

Open House Welcome

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Washington Metropolitan Area Transit Authority (WMATA)



Planning Context

- **Previous Initiatives**

- Baileys Crossroads Revitalization District
- Columbia Pike Revitalization Plan (Form-Based Code)
- Streetspace Task Force

- **Planning Parameters**

- Horizon Year: 2030
- Surface Running
- Mixed Traffic
- “Main Street” Environment
- Pedestrian Friendly



Planning Process

DECISIONS

Related Arlington and Fairfax County and WMATA Plans

PREVIOUS WORK

Does the current system work?

Constrained Long Range Plan, 1998
WMATA Transit Service Expansion Plan, 1999
Northern Virginia 2020 Plan, 1999
10 Year Capital Improvement Plan, 2002

What are the problems or needs?

Regional Bus Study, 2002
Columbia Pike Initiative - Revitalization Plan, 2002
Baileys Planning District, 2003

What are the options?

WE ARE
HERE

Columbia Pike Phase I Study
Columbia Pike Phase II Study, 2002
Pike Transit Initiative, 2004

NEXT STEPS

What are the costs and benefits?

Environmental analysis and documentation
Mitigation plan
Identification of funding sources

What is the preferred option?

Select locally preferred alternative (LPA)
Environmental finding
Financial plan

How can we get it done?

Permits
Funding

Study Scope/Schedule

	SPRING	SUMMER	FALL	WINTER
Alternatives Development	■			
Design Dialogues	■			
Technical Analysis		■		
Alternatives Evaluation			■	
Selection of the Locally Preferred Alternative			■	
Final Report			■	
Public Involvement Program	<ul style="list-style-type: none"> • Stakeholder Outreach 		<ul style="list-style-type: none"> • Storefront Displays • Project Newsletter • Project Website 	

Community Involvement



WMATA Board
and Local
Elected Officials

(informal)

Public Participation

Design Dialogue
Sessions

Community
Meetings

Website

Hotline

Newsletters

Storefront displays

Policy
Advisory Committee

Project Working
Group

(Formal)



Statement of Needs

- **Improve mobility and capacity within and through the corridor**
- **Improve access to jobs and services**
- **Support economic development plans**



Goals and Objectives

- **Increase mobility within the corridor**
- **Contribute to and serve as a catalyst for economic development**
- **Provide a safe environment for all modes of travel**
- **Improve regional connections**
- **Complement community goals to create a pedestrian - friendly main street environment**



Evaluation Criteria

Goals/Objectives	Evaluation Criteria	Measure of Effectiveness
Access & Mobility		
Increase mobility within the corridor	Corridor Transit Travel Time	Change in Transit Travel Time to Pentagon/Pentagon City from Bailey's Crossroads Change in Transit Travel Time to Bailey's Crossroads from Pentagon/Pentagon City
	Accessibility	Future Employment Near Stops (within 1/4 mile for Build Alternatives, within 1/4 mile for Baseline) Future Population Near Stops (within 1/4 mile for Build Alternatives, within 1/4 mile for Baseline)
	Ridership	Change in transit ridership or mode share Change in transit passenger capacity Change in total person through-put
	Traffic Conditions	Change in intersection Levels of Service Automobile travel time between Pentagon/Pentagon City and Bailey's Crossroads
Community & Economic Development		
Contribute to and serve as a catalyst for economic development	Support of County revitalization efforts	Percentage of Revitalization Districts within walking distance of stops (1/4 mile for Build Alternatives, 1/4 mile for Baseline) Potential of Alternative to serve as catalyst for development Probability of private sector funding support
Safety, Reliability, and Comfort		
Provide a safe environment for all modes of travel	Accommodation of transit, auto, pedestrian, and bicycle modes	Accident rates for transit vehicles in environments similar to project Alternatives Accident rates for pedestrians in environments similar to project Alternatives Accident rates for bicycles in environments similar to project Alternatives Accident rates for automobiles in environments similar to project Alternatives
	Transit Rider Visibility	Standards for Crime prevention through Environmental Design (CPTED) incorporated into station concepts.
	Ride Quality and Technical Reliability	Passenger comfort and ride quality Average frequency of vehicle breakdowns by technology type Precision docking capability
Regional Connections		
Improve regional transportation connections	Regional Transit Travel Time	Change in Transit Travel Time to select Regional Activity Centers Percentage of regional employment accessible by transit in less than 60 minutes
Community Goals		
Complement community goals to create a pedestrian-friendly main-street environment in the corridor	Consistency with Adopted Local Plans	Columbia Pike revitalization recommendations incorporated
	Aesthetics	Potential visual impacts Potential noise impacts

Draft Measures of Effectiveness, - October 21, 2004

Wide Range of Alternatives



MODES:

- Automated Guideway
- Bus Rapid Transit
- Light Rail Transit
- Monorail
- Streetcar
- Metrorail

PROPULSION

- Compressed Natural Gas (CNG)
- Diesel
- Hybrid
- Overhead Electric
- "Third Rail" Electric

ALIGNMENT

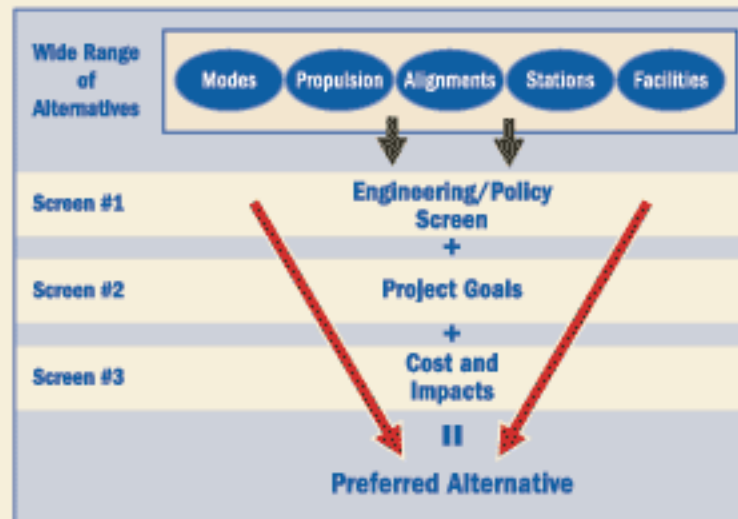
- Surface/Underground/Aerial
- Parallel Routes/Couplet
- Dedicated right-of-way
- Mixed Traffic Right-of-Way
- Curb or Median

STATIONS/STOPS & FACILITIES

- Spacing
- Amenities
- Joint Development



Screening of Alternatives



Engineering and Policy Screen: Mode

Criteria	BRT	Streetcar	LRT	DMU	AGT	Monorail	Heavy Rail
Surface Running	●	●	●	●	○	○	○
Shared Travel Lanes	●	●	●	●	○	○	○
Compatible with Urban Form	●	●	○	○	○	○	○

● = Yes ○ = No

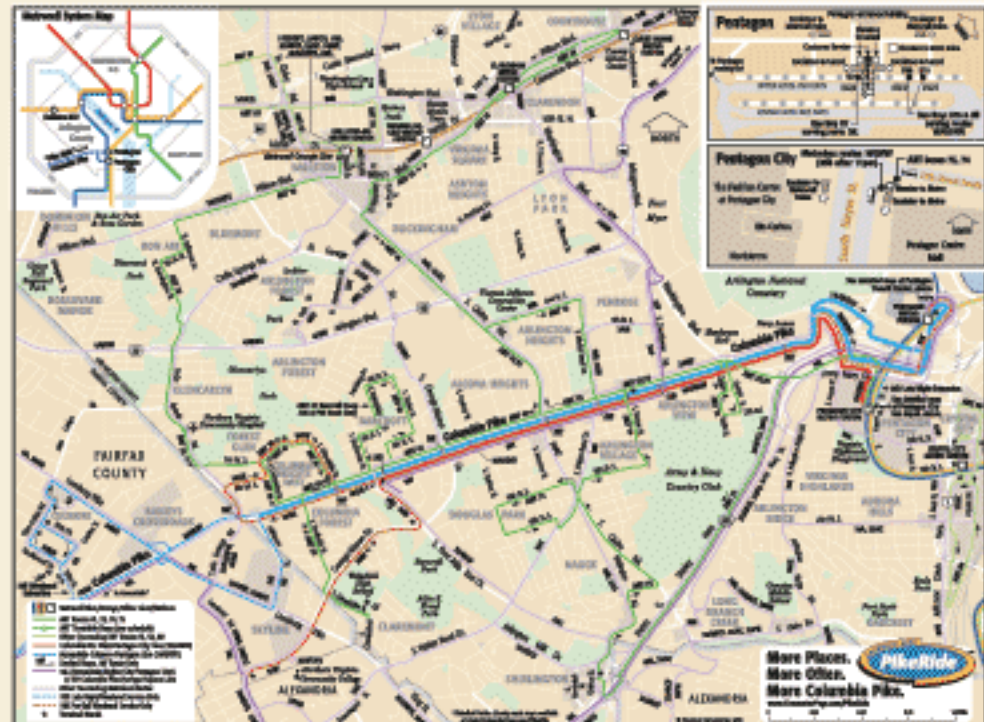
Baseline/No Action Alternative

TRANSIT IMPROVEMENTS

- Existing “PikeRide” Service to Pentagon and Pentagon City
- Signal Prioritization for Transit
- Real-Time Bus Arrival Information
- Enhanced Bus Stops

ROADWAY IMPROVEMENTS

- Redesign and rebuild segments of Columbia Pike to include:
 - Wider sidewalks
 - On-street parking
 - Narrower travel lanes
 - Streetscape improvements



Bus Rapid Transit (BRT) Alternative

VEHICLE (Typical)

- 60-foot diesel-electric hybrid bus with 4 doors and capacity of 46 seated passengers and 60 standees; rubber-tired for operation on paved way

ALIGNMENT

- Along the outside travel lane on Columbia Pike, and along the inside travel lane or the median in the Bailey's Crossroads and Pentagon City areas.

PASSENGERS STATIONS

- 80-foot low platforms with shelter and amenities.

STREET IMPROVEMENTS

- Curb-to-curb reconstruction to achieve "rail-like" ride quality for BRT passengers. Would be coordinated with Roadway Improvements under "No Action" Alternative

SERVICE - SPAN

- 7 days per week (20 hrs/day)

PEAK HEADWAYS

- 3 Minutes

BASELINE BUS NETWORK

- Reconfigured to feed new service along Columbia Pike

PARK AND RIDE FACILITY

- At Jefferson Street near Bailey's Crossroads



Build Alternatives: Alignment

Bus Rapid Transit (BRT)

Bus rapid transit (BRT) is a type of limited-stop bus service developed in the 1990s that relies on technology to help speed up the service. It can operate on exclusive busways, high-occupancy-vehicle lanes, expressways, or ordinary streets. A BRT line combines intelligent transportation systems technology, priority for transit, rapid and convenient fare collection, and integration with land use policy in order to substantially upgrade bus system performance.

Average Cost:	\$4 - \$10 million per mile / \$300,000 - \$1 million per vehicle
Typical Daily Ridership:	5,000 - 15,000 per day
Typical Application:	Medium to high volume commute corridors
Where Used:	Ottawa, Canada Systems under development nationwide

Streetcar

Streetcars are metropolitan electric railway vehicles designed to fit the scale and traffic patterns of the neighborhoods through which they travel. Streetcar vehicles are narrower and shorter than other rail cars typically seen in service in the United States. They run in mixed traffic and, except at stops, accommodate existing curbside parking and loading.

Average Cost:	\$10-\$12 million per mile/\$600,000-\$2.5 million per vehicle
Typical Daily Ridership:	5,000 - 15,000 per day
Typical Application:	Medium to high volume circulator service Collector/Distributor for regional transit systems
Where Used:	Modern systems: Portland Vintage systems: Tampa, New Orleans, Memphis, others



Streetcar Alternative

VEHICLE (Typical)

- 66-foot electric tram with 4 doors and capacity of 44 seated passengers and 90 standees; steel-wheeled for operation on track; may be linked to form multiple-car consists

ALIGNMENT

- Along the outside travel lane on Columbia Pike, and along the inside travel lane or the median in the Bailey's Crossroads and Pentagon City areas

PASSENGER STATIONS

- 80-foot low platforms with shelters and amenities



STREET IMPROVEMENTS

- Street reconstruction as needed to place track slab

SERVICE SPAN

- 7 days per week (20 hrs/day)

PEAK HEADWAYS

- 3 minutes

BASELINE BUS NETWORK

- Reconfigured to feed new service along Columbia Pike

PARK AND RIDE FACILITY

- At Jefferson Street near Bailey's Crossroads



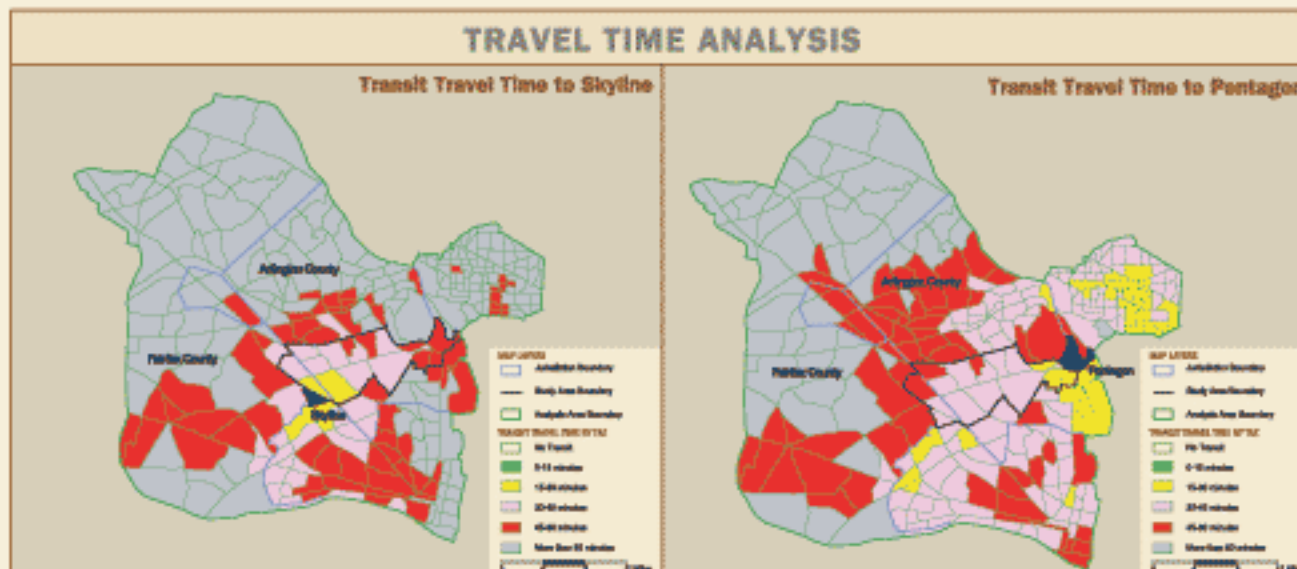
Baseline/No Action Alternative

BUS SERVICE MODIFICATIONS

- Street space modifications result in elimination of Route 16F. Peak frequencies along Columbia Pike will be improved to accommodate riders formerly using Route 16F.
- Extend existing Route 16H inbound service to begin near Blair Road and Columbia Pike in Fairfax County.

Roughly one-half of the existing 16G outbound service will be converted to provide two-way service through to Blair Road.

- Extend existing peak period 16W to begin at the Northern Virginia Community College



Build Alternatives: Operating Characteristics

BUS SERVICE MODIFICATIONS

- Replace current Columbia Pike service with Build Alternative service.
- Retain Route 16Y service to Farragut Square. Along Columbia Pike, stop only at Build Alternative stations.
- Reroute Routes 16A and 16D from Annandale to Jefferson Transit Center, where a transfer would be made to the Build Alternative.
- Retain Route 16L (Annandale to Pentagon).
- Operate Route 16E as a shuttle from Culmore to Jefferson Transit Center, where a transfer would be made to the Build Alternative.
- Begin Route 16H at Blair Road. Transfer to Build Alternative at the Jefferson Transit Center.
- Extend Route 4A from Culmore to the Jefferson Transit Center.
- Replace Route 16W with Build Alternative station near Four Mile Run and shuttle service from Northern Virginia Community College Alexandria Campus to Jefferson Transit Center.
- Divert Routes 25 and 28 to the Jefferson Transit Center to provide a connection with the Build Alternative.
- Limit stops for service along Columbia Pike to Build Alternative stops.

Build Alternatives: Schedule

Service Periods	Monday-Thursday	Friday	Saturday	Sunday
Peak Hours (5:30 a.m. – 9:30 a.m., 3:00 p.m. – 7:00 p.m.)	3 minute	3 minute	10 minute	10 minute (service begins at 6:30 a.m.)
Midday (9:30 a.m. – 3:00 p.m.)	10 minute	10 minute	10 minute	10 minute
Evening (7:00 p.m. – 12:30 a.m.)	10 minute	10 minute	10 minute	10 minute
Early Morning / Late Night (5:00 a.m. – 5:30 a.m., 12:30 a.m. – 3:30 a.m.)	15 minute (until 1:30 a.m. only)	15 minute	15 minute (service begins at 6:30 a.m.)	No Service



Build Alternatives: Operating Characteristics

Streetcar

Option	Alignment					
	Baileys's Crossroads	Pentagon/Pentagon City	Distance (miles)	Run Time (min:sec)	Average Speed (mph)	Fleet Vehicles
1A	Jefferson St. through Skyline Mall, George Mason Dr., Seminary Rd.	Hayes St., Army Navy Dr	5.89	29:19	12.1	29
1B		Joyce St. w/ Pentagon Row	6.18	30:09	12.3	30
2A	Jefferson St., Leesburg Pike, George Mason Dr., Seminary Rd.	Hayes St., Army Navy Dr	6.04	29:38	12.2	29
2B		Joyce St. w/ Pentagon Row	6.32	30:18	12.5	30



Bus Rapid Transit (BRT)

Option	Alignment					
	Baileys's Crossroads	Pentagon/Pentagon City	Distance (miles)	Run Time (min:sec)	Average Speed (mph)	Fleet Vehicles
1A	Jefferson St. through Skyline Mall, George Mason Dr., Seminary Rd.	Hayes St., Army Navy Dr	5.89	31:13	11.3	31
1B		Joyce St. w/ Pentagon Row	6.18	32:07	11.5	33
2A	Jefferson St., Leesburg Pike, George Mason Dr., Seminary Rd.	Hayes St., Army Navy Dr	6.04	31:31	11.5	31
2B		Joyce St. w/ Pentagon Row	6.32	32:15	11.8	33



Summary of Estimated Costs

CONSTRUCTION COSTS

	Stations and Running Way	Facilities	Vehicles	Totals
BRT	\$20 to \$65 Million	\$20 to \$30 Million	\$10 to \$35 Million	\$50 to \$130 Million
Streetcar	\$45 to \$75 Million	\$25 to \$35 Million	\$20 to \$75 Million	\$90 to \$185 Million

YEARLY OPERATIONS AND MAINTENANCE COSTS

	Hours	Costs per hour	Totals	Costs Per Passenger
BRT	95,000 - 100,000	\$130 - \$145 / hour	\$12 to \$14 Million	?
Streetcar	90,000 - 95,000	\$175 - \$200 / hour*	\$16 to \$19 Million	?

*Assumed single car operation

Effects on Traffic: Key Locations



COLUMBIA PIKE & S. JEFFERSON STREET

- Platforms could be accommodated in recommended narrowed width of Columbia Pike.
- Westbound transit left turn would require exclusive signal phase.
- No effect on auto turning movements.
- No encroachment on existing curbs/sidewalks.



COLUMBIA PIKE & SCOTT STREET

- Transitway transitions from curbside-running to median-running at a new traffic signal planned for Scott Street.
- Scott Street traffic signal would likely include separate signal phase for transit vehicles.
- Minor adjustment of existing curbs to implement recommended street width.



12th STREET & HAYES STREET

- Northbound transit right turn would require exclusive signal phase.
- No effect on auto turning movements.
- No encroachment on existing curbs/sidewalks.

Effect On Traffic

Simulation Model



Inputs coded into the simulation model

Street network:

- Street and intersection locations
- Number of lanes
- Traffic signal operations

Traffic volume:

- Number of turns at intersections

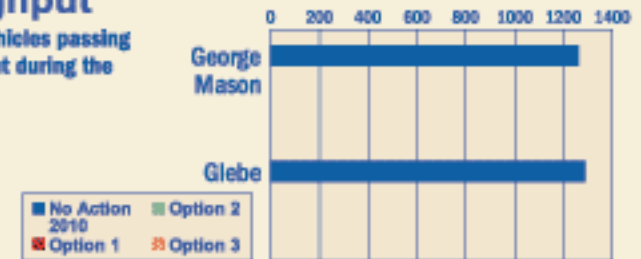
Within the model

- Random variation
- Vehicles make decisions

MEASURES OF EFFECTIVENESS

Throughput

Number of vehicles passing a certain point during the peak hour



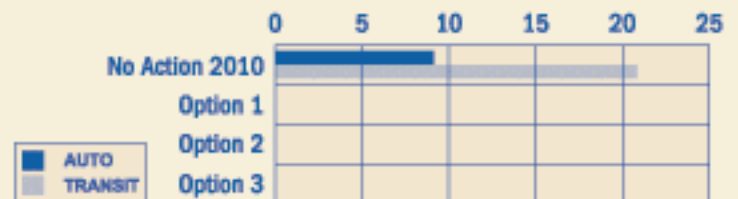
Intersection Performance

Average delay experienced by autos and transit vehicles

Intersection of Columbia Pike with:	No Action 2010	Option 1	Option 2	Option 3
George Mason Dr	○ (POOR)			
Glebe Rd	◐ (FAIR)			
Walter Reed Dr	◐ (FAIR)			
Others	● (GOOD)			

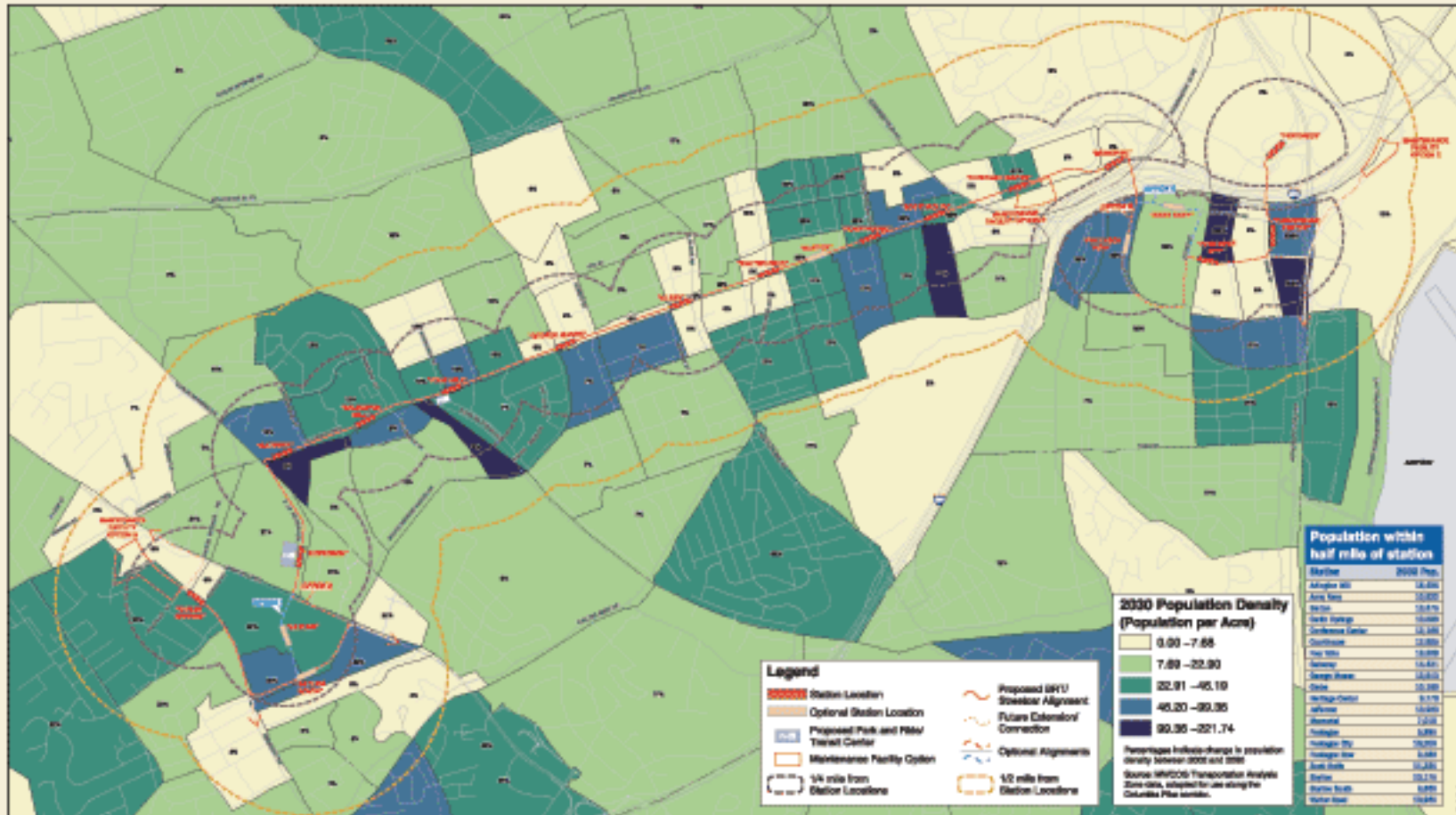
Travel Time

Time needed to traverse the corridor using autos or transit



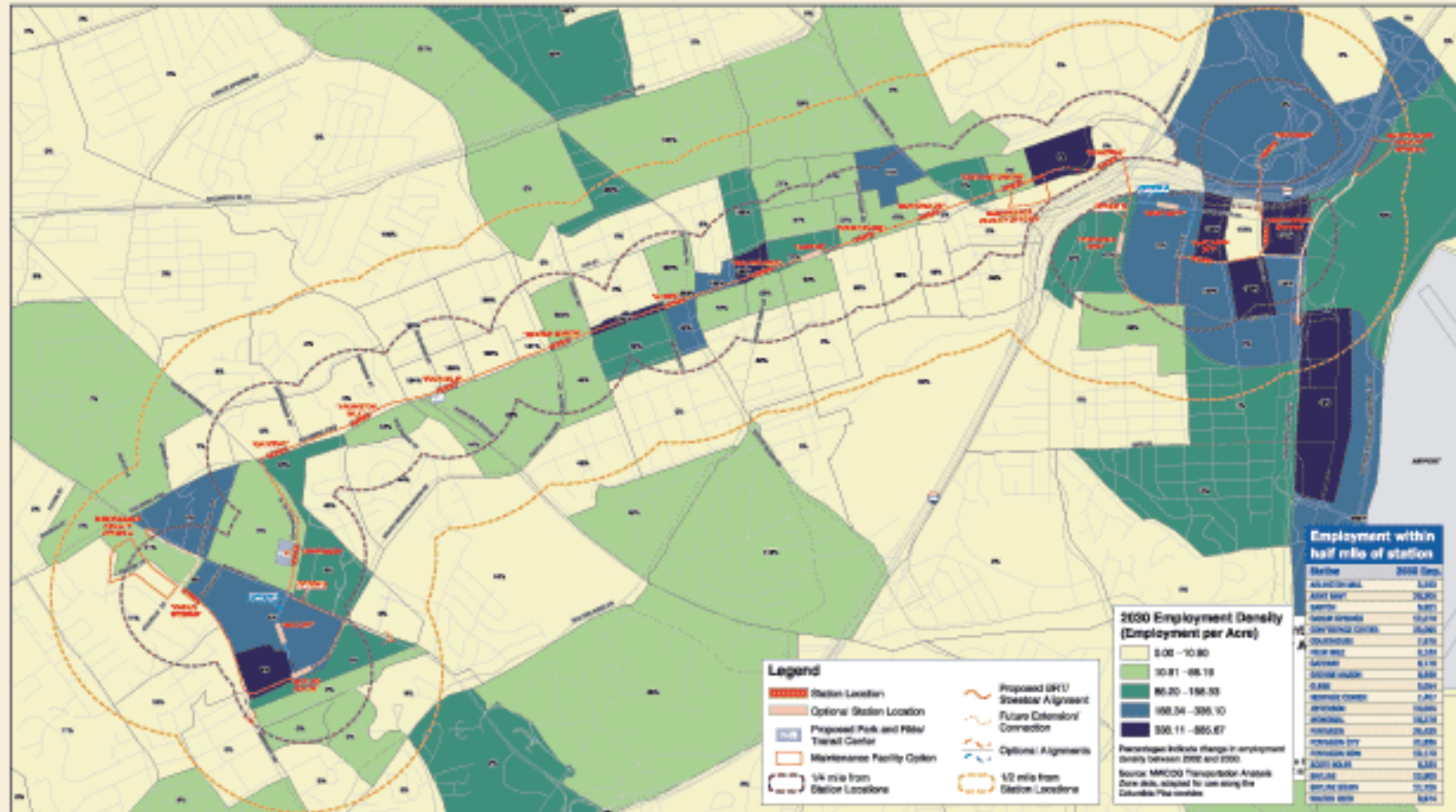
Population and Employment

Population by TAZ within 1/2 Mile of Stations



Population and Employment

Employment by TAZ within 1/2 Mile of Stations



Funding and Financing Options

FEDERAL FUNDING SOURCES

- **New Starts Funds**

- In past, available projects with dedicated running ways
- high competition for limited funds
- Concerns over long-term funding commitments
- FTA proposed change for TEA-21 reauthorization makes all capital performance enhancements eligible for new start funds

- **Other Federal funding sources used for BRT**

- Urbanized Area Formula Grant
- Bus Capital Program
- STP funds (through FHWA)
- CMAQ

LOCAL FUNDING SOURCES

- **State Revenues**

- **County Revenues**

- **Non-government sources**

- Benefit Assessment District
- Value Capture
- Lease Arrangements
- Transfer and Lease Back
- Joint Development

