DRAFT WORKING DOCUMENT

POTOMAC YARD MULTIMODAL TRANSPORTATION STUDY

PRELIMINARY FINDINGS

Prepared for:

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1.0 Introduction

Potomac Yard is strategically located at the center of the region and convenient to the most urban areas of the core—as well as the core's transportation assets. This document is a summary of the underlying principles and assumptions as well as a presentation of the findings of the future transportation evaluation prepared in support of the long-term plan of Potomac Yard. From a planning perspective, the study of Potomac Yard assumes that Alexandria's high-quality urban fabric is replicated and enhanced in a way that not only promotes, but encourages walking, bicycling, and transit use, while discouraging the unsustainable practice of making single-occupant auto trips.

This document addresses transportation impacts associated with proposed development in Potomac Yard, focused on Landbay F (69 acres) and Landbay L (12 acres). It summarizes results of the transportation analysis of future no-build and build conditions (with and without Metro). All analysis includes the dedicated transit corridor. No-build conditions include currently planned transportation improvements and planned and approved development in the vicinity of Landbay F and L. Build conditions include further transportation improvements as well as the build out of Landbay F at approximately an 2.5 floor area ratio (FAR) density.

For the reader/reviewer…

As you review this summary, think about whether or not the study reveals conditions that are supportive of Potomac Yard Planning Advisory Group (PYPAG) principles, and what strategies, measures, policies, or an approach might be considered to improve conditions. To prepare for presentation of the findings to the PYPAG, it also would be helpful for you to provide feedback on the following:

- What do you think of the results?
- Is there anything that is unclear?
- What's missing?
- How can we better manage the transportation system and moderate traffic growth, while creating opportunities for urban amenities that benefit neighborhoods and the city?
- How can we get more people to walk, bicycle, and take transit?

Alexandria's Transportation Vision

The City of Alexandria envisions the enhancement of its transportation system to further promote and encourage the use of alternative travel modes while reducing dependence on travel by private automobile. The city's multimodal approach and planning efforts will foster the establishment of transit-oriented, pedestrian-friendly villages, focused on the creation, preservation, and enhancement of neighborhoods. This will result in increased community cohesion and the formation of a more urban, vibrant, and sustainable city. Promoting a balance between travel efficiency and quality of life will provide Alexandrians real opportunities for travel mode choice, and continued environmental and economic sustainability.

Potomac Yard Planning Advisory Group Vision and Principles

The Potomac Yard Planning Advisory Group (PYPAG) envisions Potomac Yard as an environmentally and economically sustainable 21st Century urban, transit-oriented community. The group envisions the transportation system to be multimodal, comprehensive, and integral to supporting and creating a vibrant and diverse mixed-use community. The PYPAG's vision furthers the transportation planning goals of Alexandria.

Transportation in Urban Environments and Best Practices

Urban places and cities follow a very different model for moving people than do suburban areas. The focus of suburban areas is primarily on vehicular level of service and the movement of vehicles. In successful urban areas, the focus is on the movement of people by all modes—walking, bicycling, transit, and driving. Points to consider with regard to transportation in urban environments include:

- **Congestion:** To achieve some transportation system goals, planning for a manageable level of congestion is a good practice and is a tremendous factor in increasing transit ridership, bicycle usage, and pedestrian activity. Slow speeds make non-auto modes more attractive, competitive, and in some cases safer.
- **Design for all day:** Often, roads and intersections are designed so that traffic (auto) volumes during the busiest 15 minutes of the busiest hour of one day a week can be accommodated with little to no delay. Results of this approach: large intersections that are unfriendly to all non-auto modes, high transportation infrastructure costs, unrealistic expectations from drivers, and roads that go mostly underused 23 or more hours of the day.
- **Interconnected network of streets:** Not only does a grid or web of streets spread the load of traffic over many, rather than few streets, it allows different streets to perform different functions.
- **Interconnectivity between all modes:** Interconnectivity between all modes should never be an afterthought in an urban environment. Successful urban areas deliberately plan connections between all modes.
- **Compact urban form/density:** With greater densities and complementary uses close to one another, there is a much higher probability that people will walk, bicycle, and take transit from one place to another.
- **People-moving capacity:** In urban areas, capacity in common terms refers to the system's ability to move people, whether they choose to drive, walk, bicycle, or take transit. A diverse system has a much greater ability to move a larger number of people from place to place.
- **Quality of the experience:** Consistent with the previous points, the quality of, and consideration of future investment in the transportation system should not be determined by a single mode—which is often the case.
- **Vehicle speed:** While high travel speeds may be appealing to through traffic, they are not always viewed favorably by residents, businesses, bicyclists, transit users, or pedestrians along the same street. In urban places, slow and steady is a much more successful approach to corridor operations.
- **Travel time:** Travel time will never be equal among all modes, but should be competitive based on value—actual monetary cost of the trip, quality of travel experience, time, and other similar considerations.
- **Parking:** Great places aren't limited by the parking they can provide or the vehicular trips they can accommodate. Whether or not a parking space is available and how much parking will cost heavily influences people's decision whether or not to drive to a place. Parking should be available for those that choose to drive and are willing to pay its cost. At the same time, incentives (financial and otherwise) should be provided to those that choose not to drive.

2.0 Rationale and Assumptions for Future Evaluations

Citywide Experience

Much like its regional neighbors, Alexandria left behind auto-centric policies and planning practices long ago. While the city continues to implement improvements to its transportation system to benefit vehicles, significant road widening to accommodate increases in travel demand are not the center of the city's transportation improvement program. At a practical level, street rights-of-way are very constrained and the value (benefit vs. actual cost) of widening streets to accommodate, in some cases non-Alexandria traffic, is low. In general, Alexandria's overall transportation focus is oriented toward making the most efficient use of the existing vehicular network (while protecting neighborhoods) and increasing the people-moving capacity of the transportation system.

Regional Experience

Locating growth where it can be well-served by transit is at the center of the big picture growth strategy of Alexandria, Arlington, and the District of Columbia. The cost of allowing development in locations that are not conveniently served, or could be conveniently served, by transit is too high. Being at the urban core of the region, Alexandria, Arlington, and the District of Columbia recognize that widening streets to accommodate regional traffic growth is not an activity that is beneficial to their communities' long-term vision. Each of these communities clearly understand that widening streets to solve a traffic problem isn't any more a solution to traffic congestion than someone loosening their belt to solve a weight problem. Instead, each of these areas has chosen to further diversify their transportation system through approaches that include:

- **Road diets:** removing vehicular travel lanes on streets to make more room for pedestrians, bicycles, and transit users
- **Pedestrian network additions and enhancements:** new sidewalks, widened sidewalks, pedestrian safety improvements at intersections and in mid blocks (bulb-outs, pedestrian heads, pavement markings, medians, etc.), and similar measures
- **Bicycle network additions and enhancements:** bike lanes, paths, bike parking areas, bike sharing, bike stations, and other facilities
- **Transit service increases and facilities improvements:** shelters, benches, lighting, paved waiting areas, more frequent service, longer trains, more routes, more direct routes, super stops, BRT/transitway planning
- **Parking and Transit Demand Management (TDM) requirements:** limiting parking, charging a fee for parking, sharing parking, transit passes, unbundling parking cost, transit incentives, required TDM plans and monitoring, and similar measures

As each of these areas has become much denser and populations have either stabilized or grown in the last 20 years, traffic growth on major roadways has been moderate or has simply not occurred. Using Wilson Boulevard in Arlington as an example because it is well-documented, the volume of daily traffic has not changed in the corridor in more than 20 years, despite the significant increase in density. In 1980, Wilson Boulevard carried approximately 19,500 vehicles per day. By 2000, Wilson Boulevard was carrying 18,600 vehicles per day. To accommodate the tremendous increases in density in the corridor, transit, walk, and bicycle mode shares have increased exponentially.

Transportation Study Assumptions

In the preparation of the transportation evaluation for Potomac Yard, a set of assumptions was developed to address essential considerations such as development density, the future transportation network, travel mode choice (mode split), and general future traffic growth (background traffic). Each of these is briefly described in the following:

Development Density

The analysis considered currently approved development Arlington and Alexandria as well as redevelopment in Landbay F at a 2.5 FAR and development of Landbay L at a 2.0 FAR. A summary of development densities in Landbays F and L is shown in **Table 3.1**.

Table 3.1: Potomac Yard Landbays F and L Development Totals

Landbay F	
Office	1,475,000 sf
Residential	4750 dwelling units
Hotel	400 rooms
Retail	1,000,000 sf
Landbay L	
Residential	1,000 dwelling units
Retail	10,000 sf
Assumptions *Residential dwelling units assumed to be 1,000 square feet* *Hotel rooms assumed to be 750 square feet*	

Future Transportation Network

In the context of the redevelopment of Landbays F and L, several key major transportation network assumptions were developed and are shown in Figure 3-1, 2030 Transportation Network, and briefly described as follows:

- **US Route 1:** Assumed that US 1 would not be widened to accommodate additional through vehicle lanes, but that widening would occur to support the future transitway.
- **Potomac Avenue:** This new major route will connect US 1 on the south with Crystal Drive on the north and will provide additional north/south capacity for local and non-local trips.
- **Internal Street Network:** Landbay F would develop a fine-grained interconnected network of streets that would complement and protect surrounding neighborhoods. Existing traffic signals would remain on US 1 and new signals are not planned to be added. To manage access, a median would be retained along US 1.
- **Crystal City/Potomac Yard (CCPY) Transitway:** Transit service would connect the Braddock Road Metrorail station, Potomac Yard, Crystal City (general), the Crystal City Metrorail station, and points north in Arlington. Service would operate in shared right-of-way in some sections and exclusive right-of-way in others.
- **Possible Future Metrorail Station:** A feasibility study is being performed for the proposed Metrorail Station that could be located adjacent to Landbay F. Transportation evaluations for the Potomac Yard study considered transportation conditions with and without a new Metrorail station.
- **New Landbay K bicycle/pedestrian connection:** This trail connection will tie Potomac Yard directly to Four-Mile Run through a linear park connecting Braddock Road and Four-Mile Run, enhancing its access to the regional major trail network that currently serves recreational users as well as commuters.

Travel Mode Choice

To accurately represent the anticipated trip-making patterns associated with the redevelopment of Potomac Yard, assumptions were developed to assign trips to transit, walk, bicycle, and auto modes. Assumptions were based on local, regional, and national experience and evidence for similar scale redevelopment projects in like contexts. Specifically, the recent Metro ridership study was consulted in addition to data from the Crystal City, Braddock Road, and King Street Metro stations and US Census, Journey to Work data. Generally guiding the development of travel mode choice assumptions were the following:

- Potomac Yard will have compatible and complementary uses and densities close to one another in a pattern supportive of non-auto trip-making (live/work/play)
- Regional and city policy environments encourage non-auto travel through strategic incentives and disincentives
- Potomac Yard is within the urban core of Alexandria and is proximate to significant urban areas of Arlington and the District of Columbia
- Potomac Yard is a natural extension of Alexandria's urban fabric
- Proximity to surrounding established neighborhoods
- Proximity to Metro is important
- Significant transit investment for many technologies is planned locally and regionally and will positively affect Potomac Yard
- Vehicular transportation network locally and regionally has a finite car-carrying capacity

A summary of general assumptions for travel mode choice is shown in **Table 3.2** and **Table 3.3**.

Table 3.2: Mode Choice Assumptions with a Potomac Yard Metrorail Station

Land Use	**Transit** (Metrorail)	**Transit** (Metrobus, DASH, and CCPY)	**Pedestrian/ Bicycle** (non-auto)	**Auto**	**Total**
Office: adjacent to a transit station	35%	11%	6%	48%	100%
Office: within ¼ mile of a transit station	21%	9%	6%	64%	100%
Residential: adjacent to a transit station	54%	1%	16%	29%	100%
Residential: within ¼ mile of a transit station	48%	1%	15%	36%	100%
Residential: ¼ to ½ mile of a transit station	31%	5%	10%	54%	100%
Hotel	27%	4%	31%	38%	100%
Entertainment (theater)	26%	6%	11%	57%	100%
Retail: all, excluding large format	29%	8%	27%	36%	100%
Retail: large format	9%	5%	14%	73%	100%
Summary	**35%**		**17%**	**49%**	**100%**

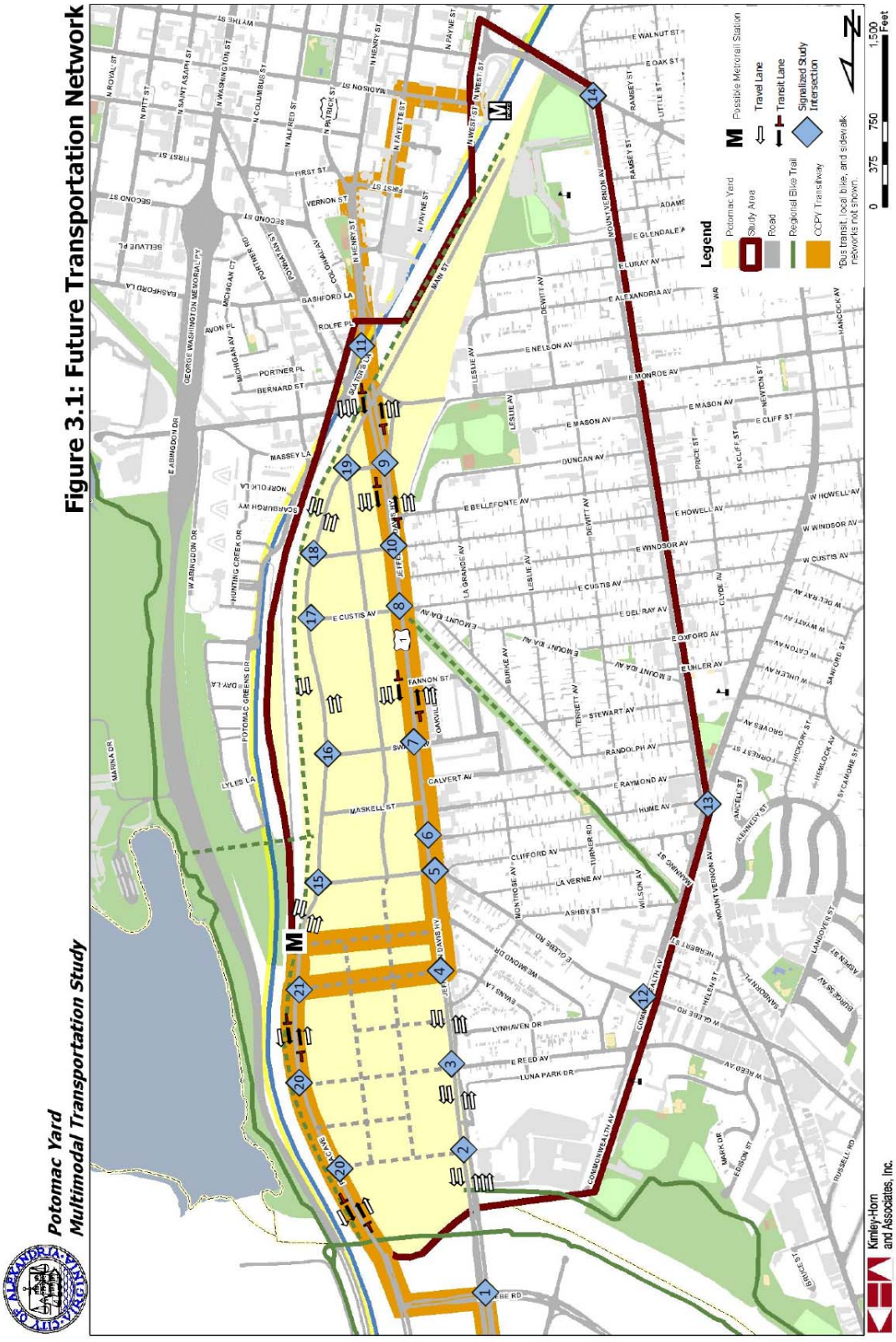
Table 3.3: Mode Choice Assumptions without a Potomac Yard Metrorail Station				
Land Use	**Transit** (Metrobus, DASH, and CCPY)	**Pedestrian/ Bicycle** (non-auto)	**Auto**	**Total**
Office: adjacent to a transit station	20%	6%	74%	100%
Office: within ¼ mile of a transit station	14%	6%	80%	100%
Residential: adjacent to a transit station	15%	16%	69%	100%
Residential: within 1/4 mile of a transit station	13%	15%	72%	100%
Residential: ¼ to ½ mile of a transit station	13%	10%	77%	100%
Hotel	11%	31%	58%	100%
Entertainment (theater)	13%	11%	76%	100%
Retail: all, excluding large format	15%	27%	58%	100%
Retail: large format	20%	6%	74%	100%
Summary	**14%**	**17%**	**69%**	**100%**

General Future Traffic Growth

Travel demand will continue to grow as Alexandria and the Washington region experience further influxes of population, employment, and services. Understanding that in urban localities such as Alexandria, Arlington, and the District of Columbia travel growth will manifest itself not only on streets, but also in the form of more transit, walking, and bicycling trips, Potomac Yard includes general traffic growth on US 1, but at a reduced rate. The evaluation conducted for the 22-year period assumes that through traffic on US 1 will grow by approximately 10 percent.

This general growth is intended to reflect likely increases in traffic attributable to general city growth and currently unknown development in the vicinity of Potomac Yard. Unlike in suburban areas where an increase in travel demand nearly linearly enacts a plan to increase road capacity, in Alexandria, an increase in travel demand instead further galvanizes the city to continue its investment in promoting diverse travel options.

Figure 3.1: Future Transportation Network



3.0 Initial Findings

Existing Conditions

Currently, US 1 along Potomac Yard operates at a reasonable level of delay during normal weekday and weekend peak periods. During morning and afternoon peak hours some back-ups occur; however, traffic congestion is not persistent. By contrast, conditions for bicycles and pedestrians are relatively poor, owing to the significant vehicular focus along the US 1 corridor and a lack of high-quality facilities and conditions. Currently, transit usage is low (compared to other parts of the city) along the corridor similarly owing to a vehicular focus along US 1 with regard to urban design and land use.

The majority of traffic travels north/south along US 1 and correspondingly, traffic signal timings are devised to progress this traffic as efficiently as possible, while offering side-streets and pedestrians the minimum amount of time needed to serve demand reasonably. There are many measures of effectiveness that can be used to benchmark or document the traffic operations of a street. These include level of service, amount of average delay, speed, length of traffic back-up (queue), and travel time. Travel time is a useful measure in documenting a corridor's performance as it is relatively easy to measure, straightforward to explain to a broad audience, and simple to compare from one year to another and between similar corridors under similar conditions over the course of time.

The weekday PM peak hour was used in the Potomac Yard evaluation because it represents the busiest period for major travel corridors serving Potomac Yard currently and in the future. A summary of PM peak hour average travel speed and time for the approximately 1.7-mile section of US 1 between S. Glebe Road and Slater's Lane is shown in the following:

- **Northbound:** 22.3 mph, 4.5 minutes
- **Southbound:** 20.9 mph, 5 minutes

As a benchmark for comparison, existing and future, Alexandria staff measured PM peak hour travel times for several important corridors in its urban core as shown in **Table 3.4**.

Table 3.4: Average PM Peak Hour Travel Speed and Time for Urban Roadways in Alexandria		
Location/Direction	**Average Travel Speed (mph)**	**Average Travel Time (in minutes for 1.7 miles*)**
US 1 Southbound in Old Town	5.3	19.0
US 1 Northbound in Old Town	13.0	8.0
Washington Street Southbound	8.8	11.5
Duke Street (Westbound)	14.4	7.0
Duke Street (Eastbound)	11.6	9.0
* This is the equivalent time required to travel 1.7 miles, which is the same as the length of US 1 from S. Glebe Road to Slater's Lane		

Existing transportation issues in the study area include:

- Auto-orientation of US 1. Intersection analyses show that most study area intersections are operating at relatively good levels of service
- Barrier-effect of US 1 for pedestrians and bicyclists
- Gaps exist in the bicycle and pedestrian networks. Better access could be provided to nearby regional trail facilities such as the Four-Mile Run trail and the Mount Vernon Trail
- Potomac Yard's transit unfriendly form
- Abundance of surface parking discourages walking, bicycling, and transit use

Future Conditions

With the increment of background traffic growth, traffic from approved (currently unbuilt) developments, and the completion of Potomac Yard, traffic will increase on roadways and at intersections. Transportation evaluations were completed for several scenarios. **Table 3.5** shows a summary of, and compares corridor travel times and average speeds on US 1 in the study area under existing conditions, future background conditions (without Potomac Yard Landbays F and L Redevelopment), and future build conditions with and without a new Metrorail station.

Table 3.5: Average PM Peak Hour Travel Speeds and Times for US 1						
	Southbound			**Northbound**		
Scenario	**Speed (mph)**	**Travel Time (min)**	**Increase in Travel Time/ Speed** (from existing)	**Speed (mph)**	**Travel Time (min)**	**Increase in Travel Time/ Speed** (from existing)
Existing	20.9	5.0	-	22.3	4.5	-
Future Background (no-build)	15.4	6.5	30%	19.2	5.5	22%
Future Build (with Metro station)	13.6	7.5	50%	17.7	6.0	33%
Future Build (without Metro station)	11.5	9.0	80%	12.0	8.5	89%

* All options assume the construction of a transitway generally located on US 1.

As shown in the table, as the level of traffic increases, contributed to by a number of factors, PM peak hour travel speed and delay increase. The following observations can be made from the data shown in the table:

- Under the most auto-intensive scenario (future build without a new Metrorail station), US 1 travel speeds remain higher than many major travel corridors in the city under existing conditions (**Table 3.4**)
- Providing a new Metrorail station has significant benefit on traffic conditions on US 1 (2 to 5 mph of travel speed savings with the same development intensities)
- Future background traffic conditions alone contribute significantly to a reduction in travel speeds on US 1
- A transitway such as Bus Rapid Transit (BRT) or similar system has benefit on traffic conditions on US 1.

Not shown in the table, but a part of the more detailed analysis, there will be some operational challenges along the US 1 corridor. These are briefly summarized in the following:

- **Future background:** traffic is unlikely to progress through the US 1/E. Glebe Road intersection on the first signal cycle. Delays for traffic turning from side-streets will increase.
- **Future build (with Metro station):** traffic is unlikely to progress through the US 1/E. Glebe Road intersection on the first signal cycle and will experience slightly longer delays than Future background conditions. Delays will further increase for traffic on side-streets.
- **Future build (without Metro station):** traffic will not progress through the US 1/E. Glebe Road intersection on the first signal cycle and will longer delays than Future build (with Metro) conditions. The US 1/Reed Avenue intersection will experience delays preventing vehicles from progressing through the intersection during the first signal-cycle. As traffic increases on US 1, delays on side-streets will lengthen considerably.

Summary

Over time, the vehicular transportation network will steadily approach capacity and traffic delays will increase on major roadways such as US 1. Regardless of whether and at what density Potomac Yard is developed, US 1 will reach its vehicular capacity. If Alexandria and other local trips do not use available road capacity, then regional trips will consume the available capacity. On the other hand, if and when Alexandria further urbanizes, a larger proportion of all trips made on US 1 are likely to be local trips of a shorter length. In this scenario, regional trips would be likely to appear on the regional transit network.

The investments in the multimodal transportation network that are already planned will create substantial people movement capacity to accommodate increases in travel demand associated with continued development in Alexandria as well as in Potomac Yard specifically. Additional development in Potomac Yard will contribute to increases in traffic congestion at some intersections and reduced travel speeds in major road corridors. Through a comprehensive approach and good planning, neighborhood streets can be protected from unwanted traffic. Redevelopment will provide immeasurable benefits to the urban environment and the multimodal transportation system in addition to strengthening the city's argument for the addition of a Metrorail station to serve Potomac Yard and nearby neighborhoods.