



# APPENDIX

## APPENDIX

### A.1 Public and Agency Involvement

#### A.1.1 Technical Working Group

The Technical Working Group was composed of transportation and planning staff from Arlington County, Fairfax County, the Virginia Department of Transportation (VDOT), Virginia Department of Rail and Public Transportation (DRPT), WMATA, the Columbia Pike Revitalization Organization (CPRO), the Department of Defense, and the Pentagon. The group met monthly to review and discuss progress on the project. Members of the Technical Working Group provided information on the study area to the project team, and worked closely with the project team in the definition and evaluation of project alternatives.

The members of the Technical Working Group were:

<u>Name</u>	<u>Agency</u>
Robin McElhenny	Washington Metropolitan Area Transit Authority
Kristin Haldeman	Washington Metropolitan Area Transit Authority
Lora Byala	Washington Metropolitan Area Transit Authority
Rick Stevens	Washington Metropolitan Area Transit Authority
James Hamre	Arlington County Department of Transportation
Richard Hartman	Arlington County Department of Transportation
Mark Kellogg	Arlington County Department of Transportation
Richard Tucker	Arlington County Department of Transportation
Elizabeth McKeeby	Fairfax County – Supervisor Gross’ Office
Clara Pizana	Fairfax County – Supervisor Gross’ Office
Sterling Wheeler	Fairfax County Department of Planning and Zoning
Clara Quintero Johnson	Fairfax County Department of Planning and Zoning
Caijun Luo	Fairfax County Department of Transportation
Valerie Pardo	Virginia Department of Transportation
Julie Ruszczyk	Virginia Department of Transportation
Tanya Husick	Virginia Department of Rail and Public Transportation
Tim Lynch	Columbia Pike Revitalization Organization
Marilyn Jajko	Department of Defense
John Pugrud	Pentagon Force Protection Agency

The Technical Working Group met on the following dates:

<u>Date</u>	<u>Location</u>
February 27, 2004	Columbia Pike Revitalization Organization (CPRO) Offices
March 25, 2004	CPRO Offices
April 23, 2004	CPRO Offices
June 18, 2004	CPRO Offices
July 15, 2004	CPRO Offices
September 23, 2004	CPRO Offices
October 22, 2004	CPRO Offices
November 19, 2004	CPRO Offices
January 7, 2005	Arlington County Office Building, 2100 Clarendon Blvd
February 11, 2005	Arlington County Office Building, 3033 Wilson Blvd
March 1, 2005	Arlington County Office Building, 3033 Wilson Blvd
April 5, 2005	Arlington County Office Building, 2100 Clarendon Blvd
May 20, 2005	Arlington County Office Building, 2100 Clarendon Blvd
June 17, 2005	Arlington County Office Building, 2100 Clarendon Blvd

### **A.1.2 Policy Advisory Committee**

The Policy Advisory Committee (PAC) was composed of decision-makers from relevant jurisdictions and public agencies. Members of the PAC reviewed materials and provided policy direction at key points during the Alternatives Analysis process. The PAC co-chairs, Chris Zimmerman Arlington County Board Member and Supervisor Penelope Gross of Fairfax County, provided guidance on policy decisions affecting the project. Mr. Zimmerman and Supervisor Gross also reviewed presentation materials and project recommendations.

The members of the Policy Advisory Committee were:

<u>Name</u>	<u>Agency/Organization</u>
Hon. Chris Zimmerman, co-chair	Arlington County Board
Hon. Penelope A. Gross, co-chair	Fairfax County, Mason District Supervisor
Hon. Patricia S. Ticer	Senate of Virginia, 30th District
Hon. Mary Margaret Whipple	Senate of Virginia, 31st District
Hon. Robert C. Hull	Virginia House of Delegates, 38th District
Hon. Albert C. Eisenberg	Virginia House of Delegates, 47th District
Hon. Adam P. Ebbin	Virginia House of Delegates, 49th District
William Cuttler	Virginia Department of Transportation
Richard K. Taube	Northern Virginia Transportation Commission
Hon. Katherine Hanley	Commonwealth Transportation Board

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Edward Thomas	Washington Metropolitan Area Transit Authority
J. Kenneth Klinge	Formerly of the Commonwealth Transportation Board
Karen Rae	VA Department of Rail and Public Transportation

The Policy Advisory Committee met on the following dates:

**July 21, 2004** at Arlington County Courthouse Plaza in Arlington, Virginia. The first meeting of the Policy Advisory Committee included an overview of the planning process for the project and the alternatives to be evaluated as part of the process.

**December 1, 2004** at the Mason District Governmental Building in Annandale, Virginia. At the second meeting of the Policy Advisory Committee, members were provided with an update on technical work and public involvement activities for the project, specifically the two Open Houses held in November 2004. The project team also provided detailed descriptions of the Measures of Effectiveness (MOEs), the project Alternatives, and initial modeling results.

**April 21, 2005** at the Arlington Mill Community Center in Arlington, Virginia. The third meeting of the Policy Advisory Committee was held after the conclusion of the technical work for the project and before the public open houses scheduled for the 25<sup>th</sup> and 26<sup>th</sup> of April 2005. The purpose of this meeting was to present to the committee the recommendations of the Pike Transit Initiative, and to discuss with the committee materials to be presented at the public open houses.

### **A.1.3 Agency Comments Received**

#### **FTA Comments**

The Federal Transit Administration commented on a draft Description of Alternatives report on February 1, 2005:

Overall Comment: There should be greater detail provided that describes the operating plans for the various alternatives.

1. There should be a map of the transit services provided under the no-build/TSM alternative in the corridor, similar to the maps provided for the BRT and Streetcar alternatives.
2. There should be a table that shows a comparison of the bus route headway frequency in the no-build/TSM, BRT and Streetcar alternatives, showing the routes assumed in each alternative, the headway frequency, and the service level. This may be included as an appendix. This would enable the reader to determine how the routes they use would be reconfigured in each alternative and enable a comparison of the service levels of each alternative.
3. It would be helpful if a table was provided that showed a comparison of the station locations, park and ride lots, maintenance facilities, and intelligent transportation system (ITS) components used in each alternative, including the no-build, TSM, and build alternatives.
4. The TSM alternative could include more low-cost improvements such as signal pre-emption and bus-preference at traffic signals to improve travel time in the corridor. This may be a good pre-cursor to implementing full BRT or trolley alternatives in the corridor, and it would be beneficial to evaluate the cost/benefits of lower cost ITS strategies to improve the operating speeds of existing bus service in the corridor.
5. It appears that there are 5 (or more) potential alignments for the BRT alternative that share a central trunk line along Columbia Pike. Because each alignment alternative will have different costs, travel times, and transportation benefits, it may be helpful to show each

alignment as a separate, stand alone alternative, with its own map, stations and maintenance facility. This would make it easier to compare the relative costs and benefits of the various alignment alternatives. This also applies to the various trolley alternative alignments and system configurations.

### **VDOT Comments**

The Virginia Department of Transportation commented on the draft Description of Alternatives report on December 23, 2004:

1. The report assumes that recommendations that are in the Arlington County Street Space Task Force Report will be in place. The recommended cross section elements are still being negotiated between VDOT and Arlington County. VDOT has specified the minimum acceptable standards for Columbia Pike (see letter to Mr. Sam Kern, December 3, 2003), and any changes to these minimum standards will need to go through the design exception process.
2. Traffic Engineering is concerned with reducing the posted speed limits on Columbia Pike, and do not support this recommendation from the Street Space Task Force Report.
3. Snow removal has been mentioned as an issue in the past since the study assumes a curb running system and VDOT traditionally plows snow to the curb. The current fleet of trucks is fairly new and well maintained (expected useful life is around 15 years), and many of these vehicles can only plow to the right. Purchasing left plowing trucks would add to overall snow removal costs because they cannot be used on other facilities. Also, any snow stored at the median would need to be removed to prevent melting and freezing in the traffic lanes. The bulbouts and proposed lane widths will also be problematic for clearing and storing snow. We suggest that the study team research this issue and proposed remedies. Any variation in VDOT Snow Removal Policy requires an agreement between VDOT and the sponsoring agency.
4. The two recommended alternatives (BRT and Streetcar) warrant revision of the vertical alignment of Columbia Pike to eliminate the more abrupt existing crest and sag curves.
5. The report lists the VDOT maintenance facility and the Smart Traffic Center as possible location for a transit vehicle maintenance and storage facility. While segments of the current services at this location may move to alternative sites, maintenance and the Virginia State Police will remain, as well as potentially other services (decisions are pending).
6. This report states that criteria from the Columbia Pike Street Space Task Force Final Report was used which specifically says the transit system should not run in exclusive lanes along Columbia Pike. Yet the BRT and Streetcar alternatives, figures show dedicated transit lanes near Bailey's Crossroads. Please clarify.
7. Both the BRT and Streetcar alternatives show the transit lane shifting from curb-running to median running near the proposed "Gateway" station and from curb-running to median-running near the proposed "Scott/Rolfe" station. This alignment transition seems problematic. Please detail information on how these transitions will be handled, and the potential impact to traffic operations (traffic flow).
8. A 10' travel lane at Bailey's Crossroads is too narrow.
9. In the typical section of Columbia Pike, the 7' parking space seems too small. Also, why is the 2' gutter not right next to the curb?

### *Bicycle Related Comments*

1. This report states that the baseline alternative includes all improvements expected to be in place by 2030, including the bicycle and pedestrian improvements as per the CLRP and Arlington County Street Space Task Force. It would help if those improvements were listed for the reader.
2. The recently completed Columbia Pike Citizens' Initiative called for bike lanes from S. Taylor to S. Jefferson, approximately ½ mile in length prior to Bailey's Crossroads. However the Baseline Alternative (Fig. 2) shows a dedicated transit lane instead on the Bailey's Crossroads Section (S. Jefferson Street). Are you assuming that there will be no bike lanes by 2030?
3. Baseline Alternative – The section at S. Hayes shows a dedicated bus lane on the outside of the roadway. However, a field visit to the site indicated that this is currently a parking area for tour buses and taxis. Verify that the planned improvements you refer to in the CLRP and Arlington County Street Space Task Force include removing the bus parking area.
4. BRT Alternative and Streetcar Alternative – We do not recommend having bike lanes between two lanes of traffic as shown in the Pentagon City Typical Section. It is an unexpected location for motorists and bicyclists resulting in confusion. In addition, sandwiching the bicyclists between two lanes of traffic will reduce the safety and comfort level thus reducing the usage.
5. Park and Ride: WMATA has a bike locker program at the metro stations. Please consider adding bike lockers at the new and existing park and ride lots. In addition, please address if there are any other locations where bike lockers/racks could be used along this corridor such as at the "superstops."
6. Metro buses have bicycle racks in the front of each vehicle. Will the BRT or Streetcar alternative have similar accommodations?

VDOT also sent a letter, dated April 25, 2005, stating that VDOT and the Virginia State Police do not intend to vacate the site at 1426 Columbia Pike, which is shown as a potential maintenance facility site.

VDOT also commented on the Draft Final Report on June 21, 2005:

1. We concur that a bicyclist should not be required to cross the rails of a streetcar since it could damage tires and could cause the bicyclist to become unstable. Since this is not specifically addressed by AASHTO or VDOT, the closest situation would be where a bicyclist crosses a drainage grate. In those situations the gap can not be more than ½".
1. Requiring the bicyclist to go behind the bus shelter onto the sidewalk area is very undesirable since this will increase conflicts and reduce safety. AASHTO list many reasons why bicycles using a sidewalk area as a shared use path is dangerous especially where numerous pedestrians can be expected.
3. As per Appendix A-5 in the Road Design Manual, the distance from bike lane stripe to the edge of pavement at a gutter pan should be 4' min. width (not 3' as shown). This is especially important when large vehicles such as trucks, buses or streetcars are adjacent to the lane.
4. Bike lanes should be on both sides of the street. Where they are proposing to have them on one side in certain areas is dangerous and not acceptable to TP.

#### **A.1.4 Arlington County Transit Advisory Committee**

The project team met numerous times with the Arlington County Transit Advisory Committee. At the meetings, the project team provided an overview of the planning process, the evaluation of alternatives, initial modeling results, and next steps.

At the May 10, 2005 Meeting the Committee made and approved a motion requesting that the definition of the Modified Streetcar Alternative be further modified and enhanced to extend the Streetcar line in this alternative to the Pentagon Metrorail Station, and to include sufficient space in the site selection and acquisition and design to provide for expansion capability for the storage/maintenance facility. This enhanced alternative would make it more viable.

#### **A.1.5 Design Dialogues May 17 – 21, 2004**

Between May 17 and May 21, 2004, the Pike Transit Initiative Team met with elected officials, community leaders, local government staff and other citizens. Attendees included members of the following groups:

Participants were identified by local government staff, including project team members, and invited to participate in the workshop sessions. In addition, public design dialogue sessions were held on May 18 and May 19. Many common themes were stated by different members of the community throughout the design dialogue. A summary of these issues follows:

#### **Arlington County Street Space Task Force**

##### ***Transit Issues***

- New system should have limited stops in the AM and PM peak and stops everywhere in the off peak and weekends.
- There should be seamless transfers between the new system and Metrorail.
- The new system needs to be fast, convenient, and protected from the weather.
- Fare payments for this system should be transferable to other transit systems.

##### ***Parking Issues***

- Smaller neighborhood parking lots are desirable.

##### ***Pedestrian, Bicycle, ADA Issues***

- Paved sidewalks; think about pedestrian connections.

##### ***Community Development/Enhancement Issues***

- More shelters in the neighborhoods (small shelters) on the feeder streets.
- Consider concrete streets regardless of technologies.
- Cut-outs and pull-outs are not desirable for the community street space.

##### ***Alignment/Station Location Issues***

- Maintenance facility should be in Fairfax County since there is more space there.

#### **Arlington County Staff**

##### ***Transit Issues***

- Curbside running for the new system makes a lot of sense.

- At strategic places we'll need to have a left lane for express service to pass local.
- If the service is in exclusive lanes, we should consider sharing the transit lane with HOV's.
- Integrating the existing local service with new service is going to be important.
- The system could stop everywhere in the off-peak and selected stops in the peak.
- Linking this system with Pentagon City (blue) and Ballston (orange) is going to be important.

#### ***Parking Issues***

- There should be parking on the Fairfax County end as well.
- We'll need to balance corridor/shared parking along the corridor.
- We should provide parking somewhere in Arlington. And we should also accommodate people who want to have zoned parking to keep commuters off of their local neighborhood streets.

#### ***Pedestrian, Bicycle, ADA Issues***

- We need to be able to make a good connection with bikes.
- We need to preserve the ability of pedestrians to cross major streets.
- From the public safety perspective, we should be considerate of pedestrian safety. Design, development, and advertisement of the new system should be such that people can easily recognize where the system is so they can stay out of harms way.
- The new system should include attractive places where pedestrians stand to wait.
- We'll need to improve sidewalks from the neighborhoods, and we'll need to consider the north and south commuters who are walking to the Pike to catch transit.
- Pedestrian connections to the new system are going to be important.

#### ***Community Development/Enhancement Issues***

- We need to link the land use and density with the transit service that is going to be along the Pike.

#### ***Alignment/Station Location Issues***

- Stations should be visible, well lit, and offer a sense of protection.
- More is better, when it comes to stops. We shouldn't eliminate stops.
- From Arlington's perspective it makes a lot of sense for the new service to terminate at Pentagon City.
- Elimination of some of the local stops is an option if we can't decide how the express service will pass the local service.
- We need to make sure to tie in the new service's stops with key locations.
- Termini are important; if we have to pick one in the east it should be Pentagon City.
- West end terminus should be Skyline either up Jefferson or Carlin Springs and be ready to connect to Route 7 so that you can eventually connect to Seven Corners.

#### ***Traffic Issues***

- Most of the traffic is coming from Arlington residents.

#### ***Technology/Vehicle Preferences***

- BRT gives you extra flexibility: pull outs, limited stops, and room for passing. With LRT you'll only be looking at limiting stops or pull outs.

## **Fairfax County Staff**

### ***Transit Issues***

- Bus stops with ITS should be considered, keeping the following in mind: maintenance, vandalism, cost to get electrical systems to the station, etc.
- Signal priority will be key to the speed of the new system.
- The new system should coordinate with other regional systems, Metrobus, Metrorail on fares, maintenance facilities, etc.
- Travel time savings of the new system could come from signal priority, off board fare collection, and limited stop service. We should integrate those into the service.

### ***Parking Issues***

- There is currently no on street parking along the Pike in Fairfax County.
- There are locations for potential park and ride and maintenance facilities in Fairfax County.
- Siting, location, and inclusion of Park and rides with the new system will be important to increase ridership.

### ***Community Development/Enhancement Issues***

- Noise is going to be a factor.

### ***Alignment/Station Location Issues***

- The new system should connect to Skyline either through Jefferson or Carlin Springs and then route back through Bailey's and back down the Pike.
- Future connections up Route 7 will be important.
- Connectivity to Route 1 study will also be important.

### ***Technology/Vehicle Preferences***

- Implementation of BRT first and then LRT afterwards would be good.
- LRT could get stuck behind broken down cars, accidents, etc.

## **VDOT, VDRPT, DOD Staff**

### ***Transit Issues***

- There is a limited right-of-way, so the new system will have to run in mixed traffic.
- Snow removal is going to be an issue with this new system.
- Incident management plan will be a necessary component of the new system.

### ***Parking Issues***

- There is a possibility of DOD building a parking deck along Army Navy Drive on the other side of I-395.

### ***Community Development/Enhancement Issues***

- We should create as much green space as possible, including in parking lots.

### ***Alignment/Station Location Issues***

- The new system should connect to the Air Force Memorial and Arlington National Cemetery.
- All transit access to the Pentagon should be routed down Eads Street.
- The Route 1 alignments are already set, and this new system should connect with that. It should also make connections with Leesburg and with Columbia Pike.

- Convenient transit links from East Falls Church or King Street Metro station to the Skyline area would be good.
- Vandalism at the stops currently is a problem that is something we'll have to worry about with the new system as well.

### **Columbia Pike Developers and Property Owners**

#### ***Transit Issues***

- Existing bus service along the Pike to the Pentagon is good; the new service should emulate that.
- The new service should focus on Local service; many people along the corridor are transit-dependant.
- Express service to Metrorail would be great.
- Increase capacity, but keep it at a low cost.

#### ***Alignment/Station Location Issues***

- Key stops are: Four Mile Run, Thomas, and George Mason.
- Don't eliminate stops; if you must, be practical about it.

#### ***Technology/Vehicle Preferences***

- No new overhead wires.

### **Arlington County Civic Associations**

#### ***Transit Issues***

- The fewer transfers the better.
- The new system should have easy transfers, climate controlled stations, lots of investment in great stations.
- The new system should have seamless transfers between modes in terms of pay and access.
- "This thing should look cool." The aesthetics of the new system are important.
- Make it a route on the Metro map; integrate it with the whole Metro system.

#### ***Pedestrian, Bicycle, ADA Issues***

- Vehicles should be easy to board and get out of.

#### ***Alignment/Station Location Issues***

- New system should go all the way out to the Annandale.
- Stations are extremely important to make the statement that the new system is a substantial investment in the community and in the transit system.
- Connectivity to other systems is going to be important including linking with the Route 1 system.
- The new service should terminate at the Pentagon.
- We need a bus stop at Parker Street because that's where there are 2 grocery stores.
- Stop locations of the new system should be between ½ -1 mile apart.

#### ***Traffic Issues***

- New system should allow for as easy movement of traffic as possible.

### ***Technology/Vehicle Preferences***

- BRT is going to be better for the Pike.
- Buses should pull out of traffic to load passengers.
- No overhead wires.

### **BCRC, Fairfax Chamber, and Fairfax Committee Members**

#### ***Transit Issues***

- New service should go where people are located.
- Put the maintenance facility down in Arlington County.

#### ***Parking Issues***

- Creating a Park and ride at the site around the Giant is a good place.

#### ***Community Development/Enhancement Issues***

- This new service could result in gentrification.

#### ***Alignment/Station Location Issues***

- Extend the new service to Annandale.
- The new system should extend service to Center Lane in Bailey's Crossroads.
- One stop could be at Carlin Springs Road where it meets Leesburg Pike.
- New service should get into the Skyline neighborhoods of Bailey's Crossroads.
- There's going to be a greater demand for transit at Goodwin House due to planned expansion. The new system needs to stop there to help mitigate this demand.

#### ***Technology/Vehicle Preferences***

- New vehicles should speed boarding and alightings.

### **CPRO Board**

#### ***Transit Issues***

- We need to have connectivity to the heavy rail system, both for fares and for the system.
- Keep costs low and make the system practical.
- During the evaluation phase we need to show the costs and impacts of No Action.
- Time impacts of each stop should be thought of before adding or subtracting stops.
- Comfort, convenience, and ride quality should be thought of before speed.

#### ***Parking Issues***

- We need to have some cars, but we don't need to be car focused.

#### ***Alignment/Station Location Issues***

- Western alignment of the new system should go to Skyline.
- Put stops at the four segments identified in the form based code. Stop spacing for the new system should be no closer than a half a mile.

#### ***Technology/Vehicle Preferences***

- Rail commitment helps to finance redevelopment.
- Rail enhances the marketing of the new development.

### **Arlington Commissions and Committee Members**

#### ***Pedestrian, Bicycle, ADA Issues***

- Slower speed of the new system would be safer for bicyclists.
- More pedestrian connections across the Pike and connecting transit to crosswalks should be two major parts of the new system.
- Create a parallel bike route for cyclists maybe on 11<sup>th</sup> street even if people would ride on the street rather than in a separate bike lane.

#### ***Traffic Issues***

- This doesn't seem like it's going to create more cut-through traffic, but we should address additional neighborhood traffic as a result of new development.

### **Columbia Pike Business Owners**

#### ***Transit Issues***

- Increased economic development beyond what we already have would be fantastic.
- A monthly pass for frequent riders with a discounted fare should be implemented.

#### ***Alignment/Station Location Issues***

- Transit to the Air Force Memorial would be great.
- Make the stations more permanent (less easy to move, and then displace current riders and impact businesses).

#### ***Technology/Vehicle Preferences***

- Overhead wires are unattractive, but Light Rail sounds like a good idea.

### **Fairfax Civic Associations**

#### ***Transit Issues***

- Make schedule rational.
- Reverse commute is huge, this should be taken into consideration when developing the operating plan.

#### ***Alignment/Station Location Issues***

- Connect to and rationalize new service to Tysons Corner and Old Town Alexandria.
- Look at service area to the County Line.
- Transit dependant populations at Culmore and Seven Corners need to be served.
- Seminary Road is as important as Leesburg Pike to residents south of Skyline.

#### ***Technology/Vehicle Preferences***

- BRT or LRT either is okay.

### **Ethnic and Multicultural Organizations**

#### ***Transit Issues***

- The new service should include more service on the weekends.

### ***Community Development/Enhancement Issues***

- Local contractors should be used for construction of the new service.

### ***Alignment/Station Location Issues***

- New service should connect up to Tyson's and Falls Church.
- Extend this new service all the way out to the Annandale.
- There is very little local transit service in Bailey's Crossroads right now.
- The stop locations look good.
- The commute is greater to Tysons than it is to the Pentagon from Bailey's Crossroads, this connection should be considered.
- The maintenance facility on Center Lane would be an improvement to what is there now.

### **Pentagon City Businesses**

#### ***Transit Issues***

- The design of the new system looks like it would be convenient.
- Fare integration and easy transfers on the new system would be good.
- Making the system unique would be good (its own color scheme etc.).

#### ***Parking Issues***

- Don't impact parking in general especially around Pentagon City.
- Don't impact tour bus parking on Hayes Street.

#### ***Pedestrian, Bicycle, ADA Issues***

- Improving pedestrian connections would be a help.

#### ***Alignment/Station Location Issues***

- Median stop across from Pentagon City would be good.
- Better stations would increase ridership.
- Don't impact the northbound left turn from 12<sup>th</sup> to Hayes. This is a major concern.
- Concern with the people being able to turn left from the shopping center mall onto Army Navy Drive and vice versa. That's a very congested spot in the road.
- Don't want a 'bus stop' in front of the Ritz Carlton.

#### ***Technology/Vehicle Preferences***

- We would love to see rail. It seems like it would be more expensive, but it would look really nice.

### **Alternative Transportation and Smart Growth Advocates**

#### ***Transit Issues***

- Commute time and ability and ease of transfers are key to the success of the new system.

#### ***Parking Issues***

- Short-term parking on the sidewalks would be good to separate pedestrians from cars.

#### ***Pedestrian, Bicycle, ADA Issues***

- Bike riders will have to watch out for pedestrians if the bike lane is removed as a result of curb extension transit stops.
- Need to make the Pike safe for casual bike riders as well as bike commuters.
- Compromise coming out from the County Board meeting was acceptable for bike riders. Try to stay within the constraints of that plan for the new system.
- Bike parking throughout the Pike would be nice.
- Bike lockers would only be useful at some of the large stations (like Metro stations).
- Need bike racks on all of the buses, and bikes should be allowed on the new system too.

### ***Technology/Vehicle Preferences***

- BRT makes more sense for bike riders.
- If there were more compatible materials for the rails that didn't harm bicyclists that would be okay too.

### **Public Workshop May 18**

#### ***Transit Issues***

- The new system should have the smoothest and fastest ride possible.
- Siting of the maintenance yard is important.
- The new system needs to have high speed and short travel time from one end to the other.
- The system should have rapid fare collection.
- There should be connectivity to regional circulation.
- The maintenance facility should be in North Arlington.
- There should be a seamless fare structure with other modes.
- The new system needs to connect to other transit systems.
- There should be some integration with the SmartTrip cards.
- Next bus technologies at the stations need to happen.
- 3 service options (local, intermediate, commuter) should be considered.
- Express service can cause problems for riders: people miss their stop.
- Express service should be branded differently by color and type of bus.
- Don't charge different fares for Pentagon and Pentagon City rail stations.
- There are too many buses and too few riders at the Pentagon City station, the new system should be careful to have better balance.
- If the new system is comprised of express and local service take the express to Pentagon and local to Pentagon City.
- Real time information at the stations is very important.
- Off board fare collection could result in theft and non-payees.
- New transit service should have pull-outs and signal priority.
- Direct bus service to National Airport would be good.
- Platooning of buses is a problem; keep frequency of the system consistent
- Higher quality and smoother ride needed.
- Increase the service during the weekends and late night to support 24/7 operations.
- We need to ensure that there will still be left hand turn lanes for general traffic.
- Mixed traffic running service is subject to traffic constraints and a dedicated lane is needed to solve that problem.
- There have been some questions in Los Angeles about actual time savings of off-bus fare collection. That's something we should look at.
- We should have a system wide integrated electronic fare collection.
- The new system could run in dedicated lanes only at problem intersections to achieve time savings (e.g., Ocean City-bus lane only during peak periods).

- Maintain affordability of the new service.
- Suggest bus pull-outs to get buses out of mixed traffic at stations/stops.
- There is a potential conflict at the Washington Boulevard interchange for eastbound transit in curb.
- Pentagon City: platform is too crowded.
- ART buses not frequent enough for connections.

### ***Pedestrian, Bicycle, ADA Issues***

- Crosswalk signal timing will be very important in the integration of the new system.
- Bus technology is easier for bike connections and safety of bikers.
- Bike lane connections to the new system need to be considered.
- We need to have better pedestrian amenities around stops (crosswalks, countdowns, etc.).
- Pedestrians need to be able to cross North and South as well.
- Safety issue of pedestrians crossing Hayes and Army Navy Drive.
- Make Columbia Pike more “walkable”. Increased sense of security.
- Walking times to transit should be between 5 and 15 minutes.
- The new system needs to be “friendly” to wheel chairs (low floor, wide doors).
- Pedestrian safety should be a paramount focus of the new system.
- Bike accommodations need to be included in the new system.

### ***Community Development/Enhancement Issues***

- Noise impacts on the community from the new system and weather impacts on patrons will have to be mitigated.
- Alternatives to fossil fuels (CNG and LPG) should be considered regardless of fuel.
- Quiet technology and clean fuel are good ideas (likes hybrid buses).
- Would like an alternative tested with a faster speed.

### ***Alignment/Station Location Issues***

- Future connections to Falls Church and Annandale would be good.
- Pentagon as an end stop has security issues – Pentagon City is a better terminus.
- We should put stops at major residential projects specifically at Foxcroft Heights.
- Connecting the new system to North Arlington is necessary.
- Weekend connections to the Rosslyn-Ballston corridor and Pentagon City would be beneficial for the community.
- Frequency of local stops on the Pike is an issue, the new service shouldn't stop so frequently.
- Stations need to have bigger overhead structures and need to be open and visible, such as protected on 3 sides, glass enclosed, etc.
- Direct route to Metro either through Pentagon or Pentagon City not both.
- In Pentagon City, the service should load on the west side of Hayes.
- Bottle neck of left turns – west bound at Four Mile Run and Buchanan. A fly-over to keep transit out of that jam would be good.
- New service route should serve Skyline on the west side.
- Some component of the new service should be a bus service to Clarendon from Arlington Heights (up Walter Reed).
- The new service should tie in somehow with the K Street Transitway.
- Include alternatives with higher average speed (technology can reach faster speeds unconstrained).
- The new service should include fewer stops and express service.
- Exclusive right-of-way at the eastern end (Columbia Pike to the Metrorail stations) would be good.

- The service should have some dedicated right-of-way along the corridor.
- Extend out towards Seven Corners and toward Potomac Yard.
- Important to link to the Route 1 corridor.
- Keep bus stops where they are.
- At the Bailey's Crossroads end, service both Skyline and Bailey's shopping center.
- Keep the new system's operations similar to PikeRide and split service between Pentagon City and Pentagon.
- Any plan continuing to the Pentagon must re-open the access road.
- Stop spacing we should carefully consider as local versus express has a conflict with regard to space and passing.
- New system should have good north and south connections especially at "priority" intersections.
- More frequent stop locations (3 blocks) and more frequent service on the new system.
- A direct trip downtown would be good.
- Would prefer new system connecting to Metro at the Pentagon Station.
- Future extensions should reach to the Tysons Corner area.
- If the new system was median running, there's a possible opening on the south entrance to the Pentagon City Metro station.
- New system should include a direct link to Rosslyn via bus.

#### ***Technology/Vehicle Preferences***

- Light Rail has lower maintenance costs over time and more permanence for developers.
- Light Rail tracks are harder on cars and may not work in the event of electric outages.
- If buses are chosen, they need to look "cool".
- Regardless of mode, the vehicles should be fuel efficient and clean.
- Light Rail might not work for us here, streets are too congested.
- Overhead wires are unsightly.
- Light Rail has inflexibility of service (especially in emergency situations).
- Small feeder buses in conjunction with the new service in the surrounding neighborhoods would be good.
- Larger buses on the trunk of the alignment (Columbia Pike) would work.
- New low floor buses are too cramped, don't seat as many people, and are difficult to get off.
- The new service could be a mix of rail for local, bus for long distance or vice versa.
- Would like to see the new technology be BRT.
- Like buses better than rail (current service is good).
- Safety issues of a 3<sup>rd</sup> rail.
- Reviewing the repair histories for different technologies would be helpful.
- Ice on overhead wires is a concern.
- Streetcars are more compatible with a Main Street environment.
- BRT requires less infrastructure overall and more flexible/adaptable on infrastructure and with service.
- Trains are disruptive.
- Bus service is confusing.
- Light Rail is preferable to bus service.
- Look at creating a Skyline circulator.
- Preference for BRT and a flexible connection to Potomac Yard.
- Does ridership justify investment in LRT?
- BRT is flexible and expandable.
- LRT would work better in median.

## **Public Workshop May 19**

### ***Transit Issues***

- Explore running new transit as an express in peak periods but a local all day.
- North tract should be included in the new express service to allow people to exercise before work.
- Priority signalization is key to success of mixed running transit.
- Set-up the system so that it can be extended to other locations in the future.
- How to handle bus passing within the corridor (i.e. Express and local bus operation)?
- Explore safety island vs. only curbside boarding vs. pedestrian walking traffic.
- The new system should improve the frequency of transit service.
- There's currently a bottleneck between local and express routes, the new service should resolve this problem.
- Automatic vehicle locators are needed for vehicles (and should be visible on a website) for passengers.
- Integrate feeder buses with the new service at transit centers in Bailey's Crossroads.
- LRT + on-street parking + snow + a snow plow could equal problems (there could be a high cost for removal of snow).
- A new infrastructure is not necessary. Improving the current system and implementing SmarTrip cards on all the buses would be good enough.
- Give away SmarTrips instead of charging for them.
- Pentagon connections of the new system should be routed immediately back to the Pike.
- If we introduce a new service we should make sure to include a good local service too.
- Fare evasion (if off-board collection is the norm) is a concern.
- Off-board fare collection is okay at some of the larger stations, but damage to the machines is a concern.
- Flat fare or a pay by the hour type of system is preferable to a Metrorail type pay structure.
- There should be easy transfers between modes and systems.
- SmarTrip recognition for transfers should be implemented on the new system.
- Span of service times of the new system should be similar to Metrorail.
- Frequency of the new system should be similar to the current service (which we're happy with).
- A cost/benefit analysis should be included in the study.
- The no build alternative should be given due consideration, it may be the most cost effective.

### ***Parking Issues***

- Don't need parking garages. It encourages sprawl not transit oriented development.
- There should be a park and ride at the Fairfax County end.

### ***Pedestrian, Bicycle, ADA Issues***

- Wider sidewalks are more desirable on the Pike and in neighborhoods.
- Construct rail flush with road for bicycle and motorcycle safety.
- Need to make sure you serve the handicapped, old, poor, and young.
- System must address language communication of how to use the system (i.e. get around) multi-language message distribution too.
- System must accommodate physically impaired individuals (e.g. visual, hearing, physically, etc.).
- Better sidewalk connections are needed in the Bailey's Crossroads area.
- Transit centers should include a priority stop for Metro Access to facilitate an easy transfer.

### ***Community Development/Enhancement Issues***

- Efficient system (environmentally efficient as well) could be a model for transit elsewhere.
- Goal should be to reduce the number of vehicles in the corridor.
- We should use the most environmentally friendly method of transit through the corridor.
- Noise and emission comparisons per vehicle would be helpful.
- There should be sufficient coordination between Metro, Fairfax County, and the Street Space Task Force.
- The study should respect the Arlington County Street Space Task Force's recommendations (especially travel speed) and try to stay within their defined contexts.

### ***Alignment/Station Location Issues***

- Connecting to the Pike from a north-south direction via sidewalks or circulating neighborhood buses is necessary.
- The new system's eastern connection should be to Pentagon City because it's more than just a 9 to 5 stop. There's a lot to do.
- New system stops must be clean and attractive.
- Connecting to the North part of the County is important.
- Stops should be safe and secure, avoid using benches to discourage vagrancy.
- ATM machines at stations and payment at fare machines with debit cards should be included in the new system.
- There should be a Metrorail type station for transfers at the connection of Leesburg Pike and Columbia Pike (or as close to Metrorail stations as possible).
- Better transfers between different bus lines (Falls Church, Fairfax Connector and Dash buses) should be a part of the new system.
- The new system should have a major transit center at Bailey's Crossroads.
- Extend the new transit line and study area out to Culmore.
- Look at extending the new system to Southern Towers.
- There are logical transit center locations at Bailey's Crossroads and Southern Towers.
- Connectivity to Skyline, Culmore, Seven Corners, Alexandria and NOVA are important. New system should provide links to all of these.
- Compatibility should be built into the system for future transit out to Seven Corners.
- Windscreens on bus shelters would be good.
- Run the new system out to Annandale.
- If the new service terminated at P.C. provide bus shuttles to Pentagon to avoid transfer to Metrorail (bus to bus).

### ***Technology/Vehicle Preferences***

- Aesthetics of vehicles is important to creating an identity and a sense of place.
- Non-polluting vehicles are the key to creating a pleasant space to be (eat, hang out), electric vehicles maybe?
- Scale of vehicles should be to the scale of the Pike.
- Light Rail is preferable (must be done well): smooth ride, low to ground, feels like Metro, smaller cars = better scale.
- BRT will have to overcome bus stigma.
- Concern that breakdowns on tracks with LRT could cause major delays.
- Criss-crossing tracks could be hazardous to cars.
- The new system should start with BRT and then transition to LRT after demand growth. What are the economic developments associated with BRT?
- Examine the cost per passenger mile of BRT versus LRT.
- Examine the fare box recovery and the percentage of the subsidy.

- Safety: what are the incidents, injuries, or deaths per million passenger miles of BRT versus LRT?
- Examine the costs per vehicle mile and per vehicle hour.
- What is the economic development along the corridor for Rail versus BRT? Examine other systems that have been implemented.
- Don't like the catenary wires.
- Light Rail technology is good. Build a bigger capacity upfront to accommodate future growth.
- I like low floor vehicles.

## **Open Houses May 21**

### ***Transit Issues***

- Plan on snow removal so we can get to the new transit system.
- New system (assumed to be express service) must be accompanied by local service (local stops as defined today).
- If local service through the neighborhoods feeds to the new systems stations, timing is everything.
- As the Pike becomes more urbanized, dense and integrated via transit with DC and other areas, service will have to include the 3-5:30 AM gap.
- The repair facility does not have to be near the Pike. It isn't now.
- Maintenance facility near Skyline is best. Other 2 locations are in very congested areas. Plus Skyline will be advantageous as the service expands west to Fairfax.
- Like maintenance facility at Skyline area.
- Maintenance facility in Revitalization District is unacceptable (RT 7 and Columbia Pike).

### ***Parking Issues***

- Don't like idea of a Park and ride location on Pike at Four Mile Run Drive.
- Should not have a Park and Ride at Four Mile Run Drive as there is not desirable auto access. Do not want cars on local streets in Barcroft neighborhood, like Buchanan street, and do not want more traffic on Columbia Pike driving to that Park and Ride.
- Park and Ride lot near Route 7 and Jefferson Street would be OK. There would be access via Route 7.

### ***Pedestrian, Bicycle, ADA Issues***

- Columbia Pike, Joyce Street (especially under I-395) S. Eads St., and Old Jefferson Davis Highway are all critical bike access routes. LRT tracks in the roadway could effectively preclude bicycle access unless ample and continuous bike lanes are provided on these streets.
- Concern about folks having to walk long distances between stations and especially in bad weather.
- Under certain situations such as bad weather and at all times for people with children and the elderly and disabled there has to be transportation between rapid transit stations.

### ***Alignment/Station Location Issues***

- Include the emerging Federal Centers at Carlin Springs and Columbia Pike as a station location for the new system.
- Take the new system to Belvoir along Route 1 and to Annandale along Columbia Pike.
- Route going west on Columbia Pike should follow a route to Bailey's Crossroads – that is where Circuit City etc. are – not just up Jefferson St.

- Stations located on the median strip (Pentagon City) are acceptable only if access to either side of the street is underground and elevator service is available.
- The new system needs to stop at Barton St. Adopted plans call for a town square “Penrose Square” at this location with grocery store. This will be a major activity center and destination.
- Bus loading in the median strip at Pentagon City seems to make no sense.
- We must have a stop at S. Barton Street as that is where the Supermarket is.
- Like idea of stop on Joyce Street side of Pentagon Row in addition to Hayes Street side.
- In order to achieve a sense of “Rapid” stops should be spaced no less than ¼ mile and stops should be alternated so the new system stops at every other stop.
- You might consider a stop at S. Barton – Heavy residential area and also planned as Pike’s “Town Center.”

### ***Technology/Vehicle Preferences***

- BRT Preferred – Overhead Wires are Unacceptable.
- BRT is the better alternative; lower cost, rail is hard on cars.
- Besides BRT and LRT consider TSM using ITS, AVL, Route Adherence, and articulated buses as needed. VA needs to be realistic about available federal funds.
- Trains would be nice, electric power preferred.
- Bus would be simpler more flexible, etc.

## **A.1.6 Public Open Houses, November 8 and 10, 2004**

This round of public meetings focused on a Description of the Alternatives under study. Characteristics of each Alternative were presented and attendees were invited to comment. One meeting was held at the Arlington Career Center, the other at the Mason District offices in Fairfax County.

### **November 8, 2004 Meeting**

#### **Written Comments**

Comment forms were available at the open house. Below is a summary of submitted written comments:

#### ***General Transit Issues***

- How will you keep the “Rapid” in BRT without queue-jumper lanes at major intersections? During peak hours Carlin Springs/Buchanan St/Four Mile Run Dr/George Mason/Glebe/Walter Reed are already congested. How will you move buses through in 2030 without full signal preemption (which will adversely affect traffic on cross streets)?
- Fewer bus stops are GOOD not BAD. Only an idiot puts stops every 1/8 of a mile.
- We really need some local service.

#### ***Pedestrian, Bicycle, ADA Issues***

- Besides accident rate for bicycles, the evaluation criteria must include *access for bicycling* on the roadway.
- Baseline roadway/rebuilt roadway to include on-road bicycle lanes along with narrower travel lanes.
- Access for elderly individuals and people with disabilities is essential – consideration of ease of use should be a major factor. Any solution that requires a mechanical lift for wheelchair users is a poor solution. Any solution that makes crossing the street (like inground rails) more

difficult would be counter to the pedestrian-friendly vision –i.e. making it more difficult for parents with strollers, older people using walkers, etc.

- What is being done to accommodate residents who are unable to walk to the proposed ½ mile distance to bus stops? Are bus stops going to be more centered on residential areas rather than business centers?

#### **Alignment/Station Location Issues**

- I like Barton Street Station, but move adjacent stations *farther away* from Barton if you use Barton.

#### **Comments on Study Process**

- Evaluation criteria: appropriate and well thought out.
- Study process: well done –obviously a serious effort.

#### **Technology/Vehicle Preferences**

- Rail is what most people want. Rail is the choice for underwriting development projects. Lenders understand and have faith in rail.
- Need consumer survey – are people more likely to ride rail, or don't they care – could influence revenue and justify marginally higher costs.
- I *very much* prefer rail – better long and short term solution – only small higher cost.
- I get excited when I imagine the community that can evolve next to/around a streetcar on the Pike. This can become a model for other corridors (like Route 1, Route 7, etc.).

#### **Economic Development**

- Economic development can justify and largely pay for this system.
- Model the economic development potential (re tax, meal taxes, etc.), then differentiate probability of alternative modes for achieving the potential.

### **November 10, 2004 Meeting**

#### **Verbal Comments**

Several comments were received at the public open houses in the form of verbal questions. A summary of those comments is presented below:

#### **General Transit Issues**

- Does track in-street preclude auto use?
- With the 3rd rail technology in use in Bordeaux, can cars still use the lane?
- Is the 3rd rail technology more expensive? How would it work with snow removal?
- With the curb-to-curb reconstruction for BRT, is there a difference in street profile?

#### **Stop Location**

- Why are stops ¼ mile apart from each other?

#### **Technology/Vehicle Preferences**

- Is the choice of mode driven by ridership? Would there be possible conversion of BRT to rail in the future?
- 80' platforms? Could be greater for rail . . . same for BRT?

### **A.1.7 Public Open Houses, April 25 and 26, 2005**

This final round of public meetings was held to discuss evaluation results and the Alternative recommended for advancement toward implementation.

#### **April 25, 2005 Meeting**

##### **Written Comments**

Comment forms were available at the open house. Below is a summary of submitted written comments:

##### ***Comments on Alternatives***

- I'm speaking as an individual, but I see NO benefit as a business either.
- Could you have made the Baseline Alternative sound any worse?
- This is/was a done deal as long as we agree with the BRT/Streetcar choice all is good.
- Why such conservative assumptions on traffic growth? New high occupancy transit stimulates development. FTA may not allow it, and WashCOG forecast don't assume it, but for internal planning greater traffic growth should be assumed.
- Great alternatives – modified alternative will aid with congestion tremendously.
- Modified Streetcar makes economic sense in the short run but keeping costs down led to the Metro mess in Rosslyn. I think we should build the full streetcar system.
- MUCH prefer streetcar option – specifically the Modified Streetcar Alternative -- start small and grow the system over time.
- Modified Streetcar with 12 minute frequency is not desirable!!!! It is just there to show a low cost, but not likely to be built.

##### ***Comments on Study Process***

- Good evaluation criteria and alternatives. Excellent publicity and outreach.
- Very informative, thanks for your work.

##### ***Pedestrian, Bicycle, ADA Issues***

- I would like to see more analysis of the impact on drivers and the efforts being made to make pedestrian crossing safer.

##### ***Alignment/Station Location Issues***

- I hope however the system is built, that it will allow expansion to Alexandria and Annandale, i.e. leave space for large enough maintenance facility, etc.

##### ***Funding and Financing Issues***

- Why do we on the Pike see so much about Fairfax County, are they going to help pay for this? This is/was skewed toward the choice certain people want!
- What happens if there is a deficit in operation? Why isn't Fairfax County involved, it's their commuters. How much is this really going to cost the local citizens and business owners?

##### ***Technology/Vehicle Preferences***

- I would like to see streetcars.
- BRT can stimulate development if done right!

##### ***General Comments***

- I was in Denver and used their free Light Rail service downtown. It was great!

### **Verbal Comments**

Several comments were received at the public open houses in the form of verbal questions. A summary of those comments is presented below:

#### **General Comments**

- Thank you!
- I was in Denver recently and they had a neat free bus that went through the center of town and connected with other service.

#### **Process**

- WHO are we making a recommendation to? Please clarify. What is the decision our elected officials would make?
- Do we have a time estimate for how long this might take?

#### **Traffic Analysis/Traffic Issues**

- How did you arrive at the 7% traffic growth number? Given the amount of development going on right now, isn't that too low?
- The intersection LOS analysis seems off -- I live at Four Mile Run and Columbia Pike, and even now it's a mess.
- There is a lack of protected left turns along Columbia Pike today. Is anyone looking at adding more protected lefts?

#### **Transit Issues**

- What about capacity at Pentagon Metrorail Station?
- Has any other city implemented a streetcar system? (question was hard to hear: did the questioner actually ask about something similar to the Modified Streetcar?)
- So this means no extension of Metrorail in Arlington? Has this been completely ruled out for Columbia Pike?
- The bus pullouts at Courthouse road are great. Are you planning on having those in the new service? If not, we're going to have a problem.

#### **Alternatives**

- I am concerned that people will need to transfer past S. Jefferson Street.
- Need an 11 foot inside lane to allow buses to pass.
- Would the smaller maintenance facility for the Modified Streetcar Alternative be an issue when it came time for expansion?
- With the Modified Streetcar Alternative, would there be a possibility that at some point the supplemental buses would be replaced by streetcar vehicles, or would there be a guarantee that buses would remain? Some bus service is good.
- Would the bus component of the Modified Streetcar Alternative use BRT equipment?
- The modified streetcar alternative at 12 minute frequency makes little to NO sense. Why it is considered is a mystery.
- Each modified streetcar alternative shows 27 vehicles (peak hour, eastbound) -- same as current baseline. How will these alternatives accommodate increased mobility, ridership, economic development etc . . . Identified in statement of need?

### ***Fares/Cost/Funding***

- Fare structure: would there be a scenario where the streetcar cost one thing and the buses cost another?
- On the Modified Streetcar Alternative, if I pay one fare can I get on either vehicle? What will be the fare structure?
- Are fares included in the cost estimates?
- Is Fairfax County going to pay for any of this?
- Have you reached out to Congressman Moran, who serves on the Appropriations Committee? He could get this project New Starts money.

### ***Pedestrian, Bicycle, ADA Issues***

- Will there be pedestrian lights at the trolley stops?

### ***Alignment/Station Location Issues***

- What is the distance between stops in the Build Alternatives?
- The stops between Glebe and Gateway are too far apart.

### ***Technology/Vehicle Preferences***

- What are the impacts of inclement weather on rails? Would bad weather pose more of a problem for Streetcar than for bus?
- What about the steep grades on Columbia Pike? Can a streetcar take those hills?
- What about using an in-street power source? Is there at least another way to power streetcar, without using a wire?
- Trolleys pose the following problems: not attractive with wires; ice on wires in the winter; falling wires; no power -- no go meaning stalled traffic
- Trolleys are psychologically better for users: any system on rail reassures users about reliability. When I use a bus, I always wonder "will the bus really come?"

## **April 26, 2005 Meeting**

### **Written Comments**

Comment forms were available at the open house. Below is a summary of submitted written comments:

### ***General Comments***

- Thank you for your work on this.
- It seems like there had been a lot of thought and planning put into the process. We appreciate your efforts – please let us know if we can help in any way!

### ***Process***

- We would like to ensure that the Arlington County Environment and Energy Conservation Commission is given ample opportunity to comment before the environmental analysis is done.
- Study process secretive/little opportunity for public involvement until study process is nearly completed and recommendations endorsed.
- Written scenarios and more detailed information should be made available in advance of public meeting.
- Study process sounds ok.

### **Alternatives**

- Will this create new roads? What route will new system cover? It may be cheaper for either Light Rail transit or streetcar. This may widen roads or create new roads. If so, you're judging cost of roads widening or whatever. What will be major stops on street rails?
- Would like to see "emergency vehicle movement" added under the "safety" criteria.
- May improve service. So far buses both Pentagon and Pentagon City always over-crowded. Pentagon route seldom comes, if so, overly crowded. ART buses; not enough or short routes.
- Which mode is more better for new system? This includes cost, route, people, traffic, etc. I've noticed sample chart behind me showing several modes of transportation such as: bus rapid, Light Rail, monorail, streetcar, etc.
- Most BRT ridership estimates are twice as high as experience. Rail estimate closer to reality.

### **Pedestrian, Bicycle, ADA Issues**

- I want to suggest improving pedestrian walking access between Scott Street near Washington Boulevard and the Pentagon City Metro/Pentagon Row Shopping. Improved pedestrian sidewalks and walkways and lighting will promote walking between Streetcar stops, and will help further connect the Pentagon City and Columbia Pike neighborhoods.
- Need to normalize bicycle crashes to use/exposure to properly evaluate. Compatibility with bicycle travel on Columbia Pike is critical, especially those portions where no bike lanes are planned. This needs to be clearly and conclusively demonstrated. Columbia Pike must become a complete street where bicycling is well accommodated. Only bicycle-friendly rail tracks would be acceptable.

### **Alignment/Station Location Issues**

- Best use to extend service to the Pentagon.
- I want to suggest funding the full Streetcar Alternative service all the way to the Pentagon. The Pentagon is the major carpool and bus center, and this transit improvement should connect to it. If you don't, there will be less utility and flexibility for commuters who need the option to connect to Pentagon City and the Pentagon. It's worth the extra money to connect all the way to the Pentagon – the increased cost appears to be only 25%. The 10% expected increase in ridership above the modified streetcar makes the full streetcar plan preferable.
- If you do the modified streetcar with 6 minute frequency, you could keep some bus service to keep streetcar costs down, but I still recommend connecting all the way to the Pentagon. Connect to the Pentagon.
- Concerned that there's not enough room for a station near Walter Reed – narrow space along that corridor with buildings to street already – unless I misunderstood and that would be a curbside station.
- I think you're underestimating the number of riders who prefer Pentagon over Pentagon City.

### **Station Amenities**

- Make sure the streetcar stops have covered shelters so that people will ride/wait/stay dry in bad weather. Have signs telling when the next streetcar and bus will arrive.

### **Fares/Cost/Funding**

- Good presentation. Very logical EXCEPT first cost is not a "cost" but an investment. BRT investment depreciates at 7.5% = \$8,500,000 per year. Streetcar = \$6,000,000 per year and 4 with modified.

### **Technology/Vehicle Preferences**

- Less expensive to run multiple small buses surely than more expensive streetcar system – even bus bunching can surely be tackled with better communications these days.

- Not sure why some alternatives such as Light Rail or monorail don't fit with "urban scheme."
- Not thrilled with the idea of adding more wires overhead, especially since neighborhoods are so interested in undergrounding (utilities).
- How seriously did you consider overhead monorail option? It would greatly reduce congestion, whereas on-street options could potentially increase it considerably.
- Data and experience support streetcar alternative.

### **Verbal Comments**

Several comments were received at the public open houses in the form of verbal questions. A summary of those comments is presented below:

### **Alternatives**

- I have lived in this area for 71 years and rode transit all my life because we had no car. Streetcars in DC did not perform well in the snow and ice -- but that was because DC does not perform well in the snow and ice. In your presentation, you cited Tampa, Florida. I was down there and I finally saw a streetcar. It's nice, but it doesn't go anywhere. I served on the ACTC for 30 years. My primary interest was transit. I hate to be a naysayer, but I am not impressed with this proposal. It's grandiose; it's pie-in-the-sky. This does not impress me that we're going to spend the money and get something done.
- Will I live long enough? What's the time frame? Do you pay more for this service? Why would you not try to make more connections to Ballston? How are you going to grow this thing? The difference between costs is minimal -- you need to be bolder.
- We are fully in support of the streetcar proposal, even perhaps running cars more frequently than the modified schedule permits.
- What is the difference between the Modified Streetcar and the Full Streetcar -- is it just shorter?
- If you had streetcars and buses operating at the same time, would you have to widen the road?
- If you decide on the modified streetcar, I think you should fund 6 minute service frequency, similar to metro. If you choose 12 minute frequency, fewer people will use it because they will choose to drive instead of waiting.
- If streetcars come every 12 minutes people will stay in their cars. Service every \*3\* minutes in rush hours is important.

### **Traffic Analysis/Traffic Issues**

- Would transit lanes be off limit to cars?
- Will Columbia Pike in the future remain 2 lanes in each direction -- 1 for transit, 1 for cars?
- How did you arrive at the projected traffic increase?
- Throughput modeling -- did you assume a traffic speed?

### **Capacity/Ridership**

- Is this system being designed to handle the same number of people as currently? Where is the increased ridership coming from? Is this designed to increase the number of people who can travel through the corridor, or simply to reallocate them?
- If we stayed with just bus service, would we reach a limit where we could not add any more buses -- when will we run into a capacity problem?

### **Pedestrian Issues**

- How compatible would streetcar be with bicycling on Columbia Pike? Is there space for a bike lane? Is there a design for rails that makes them less treacherous for bikes?

### **Alignment/Station Location Issues**

- You didn't say anything about the final destination for users of the modified service: how do you get to the Pentagon? A significant number of people go to the Pentagon. Would they not be served?
- Any security considerations with going into the Pentagon?
- Is there a redesign to the Pentagon City stop? It's overcrowded right now -- how can it handle all those people?
- Is there still a possibility to consider a hybrid (streetcar/bus) option that goes to the Pentagon? There are many military people along the Pike, it seems unfair to ask them to transfer at Pentagon City when they work off-peak shifts.
- What about Potomac Yards?
- I think it is worth paying for the full streetcar connection all the way to the Pentagon: the Pentagon is the major commuting hub for carpools and buses, and the 9/11 memorial will attract streetcar riders who will want a seamless connection to the Pentagon.

### **Station Amenities**

- Make sure each stop has a digital sign saying when the next streetcar or bus will arrive, and also post the daily schedules, and have benches for sitting while waiting.

### **Technology/Vehicle Preferences and Issues**

- Fuel type: are these streetcars going to be electric? With more buses on the Pike, would there be more pollution? Has there been any talk of using CNG buses?
- If you go for Modified Streetcar, will the buses and streetcars work with the same platforms?
- Are there problems with streetcar performance, more than with buses?
- Would it be any faster to get in by streetcar than by car?
- President of the Bailey's Crossroads Fire Department: Our station is on Columbia Pike, and we answer a lot of calls both in Fairfax and Arlington. How will a rail line impact our response time? Our response times are already critically reduced at peak times along Columbia Pike.
- Use more smaller buses (like Arlington ART) to transport -- need less infrastructure -- area is still not pedestrian friendly -- lack of sidewalks is big problem.

## **A.1.8 Comments Received via Email**

The project website ([www.piketransit.com](http://www.piketransit.com)) was updated regularly to reflect progress of the study. The site was configured to accept comments from those who read its contents. Comments received are listed below in general chronological order, from the beginning to the end of the study:

### **Comment**

I moved to Columbia Pike last July and absolutely love the area. I see so much potential for community development and economic improvements. The Metrobus changes made last fall have been great, but the unreliability often frustrates riders. I would love to get involved in your efforts to improve Columbia Pike, please let me know how I can be of assistance. Thank you!

### **Response**

Thank you again for your comments. Please visit [www.piketransit.com](http://www.piketransit.com) for information on upcoming meetings. You can click on the "Get Involved" link to find out about the May 2004 Meetings.

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**Comment**

What, specifically, are the eastern and western boundaries of the study area?

**Response**

Thank you for your interest in the Pike Transit Initiative! Your comments and concerns have been forwarded to the appropriate staff, will be recorded as part of the public comment period, and reviewed throughout the Study.

Thank you for your specific comments regarding the boundaries of the study area. The eastern boundary encompasses both the Pentagon and Pentagon City areas and the western boundary encompasses all (or most of) the Bailey's Crossroads area. At the design dialogue meetings next week, which you indicated you hope to attend, we will be discussing the specific alignments along both end points of the study area. We hope that you will be able to attend to pass along your views on what the new system (including the potential alignments) should look like.

You have also been added to our interested participants list and will be receiving periodic updates on the Study in the coming months. In the meantime, feel free to comment further on the Study by calling the project hotline at (703) 892-2776. We appreciate hearing from you, and look forward to your future participation in the Study.

**Comment**

I have lived at the Palazzo (5353 Columbia Pike) for almost 20 years. For the first three years, I owned no automobile and commuted to work in the District by bus and subway. Since then, I have used bus, subway and automobile and currently ride the 16Y bus. I use public transportation here and in other cities whenever I can, in particular New York City, Mexico City, and Hong Kong.

Unless a new system is fast, frequent and attractive, most who don't currently use the buses will not use it. For example, my wife will readily use the subway but will not use any bus or anything that looks like a bus (trolley, streetcar, most Light Rail) because she has no desire to tolerate the filth, cold, heat, rain and snow.

We travel regularly to the Dallas Fort Worth area and their public transportation is worthless (most especially their Light Rail). It doesn't take you where you want to go and doesn't run when you need it. (What fool would drive to downtown Dallas or Fort Worth to take an infrequent train to a parking lot of the airport in order to wait for a bus that will finally take you to the terminals – BUT not on Sunday.)

I support the cost and installation inconvenience of a subway line, a 'cute' San Francisco-like streetcar (not a bus made up to look like a streetcar) if it can run more often and be enclosed, or a monorail if it can be positioned at street level (I have taken the Miami monorail often, and it is ugly, inconvenient and destructive of street level commerce.)

I do not support the ugliness of wires in the air for a trolley (which is simply a bus with added ugliness or an elevated rail line. I also do not support dedicated bus or trolley lanes that will simply make life intolerable along the Pike.

Thank you for your consideration of my views.

(By the way, I tried sending this comment using your website (two different browsers) but the code is buggy and it wouldn't work.)

**Response**

Thank you for your recent comments regarding the Pike Transit Initiative. I am sorry the website was "buggy" and have asked our team to look into the problem.

The project team met with over 250 stakeholders (residents, property owners, business owners, developers, alternative transportation advocates, agency staff, and others) the week of May 17 to kick off the project. The meetings (which were advertised via over 20,000 post cards mailed to area

residents, civic association notices, flyers handed out to bus riders at the Pentagon and Pentagon City Metro stations, press releases, and public service announcements) were held to discuss the kind of transit service stakeholders would like to see on the Pike in the future.

Based upon those discussions, we are preparing to study two alternatives in detail: Bus Rapid Transit (BRT) and Light Rail Transit/Streetcar technology. These two alternatives are intended to provide a viable alternative to the automobile for travelers on the Pike. The technologies are overviewed on our website. Specific to Columbia Pike, the alternatives as envisioned will include:

1. Modern, attractive, clean-fuel vehicles with low floors, multiple doors, and large windows. Overhead electric power supply is still on the table, along with other fuels.
2. A rebuilt roadway (BRT) or track in the outer travel lane (LRT/Streetcar) to provide a smooth ride. The transit vehicles will share the lanes with other traffic; additional lanes will not be added for transit.
3. Service that is frequent enough (6 minutes peak, 10 minutes mid-day and evening, 15 minutes late night) that you will not have to consider the schedule as you plan your day.
4. Stops spaces at  $\frac{1}{4}$  to  $\frac{1}{2}$  mile intervals that are close enough to one another to provide adequate pedestrian access (maximum 5-10 minute walk to transit along the Pike) while far enough apart to keep up travel speeds.
5. Attractive stations with weather protection, fare collection equipment (to speed boarding and therefore travel), and real-time information about when the next vehicle will arrive.
6. Signal priority for transit vehicles to move them along the Pike.

We will be updating our website next month to include the results of our initial discussions with stakeholders. As we develop the BRT and LRT alternatives we will be posting additional information, as well as sending out a newsletter. Now that we have your address, you should receive the newsletters and other information regarding the project.

Hopefully we are addressing your desire for service that is fast, frequent, and attractive. That is our goal. If you have other comments or suggestions, please feel free to contact us. Thank you for your interest in the project and for your patronage on the 16Y.

#### **Comment**

Your stated goals seem on-target. I am especially interested in the shuttle run along Columbia Pike to include the far end of Crystal City (Hilton area), and to shopping of Bailey's Crossroads.

#### **Response**

Thank you for your interest in the project. Based upon the input of over 200 project stakeholders at our design dialogue the week of May 17, we have developed a draft alignment and station locations for proposed Bus Rapid Transit (BRT) or Light Rail Transit/Streetcar (LRT) service along Columbia Pike. This alignment provides the opportunity to connect Columbia Pike service with service on route 1, on Leesburg Pike, and further west on Columbia Pike to Annandale. The draft alignment and other information will be available on our web site in the near future. We would appreciate your thoughts about the draft.

#### **Comment**

Are monorails being considered anywhere within the WMATA system? They have high right-of-way and can be fully automated.

#### **Response**

Monorail technology was considered along with other alternative technologies for the Dulles Corridor as part of the initial screening evaluation during the preliminary engineering and environmental review

phase of the Dulles Corridor Rapid Transit Project. It was determined that a monorail alternative would not be as cost-effective as a Metrorail alternative, due to comparable or higher capital costs and lower ridership.

The lower ridership is attributable to the fact that the monorail technology could not operate on the Metrorail tracks therefore, passengers wishing to travel between the Dulles Corridor and the region's core would have to transfer trains where the Monorail line meets the Metrorail Orange Line. The transportation planning community agrees that travelers are very sensitive to out-of-vehicle travel time (walk time, wait time and transfer time) and forcing a transfer typically results in reduced ridership.

Ultimately, the monorail alternative was evaluated as part of the initial screen for the Columbia Pike Alternatives Analysis, but this technology is not a viable alternative for the Columbia Pike Alternatives Analysis given that one primary goal of this study is that the transit alternative fits within the context of a Main Street environment.

WMATA evaluates technology alternatives on a corridor-by-corridor basis and selects the technology best suited to meet the specific requirements for each corridor. Thank you for your interest in the Metrorail system and your participation in the Pike Transit Initiative.

#### **Comment**

I would like to ask whether monorails have been considered as a suspended network overtop of street level for this project. One alluring feature of monorails is the cost: they cost \$1 million/mile compared to \$1 billion/mile for underground subway. Also they do not interfere with existing streets or pedestrian investments as they can float 20 ft. above street level. [www.monorails.org](http://www.monorails.org) is a very informative site. Please give monorails their due; they are very viable.

#### **Response**

Monorail technology was considered along with other alternative technologies for the Dulles Corridor as part of the initial screening evaluation during the preliminary engineering and environmental review phase of the Dulles Corridor Rapid Transit Project. It was determined that a monorail alternative would not be as cost-effective as a Metrorail alternative, due to comparable or higher capital costs and lower ridership.

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WMATA evaluates technology alternatives on a corridor-by-corridor basis and selects the technology best suited to meet the specific requirements for each corridor. Thank you for your interest in the Metrorail system and your participation in the Pike Transit Initiative.

**Comment**

Where's the substance; e.g., interim study findings: When will the November public meetings be announced and posted?

**Response**

Thank you for your inquiry regarding progress on the Pike Transit Initiative and the availability of interim study findings.

The project team has been working since June to refine the alternatives being studied (No Action/FTA New Starts Baseline, Bus Rapid Transit, and Streetcar) and obtains local agency and FTA concurrence on the detailed descriptions of the alternatives. This work has also included working to refine the regional travel demand forecasting model to make it a more effective tool for decision making. Technical analysis is underway and interim study findings will be available in early November.

WMATA will be holding two public meetings, which will be announced and posted in the near future:

November 8, 2004 at Arlington Career Center, and November 10, 2004 at the Mason District Governmental Center. The meetings will be an open house format from 6:00 to 8:00 pm, with a presentation at 7:00 pm.

The meeting announcement and other information are contained in a newsletter that is currently at the printers and will be distributed in the near future. We will also be posting the announcement on the web site and advertising the meeting by other means.

Thanks for you interest in the Pike Transit Initiative. We hope to see you at one of our November meetings.

**Comment**

As owner of the Quebec Apartments on Columbia Pike at George Mason, the newly redeveloped Monterey Apartments at Greenbrier and 8<sup>th</sup> Road and the new Sierra Condominiums at Greenbrier and 7<sup>th</sup> Road I endorse the BRT system and not the electric rail system. We all (developers) have paid enormous amounts of money to underground utilities at Arlington County properties. I think that an electric system with all of the overhead wires is a step back in time.

**Response**

Thank you for taking the time to visit our web site and let us know of your preference for Bus Rapid Transit. Your comment will be a part of the project record. We encourage you to remain involved as the project develops. Your next opportunity to participate will be the Community Forums along the Pike on November 8 and 10. Please check the web site for meeting times and locations. We look forward to seeing you at a Community Forum.

**Comment**

I was looking for an online image of the Proposed BRT/Light Rail/Streetcar Alignment photo that is on the front of the "Pike Transit Initiative" brochure. One where you can read the stop names. They are too small to read in the brochure. Thank you.

**Response**

Please visit [www.piketransit.com](http://www.piketransit.com) to view the larger alignment photo. Once on the welcome page, click on "Pike Transit Initiative" and scroll down to the bottom of the page. Under the "May 2004 Open House" section you will find a PDF file of the "Proposed Alignment." Please click on the "Proposed Alignment" the file is 3.5 MB so please wait while it loads.

**Comment**

Please consider extending the line further west and placing a station closer to the shopping center at Bailey's Crossroads (Rt. 7 and Columbia Pike). You are missing a major destination point. Maybe a loop can be made at the western end to include this area.

**Response**

Thank you for your suggestion regarding a station near the shopping center at Route 7 and Columbia Pike. During our design dialogue sessions last May over 200 people helped us to lay out the proposed alignment of the Pike Transit service. A station at Route 7 and Columbia Pike was considered and not developed further at that time. One reason for this was that the volume of automobile turning movements at the interchange and all of the shopping center driveways made it difficult to locate a major transit facility safely. The big box retail land use was also not considered "transit friendly" as compared to the offices and homes at Skyline. For these reasons the participants agreed to turn the route at Jefferson and locate the terminus at Skyline.

We did consider a loop on Jefferson and Carlin Springs but that was rejected because it created too much "out of direction" travel. For example, someone at the Goodwin House on Jefferson who wanted to go to Pentagon City would have to take the loop all the way out to Skyline and back on Carlin Springs.

Route 7 and Columbia Pike will continue to have local transit service that would connect to the Columbia Pike service. We are also providing for possible extensions of the service along Route 7 to Falls Church and/or Alexandria. The Falls Church extension could provide service to the shopping center in the future.

Thank you for your interest in the Pike Transit Initiative. If you would like to learn more, please come to our workshop on November 10 at the Mason District offices in Fairfax County. Directions to the meeting are on our web site.

**Comment**

I live in the Bailey's Crossroads area of your District (in the Glen Forest neighborhood). I am also the Commercial Revitalization Coordinator for Arlington County. I have been involved with revitalization efforts along Columbia Pike for many years. I am very concerned that the transit route for Columbia Pike that Metro is currently showing to the community does not include a station near the Bailey's Crossroads Shopping Center. I think it is a mistake not to locate a stop closer to this major destination. A station closer to this area (near Circuit City, possibly) would also better serve the residents of the Culmore who rely heavily on transit. I understand the need to serve Skyline but a loop or some other way of locating a station nearer to Rt. 7 and Columbia Pike would greatly enhance the service for a greater number of Mason District residents. Anything you can do to persuade Metro to consider this option would be greatly appreciated. Thank you.

**Response**

Thank you for your suggestion regarding a station near the shopping center at Route 7 and Columbia Pike. During our design dialogue sessions last May over 200 people helped us to lay out the proposed alignment for the Pike Transit service. A station at Route 7 and Columbia Pike was considered and not developed further at that time. One reason for this was that the volume of automobile turning movements at the interchange and all of the shopping center driveways made it difficult to locate a major transit facility safely. The big box retail land use was also not considered "transit friendly" as compared to the offices and homes at Skyline. For these reasons the participants agreed to turn the route at Jefferson and locate the terminus at Skyline.

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Route 7 and Columbia Pike will continue to have local transit service that would connect to the Columbia Pike service. We are also providing for possible extensions of the service along Route 7 to Falls Church and/or Alexandria. The Falls Church extension could provide service to the shopping center in the future.

Thank you for your interest in the Pike Transit Initiative.

**Comment**

I am a local resident (since 2003). I have been unable to attend the meetings about the revitalization plan, but I want to express my strong support for the initiative. I hope we can get started and get this plan—in its entirety—up and running as quickly as humanly possible. The neighborhood has enormous potential, in my view, but needs to improve its image, the services and facilities it provides, and the overall quality of life it offer residents and visitors. I'd like to see us become the next Clarendon (only bigger and better). The transit plan on the website (trams/trolleys) looks amazing. I am glad to see the community looking for alternatives to busses, which are often noisy, ugly, and unpleasant. With better transportation alternatives, linking the Pike to the new sports facility, as well as the other burgeoning areas in Arlington and the District, we will be in great shape. If we can find a way to connect our transit to the new ballpark in DC, that would be even better.

**Response**

Thank you for your interest in the Pike Transit Initiative. Your comment is being forwarded to the appropriate project team member.

**Comment**

I am the Secretary of the Foxcroft Heights Neighborhood Association, and I couldn't help but notice the Arlington County Heritage Center listed on your Proposed Bus Rapid Transit/Light Rail Transit/Streetcar Alignment PDF file (<http://www.piketransit.com/downloads/Study-Photo-200-150.pdf>). I was wondering if you can refer me to someone from which we can get more information about it. If not, if that map was provided by Arlington County, could you let me know who provided the map, so I can work backward from there? Thank you very much.

I failed to mention that the Arlington County Heritage Center will be located within the borders of our civic association, and thus were are interested in learning more about it.

**Response**

Bill Thomas has been leading the coordination team with the Federal government on behalf of Arlington County. His email address is [wthomas2@arlingtonva.us](mailto:wthomas2@arlingtonva.us).

**Comment**

As a resident of the Barcroft neighborhood, I want to register my support for the idea of using trams (streetcars) for improving mass transit on Columbia Pike. I lived in Brussels, Belgium, for more than 3 years and commuted by using the metro (subway) and transferring to a tram. I believe that a tram down Columbia Pike to the Pentagon would reduce the time needed for commuters to reach the main metro system. Because a tram is relatively narrow, it would fit well on Columbia Pike, particularly the stretch between Glebe Road and Courthouse. This is important because another important need on Columbia Pike is bike lanes, especially between Courthouse Road and the Pentagon. Because the tracks would provide a dedicated travel lane, the trams would not impede traffic, and cars would not impede the tram. A limited number of stops, similar to the 165F bus line, would allow a rapid commute. Ideally, a tram would go underground near the Pentagon and connect directly in the existing metro station. An example can be found in Brussels, where the "premetro" – underground tram lines – operates in several metro stations, providing a seamless transfer. Currently, I rarely use mass transit to commute because of time concerns – it takes about a half-hour to go the three miles to

the Pentagon, and a total of 50 minutes for the six miles from my house to Capitol Hill. Shaving 10-15 minutes off that would induce me to use mass transit.

### **Response**

Thank you for your interest in the Pike Transit Initiative. We are currently studying three alternatives for transit on Columbia Pike – the continuation of existing service, a “bus rapid transit” alternative, and a “streetcar” alternative. These alternatives are described on the web site. The streetcar alternative would be much like the trams you remember from Brussels.

However, because of concerns about traffic volumes and the desire to provide space for four lanes of traffic, wide sidewalks, bicycle lanes, etc. without demolishing any buildings along the Pike to widen the right-of-way, the transit service will continue to run in mixed traffic. We will be enhancing the speed and reliability of transit through:

1. Traffic signal priority for transit vehicles,
2. Platform fare collection to speed boarding, and
3. Limited stop service.

We are working with the community, VDOT, and Arlington County to accommodate bicycles and with the Department of Defense and the businesses at Pentagon City to provide seamless transfers to Metro Rail. At present we are not developing a direct underground connection to Metro because of budget and security concerns and the community’s desire that the streetcar or bus system be a part of the “Main Street” environment. We are proposing to locate our stops directly adjacent to elevators and escalators to the Metro Rail platforms.

Again, thank you for your interest in the project. Please check the web site from time to time to keep track of our progress.

### **Comment**

I want to start this off by saying that I am a regular public transit rider (21 years). Before the 16Y, I rode one of the Pike buses to the Pentagon (and later Pentagon City) and took the Subway to downtown DC. I attended the Pike Transit Initiative meeting at the Arlington Career Center. I have several comments. I am concerned that you are saying there will only be a 7% increase in traffic on Columbia Pike between now and 2030. This figure boggles my mind. How can that figure be when in the Adams Square/Walter Reed area alone, 4000 new residential units are planned for completion in the next couple years. It is wishful thinking to say that all those new residents will be using public transit. Even if they were all to use public transit, the new initiative won't be completed in time to accommodate all those residents and the current system will not be able to handle them. FYI, Since the 16Y bus was initiated, I no longer or rarely ride the subway. Why? Waiting for 2-4 trains before boarding during both the morning and evening rush hours is just not worth my time. It is particularly frustrating in the evening when two orange line six-car trains go by almost empty to each blue line four-car train. The blue line trains arrive packed. I am also concerned about the safety of the platforms when there is such a high volume of people waiting for trains, especially at Pentagon City near the escalators. I have scars from backpacks, luggage, briefcases and umbrellas hitting me while on the trains from people who ARE careless, but have no room to sit these items on the floor. If you did away with the 16Y, I would definitely drive to work--it isn't worth it otherwise. Since opening up the King Street station, Metro has added no more cars and no more trains to the Blue line, but has increased the number of persons riding the train. Getting on at the Pentagon or Pentagon City finds a rider packed on like a sardine--if they get on at all. I hope that before you add anymore stops to the Blue Line in Virginia that you will consider putting on more cars and more trains. Thank you for the 16Y. It makes my commute 1000% better.

## **Response**

As you note, the 16Y route serves an important role in the Columbia Pike corridor. It is assumed to remain in place at its current level of operation under each of the Alternatives considered in the study.

The assumed 7 percent increase in traffic volume along Columbia Pike between now and 2030 is an average that comes from the Council of Governments (COG) regional transportation model. The model mathematically represents a large number of transportation related features, including the connectivity of the future roadway and transit networks, the speeds at which vehicles travel along different routes, and the choices that people make regarding the modes and routes by which they travel.

First, then, the modest increase in projected traffic along Columbia Pike may imply that the model has found other, more attractive routes for travelers along portions of the study corridor—Arlington Boulevard or Shirley Highway, for example. It is also important to note that 7 percent is an average, and that some portions of the Pike would be expected to experience more growth and others less. Data collected for Columbia Pike for 2002 show that in some areas traffic volumes decreased as compared with 1990 and even 1980 levels. Decreases may be due to road closures in the Pentagon area, and they may be related to the fact that Columbia Pike is already performing near its capacity. The Pike has consistently ranked among the top 30 roads, state-wide, where traffic volumes per mile are highest. Second, the regional model is updated periodically, and includes generalized land use forecasts that may not reflect the effects of new construction projects like the ones you highlight in your comments. As a result of these factors, the growth rates assumed in the study may or may not accurately reflect conditions along Columbia Pike in the year 2030.

The principal purpose of the traffic modeling exercise for this study is to compare the relative effects of each of the potential Alternatives, including the “no build” or Baseline case. When all the Alternatives are compared using a common basis, even though it may not be a perfect prediction of the future, the advantages and disadvantages of each scenario emerge. According to the traffic simulation exercise, the BRT and Streetcar Alternatives would have similar effects on conditions in the corridor. For example, under each of these scenarios some 16 intersections would perform worse than in the Baseline case. The Modified Streetcar scenario was more positive. With fewer premium transit vehicles moving through intersections along the corridor, only 12 intersections would perform worse than in the Baseline.

## **Comment**

There has been a lively discussion on the Columbia Heights Civic Assoc. listserv and one topic was ADA compliance of the new transit system planned for Columbia Pike especially with regard to ADA Compliance. I have attended the community meetings and I have not heard this question raised. Are there streetcars being manufactured that can accommodate persons in wheelchairs and with other physical disabilities (that is with mechanical lifts)? My other concern is inclement weather. As you know, Metrorail had to be retrofitted to install a heating system for the rails. Is this included in the cost of the street car options? Also, if the modified streetcar option is chosen, I think there needs to be a guarantee that the buses planned as part of that option will remain should the streetcar system be expanded. Thank you.

## **Response**

The transit alternatives being proposed for Columbia Pike would be very friendly to persons with disabilities. Both streetcar and bus rapid transit (BRT) alternatives would include low-floor vehicles for level boarding from each platform through multiple, wide doors. No mechanical lifts would be needed (as on current bus service) as people in wheelchairs would board just as they do on Metrorail trains.

Experience in other cities with cold climates shows that streetcar and other Light Rail systems perform well during inclement weather. For the proposed Columbia Pike line, it is envisioned that routine street clearing would be sufficient to ensure operation in most winter storms. On the rare occasions when ice

threatens to foul track switches and other equipment, maintenance crews would be deployed with ice melting devices to ensure the system's safe operation.

WMATA and Arlington County bus service would continue under any streetcar implementation plan. As the streetcar system develops, bus routes would likely be reconfigured to provide better connections between neighborhoods and the streetcar line, and to most efficiently serve the growing demand for public transit.

### **Comment**

I live in Pentagon City and commute to Bailey's Crossroads for work. My commute is 10-15 minutes. There is simply no way this system would be used by me unless my car was broken down. This system, as nice as it looks, won't save any "pollution or energy" for anyone like me since short range commuters aren't causing any problems. There is no net gain and the money might be better spent elsewhere. The only benefit I see is for long range commuters coming in from the outer burbs or Maryland on the Metro and then decamping onto the system if they work in, say Bailey's Crossroads or Skyline. Likewise residents of those areas could use the system to access the Pentagon and Pent City Metro stations for commutes. Taking the bus is a royal pain...

### **Response**

Thank you for your interest in the Pike Transit Initiative. We have read your comments. You bring up a couple of interesting points that the study addresses at least in part:

#### 1. Travel times along Columbia Pike.

Traffic and transit modeling show, as you point out, that automobile travel along Columbia Pike is faster than transit travel. For example, in the "no build" or "baseline" scenario that we modeled for the study, an automobile trip between Skyline and Pentagon City would take 15 minutes, while a transit trip would take 27 minutes. With the improvements under study in the Pike Transit Initiative, combined with the expected growth in traffic, the difference between transit and automobile trips is expected to be much smaller: the automobile trip would take between 15 and 16 minutes, while the transit trip would take 18 to 20 minutes. Both of these comparisons are for the model year of 2030.

#### 2. Regional travel connections.

You suggest that the Pike Transit improvements would benefit people traveling between the Pike and other places in the region. The regional travel model shows that many of the travel time benefits (some 40 percent) of the improvements under study would be for people with destinations in the core of Washington, DC. Still, a substantial 20 percent of travel time benefits would be for travelers to the Pentagon/Pentagon City area, and another 25 percent of the benefits would be for travelers to destinations along Columbia Pike in Arlington and Fairfax Counties.

Please note that a copy of the public presentation given on April 25 and 26 is posted on the project website. We hope that you will continue to participate in this and subsequent phases of the study.

### **Comment**

I thought this was a great presentation and I am very happy with the choice of the modified Streetcar approach. I think it will serve both Arlington and Fairfax in both the short term and long term. I think that an idea that would be great for Arlington would be to have a least one rail depot facility(maintenance) at the North Tract as was discussed. This would get the tracks there in the initial build and would potentially allow for off-peak and weekend service to the new recreation facility scheduled to be built there. As that is to be enjoyed by all Arlingtonians, it would make it much more accessible by a great number of people if the streetcar went there off peak, when it is most likely to be used.

**Response**

Thank you for participating in the Columbia Pike planning process.

Your comment regarding the potential North Tract vehicle storage and maintenance site and potential transit access to recreation facilities is similar to several other comments we have received regarding streetcar access to the Pentagon: they highlight the need for detailed study of the eastern end of the Modified Streetcar Alternative route during the next stage of the Pike Transit Initiative. As defined in the current Alternatives Analysis, the Modified Streetcar Alternative would provide one-seat rides to the Pentagon and Pentagon City via buses and express buses that would serve the same stations along Columbia Pike as the streetcar service. However, due to several comments such as yours, this study recommends that the next phase of work examine costs and operational issues associated with extending peak and off-peak streetcar service directly to the Pentagon, making use of the North Tract for vehicle storage and maintenance, and the potential for passenger service to and from future North Tract development.

**Comment**

I'm concerned that implementation of the recommendations might result in loss of a single seat and single fare to and from the Pentagon Building. (Unless I missed or forgot that the loss wouldn't occur.) Many people using the Columbia Pike corridor depend on public transportation to get to the Pentagon. Other than this concern, I support the recommendations for a modified streetcar solution, and think it was well thought out and well presented.

**Response**

Thank you for participating in the Columbia Pike planning process. Your concern regarding a one-seat, one-fare ride to the Pentagon from points along Columbia Pike is shared by many others who have participated in the Pike Transit Initiative. As defined in this Alternatives Analysis, the Modified Streetcar Alternative would provide one-seat rides to the Pentagon via bus and express buses that would serve the same stations along Columbia Pike as the streetcar service. However, due to several comments such as yours, this study recommends that the next phase of work examine the costs and operational issues associated with extending streetcar service directly to the Pentagon. Under that modified scenario, it is likely that the "premium" streetcar service would still be complemented by bus service during peak periods in order to efficiently meet rush hour demand.

**Comment**

I am a resident of Arlington, and I live two blocks from Columbia Pike. I think that the idea of the Streetcar or the Tram would be the best idea for the job. Considering all the traffic that Columbia Pike has, I think that since most of that traffic is commuters and busses, this plan would work. I am also curious if rumors of a Columbia Pike metro station are true... Thank You, Michael Pierce

**Response**

Thank you for your comments. As you suggest, the study has shown that a large percentage of travelers along Columbia Pike are commuters, and that a large percentage of those commuters are using the current PikeRide service. The alternatives studied under the Pike Transit Initiative-including investment in Streetcar or "tram" service-indicate that there would be a market for improved public transportation options in the Columbia Pike corridor: according to our estimates, the number of people using transit could be up to 45% higher for the Streetcar alternatives than for the existing bus service.

We are not aware of specific studies for a Metro Station along Columbia Pike. In the past, there have been very general estimates of the costs and impacts that a Metro line along Columbia Pike would entail, but these have not been advanced to the stage of serious studies. The current study considered the full range of potential transit technologies, and found that a Metrorail investment would not be in keeping with current plans for roadway improvements and community development along

Columbia Pike. In addition, Metrorail would not serve the community goals of being a circulator for people within the corridor. However, the Streetcar service would essentially extend the reach of Metrorail by providing improved connections to Arlington and Fairfax neighborhoods.

**Comment**

Our hearts will fill with SO much joy over your decision to move forward with LRT on the CP. The Pike and Arlington will finally again be unique and recognized for what -and its people are -deserving of more than buses...

**Response**

We appreciate your participation in the Pike Transit Initiative. Indeed, the Columbia Pike corridor is dynamic and unique in the region. As planning for transit improvements moves forward, we will inform you of other public forums and opportunities to comment. Thank you again.

**A.1.9 Further Public Outreach**

The project team met with a number of civic associations and local business organizations during the spring of 2005. These meetings were used as an opportunity to provide an overview of the study and to present the recommendations of the Pike Transit Initiative to community leaders. The project team met with the following groups:

Columbia Pike Implementation Team

Columbia Pike Revitalization Organization

Civic Associations:

- Alcova Heights Citizens Association
- Arlington Heights Civic Association
- Aurora Highlands Civic Association
- Bailey's Crossroads Civic Association
- Barcroft School and Civic League
- Claremont Civic Association
- Columbia Heights Civic Association
- Columbia Heights West Civic Association
- Douglas Park Civic Association
- Foxcroft Heights Civic Association
- Mason District Council
- Penrose Neighborhood Association

## A.2 Bicycle Treatments

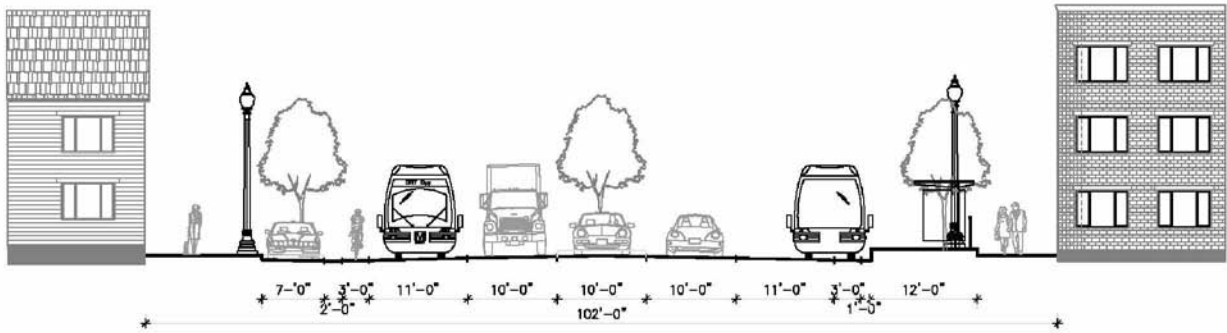
During the course of the study, members of the bicycling community raised several issues relating to the use of Columbia Pike by both streetcar vehicles and bicyclists. Recommendations of Arlington County Street Space Planning Task Force include designating bike lanes along much of Columbia Pike, with a bike path along specific shorter segments. The bike lanes would typically be between the parking lane or curb and the outside travel lane of the roadway. As described in Sections 3.0 and 4.0 of this Report, the proposed transit alignment would also run along the outside travel lanes for much of Columbia Pike. As illustrated in Figures A-1 to A-3, the configuration of both bicycle lanes and transit alignments along the curb lanes of the Pike presents design challenges, particularly at station stop locations. Level boarding requires station platforms that are configured directly next to the outside travel lanes, in the areas designated as bike lanes in street typical sections.

There are two general approaches, illustrated below for BRT and Streetcar Alternatives:

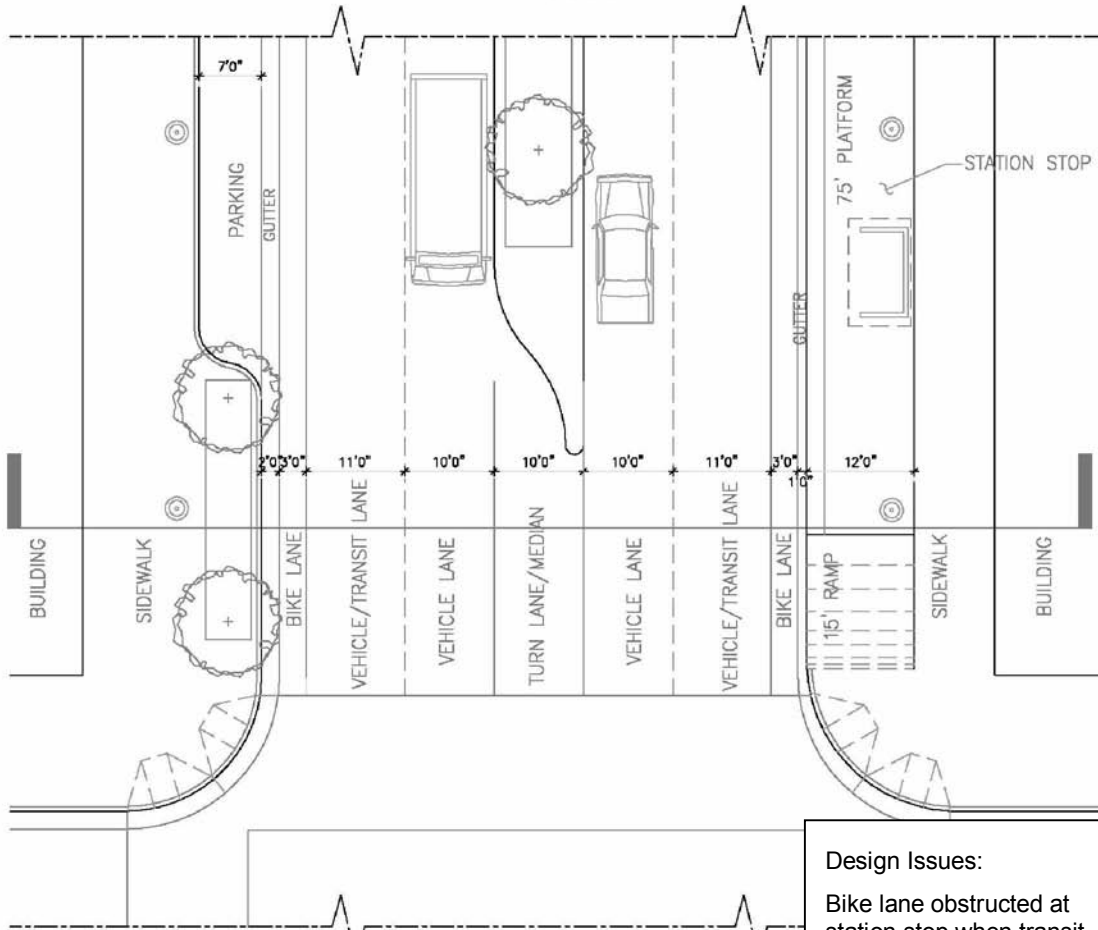
Option 1: For each of the Alternatives, bike lanes could be discontinuous at station stops, forcing cyclists to merge into the travel lane. For the BRT Alternative, the bike lane would be interrupted only when a transit vehicle is stopped. With the Streetcar Alternatives, this approach is complicated by the safety implications of cyclists merging across streetcar running rails: the gap, or flangeway, between rail and pavement makes acute-angled crossing difficult. The area between the edge of the station platform and the nearest running rail would be approximately 22 inches, narrower than the 36-inch wide designated bike lane along other portions of the street.

Option 2: Alternate pathways for cyclists could be designated behind the station platforms. At stations, bike lanes would be diverted into the sidewalk areas; beyond stations, bike lanes would transition back to a location beside travel lanes. This configuration would allow cyclists to avoid the potential hazard of crossing streetcar running rails, but it could produce conflicts between pedestrians and cyclists.

**Figure A-1: Example Bike Lanes at a BRT Station Stop, Option 1**



**Typical Section for BRT Alternative  
Based on Street Space Task Force Recommendations  
102 - Foot Section**

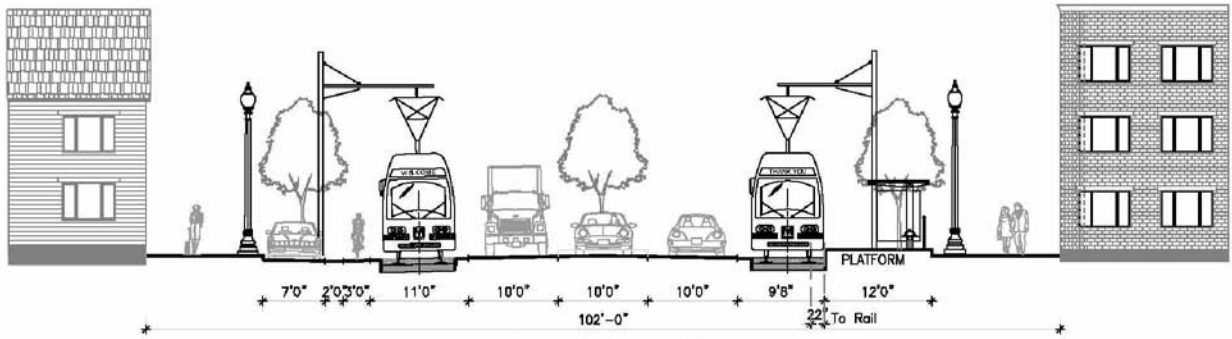


**Typical Intersection Plan for BRT Alternative  
Based on Street Space Task Force Recommendations  
102-Foot Section**

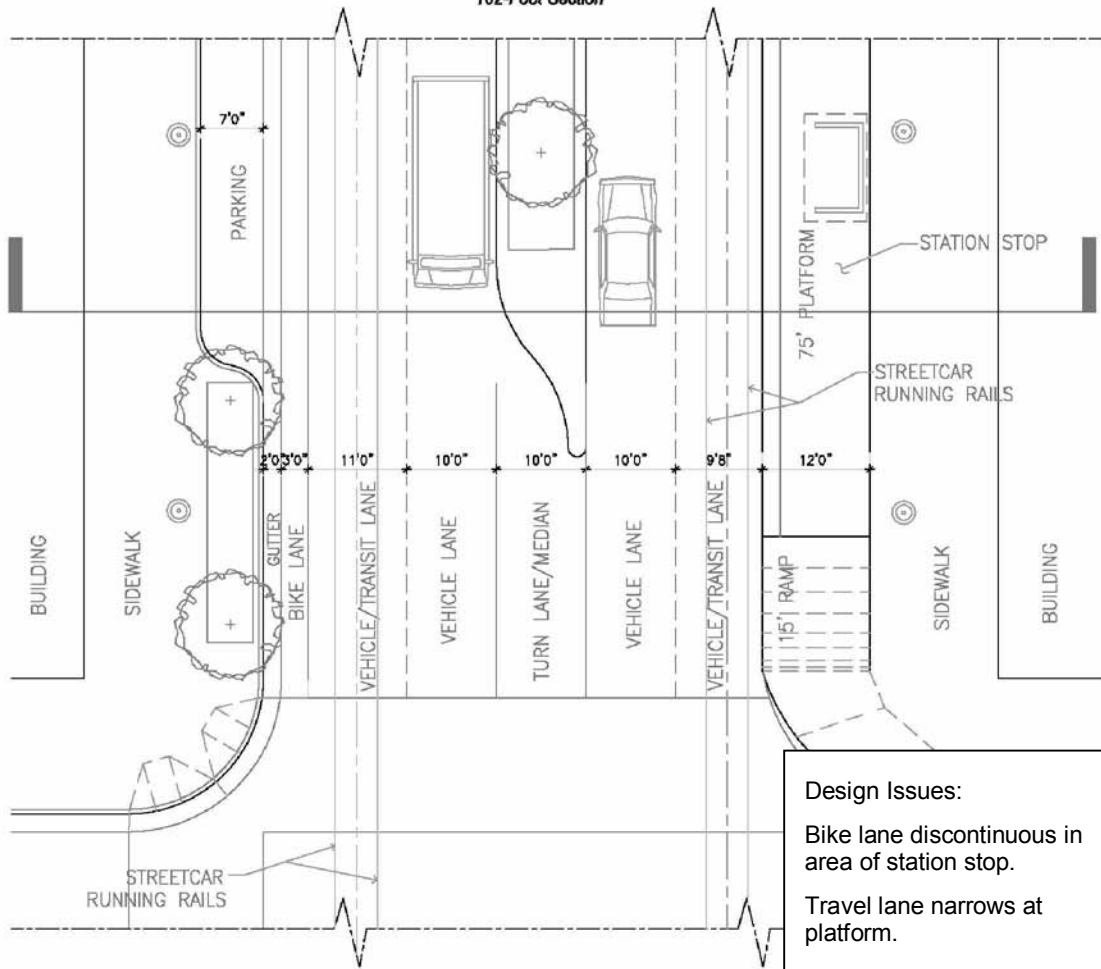
**Design Issues:**  
Bike lane obstructed at station stop when transit vehicle is present.

Concepts shown are based on Arlington County Street Space Planning Task Force Report, May 2004.

**Figure A-2: Example Bike Lanes at a Streetcar Station Stop, Option 1**



**Typical Section for Streetcar Alternative**  
 Concept Based on Street Scape Task Force Recommendations  
 102-Foot Section

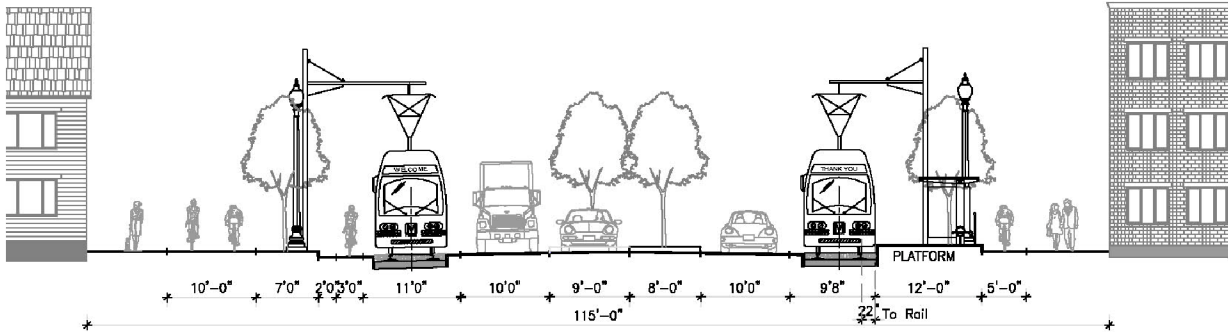


**Typical Intersection Plan for Streetcar Alternative**  
 Concept Based on Street Scape Task Force Recommendations  
 102-Foot Section

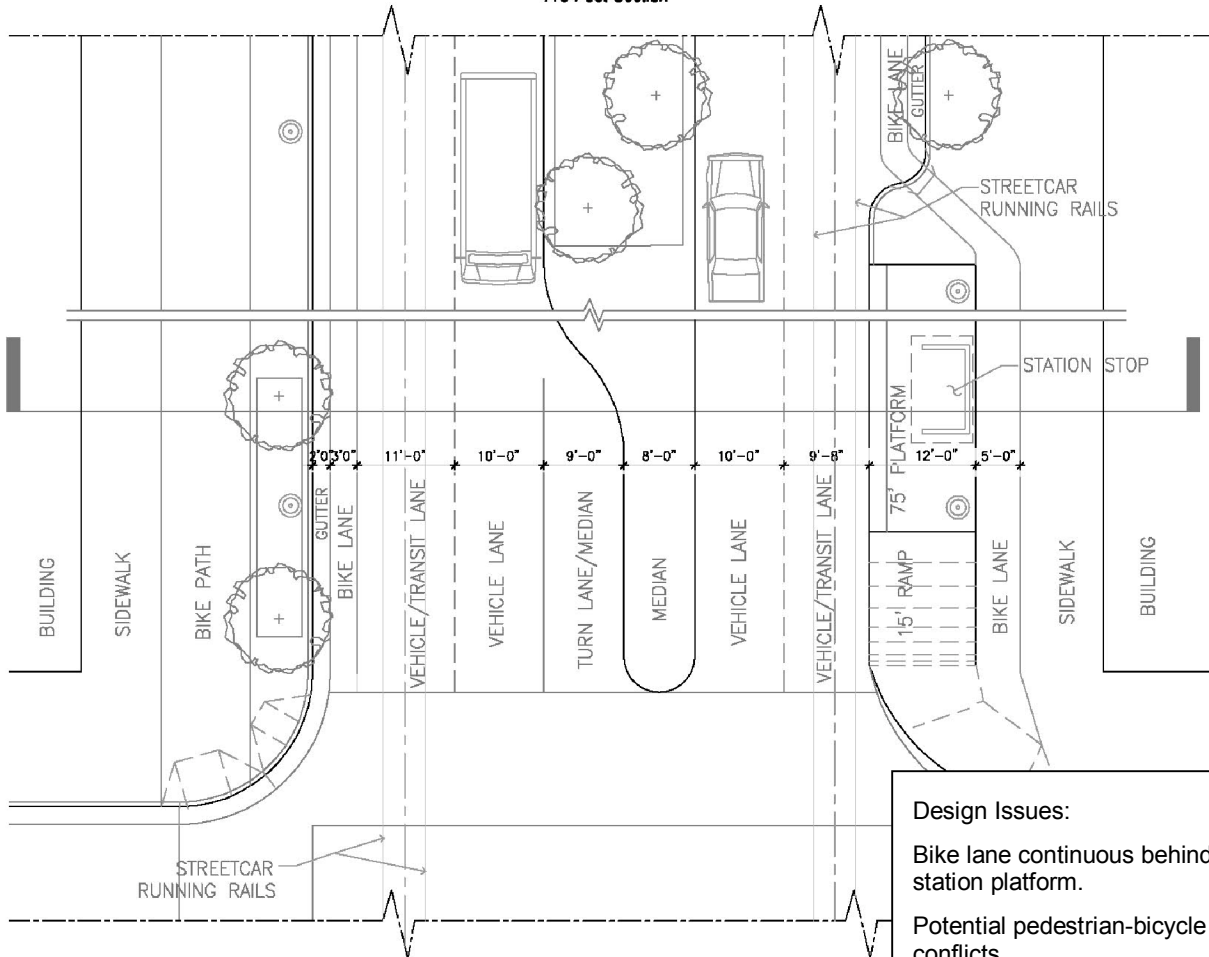
**Design Issues:**  
 Bike lane discontinuous in area of station stop.  
 Travel lane narrows at platform.

Concepts shown are based on Arlington County Street Space Planning Task Force Report, May 2004, and WMATA Tram/LRT Guideline Design Criteria, August 2003.

**Figure A-3: Example Bike Lanes at a Streetcar Station Stop, Option 2**



**Typical Section for Streetcar Alternative**  
 Concept Based on Street Scape Task Force Recommendations  
 115-Foot Section



**Typical Intersection Plan for Streetcar Alternative**  
 Concept Based on Street Scape Task Force Recommendations  
 115-Foot Section

**Design Issues:**

- Bike lane continuous behind station platform.
- Potential pedestrian-bicycle conflicts.
- Travel lane narrows at platform.

Concepts shown are based on Arlington County Street Space Planning Task Force Report, May 2004, and WMATA Tram/LRT Guideline Design Criteria, August 2003.

## A.3 Summaries of Capital Cost Estimates

### COLUMBIA PIKE COST ESTIMATE

#### Baseline Alternative

PROJECT DESCRIPTION	ESTIMATED COST
<b>1.0 Transit Projects from 2005 to 2010 TIP</b>	
1.1 Bus transfer facility at Columbia Pike and S. Walter Reed Dr.	\$ 440,000
1.2 Standardize bus stops along Columbia Pike (Super Stops)	\$ 2,467,000
1.3 Real-time passenger information for Columbia Pike transit vehicles	\$ 500,000
1.4 Hardware & software for signal prioritization, Columbia Pike	\$ 206,000
<b>Transit Project Subtotal</b>	<b>\$ 3,613,000</b>
<b>2.0 Roadway Projects from 2005 to 2010 TIP</b>	
2.1 Turn lanes at Glebe Road and Columbia Pike (complete 2004)	\$ -
2.2 Rehabilitate Washington Blvd. interchange at Columbia Pike	\$ 16,699,000
2.3 Streetscape improvements on Columbia Pike btwn Wakefield St. and Four Mile Run	\$ 135,000
2.4 Rebuild street infrastructure btwn Oakland St. & Garfield St.	\$ 310,000
2.5 Rebuild Columbia Pike btwn S. Orme St. and Southgate Rd.	\$ 7,000,000
<b>Roadway Project Subtotal</b>	<b>\$ 24,144,000</b>
<b>SUBTOTAL TIP PROJECTS</b>	<b>\$ 27,757,000</b>

All costs shown in 2005 dollars.

**COLUMBIA PIKE COST ESTIMATE**

**BRT Alternative**

Route length (mi) 5.89  
Station stop platforms 36

ITEM	UNIT	UNIT COST	QUANTITY	ITEM COST
<b>1.0 Busway Facilities (not incl. utilities)</b>				
1.1 Road Reconstruction (curb to curb along Pike)	Sq. Feet	\$9	1,317,782	\$ 11,860,042
1.2 Median Reconstruction (along Pike)	Lane Feet	\$150	21,120	\$ 3,168,000
1.3 Bus Pad Construction	Lane Feet	\$249	3,600	\$ 896,400
1.4 Traffic Signal Modifications - Miscellaneous	Lump Sum	\$600,000	1	\$ 600,000
1.5 Traffic Signal Priority System Installation	Intersection	\$8,000	19	\$ -
<b>Busway Facilities Subtotal</b>				<b>\$ 16,524,442</b>
<b>2.0 Utilities</b>				
2.1 Public Utilities	Route Feet	\$330	31,099	\$ 10,262,736
2.2 Private Utilities	Route Feet	\$150	31,099	\$ 4,664,880
2.3 Agency Agreements and Utility Fees	Lump Sum	\$340,000	1	\$ 340,000
<b>Utilities Subtotal</b>				<b>\$ 15,267,616</b>
<b>3.0 Systems</b>				
3.1 Communications	Lump Sum	\$50,000	5.89	\$ 294,500
3.2 Systems / Operations Testing	Lump Sum	5%	\$294,500	\$ 14,725
<b>Systems Subtotal</b>				<b>\$ 309,225</b>
<b>4.0 Station Stops</b>				
4.1 Bulb-out Side Platform, Complete	Platform	\$150,000	36	\$ 5,400,000
4.2 Fare Collection Equipment (per Platform)	Platform	\$90,000	36	\$ 3,240,000
4.3 Fare Collection Information Network	Allowance	\$500,000	1	\$ 500,000
4.4 Variable Message Board Equipment	Platform	\$5,000	36	\$ 180,000
<b>Station Stops Subtotal</b>				<b>\$ 9,320,000</b>
<b>5.0 Shop &amp; Yard Facilities</b>				
5.1 Site Work & Yard Facilities	Lump Sum	\$ 3,500,000	1	\$ 3,500,000
5.2 Building	Lump Sum	\$ 3,200,000	1	\$ 3,200,000
5.3 Equipment	Lump Sum	\$800,000	1	\$ 800,000
<b>Shop &amp; Yard Subtotal</b>				<b>\$ 7,500,000</b>
<b>6.0 Miscellaneous Items</b>				
6.1 Environ. Mitig. (incl. Hazmat, Noise Reduct., etc.)	Route Mile	\$285,000	5.89	\$ 1,678,650
6.2 Maintenance of Traffic During Construction	%	5%	16,085,860	\$ 804,293
<b>Miscellaneous Items Subtotal</b>				<b>\$ 2,482,943</b>
<b>SUBTOTAL CONTRACTOR COSTS</b>				<b>\$ 51,404,226</b>
<b>7.0 Contractor Cost Contingency</b>				
7.1 Contractor Cost Contingency	%	10%	51,404,226	\$ 5,140,423
<b>GRAND SUBTOTAL CONTRACTOR COSTS</b>				<b>\$ 56,544,648</b>
<b>8.0 Owner Costs</b>				
7.1 Vehicles	Each	\$1,300,000	29	\$ 37,700,000
7.2 Planning, EA and Final Design Costs	%	8%	\$56,544,648	\$ 4,523,572
7.3 WMATA, PM, CM and Admin.	%	13%	\$56,544,648	\$ 7,350,804
7.4 Owner's Insurance Program	%	4.5%	\$56,544,648	\$ 2,544,509
<b>Owner Costs Subtotal</b>				<b>\$ 52,118,885</b>
<b>9.0 Owner Cost Contingency</b>				
9.1 Owner Cost Contingency	%	7%	\$56,544,648	\$ 3,958,125
<b>SUBTOTAL OWNER COSTS</b>				<b>\$ 56,077,011</b>
<b>GRAND TOTAL</b>				<b>\$ 112,621,659</b>

All costs shown in 2005 dollars.

(1) **Features included in BRT estimate**

- Curb to curb street reconstruction along entire route.
- Vehicle storage and maintenance at an expanded North Tract site.
- Ticket vending machines and real time vehicle arrival at each station.
- Minimal utilities relocation, related to curb to curb street reconstruction.

(2) **Features not included in BRT estimate**

- Traffic signal priority--assumed already in place by Arlington County.
- Streetscape improvements and reconstruction outside of curb.
- Colored or textured paving services, or lane delineations.
- Structural enhancements at Skyline or at bridge crossings.
- Property acquisition.

**COLUMBIA PIKE COST ESTIMATE**

**Streetcar Alternative**

Route length (mi)

5.89

Station stop platforms

36

ITEM	UNIT	UNIT COST	QUANTITY	ITEM COST
<b>1.0 Guideway Facilities</b>				
1.1 Standard Embedded Track (2 Single Tracks)	Route Feet	\$735	31,099	\$ 22,857,912
1.2 Universal Crossover	Set	\$595,000	4	\$ 2,380,000
1.3 Misc. Guideway Facilities	Route Feet	\$35	31,099	\$ 1,088,472
1.4 Traffic Signal Modifications - Miscellaneous	Lump Sum	\$600,000	1	\$ 600,000
1.5 Traffic Signal Priority System Installation (2)	Intersection	\$8,000	19	\$ -
<b>Guideway Facilities Subtotal</b>				<b>\$ 26,926,384</b>
<b>2.0 Utilities</b>				
2.1 Public Utilities	Route Feet	\$220	31,099	\$ 6,841,824
2.2 Private Utilities	Route Feet	\$100	31,099	\$ 3,109,920
2.3 Agency Agreements and Utility Fees	Lump Sum	\$340,000	1	\$ 340,000
<b>Utilities Subtotal</b>				<b>\$ 10,291,744</b>
<b>3.0 Systems</b>				
3.1 Overhead Contact System	Route Feet	\$250	31,099	\$ 7,774,800
3.2 Substations	Each	\$400,000	18	\$ 7,200,000
3.3 Communications	Lump Sum	\$50,000	5.89	\$ 294,500
3.4 Systems / Operations Testing	Lump Sum	5%	\$15,269,300	\$ 763,465
<b>Systems Subtotal</b>				<b>\$ 16,032,765</b>
<b>4.0 Station Stops</b>				
4.1 Bulb-out Side Platform, Complete	Lump Sum	\$150,000	36	\$ 5,400,000
4.2 Fare Collection Equipment (per Platform)	Lump Sum	\$90,000	36	\$ 3,240,000
4.3 Fare Collection Information Network	Allowance	\$500,000	1	\$ 500,000
4.4 Variable Message Board Equipment	Lump Sum	\$5,000	36	\$ 180,000
<b>Station Stops Subtotal</b>				<b>\$ 9,320,000</b>
<b>5.0 Shop &amp; Yard Facilities</b>				
5.1 Site work	Lump Sum	\$5,000,000	1	\$ 5,000,000
5.2 Building	Lump Sum	\$ 4,900,000	1	\$ 4,900,000
5.3 Equipment	Lump Sum	\$1,000,000	1	\$ 1,000,000
5.4 Yard lead track (includes OCS)	Route feet	\$700	2,500	\$ 1,750,000
<b>Shop &amp; Yard Subtotal</b>				<b>\$ 10,900,000</b>
<b>6.0 Miscellaneous Items</b>				
6.1 Environ. Mitig. (incl. Hazmat, Noise Reduct., etc.)	Route Mile	\$285,000	5.89	\$ 1,678,650
6.2 Maintenance of Traffic During Construction	Allowance	\$3,000,000	1	\$ 3,000,000
<b>Miscellaneous Items Subtotal</b>				<b>\$ 4,678,650</b>
<b>SUBTOTAL CONTRACTOR COSTS</b>				<b>\$ 78,149,543</b>
<b>7.0 Contractor Cost Contingency</b>				
7.1 Contractor Cost Contingency	%	10%	78,149,543	\$ 7,814,954
<b>GRAND SUBTOTAL CONTRACTOR COSTS</b>				<b>\$ 85,964,497</b>
<b>8.0 Owner Costs</b>				
8.1 Vehicles	Each	\$3,000,000	27	\$ 81,000,000
8.2 Planning, EA and Final Design Costs	%	8%	\$85,964,497	\$ 6,877,160
8.3 WMATA, PM, CM and Admin.	%	13%	\$85,964,497	\$ 11,175,385
8.4 Owner's Insurance Program	%	4.5%	\$85,964,497	\$ 3,868,402
<b>Owner Costs Subtotal</b>				<b>\$ 102,920,947</b>
<b>9.0 Owner Cost Contingency</b>				
9.1 Owner Cost Contingency	%	7%	\$85,964,497	\$ 6,017,515
<b>SUBTOTAL OWNER COSTS</b>				<b>\$ 108,938,462</b>
<b>GRAND TOTAL</b>				<b>\$ 194,902,959</b>

All costs shown in 2005 dollars.

- (1) **Features included in streetcar estimate**
  - Two Tracks along entire routes, with addition of yard lead track.
  - Vehicle storage and maintenance at an expanded North Tract site.
  - Ticket vending machines and real time vehicle arrival at each station.
  - Traction power feed: minimal distance to substations
  - Minimal utilities relocation.
- (2) **Features not included in streetcar estimate**
  - Traffic signal priority--assumed already in place by Arlington County.
  - Streetscape and street reconstruction beyond the guideway.
  - Structural enhancements at Skyline or at bridge crossings.
  - Property acquisition.



## A.4 Summaries of Operating and Maintenance Cost Estimates

### Columbia Pike Corridor Baseline Operations & Maintenance Costs

Day	Route	Avg. Ridership	Revenue Hours	Annual cost	Annual Revenue	Annual Subsidy	
<b>WEEKDAY</b>							
	Ann-Sky City-Pent	16L	171.81	653	\$114,456	\$24,581	\$89,875
	Columbia Pike	16-ABDFJ	5,918.22	29,618	\$3,261,996	\$846,720	\$2,415,276
	Col Hts W-Pent Ct	16-GHKW	3,247.19	18,574	\$2,212,816	\$464,576	\$1,748,240
	Col Pke-Farr Sq	16Y	621.54	3,514	\$495,976	\$88,924	\$407,052
	<b>Total</b>		<b>9,958.76</b>	<b>52,359</b>	<b>\$6,085,244</b>	<b>\$1,424,800</b>	<b>\$4,660,444</b>
<b>SATURDAY</b>							
	Columbia Pike	16-ABDFJ	4,487.00	5,063	\$561,774	\$145,783	\$415,991
	Col Hts W-Pent Ct	16-GHKW	1,560.00	1,459	\$167,432	\$50,684	\$116,747
	<b>Total</b>		<b>6,047.00</b>	<b>6,523</b>	<b>\$729,206</b>	<b>\$196,467</b>	<b>\$532,738</b>
<b>SUNDAY</b>							
	Columbia Pike	16-ABDFJ	3,100.00	2,337	\$281,580	\$100,719	\$180,861
	Col Hts W-Pent Ct	16-GHKW	1,369.00	1,254	\$160,284	\$44,479	\$115,805
	<b>Total</b>		<b>4,469.00</b>	<b>3,591</b>	<b>\$441,864</b>	<b>\$145,198</b>	<b>\$296,666</b>
<b>GRAND TOTAL</b>			<b>N/A</b>	<b>62,472</b>	<b>\$7,256,314</b>	<b>\$1,766,465</b>	<b>\$5,308,987</b>

Source: Arlington County WMATA Bus Data, December 2004.

**Columbia Pike Corridor  
Bus Rapid Transit (BRT) Operating & Maintenance Cost Estimate  
Option 1A - Pentagon to Baileys Crossroads**

Cost Items	Measure	Cost / Unit	Units	Annual O&M Cost
<b>1) BRT O &amp; M</b>	Annual Revenue Bus Hours	\$110.00	96,700	\$10,637,000
<b>2) Station Maintenance</b>	Stations - Services	\$29,134.00	17	\$495,278
	Stations - Mat. & Supp.	\$6,934.00	17	\$117,878
Sub Total Station Maintenance Costs				\$613,156
<b>3) BRT Vehicle Maintenance</b>				
Additional Maintenance cost for Articulated BRT Vehicle (versus typical transit bus)	Fleet Buses	\$6,541.63	24	\$156,999
	Bus-Miles	\$0.22	920,900	\$201,677
				\$358,676
<b>4) BRT Non-Vehicle Maintenance / Administration</b>				
Additional G/A costs (financial, maintenance facility, corridor management)	% of G/A \$			\$319,110
<b>Total BRT O&amp;M Cost Estimate</b>				<b>\$11,927,942</b>

Notes:

- 1) BRT O&M cost per annual revenue bus hour includes all Operating expenses associated with the provision of service (i.e., Administrative, Operations & Maintenance), however does not include BRT Facility Maintenance Costs (maintenance of BRT lanes and stations)
- 2) BRT Station Maintenance Costs based on peer LRT system costs per station.
- 3) BRT Vehicle Maintenance Costs assume the use of an articulated BRT vehicle. Cost per BRT fleet bus assumed to be 10% greater than standard transit bus.

**COLUMBIA PIKE CORRIDOR**  
**Streetcar O&M Cost Model**  
**Option 1A - Pentagon to Baileys Crossroads**

**I. INPUT VARIABLES**

Operating Statistic	Input Value
Peak Cars	22
Revenue Car-Miles	920,900
Revenue Train-Hours	87,700
Passenger Stations	17
Directional Route Miles	11.8
Maintenance Facilities	1

**II. COST SUMMARY BY COST CATEGORY/COST TYPE (2005\$)**

Type										
	Dept.	FUEL	INSUR	LABOR	MATL	MISC	SERV	TAX	UTIL	TOTAL
SC Operations	100			\$6,819,292	\$108,566	\$57,128	\$3,090,653		\$414,938	\$10,490,578
SC Maintenance	200	\$18,834		\$1,382,958	\$263,084	\$6,672	\$45,362			\$1,716,911
SC Facilities Maint.	300			\$1,566,687	\$218,924	\$875	\$518,195			\$2,304,681
SC Administration	400		\$202,604	\$1,046,473	\$180,967	\$230,633	\$991,263	\$8,563	\$578,270	\$3,238,773
<b>Grand Total</b>	<b>Grand Total</b>	<b>\$18,834</b>	<b>\$202,604</b>	<b>\$10,815,410</b>	<b>\$771,540</b>	<b>\$295,310</b>	<b>\$4,645,473</b>	<b>\$8,563</b>	<b>\$993,208</b>	<b>\$17,750,942</b>

**III. ANNUAL COST FACTORS (2005\$)**

Total Cost per Revenue Train-Hour =	\$202
Total Cost per Revenue Car-Mile =	\$19.28
Veh. Ops. Cost per Train-Hour =	\$120
Veh. Maint. Cost per Car-Mile =	\$1.86
Facil. Maint. Cost per Station =	\$135,569
Administrative Cost per Peak Car =	\$147,217

**COLUMBIA PIKE CORRIDOR PROJECT**  
**Streetcar O&M Cost Model**  
**Conference Center to Skyline**  
**All Stations, 6 min peak**

**I. INPUT VARIABLES**

Operating Statistic	Input Value
Peak Cars	9
Revenue Car-Miles	445,500
Revenue Train-Hours	45,300
Passenger Stations	17
Directional Route Miles	9.4
Maintenance Facilities	1

**II. COST SUMMARY BY COST CATEGORY/COST TYPE (2005\$)**

Type		FUEL	INSUR	LABOR	MATL	MISC	SERV	TAX	UTIL	TOTAL
Dept.										
SC Operations	100			\$3,431,635	\$55,038	\$28,962	\$1,549,929		\$193,714	\$5,259,278
SC Maintenance	200	\$7,480		\$557,534	\$123,564	\$1,343	\$21,306			\$711,227
SC Facilities Maint.	300			\$914,787	\$92,867	\$560	\$222,765			\$1,230,980
SC Administration	400		\$107,471	\$0	\$44,913	\$57,240	\$196,853	\$3,401	\$388,297	\$798,175
<b>Grand Total</b>	<b>Grand Total</b>	<b>\$7,480</b>	<b>\$107,471</b>	<b>\$4,903,956</b>	<b>\$316,383</b>	<b>\$88,105</b>	<b>\$1,990,852</b>	<b>\$3,401</b>	<b>\$582,012</b>	<b>\$7,999,660</b>

**III. ANNUAL COST FACTORS (2005\$)**

Total Cost per Revenue Train-Hour =	\$177
Total Cost per Revenue Car-Mile =	\$17.96
Veh. Ops. Cost per Train-Hour =	\$116
Veh. Maint. Cost per Car-Mile =	\$1.60
Facil. Maint. Cost per Station =	\$72,411
Administrative Cost per Peak Car =	\$88,686

**COLUMBIA PIKE CORRIDOR PROJECT**  
**Streetcar O&M Cost Model**  
**Conference Center to Skyline**  
**Reduced Stations, 6 min peak**

**I. INPUT VARIABLES**

Operating Statistic	Input Value
Peak Cars	8
Revenue Car-Miles	445,500
Revenue Train-Hours	38,300
Passenger Stations	14
Directional Route Miles	9.4
Maintenance Facilities	1

**II. COST SUMMARY BY COST CATEGORY/COST TYPE (2005\$)**

	Sum of (2003 dollars)	Type								TOTAL
	Dept.	FUEL	INSUR	LABOR	MATL	MISC	SERV	TAX	UTIL	
SC Operations	100			\$2,842,349	\$46,211	\$24,317	\$1,310,425		\$183,639	\$4,406,942
SC Maintenance	200	\$6,649		\$557,534	\$123,564	\$1,343	\$21,306			\$710,396
SC Facilities Maint.	300			\$849,237	\$86,525	\$521	\$206,563			\$1,142,847
SC Administration	400		\$107,471	\$0	\$39,274	\$50,053	\$174,980	\$3,023	\$350,326	\$725,128
<b>Grand Total</b>	<b>Grand Total</b>	<b>\$6,649</b>	<b>\$107,471</b>	<b>\$4,249,120</b>	<b>\$295,575</b>	<b>\$76,234</b>	<b>\$1,713,275</b>	<b>\$3,023</b>	<b>\$533,966</b>	<b>\$6,985,313</b>

**III. ANNUAL COST FACTORS (2005\$)**

Total Cost per Revenue Train-Hour =	\$182
Total Cost per Revenue Car-Mile =	\$15.68
Veh. Ops. Cost per Train-Hour =	\$115
Veh. Maint. Cost per Car-Mile =	\$1.59
Facil. Maint. Cost per Station =	\$81,632
Administrative Cost per Peak Car =	\$90,641

**COLUMBIA PIKE CORRIDOR PROJECT**  
**Streetcar O&M Cost Model**  
**Conference Center to Skyline**  
**All Stations, 12 min peak**

**I. INPUT VARIABLES**

Operating Statistic	Input Value
Peak Cars	5
Revenue Car-Miles	349,400
Revenue Train-Hours	37,200
Passenger Stations	17
Directional Route Miles	9.4
Maintenance Facilities	1

**II. COST SUMMARY BY COST CATEGORY/COST TYPE (2005\$)**

		Type								TOTAL
	Dept.	FUEL	INSUR	LABOR	MATL	MISC	SERV	TAX	UTIL	
SC Operations	100			\$2,736,968	\$44,135	\$23,224	\$1,272,789		\$139,749	\$4,216,864
SC Maintenance	200	\$4,156		\$431,001	\$96,910	\$1,027	\$16,710			\$549,804
SC Facilities Maint.	300			\$914,787	\$92,867	\$560	\$222,765			\$1,230,980
SC Administration	400		\$91,011	\$0	\$37,494	\$47,784	\$109,363	\$1,890	\$388,297	\$675,838
<b>Grand Total</b>	<b>Grand Total</b>	<b>\$4,156</b>	<b>\$91,011</b>	<b>\$4,082,757</b>	<b>\$271,405</b>	<b>\$72,595</b>	<b>\$1,621,626</b>	<b>\$1,890</b>	<b>\$528,046</b>	<b>\$6,673,486</b>

**III. ANNUAL COST FACTORS (2005\$)**

Total Cost per Revenue Train-Hour =	\$179
Total Cost per Revenue Car-Mile =	\$19.10
Veh. Ops. Cost per Train-Hour =	\$113
Veh. Maint. Cost per Car-Mile =	\$1.57
Facil. Maint. Cost per Station =	\$72,411
Administrative Cost per Peak Car =	\$135,168

**COLUMBIA PIKE CORRIDOR PROJECT**  
**Streetcar O&M Cost Model**  
 Conference Center to Skyline  
 Reduced Stations, 12 min peak

**I. INPUT VARIABLES**

Operating Statistic	Input Value
Peak Cars	4
Revenue Car-Miles	349,400
Revenue Train-Hours	30,200
Passenger Stations	14
Directional Route Miles	9.4
Maintenance Facilities	1

**II. COST SUMMARY BY COST CATEGORY/COST TYPE (2005\$)**

	Sum of (2003 dollars)	Type								TOTAL
	Dept.	FUEL	INSUR	LABOR	MATL	MISC	SERV	TAX	UTIL	
SC Operations	100			\$2,169,980	\$35,308	\$18,579	\$1,033,286		\$129,674	\$3,386,826
SC Maintenance	200	\$3,325		\$431,001	\$96,910	\$1,027	\$16,710			\$548,972
SC Facilities Maint.	300			\$849,237	\$86,525	\$521	\$206,563			\$1,142,847
SC Administration	400		\$91,011	\$0	\$31,855	\$40,597	\$87,490	\$1,512	\$350,326	\$602,792
<b>Grand Total</b>	<b>Grand Total</b>	<b>\$3,325</b>	<b>\$91,011</b>	<b>\$3,450,219</b>	<b>\$250,598</b>	<b>\$60,724</b>	<b>\$1,344,049</b>	<b>\$1,512</b>	<b>\$480,000</b>	<b>\$5,681,437</b>

**III. ANNUAL COST FACTORS (2005\$)**

Total Cost per Revenue Train-Hour =	\$188
Total Cost per Revenue Car-Mile =	\$16.26
Veh. Ops. Cost per Train-Hour =	\$112
Veh. Maint. Cost per Car-Mile =	\$1.57
Facil. Maint. Cost per Station =	\$81,632
Administrative Cost per Peak Car =	\$150,698

## A.5 Description of VISSIM Traffic Simulation Process

VISSIM is a microscopic, time step and behavior-based simulation program developed to model traffic and transit operations. The software can account for lane configuration, traffic composition, traffic signals, transit stops, and other factors, making it a useful tool for the evaluation of alternatives.

### VISSIM Input

Unlike other traffic simulation models, which often use a rigid link-node network structure, VISSIM uses variable links and connectors to construct streets, intersections and transitways. This allows high flexibility when working with complex geometries and interfaces of transportation modes. VISSIM can accurately model roadway curvature, variable locations of intersection features, realistic vehicle paths and transit station configurations. Constructing a VISSIM model requires creating the roadway network, entering traffic volumes, specifying traffic control and signal timing, defining transit service, and setting network-wide parameters.

VISSIM models each vehicle individually and independently. The movement of each vehicle depends on nearby traffic control devices, the proximity of other vehicles, and that vehicle's driver behavior parameters. Vehicles' physical characteristics, such as length, capacity and acceleration rate also help define how they move in the model.

Each traffic signal in the network is simulated by a computer program known as a Vehicle Actuation Program (VAP). Each VAP includes programming code instructing the signals when to change. VAPs are sophisticated enough that they can replicate the behavior of most real-world signal controllers.

**Transit Scheduling.** Once a network of roadways, transitways and stations is defined in the model, multiple transit routes can be assigned to the network. Each route is defined with a specific type of vehicle, a sequence of movements along the network, and specific stops to make, at some or all of the stations along the way. Each route is also defined by the frequency of transit service on that route and the time spent dwelling at each station.

In VISSIM, transit schedules are defined by the set of sequential events composing the route. These events include the times that transit vehicles enter the model, the stations where the vehicles stop, the dwell time at each station, and the traffic delays experienced between stations. Whether the transit vehicle meets the desired schedule depends on the vehicle's interaction with the simulated environment, similar to the way a real-world bus driver must try to meet a schedule when faced with traffic congestion and traffic signals.

### Calibration

**VISSIM Characteristics.** Even a sophisticated simulation package such as VISSIM cannot fully model the wide variety of human behavior. In VISSIM, vehicles behave according to complex mathematical algorithms. Real-world drivers are infinitely more complex, often displaying erratic behavior difficult to mimic with a simulation model. The following are examples of operational characteristics of VISSIM patterns that typically differ from real-world conditions:

- VISSIM drivers do not know whether they will be turning at an intersection until they reach a decision point, typically a block or two in advance of the intersection. Drivers in the right lane are as likely to turn left as those in the left lane. This can concentrate lane changes over a short distance, unlike in the real world, where lane changes are better distributed.

- If VISSIM drivers decide to change lanes and the lane they want to enter is blocked, they will stop until the blockage clears, congesting traffic in the adjacent lane. Some real-world drivers exhibit this behavior, but nearly all VISSIM drivers do so.
- VISSIM pedestrians do not cross mid-block and only cross when the WALK signal indication is displayed. Real-world pedestrians can be more unpredictable.
- VISSIM drivers never stop in a travel lane to park or load or unload passengers. VISSIM can model trucks in the traffic stream, but even VISSIM trucks do not block lanes for loading purposes.

**Calibration Process.** Calibration of the model is a process intended to verify that the traffic conditions in the real world are sufficiently replicated by the simulation, despite the inevitable differences that exist. The calibration process uses a VISSIM model of existing conditions, an additional model beyond those developed to compare alternatives in the future. The first step in the process is to review VISSIM's animation of the simulated environment, ensuring that all the traffic and transit components are operating properly. Usually, some of the model parameters need to be fine-tuned to reproduce a realistic network. These parameters include driver behavior characteristics, saturation flow rate, roadway characteristics, vehicle characteristics, and traffic signal timing. Each signal's VAP is tested individually, and the network is tested as a whole to ensure that the traffic signals are faithfully represented in the model.

When the visual inspection of the animation appears to be satisfactory, the model is coded with travel time segments, delay segments, queue counters, and other data collection techniques to produce statistical results. Calibration of these results with field data is then performed. Traffic volume throughput is measured to ensure that the number of vehicles programmed to pass through the intersection are actually passing through. Queue lengths at critical intersections are measured both in the field and the model to ensure consistency. Some changes to model parameters may still need to be made to sufficiently replicate field conditions. The model is only considered complete when the calibration process is finished.

Because of the microscopic nature of the model, calibration can be a lengthy, iterative process. However, calibration is essential to effective operation of the model: an uncalibrated model can yield entirely inaccurate conclusions.

## **VISSIM Output**

VISSIM produces both statistical reports of measures of effectiveness and graphical animation output. Both are useful in different ways to analyze, interpret and use the results of a simulation.

**Measures of Effectiveness.** VISSIM produces text-based output reports containing detailed results for any location within the model over any time interval. Depending on the data collection requested by the user, VISSIM produces several text files containing travel time, delay and throughput data that can be extracted into a spreadsheet for interpretation.

**Animation.** Graphical animation allows the user to view traffic control operations, traffic interactions and congestion levels on the simulated roadways and transitways to verify that the model is simulating conditions realistically and to visually compare alternatives. VISSIM's 2-D animation can be displayed on top of a background aerial image of the streets being modeled.