Rio Road Corridor Plan

June 30, 2022

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INTRODUCTION

INTRODUCTION TO RIO ROAD CORRIDOR STUDY

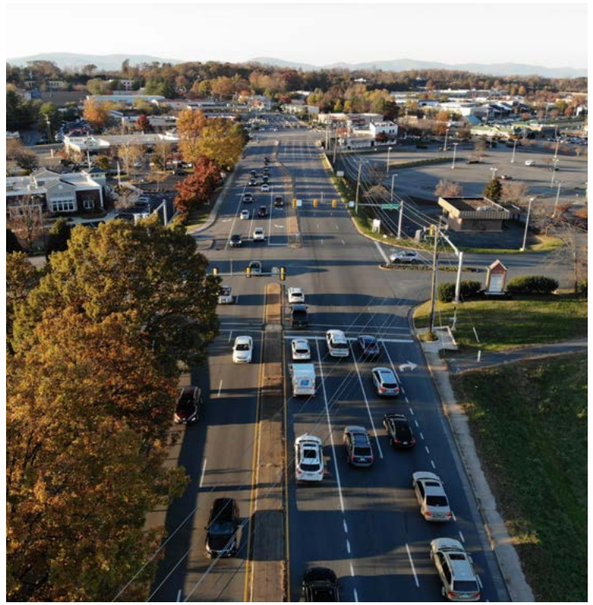
RIO ROAD EAST (ROUTE 631) creates a vital link between the County of Albemarle and the urban center in the City of Charlottesville. The areas of the county that directly surround the urban core are, themselves, becoming increasingly urban as the region continues to experience rapid growth and development. This growth necessitates that the public infrastructure respond accordingly.

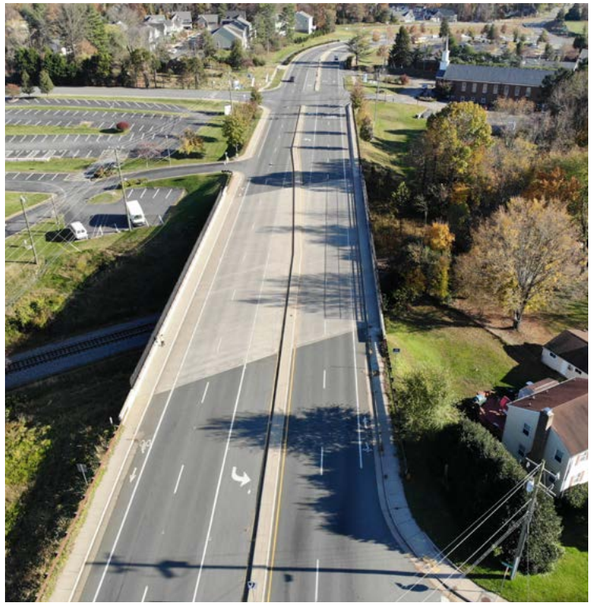
The Rio Road Corridor Plan is an opportunity to engage the diverse community partners who utilize the corridor on a daily basis and to establish a vision to unify the corridor experience. This corridor plan considers two portions of Rio Road - Phase 1 from the limits of the Rio29 Small Area Plan (Rio/29 SAP) to the John W. Warner Parkway (JWWP) Intersection and Phase 2 from JWWP southeast to the Charlottesville city limit. The corridor has been organized into these phases based on roadway characterisitcs that change sharply near the JWWP inteersection. Phase 1 exhibits relative uniformity in terms of the roadway characteristics and has diverse land uses and frontage designations. Whereas the Phase 2 roadway showcases a number of unique roadway characteristics but has relatively uniform frontage conditions along the roadway.

This Corridor Plan is an opportunity to establish informed corridor improvement strategies which will have a direct effect on the residents, property owners, developers, and the County administrators. It is also an opportunity to identify how the infrastructure of the corridor can promote human scale, meaning that the infrastructure of the roadway itsef is proportioned based on human dimensions and is at a size appropriate and comfortable to people.

This document shall serve as a guide both to identify future projects (for the County) and to guide construction on adjacent lands as the corridor continues to (re)develop. Future work should be rooted and established in the guidance presented here, in the County's Comphrehensive Plan, and in accordance with all applicable codes and standards.

The ideas presented herein have been developed based on feedback and insights from neighbors, commercial property owners, developers, administrators, adjacent municipalities, commuters, as well as VDOT. Though this document is intentionally brief, the Appendices contain additional and detailed information that was used to support the ideas and evidence presented. All proposed solutions as developed herein are conceptual in nature and will require further study and design prior to implementation.■

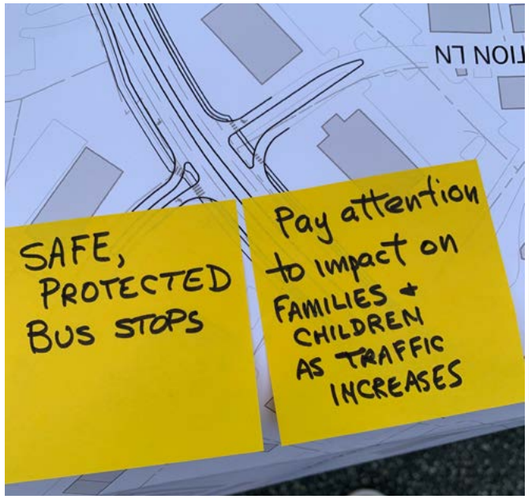




TO RESTORE A HUMAN SCALE

CURRENT EXPERIENCE

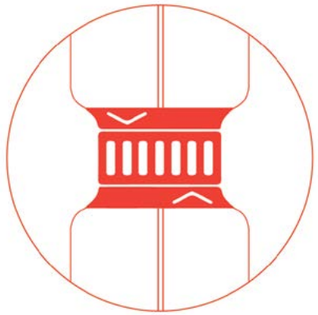
The wide areas of hard surfaces throughout the corridor contribute to the lack of distinguishable characteristics to break up the trek. According to public input, portions of Rio Road have been described as “just plain ugly,” “a dump,” and “a mess.”



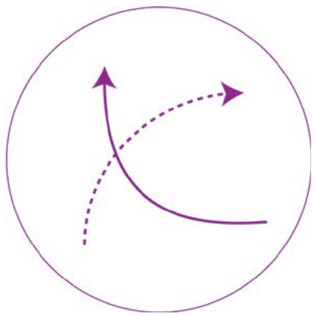
As further detailed on Page 6, the County canvassed the residents and community along the corridor to solicit their experiential knowledge and receive feedback about conceptual ideas. Applicable feedback has been incorporated into this document, and a FAQ page is included on Pages 35 and 36.

GUIDING PRINCIPLES

Roads and sidewalks that are **safe** for our families, our neighbors, and friends
Equal Access to places where we walk, bike, and drive
Protection of the **environment** and creation of vibrant **public spaces**
Promote **optimal travel** and reasonable solutions to known transportation challenges

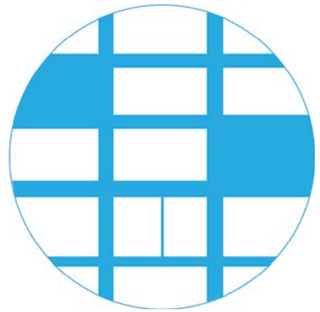


Safety For All



Equity Through Access

Unity Through Environment + Public spaces



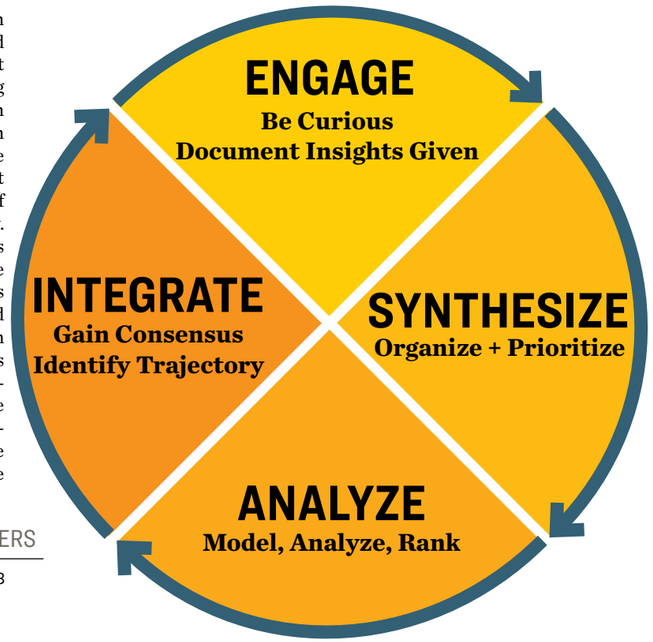
Effective Transportation + Optimal Mobility

CALL TO ACTION

To restore a **HUMAN SCALE** *along Rio Road, to* **UNIFY** *the community that lives along, and adjacent to, the corridor while making provisions for* **SAFE** *and* **EFFECTIVE** *transport of the many members of the community that use the corridor for travel and commuting.*

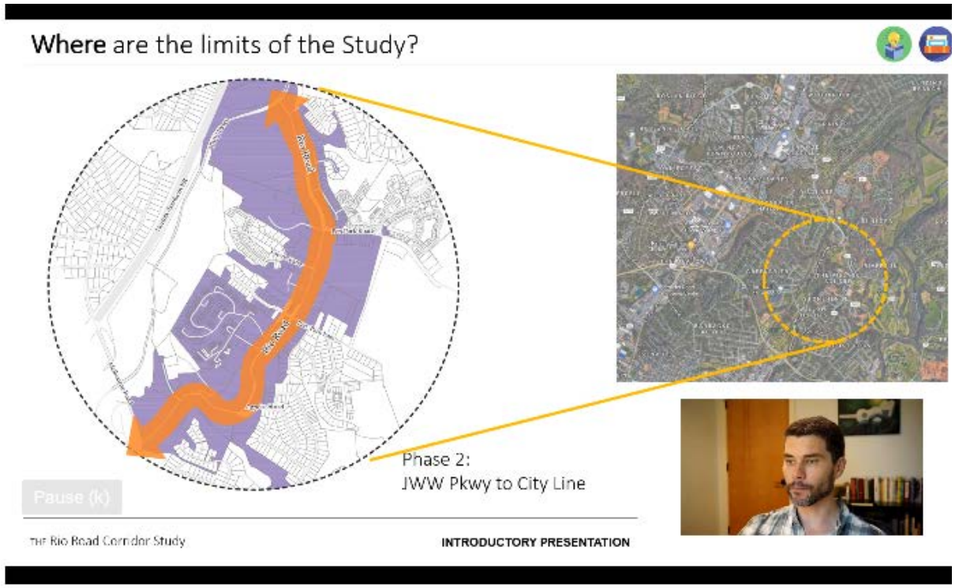
WORKING WITH STAKEHOLDERS

TO MAXIMIZE PUBLIC ENGAGEMENT in the Rio Corridor Plan, County staff and consultants offered a variety of engagement opportunities to the public, including opportunities for education and input in several formats and advertised through an assortment of methods. The goal of the activities was to generate genuine interest and public input from a cross-section of area residents. The project website (www.publicinput.com/riocorridor) served as the online hub of information where the public could access informational materials ranging from documents to videos, and respond to questions to help the project team understand the challenges and opportunities presented by the Rio Corridor. Three in-person pop-up events were created for Phase 1 and one event for Phase 2 to provide a face-to-face opportunity for the public to share ideas, comments, and concerns with the project team.



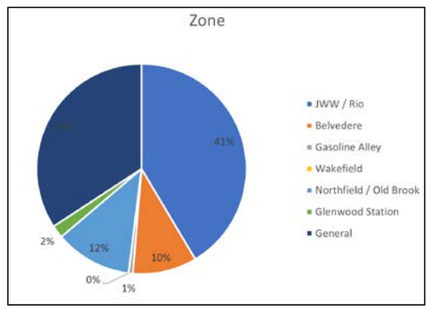
PUBLIC ENGAGEMENT BY THE NUMBERS

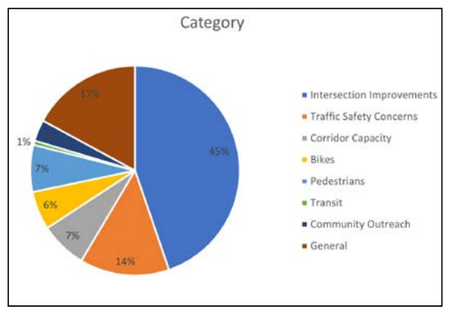
- Online Engagement Hub Participants 338
- In-Person Pop-Up Participants 114
- Virtual Meeting Attendees 108
- Podcast Listens 493
- Video Views 825



The duration of this study has largely corresponded with the COVID-19 pandemic. As a result, the consultant team and the County utilized a number of virtual and online resources to continue engaging the community. The virtual environment in no way can replace the value of in-person engagement. That said, the methods employed in this work made the most effective use of the many tools available.

#	Prompt	Yes	No	Other	Blank	Comment	Totals
1	Does the content presented in the introduction video reflect your experience of the corridor? [#115721]	53	18	4	49	0	75
2	Comments: Does the content presented in the introduction video reflect your experience of the corridor? [#115721]	0	0	0	90	34	34
3	Other: Does the content presented in the introduction video reflect your experience of the corridor? [#115721]	0	0	0	121	3	3
4	Comments: What information from the video was new or surprising to you? [#115550]	0	0	0	112	12	12
5	Comments: After watching the video, what topics would you like to learn more about? [#115722]	0	0	0	107	17	17
6	Does the proposed intersection concept at Hillsdale appear to alleviate the traffic and safety concerns you experience at that intersection? [#115723]	8	22	1	93	0	31
7	Comments: Does the proposed intersection concept at Hillsdale appear to alleviate the traffic and safety concerns you experience at that intersection? [#115723]	0	0	0	108	16	16
8	Other: Does the proposed intersection concept at Hillsdale appear to alleviate the traffic and safety concerns you experience at that intersection? [#115723]	0	0	0	123	1	1
9	Does the proposed intersection concept at Belvedere appear to alleviate the traffic and safety concerns you experience at that intersection? [#115725]	10	27	3	84	0	40
10	Comments: Does the proposed intersection concept at Belvedere appear to alleviate the traffic and safety concerns you experience at that intersection? [#115725]	0	0	0	110	14	14
11	Other: Does the proposed intersection concept at Belvedere appear to alleviate the traffic and safety concerns you experience at that intersection? [#115725]	0	0	0	121	3	3
12	Does the proposed intersection concept at John Warner Parkway appear to alleviate the traffic and safety concerns you experience at that intersection? [#115726]	8	36	4	76	0	48
13	Comments: Does the proposed intersection concept at John Warner Parkway appear to alleviate the traffic and safety concerns you experience at that intersection? [#115726]	0	0	0	97	27	27
14	Other: Does the proposed intersection concept at John Warner Parkway appear to alleviate the traffic and safety concerns you experience at that intersection? [#115726]	0	0	0	124	0	0
15	Do the proposed corridor concepts appear to integrate the needed improvements you think should be included? [#115724]	8	26	1	89	0	35
16	Comments: Do the proposed corridor concepts appear to integrate the needed improvements you think should be included? [#115724]	0	0	0	113	11	11
17	Other: Do the proposed corridor concepts appear to integrate the needed improvements you think should be included? [#115724]	0	0	0	123	1	1
18	Comments: What additional feedback or questions do you have for our project team? [#115551]	0	0	0	105	19	19
	Totals	87	129	13	1845	158	387



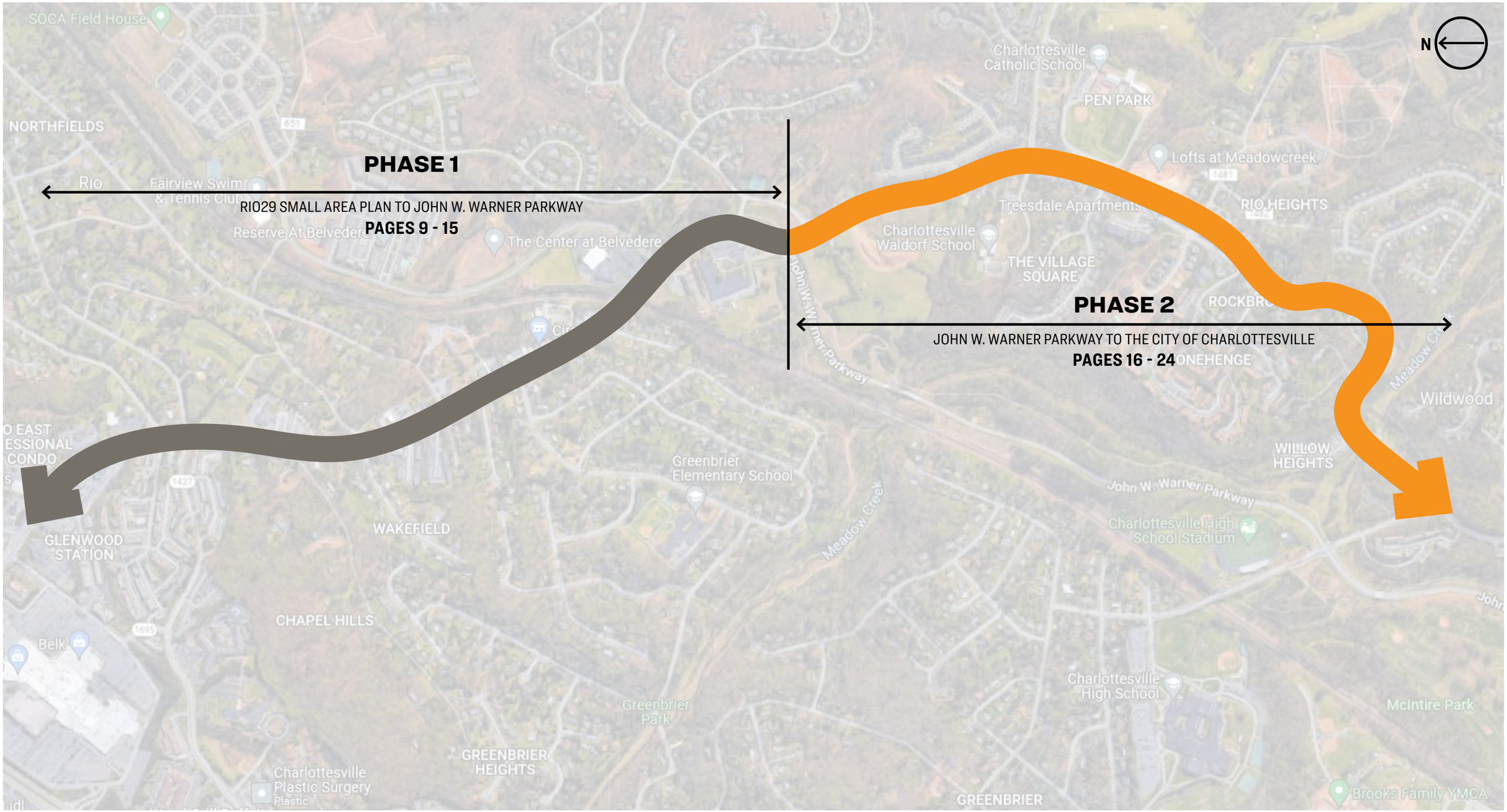


Zone	Number of Comments	Category	Number of Comments
JWW / Rio	63	Intersection Improvements	68
Belvedere	15	Traffic Safety Concerns	21
Gasoline Alley	1	Corridor Capacity	11
Wakefield	0	Bikes	9
Northfield / Old Brook	18	Pedestrians	11
Glenwood Station	3	Transit	1
General	52	Community Outreach	5
		General	26

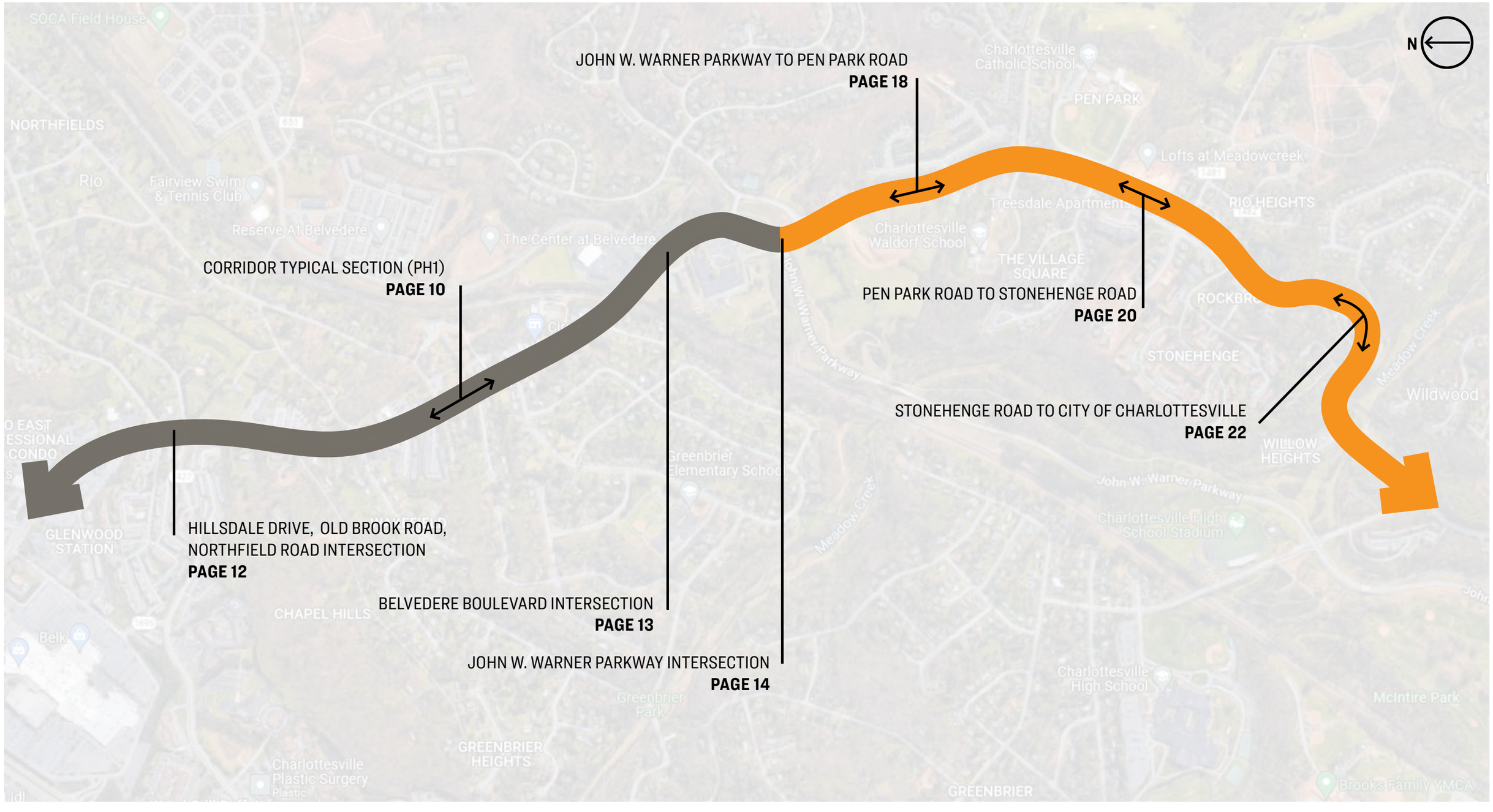
Corridor Priority Matrix	Intersection Improvements	Traffic Safety Concerns	Corridor Capacity	Bikes	Pedestrians	Transit	Community Outreach	General	Total
JWW / Rio	48	4	1	1	7	0	0	2	63
Belvedere	5	6	1	0	1	0	0	2	15
Gasoline Alley	0	1	0	0	0	0	0	0	1
Wakefield	0	0	0	0	0	0	0	0	0
Northfield / Old Brook	10	2	3	1	0	0	0	1	17
Glenwood Station	1	1	0	0	1	0	0	0	3
General	3	7	6	7	2	1	5	21	52
Total	67	21	11	9	11	1	5	26	151

For full list of comments received online, please see Appendix C.

PHASES OF STUDY



FOCUS AREAS


N
JOHN W. WARNER PARKWAY TO PEN PARK ROAD
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PEN PARK ROAD TO STONEHENGE ROAD
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NORTHFIELD ROAD INTERSECTION
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BELVEDERE BOULEVARD INTERSECTION
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JOHN W. WARNER PARKWAY INTERSECTION
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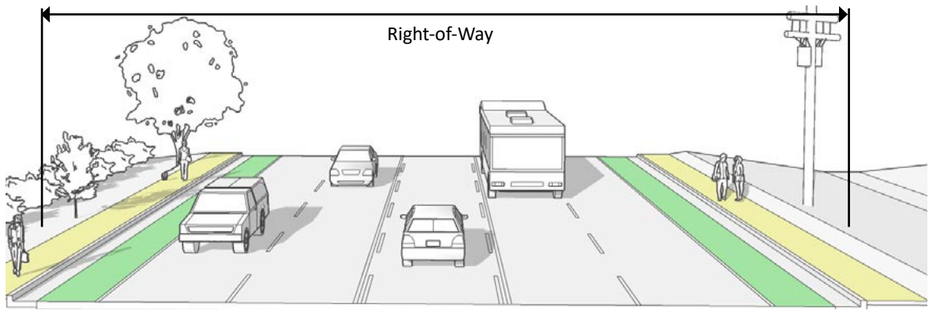
SOCA Field House
NORTHFIELDS
Rio
Fairview Swim & Tennis Club
Reserve At Belvedere
The Center at Belvedere
Charlottesville Catholic School
PEN PARK
Lofts at Meadowcreek
Treesdale Apartments
RIO HEIGHTS
Charlottesville Waldorf School
THE VILLAGE SQUARE
STONEHENGE
Wildwood
WILLOW HEIGHTS
John W. Warner Parkway
Meadow Creek
Greenbrier Elementary School
Charlottesville High School Stadium
GLENWOOD STATION
CHAPEL HILLS
Belk
Greenbrier Park
GREENBRIER HEIGHTS
Charlottesville Plastic Surgery
McIntire Park
Brooks Family YMCA
GREENBRIER

PHASE 1

PHASE 1: CORRIDOR BACKGROUND DATA AND EXISTING CONDITIONS

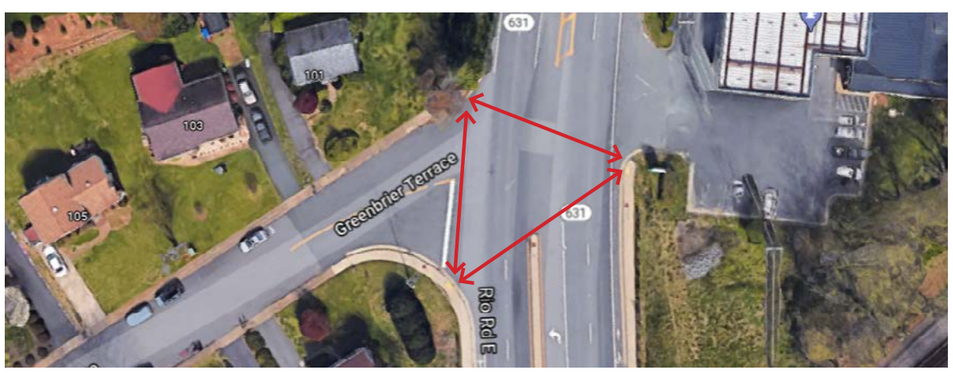
EXISTING ROADWAY TYPICAL SECTION

The existing roadway typical section consists of sidewalks, bicycle lanes, and travel lanes adjacent to one another in both north and south-bound directions. A median turn lane spans most of the corridor.



Select Roadway Elements	Corridor Observations
Buffer Strips A buffer strip is an area of separation, typically vegetated, between vehicular lanes and pedestrian or cyclist travel-ways. It serves as an added protection against vehicle-pedestrian/bicycle collisions.	• There are no buffer strips between the vehicular and bicycle lanes along this corridor. • Buffer strips between the vehicular lanes and sidewalks are only included along the frontage of CATEC.
Street Lighting Street lamps located at regular intervals to provide minimum levels of lighting for the safety of pedestrians, cyclists, and vehicles.	• No street lighting currently exists along the corridor.
Pedestrian Crossings Visually identifiable areas where pedestrians (and cyclists) can safely cross the vehicular traffic lanes.	• Inconsistent or absent crosswalk markings make crossing locations less apparent to those driving and therefore more dangerous.
Pedestrian Facilities Improvements which provide for public pedestrian foot traffic including sidewalks and shared use paths.	• Sidewalks are 5 feet wide, which is the minimum standard. • Signs, poles, railings, and vegetation encroach in many areas, making the usable width less than 5 feet.
Bicycle Facilities Improvements which provide for public bicycle traffic including bicycle lanes and shared use paths.	• Bicycle lanes 6 feet wide are present along both sides of Rio. • Lanes feel much narrower due to gutter pan and encroaching vehicles.
Transit Facilities A place providing access to transit services, in this case bus stops. These can include signs, seating, shelter, and lighting for ease of access.	• Many bus stops exist throughout the corridor. • Stops consist only of signage - no seating, shelter, or lighting.

The nature of this table is to provide observations related to select elements of the corridor and is not intended to imply that this table accounts for all corridor elements.



Pedestrian X-ing
The example to the left is an indication of the confusion and lack of safety for pedestrians to cross Rio Road.

Spacing Standards
Currently the spacing of many commercial entrances and intersections along the corridor are substandard. Areas of inadequate spacing seemingly correlate with areas of high crash-rates.

ACCESS MANAGEMENT AND ACCIDENT DATA

Entrance/Intersection	*Crashes 2014-2021*
Fashion Square Dr	4
Putt Putt Pl	46
(Charlottesville Aldersgate United Methodist Church)	1
Rio E Ct / Glenwood Station Ln	5
(Rio Center)	0
Old Brook Rd	24
Northfield Rd / Hillsdale Dr	42
Chapel Hill Rd	6
(Northside Baptist Church)	0
Wakefield Rd	4
(Charlottesville Church of the Brethren) / Carrington Pl	1
Fountain Ct	3
Huntington Rd / Pine Haven Ct	19
Denice Ln	5
Rio School Ln	2
(Zoomcash Consumer Loans)	4
(Marathon Gas) / Greenbrier Dr	17
(Kangaroo Express N)	18
(Kangaroo Express S)	7
Gasoline Alley	3
(Exxon N)	0
(Exxon S) / Greenbrier Terrace	6
(Covenant Church)	0
Belvedere Blvd / (City Church N)	13
(City Church S)	1
Dunlora Dr	0
Rio Rd E (at JWP) / CATEC	55

For clarity and conciseness this table only includes accidents within the functional area of intersections.

Entrance/Intersection	*VDOT Type 1-4*	*Existing Spacing (ft)*	*Spacing Requirement (ft)*	*Required Spacing Available*
Mall Dr	3	282	470	60%
Putt Putt Pl	3	483	470	100%
(Charlottesville Aldersgate United Methodist	3	282	470	60%
Rio E Ct	2	956	660	100%
Glenwood Station Ln	2	908	660	100%
(Rio Center)	3	279	470	59%
Old Brook Rd (E)	1	220	1050	21%
Old Brook Rd (W)	1	216	1050	21%
Northfield Rd	1	220	1050	21%
Hillsdale Dr	1	216	1050	21%
Chapel Hill Rd	3	537	470	100%
(Northside Baptist Church)	3	372	470	79%
Wakefield Rd (E)	2	375	660	57%
Wakefield Rd (W)	2	343	660	52%
(Charlottesville Church of the Brethren)	2	326	660	49%
Carrington Pl	2	334	660	51%
Fountain Ct	3	85	470	18%
Huntington Rd	2	326	660	49%
Pine Haven Ct	2	334	660	51%
Denice Ln	3	305	470	65%
Rio School Ln	3	61	470	13%
(Zoomcash Consumer Loans)	3	61	470	13%
(Marathon Gas)	1	2538	1050	100%
Greenbrier Dr	1	2454	1050	100%
(Kangaroo Express N)	3	121	470	26%
(Kangaroo Express S)	3	121	470	26%
Gasoline Alley	3	136	470	29%
(Exxon N)	3	116	470	25%
(Exxon S)	2	672	660	100%
Greenbrier Terrace	2	651	660	99%
(Covenant Church)	4	259	250	100%
Belvedere Blvd	2	672	660	100%
(City Church N)	2	651	660	99%
(City Church S)	4	169	250	68%
Dunlora Dr	4	390	250	100%
Rio Rd E (at JWP)	1	1804	1050	100%
(CATEC)	1	1672	1050	100%

ACCIDENT HOT SPOTS

ACCESS MANAGEMENT HOT SPOTS

DETAILED ACCIDENT ANALYSIS

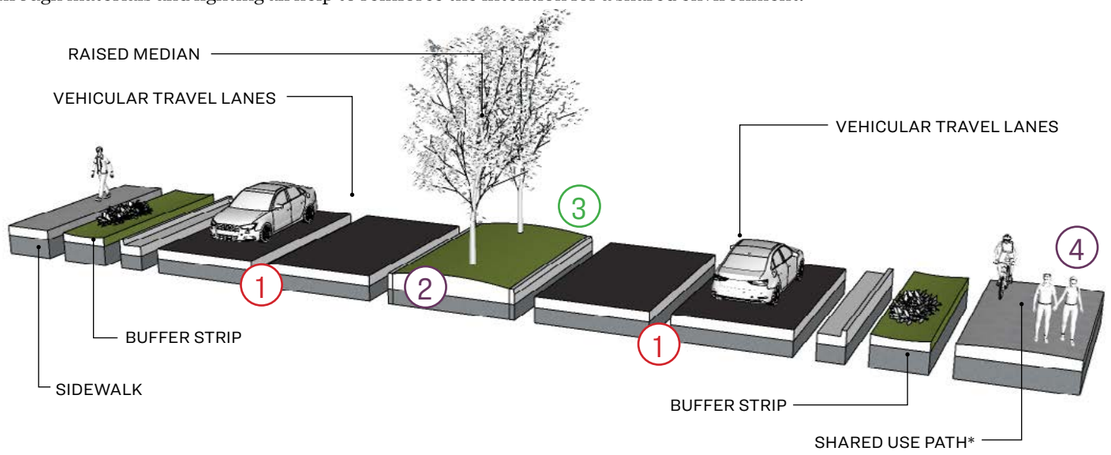
The “hot spot” diagrams included herein are necessarily simplified to support basic understanding and to suggest simple mitigation measures. A detailed and robust accident analysis has also been developed to support this work, refer to Pages 28-30.

PROPOSED SOLUTIONS FOR CORRIDOR TYPICAL SECTION AND ROADWAY

KEY MAP

THE FUTURE OF RIO ROAD WILL BE A CORRIDOR THAT IS MUCH MORE COMMUNITY FOCUSED. The community values that have been shared are not only about getting from Point A to Point B quickly, but about the safety, quality, and flexibility of the trip. Though a typical section looks at one sliver of road width at a time, the culmination of typical sections has great influence over the character of the entire corridor as well as its functionality.

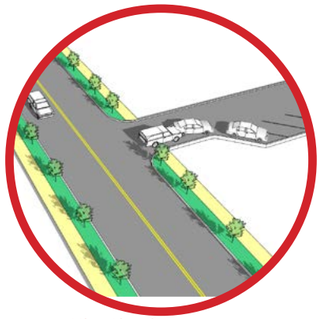
The goal of the proposed typical section is to redistribute the available space in the right-of-way to provide safer and more enjoyable spaces for all. This typical section includes buffer strips and a raised median to break up the pavement and to separate vehicles from pedestrians. A shared use path consolidates the sidewalk and bicycle lane in order to remove the bicycle lane from the road. When taken together these aspects of the Rio Road corridor can overhaul the corridor from a vehicle-centric thoroughfare to a transportation corridor reflective of the needs of the community. Providing safe pedestrian crossings and walking paths, slowing vehicle speeds, promoting transit as a viable transportation option, and establishing a series of visual cues through materials and lighting all help to reinforce the intention for a shared environment.



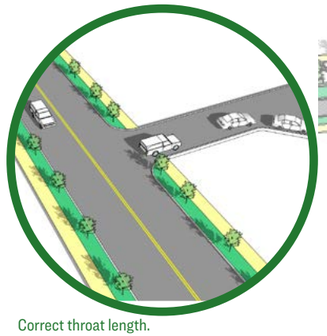
Proposed Roadway Elements	Proposed Resolutions
Buffer Strips A buffer strip is an area of separation, typically vegetated, between vehicular lanes and pedestrian or cyclist travel-ways. It serves as an added protection against vehicle-pedestrian/bicycle collisions.	• Buffer strips 4-6 feet wide are recommended to separate pedestrians and cyclists from vehicles and allow for the planting of trees. • This is not only a safety improvement but an environmental improvement.
Street Lighting Street lamps located a regular intervals to provide minimum levels of lighting for the safety of pedestrians, cyclists and vehicles.	• Street lighting is recommended in locations of high pedestrian activity, especially at crossings and bus stops. • Lights should be full cut-off.
Pedestrian Crossings Visually identifiable areas where pedestrians (and cyclists) can safely cross the vehicular traffic lanes.	• Crossings should be clearly and consistently marked. • Directional crossings should be implemented more frequently.
Pedestrian Facilities Improvements which provide for public pedestrian foot traffic including sidewalks and shared use paths.	• ADA accessibility of pedestrian facilities should be a priority. • This includes proper maintenance of sidewalk surfacing, adequate usable sidewalk width, and curb ramps at crossings.
Bicycle Facilities Improvements which provide for public bicycle traffic including bicycle lanes and shared use paths.	• Shared-use paths should be implemented to replace bicycle lanes. • Remaining bicycle lanes should be separated from vehicle lanes by use of either vegetated or striped buffer.
Transit Facilities A place providing access to transit services, in this case bus stops. These can include signs, seating, shelter, and lighting for ease of access.	• At a minimum, seating and lighting needs to be provided at the existing bus stops. • Shelters should be considered at high-volume stops.

*The Shared Use Path along Rio Road effectively creates the Northtown Trail. Connecting the JWWP Greenway to the Rio29 SAP and eventually to Berkmar Drive.

VDOT ACCESS MANAGEMENT CRITERIA FOR SAFETY



Incorrect throat length.



Correct throat length.

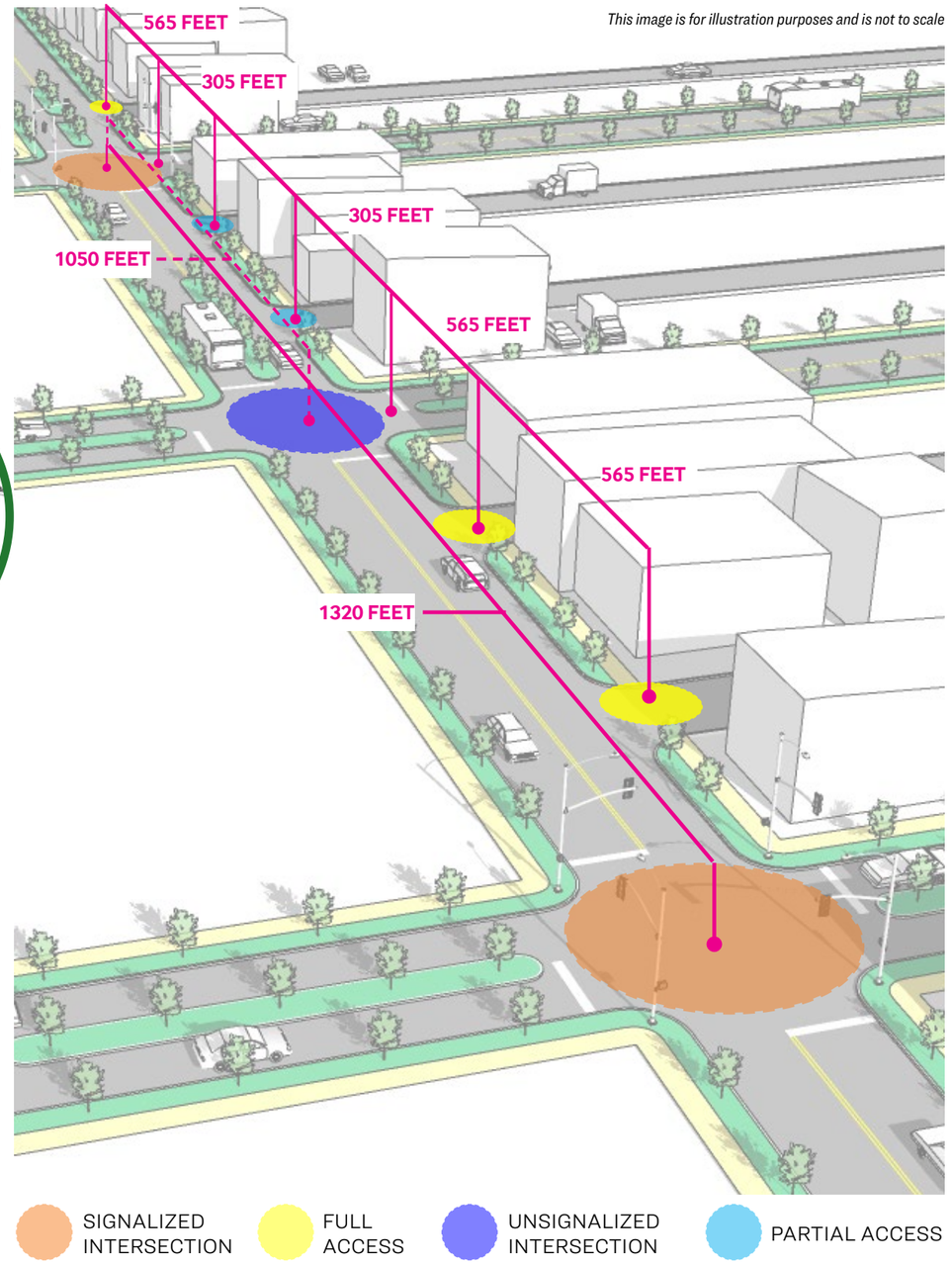
1 **Narrow Travel Lanes**
Travel lanes providing only the minimum required width promote vehicles traveling at or near the posted speed limit. Raised medians and planted buffer strips also help.

2 **Reduction of conflict points**
Reducing conflict points creates safer roadways for all user groups.

3 **Reduction of Impervious Cover**
Reducing impervious surfaces reduces stormwater runoff, lowers heat-island effect, and provides spaces for vegetation.

4 **Multi-Modal Network**
Establishing a shared-use path along Rio Road creates a much needed multi-modal link between the John W. Warner Parkway and Berkmar Drive extended.

This image is for illustration purposes and is not to scale



HILLSDALE / OLD BROOK / NORTHFIELD

KEY MAP

THE HILLSDALE DRIVE, OLD BROOK ROAD, NORTHFIELD ROAD and Rio Road intersections experience more vehicular crashes than any other intersection along the corridor. Their proximity (220 feet apart) substantially deviates from any professional guidance for intersection spacing – and thus the condition will continue to be unsafe until a new strategy can be implemented.

These intersections are also the topographic high-point of the corridor, making the area a logical point of a gateway experience to include the visual cues that the roadway context is shifting from the Rio29 Small Area Plan to a less intense land use – particularly residential density.

For the purposes of this Corridor Study, three (3) alternatives have been explored which could rectify the safety and geometric challenges at this intersection.

1. Combine the intersections into a singular intersection;
2. Encourage some vehicles to choose a different route of travel;
3. Combine or reroute crossing roads to create two 3-way intersections.

In consideration of these alternatives, it is also suggested that County determine the viability of the Hillsdale Drive realignment suggested in the Rio29 Small Area Plan. This long-range planning concept should be held in tension with the alternatives considered here.

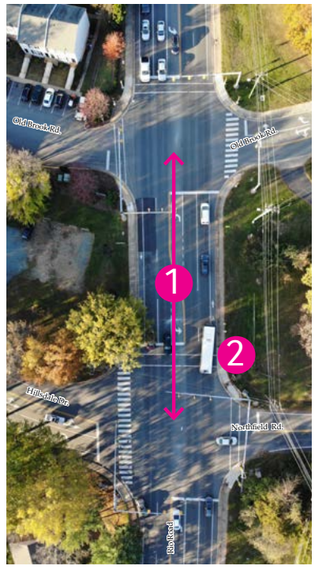
Given the long-range nature of the Hillsdale Drive realignment, this study will explore the three (3) alternatives listed above.

1 The proximity of these intersections effectively makes one large and congested intersection.

VDOT standards suggest these intersections be at least 1,050 feet apart. Currently they are 220 feet apart.

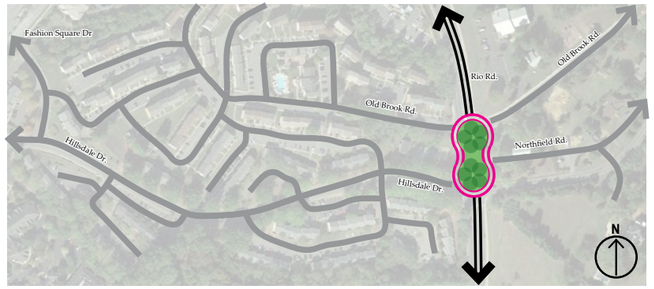
Inadequate spacing inherently means inadequate storage lengths for vehicles, as well as insufficient time to merge into the desired lane.

2 There is a high bus volume in this area, though lane widths are only 10 ft. Turning vehicles and buses often cross into the bicycle lane.



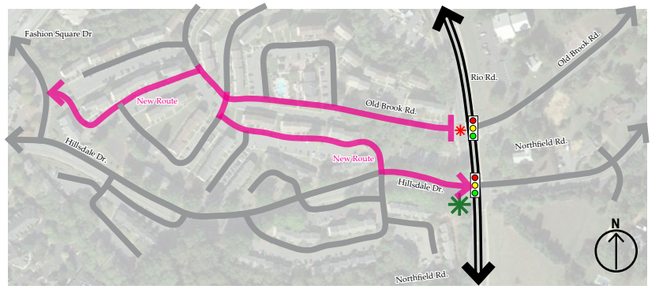
ALTERNATIVE 1: COMBINE THE INTERSECTIONS INTO A SINGULAR INTERSECTION

- All intersection movements remain full access
- All intersection movements are yield controlled
- Vehicle speeds are reduced and safety is increased
- Two intersections become a single intersection



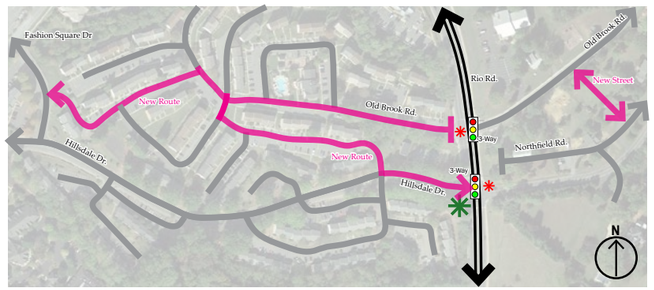
ALTERNATIVE 2: ENCOURAGE SOME VEHICLES TO CHOOSE A DIFFERENT ROUTE OF TRAVEL

- Full access for some intersection movements is reduced
- Vehicular volumes in intersection are reduced
- Pedestrians and cyclists are not specifically benefited by this improvement



ALTERNATIVE 3: COMBINE + REROUTE CROSSING ROADS TO CREATE TWO 3-WAY INTERSECTIONS

- One full intersection leg is removed from each intersection
- Two 3-way intersections are created
- A new street will be required to enable this solution
- Pedestrians and cyclists are not specifically benefited by this improvement

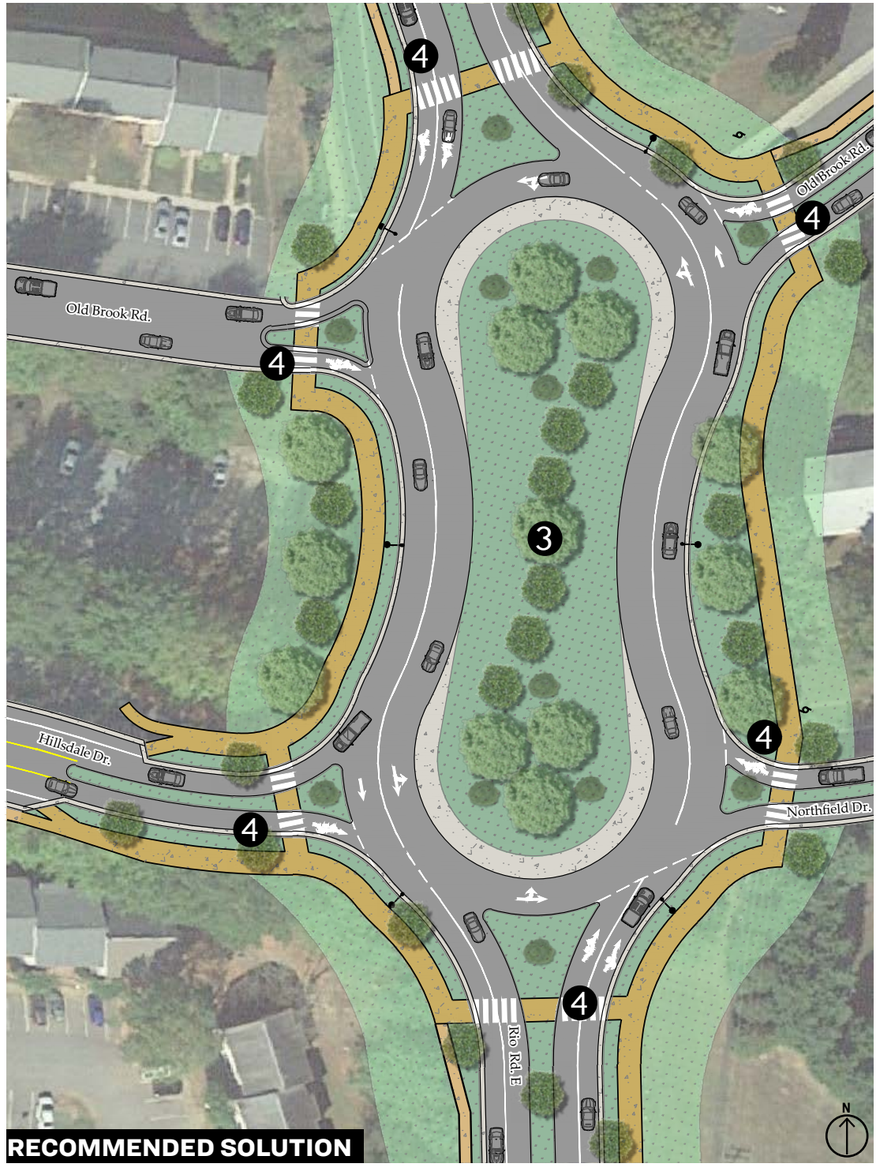


OPPORTUNITIES

- Promote context change
- Integrate two intersections as one
- Create consistent and comprehensive pedestrian access
- Create gateway experience at topographic high-point
- Promote vehicle calming

GENERAL FEEDBACK

- Positive response from VDOT
- Some citizens have expressed confusion
- Everyone recognizes a need for improvement



RECOMMENDED SOLUTION

3 A bean shaped roundabout allows the major infrastructure to remain in place while the safety and efficiency of the intersection are improved.

4 Pedestrian crossings have been integrated at every leg of the intersection and the crossing distances are shorter.

BELVEDERE BLVD.

KEY MAP

THE BELVEDERE BOULEVARD INTERSECTION poses unique challenges to the Rio Road corridor. First, the intersection experiences substantial delays (as much as 8 minutes) for left-hand turning movements out of Belvedere and, second, the intersection is also the primary commercial entrance for City Church. These challenges suggest that the intersection has both operational and geometric deficiencies which need to be resolved.

Two (2) alternative solutions have been explored which could improve the functional capacity of the intersection and promote safety for various users. These options are succinctly described as:

1) Continuous Green-T intersection;

2) Signalized intersection.

In exploration of these alternatives, it is recommended that County staff and leadership ensure that the planned improvements at the John W. Warner Parkway intersection can be well integrated with these options. Previous VDOT studies have included both of these intersections because of the interconnected nature of how these intersections operate.

It is anticipated that when the JWWP intersection is converted to a roundabout that the gaps in traffic flow may be decreased and this could further complicate the operational capacity of this intersection. However, the Continuous Green-T (CGT) alternative developed as a part of this study can offset some of this traffic flow by way of allowing left-hand turn movements to be organized into a two-step process where vehicles exiting Belvedere only need to navigate one direction of crossing travel at a time instead of two.

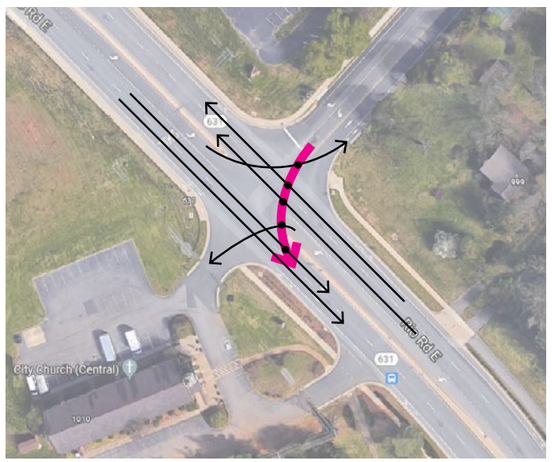


Diagram representing the current conflict points for left-hand turning movements exiting the Belvedere Boulevard Intersection

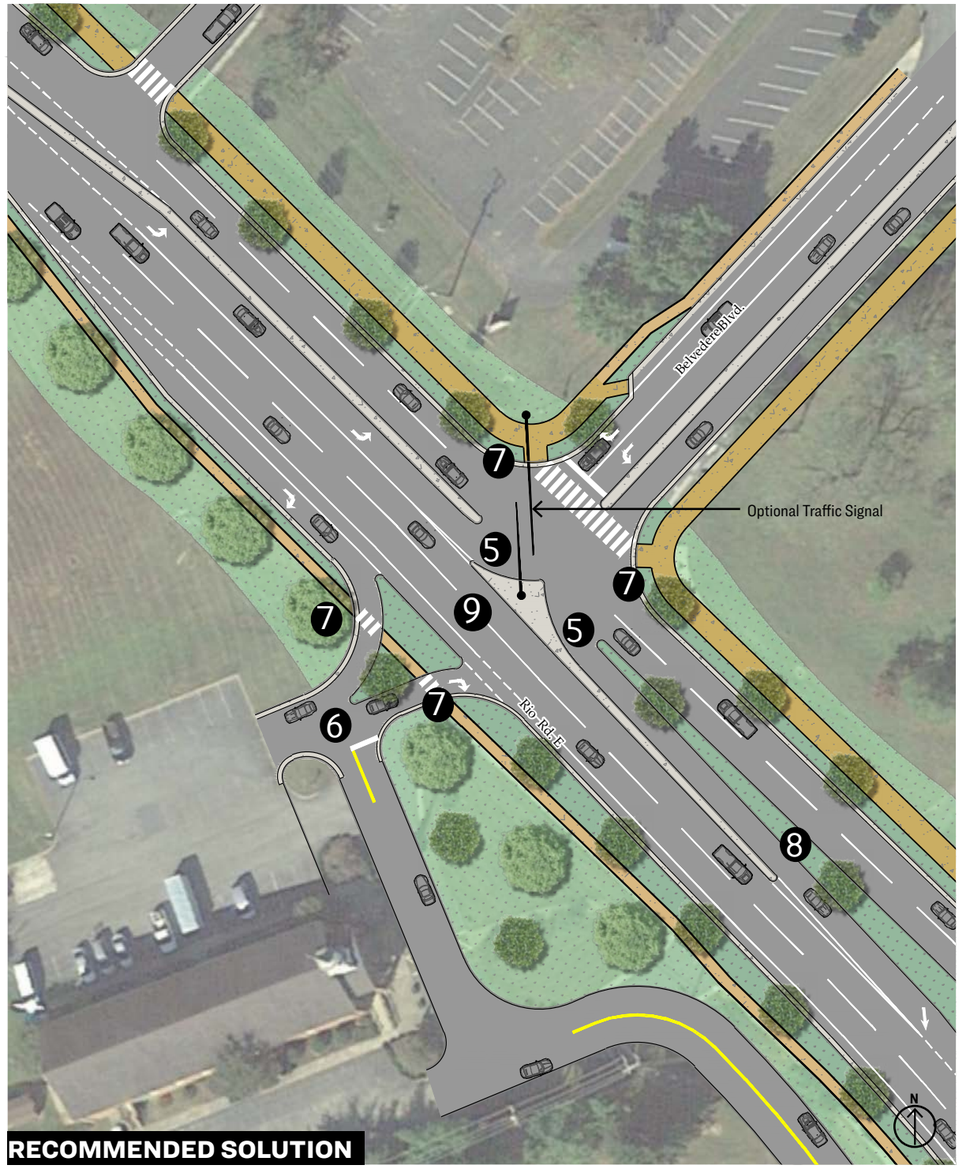
1. Vehicles making a left-hand turn movement out of Belvedere currently experience delays exceeding 500 seconds (over 8 minutes).
2. The commercial entrance of a church is located within the functional area of the intersection.
3. The secondary entrance to this same church does not meet the VDOT spacing requirements.
4. Existing curb ramps are oriented to direct pedestrians into the middle of the intersection.

OPPORTUNITIES

- Implement safety improvements
- Improve access at church to benefit church and County
- Integrate pedestrian program for safe and equitable access
- Minimize conflict points
- Increase Level of Service (LOS)
- Partial signalization possible if warranted

GENERAL FEEDBACK

- Intersection needs to be improved
- Safety is of concern
- Consider peak hour traffic signal



RECOMMENDED SOLUTION

5. The proposed Continuous Green-T intersection provides a refuge area for both left-hand turning movements.
6. Consolidating the church entrances and providing a frontage road allows these entrances to conform with VDOT spacing requirements. This frontage road also serves CATEC, which is currently part of the JWWP intersection.
7. Curb ramps are reoriented to promote clear direction of travel and crossing for pedestrians.
8. Street trees planted within roadway medians and buffer strips contribute to cooler pavement temperatures.
9. One direction of travel along Rio is free-flow even if a signal is used, which reduces delays compared to a traditional signalized intersection.

JOHN W. WARNER PARKWAY

The Rio Road intersection with John W. Warner Parkway is complex and encounters high volumes of peak hour traffic. Peak hour traffic volumes will continue to increase in the near future. These pending developments only highlight the importance of long-range transportation planning needs.

This intersection has previously been studied, both by VDOT as well as traffic engineers who represent the developers considering the adjacent projects. Information from the VDOT study is most relevant and is summarized below. Original traffic study documents can be found in Appendix F.

VDOT STUDY

as developed by Kimley-Horn and Kittelson & Associates

In March 2020 VDOT published a study that evaluated the JWWP and Rio Road intersection as well as the Belvedere intersection. (A more robust summary of this traffic study can be found on Page 31). The findings of the study suggested that the existing signalized John W. Warner Parkway intersection should be replaced with a dual-lane roundabout. After the study was issued to VDOT and the County, the improvements for this intersection were funded for implementation. A summary of the study's findings are as follows:

- The proposed roundabout should be dual-lanes and include a non-yielding bypass lane for westbound Rio road.
- The roundabout will be located where the existing signalized intersection is located and will include direct access to CATEC.
- The existing wild-flower meadow is proposed to become the stormwater management basin for the project.
- Dunlora Drive will connect to Rio Road, similar to the current condition, however left-hand turns onto Rio Road southbound will not be permitted.
- A third travel lane will be added to Rio Road between JWWP and Belvedere to accommodate the non-yielding bypass lane.

The study concluded that by replacing the signalized intersection with the dual-lane roundabout that the intersection's Level of Service during the peak hour would be improved from Level E to Level A. The study also suggested many findings were conceptual and preliminary in nature and the concept (shown at right) will be further developed during the Preliminary Engineering Phase of the project.

OPPORTUNITIES

- Improve transportation for local traffic and commuter traffic
- Create additional outdoor space
- Improve access and mobility for pedestrians and cyclists
- Consolide access points

GENERAL FEEDBACK

- VDOT response was supportive of Alternative 1 as a replacement to their study
- Community members prefer VDOT Study concept
- Desire to know more about how roundabouts work

ALTERNATIVE CONSIDERATIONS

As a result of the County initiating the Rio Road Corridor Study, the JWWP Rio Road intersection was additionally evaluated. The Rio Road Corridor Study agrees with the VDOT study in that a dual-lane roundabout will be the appropriate intervention to improve LOS at this intersection. The question evaluated by the Corridor Study was not what is the correct intervention strategy, but rather, *where* should the intersection be located for optimal and efficient traffic movements within the corridor as a whole.

Alternative 1

This design idea seeks to simplify the infrastructure at and around the intersection to make navigating the intersection intuitive and predictable. The location was identified by creating a natural crossroad geometry for all roadways (refer to blue dashed lines in diagram indicating crossroads location). A summary of this alternative includes:

- Reduction in conflict points
- Reduction in impervious cover
- Reduced impervious area and stormwater runoff volumes
- Consolidated infrastructure
- Expanded outdoor access
- The Rio Road infrastructure is proximally nearer to residential properties

Alternative 2

Similar to Alternative 1, this idea seeks to centrally locate the roundabout but not with increased proximity to residential properties. The result is an option which simplifies the VDOT concept, and allows existing infrastructure to remain in place. Particularly Dunlora Drive and Varick Street. A summary of this alternative includes:

- Hybrid option between VDOT study and Alternative 1
- Reduction in conflict points (similar to Alt 1)
- Expanded outdoor access (similar to Alt 1)
- Wildflower meadow is replaced by stormwater basin (similar to VDOT study)
- Dunlora Drive and Varick Street remain as is (similar to VDOT study)

KEY MAP

VDOT STUDY CONCEPT: REPLACE SIGNALIZED INTERSECTION WITH ROUNDABOUT

- Replace the signalized intersection with a roundabout
- Dual-lane roundabout for level of service
- Add third-travel lane for Rio Northbound between JWWP and Dunlora
- Eliminate Dunlora Drive left-hand turn onto Rio Road
- Eliminate wildflower meadow for stormwater management

ALTERNATIVE 1: CENTRALLY LOCATE INTERSECTION AND OPTIMIZE EXISTING INFRASTRUCTURE

- Replace traffic signal with dual-lane roundabout and relocate roundabout ~200' north
- 40% reduction in conflict points as compared to VDOT study
- 20% reduction of impervious surfaces as compared to VDOT study
- Expanded and consolidated outdoor space for equitable access to recreation
- Improved pedestrian safety
- Roundabout is relocated to be nearer to residential properties

ALTERNATIVE 2: HYBRID OPTION BETWEEN VDOT AND ALTERNATIVE 1

- Replace signal with roundabout but not in exact location of existing signal
- Encroachment toward CATEC instead of residential properties
- Stormwater program per VDOT study
- Moderate increase of public space per Alt. 1
- Elimination of 3rd lane per VDOT study

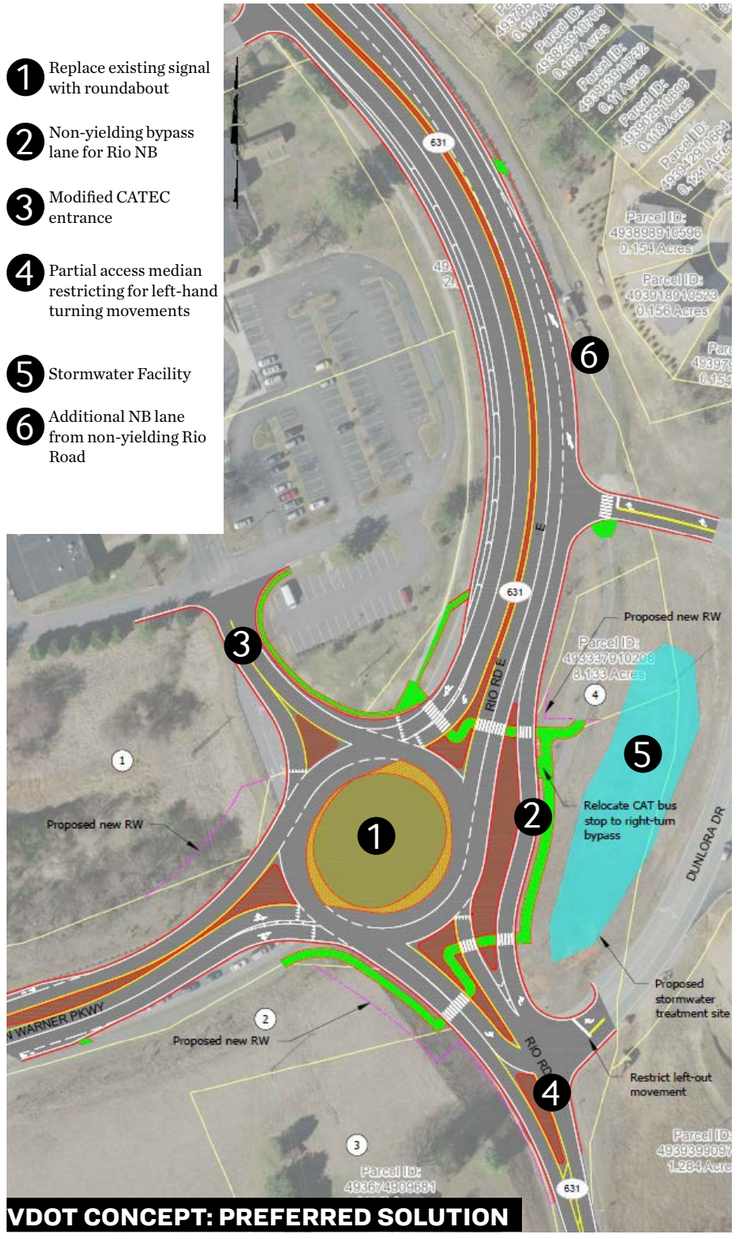
JOHN W. WARNER PARKWAY

KEY MAP

VDOT STUDY

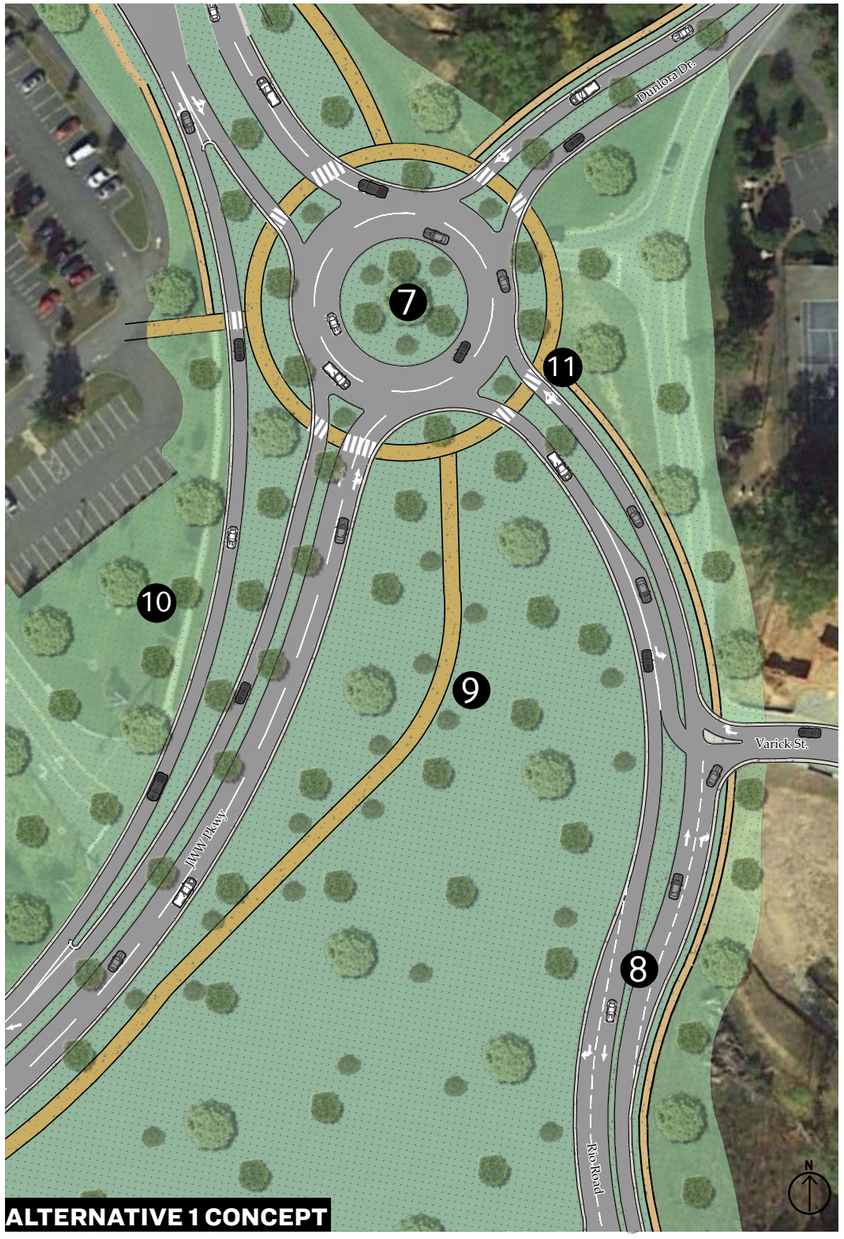
as developed by Kimley-Horn and Kittelson & Associates

1. Replace existing signal with roundabout
2. Non-yielding bypass lane for Rio NB
3. Modified CATEC entrance
4. Partial access median restricting for left-hand turning movements
5. Stormwater Facility
6. Additional NB lane from non-yielding Rio Road



VDOT CONCEPT: PREFERRED SOLUTION

ALTERNATIVE CONSIDERATIONS



ALTERNATIVE 1 CONCEPT

7. Roundabout relocated northward, proximally closer to residential properties
8. New alignment of Rio Road Northbound
9. Consolidated green space from existing wildflower garden, former Rio Road, and proffer from developer
10. CATEC access is altered and no longer enters directly into the intersection
11. Pedestrian made safer by virtue of slower vehicle speeds, shorter crossing distances and refuge islands

JOHN W. WARNER PARKWAY INTERSECTION SUMMARY

A more detailed analysis between these alternatives including their carbon emissions, vehicular miles traveled, maintenance concerns, stormwater runoff and environmental considerations can be found in Appendix E3.

Based on public comment and feedback it has been determined that the original VDOT concept is the preferred concept for this intersection. Given the time-frame of the planned improvements as performed by VDOT, the alternative recommendations presented herein are not currently being considered for implementation.

It is noteworthy to reiterate that the traffic analysis developed by VDOT, and expounded upon in the review of traffic studies on Page 31, will adequately address the traffic concerns in this area. Some traffic movements will be enhanced and others will be frustrated, but the overall solution establishes that the Rio Road and JWWP intersection will operate at an increased level of service.

PHASE 2

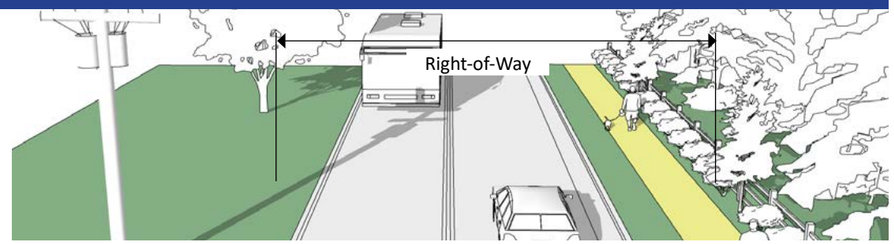
PHASE 2: CORRIDOR BACKGROUND DATA AND EXISTING CONDITIONS

KEY MAP

EXISTING ROADWAY TYPICAL SECTIONS

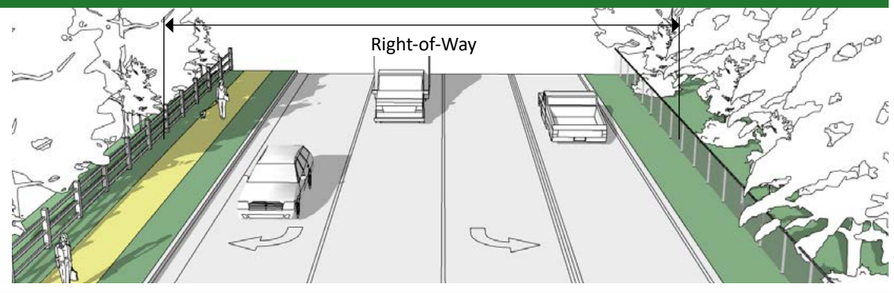
NORTH

From JWWP to Pen Park Road the roadway consists of 2 through-lanes with dedicated left or right turn lanes in discrete locations. A sidewalk with a buffer strip is present along the eastern side of the road.



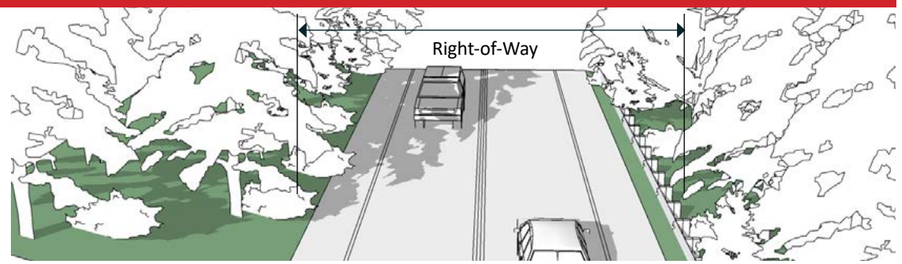
CENTRAL

From Pen Park Road to Stonehenge Road the corridor exhibits a highly variable typical section. The main source of variation along this portion of the corridor is the lane widths, which fluctuate between 10-14 feet in width as well as the inconsistent edge treatments, including turns lanes, curbs, and grass shoulders.



SOUTH

From Stonehenge Road to the City jurisdictional boundary at Melbourne Road the typical section is consistently 2-lanes with no pedestrian or cyclist infrastructure. The corridor in this area exhibits winding curves and steep terrain as well as extremely wide paved shoulders in discrete areas.



Select Roadway Elements	Corridor Observations
Pedestrian Facilities Improvements which provide for public pedestrian foot traffic including sidewalks and shared use paths.	• Sidewalks are intermittent and disconnected. The County is actively infilling some areas which will improve connectivity. • In places where sidewalks are provided, buffer strips are present. These buffers range from 2-4 feet. • The discontinuity of sidewalks discourages their use.
Bicycle Facilities Improvements which provide for public bicycle traffic including bicycle lanes and shared use paths.	• No bicycle lanes are present throughout the entire corridor. • No shared use paths are present. • Several adjacent neighborhoods contain connections to trails.
Pedestrian Crossings Visually identifiable areas where pedestrians (and cyclists) can safely cross the vehicular traffic lanes.	• There are signalized crossings at the ends of this corridor (JWWP and Melbourne), but no designated pedestrian crossing in between.
Transit Facilities A place providing access to transit services, in this case bus stops. These can include signs, seating, shelter, and lighting for ease of access.	• 5 total bus stops in North and Central areas. None in South. • One stop has seating and shelter; others have only signage. • Ridership data shows 6 or less riders per day on average for each stop.

The nature of this table is to provide observations related to select elements of the corridor and is not intended to imply that it accounts for all corridor elements.

ACCESS MANAGEMENT AND ACCIDENT DATA

Entrance/Intersection	*Crashes 2014-2021*
*John W. Warner Pkwy	11
Dunlora Dr	1
Dunlora Forest Dr	6
Pen Park Rd/Waldorf School Rd	4
Towne Ln	6
(Lofts at Meadowcreek)/Treesdale Park Ln	1
Pen Park Ln/Penfield Ln	0
Stonehenge Rd	11
Rockbrook Dr	0
Agnese St	6
(Future Ecovillage Entrance)	0
Alwood Ln	2
Brookway Dr	6
Melbourne Rd	6

**Note these are crashes along Rio Corridor Ph 2 portion only*

For clarity and conciseness this table only includes accidents within the functional area of intersections.

Entrance/Intersection	*VDOT Type 1-4*	*Ex. Spacing (ft)*	*Spacing Requirement (ft)*	*Required Spacing Available*
John W. Warner Pkwy	1	1804	1050	100%
Dunlora Dr	3	268	470	57%
(Future Parkway Pl Entrance)	3	500	470	100%
Dunlora Forest Dr	3	630	470	100%
Pen Park Rd	1	2133	1050	100%
Waldorf School Rd	1	2133	1050	100%
Towne Ln	3	611	470	100%
(Lofts at Meadowcreek)	3	462	470	98%
Treesdale Park Ln	4	362	250	100%
Pen Park Ln	2	1433	660	100%
Penfield Ln	2	1433	660	100%
Stonehenge Rd	3	92	470	20%
Rockbrook Dr	3	92	470	20%
Agnese St	3	1753	470	100%
(Future Ecovillage Entrance)	3	391	470	83%
Alwood Ln	3	299	470	64%
Brookway Dr	3	299	470	64%
Melbourne Rd	1	1220	1050	100%

ACCIDENT HOT SPOTS

ACCESS MANAGEMENT HOT SPOTS

DETAILED ACCIDENT ANALYSIS

The “hot spot” diagrams included herein are necessarily simplified to support basic understanding and to suggest simple mitigation measures. A detailed and robust accident analysis has also been developed to support this work, refer to Pages 28-30.

ACCESS MANAGEMENT CHALLENGE AT STONEHENGE ROAD AND ROCKBROOK DRIVE

JOHN W. WARNER PARKWAY TO PEN PARK ROAD

This northern area of the Phase 2 corridor is characterized as transitional, and ultimately leading to suburban. There is visual evidence of recent pedestrian improvements along Rio Road within this area, but the real transitions will be realized in the years ahead as several large properties adjacent to the corridor are developed into residential communities. The redevelopment of these properties will accelerate the opportunity for positive change but also introduce previously unforeseen challenges.

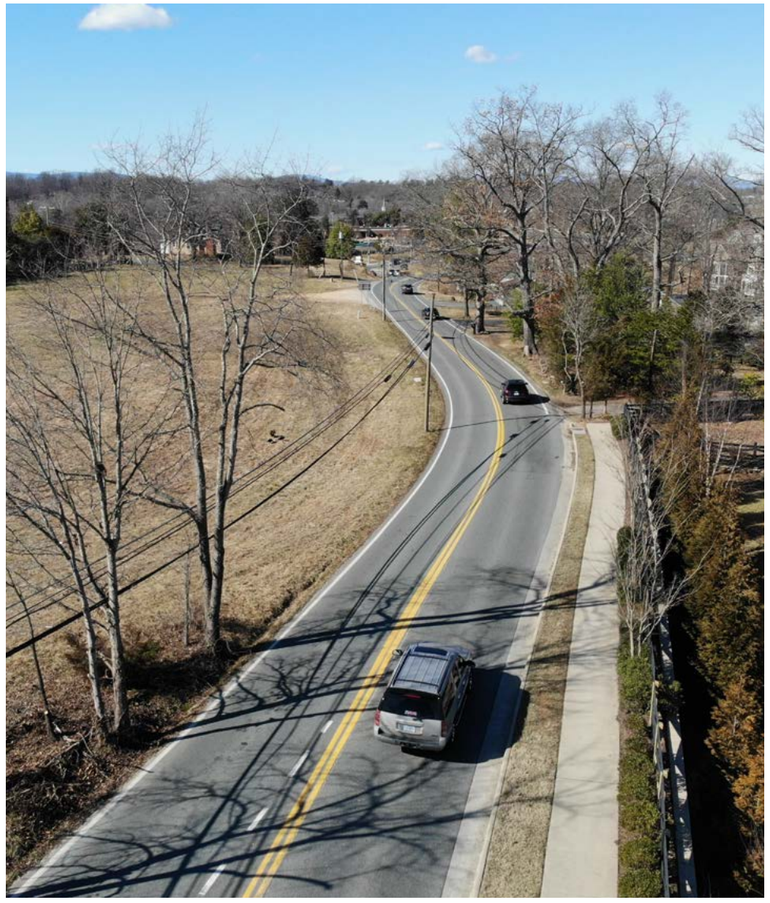
Positive opportunities include the chance to redefine the frontage characteristics along the road, and in particular, to expand the pedestrian and cyclist infrastructure. The pending Rio Point Development and the Rio Commons Development can provide the shared use path design along their frontage, creating a direct connection to the JWWP greenway trail. Establishing this connection creates the opportunity for residents in the area (current and future) to travel by means other than vehicles. Future connection opportunities exist to connect this shared use path to the Pen Park intersection, completing the connection with the JWWP greenway trail.

It is understood that these pending developments will also bring increased traffic. The future traffic volume map on Page 27 suggests that this increase will not be slight. This increase in traffic will put additional burden on the small residential side streets as well as the JWWP intersection and Pen Park Road intersection.

It is the intent of this study to balance the positive opportunities available to the corridor in such a way as to also provide solutions to the pending (traffic) challenges.

The pending developments in the corridor will drastically affect the operational efficiency of the corridor, particularly if each development implements only what is minimally necessary to support their individual burdens. As can be seen in the Roadway Allocation Diagram, at right, the 2,200 feet between JWWP and Pen Park Road will experience eleven (11) different lane configurations/allocations.

The complexity of this portion of the corridor is a result of intermittent left-hand turns. Potential solutions available to address this complexity include: incorporating predictable and organized left-hand turning movements throughout this portion of the corridor (Alternative 1), or removing left-hand turning movements altogether, (Alternative 2). Diagrammatic representations of each are shown at right.



A corridor on the brink of transition. Note recent development on right, and future development area on left.

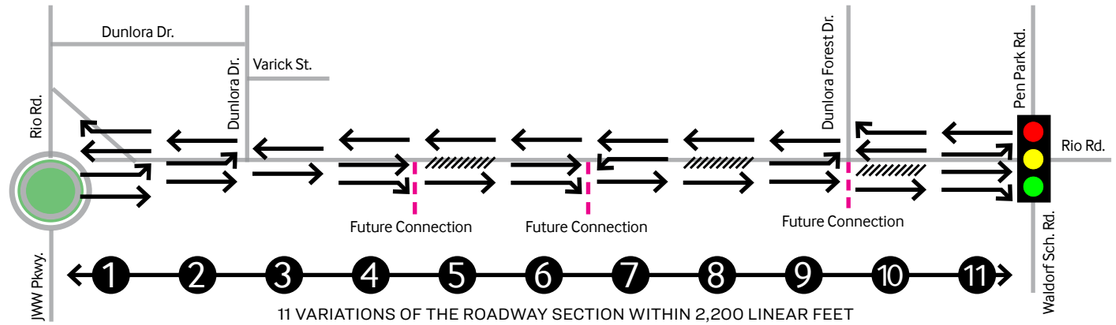
OPPORTUNITIES

- Create a uniform and logical typical section from JWWP to Pen Park Road
- Establish safe pedestrian and cyclist zones and identify logical pedestrian crossing areas
- Create integrated solutions that allow for increased traffic and safety
- Define visual aesthetic and character of roadway for visual cues including landscaping, building engagement and pedestrian areas

GENERAL FEEDBACK

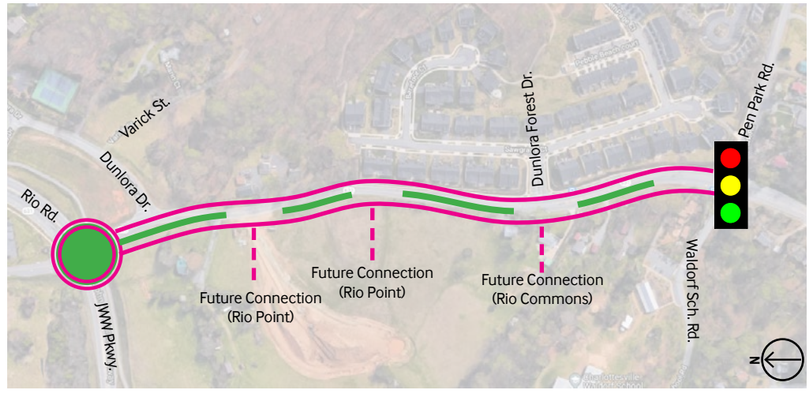
- Pedestrian activity needs to be made safer
- Road design needs to account for traffic from future developments
- Roundabout at Pen Park Road is not desired by residents

ROADWAY ALLOCATION DIAGRAM: Representing Roadway Configuration After Rio Point + Rio Commons Develop



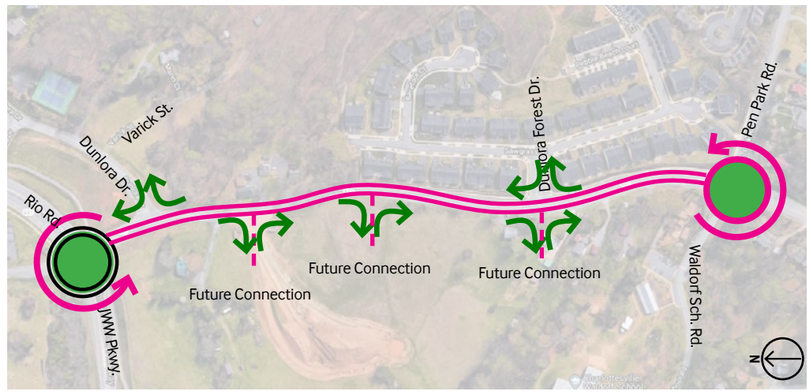
ALTERNATIVE 1: TYPICAL SECTION CONTROLLED ALTERNATIVE (FREE FLOW)

- Establish a consistent and uniform roadway typical section that can incorporate the left-hand turn lanes in a predictable and uniform manner for the duration of the corridor.
- All movements into and out of residential communities can remain as proposed.
- Use pending development projects to establish typical section uniformity along development frontage.
- Use raised medians to support mid-block crossing safety.
- Include a shared use path for the duration of corridor.
- The traffic signal at Pen Park can still be replaced with a roundabout, if desired.



ALTERNATIVE 2: REMOVE LEFT-HAND TURNING MOVEMENTS (CIRCULATORY FLOW)

- Utilize a roundabout at Pen Park Road to establish the opportunity for vehicles to make left-hand turns at the intersection instead of at the property entrances.
- All movements into and out of residential communities are right-hand only. The Pen Park roundabout would be needed near term.
- This design results in increasingly poor performance of the intersection LOS and will increase vehicle miles traveled, both negative effects of this option.
- This alternative results in a more compact roadway typical section that could include multi-modal options without additional ROW and has fewer conflict points.

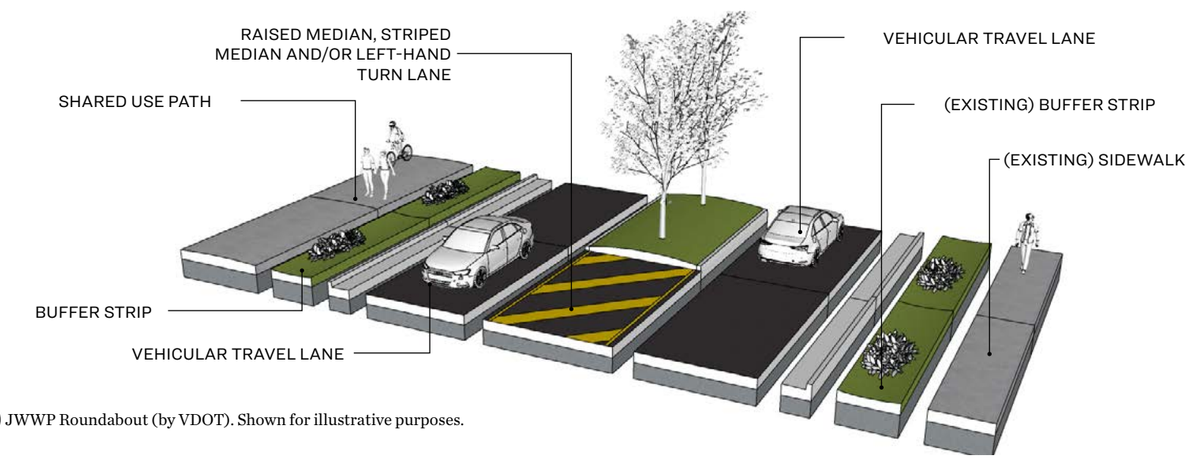


JOHN W. WARNER PARKWAY TO PEN PARK ROAD

KEY MAP

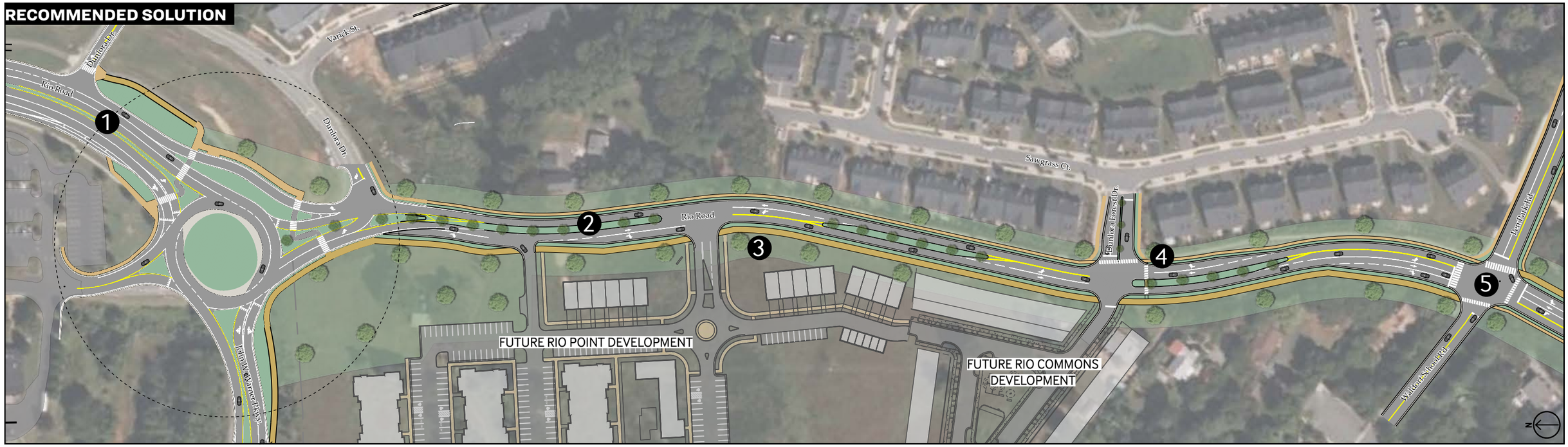
Observations	Resolutions / Suggestions
Zoning / Density • Zoning designations along the North and Central sections are largely residential, with similar density • As development increases, North and Central sections will look increasingy similar	• As development increases within the North section, the new typical section should be established by increasing the road width to the east, where the new developments are planned • The developments should also allow for the needed median, refer to typical section suggestions at right
Typical Section • There are a high number of off-road accidents along this stretch of road. People are hitting fixed objects within the clear zone • No curb and gutter exists along this section (except for Dunlora Forest frontage)	• Establish consistent roadway width and add a median for current and future left-hand turns. The median could be striped or raised, concrete or planted • Left-hand turns are warranted at every development along Rio Road. By adding the median, the through-lane capacity of the road is preserved • The median should be 12 ft wide. The travel/through lanes should be 11 ft wide
Intersections • Pen Park / Waldorf is the most significant intersection in Phase 2 • It is the largest controller of the overall roadway capacity; recent county projects make it the only marked pedestrian crossing of Rio (within PH 2); it is central to 95% of all residences in PH 2 (less than 1/2 mile walk); two (2) different schools have primary access through this intersection	• Increase the storage of the left hand turn lane into Waldorf (within Central section; see Page 21) • Crossing of Rio Road at Pen Park Road should be expanded to include future shared-use-path traffic. (Note: based on recommendations with the Central Section the SUP will switch sides of the roadway here)
Pedestrian Connectivity • Pending developments will construct a SUP on west side of road, leaving a gap from Rio Commons to Pen Park Road	• Coordinate SUP installation with Rio Point and Rio Commons. The SUP shall be 10 ft wide • County should plan to connect the SUP from Rio Commons to Pen Park Road

ALTERNATIVE 1: TYPICAL SECTION CONTROLLED ALTERNATIVE



1. JWWP Roundabout (by VDOT). Shown for illustrative purposes.
2. Raised median with plantings unless left-hand turn lane is warranted.
3. 10 ft paved shared use path from JWWP to Pen Park Road with dedicated pedestrian phase in signal timing for crossing at Pen Park Road.
4. Mid-block crossing with pedestrian refuge at future Rio Commons development entrance and existing Dunlora Forest entrance.
5. Dedicated pedestrian crossing phase within Pen Park Road signal timing.

RECOMMENDED SOLUTION



PEN PARK ROAD TO STONEHENGE ROAD

KEY MAP

OPPORTUNITIES

- Create uniformity and consistency within the North section of Rio
- Establish a consistent typical section and uniform median with left-hand turn lanes for each development
- Establish wayfinding and signage along corridor for multi-modal connections including the pedestrian bridge at Lochlyn Hills as well as connections to the JWWP trail
- Rehabilitate the Stonehenge and Rockbrook intersection area for safety

GENERAL FEEDBACK

- Create connections to multi-modal infrastructure adjacent to the corridor.
- Implement roadway design characteristics that will deter drivers who simply want to "pass through" the corridor. This includes reducing travel speeds, adding a median, more pedestrian crosswalks, etc.
- Suggestions by consultant are long-term improvement strategies. What are short-term strategies for cyclists?

The Central region of the Phase 2 corridor is characterized as suburban given the context of land-use surrounding the corridor. Surrounding land uses include single family residential, multi-family residential, and institutional. When viewed through the lens of what a suburban corridor should include within the typical section, the corridor lacks several programmatic elements that would be considered standard within the roadway. Items such as continuous sidewalks, marked pedestrian crossings, accommodations for cyclists via either bike lane or shared-use-path, and adequate sight distances[1] for side streets are all noticeably absent. Unlike the Northern portion of this Phase 2 corridor, there are not any pending development projects which can assist to infill and create the necessary infrastructure improvements. This does not suggest that future projects are not possible in this area; when and if any adjacent parcels do redevelop, the County can work with the developer to make necessary improvements.

The primary objectives within this Central portion of the corridor will be to create unity with the northern portion (thus creating a unified corridor) as well as to establish necessary multi-modal infill and safety improvement projects so the programmatic elements of this suburban corridor are present and accounted for.

As shown in the corridor diagram at right, the pedestrian network along the corridor is nearly complete along the west side of the road but incomplete along the east side of the road. The missing portions of the sidewalk network are further complicated by the odd alignments of the existing portions of sidewalk in this area. These meandering alignments are more representative of shared use paths or trails than traditional sidewalk facilities.

There are also several unsafe and poorly defined entrances along this portion of the corridor. Given the increased development and the suburban context of this area, each

1 Intersection sight distance (ISD) is the distance a motorist can see approaching vehicles before their line of sight is blocked by an obstruction near the intersection. Stopping sight distance (SSD) is the length of roadway that should be visible ahead of the driver, in order to ensure that the vehicle will be able to stop if there is an object in the travel path.

CORRIDOR DEFICIENCY MAP: IDENTIFYING OPPORTUNITIES FOR IMPROVEMENT

Several intersections exhibit impaired intersection sight lines for vehicles. These challenges are of specific safety concern and should be addressed.

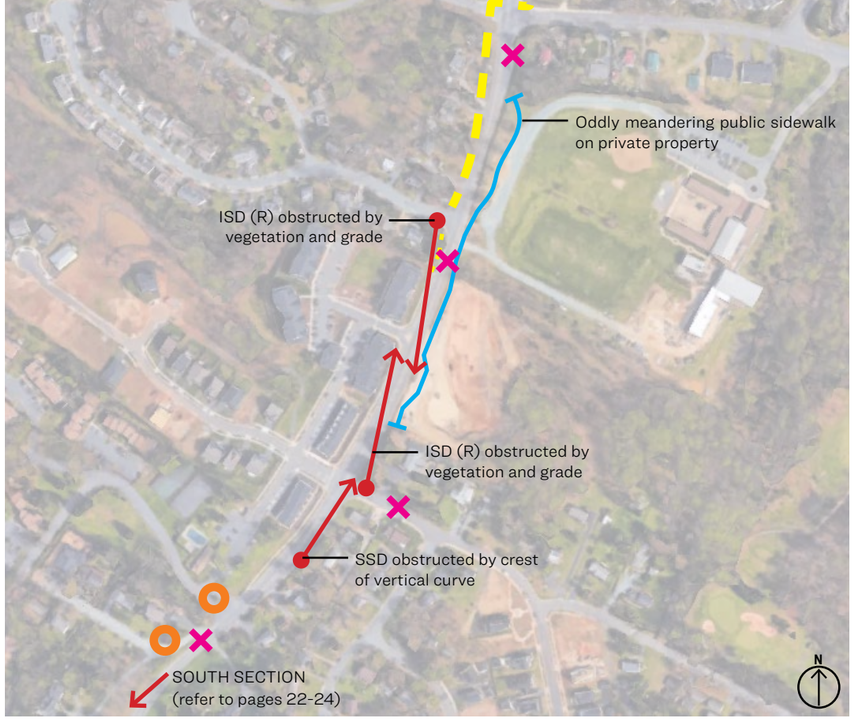
There are several areas where the vehicular accident data suggests that the roadway does not provide the required design parameters for safe operation of vehicles. The data indicates that clear delineation of turn lanes, proper length of turn lanes or additional pavement markings to correct driver confusion will prove helpful.

The County is currently working to infill this portion of missing sidewalk. This will help pedestrian movements, but further pedestrian and multi-modal improvements are still required.

Stonehenge Road and Rockbrook Drive pose a very challenging access management condition. This condition is reflective of the accidents in this area. Refer to an aerial photo of this area on Page 17.

The pedestrian sidewalk along the eastern margin of the corridor is incomplete - not reaching either of the intersections (Pen Park Rd and Pen Park Ln.) on either end of this portion of the corridor. Aside from this lack of continuity, the alignment is not consistently parallel with the roadway. The "public" sidewalk along the frontage of Charlottesville Catholic School crosses into private property, makes numerous horizontal alignment shifts and ends abruptly. Pedestrians are forced to navigate complex terrain to reach the road, or enter and cross the school campus. Neither option is desirable.

It is noteworthy to express that several side streets (Pen Park Ln., Stonehenge, Towne Ln.) also have incomplete sidewalks and do not allow pedestrians to make safe crossings or connections to the corridor.

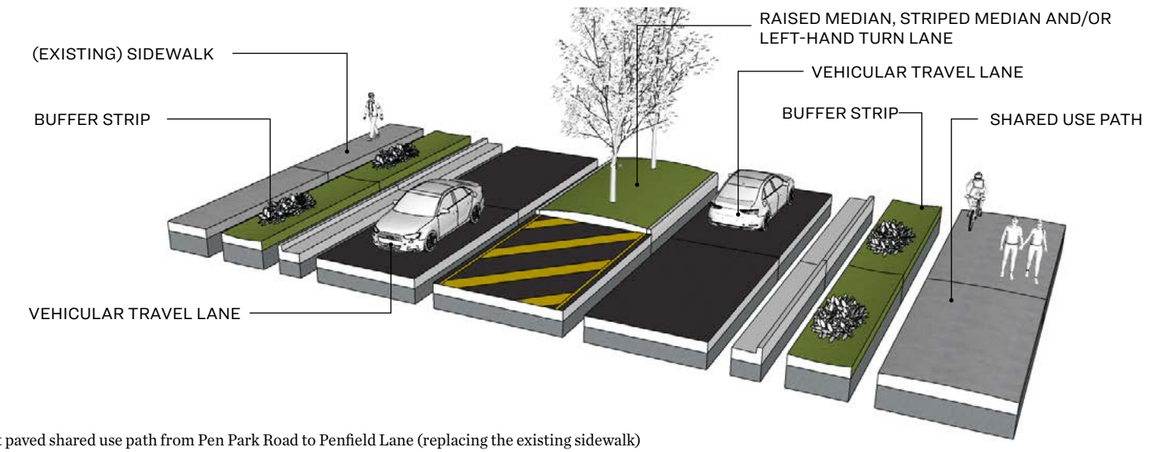


PEN PARK ROAD TO STONEHENGE ROAD

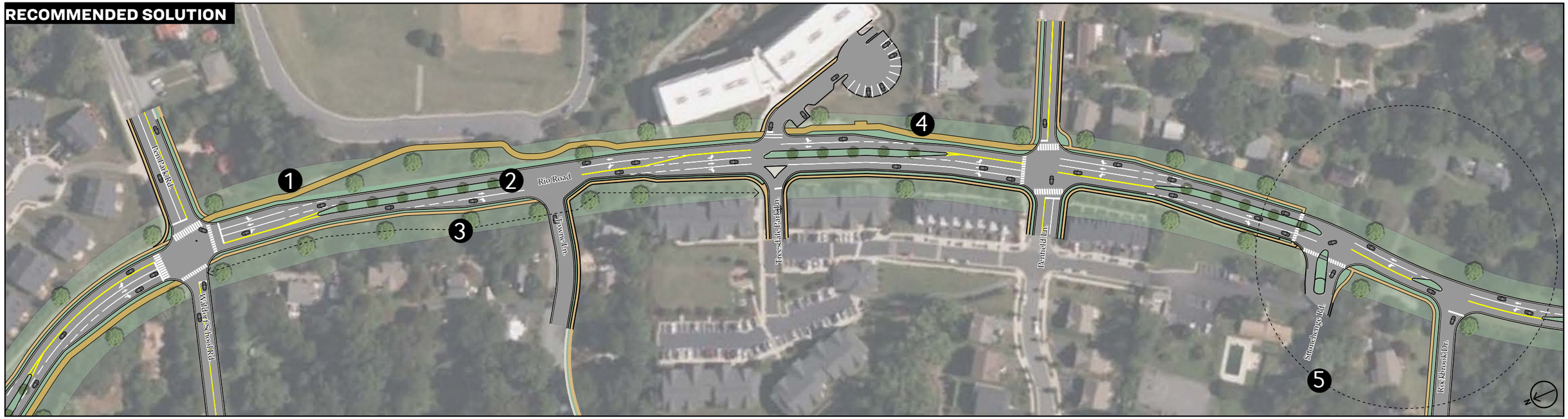
KEY MAP

Observations	Resolutions / Suggestions
Typical Section • Lane widths vary widely. The SB through lane adjacent to Treesdale is 14 ft wide whereas the corresponding NB lane is 11 ft wide. • Median tapers for left-hand turns are inconsistent.	• Using the Penfield Lane and Waldorf School left-hand turn lanes as an example, these turn lane tapers both start or end near Towne Lane, which is noticeably missing a left-hand turn lane. • Implementing the typical section at right would correct this challenge and improve the vehicular safey in this area. (Refer to Accident Analysis on Page 28).
Intersections • No left-turn lane for Towne Lane. • Pen Park Lane will experience doubled traffic volumes when Lochlyn Hills is finished developing. The capacity of the 2-way stop controlled intersection at Pen Park Ln. is unknown but this traffic increase will exacerbate capacity challenges. As shown in the Corridor Deficiency Map on Page 20, the ISD (R) for this intersection is compromised. • Stonehenge Road to Rockbrook Drive is less than 100 ft. No left-hand turn lane exists for either entrance. Furthermore, pavement markings indicating the intersection (i.e., break in double yellow) are also missing. Stonehenge has curb and gutter, though Rockbrook does not.	• Working to unify the typical section along the corridor will bring needed left-hand turn lane capacities as well as safety improvements addressing the accident concerns. • Improving the intersections to have adequate sight distances as well as uniformity of appearance (i.e., conforming with MUTCD and VDOT standards for entrances) will greatly increase the safety of the corridor and address capacity concerns. • Introducing a raised and planted median approaching the Stonehenge and Rockbrook intersection will establish a context shift as vehicles enter or leave the southern section of the corridor. • Left-hand turn lanes should be established for Stonehenge. • Extend median and splitter islands at Stonehenge to require vehicles to use Stonehenge instead of Rockbrook.
Pedestrian Connectivity • Existing pedestrian facilities along east side of road provide little use given the lack of connectivity. • No bicycle facilities exist. • CAT ridership is very low despite new bus stop at Meadowcreek Lofts which offers seating and shelter.	• Consider replacing the meandering and incomplete sidewalk along the east margin of Rio with a shared use path (SUP). The meandering alignment is more suggestive of an SUP. • Consider reclaiming the space from the Meadowcreek Lofts bus stop and replacing with an SUP. Connect with both Pen Park Road and Pen Park Lane intersections. • Seek to make connections within broader bike/trail network (i.e., Pen Park Road, the Rivanna Trail network, and the Meadow Creek Trail)

RECOMMENDED SOLUTION



1. 10 ft paved shared use path from Pen Park Road to Penfield Lane (replacing the existing sidewalk)
2. Raised median with plantings unless left-hand turn lane is warranted
3. Recent County sidewalk installation project, to be completed summer 2022
4. Replacement of dedicated bus stop with SUP and reduced turnlane storage length
5. Revised intersection geometry and safety improvements at Stonehenge Rd. and Rockbrook Drive



STONEHENGE ROAD TO CITY OF CHARLOTTESVILLE

The South section of Rio Road, the portion of the corridor that directly carries traffic into and out of the City of Charlottesville, is unlike the rest of the corridor in all respects. Development density is sparse (at least for now), the corridor navigates challenging terrain as the roadway descends into the Meadow Creek basin, and the roadway has no turn lanes, no sidewalks, wide paved shoulders, and multiple compound curves with radii that are less than the minimums allowed by VDOT (based on the posted speed limit). It is hard to believe that this stretch of the corridor is a direct link between the urban core of Charlottesville and the increasingly urban ring of Albemarle County.

Central to these observations is the question: what role does this portion of Rio Road need to play within the corridor as a whole? And, what role does it need to play for those who use this portion of the road frequently?

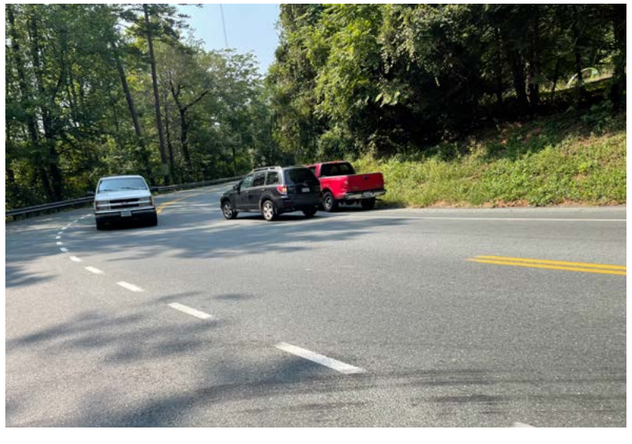
The current conditions of the road exhibit a lack of many appropriate safety provisions and a lack of corridor amenities, while the topography along the corridor complicates any safety improvement implementations.

Further solidifying the distinctive characteristics of this portion of Rio Road is the integration with Meadow Creek. Currently, Meadow Creek crosses below Rio Road near Melbourne Road, below an existing bridge with limited ability to accommodate additional roadway programming. Directly adjacent to Rio Road is the confluence point of Shenks Branch with Meadow Creek, and the waterway exhibits extensive erosion directly adjacent to Rio Road. In fact, the erosion is within feet of undermining the existing guardrail posts. It is not difficult to foresee that this erosion will continue and will eventually jeopardize Rio Road itself. Addressing the long-term stability of this waterway creates an opportunity for this corridor to improve the roadway conditions and could reduce the long-term liability of infrastructure to the County. This concept warrants additional study and evaluation.

As previously stated, this portion of the Rio Road corridor is unlike any other portion of the corridor. As such, the proposed resolutions will likewise be unique. As a starting point, this portion of the corridor needs basic safety improvements. Not including the Melbourne Road intersection, 46% of all accidents within this section are single-vehicle incidents, which reflects the dangerous nature of the road. More than any other implementations, the recommendations for this portion of the roadway will center around basic safety and serviceability improvements such as advisory speed signs, improved pavement markings and signage, upgrades to modern guardrails, and installation of built practices to encourage slower vehicular speeds.

Intersection geometry should also be evaluated to improve sight distances and, where at all possible, left-hand turn lanes should be provided. Given the proximity to the City, particularly at Agnese Street, there is certainly mutual benefit to both agencies, and cost sharing is worth discussing.

In response to the questions above, this portion of Rio Road needs to contribute to the overall safety of the corridor. As can be seen from the Accident Analysis portion of this document there is a need to increase the safety of this roadway. In doing so, the general public will be well served by these improvements.



Observations	Resolutions / Suggestions
Zoning / Density • EcoVillage is the only known potential development. • There are several other parcels along the road which could be redeveloped in accordance with the comprehensive plan density, meaning 3-6 units per acre.	• Encourage interparcel connectivity (i.e., EcoVillage to Stonehenge).
Roadway Geometry, Typical Section and Alignment • Guardrail along east side of road is not up to current standards. This may contribute to the increased severity of accidents involving the guardrail (refer to Accidents, below). • Two (2) 11 ft lanes. One (1) in each direction. • Shoulders are paved. West shoulder includes a paved ditch and is in need of repair. Noteworthy deficiencies include several deep potholes, vegetation encroachment, and debris and litter clogging paved ditch and inlets, negatively affecting water quality. • No turn lanes. • Centerline radii are tight and this results in inadequate sight-distances along the road (refer to Accidents, below). • One advisory speed sign for NB traffic. None for SB traffic which is at a greater risk. • Grade of road varies between 3.5% and 6.5% (average of 5%) • Steep slopes along both sides of road complicate opportunities to implement safety improvements.	• Upgrade guardrail to current standards. • Advisory speed signs should be installed near Stonehenge for SB traffic. • Re-stripe pavement markings for better sight distances. • Maximize use of existing corridor space, which means the paved ditch should be overhauled to place drainage under ground. • Add a left-hand turn lane at Agnese for SB approach.

Intersections
• All intersections in this section are one-leg stop controlled.
• **Agnese intersection:**
  • 70 degrees away from perpendicular
  • Located in second tightest curve in the corridor (150' CL radius)
  • Stopping sight distances encumbered
  • Vertical sight distances obstructed due to steep grades
  • Pavement markings and signage need maintenance
  • Left-turn lane warranted
• **Ecovillage Entrance:**
  • ~400 Vehicles per day
  • Left-hand turn lane desirable, but unrealistic due to effort required to widen road
• **Brookway:**
  • Intersection sight distance encumbered
  • Drainage provisions encumbered (5 accidents due to rain)
	• Redefine Agnese entrance to include a splitter island for NB Rio Road and a revised right-hand turn radius onto Agnese.
	• Relocate stop-bar and stop sign to provide the best sight distance possible.
	• Joint project with City of Charlottesville
	• Second entrance near Stonehenge would relieve conditions at primary proposed entrance.
	• Turn warrant justification should include increased traffic on Rio Rd.
	• County should permit disturbance of preserved slopes to increase sight-distances along tight turns adjacent to Ecovillage.
	• Comprehensive drainage improvements are needed.
	• Bypass Meadow Creek and Shenks Branch with box culvert

Pedestrian Connectivity • No pedestrian facilities exist for majority of roadway, exception being the bridge over Meadow Creek • No bike facilities exist • Few destinations along this portion, exception being Rivanna Trail at Melbourne	• Roadway improvements should focus on safety. • Bike and pedestrian improvements can be made "off-corridor" but until the roadway itself is safer, adding bike and pedestrians into roadway is not recommended. • Seek to make connections within broader bike/trail network (i.e., Rivanna Trail and JWWP trail)
Accidents • Accidents reflect the nature of the roadway. Accidents are not specifically concentrated at intersections, but instead distributed along the sharpest curves along the road. • 25% of accidents at Melbourne Road intersection • Not including Melbourne intersection, 46% of accidents are single vehicle events, which reflects the dangerous nature of the road. • Of the accidents involving multiple vehicles, 54% were rear-end collisions and most of them seem to have occurred in the SB lane, which is the lane that has the worst stopping sight distance due to the downhill grade.	• Focus on improvements that increase safety in this portion of the corridor

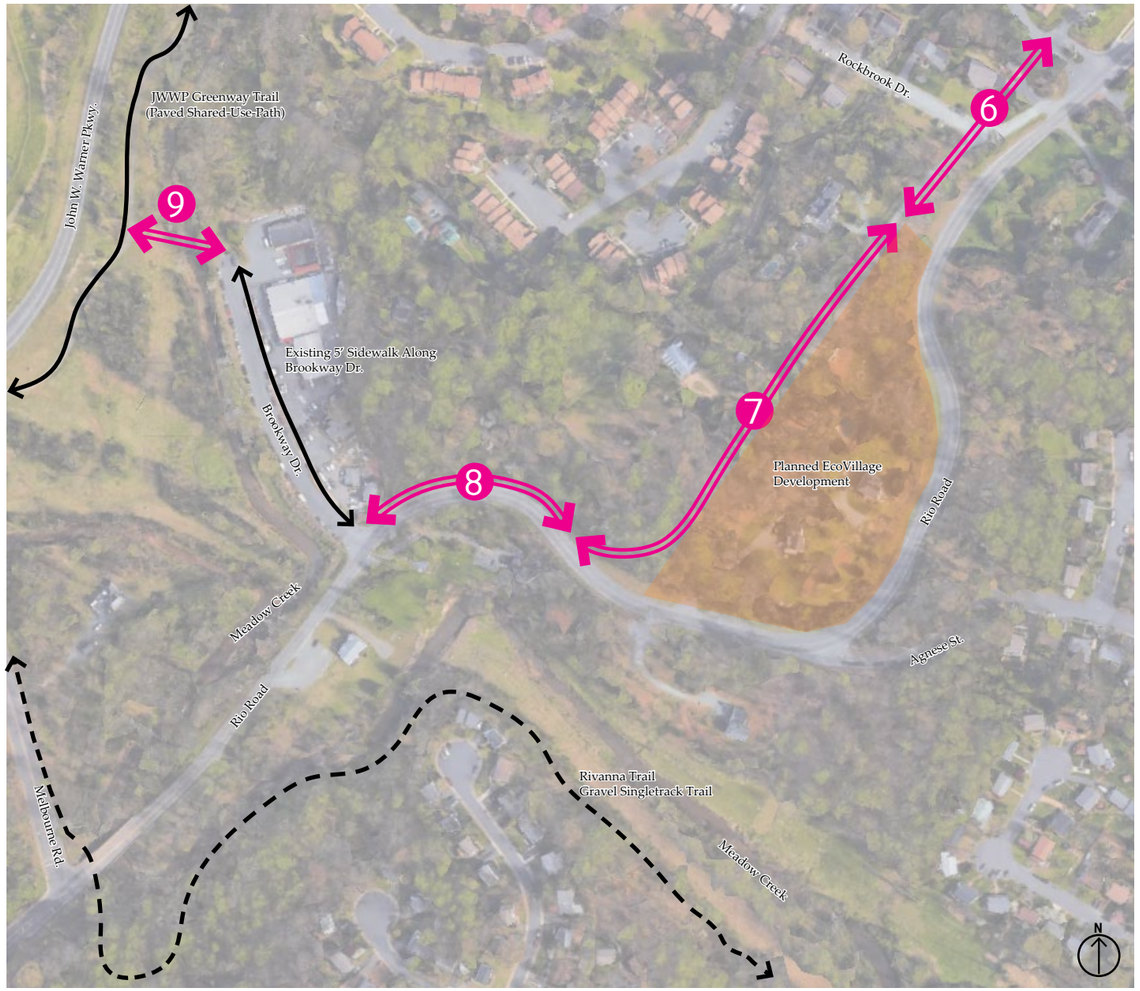
STONEHENGE ROAD TO CITY OF CHARLOTTESVILLE

KEY MAP

CORRIDOR SAFETY IMPROVEMENT PLAN: ADDRESSING KNOWN DEFICIENCIES

1. Vehicular guardrails should be brought up to current standards throughout this corridor
2. Intersection improvements to correct drainage deficiencies as well as intersection sight distances
3. Intersection improvements to promote safe interaction between vehicles and improved sight distances
4. Address erosion and degradation within Meadow Creek to ensure safety of Rio Road
5. When EcoVillage is developed, or when Rio Road is improved, the preserved slopes should be be re-graded to improve sight distances along Rio Road

MULTI-MODAL CONNECTIONS CONCEPT PLAN: OPPORTUNITIES FOR PEDESTRIAN AND CYCLIST IMPROVEMENTS

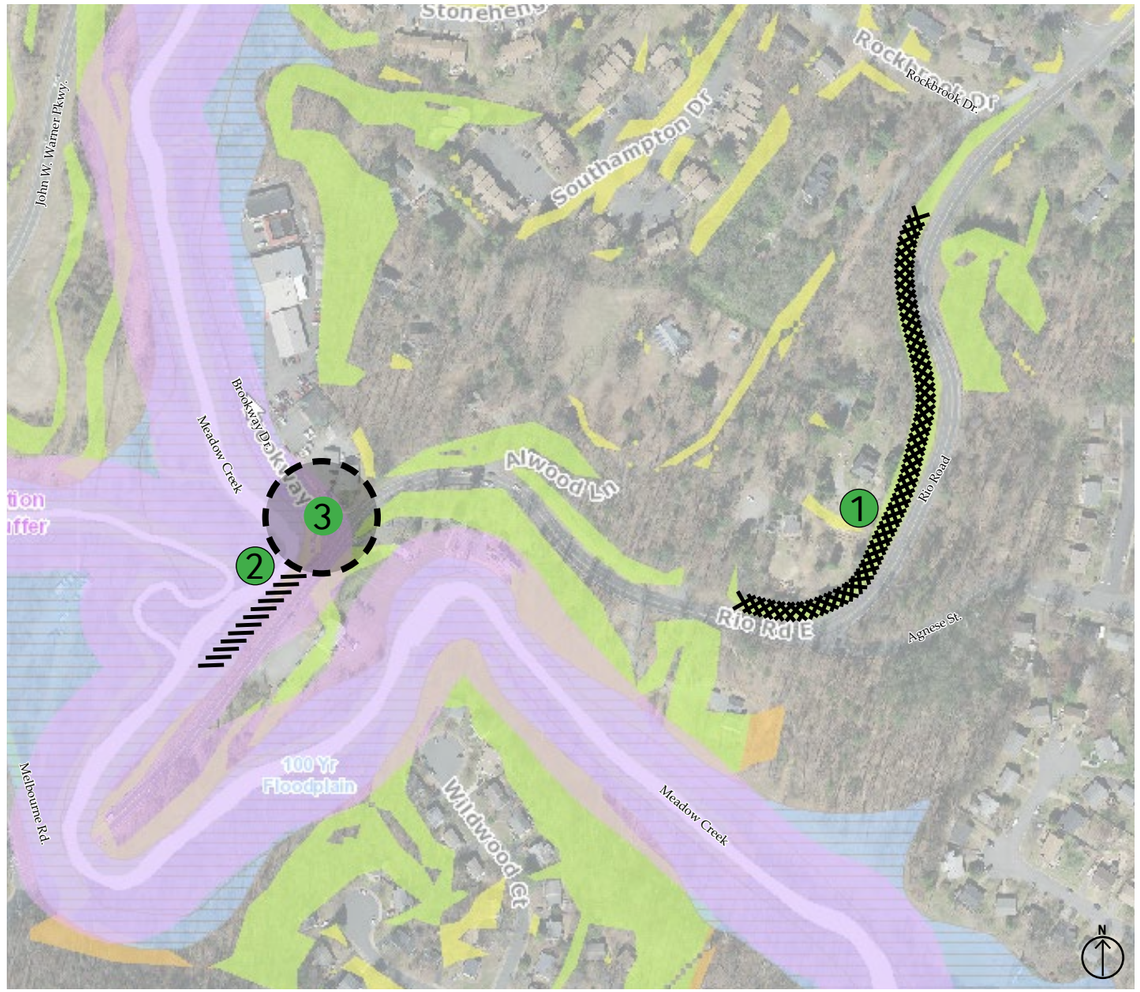


6. Opportunity to extend frontage road or bike + pedestrian connection between Treesdale, Stonehenge and (Future) EcoVillage
7. Extend shared use path along utility easement (EcoVillage Development could incorporate into their Site Plan)
8. Following the implementation of roadway safety improvements (at left), shared use path or sidewalk connection from EcoVillage to Brookway Drive
9. Pedestrian bridge across Meadow Creek connecting Rio Road to the JWWP Greenway system

STONEHENGE ROAD TO CITY OF CHARLOTTESVILLE

KEY MAP

HYDROLOGIC AND ENVIRONMENTAL CONSIDERATIONS: ADDRESSING DEFICIENCIES AND OPPORTUNITIES



1 The critical slopes within the EcoVillage site inhibit the vehicular sight distance along Rio Road. County Staff should consider a Critical Slopes Waiver to correct this condition.

2 Meadow Creek exhibits deeply incised banks and significant erosion adjacent to Rio Road. This condition poses environmental and public safety concerns. County staff should consider further study to improve Meadow Creek as well as integrate the natural resources with the built environment in this area.

3 Portions of Brookway Drive are within the 100-year floodplain. This may be associated with the observed drainage deficiencies and accident data suggesting wet conditions played a part in vehicular crash incidents.

RECOMMENDED SOLUTION

4 Dedicated left-hand turn lane and through lane for SB vehicles

5 Painted median splitter island

6 Revised intersection geometry promoting improved sight distances

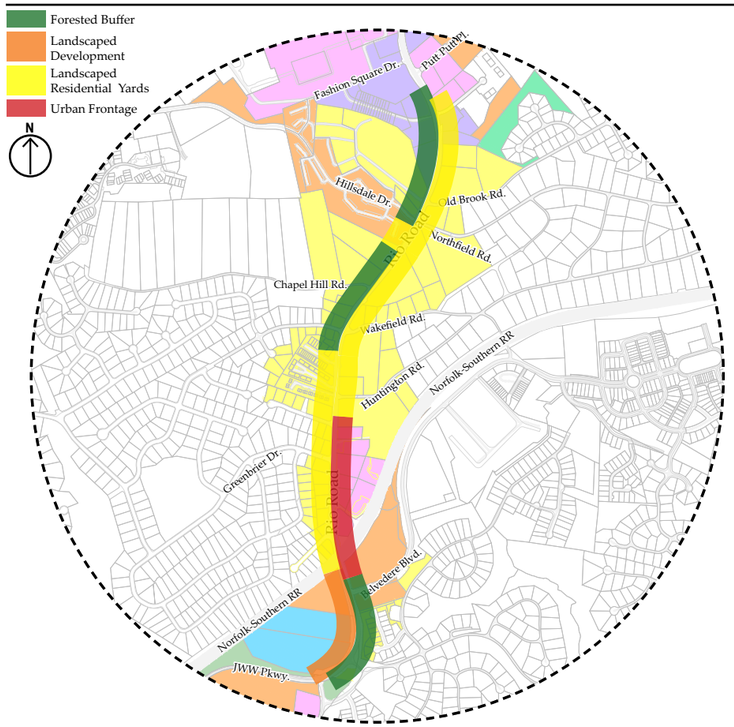
7 New pavement markings conforming with current MUTCD guidance

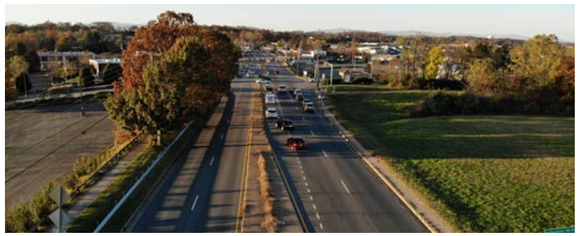
SUPPLEMENTAL INFORMATION

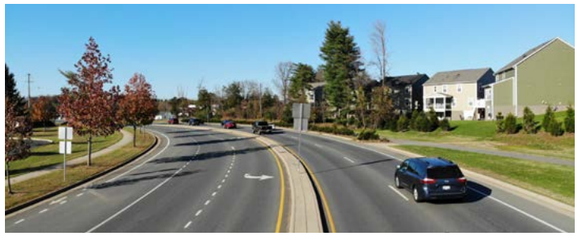
ROADWAY FRONTAGE CONDITIONS + THE PUBLIC REALM

KEY MAP

PARCEL FRONTAGE CATEGORIES ALONG RIO ROAD







EXISTING FRONTAGE CONDITIONS

The land adjacent to the corridor is essentially an extension of the typical section of the corridor. Even though this land is private, the County still has some control regarding how it gets developed. The County Zoning Ordinance provides regulations not only for what type of development is allowable, but also for the building and parking lot placement, required parking, building height, and vegetation, among other things. Depending on the execution, these regulations can have the unintended consequence of creating a vehicle-centric site and therefore a vehicle-centric corridor with lack of human scale.

Along this corridor, many parking areas are situated directly outside of the right-of-way, severing the public linkages between the surrounding buildings and businesses and further degrading the sense of community by prioritizing and showcasing the vehicle. The "transition zone," the space between the right-of-way and the building, should instead be designed with the pedestrian experience in mind.

PROPOSED FRONTAGE CONDITIONS

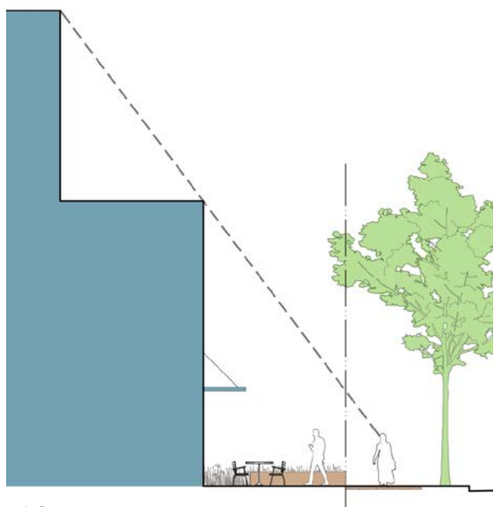
A building's height and transition zone treatments play a critical role in how a development relates to the public realm and it should be noted that different building heights and transition zone depths lead to different outcomes. Simply put, when tall buildings feature a narrow transition zone, an urban character is produced. When smaller buildings feature a wide transition zone, a suburban character is produced. Depending on how the building and its first floor activity are intended to relate to the public realm, certain geometric outcomes are more appropriate than others.

Based on the corridor's wide range of development possibilities, the building's height, transition zone size, and activity within need to be calibrated in a way that engages a building to the public realm in an appropriate manner. The following recommendations are proposed as a starting point:

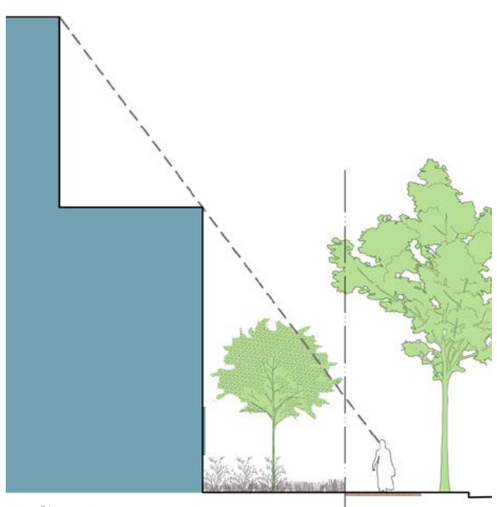
- Buildings with High Engagement should be developed in a way to invoke an urban character where the sidewalk, public spaces, and building entry are seamless, traversable, and centered around active public space.
- When people are not encouraged to peek through windows in a Medium Engagement condition, the transition zone should provide a physical, but not visual, buffer between the public sidewalk and building's first floor use.
- In situations where additional privacy is warranted, Low Engagement patterns should be used to further separate public and private uses while still tethering the public realm.
- Based on existing constraints like topography, utility infrastructure, and environmental context, a building may visually disengage from the public realm in a No Engagement condition, but is generally discouraged unless deemed critical.
- Additionally, pending the design of a building's first floor use, some buildings may feature more than one engagement zone within the same footprint. These differing engagement types create a flexible framework while also reinforcing a vibrant public realm.

BUILDING ENGAGEMENT

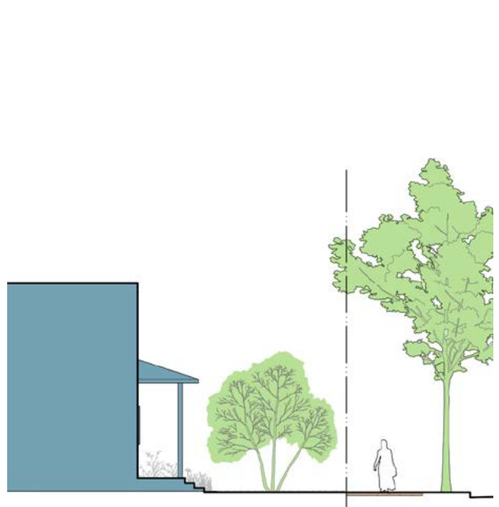
Refer to Appendix B for additional detail on Building Engagement



High Engagement



Medium Engagement



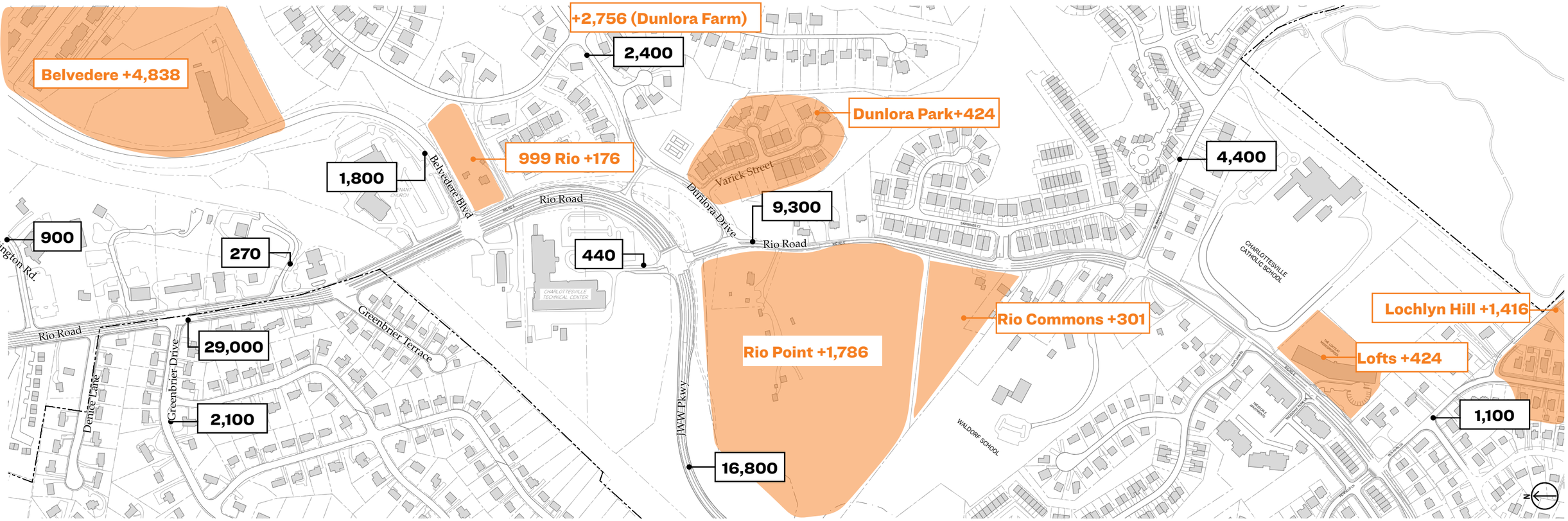
Low Engagement

No Engagement

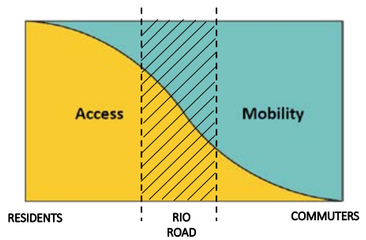
TRAFFIC VOLUMES FROM RECENT AND PLANNED DEVELOPMENTS

KEY MAP

KNOWN TRAFFIC VOLUMES AND KNOWN TRAFFIC GROWTH FROM DEVELOPMENT PROJECTS



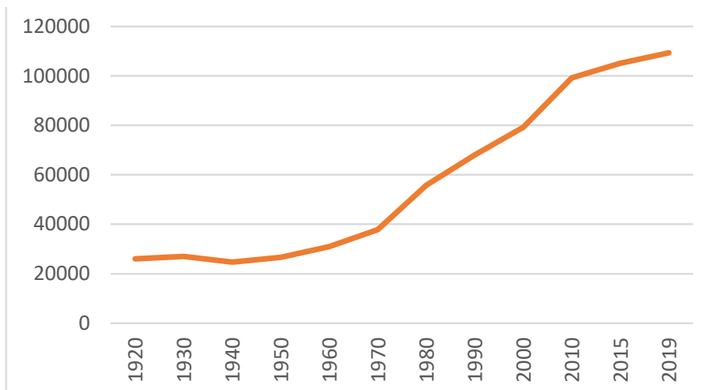
RIO ROAD WILL CONTINUE TO PROVIDE A DUAL service to the community: it both conveys commuter traffic traveling into the urban-core of Charlottesville and carries local traffic which has a different mobility pattern as well as different user-groups (i.e., walkers and cyclists).



The improvements to the corridor which are recommended in this document will enable the corridor to increase the capacity of the roadway to more appropriately accommodate local traffic without compromising the ability to convey commuter traffic. The intersection improvement concepts as well as the recommended typical section will do a good job to promote a safer environment, increase functional capacity and prepare for the needs of a corridor which will experience continued growth.

The map above indicates current traffic volumes as well as known increases from planned and recent developments. This map does not account for the future traffic volumes as a result of by-right redevelopment projects which can increase density at the time of redevelopment. It is safe to say that based on the population growth and population density trajectories shown at right the corridor will continue to experience increased traffic volumes in the future.

POPULATION GROWTH



Census Data from Social Explorer, 2021

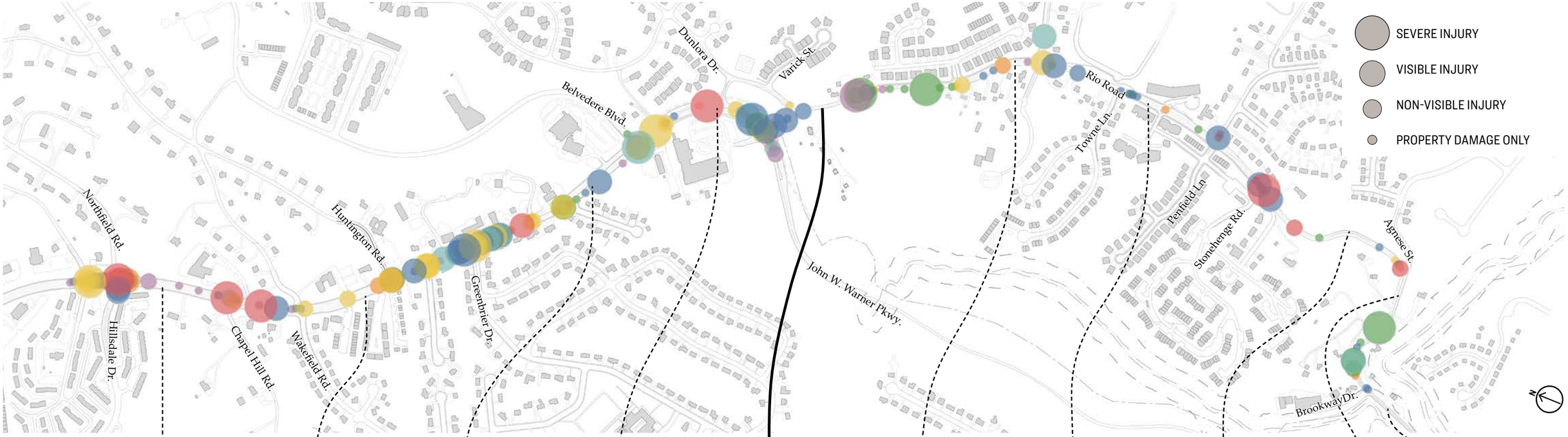
RIO ROAD EAST PH 2

2019 VDOT Data suggests: 9,300 Vehicles Per Day (VPD) along Rio Road (within Phase 2)

Recent, pending and planned development projects will increase the traffic volumes by an estimated 4,351 VPD over the 2019 VDOT volumes.

ACCIDENT ANALYSIS: TYPOLOGY AND SEVERITY

KEY MAP



Data shown herein does not eliminate DUI, distracted driving, speeding, or other crashes due to operator error. These accident types can have a significant effect on apparent data trends. When evaluating specific intersections for recommended safety improvements, these factors were taken into consideration.

ACCIDENT ANALYSIS: CRASHES PER YEAR

Crash data before 2015 not available on the VDOT website

ACCIDENT ANALYSIS: ECONOMIC IMPACT

Costs have been determined from crash severity, as defined in Section 2.3 of the Manual on Classification of Motor Vehicle Traffic Accidents ANSI Std D16.1-2007. Dollar amounts have been adjusted to 2021 dollars.

REVIEW OF TRAFFIC STUDIES AND RECENT PROJECTS

KEY MAP

RIO ROAD CORRIDOR SHOWING AREAS OF FOCUSED TRAFFIC STUDIES AND RECENT PROJECTS

1. FASHION SQUARE DRIVE + PUTT PUTT PLACE

Technically beyond the boundary of this Corridor Study, the intersection of Rio Road with the Fashion Square Mall and Albemarle Square Shopping Center access roads has been evaluated by the Rio/29 Small Area Plan Study. The intersection currently operates at a LOS D. The future success of this intersection is integrally linked to the synchronization and capacity of adjacent intersections, specifically the Putt Putt Place intersection.

The Rio29 Small Area Plan Study suggests that Hillsdale Drive be realigned to cross through the Fashion Square Mall Property and establish a new intersection with Putt Putt Place. This realignment of Hillsdale Drive will alleviate the congestion at other intersections. The study recommends this new intersection at Putt Putt Place be a roundabout which will help maintain intersection capacity as adjacent lands are redeveloped.

An initial review of this proposed relocation suggests that implementation of this plan could have a substantial impact on private properties around the intersection.

2. OLD BROOK / NORTHFIELD / HILLSDALE

Despite being one of the least safe intersections in the entire county, this intersection has received very little formal attention in terms of traffic study and analysis.

As noted in Key Note 1 (left) the Rio29 Small Area Plan suggests relocating Hillsdale Drive through Fashion Square Mall property and connecting to Putt Putt Place. Should this plan prove infeasible due to legal, physical or financial constraints the County will need to implement a plan at this intersection to promote safe and effective operation.

In 2007, A. Morton Thomas and Associates, Inc. (AMT) designed pedestrian signal phasing improvements and upgraded the crosswalks to provide means of accessibility improvements at the intersection.

In 2017 EPR, PC developed a TIA supporting the Arden Place Phase 2 proposed development. This TIA study suggests that both the Old Brook/Rio and Northfield/Hillsdale/Rio intersections were operating at a LOS B and that the proposed development would not have an adverse impact on the intersections.

It is noteworthy to express that the EPR study does suggest that several specific movements within these intersections do operate at LOS D; and that the intersection proximity does not allow for improvements which would add capacity (i.e.; turn lanes cannot be extended due to the distance between the intersections).

The nuance and complexity of these intersections warrants additional detailed study and analysis.

3. GREENBRIER DRIVE

Greenbrier Drive is currently a signalized intersection along Rio Road. No known traffic studies have been conducted at this intersection. The portion of the Rio Road Corridor around this intersection is prone to access management and safety challenges as shown on Page 10 of this study.

The intersection received pedestrian signal phasing in 2019 as well as upgraded crosswalks and ADA ramps.

This intersection may warrant specific study in the future at such a time when the gas-station commercial properties redevelop.

4. BELVEDERE BOULEVARD

In 2020 VDOT performed a study which evaluated the performance of the Belvedere intersection. The study concluded that the intersection was operating at a LOS C during the morning peak hour and at a LOS E during the evening peak hour. Of specific importance to the Belvedere community is the substantial delay experienced during the evening peak hour. The long delay, coupled with the known volume of vehicular crashes at this intersection suggest that improvements are warranted.

As the traffic volumes map on Page 27 suggests, future development will continue to increase the traffic volumes until the development reaches the full operational build-out which includes additional housing, a soccer complex and additional programming at The Center. It is estimated that the final developed condition at Belvedere will include an additional 2,380 vehicles per day, as well as the 999 Rio Development which will contribute an additional 161 daily trips. These additional traffic volumes will only exacerbate an already untenable condition.

The VDOT study concluded that a Restricted Crossing U-Turn (RCUT) was an adequate solution for the intersection. However, this solution was not preferred as it did not take into account the character and the context of the corridor and required vehicles to make a U-Turn at Greenbrier Terrace, which is a residential street.

As presented in this study, a preferred alternative to the VDOT RCUT is a Green-T which is indicated on Page 13. This alternative accomplishes many of the same goals as the RCUT and also has the option to include a traffic signal in the future.

5. JOHN W. WARNER PARKWAY

The aforementioned VDOT Study in Keynote 4 also included a study of the JWWP intersection. The study established that the intersection operates at a LOS E during both morning and afternoon peak hours.

The study concluded that a dual-lane roundabout with a non-yielding west-bound Rio right-turn lane would establish a LOS A during morning and peak hours. This solution establishes a high-performing intersection. The proposed improvements also include a third northbound Rio Road Lane.

The Rio Point Development also included a TIA Study supporting their increased residential density within the property that occupies the southeast corner of the JWWP/Rio intersection. This TIA study, performed by Ramey Kemp Associates (RKA), accounted for continued increased residential density along the Rio Road corridor. The RKA study suggests that the anticipated increased density along the corridor will downgrade the Level of Service at the JWWP/Rio intersection from an A to a B, increasing the average delay through the intersection by 3 seconds. The inclusion of the future residential density in the area suggests that this final LOS of B is a comprehensive level of service for the corridor for the foreseeable future.

The RKA TIA also included an analysis of nearby adjacent intersections, notably the Dunlora Drive intersection with Rio Road. The RKA study suggests that the Dunlora Drive intersection currently operates at various Levels of Service throughout the day, depending on the preferred vehicle movement.

In the final build-out condition, including the JWWP/Rio Roundabout and the Rio Point Development, the Dunlora Drive intersection will operate at a LOS D during the morning peak hour and LOS C during the evening peak hour. These proposed movements are reflective of the new partial access intersection allowing only left-in and right-out movements as shown on Page 15.

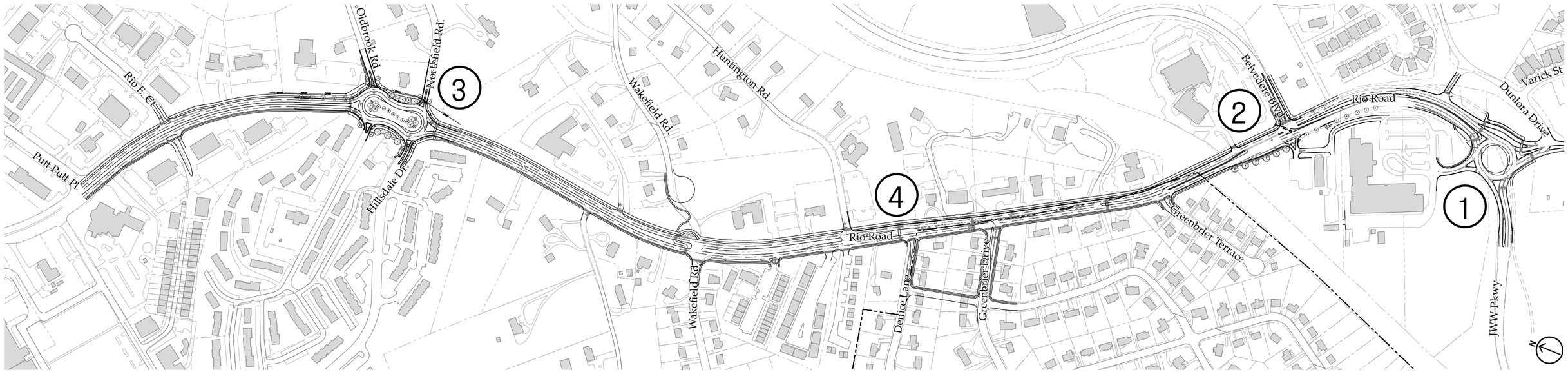
The proposed traffic conditions at the JWWP/Rio and Dunlora Drive/Rio intersections do not account for future increased density at the Dunlora Farm Properties adjacent to the Dunlora neighborhood. It is unknown when or if these properties will ever redevelop. However, if they were to redevelop the increased traffic would affect the operation of the Dunlora/Rio intersection.

ADDITIONAL INFORMATION

Relevant pages from the traffic studies summarized on this page are included in Appendix F.

PLANS FOR IMPLEMENTATION AND FUTURE PROJECTS: PHASE 1

KEY MAP



IDENTIFIED PROJECTS FOR IMPLEMENTATION

IMPLEMENTATION STRATEGY

The recommended strategy for project implementation is to:

a) Maximize the use of existing infrastructure

b) Address critical areas first (least safe, least serviceable)

c) Establish high functioning intersections

d) Infill linear pedestrian and cyclist improvements as properties along the corridor redevelop

e) Establish the North Town Trail

f) Perform discrete, small projects on an as-needed basis

The implementation strategy is to use what we have and what we know is going to be happening soon. Namely, the JWWP intersection will be overhauled in the near future. This is an opportunity to catalyze the findings of this study with visible progress. As such, the JWWP intersection is identified as the first step in implementing the Phase 1 improvements.

Next, it is recommended that the Belvedere intersection be addressed as soon after the JWWP as financially feasible. This is recommended due to its direct proximity to JWWP as well as the fact that the Belvedere community will continue to see substantial increases in traffic generation (refer to "Traffic Volumes from Recent and Planned Developments," Page 27). As will be noted by the VDOT study in Appendix F, VDOT evaluated the JWWP and Belvedere intersections at the same time, and their integrated nature is of specific interest to the functioning of this corridor.

Having established high functioning and integrated intersections at the southern terminus of Phase 1, attention is then turned to the other end of the corridor, to the Hillsdale/Northfield/Old Brook intersection. As expounded upon in the pages specifically devoted to this area, this intersection not only needs to be improved from a serviceability and safety standpoint, it also represents an opportunity to change the context of the corridor from what can best be described as a commercial boulevard within the Rio29 Small area plan to what is becoming increasingly a residential collector street within the limits of this study. This intersection can serve as an established context change with visual cues that a character shift is about to occur. It is also noteworthy to express that this context shift happens at the topographical high-point of the corridor, which further supports the notion of establishing a gateway feature integrated with this context shift.

Having established the high-functioning intersections on either end of the corridor, the work then shifts in nature and focuses on the typical section. Typical section improvements include, among other things, establishing a raised median with opportunities for U-turn movements. Careful and deliberate attention should be paid to Rio Road between Greenbrier Drive and Gasoline Alley where there are many commercial properties and numerous access management challenges. This area can, indeed, receive a raised median (Refer to Appendix A), however, the installation of this raised median ought to coincide with the properties being redeveloped. It is anticipated that the value of these properties, coupled with the trend away from reliance on fossil fuels, will eventually lead to a higher and better use of these commercial properties, and that the County will have an opportunity to address the concerns raised here.

Finally, once the raised median and typical section work has reached a tipping point of completeness, the County can work toward establishing the shared use path, which is proposed to replace the on-road bike lanes. Establishing the shared use path for the duration of this corridor will largely complete the Northtown Trail which will create an important connection for users of non-motorized transit between the urban core of Charlottesville and the Places 29-North development area.

1. JOHN W. WARNER INTERSECTION

This project has been approved for construction by VDOT and the County of Albemarle. The estimated Cost is $7.144 MM not including right-of-way acquisitions.

As of Q1, 2022, VDOT has begun the initial steps of the Preliminary Engineering (PE) phase of this project, specifically an as-built survey of the project vicinity. However, the actual schedule of design improvements is unknown.

When VDOT and/or their consultant begins formal design work on this intersection it is anticipated that the community will be notified and that VDOT will be referred to this study for background information. The concepts as presented here will be refined into a formal schematic plan and then an engineered plan.

2. BELVEDERE BOULEVARD INTERSECTION

This project has not been approved for construction, preliminary design or further analysis. Initial estimates suggest this work will cost approximately $2.7 MM.

This project would make a strong candidate for a Smart Scale Application given the safety and congestion challenges at this intersection. The project is a strong candidate given VDOT's previous involvement studying ways to mitigate these challenging circumstances.

3. HILLSDALE / NORTHFIELD / OLD BROOK

This project has not been approved for construction, preliminary design or further analysis. Initial estimates suggest this work will cost approximately $8.2MM not including right-of-way acquisitions.

It is advised that the County make a determination about this intersection improvement versus the Putt Putt Place roundabout recommended in the Rio29 Small Area plan. Both intersection improvements are likely not necessary as both seek to address some of the same safety and serviceability challenges. When a consensus is established it is recommended that the County apply for funding to finance this improvement as well as identify a fiscal year when the County can commit to this work.

4. INFILL IMPROVEMENTS

Infill improvements do not consist of a single project, but rather discrete opportunities to continue developing the corridor in accordance with this plan -- specifically working to implement the ideal typical section.

Developing the ideal typical section over time will take vigilance to work with landowners who are redeveloping their properties as well as identifying funding sources which correlate with the discrete tasks.

County staff must remain mindful of the recommendations of this study and continually use this document as a resource to identify projects which can be built with local capital improvement dollars as well as work with development professionals who can proffer improvements as recommended herein.

PLANS FOR IMPLEMENTATION AND FUTURE PROJECTS: PHASE 2

KEY MAP

IDENTIFIED PROJECTS FOR IMPLEMENTATION

IMPLEMENTATION STRATEGY

The recommended strategy for project implementation is to:

a) Work with developing properties to implement the desired roadway improvements across the frontage of the parcel(s).

b) Implement necessary safety improvements along portions of Rio Road that have been deemed unsafe and deficient.

c) Identify access management improvement projects which can be completed with local dollars (non-grant funded).

d) Complete the shared use path from Pen Park to Penfield Lane and complete small streetscape improvement projects.

The implementation strategy is to leverage the inertia of pending development projects to accomplish the vision of the North area along rio Road. The two (2) pending developments enable the County to achieve approximately 80% of the improvements along the corridor - specifically related to the shared use path and turn lanes.

Next, it is recommended that the County look to make safety improvements along Rio Road in the South section. The accident data (Pages 28-30) suggest that several specific improvements are needed in this area including new guardrails, new pavement markings, and intersection improvements.

Having leveraged the inertia of the pending developments to improve the North area and having focused on making discrete safety improvemets within the South area, the remaining projects are infill in nature and will likely require local dollars to complete. The County would benefit from adding several of these infill projects onto the priority list for future projects.

1. STREETSCAPE FROM JWWP TO PEN PARK

The work along this portion of the corridor will largely be incorporated with the two development projects currently planned, Rio Point and Rio Commons. Having two (2) adjacent developments which afford the opportunity to realize the recommendations of this study is beneficial to the County. Though development often comes with negative connotations and the additional burdens on public infrastructure, the recommendations of this plan can mitigate these impacts and allow the character of this corridor to be changed.

It is recommended that County Staff work with the developers and recommend the solutions presented in this document. This is not anticipated to have an adverse impact on the developers or developments.

Following this approach, the North section of this corridor will reflect the suggestions of this study, and only a small portion of the shared use path will remain to be built (from Rio Commons to Pen Park). It is therefore recommended that the County identify this remaining portion of the SUP as a County project and allocate funding to complete this work.

2. SAFETY IMPROVEMENTS (AGNESE TO BROOKWAY)

The intersection of Agnese Street and Rio Road can be drastically improved with the recommendations of this report. Due to size and scale, these projects are not likely to receive grant funding; however, these improvements are paramount. Furthermore, the proximity to the City, particuarly at Agnese, could lead to a cost-sharing agreement between the two agencies.

This report specifically recommends these safety improvements be implemented as soon as feasibly possible. The accident data in these areas suggest that the collisions and threat to public safety will continue until mitigating measures are implemented.

3. INTERSECTION IMPROVEMENTS

Within the Central section of the corridor there are several intersections which warrant improvements, specifically Stonehenge Road, Rockbrook Drive, and Penfield Lane. Each of these intersections exhibit specific deficiencies in need of mitigation. However, similar to Agnese, the scale of these improvements suggests that local funding would be appropriate.

4. INFILL IMPROVEMENTS

Infill improvements do not consist of a single project, but rather discrete opportunities to continue developing the corridor in accordance with this plan (i.e., working to implement the ideal typical section and pedestrian and cyclist connections to destinations near the corridor).

Developing the ideal typical section over time will take vigilance to work with landowners who are redeveloping their properties and to identify funding sources which correlate with the discrete tasks.

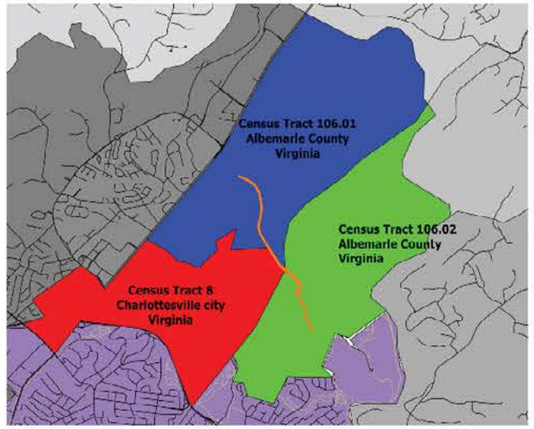
County staff must remain mindful of the recommendations of this study and continually use this document as a resource to identify projects which can be built with local capital improvement dollars and to work with development professionals who can proffer improvements as recommended herein.

5. COORDINATION WITH MASS TRANSIT

Continue to coordinate and plan logical mass transit stop locations with CAT. If a transit stop has been deemed warranted then the stop should include seating and lighting at a minimum. High volume stops should also include a shelter.

SUMMARY OF DEMOGRAPHICS

Information and Data as provided from County of Albemarle Office of Equity and Inclusion



Following the completion of the Rio/29 Small Area Plan, and having received recommendations for road improvements along Rio Rd, a corridor study is being undertaken along that route in order to guide future development patters. The road connects 29 North with Downtown Charlottesville and points east, and on its northern segment is punctuated by commercial office and retail. It quickly transitions to residential developments, is flanked by several churches and multifamily units on the eastern side.

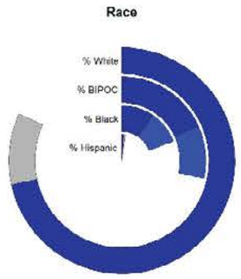
The study area intersects three Census Tracts, two in Albemarle, and a third in Charlottesville. Of note, Tract 106.01 includes a significant amount of affordable housing, evident in the lower income figures, and much higher poverty rates. In both 106.01 and 8, poverty among those under the age of 5 is much higher than the municipal average.

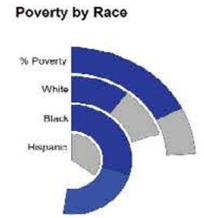
Engagement with lower income residents of the study area is imperative in future planning and implementation efforts in the corridor.

Source: Albemarle County, American Community Survey 5-year estimates (2019)

106.01

The affluent Carrsbrook and Woodbrook developments are in this tract, but the impact of the multifamily housing and the affordable housing units included in the Mallside Forest development bring income below average.





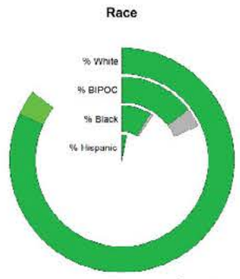
Population
6,330

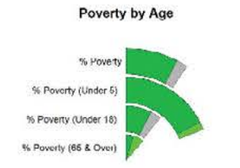
Median Age
42.7

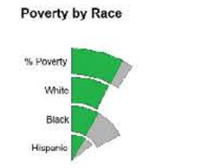
Median Household Income
$62,500

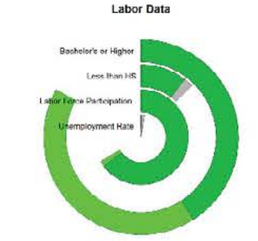
106.02

The southern portion of this tract includes the newer Belvedere neighborhood, while the norther portion includes several multifamily developments, churches, and older housing stock. Gasoline Alley is the only retail destination in the tract.









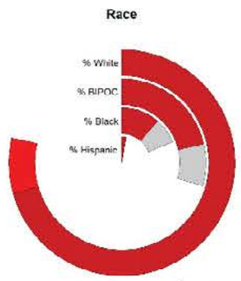
Population
4,314

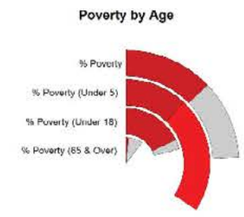
Median Age
39.5

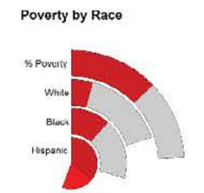
Median Household Income
$93,458

8

Much of this tract is made up of the affluent Greenbrier neighborhood, and the more mixed income Greenbrier Heights. Two grocery stores (Whole Foods and Kroger) are available in this tract, though access from the Study area involves either 29 or the recently completed Hillsdale Drive Extended.







Population
3,896

Median Age
45.2

Median Household Income
$71,648

Albemarle

Population
107,405

Median Age
39.1

Median Household Income
$79,880

FREQUENTLY ASKED QUESTIONS OR CONCERNS

Over 200 comments were received online, with many more comments via public outreach sessions, emails, CAC meetings, and phone conversations. All comments were documented and sorted through for redundancies, as many community members voiced similar concerns. The best effort has been made to respond to each comment and update the document as appropriate. Though positive feedback was received, most of that feedback does not elicit a response other than "thank you for sharing, we appreciate it" (which we do) and has not been included in this section. Please see Appendix C for the entirety of comments provided online. Thank you to everyone who has contributed their knowledge and energy to this study.

GENERAL / MISCELLANEOUS

Why is Putt Putt Place not being considered in this study? This intersection is very difficult to turn left out of and there is currently no stop light.

This intersection was studied as part of the Rio29 Small Area Plan. It was not included in this study so as not to duplicate efforts. If you are interested to learn more information, please visit the County's website.

While the recommended intersection improvements have been highlighted, it is of concern that there are not smaller scale pedestrian projects included in the implementation plan.

The recommended pedestrian improvements differ for Phase 1 and Phase 2.

Within Phase 1: pedestrian improvements largely consist of upgrading the pedestrian and cyclist infrastructure to include a continuous shared use path along the north margin of the road, effectively completing the Northtown Trail. In order for this amenity to be successfully installed it is recommended that the County first improve the primary intersections along the corridor (JWWP, Belvedere, Hillsdale/Old Brook) and then the pedestrian improvements can infill between these intersection nodes. When considered purely from a programmatic standpoint, Rio Road (within Phase 1) has continuous bike lanes and sidewalks on both sides of the road. Once the new typical section is implemented it will need to be done continuously between intersections. It is for this reason that the pedestrian improvements in Ph 1 are not "small scale".

Within Phase 2: many of the pedestrian improvements are "small scale" given the context of this portion of the corridor. These improvements can be implemented as recommended in the study and as summarized on Page 33 of this document.

Is this study considering future traffic? Many proposed developments in the area pose a concern for traffic along this corridor.

This study does consider future traffic volumes. Please refer to "Traffic Volumes from Recent and Planned Developments" on Page 27.

There seem to be a lot of roundabouts proposed in this area in the various conceptual studies. Why are roundabouts the new buzz word?

Back in 1920, stoplights were the new buzz word! After 100+ years of experience and growth, we have new tools and understanding that inform traffic engineering decisions. Beyond this, VDOT recommends that roundabouts be considered at all new intersections for their ability to handle higher traffic volumes in a safer manner. For more information on roundabouts, please see Appendix D.

Raised medians with vegetation are proposed. Who will be responsible for their care?

This is a great discussion point. Maintenance of landscaping is an important consideration in many areas of the County, not just this road corridor. Providing an attractive and environmentally beneficial road corridor is an important element toward creating a high-quality urban environment. VDOT and the County will need to continue discussions regarding a great commitment to maintaining these environments. This study is only recommending that planted medians be a priority for the County.

Why is demographic information included for areas such as the Greenbrier neighborhood included in this plan?

The demographic information includes the Census Tract Areas surrounding the Corridor. Each tract area has a predefined boundary, as shown in the graphic on Page 34. This information is simply included to give an idea of the demographics of those who may use the corridor on a daily basis. Whether County or City, the use of the corridor is shared by the general public and their safety and welfare is not dependent on which side of a jurisdictional boundary they live.

There are neighborhoods along the corridor that are not mentioned, such as Dunlora Park and Dunlora Forest. Why are these not included?

All surrounding neighborhoods were considered equally in their impact to traffic on Rio Road – which is the focus of this study.

The shared use path puts cyclists and pedestrians on the same path, which is a safety hazard for pedestrians.

While this is a valid concern, it is much safer for cyclists and pedestrians to share a path located away from and buffered from vehicles, than to leave conditions as they are currently. The shared use path is recommended at a minimum width of 10 feet, which is twice the size of the current sidewalks. This allows space for pedestrians and cyclists to coexist safely. Any cyclist/pedestrian conflict would be regrettable and yet likely to leave both parties with minor injuries. Whereas a vehicle conflict with either a pedestrian or a cyclist is likely to leave the non-vehicle user seriously injured or dead.

It is confusing to have two different speed limits on the corridor – from 40 MPH near U.S. 29 to 35 MPH near JWWP. There should be one consistent speed limit.

Posted speed limits reflect the maximum safe speed for a section of roadway, as determined by several criteria including roadway geometry, roadway classification, traffic volumes, and extent of development along the roadway. There is a change in speed limit along the corridor because the character and geometry of the roadway change. Specifically, the drop in speed from 40 to 35 miles per hour is likely reflective of the horizontal curve from Belvedere to the John W. Warner Parkway. VDOT has established the maximum safe speed for this curve to be 35 mph. A speed limit change could be warranted; however, if the roadway criteria have not significantly changed from the last time the speed limit was established, it is unlikely to warrant a change. First, the character of the roadway must change to be more uniform before VDOT will consider justifications for a uniform speed limit. More information on how speed limits are established can be found on VDOT's website in the FAQ section about speed limits, along with the speed limit change process policy.

Speed is an issue on this road which makes it unsafe for bicyclists and pedestrians.

The recommendations of this study include numerous examples of how the speeds along Rio Road can be lowered based on built interventions. Whether that be roundabout intersections, or the narrowing of travel lanes, or including a raised median. Many of these strategies can aid in lowering vehicular speeds.

I am concerned that these projects on Rio Road will take precedence over more important projects (e.g., the roundabout that has already been proposed at Putt Putt Place).

Each and every project under consideration is important. County staff and leadership will evaluate which projects are prioritized.

Why did the County approve all the development along Rio Road without a plan for the corridor? Isn't this backwards?

By State law, the County is not allowed to prohibit development that meets the Zoning Ordinance and all applicable regulations. The County has recognized the need for a cohesive vision for this corridor as it continues to develop. The recommendations of this study are still relevant and helpful even with the many planned and approved developments.

The idea of taking away bike lanes when the County is trying to build additional corridors for cyclists to connect with the existing bike lanes makes no sense.

This study does not suggest removing bike infrastructure. This study recommends relocating this infrastructure to a shared use path instead of in-road bike lanes. This recommendation accomplishes several purposes: first, it establishes the missing Northtown Trail Connection, and second, it creates a safer condition to allow more members of the community to use the amenity. For example, very few people will take their children on a bike ride within the current Rio Road bike lanes. Many more people would be willing to ride a bike with their children within the infrastructure recommended in this document.

Has there been a study to determine what this new construction and traffic pattern will do to affect home and property values?

There are published studies that suggest that increases in traffic volumes correlate with increased home values. There are also published studies suggesting that walkable streets are more economically productive. For further study on these topics feel free to read Street Smart by Samuel Schwartz or visit www.strongtowns.org.

The place I feel safest crossing Rio is at Old Brook where there is a walk sign for pedestrians. Is it possible to make more safe crosswalks available by installing pedestrian-controlled traffic lights?

This is helpful feedback. During the course of this study, a pedestrian-activated crossing signal has been installed at Greenbrier Drive. The intersection renovations in this study do not include pedestrian-controlled signals as there are no traffic lights proposed. The corridor plan, as indicated in Appendix A, includes several mid-block crossing opportunities along the corridor.

FREQUENTLY ASKED QUESTIONS OR CONCERNS

Were traffic studies actually done about cross traffic? This study seems to lack data.

The study is meant as a high-level planning and visionary document. In fact, much of the more technical information in the first draft was recommended to be moved to the appendix such that the body of this study could be more accessible to a wider audience. Traffic studies that were used to inform this study are included in Appendix F.

More detailed designs are needed to truly understand the proposal.

This study includes conceptual designs, which inherently lack detail. We have done our best to provide enough information to understand the general pros and cons of each design. Please refer to Appendix A for more detailed conceptual design information.

Is access to all intersections and entrances along the corridor going to be considered? If not, this study is incomplete.

Every entrance and intersection were considered. Please refer to Appendix A.

The designs favor commuters and through traffic, not those living off of the corridor.

The design favors the safety and serviceability of all who use the corridor. Please refer to Page 10 which discusses access and mobility and how this corridor must effectively manage both.

How is Gasoline Alley being addressed? Those wide open access points are dangerous for pedestrians and cyclists.

We believe your reference to Gasoline Alley is to the several gas-stations adjacent to one another along Rio Road, and not to the road named Gasoline Alley.

If so, please refer to the information presented in the Proposed Typical Section and to Appendix A which shows this typical section implemented along this portion of the corridor.

That said, this improvement cannot be achieved until these parcels (the gas stations) redevelop given the current conditions and the entitled access to these businesses.

HILLSDALE / OLD BROOK / NORTHFIELD

There is no current problem with this intersection. Signal phasing adjustments made years ago have significantly increased the safety and efficiency of this intersection.

There are numerous problems with this intersection as evidenced by this study and the information included in the appendices.

According to VDOT, flashing yellow arrows were installed in 2019 to alert drivers making left-hand turns off of Rio that oncoming traffic still has the green light and that they are to proceed with caution. While this is a significant safety improvement, it does not solve the spacing issue of the intersection nor reconcile all the conflict points or accidents.

The current intersection area is dangerous because vehicles often speed through one light on a yellow just to be stopped on red at the next light. The proposed peanut shaped roundabout may be a minor inconvenience but is much better than what is in place now.

We have heard a lot of mixed feedback about whether this intersection is currently safe and functioning properly. However, we must look at the data – which shows high collision rates and woefully inadequate spacing. We do anticipate this design to function much more effectively, thank you.

The issues at the intersection can be solved with adjustments to the signal phasing.

While adjustments to signal phasing can affect the safety and capacity of the intersection, there are limitations. With increasing traffic, adjustments to signal phasing cannot solve the issues of inadequate storage lanes nor minimize the numerous conflict points in this intersection.

The lack of a signaled pause in traffic makes crossing on a bicycle more dangerous. Roundabouts may increase the speed of traffic while reducing the opportunity to cross, especially during periods of high flow.

Please refer to the information on roundabouts in Appendix D. The perspective expressed in this question is in conflict with technical guidance presented therein.

JOHN W. WARNER PARKWAY

I do not experience any issues with the current signalized intersection. I do not think a roundabout needs to be implemented here at all.

This decision was a result of the VDOT conducted studies.

Line and Grade's proposed roundabout moves traffic closer to homes. There is a reason this road was realigned years ago to be moved away from homes. The Dunlora HOA worked with VDOT to extend Dunlora Drive and create a buffer between homes and Rio Road. This design was purposeful to lessen the noise and air pollution that this heavily trafficked road brings to the Dunlora neighborhood.

The realignment of Rio did create a buffer between Rio and Dunlora; however, this was happenstance, not the purpose of the realignment. Communication with a County transportation engineer who was the project manager for this realignment has revealed that the true purpose for the chosen alignment was to provide a sweeping curve to connect to the proposed John W. Warner Parkway (pka Meadow Creek Parkway) with the least impact to Meadow Creek, among other things. Please see the direct email correspondence included at the end of Appendix C.

Why is Line and Grade's concept included in the document as an alternative concept if the VDOT concept has been chosen?

It is important to note that the VDOT alternative and the Line and Grade alternative are both concepts. County leadership has advised to the preference of the VDOT concept; however, as this design progresses toward preliminary engineering the concept is subject to change.

The Line and Grade alternative is included herein to document new understandings of this intersection, primarily the detrimental effect the VDOT design will have on Dunlora residents. Though it was not chosen as the preferred concept, there are still technical components of the design that may be useful to VDOT when it comes time to prepare the final roundabout design.

The roundabout will have a negative effect on homes and the new wildflower meadow, which shows a disregard for the environment. The new intersection will have more pavement, more runoff, and will be unsafe for pedestrians.

Please refer to Appendix E3 for a detailed analysis of these two options.

The roundabout is not a good solution. I literally watched accidents happen almost daily at the airport roundabout when I worked up there. Having one with higher speeds and way more cars could be really bad.

According to VDOT Crash Data (which was also used to analyze Rio Road), 10 accidents occurred between 2014-2021 at the Airport Road roundabout. Of those accidents, 9 were property damage only. One was a minor injury, and that was a single-vehicle accident with a fixed-object collision. The traffic on Airport Road is much less than on Rio (less than 1/3); however, the number and severity of accidents at the Airport Road roundabout does not indicate that a roundabout is unsafe compared to a signalized intersection. Research shows that roundabouts are safer in general. While they may not decrease the number of accidents, they decrease the severity of them. Please refer to Appendix D for more information on roundabouts.

BELVEDERE BOULEVARD

The Green T is a good solution. The flexibility of its design is a strength in that it can be adapted in the future with a northbound stop light if needed.

You are correct that this approach allows for flexibility at the intersection in the future. This point has been added to Page 13.

A traffic signal at this intersection may be a better solution. The document should include more detail about the pros and cons of a signalized intersection at Belvedere.

In general, VDOT recommends that innovative intersection designs be implemented instead of traditional signals where feasible. This is due to the delays in through traffic that signals can cause, increased risk and frequency of rear-end crashes, and cost impacts for installation and maintenance of signals.

The Green T solution does not solve the fact that you still need to cross two lanes of northbound traffic to head southbound (left out of Belvedere). With a roundabout at JWWP, there will be fewer pauses in the traffic to allow vehicles to cross these NB lanes.

That is correct that you will still need to cross two lanes of traffic. Please refer to Page 13 for additional detail about this intersection, particularly the reduction of conflict points and the safety of merging movements versus crossing movements.

DEFINITIONS AND RESOURCES

DEFINITIONS

Access Management - a term borrowed from the Virginia Department of Transportation (VDOT) that focuses on the location, spacing, and design of entrances, street intersections, median openings, and traffic signals

Buffer Strip - an area of separation, typically vegetated, between vehicular lanes and pedestrian or cyclist travel-ways

Conflict Points - locations where vehicle travel paths intersect. These conflict points result from either crossing, merging, or diverging movements.

Continuous Green T (CGT) - Intersection design where one major street direction of travel (the top side of the "T") can pass through the intersection without stopping and the opposite major street direction of travel is typically controlled by a traffic signal

Human Scale - the proportion of space in relation to human dimension

Intersection Sight Distance (ISD) - the distance a motorist can see approaching vehicles before their line of sight is blocked by an obstruction near the intersection

Level of Service - a qualitative measure used to relate the quality of motor vehicle traffic service. Ratings are A through F, in order from best to worst conditions.

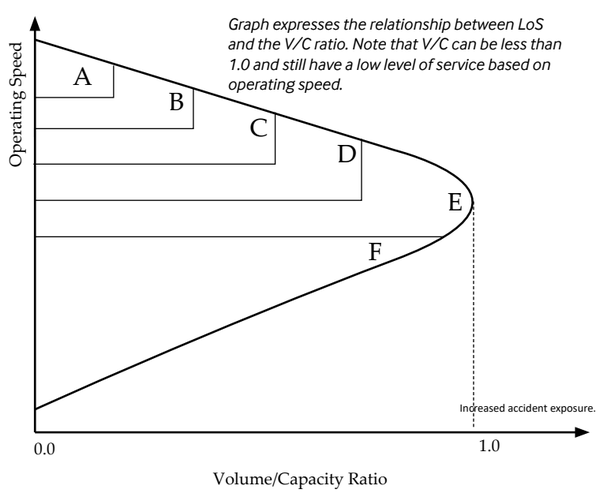
Public Realm - the publicly-owned street rights-of-way and other publicly accessible open spaces such as parks, squares, plazas, courtyards, and alleys

Restricted Crossing U-Turn (RCUT) - An intersection design where all side street movements begin with a right turn. Side street left-turn and through vehicles turn right and make a U-turn at a dedicated downstream median opening to complete the desired movement.

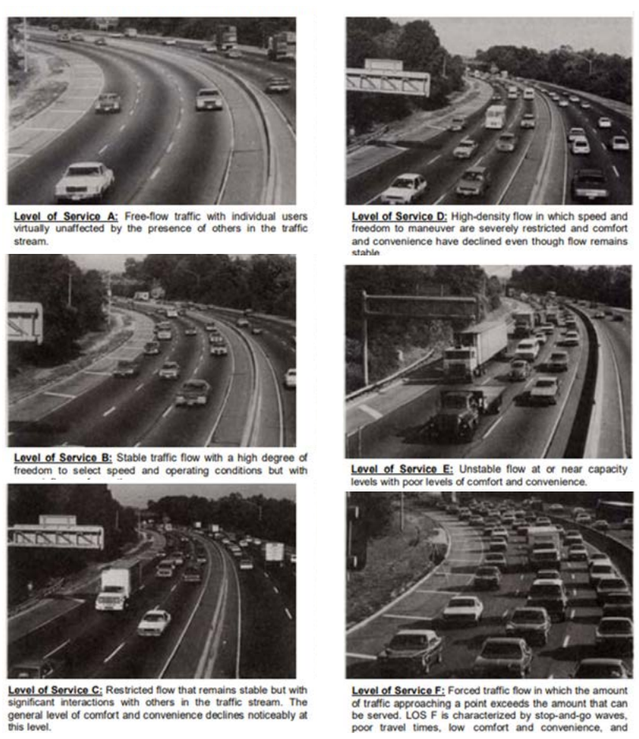
Roundabout - a road junction at which traffic moves in one direction around a central island to reach one of the roads converging on it; a traffic circle

Stopping Sight Distance (SSD) - The stopping sight distance is the sum of the braking distance and the distance traversed during the brake reaction time. In other words, it is the length of roadway that should be visible ahead of the driver, in order to ensure that the vehicle will be able to stop if there is an object in the travel path.

Volume to Capacity and Level of Servce



Level of Service Visual Examples



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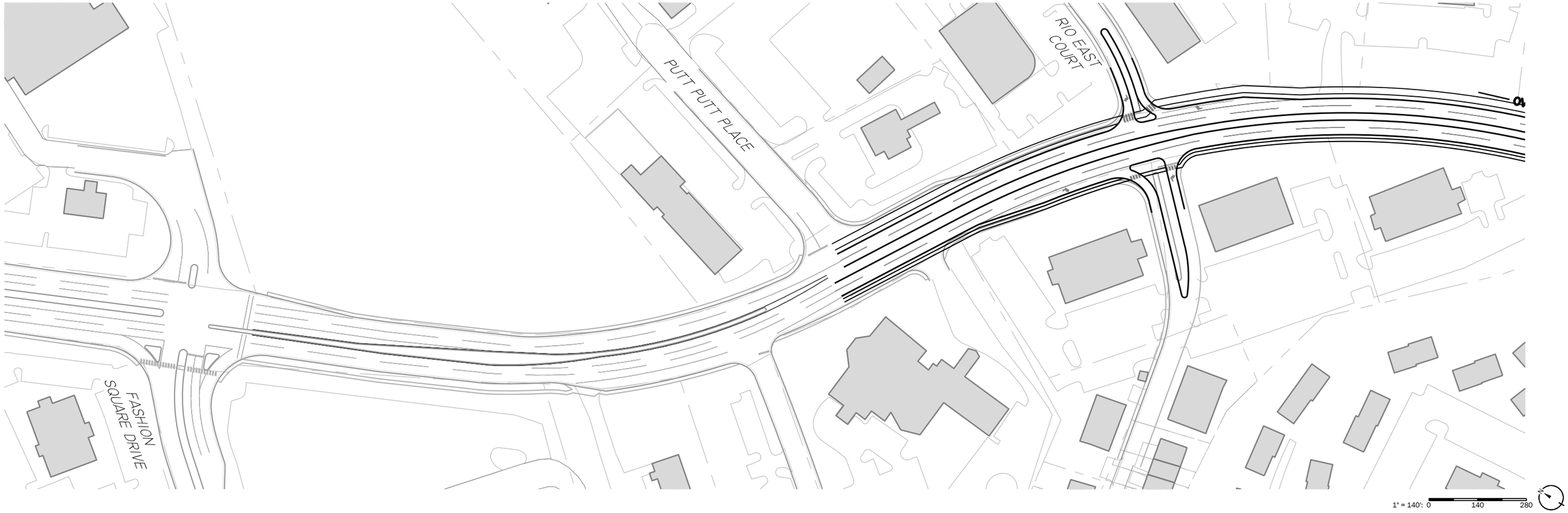
APPENDICES

APPENDIX A: CORRIDOR STUDY CONCEPTUAL DESIGNS

RIO ROAD CORRIDOR PHASE 1



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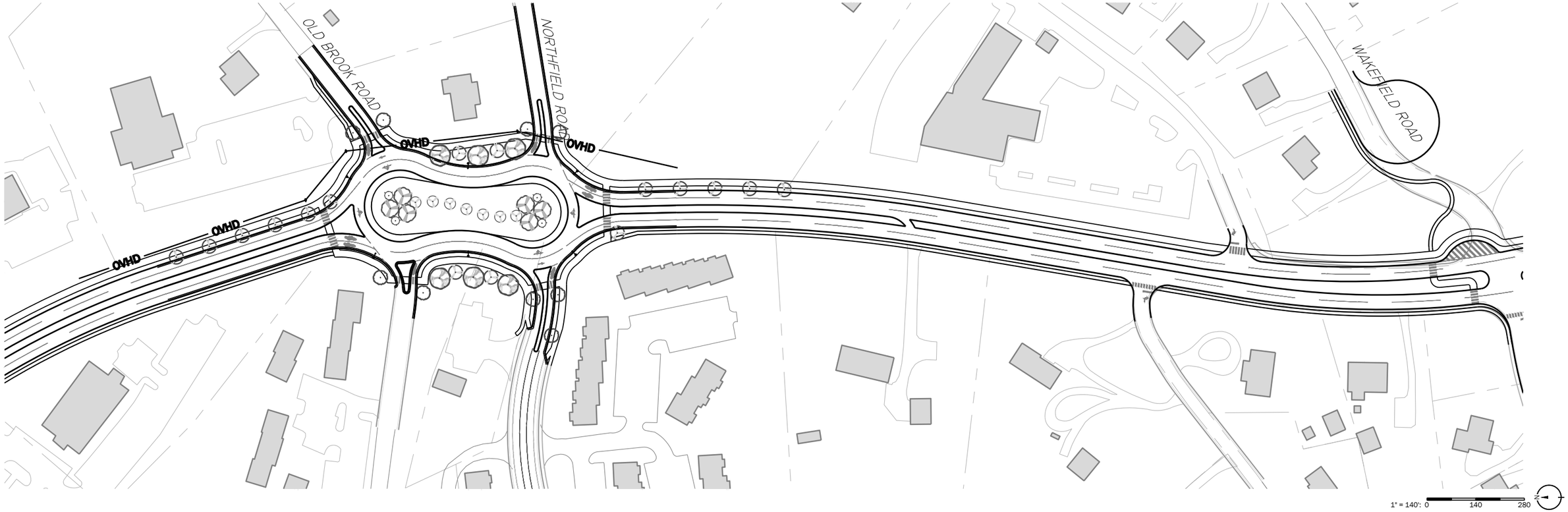

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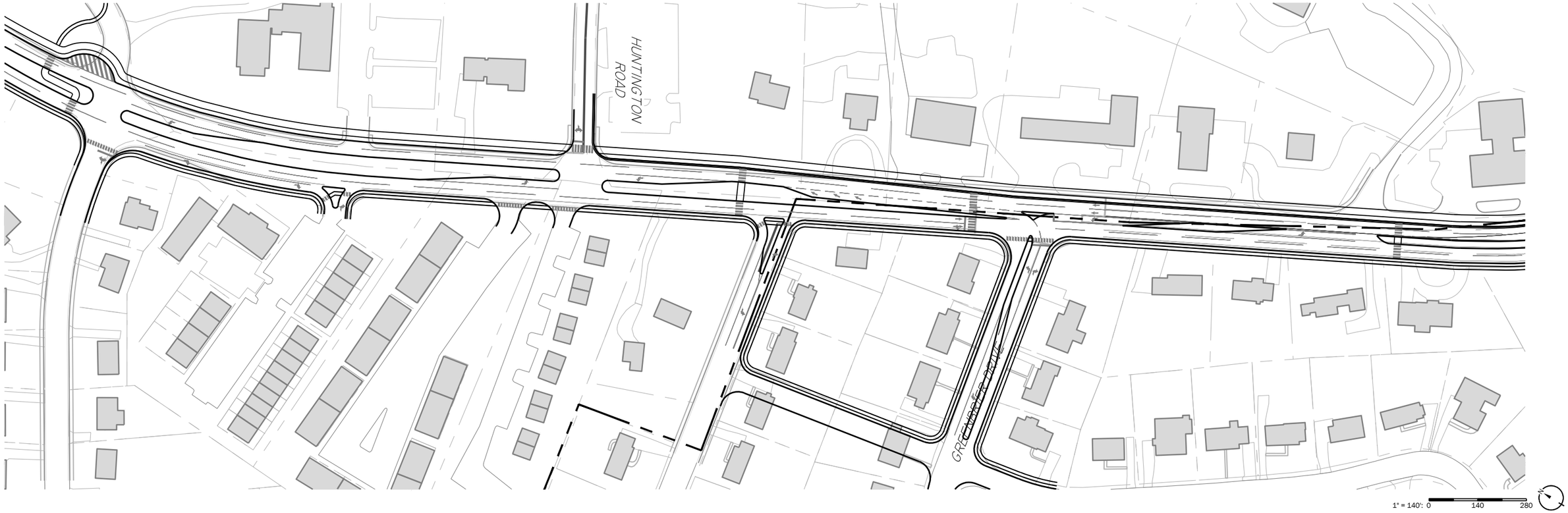

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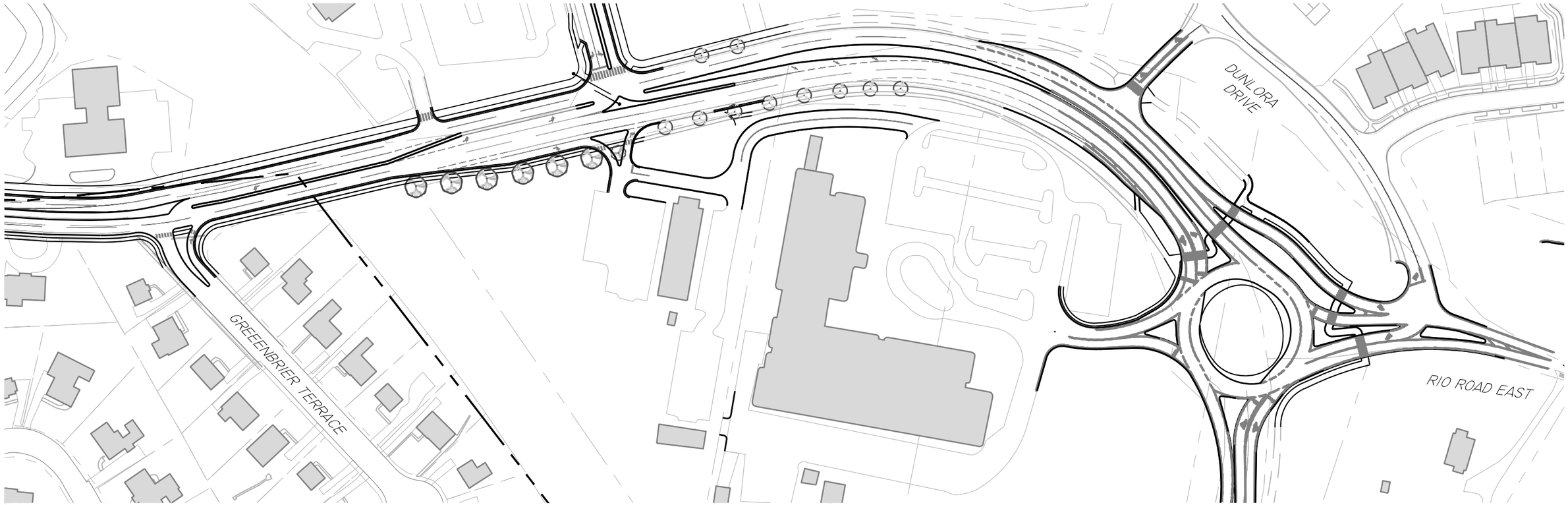
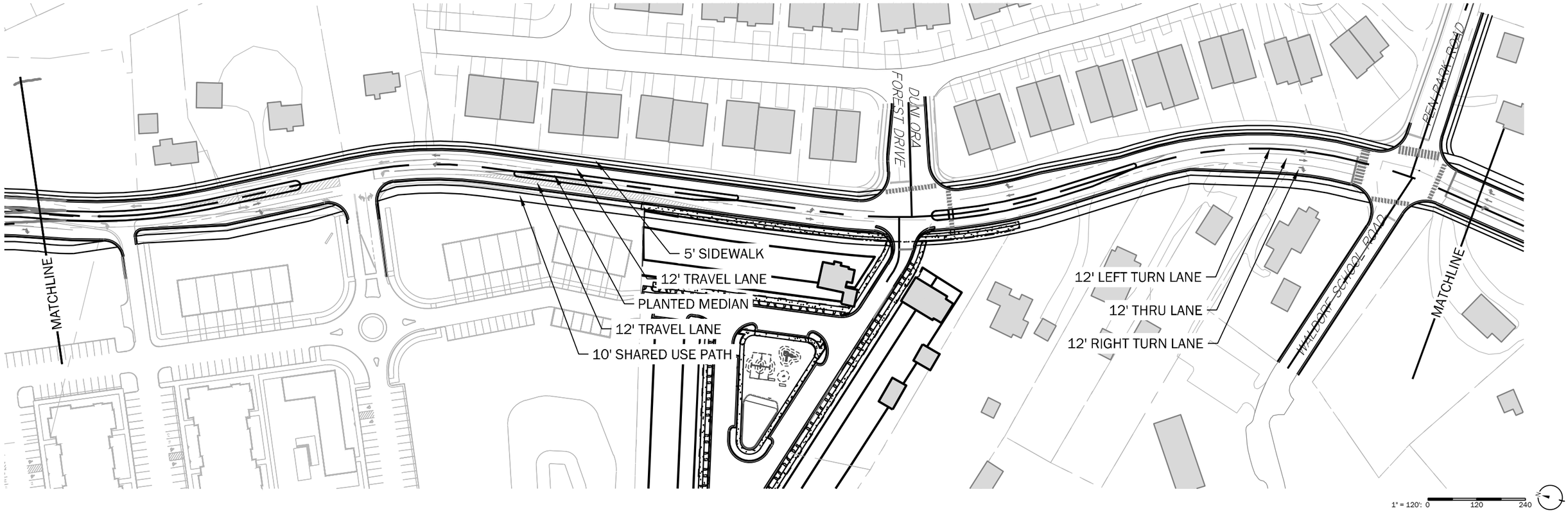


APPENDIX A: CORRIDOR STUDY CONCEPTUAL DESIGNS

RIO ROAD CORRIDOR PHASE 2



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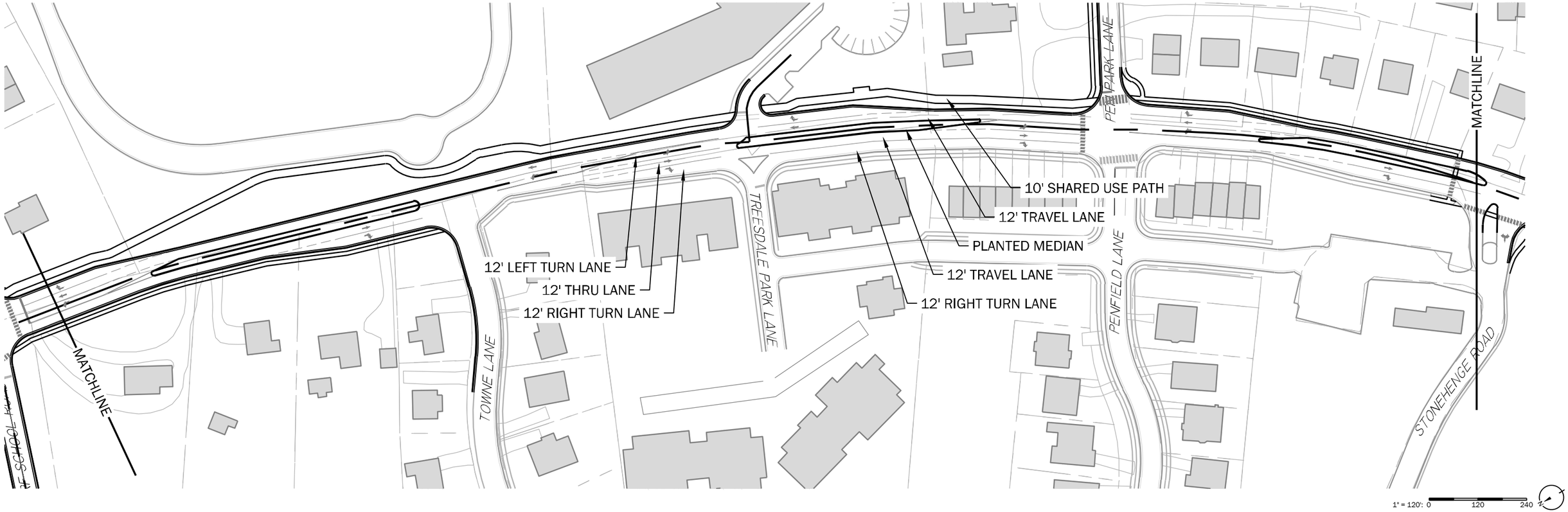

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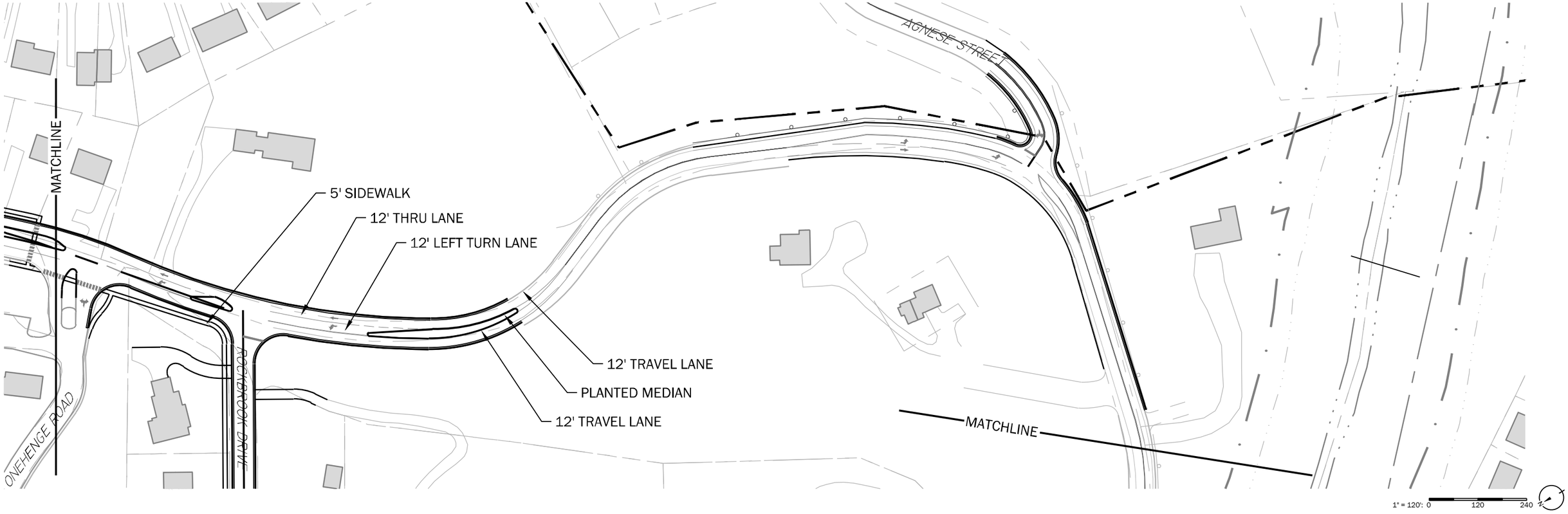


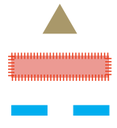
APPENDIX A: CORRIDOR STUDY CONCEPTUAL DESIGNS

RIO ROAD CORRIDOR PHASE 2

APPENDIX B: BUILDING ENGAGEMENT AND THE PUBLIC REALM

HIGH ENGAGEMENT PLAN

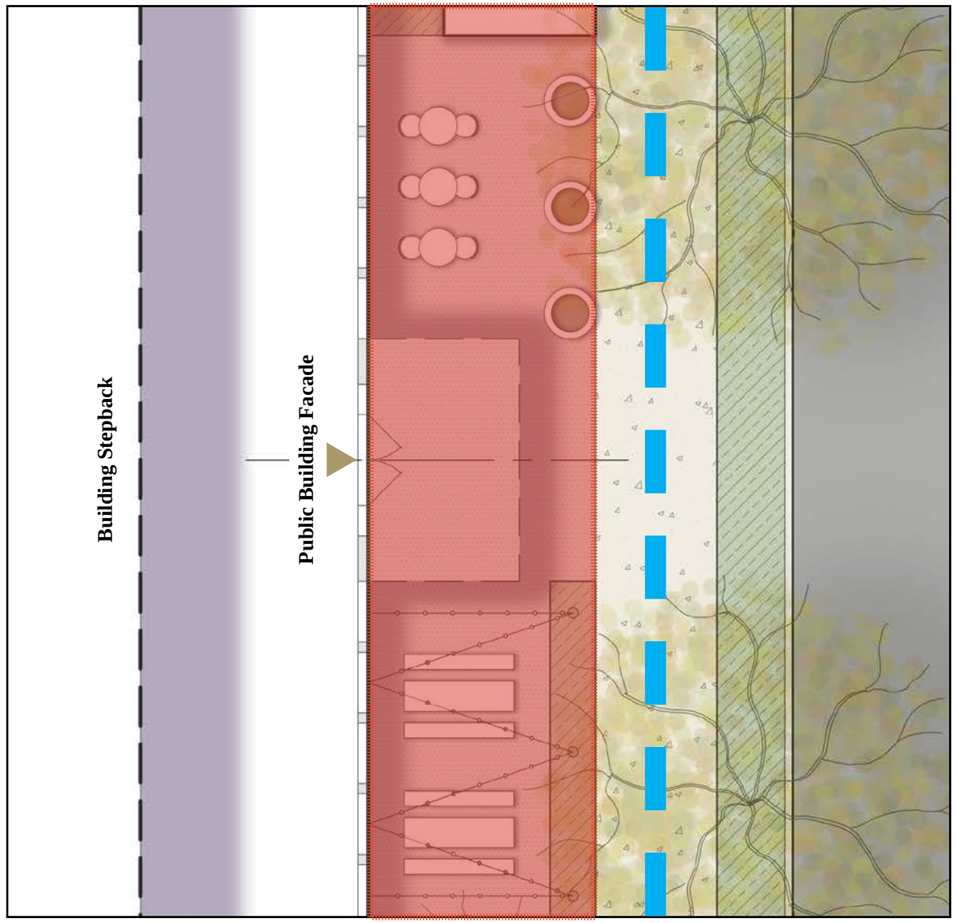
This development section should be used when first floor activity within the building is intended for High Public-Use and Engagement. Building Entry Points should be directly accessible (physically and visually) to the public realm where architectural treatments extend the building's threshold into the Transition Zone. The zone width is equal to half of the building height and should be designed in a way to engage the public edge through seating, accent paving, lighting, accent plantings, and other urban site elements. The Building Height along the public realm is limited to three (3) stories to mimic the scale of the Downtown Mall. Should the Comprehensive Plan allow heights greater than three (3) stories, the Building Stepback Height will be mitigated through the Building Stepback Depth as noted in the section.



Building Access

Plaza Transition Zone

Sidewalk



TYPICAL HIGH ENGAGEMENT SECTION

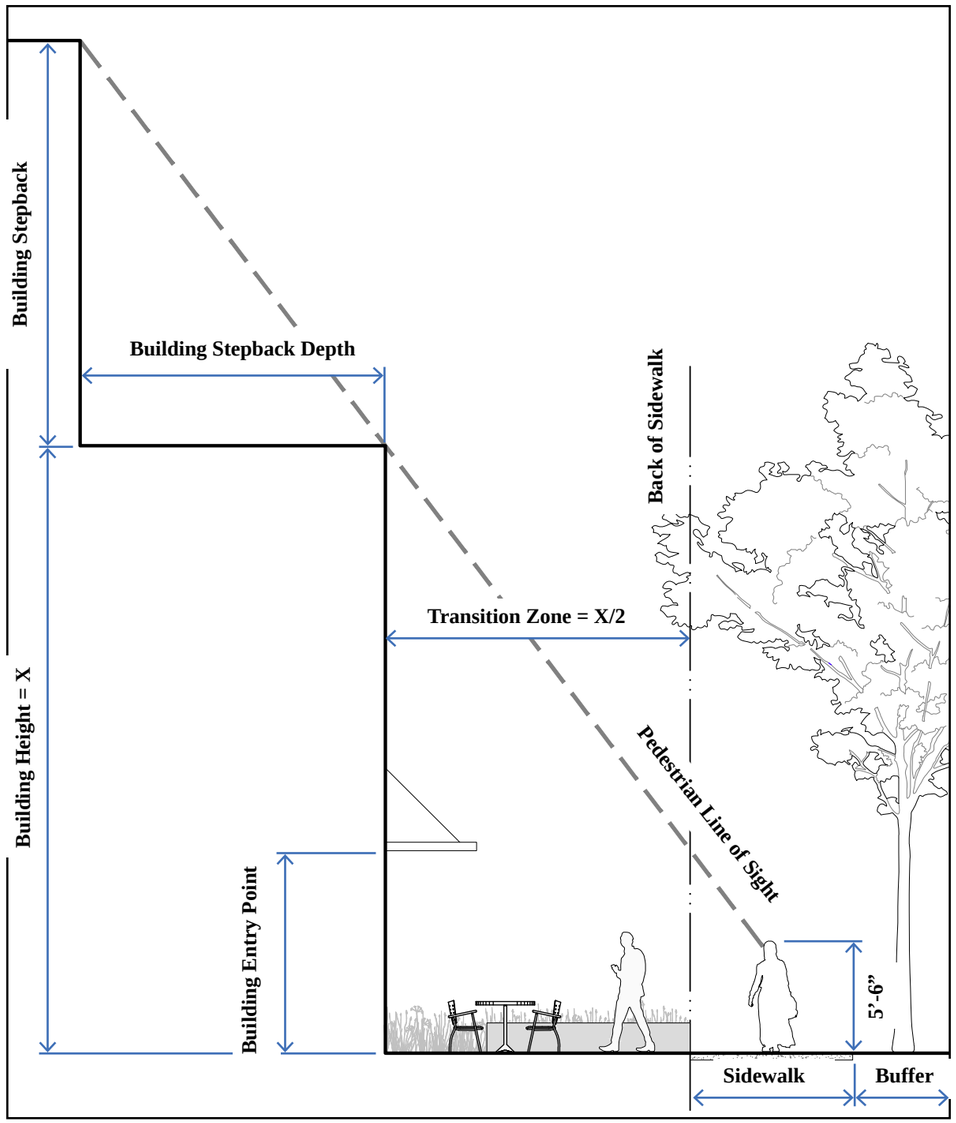
Building Height: varies, 3 stories maximum

Building Stepback Height: maximum building height to be determined by comprehensive plan

Building Stepback Depth: depth to block pedestrian line of sight from centerline of sidewalk directly in front of building to top of maximum allowed building height

Building Entry Point: provide architectural treatment highlighting threshold

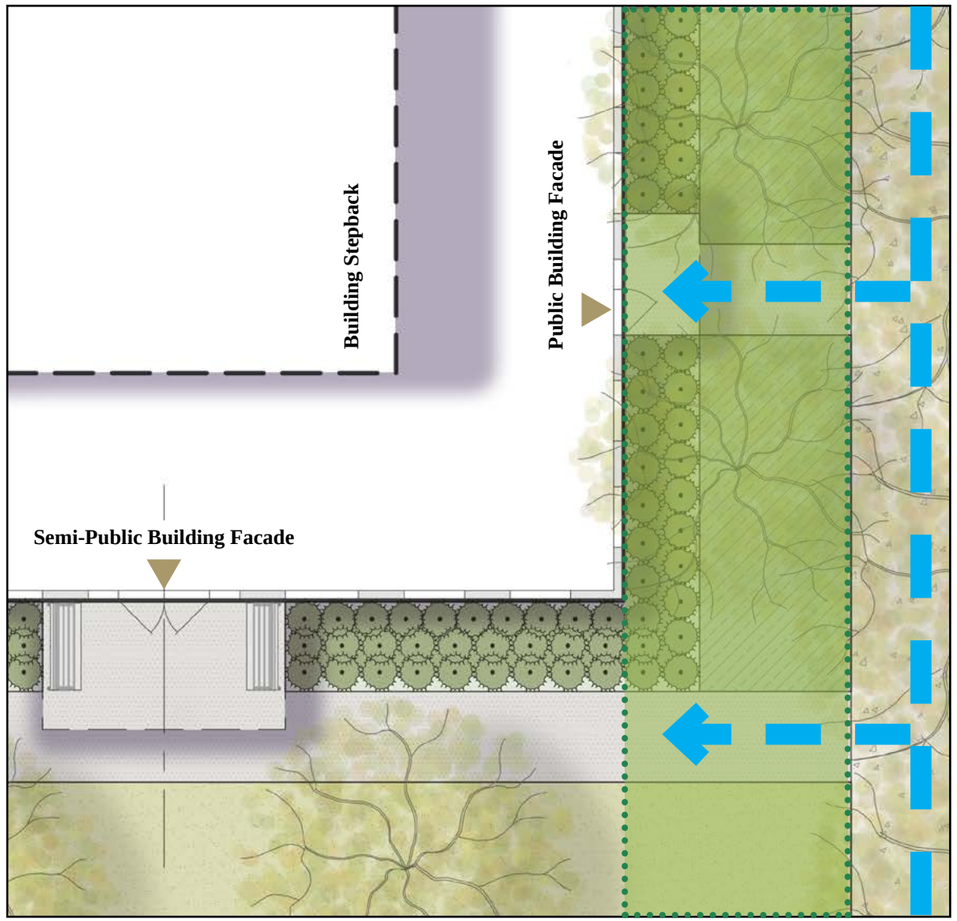
Transition Zone: depth to be half of building height; paved and may include pedestrian oriented accent paving and site furnishings such as tables chairs, seat walls, bike racks, etc.



APPENDIX B: BUILDING ENGAGEMENT AND THE PUBLIC REALM

MEDIUM ENGAGEMENT PLAN

This development section should be used when first floor activity within the building is intended for Medium Public-Use and Engagement. Building Entry Points should be indirectly accessible (physically and visually) to the public realm where architectural treatments view onto the Transition Zone. The zone width is equal to half of the building height and should be designed in a way to visually engage the public edge through lighting, accent plantings, and secondary building entrance points and corresponding pathways. Foundation Planting Heights within the zone should correlate to the sill heights of the building's windows as to maintain visual connectivity between the public realm and building's first floor activity. The Building Height along the public realm is limited to three (3) stories to mimic the scale of the Downtown Mall. Should the Comprehensive Plan allow heights greater than three (3) stories, the Building Stepback Height will be mitigated through the Building Stepback Depth as noted in the section.



TYPICAL MEDIUM ENGAGEMENT SECTION

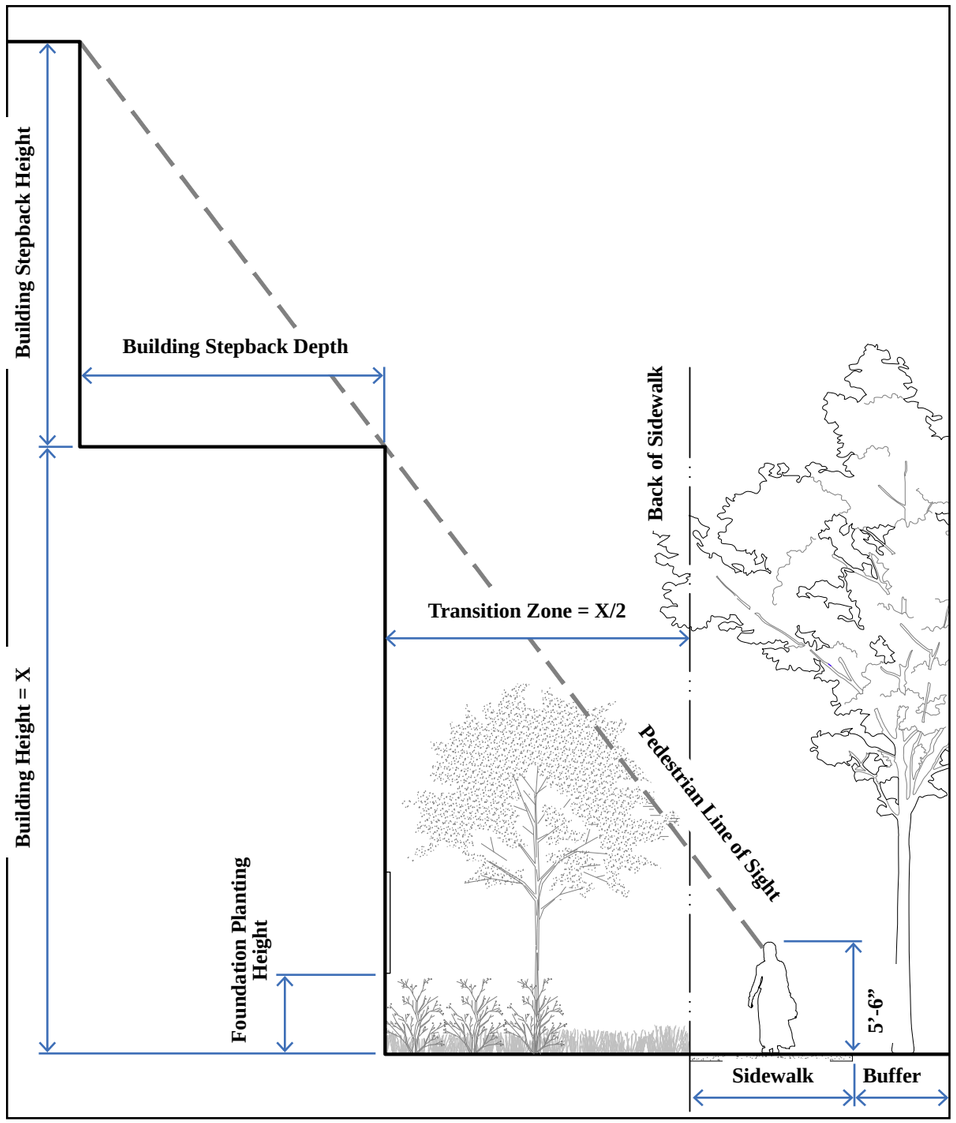
Building Height: varies, 3 stories maximum

Building Stepback Height: maximum building height to be determined by comprehensive plan

Building Stepback Depth: depth to block pedestrian line of sight from centerline of sidewalk directly in front of building to top of maximum allowed building height

Foundation Planting Height: mature height of plantings not to exceed facade window sill height

Transition Zone: depth to be half of building height; composed of foundation plantings, small trees, lawn, and secondary access paths



APPENDIX B: BUILDING ENGAGEMENT AND THE PUBLIC REALM

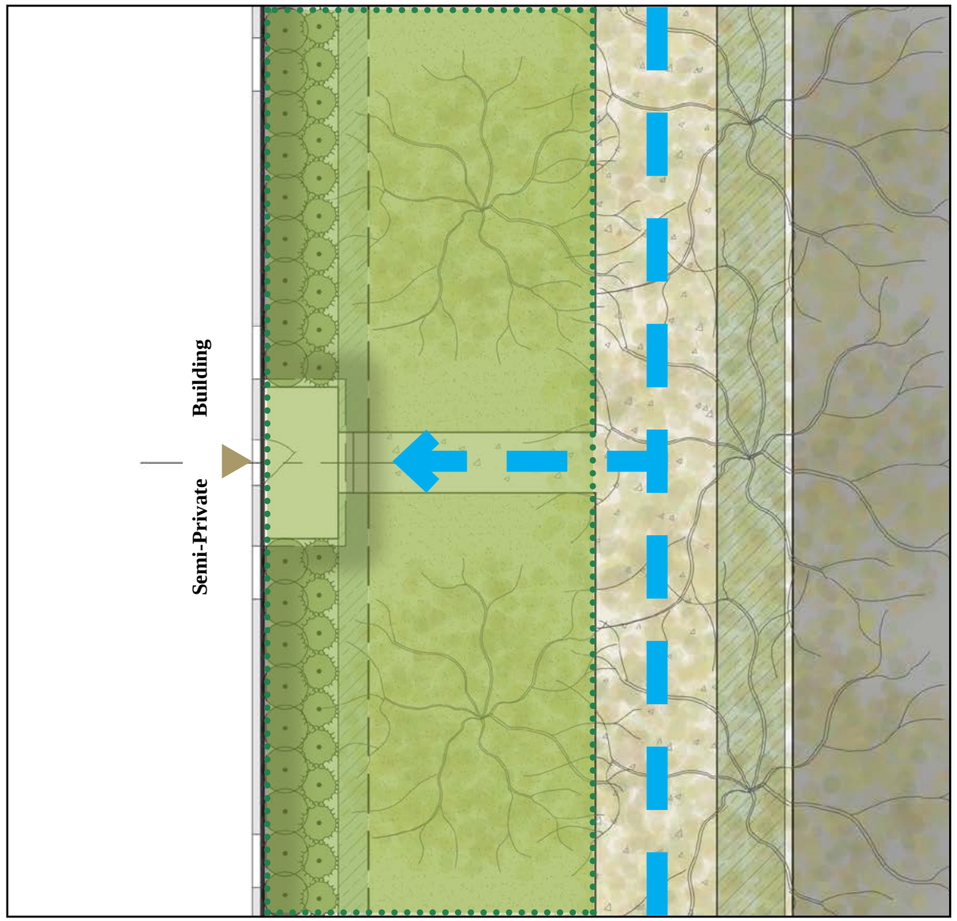
LOW ENGAGEMENT PLAN

This development section should be used when first floor activity within the building is intended for Low Public-Use and Engagement. The Transition Zone width is equal to the Building Height (three stories maximum) and should be designed in a way to visually (but not physically) engage the public edge through lighting, accent plantings, building entrance points, and corresponding pathways. The development should also include a Vertical Separation from grade to encourage a sense of privacy to the first floor use. Foundation Planting Heights within the zone should correlate to the sill heights of the building's windows as to maintain semi-public visual connectivity between the public realm and building's first floor activity.

Building Access

Landscape Transition Zone

Sidewalk



TYPICAL LOW ENGAGEMENT SECTION

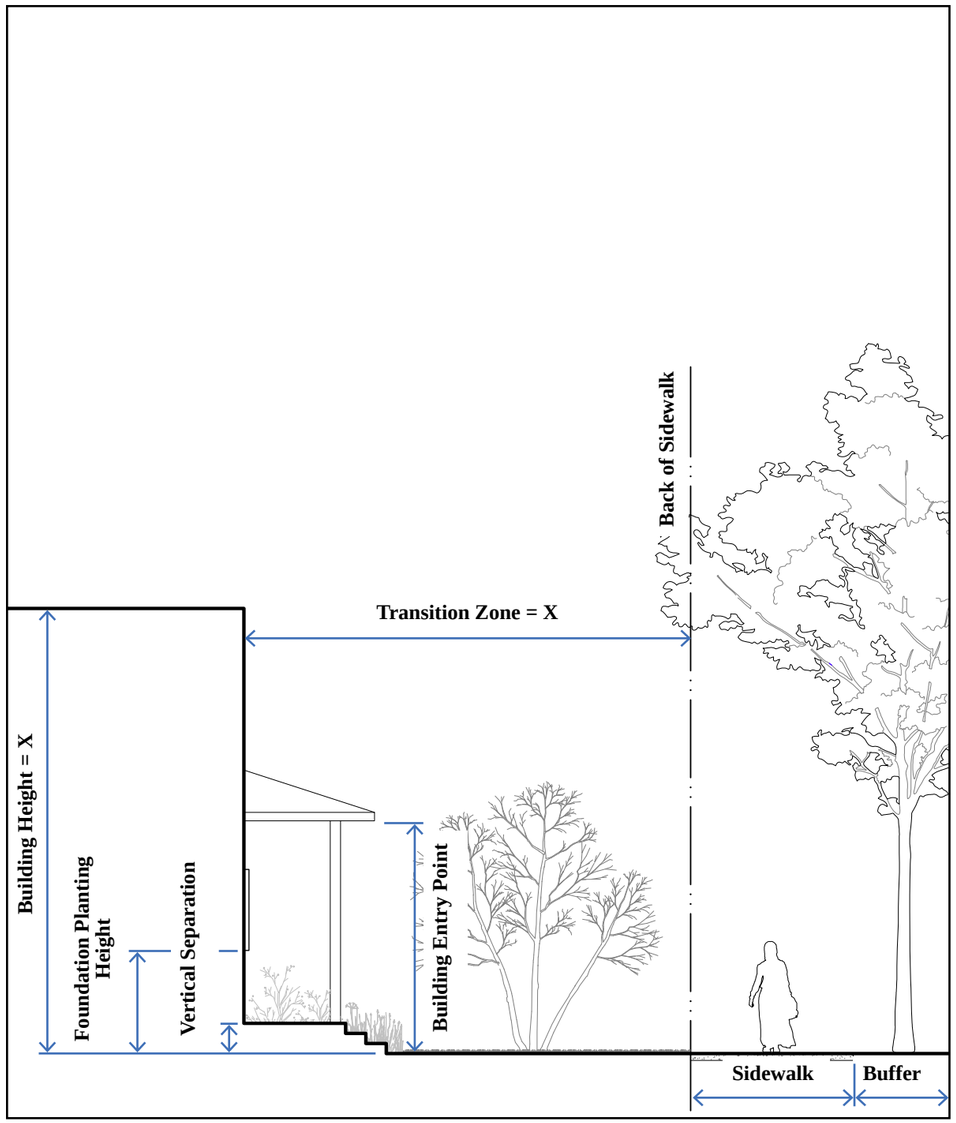
Building Height: varies, 3 stories maximum

Building Entry Point: provide architectural treatment highlighting threshold

Vertical Separation: ground floor to be 18" above finished grade

Foundation Planting Height: mature height of plantings not to exceed facade window sill height

Transition Zone: depth to be equal to building height; composed of foundation plantings, lawn, trees, and secondary access paths



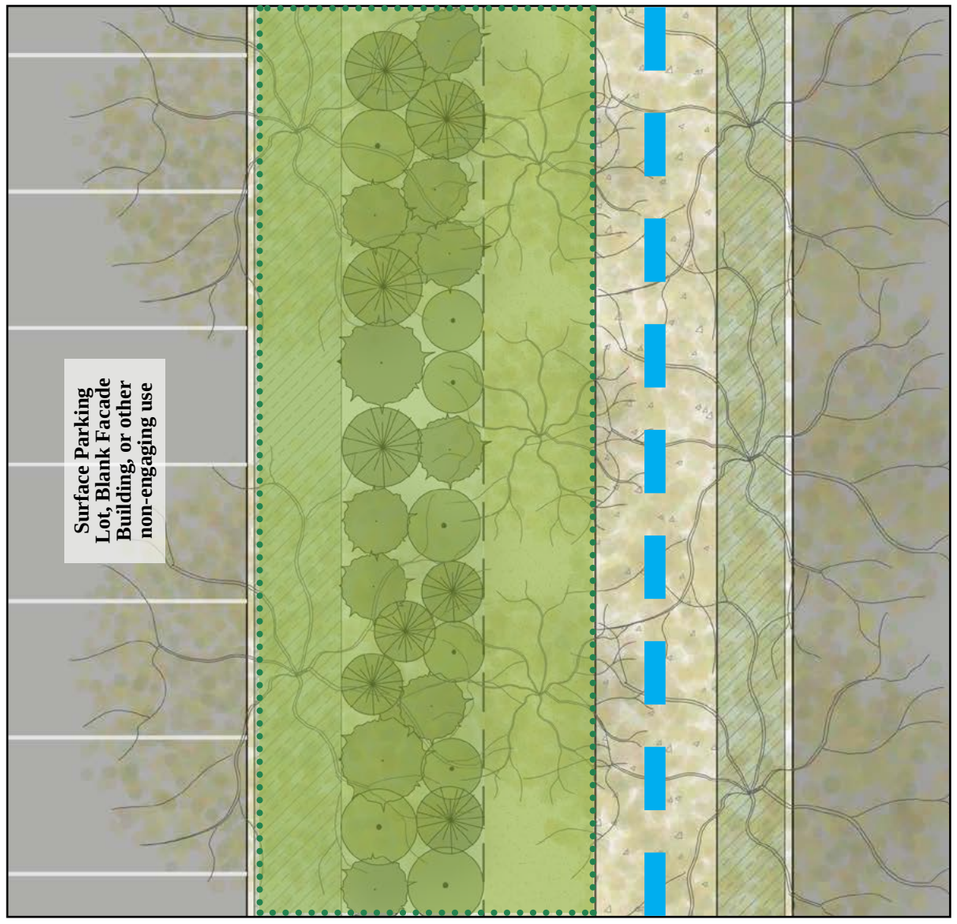
APPENDIX B: BUILDING ENGAGEMENT AND THE PUBLIC REALM

NO ENGAGEMENT PLAN

This development section should be used when land development is intended for No Public-Use and Engagement and where existing grading, utility, and environmental concerns prohibit building development along the public sidewalk. The Transition Zone width is twenty (20) feet minimum and should be designed in a way to visually disengage the public edge through eye-level hedges and foreground plantings. Shade Trees should be planted to create a continuous overhead canopy to shelter and shade the public sidewalk.

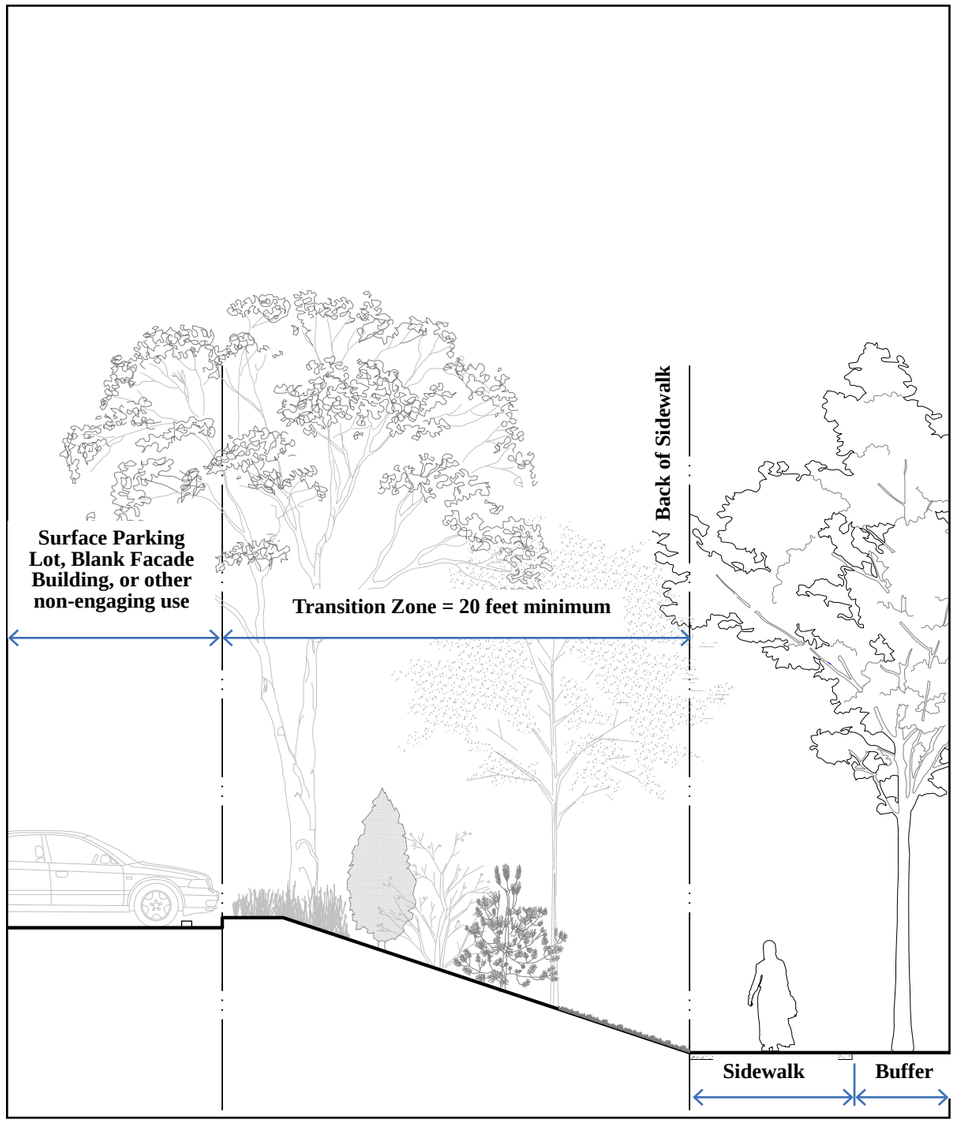
Landscape Transition Zone

Sidewalk



TYPICAL NO ENGAGEMENT SECTION

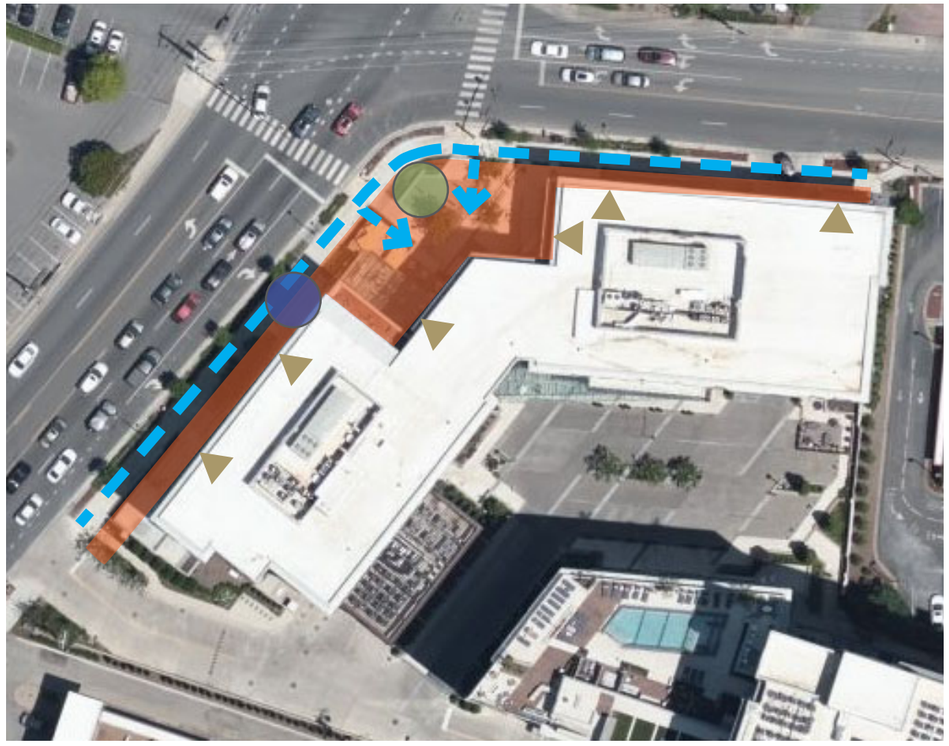
Transition Zone: depth to be 20 feet minimum; composed of shade and ornamental trees, a continuous hedge of 6-8 feet tall (mature height) evergreen and deciduous shrubs, perennial plantings, and lawn



Vertis Green Hills

NASHVILLE, TN

Land Use:	Retail, Office, Multifamily
Building Height:	4-stories Retail/Office, 18-stories Multifamily
Transition Zone:	10-20 feet5-45
Acreage:	2.57 Acres



A four-story building gives way to a central public plaza with defined seating spaces. Throughout the transition zone, building access is cued through architectural elements and ornamental plantings soften the space between occupants and the adjacent street. A parking deck is relegated to the rear of the street-side building.

Building Access

Transition Zone

Sidewalk

The street-side building features restaurants and office space opening to a public plaza with a variety of places to sit

Multiple pedestrian access points within the transition zone connect the public sidewalk to the plaza and retail uses above

OBSERVATIONS

Along the public frontage the transition zone is largely planted due to grading issues. Multiple pedestrian access points connect the public sidewalk to the retail businesses above.

The project features a central plaza within the transition zone that provides generous seating for the public and the restaurants that occupy the first floor, which responds to the site's context at a busy road intersection.

Building height for the street-side retail and office spaces is restrained to 4 stories as an approachable introduction to the street. The project features a stepback by detaching the 18-story residential tower behind, increasing privacy for residents.

Vehicular drop-off is relegated between the street-side building and the residential tower. This area allows for pedestrian circulation too, providing a woonerf type experience between the two building uses.

An underground parking deck integrated into the residential tower is accessible from an alley on the edge of this development, obscuring this use from the pedestrian realm.

Riverside Village

ALBEMARLE COUNTY, VA

Land Use:	Mixed Use: Retail, Office, Multi * Single Family
Building Height:	2-3 stories
Transition Zone:	15 feet
Acreage:	9 Acres

A densely planted transition zone is punctuated with spurs off the main sidewalk leading to public space between the buildings. Since there is no building access adjacent to the transition zone, pedestrians use side entrances within the courtyards, helping to shelter the public space from the traffic of the adjacent road.

Building Access

Transition Zone

Sidewalk

A series of public courtyards sit between three mixed-use buildings, allowing for views of the residential character beyond

The planted buffer is interspersed with pedestrian access to the public courtyards

OBSERVATIONS

A planted transition zone directs pedestrians from the sidewalk to the primary building entrances fronting the pocket plazas.

Pocket plazas of varying size and layout are located in the space between street-side buildings. The development's public space is visible and approachable from the sidewalk and more protected than if it were fronting the multi-lane road exclusively.

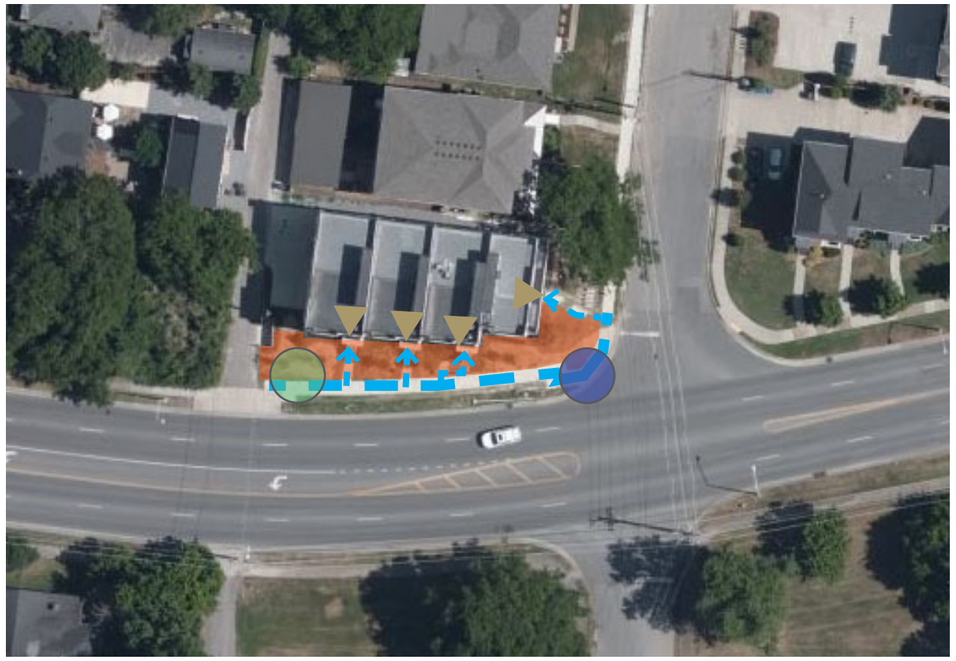
The mixed-use buildings along the street stand a story taller than the single family residential homes in the distance. This height difference, along with architectural detailing, communicates a subtle, yet distinct change in density between the two uses.

Parking is located between the different uses, providing convenience for visitors, employees, and patrons. It is easily accessible with drive aisles on either side of the street-side buildings.

Wedgewood Avenue Townhomes

NASHVILLE, TN

Land Use:	Single Famiy
Building Height:	3 stories
Transition Zone:	9-16
Acreage:	0.25 Acres



Elevated building access, spur sidewalks, small trees, foundation plantings, and lawn comprise this transition zone, defining the separateness from pedestrians on the public sidewalk. While each component is visible, public cues are absent to reinforce this development's more private use.

Building Access

Transition Zone

Sidewalk

A large transition zone with enhanced plantings reinforces a residential character within an urban context

Elevated building access gives residents an increased sense of privacy along a busy street

OBSERVATIONS

Foundation plantings and open lawn within this transition zone communicate a residential context that is visually accessible for pedestrians to observe, while providing a buffer between the private and public realms. Individual sidewalks spur off the main pedestrian path leading to the townhomes' entry steps to provide selective pedestrian access.

Building height is consistently 3 stories along the multi-lane road and these building entrances are elevated from the street to further increase privacy within the residence. On the side-street, the building height steps down to a 2 story condition to align with the adjacent neighborhood scale.

Due to grades, each unit features a garage through an english basement condition and is obscured from the public realm. Access to these garage units is provided through an existing alleyway.

Canopy at Ginter Park

RICHMOND, VA

Land Use:	Multi-Family Residential
Building Height:	3 stories
Transition Zone:	50
Acreage:	14.89 Acres

The width of this transition zone primarily composed of plantings is generally equal to the building height, emphasizing the private nature of the development similar to its context of surrounding single family homes. Gestures to the public sidewalk occur with secondary sidewalks connecting to building access.

Building Access

Transition Zone

Sidewalk

Mature trees were preserved within a larger transition zone to align with the residential character of this neighborhood

A small entry plaza with accent plantings invites pedestrians into the development

OBSERVATIONS

A deep transition zone primarily functions as a buffer and includes residential cues of lawn and ornamental plantings. The setback allowed mature trees predating this project to be preserved, integrating this development into its single family surrounding context.

A different planting pattern and a paving change off the public sidewalk signal another function of the transition zone to increase wayfinding and invite a moment of pause and invitation for pedestrians.

Parking is located between and behind the units in this development. The wide transition zone deemphasizes the parking space between buildings because it does not interrupt the public sidewalk.

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DISCOVER" PHASE COMMENTS

Comment	Zone	Category
Even though the pronunciation of the road name broadly seems ignorant and anti-Hispanic, the people of Charlottesville are generally not that mean-spirited. The road is heavily trafficked and poorly designed (because its use has outgrown its footprint). I was rear-ended and my car was totaled in this corridor within 2 weeks of moving here two years ago.	General	Traffic Safety Concerns
Cars moving too quickly. Gasoline Alley is a dump and those station owners have let each one dilapidate. Overall the corridor splits several large neighborhoods and does little to enhance those neighborhoods outside of moving traffic quickly through.	General	Corridor Capacity
We like the convenience to shopping, gym, Pen Park and Downtown Mall. Traffic is moderate at certain times of day.	General	General
Rio did not come from the word River in Spanish. It came from "R"ail road stop #10 and it was shortened. That is why it is pronounced that way it currently is. I am a fluent Spanish speaker and married into the Hispanic culture. Rio did not come from Hispanic origins.	General	General
The completion of the John Walker Parkway and the cancellation of the Western Bypass has significantly increased the traffic on Rio Road. I don't dare try to cross it on foot as I had before.	General	Pedestrians
Dangerous intersection at Rio & Northfield Speeding traffic making it challenging for bikes	Northfield / Old Brook	Bikes
It is getting more and more crowded and difficult to traverse. Additional building along the corridor and on north 29 is adding to the problem of too many cars heading to and from downtown. For walkers, Rio presents problems at intersections and because along East Rio there are long stretches with limited or NO access to sidewalks.	General	Pedestrians
Dangerous for pedestrians in the entire section between Dunlora and Dunlora Forest. Double lights at Hillsdale Drive can be frustrating. Confusing that both Rio Road from 29 to Catec is Rio Rd. but also the section that continues to Park is also Rio Rd. Dangerous for those trying to get in or out of Belvedere neighborhood with no light.	General	Pedestrians
Lots of traffic and car noise. Cars will go fast. Uncomfortable for walking. Hard to cross. Love the walking path along John Warner Parkway.; Fast moving cars on 4 lanes, not easy to make left turns esp. when closer to 29. Not a good area for walking or biking. Many lights but that's good for slowing down traffic. Not so good for people who live there and have to listen to car noise.	General	Pedestrians
Very convenient for errands, beautiful adjacent residential area. Unfortunate lack of sidewalks in Northfields neighborhood makes walking and biking to church, shops, offices almost impossible.	General	Pedestrians
It can be a little confusing until one gets familiar with it. I would think quite a challenge for bike/ped travelers.	General	Pedestrians
Traffic speed can be somewhat calm. The road will not be able to keep up with the residential development an ddensity happening	General	Corridor Capacity
Rio East pre-pandemic carries a lot of traffic. Appears to be a lot of speeding, some red light running, and a fair number of accidents at Hillsdale and Rio. Also saw an accident happen at Mall Drive and Rio East eastbound. Have observed a number of pedestrians crossing Rio not at crosswalk or light near PuttPutt. Bike lane disappears westbound near PuttPutt. Vehicles faile to use turn signals, stack up to make left turns and end up running red lights. Numerous vehicles fail to use lights in rain.	General	Traffic Safety Concerns
A busy street with too fast traffic that helps connect the north side with downtown.	General	Traffic Safety Concerns
Bad	General	General
Agree!; Very Congested - Take an alternate route. Especially when Walking!	General	Traffic Safety Concerns
This is a big highway posing as a smaller city street that is unsafe for pedestrian foot-traffic. I wouldn't want to ride a bike on this road either, not that is seems that practical, since this load only leads to other big roads like Hydraulic and 29N. No tree coverage whatsoever, and too much development going on alongside the road. If you are looking to foster vibrancy and community connections, the road is currently not doing that.	General	General
Anti-hispanic? Ignorant? Maybe you should do some homework. There's nothing mean about it. ; Obviously, you're not from around here. There's nothing mean or anti-Hispanic about it. "Ignorant" is what you are, I'm afraid. ; It can be a frustrating road if you're trying to get from the 29 intersection to anywhere off Rio or to downtown or Pantops. The madness starts at the light at the parking lots for the now-dead mall and long-dead Albemarle Sq. The light doesn't seem to be sufficiently traffic-sensitive, stopping Rio traffic even if no one is at the intersection. Watch out for cars turning left from Putt Putt Dr on to Rio -- they've been waiting for awhile and are likely desperate. Then the double light at Old Brook / Northfields makes the frustration worse. For the next mile or so, Rio becomes a dangerous, downhill freeway with now-frustrated drivers trying to make up for time lost at the lights swerving around very slow drivers who drift between lanes. The stretch also has a lot of side streets and driveways on both sides, any of which may contain a car or cyclist ready to dart into traffic.	General	Traffic Safety Concerns
Traffic lights are too close between Hillsdale and the next street to the west. Difficult to access Rio from Belvedere. Coming from John Warner at CATEC, it is confusing as to which lane is the desired one.	General	Traffic Safety Concerns
It can get very busy and can be hard to navigate if you aren't from around here. Locals speed through. There is a bike lane, but it does not feel safe.	General	Traffic Safety Concerns
It's a long bland stretch of road. There are some gems, like a thrift store, but they are hard to access and easy to miss.	General	General
Drivers tend to get very anxious and drive fast once they are on the two lane portion of Rio Road after the light at CATEC The lines on the Rio Road are very hard to see at night when it is raining.	Belvedere	Traffic Safety Concerns
Dangerous driving. Many trucks driving fast just passing through on their way to somewhere. Local drivers switch lanes fast and I've seen regular ones blowing through lights. Know exactly where you're going so you have time to proceed in correct left or right lanes.	General	Traffic Safety Concerns
Busy street during peak times. Traffic travels fast. I have never seen anyone stopped for a traffic violation such as speeding on this road.	General	Traffic Safety Concerns
Through traffic moves too fast and in too high volumes during 'rush hour' and without paying attention to people (cars, bikes, pedestrians) entering and exiting Rio Rd. This makes it feel too much like 29N and not like the neighborhood(s) that are the core of this corrido.	General	Traffic Safety Concerns
Busy and dangerous	General	Traffic Safety Concerns
It can be a bit confusing to the uninitiated	General	Traffic Safety Concerns
It's a work in progress. Making a left onto Rio is dangerous from neighborhood - need more traffic lights or more ideally, roundabouts.	General	Intersection Improvements
Rio road acts as 29 bypass from downtown to northern Albemarle.; Lots of subdivisions... Not pedestrian friendly.	General	Pedestrians
The road is dangerous to cross as a pedestrian. Increasing traffic pressures make it hard to make left-hand turns onto Rio Road (going either east or west) at intersections without traffic lights.	General	Intersection Improvements
Be hyper aware of pedestrians and bikers! Expect crumbling (or absent) sidewalks and fast traffic if walking along Rio Rd. The roadway appears to have been installed on a piecemeal basis without thought of future use. I am concerned with traffic in and out of Belvedere and (future) Park Place apartments as more of the area is developed.	General	Pedestrians
It's a very direct route for connecting with the John Warner Parkway to bike downtown. BUT a shared use path would be a tremendous improvement over the existing (sometimes poorly maintained) sidewalk. I NEVER use the bike lanes—way too scary.	General	Bikes
A definite increase in traffic over the years to the point it is now a major route to downtown Charlottesville designed to relive traffic on Rt 29 between Rio Rd and Hydraulic Rd	General	Corridor Capacity
Terrible for walking, fast traffic, and difficult turns around Belvedere and Dunlora. Crossing the street at Catec--with walk signal--involves risking one's life.	General	Pedestrians
Great access to nature trails. Traffic nightmare - more than I realized!	General	Traffic Safety Concerns
it is a mess and scary to walk or bike the entire length of Rio Road	General	Pedestrians
It can be hairy and you had better pay attention to the road.	General	Traffic Safety Concerns
It takes twice as long as you think it will because there are so many red lights. Especially during high traffic times (9am and 5pm).	General	Corridor Capacity

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DISCOVER" PHASE COMMENTS

You would never know that this is in many ways the heart of the community, with many people, of diverse income levels and backgrounds living nearby and using services and parks, also nearby. It was built (not that long ago, I might add) in a way that is designed to accelerate people through it, not to serve the many people who live around it. I would like to see other uses (besides getting to Ruckersville) reflected in the road design.	General	General
Busiest road in the area. Map out where you're going to minimize u-turns.	General	Corridor Capacity
We find it unsafe to cycle on the side walks as people who are listening to music or who are walking pets do not always hear an announcement that we are about to pass. ; First, if you are cycling the bike lanes are never cleaned and have sand, gravel, glass, trash, and dead animals in them on a regular basis. Second, cars often cut into the bike lane even when you are riding your bike in them. Third, you need to time your ride so you can cut across traffic to continue east on Rio through the Rio-John Warner intersection. Finally, beware there is no bike lane on Rio between the John Warner Trail and Penn Park. When cycling take the lane and move into the center section early to turn left into the park.	General	Bikes
The rio corridor is the second largest commuter car conduit from north 29 to Downtown Charlottesville. It currently seems to be designed for car throughput to downtown at the expense of everything else, including vehicular access to destinations inside the corridor.	General	Corridor Capacity
Using Rio Road and the JWP is the fastest way to get to the Vinegar Hill area of downtown. However, biking or walking along that corridor can be an unpleasant experience. East Rio Road is in no way equipped to handle on motorized travel.	General	Pedestrians
I am really concerned about the exit from Belvedere turning left onto Rio Road. There will be many seniors leaving the Senior Center as well as from Belvedere neighborhood and I have already seen MANY near misses with people trying to get across before getting hit and getting half way out and having to stop mid intersection. There really needs to be a light there! I travel this area daily on my way to and from work.	Belvedere	Traffic Safety Concerns
Good for driving. All other uses hazardous. Limping toward an alternative transportation community. ; Good auto connection to Downtown. Poor biking and pedestrian connections. Area is limping toward alternative transportations alternatives. No connections to parallel bike/ped routes.	General	Corridor Capacity
a main business road: the newish overpass does not make driving safer	General	Traffic Safety Concerns
The traffic flow is not equally regulated; some intersections have traffic lights, others don't	General	Intersection Improvements
It is congested and hazardous to pedestrians. Turning vehicles and exiting vehicles are at collision risk especially during high commute times. Speed limits are not enforced. Red lights are not enforced. Bike lanes are frequently crossed by vehicles. I have witnessed 4 major accidents on this corridor in 2020 and was hit from behind at a stop light there.	General	Traffic Safety Concerns
It's dangerous for pedestrians and makes what would otherwise be a walkable neighborhood un-walkable. If Rio was safe for pedestrians our neighborhood would be a nice walk to downtown.	General	Pedestrians
Large hills make walking along the older sidewalk infrastructure difficult	General	Pedestrians
Not vehicle or pedestrian friendly. Dangerous. Patience needed leaving Dunlora wanting to make a left turn heading Rio Rd E. Short amount of space for vehicles to que up on Rio Rd E. trying to make a left turn onto Dunlora Drive. There is a very short line of sight at that intersection.	General	Traffic Safety Concerns
Nightmare! Far too much development without addressing any transportation needs. JW Parkway is often backed up multiple light cycles... making it not a good option for commuting. That forces many vehicles onto side roads. Intersection in front of Dunlora is dangerous for pedestrians.	General	Corridor Capacity
The traffic has gotten a lot worse with all the development to the North on US29. Hillsdale connector helps some but without a direct connection to the Bypass for downtown traffic the volume it takes off Rio Rd East limited.	General	Corridor Capacity
There need to be shoulders on the John Warner Parkway for the volume of travelers and bicycles, there is too high a volume of vehicle traffic for there to be no shoulders for when cars break down or get into accidents. Now disabled vehicles completely shut down traffic. The intersection for Dunlora is also a mess.	General	Corridor Capacity
It is a heavily traveled corridor labeled as a high density space by those who don't live in the area and no nothing about how unsafe it is for bikers, pedisterians or automobiles.	General	Traffic Safety Concerns
Be careful and use a GPS there is no signage to Dunlora and the intersection is very dangerous!	General	Traffic Safety Concerns
Our planners have made a series of short-sighted decisions in Parkway access and capacity, zoning, and traffic lights that have turned East Rio Road into a congested and dangerous corridor. It is increasingly hazardous for drivers to access numerous businesses, churches, schools, and neighborhoods. Now we have a senior center and other businesses opening in a high-risk location with no traffic light. Biking and walking along much of the corridor is too dangerous for me to attempt. Yet, our planners continue to consider more construction that will bring more traffic.	General	Traffic Safety Concerns
As a driver it has lots of traffic lights and dangerous side road intersections. As a walker, it really does not address pedestrian needs.	General	Traffic Safety Concerns
This is a really great summation of the situation - it is being treated as a conduit to other places, except it is a place where people live, work, and recreate. I would add though that non-vehicular access within the corridor is terrible.	General	Corridor Capacity
The road is a too-wide thoroughfare where it would be preferable to have a neighborhood street, with a grassed center median and street trees. It must be difficult for pedestrians or bicyclists to cross the road.	General	Corridor Capacity
Traffic too fast; 2 lanes going into 1...bad idea. Getting in/out of gas stations life threatening	General	Traffic Safety Concerns
Some of the turns can be tricky: such as making a left turn onto Huntington at Church of Our Saviour or further down at Schoolhouse Thrift Shop which is on the church grounds but requires a separate access. At Huntington the turning lane is shared with oncoming cars who need to turn left across 4 lanes to get into an apartment complex and have been known to pull into the path of the left turn cars, cutting them off. Also night travel on this road is dangerous when it's raining because you can't see the lane lines due to the glare of oncoming headlights combined with limited and dim street lighting. Rio East is a mishmash of commercial use here and there next to churches and residential areas, seemingly without a unified plan for safe ingress and egress.	General	Traffic Safety Concerns
It has improved since the Parkway was added but there are still many major challenges. One is that biking is not safe in some sections where there is no shoulder or turn lane and cars expect to not have to slow down. Another is that there is a new large amount of trash because the County has added dense housing with a walking demographic and there are no trash receptacles. Another is that some intersections such as Penn Park Rd and Hillsdale are very dangerous and the county and VDOT decline to upgrade the intersections for safety. It has definitely been improved by the Parkway and the Parkway walking trail. Adding a wide walking path along the length of Rio would be a good improvement, if planned well for bikes and walkers.	General	Bikes
This is becoming a major roadway in Charlottesville, yet it is cluttered with multiple traffic light scheme that doesn't make sense.	General	Corridor Capacity
Confusing - Lights are poorly timed. Road changes names but clearly indicated. Speed limit goes from 35 (2 lane) to 40 (5 lane) to 35 (5 lane).	General	Corridor Capacity
I personally saw someone get hit with a car trying to cross Rio in the rain at dusk. Safe pedestrian crossings near Glenwood Station would be helpful.	General	Pedestrians
Too much car traffic for a residentially dense area.	General	Traffic Safety Concerns
Two hands on the wheel, stay alert.	General	Traffic Safety Concerns
Pay attention for turning and stopped vehicles. Be aware that the land-locked neightborhood, Belvedere, Dunlora, Dunlora Forest,, Lochlyn, etc are difficult to enter/exit during peak travel times.	General	Traffic Safety Concerns
I travel this corridor every day multiple times. I don't see it as a problem, even during rush hours in terms of vehicle traffic. It would be nice to have a sidewalk/bike path from the parkway to Pen Park.	General	Bikes
It's a mess and a tragedy waiting to happen. I mean a very bad pile up and serious injury or death will happen	General	Traffic Safety Concerns

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DISCOVER" PHASE COMMENTS

It isn't safe to do so. It is also noisy, sidewalks are right beside speeding traffic, and there is no tree coverage so you are exposed to direct sun and elements constantly. Very unattractive area to walk.	General	Pedestrians
The Hillsdale connection and the CATEC areas are not safe.	General	Traffic Safety Concerns
Fear, speed of cars, convenience, lack of alternatives.	General	Traffic Safety Concerns
At 76 years old, auto transportation is all I care about	General	Corridor Capacity
Need sidewalks on Park/Rio going from Warner pkwy intersection toward Pen park and on Dunlora drive. It is very dangerous for pedestrians and bicyclists	General	Pedestrians
Sidewalk goes away or switches sides from Stonehenge to Dunlora.	General	Pedestrians
For walking - lack of decent and contiguous sidewalks as well as speeding traffic.	General	Pedestrians
The bike lanes are terrifying. I NEVER use them and use the sidewalk instead. A multi-use path would be much preferred.	General	Bikes
Fast traffic, unpleasant walking conditions	General	Pedestrians
traffic, lack of crosswalks	General	Pedestrians
feel unsafe to walk or bike along all of Rio Road	General	Pedestrians
Uninviting sidewalks (no shade), unprotected bike lanes, high vehicle velocities too close by.	General	Pedestrians
It is difficult to cross 2 lanes of traffic to turn left and stay on Rio through the Rio - John Warner intersection. There is no bike lane from John Warner to Penn Park.	General	Intersection Improvements
Listed above.	General	Intersection Improvements
Traffic ....drivers driving way to fast; Safety	General	Traffic Safety Concerns
Safety in general	General	Traffic Safety Concerns
Either unsafe or non-existent sidewalks. Due to heavy, fast-moving traffic, it is unpleasant to walk.	General	Pedestrians
Speed of traffic	General	Traffic Safety Concerns
Lack of bike lanes and wide walking path	General	Bikes
Safety	General	Traffic Safety Concerns
unsafe	General	Traffic Safety Concerns
The lack of sidewalks, the narrow and winding roadways that have to be traversed to get to public bike paths.	General	Pedestrians
Lack of sidewalks on Rio Road between JW Parkway and Pen Park Road	General	Pedestrians
No sidewalks between Stonehenge Rd and Melbourne Rd.	General	Pedestrians
Completely unsafe for anything except driving.	General	Pedestrians
Need to deal with the traffic congestion on Rio from JWP to PArk- if to be used as an artery to get downtown or across town, widen it and have it be like JWP to 29– right now, Rio is a two lane country road from JWP to Park and JWP is also a two lane road. That combination would lead me to think that it should not be an artery to get downtown..two lane roads are not arteries!	General	Corridor Capacity
lack of sidewalks and bike lanes, difficult to cross Rio road/lack of cross walks.	General	Pedestrians
Cmon? Hello?		
Narrow winding road with no bike lanes or places to walk with more cars going faster every day - I have lost faith that Charlottesville can remedy the horrible car situation.. I know ! Spend millions on consultants with more and more studies!!	General	Corridor Capacity
Lack of continuous sidewalks.	General	Pedestrians
fewer trucks. better designed center turn lanes. eliminate the power pole obstacles by burying lines. remove private mailbox posts from the sidewalk.	General	General
Safer sidewalks and more protection from traffic. More community-focused businesses that will serve the community rather than just the passers through. Better turn lanes and more green space.	General	General
Make it more walker-friendly by slowing down traffic and adding trees.	General	Pedestrians
Safer crossing lanes. Divert downtown traffic to alternate routes.	General	Corridor Capacity
More trees/ separation between cars and pedestrians w places to sit. Less straight way traffic, more curves or other remediation to slow/control speed. More crosswalks. ; Would like to see more destination businesses like restaurants, brewery, and shops between Hillsdale Dr to Pen Park. Sidewalk and bike lane between Parkway and Dunlora Forest.	General	General
I would put a green buffer between the road and the side walks. Possibly create a pedestrian bridge to make walking easier. Provide more lanes for bicycles.	General	Pedestrians
Pedestrian-friendly in both business and adjacent residential areas, shaded sidewalk in the summer, little shops along East Rio Road, including indoor and outdoor eateries, dry cleaning. If taller offices and apt buildings on Rio, then street level retail and ample parking.	General	General
Clear traffic marks on road. Safe passage for bike/ped travelers.	General	General
More pedestrian/bike oriented with significantly more traffic calming	General	Pedestrians
Better care of landscaping. Improve enforcement of auto misbehavior.	General	General
More landscapes medians, roundabouts. Wider sidewalks or a multi use path.	General	General
More trees, slower speed.	General	General
More community space, more trees & fewer cars.	General	General
Add a natural tree/foliage barrier between the traffic and pedestrian walkways. This will help keep pedestrians safer from traffic, will provide some natural scenery, and will help provide tree coverage for those using the sidewalks and walkways. It will also help reduce (though not alleviate) the noise from traffic.	General	Pedestrians
Light at night. Pretty to look at with planters or other architectural features that also add safety barriers. Fewer cars crossing all the traffic out of neighborhoods. Some right-only intersections in and out.	General	Traffic Safety Concerns
Fewer trucks, some way to control speed.	General	Traffic Safety Concerns
Traffic light or Traffic circle at Belvedere Blvd to handle current housing and future new housing being build in Belvedere neighborhoods. Current dangerous intersection and proposed future plan to have right turn only from Belvedere to Rio with U-turn at Rio and Greenbrier Terr. for those wishing to travel south on Rio will only make Belvedere neighborhoods traffic use cut-through at Butler St/Loring Run into the Dunlora neighborhood instead of Rio U-turn to travel south on Rio or John Warner Pkwy. Loring Run and Dunlora Dr would become even more dangerous for pedestrians and bicyclists.	Belvedere	Traffic Safety Concerns
Traffic needs to be calmed; multi modal especially public transit access needs vast improvement; it needs some unity in design if possible; the gas stations area needs fixing for safe pedestrian and bike use; it needs to feel more neighborly and less thoroughfare.	General	General
Agreed!	General	General
Roundabouts and complete sidewalk system. Bury power lines.	General	General
Separated bike lanes providing safe route to shopping at Rio Hill, Seminole Sq, Whole Foods and Downtown Mall.	General	Bikes

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DISCOVER" PHASE COMMENTS

Rio corridor needs a "core" destination, currently - the mall is dead, Albemarle Square is dead. Maybe something similar to Stonefield. Local businesses / restaurants, etc. ... Improved sidewalks or shared use path away from traffic... Improved turn lanes / center turn lane.	General	General
At this point there is so much development on Rio Road and on 29 north of Rio Road, that I don't see how it can be rectified.	General	General
A shared-use path, buffered from traffic. Trees and other plantings.	General	Pedestrians
Reduce cut through traffic in residential streets	General	General
I am very concerned about the Belvedere Blvd intersection when The Center is fully operational (i.e., post-pandemic).	Belvedere	Intersection Improvements
I love the convenience of this area. It needs more/better sidewalks, crosswalks, a plan for Fashion Square and Albemarle Square	General	General
Protected shared use path. Don't forget portion between John Warner and the City Line. More commercial uses. It's built like a commercial street but there's nothing to do but drive through it	General	General
protected bike lanes. lit crosswalks with flashing lights at regular intervals.	General	Bikes
The proposed right turn only and crossing traffic to U-turn out of Belvedere will be difficult for cyclists as they will have to cross 2 lanes to do the U-turn.; First, cleaning the bike lanes that exist so they are safe. Second, putting share the road signs in the lanes before the John Warner - Rio East intersection for those turning left to continue on Rio, Third, adding bike lanes from John-Warner - Rio and Dunlora - Rio intersections to Penn Park and beyond to Park street.	Belvedere	Bikes
Traffic circle at CATEC	JWW / Rio	Intersection Improvements
picturesque walkways with sidewalks and bike lanes, lots of trees mountain views that aren't blocked by buildings. Lot's of greenspace and mini parks	General	General
Being able to walk or bike to downtown safely from Carrsbrook area and beyond.	General	Pedestrians
safer for walkers to cross	General	Pedestrians
Less new development, safer lanes/sidewalks for pedestrians and cyclists, well-lit, better-timed lights, less traffic, and improved roadway, Overall, Charlottesville and Albemarle need enforced speed limits and traffic lights (red light runners are frequent).	General	General
Safe to walk across with little automobile congestion	General	Pedestrians
Easy and safe for pedestrian use along the entire corridor!	General	Pedestrians
Evaluate rezoning requests to include limiting the number of residences that can be built on a parcel. With the current road configuration a developer could be creative in developing a nice subdivision building under BY-Right. Or better yet....have undeveloped parcels developed as a PARK which would be a nice feature to have in this part of the county.; No more approval of large developments along Rio Rd E which would impact the already antiquated overburdened road system	General	General
No more development! Make it more walkable. Keep the trees and fields as is.	General	General
Sidewalks and bike paths	General	Pedestrians
Slower traffic and less of it. Better crosswalks.	General	General
Discontinue use as a cut through to 250 bypass and make more friendly for home owners/renters for pedisterian, biking, hiking.	General	General
Additional traffic light or two with appropriately time crosswalks West of the Sunoco. Bike Lane & Walking Path separated from the vehicle lanes.	General	Pedestrians
you have already decided on two much development which will only increase traffic problems; otherwise imagine better walking and biking scenerios	General	Corridor Capacity
A true Boulevard with a center divider of shrubbery/trees. Also turn lanes should be provided to make those turns safe!	General	Traffic Safety Concerns
We are long past the point of making this a great experience. We have to settle for making it safer and reducing congestion. It is very dangerous to turn left onto East Rio at many locations. With the Senior Center and other new construction, these problems are only going to worsen. Another problem is the Parkway should have been two lanes in each direction instead of one.	General	Traffic Safety Concerns
Sidewalks with buffers. Easier turning into and out of the numerous side roads.	General	General
Provide a median with grass and trees to visually break up the expanse of pavement and provide areas of refuge for those crossing at intersections	General	Pedestrians
Trees. Slower speeds. Medians.	General	General
Add bike lanes, wide walking/running paved path, street lights, trees. Improve unsafe intersections.	General	General
No more growth in the area without traffic and pedestrian considerations. Find another artery into the city from 29N. Sidewalks along Pen Park Road into Pen Park.	General	General
Add a dedicated walking path along the North side of Rio. Adjust the traffic scheme to prioritize cars traveling along the main rio rd instead of side roads. Remove one of the lights near @ Old Brook and Northfield and make the other right turns only. The lights are about 200ft apart and both roads have connecting access within the community.	General	General
Slower/less car traffic. More foot/bike traffic.	General	Pedestrians
A side walk that connects all the way to Rio from Pen Park and Pen to Park to Melbourne. A dedicated bike lane from Pen Park to John Watner and Park to Melbourne.	General	Pedestrians
Safe transit for pedestrians, vehicles and bikes. Good line of sight.	General	Pedestrians
Safe sidewalks. Easy access to the paved walking trail along JW Parkway.	General	Pedestrians
Sidewalks and bike lanes that connect all the way down Rio to Melbourne intersection to provide connectivity to trails and into the City.	General	Pedestrians
Rio bw JWP would be a real 35 mph with spend bumps and things to slow people down. More walkable with sidewalks all along... open space at Wetzel property. Bury the power lines almost on the roadway (even the one just replaced after the recent wreck is too low and too close to the roadway.	General	Traffic Safety Concerns
Remove truck traffic when possible and bring back the neighborhood corridor.	General	General
I'm sorry ,i give up Too little too late	General	General
I could safely walk along a sidewalk from Towne Lane to a bus stop, or to a crosswalk at Pen Park Rd. I could safely walk or ride a bike from Towne Lane to the Warner Parkway Trail. ; I would be able to safely walk to the bus stops by Pen Park, run to Pen Park, and ride a bike to the Warner Parkway trail.	General	Pedestrians
Safe and community connected	General	General
The entire Rio Road East all the way to the city line should be a true entrance corridor boulevard having multiple lanes divided highway with shrubbery/ trees in the median. Also proper turn lanes. ; Tree lined divided highway with proper turn lanes all along. Pleanty of room for school busses to get into any new housing development. Children should not be droppd off along Rio Road.	General	General
I didn't see anything about traffic noise. Nor did I see anything about litter or street cleaning.	General	General
- Discussion of future plans for diverting traffic from Rio. - show how growth along 29 will impact traffic on Rio Rd.	General	Corridor Capacity
As said above, I would like the program to focus on how to remake this area into an urban village w/sidewalks, shops and homes linked. Also, please consider a light easing of zoning in residential areas to permit small accessory houses on large lots and concentrate new apartment buildings with generous setbacks on Rio Road and Rt 29.	General	General
As Botanical garden grows and becomes a bigger destination, I expect bike/ped traffic there to increase as well as vehicle traffic.	General	Corridor Capacity
landscaping	General	General

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DISCOVER" PHASE COMMENTS

Speeding traffic through the area needs attention.	General	Traffic Safety Concerns
You missed the more difficult issue of Rio Road from John Warner Parkway to the City line. This is where to the real problem will be in the future as more and more developments are approved by the County. Also must take into consideration how all the development on US29N will impact this corridor.	General	General
Why are you not addressing the Hydraulic intersection, which was what was originally the no.1 issue on the docket before the GSI was re-directed at Rio? Why not address that mess first?		
Incorporation and expansion of the Rivanna Trail network as an integral part of pedestrian travel within the area.	General	Pedestrians
thank you	General	
What about the architectural regulations along the corridor? Why aren't there more solar panels on businesses?	General	
I wish the County would focus on the section of Rio between JWP and the City line. Tons of people live in that space, in an urban condition without even being able to walk one block.	JWW / Rio	Pedestrians
Albemarle County Supervisors made the decision to fund a transportation study of the Rio - Dunlora Intersection across from the Wetzel property during the meeting to decide on zoning requests. This will be very advantageous since the proposed traffic circles will make crossing the street on the trail very difficult and if it is a two lane traffic circle cyclists will have difficulty moving through the intersection.; Based on the January Rio Corridor, I believe that the committee is thinking the roundabout at John Warner - Dulora - Rio intersection is a good idea. I was sad that our supervisor was not there to clarify that the county set aside money for a traffic study for this intersection due to the quantity of people who were against it at the meeting where the developer requested a postponement of the Wetzel property zoning. I cycle through that intersection frequently and have no idea how a 2 lane traffic circle at the intersection would be safe for cyclists on the road or the many people using the multiuse trail to commute to the downtown area.	JWW / Rio	Traffic Safety Concerns
Don't forget about the trees along the corridor. Too often the utilities end up under the planting strip so it is only grass, but trees are so essential to making walking an enjoyable experience by creating shade and a barrier between speeding steel and humans.	General	General
The area needs a Parallel Bike/Ped Grid that is not on the main auto roads and is safe for all levels of users.	General	Pedestrians
I frequently see (certainly before Covid) nearly empty buses. I think that bus transportation fails because there is too large an area to cover with a small population who need to take buses (possibly not true for rush hours). I am greatly in favor of buses -- but not here. How about jitney type public transportation that one could order and have stops for other customers along the way?	General	Transit
The BOS has continued to approve development from Rio intersection with Rt 29 northward beyond the airport. More than likely these residents be traveling Rt 29 S and will have to make a decision...continue Rt 29 S or make a left turn onto Rio Rd heading east. and continue on the JWP or continue driving on Rio Rd E. All of these vehicles will be a major factor to the future of the Rio Corridor.	General	Corridor Capacity
Far Too much development!	General	General
It is not sufficient to take all existing or zoned or comp planned land uses as givens. This study needs to examine land use as a variable that could be changed if warranted. This study should be different than the one completed for Avon Street. It should be both a land use and a transportation study. The scope needs to include both.	General	General
Plan for growth now...this area is going to continue to flourish and this reimaging of Rio needs to be as close to future proof as possible.	General	Corridor Capacity
I would like to be on the work group!	General	Community Outreach
Explain to us what they studies will accomplish and why they cost so much. Note that the county plans to develop around the Rio-29 intersection will also bring more traffic and congestion to East Rio.	General	Corridor Capacity
As president of the Glenwood Station Community Association, I am interested in serving as an Ambassador; as an engineer who has provided proposals for alternative solutions to infrastructure improvements along Rio Road, I am interested in serving as a Technical Expert; and as someone who is very involved with the discussions about Rio Road, I am very interested in serving on the Work Group.	General	Community Outreach
I would like to believe that someone is looking at the future (2-5 years out) and the impact of vast amounts of residential construction within 5 mile radius of this corridor. Near term there is the Senior Center with its older population that hasn't had a chance to build up due to Covid. Better police ticketing for speeding might be helpful.	General	Corridor Capacity
Please provide a way for residents to add suggestions as the process evolves. Agree with the problem area from Waldorf to City line. There was a fatality at Penn Park Lane, not due to the intersection design but the intersection is very dangerous. It was improved by moving the bus stop but is still very dangerous. I wrote to Brad Sheffield and VDOT and made no progress with either.	General	Community Outreach
I have lived and worked off Rio Road since 1980 and have seen the changes come to our area. The parkway was supposed to relieve traffic and congestion on Rio Rd. Instead the County has approved more development and hence more traffic in the area instead of less. Another thing...someone mentioned litter. The corner of Rio Rd and Pen Park Lane is a hazard due to on street parking.	General	Corridor Capacity
You missed the section from Stonehenge Rd. to Melbourne Rd. The Botanical Garden is coming and the HS has many events that would be great to walk/bike to. Also the trash along the road is really bad.		
The corridor planning ideally should go all the way to the city limits down to Melbourne. Given the attempt at a wholistic solution set, this seems like a missed opportunity.		
Sorry ,again too little too late		
This should absolutely consider widening Rio Road East from John Warner Parkway to The city line, ESPECIALLY across from the Wetzel Property. That property should not be developed until the road is widened. The access road into DunLora is very dangerous.	General	General

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DISCOVER" PHASE COMMENTS

I love the area but it is not pedestrian friendly at all. We need to develop pedestrian options along the corridor that connect it to the Meadow Creek trail and other parts of the city/county.	General	Pedestrians
I would love if Rio between Melbourne and JWParkway were more pedestrian and bicycle friendly. Also, there should be a way for pedestrians to cross Rio between the bus stops at Treesdale/Lofts at Meadowcreek.	General	Pedestrians
Unsafe for anything but driving.	General	Pedestrians
Need sidewalks all along Rio- they seem to start and stop. Also , although 35 is the posted speed limit, bw Park and Catec, it is not adhered to and not enforced. Makes it all even more dangerous.	General	Traffic Safety Concerns
It is very mixed use with heavy traffic and many curb cuts and side roads.	General	Traffic Safety Concerns
It has gotten a lot better for cars since I moved here 20 years ago, but not better for pedestrians or bikes or anything else.	General	Pedestrians
Many new developments have come along this area in the past several years and traffic has become more of a problem. Now a new very large development is in the works and I don't see how Rio can handle the traffic.	General	Corridor Capacity
i live on Pen park rd -with thousands of cars a day going in and out of Pen Park and people have to walk along the road and race across the street (parents with babies and kids) as cars fly in and out of Pen Park!! they risk their lives just getting to Pen park from River Run-Not even one crosswalk!! - I put up signs saying "Caution Pedestrians" Charlottesville growth is out of control-They just keep building more houses and developments without any thought of HOW people will get around. Just feeding our car culture! The Warner Creek Parkway was supposed to help with traffic flow in and out of downtown -Nope !! -Low and behold all the new developments-"affordable " to people from out of town are clogging up the arteries in and out town..	General	Corridor Capacity
I live within close proximity of a large city park, multi-use pathway, and a bus stop, none of which are safely accessible for pedestrians and cyclists. The lack of continuous sidewalks or paved shoulders makes it hazardous for foot traffic, but especially dangerous for children, and inaccessible for the disabled. ; I live within walking distance of Pen Park, a bus stop, and the Warner Parkway bike path, but cannot safely access them along Rio.	General	Pedestrians
That it is a great location close to downtown and pen park but there are no sidewalks that make traversing the area safe. It forces you to stay in your neighborhood and doesn't allow easier connection with the larger community	General	Corridor Capacity
Be very careful coming east on Rio Road . When you get to the John Warner parkway, you have to get into the left most lane and take the left on to Rio East and immediately left into a short turn lane and on to DunLora Drive. ; This whole corridor is a mess. Trying to find the entrance to Dunlora is a real puzzle and very dangerous.	JWW / Rio	Traffic Safety Concerns
Rio is chaos at all times. No one seems to know why they are driving on Rio, or where they are going. It's like they wake up behind the wheel of the car, in the middle of the road. Drivers are terrified, either going way too slow or way too fast.	General	Traffic Safety Concerns
unsafe sidewalks and bike lanes.	General	Pedestrians
The sidewalks are in disrepair and the motorists move too quickly through the area for them to be safe.	General	Traffic Safety Concerns
Traffic has increased dramatically. Crossing Rio road is hazardous. Hills dale drive connecting to Hydraulic road has further complicated the problem.	General	Pedestrians
There is no sidewalk between Dunlora and Dunlora Forest. It's extremely dangerous for pedestrians. Sidewalks going up Rio toward the mall are dirty and unappealing.	General	Pedestrians
Unpleasant to walk there due to traffic, noise, and it's just plain ugly. ; No sidewalk or bike lane between JW Parkway and Dunlora Forest. Virtually no shoulder. Dangerous for both walking and biking	General	Pedestrians
Noise and traffic. Sometimes there is quite a bit of trash. It's not attractive. ; It is not a good walking area. I use if for driving though. And that's rather effective.	General	Pedestrians
Auto traffic, too few sidewalks in adjoining neighborhoods prevents sense of a community.	General	General
Since I live on the other side of the County, I would not expect use to increase.	General	Corridor Capacity
Five lanes, fast traffic.	General	Corridor Capacity
Traffic and safety.	General	Traffic Safety Concerns
Congestion.	General	Corridor Capacity

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

The corridor appears to serve a growing number of commuters traveling from points north of Rio/29 to Charlottecville and places east. This increased traffic is a real detriment to residents along the corridor. I hope that planners recognize there is a maximum capacity limit and plans should be made to build additional capacity to accommodate travel between the northern and eastern portions of the county without having to use Rio Rd	General	Corridor Capacity
As usual, lots of talk about making things better for the people who own residential property and live along the corridor. My experience of living in Dunlora for 16 years, though, is that every change that has been made has been for the benefit of cars. Traffic has steadily increased, access to Dunlora has become more difficult, and the intersections have become more dangerous. In this video, after talking about the importance of human scale, the first stakeholders discussed are the drivers who travel through the corridor. Why should we believe that this study will result in an outcome any different from the past? What I expect is more traffic and more danger.	JWW / Rio	Pedestrians
Thank you for your comments. The project team is planning a virtual community meeting/webinar for September. We will share details as soon as the date is finalized. As for the content on this page, our intention is to provide advance materials so that community members can get informed when timing suits their schedule. We hope that this will enable us to have robust conversations at the pop-ups and the virtual meeting - which will lead to valuable design solutions.	General	General
Many citizens responded previously to participate in a Forum Group. To date, NO ONE has been contacted about the status of the Forum. Very poor PR . I have asked STAFF about this plus wrote to the BOS why, at a minimum an email was not sent thanking people for expressing interest. At the last CAC meeting the idea of POP UP venues were presented. This is a quasi way to get the public involved. Why hasn't a ZOOM meeting or a Webinar be set up. This video is a work of PR for Staff's own satisfaction and certain not taking into consideration those of us who live and travel the Rio Corridor.	General	General
This video starts with the unrealistic premise that Rio will be restored to a human scale. Let's be honest, this is a major thoroughfare into the city and that is not going to change. The ivory towner statements just damage your credibility. We want to minimize the negative effects of the corridor and do the best we can with it. At least we don't want to make things more difficult for residents and make the road as safe as we can.	General	Traffic Safety Concerns
Is a traffic circle the best solution to the traffic issues at the JW parkway-Rio Rd intersection? Availability of VDOT funds does not make the circle the best or only solution. Traffic simulations based on data can determine the best solution to the problems. It is poor engineering to impose an available (funding) solution rather than determining what will work best and improve the situation. Personally I have no issues with the current intersection. There are many other intersections in the county that are less safe and bigger bottlenkecks (e.g. free bridge area and pantops).	JWW / Rio	Intersection Improvements
A mixed use path similar to what's on Berkmar would be wonderful. I bike along the corridor, but feel like I'm taking my life in my hands every time.	General	Bikes
A roundabout is a really bad idea. It seems to be the default alternative. The realignment of Rio to the parkway both north and south make sense and adding a right lane bypass from Rio to the parkway in both directions would solve 75% of the flow issue without slowing traffic then add lights for the cross traffic. Access to CTEC could be limited to a north entrance. Traffic circles work ok in low speed situations like in Fontana neighborhood but they don't work well at higher speeds. If nothing else the radius of your roundabout is too small for anything near the posted speed limit and there is not enough real estate to make it the size it needs to be. Take another pass at a solution and rule out everything that you have proposed. I think you will find a better option.	JWW / Rio	Intersection Improvements
I support improving the corridor for pedestrian use. It should happen. I don't understand the need for a roundabout at the JWP/Rio intersection. First, I use the interaction at JWP and Rio both ways each workday and have only waited long at that intersection when the gas shortage occurred. The intersection is also simple to cross as a runner or on a bike. There are far worse places to walk, run, or ride along Rio Road. Rio Road, past the JWP intersection, lacks a sidewalk, for example. Second, I live in Belvedere. Pulling out of Belvedere Boulevard is already difficult and dangerous enough. The existing lights pattern provides necessary pauses of oncoming traffic to turn out left toward JWP. Will lights be added to allow traffic to turn out of Belvedere Boulevard if a roundabout is added? If that is the case, why add the roundabout at all? The addition of the roundabout seems like it will make it impossible to turn left out of Belvedere Boulevard, and an additional light to allow that flow of traffic would defeat the purpose of the roundabout by stopping traffic on Rio Road. The roundabout proposal is confusing and would seem to create more issues without solving actual problems. Thank you for posting the video.	JWW / Rio	Pedestrians
This information is not well advertised to the neighborhoods affected. Belonging to NextDoor allows many homeowners access, but the overall correspondence is not widely known. Better correspondence via news media, informational meetings to those neighborhoods affected - Greenbriar, Belvedere, Pen Park, Dunlora to name a few needs to be addressed frequently and more aggressively. All community members - senior citizens, schools, churches, businesses and the general communities indirectly affected needs to be addressed asap. I live in Belevdere and have not seen too much information about this and the roundabout being discussed by the John Warner Parkway is something that needs to be shared more widely and aggressively than it currently is being done. This video is a starting point but not the only form of information that needs to be done.	General	Community Outreach
I completely agree. The proposed plan places the roundabout far too close to residential property with the proposed benefit of a few acres of additional public land. That would likely just be later developed. I don't the stated reasoning. Having a traffic circle that close to homes presents enormous safety risks (especially to small children), sound pollution for those residence, and air quality concerns. These plans will also increase travel along this corridor as it becomes a quicker route for out of area residence. That is an unacceptable amount of traffic for anyone to have in their immediate back yard. Placing a traffic circle in the location or the current intersection is a far better service to the community.	JWW / Rio	Intersection Improvements
There was talk a while back about an Eastern Connector but I think that idea is dead.; We use the Rio Road corridor fairly often to get to Pantops and/or I-64. I would prefer that the county build the Eastern Connnector from US 29 to Pantops, but I think that is a dead letter. That means that, for better for worse, Rio Road will be the connection between Northern Albemarle and Pantops.	General	Corridor Capacity
My concern is that these projects are going to take precedence over others that are of equal or greater importance. I understand that the corridor plan does not include areas that are covered by the Rio/29 Small Area Plan, but my fear is that the corridor plan will so overwhelm everything else that projects in the small area plan will be delayed or eliminated. The small area plan includes a project for a roundabout at Putt Putt and Rio. This is a very dangerous intersection — your own statistics show it has almost as many accidents as Hillsdale and Rio. I witnessed an accident there a little over a month ago between an SUV and a bicyclist. It reminded me about the roundabout project for this intersection which seemed to me to be already languishing. Now it appears almost every project on Rio will have priority over it.	General	General
Moving the Rio and JWW Pk intersection closer to residential properties leads to a much less pleasing roadway and is certainly not safer for pedestrians. A steady flow of single lane cars around a circle with no breaks from lights will never allow for walkers to cross. The intersection is never that backed up that cars can't wait. Coordinated lights are more useful. The issue is the left turn from Rio to Dunlora Drive. With heavy emphasis on packing apartment complexes into the Rio 29 N area the amount of increased cars is potentially staggering. Alternative routes need to be developed without taking decades to fruition. If the planning commission really listened to residents they would reduce the number of high density apt developments. They are changing the very nature of the core area. ; The consultant firm's proposal to move the roundabout north at Rio and JWW pkway leaves the Dunlora Park neighborhood opening right onto Rio Rd. This neighborhood was built and designed with a buffer between the homes and Rio. The proposal now brings the noise and a dangerous number of fast moving vehicles right up to the homes. Making it a very different environment for the residents. This is being proposed without consultation of the homeowners. Their voices need to be heard. Proposing a new green space does nothing if it is not maintained and accessible. It buffers no one. The original roundabout design saved a neighborhood by maintaining Dunlora Parks entrance (Varick St) onto Dunlora Drive and needs to be the focus for community discussion.	JWW / Rio	Intersection Improvements
I truly appreciate the county and others for making these videos/documents/podcasts etc available for us to stay informed! I am especially grateful for the presenter stating that they would like to stay ahead of the increase in population etc instead of just reacting to it. I agree that traffic is a major concern as we have so many cars travel through our older neighborhood (Northfields) as a cut through to avoid parts of the corridor. I see cars going in access of 50 on a daily basis down Huntington where the limit is 30. The congestion and variable frontage of Rio causes my neighborhood to be unsafe for pedestrians and bikers. Often the ones speeding are from surrounding neighborhoods so we as homeowners need to take responsibility as well. ; I'm confused as to the complaints about a roundabout at Rio and JWP being close to homes. These homes are new so home buyers knew they were buying homes very close to a busy road. The roundabout would provide a better flow of traffic therefore reducing the long lines of cars in their back yards. I would think these residences would be in agreement.	General	Corridor Capacity

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

You are not addressing the many volunteers who wanted to have inputs into this process. At the start, the public was asked to volunteer on several groups. NO one was every contacted. Extremely poor public relations. Did not include how residents can be involved other than listening to videos such as this (pretty much a wast of time).; Yes, there are issues. However, it has gotten much better at Rio and JWP with the flashing yellow light for left turns. Need to talk to the neighborhoods that this will impact.	General	Community Outreach
I just saw the proposed roundabout design to replace the intersection of the JWParkway and Rio Road, and am sick to my stomach. Why move this major intersection and its accompanying noise CLOSER to established homes, rather than at the intersection it is supposed to fix? According to the drawing, the new road would cut through the beautiful trees and landscaping at the western front entrance of Dunlora. Why not place the roundabout where the parkway and Rio intersect? No, no, NO to the proposed placement of the roundabout.; Dunlora was built long before Rio became a major thoroughfare with 30,000 vehicle trips daily. The lines of cars waiting to enter the roundabout will indeed be much closer to our homes; that is why we oppose it.	JWW / Rio	Intersection Improvements
This Roundabout is a terrible idea .The affect on homes and the new wildflower meadow show a disregard for the environment. How will hundreds of runners and walkers get safely across to use the Parkway trails daily …more pavement , more runoff , less green space ……	JWW / Rio	Intersection Improvements
Exactly! The wildflower field is just maturing enough to provide a beautiful green+ space along Rio. I personally walk my dog along there regularly, as many bicyclists and pedestrians travel nearby. Can we please prioritize this area for County residents? The altered roundabout location would eradicate that small portion of developing green space at the Dunlora entrance (which has endured the construction of multiple nearby housing developments in the past five years). Let us rethink the proposal to move the intersection/roundabout from Rio + JWPkwy.	JWW / Rio	Intersection Improvements
Didn't the county just spend money creating the pollinator flora across from CATEC? Why destroy that for a bus stop and put in an obnoxious roundabout that will not actually alleviate traffic? Surely y'all can do better than this.	JWW / Rio	Intersection Improvements
Biking or walking along Rio Rd is a scary and unpleasant experience. I've biked from Dunlora to ACAC at Albemarle Square but biked only on the sidewalks as the bike lanes are too dangerous, with few vehicles traveling at or under the way to high 40 mph limit on this stretch. Another option for travel between Pantops and north of Charlottesville needs to be investigated as populations grow.	General	Bikes
I know this is outside the corridor you are discussing however, has there ever been consideration of a pedestrian/ bicycle bridge crossing 29 at Rio or elsewhere in that area?	Glenwood Station	Pedestrians
The proposed traffic circle is a nightmare. Have you any idea what this volume of traffic would do to the neighborhood? Most of the people who would use this traffic circle have no interest if our well-being--they are just passing through. But the circle itself would result in the degradation of our properties. Bad idea, bad idea.	JWW / Rio	Intersection Improvements
What could possibly justify moving traffic flow so close to already established housing on Varick St., Mountford Ct., Valcrest Ln.? The model does not appear to show all existing house locations. The proposed storm water treatment catch basin north of the roundabout will prevent planting trees to screen traffic from already established housing. Without breaks in traffic from stoplights, how will pedestrians and bicycles cross Rio Road at the proposed crosswalks to access the JW Parkway trail?	JWW / Rio	Intersection Improvements
By the time DP was developed, the entrance/exit to Dunlora Park (DP) and Dunlora had been in existence since the opening of the Parkway (2015). A green space separates Rio Road and Dunlora Drive. It's ironic that the existing roadway made way for the newer development. Why the county would propose to shift a MAJOR road to within yards of established homes and the entrance to Dunlora, is beyond me.	JWW / Rio	Intersection Improvements
As already posited by other stakeholders, while I don't appreciate construction of a roundabout on Rio Road as illustrated, I do hereby wish to reiterate that the proposed plan indeed squarely places the roundabout inexplicably and precariously far too close to Dunlora Community, especially the Tennis Courts and Sheppard Ridge residential properties. The miniscule proposed benefit of a few acres of additional public land cannot justify the consequent and permanent damage the proposed project will entail on the Community Dunlora at large. For the umpteenth time, locating a roundabout and expanding Dunlora to outside public traffic rather than at the current intersection by the CATEC entrance is an affront and certainly defies all logic in as far as town planning is concerned. This is unnecessarily aggravating as its is invasive. By design, it is undoubtedly going to add to the current level of automobile noise and inescapable air pollution consequently reducing the property value for properties closer to the the proposed controversial project. Why are you trying to fix something that ain't broke? In the least, constructing a traffic circle within the location of the current intersection would perhaps ameliorate projected future traffic volumes and make more sense than what your study seem to suggest - indeed, it would be "a far better service to the community" than something that will forever leave a bitter taste in our mouths. Thanks~LS	JWW / Rio	Intersection Improvements
Many Dunlora residents, including myself and our family are greatly concerned about the proposal to build the roundabout with the changes to the Dunlora Dr. Dunlora is a wonderful community that allows the residents to live in a quiet location despite being conveniently situated within Charlottesville area. As you are aware, Dunlora has many children who enjoy playing outdoors and their safety should be the priority. Bringing the main road with a great influx of traffic will negatively impact the safety of the residents as well as children. In particular, since tennis court facility would be located right next to a busy road. I urge the Albemarle County to retract this plan for the safety and well-being of ALL Dunlora residents.	JWW / Rio	Intersection Improvements
I have just been made aware of this Rio Corridor planning. Neither the president or vice president of the Raintree HOA were aware of the plans for this project. My question to the county planners is who is responsible for notifying the residents along this corridor? Raintree, Still Meadow, Northfields, Belvedere, Dunlora , etc.	General	Community Outreach
The worst delay happens on JWW. That project was a joke and is the reason many people continue to use Rio Road instead. What happened to VDOTS previous recommendation? Is that being considered?	JWW / Rio	General
Changing the plan to move the roundabout looks like a gift to the Kotarides Development Group who now owns the Wetzel Property. Last year's discussion with Kotarides revolved around them asking for a Zoning Change to INCREASE THE DENSITY of the development...ie, more people, more cars, etc. Kotarides probably needs a little more green space, and this gift should do the trick.; Another benefit of the proposed roundabout change will be the shifting of Dunlora traffic thru the Belvedere neighborhood. Oh wait, is "benefit" the right word?	JWW / Rio	Intersection Improvements
The county appears not to be willing to spend the money needed to make this a quality corridor? That would require clean bike lanes, and weeds removed around plantings. Is the county willing to spend money to remove the last winters sand from snow removal and plants that encroach on the bikes lands both over the curbs and in cracks, as well as the trees and bushes. The bike lanes look discussing and are not safe or useable. because of sand and debris in the lanes. ; I believe that at one time the county planned to continue John Warner through what is now Belvedere. However, Rio Road is a cut through and people can go to the intersection on Rt 250 and Rt 29 or cut through on Hydraulic. The traffic flow makes this good route.; The speed limit on Rio is also exceeded and many cars go 50. I have never understood why part of Rio has a speed limit of 40 when most of Rio has a speed limit of 35.; Yes, What happened to VDOT's previous suggestion?	General	General
Completely agree. Access to/from Dunlora has gotten worse and more dangerous. Over the past 16 years, changes have been made to benefit cars and developers... NOT pedestrians or residents. This proposal is no different. It's designed to benefit the future use of the property across the street... not residents or pedestrians.	JWW / Rio	Intersection Improvements
Completely agree with Laura Thomas above. It makes no sense to move the intersection/roundabout closer to houses when there is plenty of space at the current intersection. I am also very concerned about how walkers will access the JW Parkway walking path from Dunlora. Dozens of folks walk that way daily. The crossing of Rio Rd. is already very unsafe, moreso from the recent decision to add a blinking yellow arrow for cars turning left onto Rio. It seems that walkers will not only have to contend with all cars coming from Rio E but also all cars coming from JW Parkway. How is this an improvement?	JWW to Belvedere	Intersection Improvements
I attended a session with supervisor Galloway last Wednesday, and there learned that, because the money has been allocated, a roundabout will happen unless there is a great public push for another option. (I didn't know this, having moved into Dunlora only 11 years ago.) But more disturbing to me is the plan to make this a two-lane roundabout. As I know from driving them in Boston, these are very dangerous, since they allow for/encourage changing lanes (from interior to exterior) within the roundabout. Many of these have been so unsuccessful in Boston that traffic lights have had to be installed, ruining the entire purpose! A two-lane roundabout does not make movement through it any faster. Moreover, as I understand it, a roundabout would be the only way to get out of Dunlora, which means that an accident would trap people inside until it was clearer. Finally, a roundabout will only make it less possible to get any traffic out of any proposed development on the Wetzel property, since drivers will be timidly waiting to try to get into the roundabout and will back up down Rio Road. What I wish could happen is a campaign to buy half of the Wetzel property and add it to the Park. This would by definition limit the number of homes any developer could plan to place in the rest of the property and make such a development a discussable proposition, as opposed to one that simply can't work (and would work even less well with a roundabout) as the developers dream.	JWW / Rio	Intersection Improvements
partially	General	General
The roundabout is a terrible idea.; Why a roundabout at the intersection of JWP and Rio?	JWW / Rio	Intersection
Misrepresentation	General	General
why did the county approve all the development along Rio Road/Parkway without a plan for the corridor. Isn't this backwards?	General	General

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

No, it's pretty much the same old same old and the video is for Staff's own satisfaction. The Rio Point development has not been before the BOS as well as Dunlora Farm Development as well as Rio Commons have yet it appears the Rio Corridor Study has included them in their analysis. Granted two of the three are by-right but Rio Point COULD change significantly IF the BOS does not approve as proposed..	General	General
I'm shocked that you're moving the roundabout from the current intersection to the entrance of Dunlora. There is no redundancy here. The current set up was specifically put in place to offer a buffer zone for Dunlora from the main road. Also construction costs will be much more expensive if you move the roundabout from the current intersection. I fear something sinister is going on here in order to protect the future developer of the Wetzel property. I think you're going to get a lot of pushback from the Dunlora folks.	JWW / Rio	Intersection Improvements
The addition of green median strips (preferably with trees) is a convincing method for improving the appearance of the corridor.	General	General
the roundabout	JWW / Rio	General
The relocation of the JW Parkway/Rio traffic circle is WAY too close the those homes!	JWW / Rio	Intersection Improvements
To move the round-about closer to residential properties makes no sense. The current intersection near Catec seems more compatible with large volumes of traffic	JWW / Rio	Intersection Improvements
The consultant does not live here and does not understand getting out of the neighborhood. In addition, it seems this study only benefits commuters who use Rio Road/JWP and not the neighborhoods. The only neighborhood that will gain is the proposed Rio Point.	General	Corridor Capacity
The roundabout at Dunlora seems problematic. The light there helps create gaps in the traffic for people turning in and out of Dunlora and Belvedere. Moving it it puts it too close to a residental community besides severing Dunlora Forest. If a roundabout is done I actually much prefer the original design. It still provides similar spaces and flow while protecting the neighborhoods.	JWW / Rio	Intersection Improvements
What surprised me? That the county would propose to move a MAJOR road with daily traffic of 30,000+ cars so close to existing neighborhoods, Dunlora Park and Dunlora, Shepherds Ridge, etc. Back to the drawing boards, please. This cannot be the best idea.	JWW / Rio	Intersection Improvements
I don't think a roundabout is a good solution. I literally watched accidents happen almost daily at the airport roundabout when I worked up there. Having one with higher speeds and way more cars could be really bad. Traffic lights are necessary to provide breaks for cars leaving Dunlora and Belvedere. How will pedestrians cross a large roundabout?; There is nothing simple about the proposed roundabout at JWW Parkway. I strongly suggest everyone go back and look at that proposal again. Pause the video concept and think about adding access to CATEC (which was mentioned as a requirement)… and trying to navigate that (by car, foot, bike, etc)	JWW / Rio	Intersection Improvements
The idea of taking away bike lanes when the county is trying to build additional corridors for cyclists to connect with the existing bike lane makes no sense.	General	Bikes
How much additional neighborhood traffic was considered? How was the Dunlora Farm subdivision included? How will land be acquired for sidewalks and safer bike lanes?	General	General
Thank you so much for this visualization - it was so helpful!		
Why wasn't the public given the opportunity to have any input. Do any of the employees of Line+ Grade live, work, drive the Rio Corridor. If they do then they would most definitely have a different perspective	General	Community Outreach
Was Albemarle County's recent racial equity study with UVA Equity Center considered in this work? Or the recent data mining on communities surrounding this corridor study?; There is some reporting on CAT public bus service but I can't tell how amenities e.g. shelters, benches, access has been included in these proposals?	General	Transit
I would like to see an animation of how the bean roundabout functions with single lane streets coming into it	Northfield / Old Brook	Intersection Improvements
more details and when the work will begin. More PR needs to be done quickly. ; Is this roundabout going to be similar to the one over by Sams Club that is so narrow traffic can't around it without going on the curb. Bad idea!; Why are traffic lights not included in this study at Belvedere Blvd and Rio. With the pandemic things were slow, but now that the businesses are opening up and with increased traffic from SOCA and the Senior center, the number of crashes has increased. No mention is made as to when this crash info was done so it is hard to know how many have occurred since this data was obtained and how current it is. Making a left turn at Belvdere Blvd and Rio is absolutely impossible at certain times of the day and at night the lighting is so bad you it makes it even more dangerous.	JWW / Rio	Traffic Safety Concerns
The Green T proposed. It's an improvement but not a solution. While it will mitigate the problems in making a left-hand turn onto Rio out of Belvedere Blvd, we will still have problems between those people and those making a left from Rio onto Belvedere Blvd. These 2 factions will (and do now) collide. Most Green T solutions include a traffic light, this one does not so the fear is we will still have crashes between the 2 aforementioned factions.	JWW / Rio	Traffic Safety Concerns
Why was the plan to have citizens involved in committees not done? Extremely poor communications in the process.	General	Community Outreach
The Federal Highway Administration (Office of Safety) has endorsed a list of 20 "Proven Safety Countermeasures". Roundabouts are in this list. Another countermeasure is a "Local Road Safety Plan", where "stakeholder engagement representing engineering, enforcement, education, and emergency medical services" is defined. Is there a LRSP for the Rio Corridor Plan? If yes, what information can you share about enforcement? Are there other new and additional countermeasures under consideration? Thank you	General	Traffic Safety Concerns
I want to know more about the JWWarner Pkwy-Rio Rd. roundabout.	JWW / Rio	Intersection Improvements
Has there been a study to determine what this new construction and traffic pattern will do to affected home and property values? Unless we are missing something, we haven't seen where anyone on this site has address this issue.	General	General
Is it possible to design a road like Rio East that discourages exceeding the speed limit by more than 5 mph?	General	Traffic Safety Concerns
There are opportunities to improve traffic flow and pedestrian access and safety. I feel pretty strongly that the roundabout at JWW will do neither. Are there plans to add more high density housing to this corridor. If so, perhaps that should be re-evaluated. There are probably better areas to focus those efforts on.	JWW / Rio	Intersection Improvements
It is going to be 2 lanes. Hopefully it will be well marked to share with cyclists! It will be difficult for pedestrians to cross without a bridge or tunnel, which is done in many cities.	JWW / Rio	Bikes
I encourage all to go observe the roundabout in front of the airport. That gets very little traffic, yet you will see how confused drivers get and may may likely witness an accident (or near accident). It sounds like an exaggeration, but I encourage you to observe this for yourself. I spent years working up there and would witness accidents and confusion on a daily basis. Now... take that, make it multiple lanes, add a lot more traffic, increase speeds, and build it right next to Dunlora houses. This will not help anything and will only result in even more decreased quality of life for the residents of Dunlora. You think it's hard getting out now... just try entering the circle when there's a steady stream of cars coming. At least a traffic light add a momentary stop that allows residents to enter/exit. Residents of Belvedere should be VERY concerned. Without a traffic light providing breaks, they will have an even harder time entering/exiting their neighborhood.	JWW / Rio	Intersection Improvements
Re: the Warner Pkwy traffic circle – will the new location actually prevent the traffic turning left into Dunlora Dr. off of 631 from backing up into the roundabout as the amount of traffic on 631 increases? The distance seems too short. Re: Belvedere - Realistically what about the people turning left from Belvedere on to Rio, if they are looking to the left will they be looking for and see those cars that are turning left from Rio on to Belvedere? There is always a visibility problem with two lanes of traffic at a stop sign (see the intersection of Hillsdale and Greenbrier). People stopped in the right-hand lane may not see clearly past the vehicles in the left lane. Re: Hillsdale - Right now the safest place for me to walk across Rio Rd. is at Old Brook even if it means going out of my way. All Rio traffic is stopped and a minimal number of vehicles turn on to Rio. It appears that the new crosswalk is too close to Hillsdale to keep pedestrians safe from right turners. The current configuration, as awkward as it is, provides a pretty safe way to cross the road. Re: Corridor – It is great to see a plan that acknowledges that the safest place to cross multi-lane roads is where you can see as much of the road as possible and where an island provides a safe place so you can cross half of the road at a time. Given the probability of more traffic in the future would it be possible to make the crosswalks really safe by installing pedestrian controlled traffic lights?	General	Traffic Safety Concerns
If the JWW/Rio roundabout is moved closer to Varick Street, will Dunlora Park residents experience more road noise? If yes, will the county and/or VDOT consider noise dampening strategies?	JWW / Rio	Intersection Improvements
I believe it will be very difficult to travel from north on Old Brock to south on Hillsdale or in reverse direction given the amount of commuter traffic. This is the majority of travel for me through these two lights. I believe the peanut design roundabout favors commuters at the expense of local residents living along Rio Rd	Northfield / Old Brook	Intersection Improvements

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

While a separated mixed use path seems nice, the lack of signaled pauses in traffic makes crossing on a bicycle to use the bike lanes on Hillsdale Drive more dangerous. Roundabouts may increase the speed of traffic while reducing the opportunity to cross especially during periods of high flow. Hillsdale is an important connector to Food Lion, Seminole Sq, etc.	Northfield / Old Brook	Bikes
This is a very complicated solution to a complicated intersection. Has it worked at other places with similar traffic volumes? if so, I can't help but think that it would work better without the peanut shape. Perhaps replace the peanut with an elongated oval or with a rectangle with rounded ends. I assume that the peanut shape is designed to slow down traffic. If so, I think traversing this intersection daily would quickly get to be a frustrating experience. I said in an comment that it would be help if there were enlarged intersection plans on this webpage.	Northfield / Old Brook	Corridor Capacity
Were traffic studies actually done about cross traffic? This seems to be done done by a group of "experts" who failed to obtain data.	Northfield / Old Brook	General
The proposed "peanut" roundabout is way too complicated and will only serve to slow down and back-up traffic on Rio.	Northfield / Old Brook	Corridor Capacity
The peanut design looks like it will only encourage drivers, especially through drivers/commuters departing (or approaching) the 29N speedway to keep up their speed rather than slow into the Rio mixed use corridor. Accessing Rio from any of the side streets looks like it would be hard to do with lots of traffic coming through. And it looks very hard to cross Rio in this area with this design. What happened to the existing plans to align Hillsdale with Northfields? Why did the design delete that which has been a priority project for quite some time?	Northfield / Old Brook	Corridor Capacity
I go there everyday. The peanut roundabout would be great. The current left turn lanes are much too short and people turning left from Hillsdale are too impatient. Don't know how it would work for walkers and bikers but for those of us on Northfield Rd. I think it would be an i provement.	Northfield / Old Brook	Intersection Improvements
Due to the large amount of southbound traffic on Rio, how will cars on Hillsdale ever have an opportunity to enter the roundabout unless it is a signalized roundabout? The bean shape does not function as a conventional roundabout where flow from different directions is more equalized. The elongation gives preference to southbound cars on Rio, locking out entrance from HIllsdale unless there are gaps in traffic. The same lock out will prohibit access at the intersection of Old Brook Rd (east) due to northbound traffic on Rio.	Northfield / Old Brook	Intersection Improvements
Please address Rio East Ct left turns onto Rio Rd at peak traffic times. And please do the same for the other access points that are also in this corridor. Otherwise, this plan is incomplete.	Glenwood Station	Intersection Improvements
People still need to get out of neighborhoods. This design will only increase speed on Rio and make it more difficult to get out.	Northfield / Old Brook	Intersection Improvements
The problem with the proposed roundabout is that it is multi-lane and would have to be to accommodate 30,000 vehicles per day. Single-lane roundabouts are fairly easy for drivers to understand, but a multi-lane roundabout with 6 entry points is not. Some drivers will stop unnecessarily causing backups during peak periods, whereas other drivers will not stop when they should resulting in potential collisions. Adding pedestrians and bicycles to the mix only makes matters worse. The primary cause of accidents at the existing signalized intersections is not as much the proximity of the two signals but the fact that they are not independent. There are two signalized intersections where the John Warner Parkway crosses under the US 250 bypass that are just as close together, but the difference is that the signals north of US 250 are somewhat independent of the signals south of US 250. For example, northbound traffic on the John Warner Parkway might have a red light at the south signal but a green light at the north signal. At the Hillsdale / Rio intersection, however, if the light at Old Brook Road is green for Rio Road traffic, so is the light at Hillsdale Drive. The problem occurs when the lights change. A vehicle traveling towards the John Warner Parkway on Rio Road might enter the intersection with Old Brook Road on a yellow light, but by the time that vehicle reaches the intersection with Hillsdale Drive, the light is red. Some drivers mistakenly assume that if they made the light at Old Brook, they can also make the light at Hillsdale, and they proceed through a red light sometimes resulting in a serious collision with a vehicle entering the intersection on a green light from Hillsdale Drive. If the two signals were somewhat independent, however, the light at Hillsdale could change from green to red later than the light at Old Brook for traffic on Rio headed towards the John Warner Parkway. Likewise, the light at Old Brook could change from green to red later than the light at Hillsdale for traffic on Rio headed towards US 29. Furthermore, just because the light at Hillsdale needs to change to accommodate cross traffic at that intersection doesn't mean that the light at Old Brook needs to also change if there is no cross traffic at that intersection. Finally, because of left turn conflicts, the light for traffic on Hillsdale Drive should cycle from red to green to red before the light for traffic on Northfield Road cycles from red to green to red. All of the necessary sensors already exist, so all that is necessary is to revamp the traffic light controller, which can be done within a $250,000 budget. That is far less than the cost of a roundabout or realigning Hillsdale Drive and creating yet another problematic intersection, and with far less traffic disruption during and after construction. By the way, the existing pedestrian accommodations at that pair of intersections work just fine.	Northfield / Old Brook	Traffic Safety Concerns
Considering I've seen cars regularly turn right onto Rio from both Hillsdale and Old Brook Rd when they had a red light and there was a gap in the traffic, I'm sure cars will also be able to enter the roundabout from these directions. At both lights, the "back ups" are from cars turning left onto Rio.; I live off Old Brook, and I think this would be an improvement to an intersection that has always made me nervous. I'm still concerned about bikers and pedestrians in this intersection.	Northfield / Old Brook	Intersection Improvements
Without breaks in traffic from stoplights, crossing Rio Road in the proposed crosswalks will be impossible.	Northfield / Old Brook	Ped
A complicated intersection that still looks complicated (maybe more!)	Northfield / Old Brook	Intersection Improvements
Are you planning on having the bike lanes on the 10 foot path bidirectional and separate from the pedestrian path? As a cyclist who travels @30mph going down hill east on Rio and @10mph west on the same section of Rio, I am wondering how you would accommodate the difference in speed and am also concerned about pedestrians who wear headphones not hearing a cyclist call out "passing on your left." My husband and I use the bike lane along John Warner Parkway during times when pedestrian traffic is heavy because of safety issues. With people commuting by bicycle and pedestrians on the same path it will interesting, especially where there are hills. Will the paths be complete from Rt 29 to John Warner and Penn park at the same time the bike lanes are removed? If not, how will cyclists move through the corridor? During construction of the roads will there be designated cyclist lanes fit for road bike tires?	General	Bikes
Wow! This would be a nightmare to travel through. The proposed intersection changes to the Rio Corridor could very likely make the Rio Corridor the most confusing and frustrating road to travel (anywhere). Imagine this stretch with all the intersection proposals. OMG. Everyone using this corridor and living off this corridor should be very concerned what is being proposed.	Northfield / Old Brook	Intersection Improvements
Need more granular designs to truly understand the proposal - I agree safety is a primary concern. Wondering about the safety of roundabouts (confusing to navigate) and traffic calming strategies.	Northfield / Old Brook	Traffic Safety Concerns
nuts	General	Intersection Improvements
instead of 2 traffic lights we get to run a gauntlet of 5 different entrance/exits	Belvedere	Traffic Safety Concerns
slower Rio traffic would be helpful	Belvedere	Intersection Improvements
not sure how proposed design would help seems like ti will slow the traffic on Rio causing backups	Belvedere	Traffic Safety Concerns
good concept with positive potential for future traffic	Belvedere	Traffic Safety Concerns
While the safety lane for vehicles turning left from Belvedere is an improvement, vehicles still have to cross two lanes of westbound Rio Road traffic to get to the safety lane. While I avoid the Belvedere/Rio intersection when heading to the parkway (I drive through Dunlora to the Rio/Parkway intersection), I do use the interest toon when heading to the Route 29 corridor. I also use it when heading home from the 29 corridor. In both cases, I have to wait for a break in the westbound Rio traffic. These beaks appear to result from the stoplights at the Rio/Parkway intersection. If the lights at the intersection are replaced with a roundabout, the breaks in the westbound Rio traffic flow will probably be eliminated making it more difficult to turn into and out of Belvedere. I agree with the comment that the proposed Rio intersection improvements appear to favor the traffic already on Rio to the detriment of the neighborhood traffic that is trying to merge onto Rio. I also can't help but think that roundabouts have become the automatic go-to solution for all traffic problems. A few stop lights strategically placed on Rio would create traffic breaks that would help vehicles enter the road from the adjacent neighborhoods and businesses. For example. If the engineering studies have determined that a roundabout is a better solution than stop lights at the Rio/Parkway intersection, then study the impact of a stop light at Belvedere. Or, consider leaving the lights at a reconfigured Rio/Parkway intersection and add a roundabout at the Rio/Belvedere intersection. Please come up with compromise that creates a better balance between the needs of both through traffic and neighborhood traffic.	Belvedere	Intersection Improvements
The crosswalk across Rio at this design looks potentially dangerous. Cars turning Left out of Belvedere would be focused on passing 2 lanes of westbound Rio traffic, then immediately would be on top of a crosswalk just as they have accelerated across Rio. There appears to be too little time for a driver to adjust to pedestrian safety at that point. Generally, crosswalks across Rio need to be carefully designed including having in mind less mobile pedestrians, a group that is growing every day (e.g. folks who are older, people with strollers, etc.)	Belvedere	Traffic Safety Concerns
So to turn left from Belvedere to Rio Road, one must turn right, go a few hundred feet, cross over two lanes, make a left turn crossing two more lanes, then make a u-turn and merge onto Rio Road. Did the so-called experts examine the average age of people going through this intersection.	Belvedere	Corridor Capacity

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

If the circle at JWP and Rio Rd provides for the constant flow of traffic, it seems that trying to make a left turn out of Belvedere will be even more difficult, given there will be no traffic light to provide a break in traffic, especially at busy times of the day.	Belvedere	Traffic Safety Concerns
Safety is absolutely the number one goal here; delays are a lesser issue. The attempt to allow a Left turn from Belvedere onto Rio is welcome, compared to last year's RCut Uturn design. It may just be in how the graphics are presented but it appears that a vehicle turning from Belvedere Blvd left onto Rio would need to face on-coming traffic briefly before accessing the safety lane on Rio. That appears unsafe and would psychologically be a barrier for many drivers. But maybe that can be addressed in reality or in how the renderings illustrate the design). If the access can be safe, having a protected lane for some distance before having to merge onto Rio is appealing. Have you talked with CAT i.e. would this work for them so bus service can serve The Center at Belvedere and all the growing Belvedere neighborhood in both directions (instead of only one way as is currently planned because CAT does not think it safe for their large buses to turn left onto Rio)? It would help if City Church entrance directly onto Rio can be eliminated. It would help on the video to show directions and/or landmarks on the renderings, not simply rely on the narrator to orient the viewer. I know this area very well and it still confused me at times. In this area and throughout this project, calming to ensure folks drive below or not much over the posted speed limit is critical. If drivers actually drove 30-35 MPH around the Belvedere intersection, it would make a world of difference, but the road design allows (encourages) 40-45 MPH and more which is unsafe. Separating cars and Shared Use Path is vital. Some concern about bikes going too fast when sharing space with pedestrians--any way to address that is welcome.; How was peak load issues entering and exiting Belvedere Blvd for bigger events at SOCA, FairView, and The Center taken into account? In meetings a few years ago when representatives of all these organizations plus other area stakeholders was held with VDOT and Albemarle county staff they seemed surprised by the volume that would need to access this intersection at varying times, e.g. The Center auditorium can accommodate nearly 400 people--when an event lets out of that it will cause a big demand on this intersection that this design does not appear to account for or accommodate.	JWW / Rio	Intersection Improvements
The proposed solution is not sufficient especially when considering that will be no stop in traffic flow with traffic circles at either end.	Belvedere	Pedestrians
The Green T proposed. It's an improvement but not a solution. While it will mitigate the problems in making a left-hand turn onto Rio out of Belvedere Blvd, we will still have problems between those people and those making a left from Rio onto Belvedere Blvd. These 2 factions will (and do now) collide. Most Green T solutions include a traffic light, this one does not so the fear is we will still have crashes between the 2 aforementioned factions.	Belvedere	Intersection Improvements
What is the source of the 1800 vehicles per day estimate based on? Current traffic or future when The Center and SOCA are at full capacity? Also it appears the Belvedere development has the land and plans to develop all that land into homes and townhomes. Does the County have any plans to add an addition access point to Belvedere to account for all this additional development? A larger bridge where Free State Road crosses the train tracks would help and perhaps a second bridge across the tracks in vicinity of Carrsbrook Dr will be required in the future.	Belvedere	Intersection Improvements
Too short of making a left turn onto Rio, crossing over two lanes, and then making a U-turn. Will not decrease traffic issues and probably cause more accidents. Many people will cut through to Dunlora Drive -- a road not designed to carry heavy traffic.	General	Traffic Safety Concerns
A better solution is to make the proposed roundabout at the intersection of Rio Road and the John Warner Parkway a "dog bone" roundabout, somewhat similar to the peanut-shaped roundabout proposed at the Rio Road / Hillsdale Drive / Old Brook Road pair of intersections. By moving half of the roundabout north of Greenbrier Terrace and making Belvedere Boulevard and Greenbrier Terrace right turn in / right turn out only, safety at both intersections can be greatly improved.	Belvedere	Traffic Safety Concerns
I'm most concerned about pedestrians. As cars turning left out of Belvedere focus on passing 2 lanes of traffic, will they remember to look to the right for pedestrians crossing in front of them? What about the crosswalk across Rio? Will cars in the slip lane see someone in that crosswalk?	Belvedere	Intersection Improvements
Without breaks in traffic, access to Rio Road from Belvedere is impossible. Local traffic is forced to wind its way through the adjacent neighborhoods as through traffic flows unimpeded. Access to businesses and churches between Belvedere Blvd. and Huntington Rd. is not considered.	Belvedere	General
Still need to cross 2 lanes of traffic to turn left onto Rio.	Belvedere	General
I agree that landmarks and current road names on the renderings would be helpful. I also agree the speed limits should be reduced to 35 mph as they are when you cross over 29 going west on Rio. People tend to drive 10mph over the speed limit. When the speed was changed from 35 mph to 45 mph on Berkmar drive, cars started going 55mph and are less friendly toward cyclists.	JWW / Rio	Pedestrians
Need more granular designs to truly understand the proposal - I agree safety is a primary concern. Wondering about the safety of roundabouts (confusing to navigate) and traffic calming strategies.	JWW / Rio	Corridor Capacity
It's an improvement but not a solution.	JWW / Rio	Traffic Safety Concerns
Somewhat	General	Corridor Capacity
better than it is now	JWW / Rio	Intersection Improvements
getting out of Belvedere is difficult now	JWW / Rio	Intersection Improvements
better - much better!	JWW / Rio	Intersection Improvements
If we leave the roundabout at the current interchange that should provide 1000' to allow a light at Belvedere	JWW / Rio	Intersection Improvements
help then turn left and keep them from using Dunlora to do so.		
It appears getting out and into Belvedere will still be difficult. How about walkers trying to get to The Center? Traffic data used in this design is more than 2 years old and traffic has changed with the addition of The Center and expansion of houses.	JWW / Rio	Pedestrians
The proposed design for the green T will make it difficult to make aleft onto Rio with fewer breaks in traffic because of the circle	JWW / Rio	Pedestrians
Not sure at this time given limited ability to exam design closely	JWW / Rio	Intersection Improvements
It is unclear how pedestrian and bicycle users from Varick St and the Phase 2 area of E Rio Road access the new mixed use path, JWWP bike lanes and the Rivanna Trail safely. It would be helpful if the diagrams and generated renderings could include this.	JWW / Rio	Intersection Improvements
Moving the roundabout to the north is an improvement. I am not sure how well a roundabout would work in this situation given the heavy traffic flows. The roundabouts on Berkmar work , but the traffic flow is not heavy. Without being able to see a large detail drawing, I am not sure how easy it would be for a driver entering the roundabout from Dunlora Drive to get on to the Parkway heading into Charlottesville.	General	Intersection Improvements
Need more granular designs to truly understand the proposal - I agree safety is a primary concern. Wondering about the safety of roundabouts (confusing to navigate) and traffic calming strategies.	JWW / Rio	Intersection Improvements
And, there may be more green space, but is it not as accessible / usable when it is trapped between Rio & JWP.; It's encouraging to know that thought is being given to the entirety of the Corridor, but the plan appears to overlook future growth. For instance, the traffic counts (30,000 per day) are based on current conditions. With the addition of 328 new apartments in Rio Pointe, hundreds more homes in the build-out of Belvedere, townhomes/cottages at 999 Rio, and unknown numbers of townhomes/single family homes in Dunlora Farm, the plan would appear to be obsolete in only a few years.	JWW / Rio	Intersection Improvements
"Redundant" Dunlora drive provides an important buffer between homeowners in Dunlora and Dunlora Park and the tremendous daily traffic volume on Rio Road and the John Warner Parkway. Moving the traffic circle as proposed in this video and eliminating that stretch of Dunlora drive would basically put residents' homes in these neighborhoods right alongside a heavily-trafficked highway. I suppose this would benefit through-commuters, but it certainly would not benefit the residents of this neighborhood.	JWW / Rio	Intersection Improvements
Over 30000 cars through this intersection per day. How much did the developers of the Wetzel property influence this poor decision to move the traffic circle. The size of the traffic circle is too small for the traffic that will try to get into the circle. What about school buses trying to get into CATEC? These experts should have gotten citizen inputs who live in Dunlora, etc. and could have easily come up with better solutions., Very poor design and much worse than the VDPT design. Why are we paying this company for these poor design?	JWW / Rio	Intersection Improvements
Presently, I do not experience any traffic or safety concerns at this intersection and I drive it daily from my home in Dunlora Park. It's fairly easy to get to the JWP or turn right or left onto Rio Rd from Dunlora Drive. Removing the buffer of Dunlora Drive and realigning Rio Rd to run right by the homes at the entrance of Dunlora Park is problematic because it will eliminate one of the joys of living here - the ability to walk into Dunlora, over to the JWP trail and Pen Park. We moved here to be able to enjoy walking and it appears this plan will make it more difficult.	JWW / Rio	Intersection Improvements
I have no safety concerns with the current intersection. There are many others in the county that are far worse for safety and traffic back-ups.	JWW / Rio	Intersection Improvements
Bingo	JWW / Rio	Intersection Improvements
Who is going to use park space next to a busy road with 30,000+ cars passing each day.		

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

The lack of signaled pauses in traffic makes it very difficult/dangerous for pedestrians. This seems fundamentally at odds with the goals of connecting pedestrians on the corridor with the trails along JWW Pkwy. Fortunately, there's a proven solution! Louisville, Colorado makes extensive use of pedestrian tunnels at such roundabouts. This provides an equitable solution for pedestrians and motorists, both of whom can keep moving safely and efficiently!; *If* a roundabout is built, equity should be maintained for both motorists and pedestrians. Both should be able to keep moving without signaled pauses. A pedestrian underpass / tunnel such as this one would be the solution! https://www.pinterest.com/pin/586523551449410275/	JWW / Rio	Pedestrians
I think this roundabout is a good solution, but the graphic delineation is confusing. The inner circle of the roundabout appears to be necessary only for the portion used by northbound Rio traffic.	JWW / Rio	Traffic Safety Concerns
I am horrified by the proposal to move this intersection to the entrance to Dunlora. That is far too close to residential properties. It's current location is not the issue, the intersection design is.	JWW / Rio	Intersection Improvements
Routing heavy traffic close to homes on Varrick and in the Dunlora low density housing neighborhoods with no buffer for the benefit of city residents commuting to the northern part of Albemarle county and for residents of the northern part of Albemarle County commuting to the City of Charlottesville is difficult to justify. The pdf plan map you provided in the pdf link does not indicate any light green for public lands in that vicinity. Maybe the public lands are better used for public transit corridors especially as these things tend to be expanded over time. Give residences relief from traffic noise. Keep in mind that emergency vehicles with sirens (ambulances and fire trucks, etc.) often use this route as well to get to the area hospitals or to cut across town. Why did you move the circle closer to Dunlora Road than the crosshairs you show even if you were going to eliminate one intersection? There really isn't the forest buffer you depict in many of the areas along this corridor so let's get more accuracy before promoting a proposal. The short weave patterns are exactly what was removed from I-64 and the 250 By-pass. There is a short weave now for people turning north on 29 from Rio if they want to turn left into the Kroger/Lowes complex. At times, it is nearly impossible to navigate safely. Please consider the weaves that will be introduced by all these new circles. The flashing left turn at the JWP has alleviated backups and has been a great improvement. East Rio Road can be very dark at night (especially on a wet night) so please keep that in mind while doing this planning. Is the Wetzel property plan not including any green space for it's development? I love green space but I think it is wrong to usurp it from someone else especially if there is no plan to make it accessible. Add access to the green space along the JWP by providing mini parks and pull offs along the greenway.	JWW / Rio	Pedestrians
Please develop one or more graphics depicting how nice the area could look with the traffic circle in its original location. (Perhaps even utilizing the Whetsel proffered land for the traffic circle -- moving it further from current residential areas.)	General	Bikes
"Moving the roundabout to the north is an improvement"--for whom? Certainly not for the residents in these established neighborhoods. ; 100%	General	Corridor Capacity
Absolutely agree that the flashing left turn at the JWP has alleviated backups and has been a great improvement, many thanks to whomever put the time in to fine-tuning that timing.	General	Traffic Safety Concerns
Dunlora Drive is NOT an extension of JWP as the consultant must think based on his video. The circle is too small for the amount of traffice (30K per day) and it would be difficult to get out from Dunlora. EXTREMELY poor design -- too close to houses.		
Moving the roundabout farther north and east is a an interesting concept and a definite improvement over the Kittelson roundabout design. It still doesn't handle through traffic, bicycles or pedestrians as well as the "dog bone" roundabout I proposed, which also addresses the safety concerns at the intersections with Belvedere Boulevard and Greenbrier Terrace and doesn't interfere with the access to CATEC. With the addition of a single-lane roundabout at the intersection of Rio Road East with Dunlora Drive and the entrance to the proposed Rio Point development and a bicycle and pedestrian overpass, the "dog bone" roundabout is a more effective solution.	General	General
I'm not sure it's fair to expect public county and VDOT land to be used as a buffer for Dunlora homeowners.; I like the new location of the Rio/JWW roundabout. I think most of the backlash comes from people who have an unrealistic expectation that the county and VDOT should use the public land to provide buffers to private homeowners. The proposal is an upgrade to the weird intersection used to get in and out of Dunlora, and it looks like it would realign Rio Road away from most of the houses along Shepherds Ridge. My biggest concern is about the safety of bikers using the intersection.	General	Bikes
This proposal would move Varick St. (Dunlora Park residents) from Dunlora Dr. right onto Rio Rd. For Dunlora Park residents this translates to way more traffic, traffic noise, pedestrian and bicycle traffic safety concerns for those residents. It is unfortunate that the plan does not adopt earth noise berms or sound walls. The presentation is deceiving because the drawing shows Varick St/Rio Rd intersection where Dunlora Dr footprint once was, but the initial visualization shows green space with trees between Varick St housing and Rio Rd which is incorrect unless the Varick St/Rio Rd intersection is moved to the southwest. Also more usable park space sounds good on paper but who will maintain the park space? If it is maintained the same as the current bike path along Rio and JWW the grass/weeds are rarely cut and reaches heights of 2 to 3 feet before being cut.; I suggest the team reschedule the "Community Pop Up" at the CATEC location that was scheduled for 9/2/2021 from 12 to 2pm because the email notification titled "Rio Corridor Plan: Pop-Ups + Online Opportunities + Zoom Webinar" was sent and received after the pop up occurred (after 2pm).	General	General
Well said!	General	General
The original VDOT traffic circle is better. It does need an additional crosswalk on Dunlora Drive so people can get to the cross walk and access the trail along John Warner Parkway. You also need a way to access the bike lanes on John Warner. The plans for Parkway Place (which is now Rio Point) continued the shared use path turn off John Warner and farther down Rio East so it would be easier to get to Penn Park. Currently cyclists access Penn Park by riding on the road, which has no shoulder for a small stretch. Pedestrians access Penn Park from the Dunlora Road by walking across the yards of the houses between Dunlora Road and the sidewalks by Dunlora Forest. The VDOT plan keeps the trails through the wildflower space planted with PEC funds, which lots of people use. The proposed plan does not provide a way for people to get from Dunlora Park to the trail to downtown Charlottesville. That will make it difficult for people to commute to town. It also has no way to access the bike lanes on John Warner Parkway. Currently, it is easy to turn right out of Dunlora Drive and then left at the traffic light onto John Warner. Finally, it does not provide a way to get from Dunlora Drive to the sidewalks by Dunlora Forest and on to Penn Park Road. It also doesn't allow for access to Belvedere through Dunlora for those living in Dunlora Park. This means it limits cyclists access to Carrsbrook drive and on to Forest Lakes up the 29 trail.	General	Pedestrians
If Rio Rd is re-directed along Dunlora Dr as the design shows, trying to exit out of Varick St (Dunlora Park) will be very difficult. The "line of sight" looking left onto the new Rio Rd is limited due to the curve created as Rio Rd bends around the corner. Traffic coming around that corner will be fast and free-flowing as it approaches the circle, making it tough to exit Dunlora Park safely.	General	General
Yes, the proposed design eliminates an awkward and unsafe exit and entrance to Dunlora Drive with 2 left turns and a long line of idling cars. It improves the accessibility from Dunlora neighborhood to Rio, JWW, and Park Street. I appreciate the new design increases the usable public space and includes more sidewalks and trail connections. I do hope sidewalks eventually connect JWW walking path to Pen Park.	General	Bikes
I am not in favor of a roundabout, though I understand one is already approved for construction at the current John Warner Pkway/Rio Rd intersection. Here is how I see it. Cars heading north on Rio will be looking to their left in order to enter the roundabout. Pedestrians will mainly be crossing the intersection to the drivers' right. Thus, drivers will not be watching for pedestrians as much as they currently do with the stoplight and crosswalk. Additionally, once a vehicle is in the roundabout, it is not likely to see a pedestrian crossing the roundabout until it is too close to the person. In general, cars are not meant to stop once they are in the roundabout. There must be a complete removal of pedestrians from this scenario. A pedestrian tunnel seems like the best option so that traffic can flow, pedestrians and cyclists entering the parkway path or sidewalk along Rio will not need to cross 4 lanes of constantly moving traffic. Finally, I am not in favor of a 2 lane roundabout because I forsee unnecessary and high amounts of vehicles getting funneled into the Dunlora neighborhood.	General	General
Move the roundabout further away from Dunlora entrance, show and explain access to Dunlora tennis courts	Northfield / Old Brook	Intersection Improvements
dangerous for slow walkers going from Dunlora Dr. to JW Parkway		
extremely poor new design. Will cause major backups in and out of dunlora and Dunlora Park.	General	Intersection Improvements
this is the ideal location because it will allow a light at Belvedere	General	General
I suppose the plan here is to increase traffic flow, when needed, and reduce holding times. Are there plans to involve traffic light operation that are adjacent to the project? Flow down JWP is currently limited by the light in Charlottesville.	JWW / Rio	Intersection Improvements
The circle might be a good idea, but it is too close to Dunlora. Pedestrians need to have a really safe way to move thru the intersection.	Gasoline Alley	Traffic Safety Concerns
Clarify for funded roundabout and proposed by consultant - what land beyond street will be required? Street width is 84' and minimum diameter for multilane roundabout is 150'	General	Pedestrians

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

I support the original VDOT plan to place the roundabout at the current Rio/JWP intersection	Northfield / Old Brook	Intersection Improvements
I am very concerned about crossing, as a pedestrian, from Dunlora to the paved greenway along John Warner. Without a traffic light stopping the traffice, it is frightening.	JWW / Rio	Intersection Improvements
If moved to Dunlora Dr the concept won't work for cars coming from 29 and turning onto Varick. Going left will be an issue and could back up traffic in the circle	General	General
Increased noise, light as cars go around the circle and air pollution not considered for nearby houses. From Varick St getting in and out of neighborhood onto Rio will be an issue due to limited line of sight (out of) and stopping traffic flow while waiting for break on Rio Rd.	JWW / Rio	Intersection Improvements
The existing intersection seems to work fine. Others (putt putt, belvedere, hillsdale) are much worse not to mention Panops…The new design has inadequate sight line/distance for going from Varick onto Rio Rd. Noise/pollution also.	JWW / Rio	Intersection Improvements
The roundabout (L&G revision) is too close to the homes in Dunlora (Dunlora Dr and Valcrest) The VDOT concept is more acceptable less obtrusive	JWW / Rio	Intersection Improvements
Why not shift the design toward CATEC and not toward Varick Drive. I have a lot of concerns for pedestrians and bike riders	General	General
Terrible! Circle too small for 30K cars. No consideration for neighborhood.	Glenwood Station	Traffic Safety Concerns
Please consider your audience - their ages, their lifestyles (walkers, bikers, runners)	General	General
Start again	JWW / Rio	Intersection Improvements
Please consider the Dunlora green space as a valuable asset to our community as it is used daily to improve quality of life. It is not redundant.	General	Traffic Safety Concerns
I live in the City, but commute to work along the Rio corridor, and I commute on my bicycle as often as I can. The unprotected bike lane on Rio is by far the most dangerous part of my commute (from North Ave to Crutchfield by the airport), so I'm glad to see buffered paths in the proposal. What I don't see, and what I would like to learn more about, is how cyclists will actually use the path and how we will get on and off, turn onto side streets, and all the other maneuvers that cyclists have to do (just as cars do). For example, one of the most difficult parts of my current route is when I'm biking eastbound in the Rio bike lane, and then get on the multi-use path along JWP. There is really no safe way to do this on a bike. So I hope you're looking at real-world situations like this and not just building a lane. Thanks!	General	General
It favors commuter traffic over local residents living along Rio Rd. The country needs to work on alternate routes to east without using Rio Rd.	General	Corridor Capacity
Need more granular designs to truly understand the proposal - I agree safety is a primary concern. Wondering about the safety of roundabouts (confusing to navigate) and traffic calming strategies.	General	Traffic Safety Concerns
Great insight Josh - thank you for sharing!	General	General
The proposed round about at JWP/Rio/CATEC seems to be based upon NOT LOOSING the SmartScale money that has been allocated. CATEC is a valuable educational resource for our community yet the design team feels changing their entrance is the way to be beneficial to meet the design teams goals. Have you considered the school busses that go in/out of CATEC several times a day plus newly minted drivers going in/out of this design. You referred to City Church as a COMMERCIAL ENTITY....since when does a Church have tthat designation. This presentation is SO THEORITICAL and appears not to have taken into consideration several items. #1...I found the visual rather difficult to visualize where the roads are with the white block buildings with no identification as to whether or not it is a business/house/etc. #2...Shifting the roundabout serveral hundred feet for more public space==the Trail Head is just that....a trail head and not a park like Penn Park where people are suppose to be congregating...#3..the video shows a great deal of greenery which for presentation purposes is nice. However, reality is who is going to maintain all of this greenery...who will cut the tree limbs as they over grow onto the roadway. There is a section on Rio Rd that has junipers that are unslightly. VDOT put them in but there was no line item created for perpetual care. Is this the same senerio that will happen along Rio Rd with no one claiming responsibility for greenery maintenance..#4...there is a lovely picture of a crosswalk....where are these people walking to? The video presentation gives the impression of being pleased with this idea of a 5ft sidewalk. On the other hand it was noted that approx 30000 vehicles travel on Rio Rd per day. How many people will be walking on this sidewalk inhaling all of the exhaust fumes from the vehicle traffice.	JWW / Rio	Intersection Improvements
Loss of dedicated bike lanes is a big step backward as it promotes cars at the expense of cyclists.	General	Bikes
The raised medians, buffers, and shared use paths are good solutions which will have the added benefit of changing the aesthetic of the roadway from a drag strip to a parkway.	General	General
The designs are for commuters and not for people who live off of Rio Road. Poor designs without taking into account local residents along Rio Road.	General	Corridor Capacity
Replacing the center left turn lane with a raised median and occasional RCUTs has some merit, but the raised median would have to be wider than 11 feet for the RCUTs to work. The shared use path also has merit, but the problem with both is that there are several places along that section of Rio Road where they won't fit. Furthermore, reconfiguring the entire roadway would be prohibitively expensive. The sidewalk on the side of Rio Road closer to the city is in pretty good shape from CATEC to US 29. It would be fairly easy and much less expensive to widen and improve that sidewalk, perhaps even make it a shared use path. With the bicycle and pedestrian overpass I proposed near CATEC, such a shared use path would tie in nicely to the trails along the John Warner Parkway and into the Belvedere neighborhood.	General	Pedestrians
Commuter traffic flow is enhanced. Local traffic, pedestrians and bicycles are not considered.	General	Pedestrians
I appreciate the work that has been done and that you are now asking for input. The maps and renderings presented do not appear to show how cyclists and pedestrians can move through the Rio corridor from Belvedere to Penn Park Road. It also does not appear to show how to get from Belvedere to both the bike lanes and the shared use path on the John Warner corridor. How will a single shared use path on one side of the corridor accommodate both bicycles and pedestrians going to two directions and how will cyclists access these paths. Are there examples of this being done elsewhere? I would love to see the renderings over laid on the maps as it appears there is more green space in renderings that do not match the maps, for example Varick Street would exit onto Rio Road instead of Dunlora Drive, but the rendering shows greenspace there.	General	Pedestrians
Somewhat		
Have you considered possibility of moving Hillsdale Dr as suggested in small area plan for Rt29/Rio Rd	Northfield / Old Brook	Intersection Improvements
Thank you for your feedback. Your comments will help us to tailor the webinar later this month. The project team has been communicating with CATEC and City Church. Our team is considering their needs as well as the needs of the broader community.		
This project seems to prioritize the people commuting through the corridor by car. The people who actually live along the corridor are merely an afterthought. The roundabout design at the JWW intersection does nothing to improve the lives of those who live in the immediate vicinity. Instead, it shifts the main traffic flow closer to the nearby homes in Dunlora and Dunlora Park. Calling Dunlora Drive a "redundancy" is an incorrect view. It is in fact a much needed buffer between the thousands of cars that travel at high speeds along Rio Rd and the residential communities that are a stone's throw away.	JWW / Rio	Intersection Improvements
The proposed round about at JWP/Rio/CATEC seems to be based upon NOT LOOSING the SmartScale money that has been allocated. CATEC is a valuable educational resource for our community yet the design team feels changing their entrance is the way to be beneficial to meet the design teams goals. Have you considered the school busses that go in/out of CATEC several times a day plus newly minted drivers going in/out of this design. You referred to City Church as a COMMERCIAL ENTITY....since when does a Church has that designation. This presentation is SO THEORITICAL and appears not to have taken into consideration several items. #1...I found this rather difficult to visualize where the roads are with the white block buildings with no identification as to whether or not it is a business/house/etc. #2...Shifting the roundabout serveral hundred feet for more public space==the Trail Head is just that....a trail head and not a park like Penn Park where people are suppose to be congregating...#3..the video shows a great deal of greenery which for presentation purposes is nice. However, reality is who is going to maintain all of this greenery...who will cut the tree limbs as they over grow onto the roadway. VDOT only cuts the grass a few times/per year. There is a section on Rio Rd that has junipers that are unslightly. VDOT put them in when JWP was redesigned but there was no line item created for perpetual care. Is this the same senerio that will happen along Rio Rd with no one claiming responsibility for greenery maintenance #4...there is a lovely picture of a crosswalk....where are these people walking to? The video presentation gives the impression of being pleased with this idea of a 5ft sidewalk. On one hand it was noted that approx 30000 vehicles travel on Rio Rd per day. How many people will be walking on this sidewalk inhaling all of the exhaust fumes from the vehicle traffic. #5....What will the relocation of the roundabout do to the entrance to Dunlora? What about having traffic literally in the backyards of the residents of Shepherds Ridge at Dunlora and impacting the the yet to be built 999 Rio Rd. Many questions that need to be answered. You asked for public feedback and hope that some of this questions/concerns are addressed.	JWW / Rio	Intersection Improvements
VDOT funding availability for a traffic circle is not a good reason to build one at the JW parkway intersection. This is an example of a solution looking for a problem. It just doesn't make any sense. Basic engineering is to propose solutions based on a well defined problem and a process to determine which solution is best.	JWW / Rio	Intersection Improvements
How is gasoline alley being addressed? Those wide open access points are dangerous for walkers/runners, bicyclists.	General	Pedestrians

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

My question is how the shared use paths, sidewalks, and crosswalks will work with the roundabouts. While I see that the crosswalks are clearly marked on both the SUPs and the sidewalks, I don't see how as a practical matter they are supposed to be used. The apparent beauty of roundabouts is that automobile traffic never has to stop, but because the traffic is never stopping, how do pedestrians or cyclists ever have a protected time during which they can safely cross? Is the intention that they just stand there waiting for a clear space in traffic, or are we expecting that cars travelling 35-45 miles per hour will suddenly stop if they see someone in the crosswalk. (This of course will never happen, but if it did, we would presumably see a number of rear-enders.) Please help me understand the practical ramifications here.	General	Pedestrians
The double lane bean roundabout makes me really nervous. I don't see how it can function well for side street access without being a signalized roundabout. The curvature along the Rio portions seems to be too shallow to calm Rio traffic significantly.; While I was put off initially by the length of the videos, in the end I think this a a good method for presenting complex concepts to the community.	Northfield / Old Brook	Intersection Improvements
Yes, change is inevitable however, this current proposed roundabout could be a nightmare for the residents of Dunlora and Dunlora Park. When Varick Street that is no longer able to access Dunlora Drive, particularly with no noise abatement the solution is unacceptable. Please understand that this is about commuters and not about the residents who will be severely impacted by this major change. I've lived with roundabouts and I don't have issues with them but, I do have concerns about the way in which this proposal has moved much closer to homes, discounting their access to get out of their developments. Daniel seems to believe that they have looked at this from all perspectives, but I disagree. There is so much at stake here and cutting out a feeder road for a roundabout is just one of the many issues that I have with this project. Let your voices be heard people. Just wait until the County approves the massive development off of Rio on the Wetsel property across from Dunlora Forest. Yikes- the car count will explode and the quality of life of the residents who live along the Rio Road corridor will diminish. This current proposal has massive holes in it so it must be made more reasonable. Plus, don't forget Belvedere and the significant safety issues with getting out of there at most times of the day. This is dangerous and the roundabout will not sufficiently slow traffic down to make a difference. Back to the drawing board!	JWW / Rio	Intersection Improvements
intersection in greater detail. Among the many features worthy of note are the following: * The existing access to CATEC is accommodated. * The ramp for the bicycle and pedestrian bridge east of Rio Road doubles as a sound barrier. With a row of trees between the ramp and Dunlora Drive, this feature will enhance the value of the houses on the other side of Dunlora Drive. * The ramp for the bicycle and pedestrian bridge on the west side of Rio Road does not result in any loss of parking at CATEC. * Shared use paths, including the Rivanna Trail are accommodated and never cross more than a single traffic lane at a time. * A transit stop on northbound Rio Road is included across from CATEC.; The third attachment shows a one of the spans of the proposed bicycle and pedestrian bridge in detail. The supports for the bridge spans are shown in blue in the second attachment.; The attached JPEG file illustrates one of the potential problems with the proposed "peanut" roundabout at the intersections of Rio Road with Old Brook Road, Northfield Road, and Hillsdale Drive. For the two vehicles circled in red, if the yellow vehicle just entered the roundabout from Hillsdale Drive and wants to proceed on Rio Road towards US 29 but the blue vehicle wants to proceed on Rio Road towards the John Warner Parkway, the two vehicles will collide. This is just one of the many problems with multi-lane roundabouts.; The 3 attached PNG files show another alternative for the greater Rio Road / John Warner Parkway intersections with some significant advantages over both the Kittelson roundabout design that was used to obtain SMART SCALE funding and the roundabout design proposed by Daniel Hyer. The first attachment shows an overview of Rio Road from a point just south of Greenbrier Drive to the intersection of Rio Road East with Dunlora Drive. This alternative design shows a "dog bone" roundabout with half of the loop on the John Warner Parkway and the other half just north of the intersection of Rio Road with Greenbrier Terrace. Among the numerous advantages to this design over a circular roundabout are the following: * Rio Road / John Warner Parkway traffic is unimpeded, in contrast to the stop-and-go situation with its resulting queues characteristic of a circular roundabout in a high traffic area. * The "dog bone" roundabout solves the problems at not only the intersection of Rio Road and the John Warner Parkway, but also at the intersections of Rio Road with Belvedere Boulevard and Greenbrier Terrace. * The "dog bone" roundabout accommodates uninterrupted bicycle lanes, contrary to the circular roundabouts that expect bicyclists to mix with cars within the circle and the approaches thereto.	JWW / Rio	Intersection Improvements
The attached suggestion would eliminate the redundant Dunlora Dr (like the proposal on this site) and it would not have Rio Rd assume the footprint of Dunlora Dr which put Dunlora Park and Varick St directly on Rio Rd. A portion of the old Dunlora Dr would become Varick St meeting Rio but at least there will be a distance buffer the same as there is now. I know this suggestion takes into account traffic and position to adjacent neighborhoods and does not indicate pedestrian and bicycle flows. Just something to think about.	JWW / Rio	Intersection Improvements
Very well said. "A solution looking for a problem." I'm going to remember your phrase and--if you permit--use it on important occasions.		
Taking away the buffer of Dunlora Drive from Rio Road would be detrimental to all residents of Dunlora Park and Dunlora, and the problem of turning left out of Belvedere doesn't seem to be resolved without either a roundabout or traffic light at that intersection.	JWW / Rio	Intersection Improvements
Please consider the project from the standpoint of local traffic, pedestrians and bicyclists not just commuter traffic.	General	Pedestrians
Why isn't this plan considering safety at the intersection of Putt Putt and Rio Road? I'm sure the reason is that renters live off of that intersection and not homeowners. And many of them have household incomes below the county's median. This plan offers no relief for the less wealthy folks in that area who are often traveling on foot. That intersection has one of the highest rates of collisions along the corridor. It is extremely difficult to turn left from Putt Putt onto Rio from 8 am-6 pm. It's also challenging for pedestrians to cross the road safely there without a crosswalk or traffic light. That intersection has an extremely high level of pedestrians accessing Fashion Square or the bus stops on the other side of Rio. Further south/east on the corridor, it's shear fantasy to believe that pedestrians can cross safely at those roundabouts without a traffic light. I've nearly been hit several times as a pedestrian, not because drivers didn't see me, but because they didn't want to stop. How will this design help? The speed limit on Rio is too high for both cars and pedestrians and that was not addressed at all. As someone who is both a frequent pedestrian and driver along Rio, this plan is concerning.	Glenwood Station	Intersection Improvements
Lee's proposal addresses several important traffic flow and safety issues while also improving pedestrian and biker usability and safety! It would be ideal if this proposal could be incorporated into the Rio Corridor Study (instead of being a competing proposal). Either way, the county board should seriously consider Lee's proposals.	General	General
I am deeply concerned with the relocation of the John Warner Parkway toward the entrance to Dunlora. This move puts heavy traffic right near the backyards of people living at the entrance to Dunlora and Dunlora Park. Let's remember who the John Warner Parkway is named after. The late Senator Warner, who is credited as one of Virginia's most significant conservationists. I think using eminent domain to relocate this intersection (which is already in existence) is a contradiction to the point of the John Warner Parkway. Rio road does not need to turn into a Route 29. I understand many people need to get from the City of Charlottesville to the north, but Rio road should not be turned into a highway to accommodate this flux of traffic. The neighborhoods around the Rio Road corridor near the John Warner Parkway are some of the last single family neighborhoods with green space and trees before entering the city. With multi-family housing being developed everywhere possible, we should work to preserve desirable neighborhoods in close proximity to the city as much as possible. I am sure a reasonable compromise can be found between the residents this construction would impact on a daily basis, as well as those who commute through our neighborhood for work.	JWW / Rio	Intersection Improvements
How long will it take to construct the roundabout at Rio and John Warner? How will residents enter/leave Dunlora at rush hour with all of the traffic coming from downtown Cville on both Rio and John Warner? If we have to have a roundabout, I vote for the original concept which puts it back near the JWW Rio intersection	JWW / Rio	Intersection Improvements

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

"DEVELOP" PHASE COMMENTS

Last week's Community Pop-Up session at the Center was very helpful, because it provided the opportunity for one-on-one discussions with the Planning staff and the consultants and for discussions with fellow attendees, These are my thoughts based on the session. While the intent of the study is to balance the needs of through traffic, local traffic, pedestrians, and cyclists, the proposed design concepts tend to focus more on quickly moving through traffic along the corridor. As a 9 year resident of Belvedere, it has been my experience that the existing traffic lights provide breaks in the Rio Road through traffic that enable local traffic to safely enter and leave the road, especially during periods of heavy traffic. Yesterday, when I was coming home on Rio from Route 29 and preparing to turn left at the Huntington intersection, the light at the Greenbrier intersection had just turned red stopping traffic on Rio. This created a break in the traffic which enabled me to make a safe, unhurried left turn. Not only does the concept plan fail to add additional stoplights, it eliminates existing lights at the Parkway, Hillsdale, and Old Brook. Stop lights not only support local traffic, they also support pedestrians and cyclists trying to cross Rio. While the plan shows a wide pedestrian crossing at the Belvedere intersection and a median strip between the the east and west bound Rio traffic lanes, without a stoplight at Belvedere Blvd, pedestrians and cyclists will still have to dash across four lanes of traffic to cross Rio during peak traffic periods. In summary, to support local traffic, pedestrians, and cyclists consideration should be given to keeping the stop lights at Old Brook and Northfield, and adding a light at Belvedere especially if the lights at the parkway intersection are going to be replaced with a traffic circle. Consideration should also be given to adding a light either at Putt Putt Lane or Rio East. Getting out of these streets can be problematic during periods of heavy traffic and I occasionally see pedestrians trying to dash across the road. With regards to the intersection with the parkway, traffic does back up on both the parkway and Rio East during peak traffic periods. The proposal to replace the lights with a traffic circle should be carefully studied in terms of its actual effectiveness. Consideration needs to be given to its location, configuration (shape and size), and impact on the Sheppards Ridge and Dunlora Park developments.	General	Intersection Improvements
These proposed corridor intersection changes could very likely make this stretch of Rio Rd the most confusing and frustrating road to travel (hands down). Everyone using this corridor, and especially anyone living off this corridor, should be VERY CONCERNED! Pay attention. Ask questions. Push back.	General	Intersection Improvements
Cut through on Huntington, to north 29 - blindspot turning off the single lane bridge	Wakefield	Traffic Safety Concerns
Why didn't the traffic corridor study get completed first!	General	General
what consideration is being given to allowing for maximum development in the area to the extent that it devalues everyone's property value - except the developers	General	Corridor Capacity
All this has meaning with all the projected new traffic generated by more and more building. With 4 miles radius. So there is a strong connection with scheduling completion of all these improvements with the BOS continuing approval of rezoning applications.	General	Corridor Capacity
That there is someone with money who is manipulating the placement of the circle.	General	General
What specific equity and inclusion factors were in the various proposed design concepts, for example, location and number of bus stops. At Rio CAC meeting, Daniel stated hard to predict traffic flow. Does he plan to use a range of traffic estimates to evaluate proposed design concepts?	General	Transit
Do NOT place new roads closer to existing residential homes!	JWW / Rio	Intersection Improvements
There has been no public discussion of the quality of life for residents of Dunlora Park, Sheppard's Ridge, and Dunlora. These new homeowners did not purchase homes to be on a major roadway. The noise, pollution, and congestion will be difficult to live with. Pedestrians will not be able to walk the neighborhoods as they do now becasue of having to deal with the steady onslaught of cars. Maintaining the circle at JWW keeps the neighborhood buffer and maintains the quality of life.	JWW / Rio	Pedestrians
Please consider that cars so not automatically stop for pedestrian crossings. There has to be more visuals to make cars stop at all times of the day.	General	Pedestrians
Do you have evidence/data that shows an example(s) of an intersection replaced by a roundabout and improved metrics like accident frequency, quality of service, etc?	General	Traffic Safety Concerns
Keep communications open and timely - good job so far!	General	Community Outreach

COMMUNICATION REGARDING RIO REALIGNMENT

From: Jack Kelsey <jkelsey2@albemarle.org>
Sent: Tuesday, September 21, 2021 1:09 PM
To: David Benish <DBENISH@albemarle.org>
Cc: Blake Abplanalp <babplanalp@albemarle.org>
Subject: RE: Meadow Creek/John Warner Parkway Negotiated Design near Dunlora

The John Warner Parkway (pka Meadow Creek Parkway) was designed by VDOT based on a preferred alignment selected by the County for it's ability to achieve established criteria, values and goals. It was this alignment that resulted in the present space between the Parkway and the Dunlora residents. The Parkway was not specifically designed to create a buffer between the Parkway and the Dunlora residents. Further explanation is provided below.

As I'm sure you recall the County hired Jones & Jones Architects and Landscape Architects to study of three potential alignments of the proposed John Warner Parkway (pka Meadow Creek Parkway) and develop a design recommendation for the parkway, the adjacent park (parkway corridor & adjacent land), and the surrounding urban development areas. I was the project manager for the County and the Jones & Jones final report was published in 2001. Jones & Jones worked directly with County Staff and researched various other planning reports and studies to establish the criteria, values and goals by which the parkway alignments and their urban development and parkland potential would be assessed. These criteria were placed into a matrix that was used to compare the three alternatives. Creation of a buffer between the Parkway and the Dunlora neighborhood residents was not one of the criteria, values or goals. The alignment selected by the County provided for a sweeping curve around the CATEC property to transition from northern portion of Rio Road into the Parkway and direct it toward the western side of the corridor along the railroad tracks. Refer to the enclosed document for "Before" and "After" aerial photographs. This alignment provided a bridge crossing with the least impacts to Meadow Creek, provided for a contiguous area of parkland along the Meadow Creek, and allowed for the most effective future use of the developable land in the County's designated urban development area along Rio Road. I provided County oversight of VDOT's design of the Parkway, to assure it complied with the County's preferred alignment and principles of the Jones & Jones Report, and it was the sweeping curve of this alignment that resulted in the present space between the Parkway and the Dunlora residents. The Parkway alignment was not specifically designed to create a buffer between the Parkway and the Dunlora residents.

I hope this helps to clarify the matter. Let me know if you have any questions.

Jack Kelsey, PE

Transportation Engineer

Albemarle County

SEE NEXT PAGE FOR "BEFORE" AND "AFTER" PHOTOGRAPHS REFERENCED IN THE EMAIL

APPENDIX C: PUBLIC FEEDBACK AND COMMENTS

BEFORE

AFTER

APPENDIX D: ROUNDABOUT INFORMATION (GENERAL)

WHY ROUNDABOUTS?

A roundabout is a safer and generally higher capacity alternative to a traditional signalized intersection. VDOT's Policy Statement on Roundabouts (below) requires engineers to consider roundabouts over traditional traffic signals because of extensive research that shows their effectiveness.

VDOT Policy Statement on Roundabouts

"VDOT recognizes that Roundabouts are frequently able to address safety and operational objectives better than other types of intersections (signalized and unsignalized) in both urban and rural environments and on high-speed and low-speed highways. Therefore, it is VDOT policy that Roundabouts or other Innovative Intersections / Interchanges shall be considered when a project includes reconstructing or constructing new intersection(s), signalized or unsignalized (Roundabout HJR 594, 2003). Roundabouts and other Innovative Intersections / Interchanges shall be screened using the Department's Virginia Junction Screening Tool (VJuST). When the VJuST shows that a Roundabout or other Innovative Intersection / Interchange configuration is a feasible alternative, it is considered the Department's preferred alternative due to the proven substantial safety and operational benefits as well as the reduction in the Department's long-term maintenance costs for traffic signals. If VJuST determines that a Roundabout is a feasible alternative, then a traffic analysis and preliminary layout should be developed and analyzed in more detail. In such case, the Engineer shall provide an analysis of each intersection to determine if a roundabout is a feasible alternative based on site constraints, including right-of-way, environmental factors and other design constraints. The advantages and disadvantages of constructing a Roundabout shall be documented for each intersection."

VDOT Road Design Manual, Appendix F, pg F-58

SAFETY

Collisions at roundabouts are less severe than traditional intersections due to the reduced speeds and the angle of collisions. The image at right shows the most common types of collisions at roundabouts, in order from most common (1) to less common (8). Two of the top three are single-driver accidents, which typically result in property damage only.
The table below shows the two most common collisions at intersections are rear ends and angle collisions, both resulting in more severe injuries.

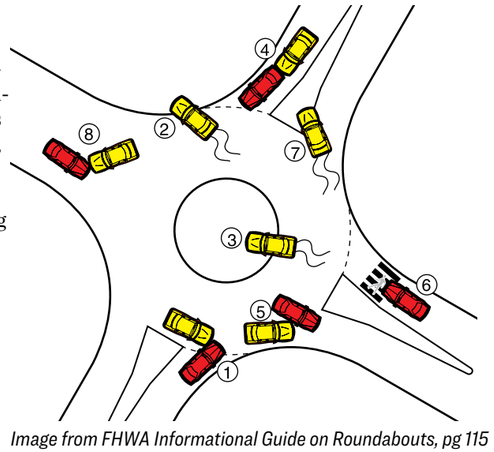


Image from FHWA Informational Guide on Roundabouts, pg 115

CAPACITY

Single-lane roundabouts have approximately equal capacity to a signalized intersection, while a dual-lane roundabout has double the capacity.

COST SAVINGS

- Roundabouts do not require the power, light bulb and detection maintenance, and signal timing updates that signalized intersections require, though they can have higher landscape maintenance costs
- A signal costs between $2K-$5K annually just to power and replace the bulbs, not including other maintenance costs
- The service life of a roundabout is approximately 25 years, compared to 10 years for a typical signal
- Construction costs of roundabout and signalized intersections vary depending on specific site conditions; therefore, there is no definitive answer about which is more expensive to install

Collision Type	Percent
Head on	5
Sideswipe	12
Rear end	43
Angle	27
Ran Off Road	6
Bicycle/Pedestrian	<1
Other	6
TOTAL	100

Table from FHWA Informational Guide on Intersections, pg 2-11

HOW TO NAVIGATE A ROUNDABOUT

Essentially, treat it like a right turn on red. Vehicles yield to pedestrians at crosswalks and to traffic that is already in the circle. Pedestrians have the right-of-way, but should still watch for vehicles to ensure their own safety.

PEDESTRIAN

1. Approach crosswalk
2. Wait for vehicles or bicycles to stop
3. Cross one direction of traffic to splitter island
4. Wait for vehicles or bicycles to stop
5. Cross second direction of traffic to destination

Safety features:

- Vehicles and bicycles must slow as they approach a roundabout entry or exit - this is inherent to the design of the roundabout.
- Pedestrian crossings are located at least one vehicle length upstream of the yield point, which allows pedestrians to cross behind a vehicle waiting to enter the roundabout. This protects the pedestrian from being hit by a driver who fails to notice them when looking left to merge into the roundabout.

VEHICLE

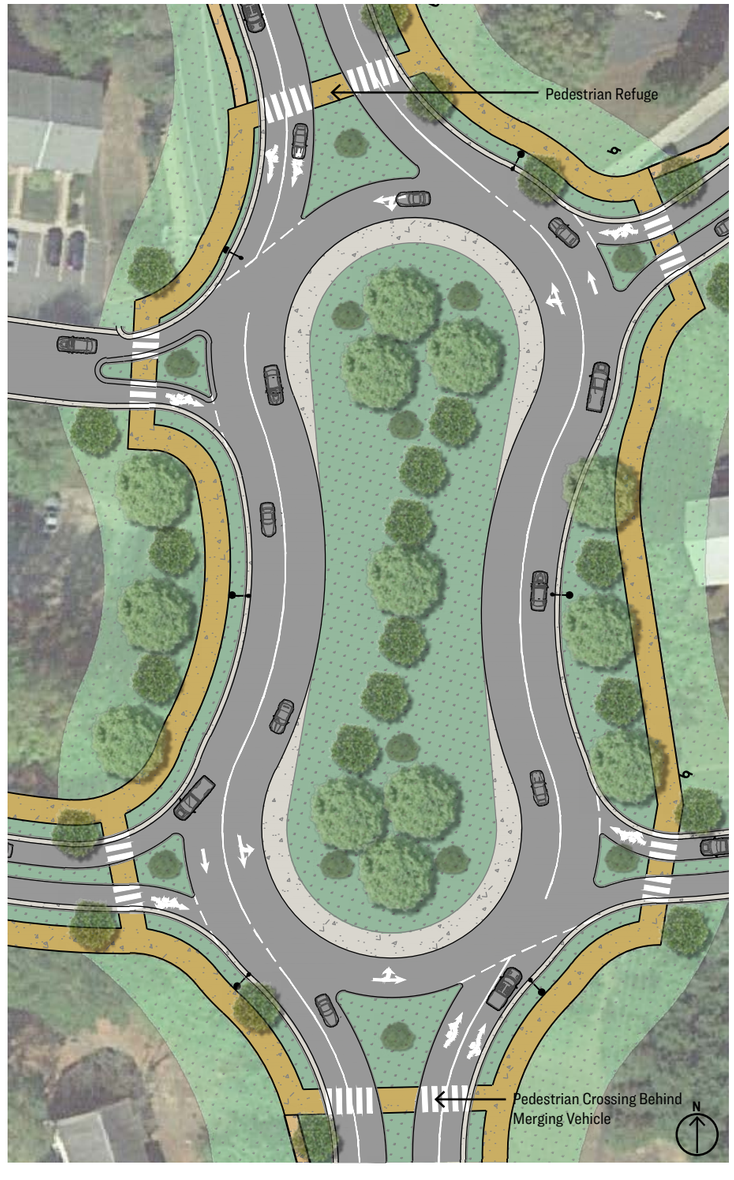
1. Slow upon approach of roundabout
2. Yield to pedestrians at crosswalks
3. Yield to vehicles or bicycles inside the roundabout
4. Merge counterclockwise once there is a break in traffic
5. If making a right-hand turn or a through movement, merge to outside lane; if making a left-hand turn or U-turn, merge into inside lane until ready to exit and use the left-turn signal to indicate intended movements
6. When exiting the roundabout, use the right-turn signal to indicate your exit to others and yield to pedestrians at crosswalks in the designated area outside of the roundabout

Safety features:

- Vehicles and bicycles must slow as they approach a roundabout entry or exit - this is inherent to the design of the roundabout.
- Pedestrian crossings are located at least one vehicle length upstream of the yield point. This allows vehicles or bicycles to exit the roundabout as they wait for the pedestrian to cross, which reduces the likelihood of rear-end collisions or impeded traffic flow within the roundabout.

CYCLIST

The cyclist has the option of traveling through the roundabout either as a vehicle or as a pedestrian, depending on level of comfort.



Roundabouts are a safer alternative to traffic signals and stop signs. The tight circle of a roundabout forces drivers to slow down, and the most severe types of intersection crashes — right-angle, left-turn and head-on collisions — are unlikely.

Roundabouts improve traffic flow and are better for the environment. Research shows that traffic flow improves after traditional intersections are converted to roundabouts. Less idling reduces vehicle emissions and fuel consumption.

Roundabouts generally are safer for pedestrians. Pedestrians walk on sidewalks around the perimeter and cross only one direction of traffic at a time. Crossing distances are relatively short, and traffic speeds are lower than at traditional intersections.

Public opinion

Drivers may be skeptical of or even opposed to roundabouts when they are proposed. However, several IIHS studies show that opinions quickly change when drivers become familiar with them.

- In three communities where single-lane roundabouts replaced stop sign-controlled intersections, 31 percent of drivers supported the roundabouts before construction, compared with 63 percent shortly after (*Retting et al., 2002*).
- In three other communities where a one- or two-lane roundabout replaced stop signs or traffic signals, 36 percent of drivers supported the roundabouts before construction compared with 50 percent shortly after (*Retting et al., 2006*).
- Follow-up surveys conducted in these six communities after roundabouts had been in place for more than one year found the level of public support increased to about 70 percent on average (*Retting et al., 2007*).
- When two intersections near Bellingham, Washington, were converted to two-lane roundabouts, support for the roundabouts went from 34 percent before construction to 51 percent six months after and 70 percent more than one year after (*Hu et al., 2014*).

Traffic flow benefits

Several studies conducted by IIHS and others have reported significant improvements in traffic flow following conversion of traditional intersections to roundabouts.

- A study of three intersections in Kansas, Maryland and Nevada where roundabouts replaced stop signs found that vehicle delays were reduced 13-23 percent and the proportion of vehicles that stopped was reduced 14-37 percent (*Retting et al., 2002*).
- A study of three locations in New Hampshire, New York and Washington state where roundabouts replaced traffic signals or stop signs found an 89 percent average reduction in vehicle delays and a 56 percent average reduction in vehicle stops (*Retting et al., 2006*).
- A study of 11 intersections in Kansas found a 65 percent average reduction in delays and a 52 percent average reduction in vehicle stops after roundabouts were installed (*Russell et al., 2004*).
- An Institute study of two-lane roundabout conversions at two intersections near Bellingham, Washington, found substantial declines in vehicle delays on the minor roads (33 percent and 90 percent) and the proportion of vehicles waiting in queues (35 percent and 43 percent) (*Hu et al., 2014*). Overall intersections delays increased (12 percent and 22 percent), due to slightly longer delays on the major approaches as vehicles slowed to enter the roundabouts.

Because roundabouts improve the efficiency of traffic flow, they also reduce vehicle emissions and fuel consumption.

Installing roundabouts in place of traffic signals or stop signs has been found to reduce carbon monoxide emissions by 15-45 percent, nitrous oxide emissions by 21-44 percent, carbon dioxide emissions by 23-34 percent and hydrocarbon emissions by 0-40 percent (*Hu et al., 2014*; *Várhelyi, 2002)*.

Constructing roundabouts in place of traffic signals or stop signs reduced fuel consumption by an estimated 23-34 percent (*Hu et al., 2014*; *Várhelyi, 2002*; *Höglund & Niittymäki, 1999*).

A 2005 Institute study documented missed opportunities to improve traffic flow and safety at 10 urban intersections suitable for roundabouts where either traffic signals were installed or major modifications were made to 10 intersections with signals (*Bergh et al., 2005*). It was estimated that the use of roundabouts instead of traffic signals at these intersections would have reduced vehicle delays by 62-74 percent.

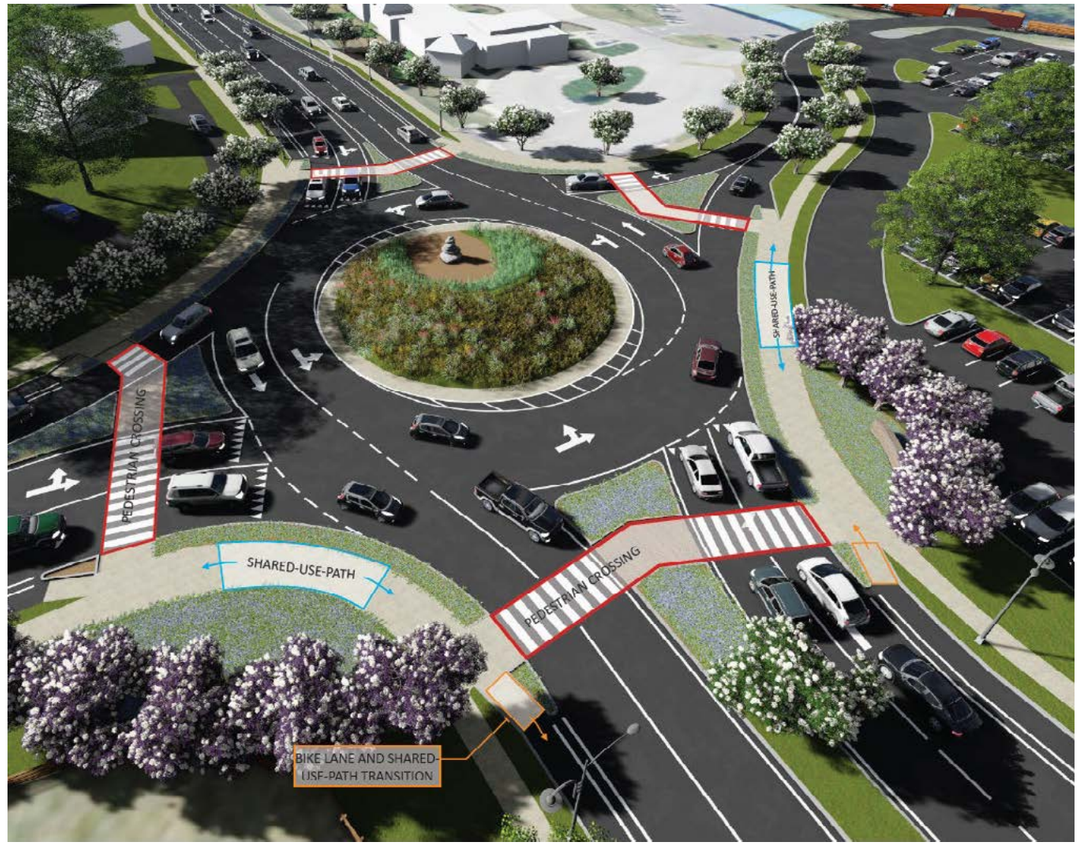
Based on the results of that study, we estimate that the conversion of 10 percent of the signalized intersections in the United States to roundabouts would have reduced vehicle delays by more than 981 million hours and fuel consumption by more than 654 million gallons in 2018.

Part 4: Transportation Design Considerations // Roundabouts Promote Safety

Roundabouts reduce pedestrian crossing distances (read: less chance to be hit)

Pedestrians cross one direction of travel at a time, promoting high visibility and predictability

Refuge islands are oriented to orient the pedestrian to face approaching traffic



Part 1: Identify our Common Ground // Promote Safety

Real World Example:

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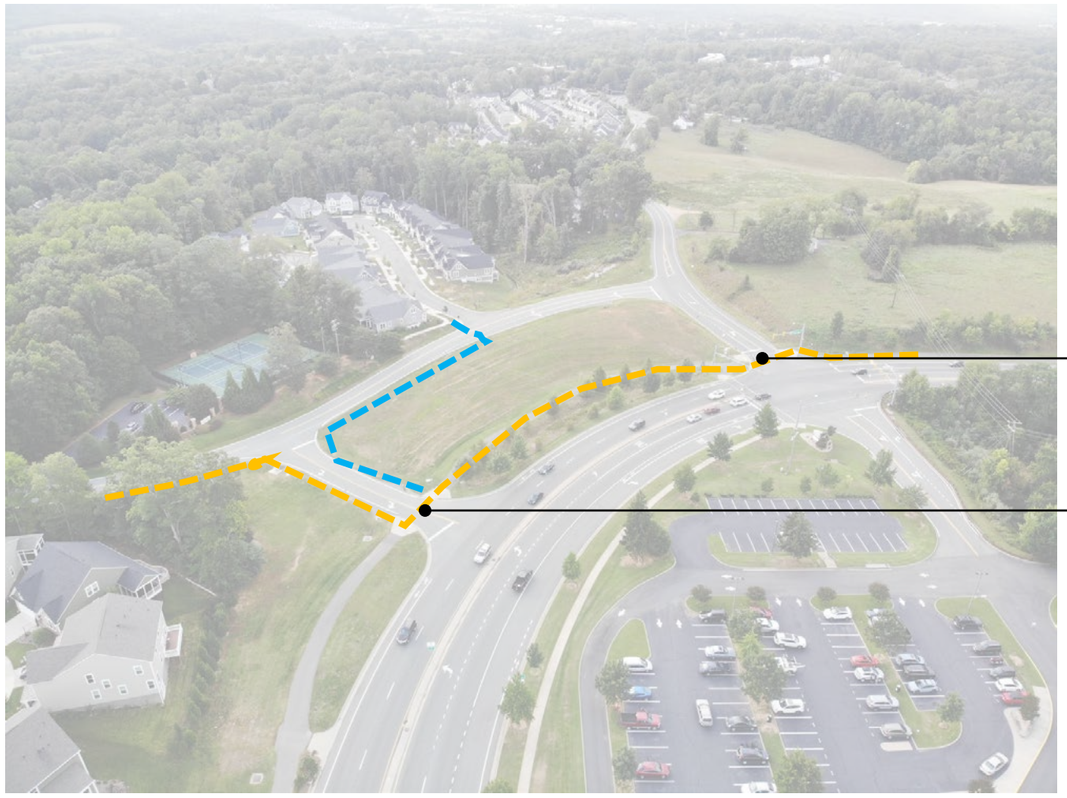
Real World Example:



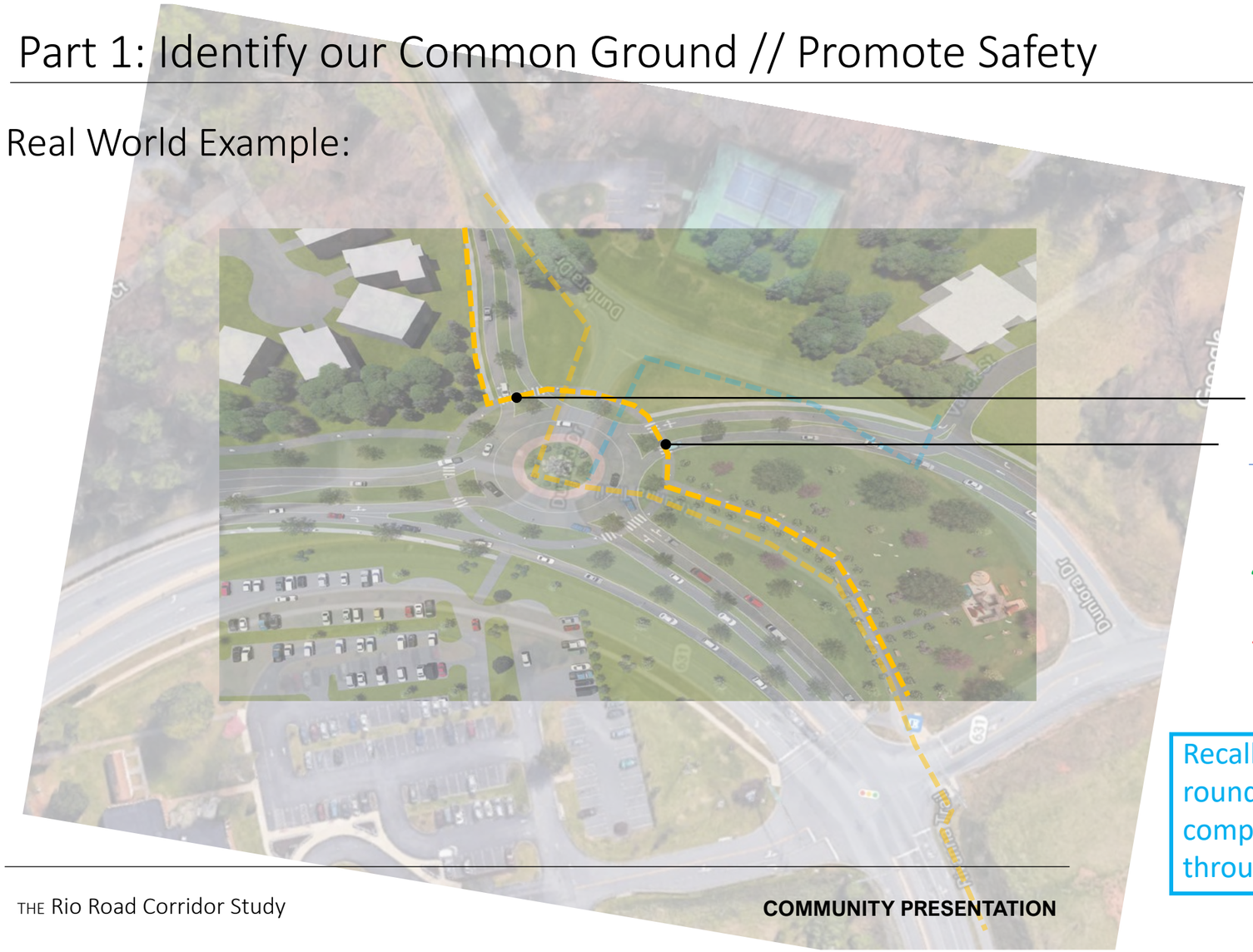
46’ crossing Unprotected

32’ crossing Unprotected

78’ of potential conflicts

Part 1: Identify our Common Ground // Promote Safety

Real World Example:



24’ protected crossing

24’ protected crossing

48’ protected crossing

48’ protected crossing
compared to
78’ unprotected crossing

Recall vehicle speeds in a roundabout ~13-22 mph as compared to vehicle speeds through a traditional intersection

APPENDIX E1: ENGINEERING ASSESSMENT | RESEARCH AND OBSERVATIONS

PHASE 1

- Traffic Flow/Safety
  - Speed studies may be warranted
  - Traffic calming measures needed for safety improvements; can be integral to the following alternatives, but also may be corridor-wide applications, such as:
    - Speed display signs
    - Additional speed enforcement/additional fines
    - Medians/Islands/crosswalk refuges (see proposed typ section below)
    - Community Gateway signs (see VDOT Traffic Calming guide for examples. Could be placed within roundabouts at either end…) https://www.virginiadot.org/programs/resources/Traffic-Calming-Guide-For-Neighborhood-Streets.pdf
      Note: this guide is for neighborhood streets. One alternative it recommends is narrowing lanes with pavement marking and introducing marked street parking or bicycle lanes with the extra space. Within this road context and at these high speeds, the recommendations in the guide may not be substantial enough to effectively lower high speed vehicles.
- Bike/Ped considerations
  - *(no non-specific points, see below for details)*
- Transit considerations
  - There are differing schools of thought on whether or not bus pull-offs are beneficial. They allow for safer alighting and reduce traffic congestion around high-passenger stops, but present delays and safety concerns as buses must merge out of and back into traffic. Due to the nature of this corridor and the constricted ROW and additional cost associated with the pulloffs, the stops should be in-line. Where a right turn lane is present, buses may use that; but immediately adjacent to roundabouts, a pulloff may be appropriate.
  - CAT has indicated that locations of stops are flexible and often changing to meet the demands of riders. Therefore, implementing permanent improvements to stops should only be done after a reasonable and consistent demand is present.
- Landscaping and Lighting
  - Street trees do not present as much of a sight hazard as shrubs IF: the right species is selected; they are pruned up and sight lines are maintained; they are located at least 100' from intersections; they are not spaced too closely.
  - While landscaping/plantings may be in high tension with safety issues now, as autonomous vehicles become more prevalent (and necessary sight lines and stopping distances are reduced) this tension may be resolved. Considering the trend of the climate, there may come a (not so distant) time where the value of mature trees eclipses the safety and maintenance concerns currently preventing street tree plantings. The County should seriously consider this point now, as healthy mature canopy can take years to develop.

Hillsdale/Old Brook/Northfield Intersection

- 3 options to rectify problem of signal spacing at this high-volume intersection:
  - **Implement approaches to reduce minor road volumes and potentially remove one signal** (intersection spacing would still probably not be met). This could consist of realigning Hillsdale, providing alternative routes for neighborhoods, and limiting development density.
    - This alternative would not solve the inherent geometric problem of the intersection spacing, and may not improve safety, although it could improve functional capacity.
    - For comparison: Old Brook is 2,600 VPD and Northfield is 1,400 VPD. Belvedere is 1,800 VPD (no signal). Therefore, it could be expected that removing one signal (Northfield) without reducing/combining volumes would result in a similar condition to Belvedere adjacent to the signal that is kept. ***Probably not an improvement.***
  - **Close/reroute Northfield and Abbington Crossing legs to create two adjacent 3-way intersections**
    - This alternative would eliminate middle inadequate left turn lane. Could become splitter island, improving ped crossing safety. This alone would yield significant improvements (cars would not be backing up in the thru lanes)
    - The removal of one leg at each intersection would shorten the signal cycle time at each signal, increasing their capacity.
    - Warrants should be evaluated for right turn lane needs.
    - Main drawback is that this would require realigning Northfield Rd to combine with Old Brook somewhere east of corridor. It would also require realigning the Abbington entrance to connect with Hillsdale. Would likely require similar amount of ROW take to roundabout alternative.
    - This alternative also does little to improve bike/pedestrian facilities or access.
  - **Combine the intersections into one intersection.** Most cost-effective way to do this is to implement large roundabout (see below). Could also try 6-way traffic signal, although historically these have not been very successful in similar areas.
- Traffic Flow/Safety
  - Large, Bean Roundabout
    - Tie ins should be designed with anticipated typical section changes in mind (lane/median shift, see typical section)
    - Reverse curves within roundabout should be designed to 1) control speeds within the long stretches of the circular lanes, and 2) minimize ROW impacts. Could potentially be reduced thinner than what's shown.
    - Project must implement proposed typical section far enough down approach legs to ensure re-work will not be required when rest of typical section is altered throughout corridor (ref. proposed typ. section chapter here)
    - It may be possible to preserve the house between Old Brook and Northfield, but likely it would require full-parcel take due to encroachment. If entire property is acquired, it may be possible to revise the layout of the roundabout to optimize ROW impact in other quadrants
      - consideration: how much ROW take occurs on lower-income properties? How much occurs on higher-income? What about business properties?
    - As shown, splitter island would impact parking at Abbington entrance
    - While an appealing area, no pedestrian facilities should extend to central island, as this could create a dangerous crossing and also present traffic flow issues if continuous traffic in circle is interrupted. A better option for public space would be in the east full-parcel take. Center area should be used for: community gateway sign and landscaping, and stormwater/other utility spaces.
    - Potential need for rectangular rapid-flashing beacons (RRFBs) at ped crossings across Rio adjacent to both roundabouts.
- Bike/ped
  - Roundabout option would improve pedestrian/bike safety over other alternatives
  - Roundabout must integrate not only existing bike lanes from Rio corridor, but bike lanes along Hillsdale as well. SUP connections should extend around the entire perimeter of the roundabout.
- Landscaping (LS)/lighting
  - Area should be heavily landscaped, both internal to circle and along exteriors.
    - Point of transition to residences, LS should indicate this
    - Screening should be provided for residences
    - 'entryway' to corridor out of SAP, LS should indicate this
  - Existing mature landscaping exists on the S/SW quadrants. Preserve if possible. If not, replace with appropriate screening and large canopy trees.
  - Existing wall is just SW of this intersection. Choose layout that does not impact this wall to keep down costs

Belvedere Intersection

- Traffic Flow/Safety
  - Main complaint is delay times/unacceptable gaps turning left out from Belvedere
  - Continuous Green-T (CGT) configuration suggested, it does several things:
    - Allows left-turn-out movements to be broken up into two steps: 1) cross NB lanes, 2) merge with SB lanes. This allows smaller gaps in traffic to be used to make the turn.
    - Acceleration lane provides space to get up to speed, reducing speed differential and making merge movement safer/easier.
    - Physical medians provide refuge for turning cars, reducing exposure during movement.
    - Eliminates certain movements (thru traffic prohibited on minor leg, left turn into church prohibited, left turn out of church prohibited). This decreases the delay caused by a traffic signal, should one be installed (less movements=less cycle time)
    - Reduces conflict points by prohibiting certain low-volume movements (see above for restricted movements).
    - The separation of the SB thru lanes from the intersection allows them to maintain free flow and also further decreases signal delay (or increases signal capacity/efficiency, however you want to say it)

        - Physical constriction of intersection with additional curbing/median reduces apparent road width along major thru lanes, which will reduce driver speed, creating larger gaps and increasing safety.
    - Church property
        - Since there is no way for a left-turn into the church property, the frontage road connection thru CATEC must be provided to serve this movement (alternatively, could create place for u-turn after bridge to serve movement, similar to RCUT plan).
        - Left-turn out of church is served via a right-turn, and then a u-turn at roundabout.
        - Does not need two entrances. Should consolidate into one.
        - Entrance should be as far north as reasonable to allow separation from the SB merging movement from the CGT
    - Signalizing is optional
        - would need to see if warranted in the future once built
        - Signalization is not dependent on CGT configuration. However: a FHWA study of signalized CGT vs. Conventional Signalization yields these results (https://www.fhwa.dot.gov/publications/research/safety/16036/16036.pdf, page 18/86):
            - 10% reduction in delay (per vehicle)
            - 3% fuel savings
            - Significant reductions in various emission types (ranging from 2%-14% for carbon dioxide, carbon monoxide, nitrogen oxide, and hydrocarbons)
        - CGT can be constructed without a signal, and it would still be an improvement. Signal could be added later if warrant is not met initially. However, if signal is installed first, signal would have to be reconfigured once CGT was constructed.
        - It may be appropriate to install 'part time' signal, only active during peak times, other times it's a flashing yellow.
        - Signal proximity to JWWP intersection is likely not an issue; 1050' between these intersections.
- Bike/Ped considerations
    - Assumption from looking at likely destinations: not many peds/bikes wishing to cross Rio at this intersection. This assumption needs confirmation prior to CGT construction (CGT's make crossing the major road problematic for bike/peds. Crossing the minor road is fine.)
    - Since at least NB bike lane is being removed in place of SUP, bike lanes on Belvedere Blvd should have easy, conflict free ramp access to SUP on both sides of intersection. A separate ramp should be provided (don't force bikes to just use the CG-12, this creates awkward sharp turns).
    - Ensure bike lane striping on SB bike lane is up to current standards across church entrance (currently no delineation across entrance).
    - Current SP under review will extend ex. SUP along Rio to Belvedere, turn right, and connect to ex. SUP stub on east side of Belvedere.
- Transit considerations
    - There is currently a bus stop (sign only) adjacent to SB lanes on CATEC property. This will likely be moved near the roundabout when constructed. If it is not, perhaps an acceleration lane can be added to the right-out movement from the church and this can serve as bus stop.
    - Currently, no service exists to Belvedere Blvd due to safety concerns turning left out of Belvedere. This improvement could resolve that concern even if a signal is not provided initially.
- Landscaping and Lighting
    - Existing shrubs in east side buffer were planted without permission. They provide good sense of separation/safety of SUP from road, however if plantings are extended in kind, they will likely interfere with sight lines from Belvedere.
    - Street trees would likely work better in this area (see All>Street Trees above)
    - Many trees exist behind sidewalk/SUP along this part of the corridor. The preservation of these should be prioritized in any future development projects.

John W. Warner Parkway

There is currently a bus stop sign on the SB side of Rio adjacent to City Church/CATEC. This would likely be relocated in the Belvedere improvement scenario. CAT mentioned it will likely be moved to near roundabout, although there are no current indications of this on the VDOT roundabout concept plans. Need to add to recommendations to VDOT.

Access Management

- Most access management violations along the corridor happen from Wakefield to Greenbrier Terrace/bridge.
- Most violations are either entrance spacing and/or entrance throat length.
    - Throat length should be addressed in building engagement section (i.e., if parking is in front, building setback should allow for throat length and parking, if in rear throat length should be a non-issue)
    - Spacing violations can be solved by either:
        - Removing/consolidating/sharing entrances (each property should have 1 entrance, or ideally share an entrance with neighbor)
        - Restricting movements via medians/turn island treatments
    - The bad news: entrance to a property is integral to site layout. Rectifying entrance problems without affecting site functionality will be costly and yield only marginal improvements.
        - The County should consider ways to incentivize business owners to consider redevelopment which would allow these problems to be addressed.
    - The good news: most properties here that have issues also happen to have high potential for redevelopment
        - The County must be diligent in requiring inter-parcel access as adjacent parcels develop. Incentivize frontage roads and inter-parcel connections, especially within the Neighborhood Center (and also on the City side).
        - Shared entrances should always be considered.
        - Considerations should be given to coordinating development potential of properties within the City of Charlottesville (west side of this area).
- Traffic Flow/Safety
    - Replace center turn lane with median in most areas from Northfield to Bridge (lanes may be offset from ex. positions, see typ section below)
        - Key median breaks (partial or full) would be required at Greenbrier Terr (partial), Greenbrier Dr (full), Huntington (full), Wakefield (partial)
    - Median will change most entrances to partial access. Therefore, alternative routes for these movements must be accounted for.
        - Opportunities for adequate, safe u-turns should be provided at: Hillsdale roundabout, Wakefield, Greenbrier Dr or Greenbrier Terr, depending on access needs of development of NC parcels.
- Bike/Ped
    - Restrict width of entrances to minimum allowable/minimum required to serve design vehicle (actual swept path, not whatever is the standard radius). This minimizes exposure of crossing bike/peds
    - Where possible, add splitter island at entrances, even if Rio center median blocks movements: the splitter island will create refuges for bike/peds and allow them to break up the crossing
    - Mark/stripe all crossings with appropriate markings per MUTCD guidance
    - Many ADA accessibility issues at entrances would be resolved if buffer were introduced between curb and sidewalk (see typ section)
    - Crossings of Rio should be provided at 1/8 – ¼ mi intervals, should be marked, and should occur at a signal or intersection.
        - If midblock crossing is needed to meet this frequency, a midblock study should be performed to ensure a safe crossing can be achieved.
- Landscape/lighting
    - Existing and proposed landscaping needs to be evaluated for sight lines at entrances
    - Maintenance of existing and proposed landscaping needs to be addressed to maintain sight lines and safety

Typical Section

- **Vehicular Travel lanes – to be deemphasized. Set at a minimum and do not widen.**
    - VDOT GS-6 (minor arterial) standard suggests 11' lane width.
    - Current lane widths are 10.5' (field measured paint to paint) along most of road. South of bridge, lanes increase to 12' wide, but median is introduced. This, along with relatively sharp geometry of curve around CATEC, introduction of planted buffers, and lower posted speed make this part of Rio feel much safer than Northern part.
    - Higher speeds* are seen along the thinner lanes; why?
        - *this is impression and anecdotal, not confirmed by any speed studies.
        - While there is an effect of lane width on speed, the effect of a 6" difference per lane may not be substantive enough to notice. It is likely speed is affected much more by road slope and sight lines/straight geometry than it is by lane width.

        - Therefore, the County should keep lane width to minimally functional widths to optimize land use. Keep lanes to 10.5' width, or maybe even 10' in some cases (if VDOT will allow). This will avoid a potential marginal increase in speed that could occur if lanes are brought up to GS-6 standards.
    - Perceived lane width is very different than actual lane width. FC to FC of existing is 64'. 64/5 lanes = 12.8' per lane; a very large perceived width. If bikes are not present in bike lanes, the outer lanes know they have 'margin'. If no cars are present in the center turn lane, the inside lanes know they have 'margin.' Addition of median and removal of bike lanes creates a FC to FC (for 2 lanes) of 23' (including GP, see edge treatment below). 23'/2 lanes = 11.5'. This cues drivers that they must drive more carefully, as an error will result in physical impact with the curb.
- Lane edge treatments
    - With gutter pan, lanes seem wider and essentially function as wider lane, since no consequence for driving on GP.
    - Gutter pan is important for decreasing spread, required inlet size and frequency, etc. However, takes up more space. County/VDOT must balance cost of space and other environmental impacts of GP vs. additional cost of storm infrastructure/maintenance associated with no GP.
    - Gutter pan not needed on median curb: save space
    - Longitudinal joint of GPs creates hazard within bike lane. Make effective bike lane 4' wide instead of 6', and push bikes towards cars. Solutions for this are:
        - no GP (removing existing GP will still leave joint unless repaved)
        - no bike lane (still need to provide bike facility somewhere)
        - wider bike lane (would have to move curb line/GP anyway, plus purchase more ROW).
        - Therefore, most economical choice is no bike lane, but need to provide other facility: SUP.
- **Bike Facilities – provide on one side of corridor. Width 8-12' depending on location.**
    - SUP along JWP is heavily utilized. Bike lanes along Rio are not as utilized (anecdotal, no data).
    - Current bike facilities (bike lanes) take 8' of pavement (two 4' bike lanes, not counting GP). If bike facilities are consolidated with pedestrian facilities on one side of road, this will save valuable ROW space.
    - This will require the relocation of curbing/potential shifting of vehicular lanes to reallocate space within the ROW for this improvement
    - SUP should be 10' min, since combining with ped facility. Could go to 8' in very constrained places like across bridge. in high activity areas like within Neighborhood Center, could go to 13' or more with material change to designate bike/ped separation, or to designate private/public maintenance responsibilities.
    - Important to provide marked crossings of Rio periodically (every ¼ mile or so) since facility is only on one side.
- **Ped Facilities – 5' min with buffer space. Do not decrease either width or buffer in any case.**
    - Buffer space is needed to solve many problems:
        - Buffer will allow space for ped path encumbrances (mailboxes, signs, manhole lids, etc) instead of conflicting with sidewalk.
        - Buffer will allow CG-12s to be more compliant at entrances, since more space is available to make up grades.
        - Keeps peds a safe distance from vehicles
        - Can filter runoff from sidewalks and yards
    - 5' minimum width on both sides
        - SUP on east side can serve as both ped and bike facility, saving space
        - Larger facility is not needed on west side as of yet, as there are fewer destinations here, maintain 5' facility.
- **Median – Where possible, expand as needed to restrict lane width to minimums**
    - 14.5' planted is ideal minimum (allows for 10.5' turn lane with 4' nose)
    - 10.5' in areas with constrained ROW
    - Even a 4' splitter creates refuge for peds and channelizes cars, increasing safety by decreasing speeds.
    - Will reduce conflict points/address access management problems (see access management section)
    - Large enough for SWM (3:1 down, 1.5' deep allows for ~5' bottom width)
        - May not be useful if road crown does not drain towards median
    - If planted, will increase annual maintenance. However, will reduce SWM infrastructure costs, reduce heat and air pollution, create more attractive space, and slow vehicle speeds. County should have cost/benefit analysis performed on material of median.
    - Median breaks at main intersections and other strategic areas to provide adequate access
    - Median shape should be fit to the actual swept path of the design vehicle in order to channelize vehicles and prevent unwanted/illegal movements.
        - Design vehicle may be different for different areas; firetruck or City Bus might not have to make every turn, there may be alternate route.

Project Sequencing

- Based on all of the above, project sequence should go:
    - JWWP roundabout
    - Belvedere
    - Hillsdale
    - Typical section/Median (requires u-turn treatment at gasoline alley ends)
    - SUP (requires typ section shift to avoid large ROW take)
    - *Other developer installed improvements would be ongoing during typ sect/SUP projects*

PHASE 2

NORTH

OBSERVATIONS

- Zoning designations along north and central sections are largely residential, with a similar density range.
  - As developments increase, North and Central will look increasingly similar.
  - Large number of smaller side streets/entrances mean frequent turn lanes (left and right) required.
- Typical section
  - High number of off-road accidents along this stretch of road. People are hitting fixed objects within the clear zone.
    - Clear zone is very constrained, with mature trees, utility poles, and signs/mailboxes at the edge of pavement.
  - No curb/gutter along most of this section (except for Dunlora Forest frontage).
  - Changes upcoming with future developments
- Pen Park Rd/Waldorf Intersection is most significant intersection in Ph 2 corridor for several reasons (not counting JWWP as part of this phase):
  - It is the largest controller of the overall capacity of the roadway. If left/right turn lanes are provided for all developments, the only thing interrupting thru traffic is this intersection.
    - LOS of this intx is listed as B/C, however not a lot of confidence in this evaluation, especially with future development.
    - Max capacity of single lane is 1200 VPH (number depends on follow length, not speed. 1200 assumes 3 sec follow gap). Based on traffic data at the top of this doc, capacity of Rio (assuming no signalized intersections) is approx. 18,700 VPD. Therefore capacity of this intersection (and the presence of left turn lanes) will govern the total capacity of the road.
  - Recent County project added a marked ped crossing with push-button to 2 legs of this intersection. This will have affected intersection capacity. But if the signal timing was re-designed and optimized for current peak hour volumes, it may have seen an improvement over the recent study. Hard to say without discovering what exact improvements were done to the signal.
  - This Intersection is central to all the residential developments along this part of the corridor (phase 2). 95% of all residences are less than ½ mile walking distance from this intersection, which is currently the only marked crossing in ph2 corridor.
  - Two schools on east/west legs of intersection mean high, concentrated left turn volumes at peak hours. Also, traffic volumes of legs are not distributed very evenly, most of traffic is thru traffic.
- Pedestrian Connectivity
  - Plans are in place for a sidewalk connection from Pen Park Rd to JWWP on the East side.
  - Developments will likely construct SUP on West side, from Rio Commons to the JWWP trail/SUP.
    - This leaves a gap in SUP from Rio Commons to Waldorf School intx
    - Rio Commons may provide fire access/ped connection to Waldorf school at rear of property, but main SUP should still extend along main corridor to intx
  - Rio Point/Rio Commons may also provide SUP connection across their property to the JWW trail, cutting off the corner and shortening travel distance for Rio residents.

RECOMMENDATIONS

- Typical section
  - To support/anticipate future development, a median should be added. This allows the roadway to remain a consistent width while providing for future left turn lanes to be installed as they are warranted, without requiring the need for lane shifts.
    - Road should be widened to the East with the new developments to allow for additional width.
    - The median may be: striped asphalt, striped with plastic delineator posts, raised concrete, or a raised planted bed. There are pros and cons to each of these options, and the correct selection will depend largely on availability of funds for construction and availability of funds to support maintenance costs.
    - The median should be 11’ wide everywhere to accommodate turn lane. Median will taper down to zero following left turn taper where necessary.
    - Also, this can effectively increase the capacity of the many 2-way stop controlled intersections, as the median creates a place for left-turn-out drivers to pause, splitting up the movement into two separate movements, which allows the use of smaller traffic gaps.
    - This treatment should extend from JWWP to Stonehenge.
  - Regardless of median material in rest of corridor, the median adjacent to Rio Point/JWWP should be raised and planted for at least 100’ or so.
    - This will create a “north gate” to the residential section of east Rio, signalizing change in character from Rio Phase 1.
    - Gateway-like effect/channelization/pinch point will serve as traffic calming.
    - This design element should be reflected at Stonehenge, where there would be a “south gate”
  - **Maintain 11’ lane widths** (from GS-7 urban collector). Minimizing lane width is necessary to:
    - Preserve ROW width for other improvements
    - Reduce SWM construction and pavement maintenance costs by 5-10%
    - Provide consistent widths throughout Phase 2 corridor
    - *Note: GS-7 calls for 12’ lanes if heavy bus/truck traffic. Likely not warranted here, keep at 11’.*
    - *Note: Rio Point draft shows all lanes as 12’.*
  - Buffer widths should be consistent and adequate, **with 4’ min** and 6’-8’ desirable, especially along SUP.
  - ROW/maintenance easements should be obtained 1’ min. behind sidewalk and 2’ min. behind SUP.
- Pen Park Rd/Waldorf intx
  - Increase storage of left turn lane into Waldorf. Storage length should be ~200’+100’ taper (this is conservatively estimated from warrant Fig. 3-6 in Appendix F. Inputs were based on future traffic projections and assume 150 left turns in peak hour. Enrollment at Waldorf is ~300. HOWEVER: signal timing will determine final design storage length).
  - Crossing of Rio Rd East should be expanded to support future SUP traffic (SUP to switch sides here, see Central section below)
  - Other improvements
    - Reduce curb radii to min. design vehicle path to reduce ped crossing distance?
    - Add island/channelization as wheel paths allow?
    - Add curbing where it does not exist currently?
- Pedestrian connectivity
  - SUP needs to be coordinated along both Rio Point and Rio Commons frontages, and should **be 10’ wide**, with a pavement section that matches the JWWP trail.
  - Interparcel vehicular access should be required between the two developments.
  - County should draw up plans to connect SUP to Waldorf intx, or make sure it is installed with future developments.
  - Adequate crossing of Rio Rd East (supporting SUP width of 10’) should be installed at Pen Park Rd intx and potentially at Dunlora Forest entrance, when Rio Commons is built.

CENTRAL

OBSERVATIONS

- Typical section
  - Lane widths vary widely. SB thru lane in front of Treesdale is ~14’ wide, while NB thru lane is 11’
- Towne Ln
  - Surprised to see no left turn lane into Towne Ln. This is likely warranted due to accident trends in this area.
  - Looking at striped middle portion of road north and south of Towne Ln: The taper for the Waldorf left turn lane ends less than 250’ north of where taper for the Pen Park Ln left turn begins.
- Pen Park Ln/ Lochlyn Hill
  - Lochlyn Hill development will more than double the traffic volume on the minor street at Penfield/Pen Park Ln
    - Capacity of the current 2-way stop control at this intersection is unknown (it is a function of main line traffic gaps). Therefore, the development’s impact on this intersection should be studied if it hasn’t already.
    - All accidents at this intersection are on Pen Park Ln, which is the leg that will receive the increase in traffic. This could increase accident rate.
- Stonehenge/Rockbrook
  - Accidents
    - 9 accidents, with 8/9 being rear end types
    - Particularly high severity for this accident type. 5/9 resulted in visible or severe injuries (normal rate: about 20% of accidents have visible injuries on average within the corridor)
    - Second highest economic cost out of the 11 accident zones in Ph 2 (1st is from Brookway to Alwood).
  - Volumes
    - Trips: Rockbrook = 80vpd, Stonehenge = ~2000vpd (190 units + pool)

        - Cut through exists to Penfield Ln, though this might be blocked off. Need to confirm in field.
        - EcoVillage appears to connect to Rockbrook entrance. If this entrance is accessible to vehicles/residents, this will add approx. half of EcoVillage's daily trips to that entrance.
    - Functionality/geometry
        - Stonehenge entrance clearance to Rockbrook entrance (CL to CL) is less than 100'.
        - No left turn lane exists for either entrance.
        - Several (2-4) individual driveways are in the functional area of the intersection (several on East side, but 1 on west side connecting to Rockbrook)
        - Right turn lane exists for Stonehenge. However, no channelization exists, so this could also be interpreted as a right turn lane for Rockbrook.
        - Skew angle of Rockbrook Dr is approximately 15° (75° away from perpendicular)
        - Curb return for Stonehenge is approx. 45'. This seems larger than needed, especially since a right turn lane exists (vehicles will be slower, can make sharper turn).
        - No pavement markings to indicate Rockbrook is entrance (i.e., no break in double yellow, no edge lines for thru lane, etc.)
    - Other considerations
        - Rockbrook entrance does not have curbing, while Stonehenge does.
        - 18" RWSA Water main directly beneath Rockbrook/Stonehenge portion of intersection (see street view image of survey markings)
        - Grade of all 3 legs (Rio, Rockbrook, Stonehenge) is fairly steep (5%, 7%, 12% respectively)
        - Rockbrook is paved only for a short distance before becoming gravel. Pavement that is there is in need of maintenance.
        - Drainage provisions look like they may need upgrading/replacement (inlet between entrances, paved swale extending into South section)
- Pedestrian Connectivity
    - Ped bridge in Lochlyn Hill recently installed over Meadow creek
    - Lochlyn Hill also connects to Rivanna Trail network
    - East side sidewalk likely sees little use due to not being connected to Waldorf intx or Pen Park Ln
    - County sidewalk project does not include connection of Loft sidewalk to Pen Park Ln, a crucial connection.
    - Sidewalk dead ends at Stonehenge.
- Multi-modal
    - Ridership of CAT buses is very low. This is contrasted against a very costly but nice bus pull-off at Meadowcreek Lofts. Why was this built?
    - No bike facilities exist anywhere in Phase 2.

RECOMMENDATIONS

- Typical section
    - Widen road between Waldorf left-turn-in and Pen Park Ln left-turn-in to allow installation of 11' median (see north Recommendations).
    - Actual widening of pavement may not be required, since some lanes are wider than the target 11' width. NB thru lane should be held and widening should happen to the West, as the NB lane is a consistent width of 11'.
- Towne Ln
    - Install left turn into Towne Ln. 100' storage, 100' taper.
- Pen Park Ln
    - Add double yellow striping along Pen Park Ln for ~200' (several sideswipe accidents). Also add stop bar at Pen Park Ln approach.
    - Perform maintenance of vegetation to clear intersection sight lines, particularly looking North from Pen Park Ln.
    - There is an embankment across the NE corner property (parallel to Rio) that may interfere with the intersection sight line. There is also no sidewalk here. A curb/sidewalk improvement here would present an opportunity to create a clear sight line and a ped connection. SUP desirable, see below.
    - Add curbing and sidewalk/SUP to north side of Pen Park Ln approach leg.
        - Decide if street parking (one or both sides) is desired and set curb-curb distance accordingly
        - If no street parking, add signage
- Stonehenge/Rockbrook
    - Place raised, planted median just north of intersection to create 'south gate' (see recommendations for north section/'north gate' above)
        - Will likely have to widen road to achieve this. Single family driveways on east side would be impacted/not have left turn in.
        - Widening may have to happen to east, which would further impact SFDs on East side, as topography to the West is challenging already.
    - If possible, remove Rockbrook entrance and instead extend Stonehenge Way to connect Rockbrook (would require obtaining 1 property).
        - If not possible, can rockbrook entrance be slid further south? Would require significant regrading of Rockbrook, as elevation difference is large. But this may be feasible, as there seems to be space on either side of Rockbrook to adjust grade.
    - Extend Stonehenge splitter median to thru lane to channelize right turns and force them to turn at Stonehenge, not Rockbrook
    - Left turn lanes should be added, at minimum, for Stonehenge.
        - If EcoVillage connects to Rockbrook, then Rockbrook will need left turn lane in as well.
        - Ideally, the two left turn lanes would be separated, but how could this be accomplished?
        - Alternatively, left turns in could be prohibited with physical restrictions (developments can still be accessed with a left turn on Penfield Ln and then another left onto Stonehenge Way). Could probably still allow left turns out.
    - Radii should be revised to be smallest possible while still accommodating design vehicle
    - Drainage improvements/curbing should be included with intersection improvements
- Ped connectivity
    - Turn East sidewalk into SUP and extend to Pen Park Ln, and probably further East to Lochlyn Hill (the upgrade to SUP is long term, for short term the connection needs to be made to Pen Park Ln sidewalk which currently is not connected to network).
    - How does SUP terminate? Is there a logical destination to tie into? Where is ped bridge? may be a long distance to go…
        - If SUP leaves main corridor, wayfinding signage should be added making people aware of the connection to the ped bridge
        - Wayfinding signage should be added wherever an off-corridor connection is made.
    - Provide crossing of Rio at Pen Park Ln. Will connect large # of users to meadowcreek park/ Lochlyn hill ped bridge
    - Ped connection needs to be made from Stonehenge to EcoVillage if that actually gets developed. This is imperative to connect EcoVillage to the rest of the network and will resolve the dead-end sidewalk at Stonehenge.
- Multi-modal
    - Bus stop improvements: consider carefully before forcing developments to do permanent improvements. Loft pull-off may not be warranted.
    - If warranted/need room for SUP, bus pull off area may be reclaimed for SUP or for SWM (ridership is low and bus may use turn lane. Shelter/bench could be maintained).

SOUTH

<u>Street typology according to Comprehensive Plan</u>

5 typologies: Avenue, Boulevard, Transit Boulevard, Local/Neighborhood Street, Through Street (See below pages from Comp plan)

- This road currently matches "Through Street" typology, except for the presence of a consistent median.
    - By adding a median, we push the street to further match the "through street" typology. Is this what we want?
    - Through street typology suggests SUPs (see below), but the design purpose of the SUP in this typology is that the SUP would serve through traffic as an alternate transportation method, parallel to the corridor. So the SUP would have to connect to downtown somehow.
- Contrast with "local/neighborhood street" typology, which includes:
    - no median
    - sidewalks instead of SUPs
    - smaller building setbacks
- This road feels like a local street that is becoming a thru street.
    - Does our vision support this direction? Should this naturally become more of a through street, or should we inhibit this trend with our design and emphasize more characteristics of a local street?

- There is a parallel through street (JWWP). However, traffic demands may warrant this corridor being preserved as a parallel through street. If so, bike/ped accommodations should somehow be made thru the South section into the City.

South accident zones:
01_Dunlora Drive to Dunlora Forest (but not including Dunlora Dr or Dunlora Forest intersections)
02_Dunlora Forest intx
03_Dunlora Forest to Pen Park Rd (not including those intersections)
04_Pen Park Rd/Waldorf intx
05_Towne Ln intx
06_Pen Park Ln intx
07_Stonehenge/Rockbrook intx
08_Rockbrook to Agnese St (not including those intersections)
09_Agnese St intx
10_Alwood to Brookway (including those intersections, crash volumes at intersections not significant)
11_Melbourne Rd

SOUTH

OBSERVATIONS

- Zoning/development
  - EcoVillage obviously biggest potential development in this section
  - However, there is currently nothing prohibiting development of several other smaller parcels along both sides of the road. Steep slopes are present, but not throughout the whole parcels. All parcels down to Brookway Dr are Neighborhood Density Residential on Comp plan, meaning 3-6 units/acre.
  - What about ADUs? If ADUs are to be present along the corridor, we can assume that alternative transportation methods to the City will be needed.
  - Preserved steep slopes (green below) border both sides of Rio for majority of Southern section. Significant areas of managed and preserved steep slopes exist within the adjacent properties.
  - Water protection ordinance buffer (purple below) covers much of the properties south of Rio and West of Brookway Dr.

- Geometry/alignment
  - Typical section
    - 11’ thru lanes (1 lane each direction)
    - Guardrail on East side for the majority of the section. Note that guardrail is 25” high (old standard) as opposed to the 31” that is the current standard. This may contribute to increased severity of accidents involving the guardrail.
    - Shoulders are paved, as required with guardrail configurations.
      - East side shoulder width = 4’ (paint to GR face).
      - West side shoulder width (including paved ditch) = 12’, however shoulder and ditch width vary within that 12’.
      - Paved ditch is in need of repair, as there are several deep potholes that may be allowing water to undermine the roadbed. In addition, vegetation, debris, and litter are migrating off the steep slope into the paved ditch, reducing its capacity and clogging inlets, and negatively affecting water quality.
  - No turn lanes anywhere until signal at Melbourne. Topography generally does not support the widening of the road for turn lanes. This limits the ability of the road to support higher density developments/entrances along its length.
  - Centerline Radii (as encountered travelling SB from Stonehenge): 180’, 200’, 150’, 300’, 150’, 225’. These tight radii result in SSD being encumbered on several of these curves.
    - GS-7 min. radius is dependent on design speed and edge treatment. Table does not show a min. radius for DS=25mph with shoulders. Min. radius for DS=35mph is 373’. Min. radius for DS=25mph with C&G is 115’. Does this imply that this road should have C&G to comply with GS-7? See below for GS-7 table.
    - While there is an advisory speed sign (25 mph) for NB traffic prior to this section, there is not one for SB traffic. This is strange, as SB traffic is the more at risk, since downhill SSD is increased.
    - Vehicles have been observed crossing outside painted edge lines since the shoulder and ditch are paved. This further exacerbates sight distance problems on inside curves, as vehicles are hugging the vegetated steep slope and can’t see/be seen as far in advance.

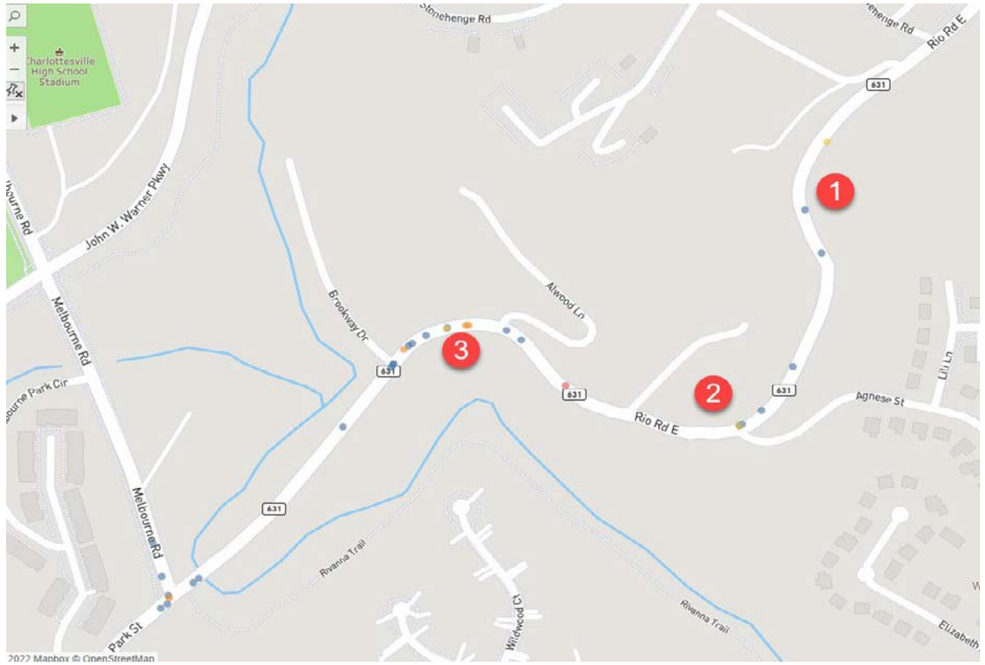
	DESIGN SPEED (MPH)	MINIMUM RADIUS	
		U	ULS
STREET WITH CURB & GUTTER	50	929'	-
	45	713'	795'
	40	536'	593'
	35	373'	408'
	30	251'	273'
	25	115'	167'
	DESIGN SPEED (MPH)	MINIMUM RADIUS	
		U	ULS*
(11) STREET WITH SHOULDER DESIGN	50	929'	-
	45	713'	795'
	40	536'	593'
	35	373'	408'
	30	251'	273'

  - Grade of road varies from 3.5% to 6.5% (5% average), sloping uphill when travelling NB.
    - This effectively lessens the SSD required while traveling NB, but increases SSD traveling SB. This exacerbates the problem sight lines identified in the sandbox map.
    - Steep slopes both sides of ROW complicate implementing safety improvements.
- Accidents
  - 32 total accidents in this section
    - 8 (25%) at Melbourne

- If Melbourne is excluded, 11 (46%) are single-vehicle incidents, which reflects the dangerous nature of the road.
- Of the 13 left that involved multiple vehicles, 7 (54%) were rear-end types, and most seem to have occurred in the SB lane (reflecting the extended SSD necessary due to the downhill grade)

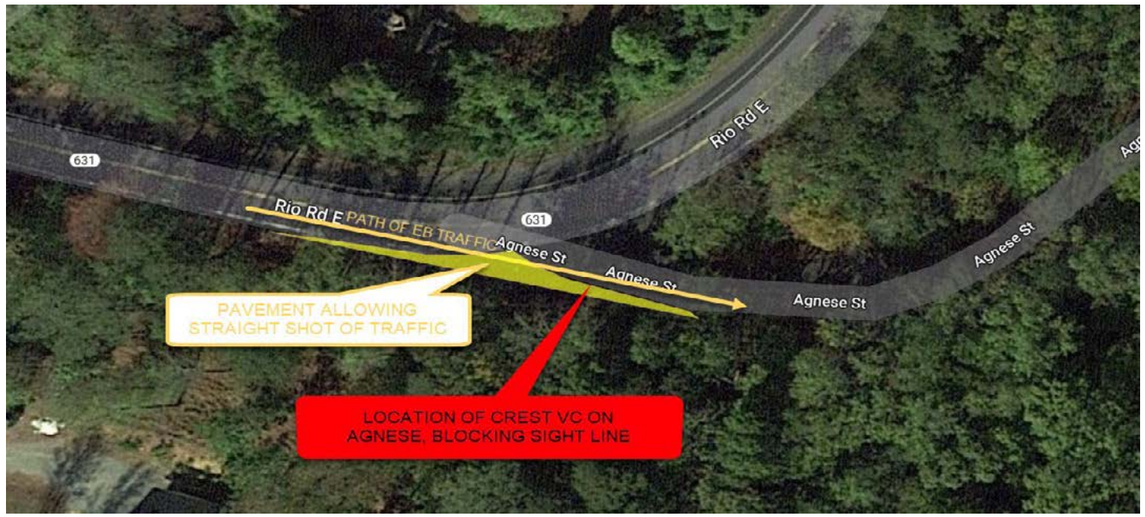
○ Except for the Melbourne intersection, accidents in the South section of the corridor reflect the nature of the roadway. In contrast to North and Central, accidents are not specifically concentrated at intersections, but instead distributed along the 3 sharpest curves in this section of roadway:

- Although there are some accidents at the 3 minor intersections (Agnese, Alwood, Brookway, all one-leg stop-controlled), the primary cause of these accidents seems to be the sight distance issues along the mainline of the road. This has impacts to safety not only at intersections, but throughout this section.



- Of the three curves above, the one between Brookway and Alwood is the worst. When looking at economic cost of accident zones, this section of road (zone 10) has the highest cost and most crashes of all 11 zones analyzed (when filtering out distracted and alcohol related crashes. When accidents are unfiltered, Stonehenge is worse than this area).

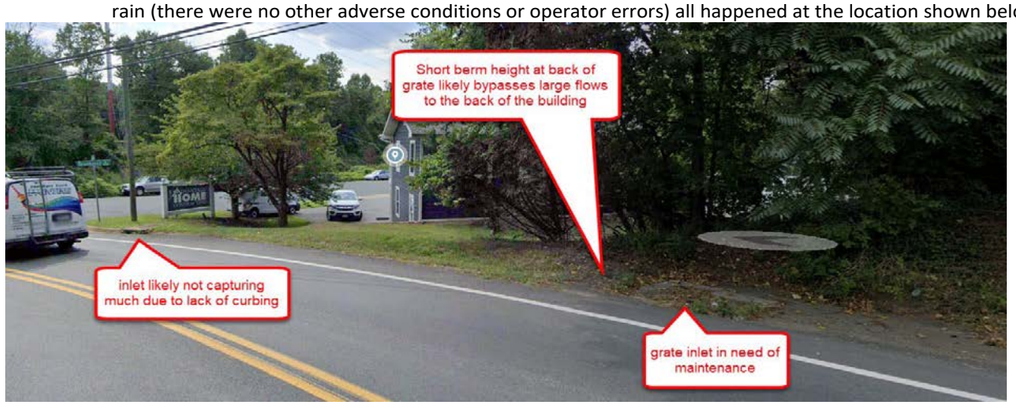
- Agnese Intx
  - Intersection angle is approx. 70° away from perpendicular
  - Intersection is within one of the 2 tightest curves in the corridor (150' CL radius) and thus stopping sight distance is encumbered along both Rio approaches.
  - The steep grade of Rio through the intersection and the steep grade of Agnese creates vertical sight distance issues through the intersection (see images below)
  - Although the Agnese centerline appears to curve North to tee into Rio, the southern intersection quadrant is completely paved. This leads drivers to not slow as they detour onto Agnese. The safety of this movement is further degraded by the sharp vertical curve on Agnese, which obstructs the sight line for this movement, as seen in the image below.



- Break in double yellow on Rio is very long, resulting in ambiguity for vehicles turning left as there is not a clear location to cross traffic. As seen in the image below, if a SB vehicle turning left stopped at the beginning of the break in the yellow, they would not be able to see oncoming traffic.
- Although edge lines are present on both sides of Rio road, there is ample pavement (~12') on the west shoulder for illegal movements. As seen in the image below, a SB vehicle drives on the shoulder to pass a turning vehicle. This is problematic because the closer to the inside of the curve a vehicle is, the more their sight distance is impeded. In addition, the pavement section of the shoulder/ditch is likely not designed for significant traffic loads.

    - There is a "watch for turning vehicles" sign for SB traffic north of the intersection, however this may not adequately communicate to drivers that vehicles may be stopped in their lane waiting to turn as well.
    - There is also a "school bus stop ahead" sign on the SB approach: where does the school bus stop? Any stop along this portion of road will likely be rife with safety issues.
  - Agnese serves a neighborhood with 120 homes and another entrance. There are no traffic data records for this road, however we can develop an assumed value.
    - The development generates 1200 trips/day. Assume these are divided evenly between the two entrances (those traveling north or returning from the north probably use Agnese) yields 600 vpd on Agnese.
    - Assuming a PHF of 10% and directional split of 50% yields 30 vph coming into Agnese. Most of these will be coming from the North, as southern return traffic would likely come in the other entrance. This yields an approximate left turn percentage of 5-10% of the SB traffic on Rio.
    - If all the above assumptions hold, <u>this intersection warrants a left turn lane on Rio Road SB approach</u>. The need for a left turn lane will only increase as thru traffic on Rio increases.
- EcoVillage entrance
  - Currently there are no accidents along the stretch of road immediately in front of the proposed entrance.
  - Spacing is slightly less than allowable from Alwood, however the low volumes of Alwood diminish this problem. Indeed, adequate sight distance is of more concern, and the proposed entrance location likely has the best sight distance along the property frontage, except perhaps at the Stonehenge intersection, if that connection could be made.
  - Current plan does not propose another vehicular entrance. This main entrance would receive all of the ~400 vpd and would likely require a taper on the right-in movement. A left turn in may not be warranted, but it may be desirable to not impede traffic flow NB. However, this lane would be costly to implement. In addition, stopping sight distance will be less as a left turning vehicle travels uphill to the entrance, so the lack of a turn lane may not be as unsafe as similar situations on the downhill, such as Agnese.
  - A second entryway near Stonehenge would relieve both of these issues by splitting trips between entrances.
- Alwood to Brookway

- This section of road has the tightest curve, highest accident rate of all 11 zones, and has the highest economic accident cost of all zones, when accidents due to impairment are filtered out.
- Alwood has at most 50 vpd, and therefore it is not likely a contributor to accidents. However, this could change if the property were developed to the maximum comp plan density (8.5 Ac at 3-6 units/acre = 250-500 VPD, similar to EcoVillage)
- Brookway does have a potential ISD problem looking left. The grade drop-off on the inside of the curve puts the canopies of many mature trees right in the line of sight across the curve. In addition, the problem approach is on a 6% downhill grade.
- Drainage in this area may be a problem as well, as vegetation and debris encroaching on the west side paved ditch certainly reduces its capacity. The few existing inlets appear in need of maintenance. The 5 accidents attributed to rain (there were no other adverse conditions or operator errors) all happened at the location shown below.



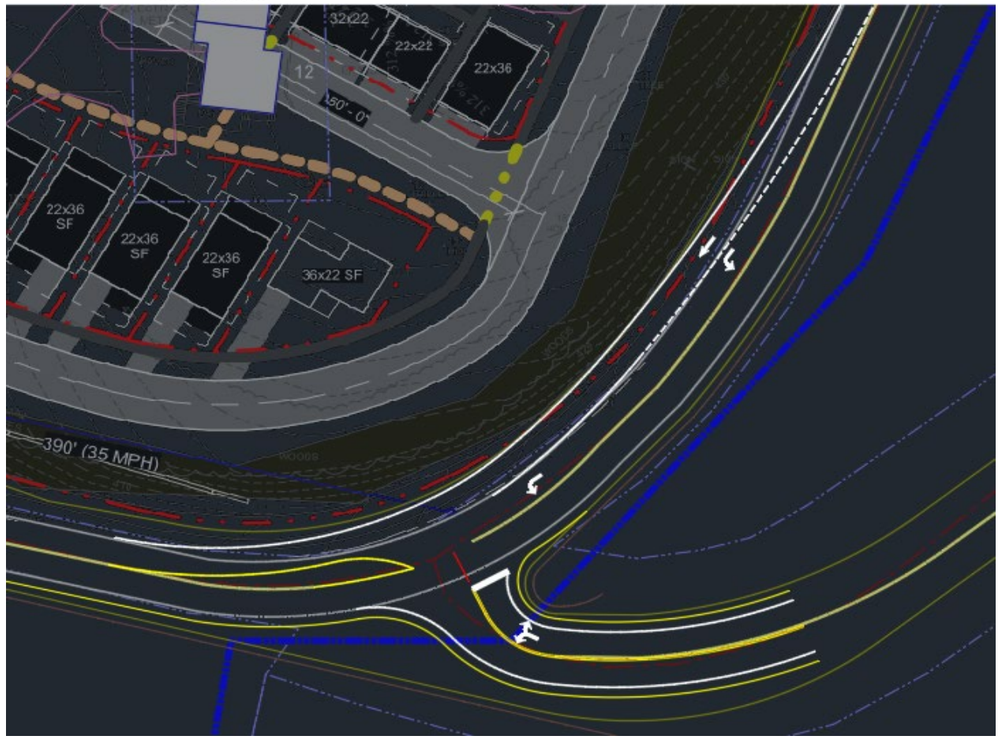
- Brookway to Melbourne
  - The existing bridge over meadowcreek is approximately 36’ wide, including a 5’ raised sidewalk on the west side. Lanes are 11’ wide with a striped median 7-9’ in width.
  - The existing sidewalk is continuous from the North side of the bridge all the way to the downtown area.
  - There is an advisory speed limit sign of 25 MPH on the northbound approach to the winding portion of the road. A complementary sign could not be found for southbound traffic.
  - Guardrail exists along the approaches to the bridge on both sides but continues north only on the west side.
  - The east side of the road in this section is relatively flat and could be an easy area to implement improvements.
  - As mentioned below, no formalized drainage provisions exist along either side of the road in this section.
  - Melbourne intersection
    - All accidents (8) in this section occur at the signalized intersection with Melbourne. There are no clear trends (many are attributed to distraction or alcohol); however, a few minor deficiencies were observed that may have contributed to accidents. Overall, this intersection is not concerning from a safety standpoint.
    - Pavement markings are very faded. This may have contributed to a sideswipe accident.
    - Sight distance left on the Melbourne approach is limited by vegetation and the back of a street sign. This causes right-turning vehicles to pull forward into the intersection when light is red.
    - The Rivanna trail network connects to the Melbourne intersection (single track). The trail extends under the bridge along the South side of the creek.
  - Due to the confluence of Schenks Branch with Meadow Creek, and the sharp turn of Meadow Creek as it approaches Rio Rd E from the North, the road embankment stability is being threatened.
    - The closest edge of embankment (which is basically a 10’-15’ vertical drop to the creek) is 6’ behind the guardrail post.
    - Due to the steepness of the bank, stabilizing vegetation is being lost, compounding the problem. It is unclear whether the embankment would last through another large storm event.
    - Another cause of erosion along the slope is the lack of drainage provisions along this portion of Rio. The road is relatively flat with no ditches or curb, and runoff flows along the edge of pavement and down the steep slope. The closest edge of the incised embankment is concurrent with the lowest point in the roadway edge.
    - An unknown utility encasement appears exposed in the creek.

- Pedestrian/bike Connectivity
  - No facilities exist along the majority of this section
  - Sidewalk exists on the west/south side starting at the bridge over meadow creek at the City line (sidewalk is present on the bridge). This sidewalk extends along Park St and is continuous all the way to downtown.
  - No bike facilities exist
  - There are few destinations along this portion of the corridor, with the exception of (maybe) the Rivanna trail at Melbourne. The main purpose of any pedestrian facility would be to connect to the existing sidewalk at the bridge and thus create a connection to both downtown, and the high school/JWWP trail via the Melbourne sidewalk.

RECOMMENDATIONS

- Geometry/alignment
  - Typical section
    - At an absolute minimum, an advisory speed sign should be installed near Stonehenge for SB traffic, similar to the sign present for NB traffic.
    - Realign paint for better sight distance. Travel lanes could be shifted West over existing ditch (install underground conveyance). This can only be achieved on curves 1 and 3. Even slight lateral shifts can result in significantly improved sight lines, depending on field conditions.
    - With any improvements, guardrail may need to be upgraded to new standard.
    - Any use of the available horizontal space within the ROW will likely require storm to be taken underground along the entire length of the road. This could be costly, but would unlock about 12’ of width.
      - The use of that space must be carefully considered, whether to dedicate it to roadway safety improvements or bike/ped improvements. It may be better to find other bike/ped routes and use the space for safety improvements, as this portion of road is fairly dangerous and will only become more so with increases in traffic volumes.

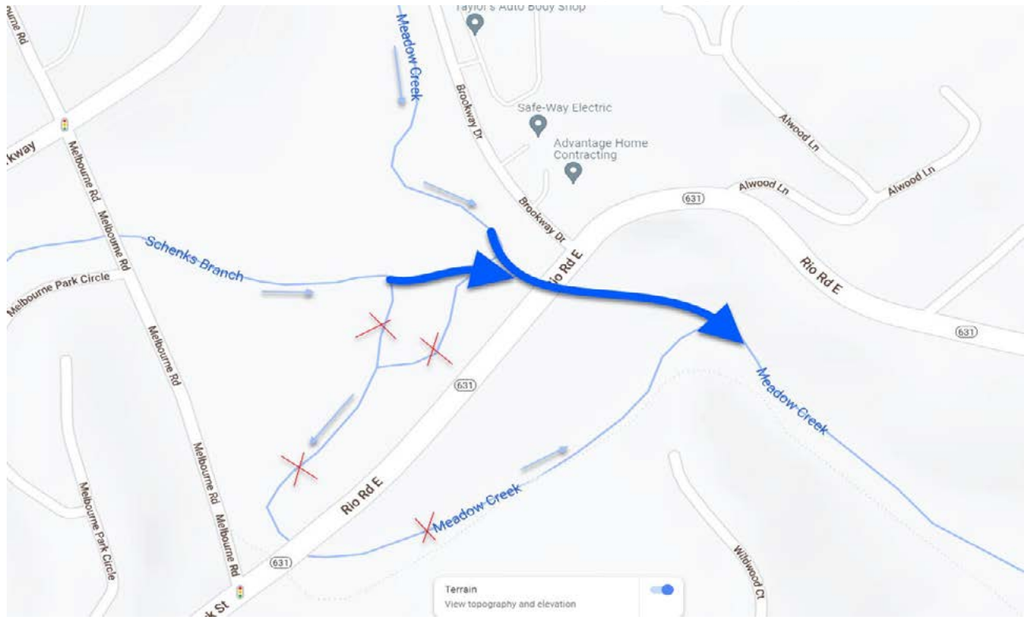
- Agnese Intx
  - Add left turn for SB approach. This can be achieved by the shifting the SB thru lane into the shoulder area (basically formalizing what is happening naturally now).
    - Requires conveying storm underground to reclaim the shoulder
    - Shift would allow a larger turning radius for SB thru lane than exists currently.
    - Would not allow for any potential sidewalk improvements, since available width would be taken up by the turn lane (unless preserved slopes are impacted)
  - Revise radius at NB approach
    - This would prevent vehicles speeding thru the intersection and over the sharp VC that blocks sight distance.
    - However, it would require right turning vehicles to slow down more in the NB thru lane. This could reduce capacity and potentially cause an increase in rear-end collisions (although this is on the uphill leg, so stopping distance is reduced).
    - This improvement does not preclude any pedestrian improvements
  - Improvements to this intersection would likely require a joint City/County project, as the City line runs through the intersection.



- EcoVillage entrance
  - Entrance evaluations must account for projected increases in Rio Road traffic, as this will affect turn warrants.
  - County should allow the disturbance of the preserved slopes, if the slopes can be removed or pulled back. These slopes present a hazard to Rio Road in a number of ways.
  - Ideally, a second entrance/vehicular connection to Stonehenge Rd would be made. The Rockbrook entrance could be removed/realigned to be a frontage road. This would alleviate much of the concerns with the south entrance, as the traffic volumes would be reduced significantly at that entrance.
  - While the south entrance is placed as well as it can be currently, if all sight distance or intersection spacing requirements cannot be met, other safety improvements should be required of the developer.
  - Depending on the pedestrian connectivity strategy selected (see below), a public SUP should extend through the property and connect to Rio at the entrance.
    - This will allow bike/peds to avoid much of the hazardous part of the south section and allow safety improvements to be made in lieu of pedestrian improvements.
    - The SUP should extend all the way to Brookway at least, as we don’t want NB cyclists to have to cross the road at the EcoVillage entrance.
- Alwood to Brookway
  - Drainage improvements should be made along this portion of road.
  - Maintenance of the sight line (removal of vegetation) should be performed. A sight distance easement should be sought from the property owner on the inside of the curve.

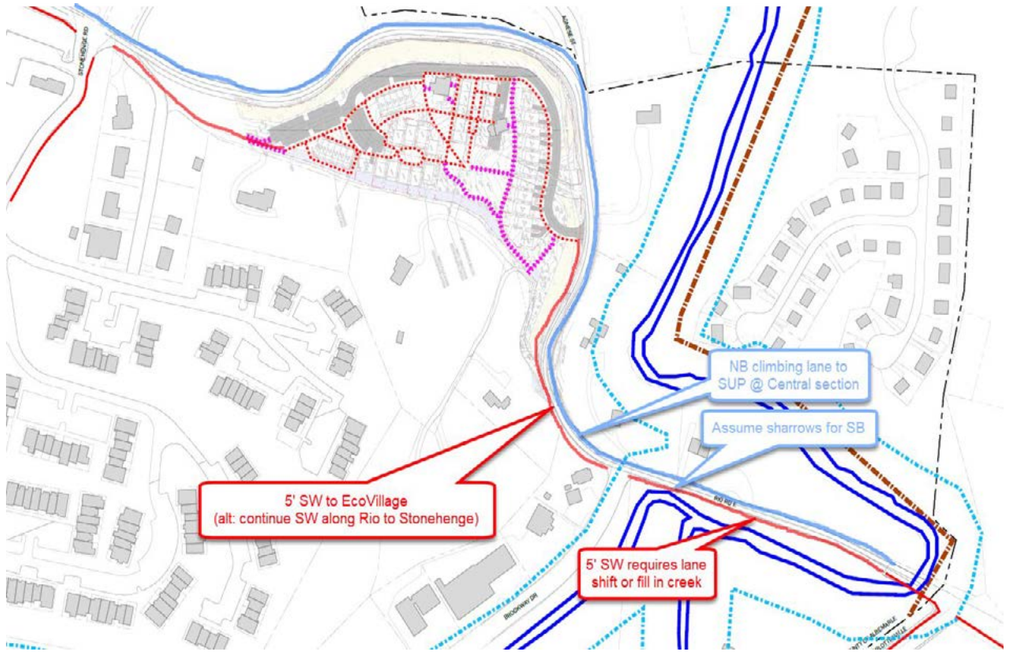
- Due to accident rate here, if Alwood properties are developed, they should connect to EcoVillage entrance to take advantage of the better sight lines there. An access easement should be established on EcoVillage for future connection, and the EcoVillage plans should assume this connection.
- Additional warning signage should be placed for this curve.
- A taper or right turn lane into Brookway may be needed to avoid rear-end collisions with turning vehicles.
- See below for ped improvement options

- Brookway to Melbourne
  - Melbourne improvements
    - Re-paint faded pavement markings
    - Trim vegetation out of sight lines. Relocate "City Limits" sign on west side of bridge out of sight line for right turning vehicles.
  - Since improvements to the East are far easier to make but the existing sidewalk is on the west of the bridge, consider shifting Rio east to allow more room for sidewalk/SUP improvements. See below for more ped improvement discussion.
  - Drainage improvements are needed along this portion of Rio to protect west embankment from further erosion and drain flat areas on the east side of the road.
  - Creek encroachment: 2 options, probably long-term projects
    - Perform creek restoration project and armor road embankment
    - Allow the creek to do what it wants to do naturally, and change pathway of creek with culvert:



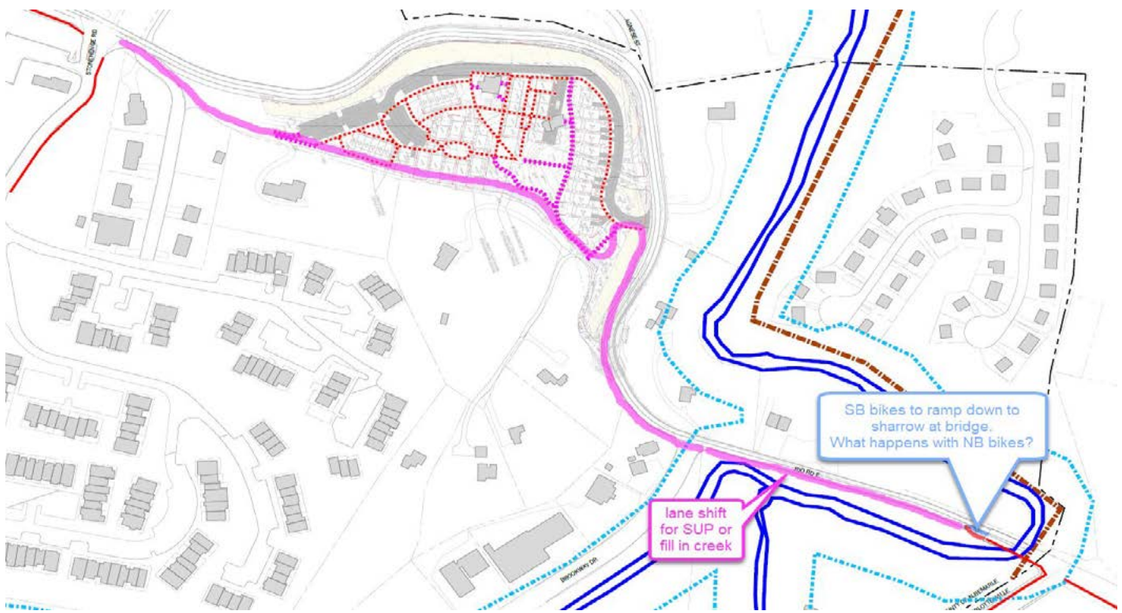
    - Would require new box culvert under Rio
    - Would remove need for bridge at Melbourne and allow for removal of guardrail on west side if old creek bed filled in. This eliminates all pinch points for bike/ped improvements to City line.
    - Would reclaim approximately 7 acres of land for development
    - Impacts on upstream/downstream floodplain and dam inundation areas unknown. Could be serious or infeasible – should be discussed with a consultant

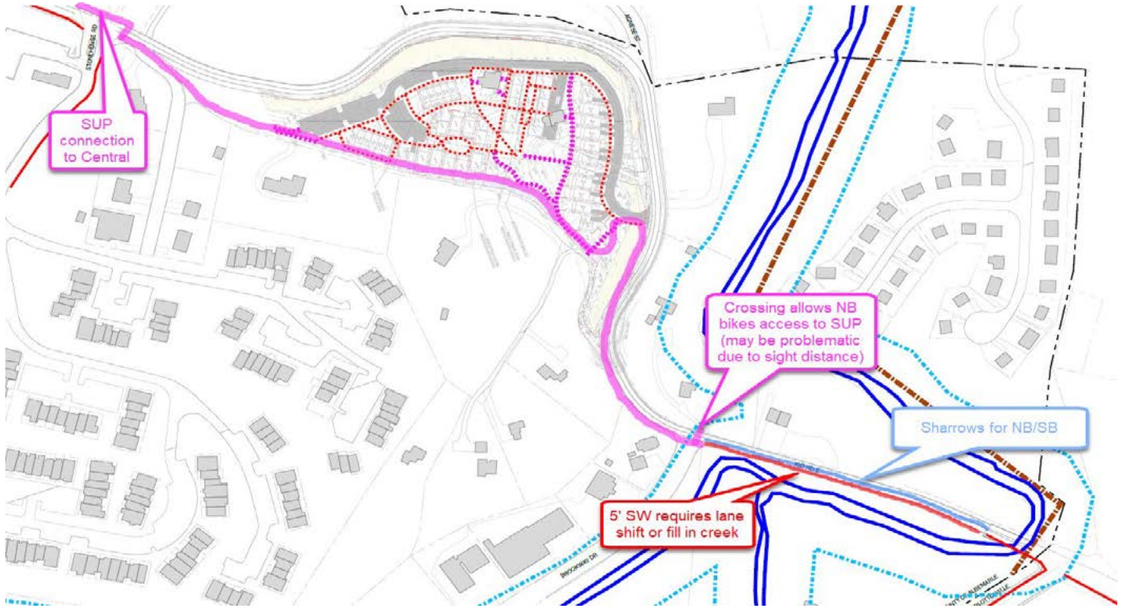
- Ped/bike connectivity
  - Connectivity boils down to 1 question: should bike/ped network in North/Central be connected to ex. facilities at Melbourne?
    - Pros of connection being made:
      - Would provide direct access to City center and high school, which could help reduce traffic volumes with alternative transportation methods.
      - Would provide link to recreational destinations of the Rivanna trail and JWW trail
    - Cons of connection:
      - Any option to make this connection will be quite costly
      - Steep grade may present challenges for ADA accessibility
      - If making connection along Rio, improvements will take up limited ROW space that could otherwise be used for safety improvements.
      - If making connection thru EcoVillage, connectivity is dependent on private development being completed.
  - What does connectivity look like? Essentially, 2 options:
    - Sidewalk along West side of Rio from Stonehenge to bridge. 6' sidewalk, 4' buffer strip along curb (underground storm). Sharrows in SB lane. Shift thru lanes 2' west to allow for dedicated bike climbing lane on East side. *-or-*
    - SUP starting at Rockbrook and cutting through EcoVillage to their proposed vehicular entrance. From here, SUP would either follow West side of road all the way to bridge (would require shifting Rio East or filling in creek), or cross Rio at Brookway and cross again just prior to bridge. SUP needs to be continuous to accommodate NB bike traffic.
    - Another option could be to connect network to JWWP trail over Meadow Creek (provide ped bridge at back of developments). This would take advantage of existing infrastructure; however, the connection would bring bike/ped route far off of corridor and therefore may not see as much use. In addition, connection across the creek would likely be costly and invasive and would likely involve substantial impacts to private properties.



APPENDIX E1: ENGINEERING ASSESSMENT | RESEARCH AND OBSERVATIONS

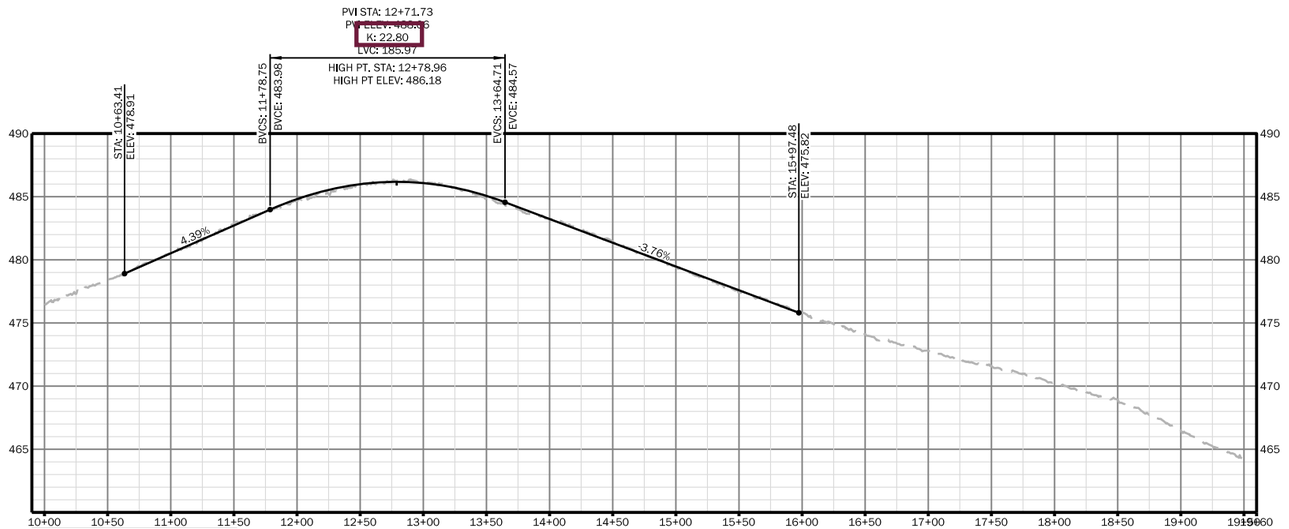
PHASE 2





APPENDIX E1: ENGINEERING ASSESSMENT | RESEARCH AND OBSERVATIONS

VERTICAL CURVE ANALYSIS AT PENFIELD LANE



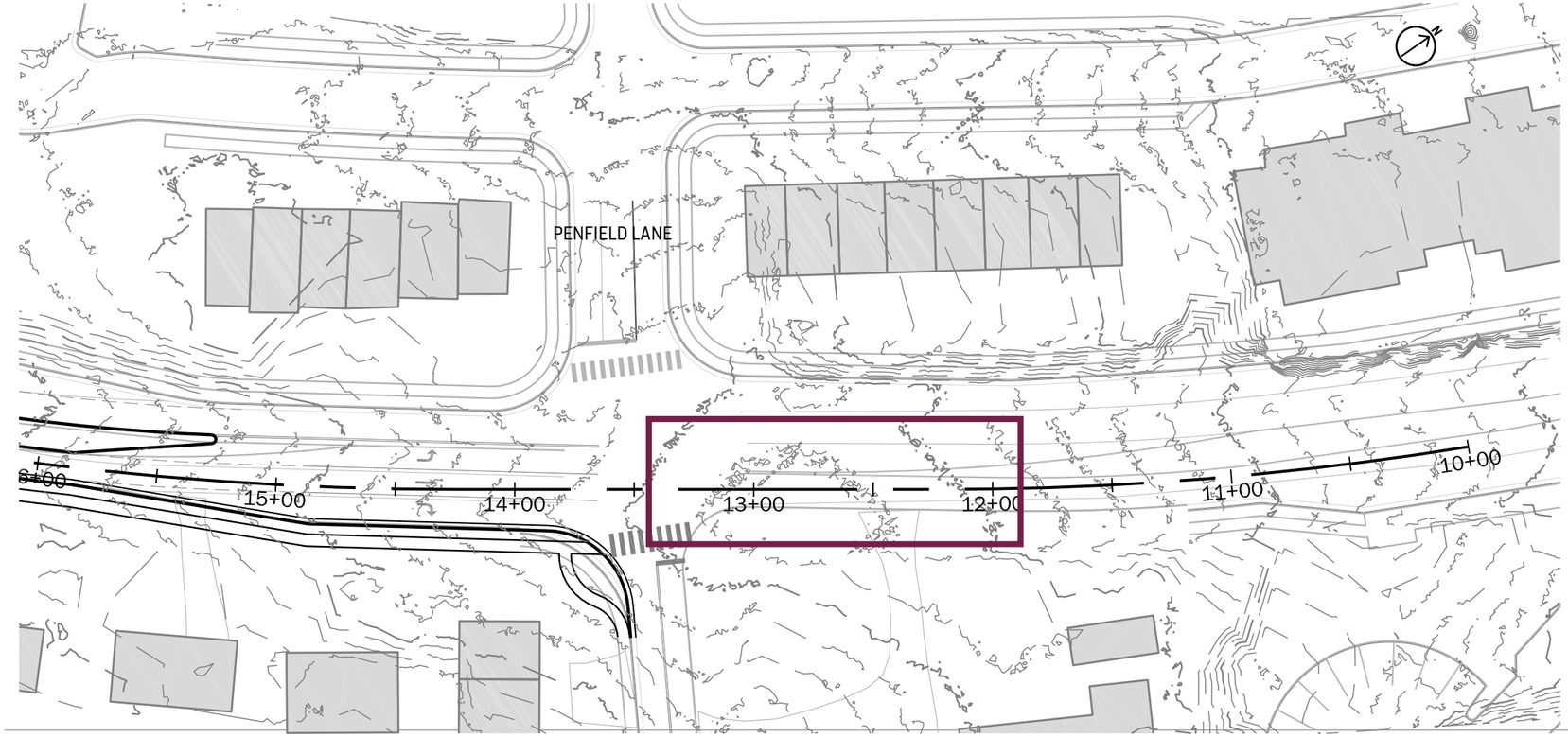
Height of Eye 3.5’										Height of Object 2’	
Design Speed (mph) **	25	30	35	40	45	50	55	60	65	70	75
Min. Sight Distance (ft.)	155	200	250	305	360	425	495	570	645	730	820

Source: 2018* AASHTO Green Book, Chapter 3, Section 3.2.2

Minimum K Value For:											
Crest Vertical Curves	12	19	29	44	61	84	114	151	193	247	312
Sag Vertical Curves	26	37	49	64	79	96	115	136	157	181	206

TABLE 2- 6 STOPPING SIGHT DISTANCE

Source: 2018* AASHTO Green Book, Chapter 3, Section 3.4.6*
**For all tables, use design speed if available, if not use legal speed limit.



The posted speed limit in this area is 35 mph, though the vertical curve of the road just north of Penfield Lane suggests that the speed limit should be 30 mph.

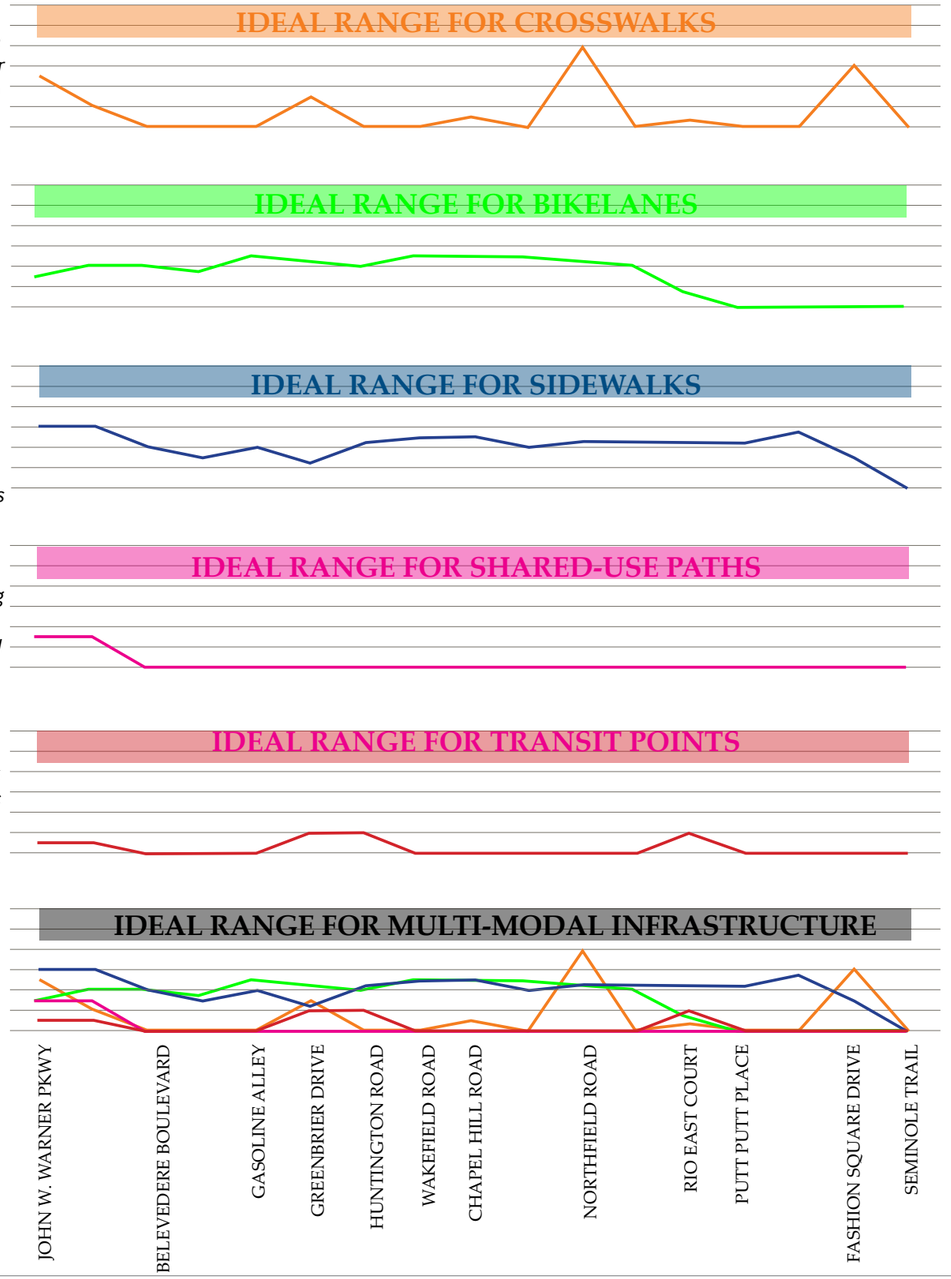
The curve is a crest vertical curve with a K value of 22.8. According to VDOT Table 2-6, the minimum K value for a 35 mph road should be 29. The existing K value is suitable for 30 mph.

The K value represents the horizontal distance along which a 1% change in grade occurs on the vertical curve. So essentially, the road in this area is changing grade in a shorter distance than is recommended for the current speed limit. This can be dangerous when sight distance is limited by a vertical curve and vehicles are approaching at high speeds.

PHASE 1

Measuring Qualitative Experience

These sparklines summarize qualitative aspects of the corridor in relative terms. Each multimodal facility is ranked based on the presence and condition of five chosen criteria on each side of the road within the spatial section of analysis (see information at right for details on the methodology). The x axis (horizontal) correlates with intersections along Rio Road, from south to north, and the y axis (vertical) correlates with rankings of each multimodal category, with zero representing the absence of functional multimodal infrastructure in the specified area. The solid bar at the top of each graph represents ideal levels of each programmatic element.



To create the sparkline graphs at left, Rio Road was analyzed in segments ranging from 400-800 ft, depending on where a logical stopping point existed. See the map below for the unnamed segments. Others were chosen at intersecting roads.

Five categories of multimodal infrastructure were evaluated – crosswalks, bike lanes, sidewalks, shared-use paths (SUPs), and transit points – each with five subcategories of criteria by which to be scored. Rankings of each category were created by assigning up to 1 point for each section of the road, meaning that each side of the road is assigned half of a point for having the criteria in good condition. The rankings listed under each intersection on the table are from that intersection to the next intersection. For example, the score listed underneath Greenbrier Drive is ranking the segment of road from Greenbrier Drive to Huntington Road.

Alternative Roundabout Location Statistics

Safety

- **Estimated 40% reduction in number of total vehicle conflict points**
  - most of reduction is a result of removing/simplifying the three T-intersections
  - On average, each movement passes through 2 less conflict points
- **Negligible difference in conflict-points-per-vehicle (anticipate slight reduction)**
- **Increased visibility of roundabout intersection from Belvedere intersection**
  - Potentially improve Belvedere functionality
  - Necessary to increase likelihood of CAT service to Belvedere
- **Slower overall speeds in proximity to the neighborhood**
  - Vehicle speed is slowest within the roundabout. Therefore, the slowest speeds will be closest to the neighborhoods.
  - Road realignment provides traffic calming

Access

- **Increased bike/ped connectivity (more bike/ped facilities)**
  - Pedestrian connections made along Dunlora Dr and Varick St
  - Residents now only need 1 crossing to access Rivanna Trail SUP
- **Increased number of marked pedestrian crossings**
- **Half of all bike/ped connections experience a reduction in length**
  - 25% stay same, 25% experience increase in length

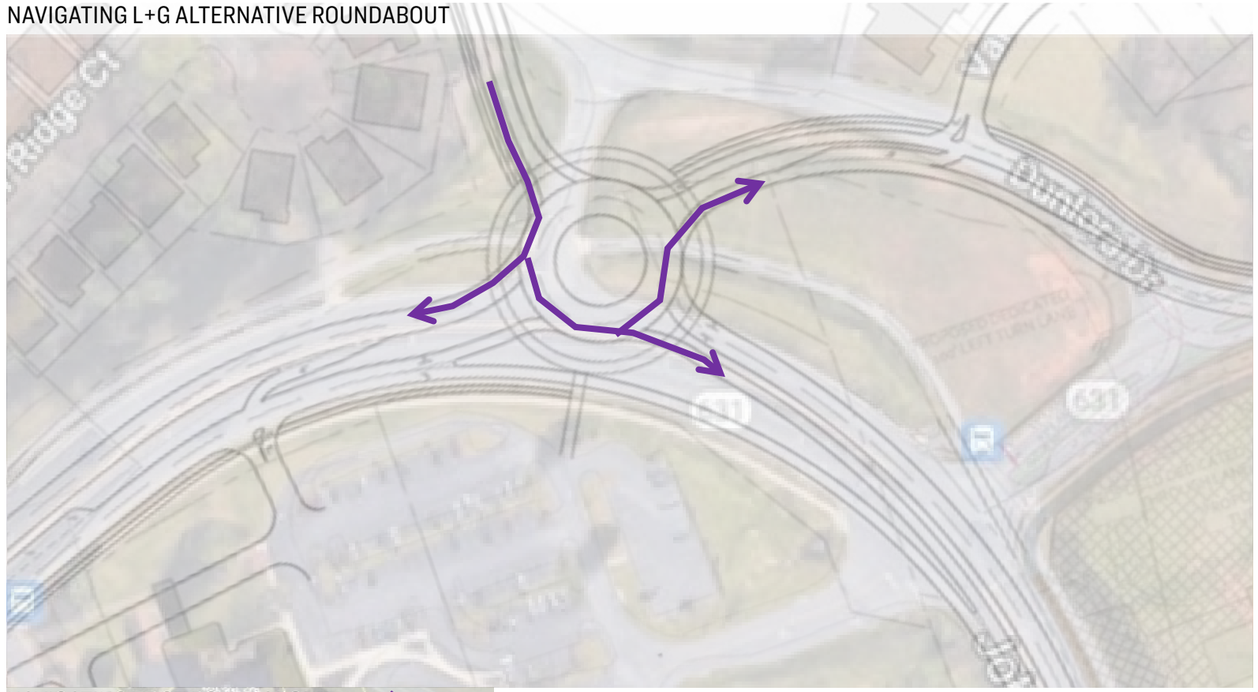
Environmental

- **Estimated 20% reduction in proposed impervious area**
  - Maintenance costs reduced? (what about maintaining greenspace? Is this more costly?)
  - Reduced stormwater runoff, and therefore stormwater infrastructure (and associated maintenance)
  - Reduced heat island effect
- **Estimate slight reduction in vehicle-miles-traveled (<10%)**
  - Local air pollution would therefore see similar % reduction
- **Vehicle noise would likely increase due to road alignment closer to houses**

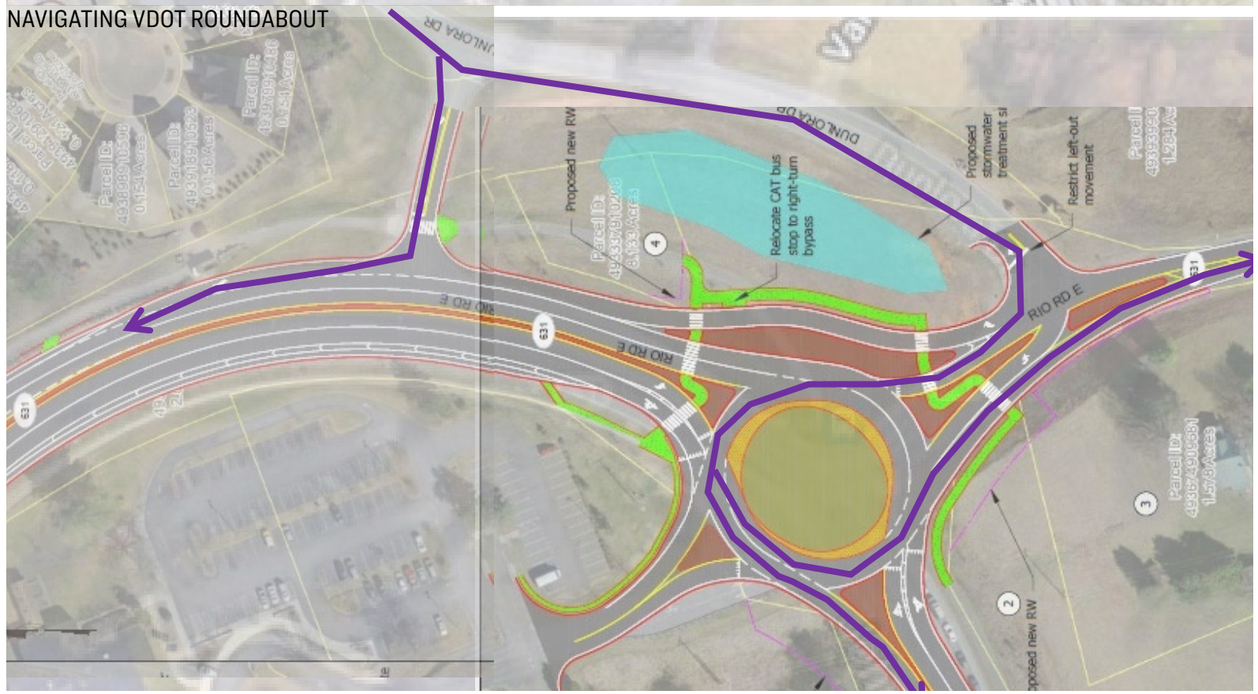
Optimization

- **Consolidation of public land**
  - Instead of two opens spaces of 1.25 Ac and 1.75 Ac, one space of 3 Ac
  - Additional ~0.75 Ac of open space created by reduction of imp. area
- **Estimated 0.25 Ac reduction in required ROW purchase**
- **Reduced impacts to traffic during construction**

NAVIGATING L+G ALTERNATIVE ROUNDABOUT



NAVIGATING VDOT ROUNDABOUT



APPENDIX E3: ENGINEERING ASSESSMENT | JWWP ROUNDABOUT ANALYSIS

NODE	ALIAS
1	RIO RD
2	DUNLORA DR
3	VARICK ST
4	RIO RD EAST
5	JOHN W WARNER PKWY
6	CATEC

RED - lack of facilities
BLUE - adj. development to make bike improv.
Green - portion of bike connection on sidewalk

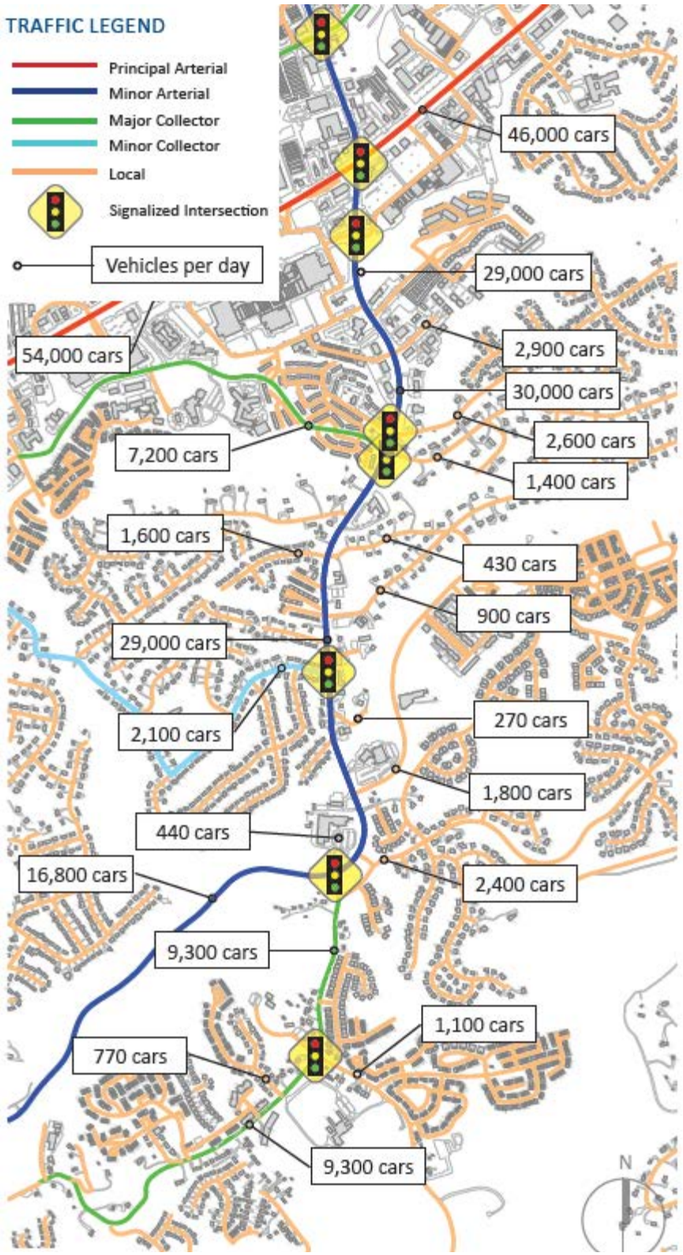
ROUTE		TRAFFIC VOLUMES		ALTERNATIVE 1 (ORIGINAL)									ALTERNATIVE 2 (L+G)								
					VEH CONFLICT POINTS									VEH CONFLICT POINTS							
BEGIN NODE	END NODE	EST. PEAK HOUR VEH	EST. VPD	VEH PATH (miles)	DIV	MRG	XING	TOTAL	BIKE/PED PATH (miles)	PED CROSSINGS	TOTAL VEH-MILES PER DAY	TOTAL PEAK HR VEH-VEH CONFLICTS	VEH PATH (miles)	DIV	MRG	XING	TOTAL	BIKE/PED PATH (miles)	PED CROSSINGS	TOTAL VEH-MILES PER DAY	TOTAL PEAK HR VEH-VEH CONFLICTS
1	2	101	945	0.35	4	5	6	15	0.14	4	326.39	1,515	0.16	3	4	1	8	0.12	2	154.43	808
1	3	9	84	0.26	3	4	4	11	0.18	4	22.12	99	0.16	3	4	3	10	0.16	3	13.46	90
1	4	456	4266	0.24	1	2	2	5	0.22	2	1,011.48	2,280	0.22	3	3	2	8	0.22	2	933.12	3,648
1	5	635	5940	0.20	2	2	2	6	0.27	1	1,206.03	3,810	0.20	3	3	0	6	0.25	1	1,176.78	3,810
1	6	34	318	0.12	1	1	0	2	0.16	1	39.40	68	0.02	1	0	0	1	0.11	1	5.42	34
2	1	113	1057	0.14	1	3	0	4	--	1	149.55	452	0.12	1	1	0	2	--	2	131.53	226
2	3	1	9	0.11	2	2	4	8	0.11	2	1.06	8	0.17	4	4	4	12	0.13	3	1.58	12
2	4	4	37	0.33	6	6	6	18	0.18	4	12.18	72	0.23	4	3	3	10	0.20	2	8.51	40
2	5	8	75	0.29	5	6	6	17	0.27	3	22.00	136	0.22	3	4	1	8	0.23	2	16.17	64
2	6	1	9	0.22	4	5	6	15	0.16	3	2.02	15	0.15	3	3	1	7	0.11	2	1.40	7
3	1	10	94	0.17	2	4	2	8	--	3	15.98	80	0.16	2	3	0	5	--	3	14.51	50
3	2	1	9	0.11	2	2	0	4	--	2	1.02	4	0.13	1	2	0	3	--	3	1.21	3
3	4	1	9	0.24	5	6	7	18	0.09	4	2.28	18	0.26	5	5	2	12	0.09	3	2.42	12
3	5	1	9	0.21	4	5	6	15	0.21	3	1.98	15	0.25	4	7	1	12	0.21	3	2.31	12
3	6	0	0	0.13	3	4	6	13	0.18	3	0.00	0	0.18	4	6	1	11	0.13	3	0.00	0
4	1	512	4790	0.21	2	3	2	7	--	2	1,000.54	3,584	0.22	3	3	1	7	--	2	1,050.43	3,584
4	2	42	393	0.18	3	3	2	8	--	2	70.39	336	0.19	2	2	1	5	--	2	75.90	210
4	3	10	94	0.10	2	2	0	4	--	2	9.02	40	0.09	1	1	0	2	--	1	8.31	20
4	5	36	337	0.19	4	4	4	12	0.18	1	65.38	432	0.31	5	6	2	13	0.28	2	104.73	468
4	6	6	56	0.12	3	3	4	10	0.15	1	6.53	60	0.24	5	5	2	12	0.20	2	13.70	72
5	1	820	7671	0.23	2	3	2	7	--	1	1,762.23	5,740	0.23	3	3	0	6	--	2	1,779.67	4,920
5	2	5	47	0.25	3	4	5	12	--	3	11.88	60	0.21	2	2	0	4	--	2	9.91	20
5	3	0	0	0.17	2	3	3	8	--	3	0.00	0	0.21	2	2	1	5	--	3	0.00	0
5	4	23	215	0.14	1	1	0	2	--	1	31.05	46	0.27	2	1	0	3	--	2	57.46	69
5	6	17	159	0.13	2	2	3	7	0.20	0	20.84	119	0.25	3	4	1	8	0.19	2	39.82	136
6	1	8	75	0.20	3	4	3	10	--	1	14.70	80	0.18	5	6	2	13	--	3	13.81	104
6	2	0	0	0.22	4	6	6	16	--	3	0.00	0	0.15	4	5	2	11	--	2	0.00	0
6	3	0	0	0.14	3	4	4	11	--	3	0.00	0	0.15	4	5	3	12	--	4	0.00	0
6	4	1	9	0.11	2	2	3	7	--	1	1.04	7	0.21	4	4	2	10	--	3	1.99	10
6	5	2	19	0.08	1	1	0	2	--	0	1.51	4	0.08	0	1	0	1	--	0	1.53	2
			TOTALS:	***5.61***	***82***	***102***	***98***	***282***	***2.69***	***64***	***5,808.59***	***19,080***	***5.62***	***89***	***102***	***36***	***227***	***2.65***	***67***	***5,620.08***	***18,431***

NODE	ALIAS
1	RIO RD
2	DUNLORA DR
3	VARICK ST
4	RIO RD EAST
5	JOHN W WARNER PKWY
6	CATEC

RED - lack of facilities
BLUE - adj. development to make bike improv.
Green - portion of bike connection on sidewalk

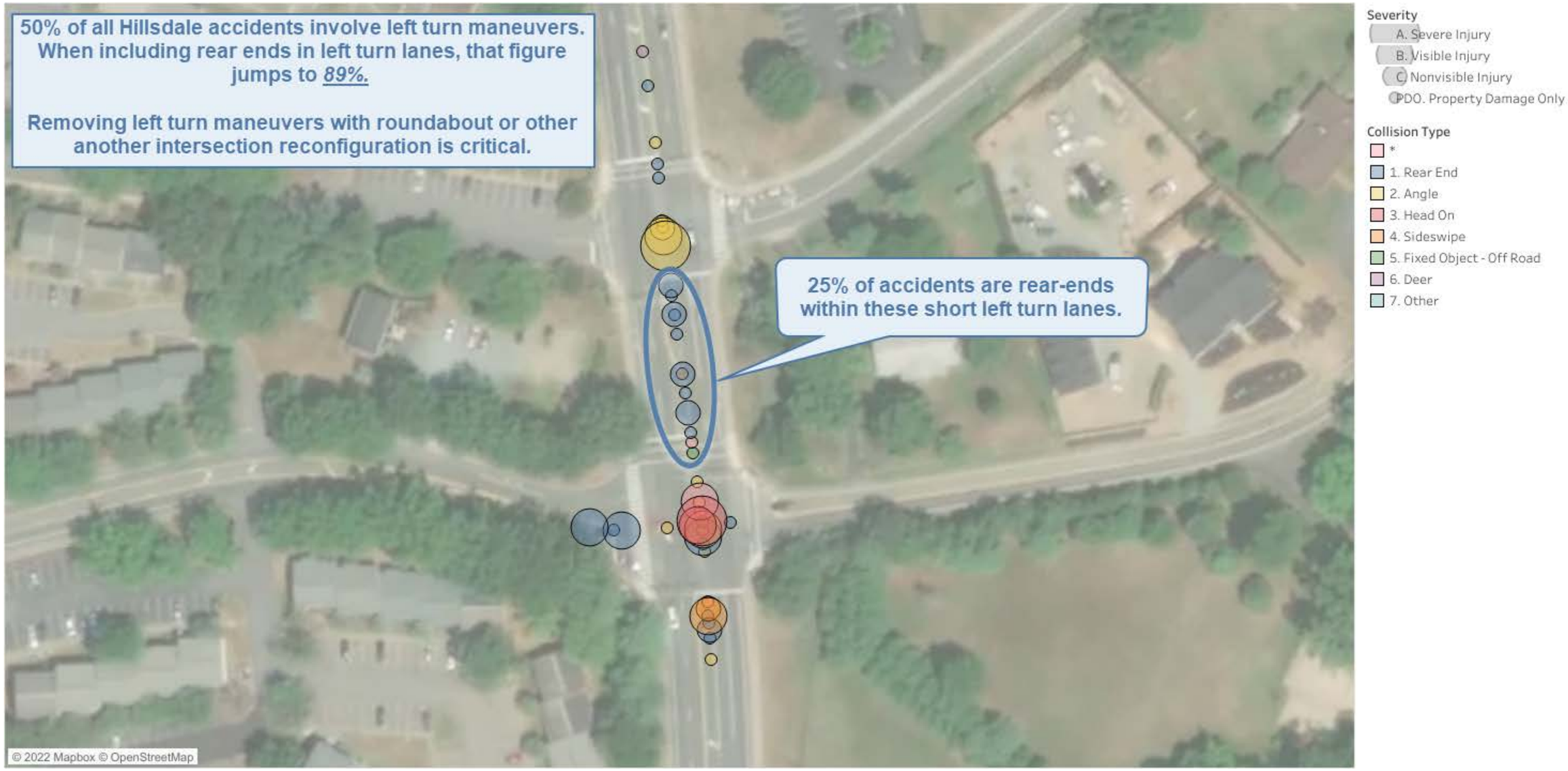
ROUTE		COMPARISONS (ALT 2 - ALT 1)						PERCENT COMPARISONS (ALT 2 - ALT 1)					
BEGIN NODE	END NODE	VEH PATH (miles)	VEH-VEH CONFLICT PTS	BIKE/PED PATH (miles)	PED CROSSINGS	TOTAL VEH-MILES PER DAY	TOTAL PEAK HR VEH-VEH CONFLICTS	VEH PATH (miles)	VEH-VEH CONFLICT PTS	BIKE/PED PATH (miles)	PED CROSSINGS	TOTAL VEH-MILES PER DAY	TOTAL PEAK HR VEH-VEH CONFLICTS
1	2	-0.18	-7	-0.02	-2	-171.96	-707	-53%	-47%	-13%	-50%	-53%	-47%
1	3	-0.10	-1	-0.02	-1	-8.66	-9	-39%	-9%	-11%	-25%	-39%	-9%
1	4	-0.02	3	0.01	0	-78.37	1368	-8%	60%	4%	0%	-8%	60%
1	5	0.00	0	-0.02	0	-29.25	0	-2%	0%	-7%	0%	-2%	0%
1	6	-0.11	-1	-0.05	0	-33.97	-34	-86%	-50%	-32%	0%	-86%	-50%
2	1	-0.02	-2	--	1	-18.02	-226	-12%	-50%	--	100%	-12%	-50%
2	3	0.06	4	0.02	1	0.52	4	49%	50%	21%	50%	49%	50%
2	4	-0.10	-8	0.03	-2	-3.67	-32	-30%	-44%	16%	-50%	-30%	-44%
2	5	-0.08	-9	-0.04	-1	-5.83	-72	-26%	-53%	-14%	-33%	-26%	-53%
2	6	-0.07	-8	-0.05	-1	-0.63	-8	-31%	-53%	-32%	-33%	-31%	-53%
3	1	-0.02	-3	--	0	-1.47	-30	-9%	-38%	--	0%	-9%	-38%
3	2	0.02	-1	--	1	0.19	-1	18%	-25%	--	50%	18%	-25%
3	4	0.01	-6	0.01	-1	0.13	-6	6%	-33%	8%	-25%	6%	-33%
3	5	0.03	-3	0.00	0	0.32	-3	16%	-20%	1%	0%	16%	-20%
3	6	0.05	-2	-0.05	0	0.00	0	34%	-15%	-29%	0%	0%	0%
4	1	0.01	0	--	0	49.89	0	5%	0%	--	0%	5%	0%
4	2	0.01	-3	--	0	5.51	-126	8%	-38%	--	0%	8%	-38%
4	3	-0.01	-2	--	-1	-0.71	-20	-8%	-50%	--	-50%	-8%	-50%
4	5	0.12	1	0.10	1	39.35	36	60%	8%	58%	100%	60%	8%
4	6	0.13	2	0.05	1	7.18	12	110%	20%	33%	100%	110%	20%
5	1	0.00	-1	--	1	17.43	-820	1%	-14%	--	100%	1%	-14%
5	2	-0.04	-8	--	-1	-1.97	-40	-17%	-67%	--	-33%	-17%	-67%
5	3	0.04	-3	--	0	0.00	0	22%	-38%	--	0%	0%	0%
5	4	0.12	1	--	1	26.41	23	85%	50%	--	100%	85%	50%
5	6	0.12	1	-0.01	2	18.97	17	91%	14%	-5%	0%	91%	14%
6	1	-0.01	3	--	2	-0.89	24	-6%	30%	--	200%	-6%	30%
6	2	-0.07	-5	--	-1	0.00	0	-32%	-31%	--	-33%	0%	0%
6	3	0.02	1	--	1	0.00	0	12%	9%	--	33%	0%	0%
6	4	0.10	3	--	2	0.95	3	91%	43%	--	200%	91%	43%
6	5	0.00	-1	--	0	0.02	-2	2%	-50%	--	0%	2%	-50%
		0.02	***-55***	***-0.04***	***3***	***-188.51***	***-649***	***0%***	***-20%***	***-1%***	***5%***	***-3%***	***-3%***

APPENDIX E4: ENGINEERING ASSESSMENT | TRIP GENERATION AND TRAFFIC VOLUMES CALCULATIONS



Development	Proposed Use	VPD, by others	[1]VPD, verified
Belvedere	SOCA fieldhouse, The Center, 190 SFD, 90 Multifamily	4838	4817
999 Rio	5 SFD, 20 Multifamily	176	176
Dunlora Farm	(assume potential of 370 multifamily)	-	2756
Dunlora Park	28 SFD, 14 Multifamily	424	387
Rio Point	328 Multifamily (Mid-rise)	1786	1786
Rio Commons	43 Multifamily	301	284
Lochlyn Hill	129 SFD, 14 Multifamily	1416	1379
Lofts	65 Multifamily (Mid-rise)	433	353
[1]L+G verified other studies' traffic estimates with ITE TripGen 10th Edition Multifamily is low-rise unless otherwise noted			

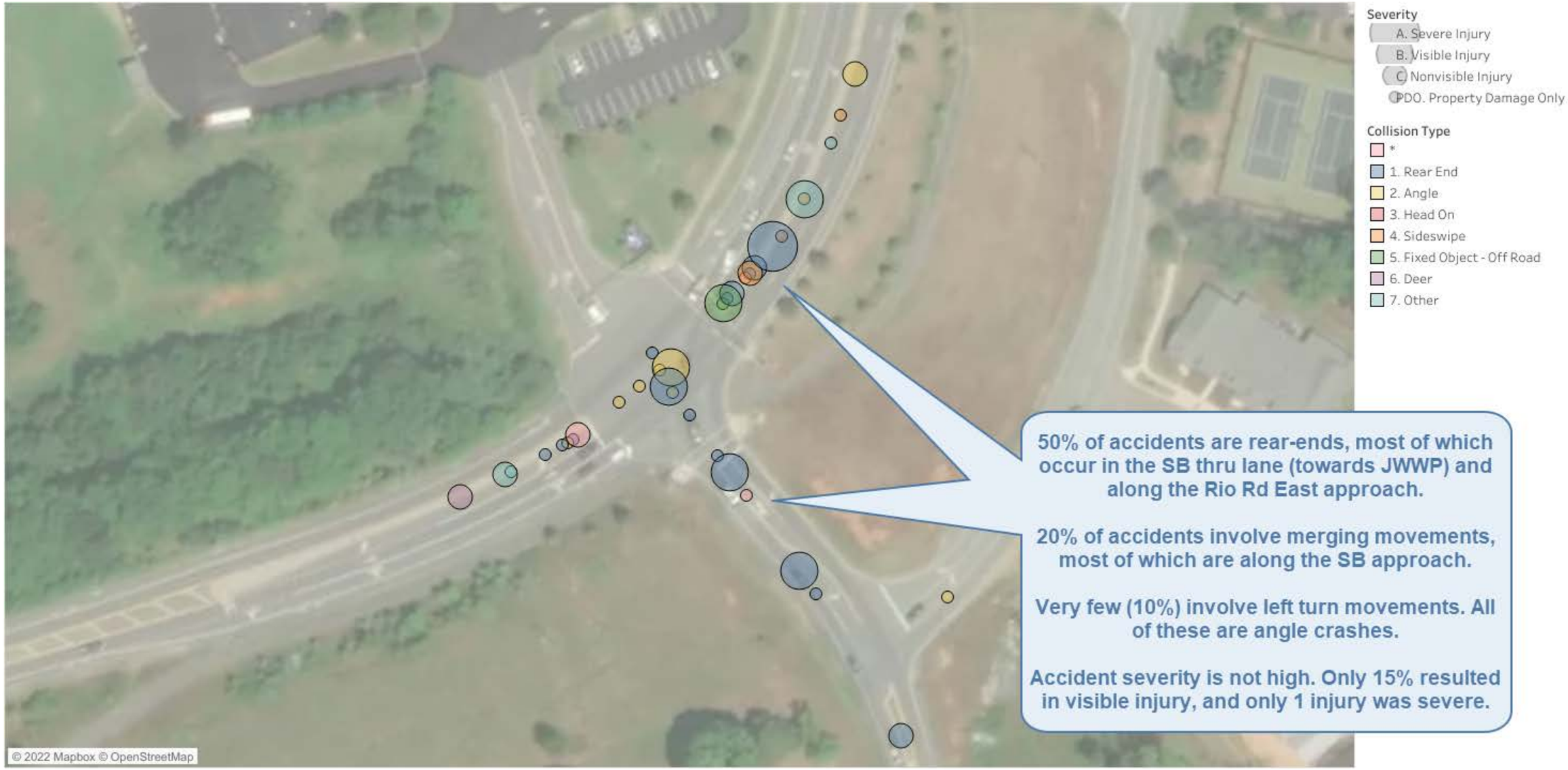
HILLSDALE DRIVE



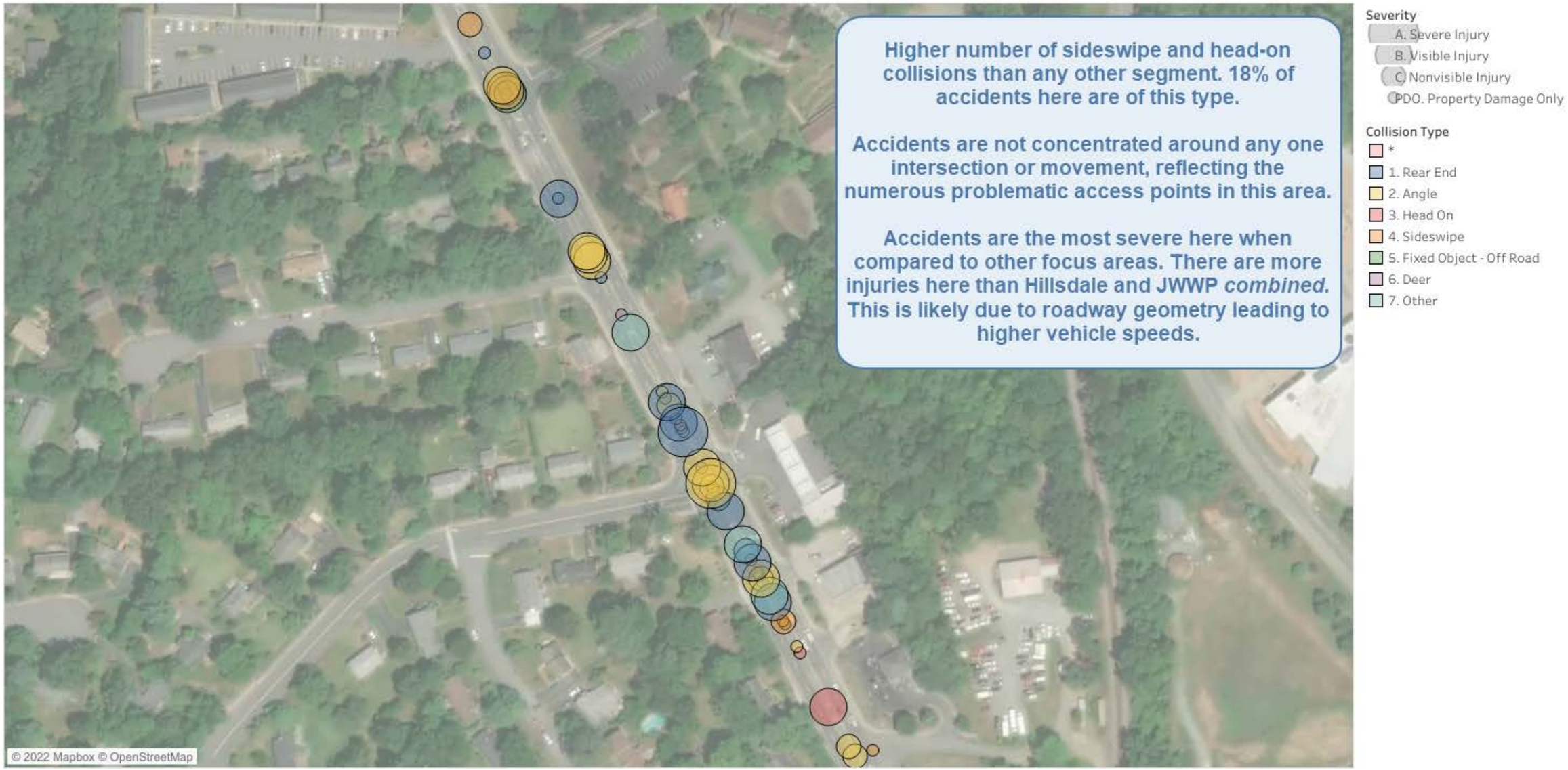
BELVEDERE BOULEVARD

APPENDIX E5: ENGINEERING ASSESSMENT | CRASH ANALYSIS

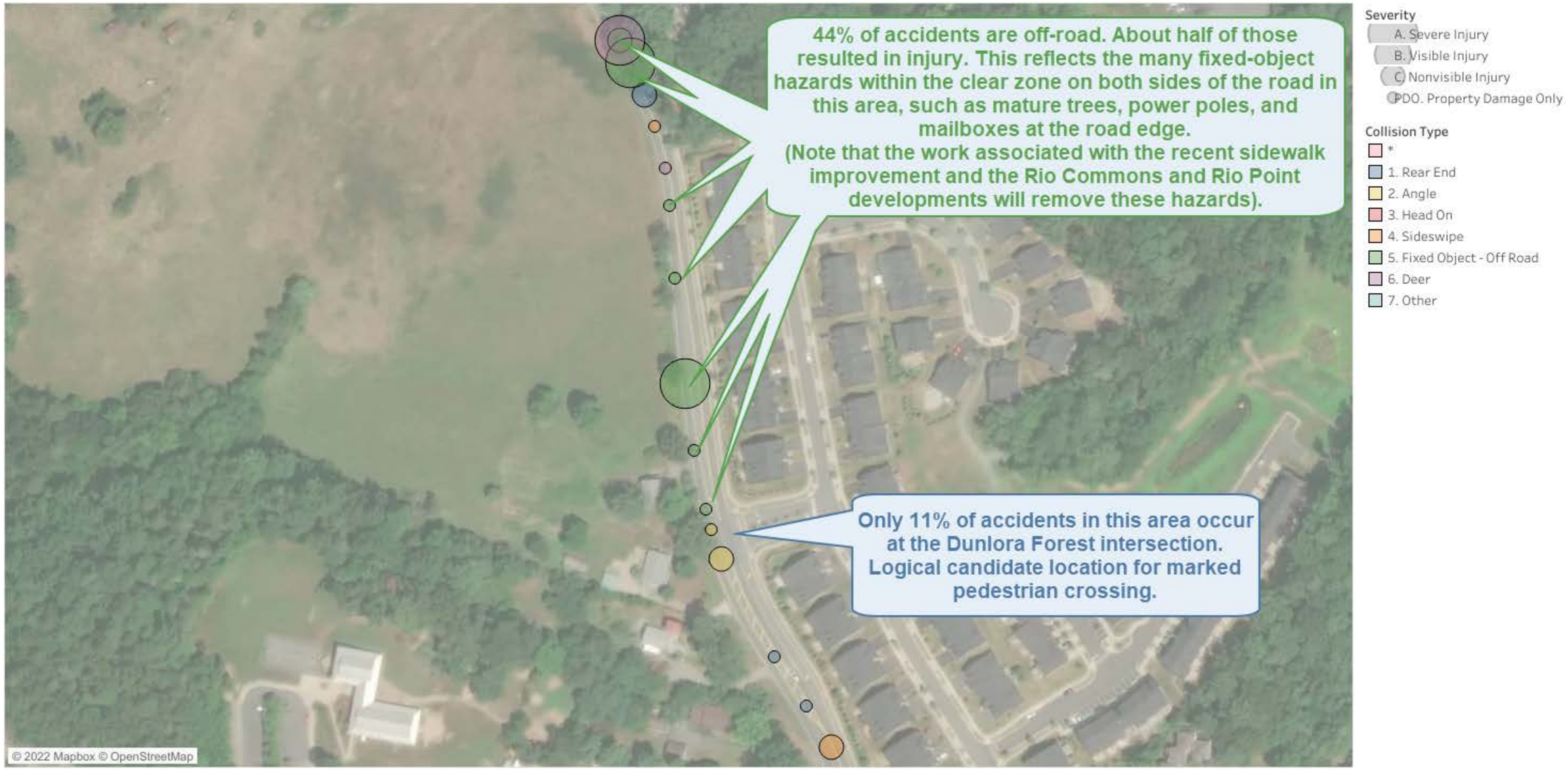
JOHN W. WARNER PARKWAY



GASOLINE ALLEY



FUTURE RIO POINT FRONTAGE AREA



PEN PARK ROAD

TOWNE LANE


String of rear-end accidents all involve left turn movement into Towne Ln. No left turn lane currently exists. Roadway appears wide enough to accommodate turn lane.
Single accident resulting from illegal turn. Community members report many drivers illegally maneuver around splitter island. Further physical restrictions recommended.
© 2022 Mapbox © OpenStreetMap
Severity
A. Severe Injury
B. Visible Injury
C. Nonvisible Injury
PDO. Property Damage Only
Collision Type
*
1. Rear End
2. Angle
3. Head On
4. Sideswipe
5. Fixed Object - Off Road
6. Deer
7. Other

PEN PARK LANE

STONEHENGE ROAD

AGNESE STREET

APPENDIX E5: ENGINEERING ASSESSMENT | CRASH ANALYSIS

BROOKWAY DRIVE AND ALWOOD LANE AREA

Transportation Modeling Overview

INTRODUCTION

The Rio29 area consists of mixed use development and exhibits relatively high traffic volumes due to the presence of several shopping centers and the Fashion Square Mall. Though current travel patterns are driven by these commercial centers, Albemarle County is examining the need for connectivity improvements given anticipated future land use and the desire to accommodate all modes of transportation. To aid in the planning process, Kimley-Horn has estimated future travel demand and performed intersection-level traffic analyses to determine possible future intersection performance. The purpose of their work was to provide an existing network year of failure and a summary of operations under each build scenario at the following four intersections:

- Rio Road at Hillsdale Drive/Putt Putt Drive
- Rio Road at Fashion Square/Albemarle Square
- Rio Road at US 29
- Rio Road at Berkmar Drive

The results of this analysis were used to develop recommended intersection configurations and may be utilized by Albemarle County to prioritize implementation. All analyses were performed assuming a base year of 2018 and a future year of 2045.

SUMMARY OF MODELING METHOD

A small area model was developed in TransCAD using existing intersection turning movement counts during the PM peak hour to develop a base year origin-destination (O-D) matrix. This base year O-D matrix was compared at an aggregate level to the current Charlottesville regional model and calibrated to the base year O-D matrix from the regional model.

Based on proposed land use in the area, future site trips in the model traffic analysis zones (TAZs) were calculated using TransCAD's traffic impact analysis (TIA) tool. Using the growth factor method, these future site trips were distributed based on the base year O-D matrix to create a future year O-D matrix. External station traffic volumes were grown based on historic information and engineering judgment and adjusted in the future year network. Finally, volumes in the final future year O-D matrix were reduced by assuming internal capture and transit/non-motorized trip utilization will total 10%.

TRAFFIC FORECASTING AND INTERSECTION-LEVEL ANALYSIS

Using outputs from the small area model, traffic volumes and turning movement counts were estimated for the PM peak period under the following build scenarios:

- 2018 No-Build – Existing Conditions
- 2018 No-Build (Interim analysis at US 29) – Existing Conditions with only a single through lane in each direction of Rio Road at US 29 to accommodate bike lanes
- 2045 No-Build (with existing land use) – Existing network with existing land uses grown at 1% per year to 2045
- 2045 No-Build (with proposed land use) – Existing network with future proposed land uses
- 2045 Build 1 – Future proposed network and future proposed land uses
  - Right-in/right-out at Fashion Square/Albemarle Square
  - Signal control at Berkmar Drive, US 29, and Hillsdale Drive/Putt Putt Place
- 2045 Build 2 – Future proposed network and future proposed land uses
  - Right-in/right-out at Fashion Square/Albemarle Square
  - Roundabouts at Berkmar Drive, US 29 ("dog bone" configuration), and Hillsdale Drive/Putt Putt Place

In each case, raw model outputs were adjusted where it was deemed necessary to facilitate network volume balancing or correct model bias. These traffic volumes were used as inputs in Synchro Version 9 and SIDRA Intersection Version 8.0, and operational measures of effectiveness—levels of service (LOS), delays, and volume-to-capacity ratios—were calculated for each intersection as summarized in **Tables 1-4** below.

TABLE 1: RIO ROAD AT HILLSDALE DRIVE/PUTT PUTT PLACE

Scenario	LOS (Delay [s/veh])	Maximum Volume-to-Capacity Ratio
Base Year No-Build - *Unsignalized*	SB - D (25.2) EBL - B (14.9)	-
Future Year No-Build (Existing Land Use) - *Unsignalized*	SB - E (35.0) EBL - C (18.7)	-
Future Year No-Build (Proposed Land Use) - *Unsignalized*	SB - F (153.3) EBL - C (20.4)	-
No-Build Year of Failure[A]	2025	
Future Year Build 1 - *Signalized*	D (37.5)	0.90
Future Year Build 2 - *Roundabout*	C (24.6)	0.87

[A]Based on two-way stop control and proposed land use

TABLE 2: RIO ROAD AT FASHION SQUARE/ALBEMARLE SQUARE

Scenario	LOS (Delay [s/veh])	Maximum Volume-to-Capacity Ratio
Base Year No-Build - *Signalized*	D (38.6)	0.70
Future Year No-Build (Existing Land Use) - *Signalized*	C (29.5)[A]	0.85
Future Year No-Build (Proposed Land Use) - *Signalized*	E (56.9)	0.93
No-Build Year of Failure	N/A	
Future Year Build 1 and 2 – *Unsignalized (Right-in/Right-out)*	SB - C (15.1) NB - B (14.5)	-

[A]Improvements to delay in future year based on signal timing adjustments

TABLE 3: RIO ROAD AT ROUTE 29

Scenario	LOS (Delay [s/veh])	Maximum Volume-to-Capacity Ratio
Base Year No-Build - *Signalized*	E (56.6)	0.96
Base Year No-Build Interim Solution - *Signalized*	F (86.9)	1.38
Future Year No-Build (Existing Land Use) - *Signalized*	E (70.8)	1.13
Future Year No-Build (Proposed Land Use) - *Signalized*	F (96.5)	1.27
No-Build Year of Failure[A]	2030	
Future Year Build 1 - *Signalized*	D (53.5)	0.82
Future Year Build 2 - *Roundabout*[B]	West - C (24.4) East - B (11.9)	West - 0.91 East - 0.62

[A]Based on signal control and existing land use
[B]Each half of dog bone roundabout analyzed independently

TABLE 4: RIO ROAD AT BERKMAR DRIVE

Scenario	LOS (Delay [s/veh])	Maximum Volume-to-Capacity Ratio
Base Year No-Build - *Signalized*	C (30.3)	0.72
Future Year No-Build (Existing Land Use) - *Signalized*	C (34.2)	0.86
Future Year No-Build (Proposed Land Use) - *Signalized*	D (47.2)	0.96
No-Build Year of Failure	N/A	
Future Year Build 1 - *Signalized*	C (29.9)	0.83
Future Year Build 2 - *Roundabout*	C (19.2)	0.76

EPR, P.C. "Engineering & Planning Resources"
637 Berkmar Circle, Charlottesville, VA 22901

Executive Summary

This report provides a summary of the traffic impact analysis for the Arden II project located on the north side of Rio Road between Albemarle Square Drive and Putt Putt Place (Albemarle County parcels 06100-00-00-124E0, 06100-00-00-124F0, and 06100-00-00-124G0) in support of the special use permit application for Phase I only (Figure 1). While it is anticipated that the project will consist of two phases, only Phase 1 is considered in this study (Figure 2).

The proposed land use includes: 150 apartments, a 120 room hotel, and a 50,000 square foot self-storage facility. The trip generation for the site is shown in the table below.

Site Trip Generation

item	LU	unit	qty	daily	AM			PM		
					in	out	total	in	out	total
apartments	220	du	150	1033	15	62	77	65	35	100
hotel	310	or	120	1070	46	34	80	42	42	84
self-storage	151	ksf	50	125	4	3	7	7	6	13
			totals	**2228**	**65**	**99**	**164**	**114**	**83**	**197**

Access to the site will be provided via Putt Putt Place and no connection is assumed between the project and Albemarle Square for this phase. The site trip distribution agreed upon by VDOT staff is shown in Figure 6.

Included within this study are analyses of existing conditions, future no build conditions, and future build conditions for the year 2020 at the following intersections with Rio Road: Albemarle Square Drive/Mall Drive, Putt Putt Place, Old Brook Road, and Hillsdale Drive/Northfield Road.

The analyses indicate that additional queue storage is needed today unrelated to the project at the locations listed below. It should be noted that this entire corridor is part of a small area plan currently underway. Phase II of the Rio/29 Small Area Plan project, expected to be complete in October 2017, will include further study of these intersections and a transportation plan.

- Albemarle Square Drive and Mall Drive – eastbound left turn lane, westbound left turn and right turn lanes,
- Old Brook Road – eastbound and westbound left turn lanes, southbound right turn lane, and
- Northfield Road and Hillsdale Drive – eastbound left turn lane, westbound left turn lane, and northbound shared through/left turn lane.

At the intersections of Putt Putt Place with Rio Road a traffic signal is nearly warranted today and with the addition of the future site traffic is warranted. With signalization, the intersection it is expected to operate at LOS A overall and LOS C or better for all movements.

It is recommended that a traffic signal be installed at the intersection and that it be coordinated with the nearby Albemarle Square Drive/Mall Drive traffic signal. Due to the spacing between these two intersections a design exception will be required. It is also recommended that the westbound right turn lane be extended 50 feet to accommodate the increased queue.

Conclusions and Recommendations

The traffic associated with Arden II Phase 1 will have a minimal impact on the traffic operations of the surrounding transportation network. The off-site intersections will operate at the same overall and individual movement levels of service during both peak periods analyzed with the addition of the Arden II Phase 1 site traffic.

At the intersection of Putt Putt Place with Rio Road a traffic signal is nearly warranted today and is warranted with the addition of the future site traffic. With the installation of a traffic signal at the intersection it is expected to operate LOS A overall and LOS C or better for all movements. Without a traffic signal at this intersection the southbound left turn movement is expected to operate at LOS F during both peak periods.

It is recommended that a traffic signal be installed at the intersection and that it be coordinated with the nearby Albemarle Square Drive and Mall Drive traffic signal. Due to the spacing between these two intersections a design exception will be required. It is also recommended that the westbound right turn lane be extended 50 feet to accommodate the increased queue.

Unrelated to the Arden II Phase 1 project, the following improvements are needed and will improve traffic operations at the study area intersections.

Rio Road at Albemarle Square Drive and Mall Drive – Extension of the westbound left and right turn lanes is needed to accommodate the existing queues. To extend the turn lanes the curb line along the median and outside lane will need to be adjusted.

Extension of the eastbound left turn lane is also needed to accommodate existing queues. This is problematic because this turn lane is positioned back-to-back with the Route 29 dual westbound left turn lanes.

Rio Road at Old Brook Road – Extension of the eastbound left turn lane and southbound right turn lane is needed to accommodate the existing queues. It appears that these improvements may be possible with markings only.

Rio Road at Northfield Road and Hillsdale Drive – Extension of the westbound left turn lane and northbound shared through/left turn lane is needed to accommodate the existing queues. It appears that these improvements are possible with markings only.

Rio Road at Old Brook Road, Northfield Road, and Hillsdale Drive – It is not possible to extend the turn lanes between the two signalized intersections. However, it should be noted that the queues extend beyond the provided storage by less than a car length.

It is recommended that the operational deficiencies noted above not be addressed until the completion of the larger Rio/29 Small Area Plan traffic study.

APPENDIX F: TRAFFIC STUDY EXCERPTS (BY OTHERS)

Table 1 - John Warner Parkway & Rio Road E AM/PM (HCM6) Results

Approach	Movement	AM Peak Hour: 7:00 - 8:00 AM			PM Peak Hour: 4:45 - 5:45 PM		
		V/C	Delay (s) [LOS]	95 % Queue (ft)	V/C	Delay (s) [LOS]	95 % Queue (ft)
Eastbound (Driveway)	Left-Through	0.11	97.7 [F]	25	0.24	91.7 [F]	50
	Right	0.0	0.0 [A]	0	0.01	65.8 [E]	0
	Approach	-	**97.7 [F]**	-	-	**87.0 [F]**	-
Westbound (Rio)	Left	>1.0	305.7 [F]	200	>1.0	390.1 [F]	125
	Through	0.0	0.0 [A]	225	0.0	0.0 [A]	650
	Right	>1.0	203.1 [F]	225	>1.0	204.0 [F]	650
	Approach	-	223.7 [F]	-	-	217.9 [F]	-
Northbound (John Warner)	Left	0.01	13.2 [B]	25	0.04	16.2 [B]	25
	Through-Right	0.27	16.4 [B]	325	0.43	24.9 [C]	675
	Approach	-	**16.4 [B]**	-	-	**24.7 [C]**	-
Southbound (Rio)	Left	0.72	11.4 [B]	275	0.96	40.2 [D]	600
	Through	0.55	12.7 [B]	550	0.49	12.7 [B]	525
	Right	0.01	6.6 [A]	0	0.03	7.6 [A]	0
	Approach	-	12.2 [B]	-	-	25.2 [C]	-
Overall Intersection		-	**68.6 [E]**	-	-	**72.5 [E]**	-

Table 2 - Belvedere Boulevard & Rio Road E AM/PM (HCM6) Results

Approach	Movement	AM Peak Hour: 7:00 - 8:00 AM			PM Peak Hour: 4:45 - 5:45 PM		
		V/C	Delay (s) [LOS]	95 % Queue (ft)	V/C	Delay (s) [LOS]	95 % Queue (ft)
Eastbound (Driveway)	Left-Through-Right	0.0	0.0 [A]	-	0.01	15.9 [C]	0
	Approach	-	**0.0 [A]**	-	-	**15.9 [C]**	-
Westbound (Belvedere)	Left - Through	>1.0	>500.0 [F]	225	8	>500.0 [F]	175
	Right	0.17	15.0 [C]	25	0.42	30.1 [D]	50
	Approach	-	**313.9 [F]**	-	-	**>500.0 [F]**	-
Northbound (Rio)	Left	-	0.0 [A]	0	-	0.0[A]	0
	Through-Right	-	0.0 [A]	0	-	0.0 [A]	0
	Approach	-	**0 [A]**	-	-	**0 [A]**	-
Southbound (Rio)	Left	0.04	12.7 [B]	25	0.26	25.1 [D]	25
	Through	-	0.0 [A]	-	-	0.0 [A]	0
	Right	-	0.0 [A]	-		0.0 [A]	0
	Approach	-	**0.2 [A]**	-		**1.0 [A]**	-
Overall Intersection		-	**19.8 [C]**	-	-	**49.0 [E]**	-

FINDINGS AND RECOMMENDATIONS

The following summarizes the findings of the analyses conducted and recommendations based on conceptual design development.

Existing Operations Summary

- Existing traffic operations show that all intersections experience delays resulting in LOS E and F during both the AM and PM peak hours.
  - Belvedere Boulevard & Rio Road E show delays exceeding 500 second per vehicle from the stop-controlled approaches due to through volumes on Rio Road E.
  - Turning volumes at John Warner Parkway & Rio Road E experience delays higher than 300 seconds per vehicle during both AM and PM peak hours.

Crash Summary

- A total of 63 crashes occurred in the study area between January 2014 and May 2019; no fatalities were recorded.
- Crashes are predominantly concentrated at the three study intersections with less crashes on the roadway segments between intersections.
- Rear-end crashes are the most common crash type and clustered around three of the four approaches at John Warner Parkway & Rio Road E.

VJuST Results

- VJuST screening and supplemental analysis identified a ***roundabout*** as the recommended alternative when compared to existing and other alternatives to advance for **John Warner Parkway & Rio Road E**.
- VJuST screening and supplemental analysis identified a ***restricted crossing U-turn (RCUT)*** as the recommended alternative when compared to existing and other alternatives to advance for **Belvedere Boulevard & Rio Road E**.

Proposed Design Concepts

- John Warner Parkway & Rio Road E (Roundabout)
  - The roundabout requires dual lanes for the northbound (John Warner Parkway) and southbound (Rio Road E) approaches to provide sufficient capacity.
  - The westbound (Rio Road E) approach requires a right-turn bypass lane.
  - The existing southbound left-out movement at the adjacent Dunlora Drive & Rio Road E intersection should be restricted and instead require drivers to U-turn through the roundabout to accomplish this maneuver.
  - Right-of-way acquisitions are anticipated (4 partial takes) in the northwest, southwest, and southeast quadrants.
  - Planning-level cost estimate is $7,144,000 (2020 dollars) excluding right-of-way costs.
- Belvedere Boulevard & Rio Road E (Restricted Crossing U-turn)
  - The north U-turn loon has been designed and positioned at the intersection of Greenbrier Terrace & Rio Road E to avoid impacting the bridge to the south.
  - The north RCUT U-turn loon is designed to accommodate a fire truck and school bus.
  - The south RCUT U-turn is anticipated to use the proposed roundabout at John Warner Parkway & Rio Road E.
    - If RCUT is implemented without the proposed roundabout, the signal

RAMEY KEMP ASSOCIATES
Moving forward.

T 804 217 8560
4343 Cox Road
Glen Allen, VA 23060

May 24, 2021

Mr. Kevin McDermott
Albemarle County
401 McIntire Road
Charlottesville, Virginia 22902
Phone: (434) 296-5832

Reference: Rio Point –Traffic Impact Analysis (TIA) ***- Revised***

Dear Mr. McDermott,

Ramey Kemp & Associates, Inc. (RKA) has performed a Traffic Impact Analysis (TIA) for the proposed 328-unit multi-family development located on the southwest corner of the Rio Road at John Warner Parkway / CATEC Driveway intersection. The access plan includes one full-movement driveway and one right-in only driveway on Rio Road and a stub-out for a future connection on the south side of the property. If approved, the proposed development is expected to be built in 2023. Figure 1 shows the site location and study intersections, and Figure 2 shows the preliminary site plan.

The purpose of this letter report is to provide the following:

- Trip generation calculations
- Evaluation of turn lane warrants for the site driveways
- Capacity and queueing analysis of the study intersections

Existing Roadway Conditions
Route 631 (Rio Road) is a four-lane divided Minor Arterial with a 2019 Virginia Department of Transportation (VDOT) average daily traffic (ADT) volume of approximately 28,000 vehicles per day (vpd) and a posted speed limit of 35 miles per hour (mph) north of the John Warner Parkway intersection. Rio Road becomes a two-lane Major Collector with a posted speed limit of 35 mph south of the John Warner Parkway intersection. South of the Pen Park Road / Waldorf School Road intersection, the approximate 2019 VDOT ADT of Rio Road is 9,300 vpd.

Route 2500 (John Warner Parkway) is a two-lane Minor Arterial with a posted speed limit of 35 mph in the vicinity of the site and does not have a VDOT published ADT volume. Based on discussion with the County, the ADT is approximately 17,500 vpd.

Route 768 (Pen Park Road) is a two-lane local road with a 2019 VDOT ADT volume of approximately 4,400 vpd, and a posted speed limit of 35 mph in the vicinity of the site.

Route 1177 (Dunlora Drive) is a two-lane local road with a 2019 VDOT ADT volume of approximately 2,400 vpd, and a posted speed limit of 35 mph in the vicinity of the site.

Table 1
ITE Trip Generation – Belvedere Residential – Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	190 homes	938	938	35	106	118	70
Multifamily Housing (Low-Rise) (220)	90 units	330	330	10	33	34	20
Total Trips		**1,268**	**1,268**	**45**	**139**	**152**	**90**

Table 2
ITE Trip Generation – Dunlora Park Residential – Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	28 homes	161	161	6	19	19	11
Multifamily Housing (Low-Rise) (220)	14 units	51	51	1	6	6	4
Total Trips		**212**	**212**	**7**	**25**	**25**	**15**

Figures 7 and 8 show the trip distribution and assignment for Dunlora Park Residential.

Lochlyn Hill Residential is partially built-out, with 129 single family homes and 14 townhomes remaining to be built and is located on the south side of Pen Park Lane. The ITE trip generation potential of Lochlyn Hill Residential is shown in Table 3.

Table 3
ITE Trip Generation – Lochlyn Hill Residential – Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	129 homes	657	657	24	72	82	48
Multifamily Housing (Low-Rise) (220)	14 units	51	51	1	6	6	4
Total Trips		**708**	**708**	**25**	**78**	**88**	**52**

The SOCA Fieldhouse is a proposed indoor soccer fieldhouse, to be located at the end of Belvedere Boulevard. In addition to one indoor field, the development plan also includes a synthetic field, 3 full-sized natural surface fields, and 2 half-sized natural surface fields, all of which will be outdoors. The ITE trip generation potential of the SOCA Fieldhouse is shown in Table 4.

Table 4
ITE Trip Generation – SOCA Fieldhouse – Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Average Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Soccer Complex (488)	8 fields	286	286	5	3	96	50

Figures 11 and 12 show the trip distribution and assignment for the SOCA Fieldhouse.

The Center at Belvedere is a recreation center for senior citizens, located on Belvedere Road. The project is set to be constructed in two phases, with the first phase, a 43,240 s.f. recreation center, already built out. An additional 16,760 s.f. building is planned to be constructed in the future. The ITE trip generation potential of The Center at Belvedere is shown in Table 5.

Table 5
ITE Trip Generation – The Center at Belvedere (Senior Center) – Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Phase 1 – Recreational Community Center[1] (495)	43,240 s.f.	623	623	50	26	47	53
Phase 2 – Recreational Community Center[1] (495)	16,760 s.f.	242	242	19	10	18	21
Total Trips		**865**	**865**	**69**	**36**	**65**	**74**

1. ITE has no data for a senior recreation center. The trip generation estimates shown are for a standard recreational community center (all ages) and likely over-estimate the number of trips that would be generated by the proposed use.

Figures 13 and 14 show the trip distribution and assignment for The Center at Belvedere. The total approved development trips are shown in Figure 15. The total approved development trips were combined with the background growth to estimate the 2023 no-build traffic volumes, which are shown in Figure 16. Additionally, Figure 17 shows a 2023 no-build scenario including the construction of the planned roundabout.

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Trip Generation
The trip generation potential of the proposed neighborhood during a typical weekday, AM peak hour, and PM peak hour was estimated using the methodologies published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual – 10th Edition*. Table 6 summarizes the trip generation calculations.

Table 6
ITE Trip Generation – Typical Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Average Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Multifamily Housing (Mid-Rise) (221)	328 units	893	893	31	87	85	54

It should be noted that Rio Road is an existing transit corridor, and some of the future residents living along Rio Road will likely use the transit service. This will reduce the number of vehicles on Rio Road. To be conservative, this reduction was not applied to the trip generation potential of the site or the surrounding approved developments.

Site Traffic Distribution
The following site traffic distribution was applied based on coordination with the County and VDOT:

- 32% to / from the north on Rio Road
- 32% to / from the south on Rio Road
- 31% to / from the south on John Warner Parkway
- 2% to / from the east on Pen Park Road
- 1% to / from the south on Waldorf School Road
- 1% to / from the north on CATEC Driveway
- 1% to / from the north on Dunlora Drive

Figures 18 and 19 show the site trip distribution and site trip assignment, respectively. Figure 20 shows the projected 2023 build-out peak hour traffic volumes without improvements and Figure 21 shows the projected 2023 build-out volumes with a roundabout.

VDOT Turn Lane Warrant Analysis
The projected build-out AM and PM peak hour traffic volumes at the proposed site driveways were compared to the turn lane warrants in the Virginia Department of Transportation (VDOT) *Access Management Design Standards for Entrances and Intersections*:

Rio Road at Right-in Only Driveway:

- A southbound right-turn taper on Rio Road is warranted in the PM peak hour only

Rio Road at Full-Movement Driveway:

- A northbound left-turn lane on Rio Road is warranted
- A southbound right-turn taper on Rio Road is warranted in the PM peak hour only

Task Order: Task Order 2.002 – Rio Road and Pen Park Intersection Analysis

EXISTING OPERATIONS SUMMARY

Table 1 – Existing (2018) AM/PM HCM 2010 Results

Approach	Movement	AM Peak Hour: 7:00 - 8:00 AM			PM Peak Hour: 4:45 - 5:45 PM		
		V/C	Delay (s) [LOS]	95 % Queue (ft)	V/C	Delay (s) [LOS]	95 % Queue (ft)
Eastbound	Left / Through / Right	0.05	17.0 [B]	<25	0.03	31.3 [C]	<25
	Approach	-	**29.7 [C]**	-	-	**31.8 [C]**	-
Westbound	Left / Through	0.56	34.2 [C]	175	0.22	32.6 [C]	50
	Right	0.83	36.1 [D]	225	0.65	35.6 [D]	75
	Approach	-	**35.3 [D]**	-	-	**34.4 [C]**	-
Northbound	Left	0.08	9.7 [A]	<25	0.06	5.7 [A]	<25
	Through	0.52	16.2 [B]	325	0.51	10.5 [B]	300
	Right	0.20	12.1 [B]	100	0.08	6.6 [A]	25
	Approach	-	**14.8 [B]**	-	-	**9.8 [A]**	-
Southbound	Left	0.35	10.4 [B]	75	0.20	6.4 [A]	25
	Through	0.40	12.4 [B]	250	0.35	7.9 [A]	200
	Right	0.03	9.0 [A]	<25	0.02	5.6 [A]	<25
	Approach	-	**11.7 [B]**	-	-	**7.5 [A]**	-
Overall Intersection		-	**18.7 [B]**	-	-	**11.1 [B]**	-

ROUNDABOUT CONCEPT

Table 7 - Year 2035 Traffic Conditions (SIDRA)* - Weekday AM/PM Peak Hours

Approach	Movement	AM Peak Hour			PM Peak Hour		
		V/C	Delay (s) [LOS]	95 % Queue (ft)	V/C	Delay (s) [LOS]	95 % Queue (ft)
Eastbound	Approach	0.01	4.7 [A]	25	0.02	5.3 [A]	25
Westbound	Approach	0.33	7.7 [A]	50	0.21	8.3 [A]	25
Northbound	Approach	0.44	7.6 [A]	75	0.67	12.2 [B]	175
Southbound	Approach	0.38	6.9 [A]	75	0.49	8.1 [A]	100
Overall Intersection		**0.44**	**7.4 [A]**	-	**0.67**	**10.2 [B]**	-

*SIDRA analysis utilizes HCM 6 roundabout capacity methodology.

A design concept is provided assuming a 100-foot inscribe circle diameter, single-lane roundabout for the Rio Road/Pen Park Road intersection.

PRELIMINARY CONCEPT COST ESTIMATE

A preliminary cost estimate of $4,522,931.00 has been determined for this roundabout conversion. A detailed itemized estimated is attached.

Table 5 – Intersection Results from vJuST Tool – AM Peak Hour

Intersection Results AM Peak Hour			
	Congestion	Pedestrian	Safety
Type	Maximum V/C	Accommodation Compared to Traditional Diamond	Weighted Total Conflict Points
Conventional	0.37		48
Partial Median U-Turn	0.36	+	28
Restricted Crossing U-Turn	0.31		20
Roundabout	0.49		8

Table 6 – Intersection Results from vJuST Tool – PM Peak Hour

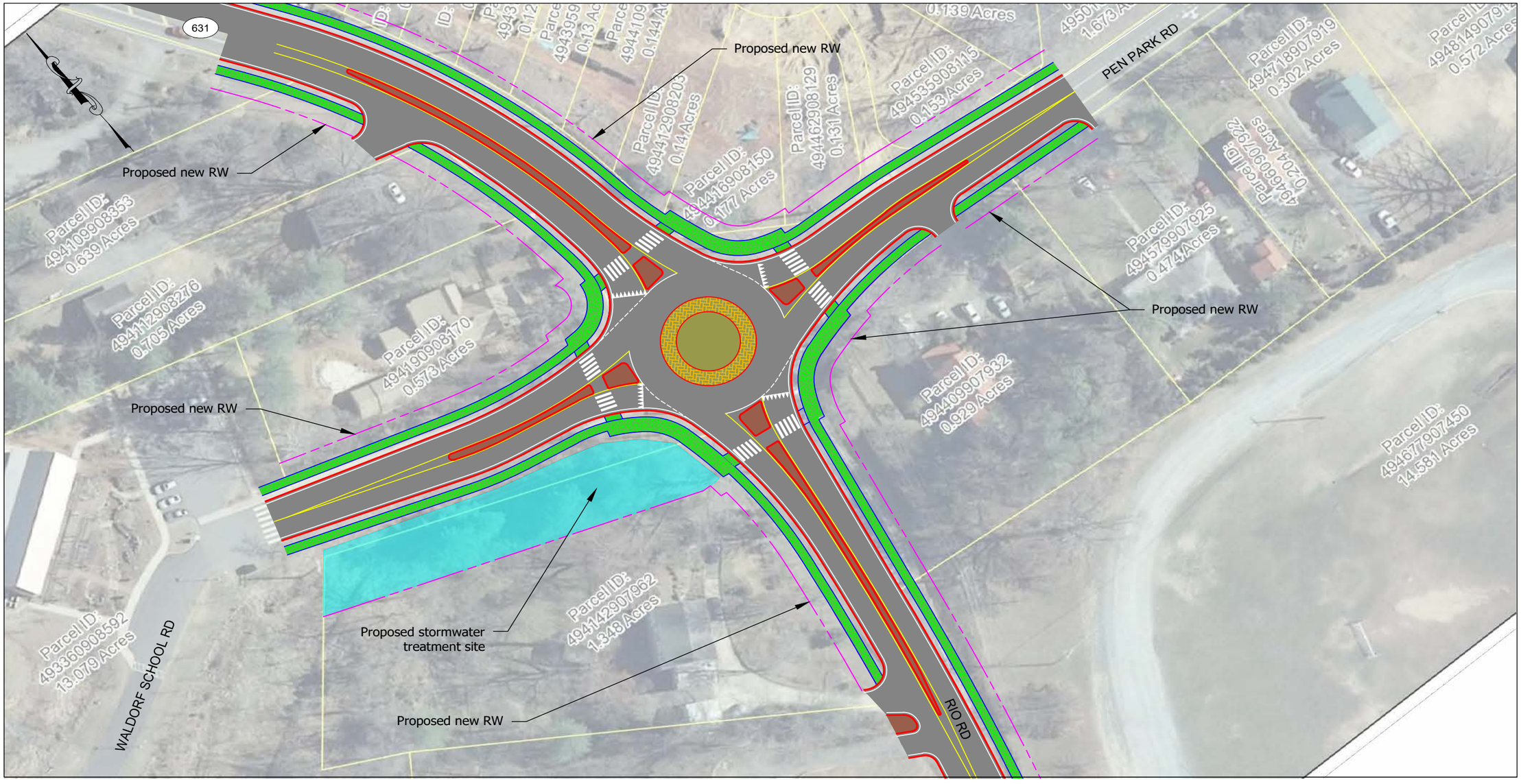
Intersection Results PM Peak Hour			
	Congestion	Pedestrian	Safety
Type	Maximum V/C	Accommodation Compared to Traditional Diamond	Weighted Total Conflict Points
Conventional	0.35		48
Partial Median U-Turn	0.32	+	28
Restricted Crossing U-Turn	0.29		20
Roundabout	0.74		8

Reviewing vJuST results, all options performed well from a congestion perspective, however some intersection forms such as the partial median U-turn and the restricted crossing U-turn would likely have major impacts to the surrounding residential developments. A roundabout is a major safety improvement over the conventional signalized intersection and is likely a better fit for this location.

KITTELSON RECOMMENDATION – Roundabout

Kittelson & Associates, Inc. *Reston, Virginia*

VDOT TMPD Intersection Analysis *June 2018*



Scale: 1" = 60'

60 30 0 60

Roundabout Conceptual Design - DRAFT
Route 631 (Rio Road) / Pen Park Road
Albemarle County, VA

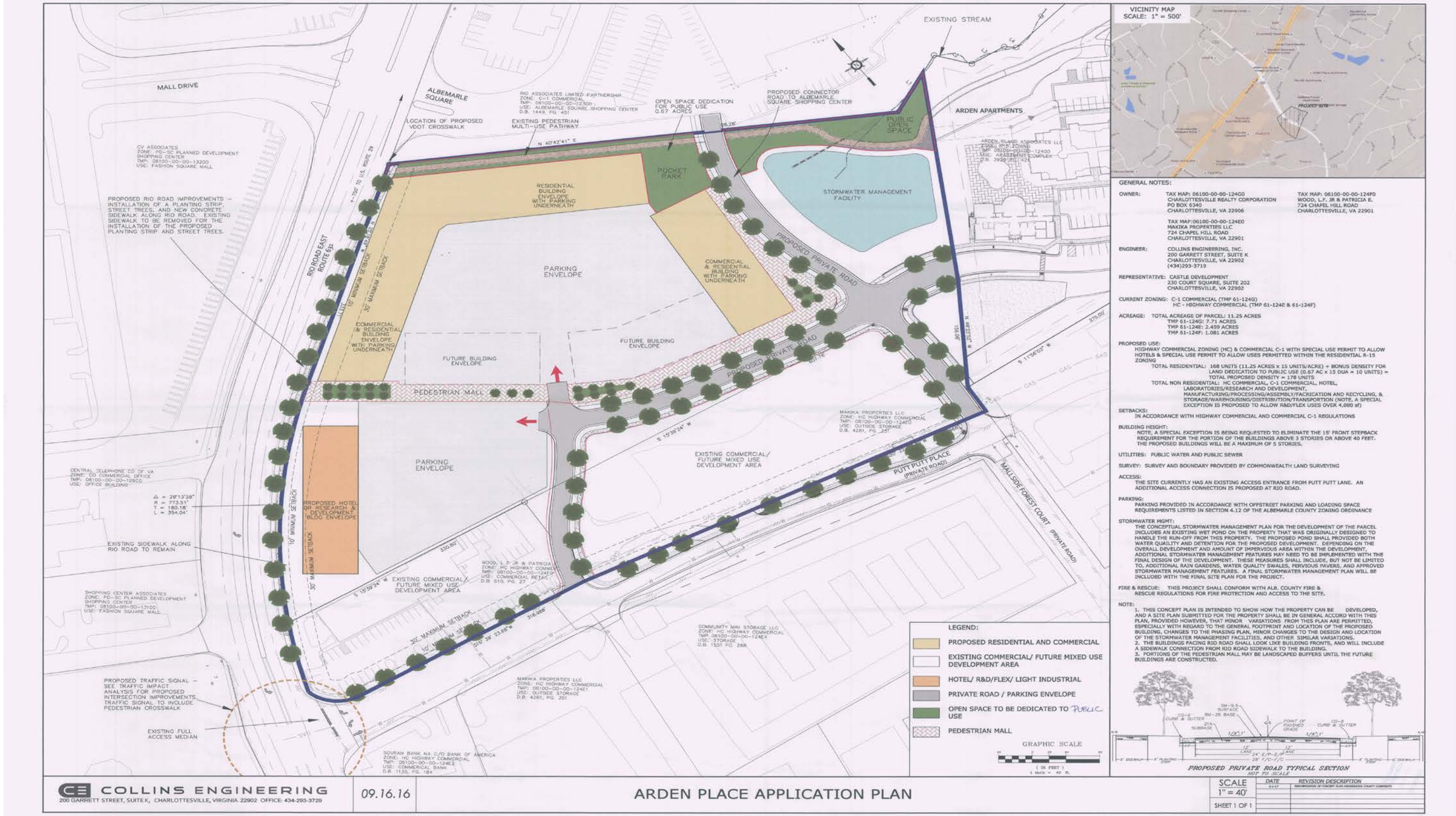
Task 2.002

H:\22\22637 - Rio Rd & Pen Park Rd Analysis\design_Models\22637_base_concept-mini.dwg Jul 20, 2018 - 1:56pm - jcrisafi Layout Tab: Layout1

KITTELSON & ASSOCIATES

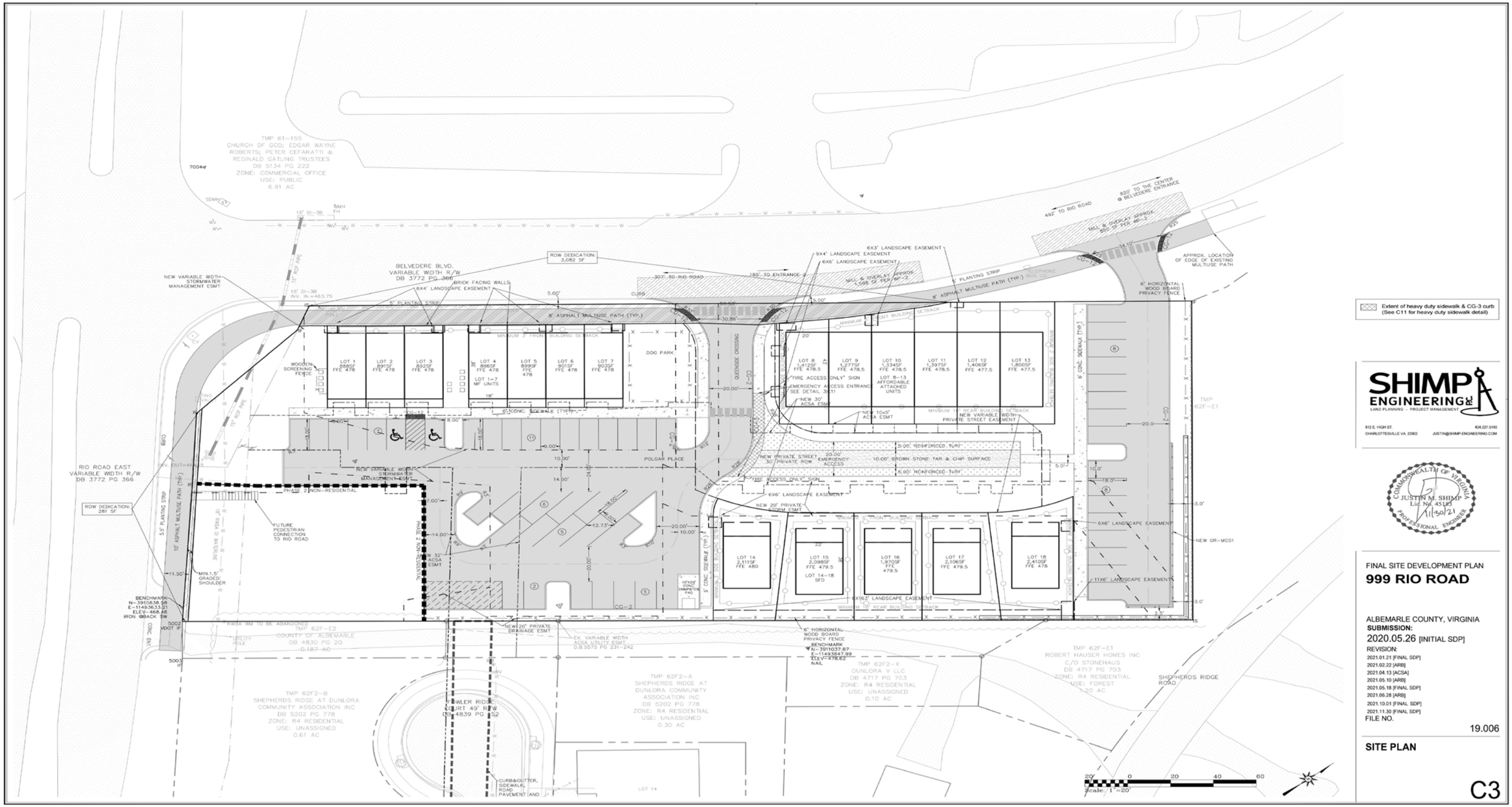
APPENDIX G: ADJACENT DEVELOPMENT PLANS

SP201600023 ARDEN PLACE (SEPTEMBER 2016) COLLINS ENGINEERING



APPENDIX G: ADJACENT DEVELOPMENT PLANS

SDP202100009 999 RIO (NOVEMBER 2021) SHIMP ENGINEERING, PC



SHIMP ENGINEERING PC
LAND PLANNING · PROJECT MANAGEMENT
912 E. HIGH ST. CHARLOTTESVILLE VA, 22902
434.227.5140 JUSTIN@SHIMP-ENGINEERING.COM

COMMONWEALTH OF VIRGINIA
JUSTIN M. SHIMP
Lic. No. 45183
11/30/21
PROFESSIONAL ENGINEER

FINAL SITE DEVELOPMENT PLAN

999 RIO ROAD

ALBEMARLE COUNTY, VIRGINIA

SUBMISSION:
2020.05.26 [INITIAL SDP]

REVISION:
2021.01.21 [FINAL SDP]
2021.02.22 [ARB]
2021.04.13 [ACSA]
2021.05.10 [ARB]
2021.05.18 [FINAL SDP]
2021.06.28 [ARB]
2021.10.01 [FINAL SDP]
2021.11.30 [FINAL SDP]

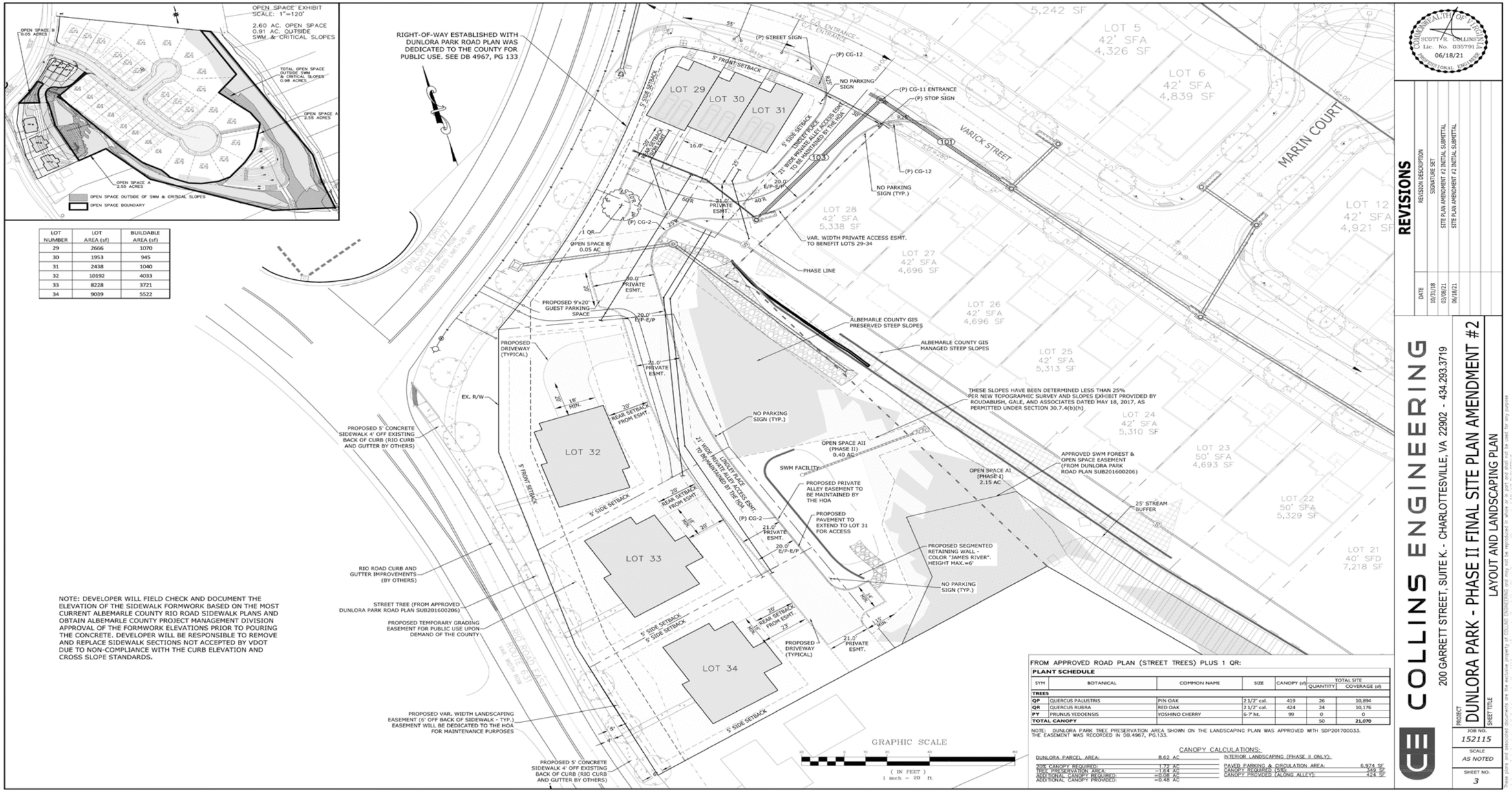
FILE NO. 19.006

SITE PLAN

C3

APPENDIX G: ADJACENT DEVELOPMENT PLANS

SDP202100023 DUNLORA PARK - PHASE II SPA#2 (JUNE 2021) COLLINS ENGINEERING



LOT NUMBER	LOT AREA (sf)	BUILDABLE AREA (sf)
29	2666	1070
30	1953	945
31	2438	1040
32	10192	4033
33	8228	3721
34	9039	5522

NOTE: DEVELOPER WILL FIELD CHECK AND DOCUMENT THE ELEVATION OF THE SIDEWALK FORMWORK BASED ON THE MOST CURRENT ALBEMARLE COUNTY RIO ROAD SIDEWALK PLANS AND OBTAIN ALBEMARLE COUNTY PROJECT MANAGEMENT DIVISION APPROVAL OF THE FORMWORK ELEVATIONS PRIOR TO POURING THE CONCRETE. DEVELOPER WILL BE RESPONSIBLE TO REMOVE AND REPLACE SIDEWALK SECTIONS NOT ACCEPTED BY VDOT DUE TO NON-COMPLIANCE WITH THE CURB ELEVATION AND CROSS SLOPE STANDARDS.

FROM APPROVED ROAD PLAN (STREET TREES) PLUS 1 QR:

PLANT SCHEDULE

SYM	BOTANICAL	COMMON NAME	SIZE	CANOPY (sf)	TOTAL SITE QUANTITY	TOTAL SITE COVERAGE (sf)
TREES						
QP	QUERCUS PALUSTRIS	PIN OAK	2 1/2" cal.	419	26	10,894
QR	QUERCUS RUBRA	RED OAK	2 1/2" cal.	424	24	10,176
PY	PRUNUS YEDOENSIS	YOSHINO CHERRY	6-7' ht.	99	0	0
TOTAL CANOPY					50	21,070

NOTE: DUNLORA PARK TREE PRESERVATION AREA SHOWN ON THE LANDSCAPING PLAN WAS APPROVED WITH SDP201700033. THE EASEMENT WAS RECORDED IN DB 4967, PG.133.

CANOPY CALCULATIONS:

DUNLORA PARCEL AREA:	8.62 AC	INTERIOR LANDSCAPING (PHASE II ONLY):	
SITE CANOPY REQUIRED:	1.73 AC	PAVED PARKING & CIRCULATION AREA:	6,974 SF
TREE PRESERVATION AREA:	-1.64 AC	CANOPY REQUIRED (5%):	349 SF
ADDITIONAL CANOPY REQUIRED:	=0.08 AC	CANOPY PROVIDED (ALONG ALLEY):	424 SF
ADDITIONAL CANOPY PROVIDED:	=0.48 AC		

COMMONWEALTH OF VIRGINIA
SCOTT R. COLLINS
Lic. No. 035791
PROFESSIONAL ENGINEER
06/18/21

REVISIONS

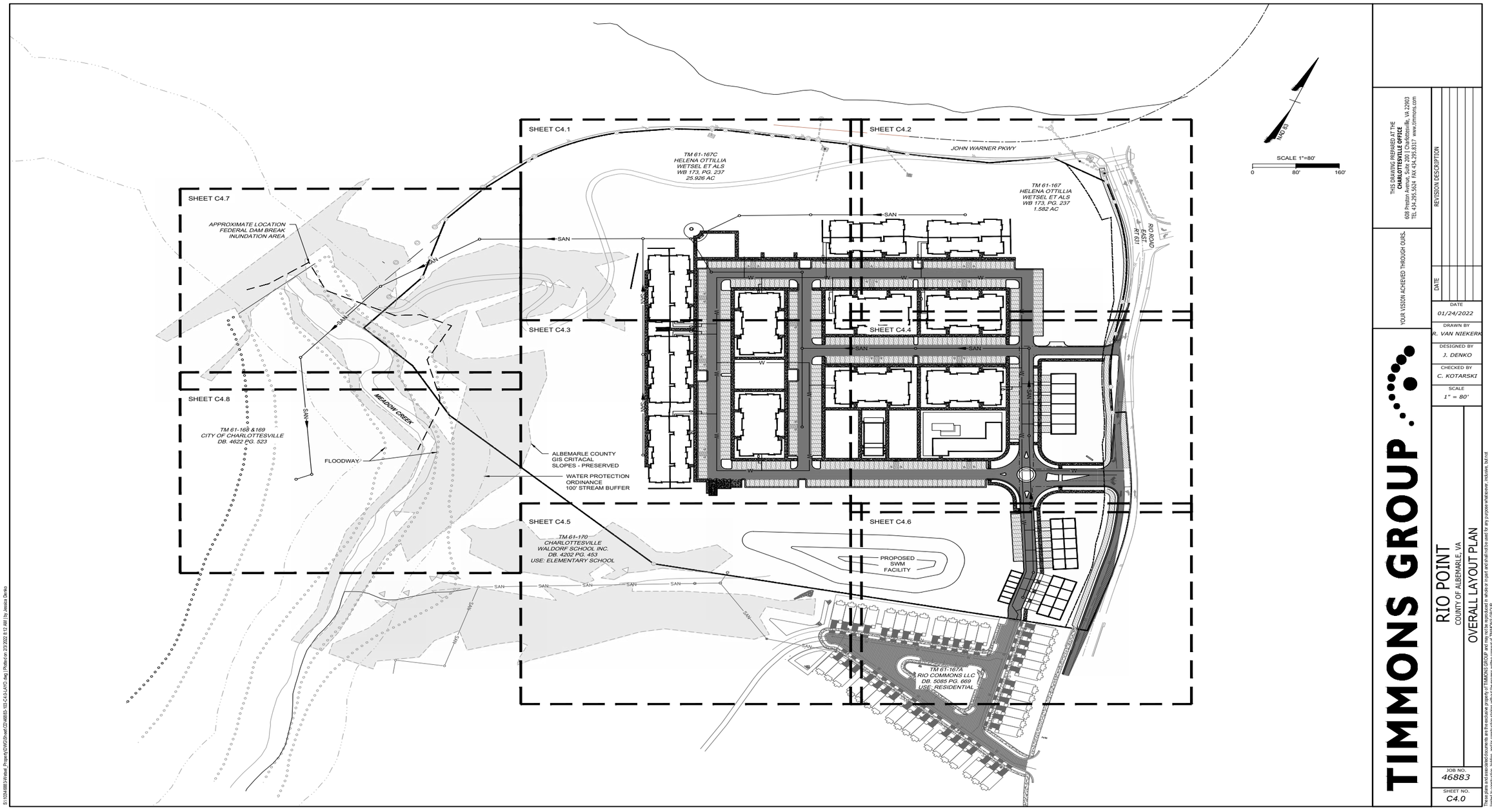
DATE	REVISION DESCRIPTION
10/31/18	SIGNATURE SET
03/08/21	SITE PLAN AMENDMENT #2 INITIAL SUBMITTAL
06/18/21	SITE PLAN AMENDMENT #2 INITIAL SUBMITTAL

COLLINS ENGINEERING
200 GARRETT STREET, SUITE K. - CHARLOTTESVILLE, VA 22902 - 434.293.3719

PROJECT: DUNLORA PARK - PHASE II FINAL SITE PLAN AMENDMENT #2
SHEET TITLE: LAYOUT AND LANDSCAPING PLAN
JOB NO.: 152115
SCALE: AS NOTED
SHEET NO.: 3

APPENDIX G: ADJACENT DEVELOPMENT PLANS

RIO POINT (JANUARY 2022) TIMMONS GROUP



THIS DRAWING PREPARED AT THE
CHARLOTTESVILLE OFFICE
608 Preston Avenue, Suite 200 | Charlottesville, VA 22903
TEL 434.295.3624 FAX 434.295.8217 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 01/24/2022
DRAWN BY R. VAN NIEKERK
DESIGNED BY J. DENKO
CHECKED BY C. KOTARSKI
SCALE 1" = 80'

TIMMONS GROUP

RIO POINT
COUNTY OF ALBEMARLE, VA
OVERALL LAYOUT PLAN

JOB NO. 46883
SHEET NO. C4.0

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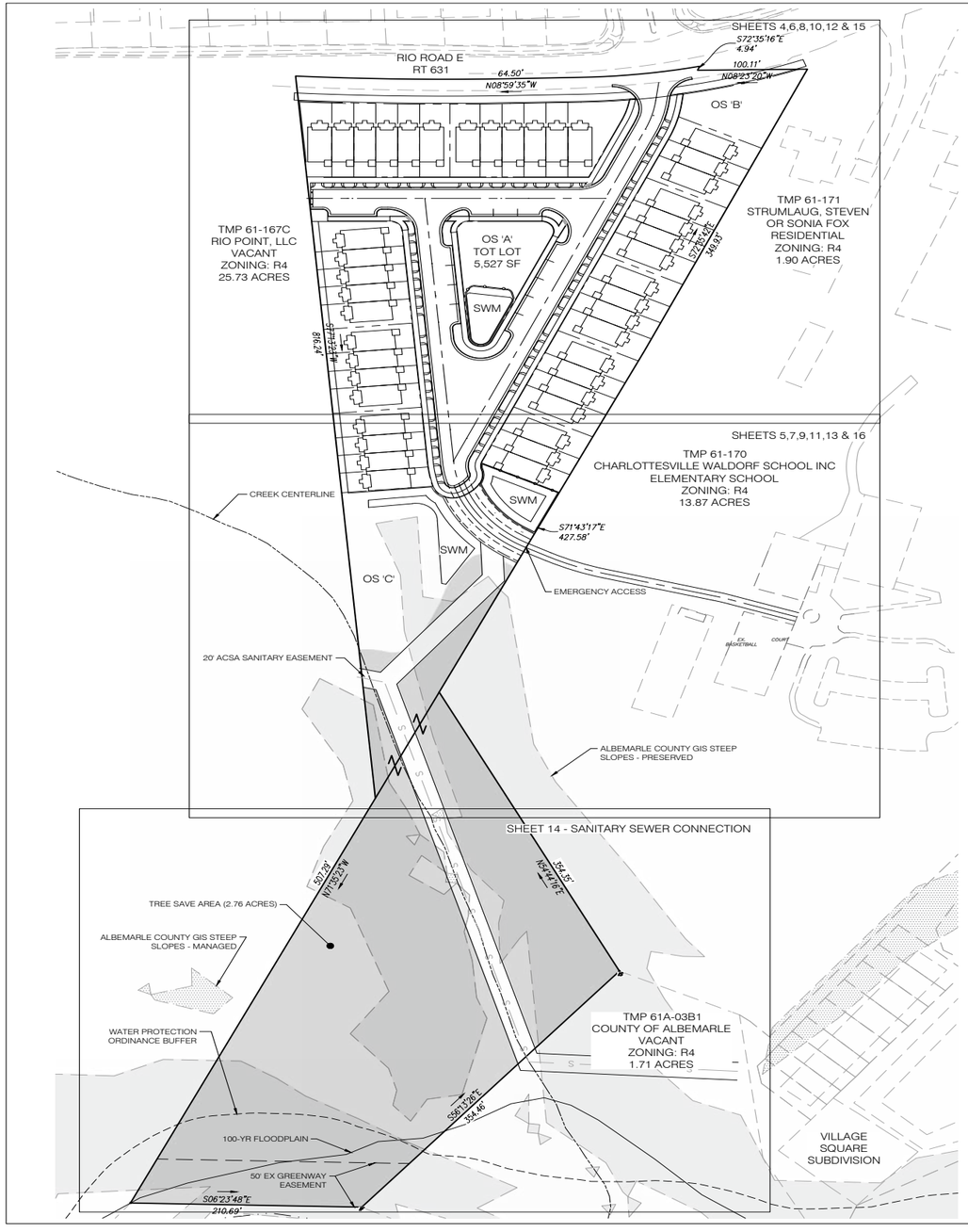
APPENDIX G: ADJACENT DEVELOPMENT PLANS

RIO COMMONS INITIAL SITE PLAN (MAY 2021) ROUDABUSH, GALE & ASSOC., INC.



SITE DATA

MAXIMUM LOT SIZE PERMITTED:	N/A
MAXIMUM BUILDING HEIGHT:	35' MAXIMUM
LOT TABULATION:	43 TOWNHOUSE LOTS 2.01 ACRES
IMPERVIOUS AREA:	SFA DWELLINGS & DRIVEWAYS 1.21 ACRES SIDEWALKS 0.15 ACRES ROADS 0.94 ACRES TOTAL IMPERVIOUS AREA 2.30 ACRES
OPEN SPACE REQUIRED:	25% x 7.10 ACRES = 1.8 ACRES
OPEN SPACE PROVIDED:	OPEN SPACE 'A' 0.13 ACRES OPEN SPACE 'B' 0.12 ACRES OPEN SPACE 'C' 3.25 ACRES TOTAL OPEN SPACE AREA 3.50 ACRES (49% OF SITE)
RECREATIONAL AREA REQUIRED:	200 SF * 43 UNITS = 8,600 SF (0.20 ACRES)
RECREATIONAL AREA PROVIDED:	5,527 SF TOT LOT IN OPEN SPACE 'A' 141,570 SF PASSIVE RECREATION SPACE IN OPEN SPACE 'C' 147,097 SF TOTAL PROVIDED RECREATION EQUIPMENT AND FACILITIES, INCLUDING THE TOT LOT, SHALL BE MAINTAINED IN A SAFE CONDITION AND REPLACED AS NECESSARY. MAINTENANCE SHALL BE THE RESPONSIBILITY OF RIO COMMONS, LLC. RECREATIONAL FACILITIES SHALL BE COMPLETED WHEN FIFTY PERCENT (50%) OF THE UNITS HAVE RECEIVED CERTIFICATE OF OCCUPANCY.
TOWNHOUSE SETBACKS:	FRONT: 5'-25' FROM ROW/PROPERTY LINE SIDE: 5' REAR: 20' GARAGE: 18'
ROADS & STREETS:	ALL PUBLIC STREETS SHALL HAVE CG-6 CURB AND GUTTER. NEW PUBLIC STREETS RIGHT-OF-WAY HEREON IS HEREBY DEDICATED TO COUNTY FOR PUBLIC USE.
MAGISTERIAL DISTRICT:	RIO MAGISTERIAL DISTRICT
CRITICAL SLOPES:	PRESERVED & MANAGED SLOPES SHOWN PER ALBEMARLE COUNTY GIS.
STORMWATER MANAGEMENT:	3 BIORETENTION PONDS ARE PROPOSED IN THE SUBJECT PARCELS. STORMWATER CALCULATIONS SHALL BE SUBMITTED AFTER THE INITIAL SITE PLAN.
WATERSHED:	A MAJORITY OF THE SITE LIES IN MEADOW CREEK WATERSHED; A PORTION ON THE SOUTHEAST SIDE OF THE SUBJECT PROPERTIES LIES IN THE UPPER RIVANNA RIVER WATERSHED
BOUNDARY SOURCE:	TOPOGRAPHIC SURVEY PREPARED JUNE 8, 2018 BY ROUDABUSH, GALE AND ASSOCIATES, INC.
TOPOGRAPHY:	BARE EARTH DEM FROM LIDAR, SOURCE VGIN (2016). POINT CLOUD DATA FILTERED BY RGA
BENCHMARK:	WATER METER NEAR PROPOSE SITE ENTRANCE, 473.22
DATUM	HORZ: NAVD 83; VERT: NAVD 88
FLOODPLAIN:	THE PROJECT SITE SHOWN HEREON IS LOCATED IN ZONE "X" AND DOES NOT FALL WITHIN FLOOD HAZARD ZONE "AE" FOR A 100-YEAR FLOOD AS SHOWN ON FEMA MAP 51003C0287D, EFFECTIVE 2/4/2005, THIS DETERMINATION HAS BEEN MADE BY GRAPHIC METHODS, NO ELEVATION STUDY HAS BEEN PREFORMED AS A PORTION OF THIS PROJECT..
STREAM BUFFER:	THERE ARE NO STREAM BUFFERS WITHIN THE PROJECT SITE.
PARKING REQUIRED:	(2) SPACES PER SFA UNIT PLUS (1) GUEST SPACE PER EACH (4) UNITS. 43 UNITS x 2 + (43/4) = 97 SPACES REQUIRED.
PARKING PROVIDED:	(2) SPACES PER SFA UNIT OFF-STREET PLUS (12) STREET PARKING SPACES = 43 UNITS x 2 + 12 = 98 SPACES PROVIDED.
LANDSCAPING:	STREET TREES TO BE PROVIDED ALONG PUBLIC ROADS PER CODE OF DEVELOPMENT & COUNTY CODE SECTION 32.7.9.
ENVIRONMENTAL:	A PORTION OF THE SITE WILL BE PRESERVED AS TREE SAVE AREA FOR BONUS DENSITY CREDIT (2.76 ACRES)
LIGHTING:	NO OUTDOOR STREET LIGHTING IS PROPOSED AT THIS TIME. UNITS SHALL HAVE PORCH LIGHTS AND/OR POST LIGHTS THAT WILL EMIT LIGHT THAT IS LESS THAN 3000 LUMENS. ALL PROPOSED LIGHTING WILL NOT EXCEED 3,000 LUMENS. EACH OUTDOOR LUMINARIES EQUIPPED WITH A LAMP THAT EMITS 3,000 OR MORE INITIAL LUMENS SHALL BE A FULL CUTOFF LUMINARIES AND SHALL BE ARRANGED OR SHIELDED TO REFLECT LIGHT AWAY FROM AN ADJOINING RESIDENTIAL DISTRICTS AND FROM ADJACENT ROADS. ALL OUTDOOR LIGHTING SHALL BE ARRANGED OR SHIELDED TO REFLECT LIGHT AWAY FROM ADJOINING RESIDENTIAL DISTRICTS AND AWAY FROM ADJACENT ROADS.
RETAINING WALLS:	RETAINING WALLS GREATER THAN 3 FEET IN HEIGHT REQUIRE A SEPARATE BUILDING PERMIT. WALLS EXCEEDING 4 FEET IN HEIGHT REQUIRE A STAMPED ENGINEERING DESIGN. WALLS REQUIRE INSPECTIONS AS OUTLINED IN THE USBC. ALL RETAINING WALLS OVER 30 INCHES IN HEIGHT WILL HAVE SAFETY RAILING.
CEMETERIES:	NO EVIDENCE OF A BURIAL SITE WAS DISCOVERED ON THE SUBJECT PARCELS
TRASH RECEPTACLES:	ALL UNITS SHALL HAVE AN INDIVIDUAL TRASH CONTAINERS
FIRE & RESCUE:	FIRE HYDRANTS SHALL BE PROVIDED ALONG PUBLIC STREETS AT A MAXIMUM SPACING OF 500-FEET ALONG THE TRAVELWAY.

ALL WATER LINES, SEWER LINES, AND FIRE LINES FROM THE MAIN TO THE STRUCTURE MUST HAVE A VISUAL INSPECTION PERFORMED BY THE BUILDING DEPARTMENT.

THE SUBJECT PROPERTY IS NOT LOCATED WITHIN AN AGRICULTURAL-FORESTAL DISTRICT.

THIS SITE IS NOT LOCATED WITHIN THE WATERSHED OF A PUBLIC WATER SUPPLY RESERVOIR.

60 0 60 120 180
SCALE: 1"=60'

LEGEND

EXISTING INTERMEDIATE CONTOUR	332	EXISTING WATERLINE	W
EXISTING INDEX CONTOUR	300	PROPOSED WATERLINE	W
PROPOSED CONTOUR	20	EXISTING FIRE HYDRANT	
EXISTING EDGE OF PAVEMENT	EX. EP	PROPOSED FIRE HYDRANT	
PROPOSED EDGE OF PAVEMENT		EXISTING WATER VALVE	W
EXISTING CURB AND GUTTER	EX. C&G	PROPOSED WATER VALVE	W
PROPOSED CURB AND GUTTER		PROPOSED WATER METER	
TRANSITION FROM CG-6 ROLL-TOP		EXISTING REDUCER	W
EXISTING STORM SEWER	EX. 15" RCP	PROPOSED REDUCER	W
PROPOSED STORM SEWER		HANDICAP RAMP (CG-12) DENOTES LOCATION OF ADA VERIFY CG-12 AND/OR JURISDICTIONAL STANDARD RAMP CONSTRUCTION	
EXISTING SANITARY SEWER	S	PARKING INDICATOR INDICATES THE NUMBER OF TYPICAL PARKING SPACES	12
PROPOSED SANITARY SEWER		BENCHMARK	
PROPERTY LINE		PROPERTY BOUNDARY	
EASEMENT LINE			
CENTERLINE		VEHICLES PER DAY COUNT	1,234 VPD
LIMITS OF CLEARING AND/OR GRADING		PROPOSED STREET NAME SIGN	
EXISTING SPOT ELEVATION	+	EXISTING SIGN	
PROPOSED SPOT ELEVATION	+12.0	PROPOSED SIGN	
EXISTING TREE DRIP LINE		SANITARY MANHOLE IDENTIFIER	10
EXISTING TREE		STORM DRAIN STRUCTURE IDENTIFIER	18
PROPOSED TREE	OAK		

CONTRACTOR'S RECORD DRAWING REQUIREMENTS

CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ANY CHANGES SUBSTITUTIONS, ALTERATIONS, VARIATIONS OR UNUSUAL CONDITIONS ENCOUNTERED OR IMPLEMENTED WHILE ENGAGED ON THIS PROJECT. THESE RECORDS SHALL BE IN THE FORM OF "REDLINES". "REDLINES" SHALL REFER TO THE CONTRACTOR'S HAND ANNOTATIONS USING RED COLORED PEN/PENCIL TO DEPICT ACTUAL CHANGE, SUBSTITUTION, OR CONDITION.

PRIOR TO CONTRACTOR REQUESTING PARTIAL OR FULL PAYMENT, CONTRACTOR SHALL PROVIDE THE OWNER WITH AN UP-TO-DATE CONTRACTORS RECORD DRAWING. SPECIFICALLY, THIS SET OF PLANS, ISSUED TO THE CONTRACTOR AS 'FINAL CONSTRUCTION DRAWINGS,' SHALL BEAR THE "REDLINE" MARKINGS LISTED BELOW AS WELL AS THE CONTRACTOR (AGENT OR SUPERINTENDENT) SIGNATURE AND CERTIFICATION BELOW:

1. REDLINES SHOULD ALWAYS BE ACCURATE NEAT, LEGIBLE, DATED AND REASONABLY SCALED.
2. ADD LARGE RED LETTERS TO TITLE SHEET WITH 'CONTRACTOR'S RECORD DRAWING' INCLUDING CONTRACTOR'S NAME, DATE, AND OTHER RELEVANT INFORMATION
3. CONTRACTOR'S REPRESENTATIVE OR SUPERINTENDENT SHALL INITIAL EACH SHEET. IF A SHEET HAS NOT BEEN CHANGED AT ALL OR NO MARK HAS BEEN ADDED, LABEL THE SHEET ONLY 'NO CHANGES'
4. IF A SHEET HAS BEEN CHANGED OR MODIFICATIONS HAVE BEEN ADDED, LABEL IT 'REVISED'
5. USE WRITTEN EXPLANATION TO DESCRIBE CHANGES. REFER TO SPECIFIC ACTIONS INSTEAD OF REFERENCING CHANGE ORDER NUMBERS OR RELATED DOCUMENTS
6. USE CLEAR LETTERING
7. NEVER REMOVE OLD VALUES OR DETAILS, JUST REDLINE OR "X" THROUGH THEM. IF THERE IS NO ROOM FOR THE NEW VALUE, YOU CAN GO TO THE SIDE AND REDLINE THE REPLACEMENT VALUE.
8. PROVIDE THE REDLINE DETAILS OF CHANGES OR ADDITIONAL INFORMATION, INCLUDING BUT NOT LIMITED TO FABRICATION, ERECTION, INSTALLATION, LOCATION, SIZING, MATERIAL, DIMENSION, ADDITIONS, RELOCATIONS, SUBSTITUTIONS, ETC
9. BE SPECIFIC WHEN MAKING NOTES TO UNDERGROUND UTILITIES, SHOWING EXACT LOCATION, DEPTH, AND MATERIAL USED (EXAMPLE: SEWER LATERALS)
10. PROVIDE ALL NECESSARY INFORMATION OF CONTRACTOR'S DESIGNED SYSTEMS OR SUBSTITUTIONS
11. CROSS OUT ANY PLAN REFERENCE TO "APPROVED EQUAL" AND REPLACE WITH ANY SPECIFIC INFORMATION OF VARIANCE USED DURING THE CONSTRUCTION PROCESS
12. ANY CHANGES IN INVERT ELEVATIONS, GRADE MODIFICATIONS, SLOPES, AND RELATED INFORMATION ON PIPING UTILITIES, EARTHWORK, ETC. SHALL BE REDLINED.
13. RECORD ALL UNEXPECTED OBSTRUCTIONS, COMPLICATING FACTORS, UNSUITABLE CONDITIONS FOUND IN THE PROJECT AREA INCLUDING ROCK, UNUSUAL TOPSOIL CONDITIONS, BURIED DEBRIS, ETC.
14. ATTACH OR INCLUDE ANY SHOW DRAWINGS OR SUPPLEMENTAL INFORMATION TO THE CONTRACTORS RECORD DRAWING
15. CHANGES MADE AS A RESULT OF ANY REGULATORY OR OWNER INSPECTION PROCESS

CERTIFICATION STATEMENT:

THIS HAND-MARKED SET OF DRAWINGS HAS BEEN "REDLINED" TO PROVIDE ACCURATE DETAILED RECORD OF ANY SUBSTANTIVE CHANGES TO THE APPROVED DESIGN DRAWINGS. ANY ITEM NOT "REDLINED" ON THIS PLAN SET OR SUBSEQUENT PAGES SHOULD BE CONSIDERED TO BE "CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AS SHOWN".

_____ _____ _____
NAME, TITLE (DATE)

FOR: _____ (CONTRACTOR)

ROUDABUSH, GALE & ASSOC., INC.
A PROFESSIONAL CORPORATION
SERVING VIRGINIA SINCE 1956
PHYSICAL
999 SECOND ST. SE
CHARLOTTESVILLE, VA 22902
PHONE 434-977-0205
MAILING
438 MERCHANT WALK SQ., SUITE 300-189
CHARLOTTESVILLE, VA 22902
WWW.ROUDABUSH.COM

REVISIONS			
NO.	DATE	BY	DESCRIPTION

COMMONWEALTH OF VIRGINIA
Jimmy L. Taggart
Lic. No. 02961
10 MAY 21
PROFESSIONAL ENGINEER

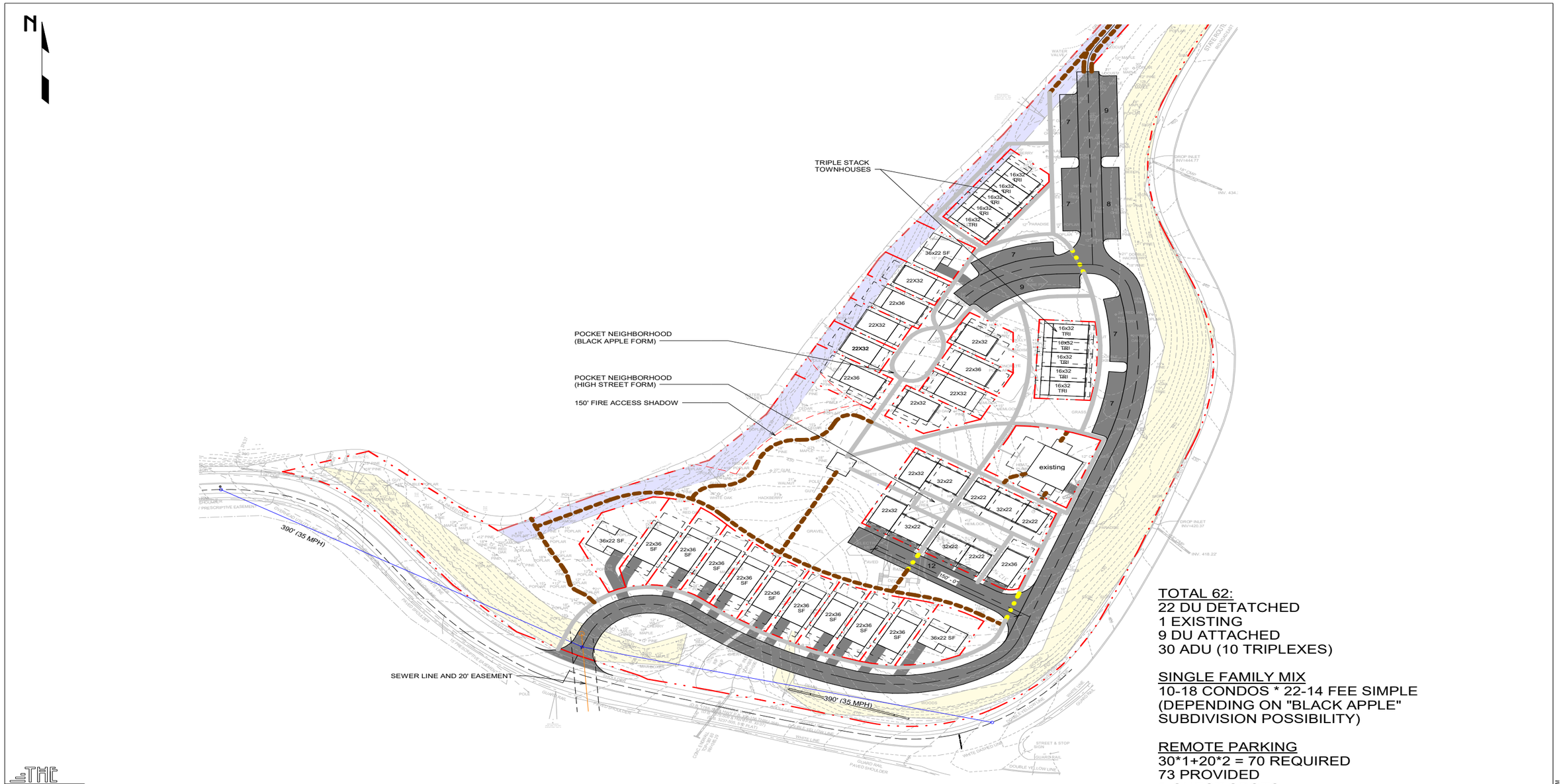
RIO COMMONS
INITIAL SITE PLAN

PROJECT NOTES & OVERALL PLAN

DATE:	10 MAY 21
SCALE:	1" = 60'
JOB:	18.0025
SDP:	- -
SHEET:	2 OF 20

APPENDIX G: ADJACENT DEVELOPMENT PLANS

ECOVILLAGE REZONING STUDY CONCEPT (SEPTEMBER 2021) THE HOUSING LAB



TOTAL 62:
22 DU DETATCHED
1 EXISTING
9 DU ATTACHED
30 ADU (10 TRIPLEXES)

SINGLE FAMILY MIX
10-18 CONDOS * 22-14 FEE SIMPLE
(DEPENDING ON "BLACK APPLE"
SUBDIVISION POSSIBILITY)

REMOTE PARKING
30*1+20*2 = 70 REQUIRED
73 PROVIDED
3 GUEST SPOTS

THE HOUSING LAB

REZONING STUDY - CONCEPT 8

SCALE: 1" = 40'-0"

ECOVILLAGE CHARLOTTESVILLE
CONCEPTUAL SITE MODEL

9/15/2021 2:04:32 PM

APPENDIX H: NOTEWORTHY PRESENTATION EXCERPTS

FIRST PUBLIC MEETING (MARCH 2021)

Rio Corridor
Public Meeting #1
Line and Grade Presentation Outline

Objective: Background corridor information and context (similar content to first presentation from us [L+G]) (15 minutes)

Part 1: Background Information (4 minutes)

_ Rio Road Introduction **(2 min)**
  _ Project Context
    _ Area of Study + Why

_ Summary of Existing Infrastructure **(2 min)**
  _ 4 lane road with median turn lane for majority of Rio within the project extents
  _ Sidewalks and bike lanes on both sides of road
  _ 8 transit stops.
  _ Shared Use Path continuing from JWP to just short of Belvedere.

Part 2: Problematic Conditions (10 minutes)

_ Traffic
  _ Congestion + LOS (data from existing traffic studies and Google Maps traffic)
    _ What is Level of Service (LOS) + Example Pictures.
    _ JWP (LOS E&F during peak hours) (show image)
    _ Belvedere (LOS E&F during peak hours) (show image)
    _ Northfield/Old Brook Intersection (LOS D for right and left turns onto Rio) (show image)
    _ Putt Putt Place (LOS E to turn left onto Rio)
    _ Greenbrier Drive thru Greenbrier Terrace

_ Safety Considerations
  _ Summary Accident Data
    _ Show imagery of vehicular accidents along corridor. (speaks for itself).

  _ Summary of Entrance Spacing
    _ Areas of inadequate entrance spacing seem to correlate with accident data.

  _ Summary of Pedestrian Crossings
    _ few signalized crossings of Rio
    _ curb ramps with no receiving ramps

  _ Summary of Roadside Conditions
    _ No buffer between road and bicycle lane or sidewalk.

  _ Summary of existing (lack of) Lighting
    _ Currently no lighting, especially at bus stops

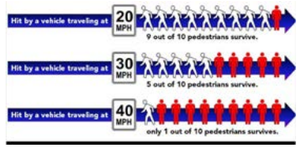
  _ Summary of Travel Speeds
    _Listed 35/40 mph
    _(Share speed data)

Rio Road | An Introduction

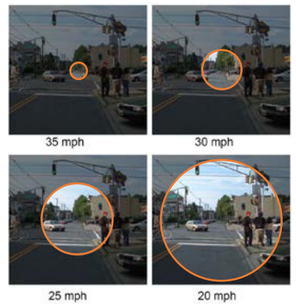
Background Information + Known Challenges

Background Information

Pedestrian Accommodations

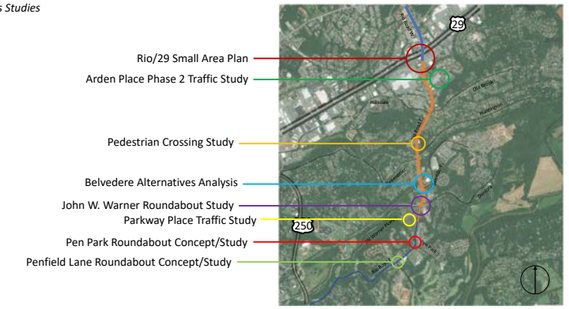


Correlation between Speed, Safety and driver field of view



Background Information

Previous Studies



Background Information

Pedestrian Accommodations

Sidewalks or Shared Use Paths

Known Challenges

Access Management

Known Challenges

Vehicular Accidents

APPENDIX H: NOTEWORTHY PRESENTATION EXCERPTS

PH 1 COMMUNITY ADVISORY COMMITTEE (CAC) MEETING (SEPTEMBER 2021)

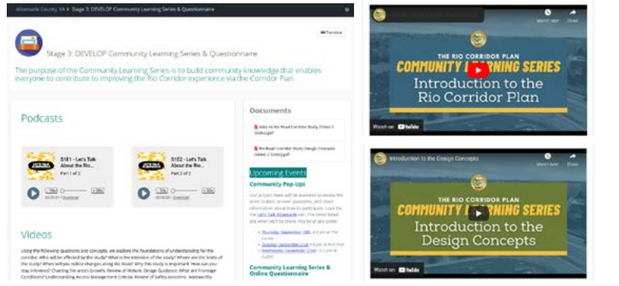
PRESENTATION

1. Why is the County creating the Rio Corridor Plan?
    a. Help elected officials and County managers guide future development
    b. Why Rio Corridor, why not another place?
2. Who is the Corridor Plan meant to serve?
    a. Demographics of Corridor
    b. 30,000 ppl? Where does this number come from?
    c. need a compromise between needs of neighbors and needs of commuters
3. What are the challenges/opportunities of the Corridor?
    a. Safety
    b. Access
    c. Flow
    d. Environment
    e. Future Development
4. Where are we in the process?
5. Review draft concepts
6. How do the draft concepts respond to our challenges/opportunities?
    a. Hillsdale Intersection (not sure all the following need to be addressed)
        i. Safety
        ii. Access
        iii. Flow
        iv. Environment
        v. Future Development
    b. Belvedere Access
        i. Safety
        ii. Access
        iii. Flow
        iv. Environment
        v. Future Development
    c. JWP/Rio Roundabout
        i. Safety
        ii. Access
        iii. Flow
        iv. Environment
        v. Future Development

PANEL DISCUSSION

1. Why did you explore an alternate location for the roundabout?
2. In the context of civil engineering, transportation design - what does "redundant" indicate?
3. How was peak load assessed?
4. How are pedestrian and cyclist needs met by roundabouts? We have heard about folks that need to bike fast or walk slow - how does the design accommodate a diversity needs and abilities? Timing/signage/speed/protective measures?
5. How will cars have an opportunity to enter the roundabout unless it is a signalized roundabout?
6. Why are traffic lights not included in the study at Belvedere Blvd and Rio?
7. How will land be acquired for sidewalks and safer bike lanes?

(very) Brief RE:Cap



THE Rio Road Corridor Study

Part 1: Identify our Common Ground

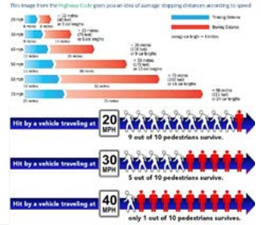
We all want the same thing:

1) We want roads and sidewalks that are safe for our families, our neighbors, and friends
2) We want access to places where we walk, bike and drive
3) We want to protect the environment and create vibrant public places
4) We want to promote optimal travel and reasonable solutions to known challenges

THE Rio Road Corridor Study

Part 1: Identify our Common Ground // Promote Safety at Intersections

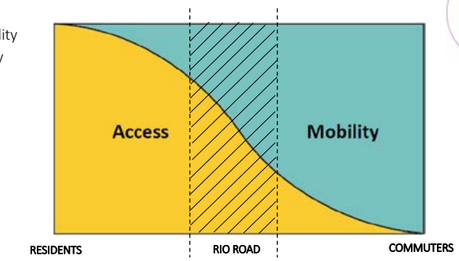
1) We want to **promote slower travel speeds**
2) We want to **avoid conflict points** for vehicle/vehicle and vehicle/person
3) We want the infrastructure to **promote predictability** (remove variables)



THE Rio Road Corridor Study

Part 1: Identify our Common Ground // Promote Access

1) Adaptability
2) Resiliency



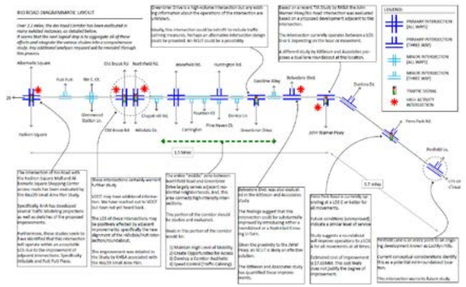
THE Rio Road Corridor Study

Part 1: Identify our Common Ground // Environment and Public Space

1) Use Public Space for Public Benefit
2) Which is another way of promoting Human Scale

THE Rio Road Corridor Study

Part 1: Identify our Common Ground // Optimal Travel and Reasonable Solutions



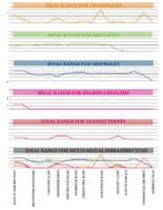
1) Understand the interconnected nature of civic spaces
2) Balance diverging interests and needs

THE Rio Road Corridor Study

Part 2: Confirm the Intent of our Work and our Call to Action

Who is using the corridor?
How are they using it?

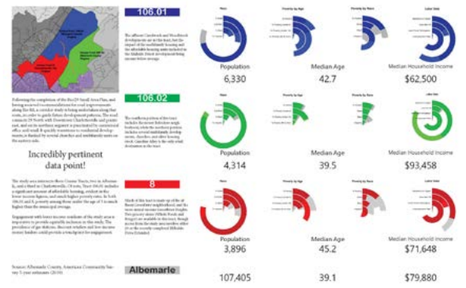
Where is redevelopment likely to happen?
How can we guide it?



Where are the deficiencies?
How do we resolve them?

THE Rio Road Corridor Study

Part 2: Confirm the Intent of our Work and our Call to Action



Use Census Data as an opportunity to unify the community

THE Rio Road Corridor Study

APPENDIX H: NOTEWORTHY PRESENTATION EXCERPTS

PH 1 AND 2 BOARD OF SUPERVISORS (BOS) MEETING (OCTOBER 2021)

Rio Road Corridor Study – Path Forward, 10/2021

1. The Corridor Roadway Section:

Broad Roadway and Wide Lanes Promote Speeding
Continuous Dual Left Turn Lane adds many conflict points
Large Volumes of Stormwater Runoff
Limited Users of non-motorized Transit

What We've Heard: Limited Feedback; General Concern about commuter traffic Vehicle; Travel Speed is a Concern

2. **The Public Realm**:
Missing/Lacking public Realm
Suburban Development "spread"
No Visual or Physical Buffers [Slide No. 23]

What We've Heard: Not Much; Human Scale is Difficult to Accomplish

3. Hillsdale + Old Brook + Northfield Intersection:

Promote Context Change
Integrate 2 Intersections as 1
Establish Inclusive Ped. Access
Topographic High-Point Slow Vehicles Down

What We've Heard: It Depends on Who You ask; Positive response from VDOT; Some citizens express confusion; Everyone recognizes need to improve

4. Belvedere Intersection Minimize:
Conflict Points
Increase Level of Service
Consolidate/Simplify Access Slide No. 2

What We've Heard: Everyone Recognizes Need to Improve; Safety is of Specific Concern (left hand turns); Revisit Church Access Program; Revise Pedestrian Integration; Consider Peak Hour Traffic Signal; Polish/Refine Merging Movement Design

5. JWW/Rio Intersection // Concept:
Minimize Conflict Points
Increase Level of Service
Consolidate/Simplify Access
Reduce Stormwater Runoff
Expand Outdoor Access

What We've Heard: It Depends on Who You ask; Positive response from VDOT; Dunlora residents express concern; Confusion about how Roundabouts Work

Phasing of Work — Slide No. 3

Phase 1
Phase 1:
Rio/29 SAP to JWW Pkwy

Phase 2
Phase 2:
JWW Pkwy to City Line

THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

Research + Documentation : **Pedestrian + Bicycle Safety and Experience** — Slide No. 10

THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

Research + Documentation : **Vehicular Safety** — Slide No. 11

Entrance/Intersection	Crashes 2013-2020
Mall Dr	7
Putt Putt Pl	39
(Charlottesville Aldersgate United Methodist Church)	1
Rio E Ct / Glenwood Station Ln	7
(Rio Center)	0
Old Brook Rd	29
Northfield Rd / Hillsdale Dr	43
Chapel Hill Rd	6
(Northside Baptist Church)	1
Wakefield Rd	4
(Charlottesville Church of the Brethren) / Carrington Pl	1
Fountain Ct	3
Huntington Rd / Pine Haven Ct	6
Denice Ln	5
Rio School Ln	0
(Zoomcash Consumer Loans)	4
(Marathon Gas) / Greenbrier Dr	39
(Kangaroo Express N)	0
(Kangaroo Express S)	6
Gasoline Alley	4
(Exxon N)	0
(Exxon S) / Greenbrier Terrace	5
(Covenant Church)	0
Belvedere Blvd / (City Church N)	18
(City Church S)	1
Dunlora Dr	0
Rio Rd E (at JWP) / CATEC	38
Total	240

Image Courtesy of: The Daily Progress

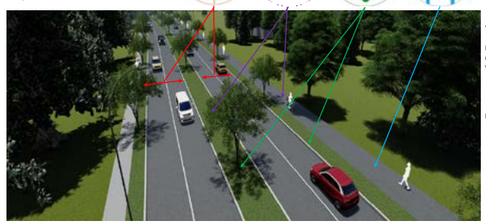
THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

Research + Documentation : **Frontage Conditions** — Slide No. 16

THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

The Corridor Roadway Section // Concept — Slide No. 21

Promote slower travel speeds
Minimize conflict points
Reduce Impervious Cover
Expand Multi-Modal Network



What We've Heard

Limited Feedback
General Concern about commuter traffic
Vehicle Travel Speed is a Concern

Path Forward

Refine Concepts toward Final Draft

THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

Hillsdale + Old Brook + Northfield Intersection // Concept — Slide No. 25

Promote Context Change
Integrate 2 Intersections as 1
Consistent Pedestrian Access
Topographic High-Point
Slow Vehicles Down

What We've Heard

It Depends on Who You ask:
- Positive response from VDOT
- Citizens express confusion
- Everyone recognizes need to improve

Clarifications

Other alternatives either:
- Inadequately address concerns
- Would be much more invasive

Path Forward

Further confirm intent of SAP Fashion Sq. Roundabout.

Solicit Feedback from Board

THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

Belvedere Intersection // Concept — Slide No. 27

Minimize Conflict Points
Increase Level of Service
Consolidate/Simplify Access

What We've Heard

- Everyone Recognizes Need to Improve
- Safety is of Specific Concern (left hand turns)
- Revisit Church Access Program
- Revise Pedestrian Integration
- Consider Peak Hour Traffic Signal
- Polish/Refine Merging Movement Design

Path Forward

Revise Concept to Integrate Church Access
Continue to Work with VDOT/County Staff
Solicit Feedback from Board

THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

JWW/Rio Intersection // Concept — Slide No. 29

Minimize Conflict Points
Increase Level of Service
Consolidate/Simplify Access
Reduce Stormwater Runoff
Expand Outdoor Access

What We've Heard

It Depends on Who You ask:
- Positive response from VDOT
- Dunlora residents express concern
- Confusion about how Roundabouts Work

Path Forward

- Additional Education on Roundabouts
- Revisions based on CATEC Feedback
- Refine design based on board direction
- Pending VDOT Project necessitates action
- Additional Traffic/Cost Analysis
- Address Concerns

Clarifications

- LG Design reduces Conflict Points by 40%
- Increased Bike/Ped Connectivity
- 20% Less Impervious Area
  - Stormwater Reduction / Heat Island
  - Pavement Maintenance Reduction
- Consolidation of Public Recreational Space

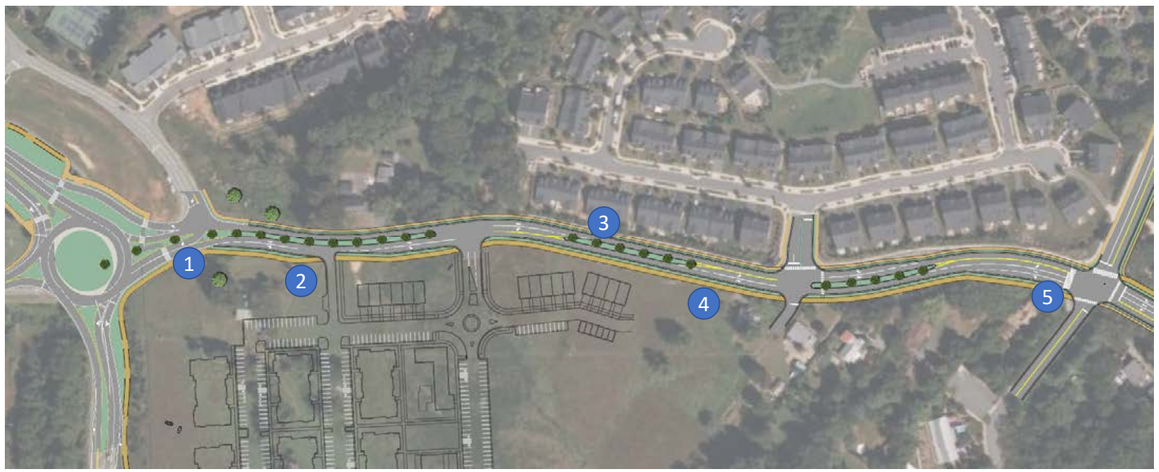
THE Rio Road Corridor Study — BOARD OF SUPERVISORS PRESENTATION

APPENDIX H: NOTEWORTHY PRESENTATION EXCERPTS

PH 2 PRESENTATION OF CONCEPTS TO CAC (MARCH 2022)

Design Concept: North

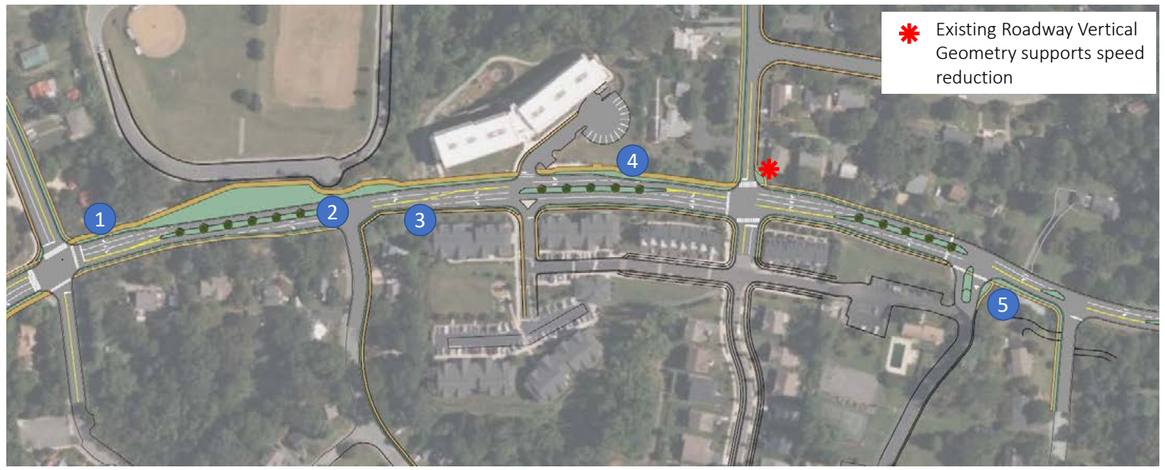
Slide No. 28



1 Integrate with JWWP Project
2 Shared Use Path
3 Raised Medians
4 Consistent ROW Width
5 SUP Crossing @ intersection

Design Concept: Central

Slide No. 32



1 Shared Use Path
2 Raised Median
3 Left-Hand Turn @ Towne Lane
4 Remove Bus Pull off
5 Access Management Improvements

Design Concept: South

Slide No. 36

Observations	Resolutions / Suggestions
Zoning / Density • Ecovillage is the only known potential development. • There are several other parcels along the road which could be redeveloped in accordance with the comprehensive plan density, meaning 3-6 units per acre.	• Encourage interparcel connectivity (i.e., Ecovillage to Stonehenge).
Roadway Geometry, Typical Section and Alignment • Guardrail along east side of road is not up to current standards. This may contribute to the increased severity of accidents involving the guardrail (refer to Accidents, below). • Two (2) 11 ft lanes. One (1) in each direction. • Shoulders are paved. West shoulder includes a paved ditch and is in need of repair. Noteworthy deficiencies include several deep potholes, vegetation encroachment, and debris and litter clogging paved ditch and inlets, negatively affecting water quality. • No turn lanes. • Centerline radii are tight and this results in inadequate sight-distances along the road (refer to Accidents, below). • One advisory speed sign for NB traffic. None for SB traffic which is at a greater risk. • Grade of road varies between 3.5% and 6.5% (average of 5%) • Steep slopes along both sides of road complicate opportunities to implement safety improvements.	• Upgrade guardrail to current standards. • Advisory speed signs should be installed near Stonehenge for SB traffic. • Re-stripe pavement markings for better sight distances. • Maximize use of existing corridor space, which means the paved ditch should be overhauled to place drainage under ground. • Add a left-hand turn lane at Agnese for SB approach.

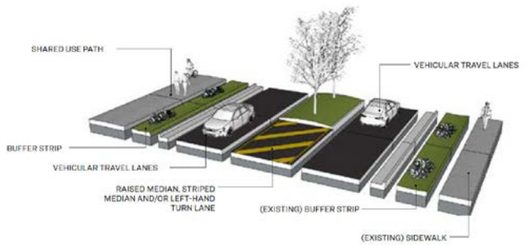
Intersections
• All intersections in this section are one-lag stop-controlled.
• **Agnese intersection:**
  • 70 degrees away from perpendicular
  • Located in second tightest curve in the corridor (1147 Ct. radius)
  • Stopping sight distances encumbered
  • Vertical sight distances obstructed due to steep grades
  • Pavement markings and signage need maintenance
  • Left-turn lane warranted
• **Ecovillage Entrance:**
  • ~400 Vehicles per day
  • Left-hand turn lane desirable, but unrealistic due to effort required to widen road
• **Brookway:**
  • Intersection sight distance encumbered
  • Drainage provisions encumbered (5 accidents due to rain)
	• Sideline Agnese entrance to include a splitter island for NB Rio Road and a revised right-hand turn radius onto Agnese.
	• Relocate stop bar and stop sign to provide the best sight distance possible.
	• Joint project with City of Charlottesville.
	• Second entrance near Stonehenge would relieve conditions at primary proposed entrance.
	• Turn warrant justification should include increased traffic on Rio Rd.
	• County should permit disturbance of preserved slopes to increase sight-distances along right turns adjacent to Ecovillage.
	• Comprehensive drainage improvements are needed.
	• Bypass Meadow Creek and Ohenks Branch with box culvert

Pedestrian Connectivity • No pedestrian facilities exist for majority of roadway, exception being the bridge over Meadow Creek. • No bike facilities exist. • Few destinations along this portion, exception being Rivanna Trail at Melbourne.	• Roadway improvements should focus on safety. • Bike and pedestrian improvements can be made "off-corridor" but until the roadway itself is safer, adding bike and pedestrians into roadway is not recommended. • Seek to make connections within broader bike/trail network (i.e., Rivanna Trail and JWWP trail)
Accidents • Accidents reflect the nature of the roadway. Accidents are not specifically concentrated at intersections, but instead distributed along the sharpest curves along the road. • 21% of accidents at Melbourne Road intersection • Not including Melbourne intersection, 46% of accidents are single vehicle events, which reflects the dangerous nature of the road. • Of the accidents involving multiple vehicles, 54% were rear-end collisions and most of them seem to have occurred in the SB lane, which is the lane that has the worst stopping sight distance due to the downhill grade.	• Focus on improvements that increase safety in this portion of the corridor.

1 Guardrail Upgrades
2 Painted Median
3 Intersection Geometry Improvements

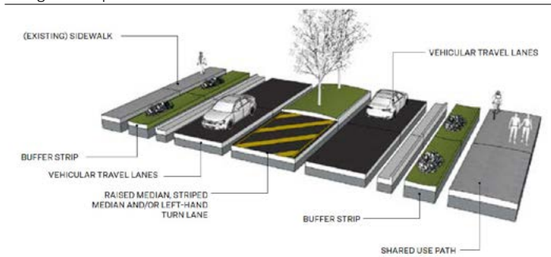
Design Concept: Central

Slide No. 29



Design Concept: Central

Slide No. 33



APPENDIX H: NOTEWORTHY PRESENTATION EXCERPTS

PRESENTATION TO THE PLANNING COMMISSION (APRIL 2022)

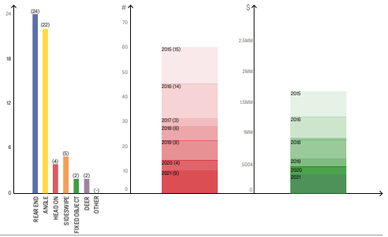
HILLSDALE DRIVE: **BASIS OF UNDERSTANDING**

KEY MAP

NOTEWORTHY OBSERVATIONS

- Opportunity for context change (leaving the Rio29 SAP and entering a Residential area)
- Topographic high-point of corridor
- Does not meet minimum geometric design standards
- 89% of accidents involve left-hand-turns (LHTs)
- 8 different left hand turning movements

NOTEWORTHY STATISTICS



JWWP: **BASIS OF UNDERSTANDING**

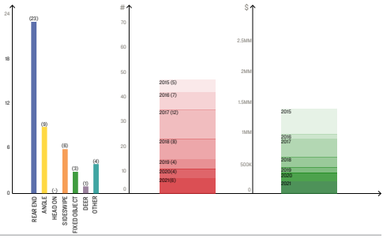
KEY MAP

PHOTO FROM THE DAILY PROGRESS

NOTEWORTHY OBSERVATIONS

- Pedestrian X-ing at JWWP Greenway Trail likely to substantially increase as development continues.
- Poor Level of Service During Peak Hour
- 50% of accidents are “rear-ends”
- 20% of accidents involve a merging maneuver
- 10% of accidents involve a LHT

NOTEWORTHY STATISTICS



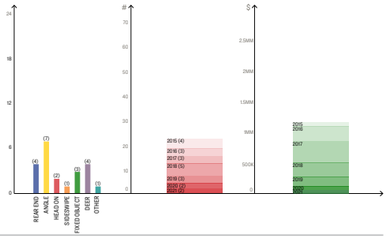
BELVEDERE: **BASIS OF UNDERSTANDING**

KEY MAP

NOTEWORTHY OBSERVATIONS

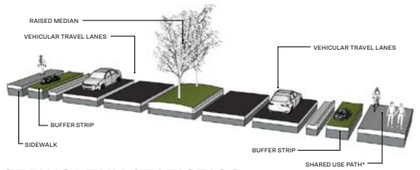
- Lacking adequate pedestrian and bike safety (costly bike accident occurred here)
- Lacks adequate traffic Control
  - Substantial Peak Hour Delays
  - Numerous Conflict Points
  - Commercial entrance in functional area of intersection.
- Capacity/Delay is the priority at this intersection

NOTEWORTHY STATISTICS



RIO ROAD CORRIDOR (PH1): **RECOMMENDATIONS**

KEY MAP



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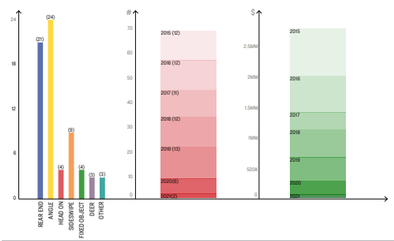
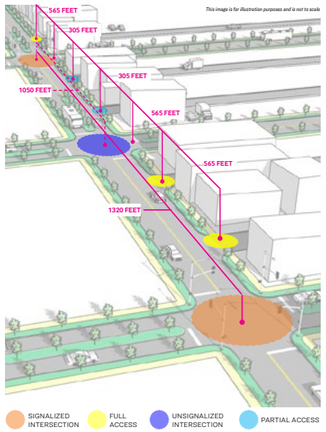
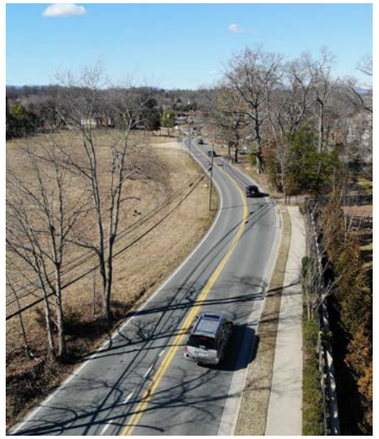




JWWP TO PEN PARK: **BASIS OF UNDERSTANDING**

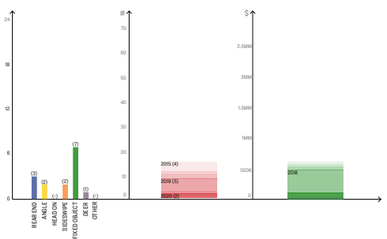
KEY MAP



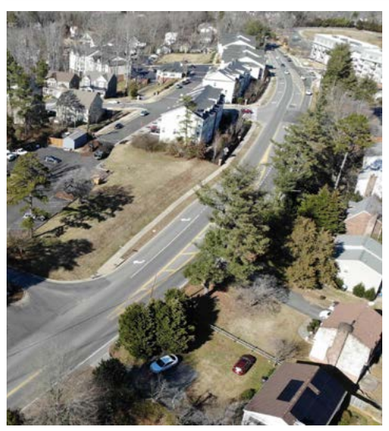
NOTEWORTHY OBSERVATIONS

- Substantial near-term development projects
- Opportunity to make necessary and logical bike/ped connections
- Opportunity to implement recommendations of this Study
- 44% of accidents are “off-road” fixed object collisions

NOTEWORTHY STATISTICS



PEN PARK TO STONEHENGE: **BASIS OF UNDERSTANDING**



NOTEWORTHY OBSERVATIONS

- Opportunity to integrate North and Central portions of this corridor with unified aesthetic and character
- Numerous Safety Concerns
  - LHT for Waldorf School storage length is deficient. 50% of accidents are rear-end collisions
  - Rear-end accidents at Towne Lane consistent with lack of turn lane. Roadway is wide enough to incorporate this
  - Intersection sight triangles obstructed at Penfield Lane
  - Vertical Curve Geometry concerns related to posted speed limit

NOTEWORTHY STATISTICS