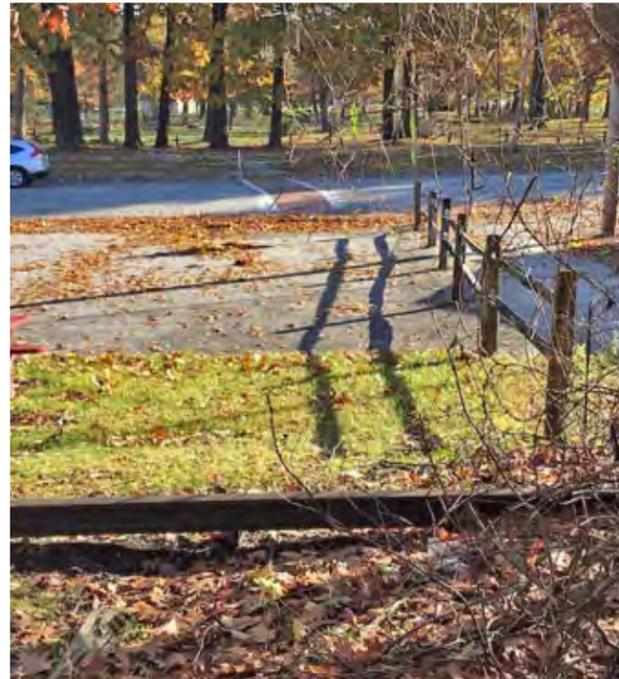


NORTH STREET AREA BICYCLE/PEDESTRIAN INFRASTRUCTURE STUDY



Funded through a Municipal Planning Grant as administered by the Vermont Agency of Commerce & Community Development

Prepared for the Town of Bennington, VT by the Bennington County Regional Commission April, 2018

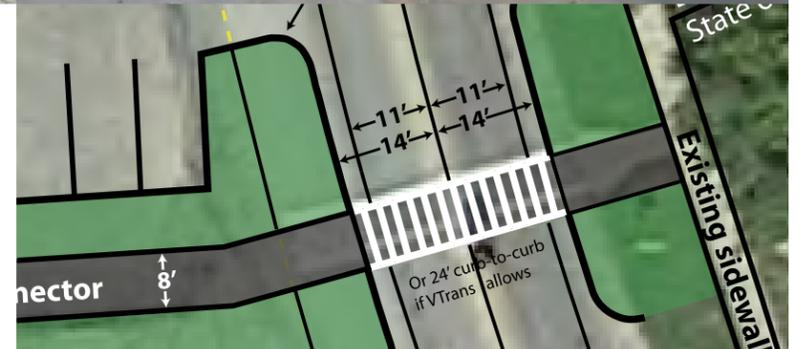
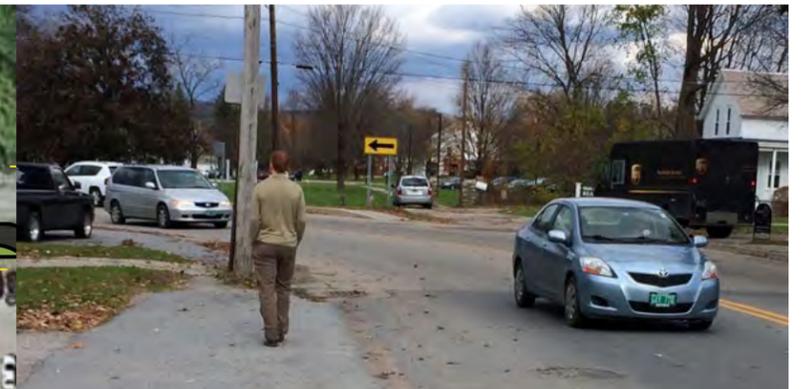
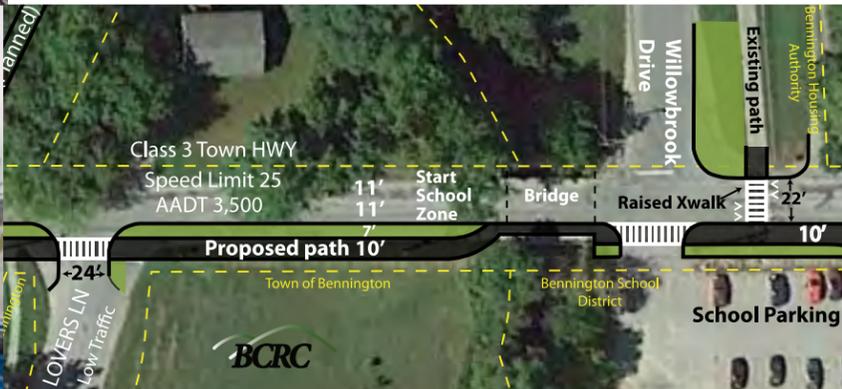
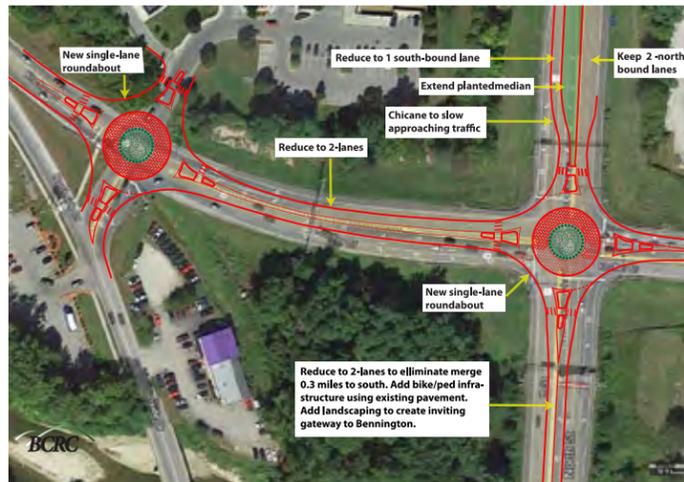


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INTRODUCTION

This report identifies transportation infrastructure problems and projects to address them in an area centered on North Street and the US7/Kocher Drive intersection. The study focuses on:

Missing Path Connections

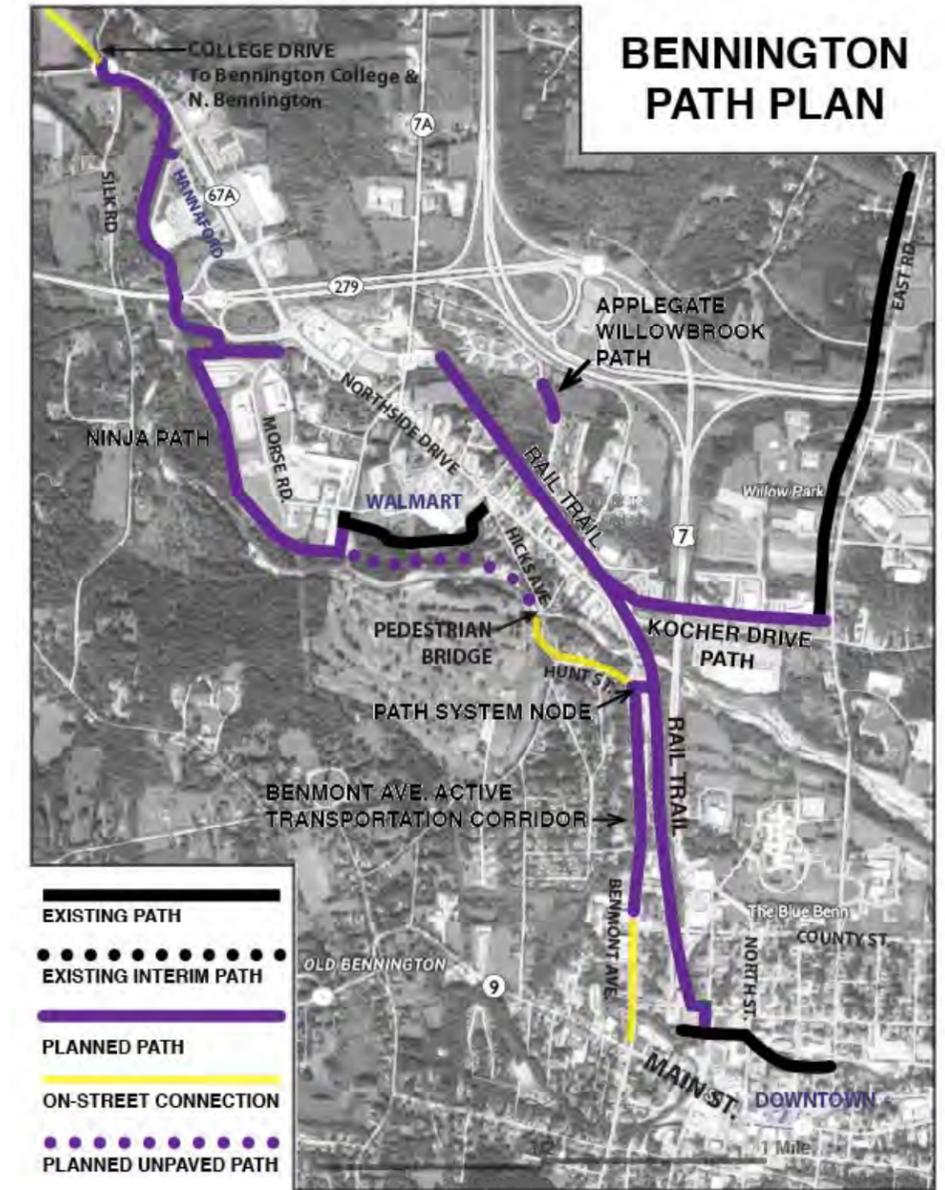
- Five of Bennington’s planned path projects (the Kocher Drive Path, the Ninja Path, the Rail Trail, the Benmont Avenue Active Transportation Corridor, and the Applegate to Willowbrook Path) converge in the study area but don’t connect optimally or at all. Inviting, frictionless connections will leverage each project and create a better path network.
- Bicycle and Pedestrian Barriers
- The abandoned rail corridor between Benmont Avenue and North Street is a 0.7-mile pedestrian barrier from County Street to Kocher Drive.
- US7 North of the Vermont Veteran’s Home has no sidewalks. It is not uncommon to see people walking in the shoulder.
- The sidewalks on the west side of North Street end just north of County Street. To get to the Blue Benn Diner and other nearby businesses from Four Corners North, pedestrians must walk in the shoulder.
- There is no pedestrian access to Kmart Plaza.
- Orchard Road is a busy pedestrian street and a logical node for several planned path projects, but it (mostly) lacks sidewalks and is uncomfortable to bicycle on making it a poor connection between the Ninja Path and the future Rail Trail.

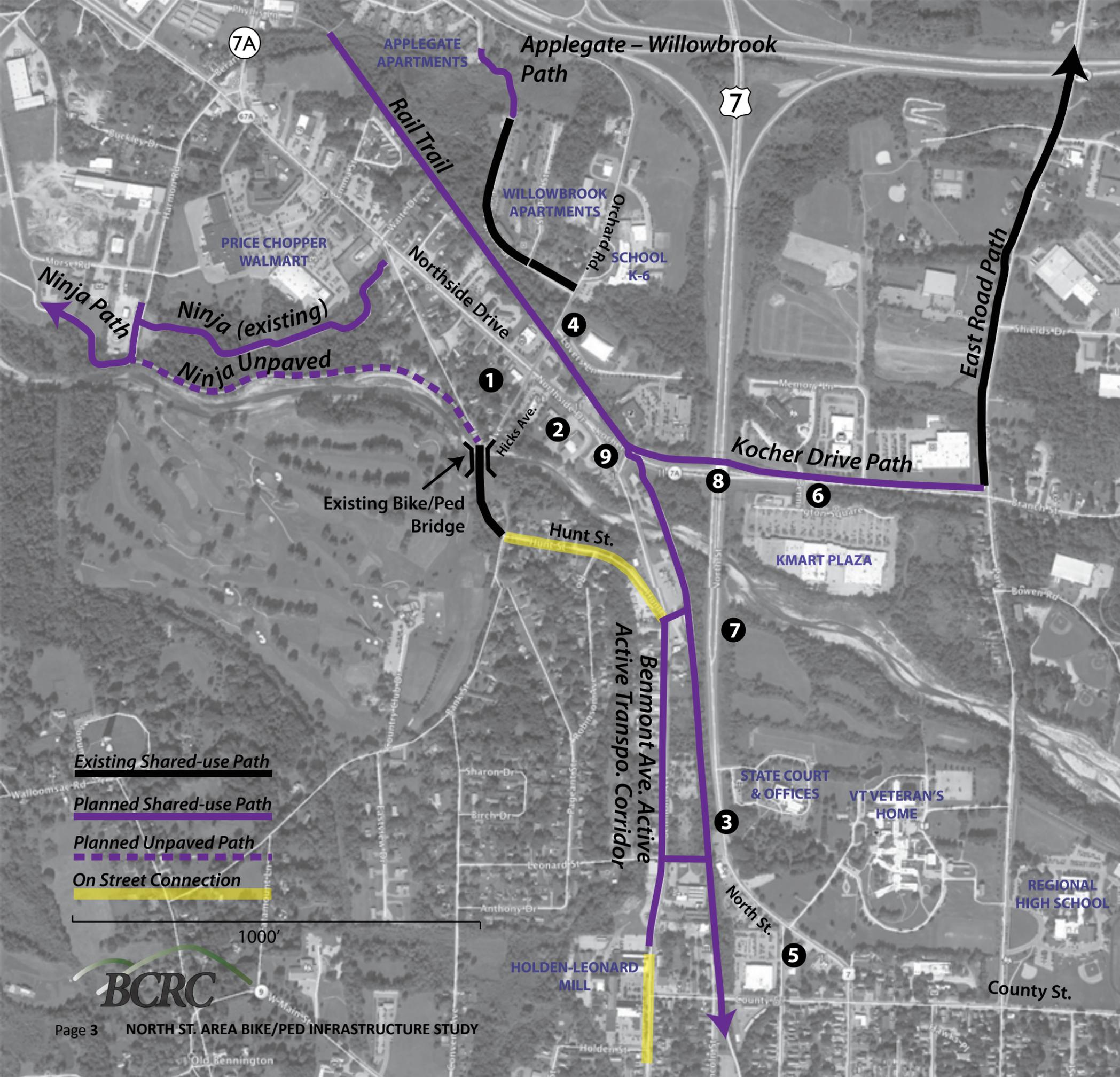
Traffic Operations/Safety

- The Kocher Drive US/7 intersection is overbuilt for the amount of traffic it processes (a total of 21 lanes lead in and out of it), is dangerous (it is listed as a High Crash Location), and does not accommodate walking and biking (although a north-south path is planned). Because there are four signal phases, on average 75% of the vehicles are stopped at a red light (assuming the phases are equal length).
- US7 is overbuilt. It expands from two lanes in the system interchange north of the Kocher Drive/US7 intersection, to six lanes (4 thru lanes and 2 turn lanes) at the Kocher Drive intersection, and back to two lanes 0.4 miles south of the intersection without any noticeable change in level of service. The Benmont/Kocher Drive intersection is inefficient (it has three signal phases).

Aesthetics/Streetscape

- The US7/Kocher Drive intersection has a massive paved footprint devoid of landscaping and is an ugly gateway into Bennington.
- The east lane of North Street near Depot Street is roughly 25 feet wide making a major Bennington gateway into a swath of unnecessary pavement.





PROJECT AREA PROBLEMS

Path Connections

- 1 Ninja Path & Rail Trail – no connection north of Hunt St.
- 2 Ninja Path & Kocher Drive Path – no efficient connection.
- 3 Rail Trail & North Street – no connection north of County Street.

Pedestrian & Bicycle Problems

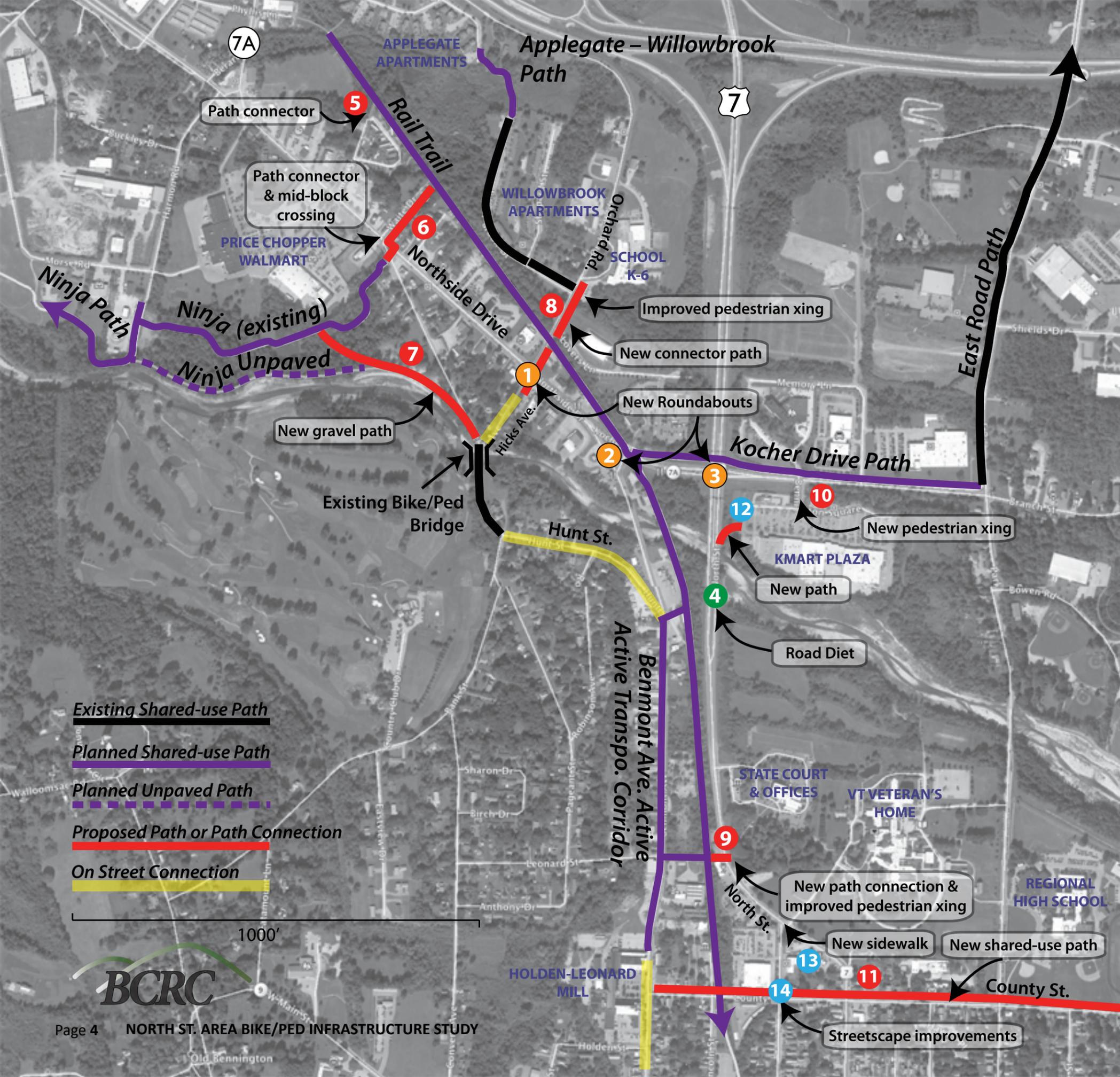
- 3 Pedestrian/bike barrier between County Street and Kocher Drive.
- 4 Sidewalk gap on Orchard Road. Many people walk in shoulder to reach school and apartment complexes.
- 5 No sidewalks on the west side of North Street.
- 6 No pedestrian access to Kmart Plaza.
- 7 Pedestrians walk in upper North St. shoulder. No sidewalk.

Traffic Operations/Safety

- 7 US7 narrows down from six lanes (4 thru lanes and two turn lanes) to two lanes.
- 8 US7 intersection is overbuilt, dangerous, and does not accommodate walking and biking. Some turning movements are slow.
- 9 Benmont Ave/Kocher Drive intersection is slow and doesn't work well for pedestrians and bikes.

Aesthetics/Streetscape

- 8 The US7/Kocher Drive intersection is an ugly gateway into Bennington.
- 5 Poor access management and ugly streetscape on upper North Street.



RECOMMENDATIONS

New Roundabouts

- 1 2 3 New single-lane roundabouts will improve safety, efficiency, and aesthetics.

Road Diet

- 4 Reduce road width from four lanes to two lanes in conjunction with roundabout project to provide bike/ped infrastructure using existing pavement, eliminate merge, and to match two-lane road that begins 0.3 miles from the intersection.

New Paths & Path Connections

- 5 Connect the Rail Trail to Emma St. by improving existing path of desire.
- 6 Link the Rail Trail and the Ninja Path via Waite Drive and a mid-block crossing with a refuge island.
- 7 New gravel path along Walloomsac's top bank as a scenic shortcut to connect the Ninja Path to points south.
- 8 New shared-use path and improved pedestrian crossing in front of the Molly Stark School to connect the school, nearby apartment complexes, Northside Drive, the Rail Trail, and the Ninja Path.
- 9 New short connector path and improved pedestrian crossing to link the state office complex, Veteran's Home, and regional high school, to the Rail Trail and Benmont Ave.
- 10 New crosswalk and walkway to give pedestrians access to Kmart Plaza.
- 11 New east-west path along County Street to connect residential neighborhoods to the Rail Trail and the regional high school.

New Sidewalk and streetscape improvements

- 12 New path to provide efficient walking route to Kmart Plaza.
- 13 New sidewalk and improved access management on the west side of North Street to connect businesses to the town's sidewalk network.
- 14 Plantings and access management to improve aesthetics and safety at the 4 Corners North intersection.

ORCHARD ROAD CONNECTOR PATH

What is the Project?

The project is a new 10-foot wide, 990-foot long shared-use path along the east side of Orchard Road and Hicks Avenue between the Molly Stark School and 100 feet south of the McDonald's driveway on Hicks Avenue. A grass strip of varying width will separate it from the street. Improvements will be made to the existing pedestrian crossing in front of the Molly Stark School to better connect the path to the Applegate and Willowbrook apartment complexes. A raised crosswalk will calm traffic, and a curbed grass area at the entrance to Willowbrook Drive will reduce the corner radius to slow turning vehicles and shorten the crossing distance. Slimmed turning radiuses will also shorten the crossing distance at the Orchard Road/Lover's Lane intersection and at the Orchard Road/Northside Drive intersection. A Leading Pedestrian Interval (LPI) signal phase will give pedestrians a three second head start and make it safer to cross Northside Drive.

Why is the project needed?

- There is no connection between the northern end of the planned Rail Trail and the Ninja Path. Orchard Road is a logical connection, but it lacks sidewalks, except in two short sections, and is a busy and uncomfortable road to bicycle on.
- Because of the sidewalk gap, many pedestrians now walk in Orchard Road's shoulder to reach Molly Stark School and Willowbrook Apartments. Pedestrian traffic will increase when the planned Applegate - Willowbrook Path is built.
- The existing crosswalk in front of the Molly Stark School is at the bottom of a hill, and many vehicles travel down it at speeds that would be catastrophic in a vehicle/pedestrian crash.
- The corner radiuses at the Orchard Road/Willowbrook Drive, Orchard Road/Lover's Lane and Orchard Road/Northside Drive intersections are longer than necessary making the crossing distances long and encouraging vehicles to turn at speeds unsafe for crossing pedestrians.
- The commercial driveway entrance to McDonald's on Hicks Avenue is very active. South of the driveway, Hicks Avenue has little traffic and a separated path is not necessary.
- Many vehicles turn left from Orchard Road onto Northside Drive. The green light and the walk phase go at the same time creating a conflict between pedestrians and left turning vehicles.

What will the Project Accomplish?

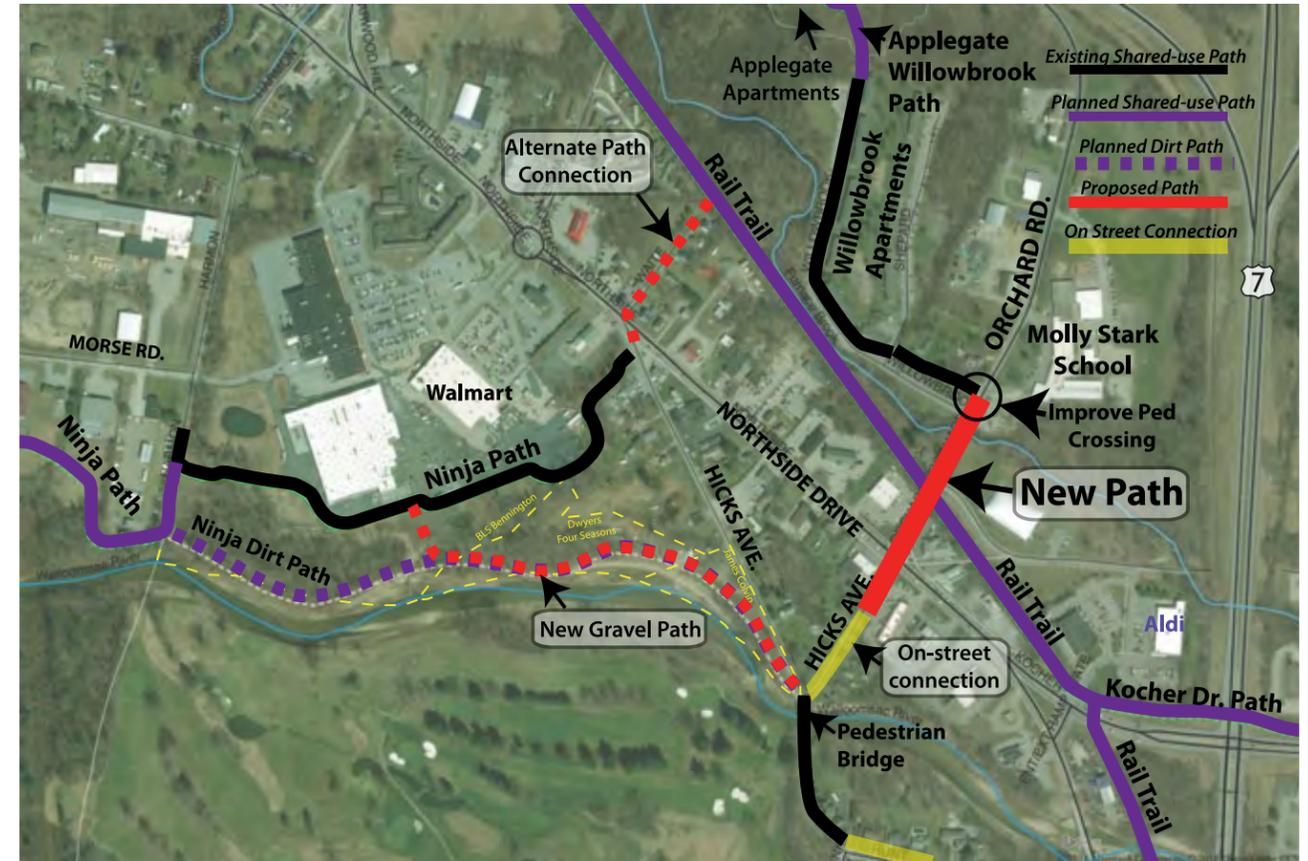
The project will create safe and inviting walking and bicycling connections between the Ninja Path and Northside Drive to the:

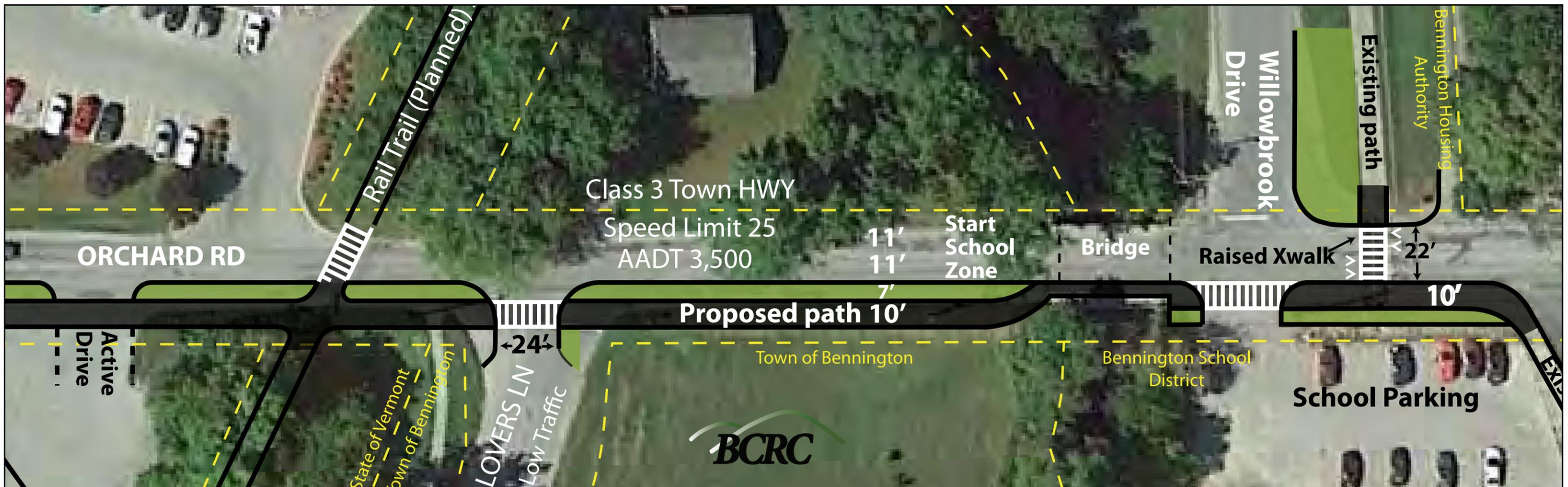
- Future Rail Trail
- The Molly Stark School
- Willowbrook Apartments
- Applegate Apartments (via the future Applegate-Willowbrook Path)

The pedestrian crossing in front of the Molly Stark School will be made safer with reduced corner radiuses, shorter crossing distances, and a raised crosswalk.

Project Feasibility

The path could be constructed within Town right-of-way except where it crosses Northside Drive/VT7A, which is a state highway. Construction within state right-of-way requires a Section 1111 permit from VTrans.





WAITE DRIVE CONNECTOR

What is the project?

The project will connect the northern end of the planned Rail Trail to the Ninja Path via Waite Drive and Hicks Avenue. It will consist of a short, (approximately 100-foot) connection between the Rail Trail and Waite Drive, and a short (approximately 140-foot) path connection along Northside Drive, and a new mid-block crossing with a pedestrian refuge island in the Northside Drive turning lane.

Why is the project needed?

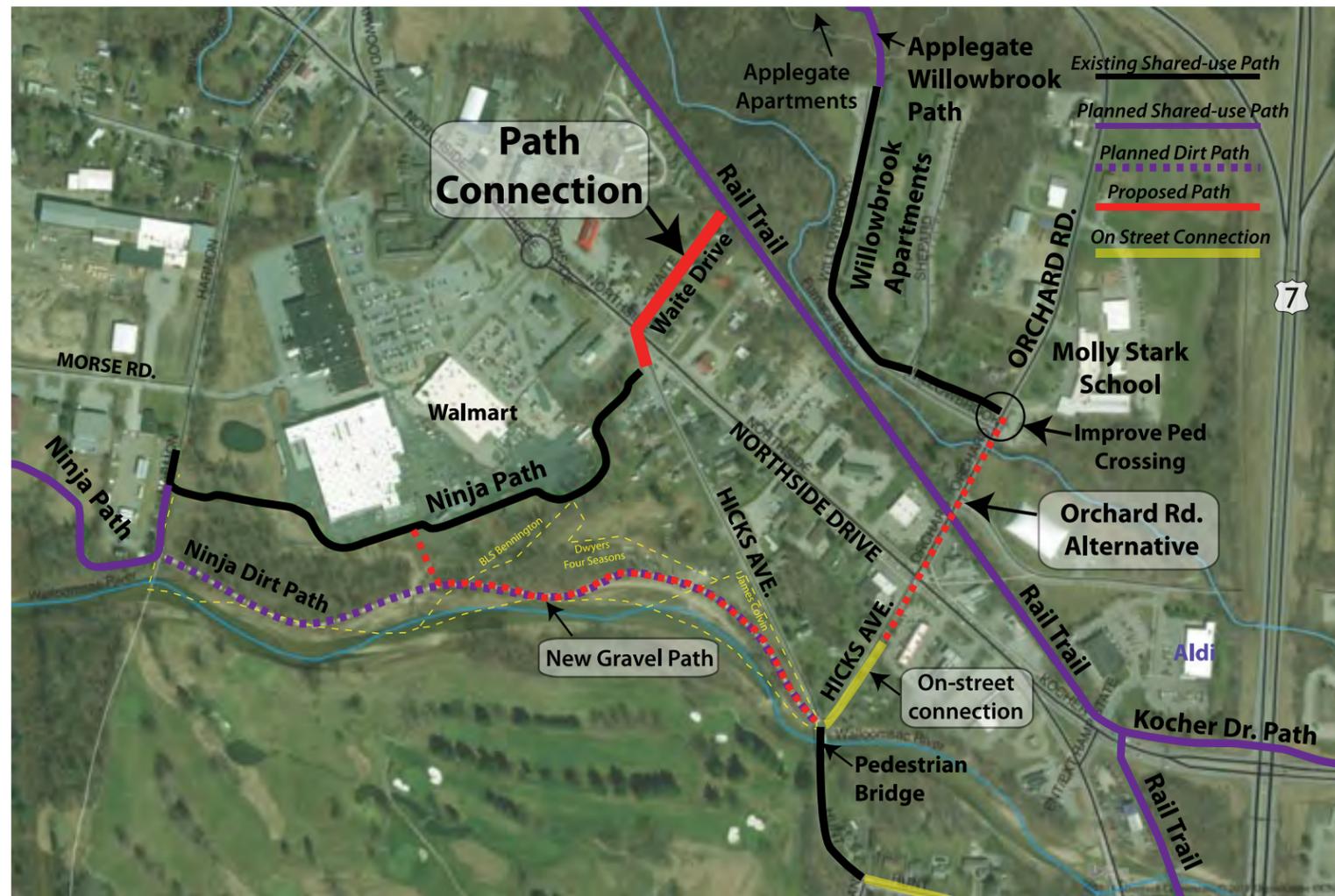
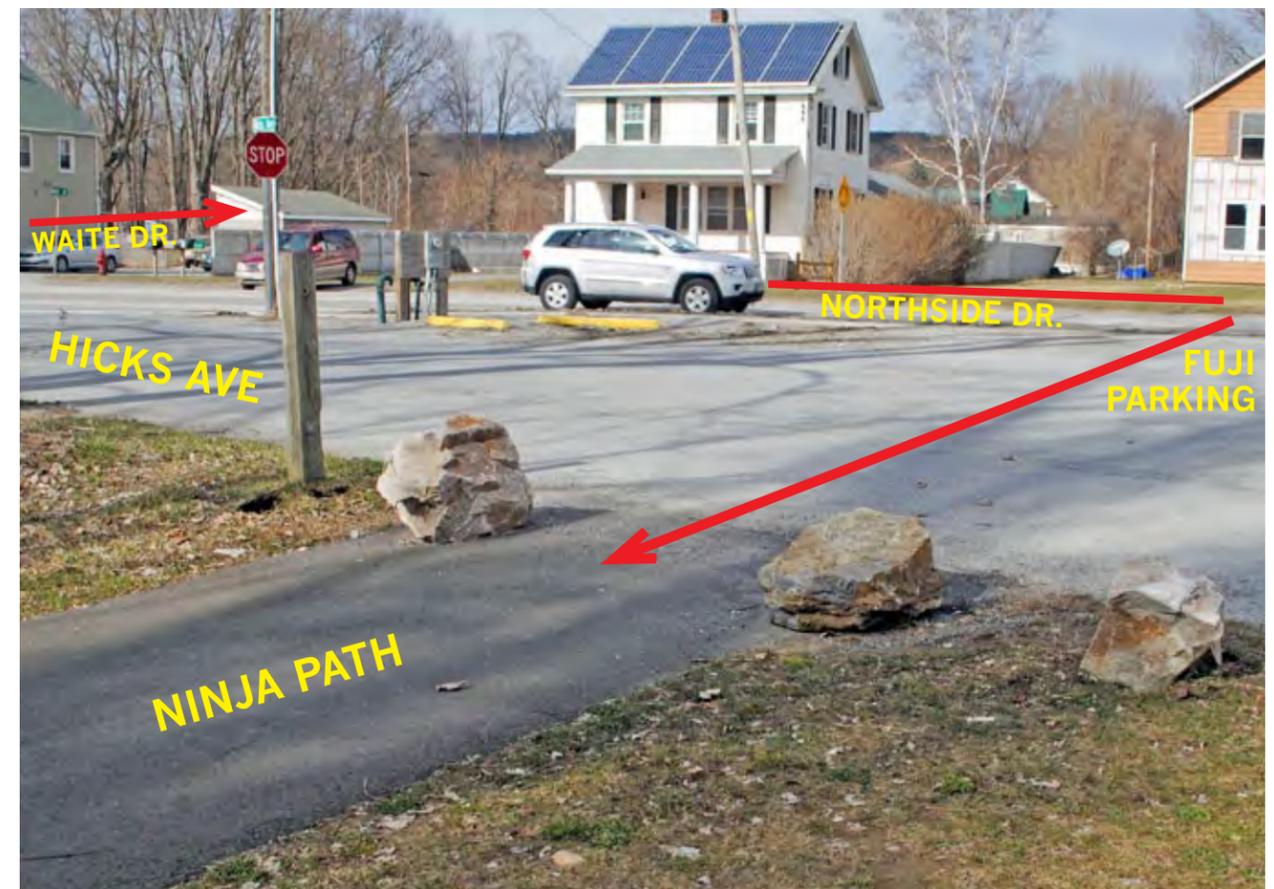
There is no connection between the Ninja Path and the northern end of the Rail Trail.

What will the project accomplish?

The project will connect the Rail Trail to the completed section of the Ninja Path behind Walmart.

Project Feasibility

There is a short section of privately owned land between the end of Waite Drive and the Rail Trail. To connect them it will be necessary to get an easement. In addition, Northside Drive/VT7A is a state highway. Construction of a mid-block pedestrian crossing will require a Section 1111 permit from VTrans.



**RAIL TRAIL - NINJA PATH
WAITE DRIVE CONNECTOR**

PATH CONNECTOR

Rail Trail (planned)

STP BIKE (26)S

WAITE DR.

PRIVATE ROAD

NORTHSIDE DR. / VT7A

Path Connector

New X-walk

**New Ped Refuge
Island**

Path Connector

New X-walk

**New Ped Refuge
Island**

Rosan Greene
Parking FUJI
HIBACHI

Rosan Greene
Parking FUJI
HIBACHI

New X-walk

New X-walk

**Ninja Path
Existing Walmart
Section**

**Existing
Ninja
Sec**

HICKS AVE.

HICKS A

Allen Hayes

Patricia Lyons

Patricia Lyons

Patricia Lyons

FUEL TANKS

DAVEY OIL



BENMONT AVENUE - NORTH STREET CONNECTOR

What is the project?

The project is a new, short (approximately 90 feet long) shared-use path to connect Benmont Avenue and North Street. There is already a path connector planned between Benmont Avenue and the Rail Trail as part of the Benmont Avenue Active Transportation Corridor (Bennington TAP TA 16(1)), but it ends at the Rail Trail and does not connect all the way to North Street. This project will complete the connection all the way to North Street. The project also improves the existing pedestrian crossing near Tastee Freez, with a new curb extension (to reduce the crossing distance and to better define the commercial parking area), and a curbed grass area to enhance aesthetics.

Why is the project needed?

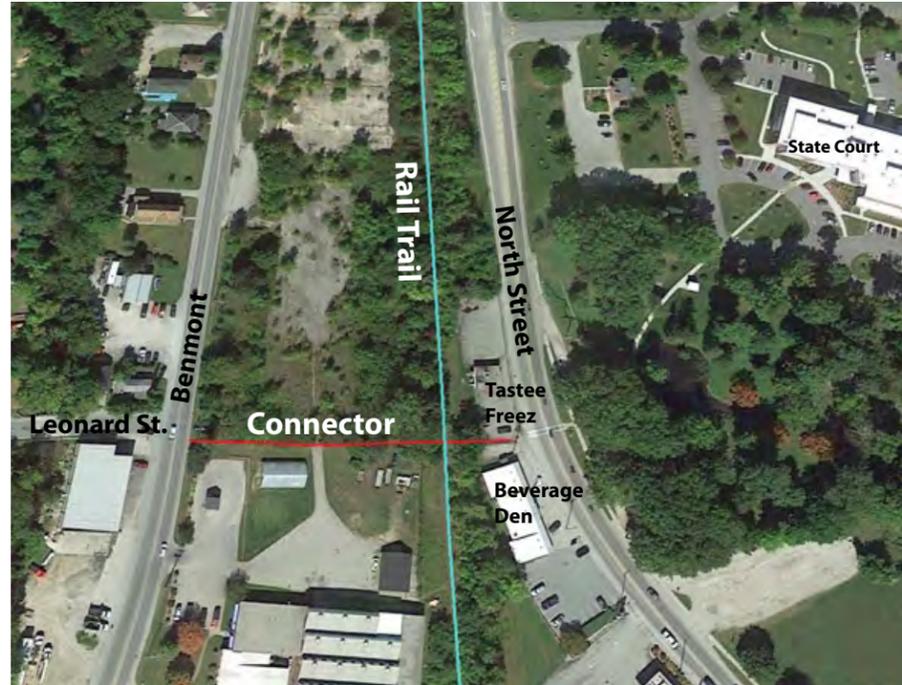
An abandoned rail corridor between North Street and Benmont Avenue blocks Bennington's north-south street grid for 0.7-miles between County Street and Kocher Drive. Pedestrians and cyclists must navigate around it or use one of the improvised dirt trails (paths of desire) between Benmont Avenue and North Street, which highlight the need for a formal connection. A rail trail is planned, but there are no planned links between the rail trail and North Street.

What will the project accomplish?

The new path will connect Benmont Avenue and North Street creating a much-needed east west walking and bicycling route. It will link the planned rail trail to North Street and will make it much easier to walk or bike to the state office and court complex, the Vermont Veteran's Home, and the regional high school from points east and north. It will also improve the existing pedestrian crossing near the Tastee Freez on North Street and will bolster access management and aesthetics.

Project Feasibility

The proposed path crosses two privately owned parcels, and easements will be required to construct it. The Town has some jurisdiction over North Street/US Route 7 because it is a Class 1 Town Highway, but VTrans may still require a Section 1111 permit to construct the curb extension.



BENMONT – NORTH STREET CONNECTOR

State of Vermont

Rail Trail (planned)

STP BIKE (26)S

Part of: Benmont Avenue Active Transportation Corridor
Bennington TAP TA16(1)

Benmont Avenue

Proposed path connector

Optional green space

TASTEE FREEZ

New curb extensions

Existing sidewalk to State offices & courthouse

Existing sidewalk

Or 24' curb-to-curb if VTrans allows

Class 1 Town Highway
North St./Route 7

AADT 9300
Speed limit 30 mph

VT Veteran's Home
State of Vermont

Amory Pacific LLC

Keith Martin

10'

Beverage Den

Keith Martin

BEVERAGE DEN

*Property boundaries are approximate



50'

COUNTY STREET SHARED-USE PATH

What is the project?

The project is a new 10' wide, paved, shared use path along County Street between Branch Street and Benmont Avenue shielded from the street by a 5' wide green strip.

Why is the project needed?

Bennington lacks a comfortable east west cycling route to connect its dense residential neighborhood north of Main Street to its planned shared-use path network. County Street is an important east

west route with access to the regional high school and the planned rail trail, but high traffic volume makes it uninviting for cycling.

What will the project accomplish?

The project will create a comfortable walking and cycling link between a dense residential neighborhood, the regional high school, and the town's planned shared-use path network.

Project Feasibility

There is room in the Town right of way to construct the path and the green strip. Part of the route is along a historic trolley line, which remains free of buildings.



**PROPOSED COUNTY ST. SHARED-USE PATH
1 Mile: Benmont Ave. to Branch St**

Will provide an inviting east-west walking and bicycling route, a connection between residential neighborhoods and the shared-use path system, and a connection to the regional high school.

COUNTY ST. SHARED-USE PATH 4 CORNERS NORTH IMPROVEMENTS



FOUR CORNERS NORTH IMPROVEMENTS

What is the project?

The project's purpose is to improve the streetscape and access management in the Four Corners North intersection. It consists of a series of curbed landscaped islands around Earl's Service Station.

Why is the project needed?

The intersection is the center of a commercial area north of Main Street, but suffers from an unsightly streetscape and poor access management around the service station.

What will the project accomplish?

The curbed landscaped islands will make the area around the service station more attractive and safer for pedestrians.

Project Feasibility

The curbed islands between the sidewalk and the street are in the town right of way and could be constructed without the property owner's permission. However, the islands on the inside of the sidewalk are on private property, and the property owner's permission is needed to construct them.



KMART CROSSING

What is the project?

The project is a new pedestrian connection between the planned Kocher Drive Path and Kmart plaza. It consists of a new cross walk, a new 150-foot concrete walk, and a reduced turning radius at the plaza entrance.

Why is the project needed?

There is no pedestrian connection to the Plaza. To reach it, many pedestrians cross Kocher Drive without the benefit of a crosswalk. The planned Kocher Drive Shared-use Path will increase their numbers. Also, the turning radius into the plaza is too long, which encourages fast turns in the logical crossing location. Once across the street, pedestrians have to walk in the busy plaza driveway because there is no walkway.

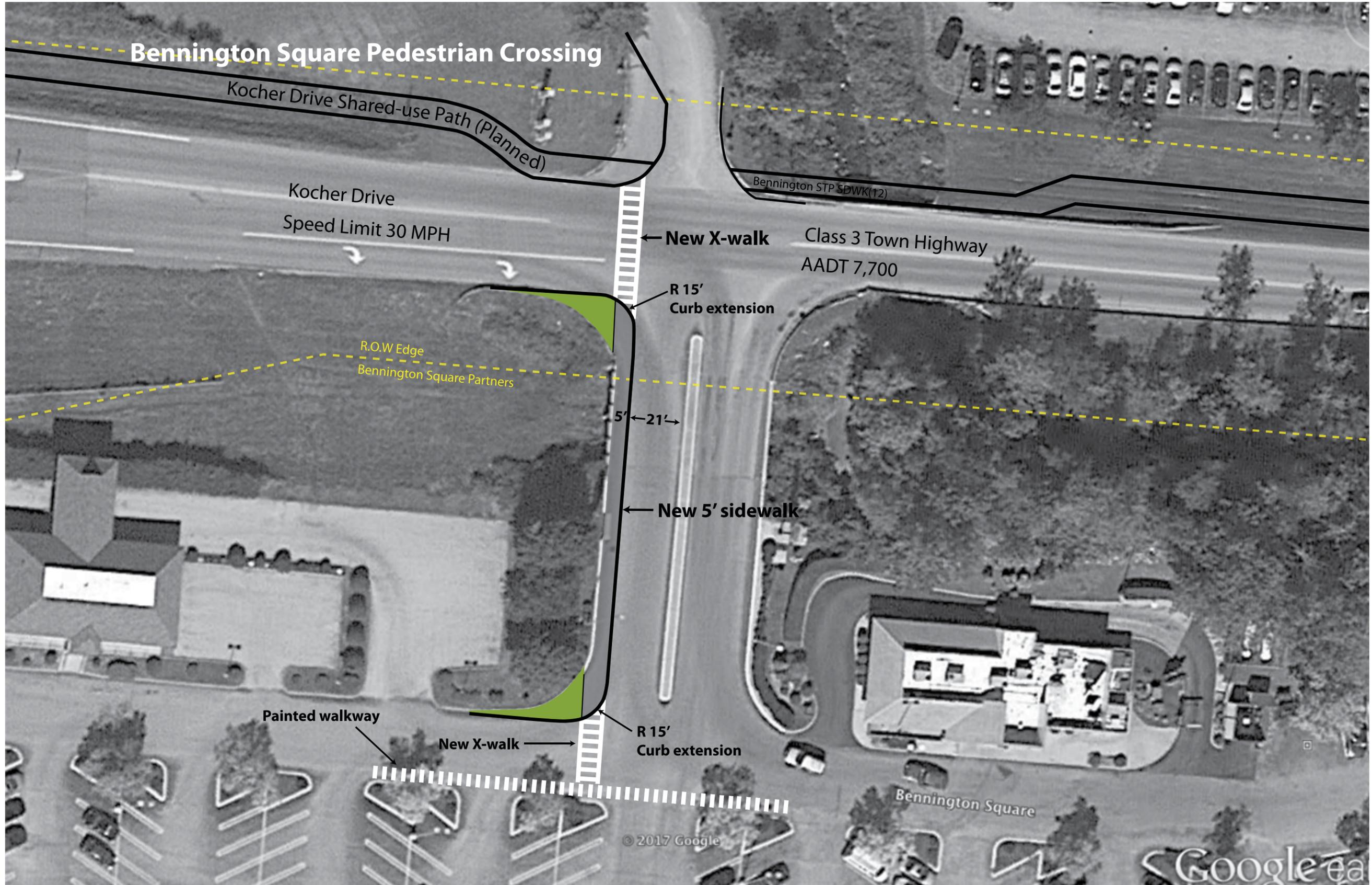
What will the project accomplish?

The project will allow pedestrians to walk safely from the Kocher Drive Shared-use Path to Kmart Plaza. Reducing the plaza entrance corner radius will improve aesthetics and safety.

Project Feasibility

The proposed crosswalk and curb extension are within town ROW. The new five-foot sidewalk is on property owned by Bennington Square Properties.





NORTH STREET SIDEWALK EXTENSION

What is the project?

The project is to extend the sidewalk for 0.3 miles on the west side of North Street from County Street to Tastee Freez. A curbed grass area will buffer the sidewalk from the road. Bike lanes on both sides of the street, and a green strip on the east side of the street should be considered.

Why is the project needed?

The sidewalk on the east side of North Street ends abruptly just north of County Street. To reach businesses on the east side of North

Street, such as the Blue Benn Diner, pedestrians must now hike across lawns, wide commercial driveways and in the road's shoulder. In addition, North Street's southbound travel lane is roughly 25' wide. Travel lanes wider than 11' in developed areas are not recommended. The excessive pavement hurts the street's aesthetics. Also, the commercial driveways in the area are poorly defined.

What will the project accomplish?

The project will make it safe to walk to businesses on the east side of North Street, such as the Blue Benn Diner. It will also improve the street's aesthetics by reducing unnecessary pavement, and improve safety by better defining commercial driveway entrances.

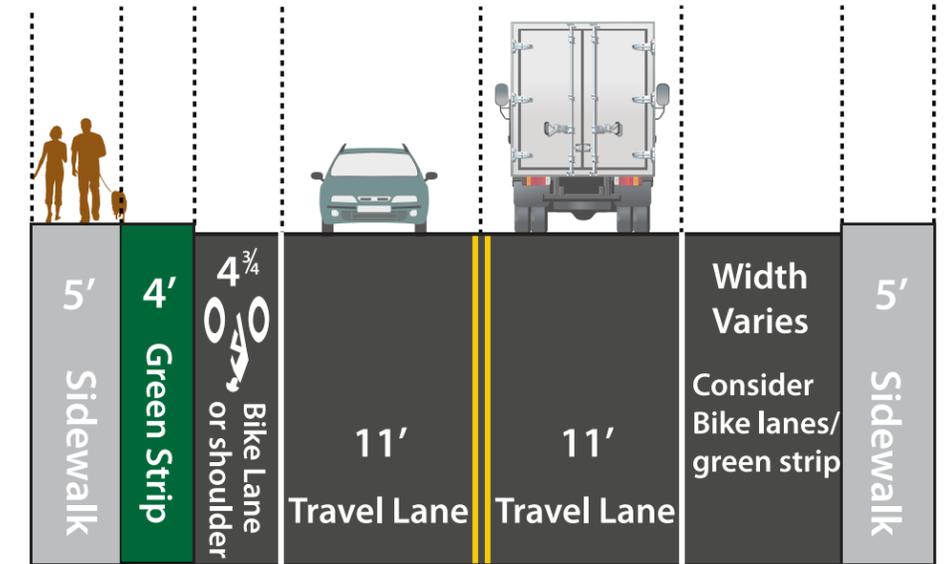
Project Feasibility

There is room in the town's right of way to construct the new sidewalk and curbed grass buffer.

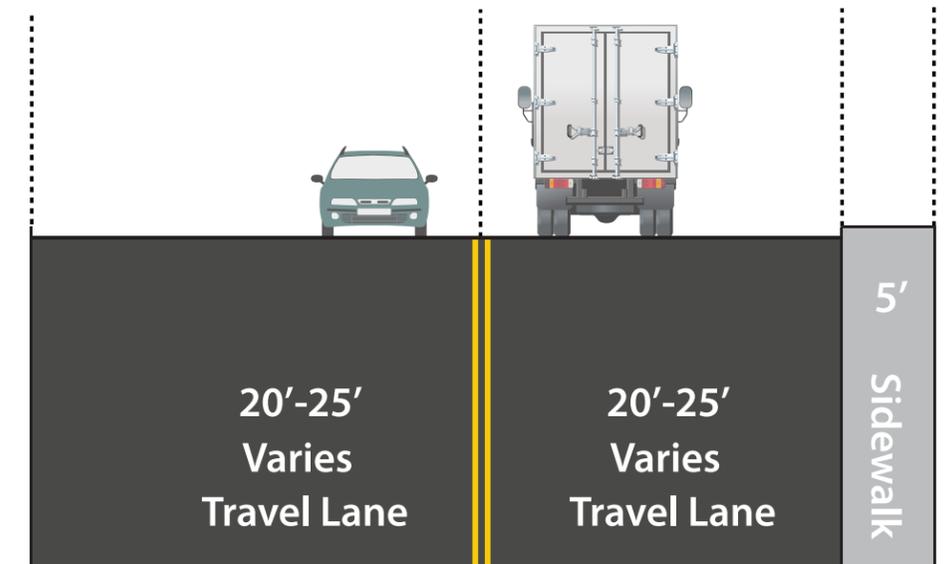




**(Upper) North Street
Proposed**



**(Upper) North Street
Existing**



THREE NEW ROUNDABOUTS ALONG NORTHSIDE/KOCHER DRIVE

What is the project?

The project is series of three new single-lane roundabouts along the Northside Drive/Kocher Drive corridor at the Northside Drive/Orchard Road intersection, at the Northside Drive/Benmont Avenue intersection, and at the Kocher Drive/US 7 intersection.

Why is the project needed?

All three intersections are dangerous

All three intersections are listed as a high crash location or a high crash segment in the VTrans Office of Highway Safety Division's High Crash Location Report 2012 - 2016. Over the five-year period covered by the report, the three intersections had a total of 135 crashes and 26 injuries.

- The US7/VT7A/Kocher Drive intersection (High Crash Location) had 56 crashes and 14 injuries.
- The Northside Drive/VT7A/Orchard Road intersection (High Crash Section) had 59 crashes and 10 injuries between mile markers 0.200 and 0.500.
- The Northside Drive/VT7A/Benmont Avenue intersection (High Crash Location) had 20 crashes and 2 injuries.

The intersections are inefficient

All three intersections are signalized, and vehicles are often delayed while waiting for a green light. For example, The US7/VT7A/Kocher Drive intersection has four signal phases, so vehicles have a 75% chance of having to stop for a red light, assuming green time is equal for each phase.

The Intersections Are Ugly

The US7/VT7A/Kocher Drive intersection's massive paved area and lack of landscaping make it an unwelcoming gateway to Bennington. The intersection legs have a total of 21 lanes. US7 is approximately 100 feet wide at the intersection, but only 40 feet wide 0.3 miles to the south. North of the intersection, one southbound lane combines with a lane for Welcome Center and downtown-bound VT279 east traffic. The two southbound lanes then branch out to four at the intersection.

What will the project accomplish?

Increased Safety

Roundabouts REDUCE the types of crashes where people are seriously hurt or killed by 78-82% when compared to conventional stop-controlled and signalized intersections [Source FHWA].

Decreased Vehicle Delay

Roundabouts typically have less vehicle delay than signalized intersections. A study by Kansas State University found that roundabouts on average cut vehicle delays by 65%.

Improved Aesthetics

The center island of roundabouts can be landscaped to make intersections more attractive. In addition, the paved area of the US7/VT7A/Kocher Drive intersection could be dramatically reduced. For example, the intersection's total of 21 lanes could be reduced to eight, and US7 south of the intersection's four lanes could be reduced to two lanes to match the street geometry 0.3 miles south of the intersection. This would eliminate the "drag race" as vehicles jockey for space where the southbound lanes merge.

Project Feasibility

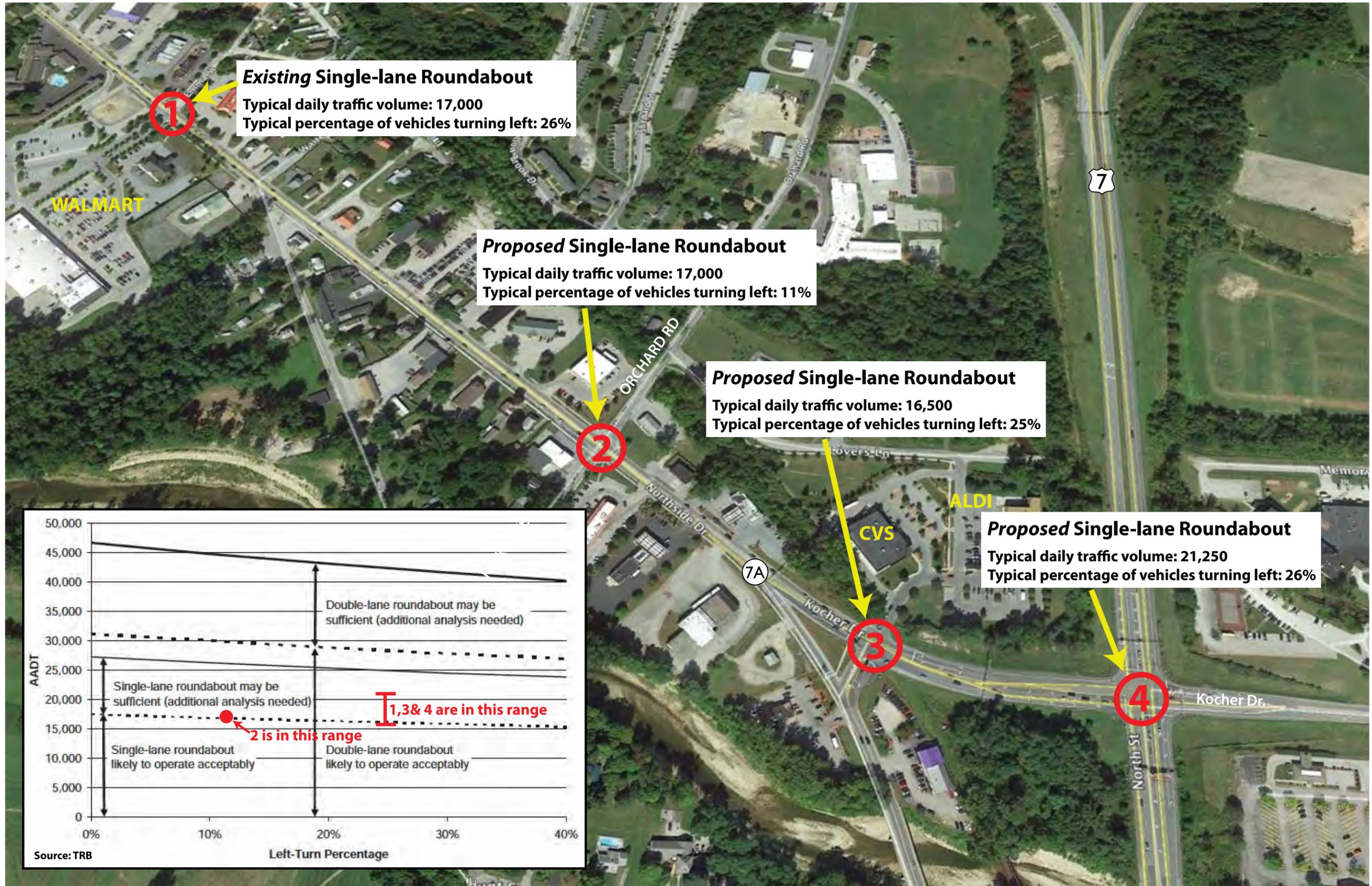
For single-lane roundabouts the inscribed circle diameter is largely dependent on the turning requirements of the design vehicle. It should be wide enough to accommodate the design vehicle, but small enough for adequate deflection. The minimum is about 105 feet.

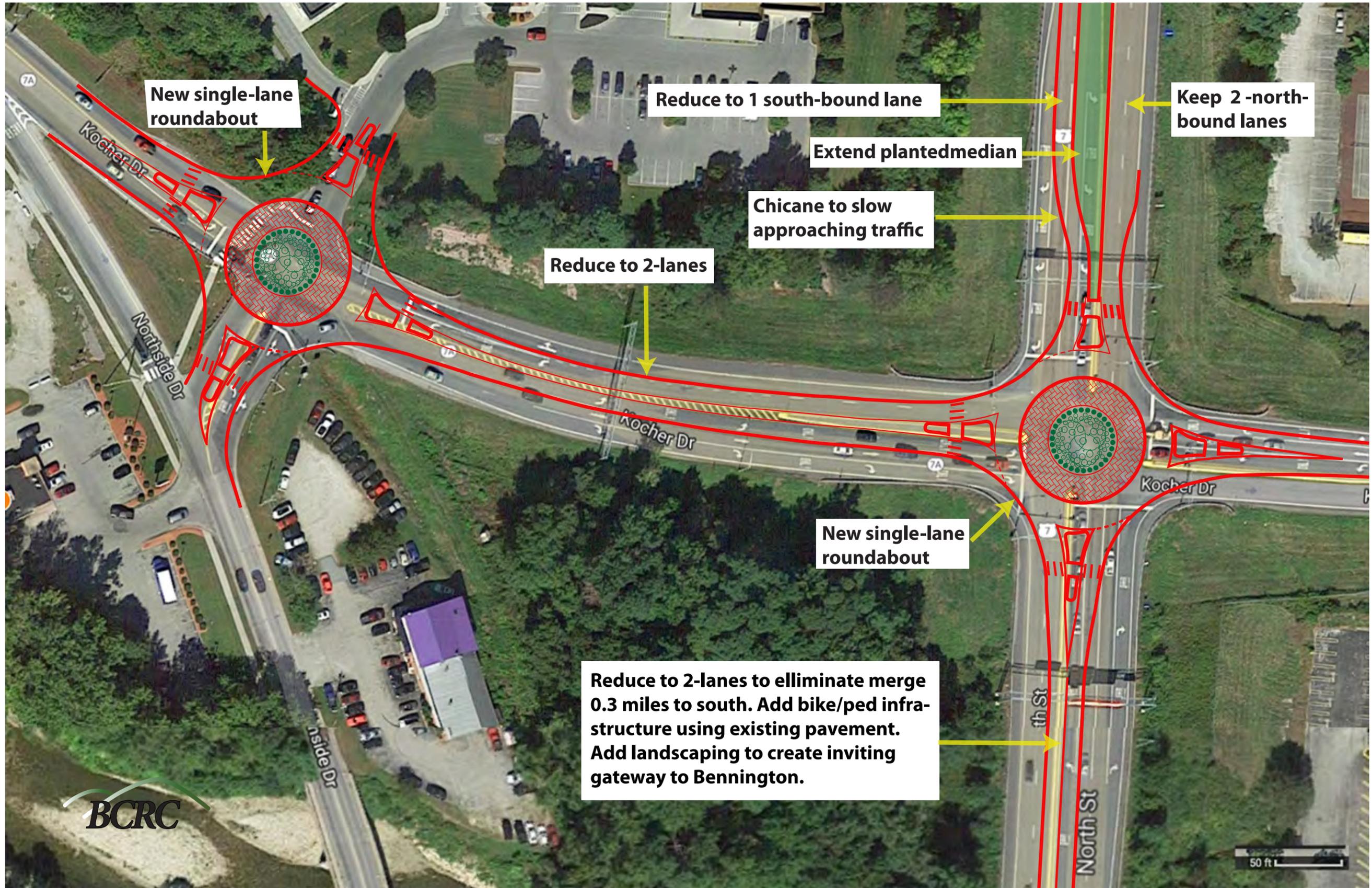
A roundabout the size of the existing roundabout on Northside drive could be constructed at the US7/VT7A/Kocher Drive intersection within the existing state ROW. Additional ROW would be needed to construct roundabouts at the other two intersections.

Although detailed traffic studies will be required to see if single lane roundabouts could work at these locations, this initial screening suggests they may work. The percentage of left turns is a key variable in determining how much traffic volume a single-lane roundabout can handle. Left turns on any approach should not exceed 40%. The proposed intersections have a typical left turn percentages of 11%, 25%, and 26%, and average daily traffic volumes between 17,000 and 21,500 (see diagram on page 19), putting them in the range of where "single-lane roundabouts may be sufficient but additional analysis needed", according to criteria established by the Transportation Research Board (TRB).

The new roundabout on Northside Drive at the Walmart entrance is a compelling demonstration of the safety, efficiency, and aesthetic benefits of roundabouts and could make the public receptive to additional roundabouts along the corridor.







New single-lane roundabout

Reduce to 1 south-bound lane

Keep 2 -north-bound lanes

Extend planted median

Chicane to slow approaching traffic

Reduce to 2-lanes

New single-lane roundabout

Reduce to 2-lanes to eliminate merge 0.3 miles to south. Add bike/ped infrastructure using existing pavement. Add landscaping to create inviting gateway to Bennington.

BCRC

50 ft