrian, bicycles and motor vehicles by consolidating access to land at points where safe crossings can be provided.



Travel Demand Management

Signalization and Intelligent Transportation Systems (ITS)

The City of Alexandria has a modern traffic signal system that is used to control traffic on the City's streets. Traffic signals provide safety at intersections by determining who has the right-of-way. They facilitate orderly traffic flow, allow pedestrians to cross, and provide cross-street traffic a chance to cross or enter an intersection. The installation of traffic signals can increase the capacity of the street network and reduce many types of collisions. Most signals in the City are connected to a central computer that coordinates and optimizes traffic flow to improve the efficiency of the street network.



Intelligent Transportation Systems (ITS) is the collective term for a variety of advanced technologies intended to aid travel, enhance the capacity and efficiency of the highway system, improve safety, and assist in the active management of facilities and traffic. ITS can provide real-time traffic information to motorists and emergency services, informing motorists about the best route to travel, and allowing emergency services to remove incidents quickly.

The option for adding road capacity in the form of additional lanes or roadways is very limited within the City of Alexandria. Therefore, the use of ITS strategies will allow the City to make most efficient use of its existing road system in accordance with the priority to serve Alexandria destinations in preference to through traffic. The elements of ITS may include:

- ◆ Wireless technology;
- ◆ Sensors to provide information on average traffic speed and volume;
- ◆ Closed-circuit cameras at major intersections to provide live video information on traffic flow;
- ◆ Variable message signs to inform motorists of incidents ahead and supply alternate route options;
- ◆ Synchronization of traffic signals;
- ◆ Direct emergency services tie-in for immediate response to incidents;
- ◆ Information sharing with transit centers about traffic flow;
- ◆ Information on parking availability and location; and
- ◆ Transit priority measures (i.e. que jumping).

Travel Demand Management

Travel Demand Management (TDM) strategies play an important role in the overall operation and planning of the street system. These strategies can complement other City efforts in minimizing total auto trips, reducing the peak load of vehicles, and spreading traffic over a longer time period to ease peak period congestion. TDM strategies that will play an important role in the overall success of the City's transportation vision fall into two categories:

Employer Based Strategies

These strategies are based on individual companies instituting programs designed to move people from single occupant vehicles (SOV) into carpools / high occupancy vehicles (HOV) and/or public transit. Companies will implement these programs either voluntarily (they realize some internal benefit) or because a government entity has mandated that SOV usage must be reduced. Generally, the effectiveness of employer based programs is directly related to the strictness of a government mandate. Examples of TDM employer based strategies are:

- ◆ Company based rideshare program
- ◆ Company based vanpool program
- ◆ Transit fare subsidy program
- ◆ Preferential parking for rideshare participants
- ◆ Parking cost increases/subsidies based on vehicle occupancy
- ◆ Variable work hours (flex time, alternate work weeks, etc.)
- ◆ Telecommuting

The effectiveness of a TDM program is measured in terms of peak hour vehicle trips reduced. For employer based programs, this can range from around 0.5% (voluntary, modest rideshare program) to over 30% for a highly aggressive, mandated program that includes a superior rideshare and/or vanpool program, financial incentives and disincentives and variable work hours.

It should be noted that some employer-based strategies and transportation services (shuttles, etc.) have different impacts depending on the type of employment in a study area. Rideshare programs work better where many employees have the same work schedule. A variable work hours strategy is more effective in an office setting where people can follow more independent work schedules.

Areawide Strategies

These strategies are based on government entities implementing changes designed to encourage people to use carpools or public transit. Examples of areawide strategies are:

- ◆ Transit service improvements
- ◆ Transit fare reductions
- ◆ Parking cost increases
- ◆ HOV Lane Implementation

HOV Lane Implementation

As an areawide TDM strategy that is quite common in the Northern Virginia Region the implementation of additional or expanded HOV lanes is a strategy that must be explored closely for the City of Alexandria. HOV priority refers to strategies that give priority to High Occupant Vehicles, including transit buses, vanpools and carpools. HOV priority is a major component of many regional TDM programs. Two, three or four occupants may be required to be considered an HOV, depending on circumstances. HOV priority provides travel time savings, operating cost savings and increased travel reliability. HOV lanes typically provide time savings from 0-5 minutes per mile on arterial streets⁵. A study by Ewing cited in the Victoria Transportation Policy Institute's TDM Encyclopedia estimated that HOV facilities can reduce peak-period vehicle trips on individual facilities by 2-10 percent.

Funding

The City of Alexandria does not propose the construction of any new streets with the adoption of this Transportation Plan. Any new street connections required from new or redevelopment activities will be paid for by developers. Therefore, costs associated with City streets are limited to maintenance and repair. The Street Maintenance Section is responsible for repairing all sidewalks, curbs and gutters, pavement areas in the public right of way. In addition this Section is responsible for snow removal, pothole patching, guardrail, fence and barrier repairs, as well as bike path and trail repairs on request. The Street Maintenance Section places and programs variable message boards as part of the traffic management and control associated with it's activities, as well as for other City Departments. This Section also supports other City Departments with their construction activities.

Each year the Street Maintenance Section resurfaces approximately 60 lane miles of City streets using funds provided. Funding for this work is provided annually by the Virginia Department of Transportation based upon a formula that is derived from the total lane miles of paved roadway within the City of Alexandria. This funding also provides for concrete curb and gutter work, asphalt patching and localized repair and engineering studies. The State inspects the City streets, in conjunction with City inspectors, and directs which streets are to be repaired each year. Additional annual improvements and repairs to the City's roadways are typically funded out of the City's General Fund.

With the passage of HB 3202 on April 4, 2007, the Commonwealth of Virginia offered a number of new transportation funding initiatives at the State, regional and local levels including authority for the City to increase its motor vehicle registration fee, increase its real estate tax rate and levy commercial/residential impact fees.

Revenue sources and the allocation of funding are discussed in detail in the funding and implementation Section.

Actions & Strategies

In order to comprehensively address the City's street system and to enhance the transportation network for the City of Alexandria the City has identified the following actions and strategies to be implemented.

- S1. The City will ensure that its streets safely accommodate all users
 - S1.A. Evaluate and, if necessary, re-write design manuals to encompass the safety of all users
 - S1.B. Keep neighborhood street use, to the greatest extent possible, within the classification defined earlier in this chapter of the Master Plan (i.e. local streets, residential collectors, primary collectors).
 - S1.C. Continue funding, improving and evaluating the City's Neighborhood Traffic Calming Program.
 - S1.D. Foster a proactive working relationship between City Staff and neighborhood residents in the development of traffic calming measures.

- S2. The City will formally develop and adopt a "Complete Streets" Policy.
 - S2.A. Increase access, safety, comfort and convenience for pedestrians and bicyclists by changing the culture of neighborhood street use from "cars first" to "people first."
 - S2.B. Ensure that the entire right of way is routinely designed and operated to enable safe access for all users.
 - S2.C. Develop means of data collection that provides an efficient means of tracking the success of streets serving all users.

- S3. Develop new and enhance existing education programs to market and educate the public on Travel Demand Management (TDM) strategies.

- S4. The City will improve mobility on the City's arterial streets through the development of a comprehensive policy for incorporating technology into all aspects of transportation infrastructure.
 - S4.A. Redesign signal timings and coordination to coincide with the main flow of traffic during peak periods.
 - S4.B. Install traffic response program using roadway sensors to adjust signal timings according to directional traffic flow.

- S5. The City will improve safety at signalized intersections.
 - S5.A. Use signal technology and sensors to reduce speeding on arterial streets.
 - S5.B. Use cameras and law enforcement, and signal timing to minimize red-light running.
 - S5.C. Convert all pedestrian signals to countdown signals.
 - S5.D. Install signal pre-emption for emergency vehicles and transit.

- S6. The City will focus on improvements that improve the natural and human environment, preservation of historic resources, and creation of more enjoyable public street spaces.
 - S6.A. Incorporate attractive landscaping, pedestrian amenities and public art into all improvement projects.
 - S6.B. Incorporate street trees into all improvement projects where possible.
 - S6.C. Incorporate traffic calming features in street improvement projects whenever possible.

Actions & Strategies

- S7. The City will develop a comprehensive design manual for City streetspace.
 - S7.A. Planning & Zoning, Transportation & Environmental Services and other departments will coordinate efforts to effectively link land-use and transportation planning.
 - S7.B. Develop multi-modal corridor design guidelines focused on preserving and enhancing the character and identity of City neighborhoods, streets and corridors.
 - S7.C. Develop policies to require the incorporation of pedestrian amenities to promote walking, bicycling and transit use into the planning, design and construction all development and redevelopment efforts.
 - S7.D. Identify policy for access management along applicable corridors to improve safety, function and appearance.
 - S7.E. Develop overlay corridors that will guide the integration of design elements into a system of multimodal corridors.
- S8. The City will explore opportunities to enhance the use of high-occupancy vehicle (HOV) lanes as a traffic management strategy for periods of peak travel demand.
 - S8.A. The City will study its existing HOV travel lanes to determine if changes in their operations would improve traffic flow during peak travel periods.
 - S8.B. The City will evaluate opportunities for implementation of additional or expanded HOV travel lanes or reduction of existing HOV travel lanes on City streets.

Endnotes

1. Southworth, Michael & Ben-Joseph, Eran. 2003. Streets and the Shaping of Towns and Cities
2. Asheville – Wayfinding
3. University of Michigan Studio. 2002. Wayfinding: Navigating Human Space. http://www.umich.edu/~wayfind/flash_home.htm
4. METRO. 2002. Creating Livable Streets: Street Design Guidelines
5. Victoria Transportation Policy Institute. 2007. TDM Encyclopedia. HOV Priority: Strategies to Improve Transit and Ridesharing Speed and Convenience. <http://www.vtpi.org/tdm/tdm19.htm>