CITY OF GAITHERSBURG
MD 355 BRT STUDY

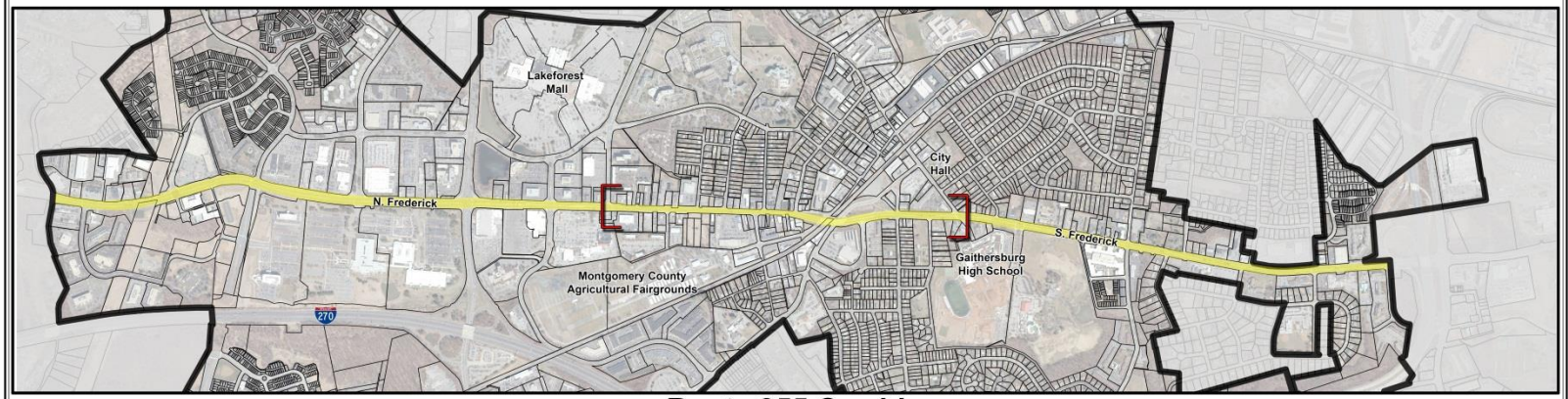
Gaithersburg

Thursday, December 3, 2015

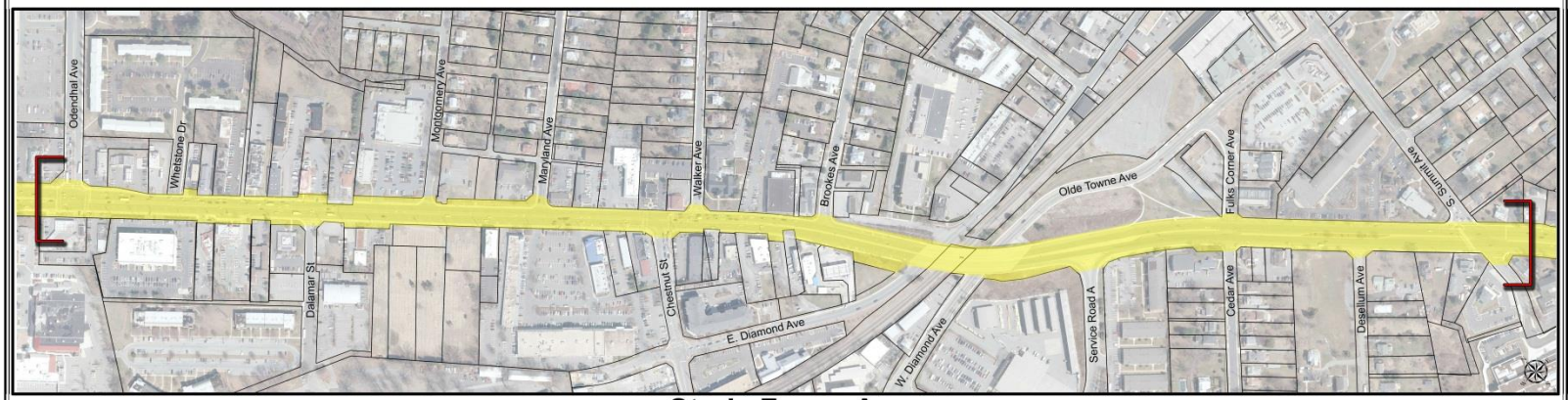
Study Background

- 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 ±-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

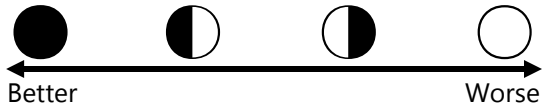
Alternative Comparison

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

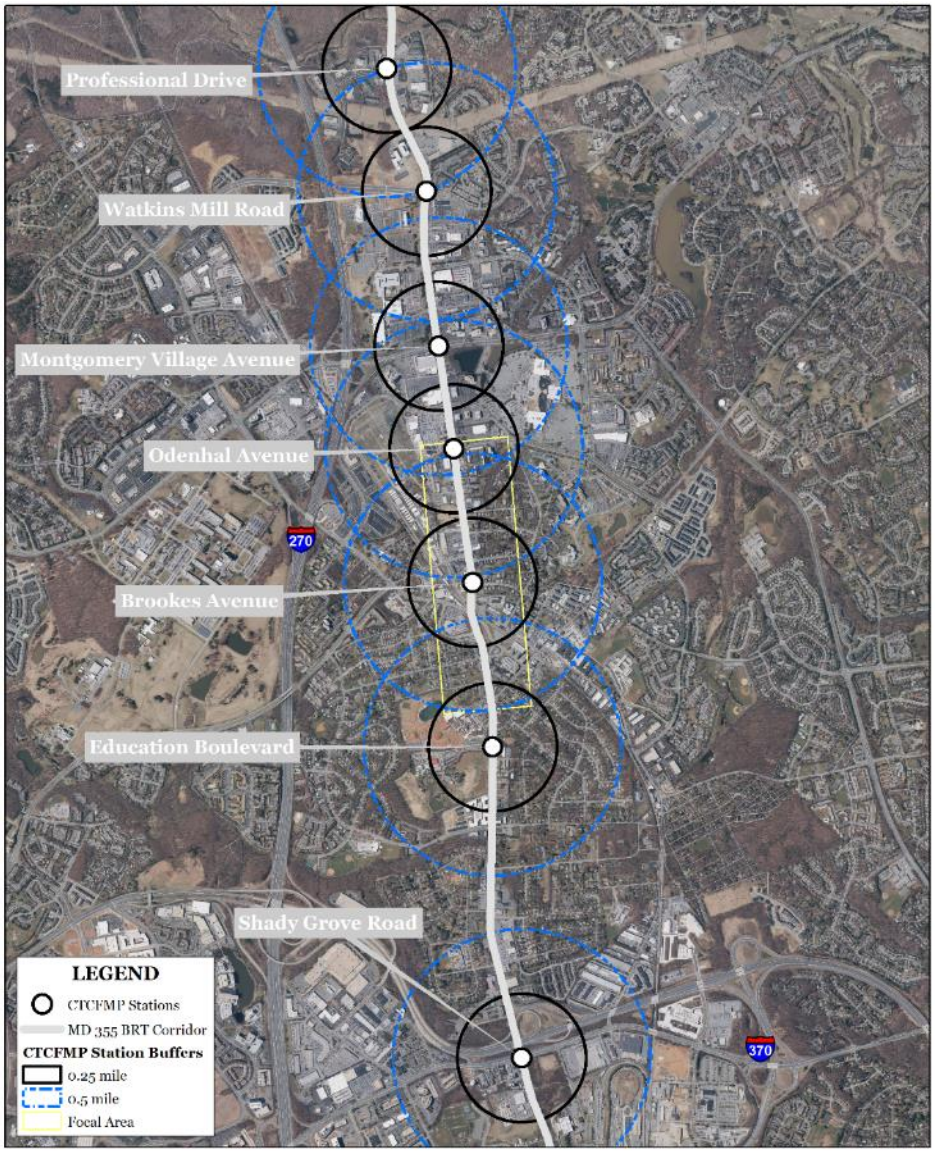
- Speed: Both the Dual-Lane Reduced and the Hybrid alternatives will operate with a BRT average speed of 18-22 mph
- Intersection capacity: the Dual-Lane Reduced performs better by a small margin (25 vehicles) in the AM peak at Odendhal only. The CLVs (critical lane volume) otherwise are identical
- 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

Summary Matrix

	BRT Operations		Traffic Operations				Property Impacts	Cost ($ million)
	Operating Speed	Stop Locations	Traffic Density/ Congestion	Intersection Capacity	Unsignalized Turning Movements	Land Use Access/ Egress		
Dual-lane Standard	●	●	●	●	○	○	○	$251.6
Dual-lane Minimum	●	●	●	●	○	○	○	$230.0
Dual-lane Reduced	●	●	○	●	○	○	◑	$188.7
Single-lane Standard	◐	◐	●	●	○	○	○	$236.7
Single-lane Minimum	◐	◐	●	●	○	○	◑	$222.9
Single-lane Reduced	◐	◐	○	●	○	○	◐	$181.7
Lane Repurposing	◑	○	○	●	○	○	◐	$183.1
Mixed Traffic	○	◑	◐	●	●	●	●	$156.5
Hybrid Alternative	◐	◐	●	●	○	○	◐	$189.1



County Master Plan Station Locations



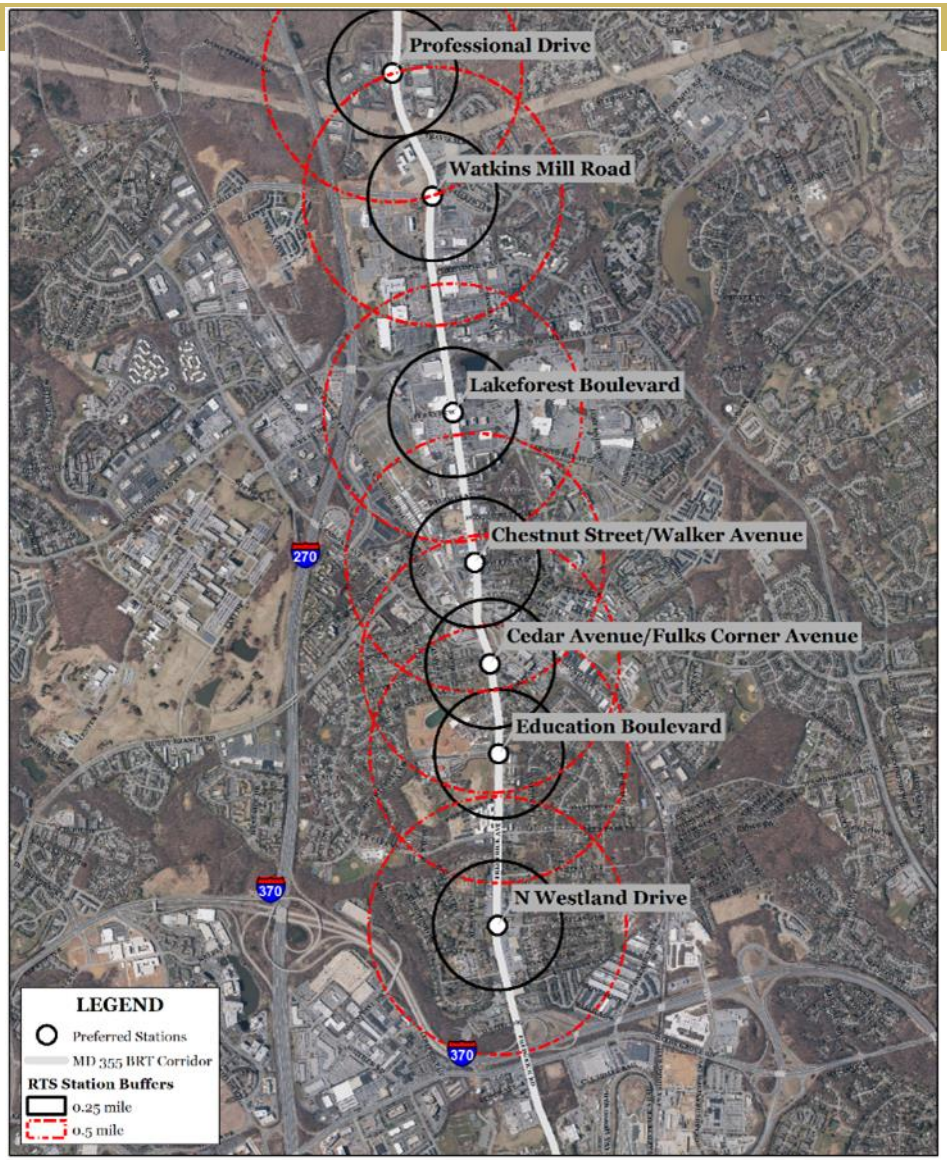
Station Locations Matrix

	Existing Ridership	Land Use	Connectivity	Existing Traffic
Professional Drive	○	◑	◑	●
Travis Avenue/Spectrum Avenue	○	◑	◑	●
Watkins Mill Road	◑	●	●	◑
Christopher Avenue	○	◑	◑	◑
Montgomery Village Drive (MD 124)	○	◑	◑	○
Lakeforest Boulevard	●	●	◑	◑
Odendhal Avenue	●	◑	◑	◑
Chestnut Street/Walker Avenue	●	◑	◑	◑
Brookes Avenue	◑	○	○	○
Cedar Avenue/Fulks Corner Avenue	◑	◑	◑	◑
Summit Avenue	◑	○	◑	◑
Education Boulevard	○	◑	●	●
Deer Park Road	◑	◑	◑	◑
North Westland Drive	◑	◑	◑	◑

● ◐ ◑ ○

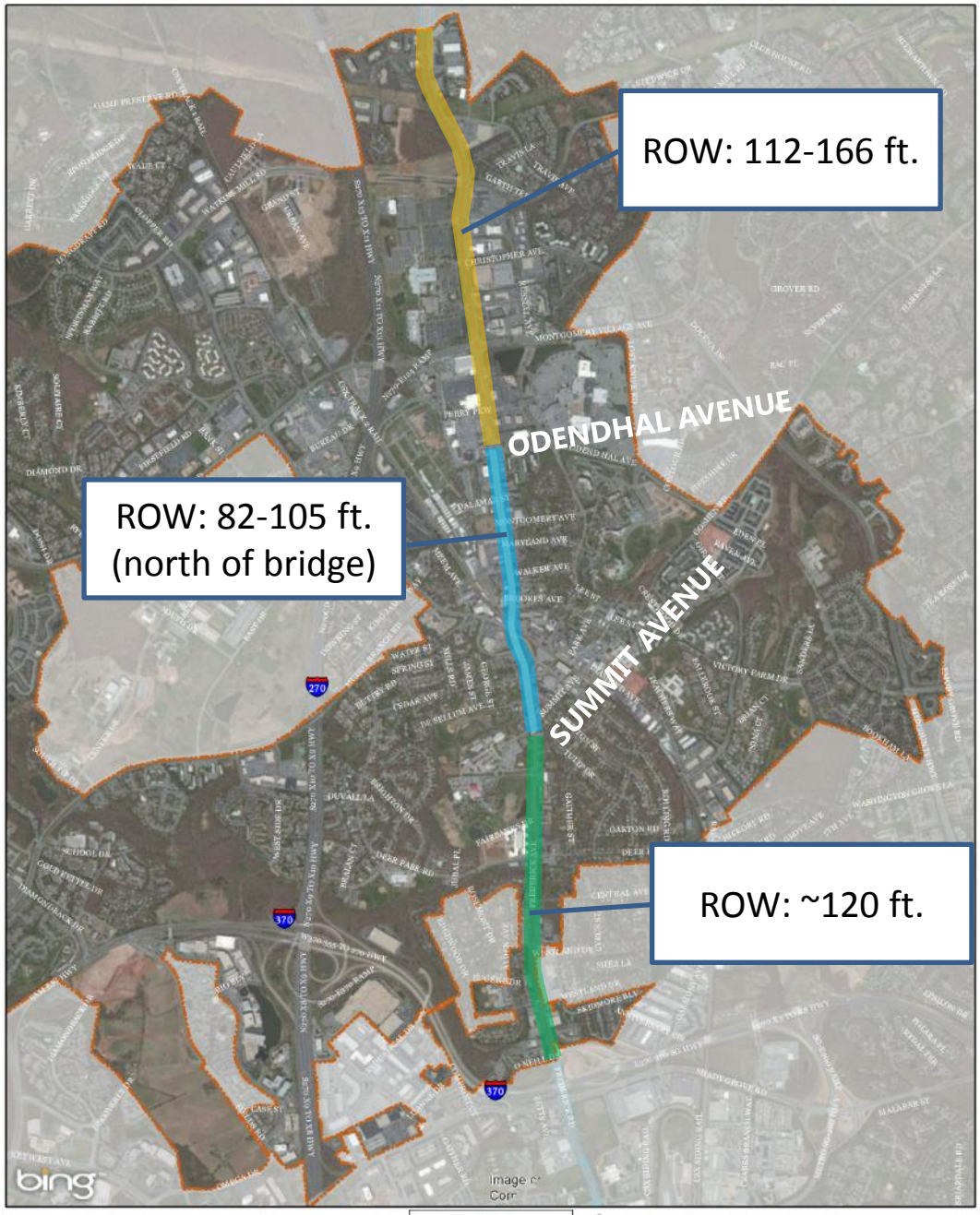
Better ⟷ Worse

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



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.