

# GAP SUMMARY DOCUMENT CULPEPER SMALL AREA PLAN



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### ACKNOWLEDGMENTS

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### ABOUT GAP-TA

The following study was conducted under a Growth and Accessibility Planning (GAP) technical assistance grant. Administered by Virginia's Office of Intermodal Planning and Investment (OIPI), GAP technical assistance projects seek to align infrastructure development with designated and emerging growth areas to improve efficiency and effectiveness. Visit [vtrans.org/about/GAP-TA](https://vtrans.org/about/GAP-TA) for information about the Growth and Accessibility Planning Technical Assistance program.

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# I. INTRODUCTION

## GAP Technical Assistance

The following study was conducted under a Growth and Accessibility Planning (GAP) technical assistance grant. Administered by Virginia's Office of Intermodal Planning and Investment (OIPI), GAP technical assistance projects seek to align infrastructure development with designated and emerging growth areas to improve efficiency and effectiveness. Organized under four program components, the Rappahannock-Rapidan Regional Commission (RRRC) applied for planning assistance to explore improvements necessary to the expended development of lands east of the Town of Culpeper.

## Study Area & Background

The study area for this plan is a 2.5 square mile portion of Culpeper County, immediately east of the Town of Culpeper and bounded to the south by James Madison Highway (US Route 15/29) and to the north by a major railroad line. The area is adjacent to three interchanges on the limited-access James Madison Highway; exits serving route 522 (Fredericksburg Road), route 666 (Braggs Corner Road), and route 15-Business (Brandy Road). The area is lightly developed, with a few widely-spaced industrial, institutional, commercial, and other uses in addition to many undeveloped parcels. Existing routes within the project area include route 799 (McDevitt Drive), route 667 (Nalles Mill Road), and route 666 (Braggs Corner Road).

The study area is a key growth area for Culpeper County; located in an area with little existing development, substantial visibility and accessibility to 15/29, and adjacent to major activity centers in and near the Town of Culpeper.

## Project Process and Activities

An in-person project kickoff meeting was held on June 22, 2021, at the offices of the offices of the Rappahannock-Rapidan Regional Commission in Culpeper, after which monthly project progress meetings were held virtually between the Consultant Team and the Project Steering Committee to guide project activities and review deliverables.

Project activities were in two major phases: Existing Conditions Analysis and Transportation Analysis. Existing Conditions Analysis included a review by consultants of existing planning documents from the County, Town, and region, drawing themes and general strategies for the growth and development of the area. Additionally, consultants mapped and analyzed existing

traffic, environmental constraints, land use, existing transit, and other parameters to measure background conditions, constraints, and opportunities. The Transportation Analysis phase included creating an assumed future land use program, projecting traffic generated by potential growth, assigning trips to new and existing routes, proposing street section improvements necessary to handle increased traffic, and proposing bicycle and pedestrian improvements to complete a multimodal network.

Consultants presented draft results and recommendations to the County's Planning Commission on January 12, 2022, in a meeting also attended by Town, County, and Regional Commission planning staff as well as three members of the Town of Culpeper Planning Commission.

## Project Steering Committee

A Project Steering Committee made up of Rappahannock-Rapidan Regional Commission, County of Culpeper, Town of Culpeper, and VDOT representatives met monthly to guide project activities. Steering Committee participants included:

**Patrick Mauney** • RRRC, Executive Director

**Matthew Decatur** • RRRC, Regional Planner

**Jennifer Little** • RRRC, Regional Planner

**Sam McLearen** • County, Director of Planning & Zoning

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## II. EXISTING CONDITIONS ANALYSIS

### Existing Conditions

The purpose of the existing conditions analysis is to develop an understanding of project area destinations, conditions, unbuildable areas, previously adopted goals, and other features. The analysis of existing conditions sets a baseline for project area opportunities and constraints, and for envisioning potential future travel and land use issues.

This existing conditions analysis included two major components; a review of previously-adopted local plans and regulations that set expectations and general direction for the future of the project area, and a review of data and mapping that summarizes zoning, future land use designations, available roadway rights-of-way, topography, and other site conditions.

The existing conditions analysis was used to identify travel and land use dynamics in the project area and to inform the design of a feasible network of transportation connections to serve potential future needs in the project area and connect the project area to adjacent and regional destinations, routes, and activity areas.

### Existing Vtrans Needs

While this project plans for the potential impacts of future growth on Culpeper, the area is also subject to existing transportation needs identified in the 2021 VTrans Mid-Term Needs. Identified 2021 Mid-Term needs for streets, intersections, and areas in or near the project area can be found in **Table 1**.

### Existing Land Uses & Destinations

The project area is lightly developed, with a few widely spaced industrial, institutional, commercial, and other uses in addition to many undeveloped parcels. Institutional uses include Germanna Community College and the recently opened Culpeper Technical Education Center, a facility in the Culpeper County Public School system. Commercial uses include an Equinix Data Center and office/medical and small retail uses along Braggs Corner Road (route 666). The Town of Culpeper maintains a public works facility near the center of the project area, including wastewater treatment. While there are no established residential neighborhoods in the project area, some scattered homes are found throughout. The overall density of development in the area

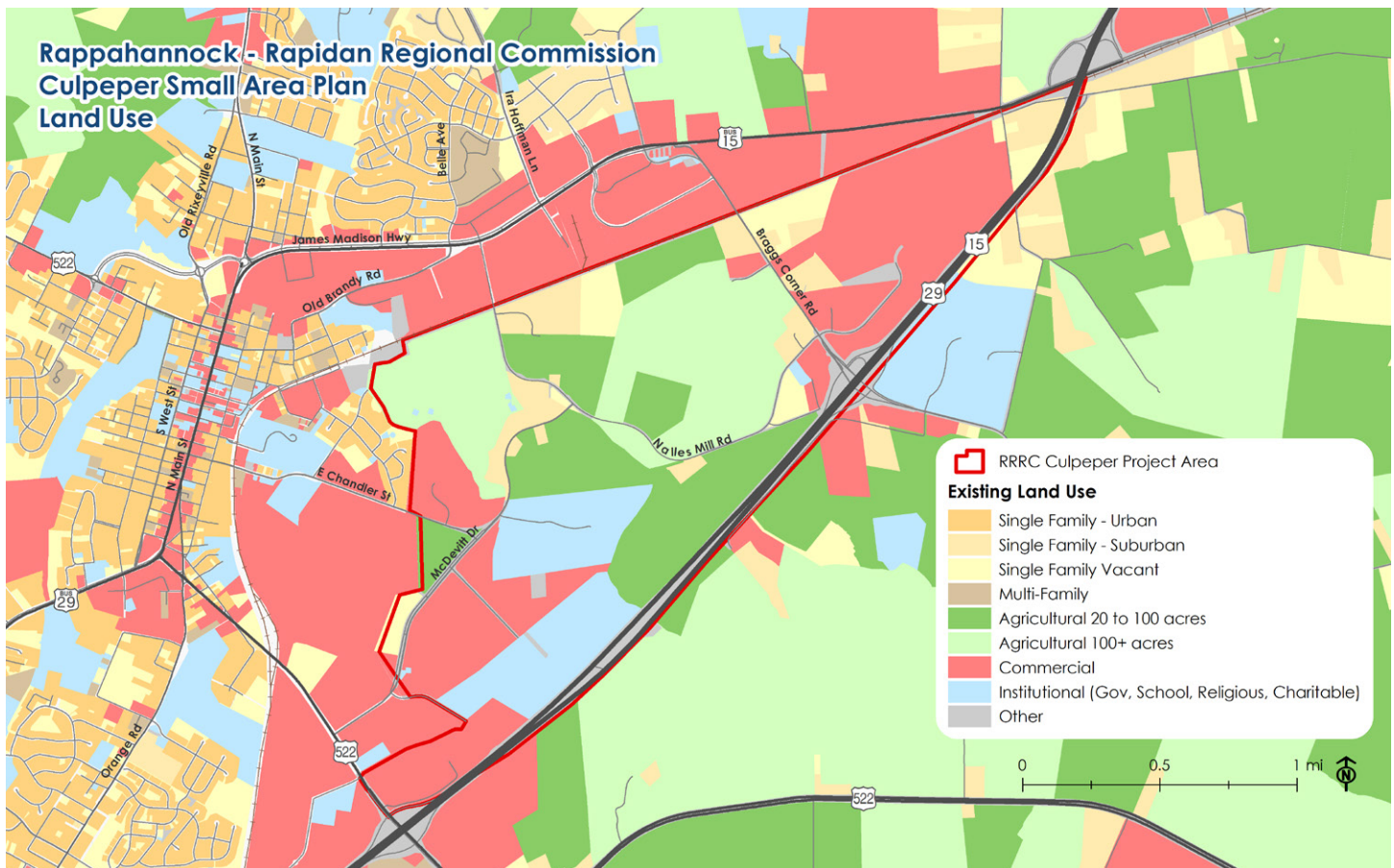


Figure 1: Existing Land Use

**Table 1: Existing Vtrans Needs**

Route Segments	Needs
McDevitt Dr./Keyser Rd. (w. of Chandler St.)	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
Keyser Rd. (e. of Chandler St.)	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> <li>Safety Improvement</li> </ul>
Braggs Corner Rd.	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
Nalles Mill Rd. (n. of Keyser Rd.)	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> <li>Safety Improvement</li> </ul>
Nalles Mill Rd. (s. of Keyser Rd.)	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
Chandler St.	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
Montanus Dr.	<ul style="list-style-type: none"> <li>Safety Improvement</li> </ul>
Route 522	<ul style="list-style-type: none"> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
U.S. 29 Bypass	<ul style="list-style-type: none"> <li>Capacity Preservation</li> <li>Transportation Demand Management (limited access)</li> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
U.S. 29 Business	<ul style="list-style-type: none"> <li>Transportation Demand Management (non-limited access)</li> <li>Safety Improvement</li> <li>Improved Access to Industrial and Economic Development Area</li> </ul>
Intersections	Intersections
Braggs Corner Rd./Nalles Mill Rd.	<ul style="list-style-type: none"> <li>Intersection Safety Improvement</li> </ul>
U.S. 29 Business/Old Brandy Rd.	<ul style="list-style-type: none"> <li>Intersection Safety Improvement</li> </ul>
U.S. 29 Business/Montanus Dr.	<ul style="list-style-type: none"> <li>Intersection Safety Improvement</li> </ul>
U.S. 28 Business/Braggs Corner Rd.	<ul style="list-style-type: none"> <li>Intersection Safety Improvement</li> </ul>
Areas	Intersections
Downtown Culpeper Urban Development Area (UDA)	<p>Urban Development Area needs, including:</p> <ul style="list-style-type: none"> <li>Roadway capacity</li> <li>Roadway operations</li> <li>Intersection design</li> <li>Street grid</li> <li>Safety features</li> <li>Traffic calming</li> <li>Signage/wayfinding</li> <li>Transit frequency</li> <li>Transit operations</li> <li>Transit capacity</li> <li>Transit facilities</li> <li>Bicycle infrastructure</li> <li>Pedestrian infrastructure</li> <li>Complete Streets</li> <li>Sidewalks</li> <li>On-street parking</li> <li>Off-street parking</li> </ul>

is very low, with many undeveloped and agricultural parcels, including large parcels that may host future development. The large size of project area parcels has an effect on mapping of existing land use. Parcels designated as commercial or industrial may represent only a small use taking up just a portion of an otherwise developable parcel. Outside of the defined project site, other nearby uses may be important destinations for walking, biking, and driving in the area, including downtown Culpeper to the west, major national chain retail development to the north, and Eastern View High School/Culpeper Sports complex to the east.

### Parcel & Roadway Classifications

Roads within the County are regulated and maintained by VDOT. Any improvements to these roads may be affected by specific regulations based on the system of functional classification, or hierarchy of each roads function in the regional transportation system. While some of the roads bounding the study area have higher order classifications, roads interior to the study area (McDevitt Drive, Braggs Corner Road, Nalles Mill Road, and East Chandler Street) are classified as lower order major collectors or are classified only as local streets (the lowest classification).

Parcels in the project area are generally large, with buildings set well back from public rights-of-way. Public road rights-of-way are generally available along many portions of route 799 (McDevitt

Drive) and route 667 (Nalles Mill Road). Some sections of routes 799 and 667 show no mapped right-of-way. These portions may be controlled by prescriptive easements for public roads. Further investigation will be necessary when engineering improvements. Route 666 (Braggs Corner Road) includes a narrow right-of-way that may require additional right of way acquisition if improvements are to be made. The project area’s sparse, low-density development pattern should give room for improvements to existing routes, in some cases within existing rights-of-way.

The process of planning new roadways to access future development should respect existing property lines wherever possible to create an efficient system of transportation for future development and a fair distribution of infrastructure for parcel owners. Roadways could be proposed along property lines, or in locations that divide parcels into usable pieces and provide suitable land bays for future development.

### Environmental Conditions

The project area has generally rolling topography that is similar to surrounding areas and has few topographic constraints to future development. Water courses, flood zones and wetlands take up significant areas of the middle of the area, particularly south and east of route 799 (McDevitt Drive), route 667 (Nalles Mill Road). A second area of floodplain affects the northeast corner of

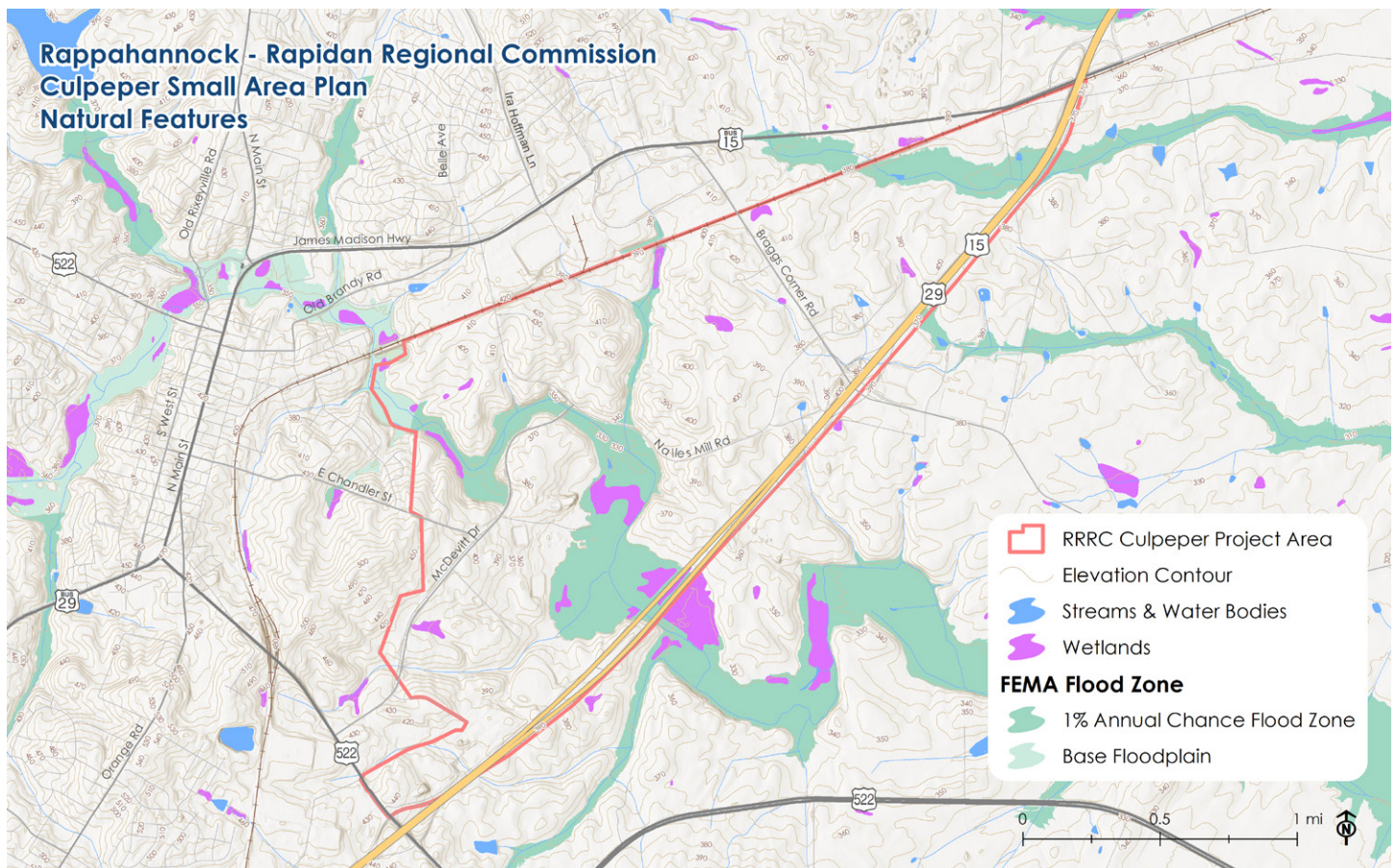


Figure 2: Natural Features



the area. These areas may need to be crossed for transportation connections, and may be valuable areas for trail facilities, but are not suitable for development.

Flood zones, wetlands, and water courses will have significant impacts on the location of future development and should be considered when planning a transportation system. Topography should also be carefully considered with respect to the existing railroad, in order to consider the potential for future roadway connections either over or under the rail line.

### Circulation Network

An existing park and ride lot is found inside the project area, north of the interchange between James Madison Highway (US Route 15/29) and route 522 (Fredericksburg Road). Other multimodal transportation facilities exist near the site, but not within it. Virginia Regional Transit operates bus service within the Town of Culpeper, including stops throughout the downtown and Business 15 commercial corridor. The town also has bicycle lanes along portions of East Street in the downtown.

The only pedestrian facilities that exist in the project area are along Bragg’s Corner Road, from the bridge over Rt. 15/29 up to the intersection with Nalles Mill Road. The cross section of this portion of Braggs Corner Road seems to meet current VDOT standards

providing a shared use path on one side of the roadway and a sidewalk on the other side. While little or no transit or pedestrian facilities exist in the project area, it is important to note off site networks that could be extended into the site as development occurs in this area. Pedestrian facilities associated with new development can provide important “first-mile/last mile” links to transit, in addition to accessing major destinations. At present, bicycle facilities in the surrounding area do not form a cohesive network but could be extended over time to form meaningful connections.

Data on the function of existing public roadways is available from VDOT. Data for the project are shows expected numbers of crashes interior to the site, including angle crashes at intersections and crashes on rural section roads McDevitt Drive, Nalles Mill Road, and Braggs Corner Road involving vehicles leaving the roadway and animal collisions. Data on Average Daily Traffic shows busy roadways around the project area’s perimeter (James Madison Highway (US Route 15/29), route 522 (Fredericksburg Road), and route 15-Business (Brandy Road) in keeping with the regional highway and commercial corridor uses of these roads. Traffic within the project area is light but may reveal the use of Nalles Mill Road and McDevitt drive as shortcuts through the site rather than as accesses to destinations within the site.

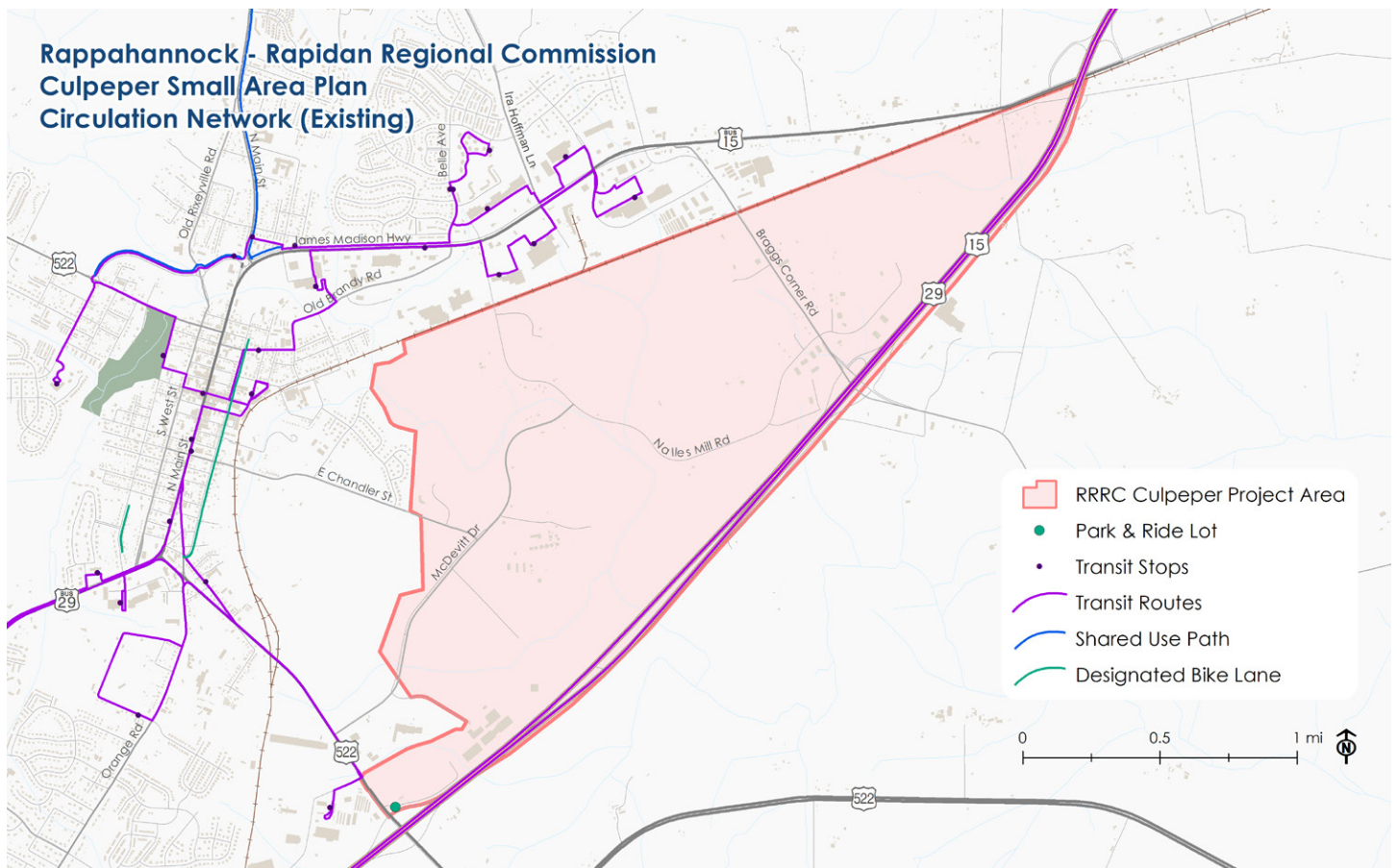


Figure 3: Circulation Network (Existing)

## Future Land Use

The County's Comprehensive Plan calls for primarily industrial development in the project area, with mixed use development in the northwestern area of the site, nearest the Town. Some small portions of future commercial use are mapped near the intersection of McDevitt Drive and East Chandler Street and north of the interchange between James Madison Highway (US Route 15/29) and route 666 (Braggs Corner Road).

The County's Comprehensive Plan should be reviewed for necessary updates at least every five years as called for in Virginia law. While this planning process will not make land use recommendations for the project site, it will propose potential vehicle, pedestrian and bicycle infrastructure based on land use assumptions.

## Summary of Plans & Documents

The project area is addressed by a range of existing plans and policies from both the County and Town of Culpeper. This planning process included a review of existing plans for context and overall strategic direction for the site. Documents reviewed for relevance to this process include:

1. *Culpeper County Draft 2020 Comprehensive Plan*
2. *Culpeper County 2015 Comprehensive Plan*
3. *Town Of Culpeper Comprehensive Plan*
4. *Rappahannock-Rapidan Regional Commission 2045 Regional Long Range Transportation Plan*
5. *Town Of Culpeper Urban Development Area Master Plan*
6. *Town Of Culpeper Parks and Greenway Master Plan*
7. *Town Vicinity Improvements Town/County Loop Road Culpeper County, Virginia*
8. *Eastern Business Area Transportation Plan Culpeper County, Virginia*

Based on a review of these documents, several common policy themes emerge that can give guidance to the future planning and development of the project area, including:

### **1. Provide infrastructure and amenities that will allow the site to become a hub for business and industry in Culpeper County.**

The County's Comprehensive Plan identifies the site as industrial on the Future Land Use Map. Industrial areas were selected because they have access to utilities, roads, and other infrastructure

such as rail access, and are suitable locations for current and future employment uses. The Town's Comprehensive Plan also plans for concentrations of economic development projects in areas with good rail and highway access such as the project site. Finally, the Regional Long Range Transportation Plan supports the concentration of freight activity in designated growth areas to maximize the performance of the existing transportation system while preserving the region's rural areas.

The Regional Long Range Transportation Plan advocates for supporting and improving economic viability by investing in projects that improve access to economic opportunities. The plan points out that the entire Rappahannock-Rapidan Region is classified in SMART SCALE Category D, which prioritizes economic development in project prioritization. Critically, the County's Comprehensive Plan identifies quality of life as an important element of economic development.

### **2. Create a road network on the site that will improve traffic operations in and around the Town of Culpeper.**

The County and Town of Culpeper have taken steps to promote a transportation network that supports future development in the project area through existing improvements and plans for further upgrades. McDevitt Drive has been constructed to provide a major access corridor for industrial development in the area. A planned roundabout at its intersection with route 522 will improve safety and efficiency. The County has proposed upgrading Keyser Road and Nalles Mill Road to accommodate increased traffic and is interested in providing a service road through the study area that would parallel US 15/29 Business to relieve traffic on that corridor. The County has proposed extending Ira Hoffman Lane (Rt 694) to connect with Braggs Corner Road (Rt 666), and advocates for a loop road around the Town of Culpeper to provide thru traffic with an alternative to Main St. The proposed loop could include portions of Braggs Corner Road and the Ira Hoffman Road extension.

Culpeper County is interested in exploring options for multimodal transportation that are appropriate for a rural development pattern, and East Chandler St, Keyser St, and Nalles Mill Rd have been proposed as bikeways for the Town of Culpeper.

### 3. Incorporate transportation and land use practices that allow the site to become a cohesive extension of the Town of Culpeper.

While the entirety of the project area is located in the Culpeper County, its proximity to the Town of Culpeper, and the Town's position as the County's major hub of activity and development, make connections between the site and the Town critical.

A majority of the properties in the town that border the study area are designated as "Mixed-Use Business" in future land use plans, a designation that envisions developments that include a walkable town-center style area but may be primarily accessed by automobiles. Developments under this designation would utilize a grid or intersecting perpendicular street pattern.

The Town of Culpeper intends to enhance key gateway corridors, including East Chandler St with sidewalks and landscaping elements. The Town is also exploring multimodal transportation options, with two fixed route buses operating in the town, and interest in future expansion of the transit network. Multi-Use trails are one of the most popular outdoor recreation amenities for town residents, and the town intends to require new developments to include accommodations, facilities, and furniture for bicycles. The Rappahannock-Rapidan Regional Commission encourages the development of multimodal transportation networks throughout the region.

## Summary of Opportunities & Challenges

This analysis has revealed numerous challenges and opportunities as benchmarks for consideration in the planning process.

### Challenges

- **Lack of existing bicycle and pedestrian facilities.** There are presently no existing sidewalks, trails, or bicycle lanes within the study area, with the exception of a small section of sidewalk and shared use path along Braggs Corner Road.
- **Railroad as a barrier.** The active rail line making up the north edge of the project area is crossed only by an at-grade road crossing at Braggs Corner Road and an elevated crossing at Nalles Mill Road. Any new crossing of the rail line may be complex and costly.
- **Limited right-of-way.** Mapped rights-of-way are very limited for Braggs Corner Road. Sections of Nalles Mill Road and McDevitt Drive may have only prescriptive easements. Any improvements may involve the additional requirement of

acquiring right-of-way, either by purchase, condemnation or proffer as part of future development.

- **Environmental constraints.** Significant portions of the study area are affected by wetlands and flood zones, limiting potential development.
- **Overall distances.** A walking distance of one quarter to one half of a mile is commonly used to plan pedestrian centers. This large project area is 3.5 miles long, while the center of the site (intersection of McDevitt Drive and Nalles Mill Road) is 1.25 miles from downtown Culpeper.

### Opportunities

- **Developable land.** The project area represents a sizable area of undeveloped land with access to major roadways, infrastructure and services. Development of this land is generally supported by policies and plans of the County and Town.
- **Town adjacency.** The Town of Culpeper provides an adjacent example of traditional compact development, bicycle/pedestrian access, and mixed land uses, and provides a hub of activity, employment, and services for future development that can inspire the planning of the project area.
- **Existing destinations.** The project area contains important destinations that may attract significant vehicular, bicycle and pedestrian traffic even prior to the development of vacant parcels. Germanna Community College and the Culpeper Technical Education Center are important destinations within the area, while downtown Culpeper, the major national chain retail development along Route 15/29 Business, and Eastern View High School/Culpeper Sports Complex are nearby.

### III. TRANSPORTATION ANALYSIS

#### Transportation Analysis

The Transportation Analysis measures the potential traffic impacts of growth and development in the project area. While sparsely developed at this time, the area’s access to transportation routes, proximity to the Town of Culpeper, utility access, and other factors make future development of these parcels very likely. The traffic impact analysis included here shows the potential traffic added to new and existing routes under one land development scenario.

#### Transportation Analysis Methodology

The consultant team conducted a traffic impact analysis of one potential land development scenario in the project area. This analysis considers existing traffic and plans for projected traffic in the year 2045, matching the planning horizon in the County’s Comprehensive Plan. The impact analysis is based on the County’s assumptions about future land use mix and density and uses established ITE trip generation rates to project traffic impacts. The traffic impact analysis was constructed using the following steps:

1. Identify developable land bays, and their acreage, based on environmental conditions, transportation access, and existing ownership patterns
2. Identify potential new transportation connections that may be necessary to future land bay development. These connections are shown conceptually, and may vary in their location. Additional minor routes within each land bay may also be necessary, and will be dictated by the future development program)
3. Prepare land use type and density assumptions (land use assumptions by County planning staff)
4. Propose additional assumptions for internal trip capture, residential unit size, and pass by trips

5. Forecast generated traffic using ITE rates for proposed residential units and commercial square feet, assigning trips to new and existing routes

#### Land Use Assumptions

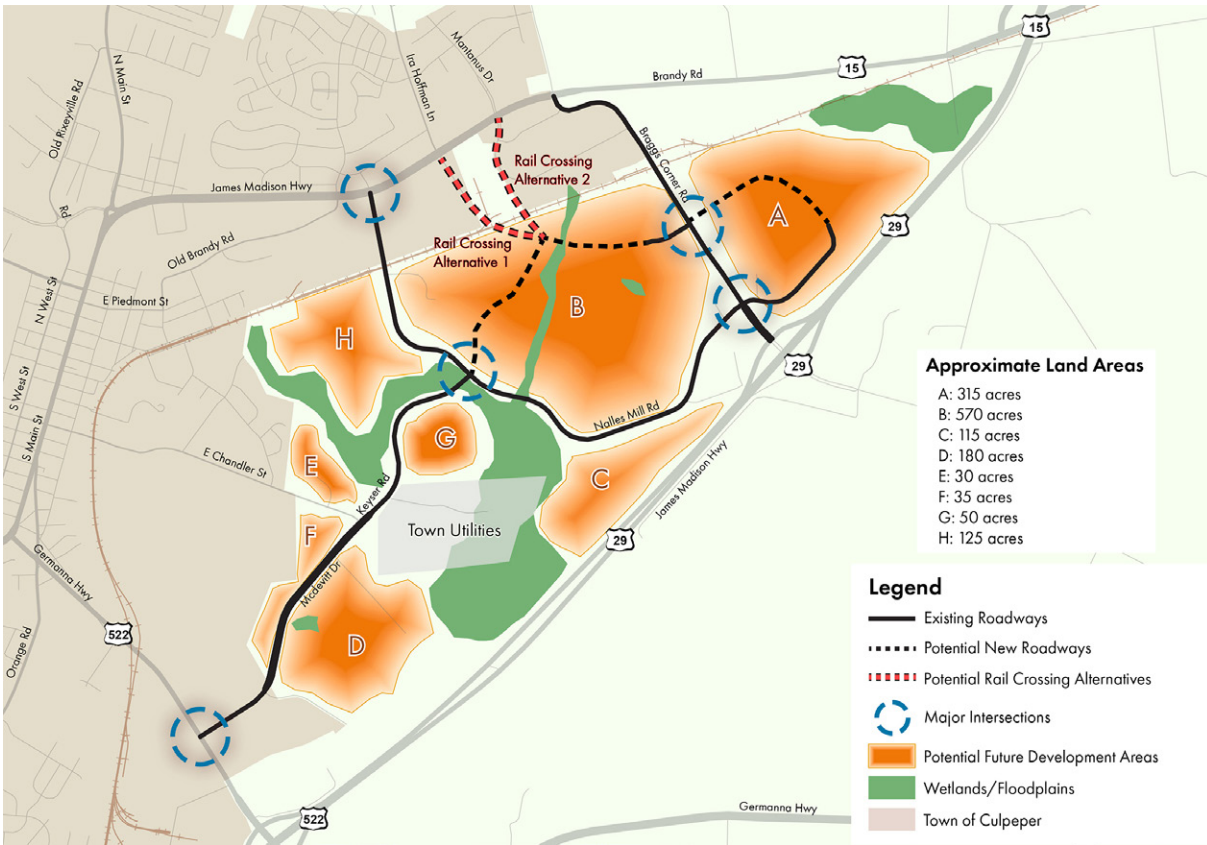
Using maps of existing transportation routes, parcel lines, and environmental conditions, the consultant team mapped the location and extent of conceptual land bays in which future development in the project area may occur. For each proposed land bay Culpeper County planning staff provided order of magnitude estimates of future development potential based on a mix of light industrial, office, retail, single-family residential, and multi-family (apartment) residential. These estimates were based on recent County growth, developer interest, and the County’s economic development plans, among other factors. The potential land use mix is not intended to replace the County’s presently adopted Comprehensive Plan but is an estimate of potential future development capacity for the purpose of analyzing potential traffic impacts. Using the potential future land use scenario, the consultant team derived conceptual building square footage and residential unit counts using an assumed floor area ratio (FAR) of 0.15 for all land bays and average residential unit sizes of 2,531 square feet for single family and 752 square feet for multi-family.

The land use scenario included here represents one possible scenario for the future development of the project area. This scenario has been used for the purposes of this traffic impact analysis only and may not represent the eventual development of the area, the ideal development scenario envisioned by County leaders, or the development called for by existing long-range plans or zoning regulations. The assumptions about future development potential are shown in Table 2, below.



Figure 4: Aerial view of project site, showing developable land in foreground and existing development in background

**Figure 5: Land Bays and Potential Future Circulation**



**Table 2: Assumed Future Development Potential by Land Bay**

Land Bay	Acreage	Land Use Mix	Commercial Sq. Ft.	Residen. Units
A	315	70% LI, 12.5% O, 12.5% R, 5% SFR	2,058,210	41
B	570	56% SFR, 24% MFR, 10% O, 10% R	3,724,380	2,013
C	115	80% LI, 10% O, 10% R	751,410	
D	180	100% LI	1,176,120	
E	30	100% LI	196,020	
F	35	100% LI	228,690	
G	30	100% LI	326,700	
H	125	100% SFR (senior)		274

LI = Light Industrial, O = Office, R = Retail  
 SFR = Single-Family Residential, MFR = Multi-Family Residential

## Trip Generation

Using the assumed future development potential scenario, the consultant team examined the number of vehicle trips likely to be generated by each land use and land bay. Trip generation is based on current generation figures for individual land uses published in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Additionally, the consultants have made assumptions for internal capture and pass-by trips. Internal capture represents trips that begin and end within a single land bay and are assumed at 15% for land bays with multiple uses (land bays A, B, and C). Internal capture reduces the impact of generated trips on nearby roads. Pass-by trips represent trips already occurring between other origins and destinations in the network. For these trips, an incidental stop in the project area does not add more trips than would otherwise exist and are estimated at 34% of all retail trips.

**Table 3: Trip Generation**

Land Bay	Land Use Mix	Trip Generation (daily)
A	70% LI, 12.5% O, 12.5% R, 5% SFR	16,264
B	56% SFR, 24% MFR, 10% O, 10% R	27,260
C	80% LI, 10% O, 10% R	6,485
D	100% LI	5,834
E	100% LI	972
F	100% LI	1,134
G	100% LI	1,620
H	100% SFR (senior)	1,366

LI = Light Industrial (ITE code 110)

O = Office (ITE code 710)

R = Retail (ITE code 820)

SFR = Single-Family Residential (ITE code 210; 251 for senior)

MFR = Multi-Family Residential (ITE code 220)

## Traffic Impact Analysis Results

The new trips generated by each land bay were assigned to new and adjacent routes to estimate overall traffic in the horizon year of 2045. Results are given for three different scenarios: 1) 2045 No Build, 2) 2045 50% Build, and 3) 2045 Full Build. The no build scenario represents a future where no new development in the project area takes place, but where traffic on nearby routes has increased 0.5% per year from existing levels. The 50% build scenario represents a future where only half of all proposed development under the land use assumption has been built by

2045. The full build scenario represents the full extent of assumed development by 2045.

As expected, under the no build scenario there is little traffic impact on existing routes. Traffic volumes on Routes 522 and 666 remain well within the capacity of these roads, and routes internal to the project area, such as Nalles Mill, remain very lightly traveled. At 50% build-out, significant traffic impacts are seen on new and existing routes. Braggs Corner Road, Nalles Mill Road, McDevitt Drive, and all other routes other than U.S. 15/29 and U.S. 15/29 Business are currently 2-lane roads. This impact analysis assumes as a general rule that traffic volumes over 15,000 trips per day will require additional lanes. At 50% buildout, projected traffic can generally be accommodated without widening existing routes. At full build-out, major traffic impacts could be seen, including Braggs Corner Road, Nalles Mill Road, and McDevitt Drive/Keyser Road exceeding the capacity if their existing two-lane designs. Significant road improvements would be required to increase the capacity of these routes to meet the needs of development in the project area.

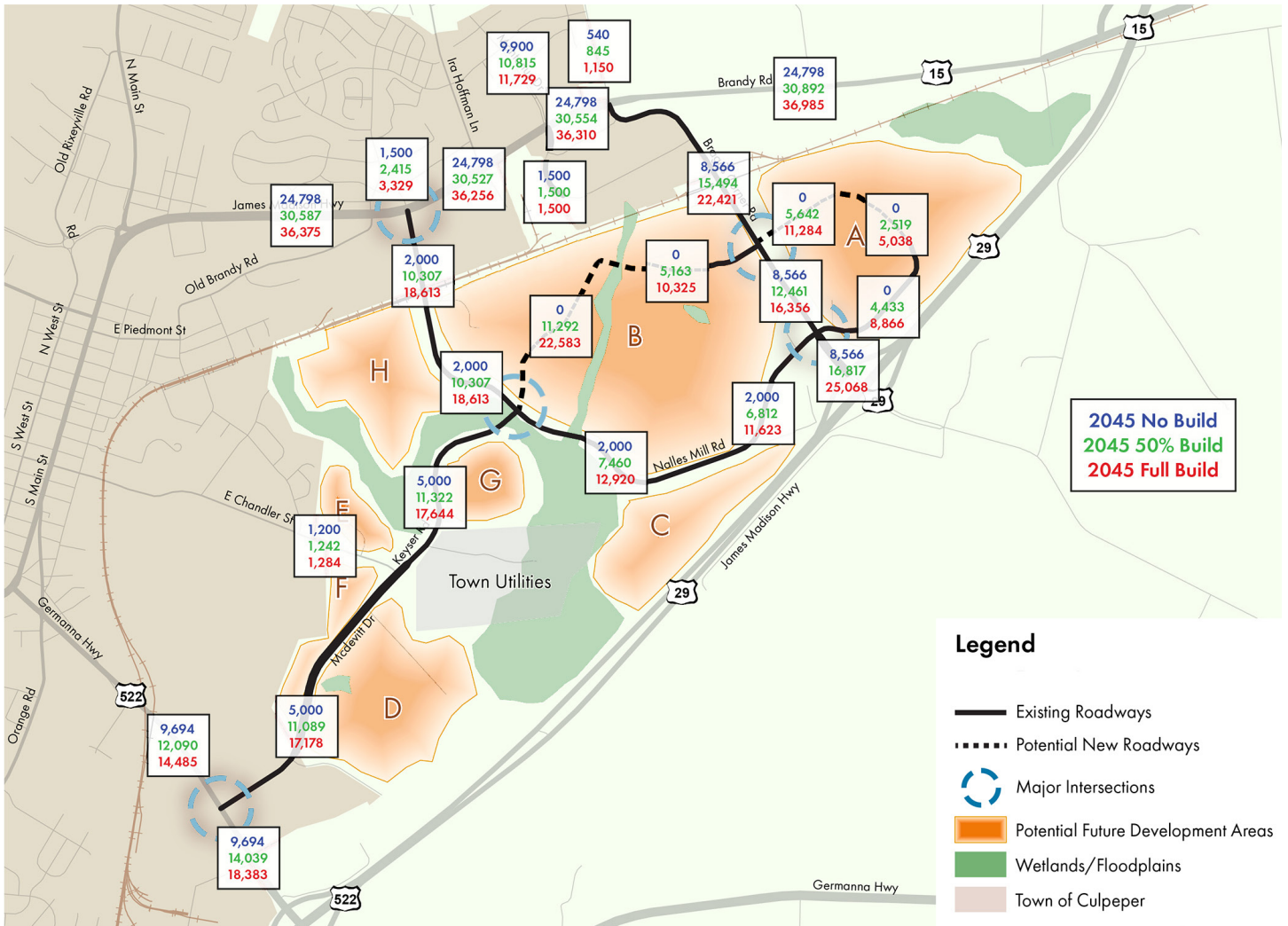
## Alternative Circulation Scenario

An alternative circulation scenario was explored as one way of dealing with the transportation barrier presented by the existing rail line at the project area's north edge. Existing crossings of the rail line include an at-grade crossing on Braggs Corner Road and a bridge carrying Nalles Mill Road over the rail line. The existing bridge on Nalles Mill is two lanes wide with no room for pedestrian or bicycle travel.

The creation of a new connection between the U.S. 15/29 Business commercial corridor and land bay B in the proposed land use scenario, while potentially complex and costly, could provide additional route options and reduce pressure on existing crossings. A potential crossing by bridge could be considered as an extension of Ira Hoffman Lane, an extension of Montanus Drive, or some other location.

In an alternative circulation scenario that includes a new bridge over the railway, the no-build scenario continues to show little impact. At 50% build-out significant traffic impacts are seen, but all routes remain within the capacity of their existing design sections. At full build-out, Braggs Corner Road and McDevitt Drive/Keyser Road would exceed the capacity if their existing two-lane designs, while Nalles Mill Road may continue to function as a two lane road, albeit near capacity. Additional lanes on Braggs Corner Road and McDevitt Drive/Keyser Road would be required.

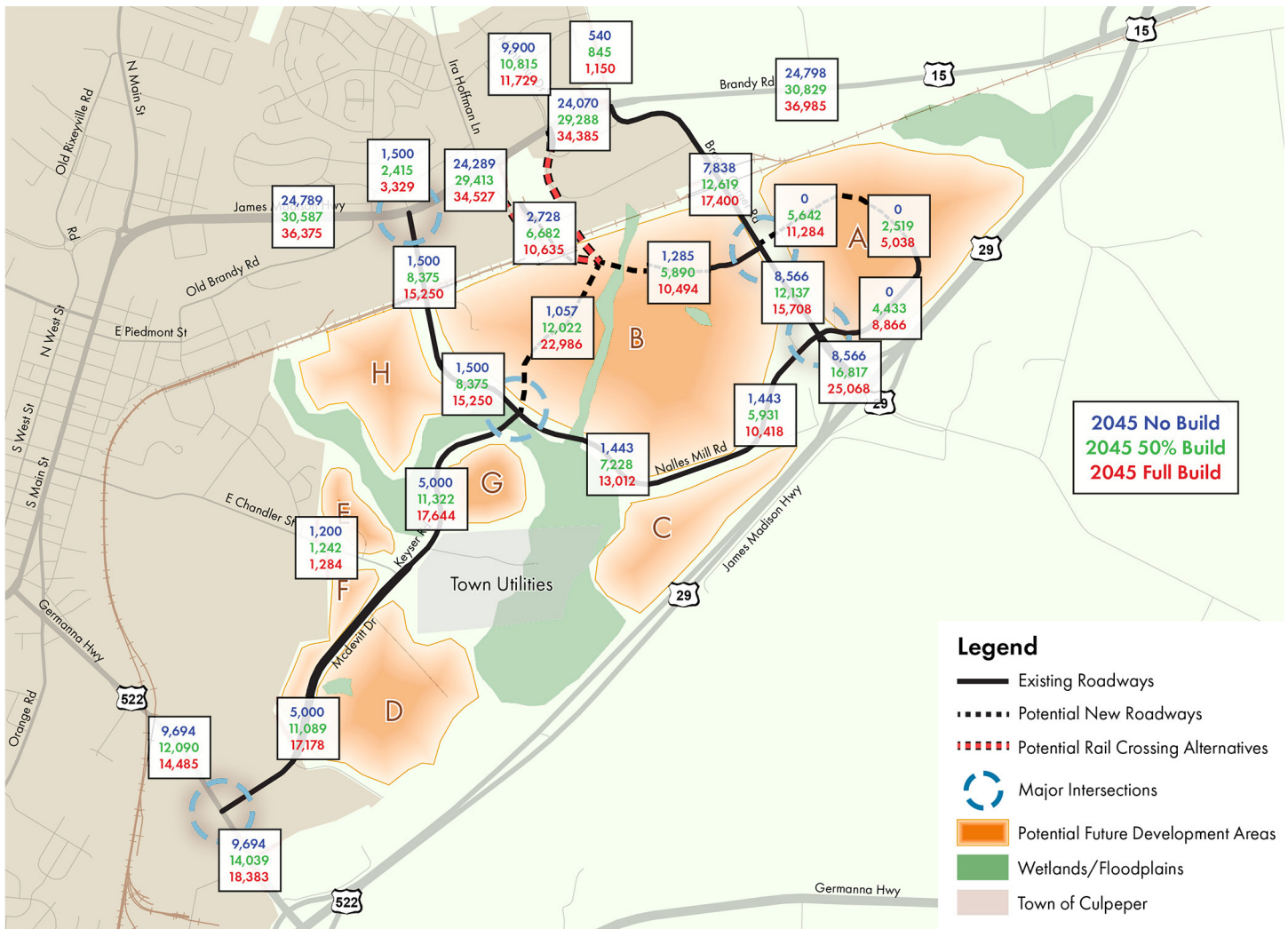
**Figure 6: Traffic Impact Analysis Results**



**Table 4: Traffic Impact Analysis Results**

Segment	2045 No-Build Trips per Day	2045 50% Build Trips per Day	2045 Full-Build Trips per Day
McDevitt Drive (east of Chandler)	5,000	11,089	17,178
Nalles Mill Road (west of Keyser)	2,000	10,307	18,613
Braggs Corner Road (south of Bennett)	8,566	16,817	25,068
Germanna Highway/522 (north of McDevitt)	9,694	14,039	18,383
James Madison Hwy./15-29 Bus. (west of Nalles Mill)	24,798	30,587	36,375

**Figure 7: Traffic Impact Analysis Results (alternate circulation scenario)**



**Table 5: Traffic Impact Analysis Results (alternate circulation scenario)**

Segment	2045 No-Build Trips per Day	2045 50% Build Trips per Day	2045 Full-Build Trips per Day
McDevitt Drive (east of Chandler)	5,000	11,089	17,178
Nalles Mill Road (west of Keyser)	1,500	8,375	15,250
New Bridge Link (Keyser Rd. Ext. to James Madison Hwy.)	2,728	6,682	10,635
Braggs Corner Road (south of Bennett)	8,566	16,817	25,068
Germanna Highway/522 (north of McDevitt)	9,694	14,039	18,383
James Madison Hwy./15-29 Bus. (west of Nalles Mill)	24,798	30,587	36,375



## Opportunities for Roadway Improvements

The existing two-lane roadways in the project area will have limited capacity for future traffic. This analysis assumes as a general rule that traffic volumes over 15,000 trips per day will require additional lanes. Applying this assumption to the traffic impact results, the consultant team developed a series of typical sections that would meet the capacity needs of the potential future development scenario. The typical sections provided here can help inform long-range planning efforts, as well as be considered in the approvals process when reviewing applications for development.



Figure 8: Opportunities for Roadway Improvements

### Section A: McDevitt Drive/Keyser Road

Projected traffic under the full build-out scenario will require a four-lane section for existing McDevitt Drive and Keyser Road, as well as for the proposed new extension of Keyser Road serving Land Bay B. As a major route in an area of new development, an ideal section would include a dividing median, landscape space, and bicycle and pedestrian facilities.



Figure 9: Existing Section, Nalles Mill Road

The proposed design includes four 12-foot lanes, a 16-foot median from which turn lanes can be taken, and a 10-foot shared use path with landscaped separation from automobile travel. Which currently two lanes, portions of McDevitt drive have already been planned for upgrade to a four-lane section, with some grading and other work already installed.

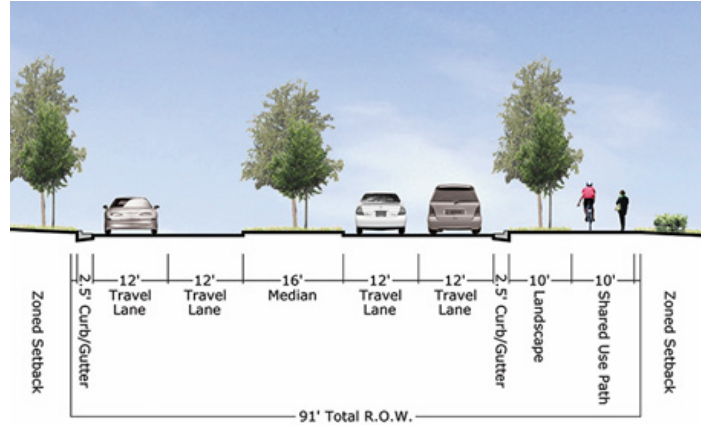


Figure 10: Section A (McDevitt Drive/Keyser Road)

### Section B: Nalles Mill Road/Bennett Drive

Nalles Mill Road is a very lightly traveled two-lane road but may see significant traffic when the project area develops. Segments of Nalles Mill South of its intersection with Keyser Road can continue to meet the needs of the proposed development scenario as a two-lane section but should be formalized with a more standard design. The proposed design includes two 12-foot lanes and a 10-foot shared use path with landscaped separation from automobile travel. The full build-out of the proposed development scenario may also require a four-lane upgrade of Nalles Mill Road if no new connection over the railroad can be established. In this scenario a four-lane section similar to the proposal for McDevitt Drive may be used north of Keyser Road, along with improvements to the existing bridge carrying Nalles Mill Road over the railroad to increase to four lanes.

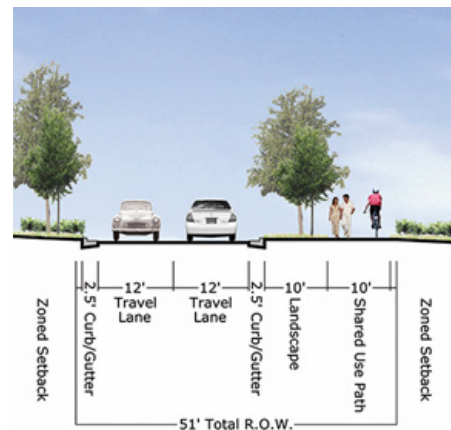


Figure 11: Section B (Nalles Mill Road/Bennett Drive)

## Section C: Braggs Corner Road

Unlike Nalles Mill Road, McDevitt Drive, and Keyser Road, Braggs Corner Road is already a major route carrying through traffic. This route is a major connection between the U.S. 15/29 Bypass and commercial areas along U.S. 15/29 Business, and also connects to Eastern View High School and the County's sports complex to the south and east of the project area. Braggs Corner Road has already received major improvements with the installation of a grade-separated interchange with U.S. 15/29 Bypass. The full buildout of the proposed development scenario would add more traffic to this already well-used route, requiring that Braggs Corner Road be upgraded to a four-lane section. The proposed design shown here carries the existing upgraded road section at the interchange through the remainder of the route, including four 12-foot lanes, a 16-foot median, on-street bicycle lanes, a sidewalk on the west side and a 10-foot shared use path with landscaped separation on the east side.

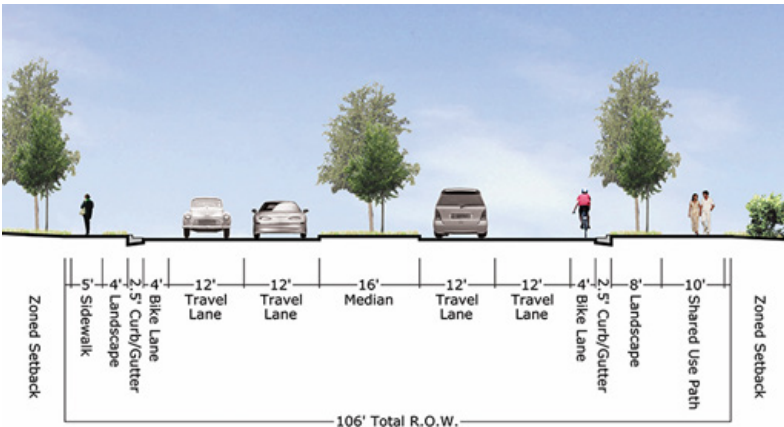


Figure 12: Section C (Braggs Corner Road)



Figure 13: Existing Section, Braggs Corner Road

## Other Streets

While this study analyzes traffic impacts of potential development on major new and existing roadways, additional streets will be needed within each land bay to provide local access to new development. The design of these streets will vary according to the use and density of the development, but typical sections are provided here showing the type and size of improvements that may be needed to complete the overall transportation network.

### Commercial Section

Commercial streets may serve retail and office uses in Land Bays A, B, and C ranging from town-center type retail uses to big-box retail and office campus uses. This section includes variable 11 to 12-foot lanes based on expected traffic, as well as pedestrian space and the potential for on-street parking where appropriate.

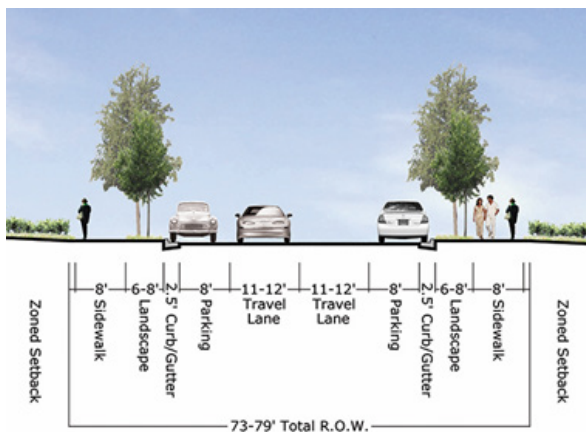


Figure 14: Commercial Section

### Residential Section

Residential streets may be needed to support residential development included in the land use scenario for Land Bays A, B, and H. Residential streets may serve a range of residential types, from single-family detached neighborhoods to apartment complexes. Travel lanes may be narrower, but pedestrian and landscape spaces are still included.

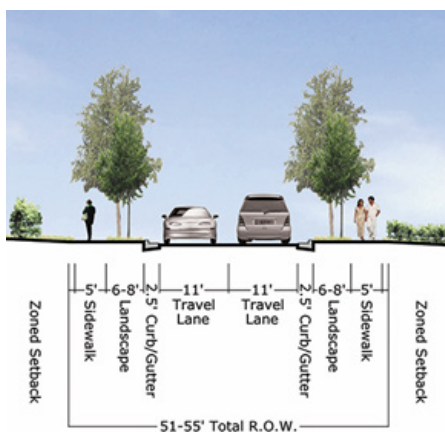


Figure 15: Residential Section

### Light Industrial Section

Light Industrial development is included in Land Bays A, C, D, E, F, and G. Light industry may encompass light manufacturing, research and development, data centers, and more. Lanes greater than the 12 feet shown may be required in some instances to accommodate truck traffic.

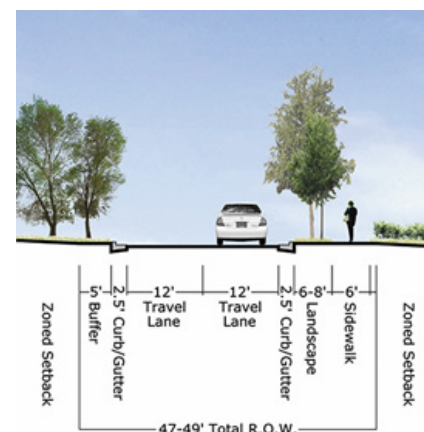


Figure 16: Light Industrial Section

### Village Center Section

Village Center streets may apply to areas where development is designed around a walkable, mixed-use core such as in the range of uses in the scenario for Land Bay B. This street section includes additional landscape space in the street median as well as on-street parking and wide, landscape-buffered sidewalks to serve pedestrians.

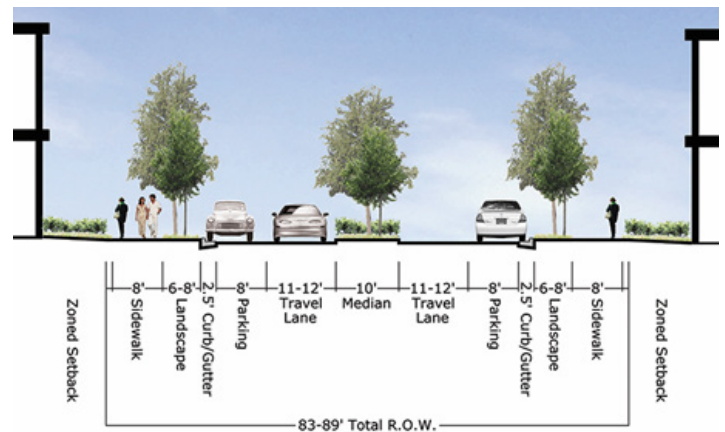


Figure 17: Village Center Section

## Opportunities for Bicycle and Pedestrian Improvements

The project area is largely undeveloped, with very few existing bicycle and pedestrian facilities. Existing facilities include only a small section of sidewalk and shared use path along Braggs Corner Road associated with recently installed interchange improvements.

The overall size of the project area poses a challenge to bicycle and pedestrian activity. While a walking distance of one quarter to one half of a mile is commonly used to plan walkable distances, the project area is 3.5 miles long and its approximate center, at the intersection of McDevitt Drive and Nalles Mill Road, is 1.25 miles from downtown Culpeper. Until the area experiences significant new development activity, it is likely that the bicycle and pedestrian demand in the area will be low.

Despite challenges to bicycle and pedestrian demand resulting from the undeveloped nature of the area, it is in fact immediately adjacent to the Town of Culpeper. The Town is an example of traditional compact development, bicycle and pedestrian access, and mixed land uses, and provides a hub of activity, employment, and services that will help to stimulate future development of the project area. Individual destinations that may also contribute to bicycling and walking in the area include East View High School, the Culpeper Sports Park, Germanna Community College, Culpeper Technical Education Center, and retail businesses along U.S. 15/29 Business.

### Existing Pedestrian Destinations:

- Downtown Culpeper
- Culpeper train station
- Culpeper Human Services office
- Mountainbrook neighborhood
- Germanna Community College
- Culpeper Technical Education Center
- U.S. 29 retail
- Bennett Road medical offices
- Eastern View High School Culpeper Sports Complex



Figure 18: Germanna Community College



Figure 19: Main Street, Downtown Culpeper

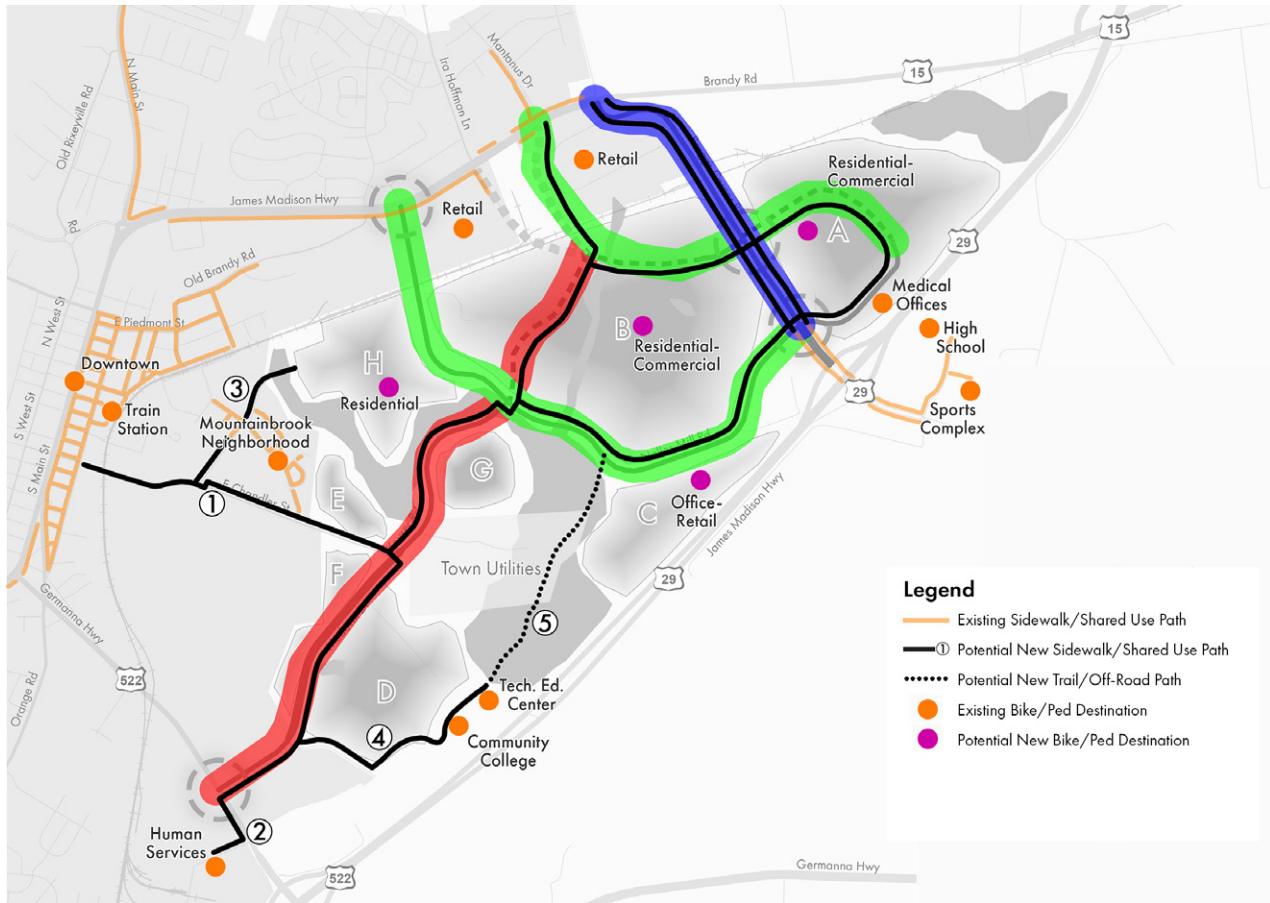
### Potential Pedestrian Destinations:

- Potential Land Bay A residential/commercial
- Potential Land Bay B residential/commercial
- Potential Land Bay C office/retail
- Potential Land Bay H residential development (Williams Mill)

The future development of the project area can create new bicycle and pedestrian destinations, as well as create demand for bicycle and pedestrian connections to the Town of Culpeper and other existing destinations. Off-site networks can be extended into the site as development occurs in this area. At present, bicycle facilities in the surrounding area do not form a cohesive network but can be extended over time to form meaningful connections.

The street section designs proposed by this study to accommodate projected vehicle traffic each include facilities for bicycles and pedestrians. Section A (McDevitt, Keyser, Keyser Ext.) and Section B (Nalles Mill, Bennett, Enterprise Ext.) include a 10-foot-wide paved shared use path for both bicycles and pedestrians. Section C (Braggs Corner) includes sidewalk, shared use path, and on-street bicycle lanes to match the existing improved interchange design. The inclusion of bicycle and pedestrian facilities on these main routes can help form the foundation of a bike/ped transportation network for the project area.

**Figure 20: Opportunities for Bicycle and Pedestrian Improvements**



**Additional Connections**

To connect to the overall bicycle and pedestrian network beyond the project area, additional connections should be made. Additional recommended bicycle or pedestrian connections have been suggested in Figure 15, above, and include:

1. Sidewalk or shared use path on Chandler Street to access downtown Culpeper
2. Sidewalk or shared use path on Route 522 connecting McDevitt Drive to Industry Drive and Culpeper Human Service office
3. Sidewalk on Electric Avenue connecting Chandler Street to existing sidewalks in Mountainbrook neighborhood
4. Sidewalk or shared use path on Technology Drive to access Germanna Community College and Culpeper Technical Education Center
5. Off road shared use path connecting Technology Drive to Nalles Mill Road along Mountain Run stream corridor

Additional local streets beyond the three major routes considered in this traffic impact analysis will be necessary to support development within individual land bays. Typical design sections for such streets are included in this study. Although the eventual design of these minor streets will vary depending on the development’s final land use mix, density, and other factors, bicycle and pedestrian facilities should be included at appropriate scales on all streets.

**Transit**

Existing transit serves downtown Culpeper, the U.S. 15/29 Business corridor, and key destinations including the Culpeper Human Service office on Industry Drive. Pedestrian facilities associated with new development should provide important “first-mile/last mile” links to transit stops. Additionally, new transit routes and stops should be planned within and nearby the project area as growth and development occur. Potential new transit stops may include:

- Eastern View High School
- Culpeper Sports Complex
- Bennett Road medical offices
- New village center, office, retail, and residential developments

## IV. CONCLUSIONS

As outlined in the proposal for GAP Technical Assistance for this project, this report analyzes potential traffic impacts and access opportunities for a study area that will be critical to the future growth of the County and Town of Culpeper.

The analysis presented here is based on a set of land use and future development density assumptions for potential land bays, and the levels of new traffic that such development may potentially generate.

While the eventual development of the study area will be based on a range of factors and individual land owner decisions, and may not conform to this study's land use or timeline assumptions, some important conclusions of this analysis are:

- Existing roadways in the project area should continue to function well under a no-build scenario. The need for any capacity improvements will be based on new traffic generated by new development.
- Existing roadways in the study area should continue to function without excessive congestion at 50% build-out of the proposed development scenario, but significant transportation improvements will be necessary at full build-out.
- The development of a new road connection across the railroad can be an important future connection for the future development of the project area. Without this new connection, traffic impacts may eventually necessitate larger scale improvements to Braggs Corner Road and Nalles Mill Road , including the potential widening of the existing Nalles Mill Road bridge from two lanes to four lanes.
- The inclusion of pedestrian and bicycle facilities on all new or improved road segments, in addition to other pedestrian and bicycle improvements included in this study, can create a multimodal transportation network that supports future development and existing destinations.

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