Chapter 12

Transportation and Mobility

Adopted June 16, 2020

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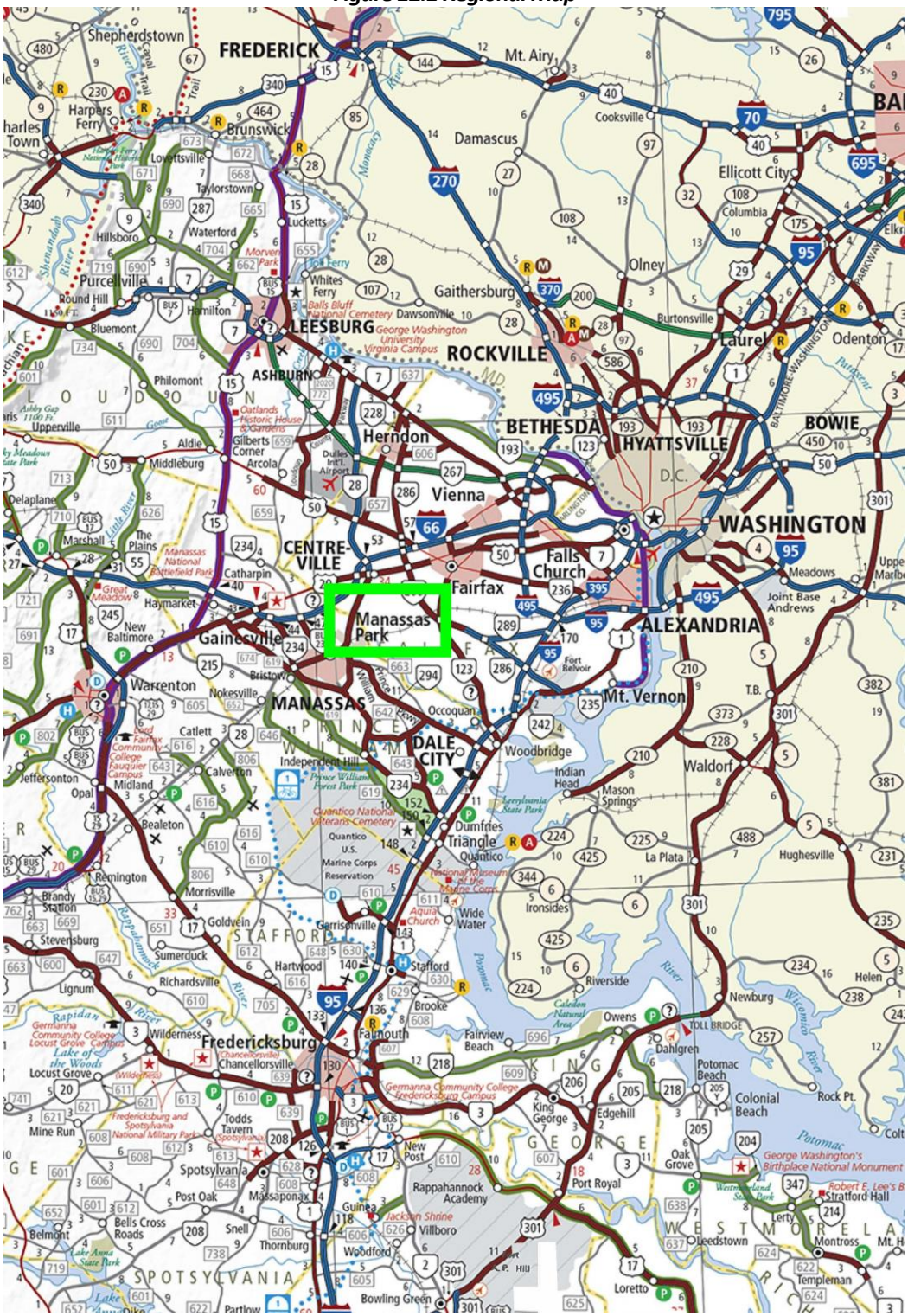


12. Transportation and Mobility

Overview: Local and Regional Facilities

Overview of Transportation Options and Systems

The City of Manassas Park is served by a wide variety of transportation networks, either directly or indirectly. The City's street system serves all residential, commercial and industrial users and is linked to an extensive regional and national highway system. The Virginia Railway Express (VRE) provides weekday commuter rail service from the City to Washington, DC and the Virginia suburbs of Burke, Springfield, Alexandria and Arlington.

Major airports in the region include Washington Dulles International Airport, Ronald Reagan Washington National Airport and Baltimore/Washington International Thurgood Marshall Airport. Manassas Regional Airport provides access for smaller aircraft. Access to commercial waterways is available in nearby Washington, DC as well as Annapolis and Baltimore in Maryland. Local, regional and nationwide bus service is available both directly and indirectly to residents of Manassas Park. Taxicab service to regional destinations is also available. Bicycle and other non-motorized means of travel share the street and highway system as well as a limited number of trails. Pedestrian traffic is accommodated primarily by an extensive sidewalk system.

The Public Works branch of the Department of Community Development is responsible for maintaining most City streets (those not privately maintained), sidewalks and trails (outside residential developments). Transportation planning is a function of the Planning and Zoning Administrator, who works with the City Engineer and on-call engineering firms to evaluate need, analyze options, develop estimates, and ultimately provide capital planning for transportation improvements.

Streets and Highways

Existing Road Network

The primary form of transportation provided within the City boundaries is the street and highway system. The publicly maintained street system consists of 52.62 lane miles (*Table 12.1 and Figure 12.2*), interconnecting numerous privately maintained subdivisions and the adjacent jurisdictions.

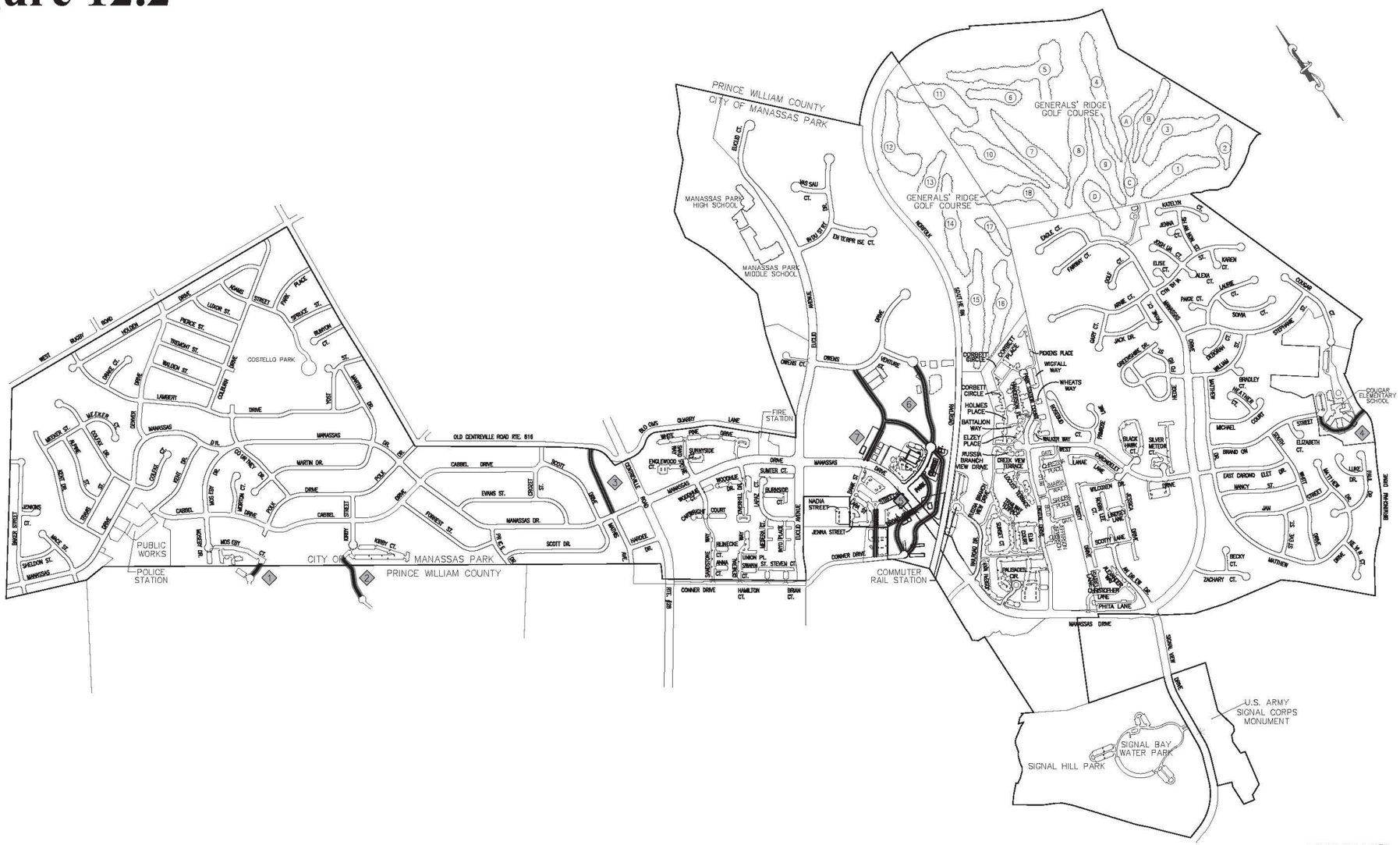
Table 12.1 Road Mileage Tools

Road Mileage Totals	
Functional Classification	**Lane Miles**
Principal Arterial	1.24
Minor Arterial	6.00
Collector	6.54
Local	38.84
All Roads	**52.62**

Source: VDOT Local Assistance Division Urban Municipal Mileage and Payments Based on State Functional Classification FY20

Figure 12.2 City of Manassas Park Street System

Figure 12.2



STREET SYSTEM
CITY OF MANASSAS PARK

500 0 600 1200 1800
Scale 1" = 600'

Bowman CONSULTING

PUBLIC WORKS DEPARTMENT MAPPING
DECEMBER 27, 2011
REVISED JANUARY 8, 2015

Figure 12.3 City of Manassas Park Street System

Figure 12.3

Bowman CONSULTING

STREET SYSTEM
CITY OF MANASSAS PARK

600 0 600 1200 1800

Scale 1" = 600'

PUBLIC WORKS DEPARTMENT MAPPING

DECEMBER 27, 2011
REVISED JANUARY 8, 2015

Manassas Drive is a minor arterial with a primary extension designation (Route 213), which spans nearly the entire City from east to west. Manassas Drive has always been the central artery upon which Manassas Park has grown. It bisected the original Town of Manassas Park from its western terminus at the City of Manassas, carrying drivers to the vital Route 28 corridor. As annexation and boundary adjustments expanded the City's borders east, the extension of Manassas Drive replaced Blooms Road with an alignment that eventually connects to Prince William County before entering Blooms Crossing and Blooms Park, the eastern most portions of the City near Bull Run. The City and Manassas Drive have expanded simultaneously, with Manassas Drive now carrying over 16,000 vehicles per day through the City Center Redevelopment District.

Many of the 16,000 vehicles traveling along Manassas Drive are coming from or going to the intersection of VA Route 28. With Rt. 29 and I-66 approximately five miles to the north, and the Rt. 234 bypass to the south, this crucial intersection is in the middle of a densely developed portion of the Rt. 28 corridor. As these crucial interstates and state routes congest, the intersection of Rt. 28 and Manassas Drive, identified as the Four Corners Redevelopment District, has become a viable, less congested alternative for commuters seeking access to Prince William Parkway and Sudley Road. Annual average daily traffic along VA Route 28 is about 46,000 vehicles (Table 12.2). This leaves many commuters looking for available north-south options, such as Old Centreville Road and Mathis Avenue that likewise converge in the Four Corners District. To accommodate this demand, the City has widened and improved all three of its signalized intersections along Manassas Drive in the Four Corners district over the last two decades (Rt. 28, Mathis Avenue, and Euclid Avenue).

Table 12.2 Average Daily Traffic

Average Daily Traffic (Vehicles Per Day)	
Location	**AADT***
VA Route 28 from Liberia Avenue to Prince William County line	46,000
Manassas Drive from Cabbel Drive to VA Route 28	8,900
Manassas Drive from Baker Street to Cabbel Drive	7,400
Manassas Drive from VA Route 28 to Euclid Avenue	20,000
Signal View Drive	14,000

**AADT is the estimate of typical daily traffic on a road segment for all days of the week, Sunday through Saturday, over the period of one year.*

Source: Virginia Department of Transportation Daily Traffic Volume Estimates Including Vehicle Classification Estimates Jurisdiction Report for City of Manassas Park and Prince William County

Streets and Highways

Planned Improvements

Functional Solutions to Growth and Development

Continuing growth in the City and the region drive needed changes to the City's transportation infrastructure. While this growth can reveal the inadequacy of existing facilities, it often spurs the need for new roadways, interconnections, and amenities. The City of Manassas Park is one of the fastest growing populations in the state, with a population growth of 16% over the past decade (2010-2020), and a projected growth of 11% over the next ten years. This growth, coupled with continued residential and economic development growth in the region have put immense pressures on roadway and intersection capacity. Along Manassas Drive, the primary corridor through the City, vehicle counts appear to be rising at a rate of 1.7% per year. While this rate outpaces the City's population growth, it reflects residential growth in adjacent jurisdictions, and cut-through traffic of frustrated commuters who are seeking alternatives to congested primary routes.

The City desires to increase residential and commercial development in the City Center Redevelopment District. Such density will put additional vehicles on Manassas Drive and will ultimately result in modifying existing intersections to preserve existing levels of service. With further push to increase commercial density in the Four-Corners Redevelopment District along Rt. 28 and an aging improvement at that major intersection, the City is closely monitoring potential changes to that corridor and judging the need for intersection improvement planning accordingly. With three redevelopment overlay districts offering incentives for property improvement and additional density, the predicted rate of growth could accelerate. Even under current estimates, population will continue to rise to nearly 20,000 within the next two decades. In order to facilitate and accommodate such growth, the City must continually evaluate existing and proposed facilities that will move people around efficiently and effectively.

A measure of the ability of traffic to flow along city streets and highways is stated by its level of service.

Table 12.3 Levels of Service Definitions

Levels of Service (LOS) Definitions		
Level	**General Description** (Signalized Intersections)	**Average Control Delay** (sec/veh)
A	Free flow	Less than 10
B	Stable flow (slight delays)	10-20
C	Stable flow (acceptable delays)	20-35
D	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)	35-55
E	Unstable flow (intolerable delay)	55-80
F	Forced flow (jammed)	More than 80

Source: Highway Capacity Manual (Chapters 19 & 20, 2016)

As new development changes the demands on our roads and intersections, it is important that level of service be evaluated and improvements made to accommodate impacts and restore level of service. A traffic impact analysis should be required with any rezoning plan or site plan, and should be considered where a conditional use permit may significantly change the number or type of vehicles on a roadway. If a site plan is not anticipated to make significant changes to a traffic pattern or significantly increase the number of vehicles, a traffic impact analysis deferral can be requested. The traffic impact analysis must demonstrate that the proposed rezoning or site changes will not reduce the existing level of service at intersections and roadways in the area. A level of service D is the minimum acceptable standard for a post development condition. If the existing level of service at a studied intersection or roadway is below a level of D, development should be deferred until improvements can be made to improve the level of service. If level of service is below a D (E or F), but only during peak hours, and it can be demonstrated that the plan or development will not further degrade the level of service, a request can be made to the Governing Body to consider constrained long range plans that will improve the level of service, thereby justifying further development.

As the City and region move toward a healthier future of transportation alternatives, multi-modal solutions, and transit oriented development, the City of Manassas Park will continue to ensure that transportation improvement projects provide appropriate accommodation for pedestrians, bicyclists, transit riders, and persons of all abilities, while promoting safe operation for all users. Both public and privately funded improvements should utilize cross-sections that include adequate space for vehicles, pedestrians, and bicyclists to safely enjoy simultaneously. As improvements are planned, the use of transit should be considered by ensuring these improvements provide safe access to transit facilities for vehicles, pedestrians, and bicyclists alike.

The City will identify transportation improvements where safety, excessive maintenance costs, congestion, lack of parking, lack of accessibility or other detriments require action. The City will also participate in regional planning activities, and collaborate with regional stakeholders on projects that reduce congestion, improve mass transit, increase recreation and leisure opportunities, and promote economic vitality across Northern Virginia. As the City plans and executes transportation improvements, these improvements should ensure that the plans take advantage of opportunities to increase safety for multi-modal users, relieve congestion, improve level of service, encourage transit use, and promote economic development in an efficient and cost effective manner.

The City has identified several new roadway segments needed to provide emergency connections where interconnections were not provided with initial development:

1. *Figures 12.4 and 12.5* illustrate potential alignments for emergency connections to the Moseby Ridge I and Moseby Ridge II subdivisions. Both of these subdivisions were constructed with a single point of ingress/egress, that passes over a tributary of Flat Branch. As such, flooding and culvert failure continually represent risks for access to the communities. Providing emergency connections will ensure that if a catastrophic failure of the culvert structures did occur there would still be viable routes in and out of the subdivisions.

Figure 12.4 – Potential Alignment - Moseby Ridge I & Moseby Ridge II

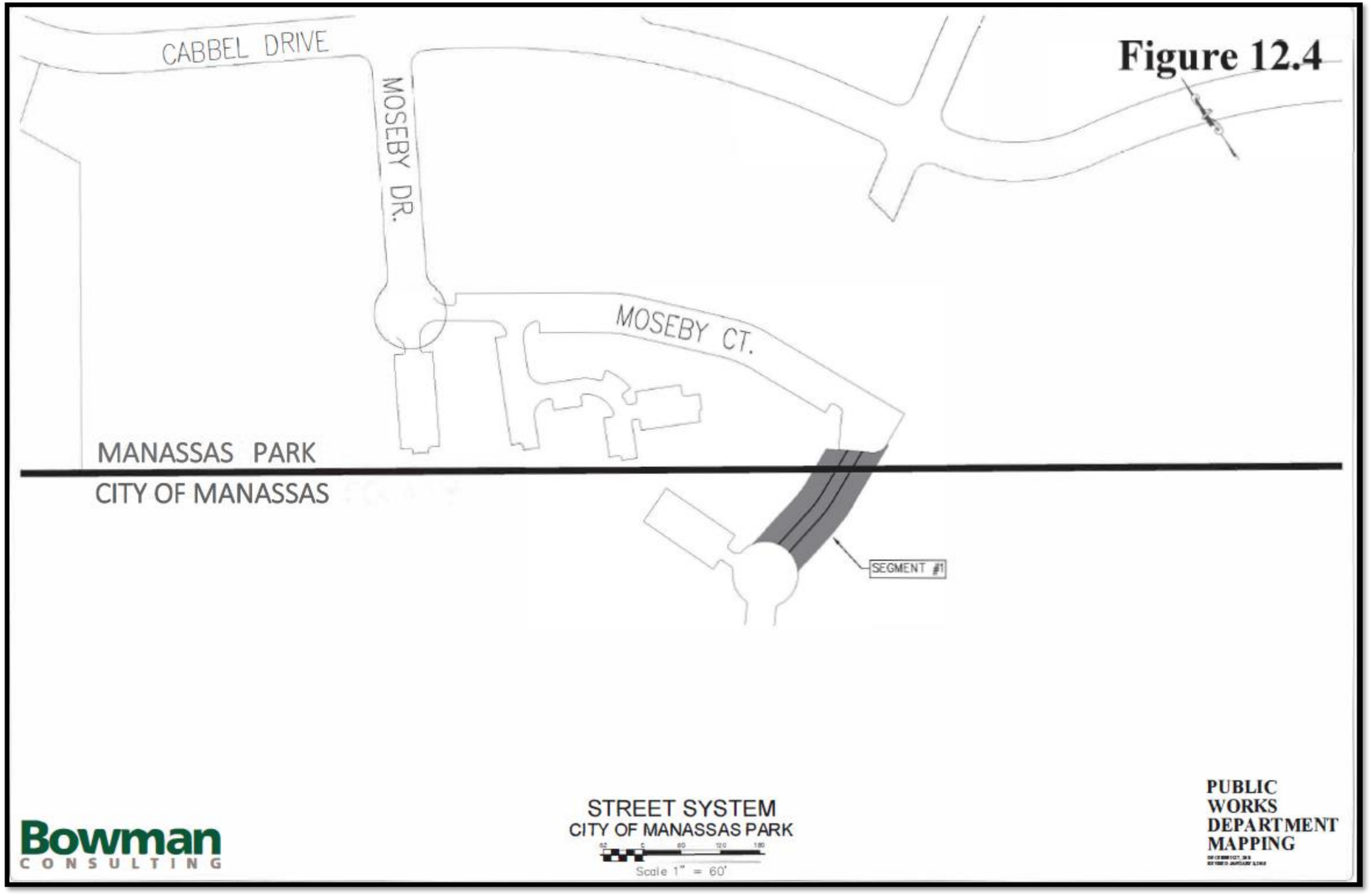
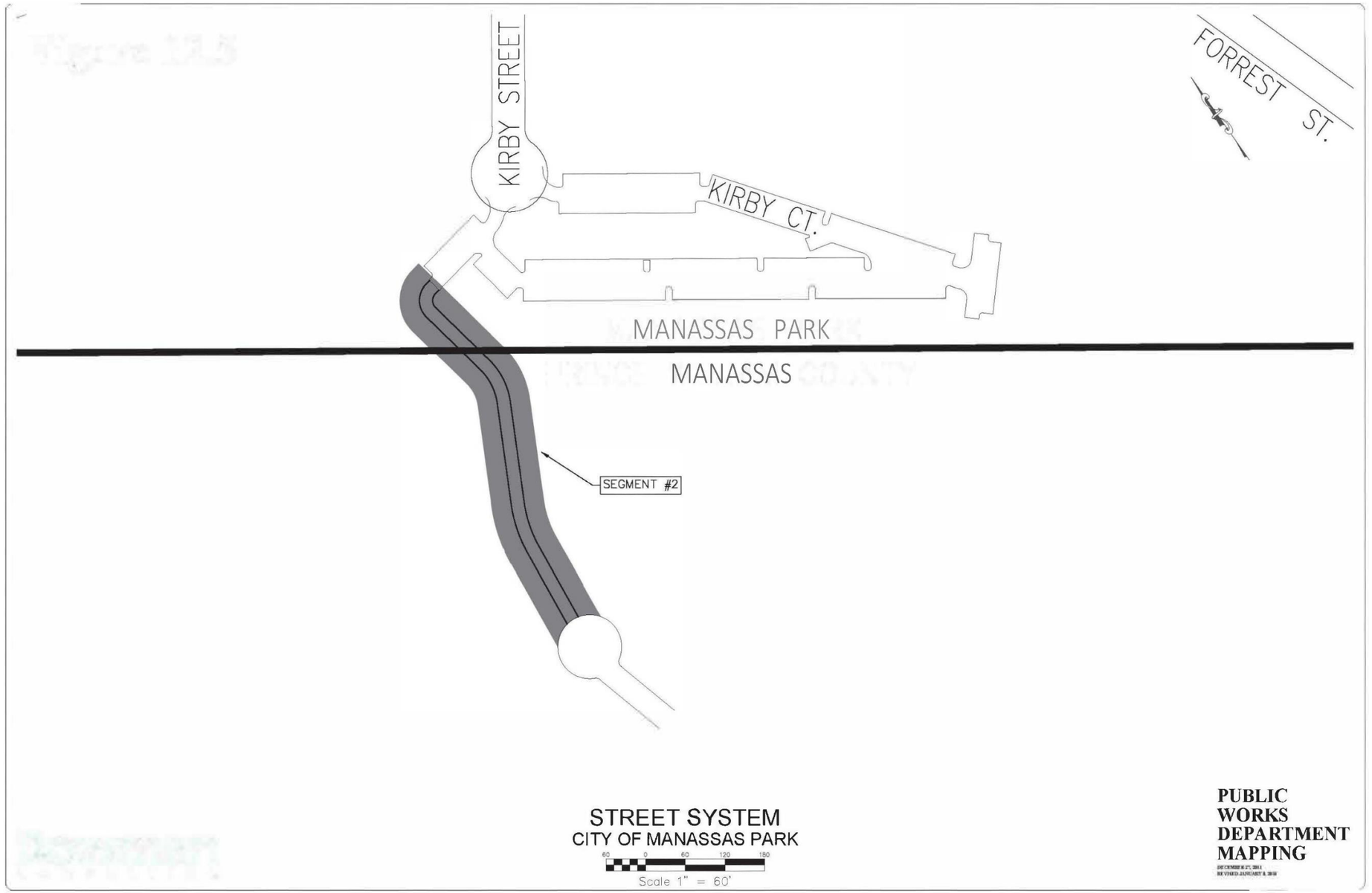
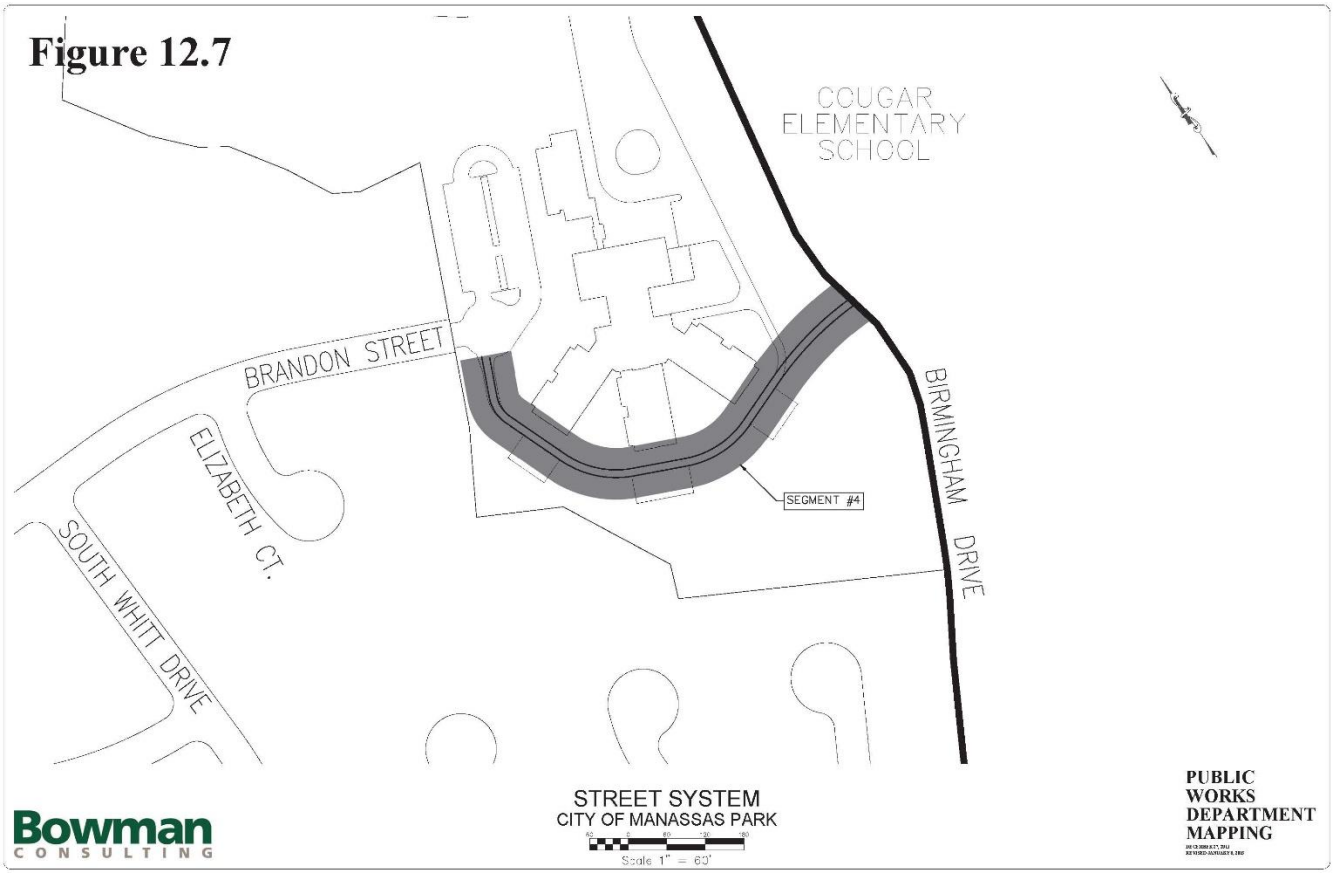


Figure 12.5 – Potential Alignment - Moseby Ridge I & Moseby Ridge II



2. Likewise, *Figure 12.7* illustrates a feasible emergency interconnection between the Blooms Crossing subdivision and Birmingham Drive in Prince William County. In the event of a major incident involving the railroad, it is known that travel along Manassas Drive and Signal Hill Drive would cease to be viable options. Providing an emergency interconnection to Birmingham Drive would provide emergency access and an evacuation route if a major incident were to close Manassas Drive.

Figure 12.7 – Emergency Interconnection



3. Due to congestion on Route 28, commuters have placed a heavy burden on small residential streets in order to access Old Centreville Road. *Figure 12.6* illustrates a potential extension of Mathis Avenue to Old Centreville Road that would keep traffic out of the residential neighborhood, and in the business district. The preferred cross section is shown in *Figure 12.13.*

Figure 12.6 - Mathis Avenue Extension

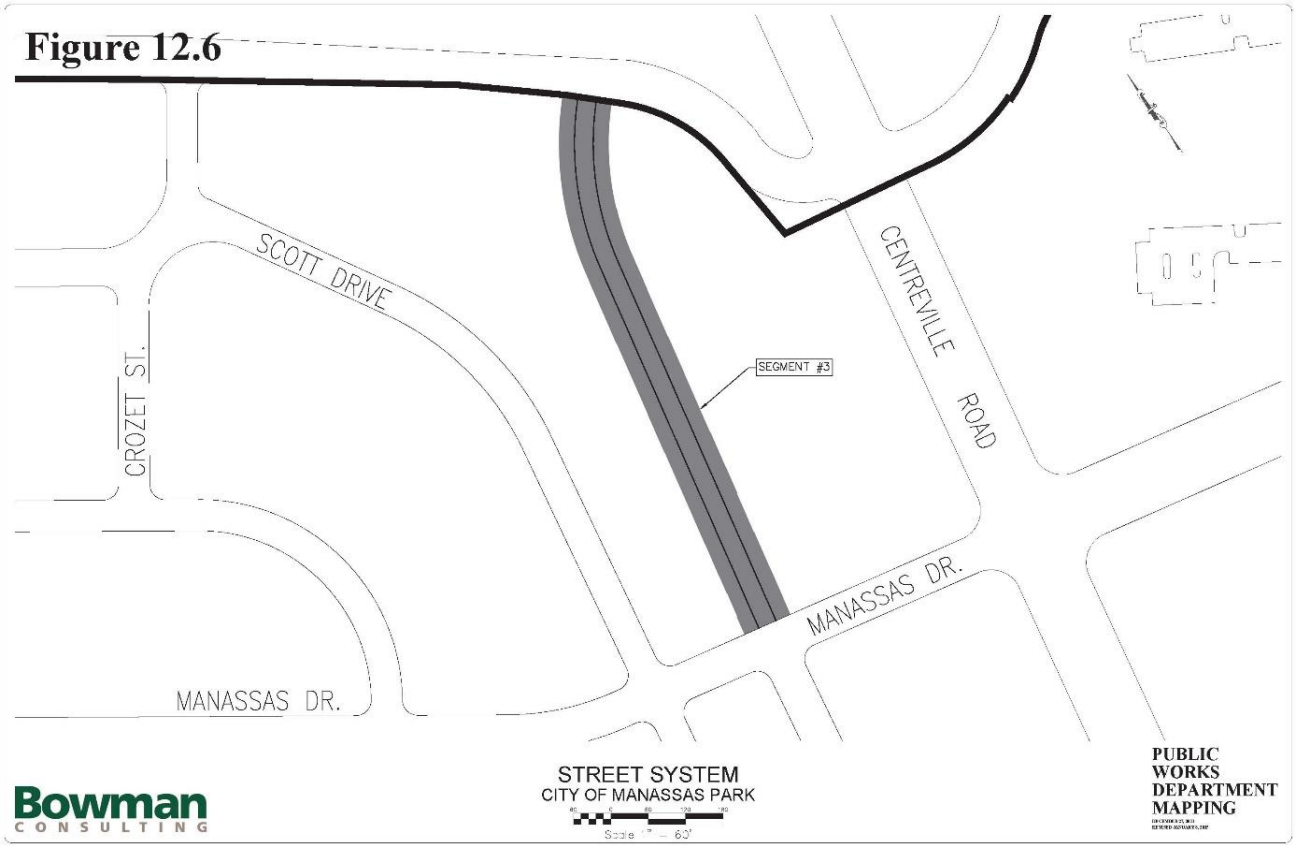
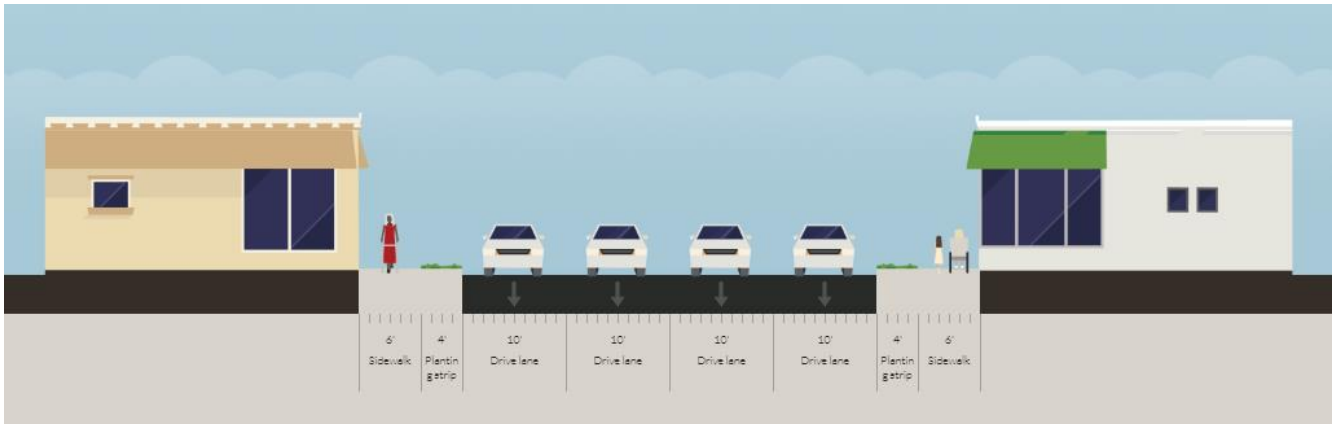


Figure 12.13 – Preferred Cross Section Mathis Avenue



4. *Figures 12.8 through 12.10* Illustrate options for vital interconnections within the City Center Redevelopment District. Discussed in more depth later in the chapter, growth of VRE ridership and increased residential and commercial development in the district create a need for multiple routes in and out of the center of town. *Figures 12.8 and 12.9* represent several possible alignments for

the extension of Conner Drive across Manassas Drive. The first Conner Drive Extension Project, scheduled for completion in 2020, will extend Conner Drive west to Rt. 28. However, extending Conner Drive east across Manassas Drive completes a vital secondary roadway to the district.

Figure 12.8 – City of Manassas Park Street System

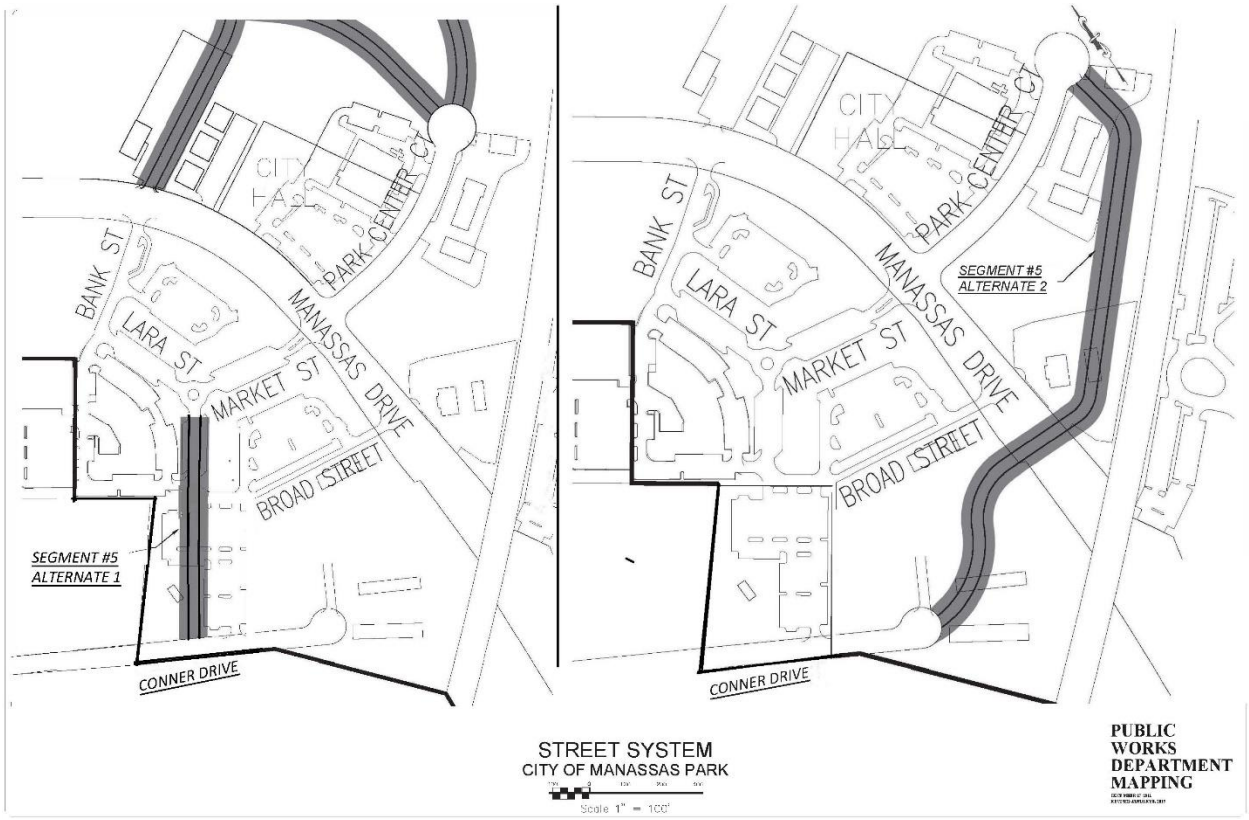


Figure 12.9 - City of Manassas Park Street System

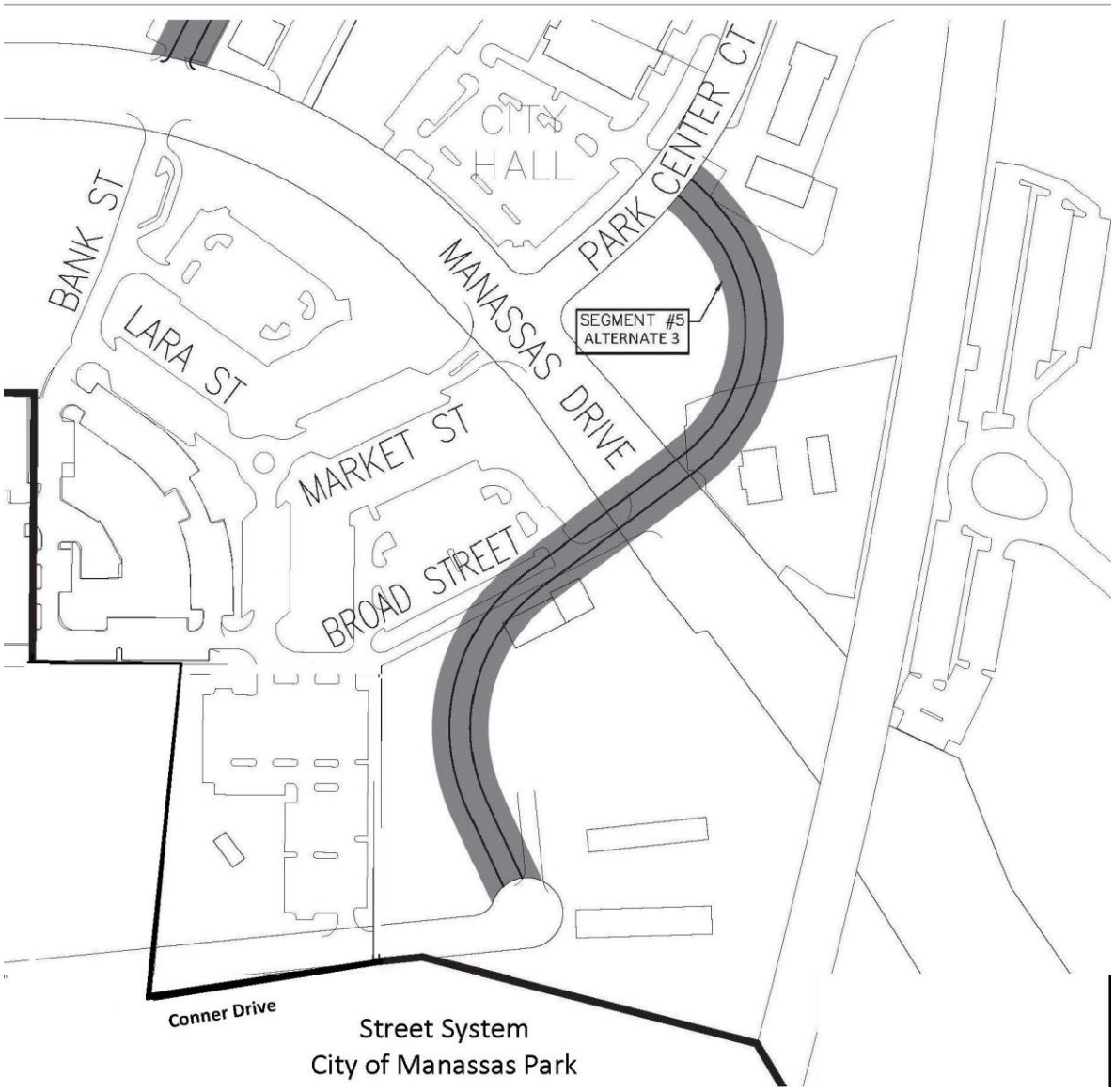


Figure 12.10 represents potential alignments of roadway segments leading out of the north side of the City Center Redevelopment District, thereby providing alternative route(s) to Euclid Ave.

Figure 12.10 Roadway Alignment

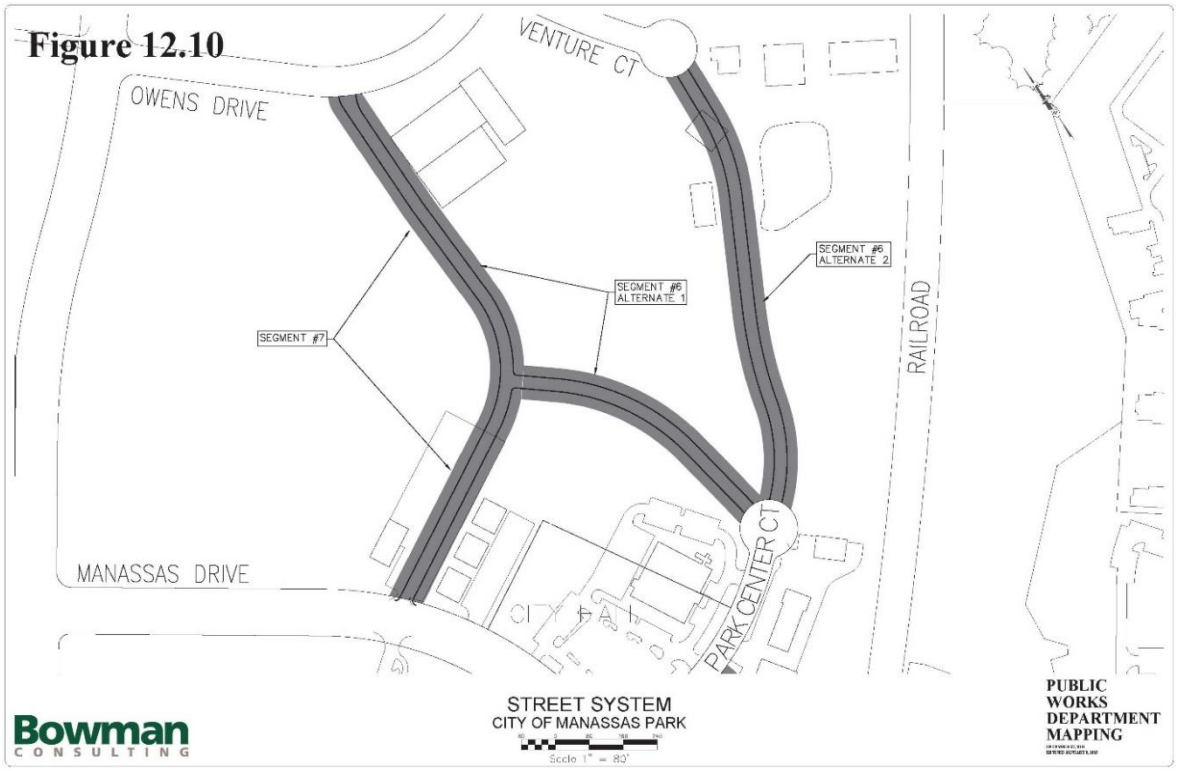


Table 12.4 provides quick summary to the cost estimate breakdowns provided in *Appendix A.*

Table 12.4 Planned Roadway Segments

Table 12.4 Planned Roadway Segments and Improvements	
Section or Improvement	**Cost Estimate**
Segment 1: Moseby Ridge I Emergency Connection	$442,208
Segment 2: Moseby Ridge II Emergency Connection	$1,326,624
Segment 3: Mathis Avenue Extension	$2,034,156
Segment 4: Blooms Crossing Emergency Connection	$1,768,832
Segment 5: Conner Drive Extension II, Alternate 1 w/ Alternate 2	$4,134,644
Segment 5: Conner Drive Extension II, Alternate 1 w/ Alternate 3	$4,134,644
Segment 6: Park Center Court Extension, Alternate 1	$1,459,286
Segment 6: Park Center Court Extension, Alternate 2	$2,365,812
Segment 7: Manassas Drive/Owens Drive Interconnection	$3,029,124

Streets and Highways:
Regional Approach
Transportation Stakeholder Cooperation

Congestion is a major concern throughout the Washington DC metropolitan area. Traffic volumes continue to increase even with the availability of various mass transit options. As residential, commercial and industrial development continue to grow, the region as a whole must address congestion concerns. It is critical that the City continue to actively participate in regional organizations such as the Metropolitan Washington Council of Government (MWCOG), and the Potomac and Rappahannock Transportation Commission (PRTC) to help minimize congestion and its sources.

An area of primary concern is the congestion along the VA Route 28 corridor passing through the City. In cooperation with neighboring communities, and where feasible, the City should continue to study alternate access to or bypasses around VA Route 28.

Rt. 28 Alternatives and Improvements
Transportation Stakeholder Cooperation

The Rt. 28 corridor, from Manassas through the limits of Fairfax County, remains one of the major congestion issues in the region. In 2014, The Virginia Department of Transportation initiated a study of

short-term projects capable of being implementation within established cost and time constraints while a long-term study took place. The long-term study has since narrowed down options to several projects that will provide significant congestion relief and reduced travel time in the corridor. Those options, inclusive of both bypasses and corridor widening, must undergo environmental review and approval from the Corps of Engineers. Manassas Park continues to work with the City of Manassas and Prince William County in the technical review and public involvement processes. Regardless of the alternative chosen, the impact on traffic flow within the City of Manassas Park may be significant. The City must carefully plan to benefit from the alternative chosen.

A simultaneous effort for corridor-specific improvements is underway, evaluating the use of innovative intersection designs, sometimes called superstreet intersections. These intersection improvements would reconfigure the way vehicles from side streets can enter the primary flow of Rt. 28. With the numerous signals along the corridor serving both residential and commercial traffic with protected movements onto Rt. 28, flow along the principal arterial is constantly disrupted. The goal of such innovative intersections is to limit the number and frequency of protected turns approaching from the side streets. A STARS study concluded in early 2020, laid out a plan to reconfigure five intersections north of Manassas Park incorporating innovative designs. The City should continue to support this and future efforts to improve traffic flow along the corridor.

As growth continues to bring more traffic to the region, it's important that Manassas Park and its regional partners continue to work together to find solutions to relieving congestion and improving travel times along the Rt. 28 corridor.

Multi-Modal Solutions:

Bicycle and Pedestrian Travel

Relieving Congestion through Transportation Alternatives

The City of Manassas Park has been pursuing a more complete pedestrian amenity system for decades. Street system improvements have added sidewalks to significant portions of the original subdivision, new subdivisions have been created with extremely viable sidewalks and path options, intersection improvement projects have widened existing sidewalks and added signalized crossings, and major focus has been put on safe pedestrian access to the school campuses. Although there are still missing pieces of the pedestrian puzzle, the City has made great strides toward becoming a completely walkable community.

Although the need for focus on multi-modal, transit oriented improvements is discussed previously in the Planned Improvements section, it is important to reiterate the need for a planning focused on ensuring that transportation improvement projects provide appropriate accommodation for pedestrians, bicyclists, transit riders, and persons of all abilities, while promoting safe operation for all users. The most effective way to ensure a constantly improving and ever expanding network for pedestrians and bicyclists is to incorporate those needs into every transportation project, and not treat them as separate priorities. The City has hosted educational presentations on the Complete Streets initiative, and encourages that all new roads and improvements incorporate these principles to the fullest extent feasible. Preferred cross-sections in the illustrations of this chapter offer options to provide multi-modal accommodations under

a variety of constraints. It is imperative that proposed road sections offer options for all modes of travel to persons of all abilities.

In recent years, the City has achieved trail connections with multiple jurisdictions. The trail system in Signal Bay Park has been expanded, creating connections between the City of Manassas Park and adjacent Prince William County subdivisions. Improvements at the County's Cayden Ridge subdivision connected a path along Signal View Drive to the trail system in Signal Bay Park, and also a connection to an existing path between Roseberry Farms and Manassas Drive. With the boundary line adjustment that transformed General's Ridge golf course into Blooms Park, utilizing the existing cart paths as public trails, a link was completed that joined separate trail and sidewalk systems, between multiple jurisdictions, into miles of walkable path. While this cooperation between jurisdictions has developed into a highly utilized amenity for all jurisdictions to enjoy, it has also opened the door to bigger ambitions.

In 2019, MWCOG took the lead on an initiative to expand the National Capital Trail system to the entire Transportation Planning Board area. The City expressed a desire to improve bicycle amenities, and discussed opportunities for interconnections with both existing and planned bicycle trails in Prince William County and Manassas. The municipalities share a desire to find an alignment that will allow connections between Manassas Park, Manassas, and Prince William to trails, just northeast of Bull Run, in Fairfax County. The transformation of the Generals Ridge golf course into Blooms Park draws a clear picture of how this connection might look. Although a pedestrian bridge across Bull Run is not a simple plan, it is certainly a more palatable option for stakeholders than the use of Rt. 28 as bike path. The City desires to work with MWCOG, Prince William County, the City of Manassas, and Fairfax County to achieve a goal of interconnected bicycle trails between the jurisdictions, and expanding the National Capital Trail system to include more areas in the Washington Metropolitan region. In addition to this specific interconnection, the City has discussed multiple opportunities to connect bicycle paths throughout the Manassas/Manassas Park/Prince William area, to create a more robust pedestrian bike path network.

Rail and Bus Service

Norfolk Southern Railroad tracks pass through the City and cross Manassas Drive near Railroad Drive. Access to major freight carrier rail operations is available throughout the region. Norfolk Southern tracks link to other major nationwide rail systems and are used by passenger trains such as the VRE commuter rail system and AMTRAK.

Improvement of the railroad crossing of Manassas Drive was recently completed to enhance safety for vehicles and pedestrians. The Norfolk Southern Railroad right-of-way was in the jurisdiction of Prince William County until 2004. The right-of-way is now within the jurisdiction of the City thus giving the City more input into the maintenance of this important railroad crossing.

The feasibility of a grade separation at this crossing should be studied in an effort to enhance the safety of this important crossing near the center of the City. In the interim, improved control of the crossing arms must be pursued to minimize needless delays to the traveling public each time a southbound VRE train stops at the station. In addition, the ability of emergency equipment to quickly reach locations on both sides of the City must not be excessively hampered by train traffic.

The VRE provides commuter rail access to the City on weekdays and on special occasions throughout the year (*see Figure 12.11*). The VRE links to other passenger transportation systems in the Washington DC metropolitan area: Metrorail; Metrobus; Ronald Reagan Washington National Airport; MARC Train Service to Maryland; AMTRAK trains nationwide; and regional/national bus services such as the Fairfax Connector, Arlington ART Bus, DASH/Alexandria Transit Company, and the Greyhound and Trailways bus systems.

The VRE is operated by the Potomac and Rappahannock Transportation Commission (PRTC) in partnership with the Northern Virginia Transportation Commission (NVTC) and provides commuter rail service along the Manassas and Fredericksburg railroad lines. The VRE station in the City is a significant regional transportation hub, drawing riders from the City and the neighboring communities of Prince William County, Fairfax County and the City of Manassas.

The City is a member of the PRTC which is a multi-jurisdictional agency representing Prince William and Stafford Counties and the cities of Manassas, Manassas Park and Fredericksburg. In addition to the VRE, the PRTC also provides a local and commuter bus service along the I-95 and I-66 corridors. OmniRide, the name of the PRTC bus service, operates more than 150 buses and provides 2.5 million passenger trips per

year. OmniRide promotes carpools and vanpools, and these rideshares account for an additional 1.5 million passenger trips per year.

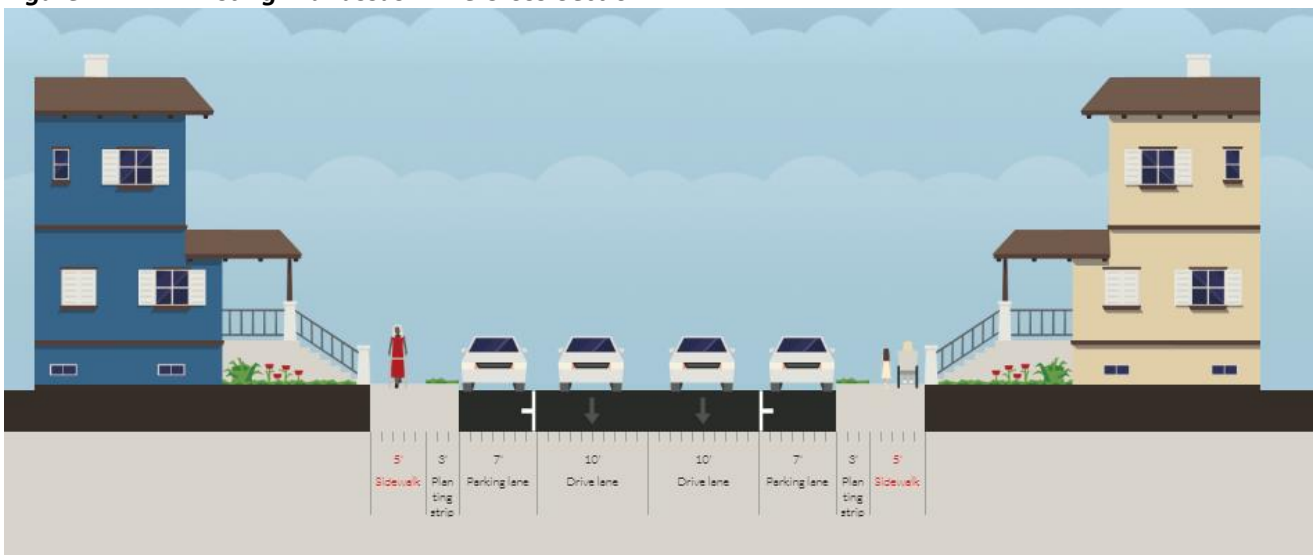
Although challenging given current trip times, another long-range solution to improve the viability of Rt. 28 as a commuter corridor could be the implementation of a regional bus rapid transit (BRT) system. It is expected that as congestion relief improvements change the travel times along the Rt. 28 corridor, an opportunity will arise to offer BRT service to Vienna and Chantilly from Prince William County, Manassas, and Manassas Park. Although it is likely that OmniRide should take the lead on such a project, Manassas Park is positioned to be a viable partner in this effort. A BRT system that carries commuters from Manassas and Manassas Park into Dulles, Vienna, or other Metro stops could keep numerous vehicles off the corridor during peak periods.

Parking

Growing Residential Demand

Parking has evolved into a major concern for both existing and future development. Inadequate parking can lead to disputes amongst neighbors, lost business, complications with emergency service delivery, and possibly subdued property values. Whether supporting a more robust and accessible retail environment, or simply accommodating a growing residential demand, the City is constantly challenged to provide solutions to parking shortfalls.

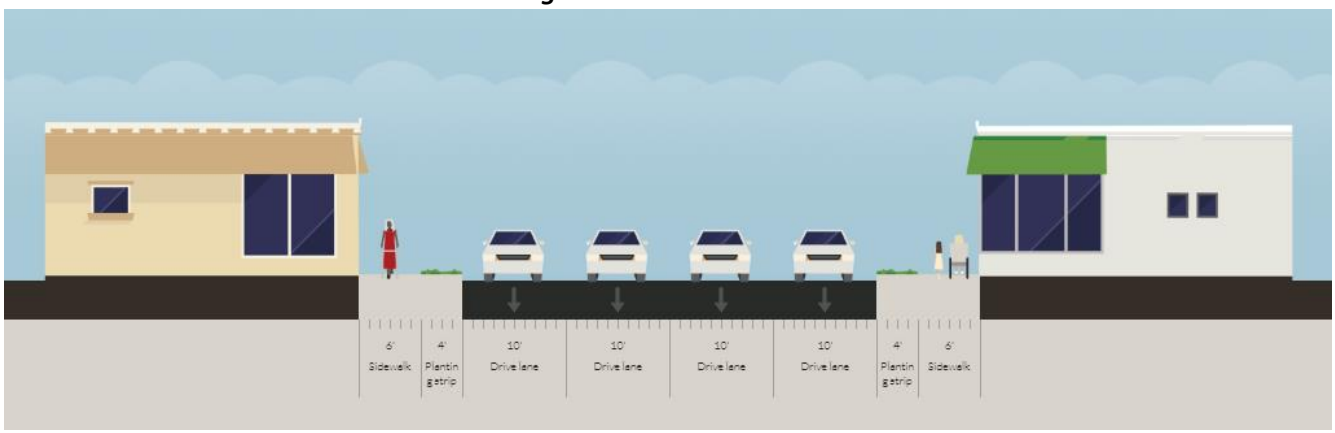
Figure 12.12 – Existing Manassas Drive Cross-Section



Due to increased numbers of vehicles per household, coupled with limited off-street parking in the original Manassas Park subdivision, on-street parking, and the growing need for it, have captured the spotlight from time to time in the arena of public opinion. As the demand for available parking increases, parking violations are becoming more frequent, and complaints from citizens about the parking habits of their neighbors are on the rise. The City must face the challenge of addressing increased demand in the limited space of an existing built environment. Options for angled parking and other innovative on-street solutions are considerations in areas where parking demand has proven exceptionally high, but design

requires demonstration of added layers of safety, as the existing data on these layouts points to increased numbers of incidents. As major reconstruction of original subdivision streets occurs, acquisition of additional right of way may be necessary to ensure parallel parking is preserved while still allowing modern pedestrian and bike improvements. Additionally, cul-de-sac widths should be expanded as feasible to increase emergency response safety while still considering parking challenges. The standard cross-section in the original Manassas Park subdivision, the 50 foot wide section illustrated in *[Figure 12.14]*, with parallel parking on both sides of the street, meets the typical need for parking while still providing updated pedestrian amenities. Where parking demand is demonstrated to be lower, and/or bike lanes are needed to complete trail goals, modifications to this cross-section that eliminate parallel parking on one side of the roadway can be considered. However, variations of this cross-section with angled parking or similar are to be considered where demand for parking is known to be exceptional, even if the design requires additional right of way.

Figure 12.14 – Standard Cross Section



A similar trend in parking demand has been noted on the publicly maintained streets in the Blooms Crossing subdivision. Although on-street parking still appears to be a last resort in some sections, many streets are crowded every evening with vehicles. In recent years, vehicles are notably parked in violation of standard parking code, and the City has had to implement signage to reiterate codified regulations. Special considerations in portions of the Blooms Crossing subdivision develop along the elementary school bus routes. The entire pre-k through 5th grade campus is accessed via the residential streets that are now heavily parked on both sides. This becomes problematic, especially during snow events, as plowed snow can encroach farther into the travel lanes as it is confined by the parked vehicles. The City may need to consider additional parking restrictions in the subdivision, especially along the bus routes, to ensure public safety.

A new parking demand is likely to develop around Blooms Park. Officially transformed from a golf course to a passive park in the summer of 2019, the potential to host large public events at the park is being explored. Though the facility is currently equipped with a surface lot of 165 spaces, large events may exceed that capacity, and push vehicles onto the nearby streets, most notably Manassas Drive. Not marked with parking restrictions, Manassas Drive is a wide cross-section that may accommodate parallel parking. However, a favorable alternative to connect the trail systems of Manassas, Prince William and Fairfax together through Manassas Park, and potentially joining the National Capital Trail system, would require the addition of bike lanes to Manassas Drive, and limit the availability of on-street parking.

Additional trail connectivity options exist farther west along Manassas Drive, where Euclid Avenue has recently been improved with bike lanes in Manassas. Whether in conjunction with the expansion of the National Capital Trails system, or just to connect the trails of Blooms Park to the trails of Signal Bay Park, Prince William County, or Manassas, additional on-street parking along Manassas Drive east of Rt. 28 should be deferred in favor of a better multi-modal cross section such as that illustrated in *[Figure 12.15]*

Figure 12.15 Preferred Multi-Modal Cross Section

Parking adequacy around existing townhouses, apartments, and condominiums is variable. In accordance with noted national and regional demand studies, apartments generate far fewer vehicles than single-family detached homes and townhouses. So, where the apartment subdivisions seem adequately parked, with available spaces even after hours, the townhouse subdivisions throughout the City have a demonstrated need for additional on-street parking outside of their privately maintained lots and streets. The City will continue to explore opportunities to accommodate requests for such "overflow parking" where it does not compromise safety.

As the City looks to tackle parking demand in existing residential areas, the need to review policy and legislation has been voiced by citizens, staff, and elected officials. The current Code of Ordinances is lenient on many aspects of parking in the residential zones, and places no obligations on owners to add off-street parking to accommodate their residential additions. As complaints and safety concerns mount, it may require tough policy decisions to both quell the demand for on-street parking, and reduce the consumption of valuable on-street space by trailers and commercial vehicles. This is a policy area that varies amongst jurisdictions, and the City may need to consider revision of residential improvement and commercial vehicle policies to satisfy the required parking demand of resident's personal vehicles. Another, more impactful policy option is that of permit parking. Some jurisdictions in Northern Virginia, including the City of Manassas, have implemented permit parking to varying degrees. Although burdensome to implement, such policies often become necessary to protect the interests of property owners and residents.

The focus of new residential development is in the City Center Redevelopment District, which blends commercial and residential demands into the mixed-use environment. Required off-street parking requirements, heavily scrutinized after the construction of Phase I of the City Center, and subsequently adjusted via zoning text amendments, have increased the challenges in maximizing the economic development and floor area density, while still providing adequate parking to meet the tabulated

requirements. The unique usage characteristics of a transit-oriented mixed-use development may justify options for shared parking arrangements, lowered tabulated requirements specific to the City Center District, and/or waivers of parking requirements where it can be demonstrated that parking demand is lower.

Parking

Commercial and Economic Developments Needs

Commercial and industrial areas have sufficient parking to meet the requirements at the time of approval, and at the indicated usage presumptions. For most commercial and industrial sites throughout the City, this has ensured adequate parking to accommodate the needs of owners, tenants, and customers. However, there are noted areas of either parking deficits, or perception of deficits that have hindered economic development. Whether poor design considerations, or lack of needed regulations of use allocations, insufficient parking can hinder existing business, deter future business, and lead to emergency access issues.

In certain post-development scenarios, often unique to mixed-use condominiums and tenant buildings, the use mixture that was assumed at the time of development no longer holds true with the current use mixture. When the actual use mixture of a mixed-use building involves more units with higher parking demand, it creates a parking deficit for the site. Setting policies and codifying ordinances that allow City zoning staff to limit usage changes based on parking, and enforce parking requirements in a post-development state are highly encouraged. At a minimum, an owner or tenant looking to change the use of a space or building should have the burden of proof that the sum of the parking needs at the proposed usage(s) does not exceed what is provided for on the site. Although this may trigger need for site modifications or deter a use change, it will protect the business interests and economic development viability of the site for owners and existing tenants, as well as help to ensure that emergency access is not impeded by approved site activities.

A unique parking hurdle has become apparent in the process of redevelopment in the Downtown, or City Center Redevelopment District. Although the stated goal of the district is dense, transit-oriented development, with a focus on multi-modal accommodations and walkability, all things that would typically support a reduction in tabulated parking requirements, the district is in its beginning stages, and these goals have not yet been met. Therefore, the need for convenient, point-of-use parking is still a driving factor in economic development and market viability of commercial uses.

Ideally, when multiple phases of downtown development are completed, residents and guests will find themselves in a walkable hub of retail, service, and activity. This will curb the perception that parking is only viable if it is in immediate proximity to a destination. This is demonstrated in downtown districts, town centers, and walking malls across the country. However, this change in perception evolves over time, as visitors find more and more reasons to “come and stay for a while” in an area. As demonstrated with market feedback for Phase I of City Center, which was designed and approved with parking layouts that either depended on future development or failed to consider an intermediate need for convenient parking for its commercial spaces, the current visitor to City Center is still looking for store-front parking options and convenience. For now, new development must consider a more rural parking expectation as the downtown paces itself into an urban, multi-modal environment.

As residential density grows, new developments bring more pedestrian and bicycle amenities to the downtown area, and viable anchors become a draw to the district, it will likely prove possible to offer lowered parking tabulations for certain uses that are able to demonstrate greater dependence upon pedestrian and bicycle traffic. In the meantime, it is important to consider shared parking arrangements, public parking options, and innovative ideas to help maximize density, economic development potential, and convenience in the downtown. If public parking lots are developed, they should also function as overflow parking for City residents. Parking management policies would need to be created to ensure there is an appropriate balance between the parking needs of the visiting public and City residents.

Small Area Focus

Downtown Development

To ensure adequate transportation services and facilities are available to residents, the City must coordinate all transportation policies with current and future land use objectives. New developments and redevelopments in the City need to encourage the use of mass transit, pedestrian and other non-motorized modes of transportation. The City must minimize the adverse impacts of development and redevelopment on the local transportation system.

The City Center Redevelopment District poses a new set of transportation challenges, as it proposes to transform the discontinuous, curvilinear streets to a more interconnected street network. The district is centered around the VRE station and Manassas Drive, between Euclid Avenue and Digital Drive. The VRE station generates between 600-1000 riders per day, and the number is expected to grow steadily. Manassas Drive is a busy arterial roadway with daily traffic of over 16,000 vehicles per day. Current roadway configurations force all existing and proposed VRE traffic, from the surface lot and planned garage, to utilize two separate single, signalized intersection. The intermittent increases in traffic, which occur as riders exit the parking areas, create excessive queuing at the associated intersections. With the new VRE garage locating in the heart of the proposed downtown retail center, it is important to identify new, alternative routes that will disperse VRE traffic and alleviate vehicle queuing to the maximum extent possible. Whereas queued traffic from the existing surface lot has little other merging traffic to contend with, the proposed garage will be centered in the downtown area, where retail and residential traffic will be an issue. Having multiple points of access to and across Manassas Drive, along with potential northern routes to Euclid Avenue, will provide various routes for vehicle trips generated by retail customers, VRE riders, and residents.

One proposed connection is the extension of Conner Drive across Manassas Drive, just west of the railroad tracks. With the extension of Conner Drive to Route 28 currently underway, there is potential for Conner Drive to become a collector for residential and commercial traffic in the downtown. An extension of Conner Drive that either connects directly to the planned garage, or connects to Park Center Court would provide access to Euclid Avenue or Route 28, as well as provide an additional stacking lane at Manassas Drive, to help relieve the traffic impacts resulting from disembarking the VRE train. Alternative alignments are shown in *Figures 12.8 and 12.9*. Preferred alignments of this connection are illustrated in Alternates 2 and 3. Alternate 1 of *Figure 12.8* would not provide stacking relief, as it utilizes the existing Park Center Court alignment to intersect with Manassas Drive. However, it may be valuable addition to the network, on its own, or in conjunction with Alternate 2 or 3.

The northern edge of the City Center Redevelopment District abuts the Conner Center Industrial Park. Tying a downtown road network into the local and connector streets of the industrial section would ensure that the center of the downtown is accessible from all directions. It would provide more direct access to Blooms Quarry Road, for those VRE riders, downtown visitors and residents desiring to connect with Rt. 28 north, and would provide a direct route into the downtown for the workers and visitors of the industrial district.

As the VRE and the City Center Redevelopment District grow together, it is important that options exist to minimize frustration with stacking and queues, provide convenient access to collectors and principal arterials, in order to promote the ease of transit use. Another key factor in promoting the use of transit and alternative modes of transportation in the downtown is to ensure that all roadway sections provide appropriate accommodation for pedestrians, bicyclists, transit riders, and persons of all abilities. While the City desires policy openness that promotes density and economic development, future proposals and designs must take into account the desired goals of the district. Improvements should be truly multi-modal, providing safe accessible routes to transit options for pedestrians and bicyclists of all ability levels. Cross sections that leave room for wide sidewalks, protected bike lanes, shared use paths, protected bus stops, and the like should take priority to other site elements. Ensuring that the streets and sidewalks of the downtown are inviting to all users, and encouraging visitors and residents to walk and bike to transit access points and commercial destinations should be a primary goal of any design.

An additional consideration for development in the downtown is public parking. The City desires to keep public facilities in the downtown, and the district is centered around VRE station access. City services, public library, school services, and transit access are public functions that will draw visitors to the downtown area. It is important that the City make available substantial public parking accommodations to ensure that this demand is not only met, but that it is convenient and accessible. The City must take advantage of opportunities to partner with VRE and private interests to maximize available public parking in the downtown area.

VRE is currently planning to add an additional 500+ parking spaces on the western side of the railroad tracks, in the heart of the downtown. This garage will be vital to growth of the VRE ridership, future expansion of VRE operations, and ensure that the transit focus of the downtown district thrives. The garage will provide a pedestrian bridge over the tracks, which will ensure safe access to the platform. If positioned correctly, this bridge can increase pedestrian safety for numerous VRE riders in the downtown. Locating the garage and its associated bridge as close to the existing City Center development and Manassas Drive will help to encourage the use of the bridge, and discourage the unsafe practice of riders crossing the tracks at grade. Improving pedestrian and bicycle access to the VRE platform, and positioning it so that it is close to Manassas Drive, help to ensure that we are promoting transit use, and providing safe, multi-modal access to it.

Goals, Objectives & Action Strategies

Goal T1

The City will maintain a high quality, efficient, safe and accessible transportation system that is coordinated with the City's current and future land use plans. Traffic will move freely throughout the City while avoiding excessive speeds and traffic noise. Access to and from the City by a wide variety of transportation alternatives will be encouraged.

- Objective T1.1 - Ensure the adequacy and maintenance of the City's transportation system.
    - Action Strategy T1.1.1 Maintain the City's streets and rights-of-way to ensure the safety of the public.
    - Action Strategy T1.1.2 Study ways to minimize costs on maintaining transportation facilities and take advantage of economies of scale, e.g., by bundling small projects together to obtain better prices.
    - Action Strategy T1.1.3 Anticipate future transportation needs to support Capital Improvement Program (CIP) decisions.
    - Action Strategy T1.1.4 Implement proposed street network for the City Center Redevelopment District to accommodate additional traffic and provide additional access to the downtown.
    - Action Strategy T1.1.5 Monitor and eliminate safety problems related to the City's transportation system.
    - Action Strategy T1.1.6 Provide adequate maintenance of transportation vehicles and facilities.
    - Action Strategy T1.1.7 Maintain the structural integrity of quality streets by decreasing the loss of bituminous products and decreasing moisture absorption into the sub-grade through using industry standards.
    - Action Strategy T1.1.8 Maintain the structural integrity of the existing streets through an on-going maintenance program that will permit rehabilitating and resurfacing all city streets at an acceptable frequency.
    - Action Strategy T1.1.9 Develop a street maintenance and rehabilitation plan with anticipated schedules for accomplishing such work throughout the City.
    - Action Strategy T1.1.10 Pursue and promote an "Adopt – A – Highway" program
- OBJECTIVE T.1.2 – Protect residential neighborhoods from adverse impacts of commuter and commercial traffic.

- Action Strategy T1.2.1 and traffic flow. Synchronize traffic signals to enhance safety
- Action Strategy T1.2.2 commuting. Encourage carpooling and mass transit
- Action Strategy T1.2.3 Identify problem areas that are in need of traffic calming solutions, which may include increasing fines.
- Action Strategy T1.2.4 Adopt standards for the application of traffic calming techniques and apply them where appropriate.
- Action Strategy T1.2.5 Ensure adequate parking for new developments or redevelopments in the commercial sections of the City.
- Action Strategy T1.2.6 Pursue the use of off-site parking agreements to allow overflow parking for VRE.
- Action Strategy T1.2.7 Limit parking of large trucks and recreational vehicles on residential streets.
- Action Strategy T1.2.8 Continue enforcing laws against abandoned, unlicensed and uninspected vehicles.
- Action Strategy T1.2.9 Support fixed route and on-demand transportation options such as OmniRide and OmniLink between commercial and industrial areas, shopping areas, the VRE, and residential areas.
- Action Strategy T1.2.10 Require new development and redevelopment proposals to provide safe and easy pedestrian access.
- Action Strategy T1.2.11 Develop parking plans and controls in mixed land use areas to encourage public transit and carpooling.
- Action Strategy T1.2.12 Study ways to expand parking for the VRE station, to include providing a parking structure.
- Action Strategy T1.2.13 Provide a street network level of service as high as practicable. At a minimum, level of service D should be provided where feasible.

➢ Objective T1.3 – Seek and develop new mechanisms for funding transportation system improvements.

- Action Strategy T1.3.1 Study alternative ways of financing projects. Use the City's CIP to plan when, where, and how to construct transportation projects. Encourage use of private sector resources to assist in the costs of construction.
- Action Strategy T1.3.2 Monitor and support legislation relating to impact fees and other

alternative funding sources for street construction and maintenance projects.

- Action Strategy T1.3.3 Design bike and pedestrian ways to parallel or share road access. Consider pedestrians when making road design decisions, including pavement widths and turning radius. Coordinate with VDOT.

- Objective T1.4

  - Work with other local governments, regional and federal agencies, VDOT, and the private sector on transportation issues and the development of new transportation facilities and systems.

  - Action Strategy T1.4.1 Support and actively participate in all local, state, and federal transportation planning organizations.

  - Action Strategy T1.4.2 Promote and encourage use of commuter facilities, such as sheltered community bus and train stops, shuttle services, ridesharing programs, pedestrian walkways.

  - Action Strategy T1.4.3 Encourage major private development, to provide protected access to public transit stops and employer-established and funded ridesharing programs such as Metrochek.

  - Action Strategy T1.4.4 Encourage telecommuting and similar programs to reduce regional transportation demand.

  - Action Strategy T1.4.5 Support the transit services of PRTC: VRE, OmniRide, OmniLink, OmniMatch, Metro Direct and Commuter Programs such as Guaranteed Ride Home, Metrochek, and SmartBenefits.

  - Action Strategy T1.4.6 Study the feasibility of a grade separation at the railroad crossing at Manassas Drive to improve the safety of this important intersection near the center of the City.

  - Action Strategy T1.4.7 Improve control of the railroad crossing arms to minimize needless delays to the motoring public each time a VRE train stops at the station.

  - Action Strategy T1.4.8 Ensure the ability of emergency equipment to quickly access locations on both sides of the City without excessive interference by train traffic.

  - Action Strategy T1.4.9 Work with the City of Manassas, Prince William County and VDOT to improve traffic flow along VA Route 28, e.g., by widening, adding additional lanes, and/or utilizing innovative intersections.

  - Action Strategy T1.4.10 Study options for providing alternative access to or bypass of VA Route 28, such as extending Euclid Avenue north into Prince William County, and additional possible crossings of Bull Run in cooperation with neighboring communities.

- Action Strategy T1.4.11 Support regional plans to develop new and improved highways, e.g., the Rt. 28 Alternatives Projects, to alleviate congestion within the City.

- Action Strategy T1.4.12 Ensure that the City receives the most transportation benefits from whatever alternative is chosen for the Rt. 28 Alternative Project.

- Action Strategy T1.4.13 Actively participate in any discussions relating to a light rail service between the City of Manassas and Dulles Airport in the VA Route 28 corridor to encourage incorporation into long-range transportation plans.

- Action Strategy T1.4.14 Identify road improvement projects that are currently planned and revise plans, where appropriate, to include parallel bicycle/pedestrian access consistent with industry standards.

- Action Strategy T1.4.15 Study the feasibility of providing of a train platform along the west side of the Norfolk Southern railroad tracks, to tie into the pedestrian overpass to be constructed as part of Park Center, to give passengers another access to the VRE trains.

Goal T2

The City will provide safe and convenient access to existing bicycle, pedestrian and other forms of non-automotive transportation and recreation to minimize congestion, enhance local and regional air quality and provide healthy recreational opportunities for the public.

- Objective T2.1 – Encourage the use of sidewalks and existing trails as alternate transportation between mass transit system access points (e.g., VRE, bus stops, etc.), high-density residential and commercial areas, public facilities and other employment areas.

    - Action Strategy T2.1.1 Establish a network of sidewalks to link residential neighborhoods with commercial services, shopping areas, public and private recreational facilities, the VRE station, schools, major public facilities and the Park Center.

    - Action Strategy T2.1.2 Designate the following as potential shared-use (bicycle and pedestrian) paths to enable the City to obtain federal funding:

        - VA Route 28 corridor
        - Manassas Drive between Blooms Park and VA Route 28
        - Signal View Drive between Manassas Drive and past Signal Hill Park
        - Euclid Avenue from Prince William County line to Manassas Drive
        - Norfolk-Southern Railroad right-of-way between Manassas Drive and Bull Run in Fairfax County

- Any existing or planned paths within the City, such as South Whitt Drive to Cougar Elementary, connecting developments to the VRE parking lot.

- Action Strategy T2.1.3 Provide outreach about the trail system within the development or redevelopment so that anyone moving to such an area is aware of the existence of the trail system within its boundaries.

- Action Strategy T2.1.4 New trails should be added only when obvious usage has occurred by foot traffic, and is supported by the community.

- Action Strategy T2.1.5 Require commercial developments, redevelopments, and public facilities to provide safe and easy access for pedestrians, bicyclists and the mobility-impaired.

- Action Strategy T2.1.6 Provide sidewalks on both sides of streets in commercial areas, if practicable.

- Action Strategy T2.1.7 Provide sidewalks on at least one side of all residential streets.

- Action Strategy T2.1.8 Minimize conflicts between pedestrian, bicycle and motor vehicle traffic.

- Action Strategy T2.1.9 Create a trail network based on a primary configuration that utilizes Park Center as a hub and Manassas Drive as the major route in which to radiate service to all parts of the City.

- Action Strategy T2.1.10 Design the trail network, utilizing existing trails and sidewalks, to link modes of activity, including city parks, schools, commerce centers, and commuting facilities.

- Action Strategy T2.1.11 Provide connecting routes to existing trail networks and bicycle systems in the City of Manassas, Prince William County and Fairfax County.

- Action Strategy T2.1.12 Amend the Zoning Ordinance to require all new commercial and industrial uses to provide adequate bicycle parking facilities commensurate to demand for the proposed use.

➢ Objective T2.2 - Provide trails that are well maintained, safe, direct and convenient to use.

- Action Strategy T2.2.1 Develop a system of trail network graphics that clearly identifies designated bike routes and instructions regarding their proper use.

- Action Strategy T2.2.2 Prepare appropriate mapping of the trail system and encourage the dissemination of maps to interested citizens and users.

- Action Strategy T2.2.3 Provide for secure bicycle-parking facilities at all public facilities,

tourist attractions and public transportation nodes.

- Action Strategy T2.2.4 Develop an "Adopt-a-Trail" program to involve citizens and to provide for clean-up along the trails.

Goal T3

- The City will maintain high quality transportation access to all land uses within the City. Objective T3.1 - Coordinate all transportation policies with current and future land use policies.

  - Action Strategy T3.1.1 Require relatively high-density residential development in mixed use centers, such as Park Center, to provide features that encourage use of mass transit and pedestrian facilities.

  - Action Strategy T3.1.2 Require all new developments and redevelopments to explore means for minimizing adverse impacts upon the City's transportation system.

  - Action Strategy T3.1.3 Encourage all new developments and redevelopments to provide features that facilitate the use of mass transit.

  - Action Strategy T3.1.4 Enhance natural areas and open space through responsible land planning and the use of carefully thought out and designed pathways.

  - Action Strategy T3.1.5. Preservation of natural features should be sought through dedication of public land or permanent conservation easements. Incorporate bikeways and pedestrian trails into these areas and development of a citywide "greenway" system.

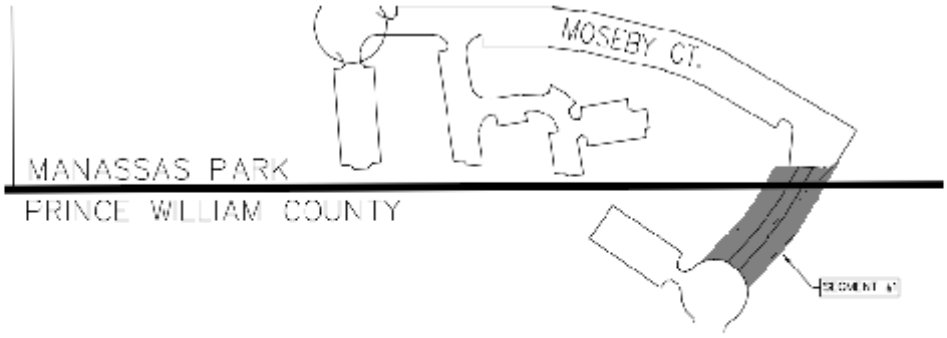
  - Action Strategy T3.1.6 Strengthen the site plan review process to assure the integration of pedestrian trails and bikeways into new development projects with appropriate linkages to community activity centers.

Appendix A

Bowman

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning – Segment 1

Summary: Segment 1 consists of approximately 200 linear feet of new roadway construction connecting from East to West Moseby Court in the City of Manassas Park to Stonewall Road in the City of Manassas.



Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #1 Road Cost Estimate				
Total Linear Feet of Road Section (LF) =	200	Width (FT) =		30
				Notes
Asphalt Roadway (SY)	577.8	$	71,355.56	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	400	$	28,080.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	2000	$	23,400.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$	184,253.33	*Accounts for Utilities and Drainage*
Construction Contingency	20%	$	61,417.78	
Construction Sub Total		$	368,506.67	
Design Services	20%	$	73,701.33	
Total Estimated Project Cost		$	442,208.00	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

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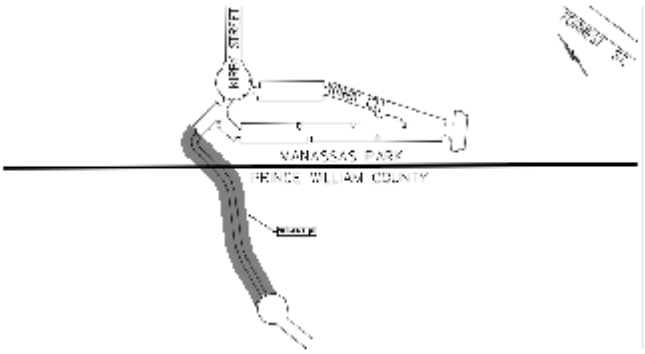
City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 2

Summary: Segment 2 consists of approximately 600 linear feet of new roadway construction connecting from North to South Kirby Street in the City of Manassas Park to Kirby Street in the City of Manassas.



Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #2 Road Cost Estimate			
Total Linear Feet of Road Section (LF) =	**600**	**Width (FT) =**	**30**
			Notes
Asphalt Roadway (SY)	1733.3	$ 214,066.67	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	1200	$ 84,240.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	6000	$ 70,200.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	**1.5**	$ 552,760.00	*Accounts for Utilities and Drainage*
Construction Contingency	**20%**	$ 184,253.33	
Construction Sub Total		$ 1,105,520.00	
Design Services	**20%**	$ 221,104.00	
Total Estimated Project Cost		$ 1,326,624.00	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 3

Summary: Segment 3 consists of approximately 920 linear feet of new roadway construction connecting from North to South Old Centreville Road to the Intersection of Manassas Drive and Mathis Avenue in the City of Manassas Park.

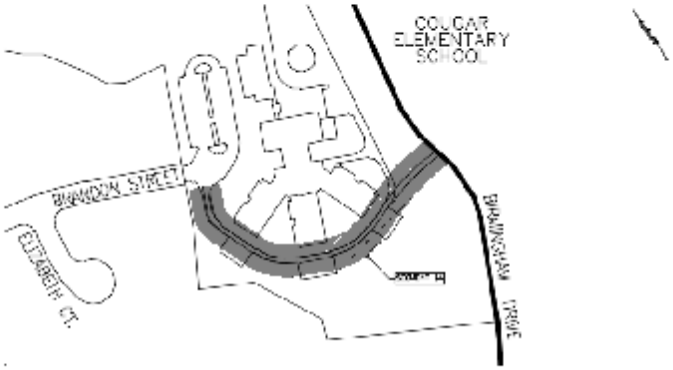
Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #3 Road Cost Estimate			
Total Linear Feet of Road Section (LF) =	**920**	**Width (FT) =**	**30**
			Notes
Asphalt Roadway (SY)	2657.8	$ 328,235.56	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	1840	$ 129,168.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	9200	$ 107,640.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$ 847,565.33	*Accounts for Utilities and Drainage*
Construction Contingency	**20%**	$ 282,521.78	
Construction Sub Total		$ 1,695,130.67	
Design Services	**20%**	$ 339,026.13	
Total Estimated Project Cost		$ 2,034,156.80	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 4

Summary: Segment 4 consists of approximately 800 linear feet of new roadway construction connecting from West to East Brandon Street to Birmingham Drive in the City of Manassas Park.



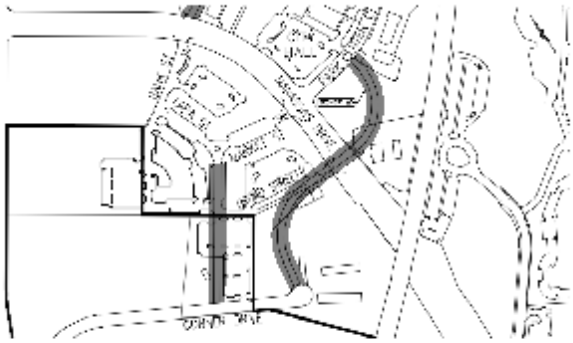
Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #4 Road Cost Estimate				
Total Linear Feet of Road Section (LF) =	800	Width (FT) =		30
				Notes
Asphalt Roadway (SY)	2311.1	$	285,422.22	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	1600	$	112,320.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	8000	$	93,600.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$	737,013.33	*Accounts for Utilities and Drainage*
Construction Contingency	20%	$	245,671.11	
Construction Sub Total		$	1,474,026.67	
Design Services	20%	$	294,805.33	
Total Estimated Project Cost		$	1,768,832.00	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 5

Summary: Segment 5 consists of approximately 1240 linear feet of new roadway construction connecting from North to South Park Center Court to Conner Drive and 630 linear feet connecting Market Street to Conner Drive in the City of Manassas Park.



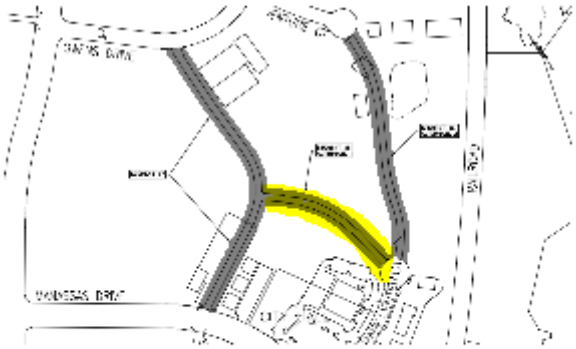
Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #5 Road Cost Estimate			
Total Linear Feet of Road Section (LF) =	**1870**	**Width (FT) =**	**30**
			Notes
Asphalt Roadway (SY)	5402.2	$ 667,174.44	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	3740	$ 262,548.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	18700	$ 218,790.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$ 1,722,768.67	*Accounts for Utilities and Drainage*
Construction Contingency	**20%**	$ 574,256.22	
Construction Sub Total		$ 3,445,537.33	
Design Services	**20%**	$ 689,107.47	
Total Estimated Project Cost		$ 4,134,644.80	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 6 Alternate 1

Summary: Segment 6 Alternate 1 consists of approximately 660 linear feet of new roadway construction connecting from North to South Park the road proposed in this Comprehensive Planning effort as "Segment 7" and Park Center Court.



Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #6 Alternate 1 Road Cost Estimate				
Total Linear Feet of Road Section (LF) =	660	Width (FT) =		30
				Notes
Asphalt Roadway (SY)	1906.7	$	235,473.33	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	1320	$	92,664.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	6600	$	77,220.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$	608,036.00	*Accounts for Utilities and Drainage*
Construction Contingency	20%	$	202,678.67	
Construction Sub Total		$	1,216,072.00	
Design Services	20%	$	243,214.40	
Total Estimated Project Cost		$	1,459,286.40	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 6 Alternate 2

Summary: Segment 6 Alternate 2 consists of approximately 1070 linear feet of new roadway construction connecting from North to South Venture Court and Park Center Court in the City of Manassas Park.

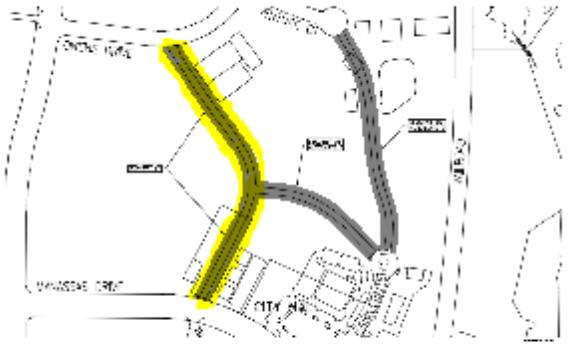
Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #6 Alternate 2 Road Cost Estimate			
Total Linear Feet of Road Section (LF) =	1070	Width (FT) =	30
			Notes
Asphalt Roadway (SY)	3091.1	$ 381,752.22	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	2140	$ 150,228.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	10700	$ 125,190.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$ 985,755.33	*Accounts for Utilities and Drainage*
Construction Contingency	20%	$ 328,585.11	
Construction Sub Total		$ 1,971,510.67	
Design Services	20%	$ 394,302.13	
Total Estimated Project Cost		$ 2,365,812.80	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.

City of Manassas Park Future Roadway Cost Estimate for Comprehensive Planning - Segment 7

Summary: Segment 7 consists of approximately 1370 linear feet of new roadway construction connecting from North to South Owens Drive and Manassas Drive in the City of Manassas Park.



Cost Estimate Considerations: Unit construction costs for roadway section, curb and gutter, and 5-foot-wide sidewalk construction on both sides of the proposed were developed using current industry costs seen on VDOT projects similar in scope and location. A multiplier of 1.5 was applied to the sum of the roadway, curb and gutter, and sidewalk costs to account for anticipated utility and storm drainage infrastructure associated with the project. A construction contingency factor of 20% is included for unanticipated conditions during construction. Design services are estimated to be 20% of the total project cost. The estimate excludes any costs associated with land acquisition and demolition.

Segment #7 Road Cost Estimate				
Total Linear Feet of Road Section (LF) =	**1370**	**Width (FT) =**		**30**
				Notes
Asphalt Roadway (SY)	3957.8	$	488,785.56	*Assumes Standard Roadway (1.5" surface, 3" Base, 6" Stone)*
Concrete Curb/Gutter (LF)	2740	$	192,348.00	*Assumes Standard CG-6*
Concrete Sidewalk (SF)	13700	$	160,290.00	*Assume Standard Sidewalk (4" Concrete, 4" stone)*
Utility Infrastructure Factor	1.5	$	1,262,135.33	*Accounts for Utilities and Drainage*
Construction Contingency	**20%**	$	420,711.78	
Construction Sub Total		$	2,524,270.67	
Design Services	**20%**	$	504,854.13	
Total Estimated Project Cost		$	3,029,124.80	

Disclaimer: The estimate being provided herein is based on Transportation Master Plan documentation and is a preliminary estimate to be used for planning and budget purposes only. Site specific exploration and design will be required in order to refine the estimate.