
Waldorf Urban Transportation Improvement Plan

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Executive Summary

Charles County has recently completed the Waldorf Urban Design Study (WUDS), identifying the downtown area of Waldorf as a key location for redevelopment with the ultimate goal of creating a mixed-use, transit-oriented development. Although the WUDS outlines a conceptual transportation network to support the urban design strategy, Charles County desired to have a clearer picture of how such a development might be realized and what infrastructure will be necessary to catalyze redevelopment and at what cost.

This study offers several case studies of large mixed-use and transit-oriented developments across Maryland. The studies focus in particular on key financing mechanisms and the degree of public participation. Key takeaways include:

1. The project site should preferably be owned by the local government (or a transit agency) – in the case of Waldorf, none of the land is owned by the local government and parcel assemblage might prove to be an issue.
2. TOD-appropriate zoning has to be adopted by the local government – Charles County has already approved appropriate zoning allowing for mixed-use development conforming to TOD standards.
3. Flexible funding options should be considered to ensure the project's success – private developers have been willing to finance and build TODs in Maryland, but are most eager to do so when flexible funding tools such as TIF, special taxing districts, land value, and bonds are offered to them.
4. The role of transit should not be underestimated – one crucial component that is missing from Waldorf when compared to the cited case studies is an active transit station. However, the WUDS calls for either a light rail or bus rapid transit stops in the proposed TOD project area in downtown Waldorf.
5. Effective management of the district is important for the long-term success – as redevelopment occurs, it will be important that there is an entity to oversee all the issues and operational details that will ensue.

Overall, the WUDS identifies some 8.75 miles of improved and new roadways that will need to be built at an estimated cost of \$75 million dollars. This includes \$32 million for improvements to Waldorf Urban Major Collector roadway projects, nearly \$20 million for Waldorf Urban Minor Collector roadway projects, \$14 million for Waldorf Urban Local Roads projects, and over \$8 million for Waldorf Alley/Service Street/Private projects.

This study identifies three key projects to help catalyze development:

- Leonardtown Road
- Old Washington Road

- Acton Lane

Together these improvements represent nearly \$16 million in roadway improvement costs alone (not including costs to acquire right-of-way or improve utilities within the corridor). While state assistance may be available for improvements along Leonardtown Road and portions of Old Washington Road, it is likely that the county will have to bear nearly all these costs if these projects are used as catalysts and constructed in advance of substantial private sector redevelopment of the area. While redevelopment will certainly occur within the area, without public investment, it is unlikely that development of the quality or density envisioned by the WUDS will occur in the short term.

Financing these improvements, particularly in the short term and in the current economic climate, will likely require a mix of solutions. Creating a tax increment financing (TIF) district prior to substantial redevelopment will maximize the potential future revenue available for district improvements. While the funds will likely be insufficient in the short term for all of the identified improvements, it would represent a sizable potential revenue stream to cover high-dollar future investments such as structured parking or transit stations. A TIF would likely be supplemented by a special assessment district and/or general obligation bonds to meet the public component of the investment. It is anticipated that many of the improvements identified in the WUDS will be completed as public-private partnerships or wholly by private entities.

Going forward, it will be important for the county to secure financing for the publicly funded improvements as well as to ensure that a management entity and other support structures are in place to oversee and promote development within the district. With careful planning and targeted improvements, it should be possible to transform the Downtown Waldorf Vision Plan into reality.

1. Introduction

Study Background, Purpose and Need

Charles County in recently completed the Waldorf Urban Design Study (WUDS). The WUDS was the outcome of the 2004 Subarea Plan and the 2006 Comprehensive Plan that identified Waldorf as a prime candidate for urban redevelopment. The major goals of the WUDS are to create an attractive urban center in Waldorf centered on two major activity centers: Waldorf Central Zone and Acton Urban Center Zone (as shown in Figure 1.1). This part of Waldorf, as envisioned by the WUDS, would feature a mixed-use, higher-density, walkable downtown with a unique sense of place; high-capacity, light rail transit; attractive, functional streets; public parks and open spaces; and pedestrian/bicycle facilities.

Although the WUDS outlines a conceptual transportation network to support the urban design strategy, it is important that Charles County have a better understanding of the necessary components that will make the successful transit, roadway, and pedestrian networks prior to the expenditure of public funds in support of the WUDS. In addition, in order to make the plan successful, an implementation strategy for the construction of facilities including prioritizing the improvements proposed in the WUDS is necessary.

Description of WUDS

The WUDS embraces Maryland's Smart Growth principles by providing an alternative vision for Waldorf that would counter suburban sprawl in Charles County. By transforming the study area into an effective mixed-use downtown center, through the incorporation of transit-oriented development (TOD) principles, the WUDS will enable downtown Waldorf to be walkable and human-scaled.

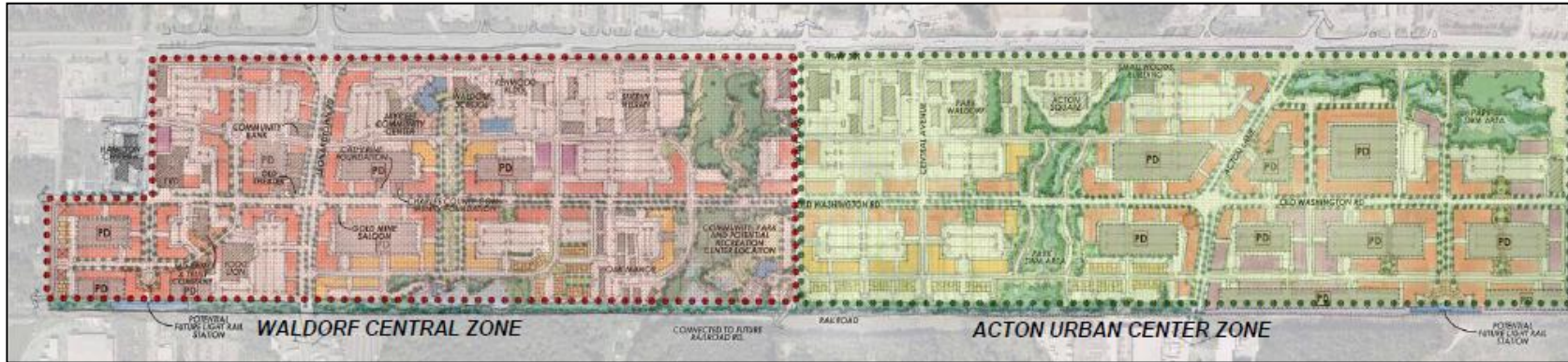
The WUDS proposes creating two main activity centers based on two different zoning districts in the redeveloped area: the Acton Urban Center Zone and Waldorf Central Zone (see Figure 1.1). The former is planned as a high density development node transitioning to the latter, which would be a medium-density commercial and civic district. The WUDS outlines the design elements that these two nodes will require to be successful, including:

- Land use pattern and mix: mixed-use development – envisioned as retail or commercial uses on the ground floor, with office, residential or civic uses on the upper levels
- Public realm: streetscape improvements along all street corridors, a new town square/plaza envisioned as a multi-purpose outdoor space; a series of greenways; and few small private pocket parks
- Roadway network and street hierarchy: analyzed in more detail in Section 4, the existing street network will have to be upgraded and new linkages will be needed. The roadway network hierarchy will consist of:
 - Arterial highways: US 301/MD 5 Business

- Waldorf Urban Major Collectors: Type A (Acton Lane), and Type B (Old Washington Road)
- Waldorf Urban Minor Collectors: Holly Lane, Central Avenue, Holly Tree Avenue extended, new east-west roadways providing access to future light rail transit stations
- Waldorf Urban Local Roads: Terrace Drive and new east-west and north-south grid connections
- Service Streets and Alleys
- Future roadway capacity LOS upgrades:
 - Acton Lane upgrade to Waldorf Urban Major Collector
 - Old Washington Road upgrade to Waldorf Urban Major Collector
 - Holly Lane extension
 - Holly Tree Avenue extension
- **Transit:** as envisioned in the WUDS, downtown Waldorf would have to be served by both local as well as regional transit services. The Maryland Transit Administration (MTA) conducted a study examining routing alternatives that would link Waldorf with the Branch Avenue Washington Metropolitan Area rapid transit Metro station. The MTA envisioned either Bus Rapid Transit or Light Rail Transit serving the corridor, and the WUDS prefers the latter, with two proposed light rail stations around downtown Waldorf, as shown in Figure 1.2. The WUDS also recommended strengthening future transit options in Waldorf by constructing a multi-modal Transportation Center in downtown Waldorf, connecting express bus service to Washington D.C. with the proposed Transportation Center, and offering a new shuttle service in the revitalized downtown.
- **Parking:** initially new development would be served by surface parking but as development density increases, structured parking will become feasible. Shared parking will be encouraged in downtown Waldorf.
- **Pedestrians and Bicyclists:** the following improvements are envisioned: sidewalks along all roadways; a bicycle depot at the proposed Transportation Center; bicycle racks at all major public parking locations; a floating lane bicycle lane on Acton Lane and Old Washington Road; share-the-road facilities on Holly Lane, Holly Tree Avenue, Central Avenue, Terrace Drive, and all Waldorf Urban Local Roads; shared path along the greenway adjacent to the railroad tracks.

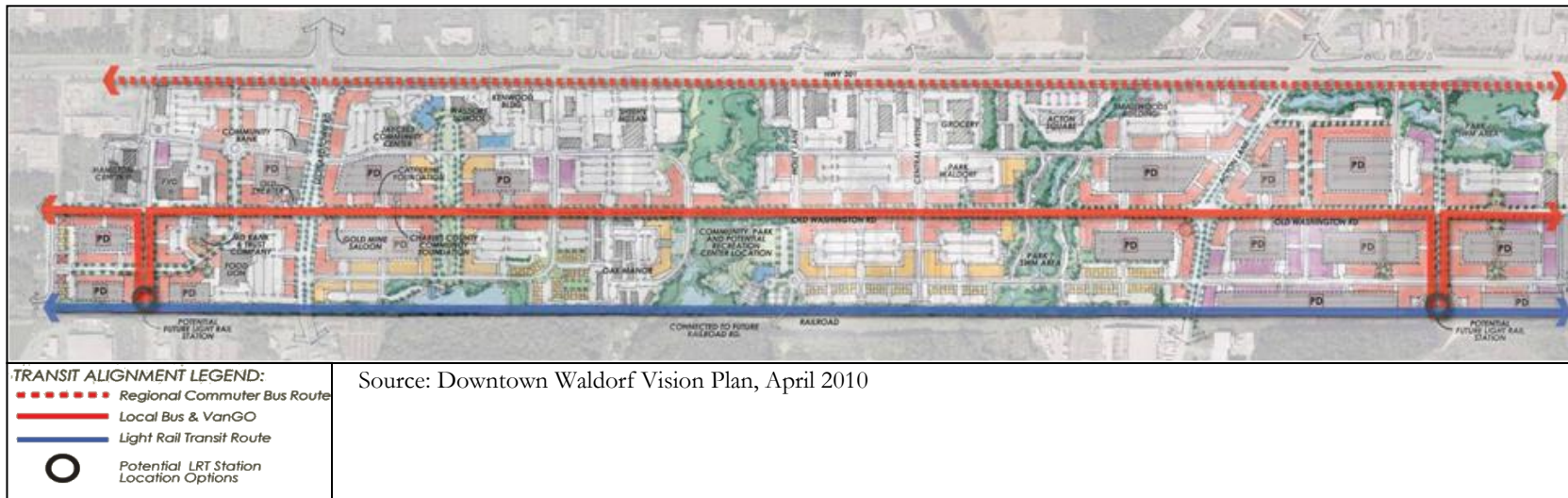
Finally, the WUDS offered some implementation ideas, with an understanding that the plan cannot become reality without both public sector investment and private sector incentives. The WUDS noted that the proposed roadway network should serve as a guide for future improvements to downtown Waldorf.

Figure 1.1 Proposed Waldorf Central Zone and Acton Urban Center Zone



Source: WUDS

Figure 1.2 Proposed Transit Alignment in downtown Waldorf



Source: Downtown Waldorf Vision Plan, April 2010

Purpose of this Report

The WUDS has laid out an ambitious plan for the revitalization of downtown Waldorf. While the TOD design guidelines will ensure that the new activity centers ultimately achieve the vision of the WUDS, it is unclear how much of the initial transportation infrastructure will require public investment to entice both developers and the public to the centers. The purpose of this report is to estimate costs of the proposed transportation improvements, prioritize those projects, and develop an implementation plan.

The key tasks this report is focused on include:

- Verification of the transportation recommendations in the current plans;
- Identification of lynchpin or catalyst improvements necessary for the realization of the Vision Plan;
- Estimation of project costs;
- Prioritization of improvements to roadway, pedestrian, bicycle and transit networks;
- Identification of likely funding sources, public and private, and recommendations for how resources of multiple entities could be combined to complete projects; and
- Completion of an implementation plan.

2. What Makes a Successful Transit-Oriented Redevelopment District?

The WUDS envisions the redevelopment of downtown Waldorf into a transit-oriented development node in the region. Transit-Oriented Development (TOD) is a type of development that places emphasis on transit and transit-friendly urban environment. It is also known by other names, such as transit village, transit-supportive development, and transit-friendly design. Peter Calthorpe, one of the first scholars to introduce the modern concept of TOD, defined TOD in his book *The Next American Metropolis: Ecology, Community, and the American Dream* as “moderate and high-density housing, along with complementary public uses, jobs, retail and services, concentrated in mixed-use developments at strategic points along the regional transit systems.” According to the Maryland Department of Transportation, “Transit Oriented Development is an approach that promotes growth around a place with relatively higher density with a mixture of residential, employment, shopping and civic uses that are located within an easy walk of a bus or rail transit center. The development design gives preference to the pedestrians and bicyclists, and may be accessed by automobiles.”

The same agency also cites specific features that make a given TOD project successful:

- Pedestrian-friendliness: a connected grid of streets that are easy to navigate; wide sidewalks, well-marked crosswalks, good lighting and narrow streets to slow car traffic; attractive landscaping and public spaces, interesting architecture;
- Transit station serves a focus point of the development: cluster of the development’s tallest buildings right around the transit station, with the density of development tapering off farther out;
- Limited number of parking spaces through appropriate parking management techniques;
- High-quality transit service that includes, wherever possible, access to buses and rail.

Given that the existing development lacks most of these qualities, it is important to have a clear vision and supportive policies to ensure that redevelopment in the district is supportive of the long term vision. The following section provides examples of several successful TODs that might resemble the proposed revitalized downtown Waldorf. A key point of focus is the public involvement in the redevelopment and how it was financed.

Redevelopment Case Studies

Silver Spring Town Center TOD, Maryland

History

Silver Spring has successfully used TOD to revitalize its downtown. It began in 1998, when Montgomery County planners and private developers targeted just four square blocks for downtown

redevelopment. They coordinated public and private funding for projects around the existing Metro and MARC stations. The resulting 22-acre Downtown Silver Spring town center promised to bring new shops, theaters, a civic building, parking garages, a public square, and townhouses to downtown Silver Spring, with connections to the transit station and the existing pedestrian streets and sidewalks. The initial project has been very successful and it stimulated a surge of new development in downtown Silver Spring: between 2000 and 2010, public (\$423 million) and private investment (\$1.37 billion) was estimated to reach \$1.8 billion. Downtown Silver Spring has become a magnet for economic activity, linking new businesses and jobs with a growing residential market. Old and new residents have enjoyed walking access to a cluster of shops, offices, parks and, perhaps most importantly, the Metro train station.



Financing

The initial project, the \$367 million town center, was funded with public and private capital. Montgomery County dedicated \$187 million to infrastructure improvements, including roads, streetscapes, utilities, and a parking garage; and Foulger-Pratt, the private developer, invested about \$180 million to build the retail structures. The project's corporate anchors, the American Film Institute and Discovery Communications, were crucial to bringing in other businesses to downtown Silver Spring. Discovery, for one, brought 1,500 employees to downtown, encouraged employees to patronize downtown establishments, and designated 65 percent of their property as public green-space.

The City of Silver Spring created a Silver Spring Urban District in the vicinity of the Metro train station. The entity acts as a business improvement district (BID), providing additional services within the boundary and is supported primarily through a property tax surcharge. The district also oversees public parking operations and receives income from these operations. In addition, the county created an Enterprise Zone offering property tax credits on any new expansions, renovations, ongoing improvements, management, or capital improvements to downtown streetscape and downtown businesses. Income tax credits are also given to businesses with newly hired employees. To further promote development, the county created a "green tape" team in concert with a unified resource center to provide a "one stop shop" for assistance with permitting, business licenses and other aspects of development in the district. The initial town center was designed to return the public investment portion on the town center project within 10 years. After 10 years the city will deed the property to the developer.

Annapolis Town Centre (Parole Growth Management Area), Maryland

History

The Annapolis Town Centre Parole is located in Anne Arundel County in the unincorporated Parole area adjacent to Annapolis. The mixed-use development is situated at the intersection of I-97 and US 50 adjacent to a regional employment center, including a regional mall, hospital and high concentrations of county and state employees. The Annapolis Town Centre is the former site of the Parole Plaza Shopping Center built in the early 1960s and closed in the 1990s. Although Wal-Mart intended to build one of its stores on site, the intention never materialized and the area had remained vacant for more than a decade.



Anne Arundel County legislation in the 1990s designated the Parole Growth Management Area to focus commercial, employment and high-density residential development. In April 2002 the Irwin L. Greenberg Commercial Corporation, a Baltimore based developer, purchased Parole Plaza for about \$26 million with plans to transform the former Parole Shopping Center into a \$300 to \$400 million mix of retail stores, residential units, and eventually offices. In 2005, the 33-acre mixed-use redevelopment project in the Parole area of Annapolis was approved with 650,000 feet of retail space, 90,000 square feet of office space, 900 residential units, and a full-service hotel. Today, this development has grown to include nearly 2 million square feet of retail, office, hotel, and residential floor space and represents a private investment of over \$500 million.



Financing

The Annapolis Town Centre Parole received no direct public investment from Anne Arundel County – the developer was responsible for all needed improvements, including constructing additional roadway connections to the project area. Separately, though, the county undertook several infrastructure improvements projects in the area which addressed many of the existing

system constraints. By initiating and funding these improvements, the number and cost of facilities which might otherwise have been subject to adequate public facilities requirements was minimized

for the developer. Concurrent with the initial subarea plans was a proposal for special taxing district or parking authority in the TOD area, but it is currently not active.

Owings Mills Town Center TOD, Maryland

History

Owings Mills Town Center is a 46 acre TOD located on the former MTA parking lot site in Baltimore County. The TOD is adjacent to Owings Mills Metro Station and I-795. The Request for Proposals (RFP) was issued by MDOT/MTA in 2000, and a long-term lease agreement for a TOD development was signed in 2005. David S. Brown was chosen as lead developer of this mixed-use TOD featuring 230,000 square feet retail, 1 million square feet office space, 75,000 square feet of restaurants, 500 residential units, a 250 room hotel and 100,000 square feet reserved for a community college and library. In terms of parking, the project will include 11,000 spaces in five garages. The first garage was delivered in 2007. Target delivery date for the first commercial tenants was 2009 and it was met. The construction of the remaining garages, community college, and library had also begun at the end of 2009. The total value of the investment in the project is estimated at \$1 billion.

Financing

Owings Mills Town Center TOD benefited from two recent financing mechanisms. In the summer of 2009, legislation was passed to allow the Maryland Economic Development Corporation (MEDCO) to finance and own the two additional garages. The TOD at Owings Mills requires a tax-increment financing (TIF) arrangement to complete construction of a commuter garage. Maryland DOT advised that Baltimore County could not issue bonds for



this project due to its limited debt capacity. Pursuant to the new legislation, Baltimore County was able to use a bond issued by MEDCO through a TIF arrangement. The county could also use revenues from the special taxing district for maintenance and operation of the garage. Around the same time, Baltimore County enacted the TIF ordinance further strengthening the project's financing options.

Savage MARC Station TOD, Maryland

History

Savage MARC Station is a 12 acre TOD located in Howard County, Maryland. Akin to the Owings Mills Town Center described above, Savage TOD is located on a former MTA parking lot site. The project is adjacent to the Savage MARC train station (hence its name). The Request for Proposals (RFP) was issued by MDOT/MTA in 2006. The project was approved in February of 2008, and has

attracted \$200 million in private investment initially. The Petrie-Ross Ventures development team has plans for 85,000 square feet of new retail space, 260 multi-family residential units, and 235,000 square feet of office space. Parking-wise, the project includes a 5-level parking structure with 700 spaces for MARC commuters. The work on the commuter garage began at the end of 2009. When completed, this particular TOD is estimated to generate about \$8 million in state and local tax annually.

Financing

Savage MARC Station TOD, just like Owings Mills Town Center TOD, has utilized TIF to finance the project's public infrastructure component – a parking structure. In February 2008, a TIF agreement was reached between Howard County and the developer and in spring of 2009 Howard County passed a countywide TIF ordinance. Howard County will fund the costs of the garage through the issuance of \$17 million in TIF bonds. Notably, originally Howard County could not guarantee a TIF bond with special taxing district revenues for this garage since it is not a county-owned asset. The Maryland House Bill 300: *Tax Increment Financing and Special Taxing Districts - Transit-Oriented Development* however, will enable Howard County to use special taxing district revenues for projects owned by MDOT or any other applicable public entity.



Application to Waldorf

All the developments described above were selected as case studies because they are located in Maryland and are generally similar in size and intent to Charles County's TOD in downtown Waldorf. There are some lessons to be learned from Waldorf's neighbors in Maryland:

1. Project site should preferably be owned by the local government (or a transit agency, considering the importance of transit in TOD application). In the case of Waldorf, none of the land is owned by the local government and parcel assemblage might prove to be an issue.
2. TOD-appropriate zoning has to be adopted by the local government – Charles County has already approved appropriate zoning allowing for mixed-use development conforming to TOD standards.
3. Flexible funding options should be considered to ensure project's success – private developers have been willing to finance and build TODs in Maryland, but are most eager to do so when

flexible funding tools such as TIF, Special Taxing Districts, land value, and bonds are offered to them. The case studies TOD have used those financing options to ensure their visions become reality. Although the initial public investment can be considerable, when the cost of acquiring the land and properties, making public improvements, paying predevelopment costs and paying for inclusionary housing is accounted for, flexible financing tools such as TIF in Savage in Owings Mills or Special Taxing District in Silver Spring have placed a lot of the burden of financing those TOD projects on private developers, rather than the public sector and local, county, and state government. In the end, what these Maryland case studies show is that downtown Waldorf TOD has a great chance of succeeding, particularly if flexible financing options are offered to developers.

4. The role of transit should not be underestimated – one crucial component that is missing from Waldorf when compared to the cited case studies is an active transit station – however, the plan calls for either a light rail or bus rapid transit stops in the proposed TOD project area in downtown Waldorf. The county is actively working with the MTA to pursue such service, in the meantime working to expand commuter bus service along the US 301 corridor.

5. Effective management of the district is important for the long-term success – as redevelopment occurs, it will be important that there is an entity to oversee all the issues and operational details that will ensue. This ranges from refining design standards to overseeing capital improvements. As there will not be a single private redeveloper that could oversee many of these details, it will be important that the county establish such an entity. At first, it may simply be a working committee of staff and outside representatives. In most cases, this will become the entity overseeing the business improvement district. Silver Spring offers insight into how a fully-developed support structure might exist.

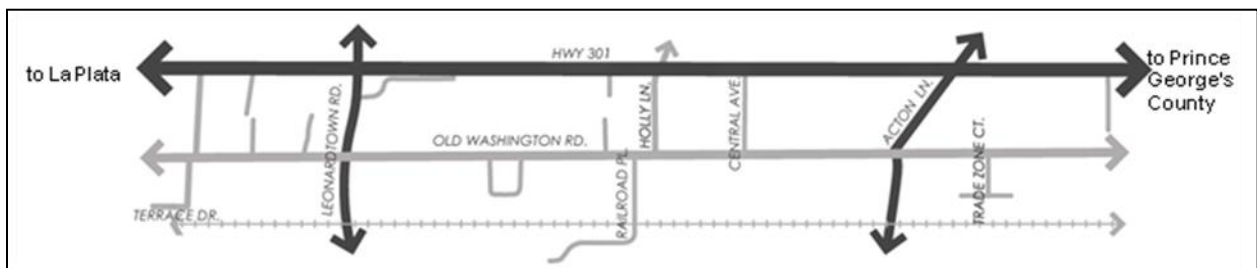
3. Project Evaluation

Project Listing and Description

The existing roadway network in the Study Area is shown in **Figure 3.1**. As shown, the area’s main highway is US 301. The actual existing major collectors in downtown Waldorf are Old Washington Road, Acton Lane, and Leonardtown Road. The proposed downtown Waldorf roadway hierarchy is described and evaluated in detail in this section. As shown in **Figure 3.2**, it includes a grid-based network of primary and secondary roadways, including new connections to the proposed light rail stations, as well as multiple alleyways spanning the Study Area.

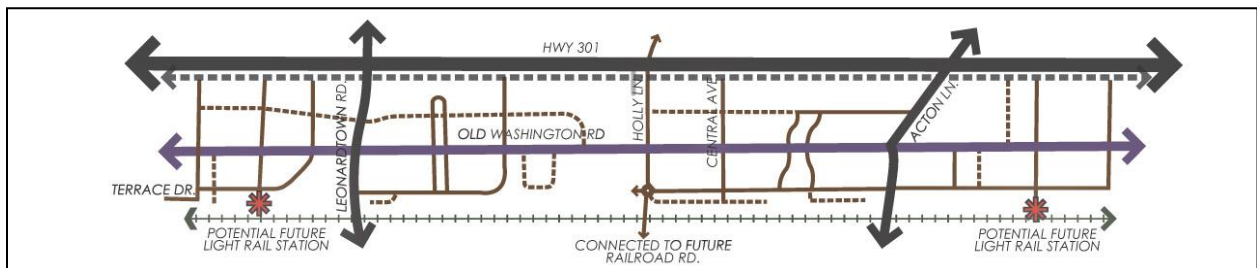
The goal of the proposed roadway classification and design standards was for it to serve as a backbone of a transportation master plan that emphasizes multi-modal transportation options in downtown Waldorf.

Figure 3.1 Existing roadway network in downtown Waldorf



Source: Downtown Waldorf Vision Plan, April 2010

Figure 3.2 Proposed roadway network in downtown Waldorf



Source: Downtown Waldorf Vision Plan, April 2010

Legend:

- highway/connector street
- potential 301 service road
- railroad
- primary street
- secondary street
address/residential street
- tertiary street
private/service street/alley

Roadways

The WUDS classifies all roadways in the downtown Waldorf area – both existing and proposed – according to the following hierarchy:

- **Arterial Highways:** US 301 and MD 5 Business (state-owned roadways): a long-distance, medium speed vehicular corridor that traverses open country. A highway should be relatively free of intersections, driveways and adjacent buildings. US 301 and MD 5 are state-owned roads – Charles County and Waldorf should work with MDOT to ensure that US 301/MD 5 incorporates improvements that would be in tune with the goals of WUDS, particularly as they relate to pedestrian/bicycle connectivity and friendliness and access to the urban centers.
- **Waldorf Urban Major Collector:** Old Washington Road and Acton Lane: a long-distance, medium speed vehicular corridor that traverses an urbanized area. It is usually lined by parallel parking, wide sidewalks, or side medians planted with trees. Buildings uniformly line the edges.
- **Waldorf Urban Minor Collectors:** Holly Lane, Central Avenue, Holly Tree Avenue extension, future transit stations' access roads: a small-scale, low speed connector. Streets provide frontage for higher density buildings such as offices, shops, apartment buildings, and townhouses. This type of street is urban in character, with raised curbs, closed drainage, wide sidewalks, parallel parking, trees in individual planting areas, and buildings aligned on short setbacks.
- **Waldorf Urban Local Roads:** Terrace Drive, new grid connections: provide direct access and connections to higher order streets, but offer little mobility for through traffic. Small scale and low design speed by nature, they have optional on-street parking.
- **Service Streets and Alleys:** new proposed alleys and access roads in the Study Area: a narrow access route servicing the rear of buildings on a street. Alleys have no sidewalks, landscaping, or building setbacks. Alleys are used by trucks and must accommodate dumpsters. Alleys are usually paved to their edges.

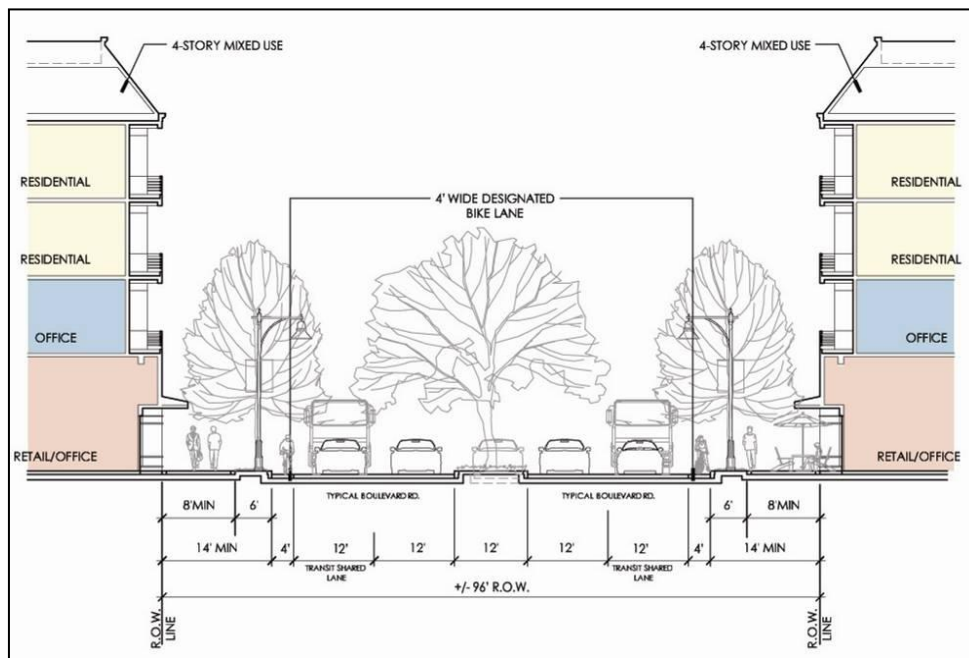
The proposed roadway classification is described and evaluated in more detail below, with illustrative descriptions of each individual roadway type. The WUDS assigns a letter to each typical roadway section based on the width of ROW, and ranging from 'A' to 'E2.' The very same typology is followed in the project evaluation below. Note that these section are treated generally and that additional prototypical cross-sections are discussed in the WUDS for other special cases.

Major

The roadway types that could be classified as 'major' in revitalized Waldorf were all assigned a letter coinciding with their respective recommended road sections – 'A,' B1' and 'B2.' The classification includes the following roadways:

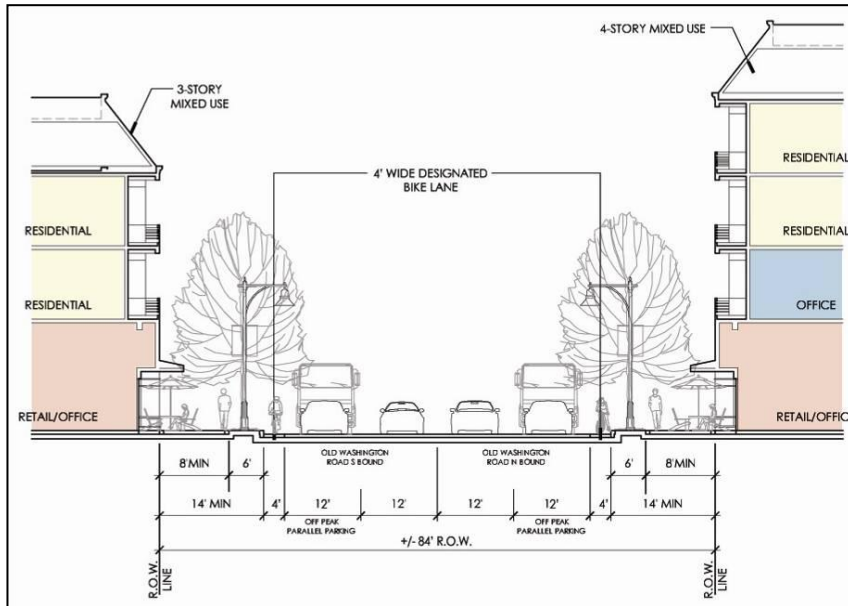
- Type **A1/A2** – Waldorf Urban Major Collector – four lanes with divided median (‘boulevard’) – includes Leonardtown Road (A1) and Acton Lane (A2). The typical Type A1/A2 road section is shown in **Figure 3.3** (*Note: while Leonardtown Road section was not provided in the WUDS, it is assigned the same section type in this report as Acton Lane - the difference between road sections A1 (Leonardtown Road) and A2 (Acton Lane) stems from varying project costs associated with the difference in existing conditions along Leonardtown Road and Acton Lane, rather than the end project result which would essentially be the same.*).
- Type **B1** – Waldorf Urban Major Collector – four lanes undivided – includes Old Washington Rd in the vicinity of Leonardtown Rd and Acton Lane and proposed Light Rail access roads in the vicinity of US 301. The typical Type B1 road section is shown in **Figure 3.4**.
- Type **B2** – Waldorf Urban Major Collector – two lanes divided – includes Old Washington Road with the exception of its section classified as Type B1, Holly Lane, and proposed Light Rail access roads in the vicinity of the future light rail stations. The typical Type B2 road section is shown in **Figure 3.5**.

Figure 3.3 Proposed Waldorf Urban Major Collector Type A1 and A2



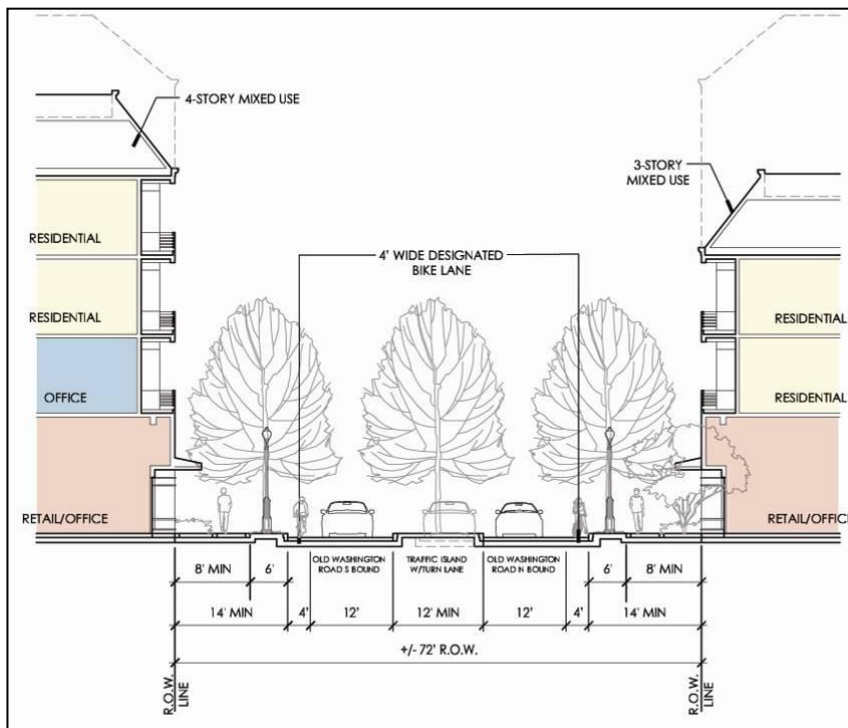
Source: Downtown Waldorf Vision Plan, April 2010

Figure 3.4 Proposed Waldorf Urban Major Collector Type B1



Source: Downtown Waldorf Vision Plan, April 2010

Figure 3.5 Proposed Waldorf Urban Major Collector Type B2



Source: Downtown Waldorf Vision Plan, April 2010

Minor

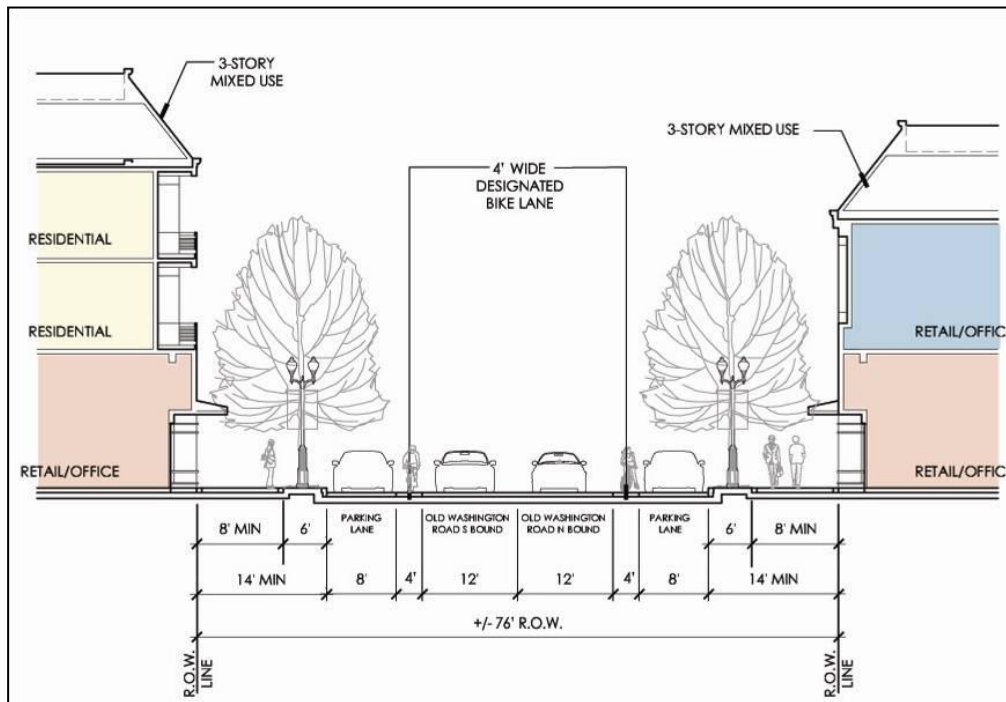
The roadway types that could be classified as ‘minor’ in revitalized Waldorf were all assigned a letter ‘C.’ The classification includes the following roadways:

- Type C - Waldorf Urban Minor Collector - two lanes undivided. Together with the major facilities will form the backbone of the grid-based street network in downtown Waldorf and extended Central Avenue. The typical Type C road section is shown in **Figure 3.6**.

Type D2 – Civic Lane is the one way street system around the proposed green. While it will function as a minor collector, the cross-section more closely resembles that of a local road, thus the ‘D’ designation. The typical Type D2 road section is shown in

- **Figure 3.8.**

Figure 3.6 Proposed Waldorf Urban Minor Collector Type C



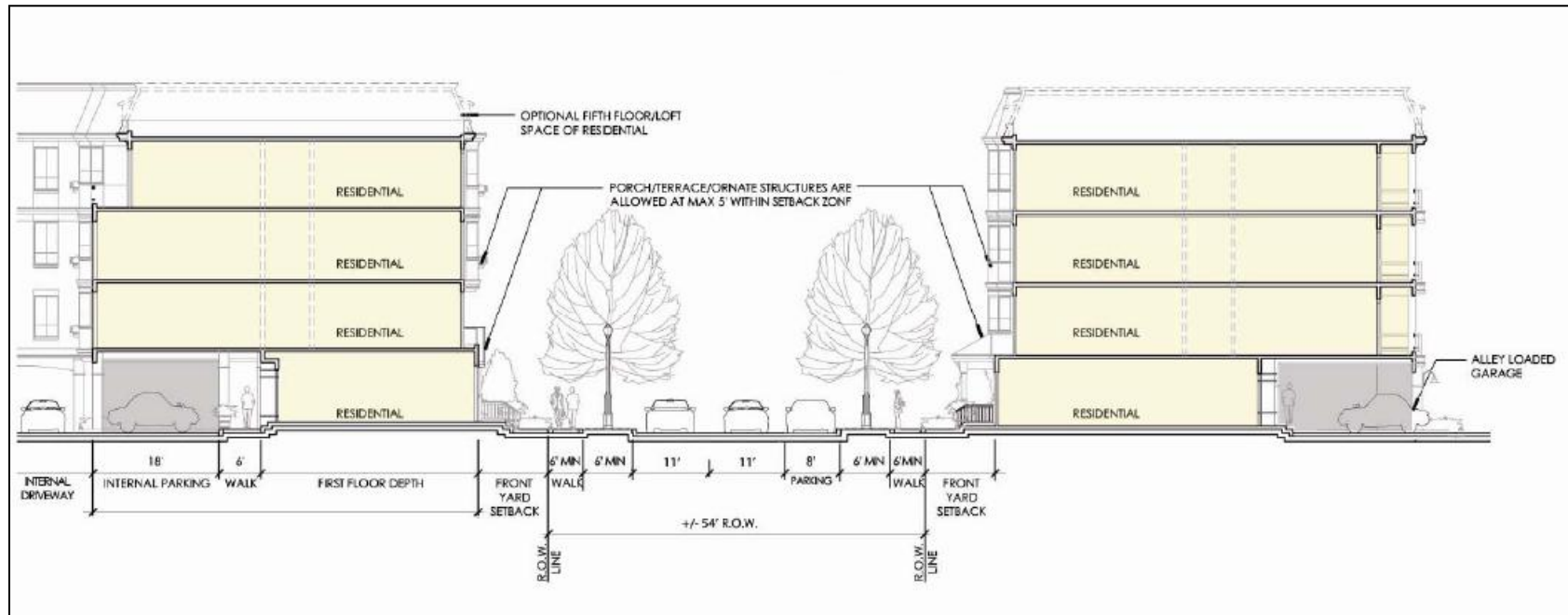
Source: Downtown Waldorf Vision Plan, April 2010

Local

The roadway types that could be classified as ‘local’ in revitalized Waldorf were assigned letters ‘D1’ or ‘D2.’ The classification includes the following roadways:

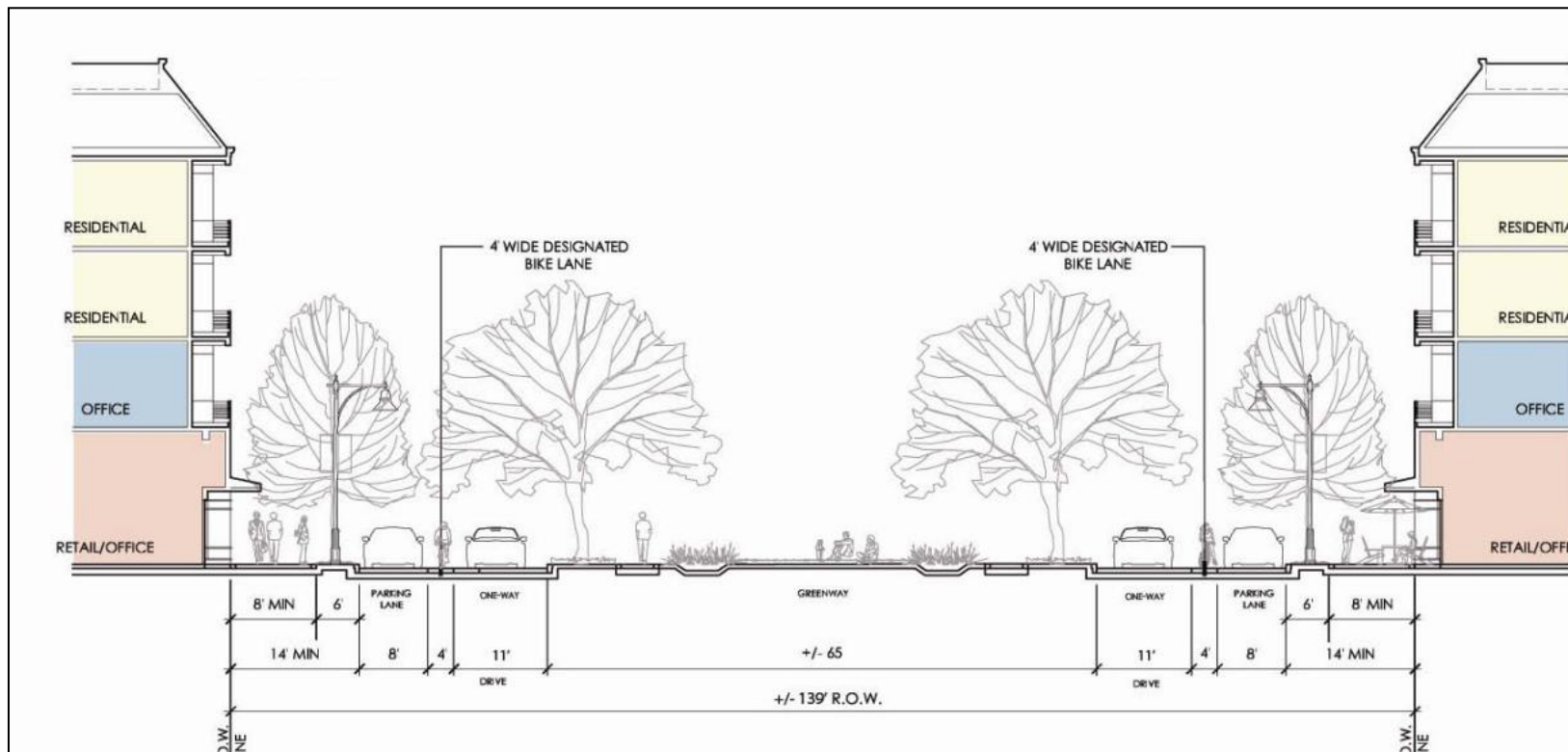
- Terrace Drive as well as a new local road connecting the proposed Acton Square with Acton Lane and Acton North/Acton South (D1). The typical Type D1 road section is shown in **Figure 3.7.**

Figure 3.7 Proposed Waldorf Urban Local Road Type D1



Source: Downtown Waldorf Vision Plan, April 2010

Figure 3.8 Proposed Waldorf Urban Local Road Type D2



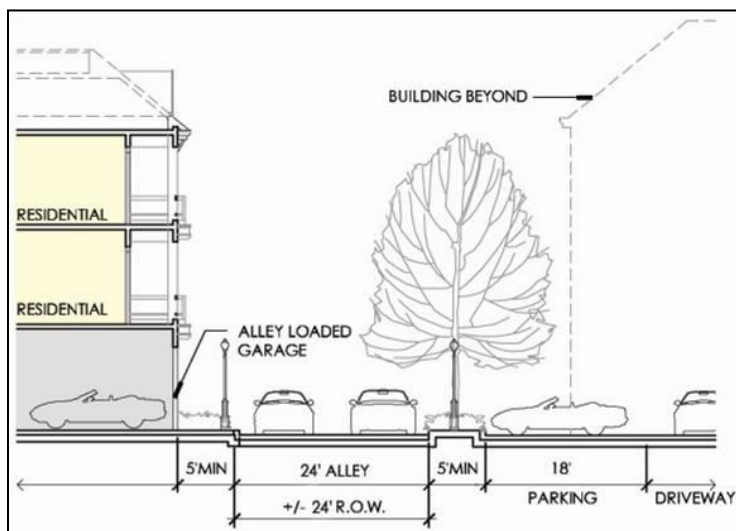
Source: Downtown Waldorf Vision Plan, April 2010

Alleys and Others

The roadway types that could be classified as ‘alleys’ and local roads serving as transit access roads in revitalized Waldorf were assigned letters ‘E1’ or ‘E2.’ Type E1 alleyway is a typical small backside road that offers connectivity and also access to parking garages and commercial loading/unloading areas in the back of the buildings if applicable. Type E2 transit service access road would be reserved for alleys adjacent to light rail line if rear of buildings have frontage. The typical Type E1 and Type E2 road section is shown in **Figure 3.9** and **Figure 3.10**, respectively.

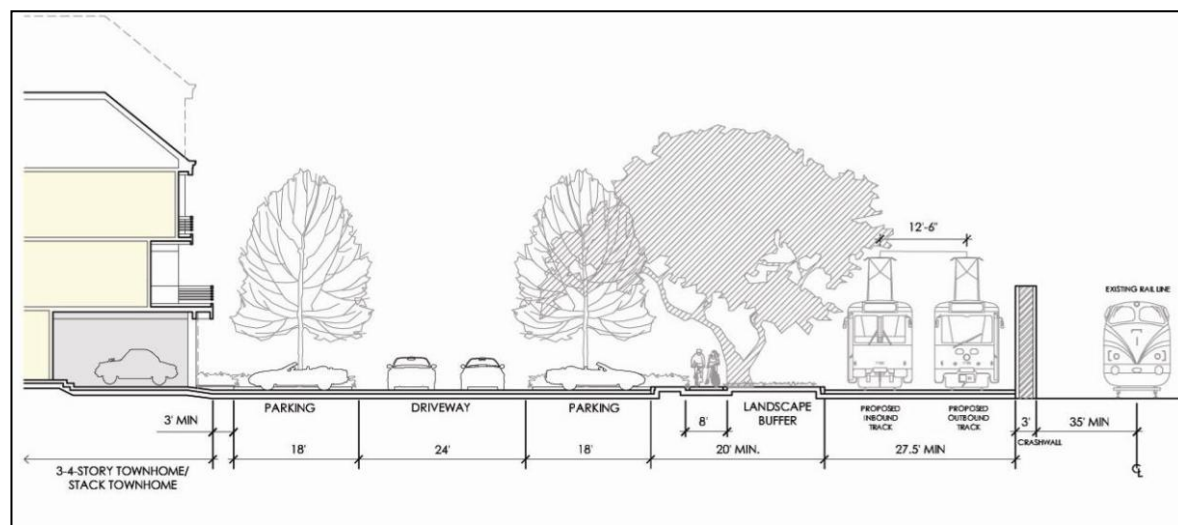
Table 3.1 lists all roadway types and their respective locations and right of way (ROW) specifications in Waldorf while **Figure 3.11** shows locations of all the road types.

Figure 3.9 Proposed Waldorf Alley Type E1



Source: Downtown Waldorf Vision Plan, April 2010

Figure 3.10 Proposed Waldorf Transit Service Access Road Type E2



Source: Downtown Waldorf Vision Plan, April 2010

Table 3.1 Waldorf Town Center Roadway Listing			
Road Type	Project Name	Typical Section	Proposed ROW
Waldorf Urban Major Collector	Old Washington Road	B1, B2	B1 84', B2 72'
	Light Rail #1	B1, B2	B1 84', B2 72'
	Light Rail #2	B1, B2	B1 84', B2 72'
	Holly Lane	B1, B2	B1 84', B2 72'
	Leonardtown Road	A1	96'
	Acton Lane	A2	96'
Waldorf Urban Minor Collector	Minor 1	C	76'
	Minor 2	C	76'
	Minor 3	C	76'
	Minor 4	C	76'
	Civic Lane	D2	37'
	Central	C	76'
Waldorf Urban Local Road	Local 1	D1	54'
	Local 2	D1	54'
	Local 3	D1	54'
	Local 4	D1	54'
	Local 5	D1	54'
	Local 6	D1	54'
	Terrace	D1	54'
	Acton South	D1	54'
	Acton North	D1	54'
Private/Service Street/ Alley	Alley 1	E1	24'
	Alley 2	E1	24'
	Alley 3	E2	80'
	Alley 4	E1	24'
	Alley 5	E2	80'
	Alley 6	E1	24'
	Alley 7	E1	24'
	Alley 8	E1	24'
	Alley 9	E2	80'
	Alley 10	E1	24'
	Alley 11	E1	24'

Figure 3.11 Proposed Waldorf Town Center Roadway Listing – Locations



Other Improvements

Parking

As envisioned, parking in Waldorf Town Center would be consolidated into centralized, shared, consumer oriented facilities in each downtown grid block. Overall parking requirements in downtown Waldorf can be expected to be lower in than in a typical auto-oriented environment for several reasons:

- *Increased transit use.* Regional transit options would include express bus and light rail, while local transit options would include a circulator shuttle. All these transit enhancements would reduce the need to use private automobiles for a variety of trips, including employment, shopping, and recreation.
- *Reduced vehicle use.* Residents and commuters to downtown Waldorf with mixed-use development patterns in place would be offered the opportunities to walk, bike or ride transit to satisfy many of their daily needs. In result, auto usage levels and demand for vehicle ownership may decrease.
- *Shared parking.* Land uses in downtown Waldorf with different peak parking demand periods could share parking – use the same parking space over a longer period of each day.

Surface Parking

Early phases of the redevelopment will rely on providing adequate amounts of surface parking. These spaces will primarily be built by developers at market rates. An over-abundance of parking, though, will be at odds with the long term goal of making the area transit and pedestrian oriented. While the new zoning allows for reduced parking supply (and offers parking maximums), real estate consultants are often eager to require parking at suburban rates independent of the context (and to a large degree cost); to the extent that the County can show that developments can succeed with lower parking supplies and utilize shared and pooled parking, developers are more than happy to go along as this can represent substantial cost-savings for their project. A few recommendations aimed at supporting these efforts include:

- Develop clear permanent way-finding signage for parking ('Park Once' approach).
- Integrate intermodal connections from parking facilities, i.e. bus stops, sidewalks and bike paths.

Structured Parking

Later phases of the redevelopment will rely on both surface and structured parking. The optimal locations for initial public parking structures would be adjacent or next to the two proposed light rail stations as these would provide parking for both the transit line as well as the rest of the development. It is likely that private developers will construct additional structured parking as their developments increase in density. If parcel size or parking availability becomes an issue in the future, the County could pursue the construction of one or more centrally located parking structures.

Transit Stations

Transportation Center

The proposed Transportation Center would serve as a multi-modal hub for all transportation modes, including pedestrian, bicycle, local bus (VanGo), and commuter bus (MTA). As envisioned in the WUDS, in order to be fully effective and accommodate all prospective transit riders and incoming commuters to Waldorf, it would offer a minimum of 1,000 shared parking spaces. At first, surface parking could be used to serve the Transportation Center, and it could be located in a few locations within walking distance to the terminal. Shared parking could be used as well for commuting purposes. If future demand warrants the upgrade, structured parking could be constructed adjacent to the Transportation Center.

Future stations for rail/bus corridor

Two potential light rail stations in downtown Waldorf were identified: one in the Waldorf Central Zone and one in the Acton Urban Center Zone. These light rail stations would be part of a regional transit corridor linking Waldorf and White Plains with the Branch Avenue METRO Station. In conjunction with the proposed light rail service, downtown Waldorf would still be served by express commuter bus service to Washington, D.C. The WUDS calls for routing this bus service through the proposed Transportation Center.

Placemaking

A key aspect for the success of the Waldorf redevelopment will be quality placemaking. One of the key attributes of a successful TOD is creating places worth coming back to through meaningful development strategies. While some of the initial efforts at placemaking will be accomplished through improved streetscape, effective placemaking is a blend of quality architecture and open spaces. It will be important for the County to work with developers to create such places and pursue them independently when developers are unable or unwilling. The civic green may be such a place. The WUDS allocates a large percentage of the land area in downtown Waldorf to open space, including community parks and multi-modal trails, all of which will contribute to the memorability of the place.

Since transit is the backbone of any TOD, in the case of Waldorf, its proposed transit stations and transportation center have the opportunity to help define downtown Waldorf, contributing to the overall placemaking. They would serve as focal points in downtown Waldorf. Creating them as iconic structures or otherwise combining them with quality public space will greatly contribute to the sense of place.

Utilities

All the proposed improvements need to be coordinated with local infrastructure improvement projects to ensure that adjacent infrastructure supports and does not hinder the implementation of the WUDS. As there are many utility upgrades associated with the WUDS, utilities will constitute a likely driver of project timing. Although this plan does not address utility needs, much of the project area will require upgrades to the storm and waste water as well as electrical and other systems.

Where the upgraded systems will overlap with existing roadways, it will be important that such improvement occur before or in tandem with roadway improvements. In some cases, the water and sewer authority may be able to bear some of the transportation-related costs (if the projects are executed in tandem) as part of what is required to return the roadway to a serviceable state.

4. Project Costs

Basic methodology

The methodology of calculating transportation-related project costs, and specifically each type of the roadway improvements in the WUDS, consisted of the following steps, described in more detail below:

- Step 1: Determining roadway cross-sections from WUDS
- Step 2: Calculating lengths of all cross-sections
- Step 3: Applying unit costs (derived from Charles County estimates and verified against national averages)
- Step 4: Compiling all unit costs in one table

Determining cross-sections from WUDS

The project roadway sections defined for the purpose of cost calculations followed the Waldorf Town Center roadway listing proposed in the WUDS (as shown in **Table 4.1** and **Figure 4.1**). Thus, the typical cross-sections were first identified according to the predefined WUDS roadway hierarchy, and were assigned the following letters: A, B1/B2, C, D1/D2, and E1/E2. Acton Lane, for instance, was assigned letter ‘A’ since it was determined to be a Waldorf Urban Major Collector.

Type	Cross-Section
A1	Typical Cross-Section A1
A2	Typical Cross-Section A2
B1	Typical Cross-Section B1
B2	Typical Cross-Section B2
C	Typical Cross-Section C
D1	Typical Cross-Section D1
D2	Typical Cross-Section D2
E1	Typical Cross-Section E1
E2	Typical Cross-Section E2

Calculating lengths

Roadway Lengths by Typical Section

The next step in the process of cost calculations consisted of calculating lengths of each individual proposed roadway segment in downtown Waldorf. While the step above was more of an aggregate approach of disseminating the proposed roadway network in downtown Waldorf, this step analyzed each of the assigned cross-section segments in detail. The length calculation organized by road type is shown below, with individual projects discussed in detail in the following section.

The roadway length calculations calculated per roadway type in downtown Waldorf include:

- Waldorf Urban Major Collector: typical Sections A1, A2, B1, and B2. As shown in **Table 4.2**, the total calculated length of roadways that could be classified as ‘Waldorf Urban Major Collector’ is 16,400 linear feet.

Table 4.2 Waldorf Urban Major Collector Length				
Road Type	Project Name	Typical Section	Proposed ROW	Length (ft)
Waldorf Urban Major Collector	Old Washington Road	B1, B2	B1 84', B2 72'	9,475
	Light Rail #1	B1, B2	B1 84', B2 72'	1,325
	Light Rail #2	B1, B2	B1 84', B2 72'	1,325
	Holly Lane	B1, B2	B1 84', B2 72'	1,275
	Leonardtwn Road	A1	96'	1,425
	Acton Lane	A2	96'	1,575
	Total Urban Major Collector length			

- Waldorf Urban Minor Collector: typical Sections C and D2. As shown in **Table 4.3**, the total calculated length of roadways that could be classified as ‘Waldorf Urban Minor Collector’ is 11,750 linear feet.

Table 4.3 Waldorf Urban Minor Collector Length				
Road Type	Project Name	Typical Section	Proposed ROW	Length (ft)
Waldorf Urban Minor Collector	Minor 1	C	76'	2,125
	Minor 2	C	76'	2,550
	Minor 3	C	76'	1,325
	Minor 4	C	76'	2,350
	Civic Lane	D2	37'	2,150
	Central Ave	C	76'	1,250
	Total Urban Minor Collector length			

- Waldorf Urban Local Road: typical Section D1. As shown in **Table 4.4**, the total calculated length of roadways that could be classified as ‘Waldorf Urban Local Road’ is 10,802 linear feet.

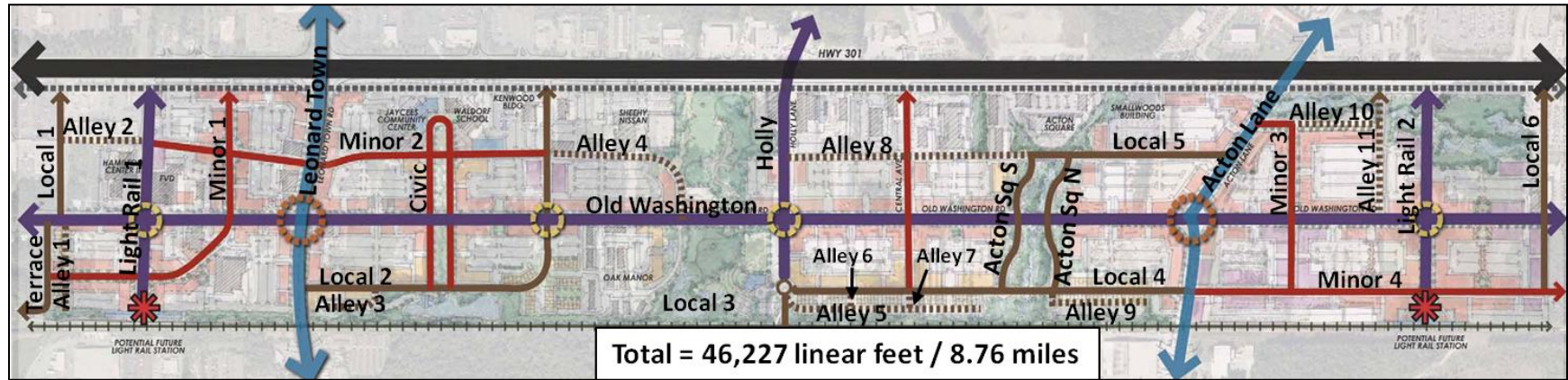
Table 4.4 Waldorf Urban Local Road Length				
Road Type	Project Name	Typical Section	Proposed ROW	Length (ft)
Waldorf Urban Local Road	Local 1	D1	54'	775
	Local 2	D1	54'	2,375
	Local 3	D1	54'	150
	Local 4	D1	54'	2,500
	Local 5	D1	54'	1,377
	Local 6	D1	54'	1,175
	Terrace Dr	D1	54'	550
	Acton South	D1	54'	950
	Acton North	D1	54'	950
	Total Urban Local Road length			

- Waldorf Alley/Service Street/Private Street: typical Sections E1 and E2. As shown in **Table 4.5**, the total calculated length of roadways that could be classified as ‘Alley/Service Street/Private Street’ is 7,275 linear feet.

Table 4.5 Waldorf Alley Length				
Road Type	Project Name	Typical Section	Proposed ROW	Length (ft)
Private/Service Street/Alley	Alley 1	E1	24'	525
	Alley 2	E1	24'	525
	Alley 3	E2	80'	350
	Alley 4	E1	24'	1,050
	Alley 5	E2	80'	1,275
	Alley 6	E1	24'	100
	Alley 7	E1	24'	100
	Alley 8	E1	24'	1,475
	Alley 9	E2	80'	625
	Alley 10	E1	24'	500
	Alley 11	E1	24'	750
	Total Private/Service Street/Alley length			

The total calculated roadway projects’ length in downtown Waldorf is 46,227 linear feet, or 8.76 miles, as shown in Figure 4.12. The actual locations of each individual projects are also shown in **Figure 3.11**. Each individual roadway lengths sorted by specific project are shown in Appendix A.

Figure 4.12 WUDS Roadway Projects Locations



Applying unit-costs

After calculating each project's length in linear feet, unit-costs were calculated and applied to each individual roadway type in downtown Waldorf. The unit cost development was based on Charles County estimates that were verified against national averages. The primary unit costs are described below and are given in 2010 dollars. Appendix B provides additional details on the cost assumptions.

- **Roadway Costs:** This includes the cost to construct the curb and gutter, roadway, sidewalk and related plantings. The cost includes a basic allotment for stormwater management as well though does not address treatment. Based on the cost data provided, an average cost of \$350 per linear foot of 12' travel lane was developed. The cost does not include utility relocation or burial or right-of-way acquisition. In most cases, the existing right-of-way does not appear to extend much beyond the edge of pavement.
- **Furnishings:** This includes the costs for quality street furnishings and public art. This is based upon approximate spacing intervals, recognizing that the final costs will be a function of the individual projects, their scale, and block length. A cost of \$12 per linear foot of roadway was estimated for major facilities with first-floor commercial. A cost of \$2 per linear foot was estimated for residential streets.
- **Lighting:** This cost covers the cost of pedestrian level street lighting. At typical 80 foot spacing this equates to roughly \$115 per linear foot of roadway. It is possible that in residential areas lower light levels would be acceptable resulting in reduced spacing and lower cost. It would also be possible to substitute traditional mast-arm lighting: while this cost will vary depending upon lighting type and desired light levels, a typical cost could be \$30 per linear foot.

Project Unit Cost Development

Table 4.6 shows the aggregate estimated project unit costs by cross-section type. These costs are based on the unit-cost calculations shown in the previous section and summed to offer a glimpse of the typical cost per linear foot in all cross-sections. At \$2,141 per project linear foot, the Typical Cross-section Type 'A' is the most expensive in terms of cost per linear foot, followed by the Cross-section E2, and Cross-section B1. Refer to Appendix B for detailed cost breakdowns by cross-section.

Cross-Section		Cost per LF
A1	Typical Cross-Section A	\$ 2,066.33
A2	Typical Cross-Section A	\$ 2,141.33
B1	Typical Cross-Section B1	\$ 1,947.33
B2	Typical Cross-Section B2	\$ 1,441.33
C	Typical Cross-Section C	\$ 1,714.00
D1	Typical Cross-Section D1	\$ 1,217.33
D2	Typical Cross-Section D2	\$ 879.00
E1	Typical Cross-Section E1	\$ 744.00
E2	Typical Cross-Section E2	\$ 2,070.00

The overall applied Waldorf Town Center roadway cost estimates are shown in **Table 4.7**. In this summary table, the costs are separated first by road type based on the proposed roadway network hierarchy in the study area, followed by each individual project. The estimated costs shown in the table include separate columns for roadway costs, as well as streetscape improvements such as lighting and furnishings. The total cost of all roadway improvements in downtown Waldorf is estimated to be \$75 million, with \$32 million needed for improvements to improve and/or construct and furnish Waldorf Urban Major Collector roadway projects, nearly \$20 million for Waldorf Urban Minor Collector roadway projects, \$14 million for Waldorf Urban Local Roads projects, and over \$8 million for Waldorf Alley/Service Street/Private projects. In addition to the summary cost table, each individual project's detailed costs are also presented in Appendix B.

It should be noted that these are typical costs estimated only for planning purposes. Detailed project costs will need to be developed. The estimated project costs do not necessarily supplant any existing estimates for projects within the downtown Waldorf study area. These costs do not include ROW acquisition or utility costs. Both of those variables will be an important factor in implementing the Plan; without the required ROW acquisition or utility improvements needed to jumpstart the proposed projects, the WUDS vision would not be easy to materialize. While a detailed right-of-way survey was beyond the scope of this study, a basic examination of the relevant property maps seems to indicate that right-of-way acquisition or dedication will be necessary for at least some portion of most all of the identified improvements along existing facilities.

Table 4.7 Waldorf Town Center Roadway Cost Estimates								
Road Type	Project Name	Typical Section	Proposed ROW	Length (ft)	Roadway Cost	Lighting	Furnishings	Total Cost
Waldorf Urban Major Collector	Old Washington Road	B1, B2	B1 84', B2 72'	9,475	\$ 16,591,433	\$ 1,089,625	\$ 114,496	\$ 17,795,554
	Light Rail #1	B1, B2	B1 84', B2 72'	1,325	\$ 2,314,567	\$ 152,375	\$ 16,011	\$ 2,482,953
	Light Rail #2	B1, B2	B1 84', B2 72'	1,325	\$ 2,289,267	\$ 152,375	\$ 16,011	\$ 2,457,653
	Holly Lane	B1, B2	B1 84', B2 72'	1,275	\$ 2,482,850	\$ 146,625	\$ 15,407	\$ 2,644,882
	Leonardtown Road	A1	96'	1,425	\$ 2,944,526	\$ 163,876	\$ 17,220	\$ 3,125,620
	Acton Lane	A2	96'	1,575	\$ 3,372,600	\$ 181,125	\$ 19,032	\$ 3,572,757
	Total Waldorf Urban Major Collector				16,400	\$ 30,102,117	\$ 1,886,000	\$ 198,178
Waldorf Urban Minor Collector	Minor 1	C	76'	2,125	\$ 3,642,250	\$ 244,375	\$ 4,718	\$ 3,891,343
	Minor 2	C	76'	2,550	\$ 4,370,700	\$ 293,250	\$ 5,661	\$ 4,669,611
	Minor 3	C	76'	1,325	\$ 2,271,050	\$ 152,375	\$ 2,942	\$ 2,426,367
	Minor 4	C	76'	2,350	\$ 4,027,900	\$ 270,250	\$ 5,217	\$ 4,303,367
	Civic Lane	D2	37'	2,150	\$ 1,889,850	\$ 247,250	\$ 25,981	\$ 2,163,081
	Central	C	76'	1,250	\$ 2,142,500	\$ 143,750	\$ 2,775	\$ 2,289,025
	Total Waldorf Urban Minor Collector				11,750	\$ 18,344,250	\$ 1,351,250	\$ 47,293
Waldorf Urban Local Road	Local 1	D1	54'	775	\$ 943,433	\$ 89,125	\$ 1,721	\$ 1,034,279
	Local 2	D1	54'	2,375	\$ 2,891,1667	\$ 273,125	\$ 5,273	\$ 3,169,564
	Local 3	D1	54'	150	\$ 182,600	\$ 17,250	\$ 333	\$ 200,183
	Local 4	D1	54'	2,500	\$ 3,043,333	\$ 287,500	\$ 5,550	\$ 3,336,383
	Local 5	D1	54'	1,377	\$ 1,676,268	\$ 158,355	\$ 3,057	\$ 1,837,680
	Local 6	D1	54'	1,175	\$ 1,430,367	\$ 135,125	\$ 2,609	\$ 1,568,100
	Terrace Drive	D1	54'	550	\$ 669,533	\$ 63,250	\$ 1,221	\$ 734,004
	Acton South	D1	54'	950	\$ 1,156,467	\$ 109,250	\$ 2,109	\$ 1,267,826
	Acton North	D1	54'	950	\$ 1,156,467	\$ 109,250	\$ 2,109	\$ 1,267,856
	Total Waldorf Urban Local Road				10,802	\$ 13,149,635	\$ 1,242,230	\$ 23,980

Private/Service Street/ Alley	Alley 1	E1	24'	525	\$ 390,600	\$ 0	\$ 0	\$ 390,600
	Alley 2	E1	24'	525	\$ 390,600	\$ 0	\$ 0	\$ 390,600
	Alley 3	E2	80'	350	\$ 724,500	\$ 0	\$ 0	\$ 724,500
	Alley 4	E1	24'	1,050	\$ 781,200	\$ 0	\$ 0	\$ 781,200
	Alley 5	E2	80'	1,275	\$ 2,639,250	\$ 0	\$ 0	\$ 2,639,250
	Alley 6	E1	24'	100	\$ 74,400	\$ 0	\$ 0	\$ 74,400
	Alley 7	E1	24'	100	\$ 74,400	\$ 0	\$ 0	\$ 74,400
	Alley 8	E1	24'	1,475	\$ 1,097,400	\$ 0	\$ 0	\$ 1,097,400
	Alley 9	E2	80'	625	\$ 1,293,750	\$ 0	\$ 0	\$ 1,293,750
	Alley 10	E1	24'	500	\$ 372,000	\$ 0	\$ 0	\$ 372,000
	Alley 11	E1	24'	750	\$ 558,000	\$ 0	\$ 0	\$ 558,000
	Total Waldorf Private/Service Street/ Alley				7,275	\$ 8,396,100	\$ 0	\$ 0

5. Project Priorities

In order to prioritize the transportation projects for the implementation of the WUDS, it is important to identify the goals of the implementation plan. While the WUDS identifies a set of general goals, they describe the end product, not the means and order by which it will be achieved.

Based on discussions with the Charles County staff, the prioritized goals for the transportation implementation plan are as follows:

1. Promote and support the development of the Waldorf and Acton Town Centers. Specifically, identify the necessary infrastructure improvements to enable developer-driven infill and redevelopment in the area.
2. Create walkable town centers with a sense of place.
3. Ensure accessibility of the centers from the rest of Waldorf by non-auto modes.
4. Ensure that the traffic generated by the development, as well as through traffic, doesn't impede the success of the town centers.
5. Create a transit-oriented development providing access to and from adjacent fixed-guideway transit.

Key Projects

While the realization of the goals will be a long term process, there are several key projects which should be pursued to advance the WUDS vision. At the same time, there are several transportation projects that, while important to the plan, will be most successful when pursued in partnership with developers or after the initial stages of the Waldorf and Acton redevelopment. **Table 5.1** lists the WUDS transportation projects according to their priority, providing recommended implementation dates assuming sustained investment on the part of both the county and private developers. It is recommended that the high priority projects be pursued by Charles County as catalyzing projects for development in the WUDS study area. Medium priority projects may be pursued by the county or in conjunction with private developers. It is anticipated that most if not all of the tertiary priority projects would be completed as part of private development. Note that the horizon years in the implementation table refer to recommended year of county participation and/or implementation. Many of the projects of lower-priority to the WUDS at the study-area level will likely be completed in conjunction with private development in advance of this timeline. Project extents have been omitted from the table for clarity when referring to the entire facility within the study area. All project costs are in 2010 dollars and have not been escalated. The following section describes each of those prioritized projects.

Note that in addition to three roadway projects, the table identifies two other high priority projects: securing property for the transfer station and the Civic Green. These are part of broader ongoing efforts and further described at the end of this section. Costs are not provided as they would be highly dependent upon the site and timing of the event.

Table 5.1 WUDS Implementation Transportation Projects List						
Priority	Project	From	To	Likely Funding Source	Estimated Cost	Implementation
<u>2011-15 Fiscal Year Five-Year Plan Projects:</u>						
Very High	Leonardtown Rd Streetscape	US 301	RR	MDOT/Charles County	\$3,126,000	2011-12
Very High	Old Washington Rd Reconstruction	Leonardtown Rd	Acton Ln	Charles County/Private	\$9,046,000	2011-12
Very High	Acton Lane Streetscape	US 301	RR	Charles County/Private	\$3,573,000	2012-13
High	Secure property for stations and transit center			Charles County/MTA		2013-14, but based on transit line progress
High	Civic Green			Charles County/Private		2012-13
Medium/High	Old Washington Rd Reconstruction	Leonardtown Rd	S boundary	Charles County/ MDOT/ Private	\$3,067,000	2014-15
Medium/High	Old Washington Rd Reconstruction	Acton Lane	N boundary	Charles County/Private	\$4,479,000	2015-16
<u>2016-20 Fiscal Year Five-Year Plan Projects:</u>						
Medium	Secondary Streets:					
	Holly Lane			Private/Charles County	\$2,645,000	2016-18
	Central Avenue				\$2,289,000	2016-18
	Light Rail #1				\$2,483,000	2018-20, but based on transit line progress
	Light Rail #2				\$2,458,000	2018-20, but based on transit line progress

<u>2021 and Beyond Plan Projects:</u>						
Medium/ Low	Tertiary Streets:					
	Civic Lane			Private	\$2,163,000	2021+
	Acton Square N/S				\$2,536,000	2021+
Low	Minor 1-4				\$15,291,000	2021+
	Local 1-6				\$11,146,000	2021+
	Alley 1-11				\$8,396,000	2021+ /if needed
Very Low	Terrace Drive				\$734,000	If needed

Leonardtwn Road

Importance

The stretch of Leonardtown Road (MD 5 Business) between US 301 and the railroad will constitute the gateway to the proposed Waldorf Central Zone and downtown Waldorf in general. It also serves as a through route for many in the area so improvements to this stretch will be a clear signal to area residents of the many things to come. As such, it fulfills goal number 1 of the prioritized goals' list, since it would promote and support the development of the Waldorf Town Center. The necessary streetscape improvements to Leonardtown Road, including roadway resurfacing, lighting, and furnishing are estimated at \$3.1 million. The existing roadway bed already has a median in place (albeit not landscaped), yet the entire road will require resurfacing because the median in place lacks curb and gutter or space for it.

Timing and Funding

The Leonardtown Road project improvements should be implemented as soon as possible in order to be successful in spearheading TOD in downtown Waldorf. As Leonardtown Road is currently listed in the State Transportation Improvement Program (STIP), it will hopefully be implemented in the next five years with primary funding coming from the Maryland Department of Transportation. Given, though, that the project has been on hold, it will be important to restart discussions with MDOT soon to ensure timely completion. If MDOT funding is unavailable or uncertain, the county may wish to pursue it tandem with Old Washington Road.

Old Washington Road

Importance

The Old Washington Road project improvements are central to the Plan as this is the spine off of which all redevelopment will occur. Old Washington Road will serve as the primary connector between the Waldorf and Acton Town Centers. Coordination with local utilities will be required from the onset of implementing the project improvements in order to be able to achieve the design characteristics that would be in tune with and support the goals of the WUDS. It should also be noted that the Old Washington Road project could serve as a catalyst of future growth in downtown Waldorf by reducing developer costs.

Timing and Funding

The Old Washington Road project improvements should be implemented as soon as possible since the roadway will serve as a lifeline connecting both proposed Activity Centers. This said, the actual implementation of the proposed Old Washington Road improvements could proceed in stages, with the priority assigned to the project segments located between Leonardtown Road and Acton Lane. It is recommended that those segments' improvements are implemented in the next five years. The other two segments, from Leonardtown Road to the southern boundary of the study area, and from Acton Lane to the northern boundary of the study area, could be implemented from approximately

year 5 to year 10 in the implementation process. It is important to note that the southern portion is a state highway (Route 925) so all work along it will need to be coordinated with MDOT.

As shown in **Table 5.2**, implementing the first phase of the Old Washington Road improvements from Leonardtown Road to Acton Lane would cost about \$9.8 million total, while the later improvements would cost an additional \$3.3 million in the project segments spanning from the WUDS southern boundary to Leonardtown Rd and \$4.8 million from Acton Lane to the study area's northern boundary. In order to more rapidly catalyze development, the funding for this project would initially come from Charles County. If the pace of development is rapid, much of the money for these improvements could come from improvements associated with private development. The Old Washington Road redesign should also be continuously coordinated with the water and other utilities in order to ensure that all utilities are in place when needed and conform to the WUDS' design standards and Plan's objectives.

Project Extent Boundary	Length in LF	Roadway	Lighting	Furnishings	Total Cost
Leonardtown Rd - Acton Lane	5,600	\$9,045,517	\$644,000	\$67,670	\$9,757,187
<i>S. boundary - Leonardtown Rd</i>	<i>1,575</i>	<i>\$3,067,050</i>	<i>\$181,125</i>	<i>\$19,032</i>	<i>\$3,267,207</i>
<i>Acton Lane – N. boundary</i>	<i>2,300</i>	<i>4,478,867 \$</i>	<i>\$264,500</i>	<i>\$27,793</i>	<i>\$4,771,160</i>
Total	9,475	\$16,591,433	\$1,089,625	\$ 114,496	\$17,795,554

Acton Lane

Importance

Akin to Leonardtown Road, Acton Lane would constitute another important gateway street to the proposed Acton Urban Center Zone and downtown Waldorf in general. Since Acton Lane will also connect US 301 to Acton Urban Center Zone its perceived future role of being an anchor for the TOD in downtown Waldorf is key. As such, it fulfills goal number 1 of the prioritized goals' list, since it would promote and support the development of the Acton Urban Center. Acton Lane would also serve as one of the primary connections to the proposed light rail stations in Waldorf. Finally, Acton Lane would also open a new roadway connection to the highly anticipated Chaney development located across the railroad tracks. The necessary streetscape improvements to Leonardtown Road, including roadway resurfacing, lighting, and furnishing are estimated at nearly \$3.6 million.

Timing and Funding

The Acton Lane project improvements should be implemented as soon as possible in order to be successful in spearheading TOD in downtown Waldorf. The project implementation timeline should

not exceed 5 years. While the area around Acton Lane is, perhaps, less ripe for redevelopment in the short term (due to relatively recent improvements to many of the parcels in the area), the WUDS calls for much higher density than the Waldorf Urban Center: such density will take time so it will be important that the underlying infrastructure be in place to support that density.

In terms of funding, one important potential source of private funding could come from the proposed Chaney development, since Acton Lane, as planned, would offer greatly improved access to that development from US 301 and to/from Acton Urban Center Zone. It would also provide a much more attractive entrance to that project than what currently exists. If possible, the entire Acton Lane project should be constructed as part of the improvements associated with the Chaney tract, but a possible public-private funding option could be considered as well. For instance, Charles County might want to consider supplementing private funding source(s) in order to accelerate this project due to it being very high on the prioritized list of improvements in the WUDS. The overall contribution from the Chaney site development will also depend upon the final site plan and traffic impacts and the extent to which improvements to Acton Lane are necessary to meet Adequate Public Facility (APF) requirements.

Secondary Projects

Holly Lane

The Holly Lane project will comprise a secondary connection from downtown Waldorf to US 301. The extended roadway will also allow access to the proposed Waldorf Community Park and possible Recreation Center. The project would cost an estimated \$2.6 million. Depending upon the pace of development and the progress of other projects in the county's CIP, the burden of the cost could be borne fully by the county, by private developers or a mix. The county currently has plans to improve Holly Lane; however, it is imperative that funding and timing is such that it could be constructed to final WUDS standards. At the same time, Holly Lane would provide key access to US 301 for future development in the vicinity, including the proposed Chaney development. So while there may be high willingness of developers to pay for its improvement, investment by the county to minimize that private outlay would presumably spur development in its vicinity.

Central Ave

Central Avenue will be another secondary connection to Old Washington Road, offering mobility enhancements in the Acton Town Center's southern area with a connection to US 301. It will eventually extend east of Old Washington Road to provide access and circulation for the adjacent proposed residential units. The project would cost an estimated \$2.3 million and it is anticipated that these improvements would primarily be made in conjunction with private development.

Parking

While the long-term aim is for the Waldorf and Acton Centers to become successful TODs, it is important to recognize that parking will be a critical component for many years to come. While the precise amount will depend upon the actual developments, the WUDS Buildout Development Program estimated the need for 8,631 parking spaces in downtown Waldorf. Initially, most

developers will likely want to provide parking on-site to successfully compete with the plentiful, adjacent parking in other nearby suburban developments. If development proceeds in a piecemeal fashion on primarily smaller parcels, public parking could be seen as a boon – or even necessary – in order to offset site parking requirements. In the end, any surface parking lots in the area (and potential parking structures in the future) could be used to offset parking requirements for redevelopments, reducing their fiscal and land burden.

While the priority locations for public parking follow the anticipated phasing (initially adjacent to the two centers, filling in over time), the order in which they might be built will more likely be determined by land availability. As the primary priority will be to secure land adjacent to the proposed transit stations, it is likely that land not used for transit purposes in the short term could be provided as public parking. Eventually, surface parking lots could be converted to parking structures based on future needs assessments and parking and traffic data analysis.

New East-West connections between US 301 and Old Washington Road

An important part of the redesigned roadway network in downtown Waldorf will be comprised of newly constructed east-west connections providing additional access point to/from US 301 and Old Washington Road. Two of the connectors, Light Rail 1 and Light Rail 2 would become essential if the proposed light rail stations materialize. The estimated cost of the Light Rail 1 and Light Rail 2 projects is \$4.9 million, a cost most likely borne as part of private development. Other new and enhanced local roads will not only offer new connections between US 301 and Old Washington Road but also result in creation of a grid-based roadway network that makes downtown Waldorf accessible to all transportation modes. Ensuring accessibility of the proposed Waldorf town centers from the rest of Waldorf by non-auto modes is one of the priority goals of the WUDS.

Tertiary Projects

Minor/local streets

When compared to the existing roadway network, the proposed network relies heavily on minor and local streets to support the goal of creating a walkable, grid-based living and working environment where all parts of downtown Waldorf are easily accessible by all transportation modes. Some of these roadways will provide the lifeline to newly developed areas of downtown Waldorf – Civic Lane, for one, will provide access to the proposed Waldorf School and Jaycees Community Center in Waldorf Town Center, while Acton Square N/S will provide access to the proposed park/recreation area on the southern edge of Acton Town Center. Other minor street and alleyways will provide access to new developments and improve interconnectivity in the area. The estimated total cost of all minor/local streets and alleys project improvements is \$40.3 million. While the county may want to pursue some of this work – particularly in concert with other goals such as placemaking and the creation of open space or utility upgrades – it is anticipated that most if not all of these projects will be implemented gradually as part of private development.

Ongoing Efforts

Property/ROW/Preservation

While most of the transportation projects – particularly those of high priority – lie within areas already owned by the county, it will be important to be mindful of property turnover and have funds at the ready to purchase key parcels in advance of anticipated projects. By securing property upfront, the county will have the flexibility to pursue these projects as the need or funding arises and will be less beholden to the eminent domain process. Even more importantly, securing key parcels in advance will ensure that they are preserved for the desired future public use and provide the flexibility for possible public-private partnerships.

The areas of primary concern will be the proposed station locations as well as the proposed transit center. As discussed above, it is not clear whether there will be a need, particularly in the short term, for publicly owned parking facilities. If ideal parcels become available, and the county has the funds, it may be preferable to acquire the property to ensure the possibility of such future parking.

In addition to parcel acquisition, the county should be vigilant of right-of-way requirements for improved and proposed roadways. In most cases, this will simply be an awareness of the requirements so that developers can be informed and have the appropriate expectation of the amount of dedication that would be required in conjunction with required improvements. In cases where the county is looking to proactively improve the transportation infrastructure, it should look for opportunities to acquire any additional right-of-way necessary, particularly for projects where property values are expected to increase substantially by the time of project implementation.

Transit Center

As proposed, the Waldorf Transit Center would be located near the intersection of Old Washington Road and Action Lane, within walking distance to major activity centers, retail areas, and direct access to major collector roads. It would serve as a multi-modal hub with structured public parking and connections to pedestrian, bicycle, local bus (VanGo), and commuter bus (MTA). While the goal is to provide a seamless connection point to the future transit line, it will also provide access to and from the surrounding area, servicing shoppers and local residents as well as commuters. The construction of the transit center sooner, rather than later, could serve as an additional catalyst for development in the area, particularly if there is adjacent development oriented to commuter bus riders. As the land requirements for such a center will be sizeable – particularly if it includes a substantial amount of parking – it will be important for the county to at least preserve a suitable site prior to substantial development in the area.

Transit Stations

The two proposed light rail transit stations would serve Waldorf and Acton Urban Centers in downtown Waldorf. As with the transit center, it will be important to preserve, in some way, the land necessary for the stations. This could be via the outright purchase of this land or the pursuit of planned transit-oriented development surrounding the stations. In the latter case, if the development occurred in advance of the transit line design or approval, the site would need to be designed to be

flexible enough to support the future system. This would include well-designed connections to local pedestrian and bike routes as well as room for local bus access and turnaround. As proposed, parking would be provided at both locations and the stations accessed via the proposed Light Rail 1 and Light Rail 2 roadway connections. In the long term, it would be reasonable to expect development to the east of the rail tracks. While this is a lower priority at present, for traffic reasons, it may be desirable to place some or most of the commuter parking to the east of the tracks to reduce congestion on Leonardtown Road and Acton Lane.

Open Space and Placemaking

As discussed previously, the creation of a memorable place will be critical to the success of the redevelopment. Much of this effort will be achieved through private development, but the county will play a role in ensuring their creation and quality. Early in the redevelopment, the county will want to ensure that a memorable central place such as the Civic Green is constructed. This will not only contribute to the placemaking but will provide a location for events such as farmers markets or evening film series which draw the community to the site.

6. Funding and Financing Options

The implementation of the WUDS will rely on a mixture of public and private funding. The timing of public investments will be key to the success of Waldorf TOD since investments will need to be made up front, and definitely in early project phases, to create high quality, walkable town centers with a sense of place that would attract residents and visitors. There are no sunk costs when creating a high-quality living environment. While direct public return on investment may be achievable by structuring financial partnerships with developers that allow upfront investment with payback in later years, indirect public returns that are harder to quantify could include high quality development contributions to Waldorf and the surrounding area, increased transit ridership, new recreational opportunities and green open space, promoting healthier lifestyle by creating walkable neighborhoods and offering new employment opportunities that benefit the local economy. The following section describes a variety of financing options that could be used to fund the vision outlined in the WUDS. Charles County is encouraged to create a ‘financial toolbox’ that would include all of the described financing mechanisms and would serve as a financing guideline.

Tax Increment Financing (TIF)

Tax Increment Financing (TIF), is a public financing method that has been used for redevelopment and community improvement projects. Typically, TIF accomplishes this by pledging the increased property tax revenues resulting from the private development to pay for the bonds or other financing used to fund the public infrastructure. TIF can be used to finance land acquisition/banking as well as public improvements. One TOD-specific example of the former use of TIF is Skyland Redevelopment in Washington, DC (Anacostia Metro Station Area). The project’s co-developer, National Capital Revitalization Corporation (a local government development organization), who acted as the landowner, received \$25.7 million in TIF to assist with land acquisition. One TOD-specific example of the latter use of TIF is Shannon Station Transit Village in Pittsburgh, Pennsylvania where TIF was used to finance infrastructure financing. In this particular TOD, TIF financed 50 percent of the public parking deck’s cost adjacent to a light rail station (\$5 million). The parking structure in question has served (as intended) as foundation for the development. Thanks to this park-n-ride user fee, the parking structure has generated around \$2 million in annual tax revenue, with the bulk of it benefiting local municipalities.

As these examples and the earlier case studies show, TIF can generate substantial revenue and guarantees revenue works toward improvements in the district. A TIF also has the advantage that it does not require a referendum or assent from the property owners within the district. TIF’s effectiveness can be slow at first if property values do not increase or if user fee is not charged for using constructed infrastructure projects. In certain instances, if the revenue stream is uncertain, a TIF can be backed by county credit, but then it is counted against the county’s total indebtedness and serves in a manner similar to a general obligation bond (and is also subject to a referendum). The rules governing TIF issuance are discussed further in the Economic Development title of the Maryland Code, § 12-201 *et seq.*

Business Improvement District (BID)

Creating a Business Improvement District (BID) is another public financing method that has been used in TOD redevelopments, although it is typically used for established projects. In essence, unlike TIF, a BID is not used to acquire land or build infrastructure, but rather to maintain and to continuously improve infrastructure improvements that have already been made. While the revenue collected varies with the assessment, annual BID budgets are typically in the hundreds of thousands of dollars, insufficient to pursue large capital improvements. BIDs have been shown to be doubly beneficial to neighborhoods, by enhancing property values as well as capturing locally generated tax revenues for local use. Silver Spring's station area BID has been used to fund TOD expansions, renovations, ongoing improvements, management, and capital improvements to downtown streetscape and downtown businesses. The increased property values around the Metro station in Silver Spring have in turn generated more tax revenues that could be used to fund a variety of different local projects.

Special Assessment District

In Maryland, Special Assessment District is a financing tool reminiscent of BID, though with goal of bonding for capital improvements. Notably, these bonds do not count as a general obligation and do not require public referendum to be approved. It should be noted that a special assessment district requires approval of two-thirds of the property owners and is governed through Art 24, § 9-1301 of the Maryland Code.

General Obligation Bonds

The debt service on county general obligation bonds is paid for with general funds that are primarily local property taxes. In nearby Virginia counties (Arlington, Fairfax, Loudoun and Prince William Counties), voters have approved over \$1.6 billion in general obligation bonds for transportation projects. Approximately 1/3 of these bonds have been dedicated to transit projects. The largest share of these bonds is used for Metro capital projects.

Developer-Funded

Virtually all existing TODs in Maryland are the result of public/private partnerships. Because the public sector operates the transit rail or bus system, they often form part of a team to finance and develop the infrastructure adjacent to the transit station, including station parking. However, the private sector is typically responsible for 'building' the TOD projects as in most cases it is private financing and construction which results in the commercial and residential space associated with TOD. Developers generally view the infrastructure investment associated with a project as a cost of business and, as necessary, include the required amounts in their financing package. At the same time, they often begrudge these amounts as they will raise their sales prices and/or rents which can reduce the competitiveness with nearby properties that are not subject to such expenditures. Particularly in the early stages of the implementation of the WUDS, the extent to which developer funding is minimized should advance the development of the area.

Recommendations for the WUDS

As discussed above, there are several means to finance the transportation improvements for the WUDS. Those that the County elects to pursue in advance of development will most-likely require bonding. While a TIF is generally attractive, it requires substantial increases in property values to generate substantial revenue streams. Because of the piecemeal way in which the WUDS may well develop, and the current real estate market in the region, it may be difficult to ensure a large enough revenue stream to back the bonds necessary to finance the recommended early improvements. Still, TIF has worked very well in TOD redevelopment projects in Maryland, and has the potential to generate substantial revenues for later-year improvements. By establishing a TIF soon, the county can lock in the existing property values as the basis.

If a TIF is not feasible, particularly for near-term improvements, either a special assessment district or general obligation bond would be the presumptive alternative. The primary difference would be political as to how the costs of the improvements should be divided amongst the county's businesses and residents. The discussed TOD redevelopment case study of Silver Spring exemplifies that creation of a special assessment district in the vicinity of a transit station can result in a surge of investment in the targeted redevelopment area.

Where possible, of course, the county should look for partners. As discussed in the case studies, the MDOT and MTA substantial experience with TOD in Maryland, and may be able to provide some funding assistance, particularly for state roads and improvements directly associated with station development. Additionally many of the improvements will likely be made in partnership with private developers or completely as part of a private development. For example, since Chaney development located across the railroad tracks would directly benefit from streetscape improvements to Acton Lane that would open up access to the area, Charles County, if possible, could require the developer to pay for such improvements to Acton Lane.

The primary difference between the Waldorf redevelopment and many other TODs is that there is not, at least as of yet, a single private developer looking to make a concentrated investment. Even in Silver Spring, where the project was a redevelopment of an existing urban area, a single developer came forward to complete the core redevelopment (further aided by the subsequent construction of the Discovery headquarters building). Not only can a large development serve as a catalyst for surrounding change, it typically has the financial resources to be a substantial contributor to facilities and infrastructure improvements in the area. If a similar developer does not step forward for the Waldorf area, the County will need to play a much more active role completing and financing the area improvements.

7. Conclusions and Next Steps

Charles County has made the first step towards creating a successful TOD in Waldorf. That step involves the WUDS – a bold vision of redesigned downtown Waldorf. One of the biggest challenges ahead of Charles County is coordination of the land use vision with current and future transportation needs and realities. Development of the desired and appropriate transportation network, together with emerging public realm and supplemental infrastructure will influence when and how the WUDS is realized. The implementation of a variety of transportation improvements needs to be comprehensive so as not to place any other on-going improvements in peril. Creative financing, including public-private partnerships, will be essential to spreading the risks of a large-scale development in downtown Waldorf. While the current economic climate has slowed growth in the region, Charles County continues to grow and the county has an opportunity to direct that growth at the Waldorf and Acton urban centers through targeted investment.

This report has verified the transportation recommendations in the WUDS, estimated and prioritized proposed transportation-related project costs, identified likely funding sources and provided examples of successful and similar TODs in Maryland, and proposed implementation timeline for roadway network improvements. Hopefully it will be used as one of the helping tools for successful implementation of the WUDS' vision.

Appendices

Appendix A Detailed Roadway Descriptions

Roadway Lengths by Project Name

This Appendix describes roadway lengths of each individual roadway project in downtown Waldorf. As proposed, the individual projects' length in linear feet (see Table A1-A32 and Figure A1-A32) would be as follows:

- Waldorf Urban Major Collector projects:
 - Old Washington Road – 9,475 linear feet
 - Light Rail 1 – 1,325 linear feet
 - Light Rail 2 – 1,325 linear feet
 - Holly Lane – 1,275 linear feet
 - Leonardtown Road – 1,425 linear feet
 - Acton Lane – 1,575 linear feet
- Waldorf Urban Minor Collector projects:
 - Minor 1 – 2,125 linear feet
 - Minor 2 – 2,550 linear feet
 - Minor 3 – 1,325 linear feet
 - Minor 4 – 2,350 linear feet
 - Civic Lane – 2,150 linear feet
 - Central Avenue – 1,250 linear feet
- Waldorf Urban Local Roads projects:
 - Local 1 – 775 linear feet
 - Local 2 – 2,375 linear feet
 - Local 3 – 150 linear feet
 - Local 4 – 2,500 linear feet
 - Local 5 – 1,377 linear feet
 - Local 6 – 1,175 linear feet
 - Terrace Drive – 550 linear feet
 - Acton Square South – 950 linear feet
 - Acton Square North – 950 linear feet
- Waldorf Alley/Service Street/Private projects:
 - Alley 1 – 525 linear feet
 - Alley 2 – 525 linear feet
 - Alley 3 – 350 linear feet
 - Alley 4 – 1,050 linear feet
 - Alley 5 – 1,275 linear feet
 - Alley 6 – 100 linear feet
 - Alley 7 – 100 linear feet
 - Alley 8 – 1,475 linear feet
 - Alley 9 – 625 linear feet

- Alley 10 – 500 linear feet
- Alley 11 – 750 linear feet

Figure A.1: Waldorf Urban Major Collector: Old Washington Road calculated length

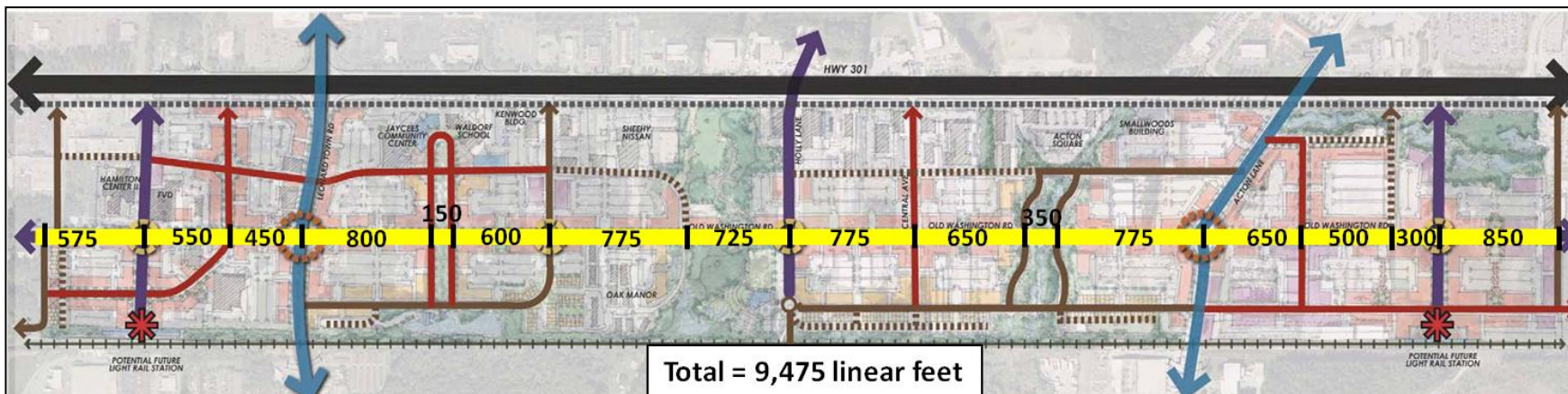


Table A.1 Old Washington Road Calculated Project Lengths		
Old Washington Road segments	Quantity	Unit
Terrace Drive - Light Rail 1 Typical Cross-Section B1	575	LF
Light Rail 1 -Minor 1 Typical Cross-Section B1	550	LF
Minor 1 - Leonardtown Rd Typical Cross-Section B1	450	LF
Leonardtown Rd - Civic Greenway Loop South Typical Cross-Section B1	800	LF
Civic Greenway Loop South - North Typical Cross-Section B2	150	LF
Civic Greenway Loop North - Local 2 Typical Cross-Section B2	600	LF
WULR 2 - Oak Manor/Alley 4 Typical Cross-Section B2	775	LF
Oak Manor/Alley 4 - Holly Lane Typical Cross-Section B2	725	LF
Holly Lane - Central Avenue Typical Cross-Section B2	775	LF
Central Avenue - Acton Square South Typical Cross-Section B2	650	LF
Acton Square South - North Typical Cross-Section B1	350	LF
Acton Square North - Acton Lane Typical Cross-Section B1	775	LF
Acton Lane - Minor 3 Typical Cross-Section B1	650	LF
Minor 3 - Alley 11 Typical Cross-Section B1	500	LF

Alley 11 - Light Rail 2 Typical Cross-Section B1	300	LF
Light Rail 2 - Local 6 Typical Cross-Section B1	850	LF
Total	9,475	LF

Figure A.2: Waldorf Urban Major Collector: Light Rail 1 calculated length

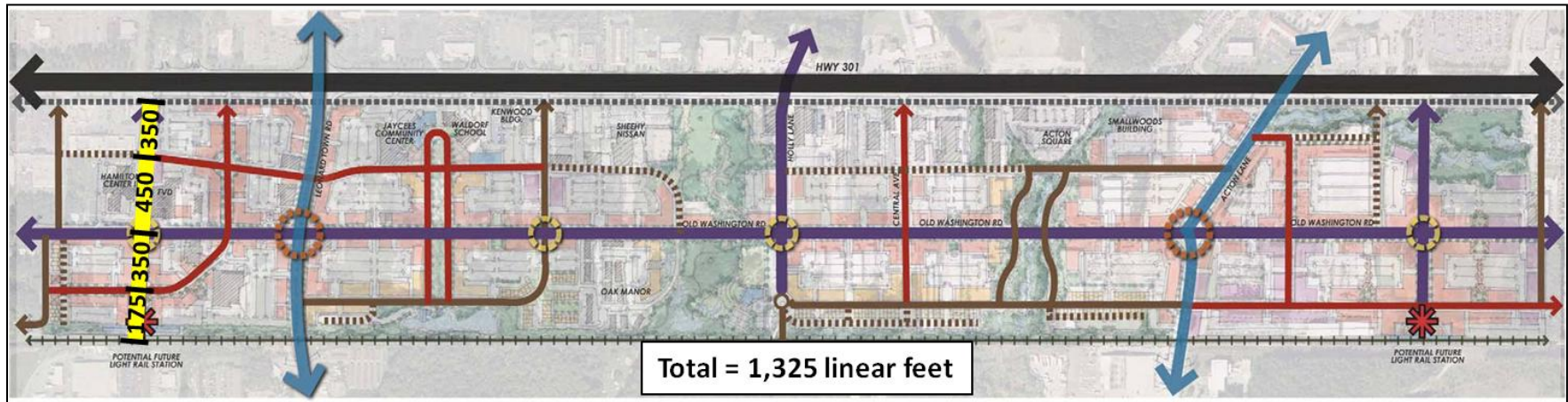
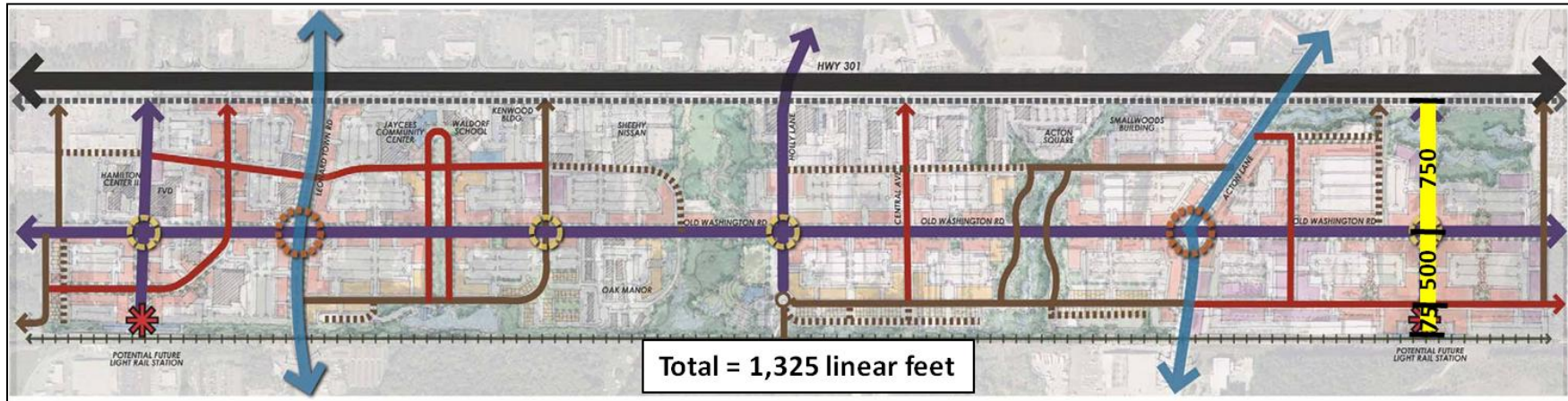


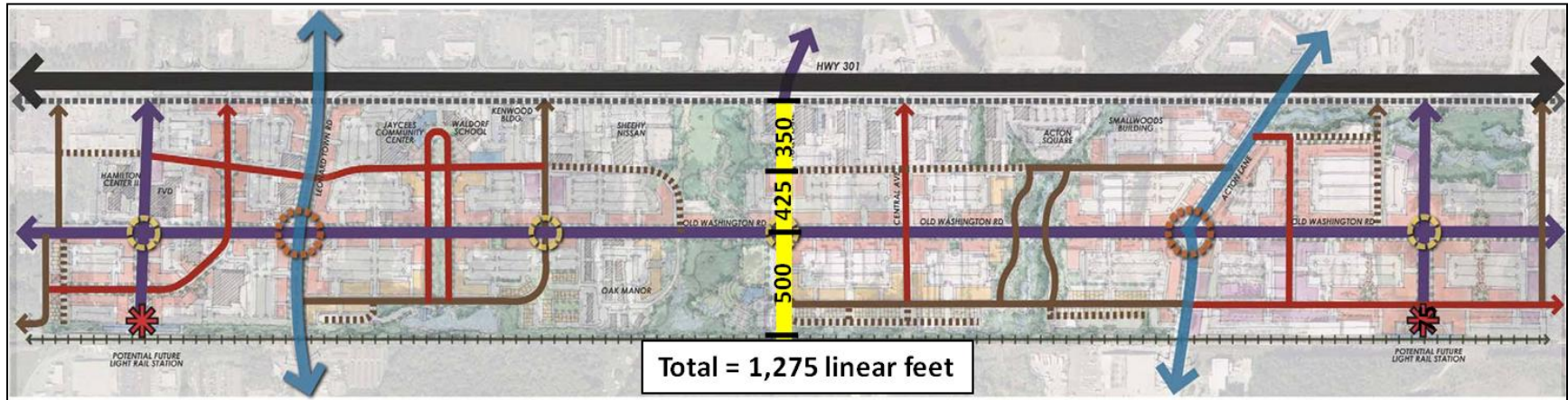
Table A.2 Light Rail 1 Calculated Project Lengths		
Project Segments	Quantity	Unit
Light Rail Station #1 - Minor 1 Typical Cross-Section B2	175	LF
Minor 1 - Old Washington Typical Cross-Section B2	350	LF
Old Washington - Alley 2/Minor 2 Typical Cross-Section B1	450	LF
Minor 2 - 301 Service Road Typical Cross-Section B1	350	LF
Total	1,325	LF

Figure A.3: Waldorf Urban Major Collector: Light Rail 2 calculated length



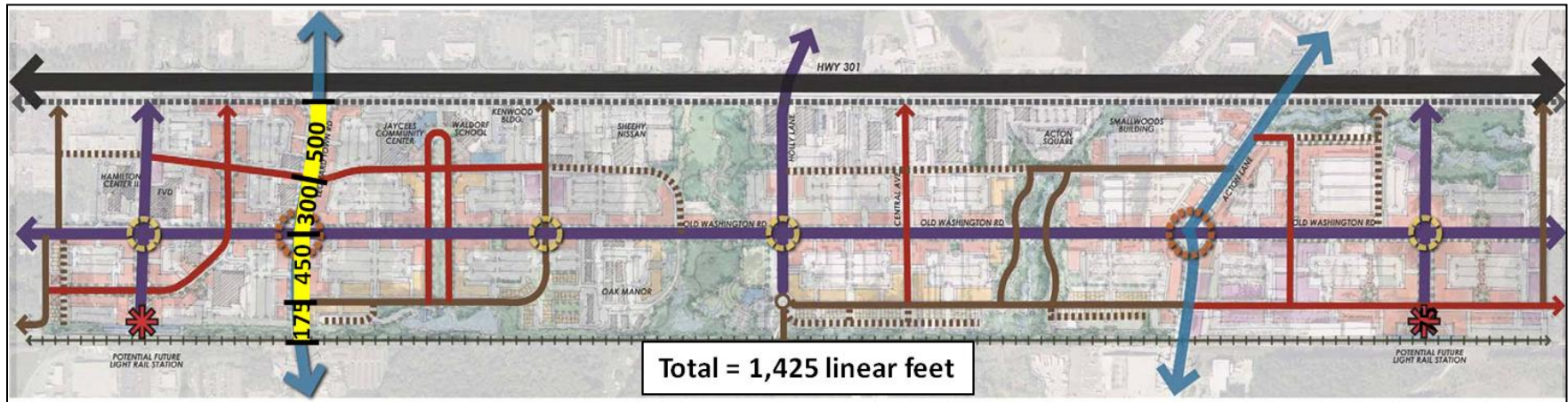
Project Segments	Quantity	Unit
Light Rail Station 2 - Minor 4 Typical Cross-Section B2	75	LF
Minor 4 - Old Washington Typical Cross-Section B2	500	LF
Old Washington - 301 Service Typical Cross-Section B1	750	LF
Total	1,325	LF

Figure A.4: Waldorf Urban Major Collector: Holly Lane calculated length



Project Segments	Quantity	Unit
Railroad Rd - Old Washington Typical Cross-Section B1	500	LF
Old Washington - Alley 8 Typical Cross-Section B1	425	LF
Alley 8 - 301 Service Typical Cross-Section B1	350	LF
Total	1,275	LF

Figure A.5: Waldorf Urban Major Collector: Leonardtown Road calculated length



Project Segments	Quantity	Unit
Railroad - Alley 3 Typical Cross-Section A1	175	LF
Alley 3 - Old Washington Rd Typical Cross-Section A1	450	LF
Old Washington Rod - Minor 2 Typical Cross-Section A1	300	LF
Minor- 301 service Typical Cross-Section A1	500	LF
Total	1,425	LF

Figure A.6: Waldorf Urban Major Collector: Acton Lane calculated length

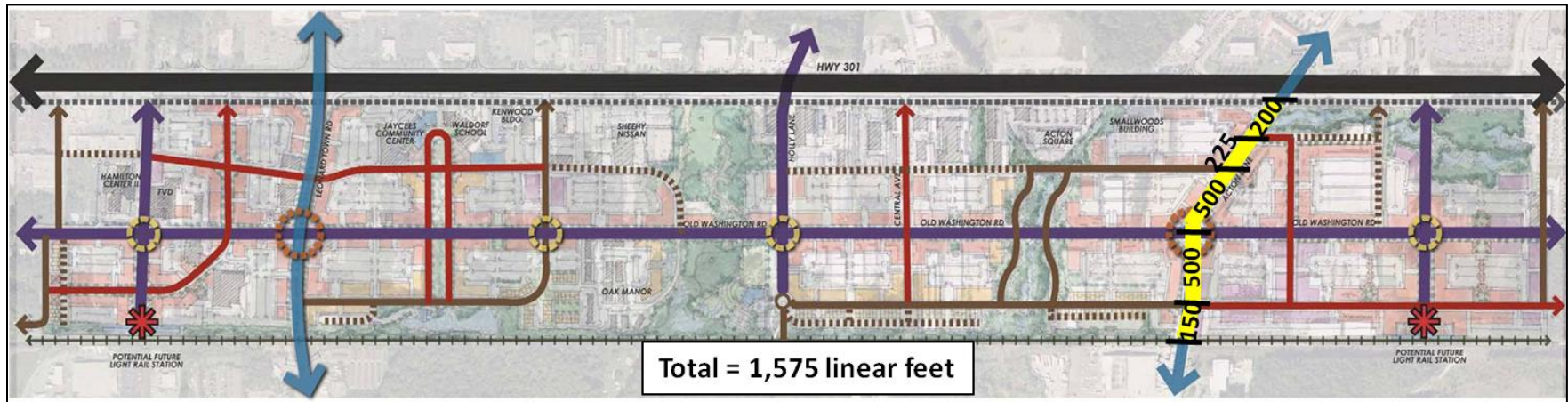
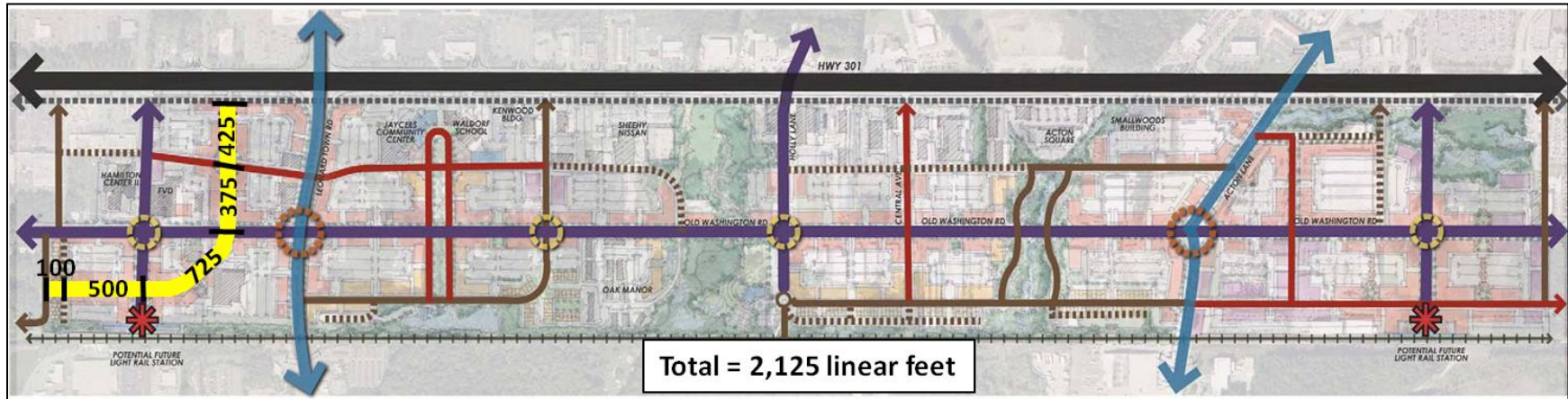


Table A.6 Acton Lane Calculated Project Lengths		
Project Segments	Quantity	Unit
Railroad - WULR 4 Typical Cross-Section A2	150	LF
Local 4 - Old Washington Typical Cross-Section A2	500	LF
Old Washington Rd - Local 5 Typical Cross-Section A2	500	LF
Local 5 - Minor 3 Typical Cross-Section A2	225	LF
Minor 3 - 301 Service Typical Cross-Section A2	200	LF
Total	1,575	LF

Figure A.7: Waldorf Urban Minor Collector: Minor 1 calculated length



Project Segments	Quantity	Unit
Terrace - Alley 1 Typical Cross-Section C	100	LF
Alley 1 - Light Rail 1 Typical Cross-Section C	500	LF
Light Rail 1 - Old Washington Typical Cross-Section C	725	LF
Old Washington - Minor 2 Typical Cross-Section C	375	LF
Minor 2 - 301 SERVICE Typical Cross-Section C	425	LF
Total	2,125	LF

Figure A.8: Waldorf Urban Minor Collector: Minor 2 calculated length

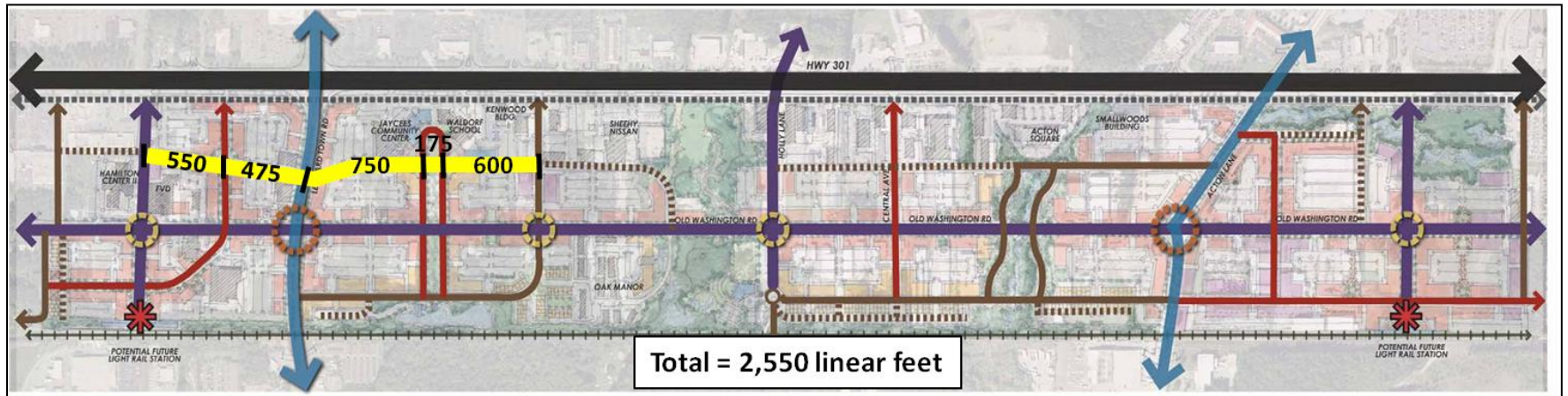


Table A.8 Minor 2 Calculated Project Lengths		
Project Segments	Quantity	Unit
Light Rail 1 - Minor 1 Typical Cross-Section C	550	LF
Minor 1 - Leonardtown Typical Cross-Section C	475	LF
Leonardtown - Civic South Typical Cross-Section C	750	LF
Civic South - Civic North Typical Cross-Section C	175	LF
Civic North - Local 2 Typical Cross-Section C	600	LF
Total	2,550	LF

Figure A.9: Waldorf Urban Minor Collector: Minor 3 calculated length

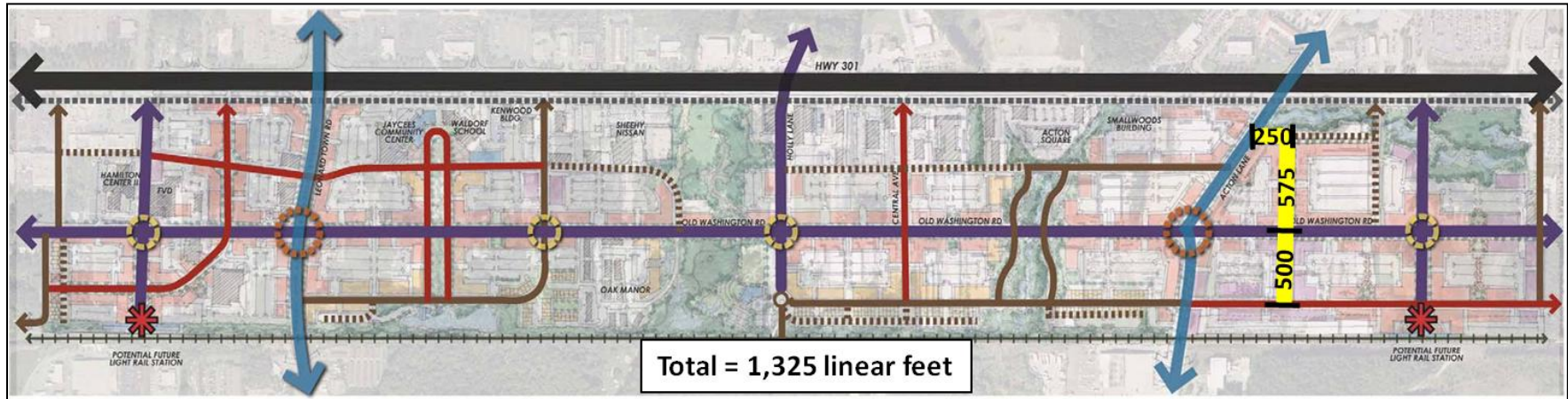
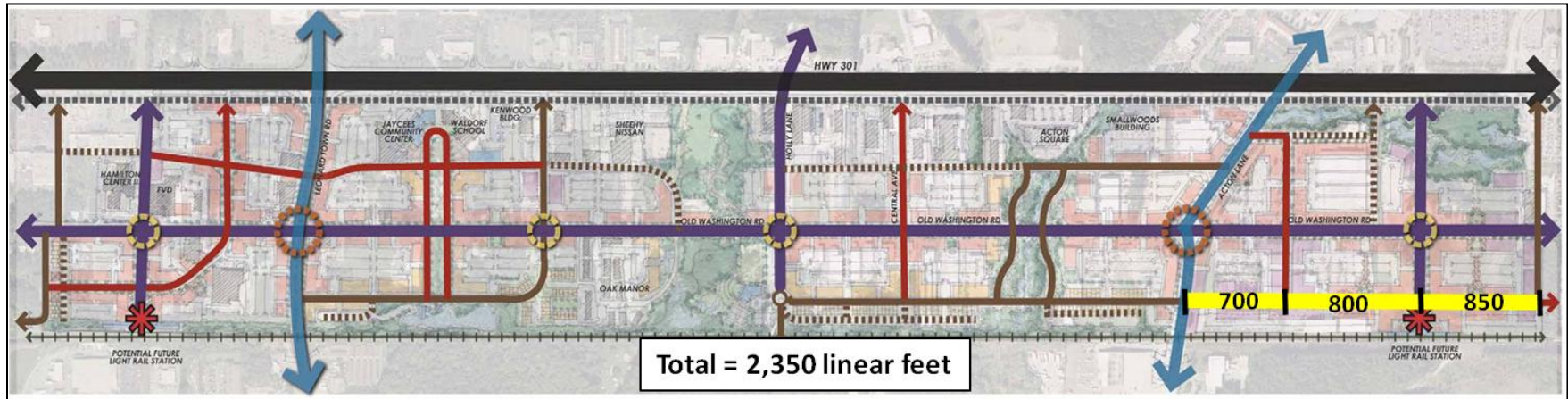


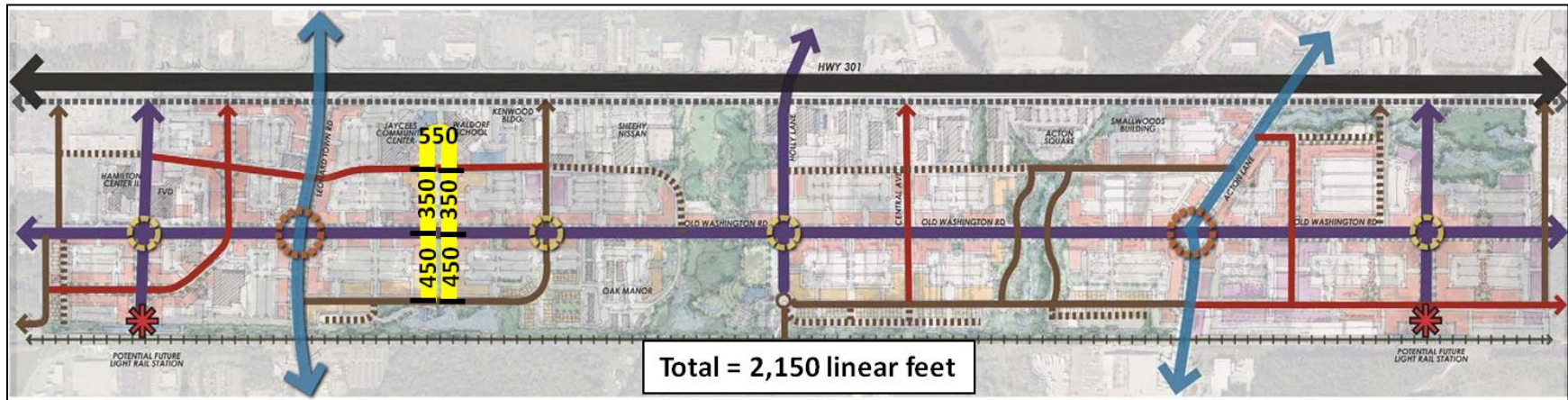
Table A.9 Minor 3 Calculated Project Lengths		
Project Segments	Quantity	Unit
Minor 4 - Old Washington Typical Cross-Section C	500	LF
Old Washington - Alley #10 Typical Cross-Section C	575	LF
Alley 10 - Acton Lane Typical Cross-Section C	250	LF
Total	1,325	LF

Figure A.10: Waldorf Urban Minor Collector: Minor 4 calculated length



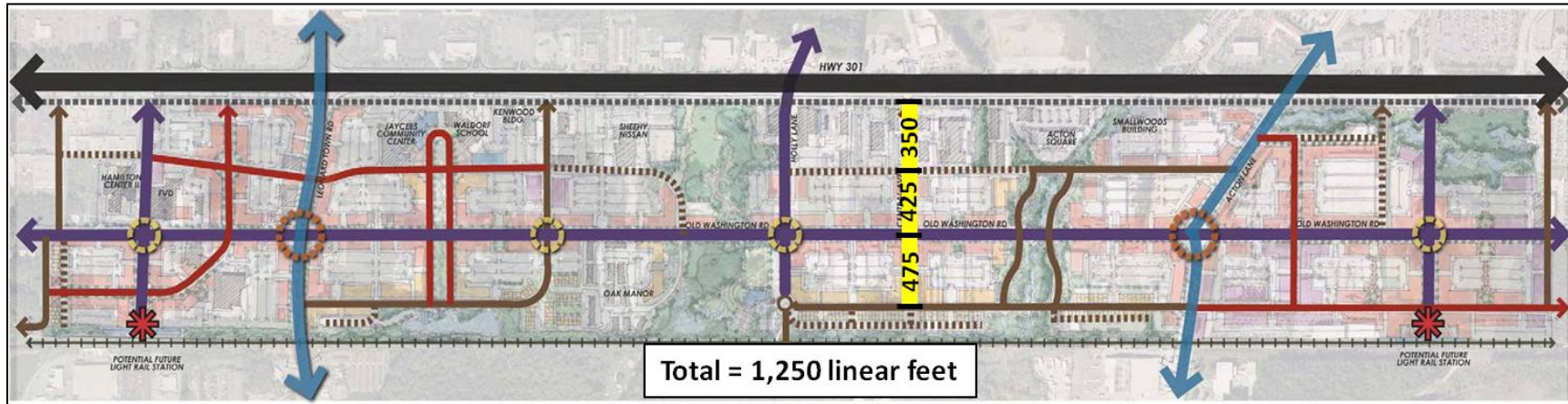
Project Segments	Quantity	Unit
Acton Lane - Minor 3 Typical Cross-Section C	700	LF
Minor 3 - Light Rail 2 Typical Cross-Section C	800	LF
Light Rail 2 - Local 6 Typical Cross-Section C	850	LF
Total	2,350	LF

Figure A.11: Waldorf Urban Minor Collector: Civic Lane calculated length



Project Segments	Quantity	Unit
WULR 2 - Old Washington Typical Cross-Section D2	450	LF
Old Washington - Minor 2 Typical Cross-Section D2	350	LF
Minor 2 - Minor 2 Typical Cross-Section D2	550	LF
Minor 2 - Old Washington Typical Cross-Section D2	350	LF
Old Washington - Local 2 Typical Cross-Section D2	450	LF
Total	2,150	LF

Figure A.12: Waldorf Urban Minor Collector: Central Avenue calculated length



Project Segments	Quantity	Unit
Local 4 - Old Washington Typical Cross-Section C	475	LF
Old Washington - Alley 8 Typical Cross-Section C	425	LF
Alley 8 - 301 Service Typical Cross-Section C	350	LF
Total	1,250	LF

Figure A.13: Waldorf Urban Local Roads: Local 1

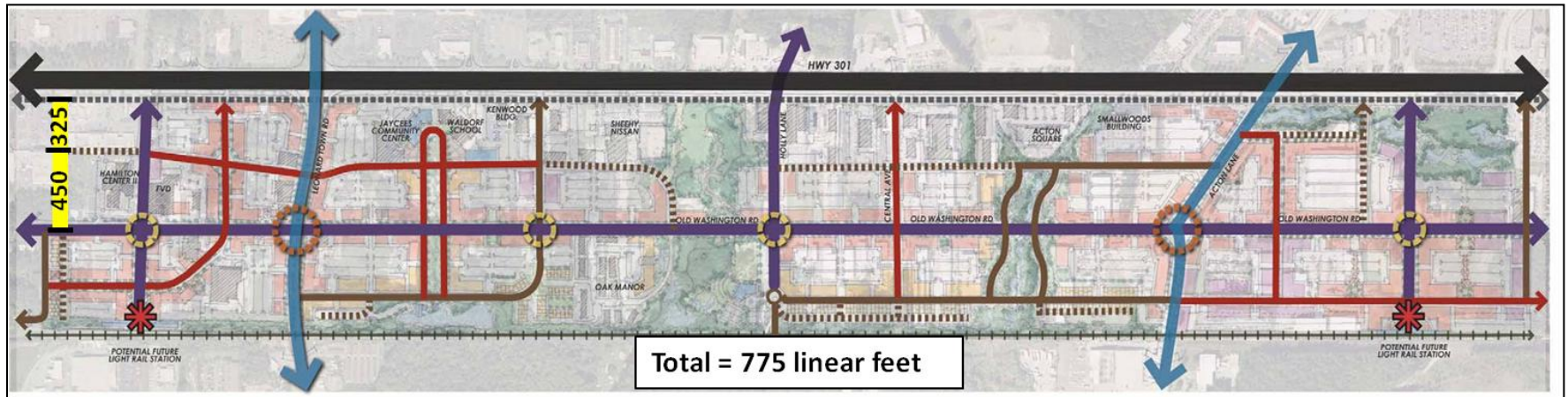
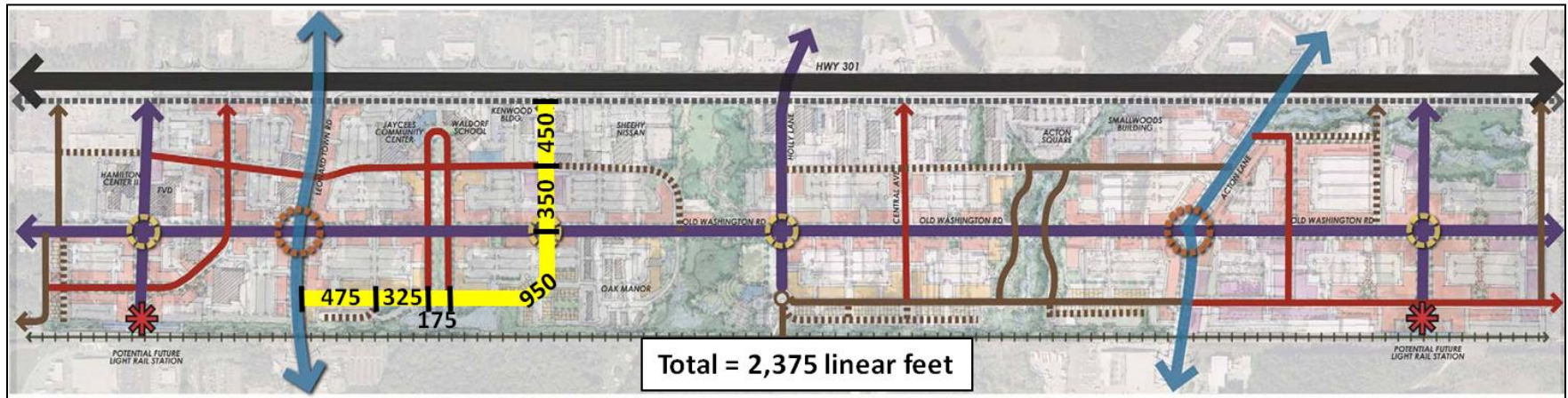


Table A.13
Local 1 Calculated Project Lengths

Project Segments	Quantity	Unit
Old Washington - Alley 2 Typical Cross-Section D1	450	LF
Alley 2 - 301 Service Typical Cross-Section D1	325	LF
Total	775	LF

Figure A.14: Waldorf Urban Local Roads: Local 2



Project Segments	Quantity	Unit
Leonard - Alley 3 Typical Cross-Section D1	475	LF
Alley 3 - Civic South Typical Cross-Section D1	325	LF
Civic South - Civic North Typical Cross-Section D1	175	LF
Civic North - Old Washington Typical Cross-Section D1	950	LF
Old Washington - Minor 2 Typical Cross-Section D1	350	LF
Minor 2 - 301 Service Typical Cross-Section D1	450	LF
Total	2,375	LF

Figure A.15: Waldorf Urban Local Roads: Local 3

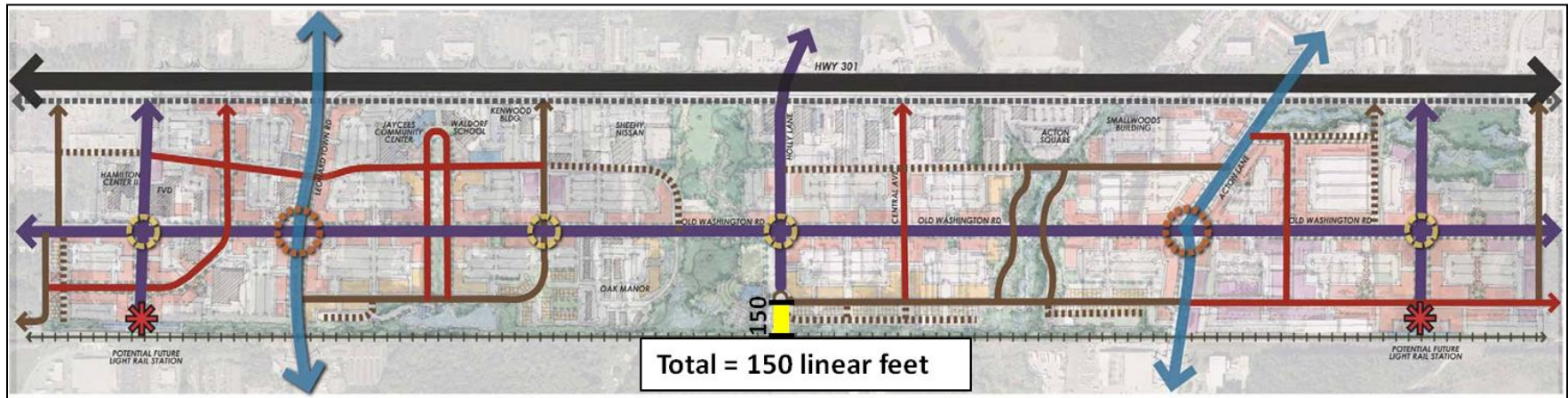


Table A.15 Local 3 Calculated Project Lengths		
Project Segments	Quantity	Unit
Local 4 - Railroad Typical Cross-Section D1	150	LF
Total	150	LF

Figure A.16: Waldorf Urban Local Roads: Local 4

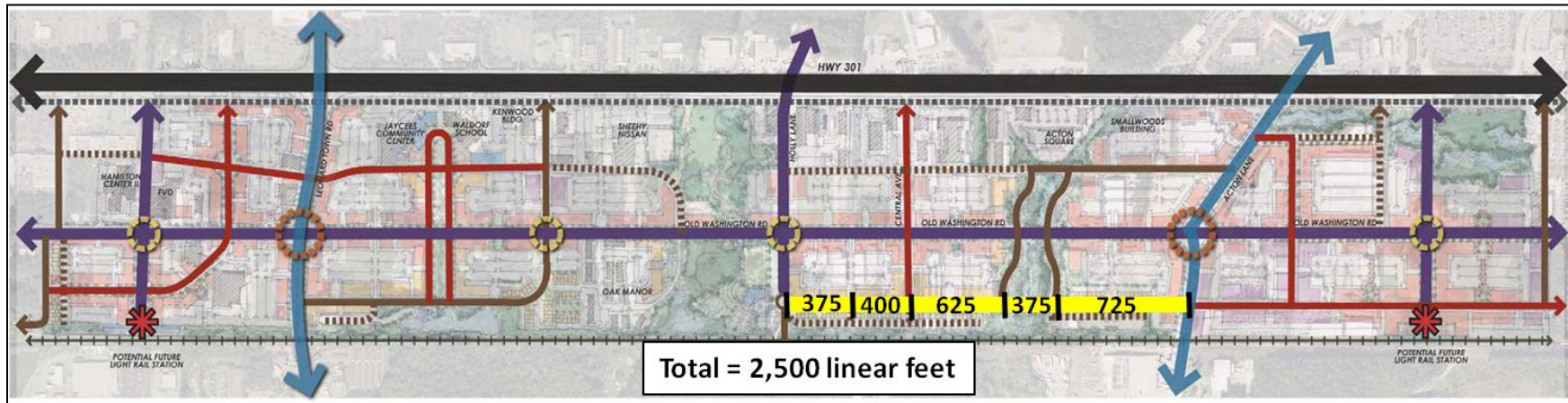
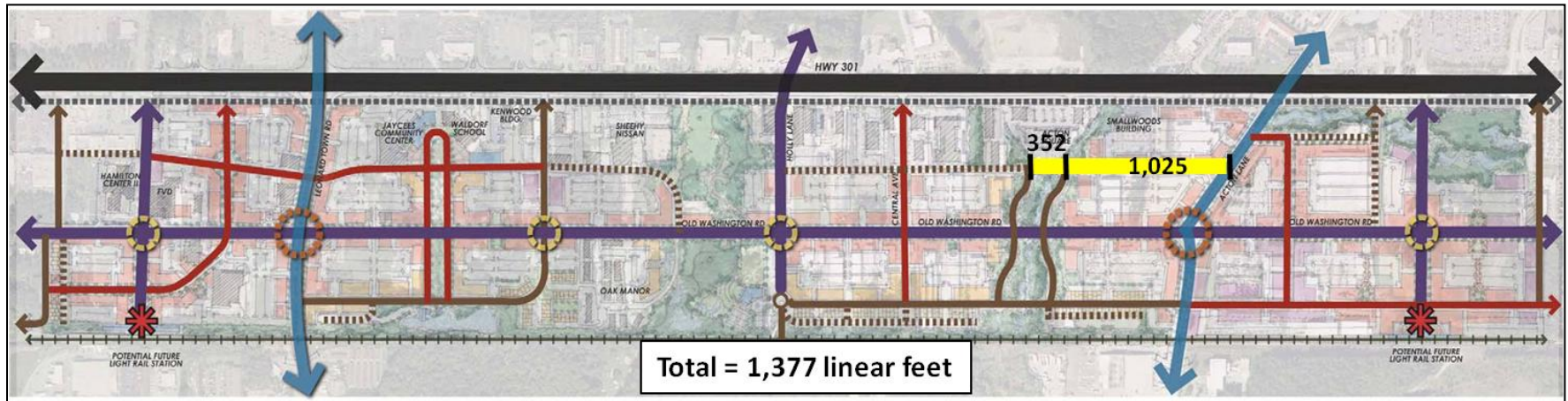


Table A.16 Local 4 Calculated Project Lengths		
Project Segments	Quantity	Unit
Holly - Alley 6 Typical Cross-Section D1	375	LF
Alley 6 - Alley 7 Typical Cross-Section D1	400	LF
Alley 7 - Acton South Typical Cross-Section D1	625	LF
Acton South - Acton North Typical Cross-Section D1	375	LF
Acton North - Acton Lane Typical Cross-Section D1	725	LF
Total	2,500	LF

Figure A.17: Waldorf Urban Local Roads: Local 5



Project Segments	Quantity	Unit
Acton South - Acton North Typical Cross-Section D1	352	LF
Acton North - Acton Lane Typical Cross-Section D1	1025	LF
Total	1,377	LF

Figure A.18: Waldorf Urban Local Roads: Local 6

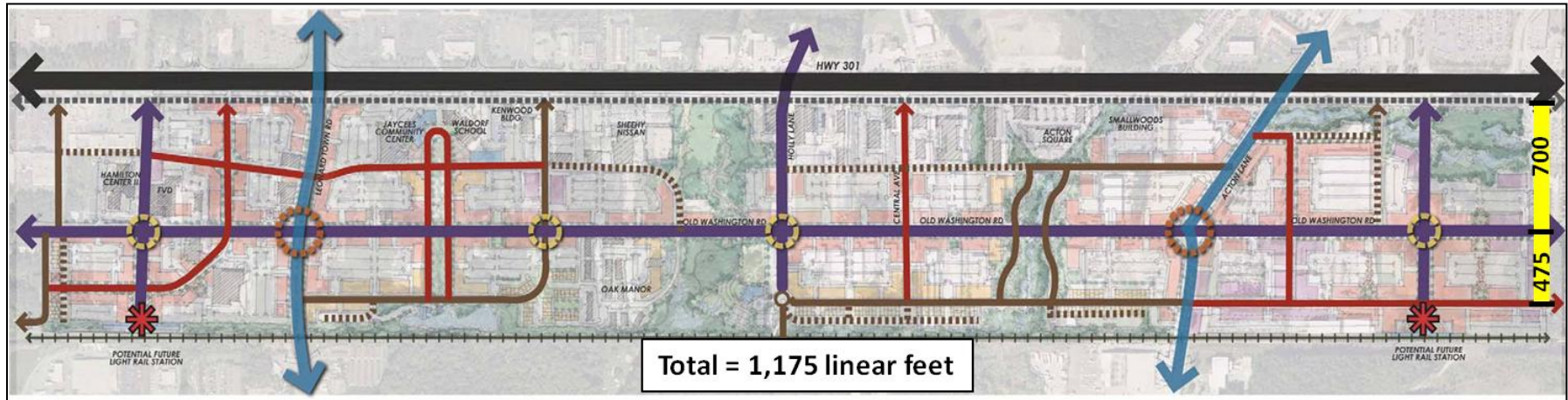
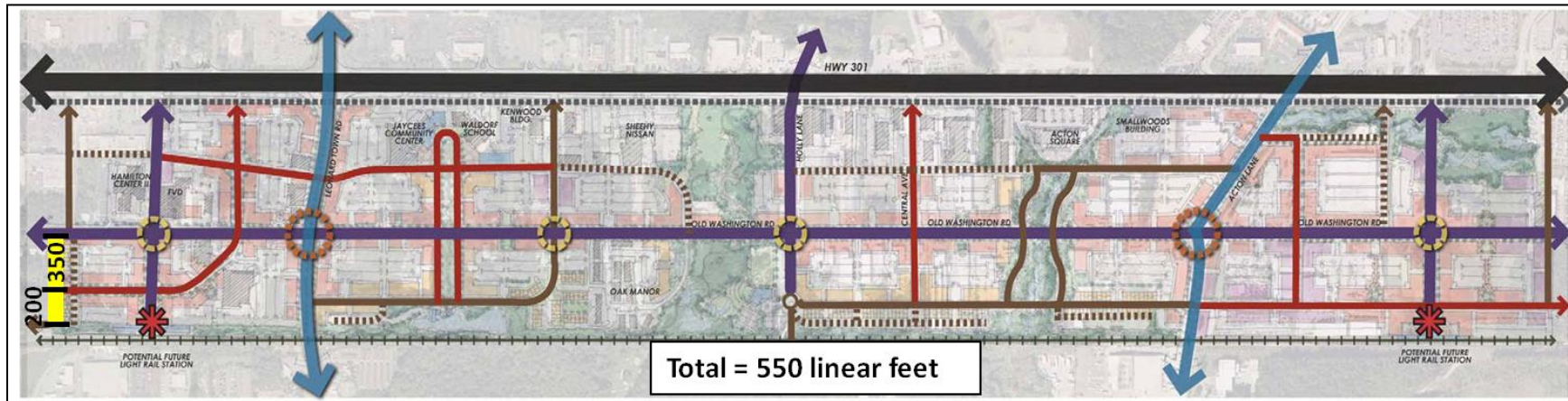


Table A.18 Local 6 Calculated Project Lengths		
Project Segments	Quantity	Unit
Minor 4 - Old Washington Typical Cross-Section D1	475	LF
Old Washington - 301 Service Typical Cross-Section D1	700	LF
Total	1,175	LF

Figure A.19: Waldorf Urban Local Roads: Terrace Drive



Project Segments	Quantity	Unit
Old Washington - Minor 1 Typical Cross-Section D1	350	LF
Minor 1 - Curve Typical Cross-Section D1	200	LF
Total	550	LF

Figure A.20: Waldorf Urban Local Roads: Acton Square South

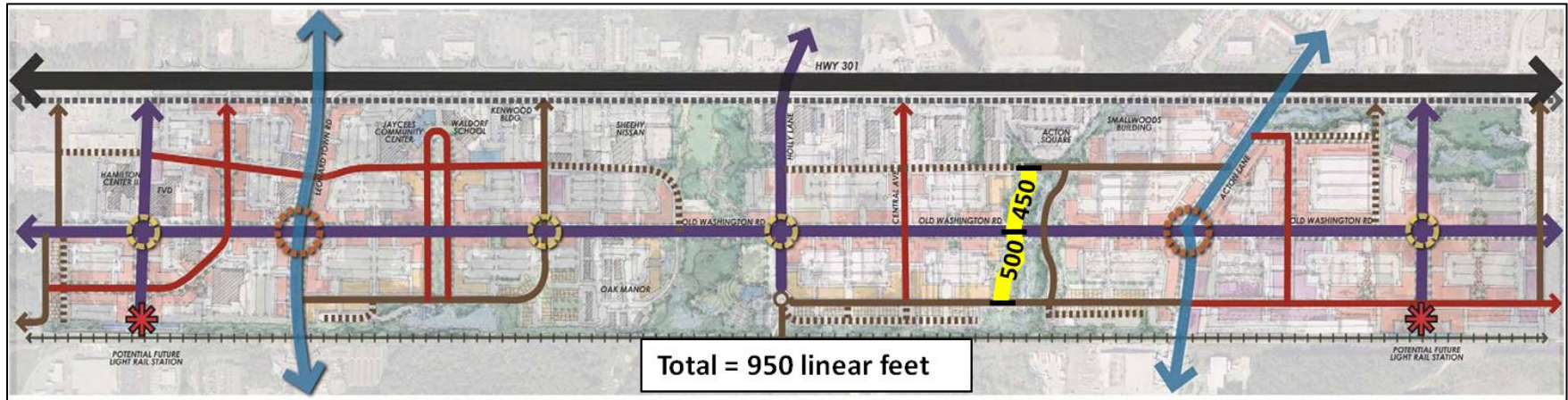
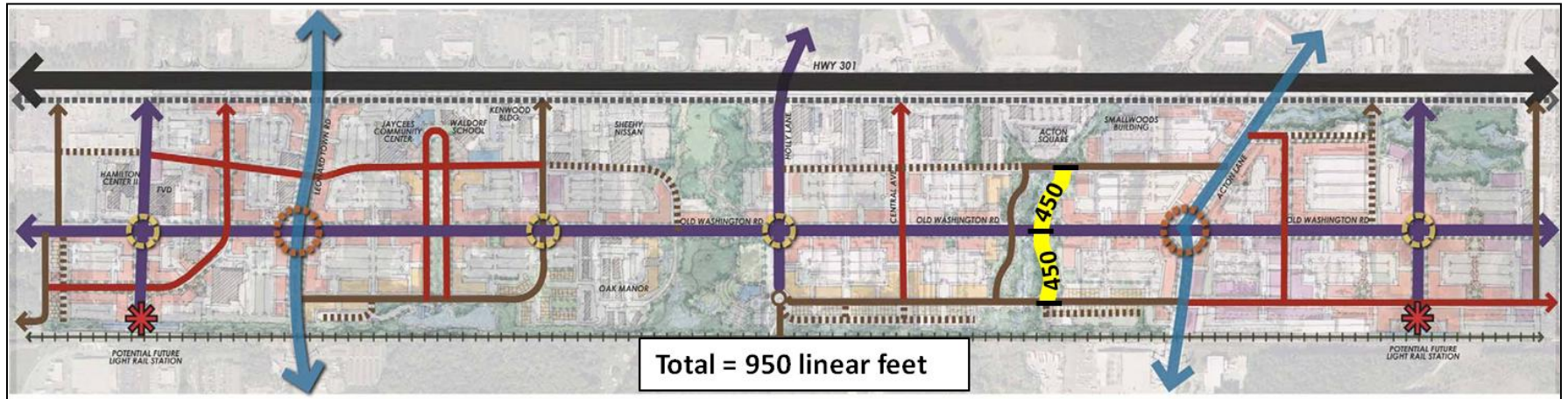


Table A.20

Acton Square South Calculated Project Lengths

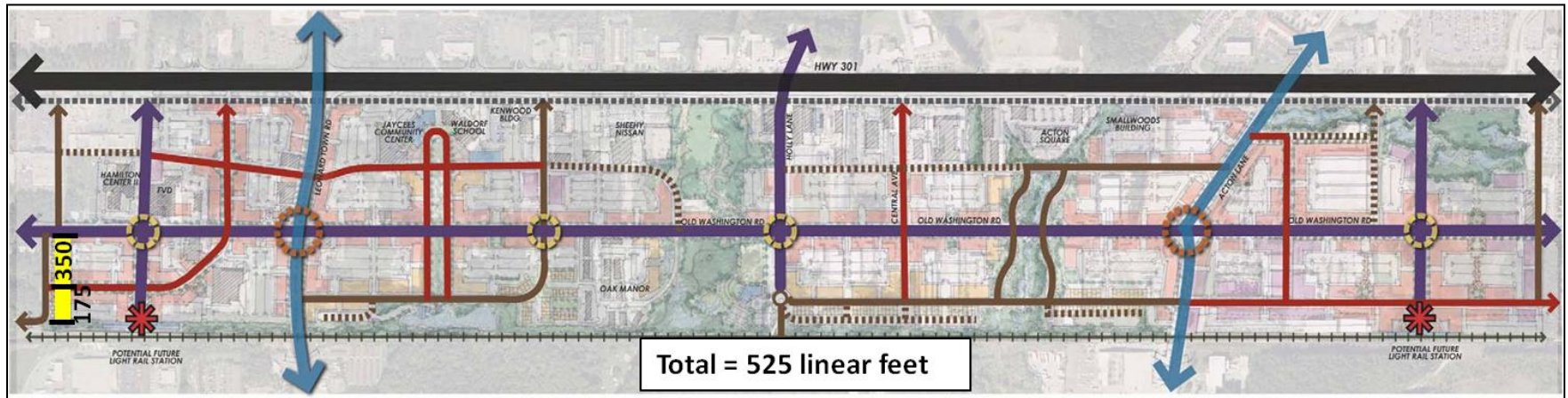
Project Segments	Quantity	Unit
Local 4 - Old Washington Typical Cross-Section D1	500	LF
Old Washington - Local 5 Typical Cross-Section D1	450	LF
Total	950	LF

Figure A.21: Waldorf Urban Local Roads: Acton Square North



Project Segments	Quantity	Unit
Local 4 - Old Washington Typical Cross-Section D1	500	LF
Old Washington - Local 5 Typical Cross-Section D1	450	LF
Total	950	LF

Figure A.22: Waldorf Alley/Service Street/Private: Alley 1



Project Segments	Quantity	Unit
Railroad - Minor 1 Typical Cross-Section E1	175	LF
Minor 1 - Old Washington Typical Cross-Section E1	350	LF
Total	525	LF

Figure A.23: Waldorf Alley/Service Street/Private: Alley 2

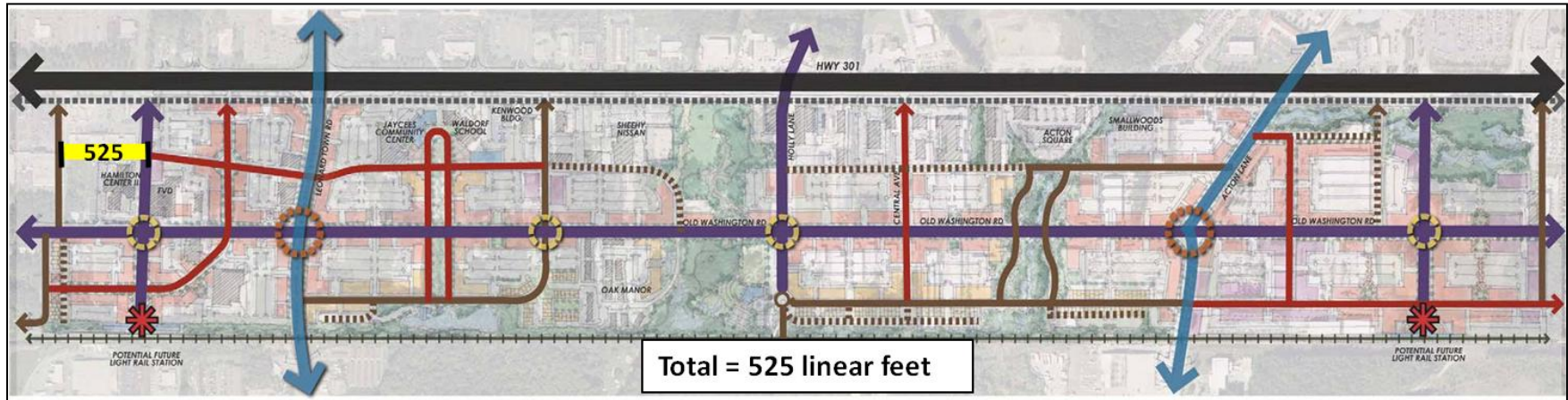
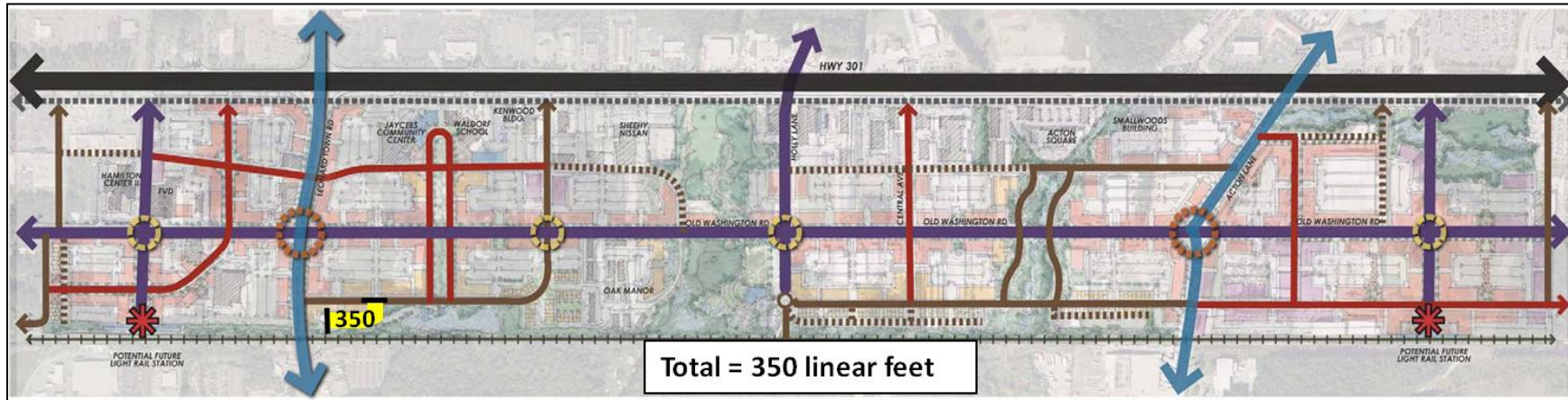


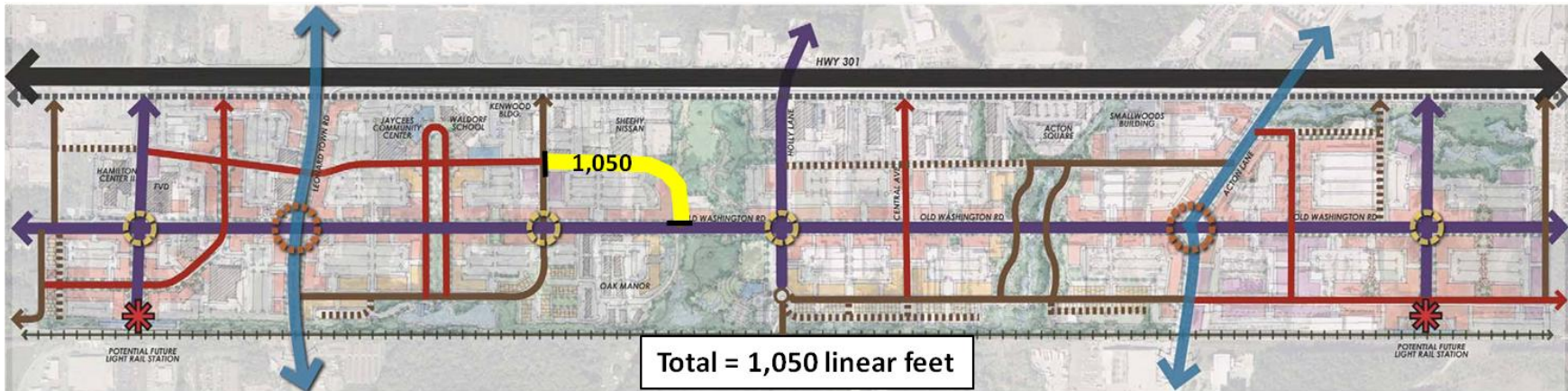
Table A.23 Alley 2 Calculated Project Lengths		
Project Segments	Quantity	Unit
Local 1 - Light Rail 1 Typical Cross-Section E1	525	LF
Total	525	LF

Figure A.24: Waldorf Alley/Service Street/Private: Alley 3



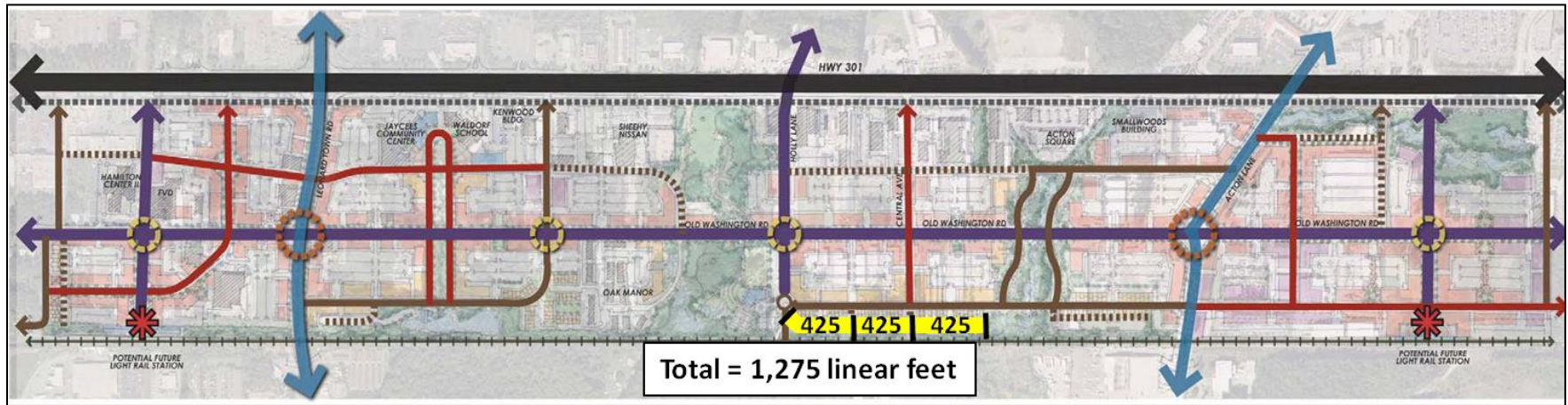
Project Segments	Quantity	Unit
Alley 3 Typical Cross-Section E2	350	LF
Total	350	LF

Figure A.25: Waldorf Alley/Service Street/Private: Alley 4



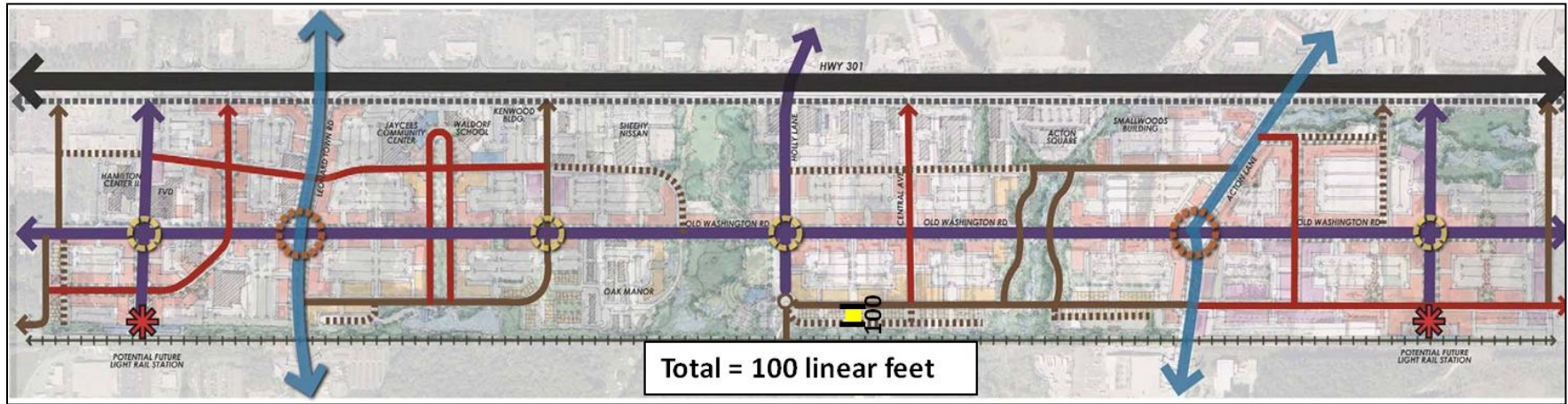
Project Segments	Quantity	Unit
Local 4 - Old Washington Typical Cross-Section E1	1,050	LF
Total	1,050	LF

Figure A.26: Waldorf Alley/Service Street/Private: Alley 5



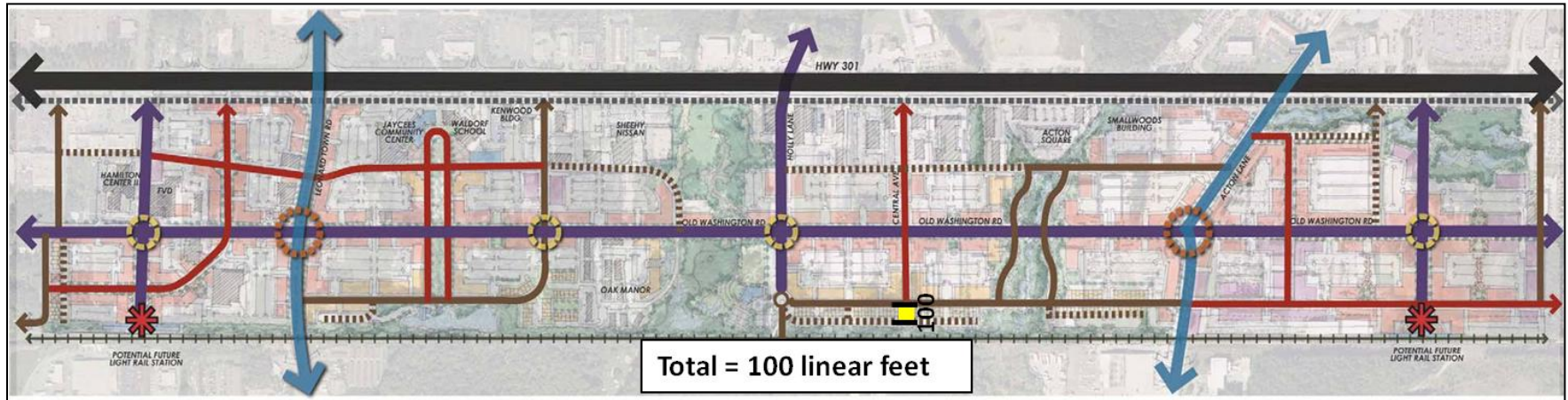
Project Segments	Quantity	Unit
Holly - Alley 6 Typical Cross-Section E2	425	LF
Alley 6 - Alley 7 Typical Cross-Section E2	425	LF
Alley 7 - End Typical Cross-Section E2	425	LF
Total	1,275	LF

Figure A.27: Waldorf Alley/Service Street/Private: Alley 6



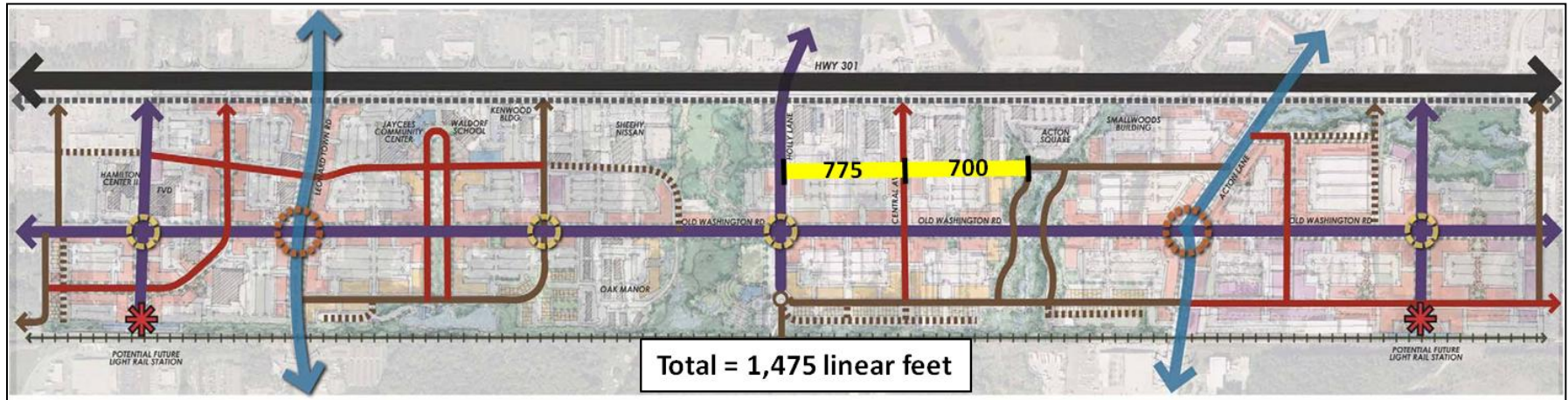
Project Segments	Quantity	Unit
Alley 6 Typical Cross-Section E1	100	LF
Total	100	LF

Figure A.28: Waldorf Alley/Service Street/Private: Alley 7



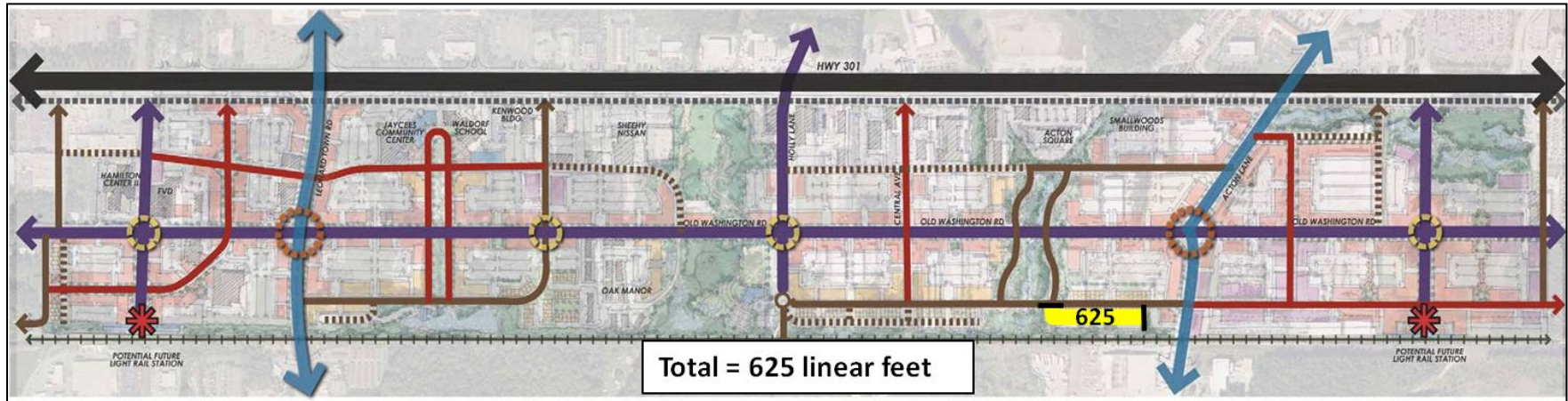
Project Segments	Quantity	Unit
Alley 7 Typical Cross-Section E1	100	LF
Total	100	LF

Figure A.29: Waldorf Alley/Service Street/Private: Alley 8



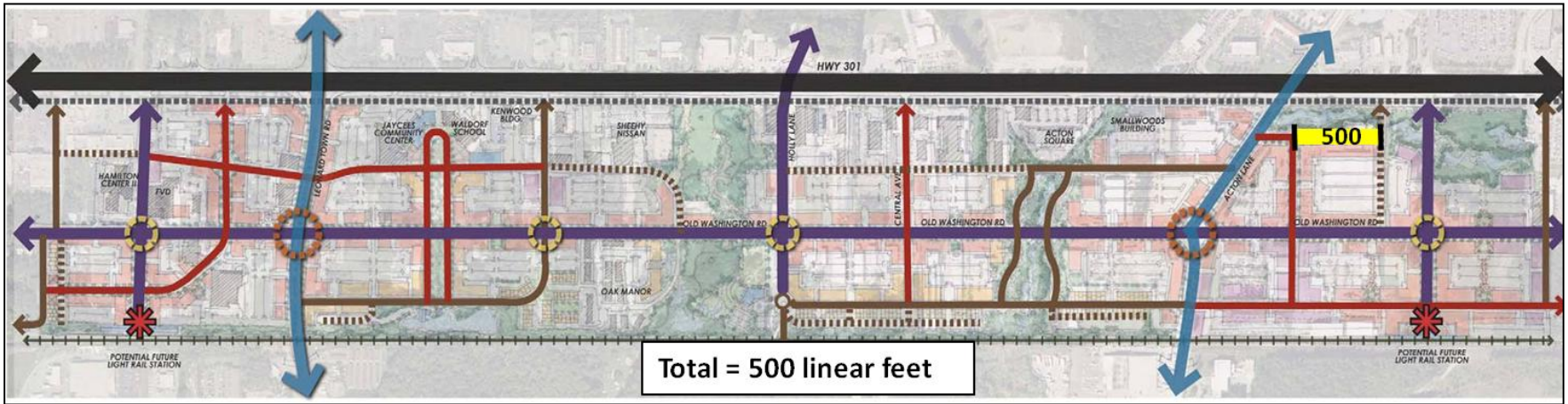
Project Segments	Quantity	Unit
Holly - Central Typical Cross-Section E1	775	LF
Central - Acton South Typical Cross-Section E1	700	LF
Total	1,475	LF

Figure A.30: Waldorf Alley/Service Street/Private: Alley 9



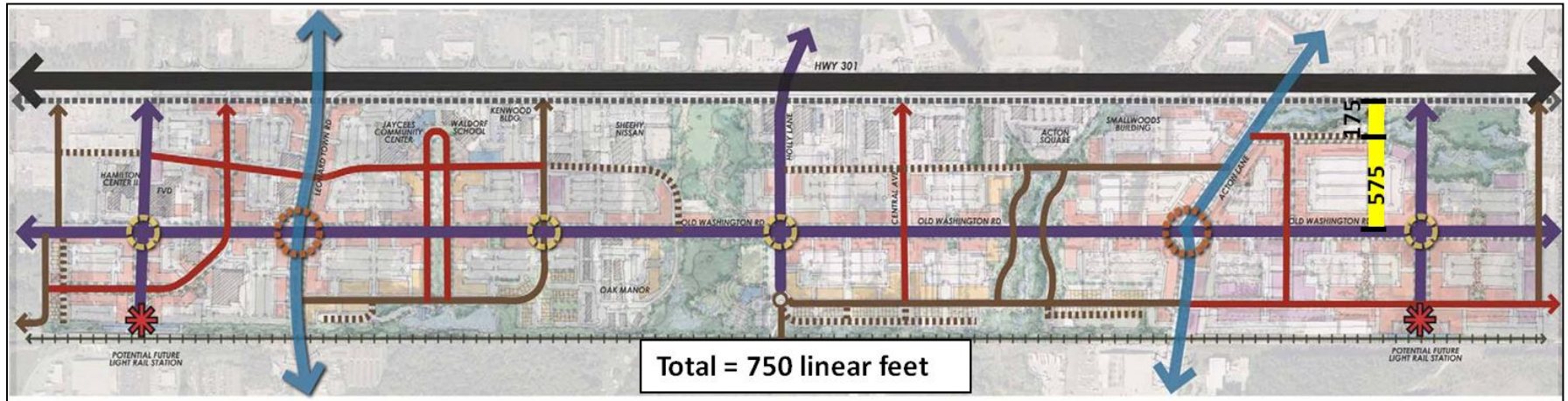
Project Segment	Quantity	Unit
Alley 9 Typical Cross-Section E2	625	LF
Total	625	LF

Figure A.31: Waldorf Alley/Service Street/Private: Alley 10



Project Segment	Quantity	Unit
WUMC 3 - Alley 11 Typical Cross-Section E1	500	LF
Total	500	LF

Figure A.32: Waldorf Alley/Service Street/Private: Alley 11



Project Segments	Quantity	Unit
Old Washington - Alley 10 Typical Cross-Section E1	575	LF
Alley 10 - 301 Service Typical Cross-Section E1	175	LF
Total	750	LF

Appendix B Project Cost Assumptions

Estimated Cost Assumptions and Project Unit Costs

Appendix B outlines the cost assumptions made in order to estimate project unit costs, and lists estimated project units costs based on each individual roadway type in downtown Waldorf.

Table B.1				
Project Unit Costs Data Inputs				
Item	Unit	Cost	Data Source	
Curb & Gutter	LF	\$22	Charles County data	
8' Sidewalk	LF	\$60	Charles County data	
6' Sidewalk	LF	\$45	Charles County data	
12' Travel Lane	LF	\$350	Calculation from Charles County data	
11' Travel Lane	LF	\$350	Calculation from Charles County data	
4' Bicycle Lane	LF	\$117	(4/12) lane	
8' Parking Lane	LF	\$233	(8/12) lane	
18' Parking Space	LF	\$525	(18/12) lane	
6' Planting Strip	LF	\$75	Based on Carolina North Cost Estimated Data	
12' Median with Planting Strip	LF	\$150	Based on Carolina North Cost Estimated Data	
Pedestrian Level Lighting	LF	\$115	Based on 80' spacing and \$4600 installed/ea	
Street Furnishings - Major	LF	\$12	Calculation	
Street Furnishings - Minor	LF	\$2	Calculation	
Travel Lane Cost Calculation (assuming 12' typical lane)				
			Cost per Lane	
5 lanes with curb/gutter and sidewalk on both sides	LF	\$1,793	Linear	Account for C&G, etc
4 lanes with curb/gutter and sidewalk on both sides	LF	\$1,543	\$250	\$345
3 lanes with curb and gutter	LF	\$902	\$521	\$286
2 lanes, no sidewalk	LF	\$500	\$402	\$250
<i>Average</i>	LF	<i>\$350</i>	<i>\$391</i>	<i>\$294</i>

Street Furnishings Calculations	Unit	Cost	Per Item	Assumed Spacing (ft)	Street Type
Artwork	LF	\$3	\$2,500	1,000	Major
Bench	LF	\$3	\$869	500	Major
Drinking Fountain	LF	\$4	\$1,944	1,000	Major
Trash receptacle	LF	\$2	\$555	500	Major, Minor

Table B.2		
Estimated Project Unit Costs Waldorf Urban Major Collector Type A1 (Leonardtwn Road)		
ROW Requirement - 96'	Unit	Cost Per 1 Unit
8' Sidewalk	LF	\$ 60.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
4' Bicycle lane	LF	\$ 116.67
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
Curb & Gutter	LF	\$ 22.00
12' Median with planting strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
4' Bicycle lane	LF	\$ 116.67
Curb & Gutter	LF	\$ 22.00
6' Planting Strip	LF	\$ 75.00
8' Sidewalk	LF	\$ 60.00
Total	LF	\$ 2,066.33

Table B.3		
Estimated Project Unit Costs Waldorf Urban Major Collector Type A2 (Acton Lane)		
ROW Requirement - 96'	Unit	Cost Per 1 Unit
8' Sidewalk	LF	\$ 60.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
4' Bicycle lane	LF	\$ 116.67
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
Curb & Gutter	LF	\$ 22.00
12' Median with planting strip	LF	\$ 150.00
Curb & Gutter	LF	\$ 22.00
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
4' Bicycle lane	LF	\$ 116.67
Curb & Gutter	LF	\$ 22.00
6' Planting Strip	LF	\$ 75.00
8' Sidewalk	LF	\$ 60.00
Total	LF	\$ 2,141.33

Table B.4		
Estimated Project Unit Costs Waldorf Urban Major Collector Type B1		
4 Lanes Undivided - Old Washington Rd in the vicinity of Leonardtown Rd and Acton Ln		
ROW Requirement - 84'	Unit	Cost Per 1 Unit
8' Sidewalk	LF	\$ 60.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
4' Bicycle lane	LF	\$ 116.67
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
12' travel lane	LF	\$ 350.00
4' Bicycle lane	LF	\$ 116.67
Curb & Gutter	LF	\$ 22.00
6' Planting Strip	LF	\$ 75.00
8' Sidewalk	LF	\$ 60.00
Total	LF	\$ 1,947.33

Table B.5		
Estimated Project Unit Costs Waldorf Urban Major Collector Type B2		
2 lanes divided - Old Washington Road		
ROW Requirement -72'	Unit	Cost Per 1 Unit
8' Sidewalk	LF	\$ 60.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
4' Bicycle lane	LF	\$ 116.67
12' travel lane	LF	\$ 350.00
Curb & Gutter	LF	\$ 22.00
12' Median with planting strip	LF	\$ 150.00
Curb & Gutter	LF	\$ 22.00
12' travel lane	LF	\$ 350.00
4' Bicycle lane	LF	\$ 116.67
Curb & Gutter	LF	\$ 22.00
6' Planting Strip	LF	\$ 75.00
8' Sidewalk	LF	\$ 60.00
Total	LF	\$ 1,441.33

Table B.6		
Estimated Project Unit Costs Waldorf Urban Minor Collector Type C		
ROW Requirement - 76'	Unit	Cost Per 1 Unit
8' Sidewalk	LF	\$ 60.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
8' Parking Lane	LF	\$ 233.33
4' Bicycle lane	LF	\$ 116.67
12' Travel lane	LF	\$ 350.00
12' Travel lane	LF	\$ 350.00
4' Bicycle lane	LF	\$ 116.67
8' Parking Lane	LF	\$ 233.33
Curb & Gutter	LF	\$ 22.00
6' Planting Strip	LF	\$ 75.00
8' Sidewalk	LF	\$ 60.00
Total	LF	\$ 1,714.00

Table B.7		
Estimated Project Unit Costs Waldorf Urban Local Road		
2 Lanes - Type D1		
ROW Requirement – 54'	Unit	Cost Per 1 Unit
6' Sidewalk	LF	\$ 45.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
11' Travel lane	LF	\$ 350.00
11' Travel lane	LF	\$ 350.00
8' Parking Lane	LF	\$ 233.33
Curb & Gutter	LF	\$ 22.00
6' Planting Strip	LF	\$ 75.00
6' Sidewalk	LF	\$ 45.00
Total	LF	\$ 1,217.33

Table B.8		
Estimated Project Unit Costs Waldorf Urban Local Road		
One-Way Road along Civic Green - Type D2		
ROW Requirement -37'	Unit	Cost Per 1 Unit
8' Sidewalk	LF	\$ 60.00
6' Planting Strip	LF	\$ 75.00
Curb & Gutter	LF	\$ 22.00
8' Parking Lane	LF	\$ 233.33
4' Bicycle lane	LF	\$ 116.67
11' Travel lane	LF	\$ 350.00
Curb & Gutter	LF	\$ 22.00
Total	LF	\$ 879.00

Table B.9		
Estimated Project Unit Costs Waldorf Alley - 2 lanes -Type E1		
ROW Requirement – 24'	Unit	Cost Per 1 Unit
Curb & Gutter	LF	\$ 22.00
12' Travel lane	LF	\$ 350.00
12' Travel lane	LF	\$ 350.00
Curb & Gutter	LF	\$ 22.00
Total	LF	\$ 744.00

Table B.10		
Estimated Project Unit Costs Waldorf Alley - 2 lanes Near transit - Type E2		
ROW Requirement -80'	Unit	Cost Per 1 Unit
Curb & Gutter	LF	\$ 22.00
18' Parking Space	LF	\$ 525.00
12' Travel lane	LF	\$ 350.00
12' Travel lane	LF	\$ 350.00
18' Parking Space	LF	\$ 525.00
8' Sidewalk	LF	\$ 60.00
12' Median with planting strip	LF	\$ 150.00
Total	LF	\$ 2070.00

Table B.11			
Old Washington Road Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Terrace Drive - Light Rail 1 Typical Cross-Section B1	575	\$ 1,947	\$ 1,119,717
Light Rail 1 -Minor 1 Typical Cross-Section B1	550	\$ 1,947	\$ 1,071,033
Minor 1 - Leonardtown Rd Typical Cross-Section B1	450	\$ 1,947	\$ 876,300
Leonardtown Rd - Civic Greenway Loop South Typical Cross-Section B1	800	\$ 1,947	\$ 1,557,867
Civic Greenway Loop South - North Typical Cross-Section B2	150	\$ 1,441	\$ 216,200
Civic Greenway Loop North - Local 2 Typical Cross-Section B2	600	\$ 1,441	\$ 864,800
WULR 2 - Oak Manor/Alley 4 Typical Cross-Section B2	775	\$ 1,441	\$ 1,117,033
Oak Manor/Alley 4 - Holly Lane Typical Cross-Section B2	725	\$ 1,441	\$ 1,044,967
Holly Lane - Central Avenue Typical Cross-Section B2	775	\$ 1,441	\$ 1,117,033
Central Avenue - Acton Square South Typical Cross-Section B2	650	\$ 1,441	\$ 936,867
Acton Square South - North Typical Cross-Section B1	350	\$ 1,947	\$ 681,567
Acton Square North - Acton Lane Typical Cross-Section B1	775	\$ 1,947	\$ 1,509,183
Acton Lane - Minor 3 Typical Cross-Section B1	650	\$ 1,947	\$ 1,265,767
Minor 3 - Alley 11 Typical Cross-Section B1	500	\$ 1,947	\$ 973,667
Alley 11 - Light Rail 2 Typical Cross-Section B1	300	\$ 1,947	\$ 584,200
Light Rail 2 - Local 6 Typical Cross-Section B1	850	\$ 1,947	\$ 1,655,233
Total	9,475		\$ 16,591,433

Table B.12			
Light Rail 1 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Light Rail Station #1 - Minor 1 Typical Cross-Section B2	175	\$ 1,441	\$ 252,233
Minor 1 - Old Washington Typical Cross-Section B2	350	\$ 1,441	\$ 504,467
Old Washington - Alley 2/Minor 2 Typical Cross-Section B1	450	\$ 1,947	\$ 876,300
Minor 2 - 301 Service Road Typical Cross-Section B1	350	\$ 1,947	\$ 681,567
Total	1,325		\$ 2,314,567

Table B.13			
Light Rail 2 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Light Rail Station 2 - Minor 4 Typical Cross-Section B2	75	\$ 1,441	\$ 108,100
Minor 4 - Old Washington Typical Cross-Section B2	500	\$ 1,441	\$ 720,667
Old Washington - 301 Service Typical Cross-Section B1	750	\$ 1,947	\$ 1,460,500
Total	1,325		\$ 2,289,267

Table B.2			
Holly Lane Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Railroad Rd - Old Washington Typical Cross-Section B1	500	\$ 1,947	\$ 973,667
Old Washington - Alley 8 Typical Cross-Section B1	425	\$ 1,947	\$ 827,617
Alley 8 - 301 Service Typical Cross-Section B1	350	\$ 1,947	\$ 681,567
Total	1,275		\$ 2,482,850

Table B.3			
Leonardtwn Road Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Railroad - Alley 3 Typical Cross-Section A1	175	\$ 2,066	\$ 361,608
Alley 3 - Old Washington Rd Typical Cross-Section A1	450	\$ 2,066	\$ 929,850
Old Washington Rod - Minor 2 Typical Cross-Section A1	300	\$ 2,066	\$ 619,900
Minor- 301 service Typical Cross-Section A1	500	\$ 2,066	\$ 1,033,167
Total	1,425		\$ 2,944,526

Table B.16			
Acton Lane Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Railroad - WULR 4 Typical Cross-Section A2	150	\$ 2,141	\$ 321,200
Local 4 - Old Washington Typical Cross-Section A2	500	\$ 2,141	\$ 1,070,667
Old Washington Rd - Local 5 Typical Cross-Section A2	500	\$ 2,141	\$ 1,070,667
Local 5 - Minor 3 Typical Cross-Section A2	225	\$ 2,141	\$ 481,800
Minor 3 - 301 Service Typical Cross-Section A2	200	\$ 2,141	\$ 481,800
Total	1,575		\$ 3,372,600

Table B.4			
Minor 1 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Terrace - Alley 1 Typical Cross-Section C	100	\$ 1,714	\$ 171,400
Alley 1 - Light Rail 1 Typical Cross-Section C	500	\$ 1,714	\$ 857,000
Light Rail 1 - Old Washington Typical Cross-Section C	725	\$ 1,714	\$ 1,242,650
Old Washington - Minor 2 Typical Cross-Section C	375	\$ 1,714	\$ 642,750
Minor 2 - 301 SERVICE Typical Cross-Section C	425	\$ 1,714	\$ 728,450
Total	2,125		\$ 3,642,250

Table B.5			
Minor 2 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Light Rail 1 - Minor 1 Typical Cross-Section C	550	\$ 1,714	\$ 942,700
Minor 1 - Leonardtown Typical Cross-Section C	475	\$ 1,714	\$ 814,150
Leonardtown - Civic South Typical Cross-Section C	750	\$ 1,714	\$ 1,285,500
Civic South - Civic North Typical Cross-Section C	175	\$ 1,714	\$ 299,950
Civic North - Local 2 Typical Cross-Section C	600	\$ 1,714	\$ 1,028,400
Total	2,550		\$ 4,370,700

Table B.6			
Minor 3 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Minor 4 - Old Washington Typical Cross-Section C	500	\$ 1,714	\$ 857,000
Old Washington - Alley #10 Typical Cross-Section C	575	\$ 1,714	\$ 985,550
Alley 10 - Acton Lane Typical Cross-Section C	250	\$ 1,714	\$ 428,500
Total	1,325		\$ 2,271,050

Table B.20			
Minor 4 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Acton Lane - Minor 3 Typical Cross-Section C	700	\$ 1,714	\$ 1,199,800
Minor 3 - Light Rail 2 Typical Cross-Section C	800	\$ 1,714	\$ 1,371,200
Light Rail 2 - Local 6 Typical Cross-Section C	850	\$ 1,714	\$ 1,456,900
Total	2,350		\$ 4,027,900

Table B.21			
Civic Lane Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
WULR 2 - Old Washington Typical Cross-Section D2	450	\$ 879	\$ 395,550
Old Washington - Minor 2 Typical Cross-Section D2	350	\$ 879	\$ 307,650
Minor 2 - Minor 2 Typical Cross-Section D2	550	\$ 879	\$ 483,450
Minor 2 - Old Washington Typical Cross-Section D2	350	\$ 879	\$ 307,650
Old Washington - Local 2 Typical Cross-Section D2	450	\$ 879	\$ 307,650
Total	2,150		\$ 1,889,850

Table B.22			
Central Avenue Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Local 4 - Old Washington Typical Cross-Section C	475	\$ 1,714	\$ 814,150
Old Washington - Alley 8 Typical Cross-Section C	425	\$ 1,714	\$ 728,450
Alley 8 - 301 Service Typical Cross-Section C	350	\$ 1,714	\$ 599,900
Total	1,250		\$ 2,142,500

Table B.7			
Local 1 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Old Washington - Alley 2 Typical Cross-Section D1	450	\$ 1,217	\$ 547,800
Alley 2 - 301 Service Typical Cross-Section D1	325	\$ 1,217	\$ 395,633
Total	775		\$ 943,433

Table B.24			
Local 2 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Leonard - Alley 3 Typical Cross-Section D1	475	\$ 1,217	\$ 578,233
Alley 3 - Civic south Typical Cross-Section D1	325	\$ 1,217	\$ 395,633
Civic South - Civic North Typical Cross-Section D1	175	\$ 1,217	\$ 213,033
Civic North - Old Washington Typical Cross-Section D1	950	\$ 1,217	\$ 1,156,467
Old Washington - Minor 2 Typical Cross-Section D1	350	\$ 1,217	\$ 426,067
Minor 2 - 301 Service Typical Cross-Section D1	450	\$ 1,217	\$ 547,800
Total	2,375		\$ 3,317,233

Table B.8			
Local 3 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Local 4 - Railroad Typical Cross-Section D1	150	\$ 1,217	\$ 182,600
Total	150		\$ 182,600

Table B.9			
Local 4 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Holly - Alley 6 Typical Cross-Section D1	375	\$ 1,217	\$ 456,500
Alley 6 - Alley 7 Typical Cross-Section D1	400	\$ 1,217	\$ 486,933
Alley 7 - Acton South Typical Cross-Section D1	625	\$ 1,217	\$ 760,833
Acton South - Acton North Typical Cross-Section D1	375	\$ 1,217	\$ 456,500
Acton North - Acton Lane Typical Cross-Section D1	725	\$ 1,217	\$ 882,567
Total	2,500		\$ 3,043,333

Table B.10			
Local 5 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Acton South - Acton North Typical Cross-Section D1	352	\$ 1,217	\$ 428,501
Acton North - Acton Lane Typical Cross-Section D1	1,025	\$ 1,217	\$ 1,247,767
Total	1,377		\$ 1,676,268

Table B.28			
Local 6 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Minor 4 - Old Washington Typical Cross-Section D1	475	\$ 1,217	\$578,233
Old Washington - 301 Service Typical Cross-Section D1	700	\$ 1,217	\$852,133
Total	1,175		\$1,430,367

Table B.11 Terrace Drive Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Old Washington - Minor 1 Typical Cross-Section D1	350	\$ 1,217	\$426,067
Minor 1 - Curve Typical Cross-Section D1	200	\$ 1,217	\$243,467
Total	550		\$669,533

Table B.30 Acton South Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Local 4 - Old Washington Typical Cross-Section D1	500	\$ 1,217	\$608,667
Old Washington - Local 5 Typical Cross-Section D1	450	\$ 1,217	\$547,800
Total	950		\$1,156,467

Table B.12 Acton North Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Local 4 - Old Washington Typical Cross-Section D1	500	\$ 1,217	\$ 608,667
Old Washington - Local 5 Typical Cross-Section D1	450	\$ 1,217	\$ 547,800
Total	950		\$ 1,156,467

Table B.32 Alley 1 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Railroad - Minor 1 Typical Cross-Section E1	175	\$ 744	\$130,200
Minor 1 - Old Washington Typical Cross-Section E1	350	\$ 744	\$260,400
Total	525		\$390,600

Table B.33			
Alley 2 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Local 1 - Light Rail 1 Typical Cross-Section E1	525	\$ 744	\$ 390,600
Total	525		\$ 390,600

Table B.13			
Alley 3 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Alley 3 Typical Cross-Section E2	350	\$ 2,070	\$ 724,500
Total	350		\$ 724,500

Table B.14			
Alley 4 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Local 4 - Old Washington Typical Cross-Section E1	1,050	\$ 744	\$781,200
Total	1,050		\$781,200

Table B.15			
Alley 5 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Holly - Alley 6 Typical Cross-Section E2	425	\$ 2,070	\$ 879,750
Alley 6 - Alley 7 Typical Cross-Section E2	425	\$ 2,070	\$ 879,750
Alley 7 - End Typical Cross-Section E2	425	\$ 2,070	\$ 879,750
Total	1,275		\$ 2,639,250

Table B.16			
Alley 6 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Typical Cross-Section E1	100	\$ 744	\$ 74,400
Total	100		\$ 74,400

Table B.17			
Alley 7 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Alley 7 Typical Cross-Section E1	100	\$ 744	\$ 74,400
Total	100		\$ 74,400

Table B.18			
Alley 8 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Holly - Central Typical Cross-Section E1	775	\$ 744	\$576,600
Central - Acton South Typical Cross-Section E1	700	\$ 744	\$520,800
Total	1,475		\$1,097,400

Table B.40			
Alley 9 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Alley 9 Typical Cross-Section E2	625	\$ 2,070	\$1,293,750
Total	625		\$1,293,750

Table B.41			
Alley 10 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
WUMC 3 - Alley 11 Typical Cross-Section E1	500	\$ 744	\$372,000
Total	500		\$372,000

Table B.19			
Alley 11 Estimated Project Costs			
Project Segments	Calculated LF	Unit Cost	Total Cost
Old Washington - Alley 10 Typical Cross-Section E1	575	\$ 744	\$372,000
Alley 10 - 301 Service Typical Cross-Section E1	175	\$ 744	\$372,000
Total	750		\$ 558,000