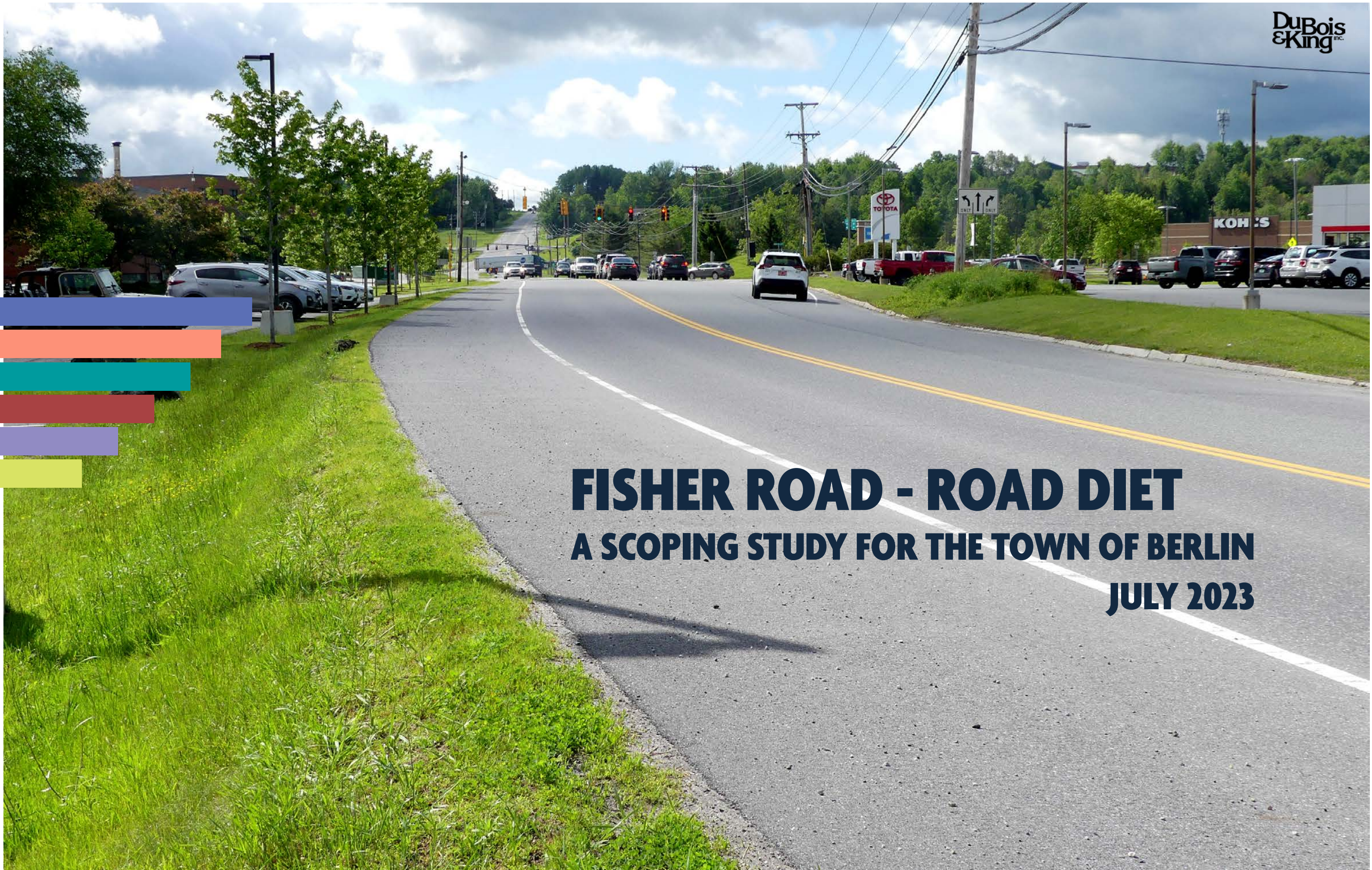




# **FISHER ROAD - ROAD DIET**

## **A SCOPING STUDY FOR THE TOWN OF BERLIN**

### **JULY 2023**



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# Introduction & Background



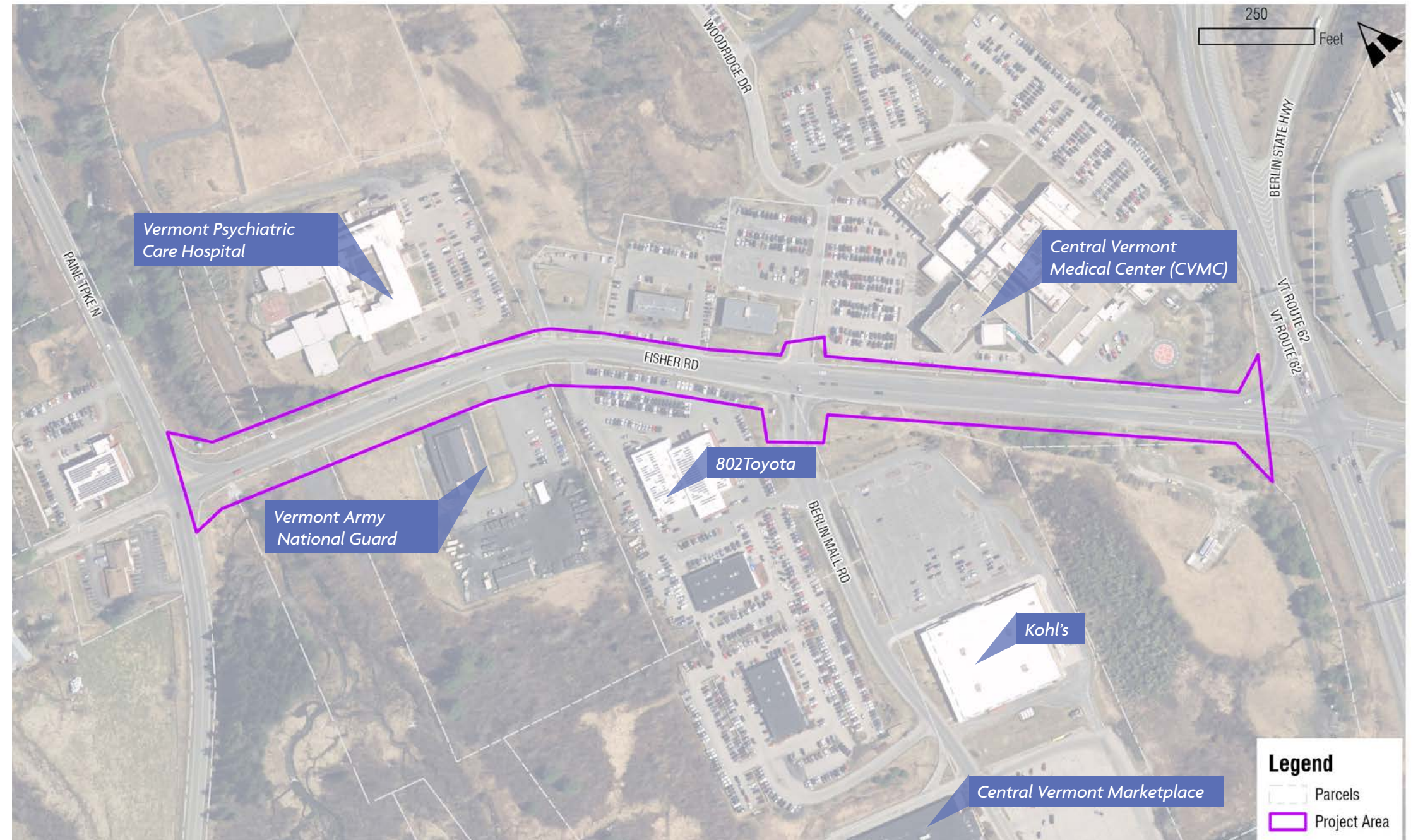
Berlin is a community in motion. With more than a decade of active planning, it has set in motion a process through which it will create a village center where none exists. Berlin knows that our villages and downtowns are the heart and soul of our communities. They are the places where residents and visitors can work, shop, plan and do business. They act as a focal point that brings people together to connect and build a stronger sense of place.

As a gateway into Berlin's New Town Center, Fisher Road is a well-traveled transportation connector and home to several major employers. While its present configuration serves existing development reasonably well, it lacks the design and infrastructure needed to play the role of welcoming visitors to Berlin's New Town Center.

To redesign this roadway a process will need to be undertaken that directly includes stakeholders, considers the needs of all users and balances those needs with the future growth and development of the New Town Center.

Recent accomplishments that have led to this scoping study include:

- 2015 Construction of Municipal Water System to Serve Town Center
- 2018 Adoption of Town Plan with Town Center as Focal Point
- 2018 Public Works Sewer Bond Approved to Serve Town Center
- 2019 Adoption of Sweeping Land Use and Development Regulations with Town Center as its Core
- 2020 Well #4 Bond Approval
- 2021 Sewer Improvement Construction Completed
- 2021 VTrans Transportation Alternatives Program Project Award - scoping study for a multi-use path
- 2019/2021 Land Use and Development Regulations
- 2021 New Town Center Designation



This plan, funded by The VTrans Bike Ped Program and the Municipal Assistance Section, builds upon prior efforts of the community to develop plans and build political will to support infrastructure improvements to support walking and bicycling along Fisher Road.

## Study Area

Fisher Road is a roughly 0.52 mile town maintained Class 2 highway. The road is bounded by Paine Turnpike Road to the west, and US Route 62 to the east. This road serves as the primary access road to Central Vermont Medical Center, 802Cars (Toyota and Subaru auto dealerships), and several other institutional facilities. In addition, the northern entrance of the Central Vermont Marketplace (formerly the Berlin Mall) is located in the project area.



# Existing Conditions

## New Town Center

Historically, Berlin has lacked a “town center,” an easily identifiable area that is the hub of commerce, culture and municipal government and other services. Therefore, Berlin town officials chose to create a town center, based around the Central Vermont Marketplace (CVM) and hospital. This area draws thousands of visitors and workers, swelling Berlin’s population from 3,000 to 12,000 during the day. In addition to the CVM and CVMC hospital campus, this area is home to the Berlin Elementary School and two highways that connect central Vermont to I-89.

To support this effort, Berlin applied for, and received, designation from the state as a “New Town Center,” the third such designation in Vermont after Colchester and South Burlington.

Being designated a New Town Center by the state will support Berlin’s efforts to attract private investment by promoting public improvements centered around achievable planning goals featuring pedestrian-oriented development.

The designation could aid Berlin create a Tax Increment Financing (TIF) district, a tool that is useful in leveraging long-term growth to make short-term capital investments. Designation can lead to streamlining permitting under the Act 250 land use review process. For example, some housing projects in Vermont’s New Town Centers are exempt from Act 250 review.

The vision for Berlin’s New Town Center calls for adding pedestrian-focused street grids, and for building 300+ units of senior affordable and market-rate housing.

Some of this vision has already been achieved, with the completion and opening in 2022 of Chestnut Place at the southern side of the New Town Center, closer to the Central Vermont Marketplace entrance from Route 62. Chestnut Place includes about 100 independent, assisted living, and memory care residential units, and associated services, for ages 55 and up.



## Land Use Context

This element of the report looks at land uses adjacent to the Fisher Road corridor, which can be considered in context of current type of use, ownership status, governing regulations, and longer-term public/private vision.

### Current Use

The types of land uses are indicated at the right. Most are either Commercial Uses (802 Toyota/Twin City Subaru Complex and the Central Vermont Marketplace) or Institutional Uses (Hospital properties and the Vermont Army National Guard Armory).

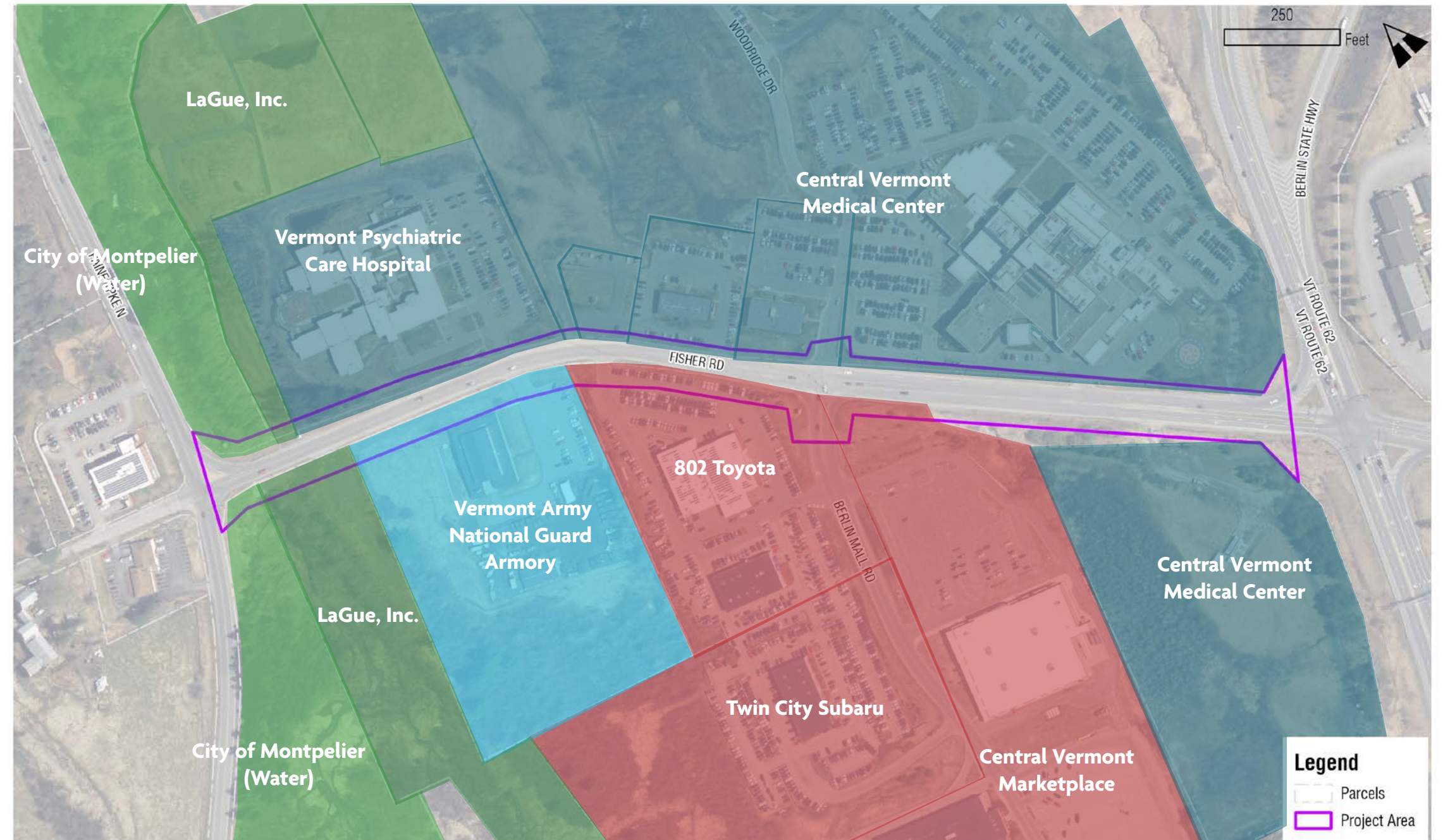
Along the western edge of the study area, LaGue, Inc. owns lands that are largely undeveloped.

The furthest west lands along the study area include portions of the Pond Brook corridor, and are owned by the City of Montpelier as part of the municipal water system that serves that city as well as the Town of Berlin.

### Future Use

The proposed New Town Center represents a significant change in land uses. When fully realized, the NTC is envisioned to include new Municipal Offices and Town Green, multiple shops, restaurants and 300+ units of housing (including the Chestnut Place 55+ residences noted above). In addition, outdoor recreation activities common to a Village Center are being planned, including linkages with area trails.

This growth will be of a significant benefit to the region. However, it will also have an impact on traffic patterns in the area through increased trip generation, including additional private motor vehicle and potentially increased public transportation travel. The focus of this scoping study is to project, and accommodate, this increased traffic while simultaneously promoting safer and more efficient pedestrian, bicycle, and other “human powered” connections.



## Key Stakeholders

Key stakeholders include major property owners in the area, they are:

- Central Vermont Medical Center (CVMC)
- Central Vermont Marketplace (Heidenberg Properties Group)
- 802 Toyota and Twin City Subaru (802Cars)
- Vermont Psychiatric Care Hospital
- Vermont Army National Guard (Armory)

### Central Vermont Medical Center

Central Vermont Hospital opened its doors on this site in 1968, and has grown to feature a greatly expanded core medical center complex with helipad, and smaller medical office buildings, all on the north side of Fisher Road. CVMC also owns property on the south side of Fisher Road, at the east end of the study area.

A large amount of the CVMC campus is devoted to parking for staff, ambulatory patients, and visitors.

### Central Vermont Marketplace

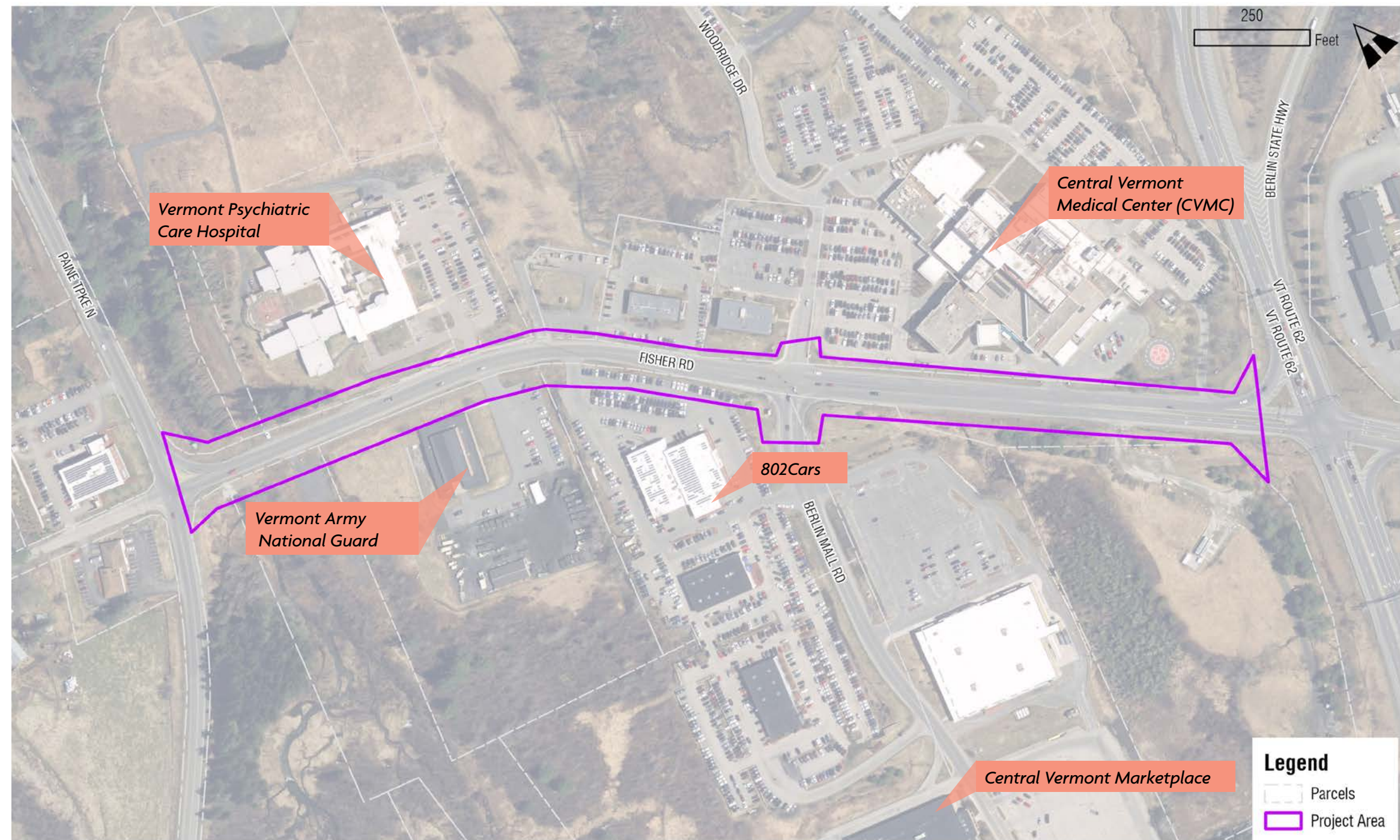
The main shopping center in Central Vermont is the Central Vermont Marketplace (formerly the Berlin Mall), which opened in 1985. At 330,000 square feet, it is Vermont's third biggest mall, with over 25 shops, including Kohl's, Walmart, and Hobby Lobby.

The larger mall-owned lands, including the private Berlin Mall Road that connects to Route 62, will be integral to the development of the New Town Center.

### 802Cars

With inventory display frontage along Fisher Road and Berlin Mall Road, 802 Toyota and Twin City Subaru are the most visible commercial destinations along the Fisher Road study area.

These two dealerships are part of a larger automobile sales group that also includes 802 Honda, located nearby on Paine Turnpike.



### Vermont Psychiatric Care Hospital

A25-bed, acute care hospital focused on recovery, safety and education of its patients.

Outdoor spaces include half-court basketball, planting beds, jogging track, labyrinth, and other landscaping.

On-lot parking serves staff and visitors. Set visiting hours are in the afternoon and evening on weekdays, and in the morning, afternoon, and evening on weekends.

### Vermont Army National Guard (Armory)

Along with this property's role as a materiel storage and muster location for the Vermont Army National Guard, Army Reserve, and Vermont State Guard, the Armory serves as a National Guard Recruiting Office, and family and veteran outreach center.

As with CVMC, the Armory property also has a helipad.

### What We Heard from Stakeholders:

#### Key themes emerged while talking with stakeholders:

- Desire for visitors and employees to have safe walking and biking facilities to work and to local amenities.
- Plans for Fisher Road should promote a better experience for motorists as well.
- Stakeholders wish to retain long-term flexibility for on-property development or redevelopment.



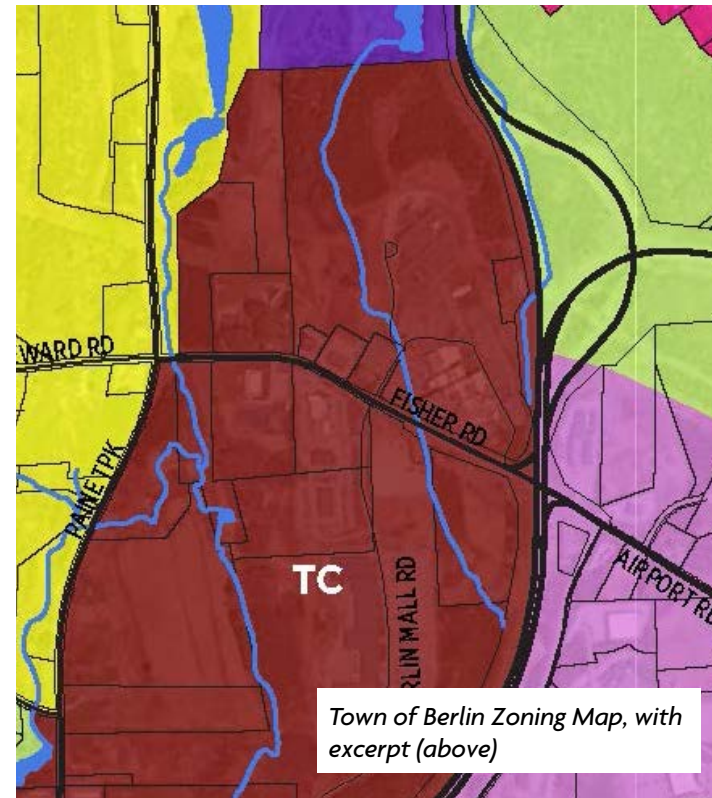
## Zoning Context

As part of the coordinated effort to build a town center, Berlin undertook a comprehensive revision to the zoning and subdivision regulations that will govern its development and redevelopment.

The new Town Center (TC) Zoning District includes the lands on both sides of the Fisher Road study area. Per the town's Land Use and Development Regulations, the TC district was created with the following Purposes:

- (1) Establishing a well-defined, mixed-use, compact and walkable center.
- (2) Transforming Fisher Road and Berlin Mall Road into pedestrian-friendly streets defined by sidewalks, street trees and landscaping, and buildings located close to the road.
- (3) Encouraging infill with smaller buildings along Fisher Road and Berlin Mall Road, and within underutilized parcels and parking lots.
- (4) Attracting regional-scale retail and service uses that will reuse and/or redevelop sites and buildings over time in response to evolving lifestyle preferences and market needs.
- (5) Promoting site designs that feature reduced parking footprints, landscaping, and green infrastructure.
- (6) Encouraging quality and efficient construction with durable, low-maintenance materials and distinctive architectural designs.
- (7) Allowing for higher density housing in areas that can be served by public infrastructure and transit.

Along with permitting a wide variety of residential and non-residential uses, the TC District provisions govern dimensional, architectural design, and access management standards, and the development approval process.



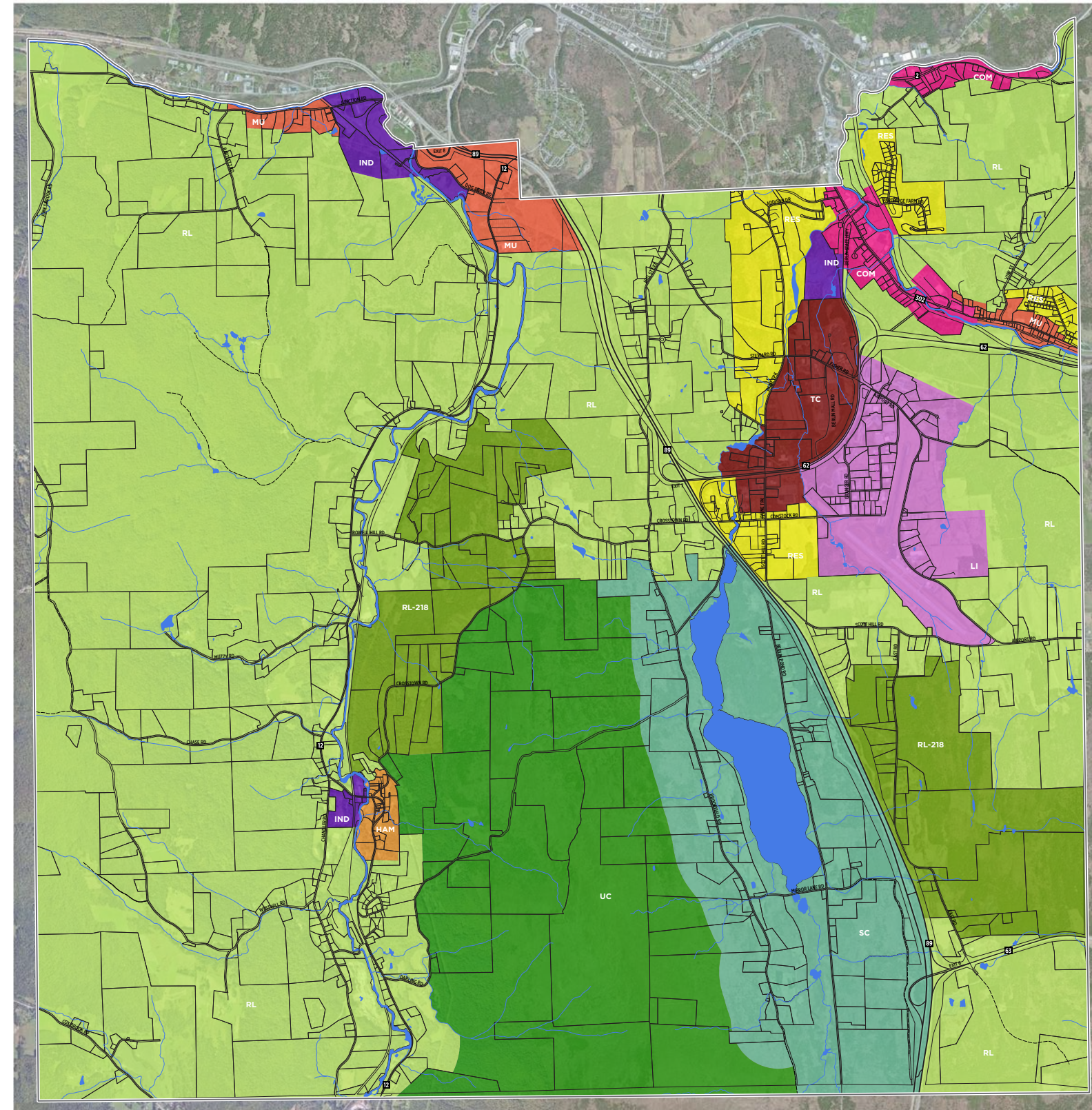
Specific to this Fisher Road Scoping Study, the TC District provisions also include Walkability Standards, which the Development Review Board may require for any land development that requires major site plan approval. These Walkability Standards address sidewalk installation, building entrance accessibility, and the installation and maintenance of internal connections among sidewalks, parking, public transit and building entrances, for the purpose of separating pedestrian and motor vehicle traffic.

## DRAFT ZONING MAP

revised: 21 november 2018



TOWN CENTER (TC)	RESIDENTIAL (RES)
HAMLET (HAM)	RURAL (RL)
MIXED USE (MU)	RURAL 218 (RL-218)
COMMERCIAL (COM)	SHORELAND CONSERVATION (S)
LIGHT INDUSTRIAL (LI)	UPLAND CONSERVATION (UP)
INDUSTRIAL (IND)	



## Road Data

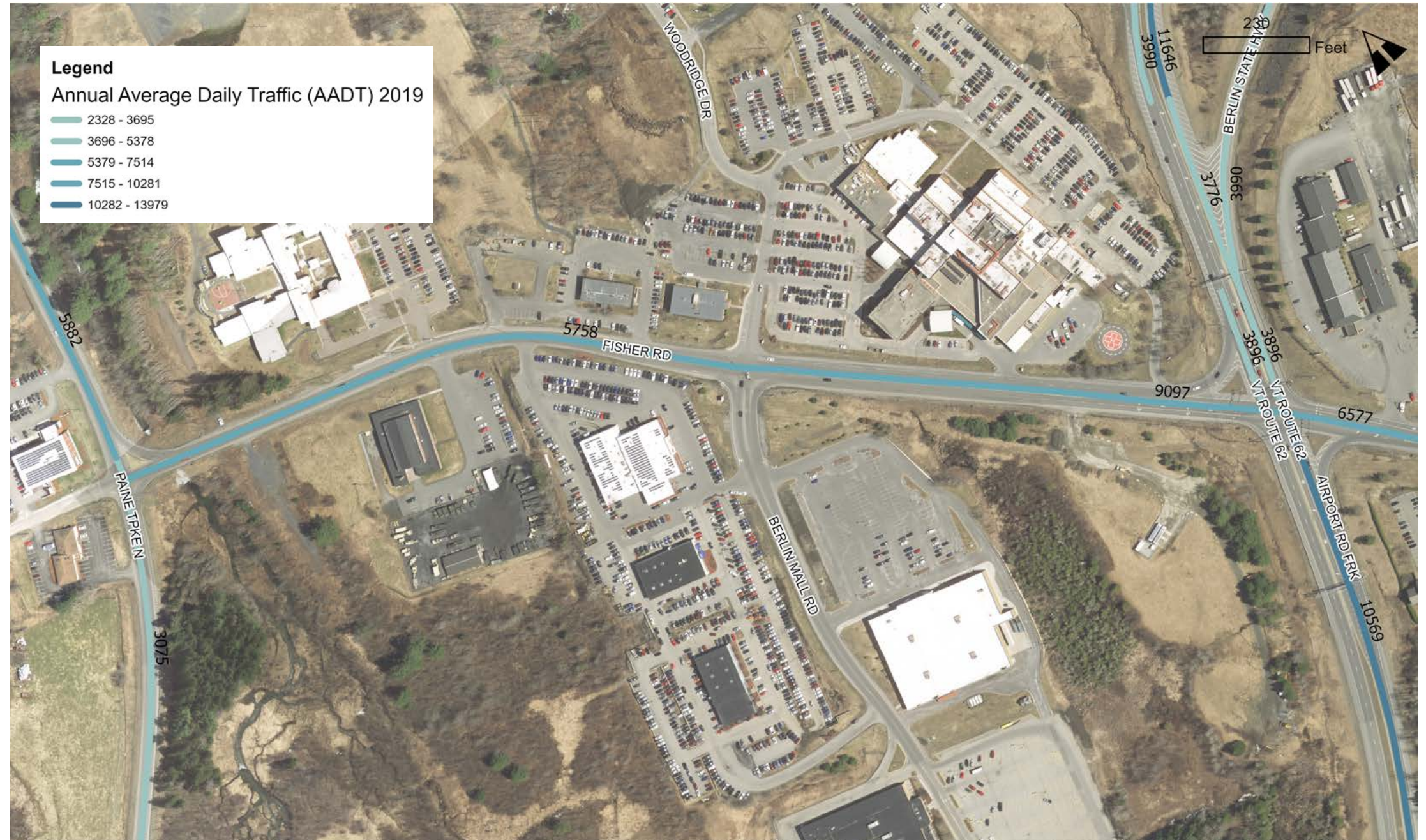
### Traffic Volumes (AADT)

Based on the VTrans 2021 Annual Average Daily Traffic by Route publication (dated June 2022), the average annual daily traffic (AADT) count on Fisher Road between Paine Turnpike and the Hospital emergency entrance was estimated to be 5,758 vehicles. Between the emergency entrance and Route 62, the estimate was 9,097 vehicles. AADTs along Fisher Road were estimated to be 18% lower in 2020, primarily due to the Covid pandemic. VTrans estimated AADTs for year 2021 were 8% lower than 2019 volumes. It is unclear whether VTrans estimated AADTs incorporated the temporary closure of a portion of Fisher Road to through traffic between October 2020 and December 2021.

The 2019 AADT of Paine Turnpike was estimated to be 3,075 between Rt 62 and Fisher Road and 5,882 between Fisher Road and the Montpelier town/city line. A decrease in AADTs for Paine Turnpike was also estimated for year 2020 and 2021 AADTs.

Route 62 AADT for year 2019 was estimated to be 10,569 to the west of the Fisher Road intersection and 11,646 to the east. Similar to Fisher Road, VTrans estimated AADTs for Paine Turnpike and Route 62 to be lower in years 2020 and 2021 than 2019 AADTs. Again, this is likely due to the impact that the Covid pandemic had on traffic volumes not only locally but regionally as well.

These volumes are illustrated in the map at right, darker blue lines indicating higher traffic volumes, and lighter blue lines indicating lower traffic volumes. Both Route 62 and Paine Turnpike are utilized to access Fisher Road. As a principle arterial, Route 62 carries a higher number of vehicles per day than Paine Turnpike, which is a major collector. The overall distribution of traffic to Fisher Road from Route 62 and Paine Turnpike are anticipated to follow a similar pattern onto Fisher Road (i.e. assume that there will be a greater number of vehicles accessing Fisher Road via Route 62 than via Paine Turnpike), where such patterns are further reflected in the current road profiles and design along the corridor.



## Crash Patterns

VTrans has designated the intersection of Fisher Road, Airport Road, and Route 62 as a high crash intersection based on 2012-2016 crash data, which ranked the Fisher Road / VT 62 / Airport Road intersection as having the 26th highest actual to critical rate ratio across the state

To the west, the southern segment of Paine Turnpike is also highlighted by VTrans as a high crash location, but as a road segment rather than an intersection.

The road's use and structure continue to generate safety concerns, as from 2017 - June 2022 there were 45 crashes on or adjacent to Fisher Road. Of these, 11 listed injuries. The map at right aggregates reported crashes on and around Fisher Road. Darker red points indicate multiple overlaid crash reports, orange points indicate single instances. This crash data illustrates the relative danger, particular on the Route 62 side of the roadway, for pedestrian and/or cyclist use.

Due to 2020 and 2021 being atypical years for traffic volumes, a review of more recent crash data was not conducted.

In regards to traffic operations, based on the nature of the VT 62 / Fisher Road intersection having been a reoccurring high crash location in the past, knowing that this intersection has previously been on the VTrans Highway Safety Improvement Program (HSIP), and due to the close proximity of the Fisher Road / VT 62 intersection to the Fisher Road / Berlin Mall intersection, it is suggested that whichever alternative is selected as the preferred alternative for the Berlin Fisher Road Diet Scoping Study be discussed with VTrans prior to moving forward.



## Road Design Details

Overall, the design of Fisher Road can be described in three broad regions. Low volume, two lane road connecting to Paine Turnpike, a high volume, five lane road connecting to Route 62, and a transition zone between them west of Hospital Loop Road / Berlin Mall Road Intersection.

## Roadway Profile

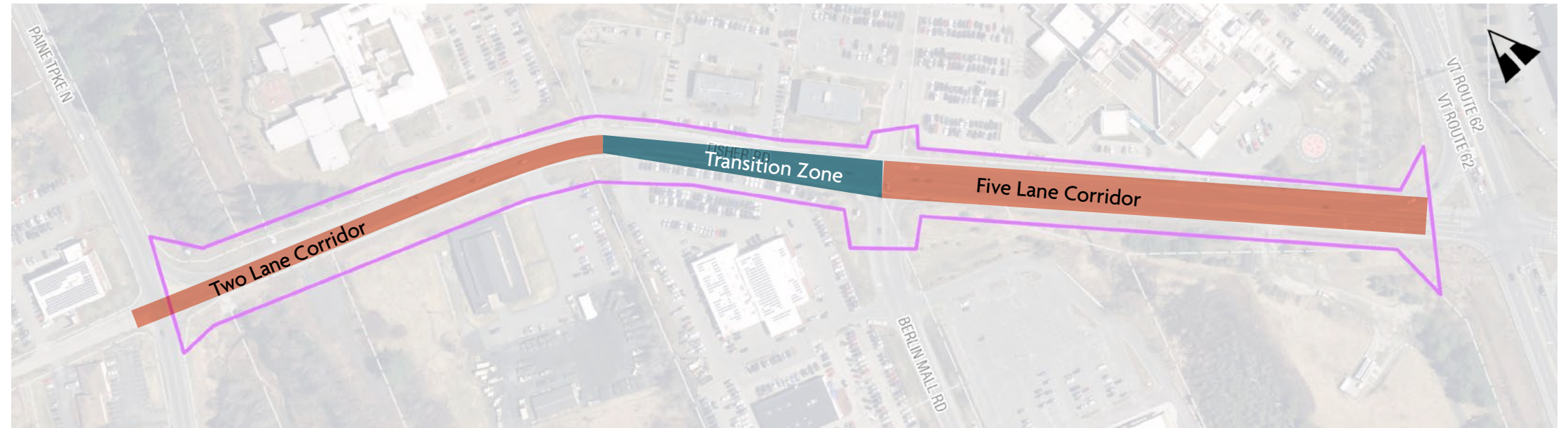
East of Paine Turnpike, Fisher Road begins as a dual travel lane road with an eight foot shoulder on either side, for a total pavement width of 40 feet.

Through the transition zone, the road gradually widens to an approximately 58 foot roadway profile. This profile carries through the intersection of Fisher Road with Berlin Mall Road and Hospital Loop Road. As the road widens, additional travel lanes are added in the eastbound direction, and shoulders are removed.

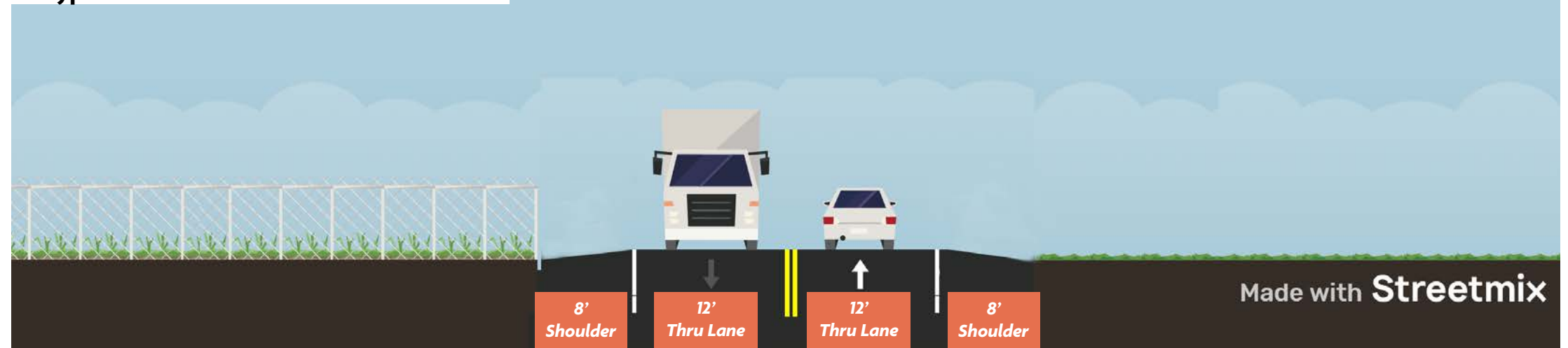
Approaching the intersection with Route 62, the pavement widens to accommodate turning lanes and a slip lane entry from Route 62 southbound. Near the intersection, the pavement measures 65 feet wide with two lanes in each direction and a narrow central median.

## Roadway Construction

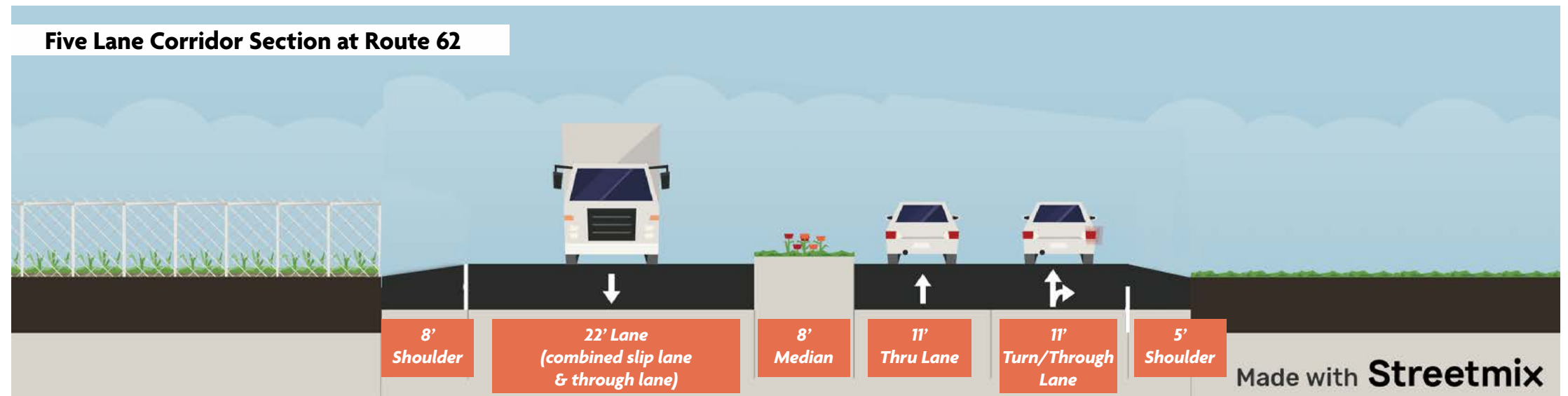
Throughout the profile, the roadway is built as an asphalt roadway without curbs. The exception to this rule is surrounding the central Berlin Mall Road/ Hospital Loop Road intersection. Here, new granite curbing has been installed on either side of the Hospital Loop Road entry, and older curbing is present on the southwestern side of the intersection in front of the Toyota dealership.



### Typical Two Lane Corridor Section



### Five Lane Corridor Section at Route 62



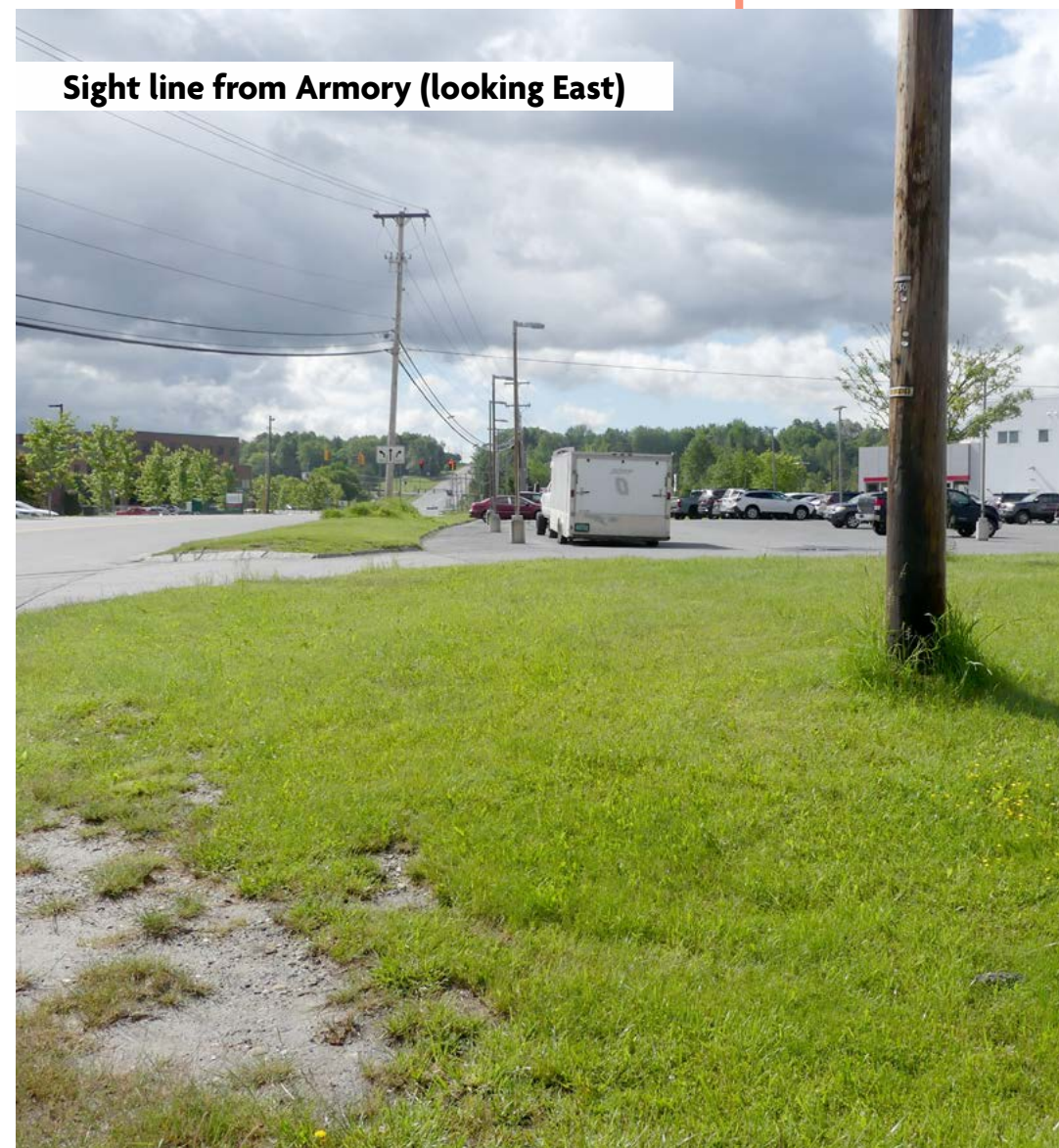
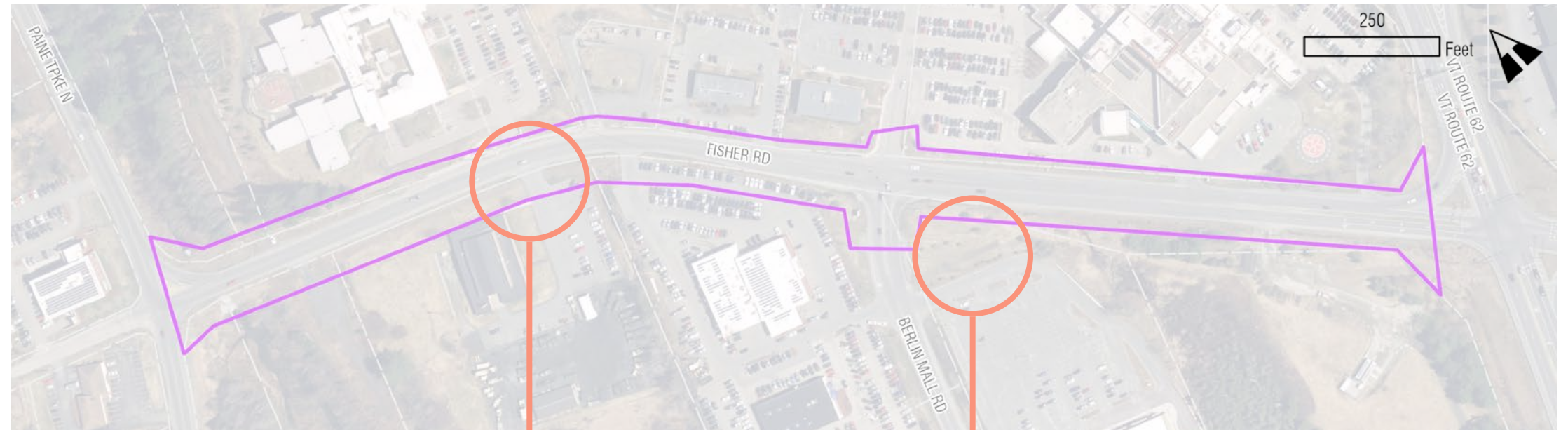
## Terrain and Site Distance Constraints

Throughout the road corridor, the road is slightly elevated above the surrounding terrain, with grassy drainage swales on either side. The exception to this standard is on the Southeast side of the Hospital Loop/ Berlin Mall Road intersection, which contains a large grassy berm rising above the roadway.

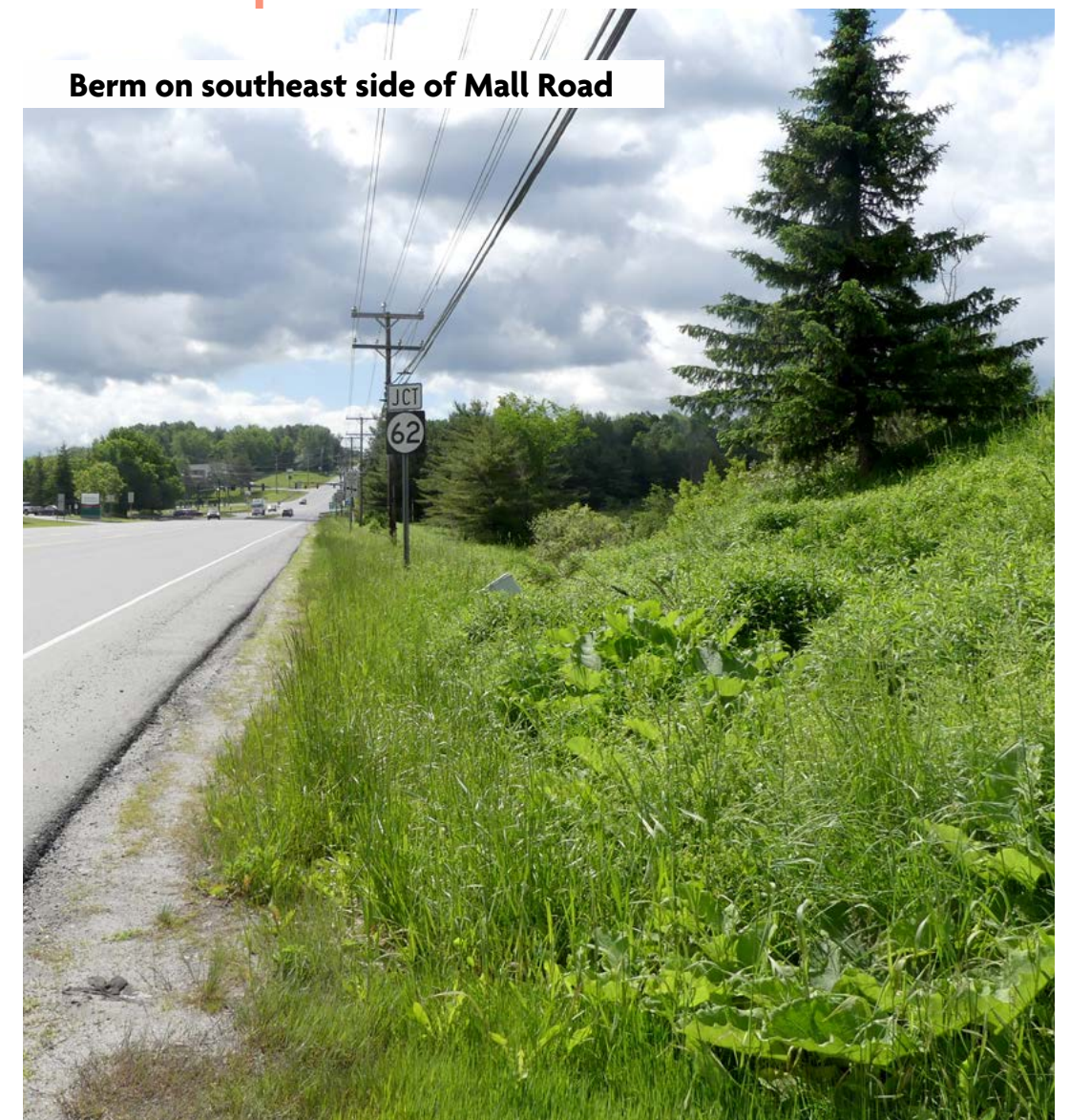
From Route 62, the roadway is level and sight lines extend throughout the corridor. Approximately 750 feet northwest of the Hospital Loop / Berlin Mall Road intersection, Fisher Road descends approximately 30 feet in elevation to the Paine Turnpike intersection. This creates a vertical curve in the roadway that should be considered when evaluating any future access management changes, as travelers are unable to see vehicles moving in the opposite direction until they arrive at the crest of this vertical curve.

### Posted Speeds

The speed limit along Fisher Road is 35 mph. Adjacent roads have speed limits of 40 mph and 50 mph, on Paine Turnpike and Route 62 respectively.



Sight line from Armory (looking East)



Berm on southeast side of Mall Road

## Right of Way

The dedicated right of way along Fisher Road is more varied than many public roadways. Based on data from the Vermont Right of Way Spatial Data Hub and VCGI parcel data, and a review of prior record drawings held by the Town, the right of way appears to be a full 100 feet wide southeast of the Hospital Loop / Berlin Mall Road intersection, and approximately 66 feet wide northwest of this intersection.

However, based on the variation in boundaries along this corridor, additional survey is recommended to confirm right of way boundaries for use in future design work.



100 200

## Fisher Road Intersections

### Paine Turnpike Intersection

Paine Turnpike to the west of the study area consists of one lane of continuous through-traffic (uncontrolled) in each direction, north and south, divided by a double yellow line. At this intersection, traffic turning left (southbound) onto Paine Turnpike from Fisher Road, or continuing straight onto Stewart Road, is stop-controlled (Stewart Road is also stop-controlled).

Traffic turning right onto Paine Turnpike from Fisher Road has a dedicated yielding slip lane to Paine Turnpike Northbound. This slip lane may increase automotive throughput, but does pose a barrier for safe bicycle and pedestrian access through this intersection. There is a dedicated left turn lane onto Fisher Road, from Paine Turnpike southbound, was added in 2021. Despite the slip lane, this is the only pragmatic entry for walking and bicycling from roads outside of Fisher Road and should be preserved as such, barring any significant changes to Route 62.

Because of this intersection's location in a valley relative to the Fisher Road corridor, sight lines and visibility should be a key consideration during further design development.

### Berlin Mall Road / Hospital Loop Intersection

This four-way intersection is controlled by a stoplight. The Fisher Road legs of the intersection maintain three lanes each - through, dedicated right turn, and dedicated left turn. A pedestrian crosswalk links sidewalks on Hospital Loop and Berlin Mall roads.

The turn lanes on the southeast leg of this intersection have 150 feet of queueing distance, for approximately 7 or 8 vehicles to stack up at a red light. The turn lanes on the northeast leg of this intersection have approximately 100 feet of queueing distance.

The Hospital Loop Road leg of this intersection has a single entry lane, a dedicated right turn exit lane, and a combined left/through exit lane. This left/through exit lane is set back approximately 50 feet

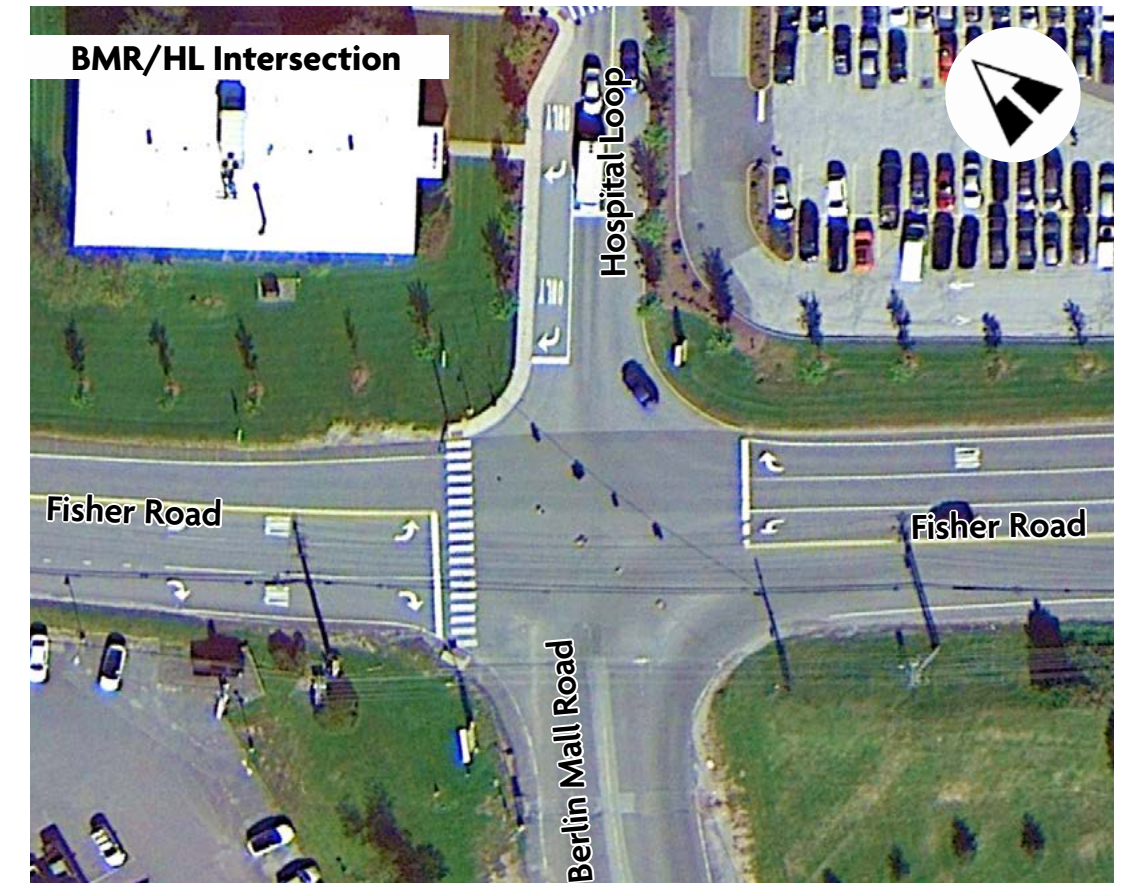
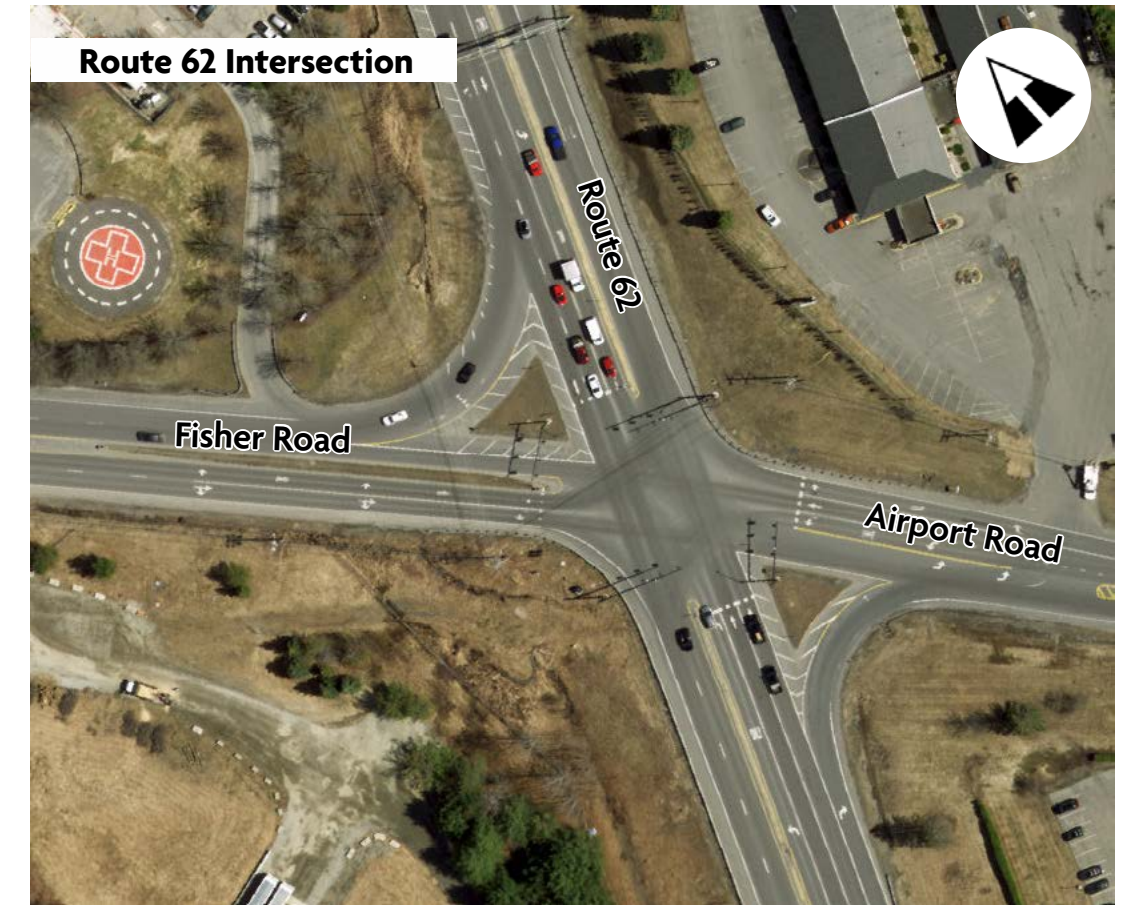
from the intersection to allow large truck turning entry movements. Due to this setback, the left/through lane has a very short queueing distance. This can block vehicles from accessing the dedicated right turn exit.

It is not possible to confirm the current demarcation of the Berlin Mall Road intersection, as nearly all street paint has been worn off from this intersection. However, 2018 historical aerial imagery via Google Earth indicates that there is a left/through lane and a dedicated right turn lane.

### Route 62 Intersection

This four way, dual slip lane intersection links Fisher Road with Route 62 and Airport Road. Fisher Road divides into two lanes at this intersection, a left-only lane and combined straight/right lane. A broad slip lane provides unfettered access from the Rt 62 to Fisher road and CVMC. A dedicated entrance to CVMC via Hospital Loop Road is located just off the slip lane.

### Paine Turnpike Intersection



## Multi Modal Access

### Public Transportation

A dedicated public transit stop is built in front of the Vermont Psychiatric Care Hospital. This stop, along with the stop at the Central Vermont Medical Center, are two major destinations for transit ridership within the project area. A stop at the Central Vermont Marketplace adds a third public transit destination.

Green Mountain Transit offers regular access to this corridor via Route 81 ("Barre Hospital Hill"), running between Main Street Barre, Fisher Road, and turning

around at the Berlin Shaws. A different Route 87 ("Northfield Community Shuttle") stops at the Central Vermont Marketplace. In addition to this service, GMT's "My Ride" service offers on-call regional access.

### Walking on Fisher Road

Of current concern for those riding the bus to Fisher Road is the lack of safe spaces to walk. There is a sidewalk segment in front of the Psychiatric Care Hospital that provides an accessible route to the

building and parking area. There is also a sidewalk segment and signalized crosswalk between the CVMC hospital campus and 200 hundred feet of sidewalk along the 802 Toyota side Berlin Mall Road.

However, other than these two isolated facilities there are no other safe or comfortable spaces to walk on Fisher Road. The other three crossings of the Mall Road/Hospital Loop intersections cannot be marked because they would not connect to any sidewalks. People therefore cross at unmarked

locations and walk along road shoulders, which are only sufficiently wide to accommodate a single person along portions of the road corridor, such the northwest.



Dedicated bus stop at VT Psychiatric Hospital



Sidewalk provides access to VT Psychiatric Hospital



Sidewalk spur that allows access to CVMC campus



Shoulders on Fisher Road are generally narrow





### **Bicycling on Fisher Road**

There are no dedicated bicycling facilities on Fisher Road, beyond narrow, roughly paved shoulders that are present near Paine Turnpike.

Despite this lack of safe and comfortable facilities, bicycle commuter use has been observed on this road. Bicycle connectivity and safety is a vital part of building a complete street that will support the future mixed-use Town Center.

Due to the limited access nature of Route 62, it can be assumed that most, if not all, of the bicycle traffic that comes to Fisher Road comes via Paine Turnpike.



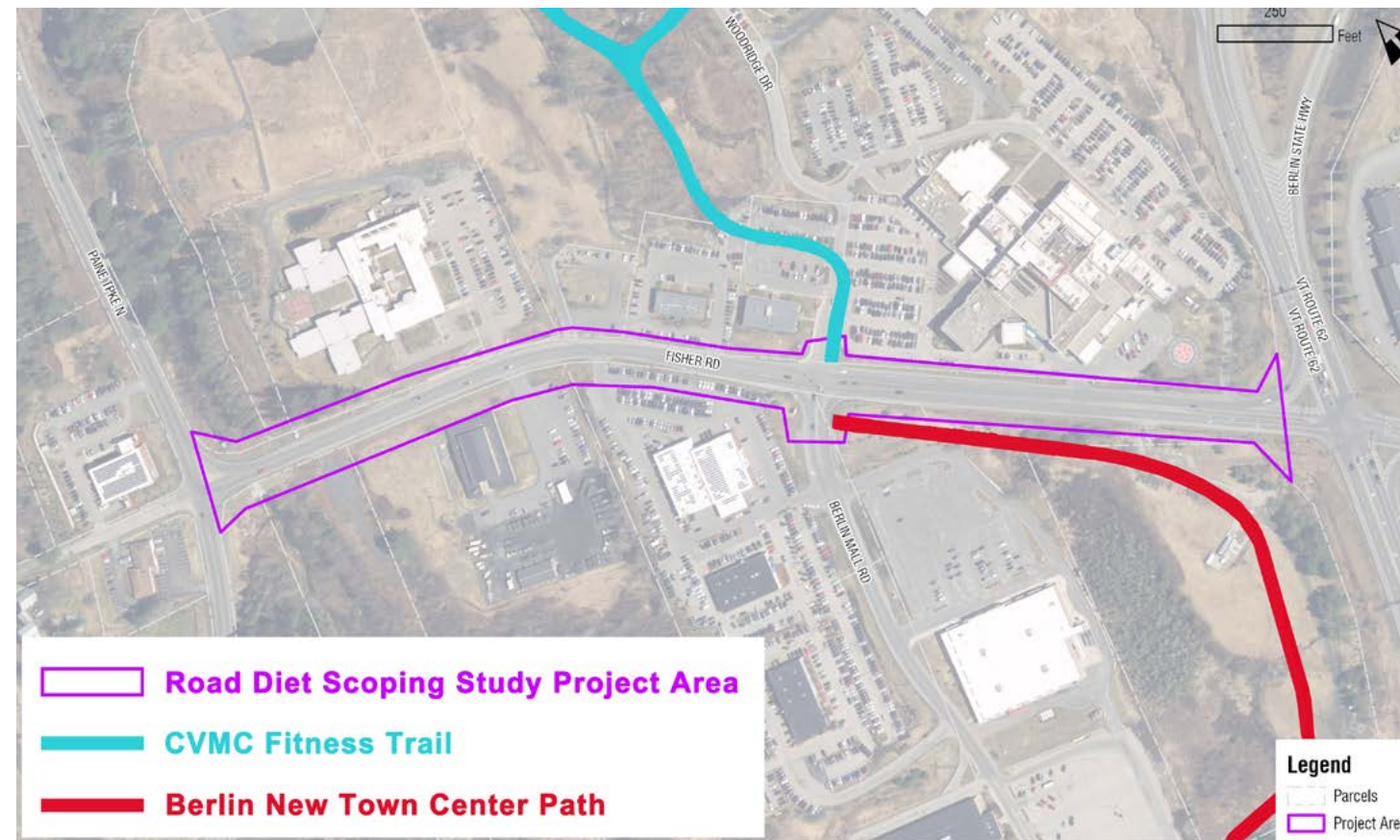
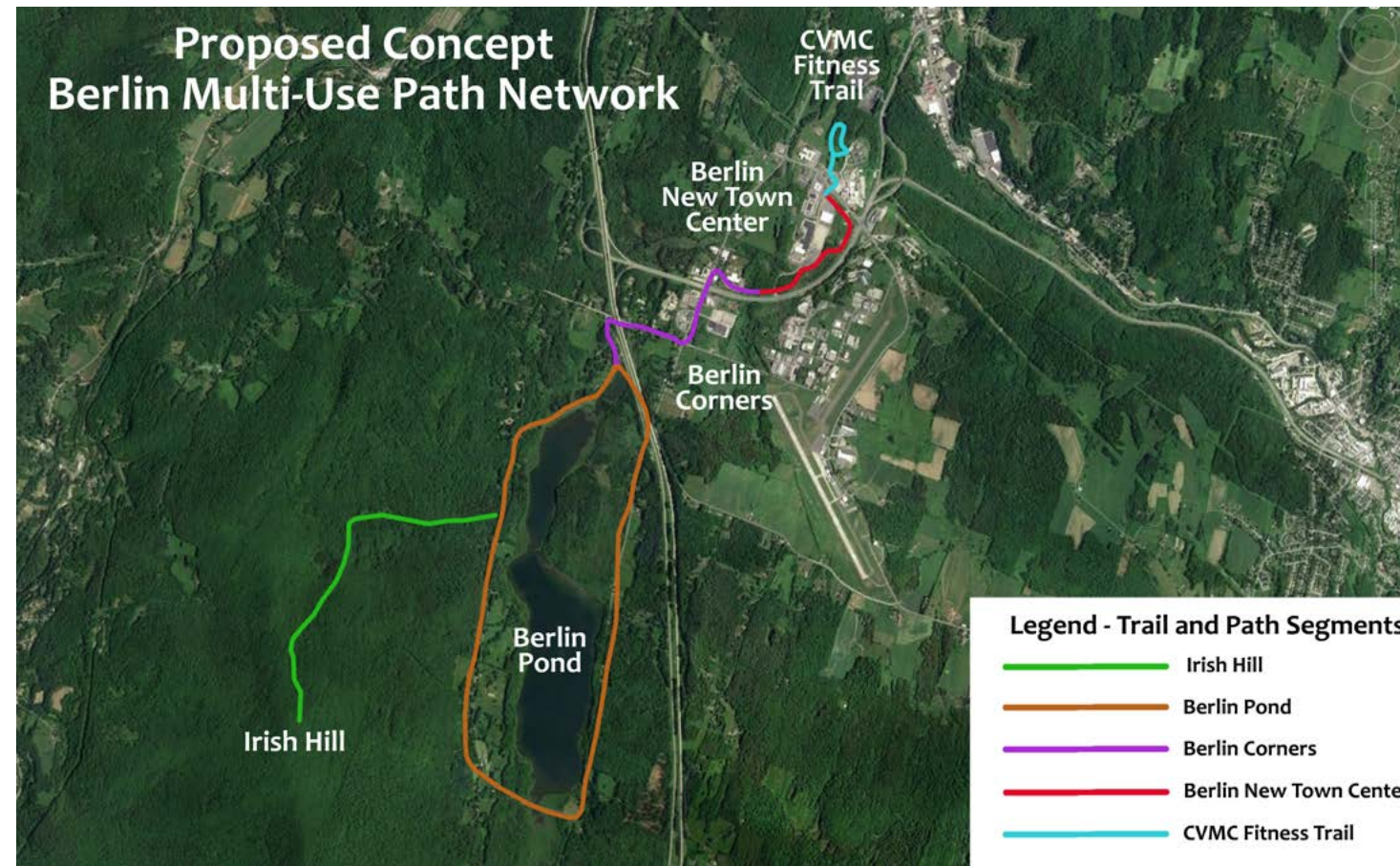
## Multi-Use Path Network Proposed Concept

The [Multi-Use Path Scoping Study](#) (Otter Creek Engineering, 2022) identified path alternatives within the Town Center, based on [VTrans Complete Streets Guidance](#). Such a path would provide “safe, pedestrian-related recreational opportunities while also serving to extend and connect with the Town’s multi-use path network.”

The Berlin New Town Center Path segment and the CVMC Fitness Trail segment of the wider Multi-Use Path Network are useful to note with respect to this Fisher Road Scoping Study document, as the preferred alternative includes a shared use path that is intended to connect with this larger network.

The upper image to the right is of the wider Network, Appendix D of the 2022 Multi-Use Path Scoping Study.

The lower image identifies the location of the Berlin New Town Center Path segment and the CVMC Fitness Trail segment relative to the current Fisher Road Scoping Study project area.



## Access Management

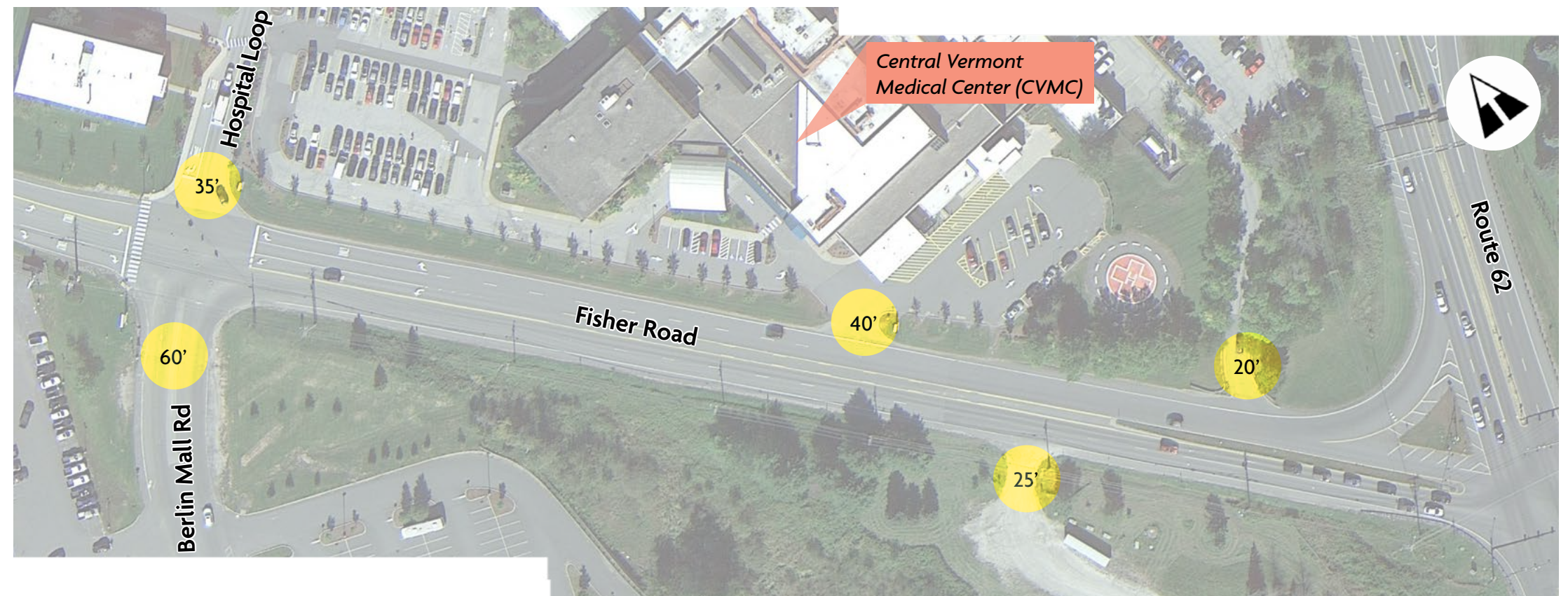
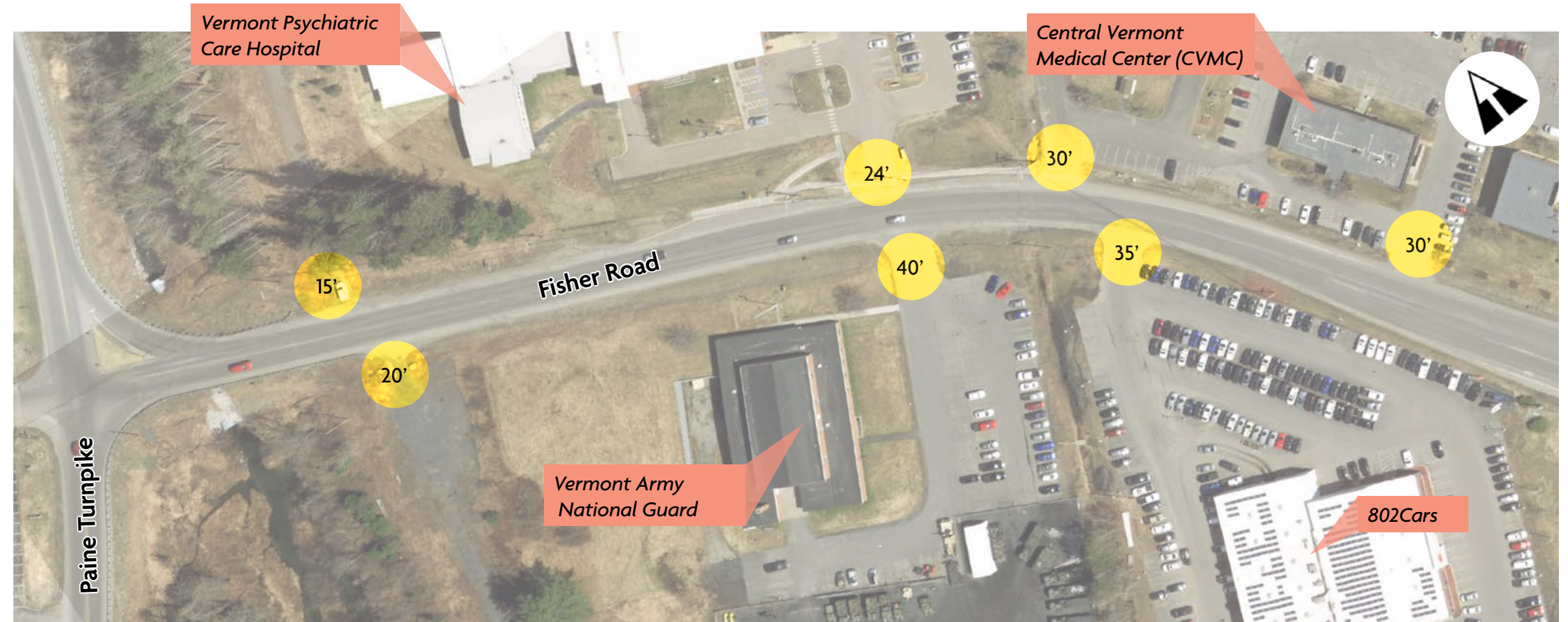
As a limited access highway, Route 62 prioritizes the through movement of vehicles, over direct access to surrounding properties or using non-motorized modes of travel.

Access points, such as driveways and intersections, though necessary, each can cause conflict points with drivers on the roadway, and if made excessively wide or redundant, can severely limit the comfort and safety of future pedestrian and bicycle facilities on any corridor.

This page illustrates the approximate width of all driveways and intersections in the study area. Most properties have only one access point to the roadway, which is a needed minimum. Typical of a hospital campus, CVMC has several access points-- five. This number may reflect the historic growth of the campus since 1968 rather than the number necessary to safely and efficiently meet needs. Reconsidering the CVMC access layout would therefore be a key part of any broader campus planning initiative, which in turn should support a safe, accessible and attractive Fisher Road.

Widths of these access points should be right-sized in any future design, and narrowed where possible, but maintained wide enough to accommodate needed traffic, including heavy trucks, snow removal and other maintenance needs.

A typical two-lane access road or driveway can be as narrow as 20 feet for personal automobiles only, or 35 feet wide and still accommodate truck traffic, assuming suitable corner radii. For example, the 60-foot wide southwestern leg of the Berlin Mall /Hospital Loop Road intersection (see right) may be a candidate for future width reduction, to improve access management and multi-modal safety.



## Utilities

### Overhead Utilities

Power lines and other overhead utilities weave through the study corridor. The utility poles alternate sides of the road. Between Paine Turnpike and 802 Toyota they are on the north side of Fisher Road, then switch to the south side to Rt 62. They are approximately 16 feet off the edge of pavement.

### Water Lines

A 12 inch diameter water line runs along the south side of Fisher Road. Several smaller lines extend north and south to existing buildings.

### Sanitary Sewer

A sanitary sewer line begins at Rt 62 and extends west along the southern side of Fisher Road for approximately 500 feet where it extends south to Kohl's and northwest towards the hospital, and then extends west along the northern side of the road to the Psychiatric Hospital.

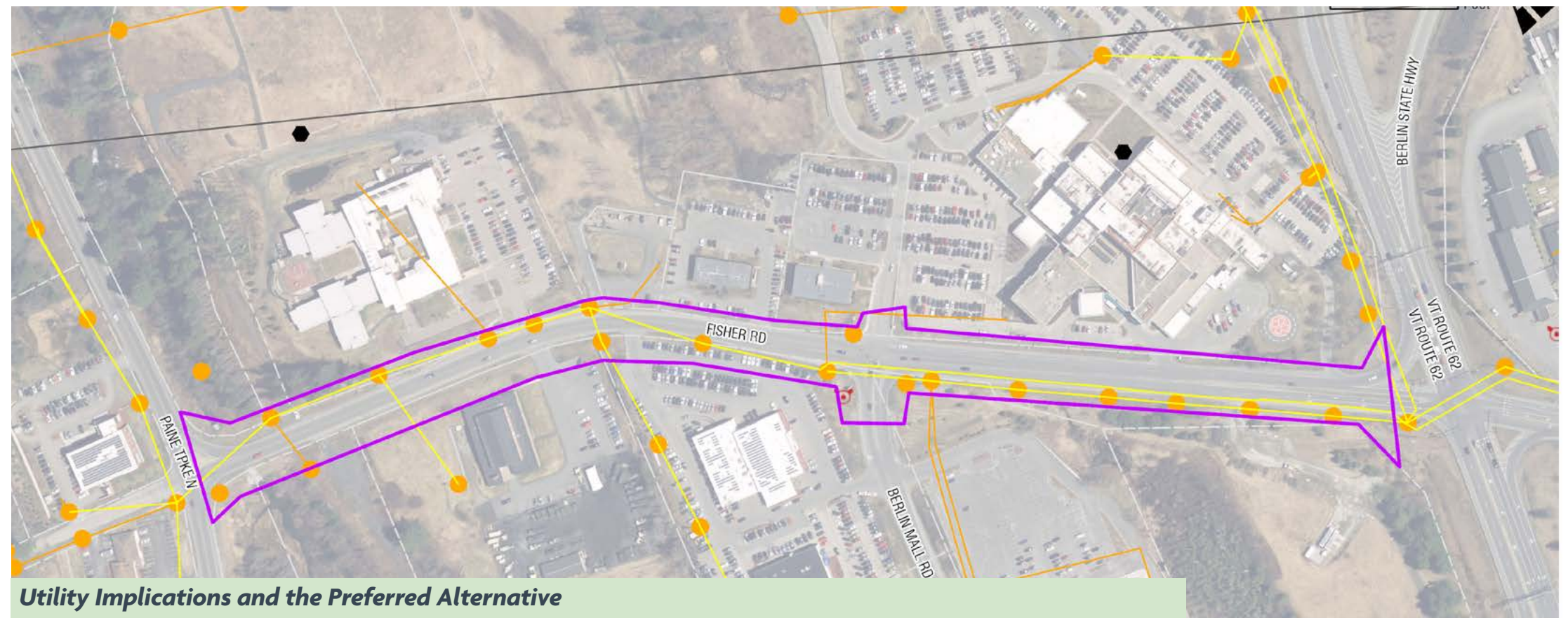
### Traffic Signals

There are traffic signals on a wire at the intersection of Fisher and Berlin Mall roads, and on post arms at Rt 62.

### Lighting

There is no pedestrian-scaled lighting (i.e., 20 feet in height or less) along Fisher Road. There are several 20+ foot high "shoebox" style lights along portions of the CVMC and 802 Toyota parking lots near the road edge, but they are aimed away from the travel lane. There are similar lights along Berlin Mall Road.

For Fisher Road itself, there are rectangular floodlight boxes, and "cobra head" lights on arms, mounted higher up on the wooden utility poles, 25+ feet above the road surface. Such higher-mounted lighting can efficiently illuminate larger surface areas, with fewer lights required. At the same time, exclusively using higher-mounted lights creates the visual perception that Fisher Road is intended only for motor vehicles. Pedestrian scaled lighting could be added, to illuminate new sidewalks, paths, and crossings, and support the overall visual character of the Town Center.



### Utility Implications and the Preferred Alternative

The next chapter of this report presents 3 options for road design and path connections: 1) Paint Only, 2) Lane Reduction and Sidewalks; 3) Roundabout and Pathway. Each option has a progressively greater potential to require the relocation of above-ground utility features, such as utility poles, along with subsurface systems, such as conduit or a water line to a hydrant.

However, most above-ground utilities along the length of Fisher Road, such as utility poles, are far enough from the pavement to permit flexibility in installing a sidewalk or a wider multi-use pathway. Utility impacts can largely be avoided.

Changes to the intersection of Fisher Road with Mall Road/Hospital Loop would present greater potential for utility impacts. The Roundabout and Pathway option, which has been selected as the preferred alternative for this scoping study, takes up more land contiguous with current roadway, as compared with the Lane Reduction and Sidewalks Option. See pages 41 and 47 for illustration of this difference. This means that some number more utilities would be shifted; traffic lights would be removed.

#### Legend

- Hydrants
- VT 3-Phase-Power (Generalized) for Planning
- VT Electric Transmission Lines
- GMP Overhead Lines
- GMP Poles
- VT Telecommunication Facilities
- Parcels
- Project Area



Overhead Utilities



"Shoebox" lights and hydrant, Berlin Mall Road



Traffic signal at Berlin Mall Road

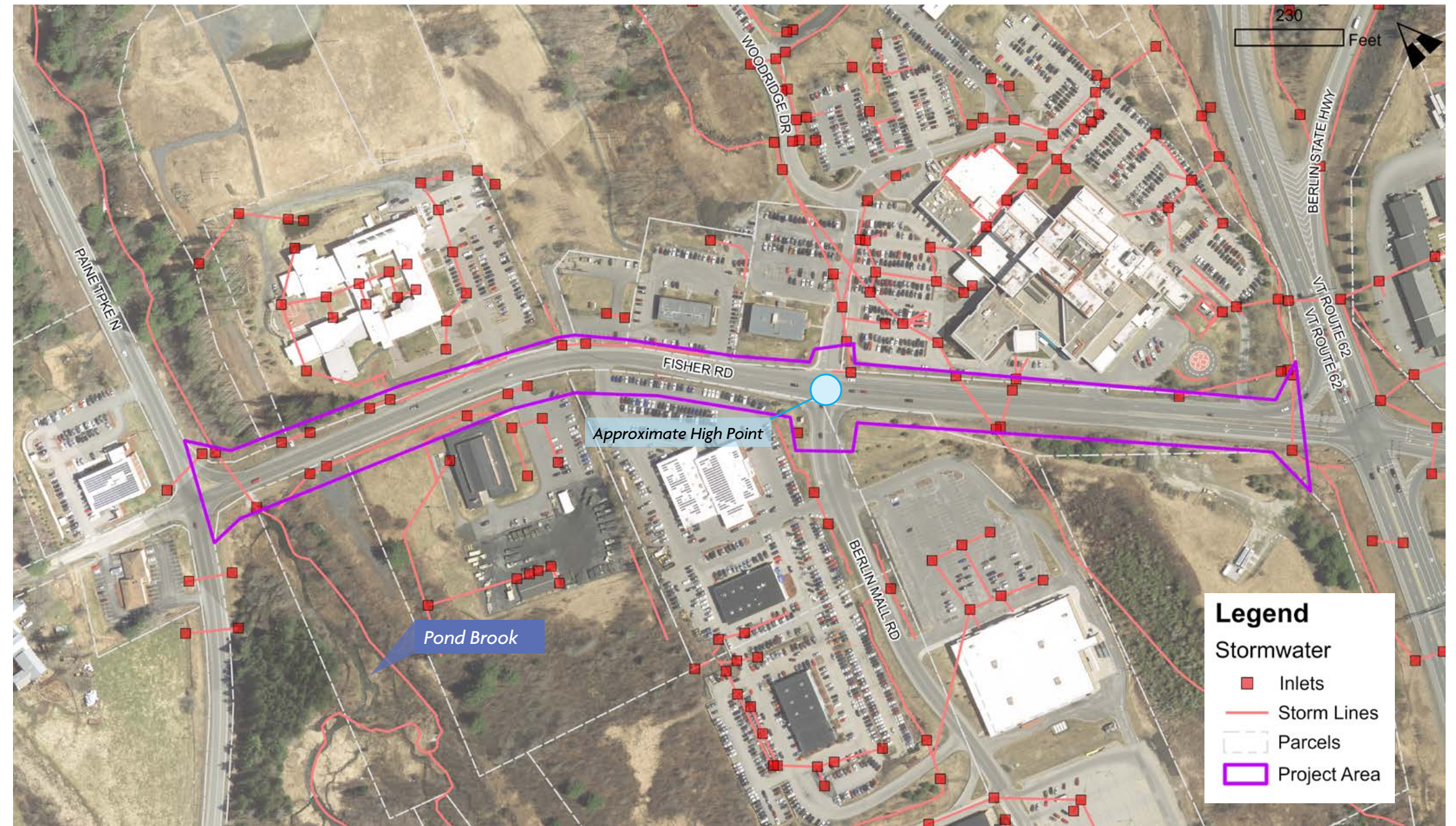
## Stormwater Infrastructure

There is a topographical high point along Fisher Road, approximately in the location of the intersection with Mall Road/Hospital Loop (see image at right), where the drainage infrastructure splits to the east and west, with a network of inlets, culverts, and swales that drain to Pond Brook to the west of the project area and an unnamed stream on the east side of the project area.

There are four culverts that cross Fisher Road. The majority of the storm lines and inlets that run parallel to the road are located on the west half of the project area. On the southeastern portion of the project area, drainage swales run parallel to the road, outfalling into several inlets at the road edge.

There are several stormwater facilities along or adjacent to Fisher Road. Several inlets and storm drains from the eastern end of the road, the eastern side of the hospital, and Route 62 drain to a stormwater management facility on the northwestern corner of the Fisher Road/Route 62 Intersection. The majority of the inlets and stormdrains associated with the hospital drain to a facility to the northwest of Hospital Loop Road, behind several parking lots that flank the northern side of Fisher Road.

Currently there is a drainage issue in the southeast corner of the Fisher Road/Mall Road/Hospital Loop intersection that creates a deep area that ponds and does not drain correctly. This issue will need to be addressed during engineered design development.



## Street Trees

There are some healthy younger deciduous trees along portions of the CVMC campus, and evergreens on the Kohl's frontage berm (see right). There are a few more mature trees near the Rt 62 slip ramp, and at creek crossings.

Developing Town Center should incorporate diverse native street tree planting, with roof gardens, bioretention beds, even agriculture. Tree clusters are also destinations for people to seek shade, and rest. Vegetation planting and management would be also integrated with plans for snow removal and other site maintenance. Visibility among all users, of each other, of signage and signals, is critical. All public safety concerns are of foremost concern in developing planting and site maintenance plans.

Particular care should also be taken with the health of the existing trees as well. Fortunately, young trees are relatively resilient to changes in constructed site conditions; they have relatively smaller root systems to be disturbed, and they are in a stage of life with faster cell regeneration to respond to physical impacts. It will still be useful to consider potential impacts to trees that might occur during site work.

### Branch Impacts

Because they start higher off the ground, a few branches of a deciduous tree can often be pruned or removed to allow for clearance underneath the canopy.

Evergreen trees may be narrower, which can have advantages in locating a sidewalk closer to their trunks, but removing lower branches to allow clear passage can change the shape of an evergreen tree and reduce their desirable visual buffering function.

### Root Impacts

The "critical root zone" of a tree extends, at a minimum, to the outer width of the canopy. There are roots that go further, and any root impacts to a tree that is otherwise stressed, such as by drought, can be harmful. That said, impacts within the critical root zone area are considered vital to the tree's structural support and its ability to get water, nutrients and air near the surface; Most of a tree's roots are in the top 6 to 24 inches of soil.

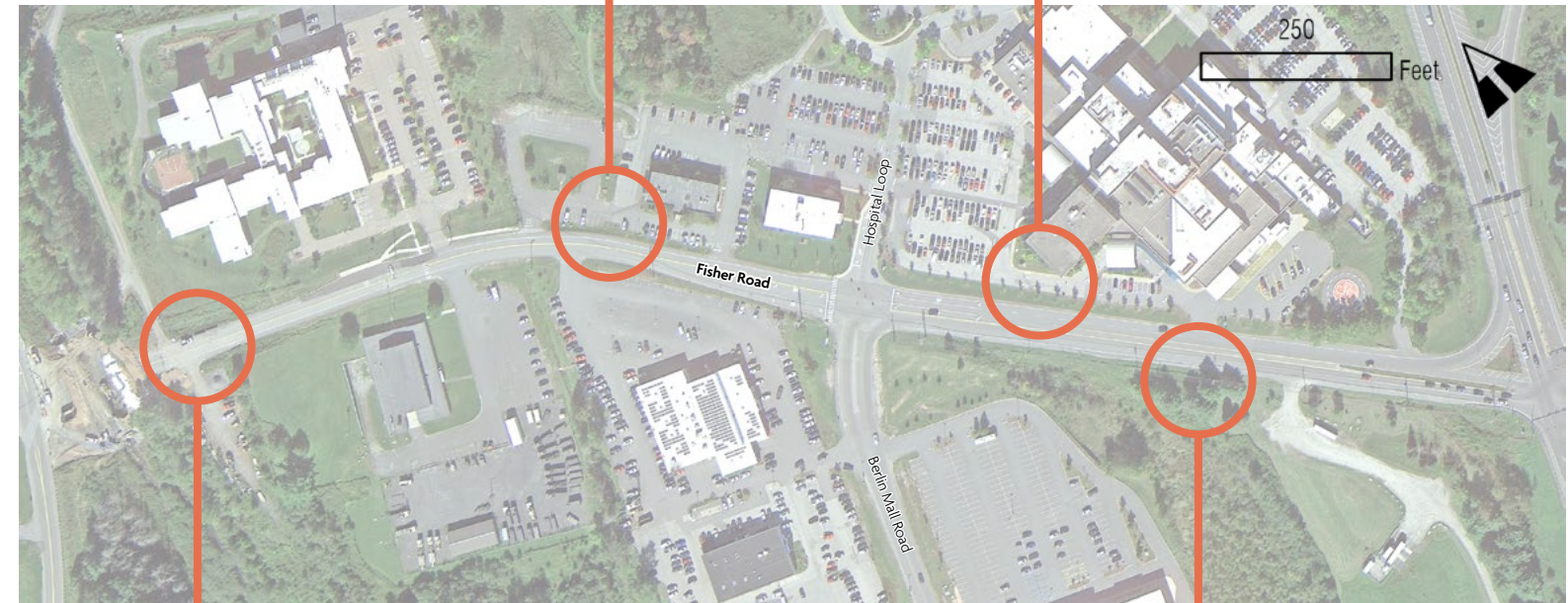
Tree roots are sensitive to two ways: severing and soil compaction.

- Root severing happens when digging shears a portion of the root. Damage to larger-diameter roots is more harmful to a tree-- these larger roots are slower to heal, and can become an entry point for harmful fungi or insects.
- Soil compaction happens when construction equipment, materials (including the sidewalk itself and any soil and rock fill) weighs down the soil, closing the open pore spaces of the soil where roots obtain water and oxygen.

Different types of trees respond differently to these root impacts. Most of the deciduous trees along Fisher Road are maples, both red maples and sugar maples. Both of these trees are somewhat tolerant of root severance (if treated), but red maples (including those in the upper left photograph), are more tolerant of soil compaction. Sugar maple trees are also less tolerant of salt and piled snow, something worth noting for design.

The evergreen trees along the south side of Fisher Road (lower right) are white pines. This tree is somewhat tolerant of treated root severance, but is less tolerant of soil compaction. White pines are also affected by fungi that can stress individual trees.

Change can induce adverse stress on a tree, a great deal that can be done during design and site work to support long-term plant vigor.



## Natural Features

The natural features in the project area are mostly adjacent to the two stream crossings. Otherwise, mowed grass and planted trees and shrubs line the edges of the road adjacent to the commercial and institutional properties.

Pond Brook runs perpendicular across the project area on its western side, with an associated river bed corridor and wetland.

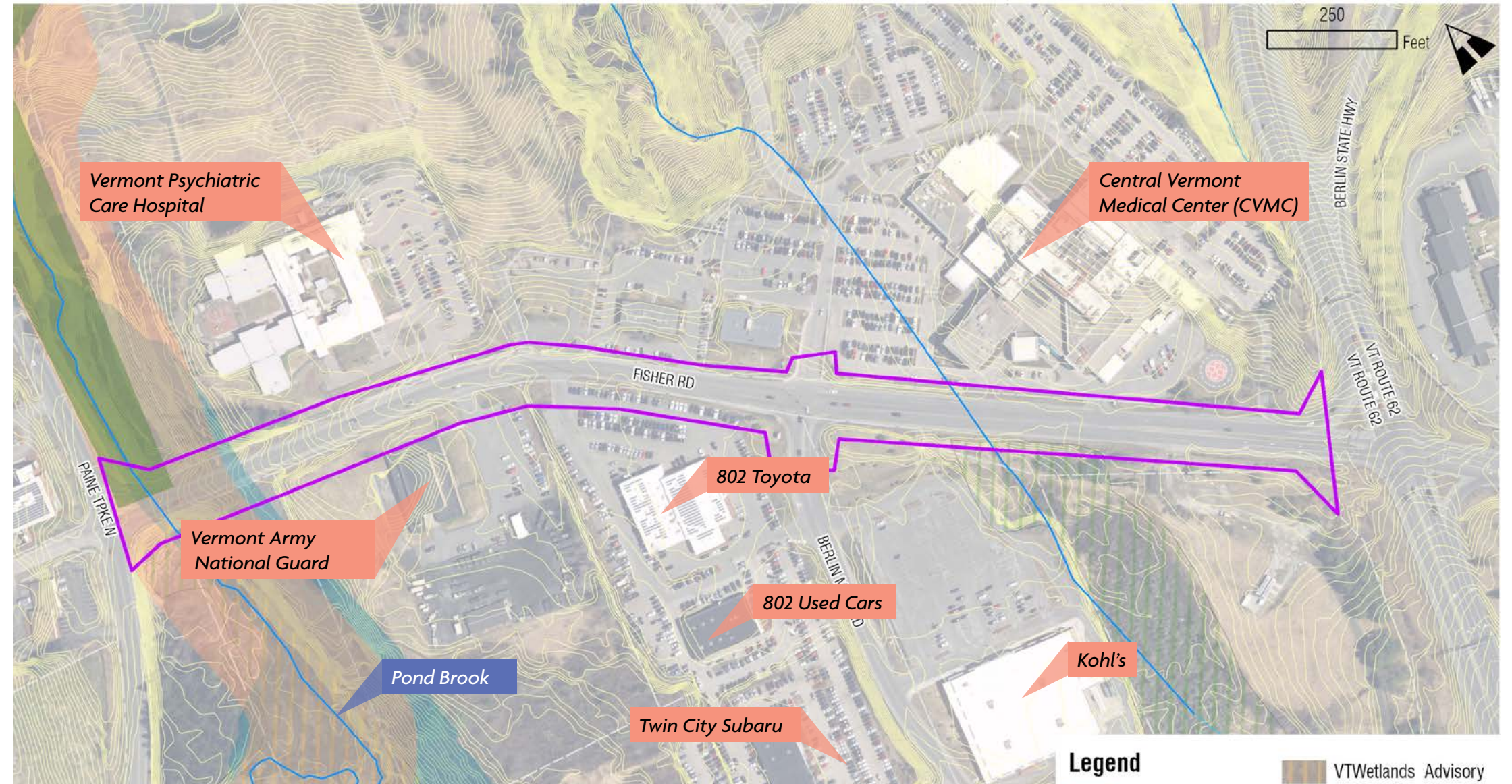
An unnamed stream runs across the project area's eastern side, with "advisory" wetlands (potential, not fully assessed) to the south of the project site.

There is forested land parallel to Paine Turnpike to the west of the project area, primarily along Pond Brook, and an island of forest to the east of Central Vermont Marketplace, on Hospital-owned land. Habitat for larger, more diverse flora and fauna is limited to these areas. There are primarily installed and maintained street trees, shrubs, and grasses within the Fisher Road right of way.

There are no known endangered species in the project area. However, the northern long-eared bat is listed as "Endangered" by the Vermont Agency of Natural Resources, and, recently, as "Endangered" at the Federal level. It has a habitat area that spans the entire State.

In addition, the project area is within the summer range of the Indiana bat, which is also a State and Federally listed "Endangered" species.

See Page 21 for information on stormwater infrastructure.



**Table -3 - Natural Resource Survey**

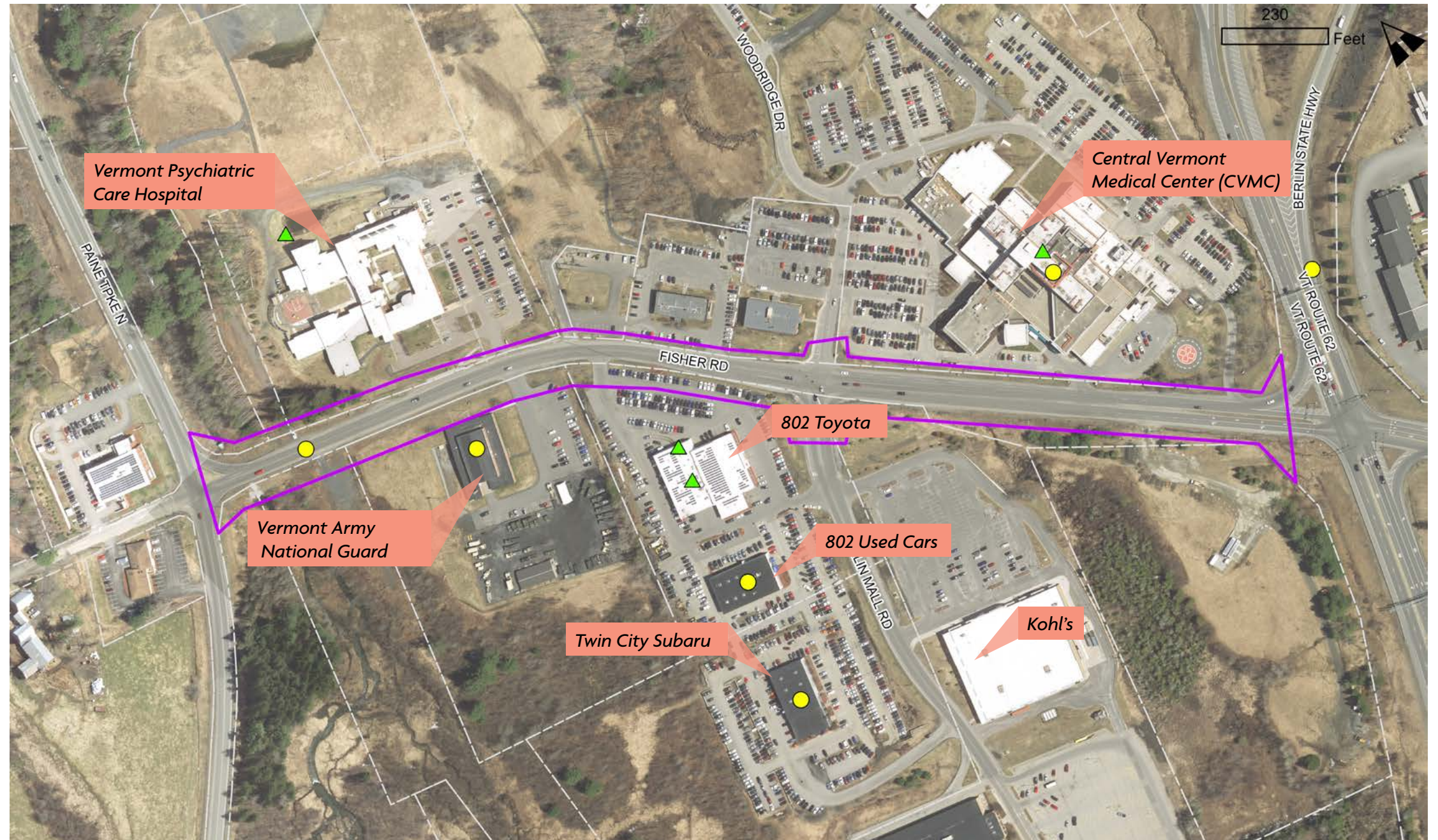
Potential Resources	Presence/Absence in Study Area
Wetlands	A Class 2 wetland runs perpendicular across the project area on the western side, encompassing approximately 0.69 acres.
Lakes/Ponds/Streams/Rivers	Pond Brook runs perpendicular across the project area on the western side. An unnamed stream runs across the eastern side of the project area.
Floodplains Flood Hazard Area	None in study area.
Endangered Species	There are no known endangered species identified in the project area, although two species of bats have larger habitat or range areas that include the project area.
Hazardous Sites	There are five hazardous sites, all with "Site Management Activities Completed," and four hazardous waste generators along or adjacent to the project area.

## Hazardous Sites

There are five hazardous sites and four hazardous waste generators along or adjacent to the project area. The hazardous sites are associated with the VT Psychiatric Care Hospital (1 site), the auto dealerships (2 sites), and CVMC (2 sites).

All five hazardous sites have "Site Management Activities Completed" status, meaning that the hazard is currently acceptably remediated in accordance with governing regulations.

The four hazardous waste generators are associated with the Armory (1), the auto dealerships (2), and CVMC (1).





## Cultural Resources

### Summary: Archeological Resource Assessment

An Archeological Resource Assessment (ARA) report has been prepared by Hartgen Archeological Associates. The full document, dated May 2022, is included as Appendix A to this Scoping Study.

According to the ARA, the archeological site files at the Vermont Division of Historic Preservation (VDHP) contained no reported sites within one mile of the Fisher Road study area.

However, the presence of few reported sites may result from a lack of previous systematic survey, and does not necessarily indicate a decreased archeological sensitivity within the study area.

Sites in the broader vicinity, beyond the one-mile radius, reflect Native American occupation and use of the area. Overall, the ARA states that the potential for intact archeological deposits to be present within the Fisher Road Scoping Study area is low.

No further archeological review is recommended for this project based on the current study area parameters.

### Summary: Historic Resources Inventory

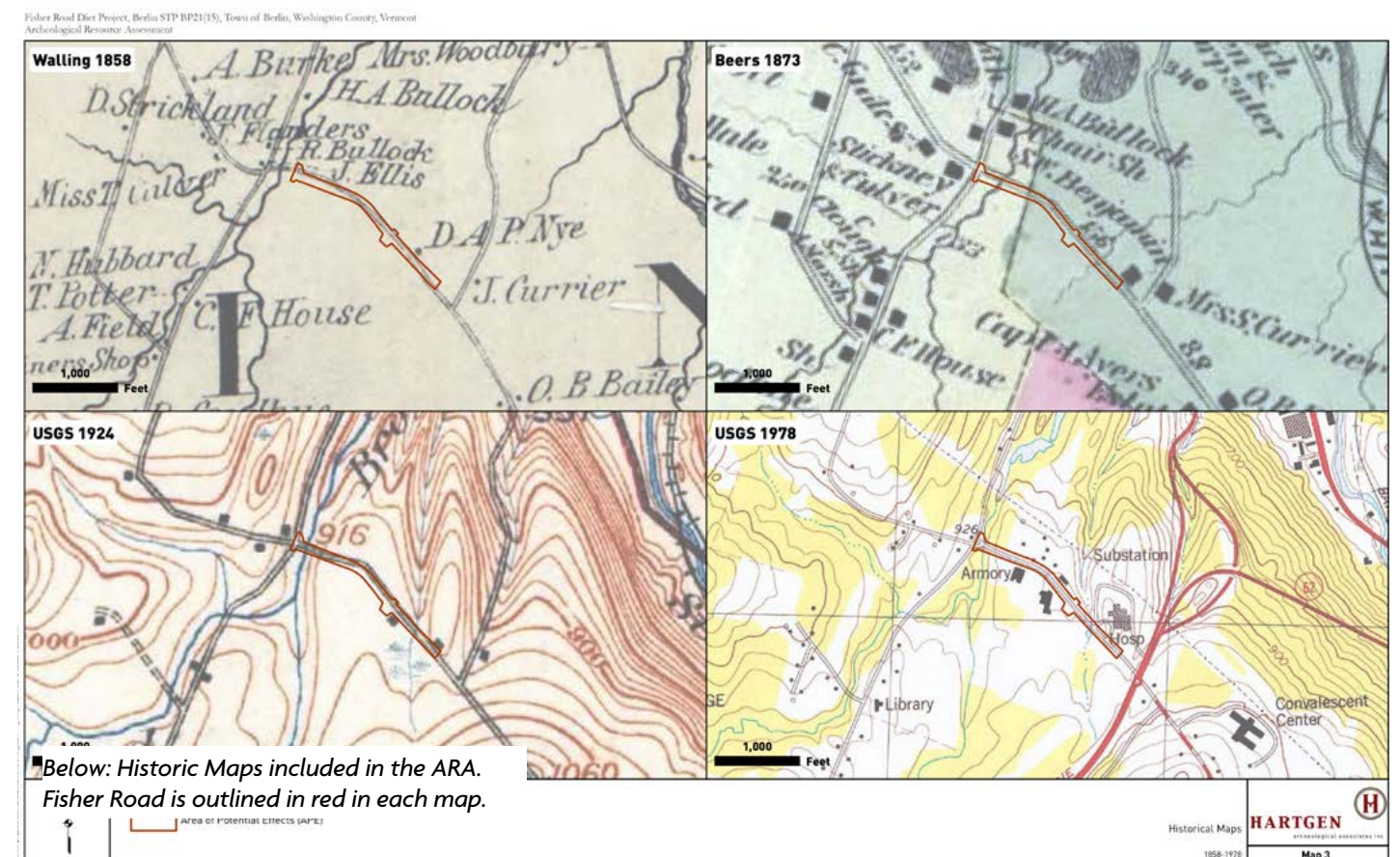
A Historical Resources Identification (HRI) report has been prepared by Hartgen Archeological Associates. The full document, dated August 2022, is included as Appendix B to this Scoping Study.

Eleven structures were surveyed. None of the structures within the project's Area of Potential Effect (APE) had previously been surveyed. A majority of the structures were found to be ineligible for listing on state or national registers of historic places, either because of insufficient age or because, if 50 years or older in age, had been significantly altered since initial construction.

One structure, the Vermont National Guard Armory building, is believed to retain sufficient design integrity to make it eligible for listing on the National Register. However, there are no additional property or setting features that contribute to this historic integrity. As such, according to the HRI, the historic integrity of the Armory building itself would not likely be adversely impacted by the site work discussed in this report.



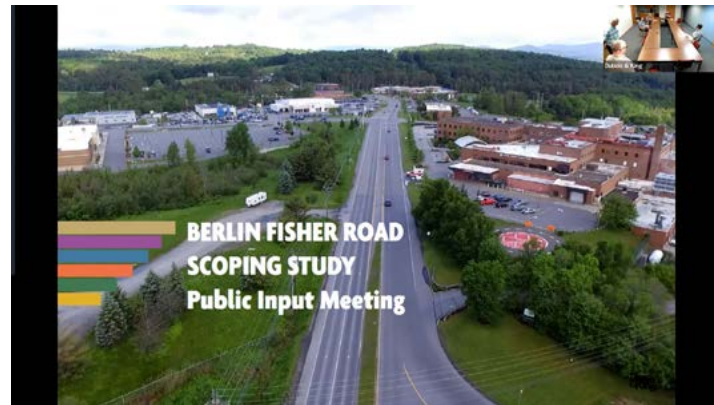
The Armory Building may be eligible for listing on the National Register of Historic Places



## Public Engagement

It is crucial to gather public input when proposing any changes to the built environment, particularly if public funds will be utilized.

### Public Input Meeting



To gather public input, a Fisher Road Local Concerns Meeting was held on June 30, 2022. The project team gave a presentation outlining the existing conditions, constraints, and possibilities along Fisher Road, and received good feedback from the attendees, which included members of the Berlin Design Review Board, Planning Commission and Conservation Committee/ Recreation Board, and the Berlin Fire Department.

Highlights of the discussion on 6-30-2022 include:

- The Town wants Fisher Road to be a more friendly, safe and comfortable space for all users.
- There is a great deal of poorly defined pavement, especially at the eastern end.
- There is notable road congestion during shift hour changes at the hospital.
- Bicyclists tend to avoid Fisher Road, and it is uncomfortable to walk along it.
- Need to “tighten up” pedestrian crossings.
- Sensors for a “preemptive/prioritized” traffic light system could improve response times and safety for emergency vehicle travel.
- As Fisher Road becomes busier, it will be important to consider the mental state of the drivers.

- Any bike/ped improvements must preserve motorists’ visibility.
- Current locations of above-ground and below-ground utilities are an important consideration in any road modification.
- There are already many signs, with an “overload” especially at the east end.
- Bike/ped facilities must be maintainable year round, and will require user advocacy.

### Local Concerns Survey Results

As a companion to the Local Concerns Meeting held on June 30, 2022, and to reach a broader section of the public, the project team created an online survey.

The online survey garnered 133 responses, with 89% of respondents either living or working in Berlin. About two-thirds of all respondents use Fisher Road at least weekly.

Respondents were asked to rank and offer their opinions of the importance of automobile, bicycle, pedestrian, and parking improvements along Fisher Road, and how they might look. Survey results charts and summary information are included on this page and on the next two pages.

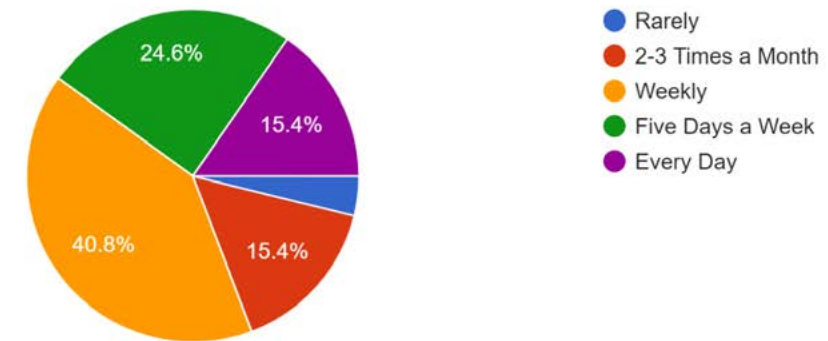
The survey also included “open ended” questions that allowed respondents to write in suggestions about what should or shouldn’t change along Fisher Road, and any other commentary. These open ended comments sort into the following four general themes:

- Desire for bike and pedestrian friendly improvements, for greater access and safety.
- No on-street parking.
- Improve traffic flow and access management, especially to/from hospital.
- A tree-lined and better landscaped road with bike/ped improvements would help calm traffic.

- Think of this planning work more broadly, including public transportation, traffic light timing, and bike/ped connections beyond Fisher Road (e.g., walk to Shaws, bike to Montpelier).

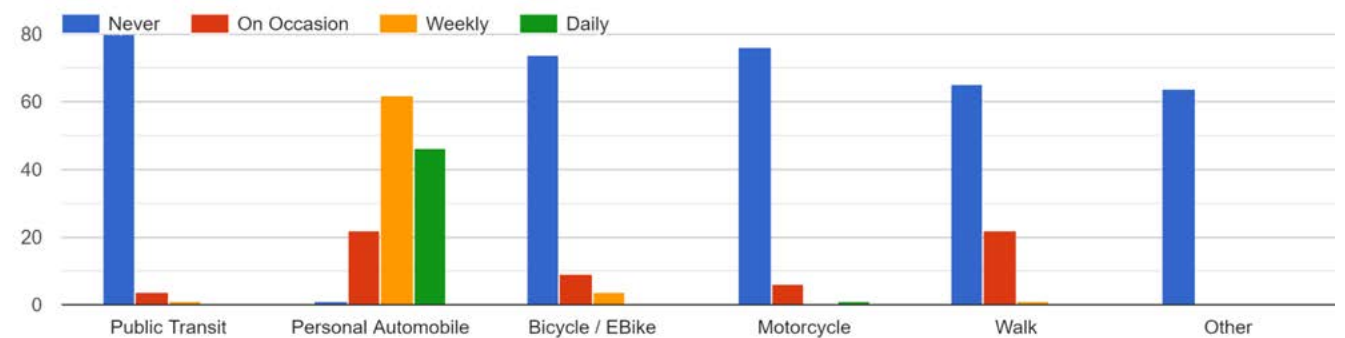
How do often do you use Fisher Road?

130 responses



About two-thirds (2/3) of survey respondents travel on Fisher Road five days a week, or at least weekly.

How do you travel on Fisher Road in the non-winter months?



The personal automobile is by far the most common mode of travel along Fisher Road, with very few survey respondents walking or biking, or riding a motorcycle.

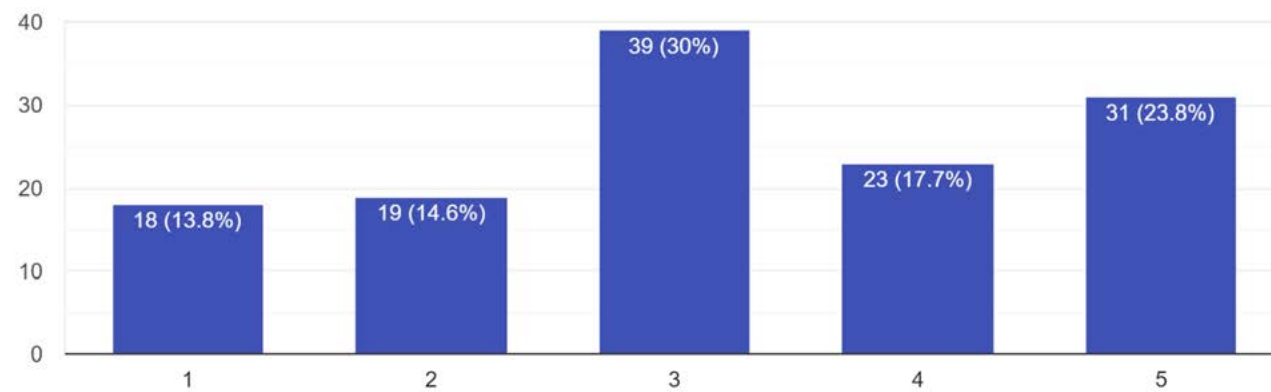
## Local Concerns Survey Results (Continued)

The Local Concerns Survey respondents were asked how the Town could best improve the driving, biking, walking and parking experience along Fisher Road, and their level of support for specific improvement strategies.

Additional Local Concerns Survey charts and summary information about the driving and bicycling experience on Fisher Road are included on this page.

How important is improving the driving experience on Fisher Road to you?

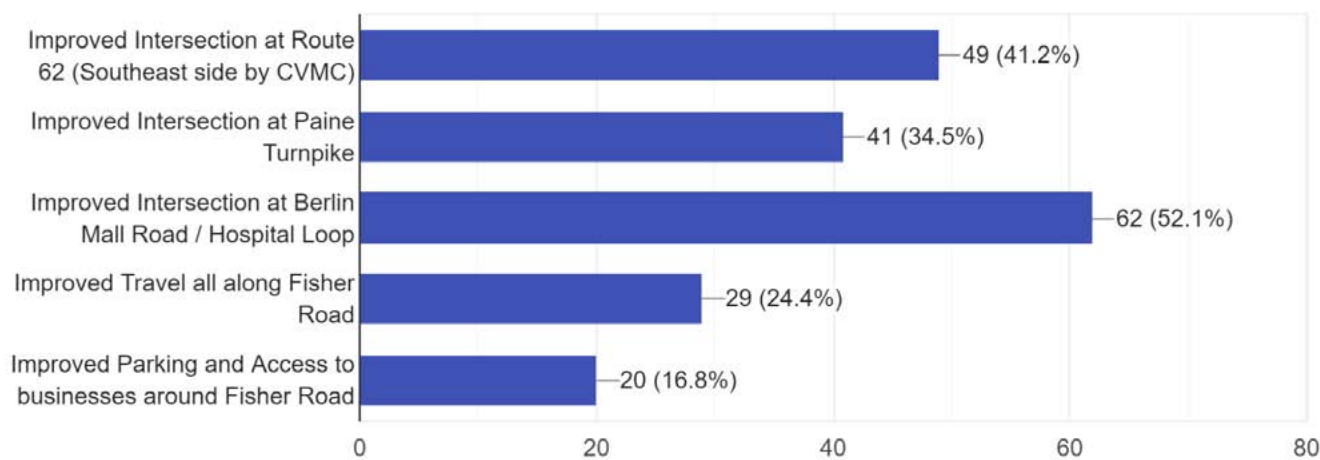
130 responses



About 40% of survey respondents believe that improving the driving experience on Fisher Road is important. The majority (60%) indicating a neutral or non-preference toward improving the driving experience.

Thinking about driving to and from destinations around Fisher Road, what two elements should be the top focus of a redesign effort? (Pick only 2)

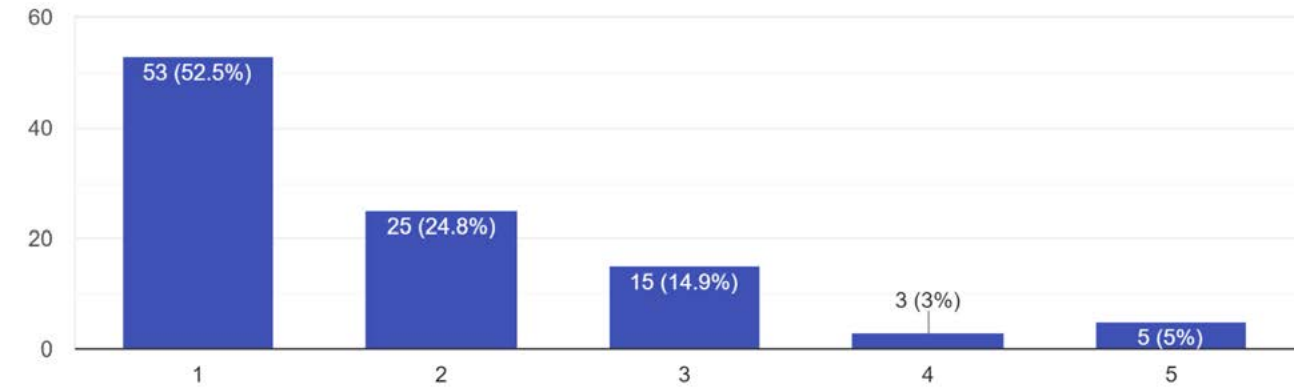
119 responses



Respondents to this survey question indicated that improving the Fisher Road intersections, especially at Mall Road/Hospital Loop, should be the focus of redesign efforts that aim to enhance the driving experience.

Are you comfortable bicycling on Fisher Road?

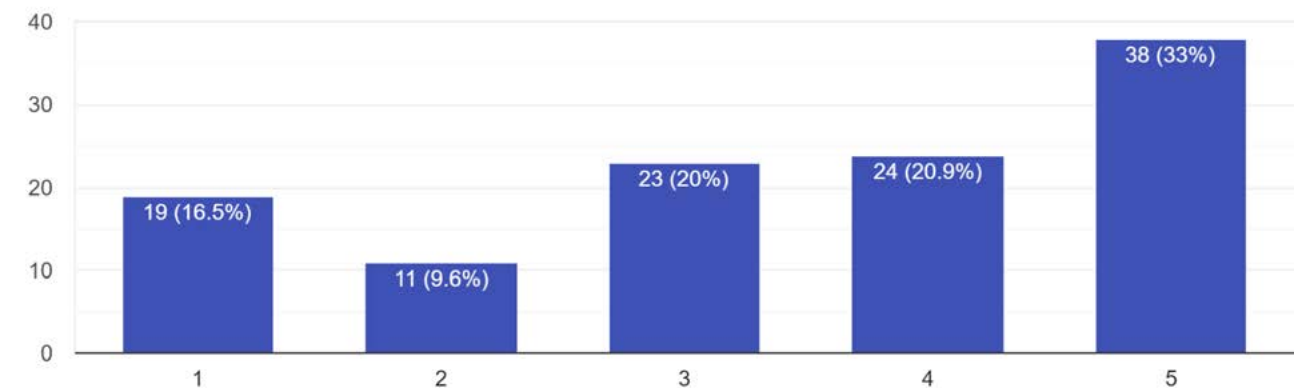
101 responses



Most respondents to this question (over 75%) are not comfortable bicycling on Fisher Road (responding with a '1' or a '2').

How important do you think bicycle focused improvements are to a future Fisher Road redesign?

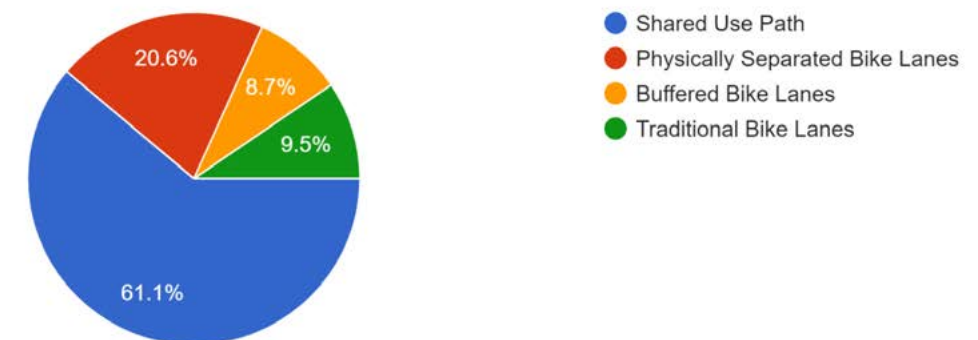
115 responses



Bicycle-focused improvements on Fisher Road were important to over half of respondents to this question (54%).

One element of this project is re-thinking Fisher Road as a safe place to bicycle. Which of the following types of bicycle facilities do you think ...st sense for travel along a redesigned Fisher Road?

126 responses



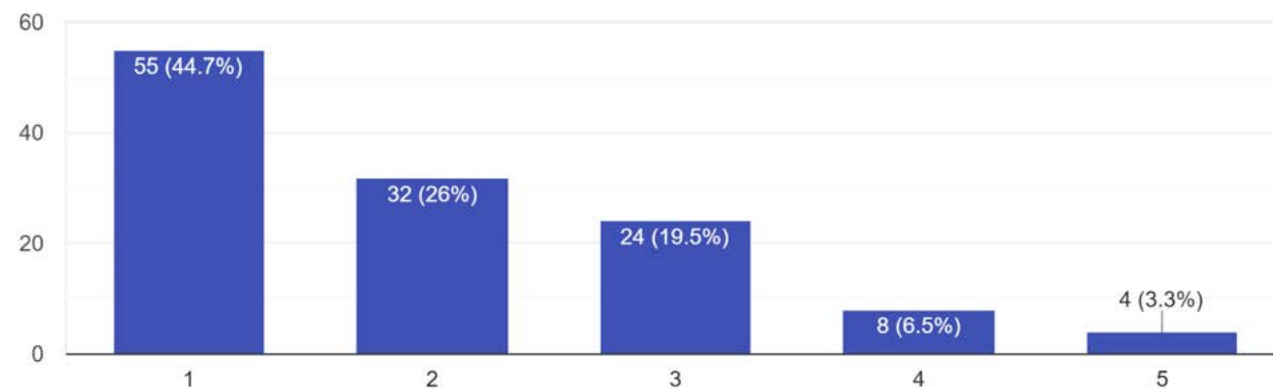
Over 80% of respondents would prefer bicycle facilities to be physically separated from motor vehicles. 60% would prefer a completely off-road shared use path (shared with pedestrians), with an additional 20% preferring a physically separated bike lane.

## Local Concerns Survey Results (Continued)

Additional Local Concerns Survey charts and summary information about the walking experience and parking on Fisher Road are included on this page.

### Are you comfortable walking on Fisher Road?

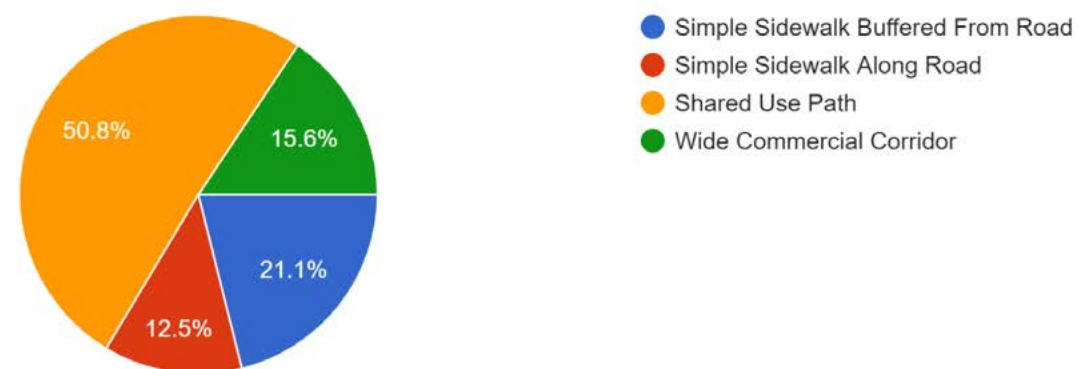
123 responses



Most respondents to this question (over 70%) are not comfortable walking on Fisher Road (responding with a '1' or a '2').

One element of this project is re-thinking Fisher Road as a safe and comfortable place to walk. Which of the following types of walking spaces do ... sense for travel along a redesigned Fisher Road?

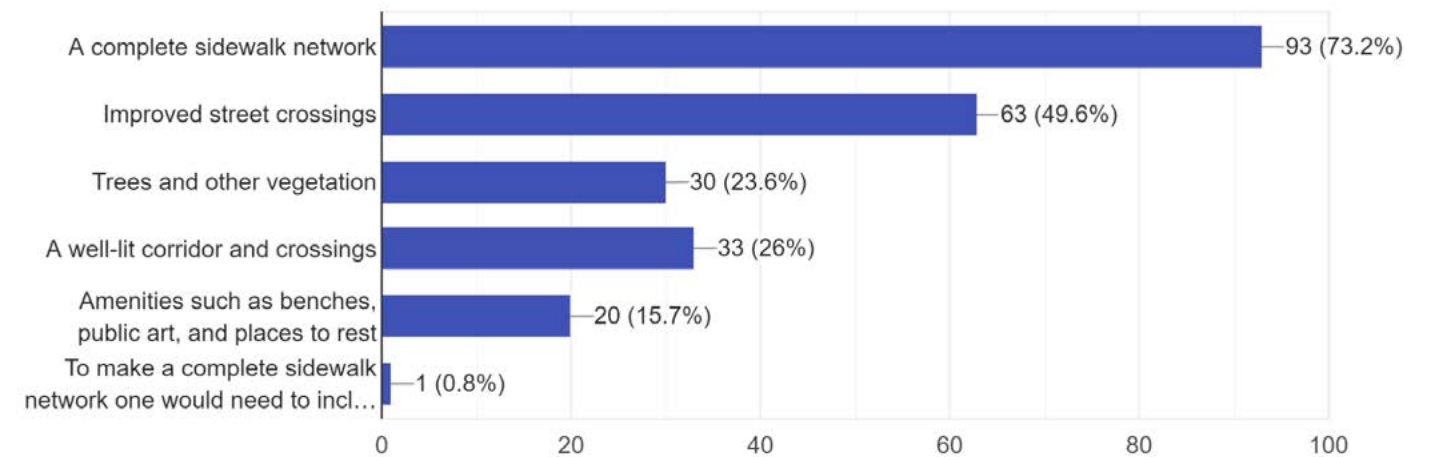
128 responses



Over 70% of respondents would prefer pedestrian facilities to be physically separated from motor vehicles. 51% would prefer a completely off-road shared use path (shared with cyclists), with an additional 21% preferring a sidewalk buffered from the road.

What two improvements do you think would make the biggest difference for walking to destinations along Fisher Road? (Pick only 2)

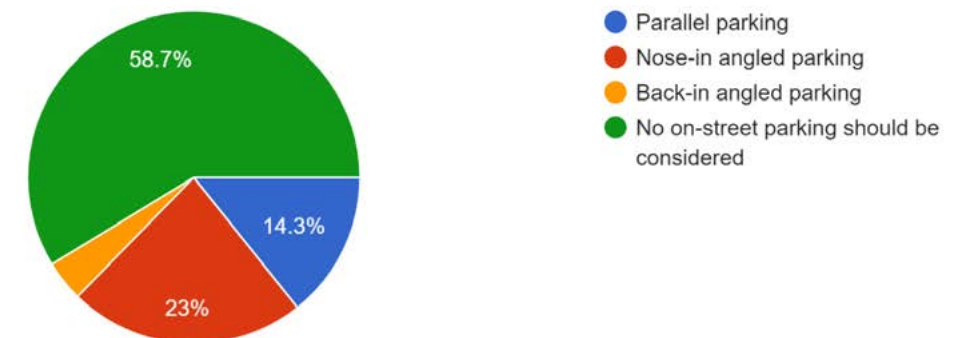
127 responses



In addition to physically separated pedestrian facilities, survey respondents also believe that a complete sidewalk network (73%) and improved street crossings (50%) would improve the walking experience along Fisher Road.

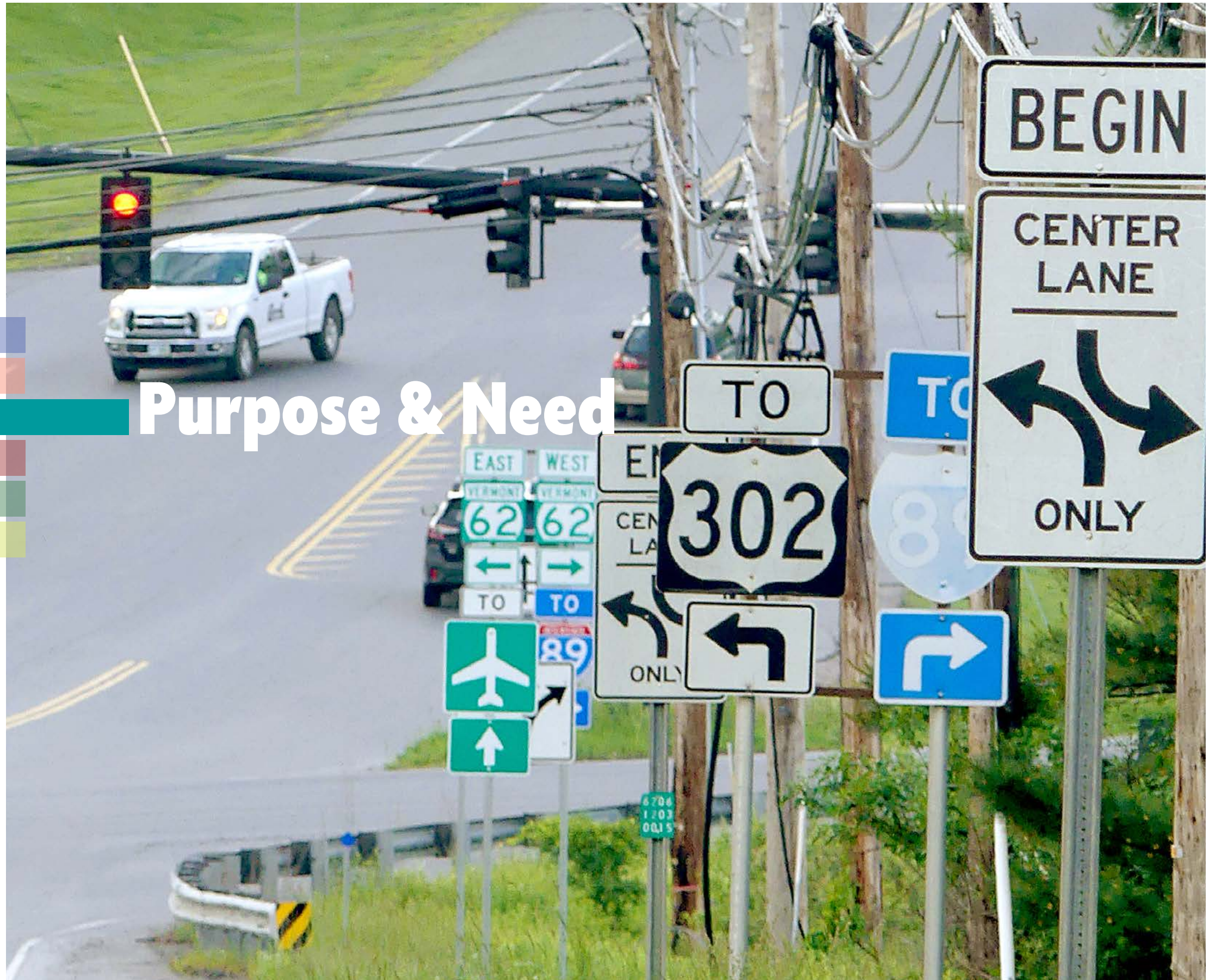
One element of this project is re-thinking Fisher Road with on-street parking. Which of the following parking types do you think would be beneficial to consider in a road redesign?

126 responses



Almost 60% of respondents to this question stated that no on-street parking should be considered for Fisher Road.

For the remaining respondents, those that thought on-street parking would be beneficial along Fisher Road, over half preferred "nose-in" angled parking.



# Purpose & Need

## Purpose

To create a safe, walkable, bikeable Fisher Road that can safely accommodate increases in traffic as well as bicycle and pedestrian uses within the New Town Center.

## Need

Berlin's designated New Town Center is envisioned to significantly build out lands located in and around the Central Vermont Marketplace. The influx of new businesses, available services, and as many as 300 new residential units will increase vehicular traffic as well as bicycle and pedestrian uses along Fisher Road.

In its present state, Fisher Road is prone to vehicle crashes and lacks adequate infrastructure to allow for safe use by cyclists or pedestrians, particularly those that travel to or from the major employers located along Fisher Road. This scoping study provides a detailed record of existing conditions and public input, and uses this record to develop and consider three conceptual redesigns for Berlin's Fisher Road to support the Town of Berlin and its stakeholders in the fiscal and logistical planning of redesigning Fisher Road as a gateway to the New Town Center.



# Design Options

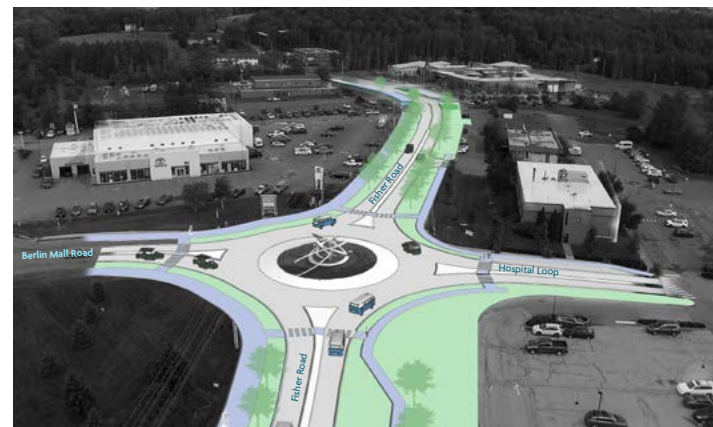
## Design Option Overview

Over the course of this study, four unique design options were developed and considered. These are:

- **No Build** - leave the roadway as it is today, with only routine or typically-planned maintenance.
- **Paint Only Quick Build** - add bike lanes and reduce the three lanes at the intersection to two. Temporary barricades can create a median and road edge buffers, and be removed in winter months to accommodate plow blades. No changes to road surface, curbing, or new construction are proposed.
- **Lane Reduction and Sidewalks** - Maintain crossing and road geometries, but right-size the central intersection to reduce the three lane intersection to a two lane intersection. Install sidewalks along the length of the roadway to improve pedestrian safety and comfort.
- **Roundabout & Pathway** - A re-envisioned central intersection becomes a single lane roundabout, both improving pedestrian safety and increasing the intersection's capacity to handle through traffic. In lieu of complete sidewalks, a complete shared use pathway allows bi-directional bicycle and pedestrian traffic to travel safely along the southwestern side of Fisher Road.

These three design options were designed, modeled, and measured as part of the design process, as well as run through traffic modeling software to assess impacts relative to anticipated future traffic loads when the Berlin New Town Center approaches build out, along with CVMC campus and regional population growth.

Each of these design options are presented in this chapter, followed by a comparison and alternatives matrix highlighting the preferred option. **Based on public feedback, anticipated traffic impacts, project costs, and pedestrian safety, this study recognizes the Roundabout & Pathway as the preferred alternative.**



## No Build Design Option

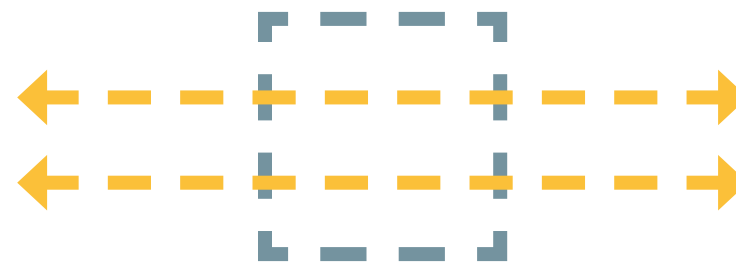
When considering any public road project, it is important to consider the least complex, and least costly option; making no changes to the road and lands as they stand today.

This option clearly has some advantages in regards to the use of public funds, but it achieves none of the project Purpose - as the current roadway is not a safe place to walk or bicycle, and has no dedicated facilities walking or bicycling beyond limited and disconnected sidewalks in front of a bus stop to the west and connecting across the roadway at the Mall Road / Hospital Loop intersection.

For a thorough review of the No Build option, please see the existing conditions chapter of this document.



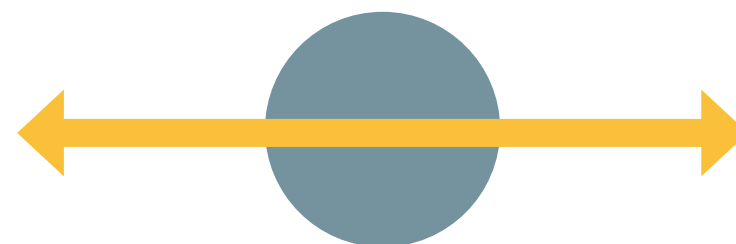
No Build



Paint Only Quick Build



Lane Reduction and Sidewalks



Roundabout & Pathway

## Traffic Modeling Methodology

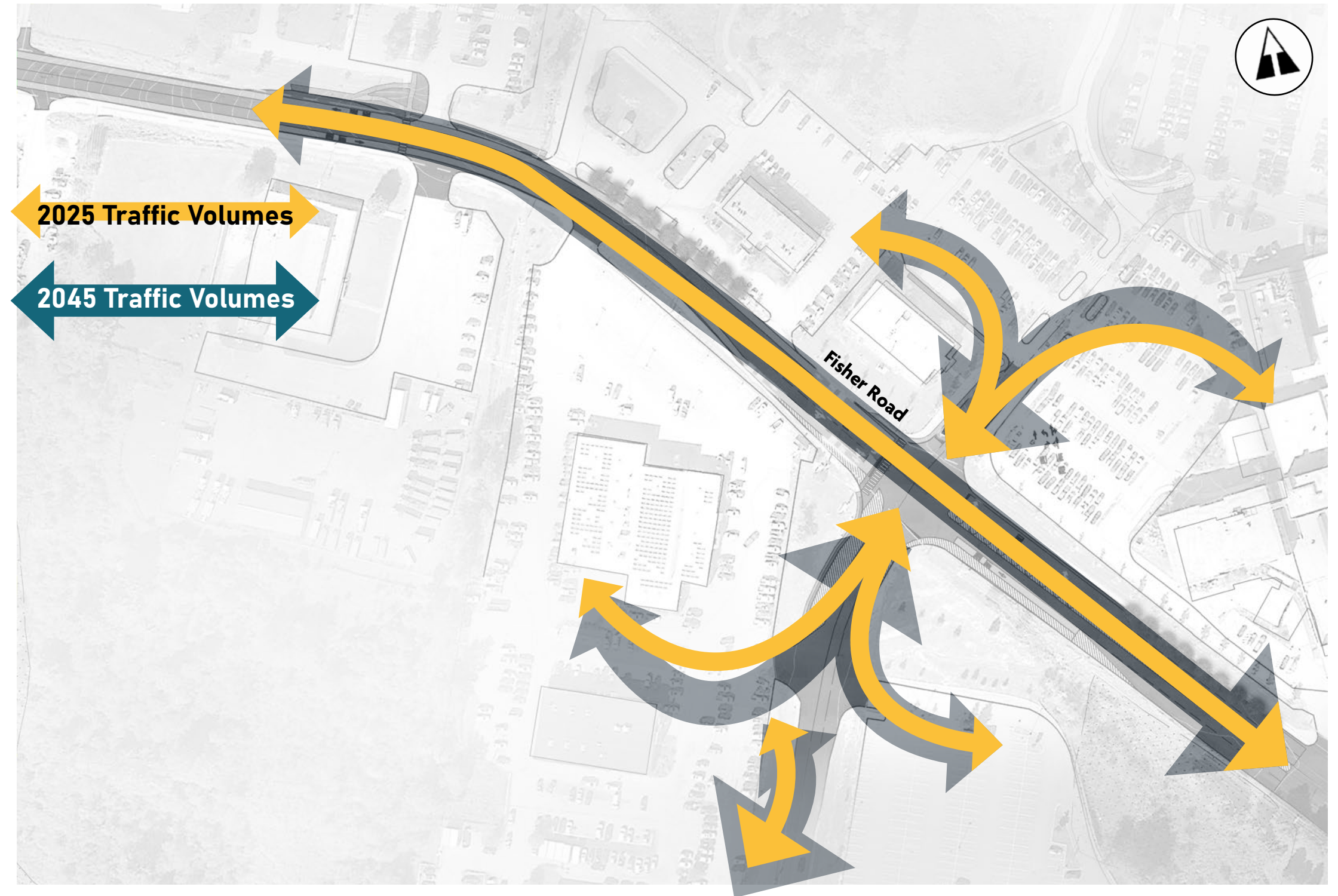
D&K conducted a predictive traffic model that evaluated traffic operations during the years 2025 and 2045, where 2025 is considered the year where any potential modifications to the Fisher Road / Berlin Mall Road / CVMC intersection would be completed. The future year of 2045 was selected for a planning-level review of future traffic operations. In addition, it is assumed that the future Berlin New Town Center is to be fully built out and occupied by that year.

To develop the traffic volumes used for study area intersection evaluations, this project utilized turning movement counts conducted by both VTrans and D&K. This modeling process followed VTrans guidelines and standard practice for traffic engineering studies by evaluating traffic volumes that represent the “design hour volume” (DHV). The DHVs are developed by applying adjustment factors to the turning movement counts, calculated using nearby traffic data from the VTrans Transportation Data Management System (VTrans MS2 website). These data were adjusted to accommodate for changes in traffic due to the COVID-19 pandemic.

Estimated traffic volumes generated by the New Town Center (NTC) are incorporated into these traffic volumes based on the planned land use areas shown in the Berlin New Town Center NTC Concept Plan, dated January 7, 2021. Trip generation for the NTC for the weekday am and pm peak hours was estimated using the ITE Trip Generation Manual 10th edition. For the purpose of traffic analyses, one “trip” is a trip end, where it is either a trip to or from the site. If a vehicle enters the site within the peak hour but leaves the site after the peak hour, this is considered as one trip. Whereas if a vehicle enters the site and leaves the site within the peak hour, this is considered two trips.

Based on New Town Center Buildout.

- 300+ residential units
- 5,200 sf of new commercial services
- Improved walkability within NTC
- Illustrates approximately 17% growth in area trips





## Traffic Modeling Components

A detailed description of the traffic modeling conducted as part of this Scoping Study, as well as a full data set are included in Appendix C of this report.

In the context of the alternatives presented, three key components of the traffic study are highlighted: Level of Service, Intersection Delays, and Maximum Queue Length. These components relate directly to the user experience, particularly for drivers, along Fisher Road based on changes to the design.

The the charts on pages 35, 40 and 46 use these three components in comparing the “before and after” results of each alternative, in both 2025 and 2045 based on use projections.

See also Appendix C, Traffic Assessment Memorandum, with Attachments. However, please note that Table 5 of this Memorandum indicates a decrease in level of service for the project preferred alternative, the Roundabout & Path, at Fisher Road/VT 62/Airport Road, from 2025 to 2045. It is the project team’s assumption that the statistical level of service loss is due to the variations of current software modeling standard practice of signalized intersections versus roundabouts. Further, it is the project team’s judgment that the actual level of service grade would not be impacted as significantly as shown for the roundabout alternative. We make this assumption based on the differences in the level of input that we are able to provide for the signalized intersection in these different evaluation softwares.

## How this Data is Presented in this Report

Each alternatives includes a “summary of traffic impacts” of each proposed alternative compared to current existing conditions. As a way to aid in understanding the data, table cells are color coded using colors that vary from red (worst) to green (best).

**Level of Service (LOS)** - Level of service (LOS) is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety. LOS ranges from best (LOS A) to worst (LOS F). In this report, the current LOS is compared to the LOS projected for each proposed alternative.

**Intersection Delays** - Intersection delay is the additional travel time experienced by a vehicle after it enters the intersection and before it reaches free-flow speed, typically characterized by needing to wait to turn, or to allow other traffic to pass. Negative numbers indicate a reduction in delays.

**Maximum Queue Lengths** - The number of cars queued at an intersection. A vehicle is considered as queued when it approaches within one car length of a stopped vehicle and is itself about to stop. A lower number in the table indicates fewer cars queued.

		Existing Conditions	Proposed Alternative
<i>Level of Service (LOS) Fisher Rd / Berlin Mall Road / CVMC</i>			
2025	LOS am	C	A
	LOS pm	D	A
2045	LOS am	C	A
	LOS pm	E	A
<i>Intersection Delays Fisher Rd / Berlin Mall Road / CVMC</i>			
2025	AM Delay	baseline	-21.3
	PM Delay	baseline	-44.8
2045	AM Delay	baseline	-22.1
	PM Delay	baseline	-50
<i>Maximum Queue Lengths (# of Cars)</i>			
		Existing Conditions	Roundabout
2025	Paine TP	4	4 PM, Fisher Road WB
	CVMC/Mall	7	3 PM, Fisher Road WB
	Route 62	14	13 PM, Fisher Rd SB
2045	Paine TP	7	6 PM, Fisher Rd WB
	CVMC/Mall	10	4 PM, Fisher Rd WB
	Route 62	13	13 PM, Fisher Rd SB

## Paint Only Quick Build

This design option is proposed as a way for the community to develop improved multi-modal access to Fisher Road, and test out the impact of reducing lanes at the Berlin Mall Road / CVMC intersection without expensive road reconstruction.

Painted bike lanes would both narrow the visual roadway and create a designated space on the roadway for biking, and in lieu of any more appropriate facilities, a place to walk as well.

More significant paint only treatments are proposed around the road's central intersection between CVMC campus and the Central Vermont Marketplace - here, the new paint scheme would right-size the roadway width to include bike lanes, and reduce the travel lanes from three lanes to two. The changes proposed for this intersection are illustrated in greater detail in the intersection change segment of this chapter. In addition to these changes, a series of concrete planters would extend the median that currently exists at the Route 62 intersection and Fisher Road towards the Hospital Loop Road / Berlin Mall Road intersection.

This median extension would complement lane reduction and create a more narrow roadway profile in an effort to reduce overall travel speeds and create a more safe multi-modal road corridor.

This quick build design option would not include any new plantings (other than in the planters), or create any new sidewalk or pedestrian crossings.



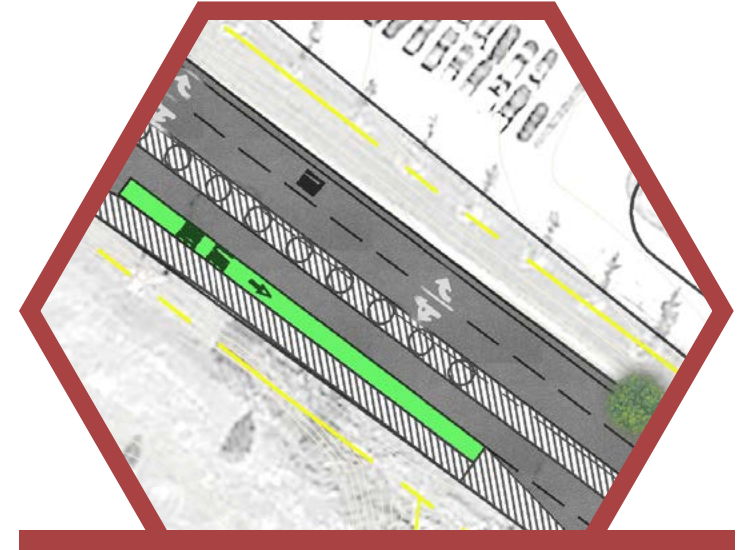
Bike lanes support safe access



No new plantings - maintain existing



No new sidewalk - maintain existing



Painted Median with concrete planters reduce travel lane widths



**Paint Only Quick Build  
Summary of Traffic Impacts**

See page 33 for definitions of Level of Service, Intersection Delay, and Queue Length.

Despite adding bike lanes and reducing the number of lanes at the intersection, this design option (and the Lane Reduction & Sidewalks option) only slightly improves upon existing Levels of Service.

This is primarily due to the existing turn movements not being overly impacted by the combination of through and right turn lanes, as well as opportunities uncovered by this study to optimize traffic signal timing.

The tables at right capture both overall Intersection Delay for this road reconfiguration, in the near term (2025) as well as in the long term, assuming full build out of the Berlin New Town Center plans (2045).

The only noted impact to this design is in the peak PM travel hour in 2045, where the road diet causes a marginal increase to Queuing Lengths at the Fisher Road / Route 62 intersection during peak PM travel volumes.

**Existing Conditions**

**Paint Only Road Diet**

Level of Service (LOS) Fisher Rd / Berlin Mall Road / CVMC			
Year	LOS am	Existing Conditions	Paint Only Road Diet
	2025	LOS am	C
LOS pm		D	C
2045	LOS am	C	C
	LOS pm	E	D

Intersection Delays Fisher Rd / Berlin Mall Road / CVMC			
Year	Delay Type	Existing Conditions	Paint Only Road Diet
	2025	AM Delay	baseline
PM Delay		baseline	-15.7
2045	AM Delay	baseline	1.2
	PM Delay	baseline	-16.8

Maximum Queue Lengths (# of Cars)				
Year	Location	Existing Conditions		Paint Only Road Diet
		2025	Paine TP	4
CVMC/Mall	7		6	6 PM, Fisher Road WB
Route 62	14		11	11 PM, Fisher Rd SB
2045	Paine TP	7	6	6 PM, Fisher Rd WB
	CVMC/Mall	10	8	8 PM, Fisher Rd WB
	Route 62	13	14	14 PM, Fisher Rd SB

## Paint Only Quick Build Intersection Changes

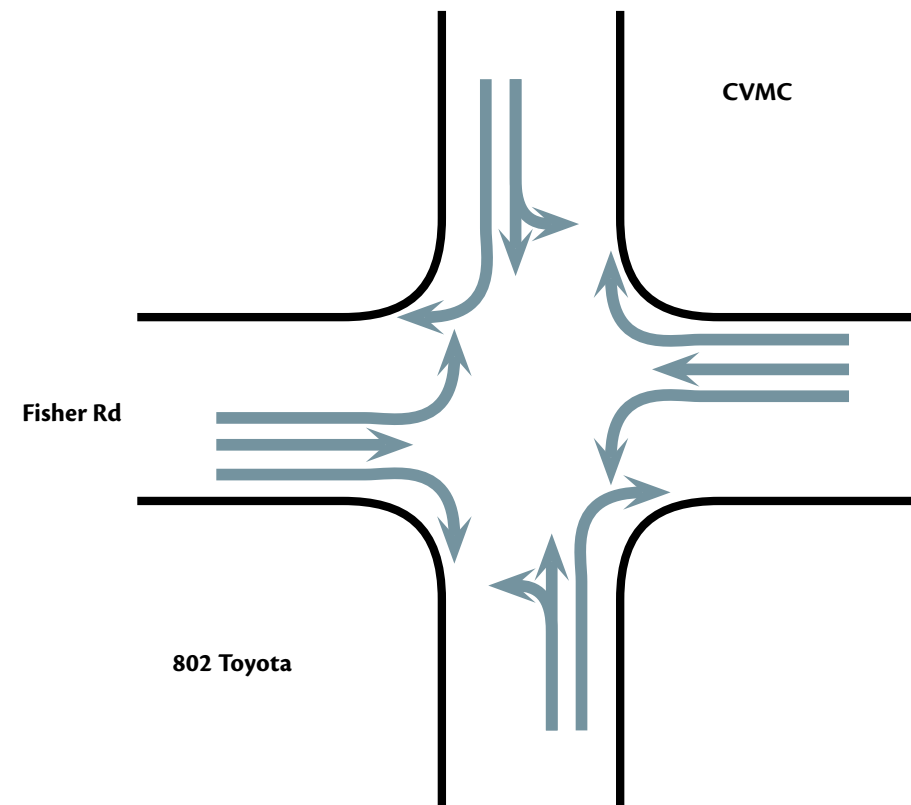
The major changes for the intersection proposed in both this paint-only design option and the lane reduction and sidewalks option are twofold: Addition of a bike lane and bike box at the intersection, as well as a reduction of the eastbound and westbound lanes.

As illustrated in the diagram at right, the current three lane configuration is intended to be reduced to two lanes traveling east and west. The through lane and right turn lanes are proposed to merge to create a single lane of traffic destined to travel through or turn right.

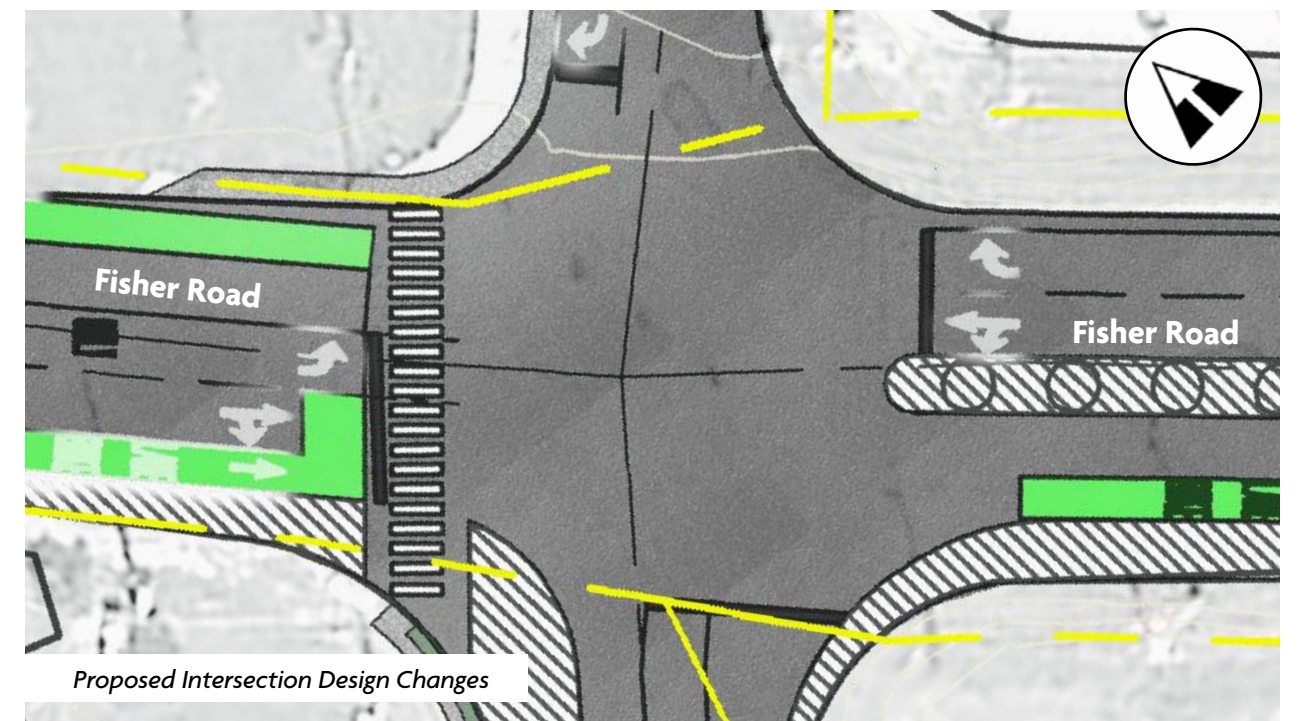
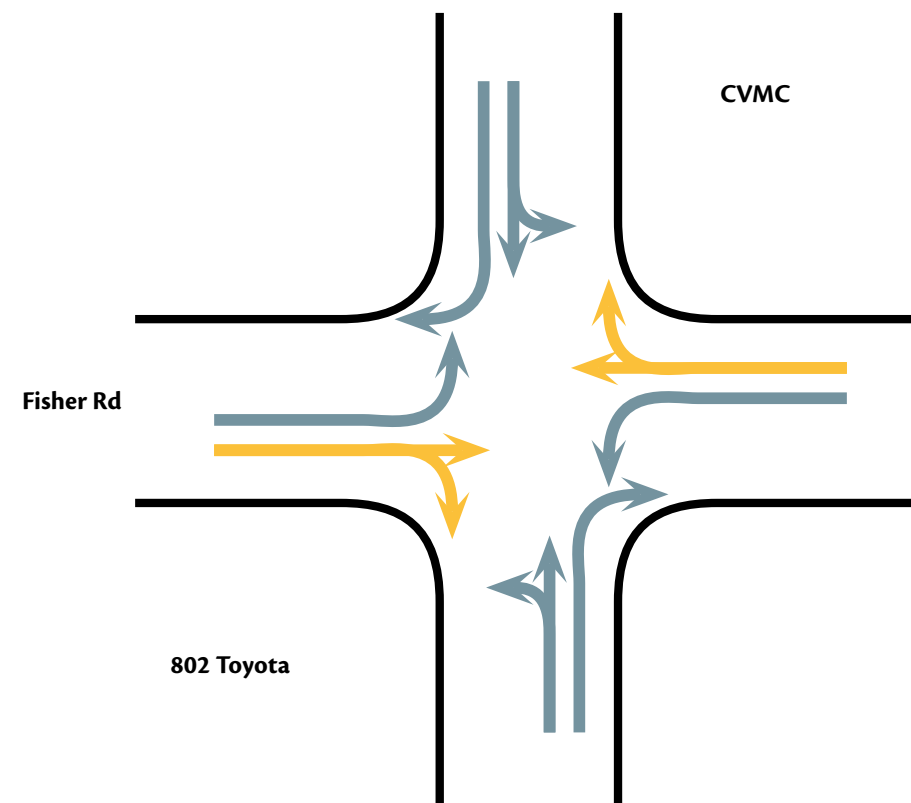
Such changes free up space on the roadway for bike lanes, and reduce overall pedestrian crossing distances in the only place where pedestrians are provided crosswalk and sidewalks on either side of Fisher Road.

A single bike box is also proposed at the NW side of this intersection, which is intended to give bicyclists turning onto Berlin Mall Road or Hospital Loop greater visibility, and reduce the incidence of cars turning right into cyclists waiting their turn at the light. Such a structure can also facilitate a bicycling right turn from this location, improving access from Paine Turnpike to CVMC for people riding bicycles. This design also can serve to reduce vehicle encroachment on Fisher Road's only pedestrian crosswalk by setting cars farther back from the crossing zone.

### Current



### Proposed

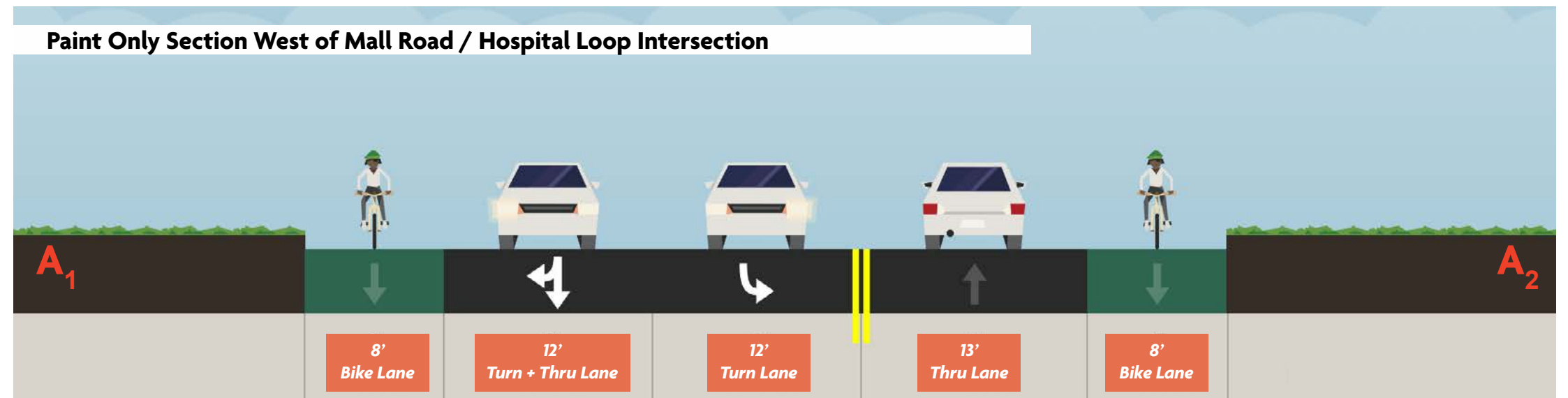
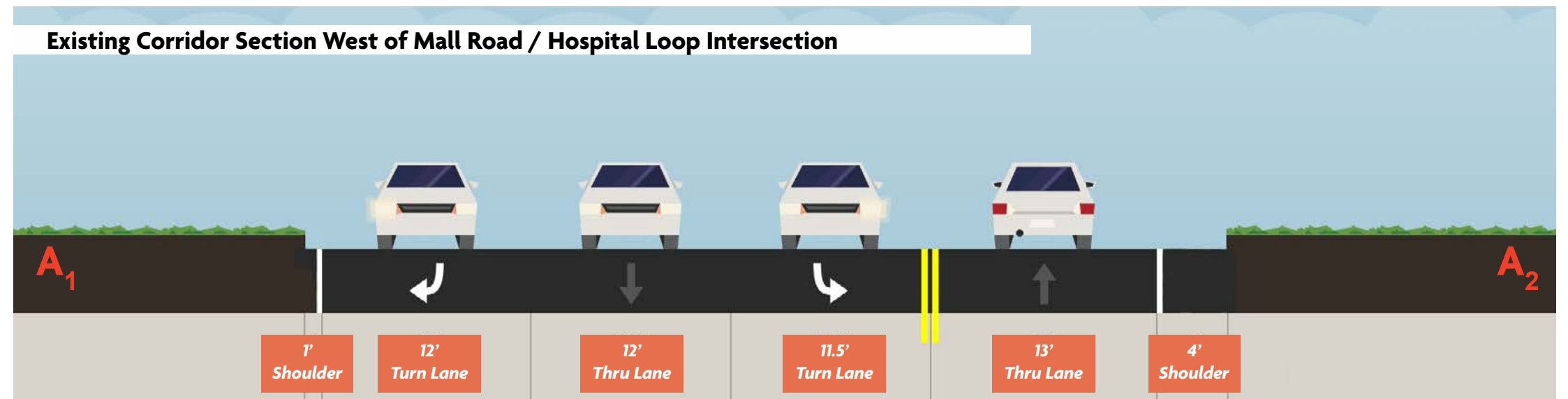


### Paint Only Quick Build Cross Section West of Mall Road/Hospital Loop Intersection

The cross sections on this page include the Existing Condition (above right) and the Paint Only Quick Build design concept (below right), for the west side of the Mall Road / Hospital Loop intersection. See the next page for the cross sections for the east side of this intersection.

As indicated below, left to right is aligned southwest to northeast, from the mall/car dealership side at the left, to the hospital side at the right.

Sections prepared using Streetmix.

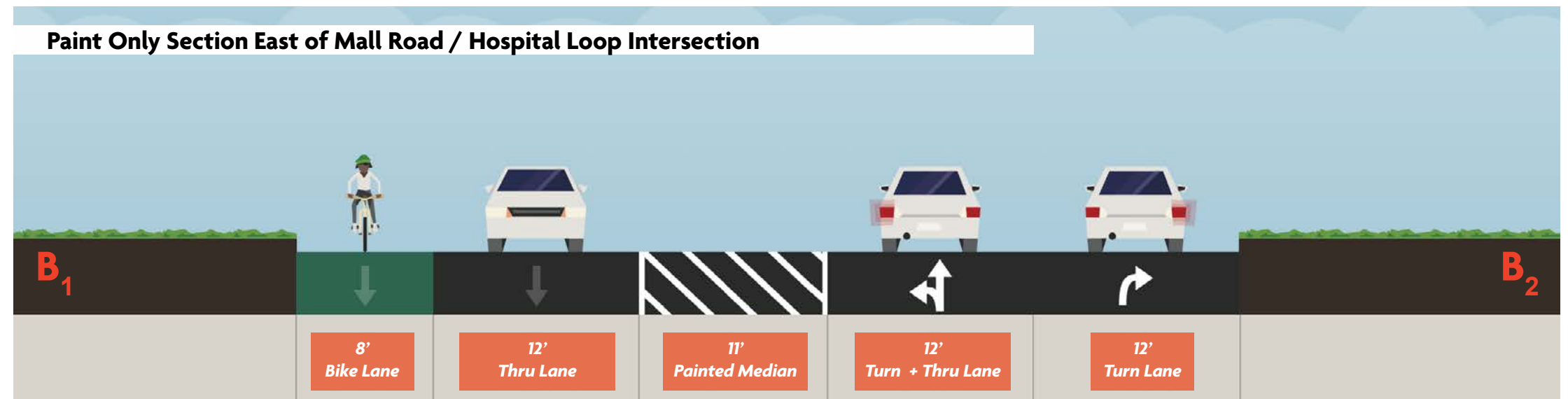
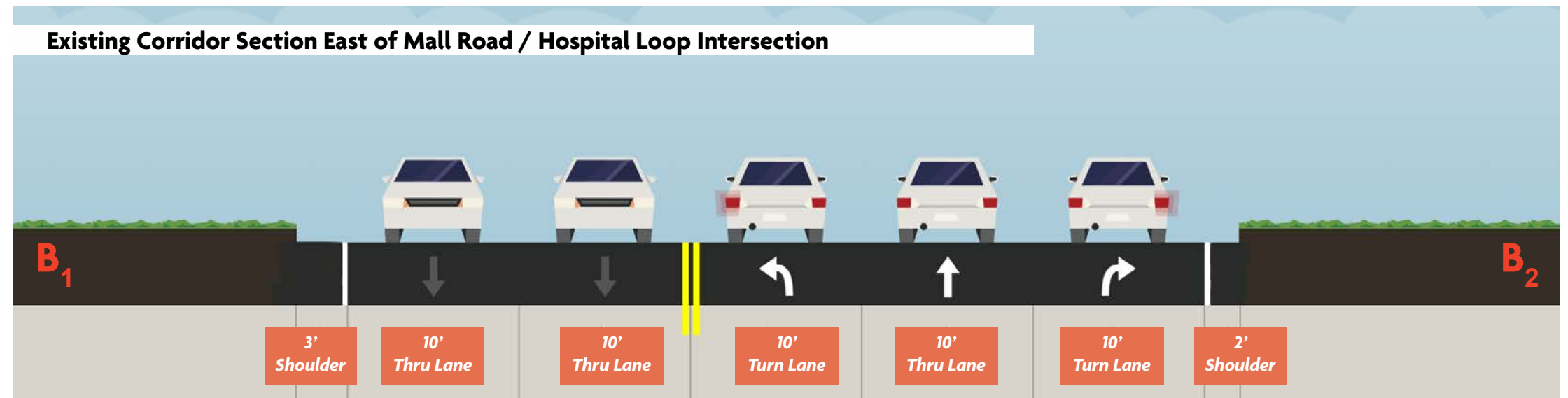


### Paint Only Quick Build Cross Section East of Mall Road/Hospital Loop Intersection

The cross sections on this page include the Existing Condition (above right) and the Paint Only Quick Build design concept (below right), for the east side of the Mall Road / Hospital Loop intersection. See the previous page for the cross sections for the west side of this intersection.

As indicated below, left to right is aligned southwest to northeast, from the mall/car dealership side at the left, to the hospital side at the right.

Sections prepared using Streetmix.



# Lane Reduction & Sidewalks

This design option builds a complete street along the length of Fisher Road. Similar in roadway design to the Paint Only option, this approach builds a complete sidewalk network as well as a shared use path corridor connecting Fisher Road to Paine Turnpike and the Berlin New Town Center developments.

Existing crosswalks are maintained, and an additional three pedestrian crossings are added to the four way stop at Berlin Mall Road / Hospital Loop.

A shared use path is developed in conjunction with the New Town Center Development that allows eastbound travelers on foot or bicycle to connect with the development's destinations.

Roadway changes in this alternative, and modeled traffic impacts are identical to the Paint Only design option, but would be more expensive to construct, less expensive to maintain, and would actually reconfigure the roadway as a complete street, as opposed to painting the roadway like one.



Buffered bike lanes on western side of road. Sidewalk throughout corridor to connect with shared use path.



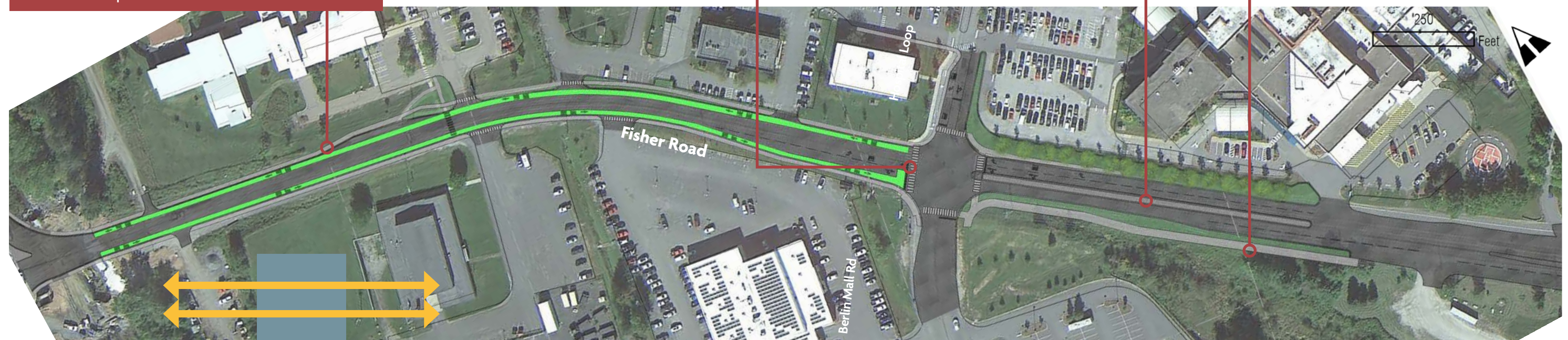
Four way pedestrian crossing improves pedestrian access throughout area.



Planted median continues street tree rhythm towards Route 62.



Shared Use path connects to Town Center.



**Lane Reduction & Sidewalks  
Traffic Modeling Results**

See page 33 for definitions of Level of Service, Intersection Delay, and Queue Length.

As with the Paint Only option, the Lane Reduction and Sidewalk option slightly improves upon existing levels of service.

This is primarily due to the existing turn movements not being overly impacted by the combination of through and right turn lanes, as well as opportunities uncovered by this study to optimize traffic signal timing.

The tables at right capture both overall intersection delay for this road reconfiguration, in the near term (2025) as well as in the long term, assuming full build out of the Berlin New Town Center plans. (2045).

The only noted impact to this design is in the peak PM travel hour in 2045, where the road diet causes a marginal increase to queuing lengths at the Fisher Road / Route 62 intersection during peak PM travel volumes.

		Existing Conditions	Lane Reduction & Sidewalks
<i>Level of Service (LOS) Fisher Rd / Berlin Mall Road / CVMC</i>			
<b>2025</b>	LOS am	C	C
	LOS pm	D	C
<b>2045</b>	LOS am	C	C
	LOS pm	E	D
<i>Intersection Delays Fisher Rd / Berlin Mall Road / CVMC</i>			
<b>2025</b>	AM Delay	baseline	0.9
	PM Delay	baseline	-15.7
<b>2045</b>	AM Delay	baseline	1.2
	PM Delay	baseline	-16.8

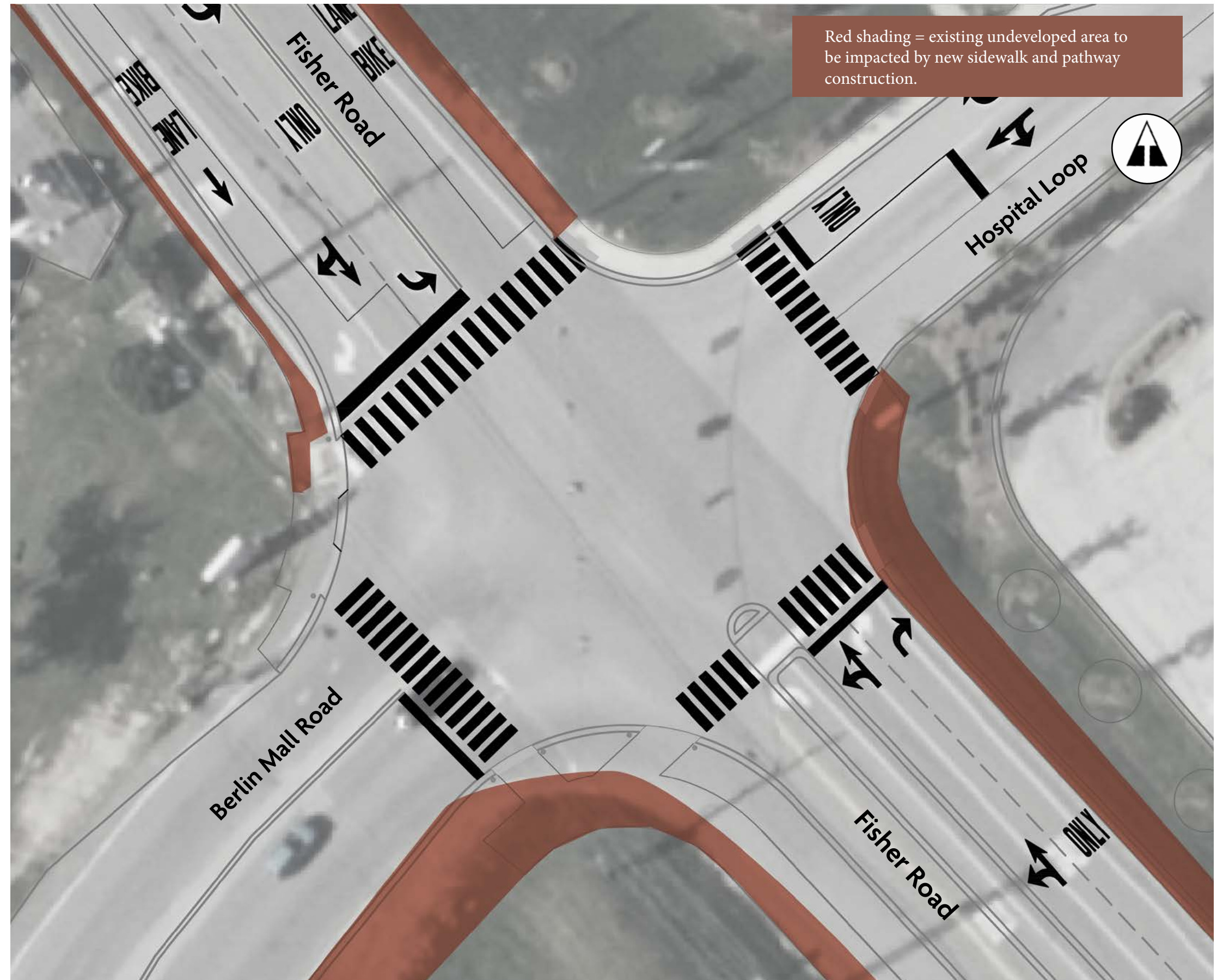
<i>Maximum Queue Lengths (# of Cars)</i>			
		Existing Conditions	Lane Reduction and Sidewalks
<b>2025</b>	Paine TP	4	4 PM, Fisher Road WB
	CVMC/Mall	7	6 PM, Fisher Road WB
	Route 62	14	11 PM, Fisher Rd SB
<b>2045</b>	Paine TP	7	6 PM, Fisher Rd WB
	CVMC/Mall	10	8 PM, Fisher Rd WB
	Route 62	13	14 PM, Fisher Rd SB



### Lane Reduction & Sidewalks Intersection Impacts

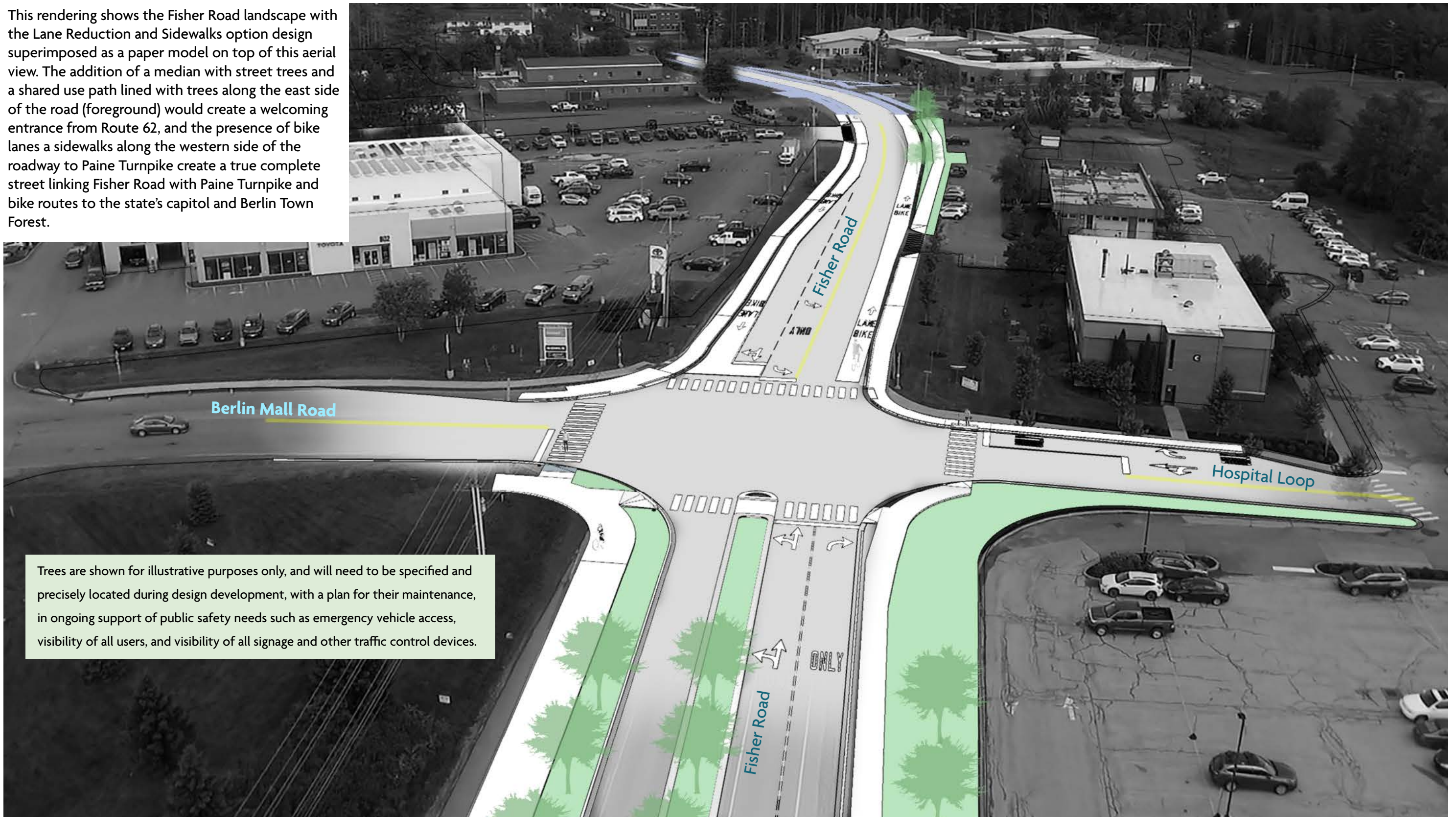
This diagram illustrates, in red, the impacts outside of the existing pavement that this alternative would have when constructed. Impacts are relatively minor, with new sidewalk adjacent to the CVMC Campus, as well as new sidewalk adjacent to Berlin Mall Road being the only areas impacted outside of the roadways current footprint.

This illustration also captures the changes that would occur as part of creating a more pedestrian friendly intersection with sidewalks or a shared use path on all sides. Beyond offering more direct routes of travel for people walking, the presence of a median along the southeastern side of the intersection would also provide pedestrian refuge and a reduced overall crossing distance.



## Lane Reduction & Sidewalks Concept Rendering

This rendering shows the Fisher Road landscape with the Lane Reduction and Sidewalks option design superimposed as a paper model on top of this aerial view. The addition of a median with street trees and a shared use path lined with trees along the east side of the road (foreground) would create a welcoming entrance from Route 62, and the presence of bike lanes a sidewalks along the western side of the roadway to Paine Turnpike create a true complete street linking Fisher Road with Paine Turnpike and bike routes to the state's capitol and Berlin Town Forest.



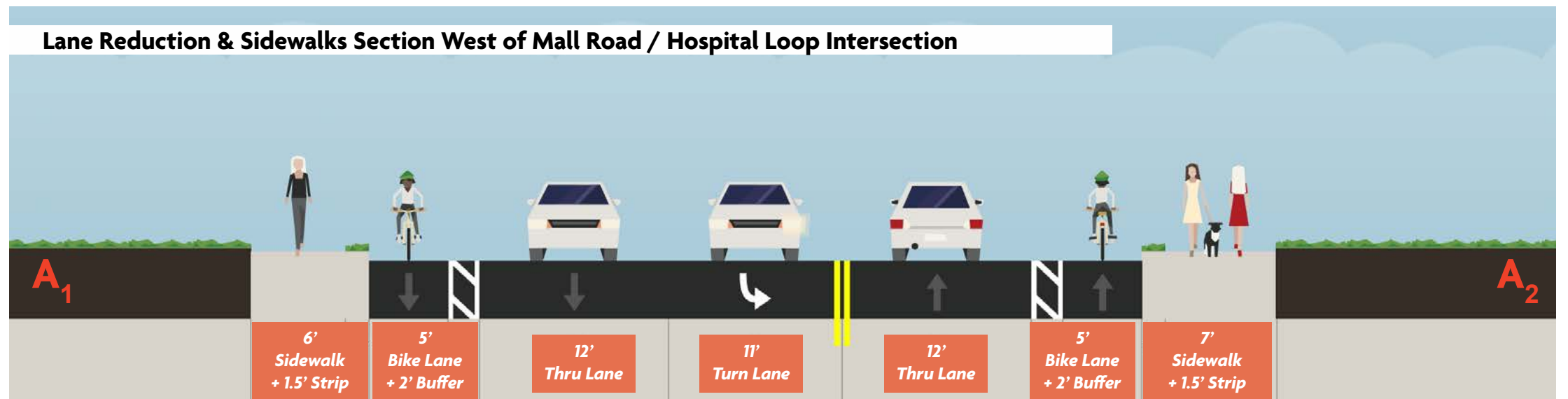
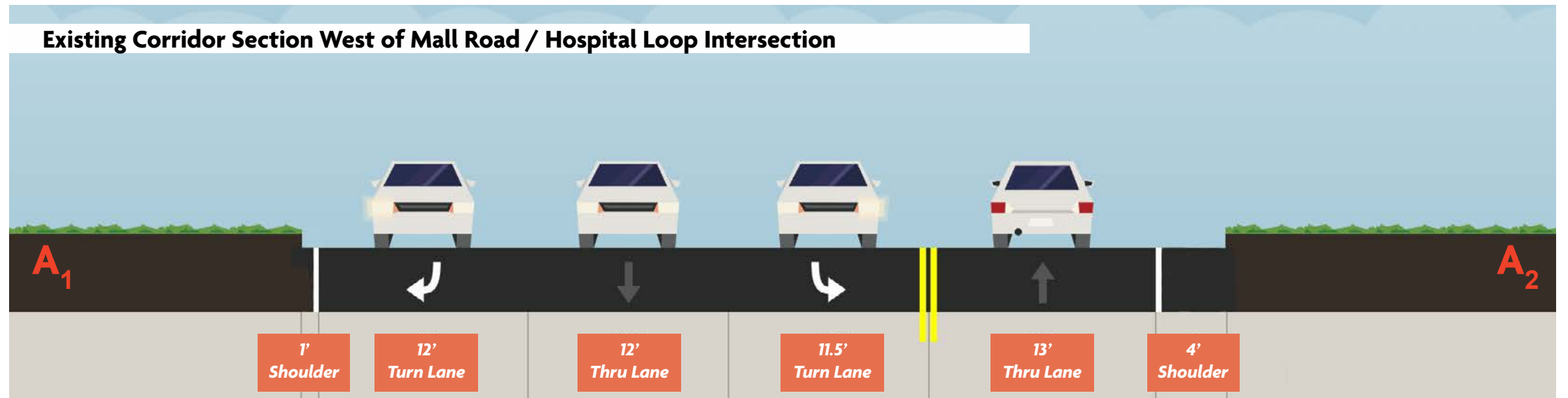
Trees are shown for illustrative purposes only, and will need to be specified and precisely located during design development, with a plan for their maintenance, in ongoing support of public safety needs such as emergency vehicle access, visibility of all users, and visibility of all signage and other traffic control devices.

### Lane Reduction & Sidewalks Cross Section West of Mall Road/Hospital Loop Intersection

The cross sections on this page include the Existing Condition (above right) and the Lane Reduction & Sidewalks design concept (below right), for the west side of the Mall Road / Hospital Loop intersection. See the next page for the cross sections for the east side of this intersection.

As indicated below, left to right is aligned southwest to northeast, from the mall/car dealership side at the left, to the hospital side at the right.

Sections prepared using Streetmix.

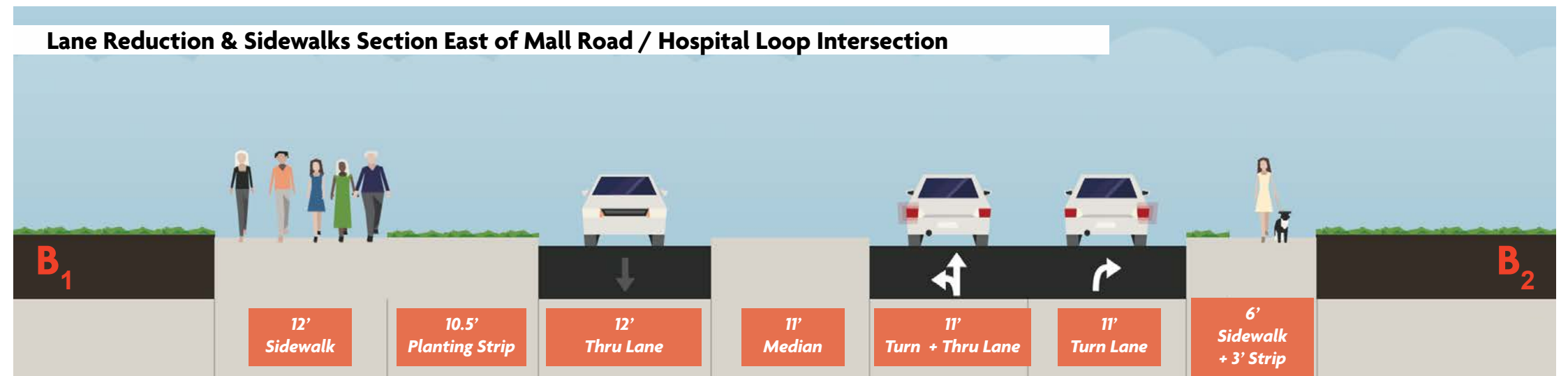
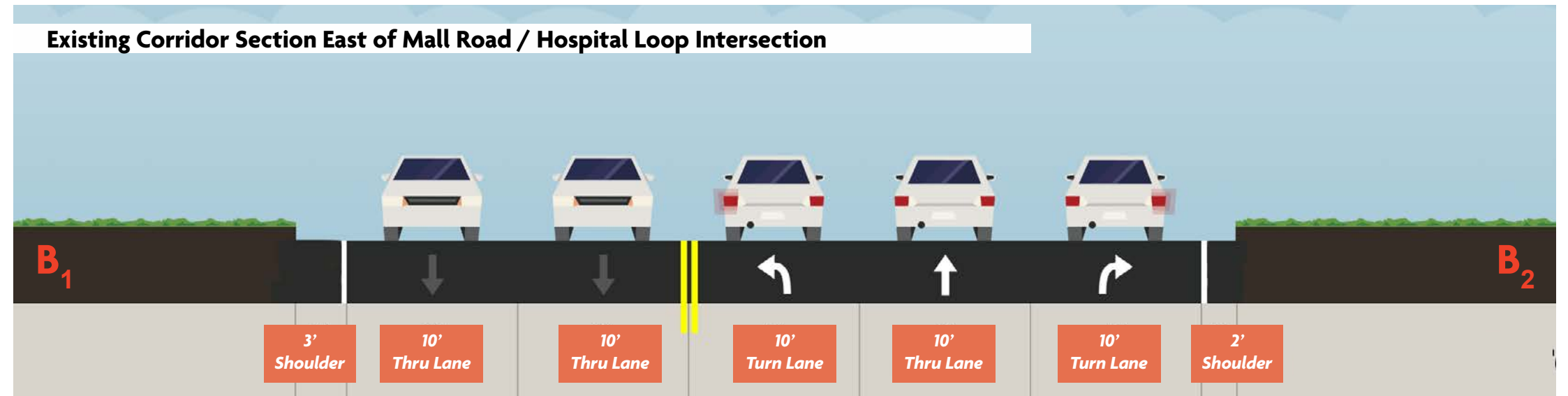


### Lane Reduction & Sidewalks Cross Section East of Mall Road/Hospital Loop Intersection

The cross sections on this page include the Existing Condition (above right) and the Lane Reduction & Sidewalks design concept (below right), for the east side of the Mall Road / Hospital Loop intersection. See the previous page for the cross sections for the west side of this intersection.

As indicated below, left to right is aligned southwest to northeast, from the car dealership side at the left, to the hospital side at the right.

Sections prepared using Streetmix.



# Roundabout and Pathway

This design option replaces the four way stop in the center of the Fisher Road corridor with a single lane roundabout. In doing so, it reduces traffic congestion at this busy intersection while creating opportunity for placemaking artwork and improving multi-modal safety at this link between CVMC and future New Town Center development.

Instead of sidewalks and bike lanes, this design option concentrates multi-modal access on a broad, 12 foot wide shared use pathway along the southwest side of the roadway. This facility would accommodate two way bicycling and walking traffic. New sidewalk would be constructed along the northern side of the roadway adjacent to the CVMC campus to create a more walkable health center.

The addition of street trees through this corridor would create a traffic calming gateway effect, mimicking the existing pattern of trees planted just outside the public right of way by CVMC.



New street trees create traffic calming effect and street beautification



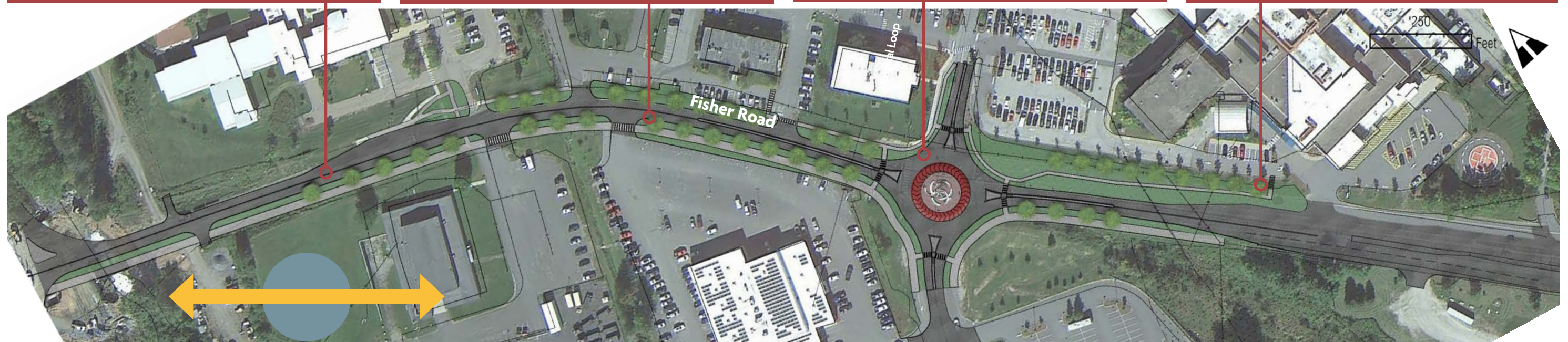
Continuous 12 foot wide shared use pathway links Town Center to Fisher Road



Roundabout reduces pedestrian crossing distances and reduces traffic congestion at intersection



Sidewalk extensions create a more accessible & healthy CVMC campus



## Roundabout and Pathway Traffic Modeling Results

See page 33 for definitions of Level of Service, Intersection Delay, and Queue Length.

The design of a roundabout needs no stoplight controls, and can accommodate a larger traffic load without generating significant delays. Even with the Berlin New Town Center adding 300+ residences and numerous businesses to the area, this intersection built as a roundabout would be more than sufficient to handle the traffic load, and handle it well.

The charts at right capture the results of traffic modeling with a roundabout at this location. This design far outperforms the four way designs in both the near and long term.

However, it should be noted that the modeling results get complicated when considering this intersection's impact on the Route 62 intersection, and to a lesser extent Paine Turnpike. Queues at these locations are not modeled as improved from current day with this model, and additional study of adjacent intersection impacts are recommended should the Town wish to pursue the roundabout installation.

### Existing Conditions

### Roundabout and Pathway

Level of Service (LOS) Fisher Rd / Berlin Mall Road / CVMC			
2025	LOS am	C	A
	LOS pm	D	A
2045	LOS am	C	A
	LOS pm	E	A
Intersection Delays Fisher Rd / Berlin Mall Road / CVMC			
2025	AM Delay	baseline	-21.3
	PM Delay	baseline	-44.8
2045	AM Delay	baseline	-22.1
	PM Delay	baseline	-50
Maximum Queue Lengths (# of Cars)			
		Existing Conditions	Roundabout
2025	Paine TP	4	4 PM, Fisher Road WB
	CVMC/Mall	7	3 PM, Fisher Road WB
	Route 62	14	13 PM, Fisher Rd SB
2045	Paine TP	7	6 PM, Fisher Rd WB
	CVMC/Mall	10	4 PM, Fisher Rd WB
	Route 62	13	13 PM, Fisher Rd SB

## Roundabout and Pathway Intersection Impacts

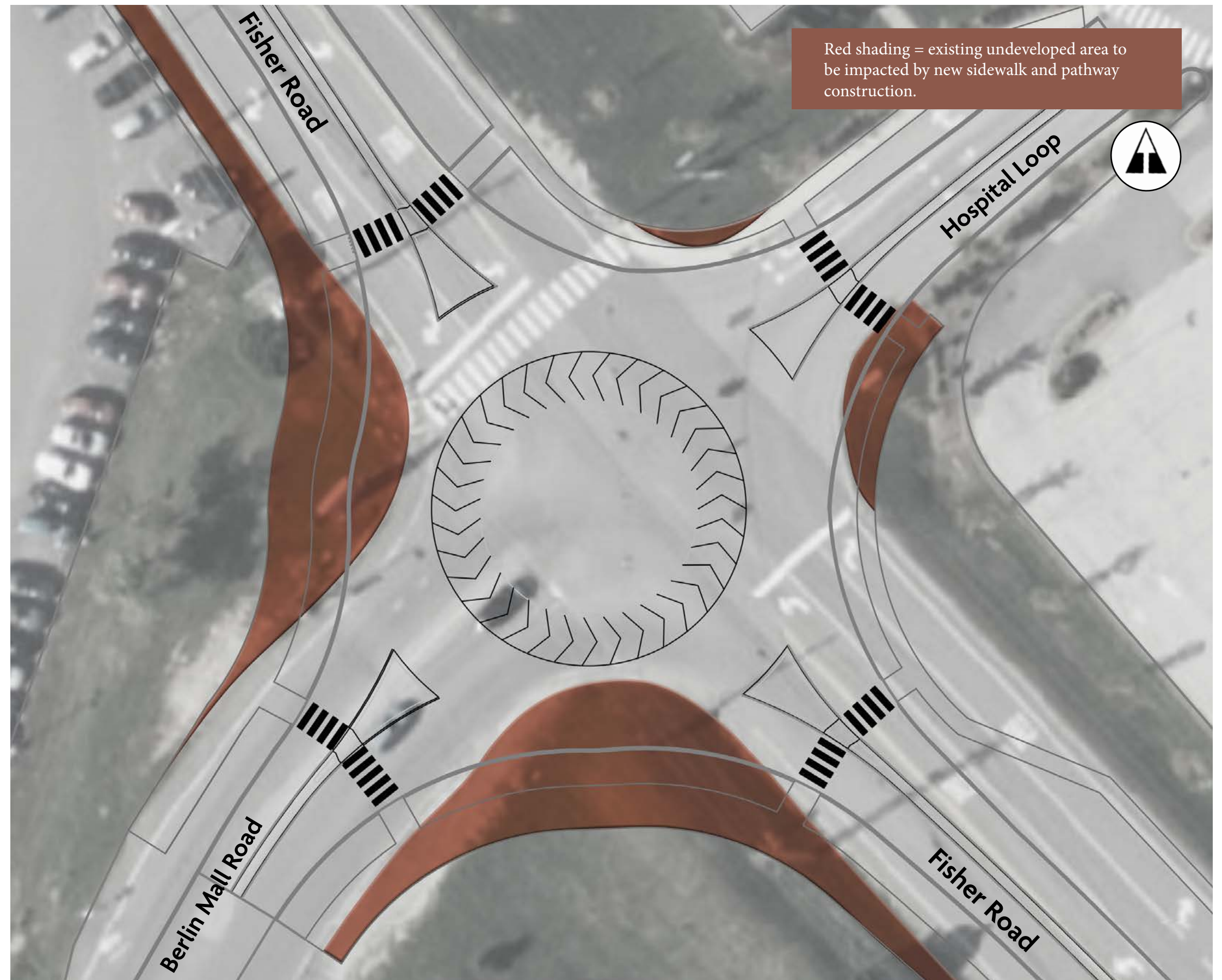
This graphic illustrates how the proposed roundabout intersection would impact areas outside of the current road profile.

Marked in red, small areas on the CVMC side would be impacted outside of the current road profile, and larger areas at the southwestern and southeastern corners would also be impacted.

This diagram also offers an opportunity to compare the notable difference of crossing distances for anyone walking across between today's intersection design and this proposed approach.

Visible in the underlying aerial in white, the existing crosswalk is 78 feet long, and offers no pedestrian refuge. The proposed roundabout intersection not only expands pedestrian crossing to all four legs of the intersection, but shortens this existing crossing distance by 45 feet. Along with the pedestrian refuge, this results in a pedestrian crossing distance reduction of 58% - a marked improvement for roadway safety at this busy intersection.

It should also be noted that due to differences in elevation (average slope of 2.7%), some modifications to Hospital Loop would need to be made in order to safely enter the roundabout.



## Details of Shared Use Path at Roundabout

The graphics on this page offer additional detail about the critical interaction between the shared use path and the roundabout.

As illustrated on this page, components of a safe crossing at a roundabout include:

**Rectangular Rapid Flashing Beacons (push-button activated):** Alert motorists to the crosser, in combination with standard crosswalk signs.

**Tactile Warning Strips:** Required at all marked crossings, to aid the visually impaired and add a brightly colored space immediately next to the road surface.

**Painted Crosswalk:** Standard “continental” style crosswalks, as permitted by VTrans. They should be repainted as often as necessary to retain visibility.

**Landscape Buffer:** The strip between the shared use path and the roadway should remain the same width, or widen at the crossing, to offer greater visibility of the crosser by motorists.

**Splitter Island:** Where the opposing lanes of the roundabout diverge, a “refuge” island is created for the pedestrian to reassess crossing safety based on oncoming traffic.

**Lighting:** As with all road crossings at major intersections, area lighting should offer even illumination that minimizes shadows, very bright “hot spots,” and objectionable glare.

**Landscaping:** Trees and shrubs should be maintained to promote visibility of crossers, including allowing for the illumination to reach all surfaces as intended. For a distance of 75 feet back from the entrance to the roundabout, no shrubs, grasses or other ornamental plants should be taller than 2 feet in height. There should be no tree trunks within this clear area, and any branches from nearby trees should be pruned to allow for at least 8 feet of visual clearance.

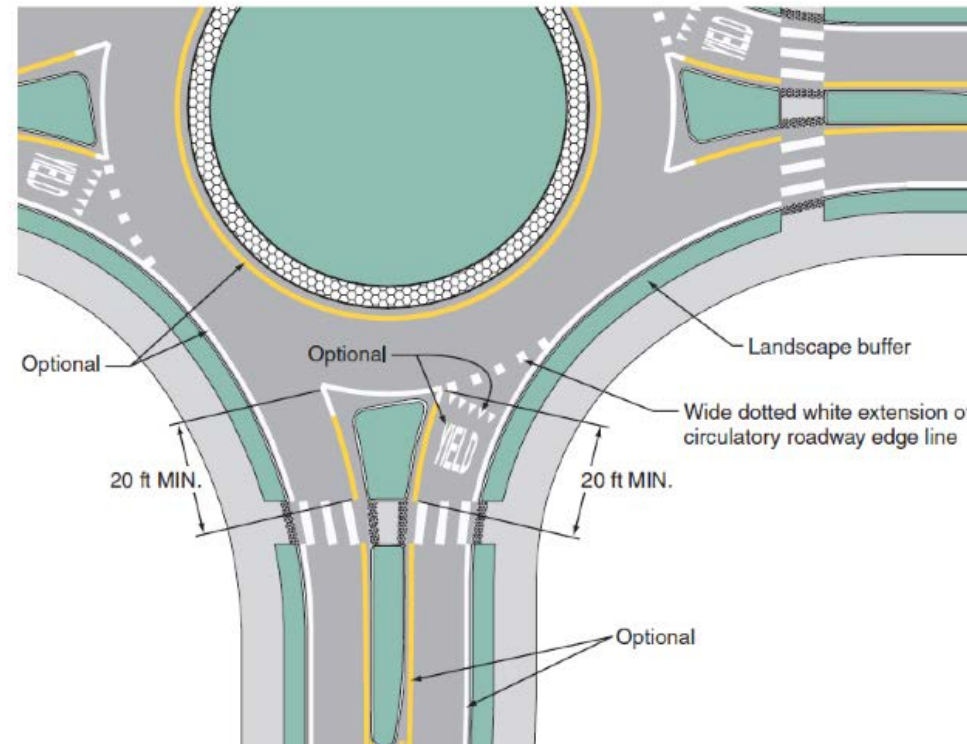
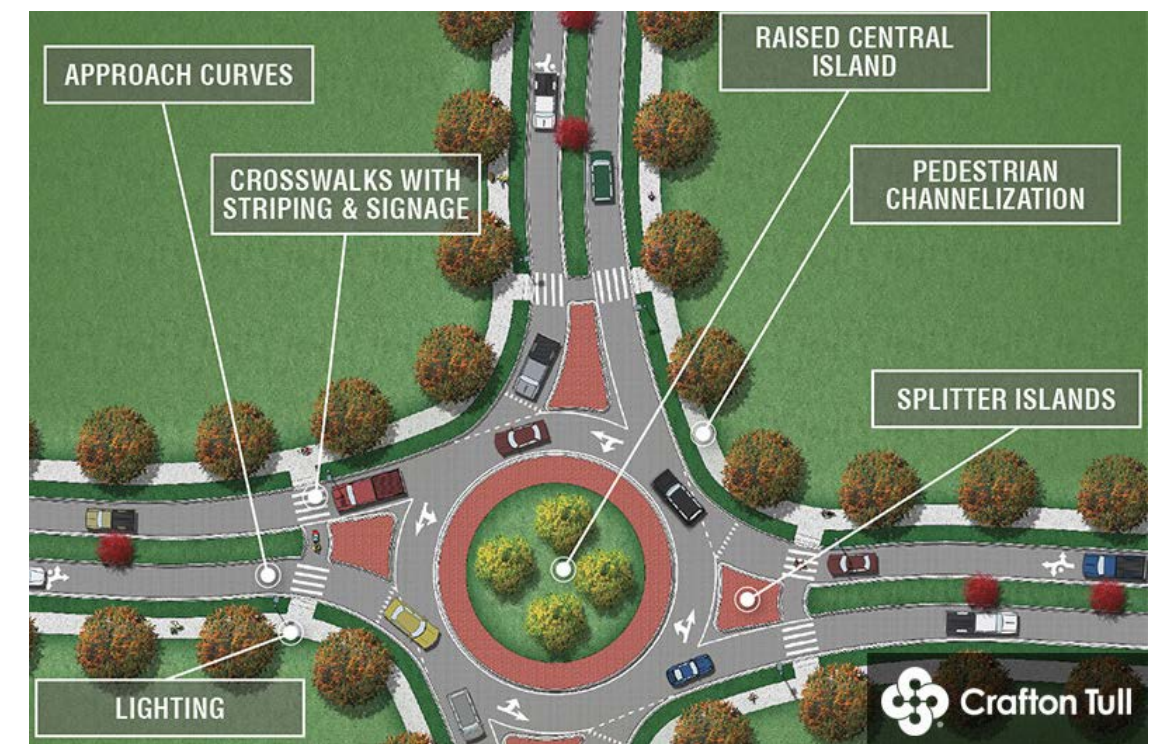


Diagram of a roundabout from the Manual of Uniform Traffic Control Devices (MUTCD). Note the 20 foot minimum distance between the near-edge of the crosswalk and the roundabout drive lane. *Source: MUTCD*



Example of roundabout in Edmonds, Washington. Note the attractive splitter island with refuge area, the rectangular rapid flashing beacons (RRFBs), brightly colored tactile warning strip and paints. *Source: Carmanah Technologies Corp.*



Roundabout illustration that could inform design at Berlin Town Center. Note the mountable apron in the roundabout, the attractive use of brick coloring, the substantial setback of trees in the medians, and lighting. *Source: Crafton Tull*



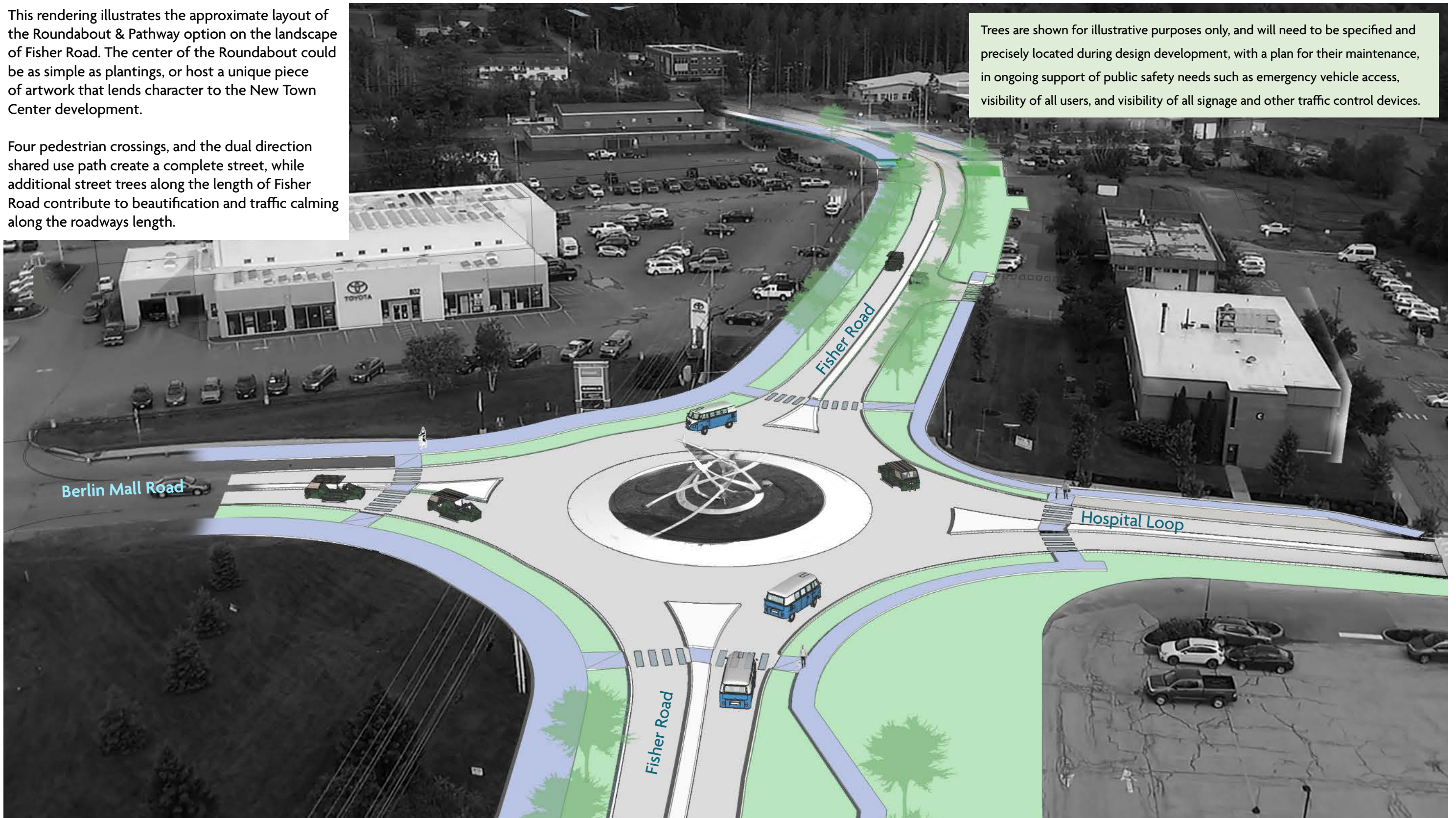
Roundabout illustration with features that could be utilized at Berlin Town Center. Note the landscape buffer, attractive human-scaled lighting, and continental-style crosswalk with side-lines. *Source: Toole Design Group*



## Roundabout & Pathway Concept Rendering

This rendering illustrates the approximate layout of the Roundabout & Pathway option on the landscape of Fisher Road. The center of the Roundabout could be as simple as plantings, or host a unique piece of artwork that lends character to the New Town Center development.

Four pedestrian crossings, and the dual direction shared use path create a complete street, while additional street trees along the length of Fisher Road contribute to beautification and traffic calming along the roadway length.



## Roundabout & Pathway Cross Section West of Mall Road/Hospital Loop Intersection

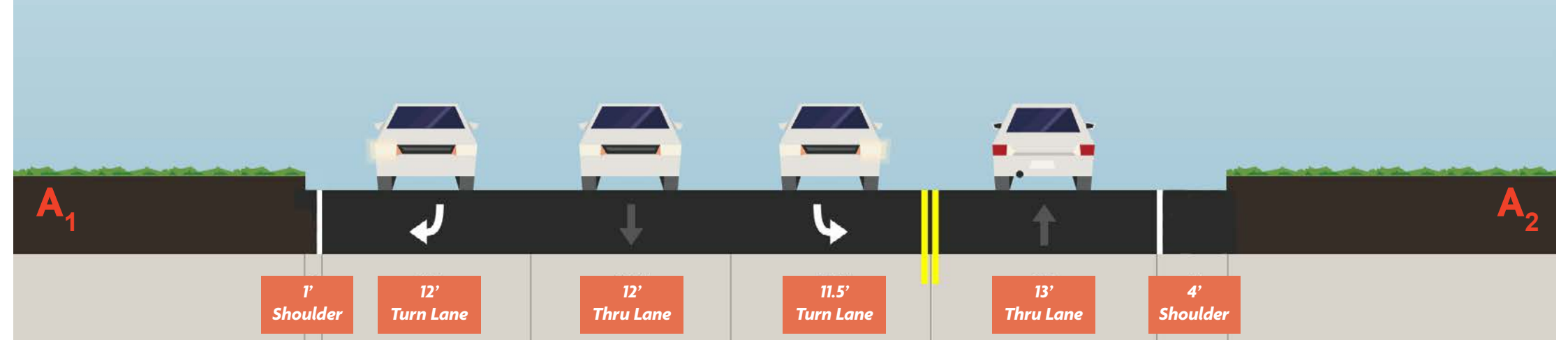
The cross sections on this page include the Existing Condition (above right) and the Roundabout & Pathway design concept (below right), for the west side of the Mall Road / Hospital Loop intersection. See the next page for the cross sections for the east side of this intersection.

As indicated below, left to right is aligned southwest to northeast, from the car dealership side at the left, to the hospital side at the right.

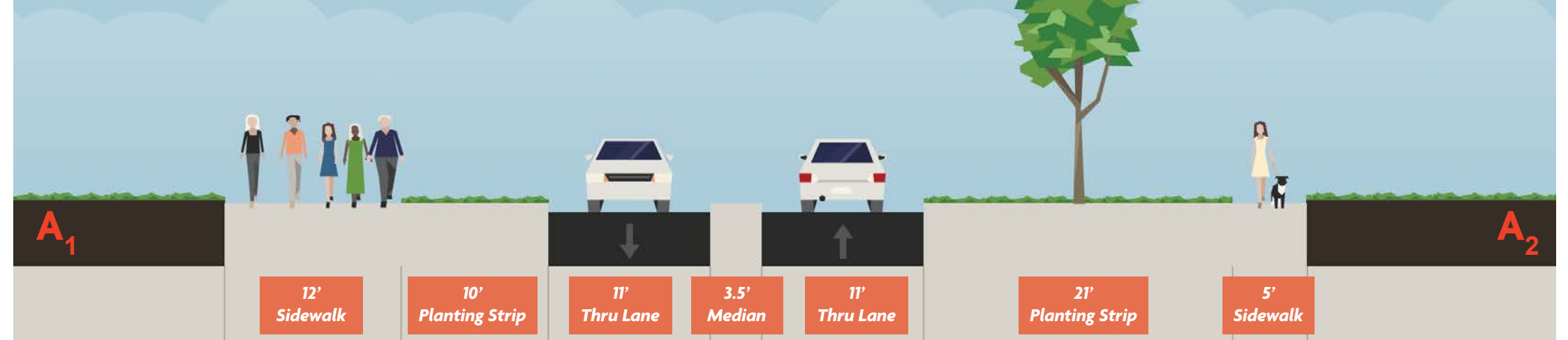
Sections prepared using Streetmix.



### Existing Corridor Section West of Mall Road / Hospital Loop Intersection



### Roundabout and Pathway Section West of Mall Road / Hospital Loop Intersection

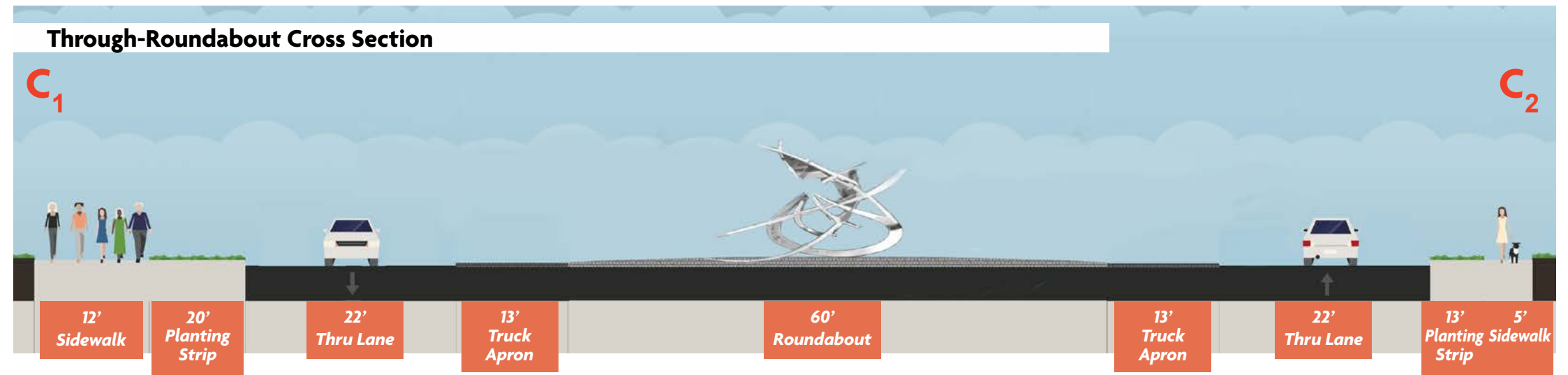
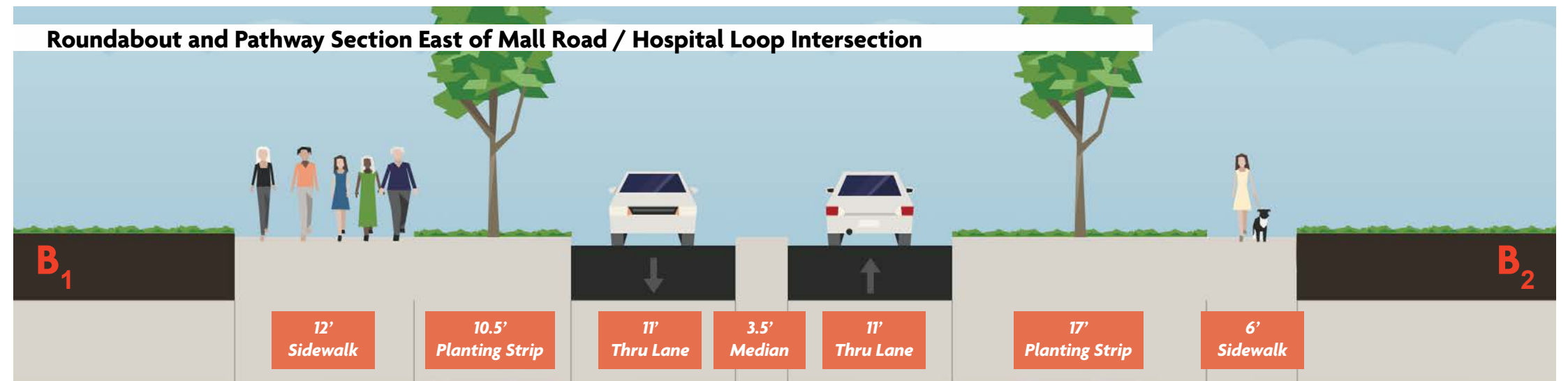
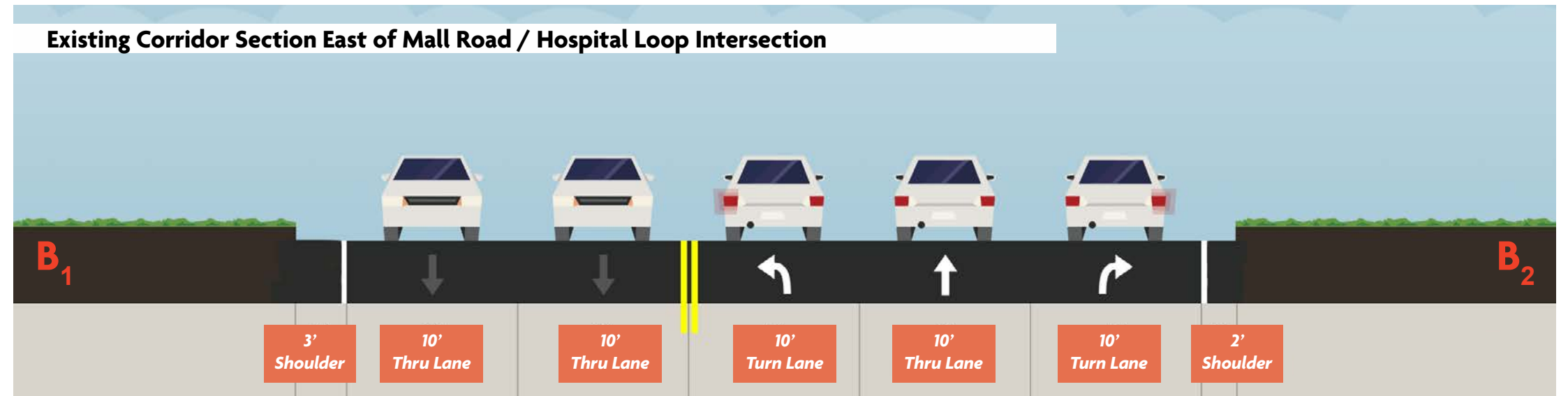
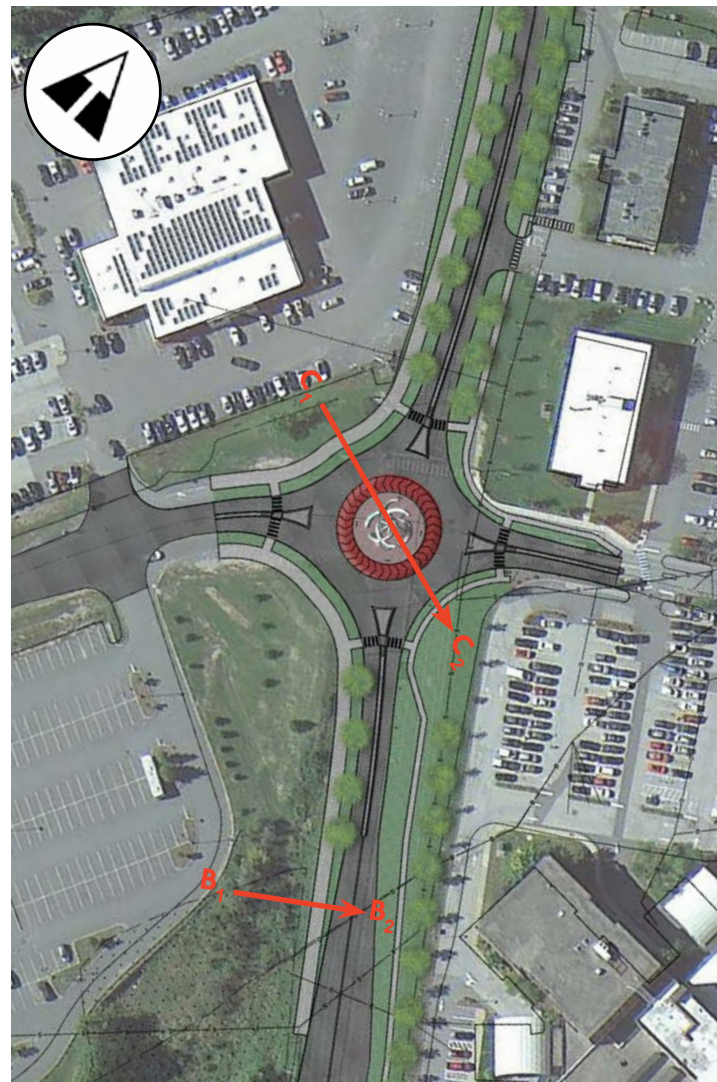


## Roundabout & Pathway Cross Sections East of Mall Road/Hospital Loop Intersection, and Through the Roundabout

The cross sections on this page include the Existing Condition (above right) and the Roundabout and Pathway design concept (middle right), for the east side of the Mall Road / Hospital Loop intersection. See the previous page for the cross sections for the west side of this intersection. As indicated below, left to right is aligned southwest to northeast, from the car dealership side at the left, to the hospital side at the right.

This page (below right) also includes a cross section through the middle of the roundabout, west to east from the car dealership to the hospital parking lot.

Sections prepared using Streetmix.



# Paine Turnpike Intersection

The northwest intersection of Fisher Road is convenient to navigate in a vehicle, with a slip lane connecting northwest bound traffic with Paine Turnpike east towards Montpelier.

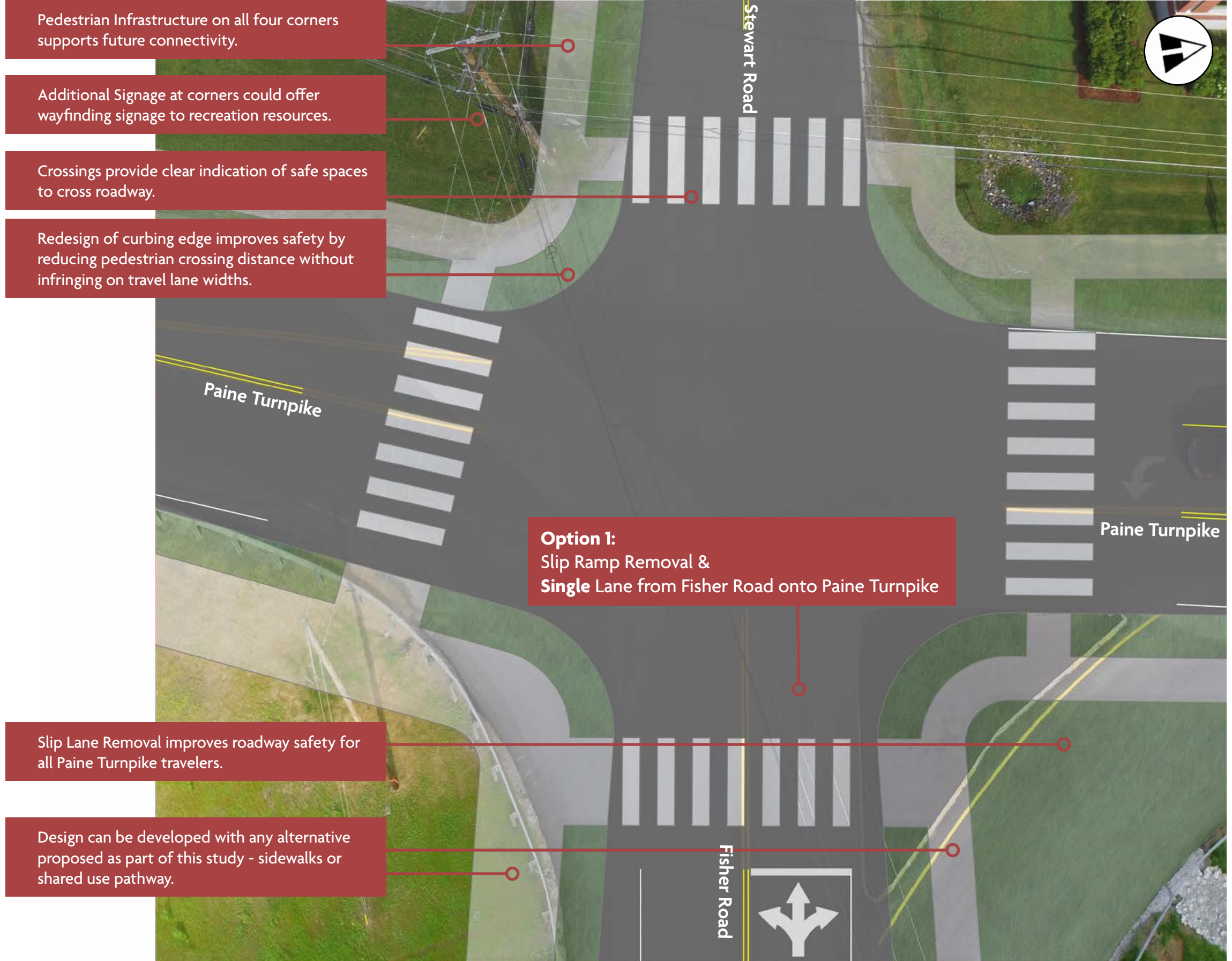
However, this intersection lacks any infrastructure to support safe access for modes beyond the vehicle, and the design of a slip lane creates additional conflict points where a pedestrian / driver crash could occur.

This intersection also serves as a gateway between the future Berlin New Town Center and recreational assets for the Town and region such as Berlin Pond and the trails at Irish Hill. All alternative designs that include the construction of sidewalks or a shared use pathway should include construction on the NW side of Paine Turnpike in order to link Fisher Road with the quiet rural roads in this direction and provide a direct link for non-motorized access from this intersection.

This page illustrates Option 1, removing the slip lane and having all turns from the single lane. Option 2 on the next page also removes the slip lane, but creates a dedicated right-turn only lane to replace it.



Existing Roadway Configuration



Pedestrian Infrastructure on all four corners supports future connectivity.

Additional Signage at corners could offer wayfinding signage to recreation resources.

Crossings provide clear indication of safe spaces to cross roadway.

Redesign of curbing edge improves safety by reducing pedestrian crossing distance without infringing on travel lane widths.

**Option 1:**  
Slip Ramp Removal &  
Single Lane from Fisher Road onto Paine Turnpike

Slip Lane Removal improves roadway safety for all Paine Turnpike travelers.

Design can be developed with any alternative proposed as part of this study - sidewalks or shared use pathway.

# Paine Turnpike Intersection

The previous page illustrated Option 1 for more safely accommodating sidewalks at this intersection, particularly in the vicinity of the existing slip ramp. In that option, the slip ramp was removed, and vehicles would undertake all turning movements onto Paine Turnpike from the remaining single lane of Fisher Road.

This page illustrates Option 2. Again, the slip lane would be removed, to allow for a safer sidewalk connection at this corner. However, Option 2 illustrates a new right-turn only lane. This right-turn only lane allows for those who are turning right onto Paine Turnpike to do so without waiting in the queue behind vehicles turning left onto Paine Turnpike or continuing straight onto Stewart Road.



Existing Roadway Configuration



Pedestrian Infrastructure on all four corners supports future connectivity.

Additional Signage at corners could offer wayfinding signage to recreation resources.

Crossings provide clear indication of safe spaces to cross roadway.

Redesign of curbing edge improves safety by reducing pedestrian crossing distance without infringing on travel lane widths.

**Option 2:**  
Slip Ramp Removal &  
**Double Lane** from Fisher Road onto Paine Turnpike

Slip Lane Removal improves roadway safety for all Paine Turnpike travelers.

Design can be developed with any alternative proposed as part of this study - sidewalks or shared use pathway.

# Design Option Matrix & Preferred Design

The four designs considered in this scoping study were compared across multiple categories related to the project purpose and need.

These categories were translated into the Design Option Matrix that is presented at the right. Each alternative was ranked based on its anticipated roadway safety for all road users, implementation challenges, including overall conceptual cost, adjacent property impacts, and utility impacts. Traffic modeling results were utilized to provide a traffic score, which ranks more highly those designs that improved upon baseline traffic estimates for 2045 and full Town Center build out. Finally, a score was applied for overall public support, based on responses to the Alternatives Survey undertaken as part of this study.

The Final Score is the sum of the Safety, Implementation, Traffic and Public Support scores.

Based upon review of all design options with adjacent landowners, the general public, the project steering committee, and the Town of Berlin, **the preferred alternative identified for this study is the Roundabout and Pathway**, as its contributions to Fisher Road as a complete and safe street, which can better manage future traffic loads, and is strongly supported by public review, far outweighs the other design options.

While it received, by far, the highest final score in the Design Option Matrix at the right (10.1), it should be noted that this preferred alternative design option also has the lowest implementation score, recognizing that the cost and complexity of this option is above others. Therefore, if this design option is to be implemented, it will require ongoing coordination and additional study regarding traffic impacts.

<b>Fisher Road Design Option Matrix</b>										
<b>DESIGN OPTION</b>	<b>Bike/Ped Safety</b>	<b>Traffic Calming</b>	<b>SAFETY SCORE</b>	<b>Property Impact</b>	<b>Conceptual Cost</b>	<b>Utility Impacts</b>	<b>IMPLEMENTATION SCORE</b>	<b>TRAFFIC SCORE</b>	<b>PUBLIC SUPPORT SCORE</b>	<b>FINAL SCORE</b>
<i>0: No Build</i>	0	0	0	3	3	3	3.0	1	1	5.0
<i>1: Paint Only Road Diet</i>	1	1	1.0	3	2	3	2.7	2	1	6.7
<i>2: Lane Reduction + Sidewalk</i>	2	2	2.0	2	1.5	2	1.8	2	1	6.8
<i>3: Roundabout and Pathway</i>	3	2.5	2.75	1	0.5	2	1.15	3	3	9.9
<b>SCORING SYSTEM</b>										
0	No safe bike/ped accommodation	No traffic calming elements		N/A	N/A	N/A		N/A	N/A	
1		Minor traffic calming elements		Easements likely	Over \$1 Million	Significant impacts		Deterioration of 2045 traffic flow	Less than 20% support	
2	Safe pedestrian accommodation, improved bicycle accommodation	Physical roadway changes to calm traffic		Easements unlikely	Under \$1 Million	Minor impacts		Some improvements to 2045 traffic flow	Between 20% and 50% support	
3	Fully safe and separated bicycle and pedestrian accommodation	Significant physical roadway changes to calm traffic		No impacts	No cost	No impacts		Greatest improvements to 2045 traffic flow	More than 50% support	



# Implementation

# Cost Estimates and Permitting

In this Implementation chapter, cost estimates, permitting review, and implementation guidance are provided to support Berlin in planning, budgeting, and fundraising for this transformational project.

Each design concept presented below from least to most cost or build requirements, with relevant cost estimates and anticipated permitting impacts. A more detailed cost estimate is at the right for the preferred Roundabout and Pathway design concept. Cost estimates are calculated in 2023 dollars. Inflation over time will drive these costs higher.

## No Build

**Planning-Level Cost Estimate**  
\$0

**Potential Permit Requirements**  
None

**Paint Only Quick Build**  
**Planning-Level Cost Estimate**  
\$765,000 (20% Local Match: \$153,000)

This cost includes local project management, design and construction engineering.

**Potential Permit Requirements**  
None

## Lane Reduction and Sidewalks

Though the lane reduction component and individual sidewalk segments can be built at the same time, and doing so could benefit from significant cost efficiencies, the concepts are designed so they don't have to be.

**Planning-Level Cost Estimate**  
\$1,500,000 (20% Local Match: \$300,000)

This cost includes local project management, design and construction engineering.

## Potential Permit Requirements

This design concept will likely require a Vermont Individual Wetland Permit, and may require a State Highway Access (1111) permit, NEPA documentation, and a Stream Alteration Permit. See page 57 for more information.

**Roundabout and Pathway (Preferred Alternative)**  
**Planning-Level Cost Estimate**  
4,700,000 (20% Local Match: \$940,000)

Though the project components (roundabout, shared use path, and sidewalks at CVMC) can be built at the same time, and doing so could benefit from significant cost efficiencies, they don't have to be.

## Potential Permit Requirements

This design concept will likely require a Vermont Individual Wetland Permit and a Construction Stormwater Operational Permit. It may also require a State Highway Access (1111) permit, NEPA documentation, and a Stream Alteration Permit. See page 57 for more information.

## Potential Phasing

Portions of this project could be phased, with potential separation of the "on road" road diet and roundabout components, and the off-road shared use path component. Phasing need, or opportunity, would depend on the availability of funding, and the Town's ability to realize construction efficiencies by coordinating Fisher Road improvements with private development on either the Central Vermont Marketplace property or the CVMC campus.

However, this study recommends that the pedestrian and bicycle safety components described herein be either a first, standalone phase, or integrated with road improvements. Road improvements for motor vehicles should not be made absent corresponding pedestrian and bicycle safety improvements.

## BERLIN FISHER ROAD SCOPING STUDY ROUNDBOUT OPTION ESTIMATE

Phase: SCOPING	Town: Berlin	Description: ROUNDBOUT
Estimate Date: May 16, 2023		Highway Type: Roadway
Specification: Standard Specifications for Construction		Urban/Rural: Rural
Estimated By: CDL		

Item Number	Description	Supplemental Description	Quantity	Unit	Unit Price	Amount
203.15	COMMON EXCAVATION		7,100.00	CY	\$19.124	\$135,778.63
301.26	SUBBASE OF CRUSHED GRAVEL, FINE GRADED		6,600.00	CY	\$60.000	\$396,000.00
404.65	EMULSIFIED ASPHALT		55.00	CWT	\$55.423	\$3,048.24
406.35	SUPERPAVE BITUMINOUS CONCRETE PAVEMENT	(BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	3,800.00	TON	\$133.898	\$508,810.50
406.45	BITUMINOUS CONCRETE PAVEMENT SURFACE PREPARATION		10.00	TON	\$260.698	\$2,606.98
406.50	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)		1.00	LU	\$1.000	\$1.00
410.10	MATERIAL TRANSFER VEHICLE		3,800.00	TON	\$2.390	\$9,082.00
608.30	POWER BROOM RENTAL, TYPE I		80.00	HR	\$28.049	\$2,243.90
616.21	VERTICAL GRANITE CURB		1,400.00	LF	\$67.455	\$94,437.00
616.47	BITUMINOUS CONCRETE GUTTERS AND TRAFFIC ISLANDS		80.00	TON	\$327.144	\$26,171.51
618.10	PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH		3,000.00	SY	\$125.000	\$375,000.00
618.3	DETECTABLE WARNING SURFACE		260.00	SF	\$45.000	\$11,700.00
630.10	UNIFORMED TRAFFIC OFFICERS		160.00	HR	\$74.396	\$11,903.36
630.15	FLAGGERS		3,200.00	HR	\$47.315	\$151,408.00
631.17	TESTING EQUIPMENT, BITUMINOUS		1.00	LS	\$1,000.000	\$1,000.00
635.11	MOBILIZATION/DEMobilIZATION		1.00	LS	\$220,000.000	\$220,000.00
641.11	TRAFFIC CONTROL, ALL-INCLUSIVE		1.00	LS	\$200,000.000	\$200,000.00
641.15	PORTABLE CHANGEABLE MESSAGE SIGN		2.00	EACH	\$3,600.000	\$7,200.00
646.403	DURABLE 4 INCH WHITE LINE, EPOXY PAINT		6,000.00	LF	\$1.261	\$7,567.50
646.413	DURABLE 4 INCH YELLOW LINE, EPOXY PAINT		4,600.00	LF	\$1.554	\$7,147.25
646.503	DURABLE CROSSWALK MARKING, EPOXY PAINT		300.00	LF	\$27.080	\$8,124.00
646.76	LINE STRIPING TARGETS		1,000.00	EACH	\$1.045	\$1,045.00
690.50	PRICE ADJUSTMENT, FUEL (N.A.B.I.)		1.00	LU	\$1.000	\$1.00
900.545	SUPPLEMENTAL AGREEMENT		1.00	LS	\$25,000.000	\$25,000.00
900.620	SPECIAL PROVISION	(TREES)	43.00	EACH	\$1,800.000	\$77,400.00
900.620	SPECIAL PROVISION	(ART STRUCTURE)	1.00	EACH	\$25,000.000	\$25,000.00
900.620	SPECIAL PROVISION	(CONCRETE PLANTER)	23.00	EACH	\$1,500.000	\$34,500.00
900.67	SPECIAL PROVISION	(RETAINING WALL WITH FENCE)	1.00	LS	\$40,000.000	\$40,000.00
900.675	SPECIAL PROVISION	(GREEN PAVEMENT MARKINGS)	1,500.00	SY	\$150.000	\$225,000.00
Category total:						\$2,607,175.86

	\$2,607,175.86
Drainage contingency	\$200,000.00
Storm water contingency	\$100,000.00
25% Contingency	\$726,793.97
<b>CONSTRUCTION TOTAL</b>	<b>\$3,633,969.83</b>
OTHER EXPENSES	
Local Project Management (5%)	\$218,038.19
Design Fee (15%)	\$545,095.47
Construction Inspection Fee (8%)	\$290,717.59
<b>GRAND TOTAL 2023 DOLLARS</b>	<b>\$ 4,687,821</b>



# Beyond the Scoping Study

This scoping study is intended to act as a springboard to support the Town of Berlin in designing, permitting, and funding construction.

This section outlines the general steps needed to take the plans, cost estimates, and diagrams contained in this report towards an investment in the safety and comfort of road users along Fisher Road.

- Step 0 - Find a champion
- Step 1 - Selectboard Approval
- Step 2 - VTrans Coordination
- Step 3 - Fundraising and Grant Writing
- Step 4 - Survey, Design & Permitting
- Step 5 - Construction & Maintenance

## Step 0 - Find a Champion

Town Staff or engaged resident or business owner, every plan needs a champion. Human resources are needed to use this plan as a tool to communicate public sentiment, cost, and design intent of a future project along Fisher Road. Ongoing conversations and projects are a part of bringing any infrastructure project to life, and a local champion plays an out-sized role in making sure projects can be approved, funded, and developed in a timely fashion. The regional planning commission may be able to offer some assistance to the Local Champion.

## Step 1 - Selectboard Approval

As discussed in the previous section, there are different paths forward available for this project. Whether the Town chooses to construct any components on their own, or decides to wait until a VTrans or utility project on Fisher Road happens, this plan's preferred alternative needs to be endorsed by the Selectboard.

## Step 2 - VTrans Coordination

This piece of this coordination will involve the Town advocating for the preferred alternative to be built. This scoping study and its public engagement element is an important piece of that advocacy.

At, or just after, scoping is an excellent time to begin using the Transportation Management Plan (TMP) checklist to determine if any additional traffic control measures or work zone easements will be required, based in part on whether the project and potential effects would be "significant," as appears to be the case based on preliminary consideration.

A TMP is the compilation of all necessary documentation related to the management of traffic within a work zone. This may include Traffic Control Plans, a Transportation Operations Plan, and a Public Information Plan as needed. Some projects require all of these components to be considered. The implementation of the Work Zone Safety and Mobility Policy and Guidance is required all federal-aid highway projects and is expected for all other construction and maintenance activities on Vermont highways.

## Step 3 - Fundraising & Grant Writing

Funding the final design and construction of Fisher Road improvements are likely to center around public investment in the form of matching funds to grants. The Grant Resources outlined in Table 5 to the right are some of the common funding resources for Vermont towns that are seeking to develop pedestrian and bicycle facilities.

Projects of this nature and cost are also often funded through federal resources. Federal requirements shall therefore be followed throughout the project development and implementation process.

Table -5 - Grant Resources					
Grant Title	What does it fund?	Maximum Grant Amount	Local Match Required	Federal Funding	Grant Contact
<a href="#">CDBG - Planning Grants</a>	Feasibility studies, marketing plans, engineering and architectural plans, etc	\$60,000	10 percent	x	Julia Connell julia.connell@vermont.gov
<a href="#">VTrans - Transportation Alternatives Program (TAP)</a>	Construction, planning and design of on and off roadway facilities for active transportation facilities	\$300,000	20 percent	x	Scott Robertson scott.robertson@vermont.gov 802-793-2395
<a href="#">VTrans - Bicycle and Pedestrian Program Grants</a>	Construction, planning and design of on and off roadway facilities for active transportation facilities	\$1,000,000	20 percent	x	Peter Pochop - peter.pochop@vermont.gov 802-477-3123
<a href="#">VTrans - Bicycle and Pedestrian Program Grants - Small Scale</a>	Distinguished from Bike/Ped program by smaller maximum funding amount and lack of federal requirements	\$100,000	50 percent		Peter Pochop - peter.pochop@vermont.gov 802-477-3123
<a href="#">AARP Community Challenge Grants</a>	Infrastructure, programs, events, and organizations supporting livable communities and smart growth objectives	\$20,000+	None Required		Kelly Stoddard Poor- kstoddardpoor@aarp.org 802-951-1313

## Step 4 - Survey, Design & Permitting

Once Selectboard approval is in place, VTrans has been consulted, and agreements or grant awards are in hand, the Town can then move towards contracting an engineering firm to conduct a survey, develop construction documents.

An overview of the permits needed for the sidewalk and streetscape components of the preferred alternative is provided in the Permit Overview section on the next page. Because it is anticipated that bike lanes would be installed as part of a larger paving and road striping project, permitting for installing bike lanes alone is not included.

## Step 5 - Construction & Maintenance

Construction is the final step towards a new facility. As the community plans towards this goal, long term (25 year) maintenance and repair, as well as winter maintenance should also be considered.

# Permit Overview

Described below are the permits reviewed for the Roundabout and Pathway preferred alternative, as well for as the Lane Reduction and Sidewalk alternative. Table 6 at the right includes a summary. Given the varied and changing permitting structure, future project work should evaluate permitting needs at the outset of the planning and design process, and throughout.

- State Highway Access (1111). This permit is required when a project is within the state highway right-of-way. This permit would be required for work adjacent to Route 62.
- ACT 250. There are several jurisdiction categories that trigger the need for an Act 250 permit. They are listed by the State of Vermont Natural Resources Board [here](#). Note that while a given project may not require an Act 250 permit for the specific project work, entities (e.g., businesses) located within the project area that already have an Act 250 permit may need that permit to be amended to reflect the changed site condition.
- National Environmental Policy Act (NEPA). The NEPA process needs to be followed if federal funding is involved. Based on this study's review of natural resources in the project area, including wetlands, the NEPA process will be triggered if there is Federal funding for the project. A shorter Categorical Exclusion may be warranted, but NEPA review determinations will guide the level of documentation needed.
- Construction Stormwater General (3-9020 or INDC). This permit is triggered when a project exceeds one (1) acre in disturbance.
- Operational Stormwater General Permit (3-9050 or INDS). As of June 2022, the threshold for this permit will be a half (0.5) acres of newly constructed impervious material.
- Stream Alteration. The Stream Alteration Rule regulates activities that take place in or along streams. A permit is required for movement, excavation, or fills involving 10 or more cubic yards annually in any perennial stream.
- The United States Army Corps of Engineers (USACOE). USACOE regulates all wetlands and fill below the Ordinary High Water (OHW).
- VT Individual Wetland Permit. A permit would be required if the project impacts any type of wetland, or encroaches on a class I or II 50 foot buffer. The level of state wetland permitting is determined by review process criteria.

Permit	Lane Reduction and Sidewalks		Roundabout & Pathway	
	Permit Needed?	Explanation	Permit Needed?	Explanation
State Highway Access (1111)	Maybe	Required if project work intersects with the Route 62 right of way.	Maybe	Required if project work intersects with the Route 62 right of way.
ACT 250	No	Based on our review of the jurisdiction categories, an Act 250 permit will not be required unless the total project area exceeds 10 acres. However, entities in the project area may need to amend existing Act 250 permits.	No	Based on our review of the jurisdiction categories, an Act 250 permit will not be required. However, entities in the project area may need to amend existing Act 250 permits.
NEPA	Maybe	If federally funded NEPA will be required; explore the option for a categorical exclusion.	Maybe	If federally funded NEPA will be required; explore the option for a categorical exclusion.
Construction Stormwater General	No	This alternative indicates 2,350 feet of 5 foot wide sidewalk (11,750 sf) and 550 feet of a 12 foot wide shared use path (6,600 sf), a total of 18,350 sf, well beneath the 1 acre threshold.	No	This alternative indicates 800 feet of 5 foot wide sidewalk (4,000 sf), 1,800 feet of a 12 foot wide shared use path (21,600 sf), and approx. 5,000 sf of disturbance around the roundabout, a total of 30,600 sf, well beneath the 1 acre threshold.
Construction Stormwater Operational	Maybe	This alternative indicates 2,350 feet of 5 foot wide sidewalk (11,750 sf) and 550 feet of a 12 foot wide shared use path (6,600 sf), a total of 18,350 sf, just beneath the 0.5 acre threshold. (As with all permit needs, this figure would be confirmed at a later phase.)	Yes	This alternative indicates 800 feet of 5 foot wide sidewalk (4,000 sf), 1,800 feet of a 12 foot wide shared use path (21,600 sf), and about 5,000 sf of disturbance around the roundabout, for a total of 30,600 sf, above the 0.5 acre threshold.
Stream Alteration	Maybe	This project may require 10 cubic yards or more of earthworks to make room for a sidewalk at Pond Brook, and there is a stream that crosses Fisher Road to the east of Kohl's/ through the CVMC parking lot that may be impacted.	Maybe	This project may require 10 cubic yards or more of earthwork to make room for a sidewalk at Pond Brook, and there is a stream that crosses Fisher Road to the east of Kohl's/ through the CVMC parking lot that may be impacted.
USACOE General	No	This project will not disturb any lands below the ordinary high water line.	No	This project will not disturb any lands below the ordinary high water line.
Indiv. Wetland	Yes	This project may impact mapped wetlands or buffers.	Yes	This project may impact mapped wetlands or buffers.



# Appendices

## Appendices

- A: Archeological Resource Assessment
- B: Historic Resources Identification
- C: Traffic Assessment Memorandum and Attachments