

Planning for Bus Rapid Transit in the Rockville/Gaithersburg Area

**Executive Office Building, Lobby Auditorium
December 3, 2015
7:00-9:30 pm**

AGENDA

- 7:00** *Introductory remarks:* County Executive Leggett, Council President Floreen, Mayors Newton and Ashman
- 7:10** *Overview of BRT planning in Montgomery County:* Joana Conklin, Rapid Transit System Development Manager, Montgomery County Department of Transportation
- 7:25** *Corridor Cities Transitway Planning Study:* Rick Kiegel, Maryland Transit Administration
- 7:40** *MTA's role in BRT planning in Montgomery County:* Kevin Quinn, Director, Office of Planning & Programming, Maryland Transit Administration
- 7:45** *MD 355 BRT Planning Study:* Jackie Seneschal, Parsons Brinckerhoff
- 8:15** *Gaithersburg studies re MD 355 BRT:* Martin Matsen, Planning Division Chief, City of Gaithersburg
- 8:30** *Rockville Town Center BRT Study:* Andrew Gunning, Assistant Director, Department of Community Planning & Development Services, City of Rockville,
- 8:45** *MD 586 (Veirs Mill Road) BRT Planning Study:* Jackie Seneschal, Parsons Brinckerhoff
- 9:00** *Discussion and closing remarks*
- 9:30** *Adjournment*



Montgomery County Department of Transportation

Rapid Transit System Update

Elected Officials Briefing
December 3, 2015

Topics

- Public Outreach Efforts
- Development of RTS Goals, Objectives, and Measures of Effectiveness
- RTS Program Status and Schedule Update

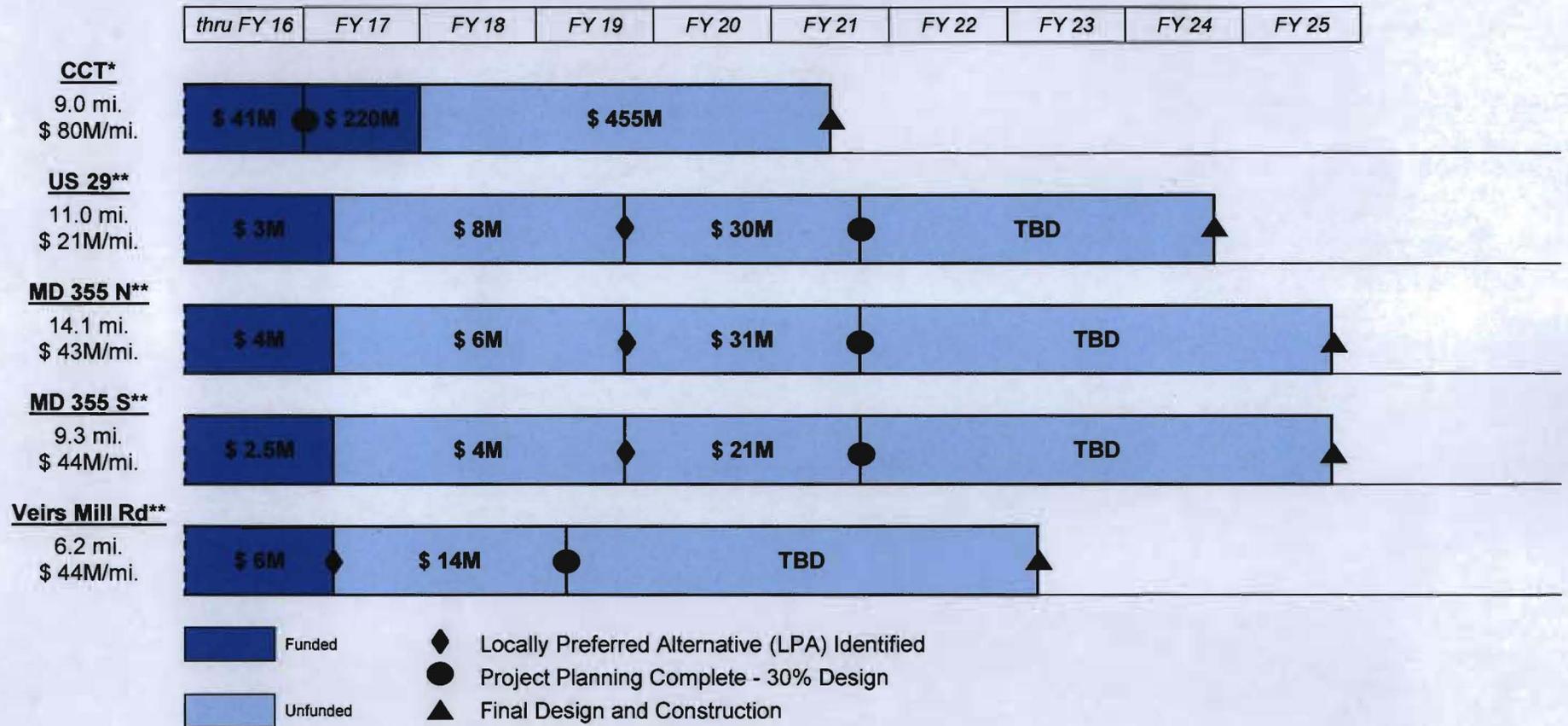
Outreach Efforts

- Corridor Advisory Committees (CACs)
 - Four meetings held so far
 - Next round of meetings in December/January
- Coordination with agencies through Steering Committee
- Open Houses (MD 355 and US 29)
 - Project Introduction – April 2016
 - Alternatives Retained for Study – Fall 2016
- Veirs Mill Road Alternatives Open House Spring 2016
- Stakeholder Meetings as Requested

RTS Goals, Objectives, and Measures of Effectiveness

- Developed jointly by county and state
- Guidance leading toward:
 - Purpose and need statements for corridor studies and NEPA documents
 - Evaluation measures to compare alternatives
 - Development of design standards for stations, vehicles, and service plans
 - Performance standards for operating service

Program Status and Schedule



Notes

* Costs based on MTA's 2012 CTP, with outstanding expenditures escalated to 2015 dollar values. Based on recent discussions with MTA, it is expected that project costs will be higher than 2012 estimates.

** Project costs based on SHAMTA estimates

CORRIDOR CITIES TRANSITWAY

Montgomery County Council Briefing

December 3, 2015



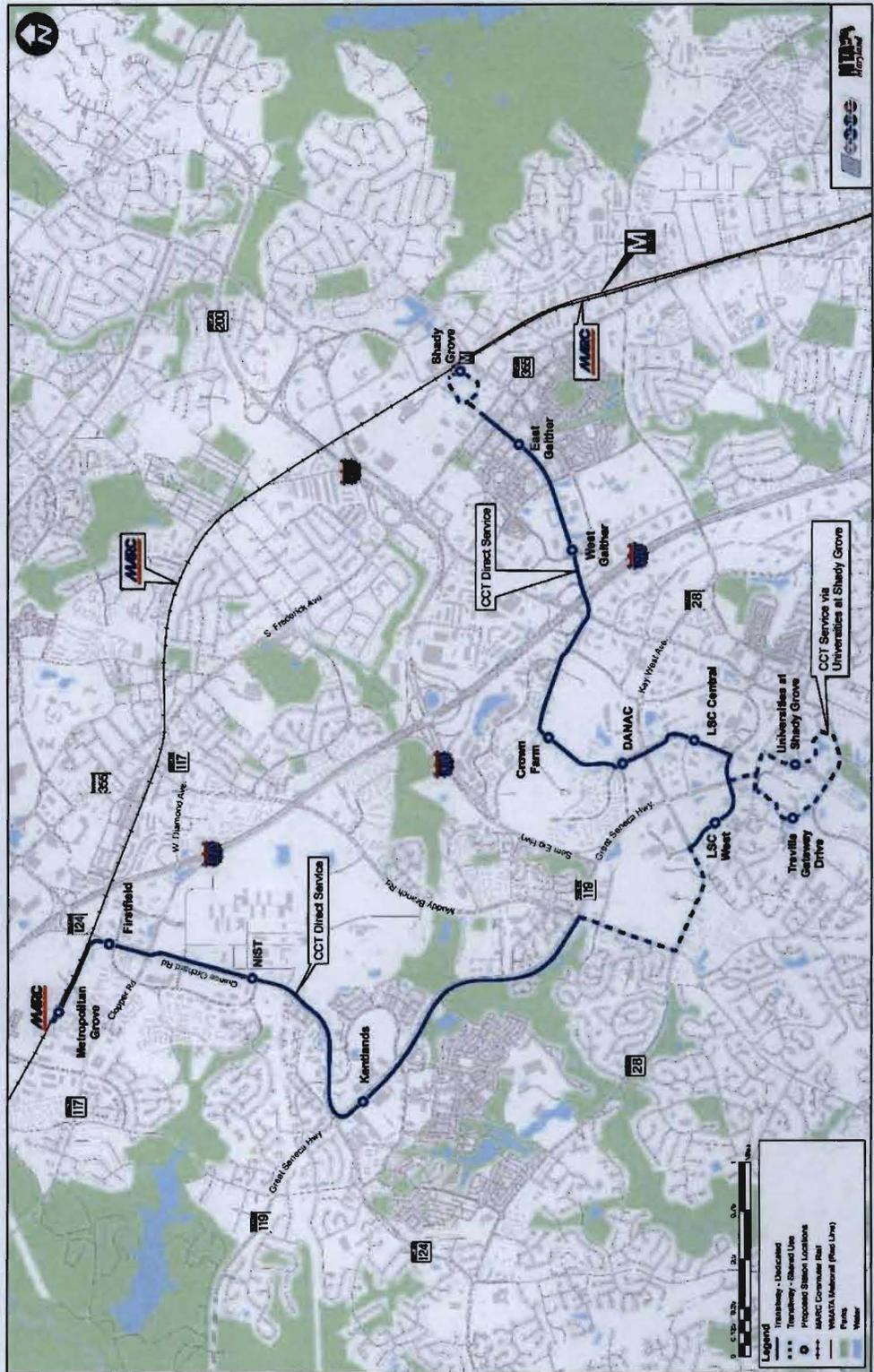


Background

- Corridor Cities Transitway studied since 1990s
- Originally part of I-270/US 15 Multi-Modal Corridor Study
- MTA received approval from FTA and FHWA to advance CCT efforts without highway improvements (late 2011)
- Locally Preferred Alternative selected in May 2012
 - Mode: Bus Rapid Transit
 - Overall Length: 15 miles
 - Stations: 18 Proposed
 - Phased construction



Phase I - Project Map





Phase I

- Nine miles
- Fully dedicated transitway except:
 - Shady Grove Metro access
 - USG service loop
 - MD 28/Muddy Branch Road
- Stations: 11 (Direct service), 2 (Service via Universities at Shady Grove)
- Ridership: 35,900 trips per day in 2035
- Travel Time: 38 minutes
- Cost (2012\$): \$545M



Phase I

- Vehicles
 - 30-35 articulated, high capacity rubber tire modern vehicles
 - Multiple entry ways (left and right side)
 - Off-board fare collection
- Service Frequency
 - 3.5 minutes peak period
 - 6 minutes mid-day
 - 10 minutes off peak
 - Service via USG – 15 minutes all times
- Parking
 - Shady Grove, Crown Farm, LSC West, Kentlands, and Metropolitan Grove



Project Status

- Area Advisory Committee process was completed in June 2015
- 30% design was completed and plans were submitted to MTA on October 30, 2015
- Plans provided to Agency Stakeholders for comment. Requested a 60 day review period.
- Updating the Capital Cost Estimate
- Finalizing the Basis of Design Report and the Design Criteria Report

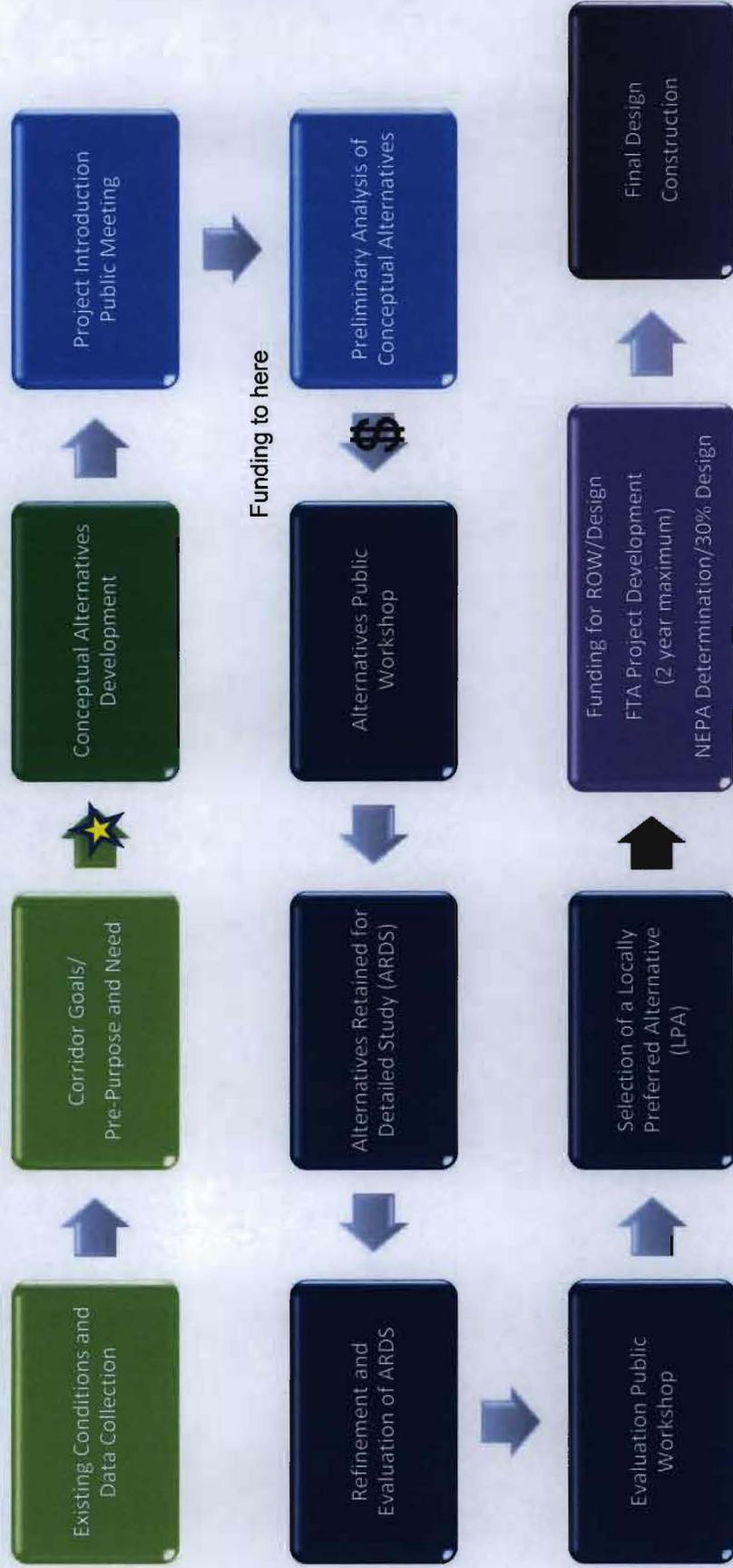


Project Status

- Funding in place for Final Design and R/W acquisition. Assessing funding options for construction.
- Working with MCDOT to identify significant cost reduction measures
- Finalizing Environmental Assessment and planning for an April 2016 Public Hearing
- Preparing for transfer of project to MTA Engineering

Corridor Planning Process

MD 355 is here



MD 355 Milestone Schedule

	Summer 2015	Fall 2015	Winter 2016	Spring 2016	Summer 2016	Fall 2016	Winter 2017	Spring 2017	Summer 2017	Fall 2017	Winter 2018	Spring 2018	Summer 2018	Fall 2018	Winter 2019
Project Purpose and Need Background		★													
Conceptual Alternatives			★												
Project Introduction Public Meeting				★											
Ridership, Traffic and Impacts Analysis						★									
Alts. Public Workshop															
ARDS Package							★								
Alternatives Refinement															
Build Traffic & Ridership															
Environmental Tech Analysis															
Draft Corridor Report															
Public Workshop															
LPA Selection															

MD 355 – Work Performed to Date

▪ Engineering

- Laid out Master Plan at a conceptual level to assess feasibility of recommendations and impacts
- Investigated additional conceptual alternatives

▪ Environmental

- Conducted preliminary environmental inventory of natural and socio-economic resources
- Prepared Draft Environmental Assessment Form (EAF)

▪ Traffic

- Completed existing traffic counts
- Completed Existing and Future 2040 No-Build Operational Analysis

▪ Service Planning

- Began service planning work

▪ Ridership

- Developed MWCOG model for ridership
- Developed Existing and Future 2040 No-Build Ridership

▪ Municipal Engagement

- Coordinated with Rockville and Gaithersburg BRT planning efforts

▪ Documentation

- Developed Goals and Objectives
- Drafting Preliminary Pre-Purpose and Need

MD 355 – Next Steps

- **Engineering**
 - Refine and evaluate alternatives
- **Environmental**
 - Evaluate potential environmental impacts
- **Traffic**
 - Complete 2040 Build Analysis of alternatives
 - Conduct traffic operations safety review of alternatives
- **Lane Repurposing**
 - Conduct person throughput analysis
- **Ridership**
 - Complete 2040 Build Ridership for alternatives
- **Service and Station Planning**
 - Complete service planning work and station location refinements
- **Public Involvement**
 - Conduct additional CAC Meetings
 - Conduct Public Meetings
- **Municipal Engagement**
 - Continue coordination with Rockville and Gaithersburg BRT planning efforts
- **Estimates**
 - Develop construction and operations cost estimates
 - Develop right-of-way cost estimate
- **Documentation**
 - Develop Measures of Effectiveness
 - Prepare Alternatives Retained for Detailed Study Report

MD 355 – Public Involvement

▪ Corridor Advisory Committee (CAC)

- Conducted four CAC Meetings:
 - Meeting # 1 - February 2015
 - Meeting # 2 – April 2015
 - Meeting # 3 – June 2015
 - Meeting # 4 – August / September 2015
 - Meeting # 5 – December 2015

▪ Next Public Meetings – Spring 2016

▪ Project Website

- SHA – apps.roads.maryland.gov/WebProjectLifeCycle/ProjectHome.aspx
- MCDOT (CAC) – mongomerycountymd.gov/RTS/cacs.html

CITY OF GAITHERSBURG
MD 355 BRT STUDY



Thursday, December 3, 2015

Study Background

- An inventory of the existing conditions within the Study Area;
- A series of possible alternatives for BRT operation within the Study Area, which may include, but not be limited to, double-track guideways; single-track guideways, lane repurposing, and mixed traffic;
- Recommended cross-sections, rights-of-way, and possible engineering techniques to facilitate the various BRT scenarios within the Study Area; and
- Guidance on right-of-way policy and station locations relative to the entire four \pm -mile corridor through the City.

Study Area



Route 355 Corridor



Study Focus Area

Design Alternatives

The various Alternatives were further refined to identify probable impacts and provide a basis for estimating costs:

- ❑ Standard Design Dimensions - Uses SHA's preferred design criteria
- ❑ Minimum Design Dimensions - Uses SHA's minimum design criteria
- ❑ Reduced Impact Dimensions - Uses SHA's minimum design criteria, but also seeks to reduce impacts further by applying changes to existing lane configurations and sidewalk widths

Design Assumptions

- ❑ MD 355 outside of focal segment will accommodate dual-lane median guideway
- ❑ Existing traffic signals and existing turning lanes are maintained
- ❑ No new signalized intersections
- ❑ Median guideways provide no median breaks at unsignalized intersections
- ❑ On-street bicycle lanes will not be provided in focal segment to minimize potential property impacts

Discounted Alternatives

- Mixed traffic alternative – ***(Not Recommended)***
 - Results in no potential property acquisitions or access impacts
 - Retains the existing roadway operations within the Study Area
 - Would result in bus travels at the same speed as general traffic and an overall slower speed for the whole BRT corridor.
- Lane repurposing alternative – ***(Not Recommended)***
 - Limited property impacts,
 - Provides the fewest benefits
 - Negative impacts to BRT operations due to the minimal separation between vehicles and numerous traffic impacts resulting from limitations on turning movements and access.
- Various single-lane median guideway designs – ***(Not Recommended)***
 - Provides only reasonable BRT operations
 - Peak-directional or bi-directional have different impacts on overall bus speeds and system capacity.
 - Impacts to traffic are not great
 - Results in fewer property impacts than the minimum or standard alternative.

Hybrid Alternative

- ❑ Adopts aspects of both Dual-lane and Single-lane guideway concepts:
 - Single-lane Minimum concept from Odendhal to Chestnut
 - Dual-lane Minimum/Reduced Impact elements from Chestnut to Summit
 - Traffic signal systems required for transition between dual- and single-lane guideways
- ❑ Northbound MD 355 merge to two lanes shifted to south of Father Cuddy Bridge
- ❑ Minimizes right of way requirements in focal segment
- ❑ Accommodates BRT on existing Father Cuddy Bridge
- ❑ Lowest impact on traffic operations

Dual-Lane Median Guideway Alternative

- The dual-lane median guideway designs provides the greatest BRT operation benefits of all the alternatives presented.

- Provide seamless transition from the Dual-Lane guideway both north and south of the study area.

- Three designs were studied;
 1. Dual-Lane Standard
 2. Dual-Lane Minimum
 3. Dual-Lane Reduced

Dual-Lane Reduced Impact Alternative

- Requires eliminating the third southbound travel lane on MD 355 between Odendhal and Chestnut.
 - ▣ A reduction in the number of travel lanes would result in increased congestion along MD 355.
- Provides the least impact to intersection delay of the three dual-lane alternatives
- Does not require the reconstruction or expansion of the Father Cuddy Bridge
- Least property impacts of the three dual-lane alternatives studied

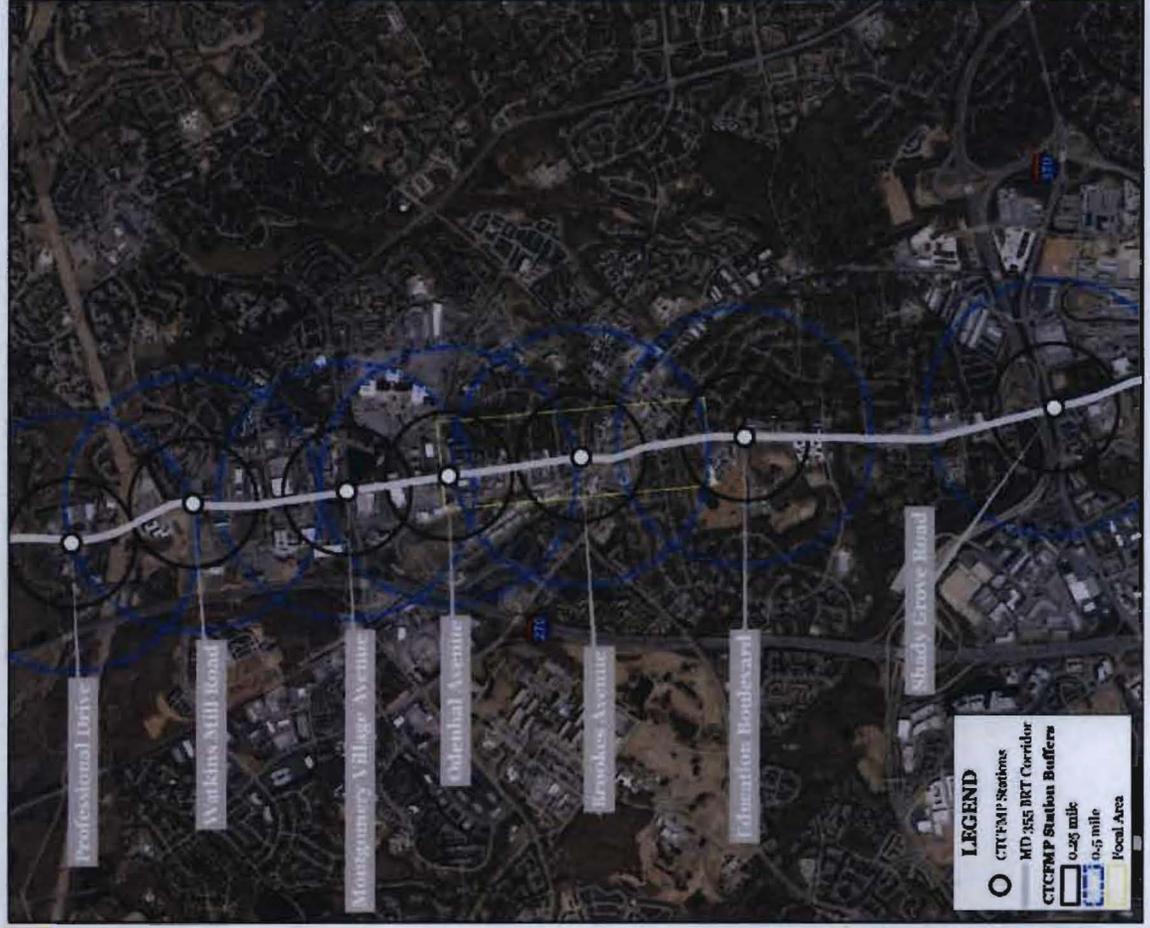
Alternative Comparison

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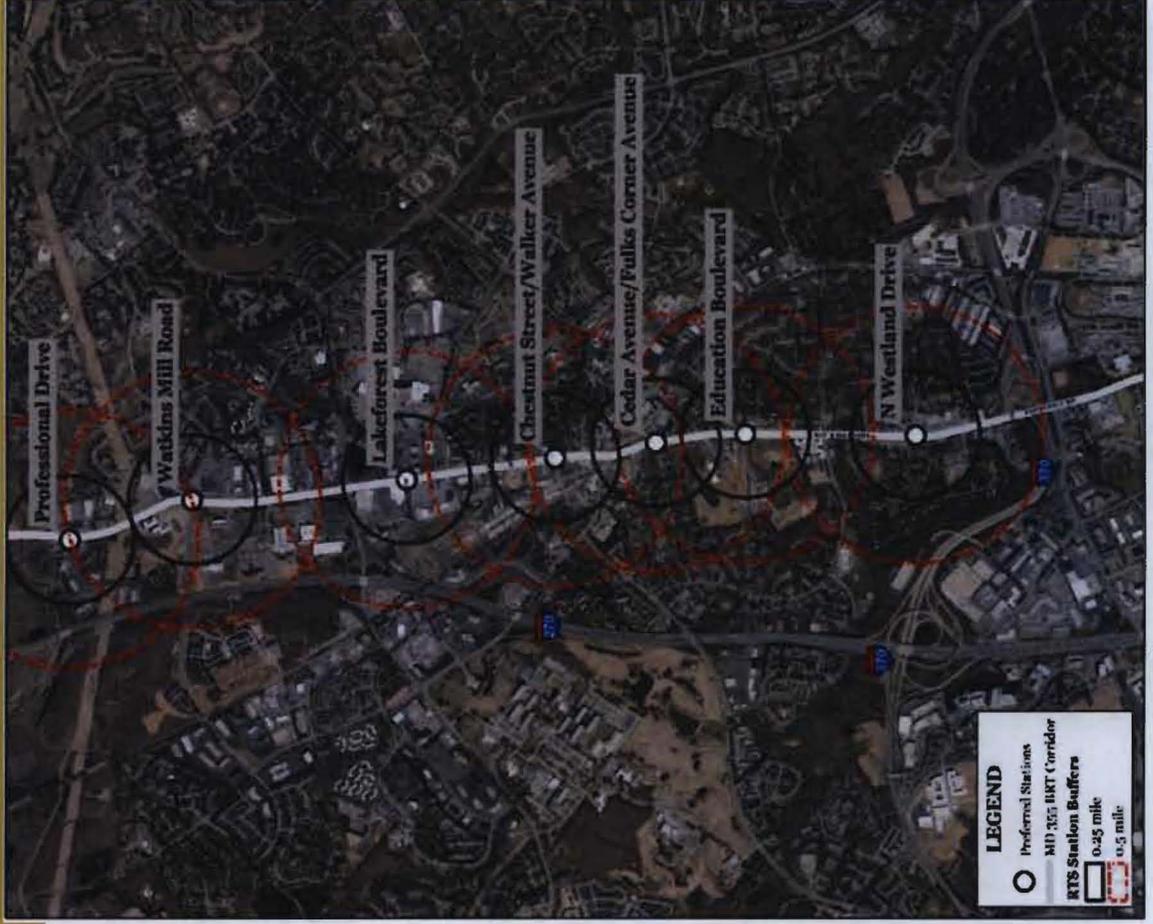
Staff Reviewed and compared the Hybrid Alternative to the Dual Lane Median Reduced

- Speed: Both the Dual-Lane Reduced and the Hybrid alternatives will operate with a BRT average speed of 18-22 mph
- Intersection capacity: the Dual-Lane Reduced performs better by a small margin (25 vehicles) in the AM peak at Odendhal only. The CLVs (critical lane volume) otherwise are identical
- Roadway segment capacity analysis: the Hybrid performs better in the AM and PM peak from Odendhal to Chestnut only (14 and 8 cars/mile/lane respectively), otherwise the densities are identical
- Property impacts: the Dual-Lane Reduced has no significant impacts to the Hybrid's one (1) and a net -3 over the hybrid with the two alternatives sharing one common impact
- Overall costs, the two alternatives are approximately \$377,000 apart in costs with the Hybrid being more expensive

County Master Plan Station Locations

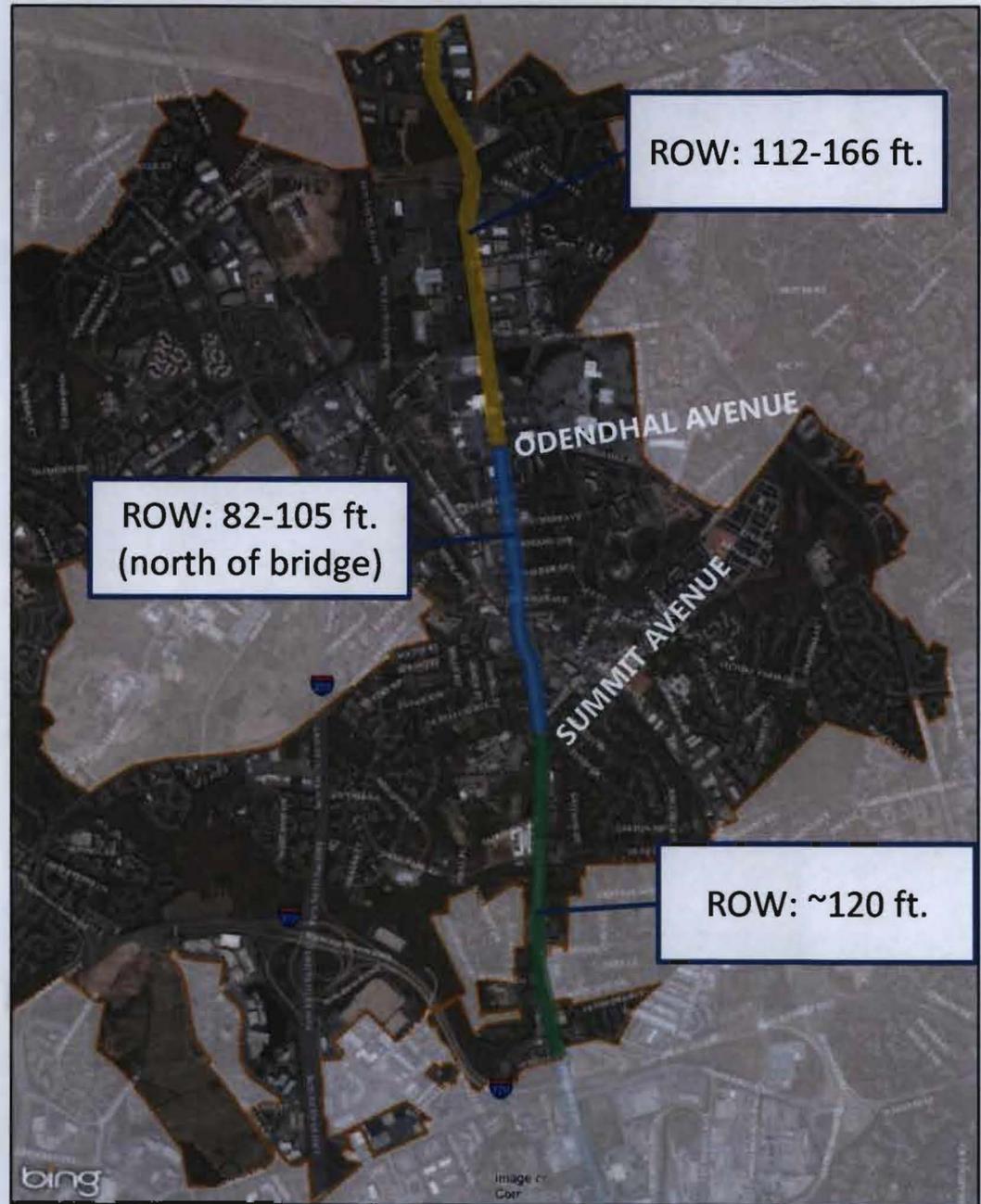


Alternative Station Locations



Existing MD 355 Right of Way (ROW)

- North Segment
 - Widest right of way
- Focal Segment
 - Irregular property boundaries
- South Segment
 - Relatively consistent ROW



Gaithersburg BRT Corridor

LEGEND
City of Gaithersburg
Traffic Impact Focus Area



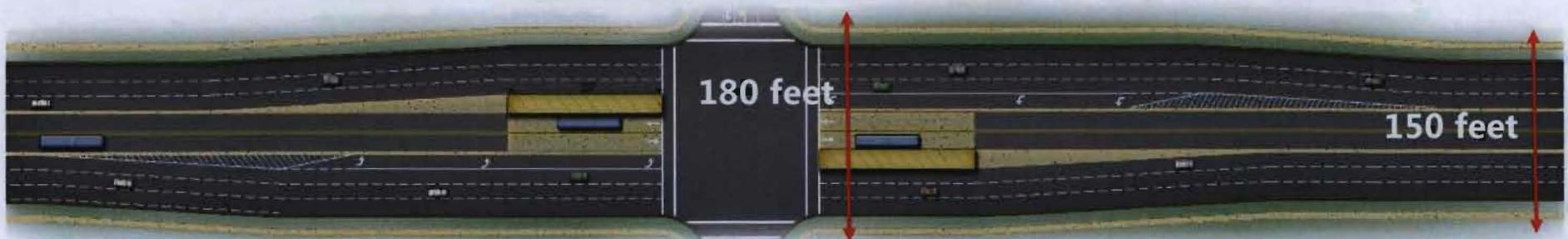
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Corridor & Station ROW Development

- Maryland SHA BRT Design Standards (Preferred and Minimum)

Design Element	Preferred Width (feet)	Minimum Width (feet)
BRT Guideway Lanes	24	22
BRT Median Separators	12	4
General Traffic Lanes	72	66
Bicycle Lanes	10	10
Gutter Pans	6	6
Landscape Buffers	8	0
Sidewalks	12	10
Utility/Maintenance Buffers	4	4
Total Roadway Width	148	122

- Property requirements are greatest at station intersections



Consultant Recommended ROW

- ROW addresses station dimensions and focal segment hybrid alternative concept
- Focal segment ROW balances property impacts and flexibility for detailed design alignment

MD 355 Corridor Segment Location	Suggested Right of Way Width	Station Locations
Game Preserve Road to Paramount Park Drive	180 feet	Professional Drive
Paramount Park Drive to 700 feet south of MD 124	205 feet	Watkins Mill Road
700 feet south of MD 124 to Odendhal Avenue	180 feet	Lakeforest Blvd/Perry Pkwy
Odendhal Avenue to 200 feet north of Chestnut Street	110 feet	n/a
200 feet north of Chestnut Street to 400 feet south of Summit Avenue	140 feet	Chestnut Street/Walker Avenue & Cedar Avenue/Fulks Corner Avenue
400 feet south of Summit Avenue to O'Neill Drive	155 feet	Education Blvd & North Westland Dr

Gaithersburg's Position

On November 16, 2015 the City Council established their position as follows;

□ **Study Area Alternatives –**

- The City will advocate for the dual-lane median reduced alternative through the Study Area and continue to support an entire dual-lane median BRT system along MD 355 through the City of Gaithersburg.

□ **Station Locations –**

- The City endorses the station locations identified and proposed by the study.

□ **Right-Of-Way –**

- The City will not adopt the proposed ROW limits at this time and instead will chose to delay a decision on ultimate ROW, in accordance with the 2009 Transportation Element, at such time as the State and County have developed the Alternatives Retained for Detailed Study (AARDS) in coordination with the City's input.



ROCKVILLE TOWN CENTER

BUS RAPID TRANSIT INTEGRATION STUDY

PREPARED FOR | The City of Rockville

PREPARED BY | ERM

Sabra Wang & Associates, Inc.
EDSA, Inc.

City Department of Community Planning and
Development Services

12.03.2015: Interagency Meeting



BRT brings opportunities and challenges

- New long term investment on MD 355 and Veirs Mill Road
- Address evolving mobility patterns – car, metro, bus, ped, bike, Amtrak, MARC
 - Challenging intersections
 - Heavily used and aging Metro Station
- Build on Town Center development progress
 - County BRT Plan does not call for a specific cross section or BRT treatment within cities
- Revisit Rockville Town Center Master Plan ideas

Study Area |



BRT Integration Study | Process | Agency Involvement

- **January to October 2015**
- Staff workshops
- Interagency workshops



Montgomery County Executive's Office	WMATA
Montgomery County Department of Transportation	Rockville City Manager's Office
State Highway Administration	Rockville Community Planning
Maryland Transit Administration	Rockville DPW
Montgomery County Ride-On	Holland and Knight

BRT Integration Study | Alternatives

- Integration Study initially identified 12 potential route and alignment alternatives
- Narrowed to 6 for study at May interagency workshop
- Narrowed to 3 for further study
 - BRT in mixed traffic with pullouts
 - BRT in a dedicated median on MD 355
 - BRT in a dedicated median on MD 355, through traffic in a tunnel

Design process was iterative; engineering and urban design

Mixed Traffic, Side BRT Station Alignment | Engineering Design Features

Near-side platforms intended to accommodate at least 2 BRT vehicles simultaneously

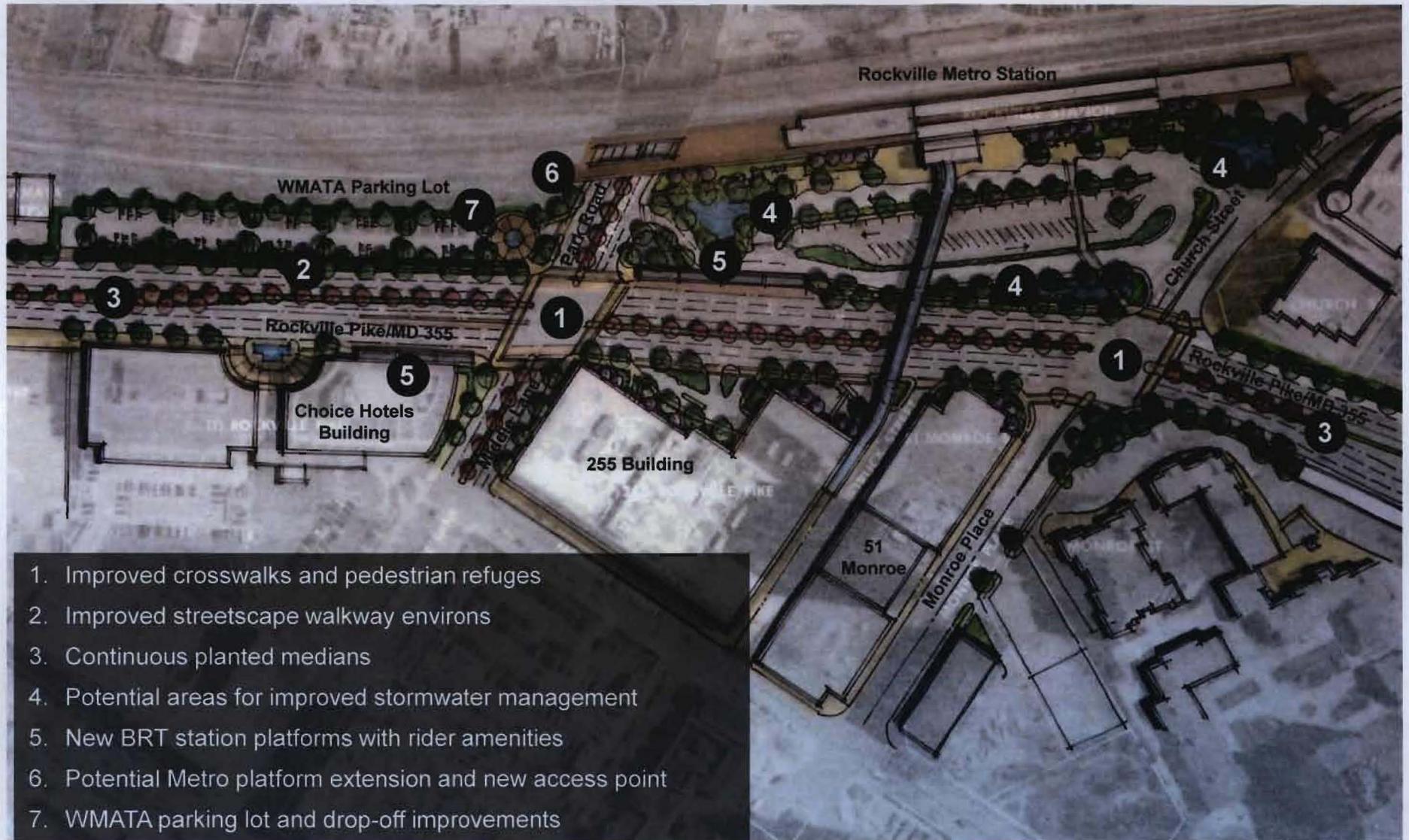


Sidewalk in front of Choice Hotels headquarters doubles as transit stop.

Opportunities for queue-jumps coming out of stops, and NB at Church Street

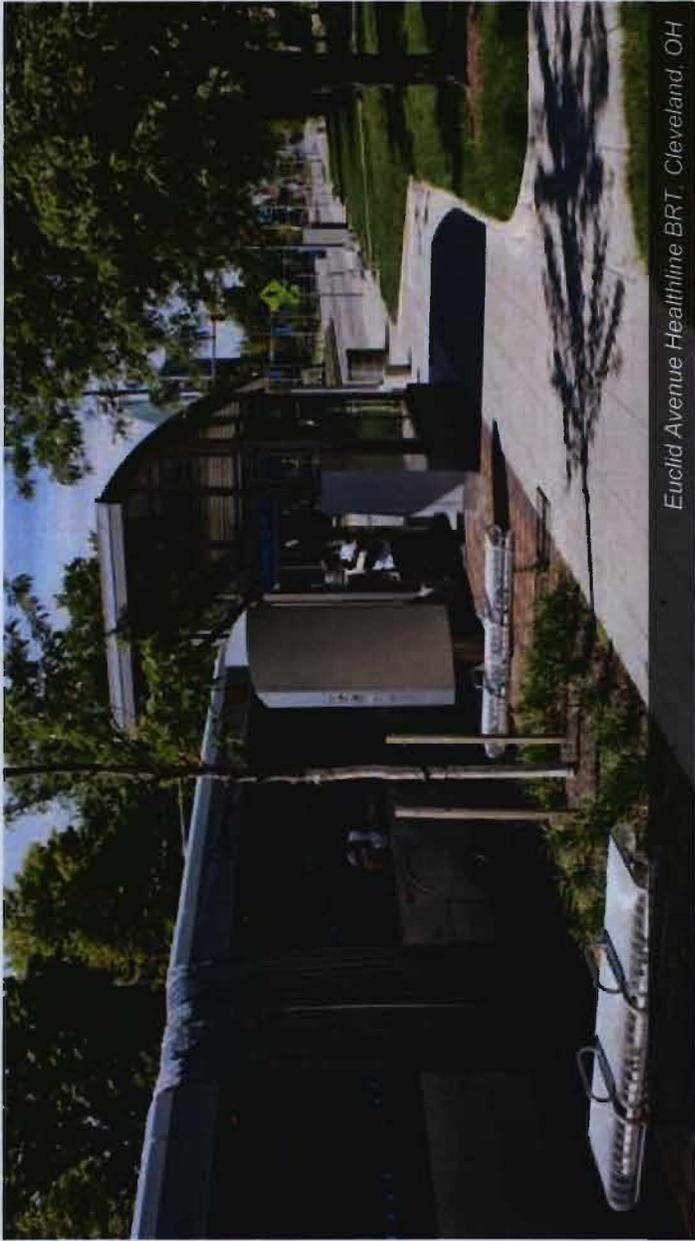
Need to reconfigure Metro Station layout slightly

Mixed Traffic, Side BRT Station Alignment | Urban Design Features



1. Improved crosswalks and pedestrian refuges
2. Improved streetscape walkway environs
3. Continuous planted medians
4. Potential areas for improved stormwater management
5. New BRT station platforms with rider amenities
6. Potential Metro platform extension and new access point
7. WMATA parking lot and drop-off improvements

Mixed Traffic | Urban Design Features



Euclid Avenue Healthline BRT, Cleveland, OH



Existing MD 355 at Rockville Station

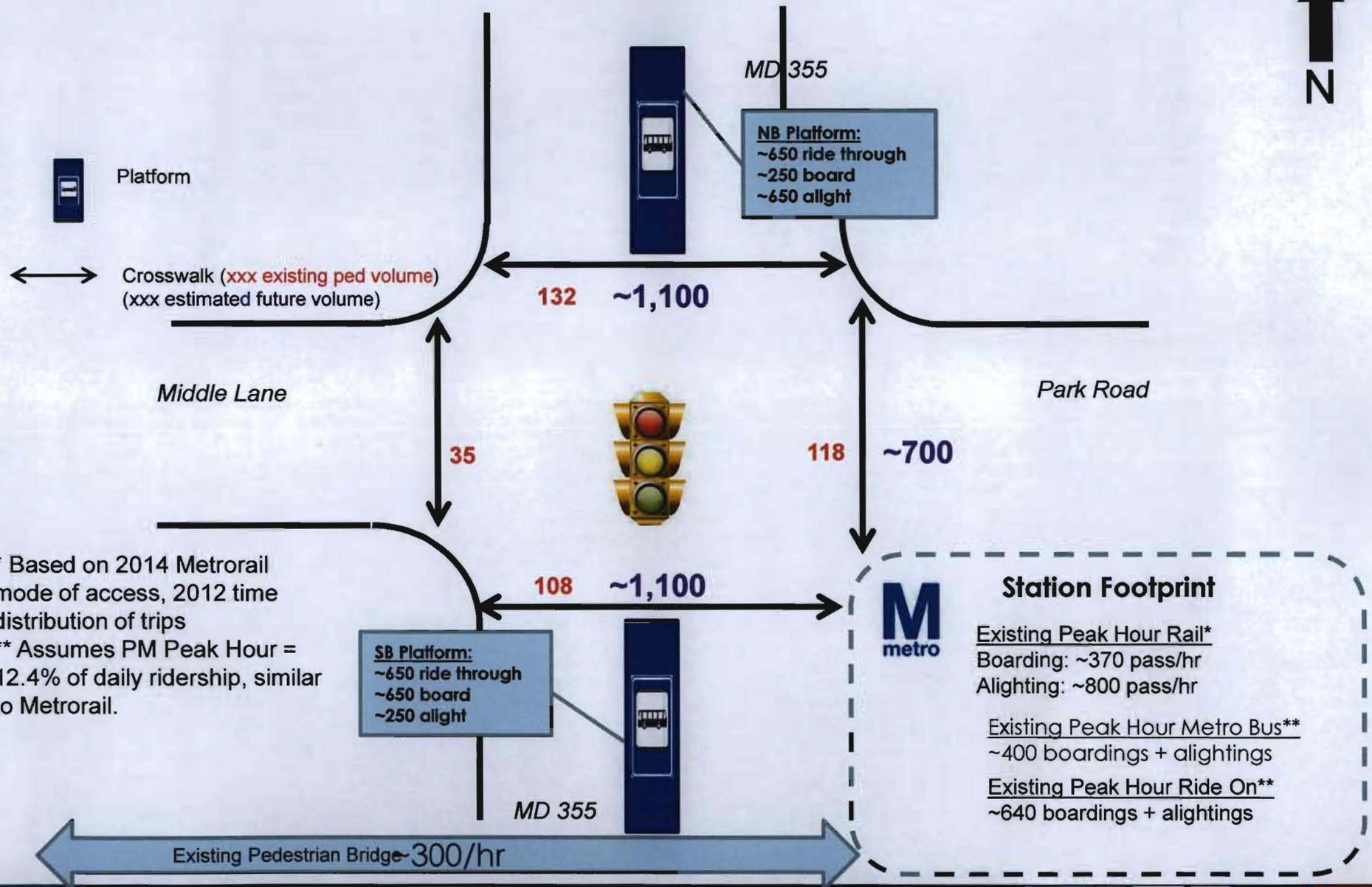


High quality BRT station architecture and platform environments



Euclid Avenue Healthline BRT, Cleveland, OH

BRT in Median, at Grade | PM Peak Hour Pedestrian Activity



* Based on 2014 Metrorail mode of access, 2012 time distribution of trips
 ** Assumes PM Peak Hour = 12.4% of daily ridership, similar to Metrorail.

Continuous dedicated BRT lanes in Median with tunnel for through traffic | Concept 6



Continuous dedicated BRT lanes in Median with tunnel for through traffic | Engineering Features

Continuous dedicated BRT lanes in median of 355

Two through lanes in either direction below grade. Tunnel entrances staggered to minimize ROW width.

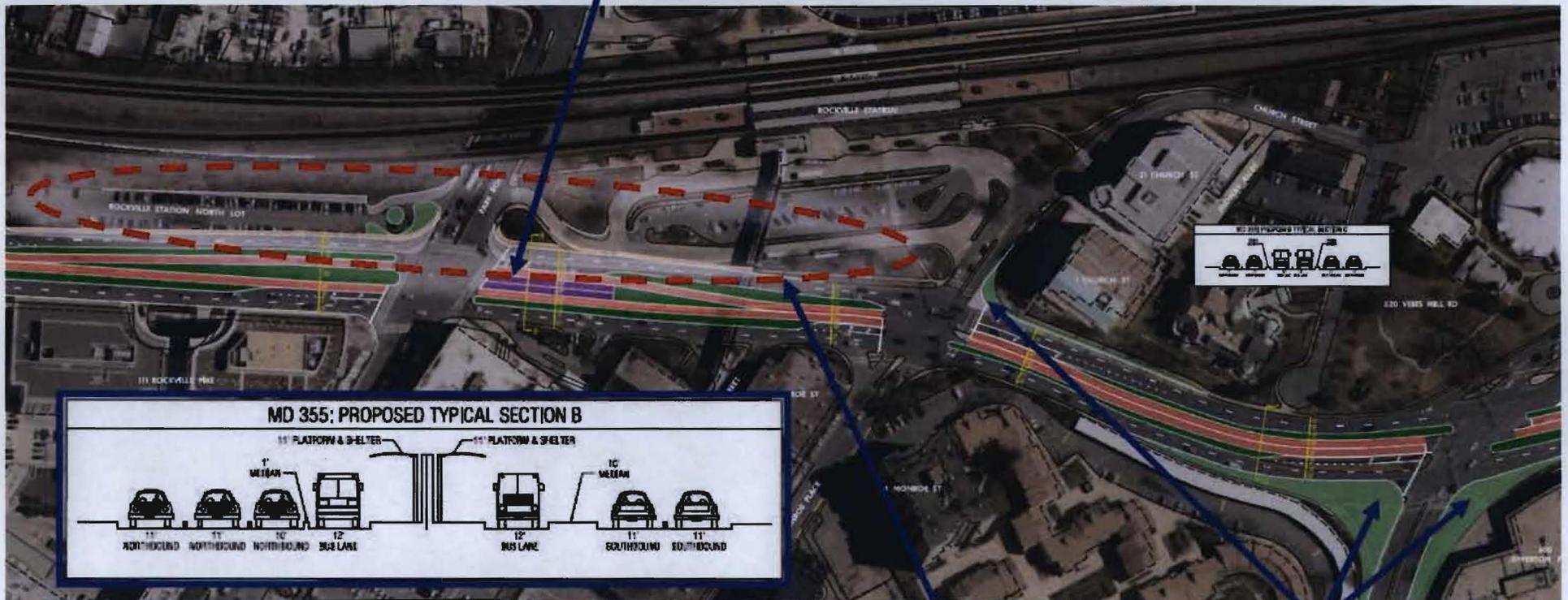


Left turns by emergency vehicles facilitated by breaks in medians, stop signal north of firehouse.

Travel lanes reduced to two in each direction for duration of tunnel. Left turn lanes preserved where they currently exist.

Median with tunnel | Engineering Design Features

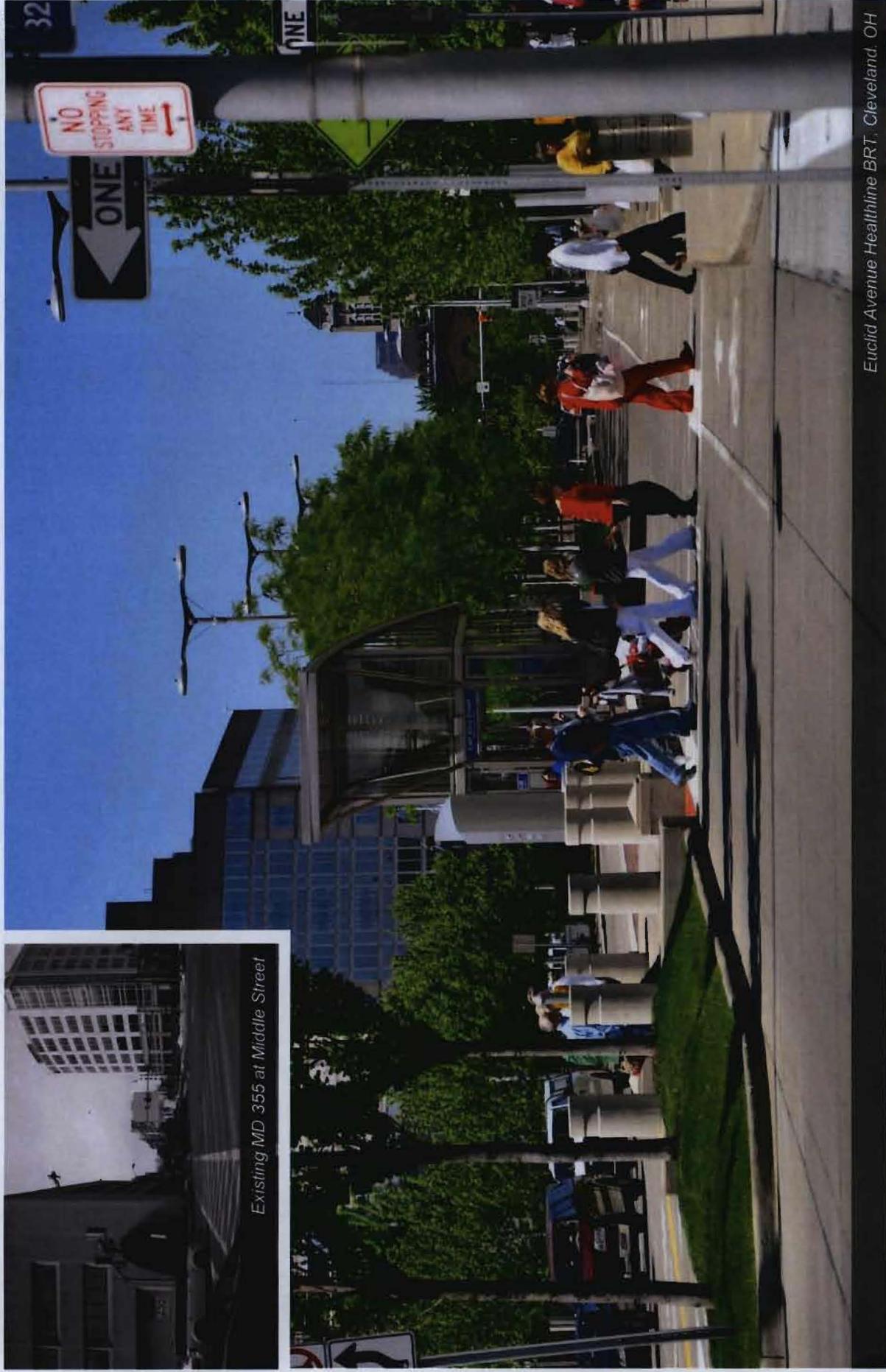
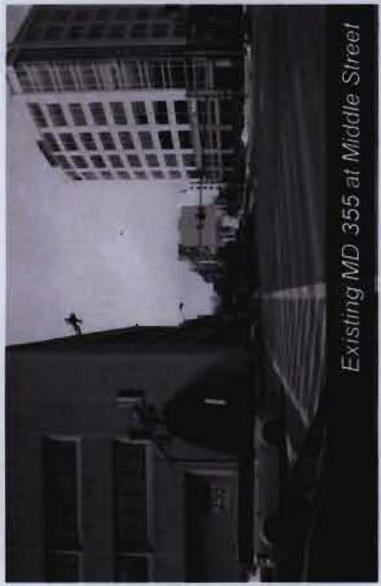
Center platform (approx. 22' wide) south of Park/Middle intersection provides best overall access to Metro Station and Town Center.



Some reconfiguring of Metro Station footprint necessary.

Less surface traffic allows for some reclaiming of paved areas.

Median, with Tunnel | Urban Design Features – Improved Crossings & Medians



Euclid Avenue Healthline BRT, Cleveland, OH

Median, with Tunnel | Urban Design Features - Other Signature Gateway Bridges

The Helix Bridge, Singapore



Signature bridge crossing from Metro Station to Town Center

Hilton Pedestrian Bridge, Columbus, OH



High quality BRT station architecture and platform environments

Paleisburg Pedestrian - Cycle Bridge, Netherlands



Stairs, escalator and elevator transition to MD 355 crossing & Metro Station

Paleisburg Pedestrian - Cycle Bridge, Netherlands



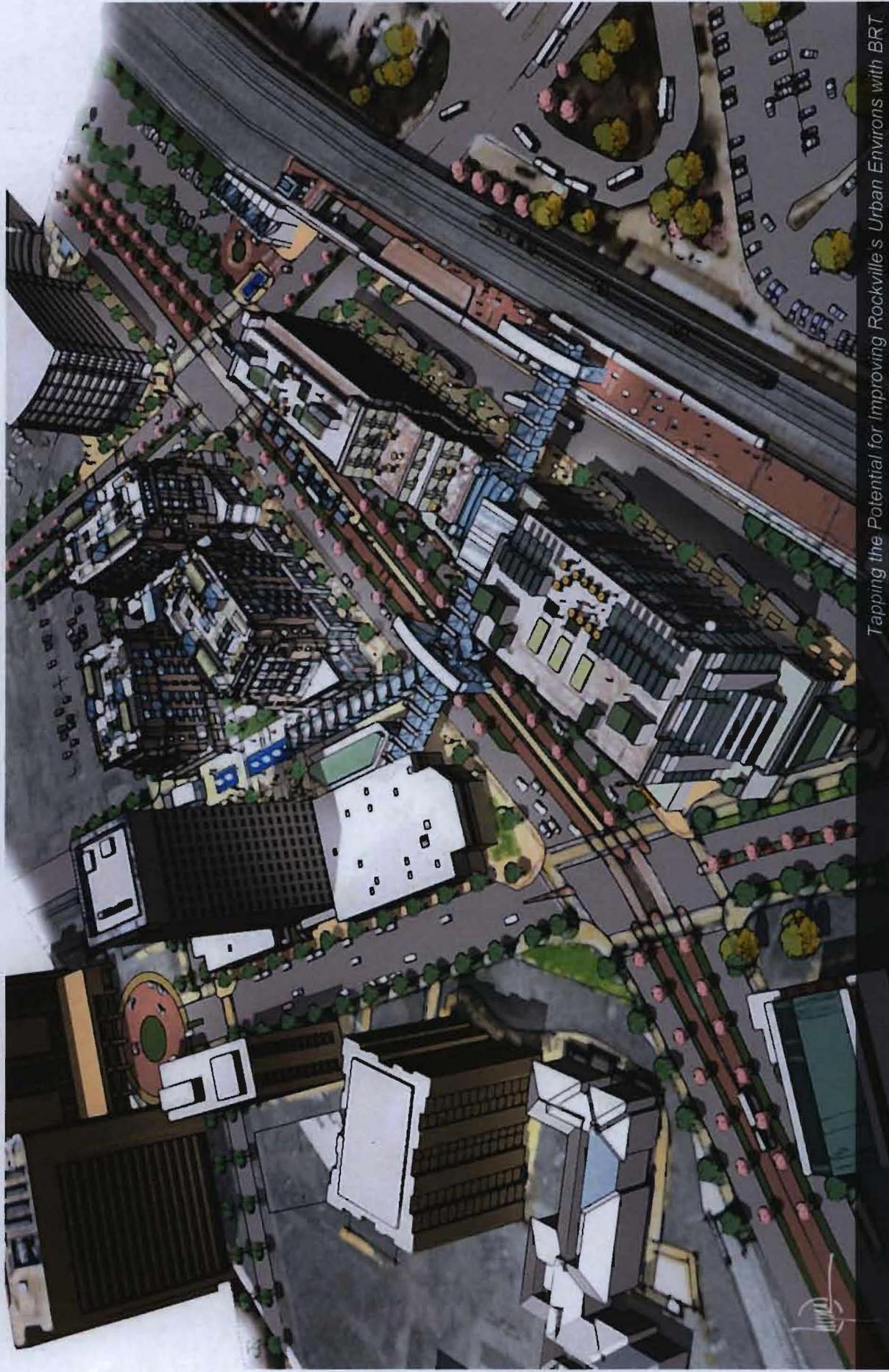
Living bridge and promenade environment over MD 355

Median, with Tunnel | Transit-Oriented Redevelopment Vision



Tapping the Potential for Improving Rockville's Urban Environs with BRT

Median, with Tunnel | Transit-Oriented Redevelopment Vision



Tapping the Potential for Improving Rockville's Urban Environs with BRT

Median, with Tunnel | Urban Design Features

1. Improved crosswalks and pedestrian refuges
2. Expanded streetscape walkway environs
3. Continuous planted medians
4. Veteran's Park edge enhancements
5. Road diet for Veirs Mill Road
6. Potential alternate parking solution for residential buildings
7. Fewer travel lanes
8. Diversion of MD 355 thru traffic into tunnel



The Mixing Bowl - MD 355 at Veirs Mill Road

BRT Integration Study | Conclusions

- BRT offers opportunities and challenges
- Accommodating BRT through Town Center requires trade-offs between motor vehicle, transit, pedestrian and bicycle needs
- BRT, without taking existing traffic lanes (re-purposing), needs right of way
- Existing right of way is limited, and acquiring it can be costly. An overly wide roadway is not desirable in Town Center
- BRT in mixed traffic with pull-outs and intersection improvements – easy to implement in the short term
- BRT in a median with through traffic in a tunnel - more complex, but offers greater Town Center integration potential and multi-modal benefits

MD 586 Status

Detailed Engineering and Environmental Analyses Underway

- Winter 2016: Engineering and Cost Estimates complete
- Winter 2016: Environmental Impacts Matrix and reports
- Winter 2016: Traffic and Ridership Forecasting
- Winter 2016: CAC Meeting for detailed alternatives
- Spring 2016: Evaluation public workshop
- Summer 2016: LPA selection