



White Oak Science Gateway LATR Cost Estimating Analysis White Paper

December 2016

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INTRODUCTION

Following approval of the White Oak Science Gateway (WOSG) Master Plan, the County Council directed that the Montgomery County Department of Transportation (MCDOT) estimate costs for LATR-scale treatments¹ across the entire White Oak Policy Area. The Council's direction is a part of an intention to replace this LATR process with a single pro-rata fee.

This fee would be applied for every new vehicle-trip² a development generates. The applicant would calculate the number of trips generated and pay the associated fee, satisfying the LATR requirements. Other payments – TPAR³ and Impact Taxes – would remain applicable.

This analysis is intended only to identify planning-level costs for identified transportation needs. It is not intended to state that any identified projects are proceeding or will proceed to design or construction, as each individual project is expected to go through a standard appropriations process before Council and to have an MCDOT-managed public process typical of any capital project.

¹ LATR = “Local Area Transportation Review” and is a component of the Subdivision Staging Policy (SSP) which requires each new development to analyze and address traffic impacts to nearby intersections. Each development completes a traffic analysis that identifies existing traffic patterns, new trips generated by approved but unbuilt development, new trips generated by the applicant's development, and then assigns these trips onto the network to identify impacts. At locations deemed to have failing levels of service, the applicant is responsible for identifying – in coordination with public agencies – treatments to either increase capacity or reduce demand.

² A “trip” is defined as a “PM peak hour vehicle-trip” albeit noting that this definition could be changed as this analysis is presented to Council for action [see the later section *Council Considerations, Definition of a Trip*]. It is assumed that a “new trip” does not include trips removed by demolishing a previous land use, internal capture (trips generated within an often mixed use development), or pass-by trips (existing trips utilizing the development, common to land uses such as fast-food and gas stations).

³ TPAR = “Transportation Policy Area Review” and is another part of the SSP prior to January 1, 2017, which looks at a wider area than LATR. Whereas LATR looks at nearby intersections, TPAR looks at roadway segments, focused explicitly on arterial roadways. Using planning models to gauge travel speeds, it is measured as a ratio between the modeled travel speed versus the free-flowing travel speed. So if a vehicle can travel at 40 MPH along a roadway with a design speed of 45 MPH: its ratio would be 40 divided by 45, or 88%. As of January 1, 2017, TPAR will no longer be required for development approval.

PURPOSE

There are several purposes achieved by this pro-rata fee mechanism:

Coordination

The scattered nature of development in an area can result in an uncoordinated conglomeration of transportation projects being pursued by various developers. In some cases an agreement can be struck between developers, though these agreements can be difficult to implement as intended.⁴ The pro-rata fee reduces these issues, allowing for a unified analysis that can identify treatments required across the policy area. Implementation is at the behest of public agencies, coordinated by Council-appropriated funds and each project managed by either County or State transportation agencies.

Equity

Intersections generally tend to have some degree of excess capacity before they are considered to be failing, necessitating treatment. The first developers to proceed with project approvals will tend to have first claim over this capacity, and later developers tend to be the projects left to mitigate impacts. This is further complicated in that as new master plans potentially free up new capacity by relaxing congestion thresholds, it is the larger and more organized developments which will tend to be more able to proceed quickly. With little transportation capacity remaining, the smaller developments may be left with disproportionate mitigation needs (building a new lane can serve several hundred new vehicles, but the constructing developer may only need to mitigate a dozen vehicles).

Transparency

A comprehensive analysis offers the potential for greater public awareness of what mitigating treatments are proposed for an area. While each new development goes through a public process before the Planning Board, public awareness may tend to be focused only on a few select developments of interest, and interested parties may not be cognizant of transportation treatments proposed elsewhere in an area. The analysis associated with the pro-rata fee can potentially provide a more transparent and visible source of information for the public to weigh in, with potential projects being identified comprehensively before the County Council rather than piecemeal before the Planning Board.

Time and Fiscal Savings

The pro-rata fee can reduce the number of traffic analyses which must be performed. As most of these analyses do not necessitate any treatments, this saves resources both for the private and public sectors. This relieves developers of the need to perform intensive studies and public officials of the resources spent reviewing them, which can often involve many months of back-and-forth comments & revisions. The centralized analysis is itself a significant undertaking, but the consolidated analysis can provide a fiscal and time savings to all parties. The “pay and go” approach significantly reduces risk to new development by providing a clear one-time payment for an applicant, serving to streamline the development review process.

⁴ Private developers may voluntarily enter into agreements to construct LATR-scale treatments and may subsequently receive credit toward the pro-rata fee.

SCOPING

The scoping process occurred over approximately 6 months in 2014 and was formed based on the input of multiple sources, including MCDOT⁵, MCDGS⁶, M-NCPPC⁷, SHA⁸, the County Council⁹, and members of the public.

In total, 61 intersections were included in the analysis, as shown in Exhibit 1 on the next page. These intersections generally represent major intersections, often accompanied by traffic signals. They include intersections within the White Oak Policy Area as well as approximately two intersections beyond the edge of the policy area. Some additional intersections were included beyond the policy area, including several locations located in Prince George's County. All intersections were publicly vetted, with several intersections being added at the public's request.

The analysis is intended to focus on intersection treatments within the White Oak Policy Area. The purpose of evaluating intersections outside the policy area was to ensure that such information was available were it later determined to be of interest.

The analysis included the proposed BRT lines within the policy area, the reconstruction of the Old Columbia Pike Bridge, and new roadways proposed by the WOSG Master Plan. Of note, however, is that the analysis did *not* include the three master planned interchanges at Stewart Ave, Tech Rd / Industrial Pkwy, or at Fairland Rd / Musgrove Rd.

The exclusion of these interchanges was to ensure a worst-case basis – in terms of highway capacity – was evaluated. Noting that none of these interchanges are funded for construction (and would therefore not typically be included in a developer's traffic impact analysis), the analysis was scoped to identify surface-level treatments that might be necessary were an interchange not built.¹⁰

⁵ MCDOT = Montgomery County Department of Transportation, a department under jurisdiction of the County Executive with authority over most non-numbered roadways throughout the County.

⁶ MCDGS = Montgomery County Department of General Services, a department under jurisdiction of the County Executive with authority over County-owned facilities, materials, and right-of-way. In the interest of full-disclosure: at the time the scope was being developed, MCDGS was a partner in the development of the Viva White Oak development located along FDA Boulevard and Cherry Hill Road. While MCDGS has been kept apprised of the project's scope and progress, this analysis has been careful to ensure that Viva White Oak did not have any effect on the analysis different from how any other trip-generating project would be handled.

⁷ M-NCPPC = Maryland-National Capital Park and Planning Commission, a State-created bi-county agency with authority over parks as well as planning in Montgomery and Prince George's Counties. Each county has a separate office that largely functions independently of the other county, with a Planning Board appointed by the County Council. All references to M-NCPPC apply to the Montgomery County office of M-NCPPC.

⁸ SHA = Maryland State Highway Administration, a State agency within the Maryland Department of Transportation with authority over all numbered roadways – generally major arterials – throughout the County and State.

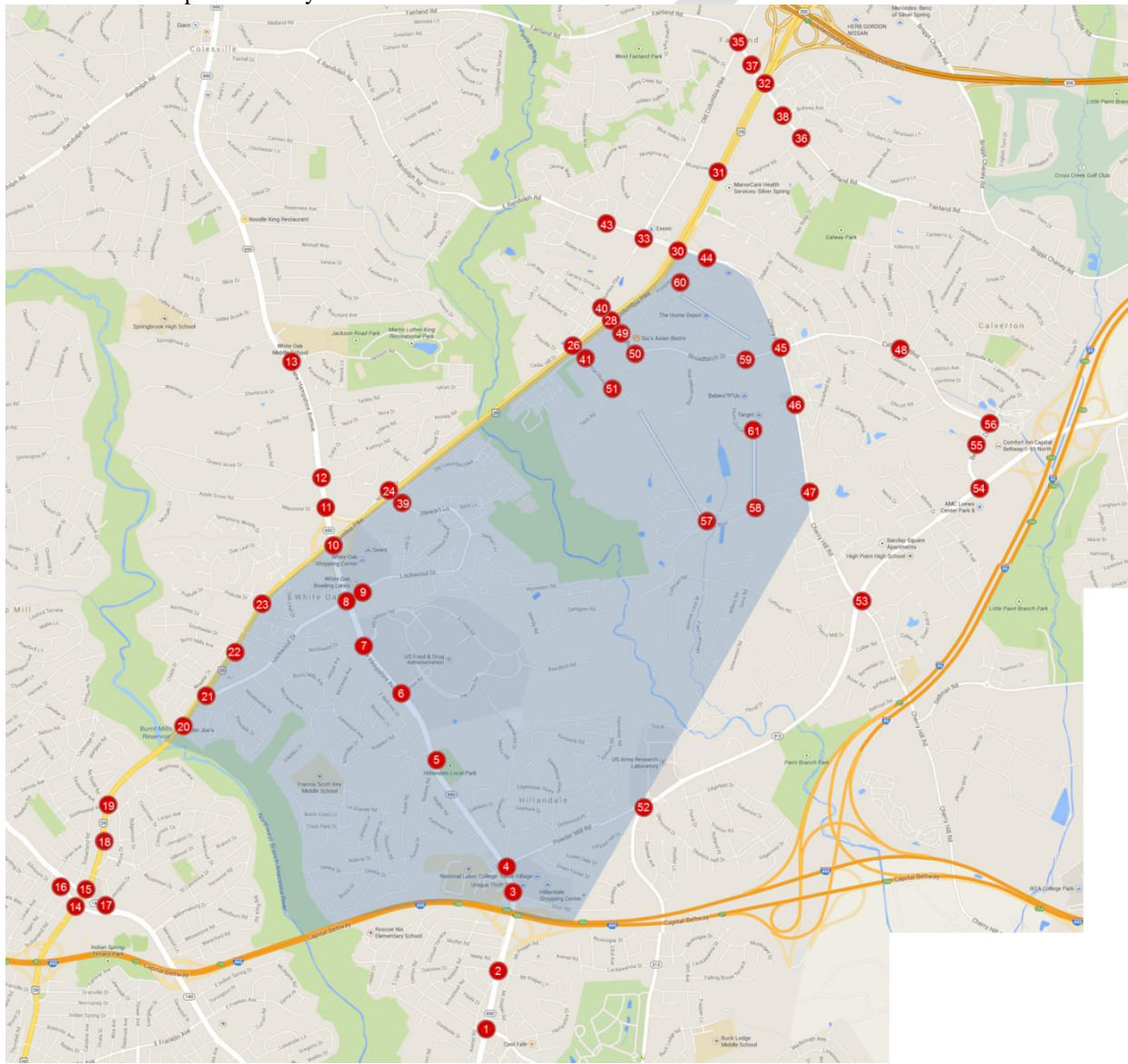
⁹ Per the Full Council Session on April 14, 2015

¹⁰ This is to ensure the information is available if found to be necessary, and is not to imply that the interchanges will not be built. The interchanges at Tech/Industrial and at Fairland/Musgrove are #5 and #9 on the County's 2015 Priorities Letter to the State.

The analysis was scoped to assume 100% development build-out into the horizon year of 2040. This differs from a conventional master plan analysis, which assumes 75% of development would be built over the lifetime of a plan – as suggested by M-NCPPC based on their experience with previous master plans. This change was made in response to public testimony suggesting that as developers would have a greater by-right capability toward development, they would be more capable of developing beyond the average 75% build-out. It is highly unlikely that development would achieve 100% of potential density for the entirety of the policy area.

Additional detail on the methodology behind the analysis can be found in the enclosed technical memorandum prepared by our consultant, Sabra, Wang, & Associates (SWA).

Exhibit 1 – Map of the analysis area



North is toward the top of the exhibit. I-495 (Capital Beltway) runs east-west along the bottom, with I-95 running north-south along the right side and MD 200 (Intercounty Connector) at the top-right. US 29 runs diagonal from bottom-left to top-right, and MD 650 runs north-south along just left of the center. The blue-shaded area shows the White Oak Policy Area. Intersections included in the scope are marked in red.

FINDINGS

The analysis was scoped to generally adhere to the practices as defined and required by the LATR process prior to the 2016 rewrite (approved by Council on November 15, 2016). The findings presented in the enclosed SWA technical memorandum reflect the results of the analysis.

Based on the LATR methodology, treatments were identified at 24 intersections, as shown in Exhibit 2. There are several important considerations:

- Four of these intersections would be addressed by an interchange at US 29 and Tech Rd / Industrial Pkwy.
- One of these intersections (Old Columbia Pike at Fairland Rd) would be addressed by an interchange at US 29 and Fairland Rd / Musgrove Rd.
- Three intersections are located outside of the White Oak Policy Area, along Old Columbia Pike at Tech Rd, Randolph Rd, and Fairland Rd.
- These results do not include work to be performed by Washington Adventist Hospital along Plum Orchard Dr at Cherry Hill Rd and at B-5 (the connector road to the Viva White Oak development).

Along US 29 there are 9 intersections identified south of the MD 650 interchange which, in most cases, require an additional through lane in each direction to satisfy the LATR methodology. The issues faced along US 29 are, to a degree, a representation of the WOSG Master Plan having been approved with the recognition that the plan fails both the Roadway and Transit TPAR Tests.

It is critical to highlight that MCDOT has no expectation that US 29 will be widened to accommodate an additional lane in each direction, which could have significant impacts. Improvements to transit, bicycle, and pedestrian accessibility, and through Traffic Mitigation Agreements (TMAGs) with developments will further reduce the generation of vehicle-trips and help to achieve compliance with LATR requirements along the corridor.

The master plan sets the Non-Auto Driver Mode Share (NADMS)¹¹ at between 25% and 30% for all new development. Our analysis did not explicitly factor in this NADMS value as an input, though the analysis does generate an NADMS as an output. The model estimated that based on the inputted infrastructure and development, an NADMS of 32.7% would be achieved. Additional efforts to increase NADMS not already included in the model could contribute to exceeding the master plan's NADMS goals and reducing vehicular demand.

¹¹ NADMS is the percentage of trips being made by non-auto modes such as by walking, bicycling, transit, carpooling, and telecommuting. The inverse of this is how many trips are performed in single occupant vehicle.

COST ESTIMATES

The enclosed SWA technical memorandum provides cost estimates for each identified intersection project. Cost estimates are summarized in Exhibit 2, with several intersections combined into singular projects (as along Broadbirch Dr as well as along Old Columbia Pike).

These estimates utilize SHA's Major Quantities Estimates methodology, which do not include utilities, stormwater management, structures, or detailed information on environmental impacts. Accordingly, contingency factors were applied to compensate for a number of these items. A 10% Environmental contingency was applied to compensate for general impacts to environmental elements and as a measure of stormwater management needs. A 5% Utilities contingency was applied to compensate for related impacts. And a large 50% General contingency was applied as a matter of general practice for a planning-level cost estimate. These contingencies were applied before adding in right-of-way costs.

It is expected that all values – particularly items covered by contingencies – would change significantly should a project enter into detailed design. Future monitoring and reassessments of project costs are expected to consider the most accurate and precise information available, refining these costs over time and adjusting the associated pro-rata fee accordingly.

These contingencies were overridden at several locations. For the work at the intersections of US 29, Old Columbia Pike / Prosperity Dr, Industrial Pkwy, and Tech Rd: the General contingency was replaced with a 100% contingency to account for the additional complexity and maintenance of traffic needs associated with the proposed work.

Exhibit 2 – Cost Estimates

Location	Estimated Cost	Identified Needs
US 29 and Industrial Parkway	\$4,400,000	Add: 1 SBL Relocation of 2 NBR from intersection
US 29 Spur and Old Columbia Pike		Relocate 2 NBR on US 29 to spur connecting to Old Columbia Pike just south of Industrial Pkwy
Old Columbia Pike and Industrial Pkwy		Signalization Add: 1 WBR
US 29 Ramps at Randolph Rd / Cherry Hill Rd	\$2,000,000	Add: 1 EBT Reconfigure: SBR to shared right-left
MD 650 and Powder Mill Road	\$1,200,000	Add: 1 NBR
MD 650 and Lockwood Drive	\$1,400,000	Add: 1 NBL, 1 WBT, and receiving lane on west leg
Tech Road and Prosperity Drive	\$2,300,000	Signalization Turn Restrictions: NBR, SBR only
Tech Road and Broadbirch Drive	\$1,700,000	Signalization Add: 1 WBR, 1 NBR
Broadbirch Drive at Cherry Hill Rd	\$3,600,000	Add: 1 SBT, 1 SBR, 1 WBT, 1 EBT, 1 EBR
Broadbirch Drive at Plum Orchard Rd		Signalization Restripe: NB and SB Approaches to 4-lane Cross-Section
TOTAL	\$16,600,000	

RECOMMENDATIONS

The large table included on the following page is split into several groupings of rows and columns. The rows are color-coded and grouped as follows: interchanges (**red**), transit (**blue**), intersections (**purple**), new roads (**brown**), road widening (**orange**), and bikeways (**green**).¹²

The focus of the analysis tasked by Council – and the subject of this report – is to identify the Intersections (**purple**) costs.¹³ However, it has been the expectation by the Council and M-NCPPC that a nexus may exist to incorporate additional projects into the cost assessed as a pro-rata fee – potentially including projects from the non-purple sections.

Furthermore, some of the projects in the Intersections section may not be necessary or preferable to include in the total cost. Some projects may be addressed by private development, outside the policy area, may be addressed by the proposed interchanges, or may be a project of minimal feasibility.

What follows are the recommendations of MCDOT, on behalf of the County Executive, for which Intersections (**purple**) projects should be **excluded** from the pro-rata fee:

- FDA Blvd at B-5
\$1,000,000

This intersection is located internally within the Viva White Oak site and should be constructed by Viva White Oak.
- Cherry Hill Rd at Plum Orchard Dr
\$2,800,000

This intersection is conditioned upon Washington Adventist Hospital to construct.
- Tech Rd at Industrial Pkwy
\$4,400,000

This intersection is critical to the site access of Viva White Oak, and will be directly affected by the development's extension of A-106 (Industrial Parkway) into the Viva site. Reconstruction of this intersection should be performed by Viva White Oak.
- Old Columbia Pike at Tech Rd
\$500,000

This intersection is located outside of the White Oak Policy Area. Current expectations have been that while the analysis would evaluate outside of the policy area, the pro-rata fee would be comprised only by projects within the policy area.
- Old Columbia Pike at Randolph Rd
\$1,100,000

As with Old Columbia / Tech, this intersection is located outside of the Policy Area.
- Old Columbia Pike at Fairland Rd
\$2,300,000

As with Old Columbia / Tech, this intersection is located outside of the Policy Area.

¹² The columns show the approximate total cost immediately left of the **grey** columns. The **grey** columns show an assumed breakdown of whether a project would be fully or partially funded by public (left column) or private (right column) sectors. These are then reflected by the next two columns to the right, showing the cost as allocated between public and private sectors. Note that summations may not be exact due to rounding upward to the nearest \$100,000 value.

¹³ The other color-coded sections are sourced from existing project cost estimates, or from other planning level cost estimates performed separately from this analysis as a part of the development of the WOSG Master Plan.

**Cost Estimates for the
White Oak Science Gateway Master Plan**

Project		Approx Total Cost	Pub	Pvt	County / State	Developers	Notes
Interchanges	Stewart La	\$ 130,000,000	100%		\$ 130,000,000	\$ -	Fairland/Musgrove based on SHA estimates as of July 2016. Stewart La and Tech/Industrial based on SHA estimates as of September 2013. Greencastle and Blackburn interchanges are excluded on account of being a significant distance outside of the plan area. Fairland/Montrose is included on account of being within 2 intersections distant of the plan area.
	Tech Rd / Industrial Pkwy	\$ 96,000,000	100%		\$ 96,000,000	\$ -	
	Fairland Rd / Musgrove Rd	\$ 139,000,000	100%		\$ 139,000,000	\$ -	
	SUBTOTAL	\$ 365,000,000			\$ 365,000,000	\$ -	
Transit (Capital)	US 29	\$ 65,800,000	100%		\$ 65,800,000	\$ -	BRT accounts for the span within the master plan area only; full build-out of the system would be necessary for adequate functionality. Costs are based on a per-mile estimate prepared for each line by VHB. Circulator assumes 2 buses with approximately 2 replacements at 12 year increments. Operating costs not included.
	MD 650	\$ 64,100,000	100%		\$ 64,100,000	\$ -	
	Randolph Rd	\$ 13,900,000	100%		\$ 13,900,000	\$ -	
	Circulator	\$ 2,400,000		100%	\$ -	\$ 2,400,000	
	New Ride-On Service	\$ 8,400,000	100%		\$ 8,400,000	\$ -	These items are not explicitly in the Master Plan, but are outstanding needs identified for the area which could contribute toward a ped, bike, and transit usage (and subsequently contribute toward achieving the NADMS goals for the policy area).
	Increased Ride-On 10 Service	\$ 6,000,000	100%		\$ 6,000,000	\$ -	
	Increased Ride-On 21 Service	\$ 2,400,000	100%		\$ 2,400,000	\$ -	
	Increased Ride-On 22 Service	\$ 3,600,000	100%		\$ 3,600,000	\$ -	
	Washington Adventist Hospital Transit Center	\$ 200,000		100%	\$ -	\$ 200,000	Washington Adventist Hospital Transit Center assumed to be built by the Hospital.
	Hillandale Transit Center	\$ 500,000	100%		\$ 500,000	\$ -	Bikeshare costs are for capital costs only over the lifetime of the plan and do not include operating costs.
	Bus Stop Improvements	\$ 100,000	100%		\$ 100,000	\$ -	
	Bikeshare	\$ 4,600,000		100%	\$ -	\$ 4,600,000	
	Transportation Management District (TMD)	\$ 13,900,000	100%		\$ 13,900,000	\$ -	
	SUBTOTAL	\$ 185,900,000			\$ 178,700,000	\$ 7,200,000	The TMD accounts for the total estimated costs to the County over the lifetime of the plan, considering linear commercial development growth and adjusting for incoming revenue.
Intersections	LATR Analysis (per each analysis)	\$ 500,000	100%		\$ 500,000	\$ -	* = Assumed to be constructed as part of the Viva White Oak development access
	US 29 at Randolph Rd / Cherry Hill Rd	\$ 2,000,000	100%		\$ 2,000,000	\$ -	
	* FDA Blvd at B-5	\$ 1,000,000		100%	\$ -	\$ 1,000,000	
	** Cherry Hill Rd at Plum Orchard Dr	\$ 2,800,000		100%	\$ -	\$ 2,800,000	
	Broadbirch Dr at Cherry Hill Rd & Plum Orchard Dr	\$ 3,600,000	100%		\$ 3,600,000	\$ -	** = Assumed to be constructed by Washington Adventist Hospital
	Broadbirch Dr at Tech Rd	\$ 1,700,000	100%		\$ 1,700,000	\$ -	
	* Tech Rd at Industrial Pkwy	\$ 2,800,000		100%	\$ -	\$ 2,800,000	
	† US 29 at Industrial Pkwy	\$ 4,400,000	100%		\$ 4,400,000	\$ -	
	† Tech Rd at Prosperity Dr / Old Columbia Pike	\$ 2,300,000	100%		\$ 2,300,000	\$ -	† = Would be negated by an interchange at US 29 and Tech Rd / Industrial Pkwy
	⊕† Old Columbia Pike at Tech Rd	\$ 500,000	100%		\$ 500,000	\$ -	‡ = Would be negated by an interchange at US 29 and Fairland Rd / Musgrove Rd
	⊖ Old Columbia Pike at Randolph Rd	\$ 1,100,000	100%		\$ 1,100,000	\$ -	
	⊖‡ Old Columbia Pike at Fairland Rd	\$ 2,300,000	100%		\$ 2,300,000	\$ -	
	MD 650 at Lockwood Dr	\$ 1,400,000	100%		\$ 1,400,000	\$ -	
	MD 650 at Powder Mill Rd	\$ 1,200,000	100%		\$ 1,200,000	\$ -	⊖ = Located outside of the WOSG Policy Area
	SUBTOTAL	\$ 27,600,000			\$ 21,000,000	\$ 6,600,000	
New Roads	A-105 (White Oak Shopping Center)	\$ 23,400,000		100%	\$ -	\$ 23,400,000	Assumed built by White Oak Shopping Center
	A-106 (Industrial Pkwy Extended)	\$ 49,500,000		100%	\$ -	\$ 49,500,000	Assumed built by Viva White Oak
	B-5 (Plum Orchard / FDA Blvd Connector)	\$ 18,300,000		100%	\$ -	\$ 18,300,000	Assumed built by Adventist Hospital & Viva White Oak
	B-6 (Plum Orchard Extended)	\$ 26,400,000		100%	\$ -	\$ 26,400,000	Assumed built by adjacent development.
	B-7 (Cherry Hill / Plum Orchard Connector)	\$ 8,600,000		100%	\$ -	\$ 8,600,000	Assumed built by adjacent development.
	SUBTOTAL	\$ 126,200,000			\$ -	\$ 126,200,000	
Roadway Widening	CM-10 US 29 (Columbia Pike) over MD 650	\$ 43,500,000	100%		\$ 43,500,000	\$ -	All projects are for road widening for either additional capacity or parking, and includes any master planned bicycle infrastructure.
	A-105 Old Columbia Pike Bridge	\$ 12,000,000	100%		\$ 12,000,000	\$ -	
	A-105 Old Columbia Pike	\$ 58,100,000	100%		\$ 58,100,000	\$ -	
	M-12 MD 650 (New Hampshire Ave)	\$ 5,900,000	100%		\$ 5,900,000	\$ -	
	P-16 Elton Rd	\$ 100,000	100%		\$ 100,000	\$ -	CM-10 (US 29) and M-12 (MD 650) widening are for additional thru lanes along in each southbound directions at US 29 and MD 650. M-12 assumes no bridge reconstruct: lanes narrowed; bikeway behind piers w/ reconstructed wall. CM-10 assumes a bridge reconstruct.
	B-9 Broadbirch Dr	\$ 33,700,000	100%		\$ 33,700,000	\$ -	
	B-10 FDA Blvd	\$ 25,100,000		100%	\$ -	\$ 25,100,000	
	B-11 Tech Rd (south of Industrial Pkwy)	\$ 10,400,000		100%	\$ -	\$ 10,400,000	
	SUBTOTAL	\$ 188,800,000			\$ 153,300,000	\$ 35,500,000	
New Bikeways	M-10 US 29 (Columbia Pike)	\$ 2,200,000	50%	50%	\$ 1,100,000	\$ 1,100,000	All projects are for shared use paths, for widening that is solely intended for provision of bicycle infrastructure, or (in the case of B-3) for narrowing as per the master planned cross-section.
	M-12 MD 650 (New Hampshire Ave)	\$ 4,800,000	50%	50%	\$ 2,400,000	\$ 2,400,000	
	A-94 Powder Mill Rd	\$ 18,200,000	100%		\$ 18,200,000	\$ -	
	A-106 Industrial Pkwy	\$ 8,400,000	50%	50%	\$ 4,200,000	\$ 4,200,000	
	A-107 Tech Rd (north of Industrial Pkwy)	\$ 8,000,000	50%	50%	\$ 4,000,000	\$ 4,000,000	
	A-108 Prosperity Dr	\$ 14,600,000	50%	50%	\$ 7,300,000	\$ 7,300,000	
	A-286 Lockwood Dr (west of New Hampshire Ave)	\$ 18,400,000	100%		\$ 18,400,000	\$ -	
	B-3 Elton Rd	\$ 500,000		100%	\$ -	\$ 500,000	
	SUBTOTAL	\$ 75,100,000			\$ 55,600,000	\$ 19,500,000	
TOTAL ESTIMATED COST		\$ 968,600,000			\$ 773,600,000	\$ 195,000,000	Roadway & Transit TPAR are both inadequate.

We recommend the following projects should be **included** as a part of the cost utilized in assessing the pro-rata fee:

INTERSECTIONS (purple)

• US 29 at Industrial Pkwy ¹⁴	\$4,400,000
• US 29 at Randolph Rd / Cherry Hill Rd	\$2,000,000
• MD 650 at Powder Mill Rd	\$1,200,000
• MD 650 at Lockwood Dr	\$1,400,000
• Tech Rd at Prosperity Dr / Old Columbia Pike ¹⁴	\$2,300,000
• Broadbirch Dr at Tech Rd	\$1,700,000
• Broadbirch Dr at Cherry Hill Rd & Plum Orchard Dr	\$3,600,000
Subtotal	\$16,600,000

TRANSIT (blue)¹⁵

• New Ride-On Service	\$8,400,000
• Increased Ride-On 10 Service	\$6,000,000
• Increased Ride-On 21 Service	\$2,400,000
• Increased Ride-On 22 Service	\$3,600,000
• Hillandale Transit Center	\$500,000
• Bus Stop Improvements	\$100,000
• Bikeshare	<u>\$4,600,000</u>
Subtotal	\$25,600,000

BIKEWAYS (green)¹⁵

• M-10 US 29 (Columbia Pike)	\$2,200,000
• M-12 MD 650 (New Hampshire Ave)	\$4,800,000
• A-94 Powder Mill Rd	\$18,200,000
• A-106 Industrial Pkwy ¹⁶	\$8,400,000
• A-107 Tech Rd	\$8,000,000
• A-108 Prosperity Dr	\$14,600,000
• A-286 Lockwood Dr	\$18,400,000
• B-3 Elton Rd	<u>\$500,000</u>
Subtotal	\$75,100,000

LATR Analyses every 5yrs, from 2017 to 2040	\$500,000
White Oak TMD Program ¹⁵	<u>\$13,900,000</u>

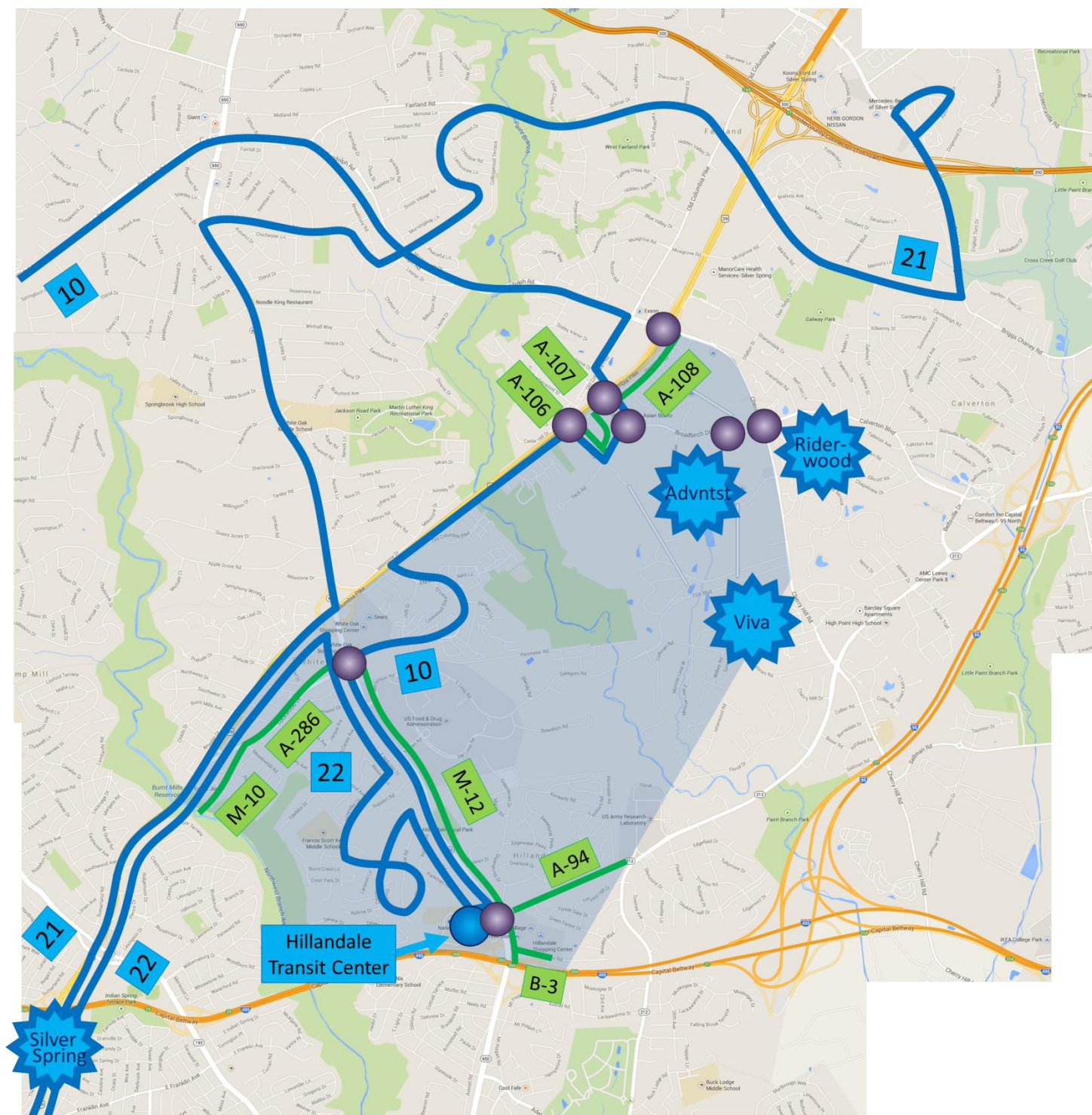
Total Amount \$131,700,000

The purpose of this analysis is to identify the total cost, or the numerator in the \$/trip estimate. The number of trips generated by the WOSG Master Plan is the denominator of this calculation.

¹⁴ This could be removed if the interchange at US 29 and Tech Rd / Industrial Pkwy is funded for construction.

¹⁵ On the basis that these will contribute toward NADMS, reducing issues encountered along US 29 and elsewhere. All costs are over the 2040 lifetime of the plan. Operating costs are not included for transit projects, though they can be substantial. Note that detailed project descriptions for each item are included later in this document.

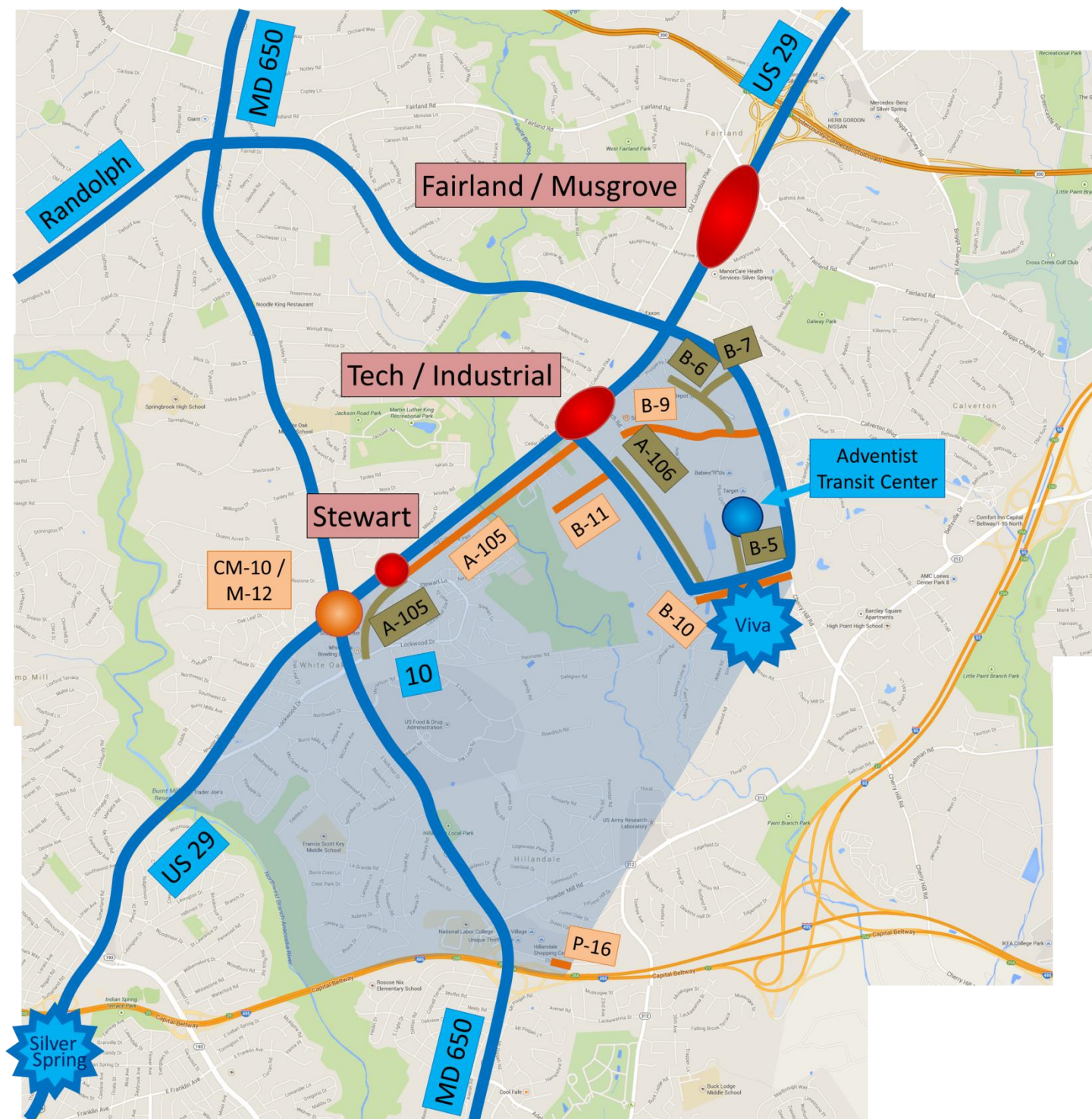
¹⁶ The existing portion of Industrial Pkwy may be reconstructed utilizing funds from the Viva White Oak project.



Projects proposed for inclusion into the cost estimate. Purple circles represent Intersections projects. Areas shown within the 12-shaped stars are service areas to be addressed by the Circulator & future Ride-On lines, along routes not yet determined

The other items called for by the Master Plan may or may not be included in the fee and we defer to the Council for consideration. These projects are either assumed as being implemented by specific developers, or are considered to be significantly beyond the proportional scale of an LATR-focused fee, and/or were not considered to have an adequate NADMS-focused nexus. These projects would otherwise fall under the domain of transportation impact taxes.

- **Interchanges (red)** **\$365,000,000**
Each of these projects is outside of the scope of the LATR analysis. General consensus through the development of this pro-rata structure is that the interchanges would not be included in the pro-rata cost estimate.
- **BRT (blue)** **\$143,800,000**
Each of these projects is outside of the scope of the LATR analysis. General consensus through the development of this pro-rata structure is that the interchanges would not be included in the pro-rata cost estimate.
- **Plum Orchard Transit Hub (blue)** **No Estimate Available**
Expected to be implemented by the Washington Adventist Hospital.
- **White Oak Circulator (blue)** **\$3,400,000**
Expected to be implemented by Viva White Oak.
- **New Roads (brown)** **\$126,200,000**
Each roadway is expected to be implemented by individual developments.
- **US 29 and MD 650 Reconstruction (orange)** **\$49,400,000**
Reconstruction of the bridge & widening in the vicinity of the ramps to accommodate a third southbound through lane along US 29 (\$43,500,000) as well as along southbound MD 650 (\$5,900,000).
- **Old Columbia Pike Widening (orange)** **\$70,100,000**
Widening of Old Columbia Pike along the east side of US 29 (\$58,100,000) and reconstruction of the bridge (\$12,000,000) to provide for a four-lane arterial.
- **Elton Rd Widening (orange)** **\$100,000**
Widening of the east end of Elton Rd to provide adequate room for two travel lanes and parking lanes along each side of the road. A very short segment and unlikely to garner support from the community, it is unlikely that this segment will be widened.
- **Broadbirch Dr Widening (orange)** **\$33,700,000**
Widening to provide parking lanes along each side of the road.
- **FDA Blvd Widening (orange)** **\$25,100,000**
Widening to provide parking lanes along each side of the road. Assumed to be constructed by Viva White Oak.
- **Tech Rd Widening (orange)** **\$10,400,000**
Widening to provide two additional travel lanes. Assumed to be constructed by adjacent developments.



Projects not currently included in the cost estimate

COUNCIL CONSIDERATIONS

In addition to determining which projects to include in the fee calculations, a number of other factors arise which must be considered in ultimately assessing the fee:

% of Trips Generated

The traffic impacts and associated costs (the numerator in the \$/trip estimate) were developed assuming 100% build-out of the developable potential, which provides for a more conservative traffic impact assessment and was selected based on extensive input from council, other public agencies, and private residents.

Assuming 100% build-out for the trips used in the denominator, however, may not necessarily result in a realistic figure given that it is unlikely that the master plan will achieve 100% of development potential. Master plans typically assume a 75% build-out, but we recognize that the nature of the pro-rata fee may enable developers to more readily utilize their developable potential, and as such the actual build-out will likely be somewhere between 75% and 100%.

For a total \$131,700,000 of included costs, at 100% development¹⁷ the pro-rata fee would be \$6,500. At 75% development¹⁸ the pro-rata fee would be \$8,700. An advantage of using a value less than 100% is that it provides not only a more realistic representation of likely development, but ensures a greater supply of revenue will be made available toward implementation of necessary infrastructure.

Forward Funding

Revenues from the pro-rata fee will not be generated quickly or early enough to allow for design and implementation of associated needs. Without forward funding, new developments may be built and become occupied before design has even begun on a project, no less a project's timeline for design, public coordination, and construction.

Forward funding either individual projects or an area-wide White Oak CIP will be critical to ensuring that necessary infrastructure and services are in place to serve the growing needs of the White Oak Policy Area.

¹⁷ 100% corresponds to 20,323 PM Peak Hour Trips in 2040, based on information provided by M-NCPPC.

¹⁸ 75% corresponds to 15,243 PM Peak Hour Trips in 2040, based on information provided by M-NCPPC.

Definition of a Trip

We currently assume a trip is defined as a 2040 PM¹⁹ Peak Hour Vehicle-Trip with no heed to a trip's directionality. Other metrics that were considered, such as:

- Using a time scale of Peak Period Trip²⁰ or a Daily Trip.
- Defining a trip as a vehicle-trip²¹ or a person-trip.²²
- Changing the directionality to specify a trip in the peak flow direction.²³
- Whether the trips used in the denominator should consist only of mitigated trips.²⁴

Local Access Analyses

This analysis uses macroscopic models that do not necessarily focus on the intricacies of an individual development, which may have a varying number of access points spread out across one or multiple roadways. New developments should still be required to evaluate access points for any necessary treatments and mitigate as necessary.

WOSG-Adjacent Developments

To address developments located outside the White Oak Policy Area but generating trips to, from, or through the White Oak Policy Area: we suggest assessing the pro-rata fee on a per-trip basis with no further analyses required within the White Oak Policy Area.

Impact Tax Credits

Contributions to the per-trip fee should not be eligible for impact tax credit. If a developer constructs a project that would otherwise be eligible for impact tax credit then it would remain eligible, though it would not be eligible for credits toward the pro-rata fee.

¹⁹ Evening / PM time spans are typically used in lieu of Morning / AM, as they tend to have higher traffic volumes – particularly in areas with a mixture of land uses.

²⁰ Typically a span of 3 to 4 hours.

²¹ A generated trip that uses an automobile.

²² A generated trip that is mode-neutral. It might be by automobile, by transit, by bike, a pedestrian, etc.

²³ This metric has been advocated by Viva White Oak on the basis that this development would attract trips in the reverse flow along US 29, utilizing underused capacity.

²⁴ Mitigated Trips being only those trips which cause a Level of Service (LOS) F and must be mitigated to achieve LOS E. At intersections failing under existing conditions, any additional trips must be mitigated at 1.5x the amount of trips.

Monitoring / Reassessment

It is expected that the pro-rata fee will be reassessed at regular intervals, and in the cost estimates above we assume approximately \$100,000 every 5 years to complete this analysis. These analyses can also be used to identify pending needs & prioritization, influencing how to utilize CIP funding and fee revenues to implement which projects.

These reassessments would address a variety of changing scenarios, including:

- Transportation needs as well as public preferences may shift such that some projects currently identified may no longer be considered necessary, and some project not currently identified may become an apparent need.
- The trend in land development may shift, with changing land uses and ratios between residential vs commercial development, or the rates of development may be more or less intensive than anticipated.
- Changes in NADMS as compared to target goals.
- Development outside but near to the White Oak Policy Area may contribute into the pro-rata program, reducing the amount that may need to be assessed.
- Increases in project costs, noting that cost estimates do not currently account for inflation.
- Changes in Federal land uses, as is the case of an expansion to FDA approved after completion of this analysis. Such an expansion would be accounted for under a future reassessment of the area.

Collection & Application

We suggest that the pro-rata fee be collected following the same procedures as adopted for transportation impact taxes. We suggest that a CIP be created for the White Oak area, into which revenues can be assigned.

However, as noted in the following section and considering that some projects will impact State roads and would subsequently be State-managed projects, consideration must be given toward a mechanism for how to apply pro-rata revenue to State projects. A potential mechanism for this is to utilize the State Transportation Participation CIP (P500722), which has already laid a framework for cost participation with SHA.

ROLE OF SHA

Coordination with the State Highway Administration (SHA) occurred from the earliest stages, with SHA staff being involved in defining the analyses' scope. Findings were presented to SHA in August 30, 2016, with SHA represented by the Assistant District Engineer for Traffic²⁵ and Regional Planner²⁶ for Montgomery County. An email response on behalf of SHA was received from the Regional Planner on September 26, 2016 indicating the following information:

Technical Concurrence

SHA concurs with the scope, methodology, and cost estimates.

Required Analyses for SHA Permitting

SHA's response on their buy-in to the pro-rata structure is copied verbatim:

While the State defers to local APFOs, where established, for required improvements, MDOT is concerned as to how pending changes in countywide LATR requirements may affect this specific application. The State expects to retain the right, as established in COMAR, to request an applicant perform a [Traffic Impact Study] to determine roadway improvements needed to mitigate additional traffic generated by a proposed development. All proposed roadway improvements will be constructed under an SHA-issued access permit. In addition, partial funding of requested improvements may not be an adequate basis for approval of an access permit.

Funding Allocation

SHA buy-in into the pro-rata structure – particularly in reducing the need for additional Traffic Impact Studies – will likely be heavily contingent on how the pro-rata fee structure can fund necessary State projects in a timely manner.

As the County will collect the pro-rata fees, considerations must be made as to how funding will provide for State needs. As noted in the preceding section on Council Considerations, a CIP mechanism will be necessary to allocate revenue from the pro-rata fee toward SHA projects.

The pro-rata fee is not expected to address transportation projects pursued by SHA that are not identified in our analysis, though such treatments may be incorporated during subsequent monitoring reassessments.

SHA noted a desire that pro-rata revenue be used solely for projects in the White Oak Policy Area. SHA has also expressed an interest in participating in project selection and how such funds are applied to planned projects along State roadways.

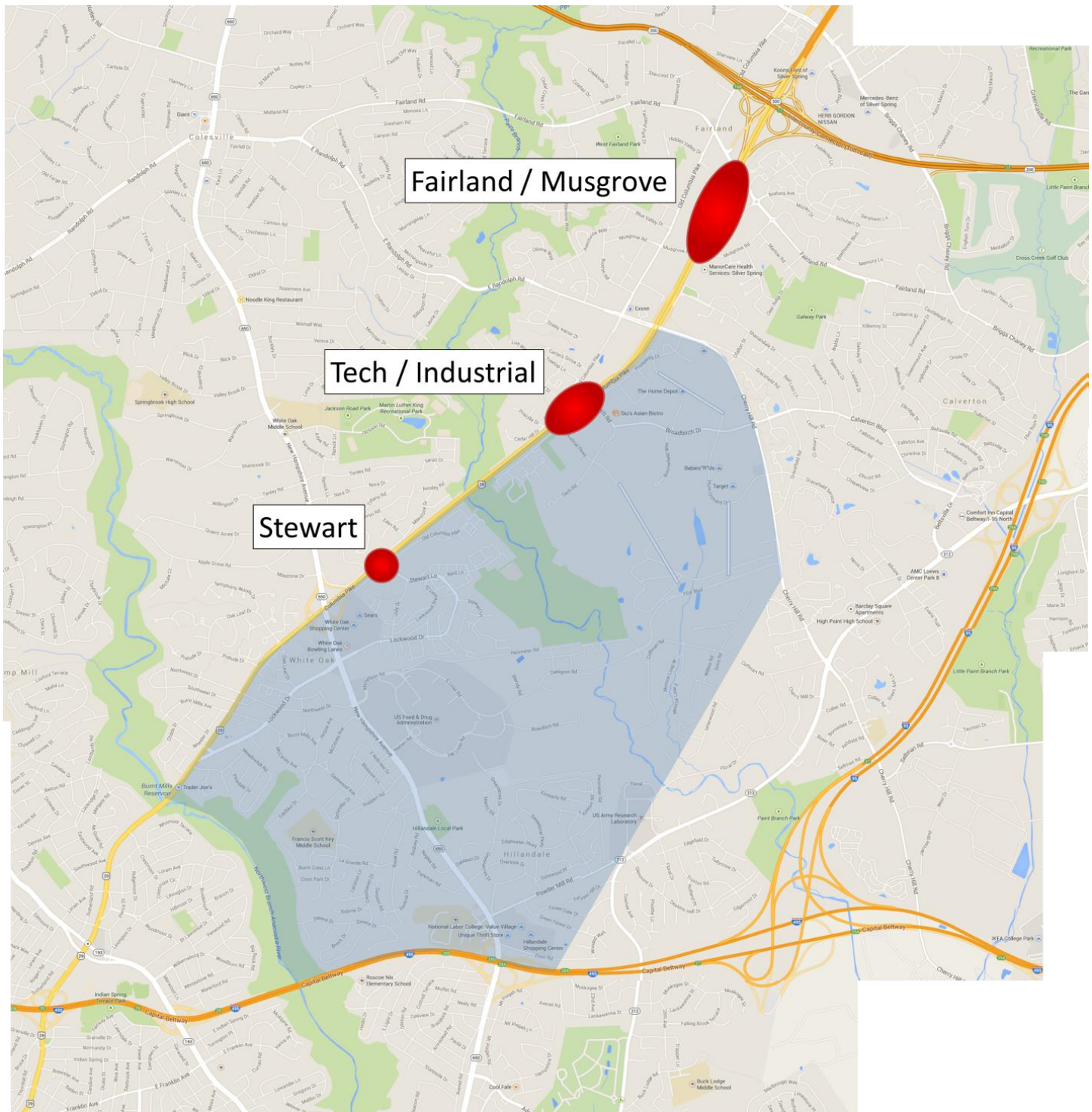
²⁵ Representing SHA's District 3 Office in Greenbelt and acting on behalf of the Assistant District Engineer for Project Development as well as District 3's Access Management and Engineering System Teams.

²⁶ Located in the Regional and Intermodal Planning Division of SHA's headquarters in Baltimore.

PROJECT DESCRIPTIONS

Interchanges (red)

- **US 29 / Stewart Lane** **\$130,000,000**
 An SHA-run project. Only conceptual designs & estimates are available. There is no funding scheduled for detailed design. Cost estimate provided by SHA in September 2013. No further information on the design is available.
- **US 29 / Tech Rd / Industrial Pkwy** **\$96,000,000**
 An SHA-run project. Only conceptual designs & estimates are available. There is no funding scheduled for detailed design, though the interchange is #5 on the County's Priorities Letter for the Construction Program. Cost estimate provided by SHA in September 2013. Two intersections identified by this LATR Analysis would be impacted by this interchange. The conceptual design shows movements to/from northbound US 29 accessed via Industrial Pkwy (which would not extend across US 29). Tech Rd would bridge over US 29 and serve movements to/from southbound US 29. This interchange is expected to serve a large proportion of traffic to the large Viva White Oak development.
- **US 29 / Fairland Rd / Musgrove Rd** **\$139,000,000**
 An SHA-run project. The project is presently on hold at 60% Design, having been put on hold in September 2016 due to State budget cuts deferring design funding indefinitely. The interchange is #9 on the County's Priorities Letter for the Construction Program. Cost estimate provided by SHA in June 2016. This interchange is not located in the White Oak Policy Area. One intersection identified by this LATR Analysis would be impacted by this interchange. The current design shows movements to/from northbound US 29 accessed via Montrose Rd (which would not extend across US 29). Fairland Rd would bridge over US 29 and serve movements to/from southbound US 29.



Interchanges

Transit (blue)

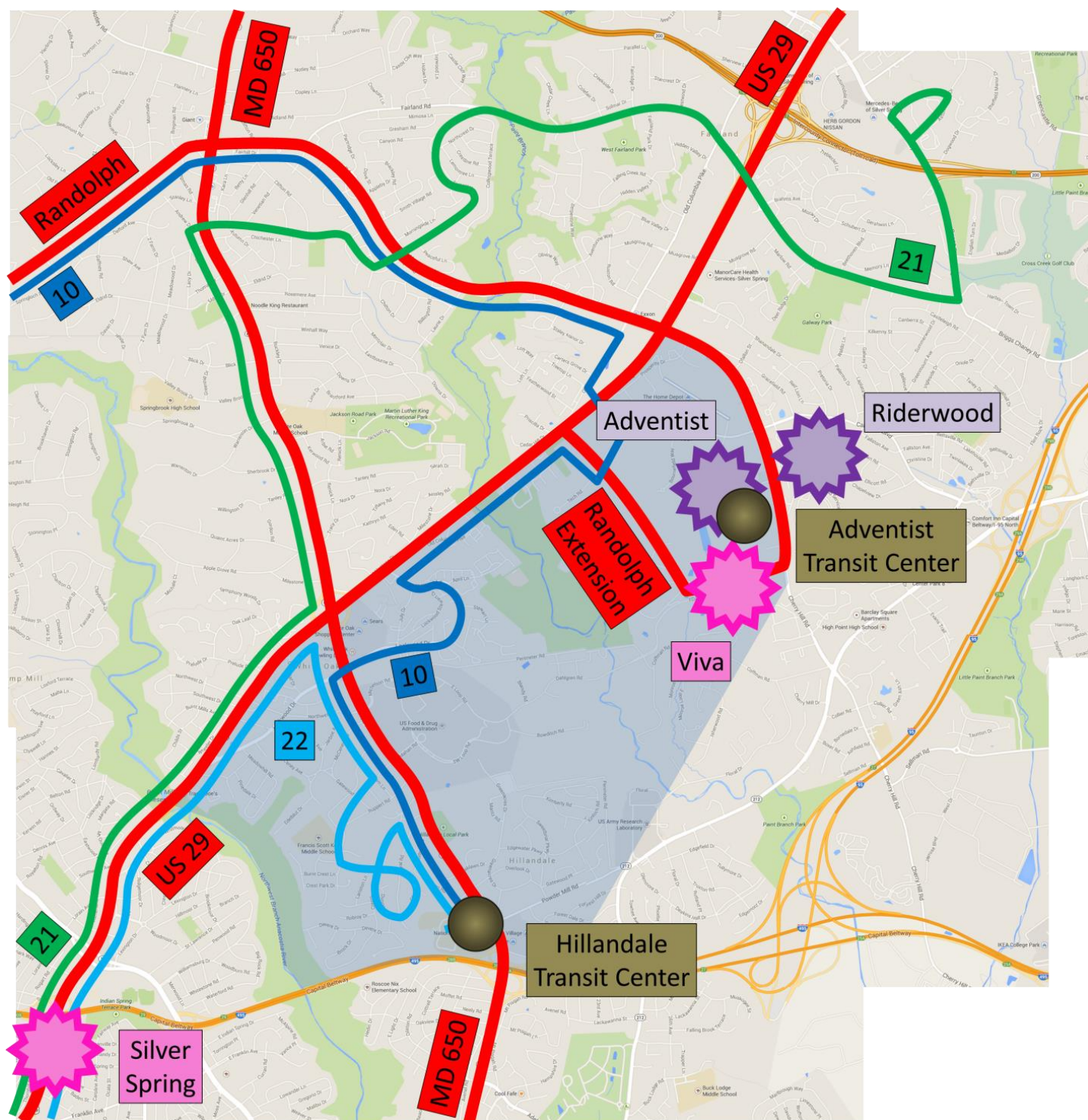
- **US 29 BRT** **\$65,800,000**
 This cost estimate utilizes a per-mile estimate (\$31,900,000/mi) from 2014 for dedicated bus lanes and applies it to the 2.06 miles within the WOSG Master Plan. Operating costs are not included.
- **MD 650 BRT** **\$64,100,000**
 This cost estimate utilizes a per-mile estimate (\$33,900,000/mi) from 2014 for dedicated bus lanes and applies it to the 1.89 miles within the WOSG Master Plan. Operating costs are not included.
- **Randolph Rd BRT** **\$13,900,000**
 This cost estimate utilizes a per-mile estimate (\$10,200,000/mi) from 2014 for shared traffic express buses and applies it to the 1.36 miles within the WOSG Master Plan. Operating costs are not included.
- **Circulator** **\$2,400,000**
 A new route serving between Viva White Oak and the Silver Spring Transit Center initially, converting to a Circulator around the White Oak Science Gateway area after construction of the US 29 BRT. Under both cases it is expected to operate at 15 minute headways, requiring 2 buses with 3 replacements at 12 year intervals. Operating costs are not included. The service is expected to be provided by the Viva White Oak development as a condition upon the development.
- **New Ride-On Route** **\$8,400,000**
 A new route serving Washington Adventist Hospital, Cherry Hill Rd, Viva White Oak, Riderwood, and the Silver Spring Transit Center. Assumed to begin in 2020, operating at 15 minute headways, requiring 7 buses with 1 set of replacements at a 12 year interval. Operating costs are not included.
- **Increased Ride-On Route 10 Service** **\$6,000,000**
 Increasing frequency to 10 minute headways and improving service from the PM peak to midnight. Assumed to occur in 2020 and require 5 additional buses with 1 set of replacements at a 12 year interval. Operating costs are not included.
- **Increased Ride-On Route 21 Service** **\$2,400,000**
 Increasing frequency to 15 minute headways and adding midday, late-evening, and weekend services. Assumed to occur in 2020 and require 2 additional buses with 1 set of replacements at a 12 year interval. Operating costs are not included.
- **Increased Ride-On Route 22 Service** **\$3,600,000**
 Increasing frequency to 10 minute headways and adding midday and late-evening services. Assumed to occur in 2020 and requires 3 additional buses with 1 set of replacements at a 12 year interval. Operating costs are not included.

- **Washington Adventist Hospital Transit Center** **\$200,000**
 The Transit Center is located at the intersection of Plum Orchard Dr and B-5 (the connector to Viva White Oak). This work is being performed entirely by the Washington Adventist Hospital as a condition upon the development.
- **Hillandale Transit Center** **\$500,000**
 The Transit Center includes layover areas and a restroom for bus operators, located along the Powder Mill Rd cul-de-sac west of MD 650.
- **Bus Stop Improvements** **\$100,000**
 Miscellaneous bus stop improvements through the White Oak Policy Area, including upgraded landing areas, ADA treatments, and improved amenities.
- **Bikeshare** **\$4,600,000**
 Conservative estimates of 67 total Bikeshare stations across the entire White Oak Policy Area under a 100% build-out scenario (spanning the full lifetime of the plan). Assuming linear development rates, approximately 2 stations are added per year beginning in 2020. Bikes are assumed to be replaced every 12 years, therefore 1 set of replacements per station is included in the cost estimate. Operating costs are not included.
- **White Oak TMD** **\$13,900,000**
 The White Oak Transportation Management District (TMD) is currently unfunded and has no developed commercial square footage contributing revenue. The \$13.9m estimate represents the anticipated cost to the County for the TMD over the 2040 lifetime of the plan.

This was derived by averaging existing data on other TMDs to determine an average of 28.32% of revenues divided by expenditures.

Revenue is determined by identifying the commercial square footage paying the current \$0.10/commercial SF fee, assuming no development for the first 5 years but maintaining linear growth to achieve the master planned 4,961,982 SF of commercial development by the end of 2040.

Dividing revenue by 28.32% yields expenditures. Summed for each year to 2040 provides an estimate of the TMD's total expenditures at \$19,272,497, less \$5,458,180 revenue, for a total of \$13,814,317. As this \$13.9m, as rounded upwards, value already discounts the revenue generated from TMD fees, inclusion of this in the pro-rata fee means that TMD fees remain applicable.



Transit, color-coded as follows: **BRT**, **Ride-On 10**, **Ride-On 21**, **Ride-On 22**, **Transit Centers**,
Service areas for Circulator and New Ride-On Service, or only the latter

Intersections (purple)

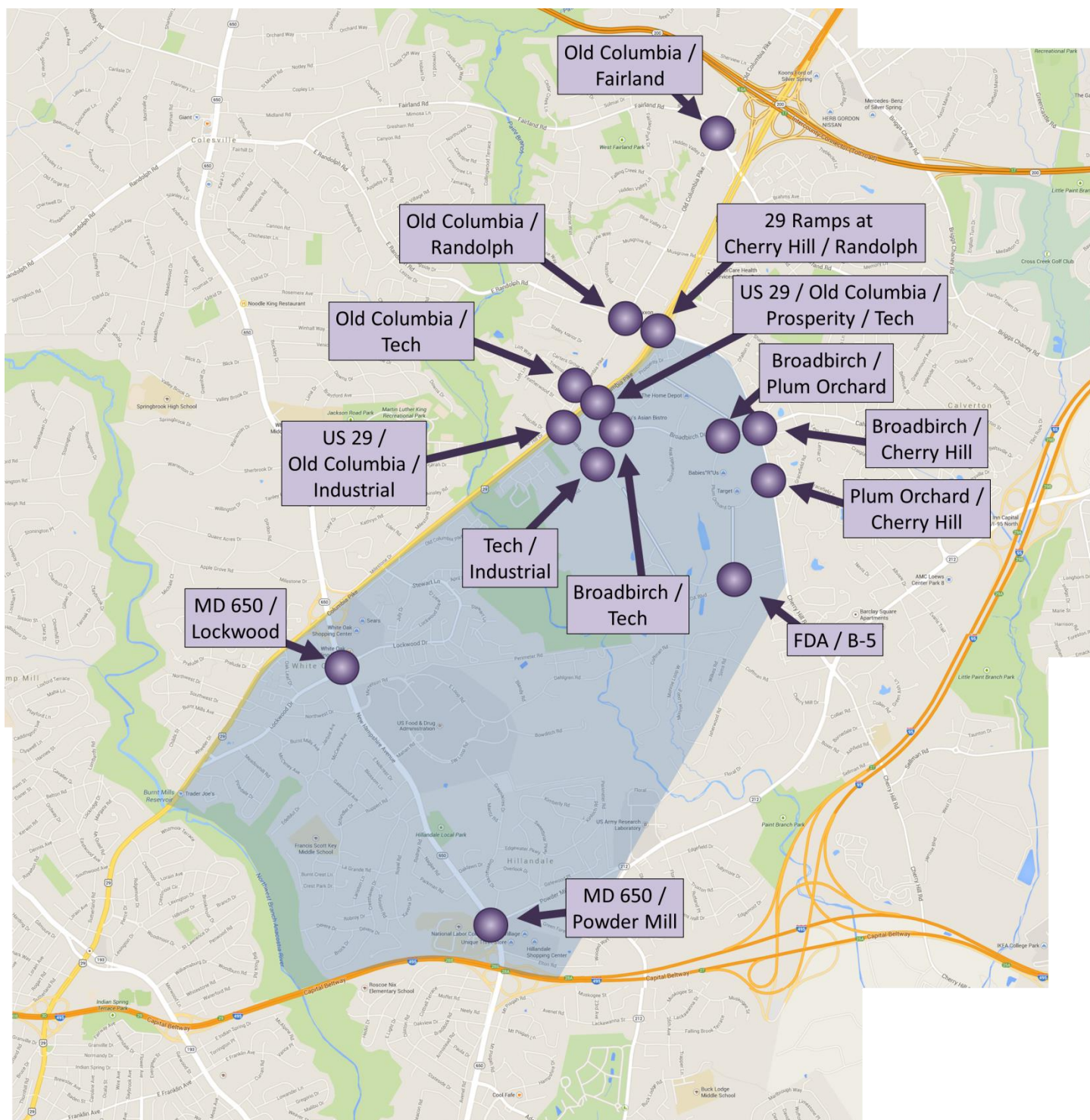
- **LATR Analyses** **\$500,000**
 Estimated at \$100,000 each, with reassessments / monitoring occurring at 5 year intervals between 2017 and 2040. This includes the first analysis in 2017 and the final analysis in 2037; a total of 5 analyses.
- **US 29 at Randolph Rd / Cherry Hill Rd** **\$2,000,000**
 Add an eastbound thru lane. Reconfigure the southbound right-turn lane to a shared right/left lane. This includes 65% in contingencies and an estimated \$459,000 in commercial property impacts (no impacts to buildings or total takes are expected).
- **FDA Blvd at B-5** **\$1,000,000**
 Add 1 westbound left-turn lane and southbound lanes accompanied by construction of B-5. Construct a new traffic signal (if warranted + justified). This includes 65% in contingencies and no property impacts, noting that it is assumed this intersection work will be completed by the Viva White Oak development.
- **Cherry Hill Rd at Plum Orchard Dr** **\$2,800,000**
 Add a southbound right-turn lane and a channelized southbound acceleration lane (serving eastbound right-turns). To be constructed by the Washington Adventist Hospital as a condition of development. This includes 65% in contingencies and no property impacts.
- **Broadburch Dr at Cherry Hill Rd & Plum Orchard Dr** **\$3,600,000**
 At Plum Orchard: restripe the north- and southbound approaches to a four-lane cross-section. Construct a new traffic signal (if warranted + justified). Note that these treatments may not be applicable until such time as B-6 (Plum Orchard Dr) is extended to connect with Prosperity Terrace by the Darcars properties.

 At Cherry Hill Rd: add a southbound thru, southbound right, westbound right, eastbound thru, and eastbound right-turn lanes.

 Combined, these intersections include 65% in contingencies and an estimated \$20,000 in residential property impacts and \$155,400 in commercial property impacts (no impacts to buildings or total takes are expected).
- **Broadburch Dr at Tech Rd** **\$1,700,000**
 Add a westbound right-turn lane and a northbound right-turn lane. Construct a new traffic signal (if warranted + justified). This includes 65% in contingencies and an estimated \$11,550 in commercial property impacts (no impacts to buildings or total takes are expected).

- **Tech Rd at Industrial Pkwy** **\$2,800,000**
 Add two eastbound left-turn lanes and a westbound right-turn lane along Industrial Pkwy, and 1 southbound left-turn lane. Construct a new traffic signal (if warranted + justified). Note that these treatments will be largely prompted by development of Viva White Oak. This includes 65% in contingencies and an estimated \$245,130 in commercial property impacts (no impacts to buildings or total takes are expected).
- **US 29 at Industrial Pkwy / Old Columbia Pike** **\$4,400,000**
 Relocation of two northbound right-turns from the primary intersection to a secondary intersection and the addition of a second southbound left-turn lane. A new westbound right-turn lane from Industrial Pkwy onto Prosperity Dr, and signalization at this intersection (if warranted + justified). Old Columbia Pike / Prosperity Dr would be converted to right-only upon approach to Industrial Pkwy. This includes 115% in contingencies – owing to the higher complexity of the proposed treatments – and an estimated \$4,800 in commercial property impacts (no impacts to buildings or total takes are expected). This project would be obsoleted if the interchange at US 29 and Tech Rd / Industrial Pkwy proceeds.
- **Tech Rd at Prosperity Dr / Old Columbia Pike** **\$2,300,000**
 Restrict each approach along Old Columbia Pike / Prosperity Dr to right-only. Construct a traffic signal (if warranted + justified). This includes 115% in contingencies – owing to the higher complexity of the proposed treatments – and does not anticipate any property impacts. This project would be obsoleted if the interchange at US 29 and Tech Rd / Industrial Pkwy proceeds.
- **Old Columbia Pike at Tech Rd** **\$500,000**
 Add a westbound right-turn lane and construct a new traffic signal (if warranted + justified). This project is not located in the White Oak Policy Area. This includes 65% in contingencies and does not anticipate any property impacts. This project would be obsoleted if the interchange at US 29 and Tech Rd / Industrial Pkwy proceeds.
- **Old Columbia Pike at Randolph Rd** **\$1,100,000**
 Reconfigure the eastbound lane configuration to a double-left and a shared thru-right. This includes 65% in contingencies and an estimated \$13,500 in commercial property impacts (no impacts to buildings or total takes are expected). This project is not located in the White Oak Policy Area.

- **Old Columbia Pike at Fairland Rd** **\$2,300,000**
Add a southbound thru lane and an accompanying receiving lane on the south leg. Reconfigure the westbound right to a shared thru-right and add an additional receiving lane on the west leg. Add an eastbound left-turn lane. This includes 65% in contingencies and an estimated \$52,050 in commercial property impacts (no impacts to buildings or total takes are expected). This project would be obsoleted if the interchange at US 29 and Fairland Rd / Musgrove Rd proceeds. This project is not located in the White Oak Policy Area.
- **MD 650 at Lockwood Dr** **\$1,400,000**
Add a northbound left-turn lane and extend the receiving lane along the west leg. This includes 65% in contingencies and does not anticipate any property impacts.
- **MD 650 at Powder Mill Rd** **\$1,200,000**
Add a northbound right-turn lane. This includes 65% in contingencies and an estimated \$6,600 in commercial property impacts (no impacts to buildings or total takes are expected). Note that while our analysis found a right-turn lane to be adequate at addressing traffic issues at build-out of the plan, SHA is evaluating more significant intersection treatments to address more immediate traffic needs. This work is not accounted for in this cost estimate.



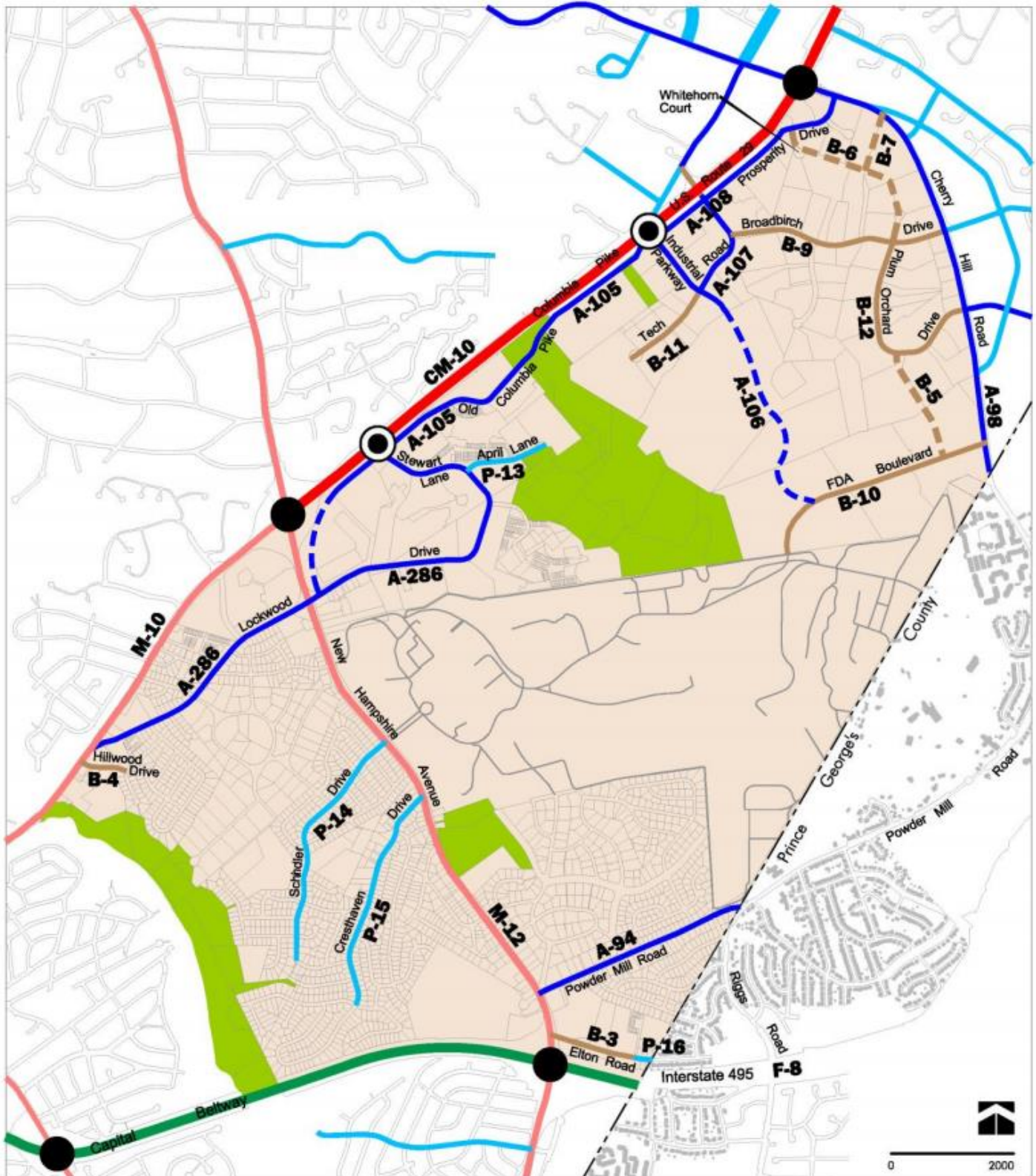
Intersections

New Roads (brown)

- **A-105 White Oak Shopping Center \$23,400,000**
 Extension of Old Columbia Pike through the White Oak Shopping Center, intersecting with Lockwood Drive immediately east of MD 650 (0.31 miles). Assumed to be constructed as a part of a future redevelopment of the shopping center. The cost estimate assumes 80% in contingencies.
- **A-106 Industrial Pkwy Extended \$49,500,000**
 Extension of Industrial Pkwy into the Viva White Oak development, intersecting with FDA Blvd (0.88 miles). Assumed to be constructed as a part of the Viva White Oak development. The cost estimate assumes 80% in contingencies.
- **B-5 Plum Orchard / FDA Blvd Connector \$18,300,000**
 A new connector street between Plum Orchard Dr and FDA Blvd (0.35 miles). Assumed to be constructed partly by the Washington Adventist Hospital (the northern portion) and Viva White Oak (the southern portion). The cost estimate assumes 80% in contingencies.
- **B-6 Plum Orchard Dr Extended \$26,400,000**
 Extension of Plum Orchard Dr to Prosperity Terrace (0.46 miles). Assumed to be constructed by future developments in the area. The cost estimate assumes 80% in contingencies.
- **B-7 Cherry Hill / Plum Orchard Connector \$8,600,000**
 A new connector street between B-6 (Plum Orchard Extended) and Cherry Hill Rd (0.17 miles). Assumed to be constructed by future developments in the area. The cost estimate assumes 80% in contingencies.

Road Widening (orange)

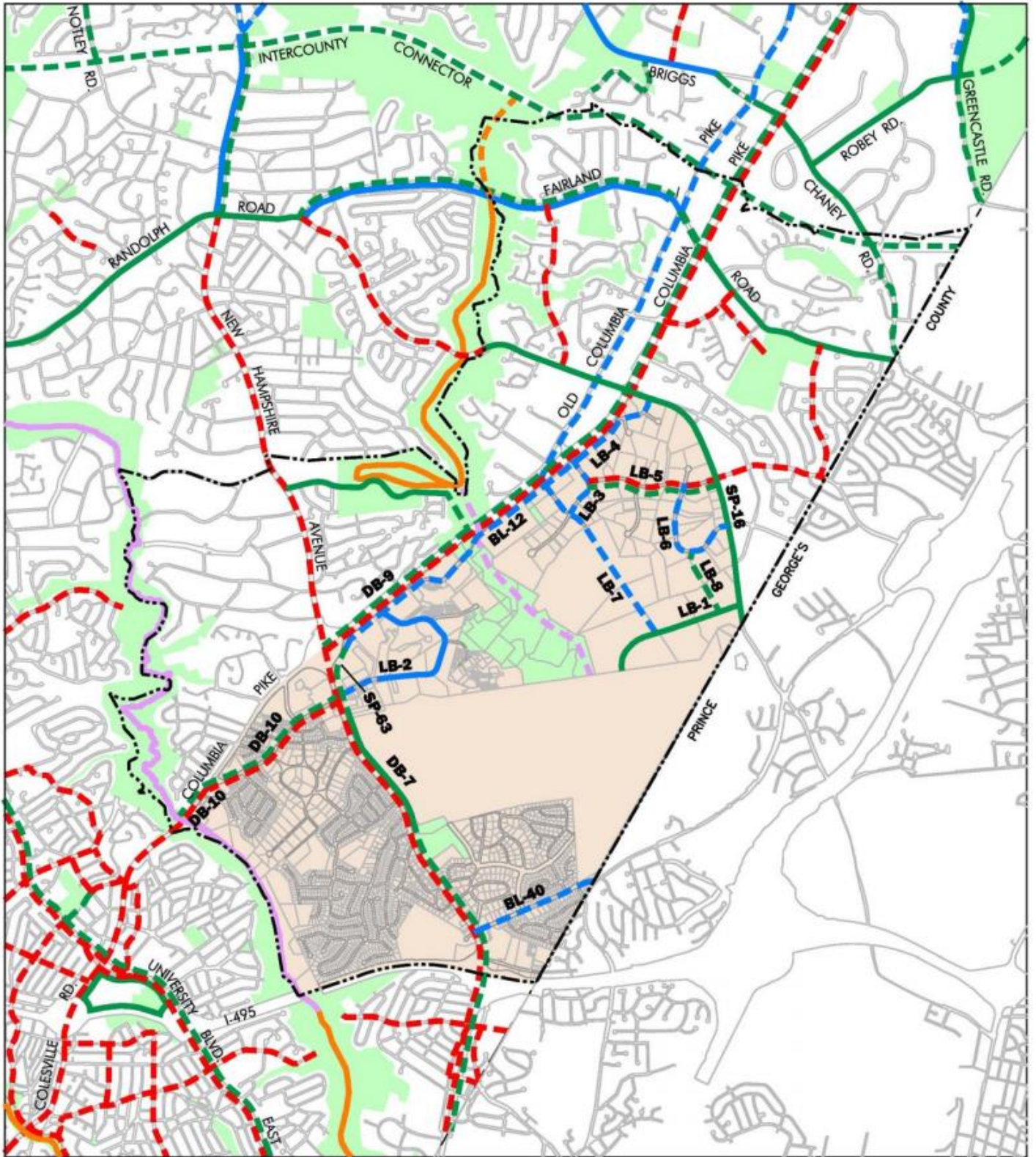
- **CM-10 US 29 over MD 650** **\$43,500,000**
 Reconstruction of the US 29 bridge over MD 650 (\$29.8m) as well as widening in the vicinity of the ramps (\$13.7m) to provide for a third continuous southbound thru lane. The cost estimate assumes 90% in contingencies for the widening, and 110% in contingencies for the bridge reconstruction.
- **A-105 Old Columbia Pike Bridge** **\$12,000,000**
 Reconstruction of the Old Columbia Pike bridge over Paint Branch to a four-lane arterial. Cost estimate is based on a preliminary conceptual design.
- **A-105 Old Columbia Pike** **\$58,100,000**
 Widening of Old Columbia Pike (along the east side of US 29) to a four-lane arterial and construction of a shared use path (1.3 miles). Cost estimate is based on a preliminary conceptual design.
- **M-12 MD 650** **\$5,900,000**
 Widening of MD 650 to provide a third continuous southbound thru lane as it travels beneath US 29. Not intended to necessitate reconstruction of the US 29 bridge, though the estimate for CM-10 does include such work. Cost estimate is based on a preliminary conceptual design.
- **P-16 Elton Rd** **\$100,000**
 Widening of a short segment (300 ft) of the residential portion of Elton Rd (P-6) to provide for 1 travel lane and 1 parking lane in each direction. Cost estimate is based on a preliminary conceptual design. It is unlikely this project would proceed unless there were strong community demand.
- **B-9 Broadbitch Dr** **\$33,700,000**
 Widening to provide for parking lanes along each direction of Broadbitch Dr as well as provide a shared use path (0.7 miles). Cost estimate is based on a preliminary conceptual design.
- **B-10 FDA Blvd** **\$25,100,000**
 Widening to provide for parking lanes along each direction of FDA Blvd (0.5 miles). Cost estimate is based on a preliminary conceptual design. It is anticipated that this work will be addressed as part of the Viva White Oak development.
- **B-11 Tech Rd** **\$10,400,000**
 Widening of Tech Rd south of Industrial Pkwy to provide for an additional travel lane in each direction (0.4 miles). Cost estimate is based on a preliminary conceptual design. It is likely that this work would be completed as a condition upon adjacent developments.



Roadways, image from the White Oak Science Gateway Master Plan

Bikeways (green)

- **M-10 US 29 DB-9 \$2,200,000**
 New shared use path between Lockwood Dr and the Northwest Branch (0.3 miles).
 Cost estimate is based on a preliminary conceptual design.
- **M-12 MD 650 DB-7 \$4,800,000**
 New shared use path between Lockwood Dr and I-495 (1.0 miles). Cost estimate is based on a preliminary conceptual design.
- **A-94 Powder Mill Rd BL-40 \$18,200,000**
 New bike lanes along each direction of Powder Mill Rd, necessitating 12 ft of additional pavement (0.7 miles). Cost estimate is based on a preliminary conceptual design.
- **A-106 Industrial Pkwy LB-7 \$8,400,000**
 Conversion of existing parking lanes to travel lanes, and the addition of new bike lanes along each direction of Industrial Pkwy, necessitating 7 ft of additional pavement and reconstruction of curb lines and drainage systems (0.4 miles). Cost estimate is based on a preliminary conceptual design.
- **A-107 Tech Rd LB-3 \$8,000,000**
 New bike lanes along each direction of Tech Rd, necessitating 7 ft of additional pavement and reconstruction of curb lines and drainage systems (0.4 miles). Cost estimate is based on a preliminary conceptual design.
- **A-108 Prosperity Dr LB-4 \$14,600,000**
 Conversion of existing parking lanes to travel lanes, and the addition of new bike lanes along each direction of Prosperity Dr, necessitating 7 ft of additional pavement and reconstruction of curb lines and drainage systems (0.7 miles). Cost estimate is based on a preliminary conceptual design.
- **A-286 Lockwood Dr DB-10 \$18,400,000**
 New shared use path between US 29 and approximately 400 ft west of MD 650 (0.7 miles). Cost estimate is based on a preliminary conceptual design.
- **B-3 Elton Rd \$500,000**
 Assumes minor pedestrian treatments along the business street portion (B-3) (0.2 miles). Cost estimate is based on a preliminary conceptual design. It is unlikely this project would proceed unless there were strong community demand.



Bikeways, image from the White Oak Science Gateway Master Plan

ADDITIONAL INFORMATION

ANALYSIS COST

<u>Invoice Period</u>	<u>Invoice Amount</u>
08/2015	\$11,334.50
09/2015	\$7,555.00
10/2015	\$28,148.50
11/2015	\$5,888.00
12/2015	\$19,172.00
01/2016	\$10,219.00
02/2016	\$6,357.50
Total	\$88,674.50

This analysis cost does not account for time spent on County staff estimating the costs of non-LATR/intersection projects, or in preparing the WOSG analysis and accompanying documentation.

ANALYSIS SCHEDULE

09/2014 – 02/2015	Fee Conception
02/2015 – 07/2015	Scoping
08/2015 – 10/2015	Obtaining Base Model
10/2015 – 03/2016	Performing Analysis
04/2016 – 06/2016	Cost Estimating
06/2016 – 09/2016	Presentation of Findings w/ Public Agencies
09/2016 – 12/2016	Finalizing

PUBLIC PRESENTATIONS

04/14/2015	Update to Council on Scoping
05/14/2015	Meeting with Harriet Quinn (resident) on Scoping
05/26/2015	Meeting with Eileen Finnegan (resident) on Scoping
09/02/2015	Update to the East County Citizens Advisory Board
04/06/2016	Update to the East County Citizens Advisory Board
08/02/2016	Update to Viva White Oak
08/30/2016	Presentation of findings to SHA
09/14/2016	Presentation of findings to M-NCPPC
09/16/2016	Presentation of findings to Glenn Orlin (Council Staff)
11/17/2016	Update to the Greater Silver Spring Chamber of Commerce

CONTACT INFORMATION

This analysis was led by Andrew Bossi, Senior Engineer in the Director's Office of the Montgomery County Department of Transportation. Any questions, comments, or concerns are welcomed at:

andrew.bossi@montgomerycountymd.gov
(240) 777-7200

101 Monroe Street, 10th Floor
Rockville, MD 20850

AB:kcf

Attachments: Sabra, Wang, & Associates Technical Memorandum