

Section 1: Summary of Findings

Introduction

In December of 2013, the Howard County Department of Planning and Zoning hired Toole Design Group (the “Consultant”) to assess the feasibility of linking Downtown Columbia to the Patuxent Branch Trail by exploring and evaluating several alternative alignments for a shared-use pathway. The scope of work included an assessment of the opportunities and constraints of each route alternative, including (but not limited to) environmental impacts, directness/desirability of route, feasibility and order-of-magnitude cost. This feasibility study was initiated in response to language in Section 5 of the remarks section of Howard County capital project T7107:

5. The feasibility study shall evaluate:

- a. potential alternatives for the alignment of the pathway, including but not limited to using BGE right of way that runs from Route 29 just north of Broken Land Parkway to just south of Oakland Mills Road before connecting with existing pathways that feed directly into the Patuxent Branch Trail*
- b. the impact of each proposed alignment on surrounding neighborhood and community including the effects the project will have on flooding*
- c. the relationship of this pathway to the Downtown-Oakland Mills bridge (Project B3863)*

Background

Downtown Columbia is currently being redeveloped into a mixed use center. An important element of downtown Columbia’s transformation are the efforts, some of which are already underway, to ensure that downtown can serve all users by making downtown a connected highly walkable and bicycle friendly town center. Howard County is also in the final stages of finalizing a Bicycle Master Plan, which reinforces the need to improve non-motorized access to Downtown Columbia. Columbia Association (CA) recently completed and approved the *Active Transportation Action Agenda*, which recommended creating a shared-use path connection between Downtown Columbia and the Patuxent Branch Trail, a regional trail that extends from south-central Columbia and Lake Elkhorn to Savage. Through these efforts, there has been a growing interest and demand for a comfortable and convenient connection between Downtown Columbia and the Patuxent Branch Trail, as well as other destinations in south-central Columbia.

Summary of Findings

A total of 19 alternative routes connecting Downtown Columbia to the Patuxent Branch Trail (see the Segment Alternatives Map located on Page 4). The routes were divided into five categories:

- A Routes (primarily on-road segments through Allview Estates)
- B Routes (segments along Broken Land Parkway)
- C Routes (segments along the existing sewer line corridor)
- D Routes (segments along existing pathways to the east of Broken Land Parkway)
- X Routes (various segments throughout the study area that were eliminated from further consideration due to physical, connectivity and environmental constraints)

The study makes the following findings related to alignments, phasing and additional actions. A description of each segment and a summary of the findings is presented in Table 1.1 on Page 3.

A more detailed discussion of the opportunities and constraints of each route are provided later in this report and in the Segment Alternatives Matrix in Section 3 on Pages 16-19.

Route Segment Summary

A detailed summary of each route series is provided in the descriptions below.

A Routes (A1, A2): Route Alignment on Local Streets West of Little Patuxent River

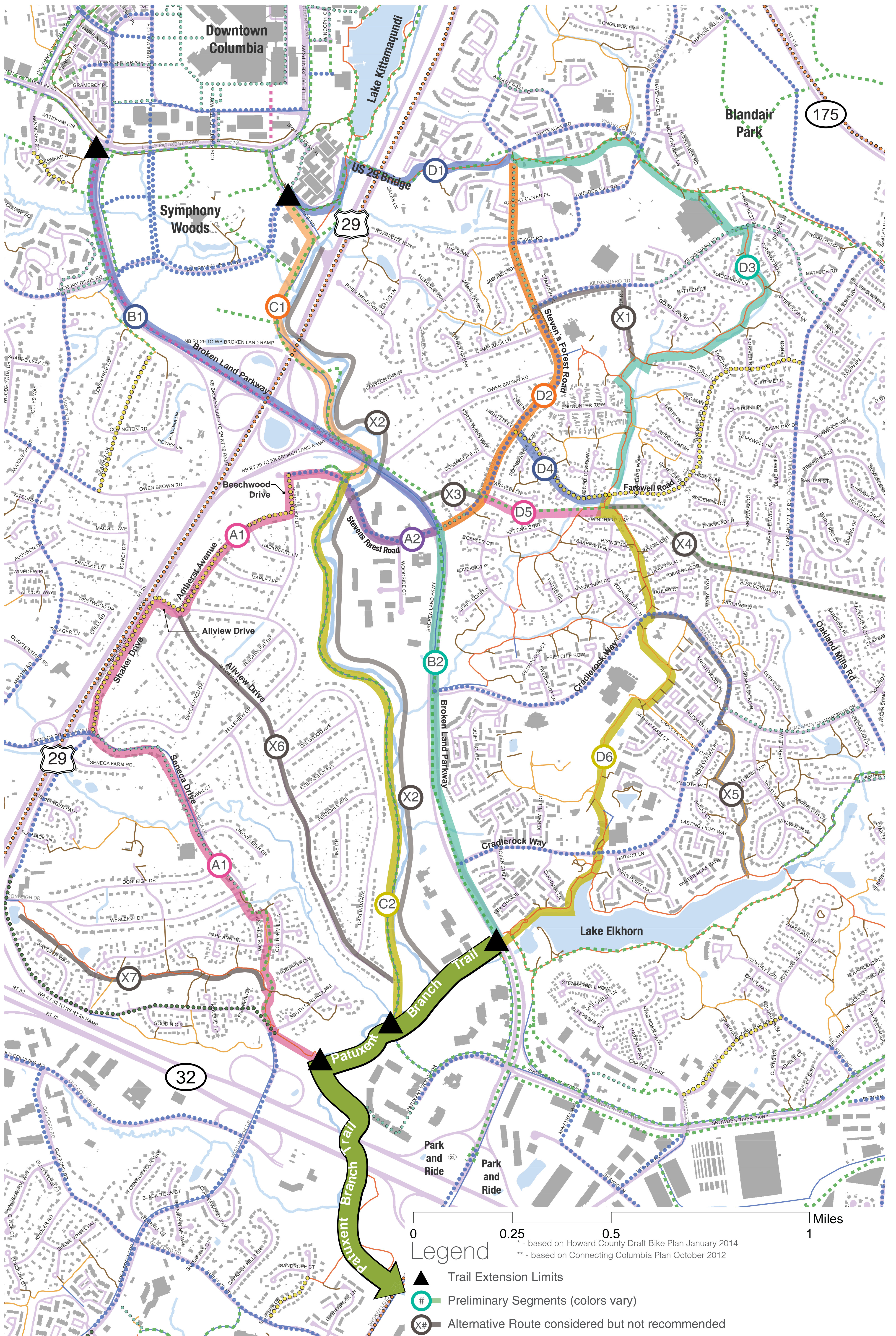
The A1 and A2 routes would connect Broken Land Parkway to the Patuxent Branch Trail via a series of on-road bikeways through Allview Estates and connecting to adjacent areas. This route would require a connection to downtown either via the B1 or C1 route.

The A1 route was determined to be less desirable because:

- It is .7 miles longer than the C2 route with steeper grades, making it longer and more difficult for casual cyclists. Therefore it does not meet the objectives of providing a comfortable and convenient connection between Downtown Columbia and the Patuxent Branch Trail.
- There are no existing sidewalks along the whole length of the A1 route. Therefore this route would not be able to safely serve pedestrians.
- The number of street crossings will increase the interactions and conflicts between motor vehicles, pedestrians and bicyclists. Therefore this route will be reducing the safety of the connection and the comfort of users.

Table 1.1 Summary of Feasible Alternatives

Segment Alternative	Description	Feasibility	Miles	Preliminary Cost	Finding
Phase 1	<i>The study recommends A2 and C1 as a phase 1 route</i>				
A2	<i>On-road bikeway connection along Stevens Forest Road from Broken Land Parkway to the intersection with the existing sewer line corridor</i>	<i>Recommended Alternative; provides a key connection to the bike lanes on Stevens Forest Road, regardless of whether B2 or the C2 Routes are chosen.</i>	0.40	\$40,000	<i>Recommended Alternative</i>
C1	<i>Shared-use pathway along the existing sewer line corridor between Downtown Columbia and Stevens Forest Road; west of the Little Patuxent River</i>	<i>Recommended Alternative; most desirable route due to its direct routing, relatively flat topography, minimal intersection crossings</i>	0.87	\$749,000	<i>Recommended Alternative</i>
Phase 2	<i>B2 or C2 could be considered as part of a phase 2 route with an alignment based on the outcomes of future studies and stakeholder discussions.</i>				
B2	<i>Shared-use pathway along Broken Land Parkway from Stevens Forest Road to the Patuxent Branch Trail</i>	<i>Feasible Option – Further Study Required; provides a direct route, however could require significant reconfiguration of Broken Land Parkway. Traffic analysis needed.</i>	1.10	\$1,782,000	<i>Feasible Option-Further Study Required</i>
C2	<i>Shared-use pathway along the sewer line corridor from Stevens Forest Road to the Patuxent Branch Trail; west of the Little Patuxent River</i>	<i>Feasible Option – Further Community Outreach Required; provides direct route, relatively flat topography, minimal crossings provide a direct, car-free route, however more discussion with stakeholders in the community is needed.</i>	1.53	\$1,621,000	<i>Feasible Option-Further Community Outreach Required</i>
A1	On-road bikeway along Seneca Drive, Shaker Drive, Allview Drive, Amherst Avenue, Beechwood Drive, and Stevens Forest Road within Allview Estates	Feasible; less desirable due to a lack of sidewalks, indirect routing, and multiple intersection crossings	2.22	\$364,000	Feasible; less desirable
B1	Shared-use pathway along Broken Land Parkway from Little Patuxent Pkwy to Stevens Forest Road	Feasible; less desirable due to multiple intersection crossings and the presence of high speed motor vehicles, decreasing user comfort	1.42	\$1,481,000	Feasible; less desirable
D Series Routes	Utilization of existing pathways and the future Downtown Columbia pathway from South Entrance Rd to Stevens Forest Road; utilizing the bicycle and pedestrian bridge over US 29 and a combination of pathway routes in the Oakland Mills and Owen Brown neighborhoods.	Feasible; less desirable due to indirect routing and multiple intersection crossings	3.94	\$1,992,00	Feasible; less desirable
X Series Routes	Refer to descriptions of each route in Section 3 and the Segment Alternatives Map on page 4.				



Patuxent Branch Trail Extension Study Segment Alternatives

October 2014

0 0.25 0.5 1 Miles

Legend

- ▲ Trail Extension Limits
- Preliminary Segments (colors vary)
- ⊗ Alternative Route considered but not recommended

<p>On Road Recommendations*</p> <ul style="list-style-type: none"> ●●●● Neighborhood Green Ways ●●●● Bike Lane — Colored Bike Lane — Paved and Striped Shoulder ●●●● Shared Roadway ●●●● Sharrow 	<p>Off Road Recommendations*</p> <ul style="list-style-type: none"> — Cycletrack 2 way — Shared-Use Path <p>Existing HC and CA Trails**</p> <ul style="list-style-type: none"> — Primary — Secondary — Tertiary <p>Recommended Pathways**</p> <ul style="list-style-type: none"> — Primary/Secondary
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* based on Howard County Draft Bike Plan January 2014
 ** based on Connecting Columbia Plan October 2012



The A2 route will be recommended, regardless of whether the B2 route or the C2 route is chosen, because it provides a key connection to Broken Land Parkway and the bike lanes on Stevens Forest Road.

B Routes (B1, B2): Route Alignment along Broken Land Parkway

The B1 and B2 routes would connect Downtown Columbia to the Patuxent Branch Trail via a center median path on the B1 section and a shared-use path on the B2 section along Broken Land Parkway. The B1 route is less desirable than the C1 Route because users would be negatively impacted by high speeds and high volumes of traffic along Broken Land Parkway. The negative impacts also include several wide road crossings which would result in conflicts between motor vehicles, pedestrians and bicyclists.

The feasibility of the B2 route is dependent on being able to either remove a lane of traffic from Broken Land Parkway or purchase additional right-of-way in order to gain the necessary land for a shared-use pathway. More study would be necessary to determine if this option is feasible.

C Routes (C1, C2): Route Alignment along Sewer Line Corridor

The C1 and C2 routes would connect Downtown Columbia to the Patuxent Branch Trail via an off-road pathway located within the existing sewer line corridor. The C1 route is a recommended alternative because it would provide a safer and more direct connection than the B1 route.

The C1 section is recommended for the following reasons:

- This route provides a comfortable and convenient connection between Downtown Columbia and the Patuxent Branch Trail.
- This route is relatively flat and has only one roadway crossing, making bicycling and walking easier, safer and more comfortable.
- The route would provide several hundred homes in Allview Estates, which are currently isolated by three major roadways (Broken Land Parkway, RT 29 and RT 32), with a direct and off-road path connection to Downtown Columbia. This connection would provide access to the new Whole Foods Market, the mall, the library and other cultural attractions. This route would include under-crossings of RT 29 and RT 32, allowing users to safely bypass these roads. Both of these under-crossings would meet the minimum clearance requirements for a shared-use path, as defined by the AASHTO Guide for the Development of Bicycle Facilities.
- The route is feasible from an environmental standpoint. It should be designed to ensure a no-rise condition for the Little Patuxent River, meaning that the construction of the trail will not increase flood heights. Similar to the downstream portion of the river, this section overflows its banks during significant rainfall events. Existing sections of the Patuxent Branch Trail to the south are located within the floodway, and have been subjected to the river have not experienced significant maintenance impacts from flooding. As with all pathways and trails, maintenance will be necessary for the upkeep, which would include debris removal, mowing edge areas, trail sweeping, etc.

- The route is located in a corridor that has already experienced significant grading and leveling work, undertaken as part of the construction of the sewer line.
- The construction cost for this route is less than the next most feasible alternative, which is the B1 route.

The C2 route is a feasible option based on the technical analysis undertaken as part of this study. As with the B2 route, it could also provide a direct connection to the Patuxent Branch Trail and has the added benefit of being located in a corridor separated from motor vehicle traffic. This route would be within view of approximately 10 homes in Allview Estates (see discussion on page 7) and some Allview residents and community members have expressed concerns about this route. To further discuss, understand and address these concerns, it is recommended that additional engagement occur with homeowners, potential pathway users, landowners, and other stakeholders prior to pursuing this route.

D Routes (D1, D2, D3, D4, D5, D6): Route Alignments on Existing Pathways - East of Broken Land Parkway

The D series of routes would connect Downtown Columbia to the Patuxent Branch Trail via the Downtown-Oakland Mills Pedestrian Bridge and connect to the existing network of pathways that extend through the neighborhoods on the eastern side of Broken Land Parkway.

The D series were determined not to be desirable for the following reasons:

- The D routes are circuitous, and when combined to form a connection to the existing Patuxent Branch Trail, they represent a significantly longer distance than either the B or C routes which are both more direct (4 miles via the D routes, versus 2.5 miles for the B or C routes).
- The routes are characterized by significant grades, making the route more difficult and slower for casual cyclists. It therefore does not meet the objectives of providing a comfortable and convenient connection between Downtown Columbia and the Patuxent Branch Trail.
- All the D section routes would entail numerous road and intersection crossings, including unmarked and unsigned mid-block crossings. This will result in more conflicts between motor vehicles, pedestrians and bicyclists, therefore reducing safety and comfort of users.

X Routes

A number of additional routes and connections were evaluated, including the BGE right-of-way that runs from RT 29 just north of Broken Land Parkway to just south of Oakland Mills Road. Portions of the BGE right-of-way was determined not to be feasible due to the significant steep topography of the segments and because the segments would lead users away from the Patuxent Branch Trail. One segment of the BGE right-of-way, shown as Segment D5, was considered feasible from a topographical perspective, but did not meet the objective of being part of a direct connection to the Patuxent Branch Trail. The segment along the east side of the Little Patuxent River faces significant topographical constraints and would also require extensive woodland clearing. A discussion of these routes are included in this report on page 21.

Community Impact Analysis

Access

A Pathway User Preference Survey conducted as a part of CA's *Active Transportation Action Agenda* supports the need for convenient, direct bicycling and walking connections. The construction of the proposed C1/A2 pathway route along the sewer line corridor and then connecting over to Broken Land Parkway along Stevens Forest Road would have beneficial impacts for both current and future bicyclists and pedestrians. The significant impact would be a direct connection from and to Downtown Columbia that is protected from car traffic. This is a connection that has been repeatedly requested by stakeholders participating in the *Active Transportation Action Agenda* as well as Howard County's Bicycle Master Plan. Currently, people walk along the median of Broken Land Parkway to access Downtown because there are no sidewalks through the RT 29 interchange.

The C1/A2 route would provide several hundred homes currently isolated by major roadways (Broken Land Parkway, RT 29 and RT 32) with a direct, off-road connection to the new Whole Foods Market and Town Center. In addition to ultimately linking to the Patuxent Branch Trail, this route could also provide a connection to other destinations in south-central Columbia, potentially including the Park-and-Ride lot at the intersection of Broken Land Parkway and RT 32. However, additional pathway segments would be needed to complete this connection.

Privacy

One concern that is typical for proposed shared-use paths is the potential loss of privacy in areas where shared-use paths are located in close proximity to adjacent homes. Historically, this has been less of a concern in Columbia, where much of the 94-mile pathway system is located directly adjacent to single-family homes, townhouses, apartments, and businesses. However, this concern has been raised by some residents of Allview Estates about the C2 route alignment. The route extends along property owned by CA, which granted Howard County an easement along this property for the construction and maintenance of public improvements, which included the sanitary sewer project. This route is within view of the backyards of approximately 10 homes in Allview Estates. The distance between the proposed pathway location and other adjacent homes ranges from approximately 50 to 365 feet. In most cases, the steep change in topography between the Allview Estates community and the Little Patuxent River/sewer line corridor places homes at a significantly higher elevation; thus creating a visual and physical barrier between the homeowners and the view of the sewer line corridor and the potential pathway.

In a few cases, some landowners appear to have encroached onto CA property along the C2 route, including erecting structures and "extending" a lawn onto CA property. It appears that one landowner has built a private basketball court on CA property.

The BGE right-of-way alignment also runs adjacent to residential areas and back yards; therefore it is possible that the same concerns would exist for that route.

Automobile Traffic Impacts

The only proposed route segment that would have the potential to significantly impact automobile traffic is the B2 route along Broken Land Parkway. Analysis of the existing roadright-of-way determined there is insufficient right-of-way adjacent to the existing roadway to fully accommodate a 10-foot wide path with a 5-foot wide buffer between the path and the roadway. These are the minimum dimensions required for a two-directional shared-use path as detailed in the AASHTO Guide for the Development of Bicycle Facilities. The B2 segment follows the alignment of Broken Land Parkway, a road characterized by six car travel lanes with an ADT of approximately 20,000 to 30,000 vehicles per day. The volume of traffic could be accommodated on a four lane road, particularly given the distance between intersections on this portion of Broken Land Parkway. Furthermore, safety improvements are needed along this corridor. While 85th percentile speeds are currently unknown, anecdotal information suggests that speeding is an issue on this road. The current sidewalks on the east side of the road are narrow and generally non-compliant with current width requirements and are directly adjacent to the road. Plans are under consideration to also provide better transit service and identify a high quality transit option from Downtown Columbia, park and ride lots, employment centers and Anne Arundel County using the Broken Land Parkway corridor. This further reinforces the need to provide better pedestrian and bicycle access, as riders will need alternatives to access transit stops along the length of this route.

There are a series of solutions that can be explored to repurpose roadway space to provide more comfortable and safe accommodations for pedestrians and bicyclists. Given the width of the median, as well as the extra capacity on Broken Land Parkway, it could be possible to accommodate a shared-use path, as well as and transit vehicles, in this corridor. Potential solutions could be; implementing strategies to more effectively align the capacity of the roadway to automobile traffic volumes; or securing additional ROW. These would require high levels of public engagement, traffic analysis and engagement with landowners.

The remainder of this report provides more details regarding the analysis that resulted in the recommendations discussed in this summary.