

6 Concepts for Druid Park Lake Drive

Using the design considerations described in Section IV, the Project Team developed three concepts for Druid Park Lake Drive. These concepts are characterized according to the number of lanes incorporated into their design:

1. **Single Lane Concept:** One lane in each direction
2. **Hybrid Concept:** One lane in the eastbound direction and two lanes in the westbound direction
3. **Two Lane Concept:** Two lanes in both directions

While the concepts illustrate design choices for end-to-end alignments, individual design elements can be interchanged between concepts based on the preferences of Baltimore City DOT, the results of public engagement and further analysis. The concepts each provide distinct proposals for the number of travel lanes, configuration of intersections, and treatment of entrances into Druid Park Lake Drive. However, they have several common elements to emphasize pedestrian, bicycle and ADA safety and access on the corridor.

Common Elements in All Concepts

- ▶ Shared-use path on the edge of Druid Hill Park
- ▶ Two-way cycle track on non-park side of roadway
- ▶ Green, tree-lined buffers separating the cycle track and shared-use path from traffic
- ▶ ADA compliant sidewalks
- ▶ ADA ramps aligned with crosswalks
- ▶ New pedestrian crossings

- ▶ Parallel bicycle and pedestrian crossing markings

Figure 33: Overview of design elements common to all concepts



Each concept has a table highlighting the primary characteristics of the concept design, including number of lanes, type of intersection, pedestrian infrastructure, bicycle infrastructure, transit infrastructure, design choices made to highlight historic elements and return land to Druid Hill Park, conversion of one-way streets to two-way streets and additional options associated with the concept. Following the table are a typical section image, renderings of select intersections with explanations of design choices, and an illustration of the end-to-end concept on the entire corridor.

Single-Lane Concept

The single-lane concept has one lane in each direction, minimizing vehicular travel lanes and maximizing the amount of roadway space returned to Druid Hill Park. This option provides traffic calming benefits and minimizes crossing distances for pedestrians, cyclists and people using mobility devices.

Table 6: Single-Lane Concept Characteristics

Single Lane Concept Overview	
Characteristic	Description
Number of lanes	<ul style="list-style-type: none"> ▶ One lane in each direction.
Proposed intersection types	<ul style="list-style-type: none"> ▶ Single lane roundabouts used at Madison Ave., Gwynns Falls Pkwy, Liberty Heights Ave. provide traffic calming effects and multiple visual interests along the corridor. ▶ T-intersections with corner islands at Lakeview Ave., Brookfield Ave., Linden Ave. and Eutaw Pl. ▶ Mt. Royal Ave. intersection is closed to Druid Park Lake Drive. ▶ Removes left turn movements from DPLD to Fulton Avenue.
Pedestrian infrastructure	<ul style="list-style-type: none"> ▶ Continuous, 12' ADA compliant sidewalk on neighborhood side of the corridor. ▶ New pedestrian crossings added at Brookfield Ave., Eutaw Pl., Whittier Ave., Ruskin Ave., Ocala Ave., and Chowan Ave. ▶ The pedestrian crossing at Brookfield Ave. has an ADA ramp up the hill to Druid Hill Park. ▶ Continuous shared-use path on the park side of the corridor.

Single Lane Concept Overview	
Characteristic	Description
Bicycle infrastructure	<ul style="list-style-type: none"> ▶ Two-way, grade-separated cycle track with 6' lanes and 8' green buffer separate cyclists from traffic. ▶ Green pavement markings at intersections separate bicycle crossings from pedestrian crosswalk and improve visibility of cyclists.
Transit infrastructure	<ul style="list-style-type: none"> ▶ Dedicated bus lanes on Reisterstown Rd.
Incorporating historic features into the streetscape	<ul style="list-style-type: none"> ▶ A roundabout at Madison Ave. provides a landscaped foreground for the historic archway when viewing from the park. ▶ The landscaped roundabout becomes one of the focal points when traveling on Druid Park Lake Drive and enhances the streetscape.
Returning land to Druid Hill Park	<ul style="list-style-type: none"> ▶ The segment of Druid Park Lake Drive from Liberty Heights Ave. to Anoka Ave. is removed and returned to the park. Traffic heading northbound is redirected down Liberty Heights Ave. and north on Reisterstown Rd. ▶ Up to four existing travel lanes are returned to Druid Hill Park. ▶ Option 1 returns the median space on Auchentoroly Terrace to Druid Hill Park.
Two-way street conversions	<ul style="list-style-type: none"> ▶ Eutaw Pl., Madison Ave. and Druid Hill Ave. are converted to two-way streets.
Additional Options	<ul style="list-style-type: none"> ▶ An additional option for Concept A (Option 1) shifts all travel lanes to the west side of the median between Fulton Ave. and Liberty Heights Ave. to return all space east of the median space to Druid Hill Park.

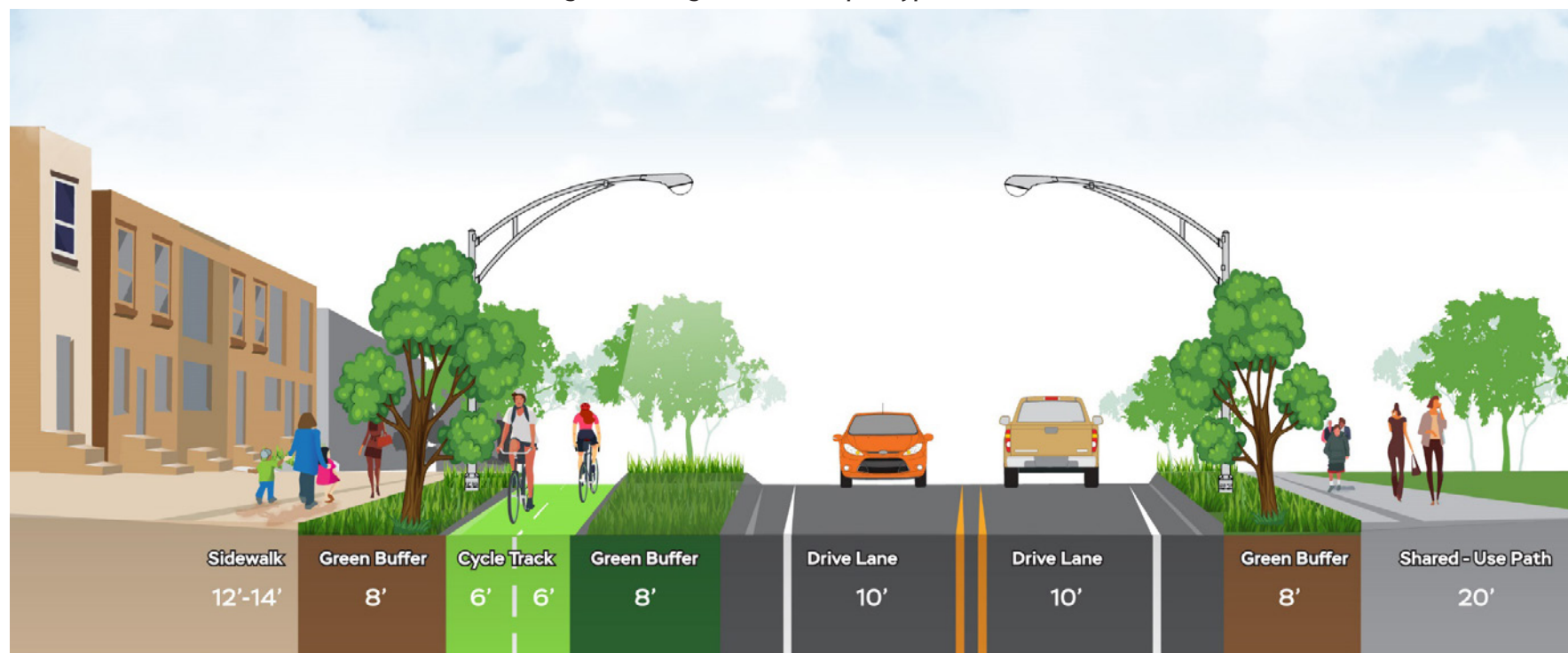
Single Lane Concept Overview	
Characteristic	Description
Streetscape	<ul style="list-style-type: none"> ▶ Preserve the parkway appearance and ambiance. ▶ Provide a safer, more relaxed, and more enjoyable driving experience. ▶ Amplify the feel of a neighborhood street in a park setting with narrower street by transforming street paving into landscaped buffer strips on both sides of two-lane street. ▶ Enhance existing parkway characteristics of the corridor. ▶ Incorporate planting medians into Reisterstown Rd. south of Park Circle.

Typical Section

The typical section in **Figure 34** shows the predominant layout of the single lane option. The layout includes one 10-foot lane per direction, an 8-foot green buffer on either side of the travel lanes to separate the 20-foot shared-use path and 12-foot cycle track from traffic. The 12-to-14-foot sidewalk is separated from the cycle track with an 8-foot green buffer.

Some variation from the typical section occurs in segments of the corridor that have existing vegetated medians. The renderings in **Figures 35-37** show how the single-lane concept would be configured on several portions of the corridor.

Figure 34: Single Lane Concept - Typical Section



Renderings

The renderings in **Figures 35-37** illustrate the single-lane concept for Druid Park Lake Drive at several locations on the corridor:

- The segment between Fulton Ave. and Gwynns Falls Pkwy. (**Figure 35**)
- The Madison Ave. intersection (**Figure 36**)
- The Eutaw Place intersection (**Figure 37**)

The rendering in **Figure 35** shows the single-lane concept between Fulton Ave. and Gwynns Falls Pkwy., including one lane in each direction separated by the existing green median, parking in front of homes, a two-way cycle track separated from the roadway by an 8-foot green buffer, and an expanded sidewalk with ADA ramps.

Figure 36 shows the single-lane concept at the Madison Ave. intersection, which includes a one-lane roundabout with a protected bicycle lane and

sidewalk around the outside of the roundabout. Pedestrian and bicycle crossings are included on all four lanes of the intersection and are set back from the entrance of the roundabout to maximize visibility for pedestrians and cyclists and minimize crossing distance. A pedestrian refuge island is added to the legs of the roundabout to allow pedestrians a place to pause while crossing.

Figure 37 illustrates the single-lane concept at the Eutaw Place intersection, which is converted to a T-intersection to improve sightlines for all intersection users. Pedestrian and bicycle crossings are added to all legs of the intersection to provide safe connections from the neighborhood to the shared-use path in Druid Hill Park. Pedestrian-scale lighting is added to the shared-use path and sidewalk for safety and visibility at night. Eutaw Place is converted to two-way vehicular traffic to improve connectivity and calm traffic by narrowing the roadway and introducing “friction” of oncoming traffic to reduce vehicular speeds.

Figure 35: Single Lane Concept- Druid Park Lake Drive between Fulton Ave. and Gwynns Falls Ave.



Figure 36: Single Lane Concept - Madison Ave. Intersection

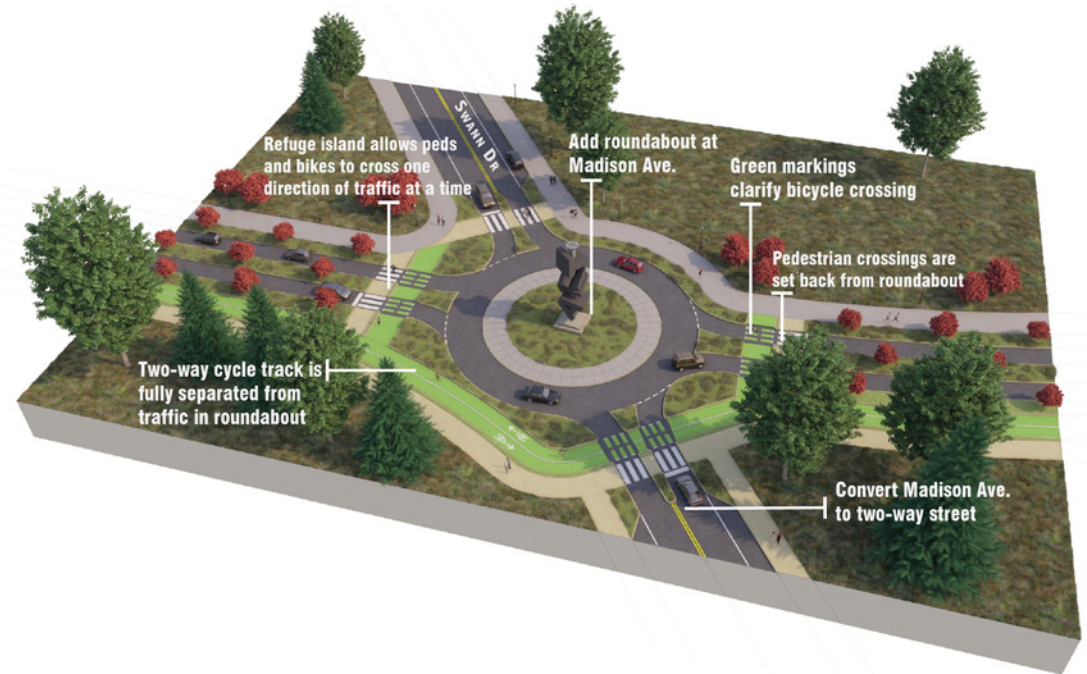


Figure 37: Single Lane Concept: End-to-End

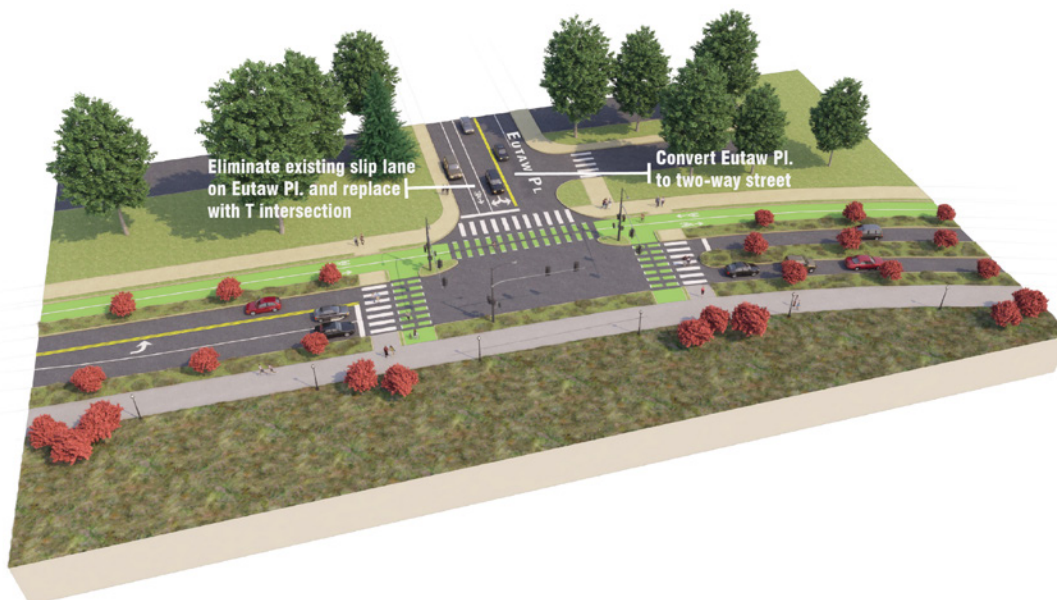


Figure 38 shows an end-to-end aerial view of the proposed elements of the single-lane concept. As shown in this image, the Madison Ave., Gwynns Falls Pkwy, and Liberty Heights Ave. intersections are converted to one-lane roundabouts. The segment of Druid Park Lake Drive from Liberty Heights Ave. to Reisterstown Rd. is fully removed and traffic is redirected down Liberty Heights Ave. The Mt. Royal Ave. intersection is permanently closed to Druid Park Lake Drive and travel lanes coming off of the I-83 ramps merge into one lane before reaching Brookfield Ave. McCulloh St. is closed to traffic north of Cloverdale Rd. to reduce the number of intersections clustered in this area. The Fulton Ave. intersection is simplified to only allow right turns from Fulton Ave. onto Druid Park Lake Drive, but restricts left turns. Druid Hill Ave. is converted to a two-way street with a turnaround past the Cloverdale Basketball Courts and does not directly connect to Druid Park Lake Drive. Access to Druid Hill Ave. is provided from Cloverdale Rd. and Fulton Ave.

Figure 38: Single Lane Concept: End-to-End



Single Lane Concept – Option A – Shift Both Travel Lanes to One Side of the Median

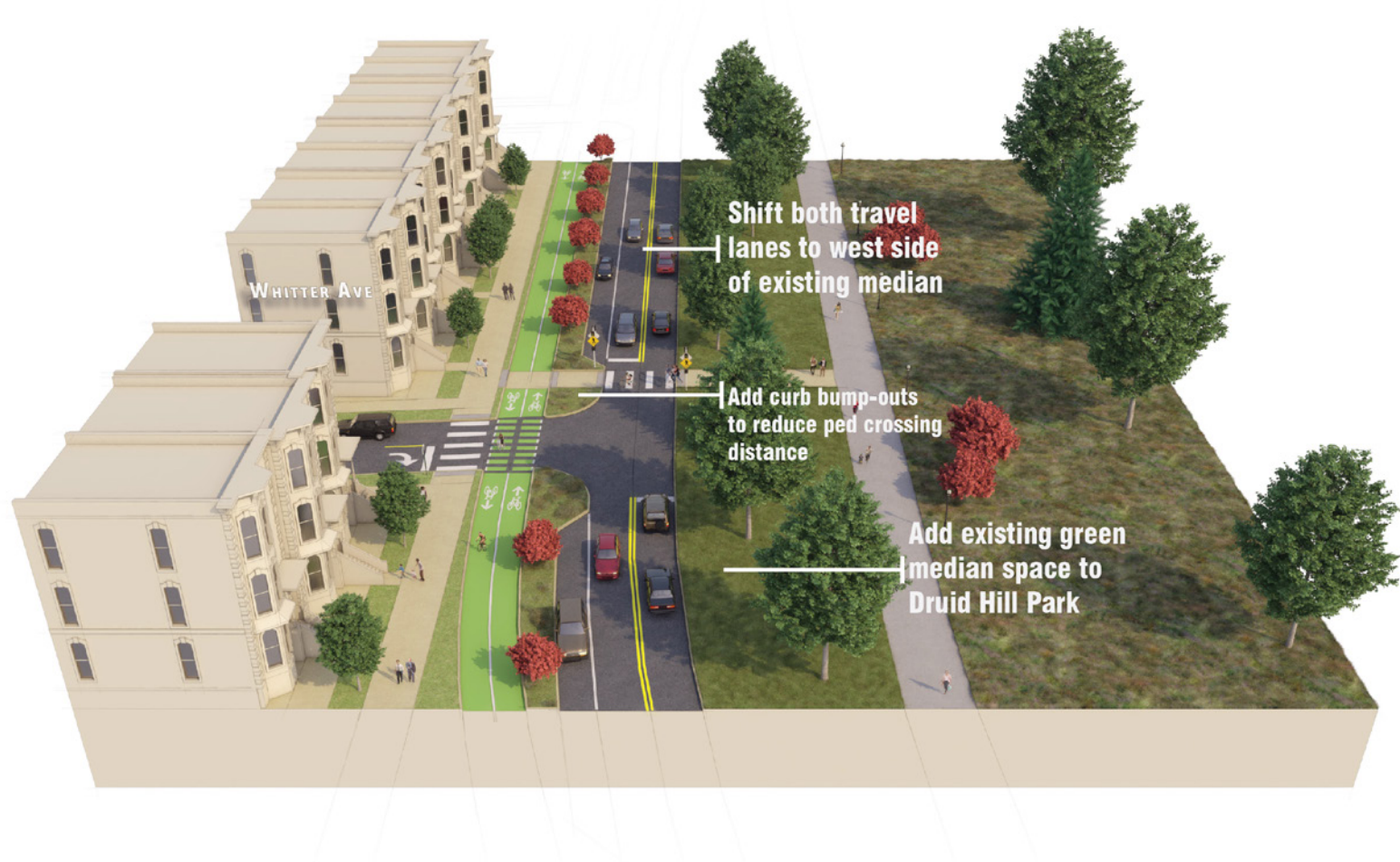
An additional option for the single lane concept is to combine both travel lanes on one side of the existing median and convert the roadway space on the opposite side of the median to park space. This would provide the shortest pedestrian crossing distance, create traffic calming effects, and produce the largest amount of additional green space on the corridor. In this concept, traffic is shifted to the west side of the existing median to keep travel lanes and parking lanes closer to the neighborhood side of the roadway. This also allows for the eastern section of the roadway to be fully integrated into Druid Hill Park. **Figure 39** shows the configuration of this option and the shading indicates the existing roadway surface that would become green space.

Figure 40 shows a conceptual rendering of this option on the segment from Fulton Ave. to Gwynns Falls Ave. As illustrated in this image, both travel lanes are shifted to the southwest side of the existing median and separated by striping. The roadway still retains a parking lane in front of houses. Bump-outs at the intersections minimize pedestrian and bicycle crossing distance.

Figure 39: Single Lane Concept Option 1 - Shift travel lanes to west side of median



Figure 40: Single Lane Concept, Option 1 - Druid Park Lake Drive Between Fulton Ave. and Gwynns Falls Ave



Hybrid Concept: Two Lanes Westbound and One Lane Eastbound

The hybrid concept includes one lane of eastbound traffic and two lanes of westbound traffic on Druid Park Lake Drive. The configuration of the hybrid concepts reflects lower observed traffic volumes in the eastbound direction and higher volumes in the westbound direction. Vehicular traffic has several options to bypass Druid Park Lake Drive in the eastbound/southbound direction (e.g., Reisterstown Rd., Fulton Ave., Monroe St.), reducing reliance on Druid Park Lake Drive in the eastbound/southbound directions.

Hybrid Concept Overview	
Characteristic	Description
Number of lanes	<ul style="list-style-type: none"> ▶ One lane of traffic heading south to east. ▶ Two lanes of traffic heading west to north Druid Park Lake Drive until Liberty Heights Ave. ▶ One lane in both directions between Liberty Heights Ave. and the second Greenspring Ave. entrance.
Proposed intersection types	<ul style="list-style-type: none"> ▶ Signalized intersections. ▶ Michigan Left at Gwynns Falls Parkway to eliminate left turns and improve pedestrian safety.
Pedestrian infrastructure	<ul style="list-style-type: none"> ▶ Continuous, 12' ADA compliant sidewalk on neighborhood side of the corridor. ▶ New pedestrian crossings added at Brookfield Ave., Eutaw Pl., Whittier Ave., Ruskin Ave., Ocala Ave., and Chowan Ave. ▶ The pedestrian crossing at Brookfield Ave. has an ADA ramp up the hill to Druid Hill Park. ▶ Continuous shared-use path on the park side of the corridor.

Hybrid Concept Overview	
Characteristic	Description
Bicycle infrastructure	<ul style="list-style-type: none"> ▶ Two-way, grade-separated cycle track with 6' lanes and 8' green buffer separating cyclists from traffic. ▶ Green pavement markings at intersections separate bicycle crossings from pedestrian crosswalk and improve visibility of cyclists.
Transit infrastructure	<ul style="list-style-type: none"> ▶ Dedicated bus lanes on Reisterstown Rd.
Incorporating historic features into the streetscape	<ul style="list-style-type: none"> ▶ Madison Ave. terminates at Druid Park Lake Drive to improve intersection spacing and reduce vehicular traffic under historic archway. This presents an opportunity to create a car-free plaza or park around the archway and highlight the presence and appreciation of the historic archway in the community. ▶ McCulloh St. becomes the primary southern entrance to Druid Hill Park.
Returning land to Druid Hill Park	<ul style="list-style-type: none"> ▶ Up to three existing travel lanes are removed and this space is returned to the park.
Two-way street conversions	<ul style="list-style-type: none"> ▶ McCulloh St., Eutaw Place and Druid Hill Ave. are converted to two-way streets.
Additional Options	<ul style="list-style-type: none"> ▶ A local access road is an option for the Achenoroly Terrace portion of the corridor. This would separate low-speed neighborhood traffic from mainline traffic on Druid Park Lake Drive.

Hybrid Concept Overview	
Characteristic	Description
Streetscape	<ul style="list-style-type: none"> ▶ From I-83 to Fulton Ave., improve pedestrian crossings by renovating intersections with hard-scape and landscape enhancements to accommodate safe and direct access to the park from the neighborhood and create a more “urban” feel without roundabouts. ▶ More cohesive streetscape along the corridor. ▶ Maintain parkway ambiance from Fulton Ave. to Liberty Heights Ave. ▶ Provide more repurposed open space by realigning the roadway, removing pavement, and consolidating small pieces of fragmented spaces. ▶ Incorporate planting medians into Reisterstown Rd. south of Park Circle.

Typical Section

The typical section in **Figure 41** shows the predominant layout of the hybrid option. The layout includes one 10-foot lane in the eastbound direction and two 10-foot lanes in the westbound direction, an 8-foot green buffer on either side of the travel lanes to separate the 20-foot shared-use path and 12-foot two-way cycle track from traffic. The 12-to-14-foot sidewalk is separated from the cycle track with an 8-foot green buffer.

Figure 41: Hybrid Concept Typical Section



Renderings

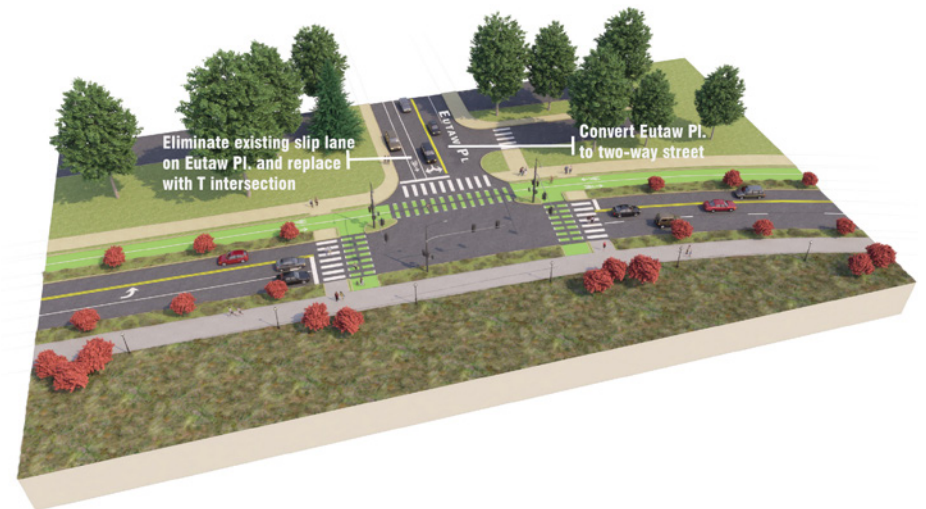
The renderings in **Figures 42-43** illustrate the hybrid concept for Druid Park Lake Drive at two locations on the corridor: the segment between Fulton Ave. and Gwynns Falls Ave. and the Eutaw Place intersection. The rendering in **Figure 42** shows the configuration of the local access road option on Auchentoroly Terrace, which would provide on-street parking next to homes, a contraflow bike lane in the northbound direction and a sharrow for bikes to share the lane with low-speed traffic in southbound direction. The remainder of the corridor outside of this segment has a two-way cycle track.

Figure 42: Hybrid Concept - Druid Park Lake Drive between Fulton Ave. and Gwynns Falls Ave.



As in the single-lane option, the Eutaw Place intersection shown in **Figure 43** is designed as a T-intersection to improve vehicular and pedestrian safety by removing the existing slip ramp at this intersection, improving sight lines, and adding pedestrian and bicycle crossings on all legs of the intersection. In this option, Druid Park Lake Drive is two lanes in the westbound direction and one lane in the eastbound direction. Eutaw Place is converted to two-way vehicular traffic to improve connectivity and calm traffic by narrowing the roadway and introducing “friction” of oncoming traffic to reduce vehicular speeds.

Figure 43: Hybrid Concept - Eutaw Place Intersection



End-to-End Concept

Figure 44: Hybrid Concept: End-to-End



Figure 44 shows an end-to-end aerial view of the proposed elements of the hybrid concept. As shown in this image, all intersections on Druid Park Lake Drive are traditional signalized intersections, except for the Gwynns Falls Pkwy intersection, which uses a Michigan Left configuration. The Michigan Left would restrict left turns within the intersection and redirect them to a turnaround further down the street, where they would be able to access westbound Gwynns Falls Pkwy. This configuration responds to safety concerns with left turning movements at this intersection. In the hybrid concept, McCulloh St. replaces Madison Ave. as a vehicular entrance to Druid Hill Park, improving spacing between intersections and reducing vehicular traffic under the historic Madison Ave. archway. A pedestrian crossing would still be available at the Madison Ave. intersection to allow pedestrians to continue crossing Druid Park Lake Drive at this location. Druid Hill Ave. is converted to a two-way street with a turnaround past the Cloverdale Basketball Courts and does not directly connect to Druid Park Lake Drive. Access to Druid Hill Ave. is provided from Cloverdale Rd. and Fulton Ave.

Two-Lane Concept

The two-lane concept is characterized by two lanes of eastbound and westbound traffic on Druid Park Lake Drive between Liberty Heights Ave. and Fulton Ave. At the Fulton Ave. intersection, one eastbound lane is dropped and the corridor configuration has only one lane in the eastbound direction and two lanes in the westbound direction between Fulton Ave. and Mt. Royal Ave., mirroring the corridor's existing configuration with the Big Jump shared-use path. This allows southbound traffic to use other routes, such as Fulton Ave., and reflects lower traffic volumes in the eastbound direction on this segment. Like the single-lane and hybrid concepts, the Reisterstown Rd. segment has one vehicular travel lane per direction and dedicated bus lanes. The segment from Park Circle to Greenspring Ave. is reduced to one lane per direction to reflect low traffic volumes.

Two-Lane Concept Overview	
Characteristic	Description
Number of lanes	<ul style="list-style-type: none"> ▶ Two lanes in each direction between Reisterstown Rd. and Fulton Ave. ▶ Two westbound lanes and 1 eastbound lane from Fulton Ave. to I-83 ramp/Mt. Royal Ave. ▶ One travel lane in each direction and dedicated bus lanes on Reisterstown Rd. segment. ▶ One travel lane in each direction from Park Circle to Greenspring Ave.
Proposed intersection types	<ul style="list-style-type: none"> ▶ Traditional signalized intersections. ▶ Two-lane roundabout at Liberty Heights Ave. ▶ Eliminate left turns onto Fulton Avenue from Druid Park Lake Drive
Pedestrian infrastructure	<ul style="list-style-type: none"> ▶ Continuous 12-foot sidewalk on neighborhood side of corridor ▶ 20-foot shared-use path along the park edge
Bicycle infrastructure	<ul style="list-style-type: none"> ▶ Two-way, grade-separated cycle track with 6' lanes and 8' green buffer separating cyclists from traffic.

Two-Lane Concept Overview	
Characteristic	Description
Transit infrastructure	<ul style="list-style-type: none"> ▶ Dedicated bus lanes on Reisterstown Rd.
Incorporating historic features into the streetscape	<ul style="list-style-type: none"> ▶ Madison Ave. is converted to two-way traffic to serve as entryway to the park.
Returning land to Druid Hill Park	<ul style="list-style-type: none"> ▶ Three roadway lanes in the Auchentoroly Terrace portion of the corridor are returned to Druid Hill Park. ▶ To improve intersection spacing, McCulloh St. is removed north of Cloverdale St. and added to green space around the Cloverdale Basketball Courts.
Two-way street conversions	<ul style="list-style-type: none"> ▶ Eutaw Place, Madison Ave., McCulloh St. and Druid Hill Ave. are converted to two-way streets.
Additional Options	<ul style="list-style-type: none"> ▶ A local access road is an option for the Auchentoroly Terrace portion of the corridor. This would separate low-speed neighborhood traffic from mainline traffic on Druid Park Lake Drive.
Streetscape	<ul style="list-style-type: none"> ▶ Hardscape and landscape enhancements for each intersection contribute to the streetscape and create safe, direct and pleasant access to the park. ▶ Planting buffers between travel lanes, bike lanes and sidewalks provide comfort, safety and visual interest for all users. ▶ The conversion of Madison Ave. to two-way traffic reconnects the historic archway directly to the park, returning the archway to its historic role as the park's gateway.

Typical Section

The typical section in **Figure 45** shows the predominant layout of the two-lane option. The layout includes two 10-foot lanes in both directions, an 8-foot green buffer on either side of the travel lanes to separate the

20-foot shared-use path and 12-foot cycle track from traffic. The 12-to-14-foot sidewalk is separated from the cycle track with an 8-foot green buffer.

Figure 45: Two-Lane Concept Typical Section

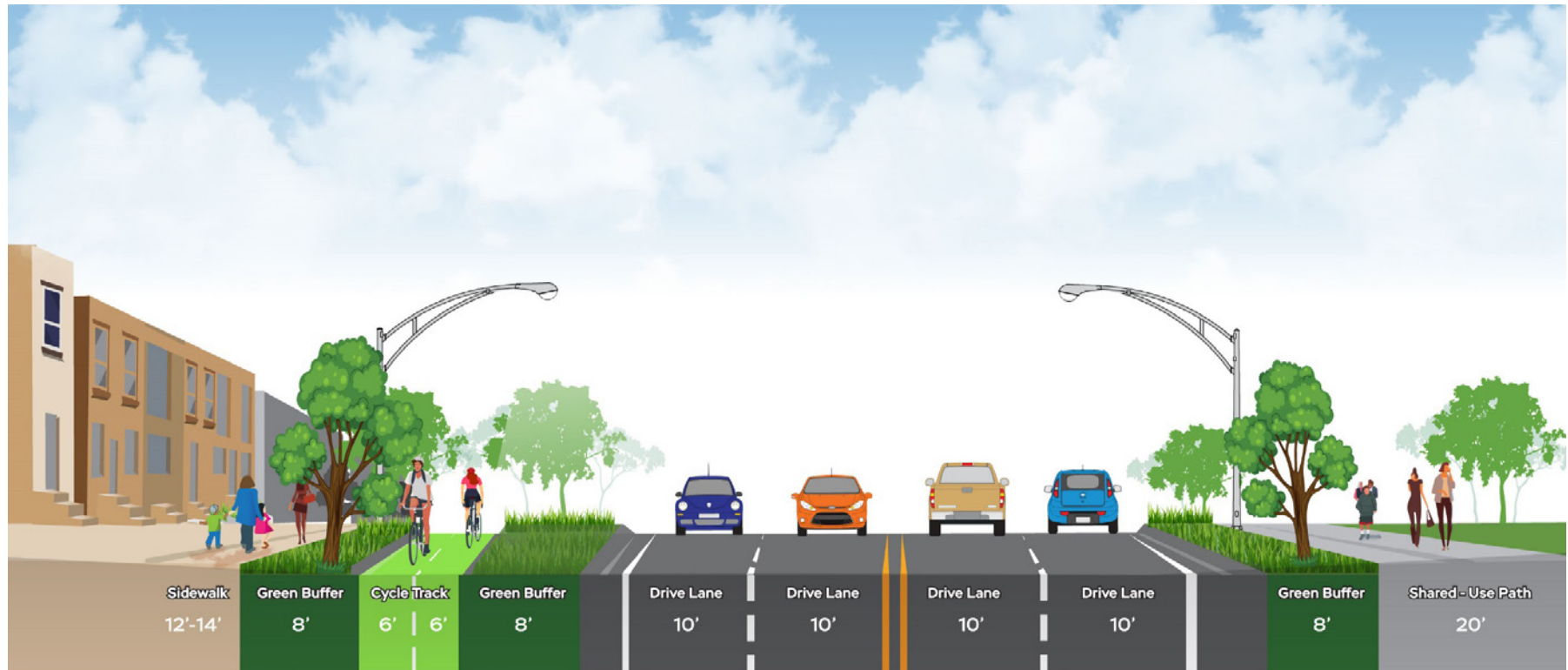


Figure 46 shows a cross section of the two-lane concept with the Auchentoroly Terrace local road option, which would add a low-speed local access road adjacent to the homes on Auchentoroly Terrace. In this

option, the two-way cycle track in this segment would be replaced with a contraflow bike lane in the northbound direction and a sharrow for bikes to share the lane with low-speed traffic in southbound direction.

Figure 46: Cross section of the two-Lane Concept with Auchentoroly Local Access Road Option



Renderings

The renderings in **Figures 47 and 48** illustrate the hybrid concept for Druid Park Lake Drive at two locations on the corridor: the segment between Fulton Ave. and Gwynns Falls Ave. and the Eutaw Place intersection. The rendering in **Figure 47** shows the configuration of the local access road option on Auchentoroly Terrace, which would provide on-street parking next to homes, a contraflow bike lane in the northbound direction and a sharrow for bikes to share the lane with low-speed traffic in southbound direction. The remainder of the corridor outside of this segment has a two-way cycle track.

Figure 47: Two-lane concept between Fulton Ave. and Gwynns Falls Pkwy



The Eutaw Place intersection shown in **Figure 48** is designed as a T-intersection to improve vehicular and pedestrian safety by removing the existing slip ramp at this intersection, improving sight lines, and adding pedestrian and bicycle crossings on all legs of the intersection. In this option, Druid Park Lake Drive is two lanes in the westbound direction and one lane in the eastbound direction. Eutaw Place is converted to two-way vehicular traffic to improve connectivity and calm traffic by narrowing the roadway and introducing “friction” of oncoming traffic to reduce vehicular speeds.

Figure 48: Two-lane concept at Eutaw Pl. intersection



End-to-End Concept

Figure 49: End-to-End Two-Lane Concept



Figure 49 shows an end-to-end aerial view of the proposed elements of the two-lane concept. As shown in this image, all intersections on Druid Park Lake Drive are traditional signalized intersections, except for the Liberty Heights intersection, which uses a roundabout. In the two-lane concept, McCulloh St. is removed north of Cloverdale Rd. to improve spacing between intersections. Fulton Ave. is closed to left-turning traffic from Druid Park Lake Drive. Druid Hill Ave. is converted to a two-way street with a turnaround past the Cloverdale Basketball Courts and does not directly connect to Druid Park Lake Drive. Access to Druid Hill Ave. is provided from Cloverdale Rd. and Fulton Ave.

Conversion of One-Way Streets to Two-Way Streets

The proposed concepts for Druid Park Lake Drive include the conversion of Madison Ave., Eutaw Pl., McCulloh St., Druid Hill Ave. from one-way streets to two-way streets. These streets originally functioned as two-way streets but were converted to one-way streets in the mid-1900s to speed the flow of automobile traffic heading to and from Downtown Baltimore. Given the safety, connectivity and economic benefits of two-way streets over one-way streets, the Project Team has incorporated two-way street conversions into the Druid Park Lake Drive concept designs for several streets intersecting the corridor.

Table 7 shows the proposed two-way street conversions in each concept.

Table 7: Proposed conversion of one-way streets to two-way streets

Street	Concept A: One Lane per Direction	Concept B: Hybrid	Concept C: Two Lanes per Direction
Eutaw Place	Two-way	Two-way	Two-way
Madison Ave.	Two-way	One-way	Two-way
McCulloh St.	Two-way	Two-way	Two-way
Druid Hill Ave.	Two-way until far side of Cloverdale Basketball Court	Two-Way until far side of Cloverdale Basketball Court	Two-Way until far side of Cloverdale Basketball Court

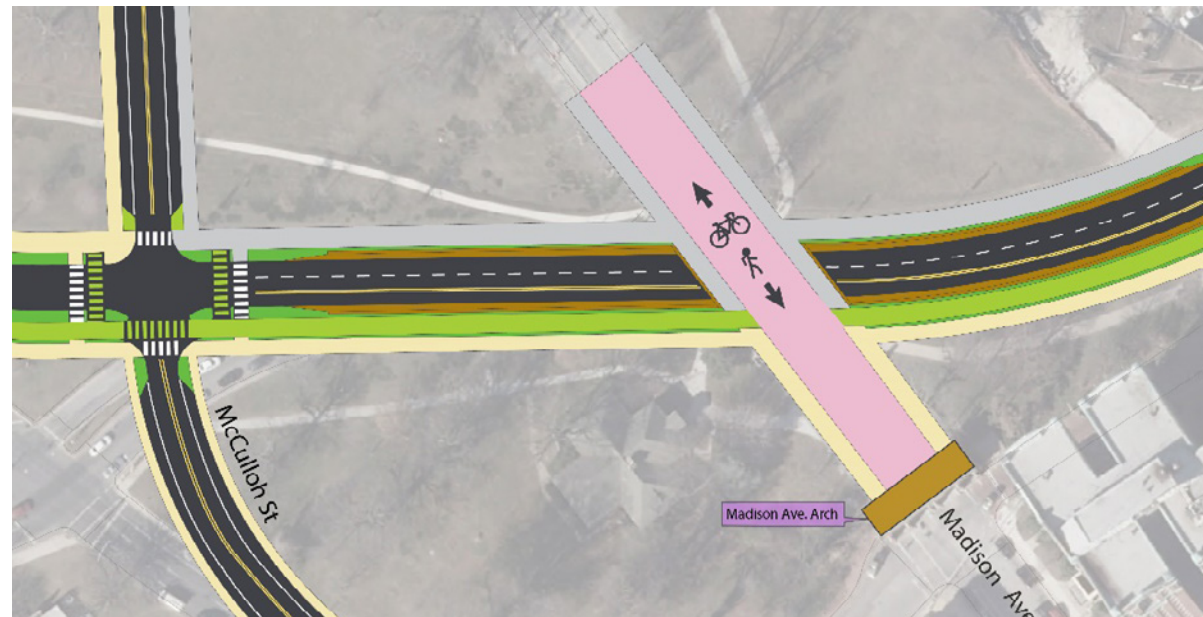
Additional Options

In order to provide additional design options for pedestrian, bike, micro-mobility and emergency response access, the Project Team developed several options that stand alone and can be added to any of the concepts described in Section VI.

1. **Cut-and-cover for at-grade, dedicated pedestrian, bike and micro-mobility access**

A cut-and-cover design for the Madison Avenue intersection would allow for the entrance to Druid Hill Park at Madison Ave. to be a promenade dedicated to pedestrian, bicycle and micro-mobility access only. This design would put Druid Park Lake Drive's vehicular lanes below-grade under Madison Ave. and add a bridge at grade for dedicated pedestrian, bicycle and micro-mobility use. Vehicular access to and from Madison Ave. would be redirected to Cloverdale Rd. The cut-and-cover option would also provide an opportunity to highlight the historic archway as a plaza and pedestrian promenade. Vehicular traffic would enter the park at McCulloh St.

Figure 50: Cut and Cover Option at Madison Ave



2. Pedestrian Bridge at Lakeview Ave.

Druid Park Lake Drive at Lakeview Ave. has a significant grade change, with a steep hill making it challenging to place an ADA-accessible at-grade crossing for pedestrian access to the park. Because of this significant topography change and two nearby highway ramps, a pedestrian bridge at Lakeview Ave. was identified as an option for ADA-accessible pedestrian access from Reservoir Hill into Druid Hill Park. The location of this pedestrian bridge option is highlighted in **Figure 51**. Three vacant parcels border Druid Park Lake Drive at this location, providing an opportunity to add a gradual bridge approach that winds gently through the site to reach the necessary grade. This site is also directly adjacent to Lakeview Towers and other large residential buildings, demonstrating the need for an accessible pedestrian crossing on this side of Reservoir Hill. The pedestrian bridge would provide an accessible pedestrian crossing for residents with disabilities, cyclists and other wheeled devices, allowing these users to easily access the park without crossing traffic.

Figure 51: Location of pedestrian bridge option



To mirror the park character of Druid Hill Park, the pedestrian bridge would incorporate park elements on the neighborhood side of the bridge.

Discussions with Baltimore Department of Housing and Community Development (DHCD) indicated that the currently-vacant parcels will likely be developed, but that a pedestrian bridge could be incorporated into a future development's site plan. The pedestrian bridge in the Brooklyn Bridge Park (**Figure 52**) is an example of the style and landscaping of a pedestrian bridge option for Druid Park Lake Drive.

Figure 52: Pedestrian Bridge at Brooklyn Bridge Park, New York City



3. Emergency Services Access

Reducing the number of lanes on Druid Park Lake Drive will change traffic conditions on the corridor, with potential impacts to emergency response times. Although many one-lane roads exist in Baltimore City, Baltimore City Fire Department (BCFD) and Baltimore City Police Department (BCPD) noted concern in losing high-capacity access to local neighborhoods from Druid Park Lake Drive, which currently serves as principal arterial road. BCFD has a requirement to respond to calls within four minutes and expressed interest in better understanding if the proposed concepts would significantly increase travel times on the corridor. In response to these concerns, the Project Team identified two options to allow emergency vehicles to bypass traffic:

- ▶ Add mountable curb to median for emergency use.
- ▶ Restrict parking in the parking lane during peak periods to allow emergency access if needed.

Figure 53: Emergency services access options



BCFD indicated that their fire trucks have the same space and turning radius requirements as buses, so any design feature that a bus can access is also accessible by a fire truck.



7 Evaluation - Measures of Effectiveness

To understand how the Druid Park Lake Drive concepts address performance outcomes identified during the goal-setting phase, the project team developed “measures of effectiveness” (MOEs) to reflect the project goals and objectives and allow for quantitative and qualitative comparison of the three concepts and a “no-build” baseline.

The MOEs are categorized under safety, accessibility, multimodal, and aesthetics. For each category, the following information is provided: primary evaluation criteria, unit of measure used to quantify performance on the criteria and value for each concept. The results are color-coded based on the concepts’ performance in meeting the project goals, with green representing the highest performance and orange representing the lowest. The concepts were also evaluated using a traffic model to measure each concept’s impact on travel time.

Safety

The concepts’ performance in the safety category were measured through the following criteria:

- ▶ **Simplified intersections** – Does the concept reduce conflict points at intersections, standardize turning movements and eliminate confusing legs of intersections?
- ▶ **Reduced crossing distances** – Does the concept reduce the width of the roadway to make it safer and easier for pedestrians to cross the street?
- ▶ **Reduced vehicular speeds** – Does the design of the roadway – lane width, visual cues and physical elements – promote slower vehicle speeds?
- ▶ **Ability to maintain current emergency services response times** – Does the concept significantly impact response times for fire and rescue services?

KEY TAKEAWAYS - SAFETY

The single lane concept has the best performance on the safety measures by simplifying intersections, significantly reducing pedestrian crossing distances and reducing speeds. While this option may marginally impact emergency response times, the options presented in Section VII and alternative routes could potentially mitigate this impact. The two-lane concept has the lowest performance on the safety measures. Crossing distances in the two-lane concept are longer compared to the other concepts and additional lanes of traffic could lead to higher vehicular speeds.

Figure 54: Gwynn Falls Pkwy. looking Eastbound



Table 8: Measures of Effectiveness - Safety

Measures of Effectiveness (MOE)				No-Build Concept	Single Lane Concept (One lane both directions)	Hybrid Concept (Two lanes WB / One Lane EB)	Two Lane Concept (Two lanes both directions)
Themes	Primary Evaluation Criteria	Secondary Evaluation Criteria	Unit of Measure				
Safety	Simplified Intersections	⊘ N/A		●	●	●	●
	Reduced crossing distances	⊘ N/A	Average intersection crossing distance (feet)	● 70 ft	● 20 ft	● 41 ft	● 56 ft
	Reduced vehicular speeds	⊘ N/A		●	●	●	●
	Ability to maintain current EMS response time levels	⊘ N/A		●	●	●	●

Ability to Meet Evaluation Criteria

⊘ N/A or TBD

● Doesn't Meet or Partially Meets

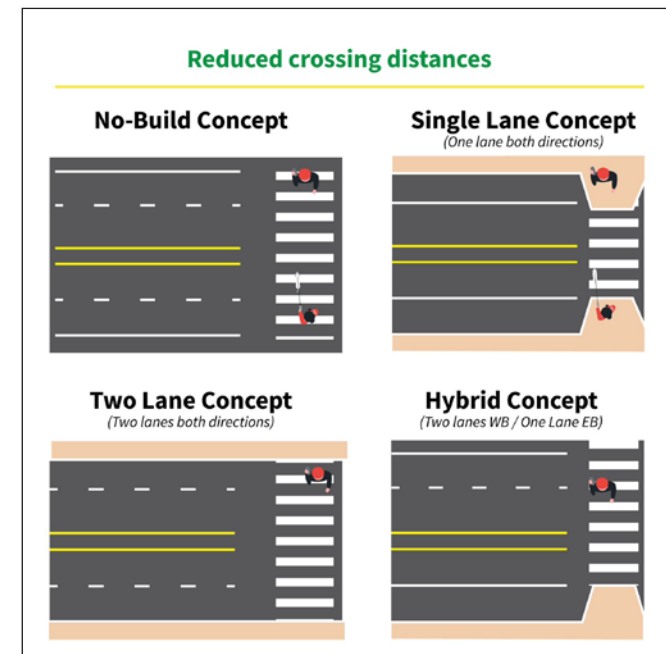
● Somewhat Meets

● Fully Meets

Accessibility

The concepts' performance in the accessibility category were measured through the following criteria:

- ▶ **Increased access for pedestrians, cyclists, carless households and individuals with disabilities** – Does the concept provide bicycle infrastructure, shared-use paths and ADA compliant sidewalks to allow all modes to safely travel?
- ▶ **Manageable traffic congestion** – To what extent does the concept impact travel times and increase the potential for diversions to neighborhood roadways?
- ▶ **Increased pedestrian crossings into Druid Hill Park** – How many new pedestrian crossing opportunities are added?



KEY TAKEAWAYS – ACCESSIBILITY

All three concepts provide significantly increased access for pedestrians, bicyclists, individuals with disabilities and micro-mobility users. The single-lane option has a relatively higher level of traffic congestion due

to the reduced vehicular capacity, but performs well on all indicators of multi-modal accessibility. All three concepts significantly increase the number of non-motorized crossing points along the corridor.

Table 9: Measure of Effectiveness - Accessibility

Measures of Effectiveness (MOE)				No-Build Concept	Single Lane Concept (One lane both directions)	Hybrid Concept (Two lanes WB / One Lane EB)	Two Lane Concept (Two lanes both directions)
Themes	Primary Evaluation Criteria	Secondary Evaluation Criteria	Unit of Measure				
Accessibility	Increased access for pedestrians, cyclists, carless households & individuals with disabilities	Shared Mobility Lanes	Lane miles	0	1.26 mi	1.46 mi	1.47 mi
		Shared Use Paths	Lane miles	0.20 mi	1.81 mi	1.84 mi	1.86 mi
		ADA Compliant Sidewalks	Lane miles	1.94 mi	2.07 mi	2.18 mi	2.29 mi
	Manageable Traffic Congestion	Delay, travel time, queuing	See traffic chart				
		Minimizes diversion to adjacent local network					
	Increases the number of crossings into the park	Total Intersections		7	15	16	16
		Signalized	# of signalized crossings		8	10	9
		Roundabouts	# of Roundabouts	0	3	0	1
		Mid-block crossings	# of Mid-block crossings	0	5	6	5

Ability to Meet Evaluation Criteria

⊖ N/A or TBD

● Doesn't Meet or Partially Meets

● Somewhat Meets

● Fully Meets

Multimodal Access

The concepts' performance in the multimodal access category were measured through the following criteria:

Table 10: Measure of Effectiveness - Multimodal

Measures of Effectiveness (MOE)				No-Build Concept	Single Lane Concept (One lane both directions)	Hybrid Concept (Two lanes WB / One Lane EB)	Two Lane Concept (Two lanes both directions)
Themes	Primary Evaluation Criteria	Secondary Evaluation Criteria	Unit of Measure				
Multimodal	Improved signal timing	⊘ N/A	Signal timing includes pedestrian phase in every cycle and leading pedestrian interval	● No	● Yes	● Yes	● Yes
		⊘ N/A	Signals are coordinated throughout the corridor	● No	● Yes	● Yes	● Yes
	Intersections with safe bike / ped accommodations	⊘ N/A	# of intersections (including mid-block crossings)	● 0	● 15	● 15	● 15
	Increased transit opportunities	Improved transit reliability	Linear feet of Dedicated Bus Lanes	● 0	● 3,500 LF	● 3,500 LF	● 3,500 LF
		Increased stop locations	Opportunity for new bus stops	● No	● Yes	● Yes	● Yes

Ability to Meet Evaluation Criteria

⊘ N/A or TBD

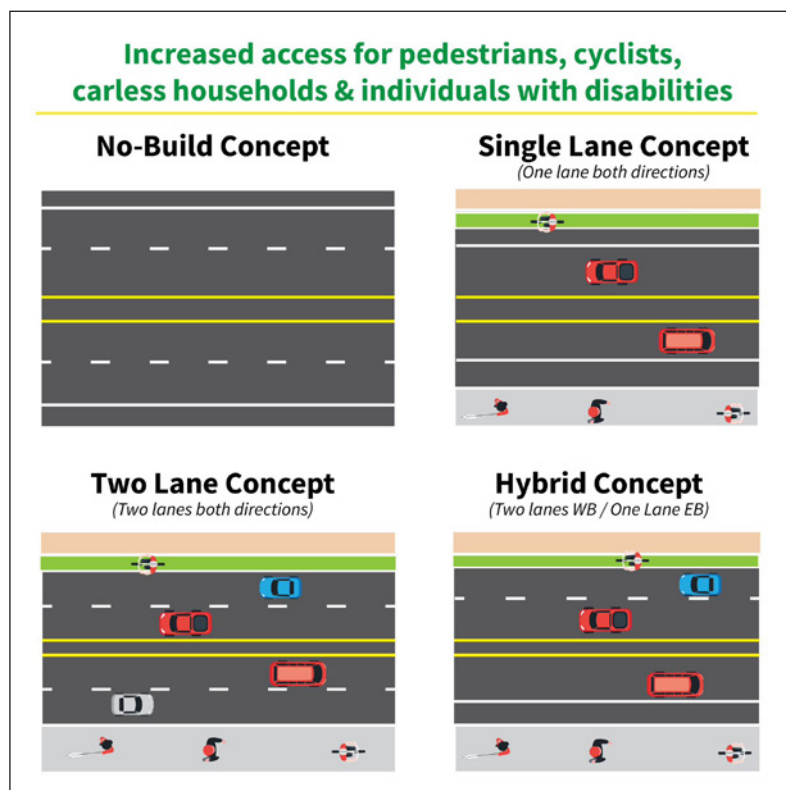
● Doesn't Meet or Partially Meets

● Somewhat Meets

● Fully Meets

The concepts' performance in the multimodal access category were measured through the following criteria:

- ▶ **Intersections with safe bicycle and pedestrian accommodations** – Do intersections include design elements, such as curb islands and painted bicycle crossing markings, to maximize bicycle and pedestrian safety?
- ▶ **Improved signal timing** – Do traffic signals include a pedestrian phase in every cycle and leading pedestrian interval? Are signals coordinated to provide for smooth movement of traffic through the corridor with minimal stops?
- ▶ **Increased transit opportunities** – Does the concept include opportunities for new bus stops with nearby crosswalks, and transit priority infrastructure such as dedicated bus lanes?



KEY TAKEAWAYS – MULTIMODAL ACCESS

All three concepts significantly improve multi-modal infrastructure on the Druid Park Lake Corridor, introducing safe bicycle/pedestrian infrastructure and increasing transit efficiency to create significant improvements in multi-modal access. While the end-to-end vehicular travel times are higher for the single-lane and hybrid concepts, improvements in vehicular signal progression can help to mitigate these impacts. Intersection design also influences the number of stops that a vehicle may make along the corridor. The decrease in signal stops can help to mitigate the impact drivers may experience due to the reduced corridor capacity by maintaining a consistent flow from end to end along the corridor. This can also increase multimodal safety by decreasing high-speed platooning of traffic at pinch points along the corridor and by introducing a slower, more consistent vehicular flow.

While transit stop locations will need to be identified by MDOT MTA according to their bus stop location process, the safer design of the corridor and increased pedestrian crossings provides opportunities for bus stops on Druid Park Lake Drive that do not currently exist. All three concepts have intersection designs that maximize pedestrian and bicycle safety.

Aesthetics

The concepts' performance in the aesthetics category were measured through the following criteria:

- ▶ **Increased green space** – Does the concept add landscaped buffers, remove impervious surface and add green space to Druid Hill Park?
- ▶ **Historic elements highlighted** – Does the concept reduce roadway space to shift visual emphasis to the park and historic elements? Does the concept highlight the Madison Ave. archway as the gateway to Druid Hill Park?

KEY TAKEAWAYS – Aesthetics

All concepts improve the aesthetic quality of the corridor by adding green buffers and removing impervious surface to improve the visual

interest and park-like ambiance of the corridor. The single-lane concept had the highest performance on increasing green space by removing the most roadway space and returning existing roadway space to Druid Hill Park. The single-lane concept also best highlights historic elements by reducing the roadway footprint and reconfiguring the Madison Ave. intersection to emphasize the archway as the park entrance. The hybrid concept improves green space and historic elements but does not reduce pavement to the extent of the single lane concept and does not fully emphasize the Madison Ave. archway as the park entrance. The two-lane concept has the lowest performance on achieving a more compacted roadway design, but does add landscaped buffer, removes significant amount of impervious surface, and highlights the Madison Ave. archway as the entrance to Druid Hill Park. It is important to note while that each of the three concepts is matched with only one option for the Madison Ave. intersection, BCDOT may select any of the Madison Ave. intersection options to pair with the preferred number of travel lanes.

Table 11: Measure of Effectiveness - Aesthetics

Measures of Effectiveness (MOE)				No-Build Concept	Single Lane Concept (One lane both directions)	Hybrid Concept (Two lanes WB / One Lane EB)	Two Lane Concept (Two lanes both directions)
Themes	Primary Evaluation Criteria	Secondary Evaluation Criteria	Unit of Measure				
Aesthetics	Increased green space	Landscaped buffers (not including medians)	Lane miles	● .81 mi	● 3.15 mi	● 3.17 mi	● 3.30 mi
		Impervious surface removal	Removal square footage	● 0	● 498,260 SF	● 378,790 SF	● 349,869 SF
		Contiguous park area	Park square footage (additional)	⊘ N/A	● 534,780 SF	● 78,165 SF	● 83,335 SF
	Historic elements highlighted	Smaller compacted roadway design	●●●	●	●	●	●
		Madison Ave. as Gateway to park	●●●	●	●	●	●

Ability to Meet Evaluation Criteria

⊘ N/A or TBD

● Doesn't Meet or Partially Meets

● Somewhat Meets

● Fully Meets

Traffic Analysis

A traffic analysis evaluated the concepts for vehicular travel times.

The process evaluated the total volumes across the study area network during AM and PM peaks. The AM peak hour was determined to be 7:45 AM to 8:45 AM, and the PM peak hour was determined to be 4:15 PM to 5:15 PM. Individual locations could have varying peaks that differ from the study area peak. For each peak period, four scenarios were evaluated using Synchro 10:

- ▶ Existing/No-Build - Existing geometry with no improvements
- ▶ Single-lane concept
- ▶ Hybrid concept
- ▶ Two-lane concept

Baltimore City DOT provided traffic controller dial sheets for the signals within the study area network. The data were entered into Synchro and applied in the Existing/No-Build scenario. In the concept scenarios, the signal phasing, timing, and offset were modified where necessary to support the proposed roadway, bicycle, and pedestrian safety and mobility improvements. This modification included adding a pedestrian signal phase to signal cycles to increase pedestrian accessibility.

Corridor Travel Times Overview

Traffic simulation is the mathematical modeling of transportation systems (e.g., freeway junctions, arterial routes, roundabouts, downtown grid systems, etc.) through the application of computer software to better help plan, design, and operate transportation systems. Traffic models study individual elements of transportation systems, such as individual vehicle dynamics and individual traveler behavior.

The Project Team used a combination of microsimulation traffic software packages including Synchro/SimTraffic and VISSIM to study how the created model behaves dynamically over time or after a certain span of time. The simulation is basically a real-time traffic flow according to the inputted data and after performing the simulation we received a set of results which included:

- ▶ Queue length
- ▶ Vehicle delay
- ▶ Stops
- ▶ Travel Times

Microsimulation Traffic modeling was performed under two scenarios to provide a range of traffic recalibration assumptions:

1. Using existing traffic counts (assumes that the level of traffic volume will remain relatively the same over time)
2. Using a 9 percent reduction in traffic. This reduction in traffic volumes is based on traffic observations following the installation of the temporary Big Jump cycle track design and lane repurposing.

The 9 percent reduction scenario assumes that individual drivers will modify their travel behavior patterns and choose a different route because the lanes have been reduced. This recalibration of traffic could occur shortly after construction of the selected alignment or over the length of several years as drivers adjust to the new traffic pattern.

As part of the modeling microsimulation, travel times (minutes) were identified under each concept scenario. The first travel time concept comparison version (**Figure 55**) shows travel times to I-83 and to Greenspring Ave. from each major intersection on Druid Park Lake Drive under each of the proposed concepts. The left column shows travel times using existing traffic counts and the right column shows travel times using a 9 percent reduction in traffic. Within each circle in the diagram, the top half shows travel time from the identified intersection to I-83 and the bottom half shows travel time to Greenspring Ave. The change in travel time can be deduced by finding the difference between the “Existing Condition / No-Build” travel time and the travel time shown for each concept option.

The second travel time version is focused on intersection-to-intersection comparison (**Figure 56 & 57**). The information is divided into two maps, one displaying the travel time minutes using the existing travel volumes and the other showing the travel times assuming the 9% volume reduction.

Additional traffic information can be found in Appendix E.

KEY TAKEAWAYS – Traffic

- ▶ All three concept have minimal travel time impacts on end-to-end travel time from Greenspring Ave. to Druid Park Lake Drive in the morning peak period. Travel time for the single-lane and two-lane concepts is projected to increase by only two minutes in the AM peak and travel time for the hybrid concept is projected to increase by only four minutes (using existing traffic counts).
- ▶ All three concepts have larger travel time impacts from Greenspring Ave. to Druid Park Lake Drive in the PM peak period. Using existing traffic counts, the single-lane concept is projected to increase PM peak travel time by twelve minutes, the hybrid concept is projected to increase travel time by eleven minutes, and the two-lane concept is projected to increase travel time by four minutes. Using a 9% traffic volume reduction, the single-lane and hybrid concepts would increase travel time from Greenspring to I-83 by just seven minutes and the two-lane option would increase travel time by two minutes.

Figure 55: Modeled Travel Times for Concept Options

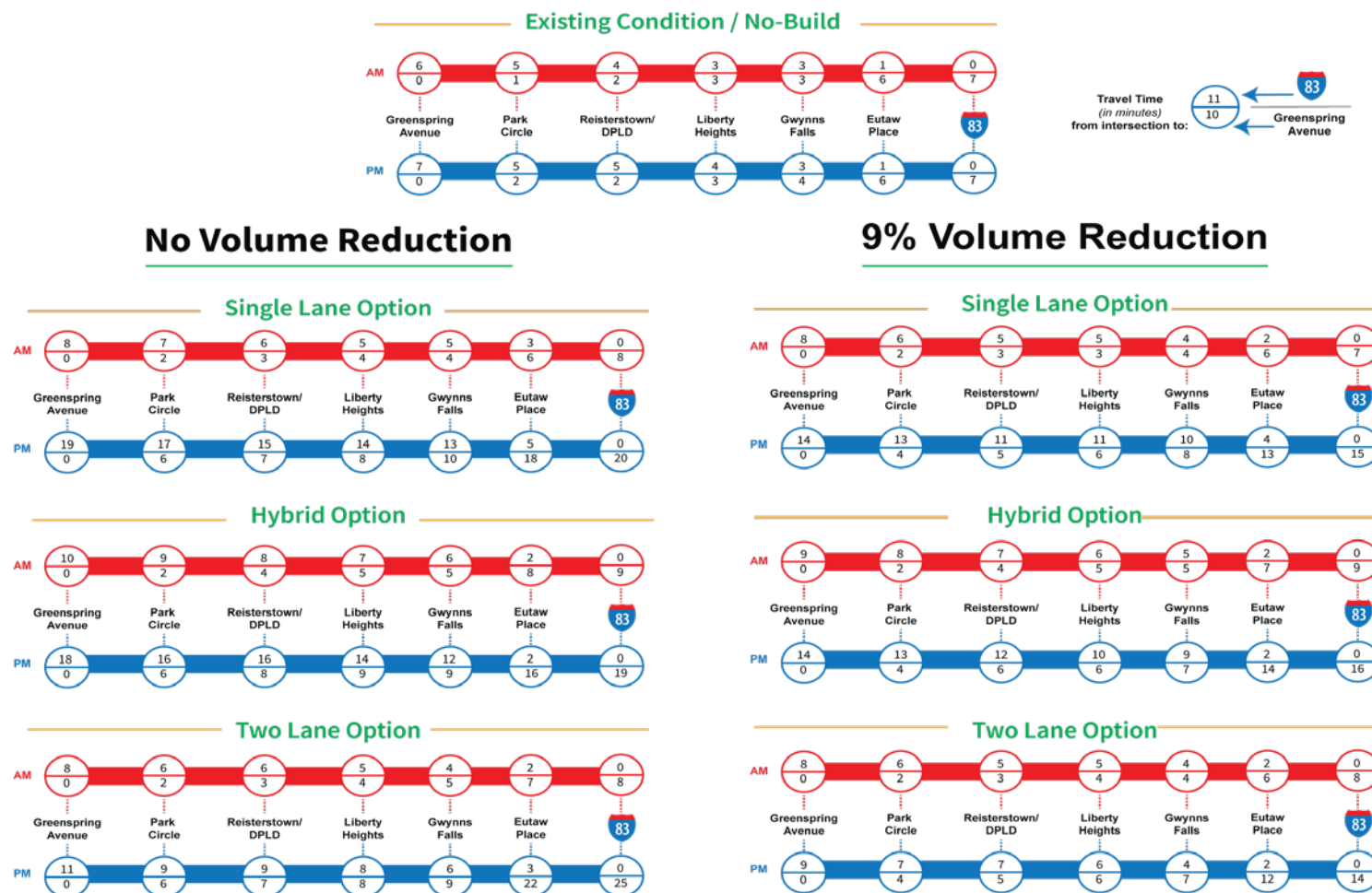


Figure 56: Modeled Travel Times for Intersections (No Volume Reduction)

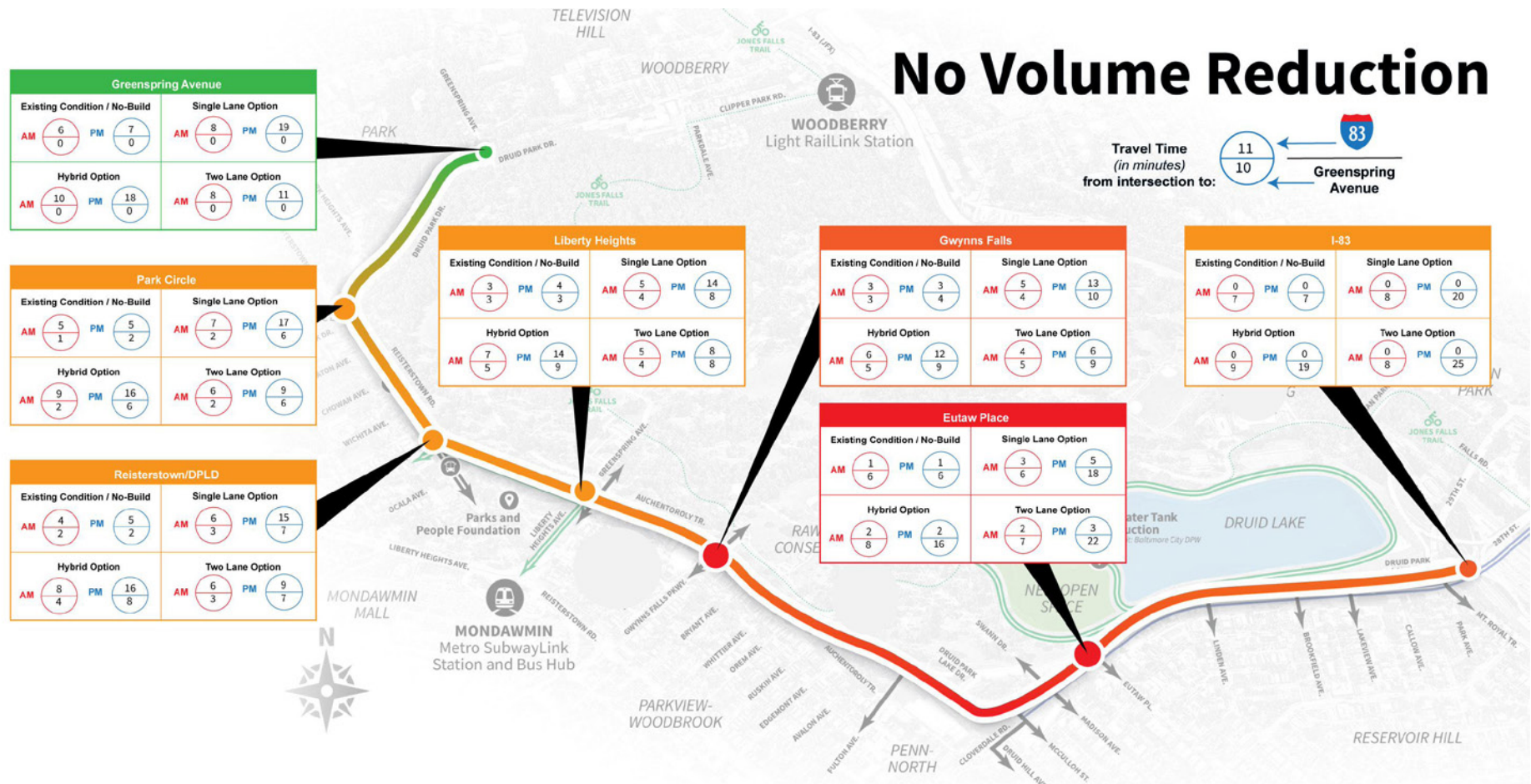
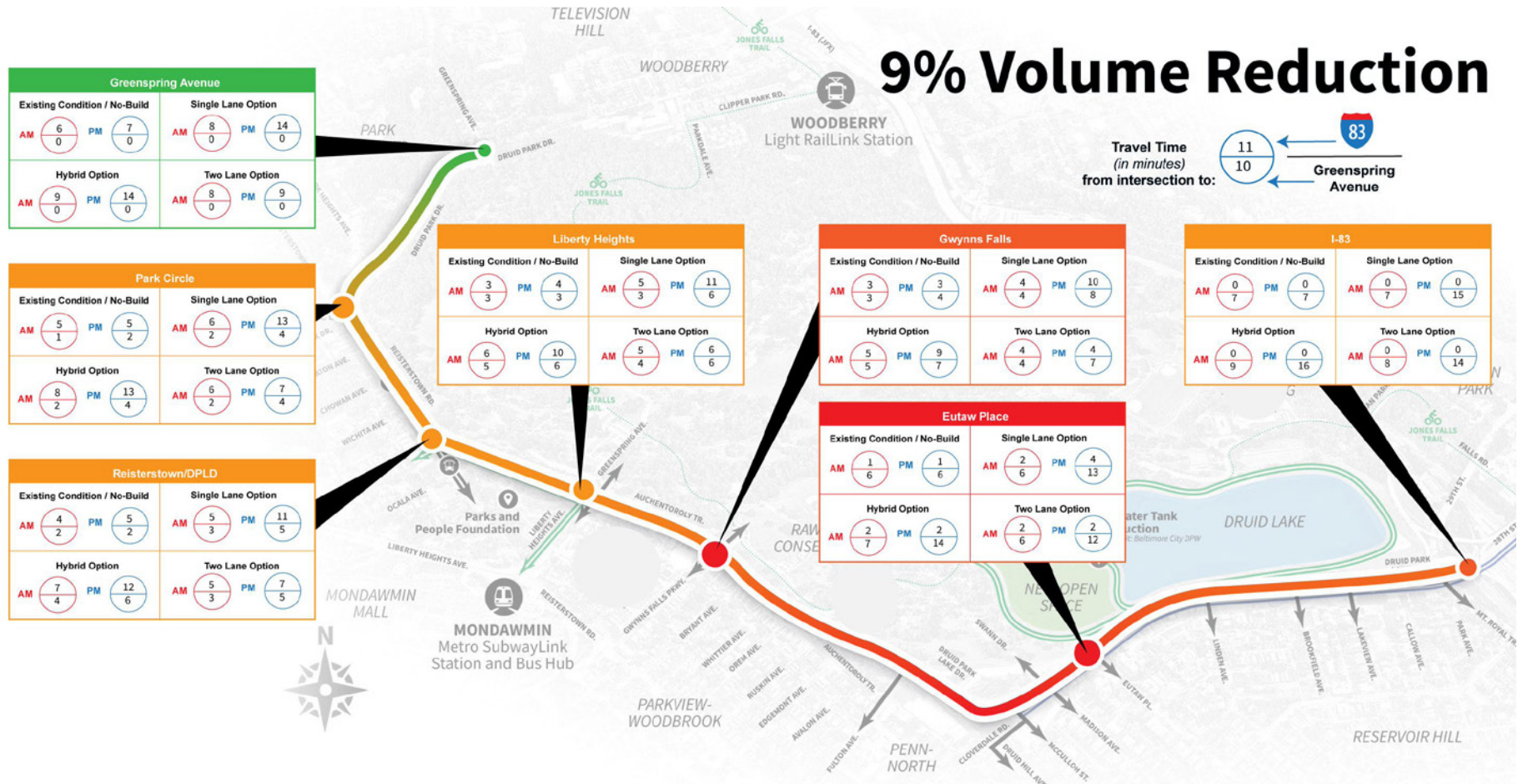


Figure 57: Modeled Travel Times for Intersections (9% Volume Reduction)



8 Public Feedback on Concepts

The Project Team invited public input on the concepts for Druid Park Lake Drive through a comment card that was available online and distributed in hard copy at several publicly accessible locations.

The comment form was promoted through BCDOT social media, shared with community organizations and stakeholders, emailed to individuals who signed up for updates, and through a postcard mailing. The comment period opened on October 7, 2021 and remained open until January 20, 2022. **80 community organizations and stakeholder groups** were included in emails that provided an electronic version of the promotional flyer, a link to the comment form, and graphics for sharing with their social media networks.

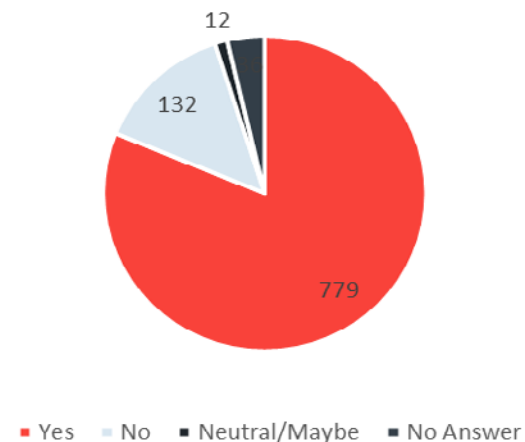
The Project Team received 959 responses.

Option 1

96.4 percent of respondents (923) provided an answer, with 779 stating that they are in favor of the single-lane concept. Thirteen percent of total respondents (132) gave negative answers about this option and 12 respondents provided a neutral statement. Statements in support of this option include improvements to safety and reduced traffic speeds, bike/ped facilities, decreasing harm to BIPOC stakeholders, and increased connectivity between the local neighborhood and Druid Park. Negative sentiments largely mentioned an increase of traffic congestion and resulting longer commute times.

Figure 58: Single-lane Concept Voting Results

Question 1: Do you prefer the single-lane concept?



Option 2

86.6 percent of respondents (831) provided an answer, with 601 stating that they are not in favor of the two-lane concept. Seventeen percent of total respondents (170) gave positive answers about this option, and 60 provided statements that either were neutral, expressed that this option is very close to the current road conditions, or that it is the second favorite option. Statements in support of this option include support for keeping traffic flowing during both peak- and off-peak travel hours, providing greenery and bike/ped options. Negative sentiments largely mentioned an increase in traffic speed and the resulting safety concerns, a lack of connectivity, and increasing harm to BIPOC stakeholders.

Option 3

82.1 percent of respondents (788) provided an answer, with 679 stating that they are not in favor of the hybrid concept. One percent of total respondents (15) gave positive answers about this option, and 94 provided statements that either were neutral, expressed that this option is a compromise, or that it is the second favorite option. Statements against this option include a preference for either the single-lane or two-lane concepts, safety concerns (especially regarding a shared travel/bike lane with no barriers) and confusion about the design.

Figure 59: Two Lane Concept Voting Results

Question 2: Do you prefer the two-lane option?

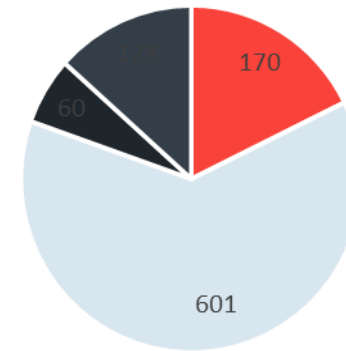
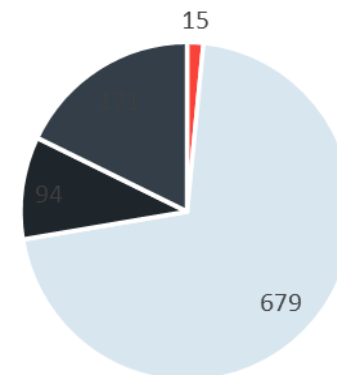


Figure 60: Hybrid Concept Voting Results

Question 3: Do you prefer the hybrid option?



■ Yes ■ No ■ Neutral/Second Option/Maybe ■ No Answer

9 Cost Estimates

The Project Team developed major quantities cost estimates using MDOT State Highway Administration's (SHA) Cost Estimating Manual. The estimates incorporate estimates of major quantities of materials such as asphalt, concrete sidewalks, drainage improvements, plantings with topsoil, retaining walls, excavation, signal reconstruction, signing, pedestrian lighting, and other factors of urban construction. Full cost estimates are provided in Appendix F. The cost estimates include a 30% contingency to account for unforeseen expenses, such as an increase in materials costs. These cost estimates do not include the costs of preliminary engineering or utility relocation.

Table 12: High Level Concept Cost Estimates

Concept	Cost Estimate – Total Neat Construction Cost
Single-Lane Concept	\$32,176,000
Hybrid Concept	\$31,693,000
Two-Lane Concept	\$28,682,000

Figure 61: Park Circle Intersection





10 Recommendations for Next Steps

The following section provides the Project Team's recommendations for next steps for BCDOT to consider as this project progresses into the next phase of development. These items are just recommendations and are entirely at the discretion of the DOT. Realizing the importance of this project to the City of Baltimore, the following items will support keeping the project moving forward and provide additional data points to help better inform the City's decision-making ability. The list of next step recommendations includes, but are not limited to the following considerations:

Identify Funding

- ▶ Identify funding opportunities, including State and Federal discretionary grant programs.
- ▶ The Infrastructure Investment & Jobs Act has several grant opportunities that could support the goals and vision of the project.
- ▶ Include project in future local capital improvement funding projections.

Reduce Alternatives Based on Feasibility Study (Optional)

- ▶ Based on Feasibility Study results and public response, one or two of the design concepts could be removed from further consideration. Additional data inputs beyond the feasibility stage of the study could help to better inform this decision.

Perform Additional Data Collection and Analysis

Traffic Operations

- ▶ Perform an origin-destination analysis for traffic on the corridor. This will allow BCDOT to identify where vehicles are traveling and identify improvements to alternate routes to complement the improvements on Druid Park Lake Drive.
- ▶ Run a VISSIM traffic Model for concept(s) selected for further study.
- ▶ Use detailed traffic simulation to better evaluate impact of proposed concepts on traffic conditions on local roads in adjacent neighborhoods and within Druid Hill Park.
- ▶ Consider using SIDRA microsimulation software to properly model roundabout traffic operations.
- ▶ Determine active and passive controls and final locations for mid-block crossings.

Design Considerations

- ▶ Evaluate end-to-end lane configuration and intersection designs based on traffic modeling results.
- ▶ Perform topographic, hazardous materials and utility surveys.
- ▶ Conduct detailed right-of-way assessment.
- ▶ Identify potential micro-mobility and bike corral or locker options along the corridor.
- ▶ Continue to evaluate impacts of one-way to two-way road conversions.

Transit Accessibility

- ▶ Coordinate with MDOT MTA's Office of Service Development (OSD) on the evaluation of bus stop locations and potential new transit service to the area.
- ▶ Complete a detailed assessment of the proposed Dedicated Bus Lanes (DBLs) to determine the timing and connectivity of the proposed DBL extensions along Reisterstown Road with MDOT MTA's larger corridor priority program.

Conduct Additional Environmental Evaluations

Environmental Assessments

- ▶ As design advances, additional environmental assessment and permitting processes will need to be performed, including wetland and waterway delineation, determination of Section 4(f) status and additional cultural resources research and/or archeological survey. See further detail in the Environmental and Cultural Resources Memo included in Appendix C.
- ▶ If federal funding is used for design or construction, initiate the National Environmental Policy Act (NEPA) process.

Landscape Architecture Enhancements

- ▶ Develop a Corridor Open Space Plan to study the use of miscellaneous small open spaces along and abutting the corridor. These open spaces are located primarily in the southern and western portions of the corridor and should be considered neighborhood parks or parklets that residents may directly access without crossing Druid Park Lake Drive. They can further enhance the streetscape and "parkway" experience of the corridor.

- ▶ Develop a comprehensive set of landscape design strategies with the following goals:
 - Provide the traveler with opportunities to experience, explore and appreciate the historic, architectural, landscape and ecological heritage of the corridor and surrounding area.
 - Establish a cohesive image and a stronger sense of place/identity on the corridor to complement the transportation and traffic improvements.
 - Consolidate the incremental landscape conceptual ideas currently recommended for the corridor, intersections and green spaces.
- ▶ Prepare a plan that addresses the systemic integration of green infrastructure and environmental site design into the streetscape. This can be a component of the Corridor Open Space Plan or the Comprehensive Landscape Design Strategies.
- ▶ Conduct a photometric assessment of the corridor lighting to confirm proper coverage from a safety perspective, especially associated with the park side shared use path.
- ▶ Consider crossing visibility enhancements opportunities (i.e., raised crosswalks, in-pavement lighting, or enhanced thermoplastic).

Continue Public Outreach Efforts

- ▶ Continue to work closely with interested stakeholders to evaluate the additional design elements and concept modifications.

Select One Preferred Alternative for Design and Construction

- ▶ Once funding is available, use the additional analyses listed above and further public outreach to identify a preferred concept to advance to 30% design and ultimately construction.

Figure 62: DPLD near Brookfield Avenue



Appendices

Appendix A:
Existing Plans and Studies

Appendix B:
Stakeholder Engagement

Appendix C:
Environmental and Cultural Resources

Appendix D:
Design Considerations

Appendix E:
Traffic Analysis

Appendix F:
Cost Estimates

