Central Vermont Regional Planning Commission

# TRANSPORTATION ADVISORY COMMITTEE

## Tuesday, April 24, 2018, 6:30 p.m.

Note Change of Location

***Central VT Chamber of Commerce, Paine Turnpike North, Berlin, VT***

(Coming off the interstate at exit 7, turn left at the first light.
At the next crossroads, the Chamber is on your left. It is the light yellow building.)

6:15 pm - Social & Pizza

*Action Item

Page **AGENDA**

**6:30 Introductions**

**Adjustments to the Agenda**

**Public Comments**

2 **6:35 Approve March 27th TAC Minutes** (enclosed)*

5 **6:40 Review of High Risk Rural Road Program and Select Sites***

11 **7:20 Introduce and Start Review of Functional Class Road Changes***

36 **8:00 Transportation Updates** (enclosed)
An opportunity for TAC members to ask questions about the updates.

**8:10 TAC Member Concerns**
Roundtable for any issues, questions, and town updates from TAC members.

**8:29 Set Agenda for the Future TAC Meeting**

**8:30 Adjourn**

## Future TAC Meeting Agendas

Below is a preview of upcoming TAC meeting agendas for consideration by the TAC.

May 22nd

- **Presentation on Emerald Ash Bore**
- **Presentation on the VTrans Long Range Transportation Plan**
- **Complete Review of Functional Class Road Changes**

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# CENTRAL VERMONT REGIONAL PLANNING COMMISSION
## Transportation Advisory Committee (TAC)
## DRAFT Minutes
### March 27, 2018
Central Vermont Regional Planning Commission Office

**Attendees:**

| | | | | | |
|---|---|---|---|---|---|
| X | Barre City: Scott Bascom | | | Northfield: Jeff Schultz |
| | Barre Town: Harry Hinrichsen | | | Orange: Lee Cattaneo |
| | Berlin: Robert Wernecke, Vice- Chair | | X | Plainfield: Bob Atchinson |
| X | Cabot: Karen Deasy | | | Roxbury: Gerry D'Amico |
| | Calais: David Ellenbogen | | X | Waitsfield: Don La Haye |
| X | Duxbury: Alan Quackenbush | | X | Warren: Jim Sanford |
| X | East Montpelier: Frank Pratt | | | Washington: Ray McCormack |
| X | Fayston: Kevin Russell | | X | Waterbury: Steve Lotspeich, Chair |
| | Marshfield: Vacant | | | Williamstown: Vacant |
| | Middlesex: Ronald Krauth | | | Woodbury: Vacant |
| X | Montpelier: Dona Bate | | X | Worcester: Bill Arrand |
| X | Moretown: Joyce Manchester | | X | Staff: Daniel Currier and Matt Germaine |

Guests: Peter Johnke (VCIL); Jon Moore and Rachel Kennedy (GMT); Bob Clark (Berlin); Tina Bohl, Derek Kenison, Scott Burbank (VTrans); Dennis Vertiyev and Erik Atkins (Green International): Sue Allen (Montpelier)

Steve Lotspeich called the meeting to order at 6:30pm. Introductions were completed.

**Adjustments to the Agenda:**

There were no adjustments to the agenda.

**Public Comments:**

There were no public comment

**Alternatives Presentation on Berlin Exit 7 Park and Ride**

Tina Bohl of VTrans and Dennis Vertiyev of Green International presented the Berlin Exit 7 Park and Ride alternatives. A total of nine alternatives where presented. Of the nine three would relocate the park and ride to a new locations while the other six would use the existing location just with different configuration options. There was one new alternative that was developed based on feedback from the public meetings and the adjacent landowners input. This is alternative was number six. What is different in this alternative from the others include:

- 110 parking spaces
- Wider travel lanes to accommodate buses

- Bus pull out area and shelter
- Exit from the Park and Ride directly onto Route 62
- Construction of a berm and screening to reduce impacts to neighbors
- Add a right hand turn lane on Paine Turnpike North

The TAC members provided the following comments and feedback on the Park and Ride alternatives.

- The exit from the park and ride directly onto Route 62 should be a stop and not a yield which would help reduce the chance for crashes.
- What about the entrance to the park and ride. Will that be expanded? The driveway exit will not be expanded.
- Will you run into any problems expanded the Paint Turnpike intersection? No the state owns that portion of the road.
- Is there good sign distance for an exit from the park and ride onto Route 62? Yes the distances meet the required signs distance.
- What screening alternatives have you considered? We have looked at many. Also we have looked at the sign lines from the house to see if we could hid the park and ride from the view of the house. A berm with vegetation on top could be installed to help with that screening.
- This is the 2nd expansion of the Park and Ride and that is why we shouldn't maximize the number of spaces.
- Why not leave this park and ride alone and add an area behind the State Library? Poor visibility is one of the biggest reason.

Bob Clark resident of Berlin and adjacent land owner outlined his concerns about the park and ride including noise, light, rubbish clean up, drug use, and encroachment on his quality of life. Bob meet with the Secretary of Transportation to work out some of the differences. Of all the alternative that keep the park and ride at its existing location he hates alternative six the least. But it's something Bob can live with as long as there is a berm and screening to help reduce the disturbance. B. Clark also talked about his willingness to work with VTrans to make this the best alternative he can.

Dona motioned to identify alternative six for the Berlin Exit 7 Park and Ride expansion as the preferred alternative and authorizes staff to write a letter to VTrans notifying them of this preference and why, Don 2nd. There was further discussion by the TAC including encouraging VTrans to continue working with on the berm and vegetation screening with B. Clark the motion passed.

**GMT Update on Ridership and NextGen Plan**

Jon Moore and Rachel Kennedy from GMT presented on the NextGen plan including the changes that are being recommended to each route based on the scenario analysis and public comments. The TAC members asked the following questions.

What is anchored flex service? The bus would start from a fixed location and then go around based on the riders on the bus.

Is there a possibility to have the bus that runs to Hannaford's stop at the Barre City pool? Yes that is a potential that we will look at.

Concerns with the complementary para transit service where shared and how the service will provide a savings. Some of the savings will be in the improved fixed route service. But the devils in the details on how the service will work. The one thing they are sure of is that they will add an eligibility screening that people will have to go through to qualify to use the para transit service. There were concerns voiced that the quality of service will go down.
There are more people 65 years and old in our population. How do you take into account those riders? We do consider them in our service planning. Including special shopping trip service.

Comments on the proposed changes being suggested in the NextGen plan can be provided to GMT by email or posting to their blog. You can also provide them to CVRPC staff who will then pass them along to GMT.

**Update from Montpelier on Transit Center (1 Taylor St)**
Sue Allen from the City of Montpelier presented on the progress of 1 Taylor St. The Transit Center will be owned by Montpelier and leased to GMT to operate its buses out of. There will be housing on the upper stories. Discussion on buses access, the bike path, and demolition of Montpelier Beverage ensued. They hope to break grown on the Center on June 18th. Sue was asked to come back and present more details to the TAC at a future meeting.

**Approval of February TAC Minutes and Prioritized VTrans Capital Program Projects:**
Minutes were reviewed along with the Prioritized VTrans Capital Program Projects. Don motioned to accept the minutes and the prioritized CVRPC FY20 Capital Program Project Priority List dated 2/27/18 and authorize staff to pass the list onto VTrans as CVRPC's Regional Project Priority Ranking. There was no discussion and the motion passed.

**TAC Member Concerns**
S. Lotspeich shared a new concern related to ACT 250 and assessing transportation impact fees to new development. The development is question being assessed the fee is in Waterbury and is contributing 5 new PM peak hour trips to the Route 2/100 roundabout. It was concerning to the Town because the fee seemed to come out of nowhere and that its assessment did not include any public involvement as the Legislation seems to require. The Legislation reference is ACT 145. Waterbury plans on doing more research into this to discover where and how the impact fee is assessed.

**Set Agenda for April**

- Review of Functional Class Road Changes
- Review of High Risk Rural Road Program Update and Sites
- Presentation on the VTrans Long Range Transportation Plan
- Presentation on Emerald Ash Bore

**Adjourn:**
The meeting was adjourned at 8:10 pm.

Central Vermont Regional Planning Commission

# MEMO

Date: April 24, 2018

To: Transportation Advisory Committee

From: Daniel Currier, Program Manager

Re: 2018 Systemic Local Road Safety Program (SLRS) formally known as the High Risk Rural Roads Program

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☒ **ACTION REQUESTED:** Motion to select one town to participate in the 2018 Systemic Local Road Safety Program.

The Vermont Agency of Transportation (VTrans) has developed the Systemic Local Road Safety program (SLRS) to help towns proactively prevent and reduce single vehicle crashes on their rural town-maintained roads.

VTrans has determined from Vermont data that curves with radii of less than 750 feet that were also on a paved road are more prone to single vehicle crashes (curves with these characteristics are called critical curves).

The towns that can take advantage of this program are the ones that have critical curves on their town highways and that have been selected by our regional planning commission from a list of eligible towns.

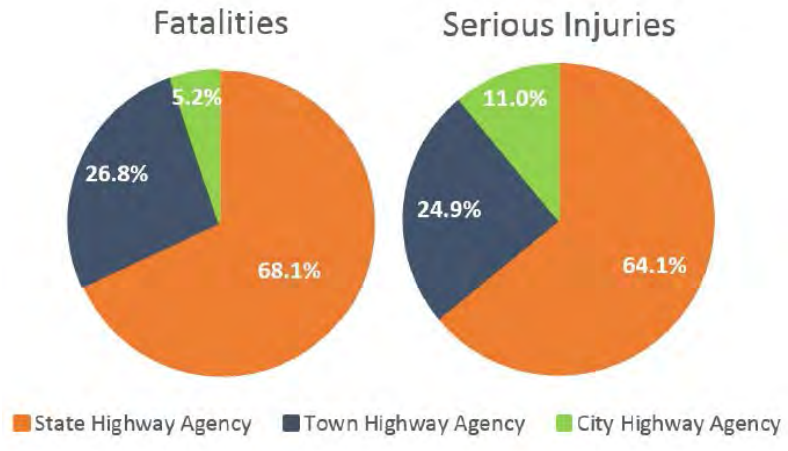
There are three towns with critical curves that qualify for the program this year and they include:

| **Town** | **Road** |
|---|---|
| Northfield | Lovers Lane |
| Williamstown | Falls Bridge Rd |
| Marshfield | Cabot Rd |

Maps showing the location of each roadway curve are included after this memo.

# VTrans' Systemic Local Road Safety Program
# Targeting Horizontal Curves with the Greatest Risks

Minimizing roadway lane departure has been identified by VTrans as one of the most critical highway safety concerns in Vermont. Lane departure crashes represent over 50% of fatal and serious injury crashes. More than 25% of the fatal and serious injury crashes in Vermont are happening on rural town-maintained roads. This is a substantial number of crashes that cannot be ignored.




## What is a Rural Town-Maintained Road?

Rural town-maintained roads are the roads that are maintained by a municipality and that are outside the adjusted Urbanized Area and Small Urban Area boundaries, established in 2016 for transportation planning purposes by VTrans in conjunction with regional planning partners.

## The Rural Road Safety Challenge

Crashes on rural town-maintained roads pose a challenge when it comes to figuring out how to eliminate them.

We know crashes are happening, we know where some happened in the past, but we cannot predict exactly where they are going to happen in the future.

If you look at your town's road system over a two-to-three year period, most likely you will observe that crashes occurred at different locations and that clusters of crashes were infrequent. This is because crashes on rural roads are random, and several crashes are not reported by motorists.

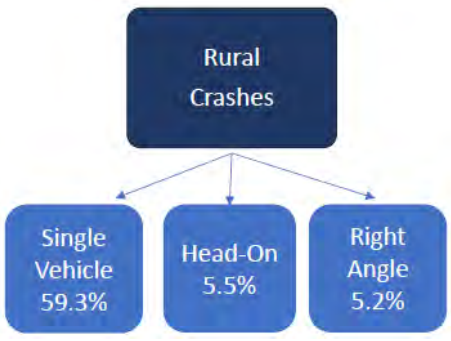
The unique characteristics of rural crashes requires that highway safety on rural town-maintained roads be done in a systemic manner.

## The Systemic Approach

The systemic approach looks at the crash history on a systemwide basis in order to identify the way that most people crash (i.e., the manner of crash, for example, a rear-end crash) and then looks at the roadway characteristics (i.e., risks) that are common to these crashes.

A specific treatment that is known to be successful at eliminating the type of crash in question is then implemented across the road system at the locations that have these particular roadway characteristics. This way, all locations with the greatest risks on the entire network are treated to help deter crashes, eliminating the need to chase crashes, trying to fix one spot while crashes are happening at other locations.

To implement the systemic method, we need to first identify the predominant manner of crash (step 1) and the roadway characteristics or risks (step 2) associated with that manner of crash.



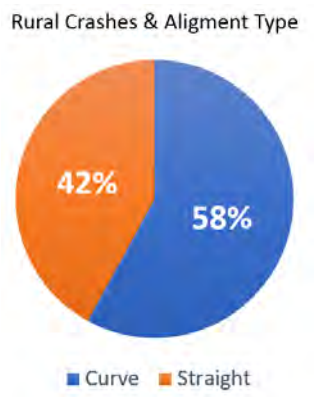

**Step 1. What Manner of Crash Stands Out on Vermont Rural Town Roads?**

Vermont data tell us that single vehicle crashes represent almost 60% of all crashes on rural town-maintained roads.

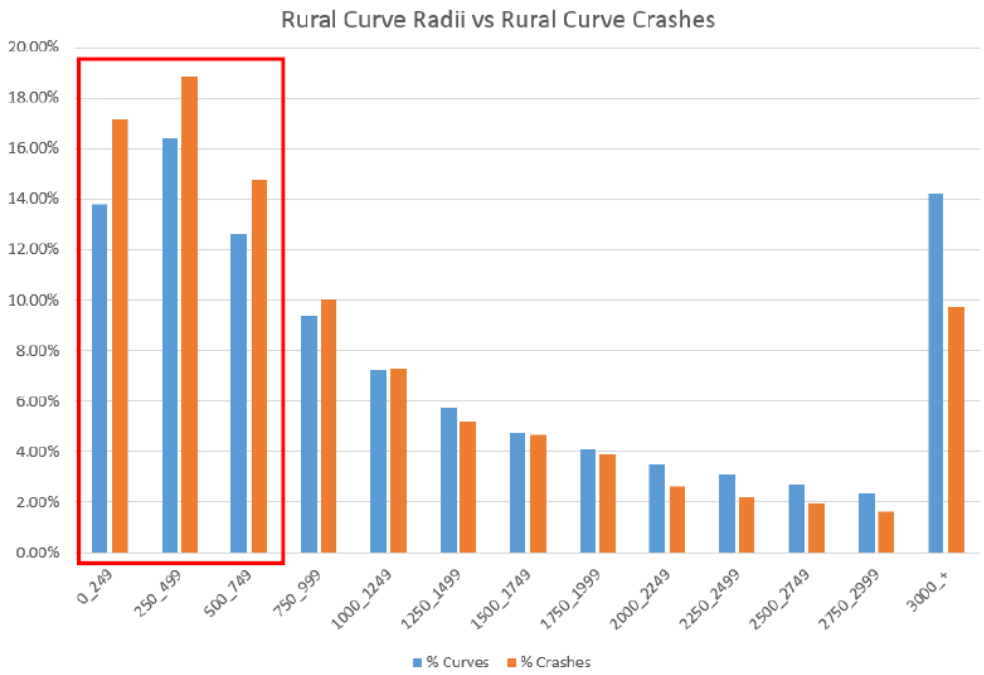
**Step 2. What are the Risk Factors Associated with Single Vehicle Crashes?**

Vermont data tell us that 58% of all single vehicle crashes on rural town-maintained roads happen on curve sections of roads.

Horizontal curve alignments are thus the primary risk factor on rural town-maintained roads. But are all horizontal curves equally at risk? The answer is no.




Vermont data tell us that crashes on curves with radii less than 750 feet are overrepresented. The data also tell us that crashes on curves with radii less than 750 feet that are also paved are overrepresented when compared to non-pave roads.



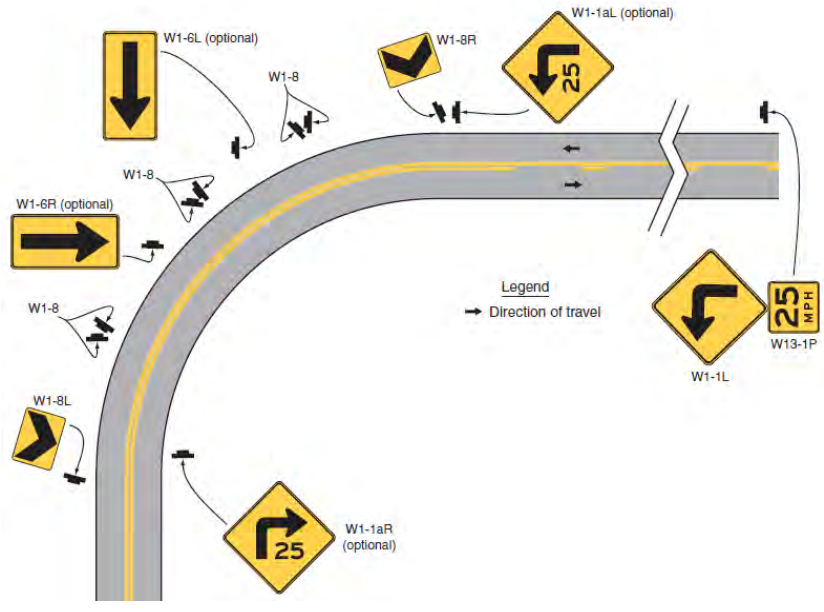

**The type of curves that present the most risk to motorists on rural town-maintained roads are <u>Paved Horizontal Curves with Radii less than 750 feet</u>**

# Horizontal Curve Safety Toolbox

The final task to complete the systemic process is to implement a countermeasure that will greatly help reduce the occurrence of crashes at the horizontal curve that have the greatest risks.

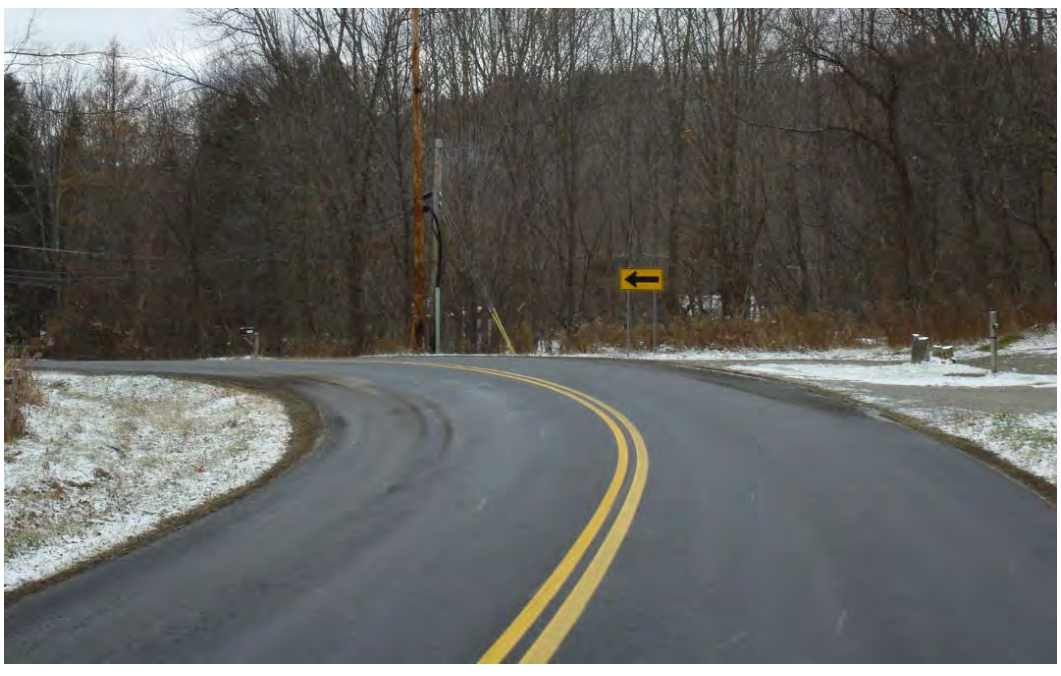
The proven solution with the most potential to save lives and prevent injuries at horizontal curves is to install curve warning signs. Research has shown that this solution can reduce crashes by 18% to 44%.

Curve warning signs consist of advance warning signs, advisory speed plaques, chevrons, large arrows and delineators. Requirements for curve warning signs are based on the difference between the speed limit and the speed at which a curve can be safely driven. When the difference is 5 mph, an advance warning sign and an advisory speed plaque are used. In addition, chevrons or large arrows are used when the difference in speed is 10 mph or more. Delineators can be used around the curve when the difference in speed is less than 10 mph.




**Example 1: Advance Warning Sign, Advisory Speed and Chevrons**


**Example 2 – Large Arrows**



**Example 3 – Delineators**

Northfield VT - Lovers Ln
Near the Intersection of
VT Route 12 South and VT Route 64

Three Crashes


**Legend**

High Priorioty Critical Curve

N

0 100 200 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, IGN, and the GIS User Community

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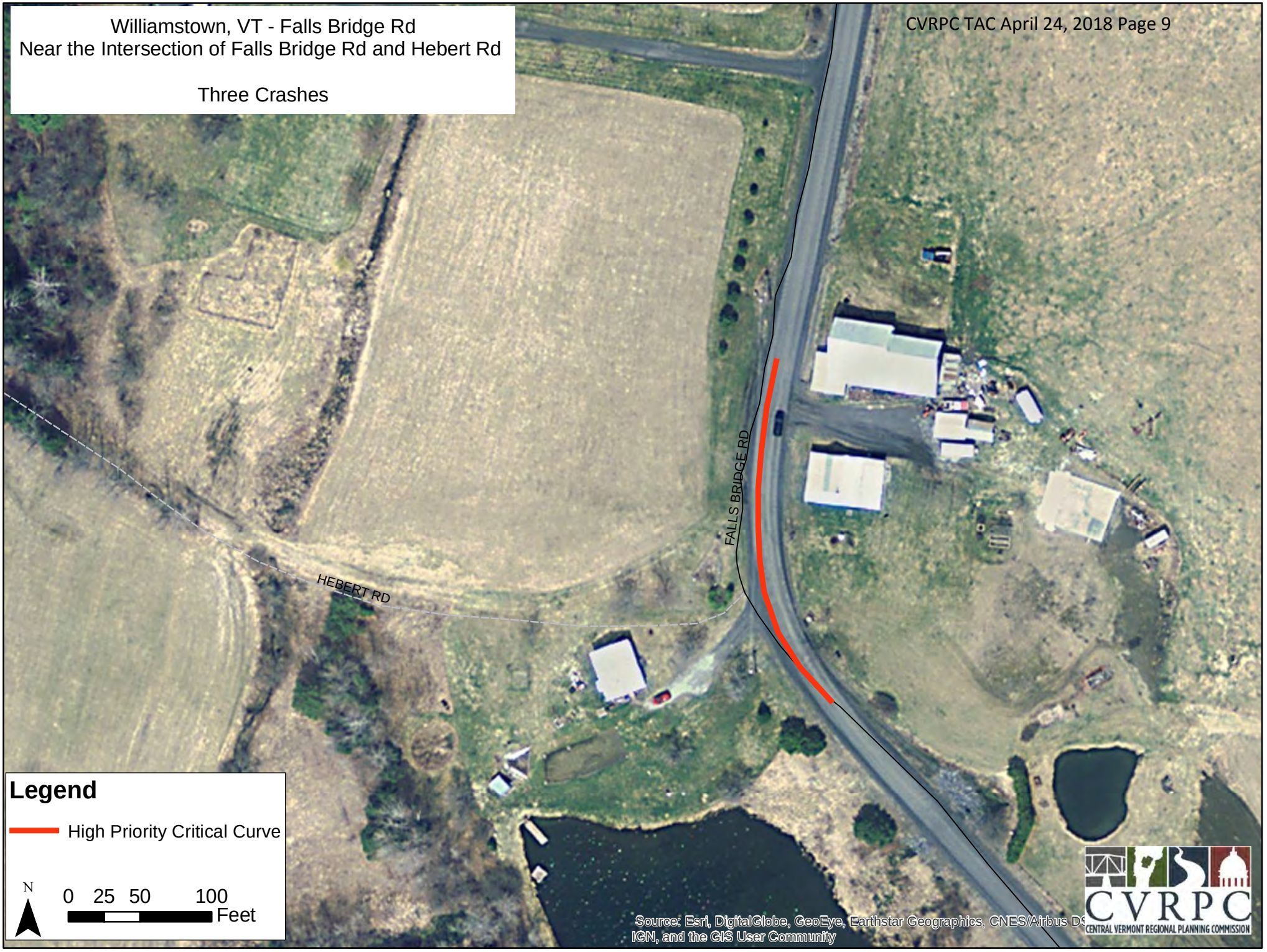
Williamstown, VT - Falls Bridge Rd
Near the Intersection of Falls Bridge Rd and Hebert Rd

Three Crashes

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Marshfield, VT - Cabot Road
At the Intersection of US Route 2 and Cabot Rd,

Three Crashes


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Central Vermont Regional Planning Commission

# MEMO

Date: April 24, 2018

To: Transportation Advisory Committee

From: Daniel Currier, Program Manager

Re: Review of Functional Classification System

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⌦ **ACTION REQUESTED:** Review and provide feedback to VTrans on the proposed changes to the Functional Classification system.

The purpose of the functional classification system is to identify the particular role a roadway plays in moving vehicles through a network of highways. It groups roads into three main functional classes as defined by the United States Federal Highway Administration: arterial, collector, and local.

In the winter of 2018 VTrans performed a review of the current functional classification system and provide each RPC with a listing of proposed changes. Each RPC is being asked to review the list, discuss any changes, and provide feedback to VTrans. Any proposed changes will need to conform with the FHWA guidance document "The Highway Functional Classification: Concepts, Criteria and Procedures, 2013 Edition".

https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/fcauab.pdf

Our region has 15 segments of roadway with proposed changes to the Functional Classification system. Maps showing existing and proposed changes are included after this memo.

**Background**

In 2014 the RPCs assisted VTrans with reviewing and adjusting Urban Area Boundaries. During that exercise, and as a result of changes in the urban area boundaries it became evident that there were some inconsistencies in the Functional Classification for some Vermont

roadways. Changes in the functional class coding during this period also contributed to the inconsistencies. Following up on the 2014 effort, VTrans would like to enlist the RPCs assistance in reviewing and seeking regional input on proposed changes in the Functional Classification system.

**Timeline & Deliverables**

10/2/2017 - VTrans begins review of the functional class and starts to prepare listing of any inconsistencies
1/5/2018 – VTrans provides listing to each RPC on suggested functional class changes
**6/1/2018** - RPCs provide feedback to VTrans on the changes and any concurrence or comments regarding the changes
8/3/2018 - RPCs and VTrans finalize listing of functional class changes
8/10/2018 - VTrans prepares and submits functional class changes for FHWA review and approval

# SECTION 3. CRITERIA

## 3.1 Definitions and Characteristics

The previous section provided a general overview of the functional classification categories of Arterial, Collector and Local. For Federal functional classification purposes, this section breaks these categories down further to stratify the range of mobility and access functions that roadways serve. Additionally, the physical layout and the official designation of some roadways dictate the classification of certain roadways.

*Access control is a key factor in the realm of functional classification. All Interstates are "limited access" or "controlled access" roadways. The use of the word "access" in this context refers to the ability to access the roadway and not the abutting land use—these roadways provide no "access" to abutting land uses. Access to these roadways is controlled or limited to maximize mobility by eliminating conflicts with driveways and at-grade intersections that would otherwise hinder travel speed. Access to these roadways is limited to a set of controlled locations at entrance and exit ramps. Travelers use a much lower functionally classified roadway to reach their destination.*

### 3.1.1 Interstates

Interstates are the highest classification of Arterials and were designed and constructed with mobility and long-distance travel in mind. (**Figure 3-1**) Since their inception in the 1950's, the Interstate System has provided a superior network of limited access, divided highways offering high levels of mobility while linking the major urban areas of the United States.

***Figure 3-1: Example of Interstate***

*Source: CDM Smith*

Determining the functional classification designation of many roadways can be somewhat subjective, but with the Interstate category of Arterials, there is no ambiguity. Roadways in this functional classification category are officially designated as Interstates by the Secretary of Transportation, and all routes that comprise the Dwight D. Eisenhower National System of Interstate and Defense Highways belong to the Interstate functional classification category and are considered Principal Arterials.

### 3.1.2 Other Freeways & Expressways

Roadways in this functional classification category look very similar to Interstates. While there can be regional differences in the use of the terms 'freeway' and 'expressway', for the purpose of functional classification the roads in this classification have directional travel lanes are usually separated by some type of physical barrier, and their access and egress points are limited to on- and off-ramp locations or a very limited number of at-grade intersections. Like Interstates, these roadways are designed and constructed to maximize their mobility function, and abutting land uses are not directly served by them.

## 3.1.3 Other Principal Arterials

*Figure 3-2: Example of Other Principal Arterial*

*Source: CDM Smith*

These roadways serve major centers of metropolitan areas, provide a high degree of mobility and can also provide mobility through rural areas. Unlike their access-controlled counterparts, abutting land uses can be served directly. Forms of access for Other Principal Arterial roadways include driveways to specific parcels and at-grade intersections with other roadways. (**Figure 3-2**) For the most part, roadways that fall into the top three functional classification categories (Interstate, Other Freeways & Expressways and Other Principal Arterials) provide similar service in both urban and rural areas. The primary difference is that there are usually multiple Arterial routes serving a particular urban area, radiating out from the urban center to serve the surrounding region. In contrast, an expanse of a rural area of equal size would be served by a single Arterial.

**Table 3-1** presents a few key differences between the character of service that urban and rural Arterials provide.

*Table 3-1: Characteristics of Urban and Rural Arterials*

| Urban | Rural |
|---|---|
| • Serve major activity centers, highest traffic volume corridors and longest trip demands<br>• Carry high proportion of total urban travel on minimum of mileage<br>• Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area<br>• Serve demand for intra-area travel between the central business district and outlying residential areas | • Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel<br>• Connect all or nearly all Urbanized Areas and a large majority of Urban Clusters with 25,000 and over population<br>• Provide an integrated network of continuous routes without stub connections (dead ends) |

## 3.1.4 Minor Arterials

*Figure 3-3: Example of Urban Minor Arterial*

*Source: Unsourced photo*

Minor Arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system. In an urban context, they interconnect and augment the higher Arterial system, provide intra-community continuity and may carry local bus routes. **(Figure 3-3)**

In rural settings, Minor Arterials should be identified and spaced at intervals consistent with population density, so that all developed areas are within a reasonable distance of a higher level Arterial. Additionally, Minor Arterials in rural areas are typically designed to provide relatively high overall travel speeds, with minimum interference to through movement. The spacing of Minor Arterial streets may typically vary from 1/8- to 1/2-mile in the central business district (CBD) and 2 to 3 miles in the suburban fringes. Normally, the spacing should not exceed 1 mile in fully developed areas (see **Table 3-2**).

*Table 3-2: Characteristics of Urban and Rural Minor Arterials*

| Urban | Rural |
|---|---|
| • Interconnect and augment the higher-level Arterials<br>• Serve trips of moderate length at a somewhat lower level of travel mobility than Principal Arterials<br>• Distribute traffic to smaller geographic areas than those served by higher-level Arterials<br>• Provide more land access than Principal Arterials without penetrating identifiable neighborhoods<br>• Provide urban connections for Rural Collectors | • Link cities and larger towns (and other major destinations such as resorts capable of attracting travel over long distances) and form an integrated network providing interstate and inter-county service<br>• Be spaced at intervals, consistent with population density, so that all developed areas within the State are within a reasonable distance of an Arterial roadway<br>• Provide service to corridors with trip lengths and travel density greater than those served by Rural Collectors and Local Roads and with relatively high travel speeds and minimum interference to through movement |

## 3.1.5 Major and Minor Collectors

Collectors serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Within the context of functional classification, Collectors are broken down into two categories: Major Collectors and Minor Collectors. Until recently, this division was considered only in the rural environment. Currently, all Collectors, regardless of whether they are within a rural area or an urban area, may be sub-stratified into *major* and *minor* categories. The determination of whether a given Collector is a Major or a Minor Collector is frequently one of the biggest challenges in functionally classifying a roadway network.

In the rural environment, Collectors generally serve primarily intra-county travel (rather than statewide) and constitute those routes on which (independent of traffic volume) predominant travel distances are shorter than on Arterial routes. Consequently, more moderate speeds may be posted.

The distinctions between Major Collectors and Minor Collectors are often subtle. Generally, Major Collector routes are longer in length; have lower connecting driveway densities; have higher speed limits; are spaced at greater intervals; have higher annual average traffic volumes; and may have more travel lanes than their

Minor Collector counterparts. Careful consideration should be given to these factors when assigning a Major or Minor Collector designation. In rural areas, AADT and spacing may be the most significant designation factors. Since Major Collectors offer more mobility and Minor Collectors offer more access, it is beneficial to reexamine these two fundamental concepts of functional classification. Overall, the total mileage of Major Collectors is typically lower than the total mileage of Minor Collectors, while the total Collector mileage is typically one-third of the Local roadway network (see **Table 3-3**).

*Table 3-3: Characteristics of Major and Minor Collectors (Urban and Rural)*

| MAJOR COLLECTORS | |
|---|---|
| **Urban** | **Rural** |
| • Serve both land access and traffic circulation in higher density residential, and commercial/industrial areas<br>• Penetrate residential neighborhoods, often for significant distances<br>• Distribute and channel trips between Local Roads and Arterials, usually over a distance of greater than three-quarters of a mile<br>• Operating characteristics include higher speeds and more signalized intersections | • Provide service to any county seat not on an Arterial route, to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks and important mining and agricultural areas<br>• Link these places with nearby larger towns and cities or with Arterial routes<br>• Serve the most important intra-county travel corridors |
| **MINOR COLLECTORS** | |
| **Urban** | **Rural** |
| • Serve both land access and traffic circulation in lower density residential and commercial/industrial areas<br>• Penetrate residential neighborhoods, often only for a short distance<br>• Distribute and channel trips between Local Roads and Arterials, usually over a distance of less than three-quarters of a mile<br>• Operating characteristics include lower speeds and fewer signalized intersections | • Be spaced at intervals, consistent with population density, to collect traffic from Local Roads and bring all developed areas within reasonable distance of a Collector<br>• Provide service to smaller communities not served by a higher class facility<br>• Link locally important traffic generators with their rural hinterlands |

## 3.1.6 Local Roads

Locally classified roads account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel, except at the origin or destination end of the trip, due to their provision of direct access to abutting land. Bus routes generally do not run on Local Roads. They are often designed to discourage through traffic. As public roads, they should be accessible for public use throughout the year.

Local Roads are often classified by default. In other words, once all Arterial and Collector roadways have been identified, all remaining roadways are classified as Local Roads (see **Table 3-4**).

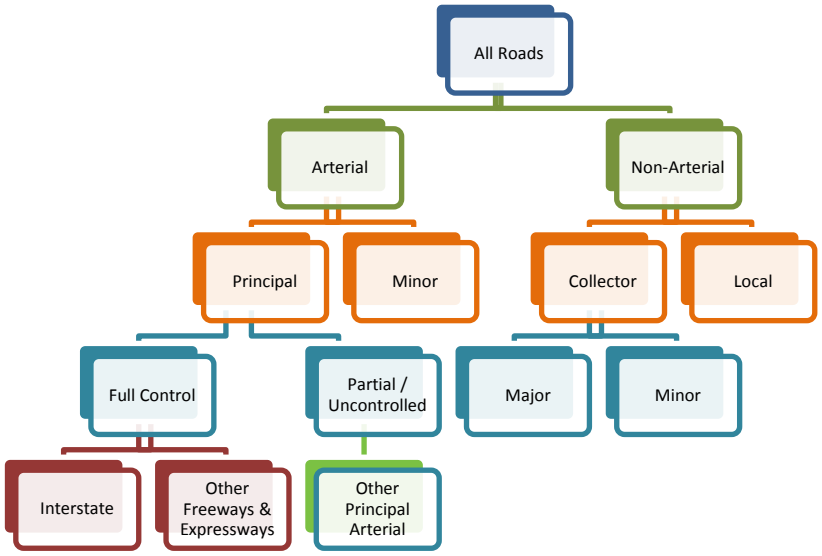
*Table 3-4: Characteristics of Urban and Rural Local Roads*

| Urban | Rural |
|---|---|
| • Provide direct access to adjacent land<br>• Provide access to higher systems<br>• Carry no through traffic movement<br>• Constitute the mileage not classified as part of the Arterial and Collector systems | • Serve primarily to provide access to adjacent land<br>• Provide service to travel over short distances as compared to higher classification categories<br>• Constitute the mileage not classified as part of the Arterial and Collector systems |

## 3.2 Putting it all Together

The functional classification system groups roadways into a logical series of decisions based upon the character of travel service they provide. **Figure 3-4** presents this process, starting from assigning the function of an Arterial by its level of access (limited or full) or Non-Arterial (full access).

*Figure 3-4: Federal Functional Classification Decision Tree*



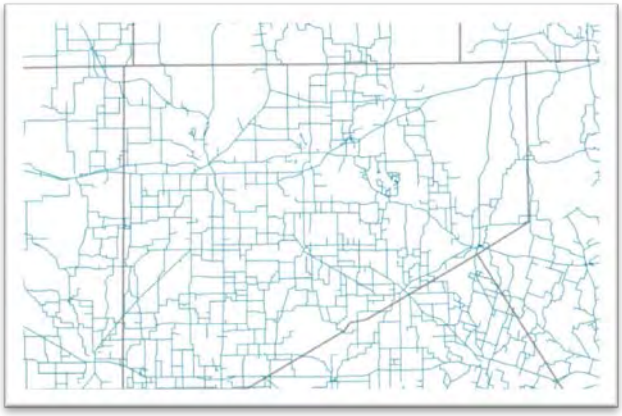

*Source: FHWA and CDM Smith*

While this document emphasizes the importance of function and service over the urban/rural distinction when classifying roads, the classification process is still influenced by the intensity and distribution of land development patterns. Classification of roadways in urban areas is typically guided by the local comprehensive planning and design process, or the fundamental principles of roadway functional classification. In comparison, rural development patterns are often more diverse, if not less orderly, thereby making the functional classification determination of some rural roadways more challenging (see **Figure 3-5** and **Figure 3-6**).

*Figure 3-5: Map of an Urban Area's Roadway Network (Functional Classification more evident)*

*Source: CDM Smith*

*Figure 3-6: Map of a Rural Area's Roadway Network (Functional Classification less evident)*



*Source: CDM Smith*

When comparing urban and rural areas, perhaps the most relevant characteristic is the density of the roadway network. Even with a cursory view of a map of an urban area's roadway network, the functional classification of many roadways can be discerned due the differences in roadway size. In contrast, the functional classification of the roadway network in many rural areas is less readily apparent, primarily due to the relatively inconsistent roadway spacing.

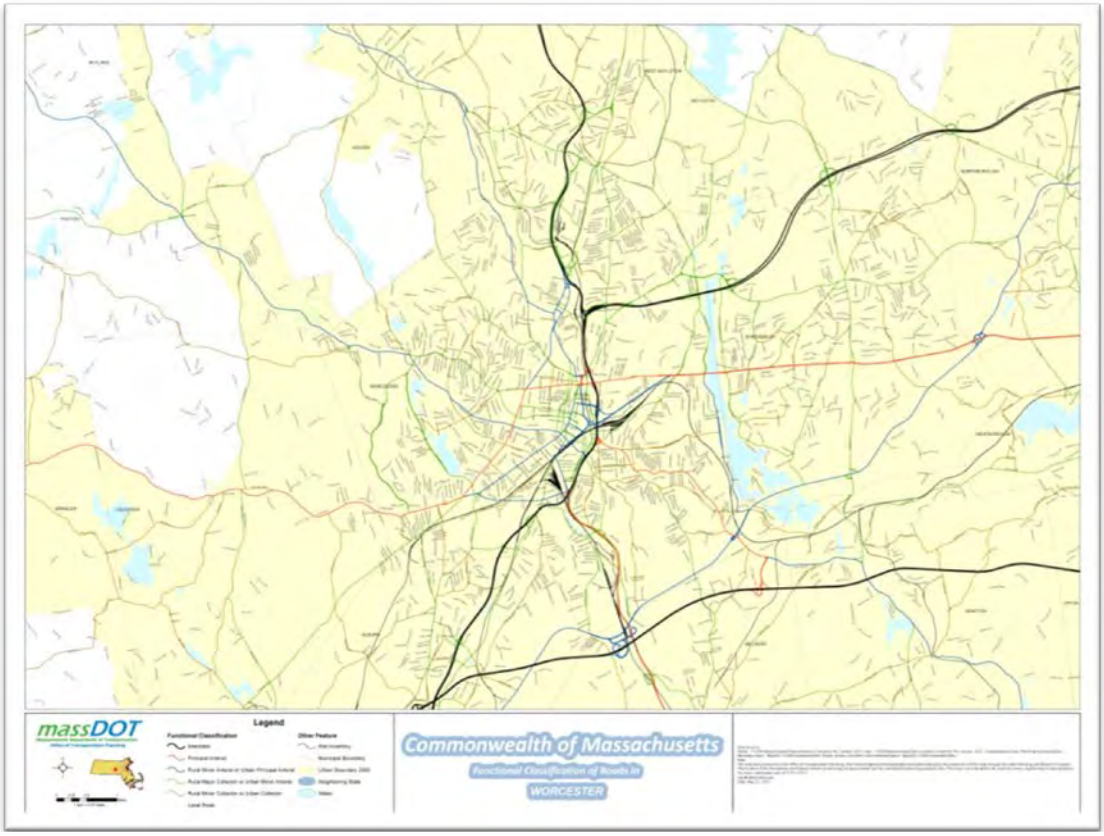
Nevertheless, functional classifications should be assigned based on actual functional criteria, rather than the location of the roadway within an urban or rural context.

## 3.3 A Real World Example

At this point, the concepts, criteria and definitions of all Federal functional classification categories have been presented. However, to strengthen the functional classification practitioner's understanding of these topics, the real world example of the city of Worcester, MA is presented below (**Figure 3-7**).

*Figure 3-7: Worcester, MA Roadway System*

Shaded area depicts the Urbanized Area




1. The city of Worcester is served by two interstate routes, Interstate 190 and Interstate 290 (shown in black). These Interstates provide high mobility service to residential communities to the north, northeast and south sides of the city.
2. A handful of Other Freeways & Expressways and Other Principal Arterials (shown in red and blue) radiate out from the central core of the city and provide direct service into, out of and through the city, offering connections to the surrounding areas not served by the Interstates.
3. An even larger number of Minor Arterials (shown in green) provide connectivity between the Interstate, Other Freeways & Expressways and Other Principal Arterials and are rather evenly spaced. Note that only a few of these Minor Arterial routes actually extend outside of the city border, as most of them terminate at Arterials within the city limits.
4. The Collector roadway system (shown in brown) consists of relatively shorter routes that mainly connect to Minor Arterials.
5. All other roadways (shown in gray) are Local Roads and comprise the vast majority of the mileage of the city's roadway network.

## 3.4 Final Considerations

In many instances, assigning a functional classification to a roadway is straightforward, especially for Interstates and Locals. However, there is flexibility when deciding between adjacent classifications. For example, deciding whether a given roadway acts as a Minor Arterial or Major Collector can be subject to debate. Deciding between a Major Collector and Minor Collector assignment can be even more challenging.

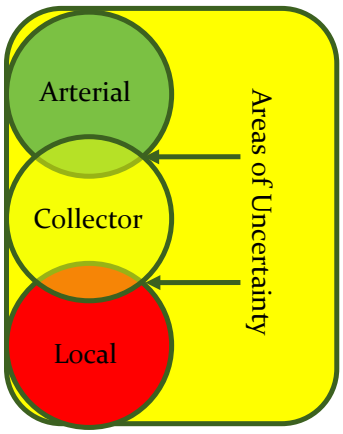
To assist transportation planners responsible for determining the functional classification of roadways, this guidebook offers a helpful tool that can make the classification process of classifying "borderline" roadways a bit easier. **Table 3-5** illustrates the range of lane width, shoulder width, AADTs, divided/undivided status, access control and access points per mile by functional classification categories.

Table 3-5 also presents guidelines for mileage and VMT ranges for Federal functional classifications of roads. These guidelines are based on an analysis of 2008 HPMS data and are adjusted to represent reasonable ranges. The table presents mileage and VMT extents for rural states, urban states and all states. For this purpose rural states are defined as having 75 percent or less of their population in urban areas. Research determined this was a natural breakpoint that approximated the geographic difference between the States.

As expected, Interstates account for the lowest portion of total system miles, but the greatest portion of travel. Conversely, Local Roads comprise the greatest portion of system mileage with Collectors carrying the lowest percentage of travel volume. Therefore, as a primary consideration in functional classification, planners and engineers can use mileage as a guideline. Where roadway systems significantly deviate from these ranges, State DOTs should consider adjusting their roadway assignments during the functional classification review process and at least every 10 years as part of the response to Census defined Urban Boundary changes. FHWA intends to review these guideline ranges for mileage and VMT periodically.

Lastly, as a result of variances within the functional classification system, the guidelines have overlapping ranges of values. This allows greater flexibility in determining functional classification (see **Figure 3-8**).

*Figure 3-8: Classification Overlap*




*Source: FHWA*

*Table 3-5: VMT and Mileage Guidelines by Functional Classifications - Arterials*

| | Arterials | | | |
|---|---|---|---|---|
| | **Interstate** | **Other Freeways & Expressway** | **Other Principal Arterial** | **Minor Arterial** |
| **Typical Characteristics** | | | | |
| **Lane Width** | 12 feet | 11 - 12 feet | 11 - 12 feet | 10 feet - 12 feet |
| **Inside Shoulder Width** | 4 feet - 12 feet | 0 feet - 6 feet | 0 feet | 0 feet |
| **Outside Shoulder Width** | 10 feet - 12 feet | 8 feet - 12 feet | 8 feet - 12 feet | 4 feet - 8 feet |
| **AADT[1] (Rural)** | 12,000 - 34,000 | 4,000 - 18,500[2] | 2,000 - 8,500[2] | 1,500 - 6,000 |
| **AADT[1] (Urban)** | 35,000 - 129,000 | 13,000 - 55,000[2] | 7,000 – 27,000[2] | 3,000 - 14,000 |
| **Divided/Undivided** | Divided | Undivided/Divided | Undivided/Divided | Undivided |
| **Access** | Fully Controlled | Partially/Fully Controlled | Partially/Uncontrolled | Uncontrolled |
| **Mileage/VMT Extent (Percentage Ranges)[1]** | | | | |
| **Rural System** | | | | |
| **Mileage Extent for Rural States[2]** | 1% - 3% | 0% - 2% | 2% - 6% | 2% - 6% |
| **Mileage Extent for Urban States** | 1% - 2% | 0% - 2% | 2% - 5% | 3% - 7% |
| **Mileage Extent for All States** | 1% - 2% | 0% - 2% | 2% - 6% | 3% - 7% |
| **VMT Extent for Rural States[2]** | 18% - 38% | 0% - 7% | 15% - 31% | 9% - 20% |
| **VMT Extent for Urban States** | 18% - 34% | 0% - 8% | 12% - 29% | 12% - 19% |
| **VMT Extent for All States** | 20% - 38% | 0% - 8% | 14% - 30% | 11% - 20% |
| **Urban System** | | | | |
| **Mileage Extent for Rural States[2]** | 1% - 3% | 0% - 2% | 4% - 9% | 7% - 14% |
| **Mileage Extent for Urban States** | 1% - 2% | 0% - 2% | 4% - 5% | 7% - 12% |
| **Mileage Extent for All States** | 1% - 3% | 0% - 2% | 4% - 5% | 7% - 14% |
| **VMT Extent for Rural States[2]** | 17% - 31% | 0% - 12% | 16% - 33% | 14% - 27% |
| **VMT Extent for Urban States** | 17% - 30% | 3% - 18% | 17% - 29% | 15% - 22% |
| **VMT Extent for All States** | 17% - 31% | 0% - 17% | 16% - 31% | 14% - 25% |
| **Qualitative Description (Urban)** | • Serve major activity centers, highest traffic volume corridors, and longest trip demands<br>• Carry high proportion of total urban travel on minimum of mileage<br>• Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area<br>• Serve demand for intra-area travel between the central business district and outlying residential areas | | | • Interconnect with and augment the principal arterials<br>• Serve trips of moderate length at a somewhat lower level of travel mobility than principal arterials<br>• Distribute traffic to smaller geographic areas than those served by principal arterials<br>• Provide more land access than principal arterials without penetrating identifiable neighborhoods<br>• Provide urban connections for rural collectors |
| **Qualitative Description (Rural)** | • Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel<br>• Serve all or nearly all urbanized areas and a large majority of urban clusters areas with 25,000 and over population<br>• Provide an integrated network of continuous routes without stub connections (dead ends) | | | • Link cities and larger towns (and other major destinations such as resorts capable of attracting travel over long distances) and form an integrated network providing interstate and inter-county service<br>• Spaced at intervals, consistent with population density, so that all developed areas within the State are within a reasonable distance of an arterial roadway<br>Provide service to corridors with trip lengths and travel density greater than those served by rural collectors and local roads and with relatively high travel speeds and minimum interference to through movement |

1- *Ranges in this table are derived from 2011 HPMS data.*

2- *For this table, Rural States are defined as those with a maximum of 75 percent of their population in urban centers.*

*Table 3-6: VMT and Mileage Guidelines by Functional Classifications – Collectors and Locals*

| | Collectors | | Local |
|---|---|---|---|
| | Major Collector[2] | Minor Collector[2] | |
| **Typical Characteristics** | | | |
| **Lane Width** | 10 feet - 12 feet | 10 - 11 feet | 8 feet - 10 feet |
| **Inside Shoulder Width** | 0 feet | 0 feet | 0 feet |
| **Outside Shoulder Width** | 1 feet - 6 feet | 1 feet - 4 feet | 0 feet - 2 feet |
| **AADT[1] (Rural)** | 300 - 2,600 | 150 - 1,110 | 15 - 400 |
| **AADT[1] (Urban)** | 1,100 - 6,300[2] | | 80 - 700 |
| **Divided/Undivided** | Undivided | Undivided | Undivided |
| **Access** | Uncontrolled | Uncontrolled | Uncontrolled |
| **Mileage/VMT Extent (Percentage Ranges)[1]** | | | |
| **Rural System** | | | |
| **Mileage Extent for Rural States[3]** | 8% - 19% | 3% - 15% | 62% - 74% |
| **Mileage Extent for Urban States** | 10% - 17% | 5% - 13% | 66% - 74% |
| **Mileage Extent for All States** | 9% - 19% | 4% - 15% | 64% - 75% |
| **VMT Extent for Rural States[3]** | 10% - 23% | 1% - 8% | 8% - 23% |
| **VMT Extent for Urban States** | 12% - 24% | 3% - 10% | 7% - 20% |
| **VMT Extent for All States** | 12% - 23% | 2% - 9% | 8% - 23% |
| **Urban System** | | | |
| **Mileage Extent for Rural States[3]** | 3% - 16% | 3% - 16%[2] | 62% - 74% |
| **Mileage Extent for Urban States** | 7% - 13% | 7% - 13%[2] | 67% - 76% |
| **Mileage Extent for All States** | 7% - 15% | 7% - 15%[2] | 63% - 75% |
| **VMT Extent for Rural States[3]** | 2% - 13% | 2% - 12%[2] | 9% - 25% |
| **VMT Extent for Urban States** | 7% - 13% | 7% - 13%[2] | 6% - 24% |
| **VMT Extent for All States** | 5% - 13% | 5% - 13%[2] | 6% - 25% |
| **Qualitative Description (Urban)** | • Serve both land access and traffic circulation in higher density residential, and commercial/industrial areas<br>• Penetrate residential neighborhoods, often for significant distances<br>• Distribute and channel trips between local streets and arterials, usually over a distance of greater than three-quarters of a mile | • Serve both land access and traffic circulation in lower density residential, and commercial/industrial areas<br>• Penetrate residential neighborhoods, often only for a short distance<br>• Distribute and channel trips between local streets and arterials, usually over a distance of less than three-quarters of a mile | • Provide direct access to adjacent land<br>• Provide access to higher systems<br>• Carry no through traffic movement |
| **Qualitative Description (Rural)** | • Provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks, important mining and agricultural areas<br>• Link these places with nearby larger towns and cities or with arterial routes<br>• Serve the most important intra-county travel corridors | • Be spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within reasonable distance of a minor collector<br>• Provide service to smaller communities not served by a higher class facility<br>• Link locally important traffic generators with their rural hinterlands | • Serve primarily to provide access to adjacent land<br>• Provide service to travel over short distances as compared to higher classification categories<br>• Constitute the mileage not classified as part of the arterial and collectors systems |

1- *Ranges in this table are derived from 2011 HPMS data.*

2- *Information for Urban Major and Minor Collectors is approximate, based on a small number of States reporting.*

3- *For this table, Rural States are defined as those with a maximum of 75 percent of their population in urban centers.*

*State DOTs are required to collect, analyze and publish traffic data on the roadways within their borders. Specifically, through the Highway Performance Monitoring System, each roadway segment on the Federal-aid highway (e.g., urban roadways classified as Minor Collectors and above and rural roadways classified as Major Collectors and above) is required to have an AADT value that is based on an actual traffic count within the last3 years. Therefore, AADT is a readily available and objective metric that can be brought into the functional classification determination process.*

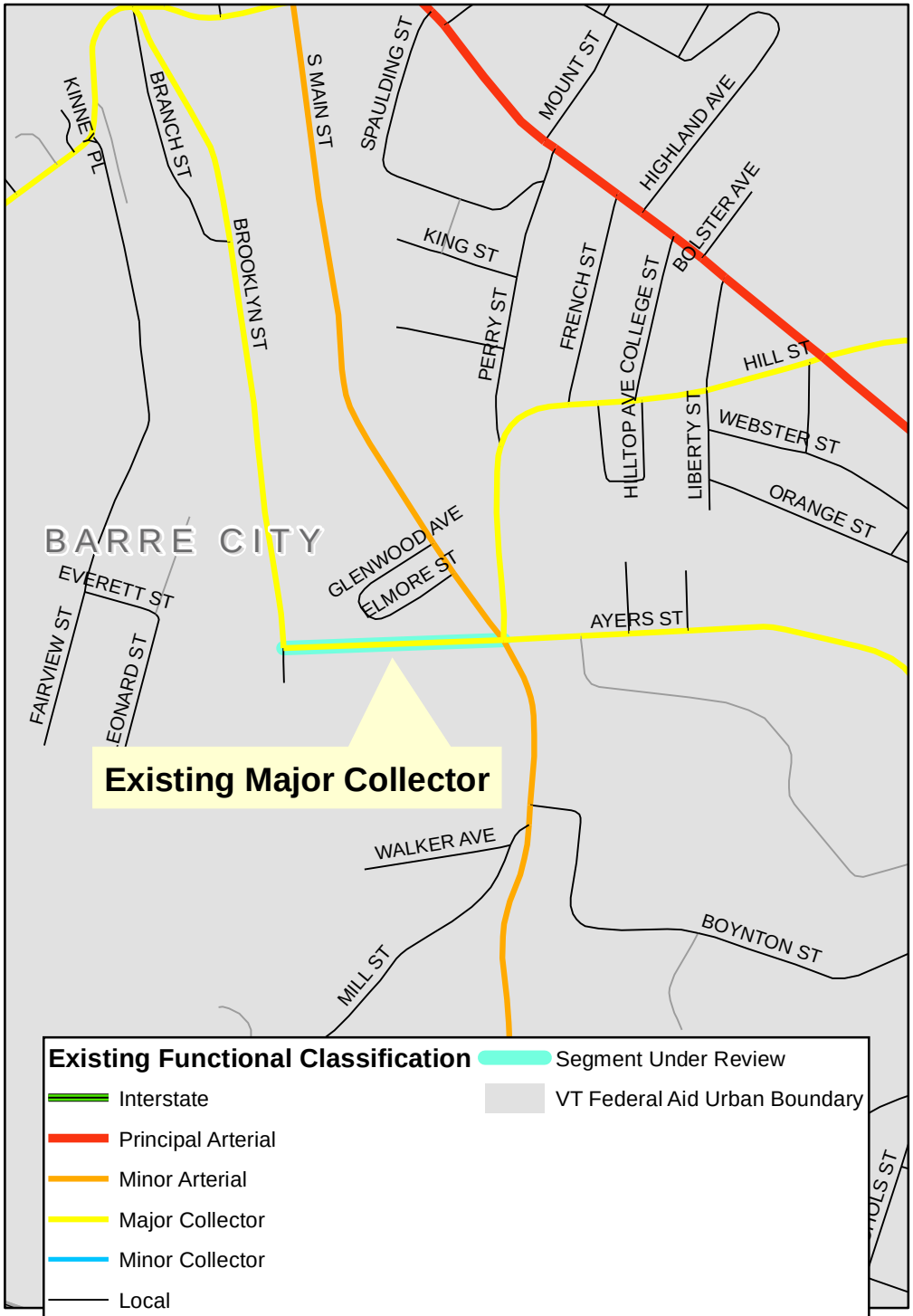
Mileage and Daily Vehicle - Miles of Travel (DVMT) Ranges: While these guidelines should be considered general rules of thumb, FHWA encourages State DOTs to generate similar statistics for their roadway network and evaluate whether they fall within the normal ranges presented here. States should also apply the urban and rural guidelines as appropriate to their urban and rural areas.

Annual Average Daily Traffic: Roadway traffic volumes are typically expressed as annual average daily traffic (AADT) and represent one of the most objective characteristics of a roadway's usage, providing a standard, easy to understand and simple metric for comparing the relative importance of roadways. In general, the higher the traffic volume is, the higher the functional classification will be (relative to the norms in the surrounding area). Therefore, examining the AADT with other roadways in both the immediate vicinity (and in the region as a whole) is helpful when deciding a "borderline" roadway classification. If, for example, when trying to determine whether a given roadway with an AADT of 3,500 should be classified as a Minor Arterial or Major Collector, most of the Minor Arterials (in the immediate area and the region at large) fall within the 4,000 to 10,000 range, and the Major Collectors fall within the 2,000 to 4,000 range, the roadway should be classified as a Major Collector.

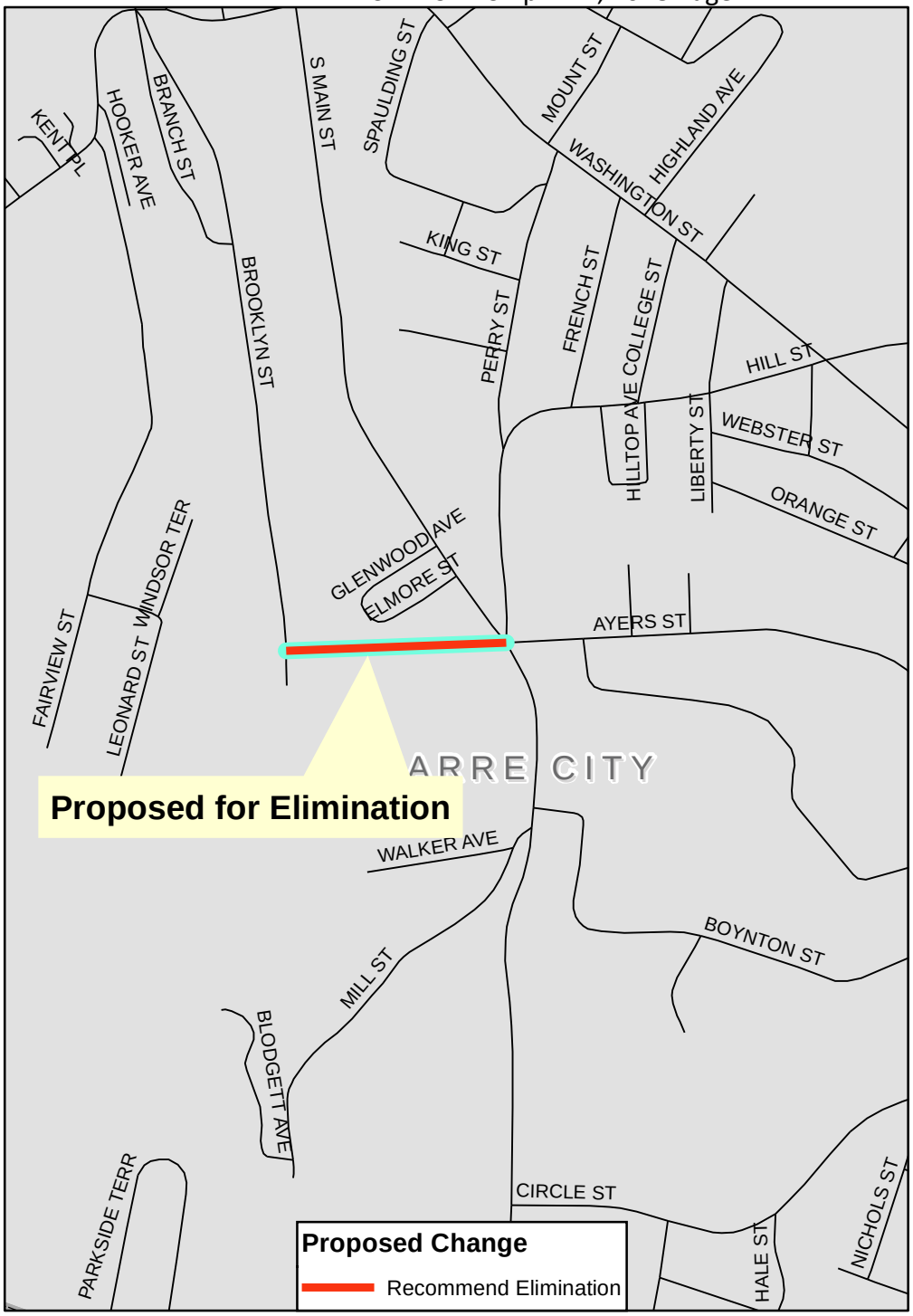
The Big Picture: If there still remains some ambiguity surrounding what classification should be applied to a given roadway, it is often helpful to examine the roadways in close proximity to it and to consider the spacing. For example, if trying to determine whether a roadway should be classified as a Minor Arterial or Major Collector, it is useful to take a "step back" and determine whether any functional classification is under- or over-represented. If the area has a significant number of Minor Arterials, then the roadway could very well be best classified as a Major Collector. Alternatively, if there is not another Minor Arterial within a few mile radius of the roadway (assuming an urban context), then the roadway may best be designated as a Minor Arterial.

Even after careful review of a given roadway's attributes, a small set of roadway segments that are difficult to classify can remain. For this reason, the set of mileage guidelines in Tables 3-5 and 3-6 can help provide high-level guidance regarding both the extent (mileage) and usage (daily vehicle miles of travel [DVMT]) of the roadway system that should fall into the different functional classification categories. While these guidelines have been developed for application at the State level, they can also be applied within regions.

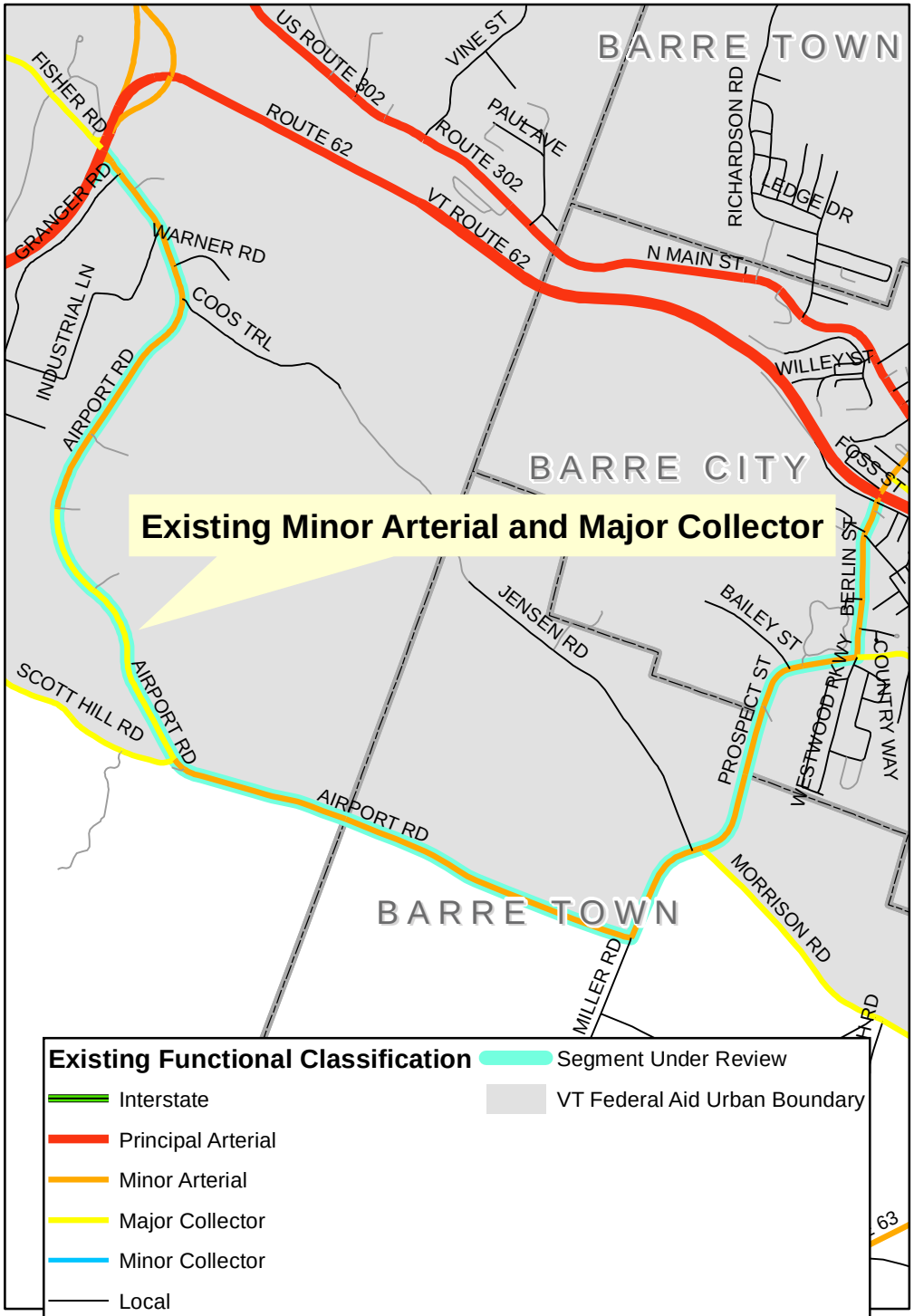
# Existing Road Functional Classification



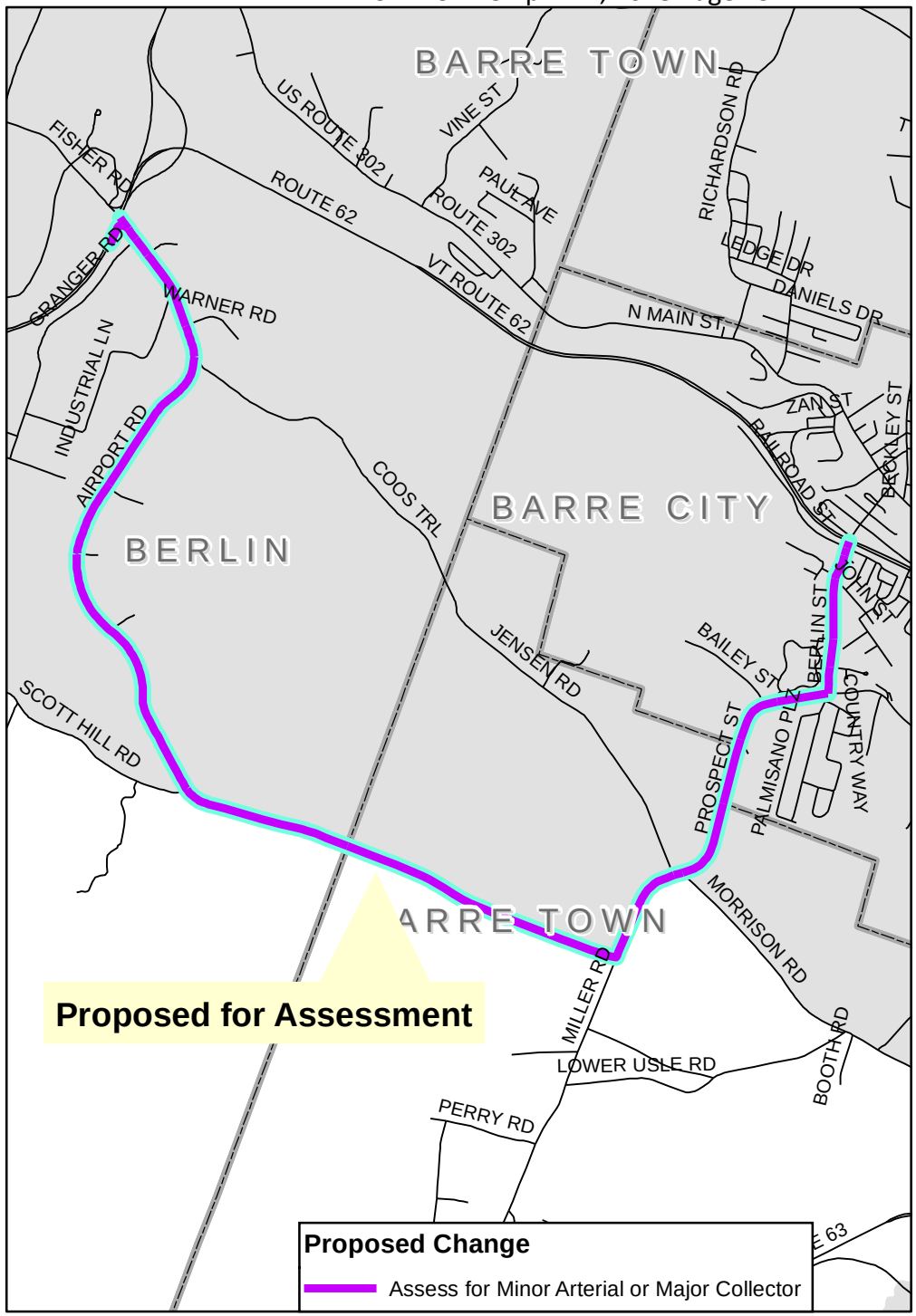

# Proposed Road Functional Classification Change



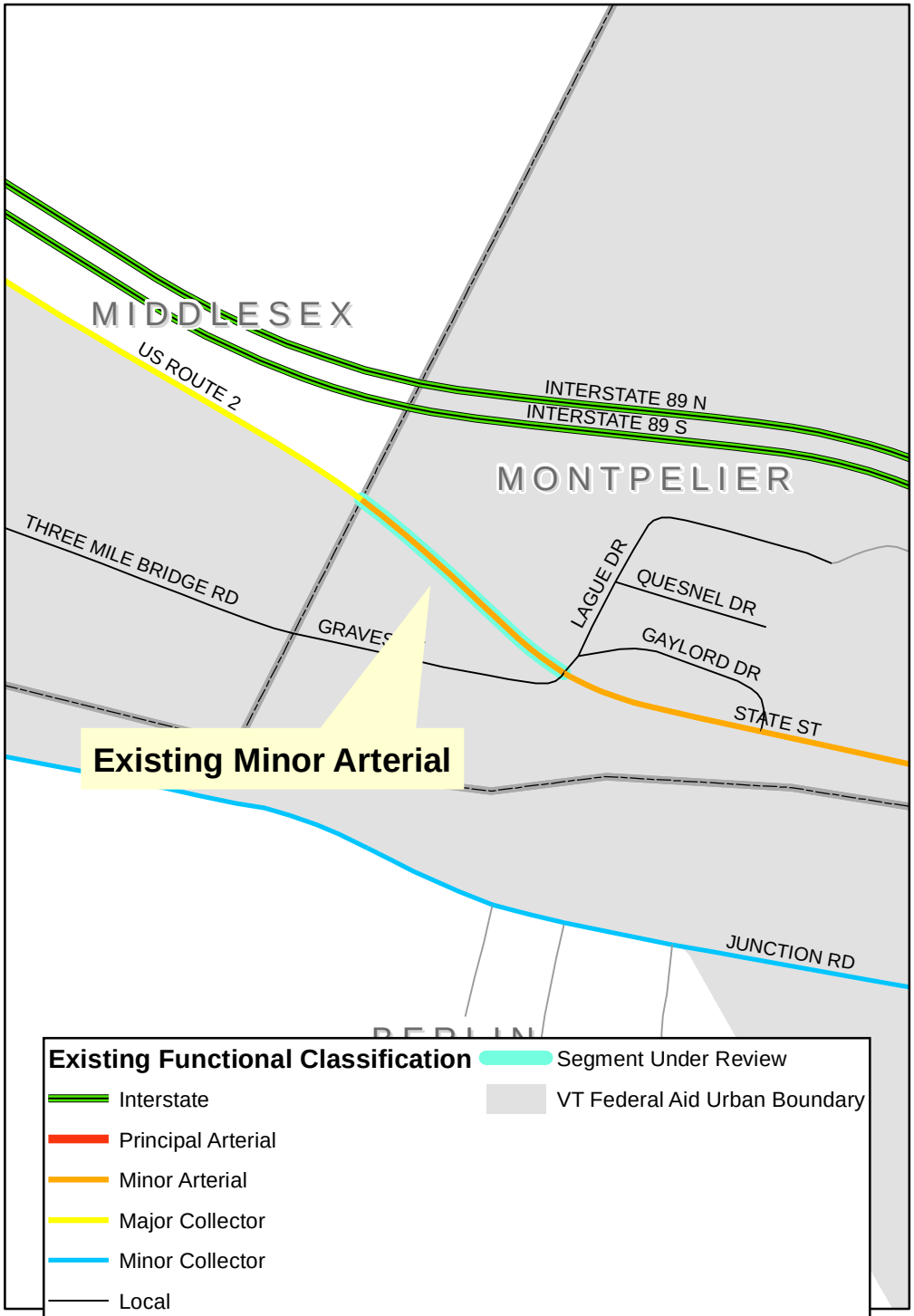
## Existing Road Functional Classification



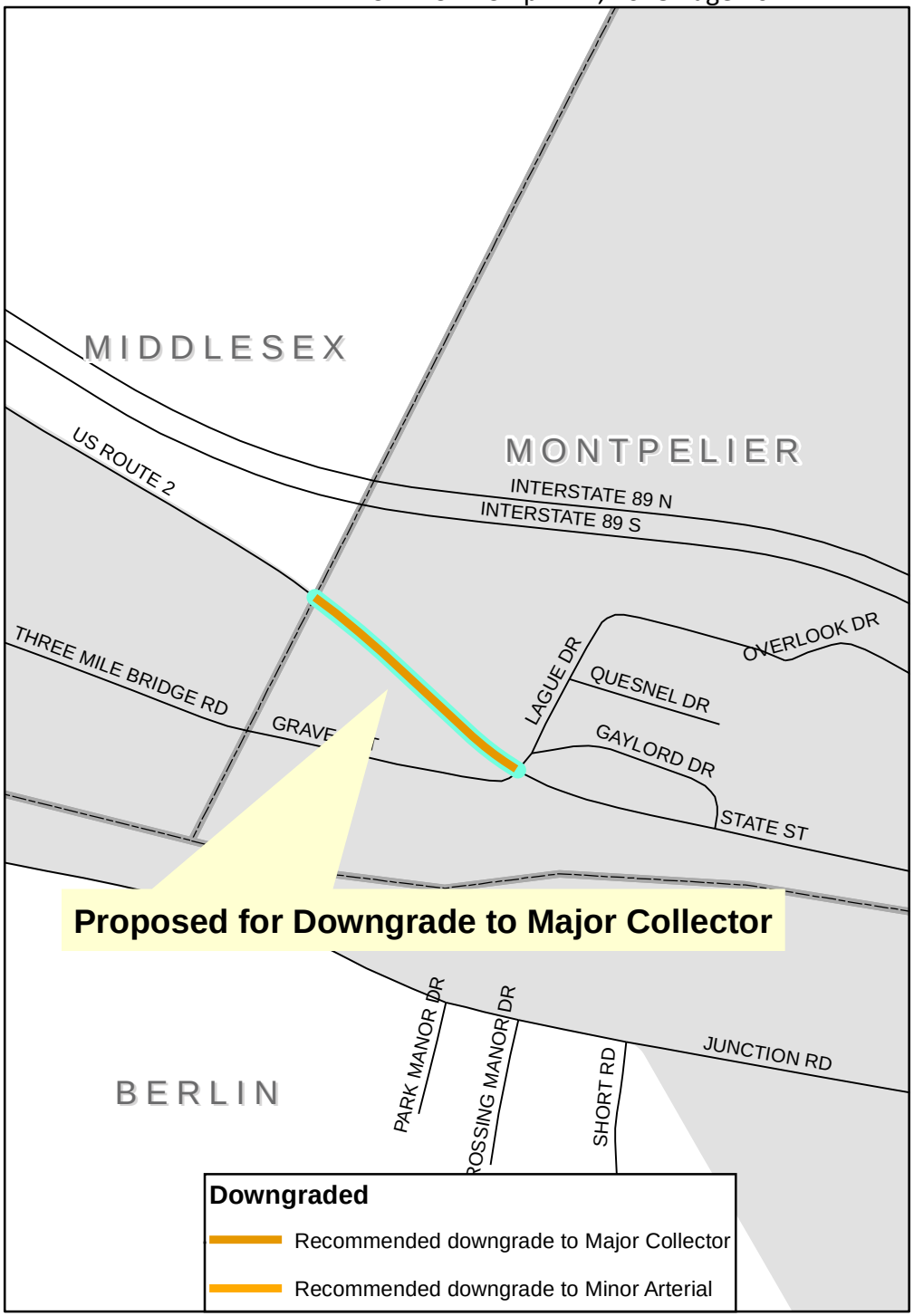

## Proposed Road Functional Classification Change



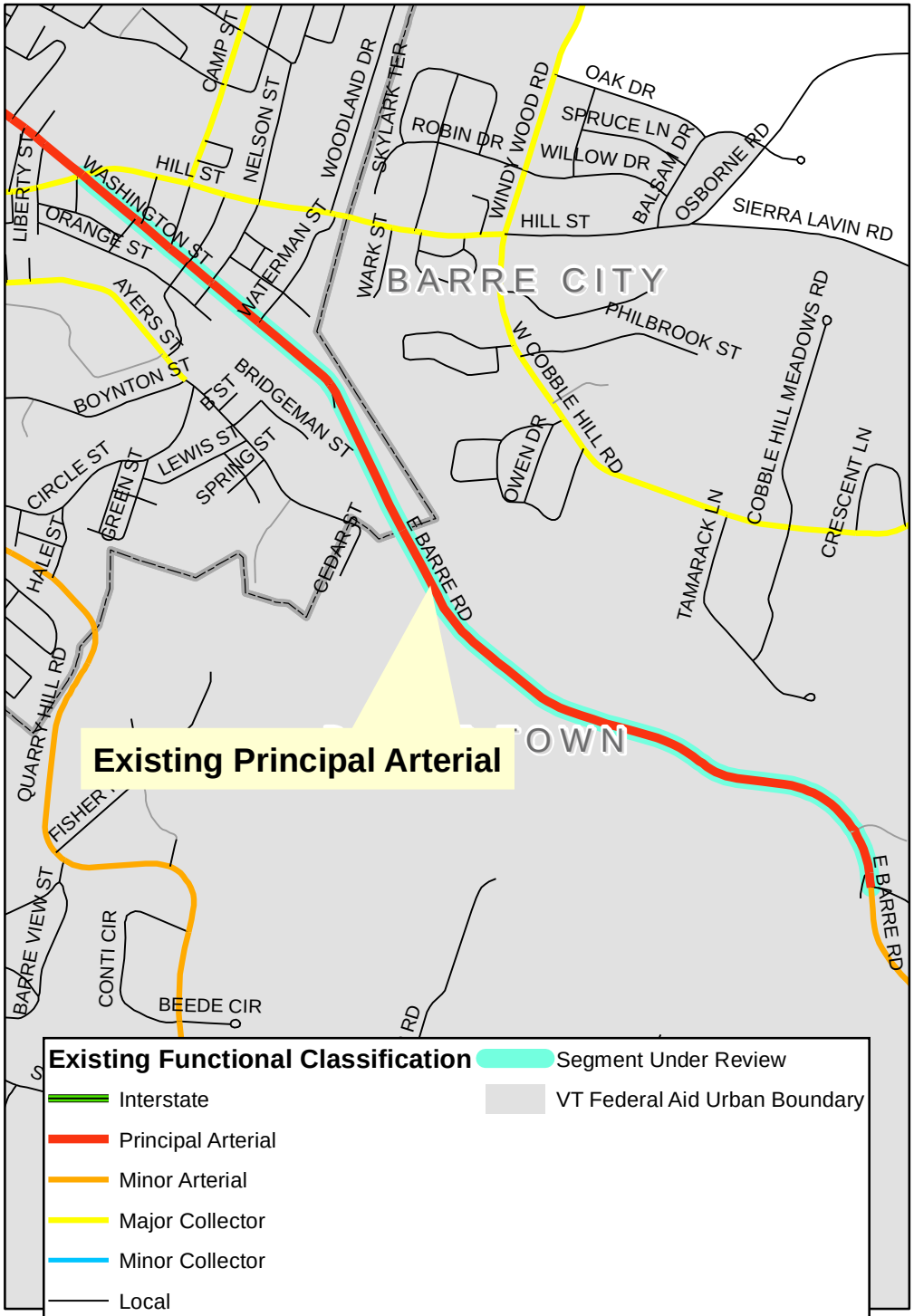
## Existing Road Functional Classification



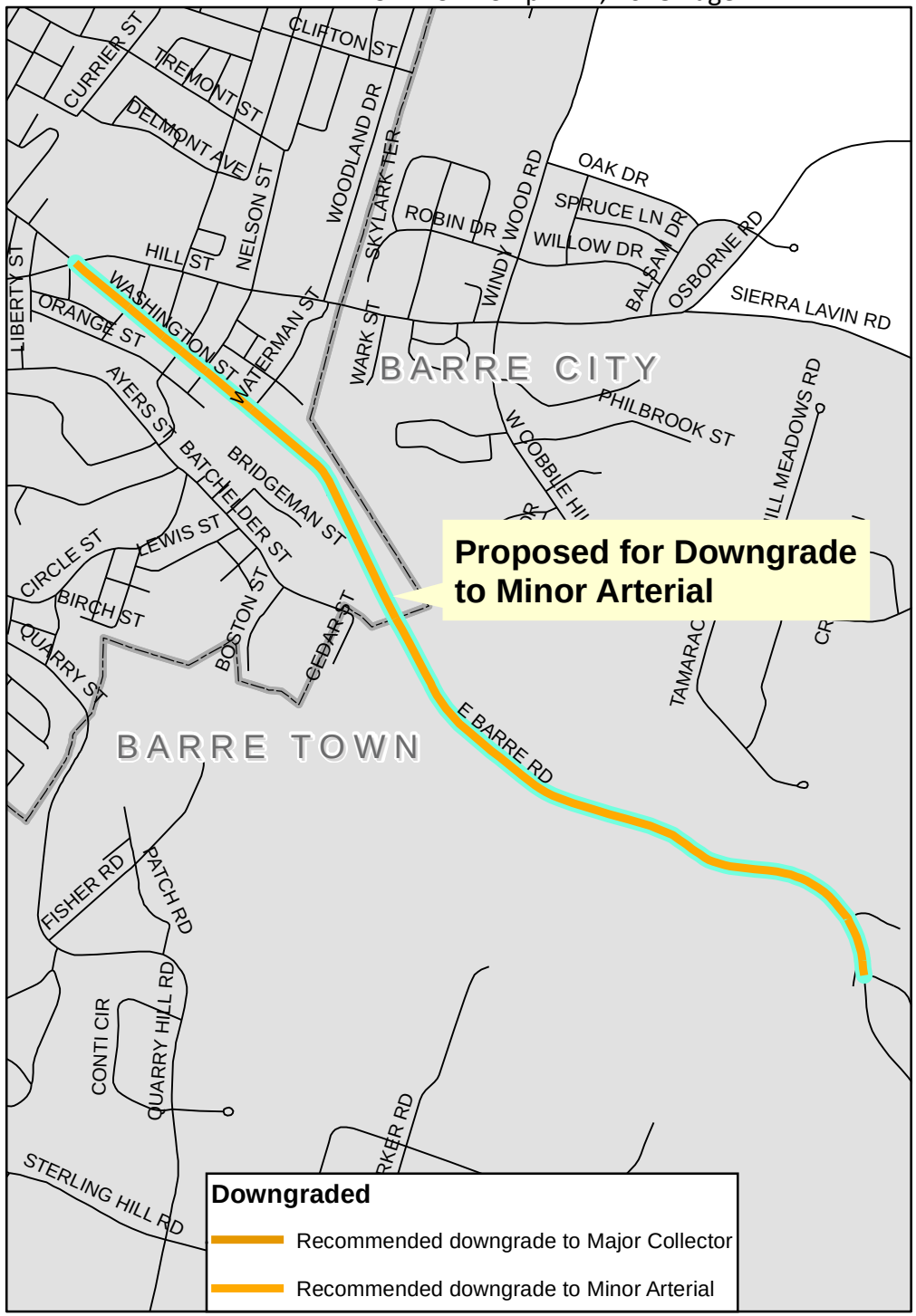

## Proposed Road Functional Classification Change



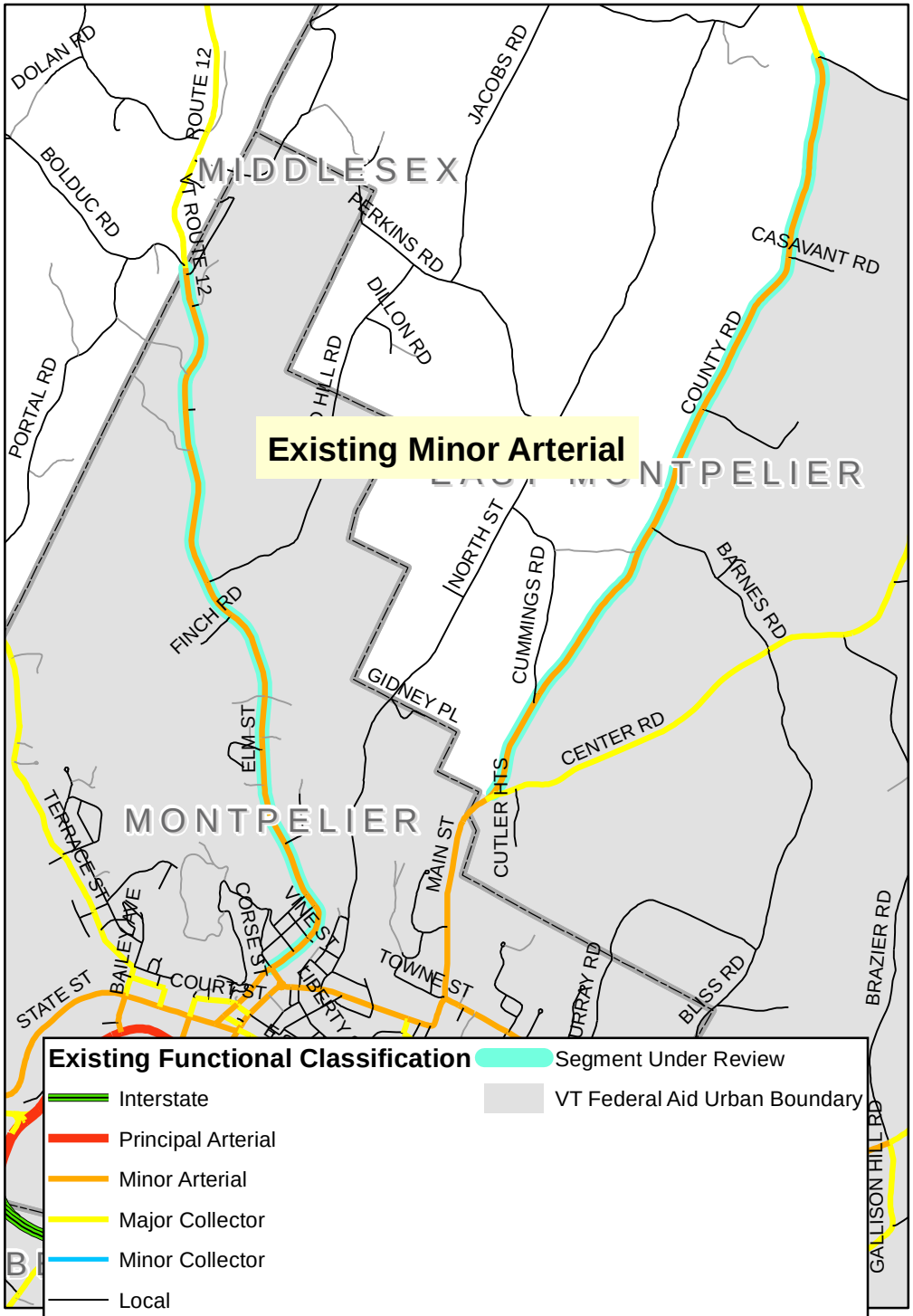
## Existing Road Functional Classification



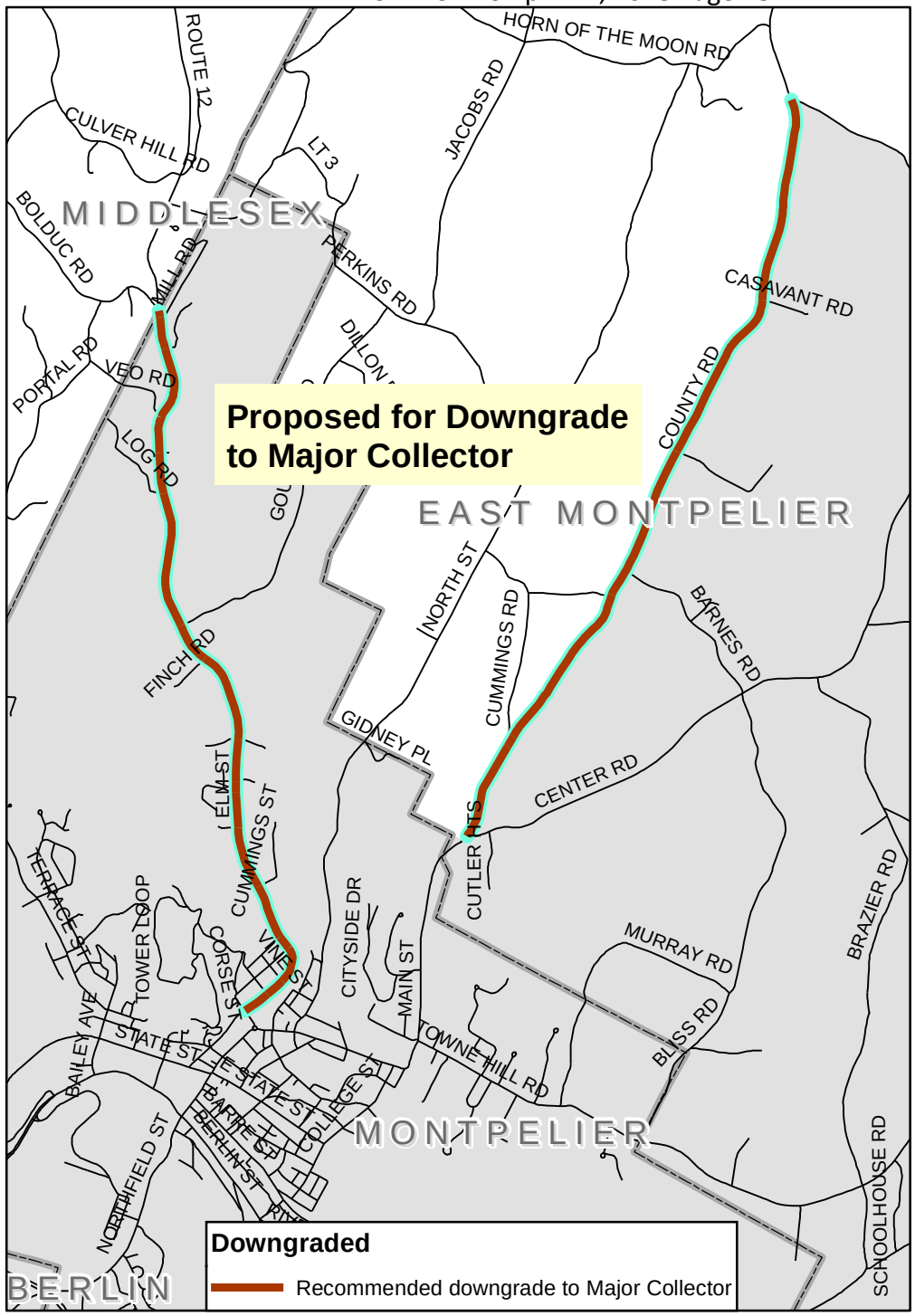

## Proposed Road Functional Classification Change



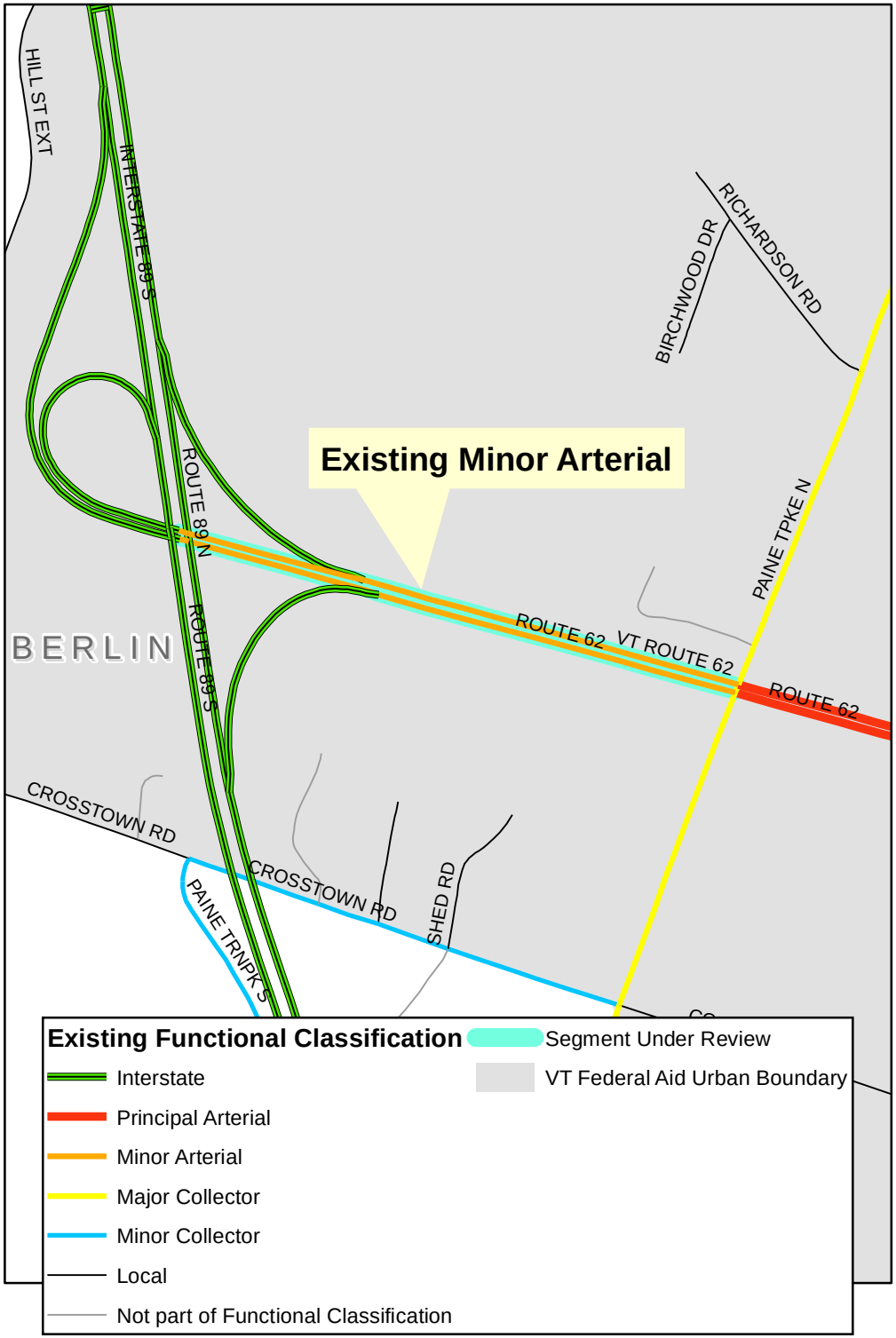
## Existing Road Functional Classification




## Proposed Road Functional Classification Change

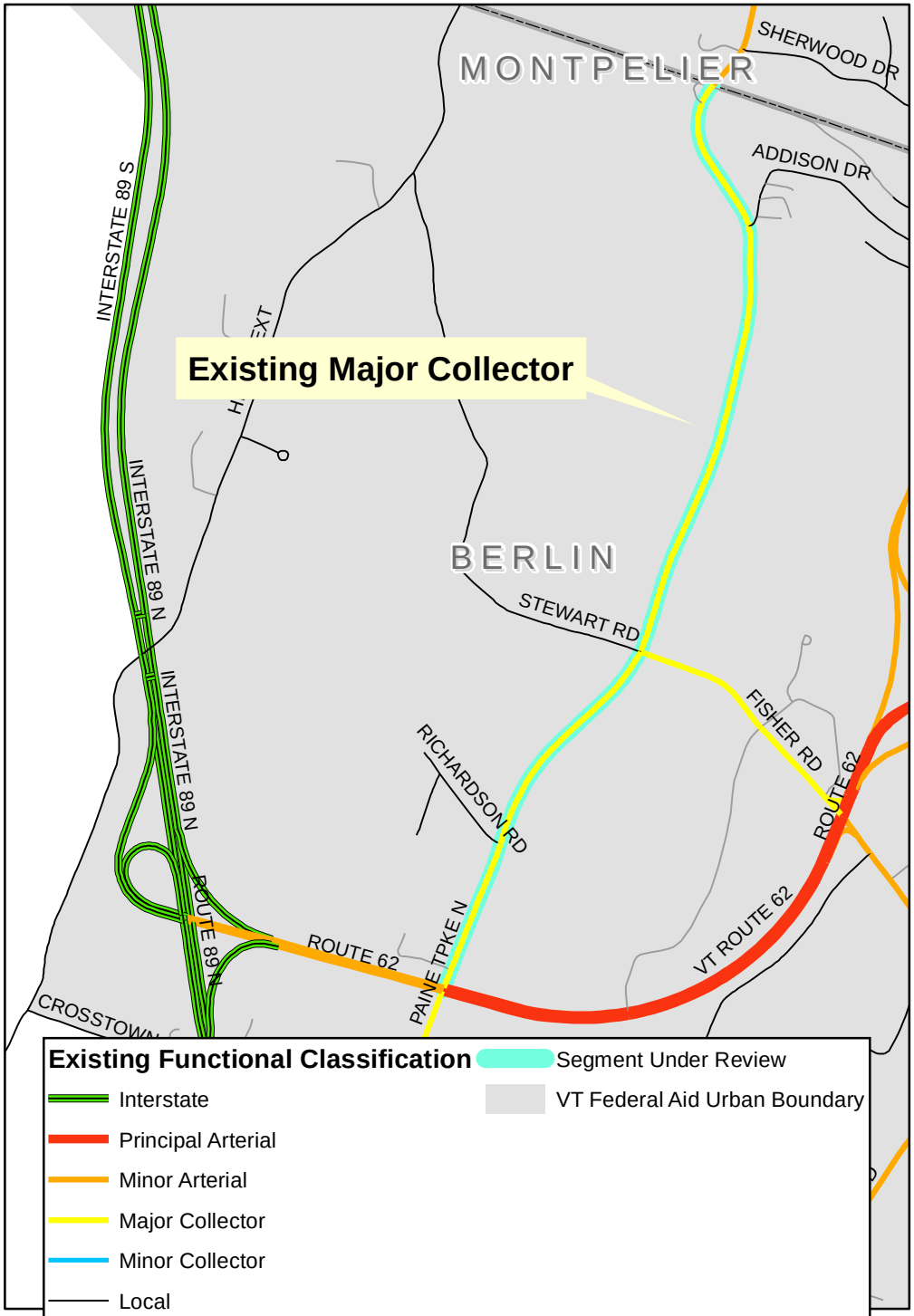


## Existing Road Functional Classification

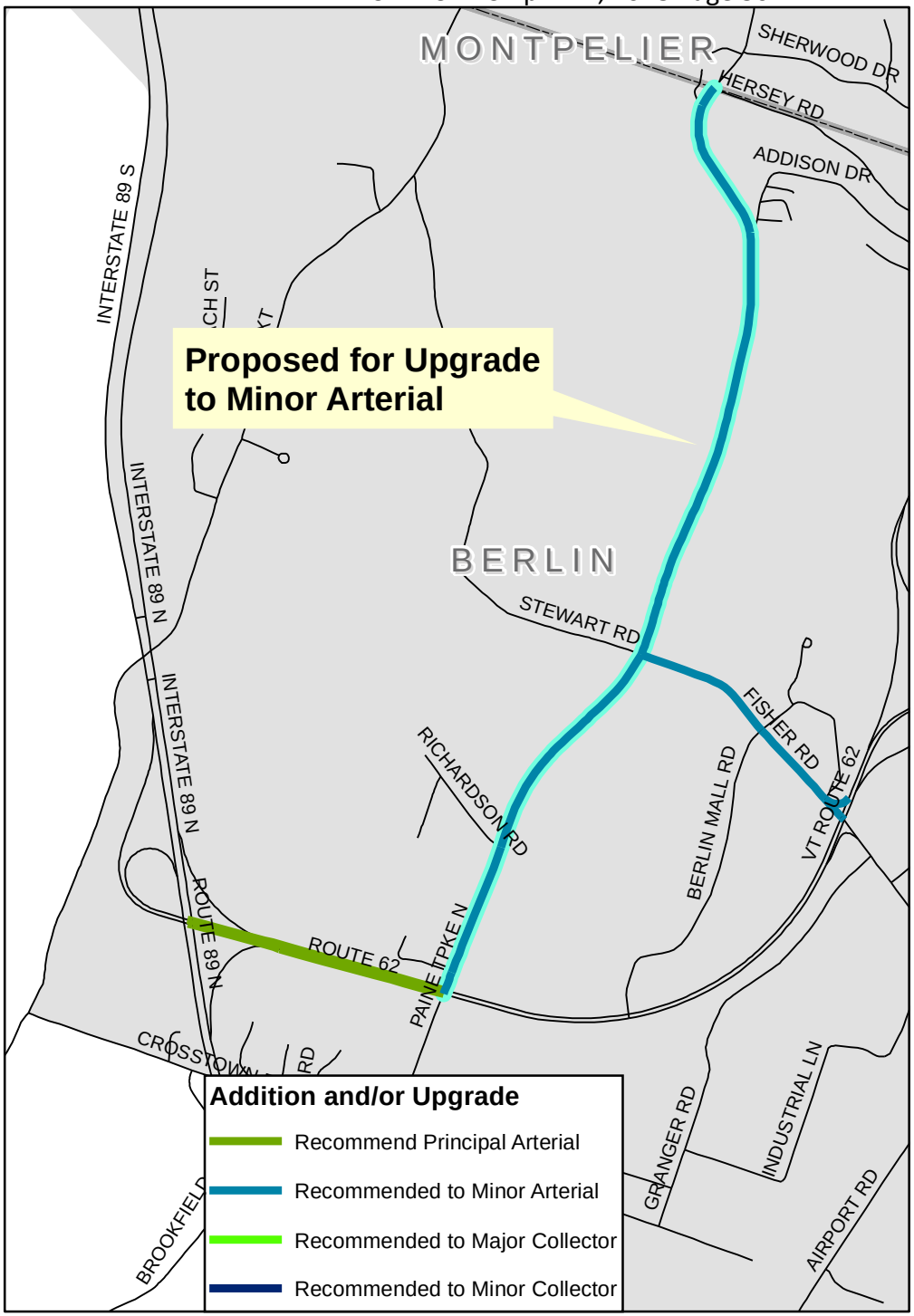



## Proposed Road Functional Classification Change

## Existing Road Functional Classification




## Proposed Road Functional Classification Change



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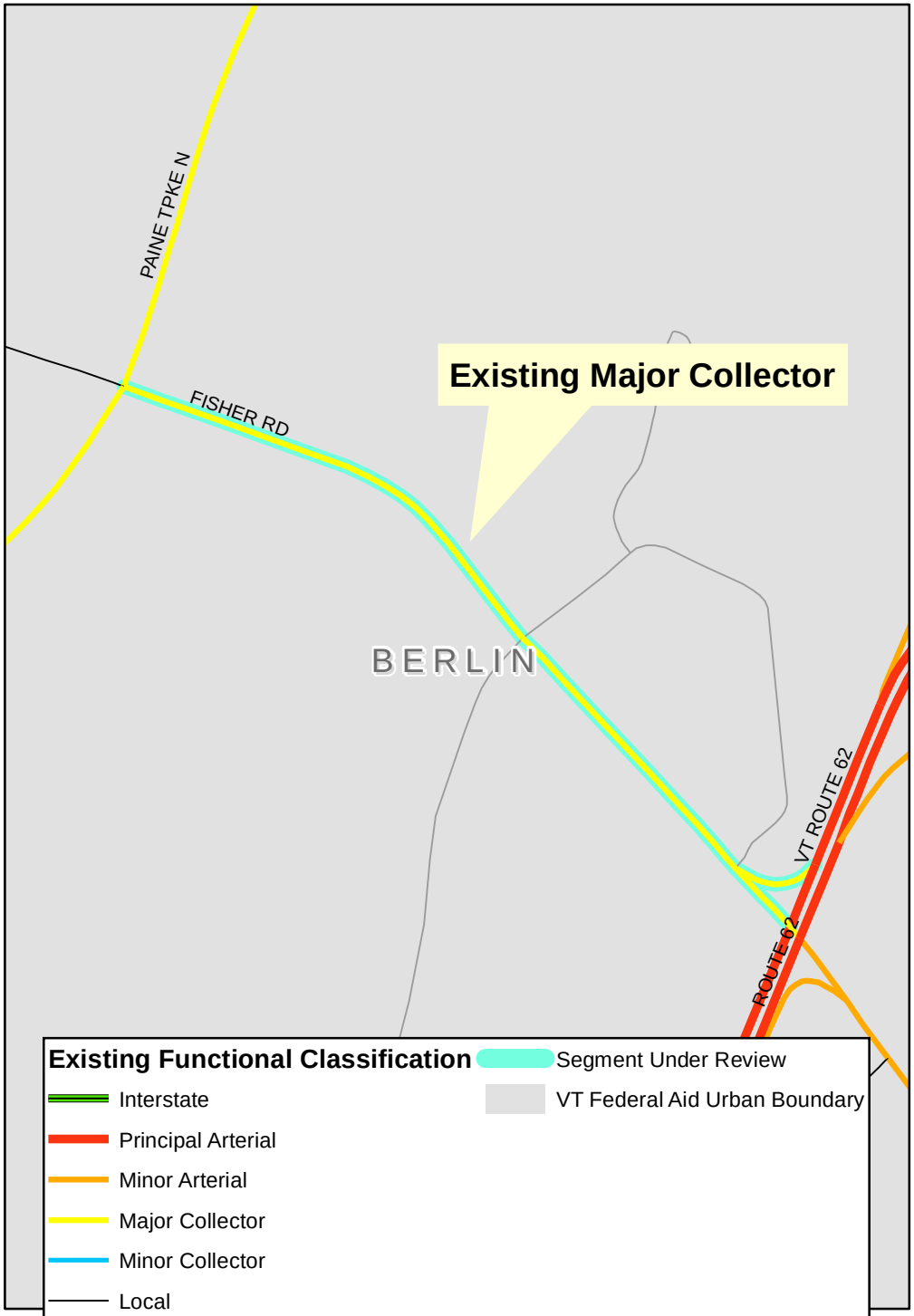


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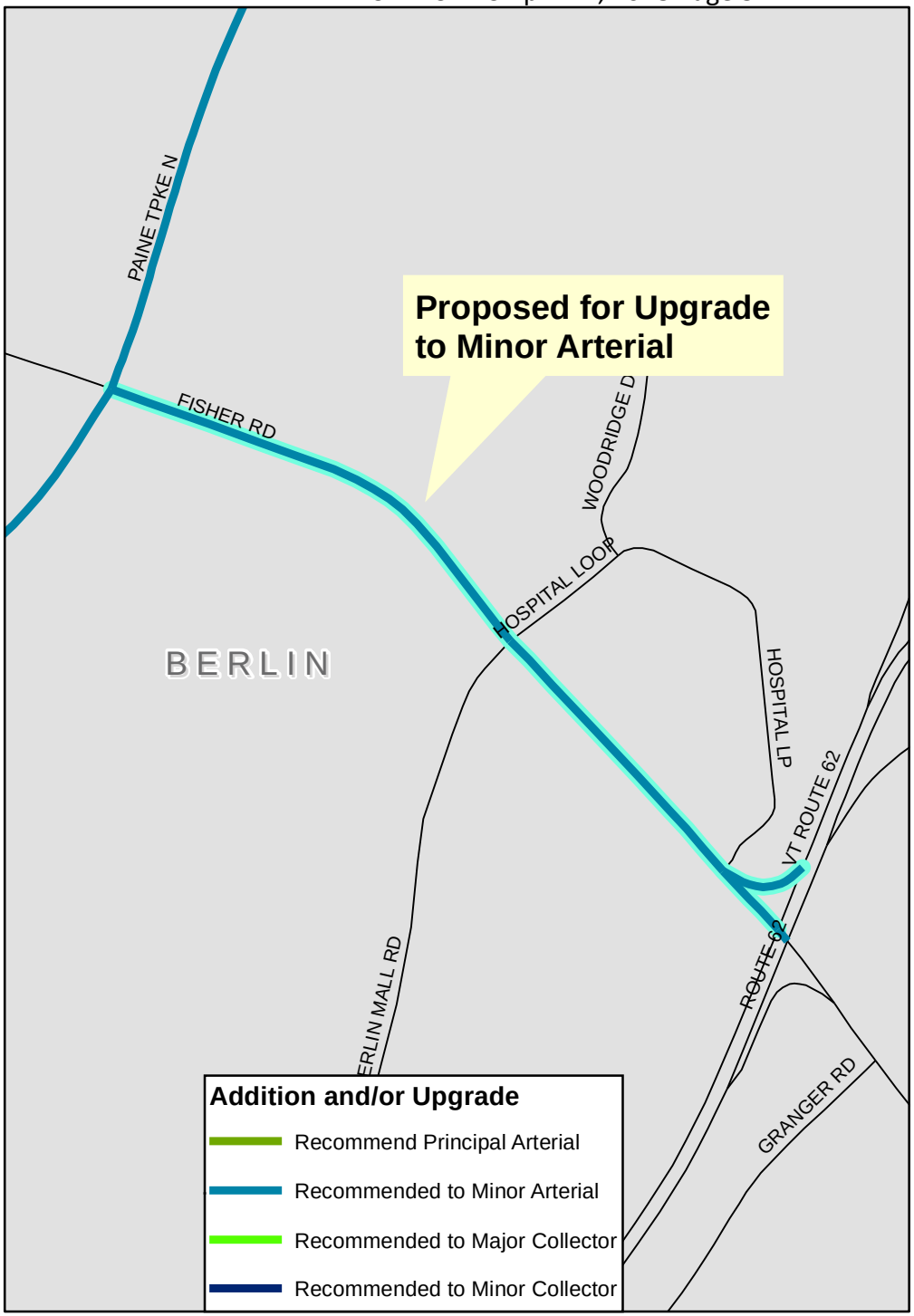

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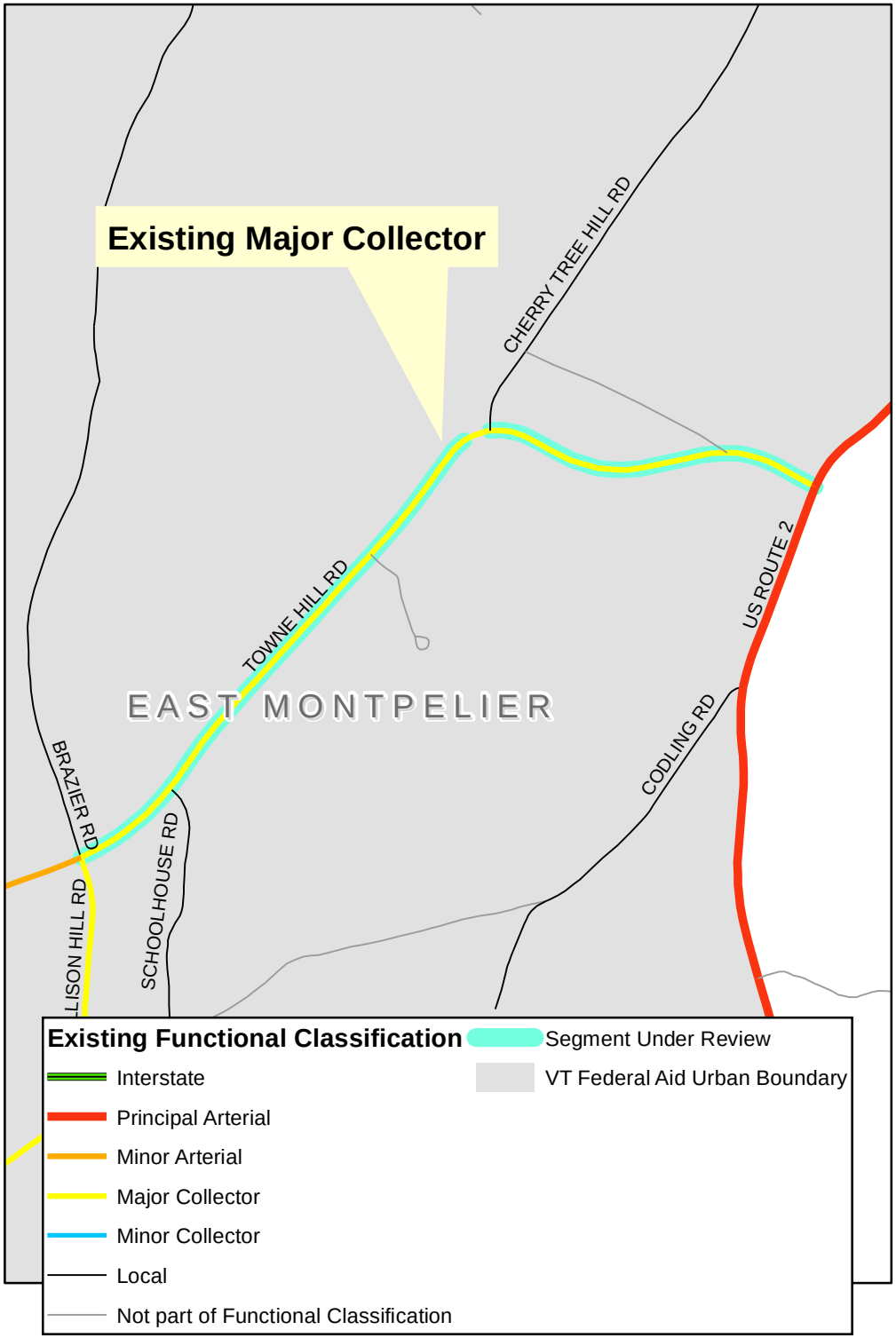


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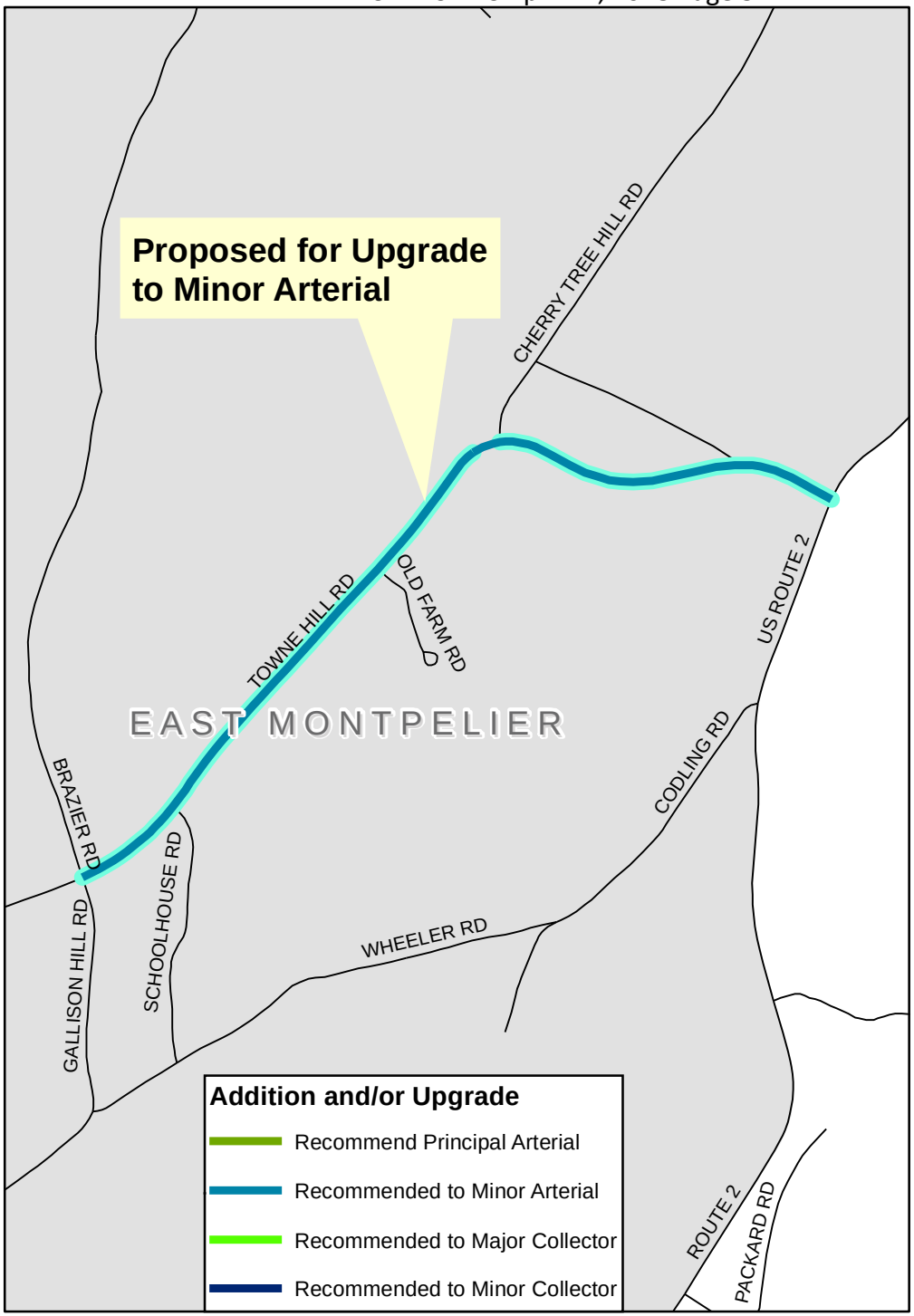
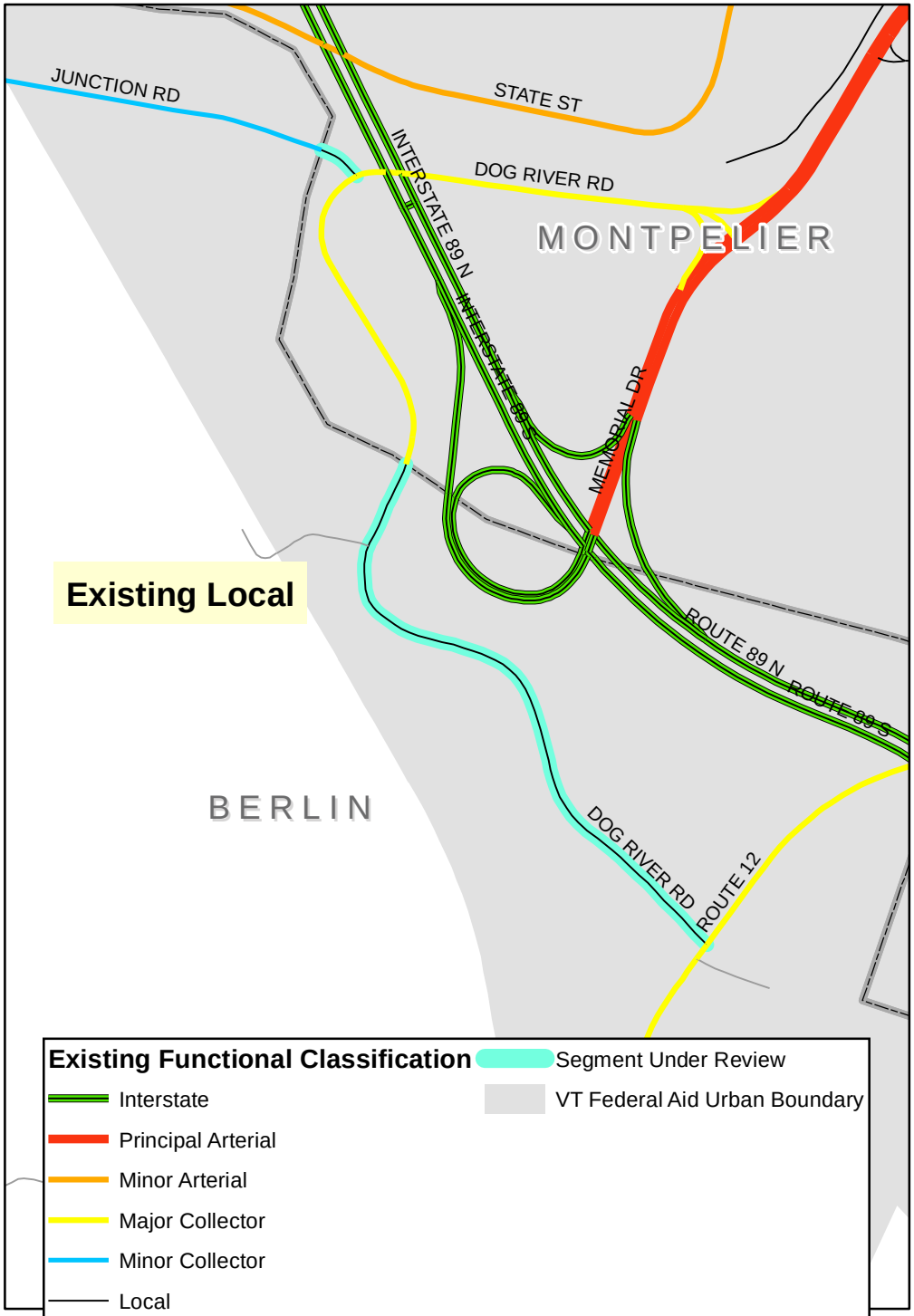
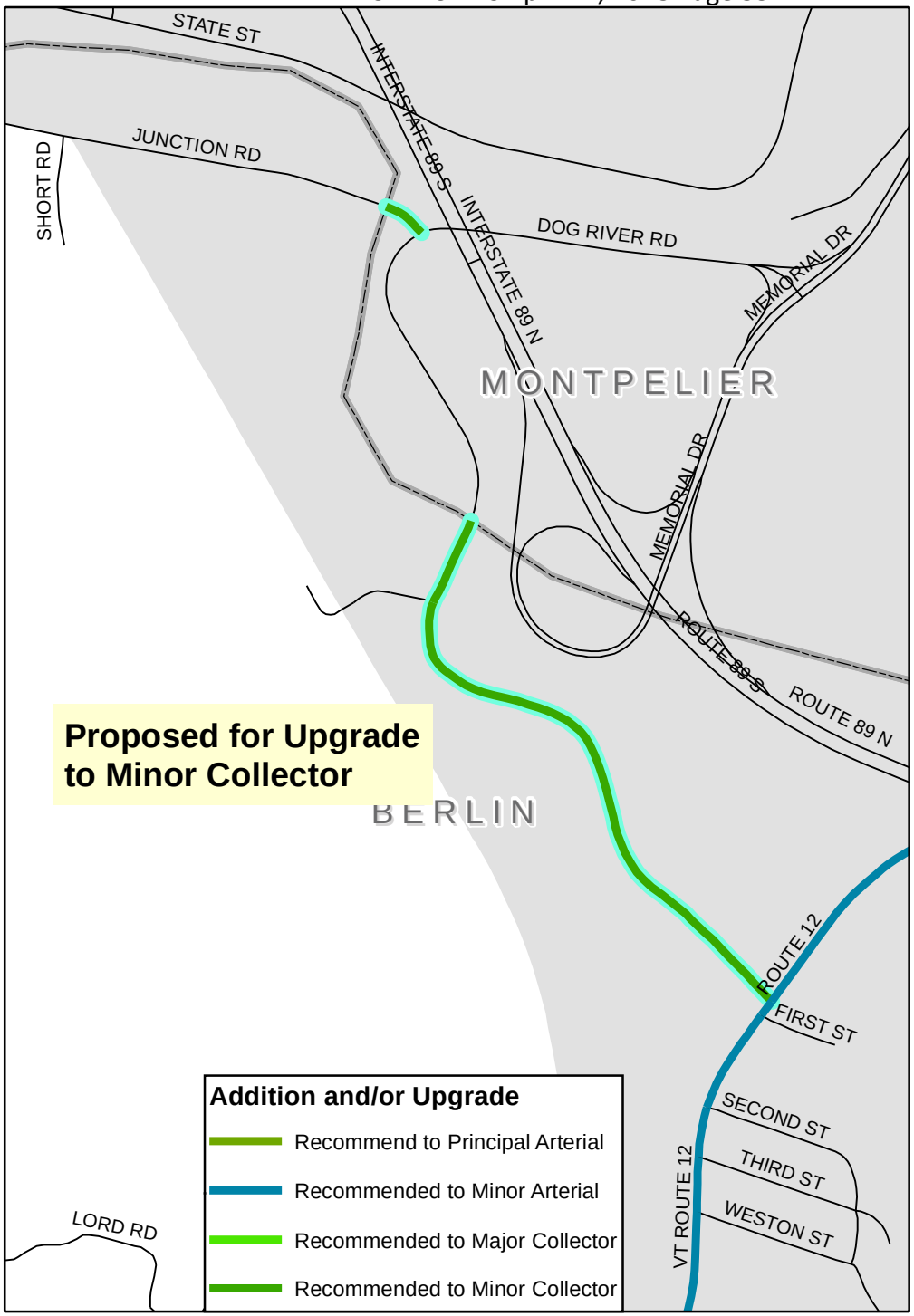


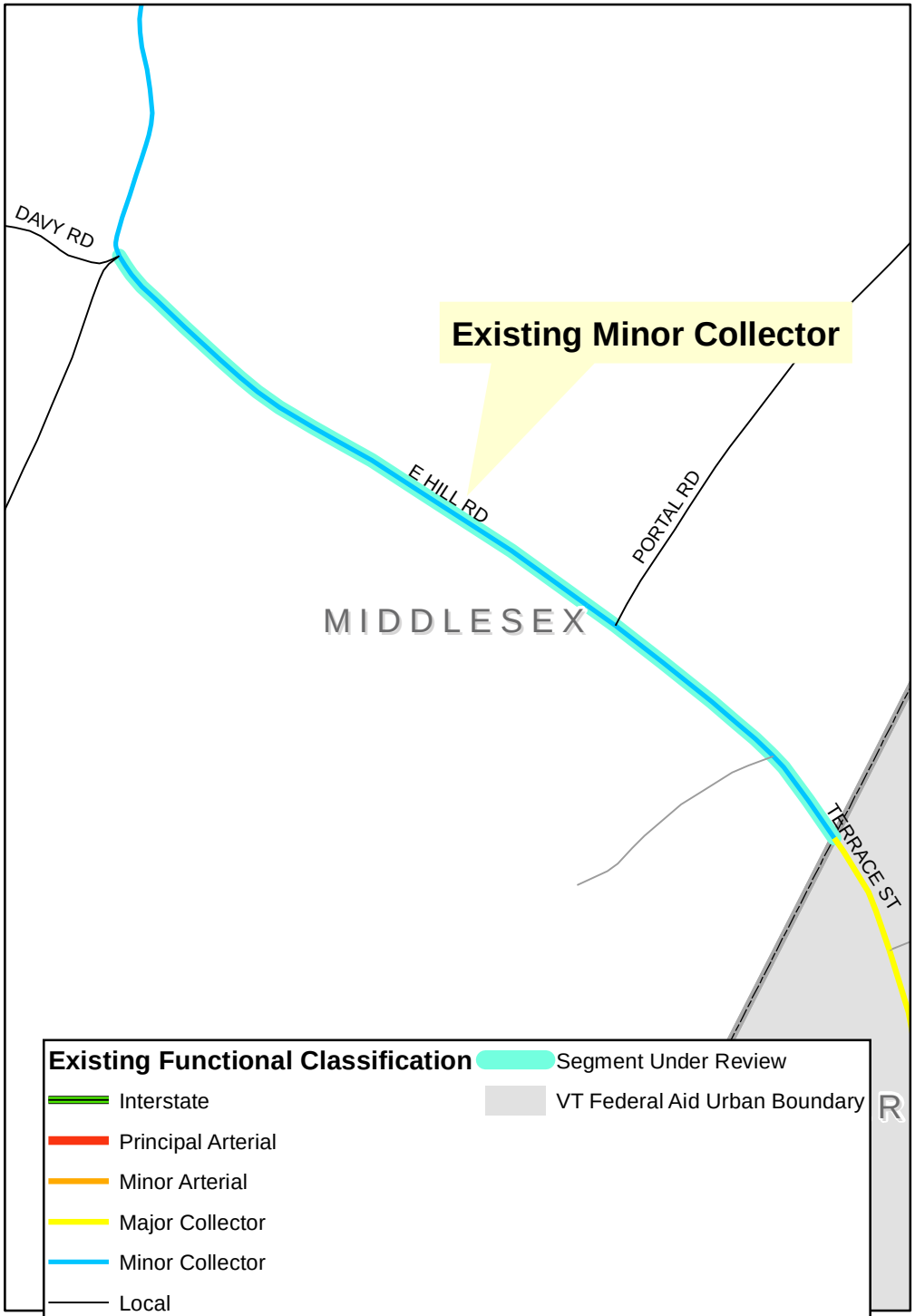
## Existing Road Functional Classification



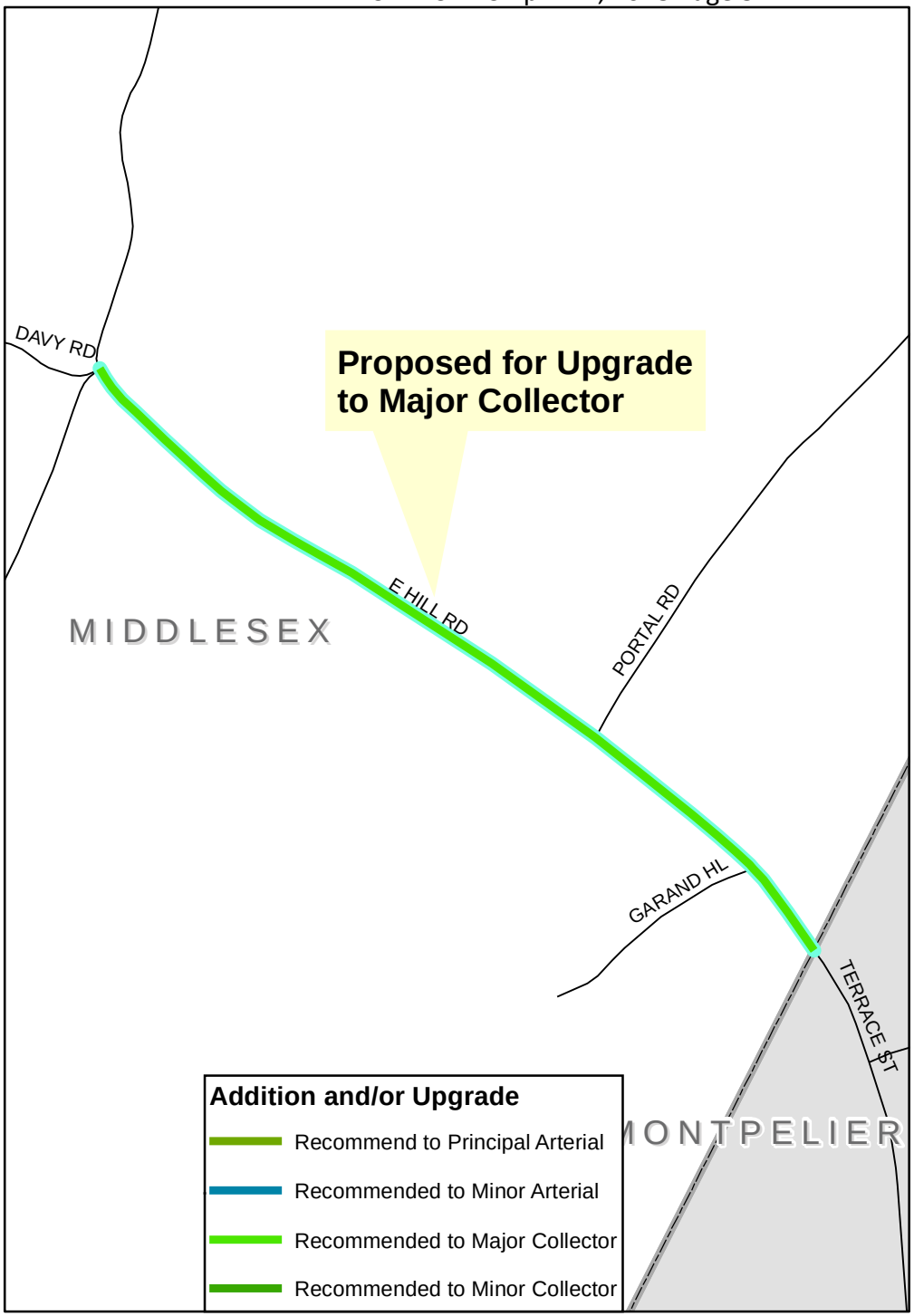

## Proposed Road Functional Classification Change



## Existing Road Functional Classification




## Proposed Road Functional Classification Change



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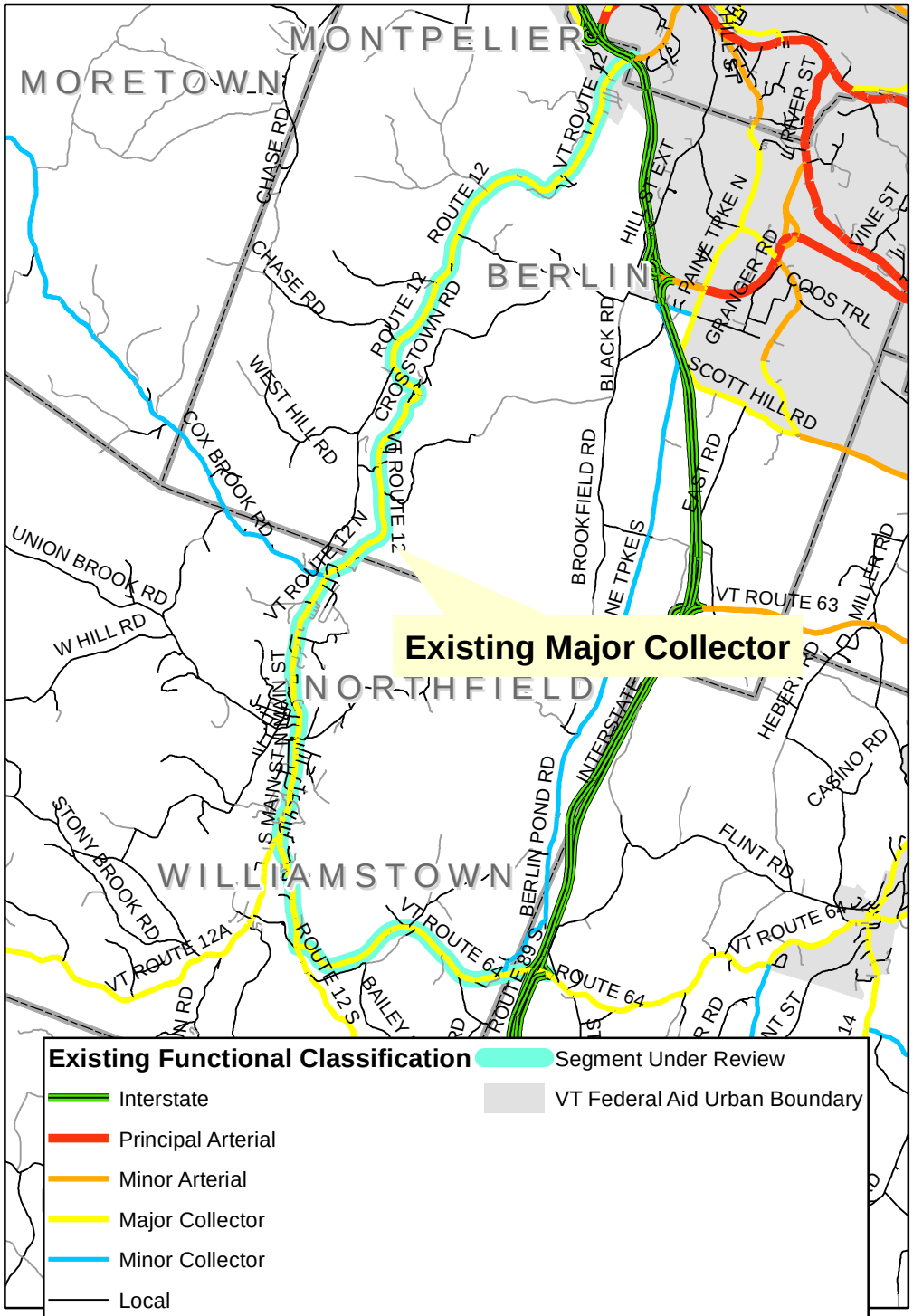
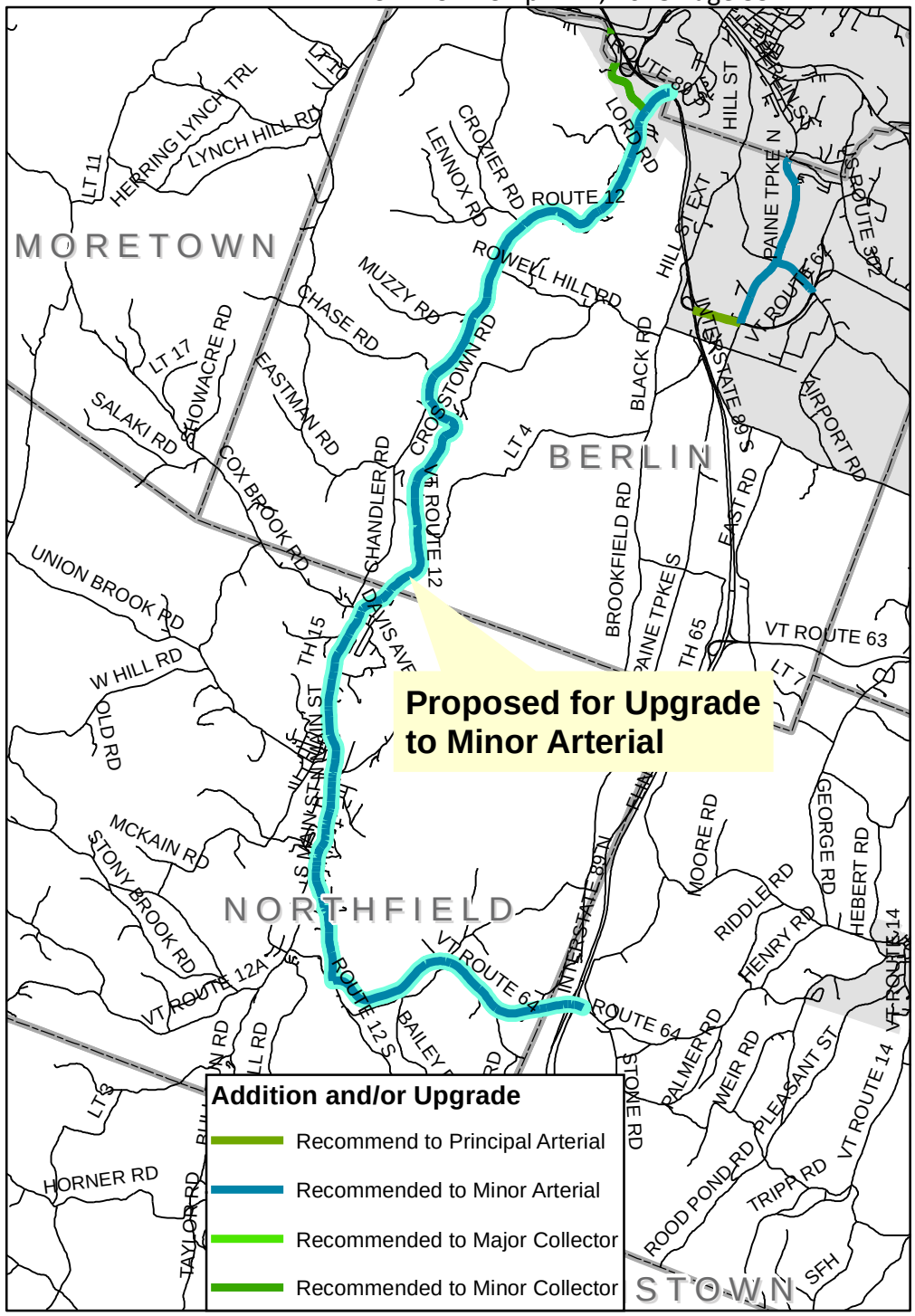



## Proposed Road Functional Classification Change



# TRANSPORTATION UPDATES

April 24, 2018

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These updates are aimed at keeping the TAC informed about potential modifications to State programs and practices that may affect transportation, CVRPC transportation initiatives, VT's Clean Water Act, and other news that may be of interest.

**Update to Transportation Planning Initiative Manual**
VTrans has just released an update to the Transportation Planning Initiative (TPI) manual. This manual is the guiding document for the work the Regional Planning Commissions do to help VTrans meet its Transportation Planning Initiative goals and objectives. A two page brief and full Manual can be downloaded here:
Brief - http://vtrans.vermont.gov/sites/aot/files/planning/documents/TPI%202018.pdf
Manual - http://vtrans.vermont.gov/sites/aot/files/planning/documents/planning/TPI%20Manual_Final%20v3.pdf

**Approval of Rectangular Rapid Flashing Beacons (RRFBs) for use in Vermont**
On March 20, 2018, FHWA issued an Interim Approval that once again allows the use of Rectangular Rapid Flashing Beacons (RRFBs) as a "pedestrian-actuated conspicuity enhancement" for pedestrian and school warning signs under certain conditions. When FHWA issues interim approvals such as this, use of the device requires either a project by project or blanket approval. VTrans requested blanket approval for use of RRFBs in Vermont on both state and locally maintained roads. VTrans recently received notification from FHWA that their request was approved. This means that, subject to the technical considerations in the interim approval, RRFBs may once again be used on local and state roadways in Vermont.

Please contact Jon Kaplan, P.E. Bicycle and Pedestrian Program Manager at Jon.Kaplan@vermont.gov if you have any questions.

**2018 Bicycle and Pedestrian Program Grants Soon to be Announced**
The 2018 round of the VTrans Bicycle and Pedestrian Grants will be announced any day now. Towns interested in applying should visit http://vtrans.vermont.gov/highway/local-projects/bike-ped for more information. There will be $3 million in Federal funding available for scoping, design, and construction projects. The local match for these projects is 20%. The deadline for application is the end of June 2018.

Please contact Jon Kaplan, P.E. Bicycle and Pedestrian Program Manager at Jon.Kaplan@vermont.gov if you have any questions.