Appendix C
Existing Conditions Summary

The City of Montpelier

Montpelier in Motion

Existing Conditions

POSTPONED!

Submitted by:

Broadreach Planning & Design

In conjunction with

RSG Inc.

July 18, 2014

A. INTRODUCTION

1. OVERVIEW

Montpelier in Motion is the pedestrian and bicycle plan for the City of Montpelier, Vermont. The City is developing this plan to serve as a guide for future actions to make bicycling and walking more visible, easier, and more widely undertaken by residents and employees. The plan covers future roadway and sidewalk improvements along with City policies regarding roadway and sidewalk maintenance, walking and bicycling education and encouragement, and local and state bicycling, walking and driving law enforcement. The plan contains overall walking and bicycling goals that the City hopes to reach as well as methods of evaluating progress towards attaining them.

To develop *Montpelier in Motion*, the City organized a Steering Committee of local elected officials, citizens, members of the City's Pedestrian and Bicycling Advisory Committees, and City and regional planning commission staff. After circulating a Request for Proposals, the City selected a consulting team consisting of Broadreach Planning & Design and RSG (the BRPD Team) to assist them with the project.

Figure A-1 shows the overall extent of the City and its bicycle and pedestrian resources.

This summary report is the first product of the work of the Steering Committee and the BRPD Team. The summary describes the existing conditions in the City. The BRPD Team formatted the report for double-sided printing; blank pages are intentional. The BRPD Team has also used the terms walkers and pedestrians interchangeably.

2. HISTORY

The City has been working to expand its bicycling and walking capacity for several years. The City Council and other groups within the City have initiated several activities to increase bicycling and walking activity within the City. One action was to hold a Bike Summit in the late fall of 2012. One set of notes that the City had available from the Bike Summit highlighted a wish list of action items.

Montpelier Bike Summit:
Streets, Infrastructure and Safety Group 11/7/12
Brainstormed Wish List

Education:

- Biker education for bicyclists,
- Education for drivers- what are the laws, how to safely coexist

Infrastructure

- Bike lanes & shared lane markings
- Shoulders widened, reallocate lane space
- Street light improvement
- Timely repainting of lane markings
- Long term goal, dedicated bike lanes in high traffic areas and on routes to key facilities
- Consistent and intuitive bike lane markings
- Advance Central VT Regional Path
- Priority streets suggested: State, Main, North/South routes

Maintenance

- Pothole repair, debris removal, shoulder sweeping
- Snow removal – clear shoulders on priority bike commuting routes
- Examine coordination between town of bike facilities and maintenance related to cycling

Change in practice or ordinance

- Early green light for bikes only
- Examine back-in angled parking

Communication

- "Dangerous spots" list
- Web or phone reporting of dangerous conditions by public
- Establish, map & co-promote loop bike routes that go through multiple towns & return to Montpelier

Action steps

1. Add attendees' names to the Montpelier Bike Summit google group. Solicit more specific input via e-list and other means.
2. Use info above & a public process to formulate a bike master plan for Montpelier
3. Use the criteria of the League of American Cyclists Bike-Friendly Communities program as our roadmap
4. Apply for Bike-Friendly designation for Montpelier.

As information later in this report highlights, several of the items on the wish list are now realities.

In the fall of 2013, a newly formed Bicycle Advisory Committee (BAC) submitted an application to the League of American Bicyclist to be designated a bicycle friendly City. They were rewarded with a Bronze level. The League sent a summary of additional things that the City might do to increase its rating. Key recommendations to further promote bicycling in Montpelier and list of measures that would increase ridership, safety, and awareness include:

- Increase bicycle parking;
- Conform to the Association of Pedestrian and Bicycle Professional (APBP) bicycle parking guidelines;
- Expand the bicycling network and connectivity with bike lanes, cycle tracks, and shared lane markings, particularly along arterial and collector roads;
- Ensure smooth transitions between on and off street bicycle facilities;
- Conform to NACTO Urban Bikeway Design Guide 2012 and AASHTO Guide for the Development of Bicycle Facilities;
- Work with Berlin to continue paved shared-use path;
- Appoint a Bicycle & Pedestrian Coordinator as designated contact person for the bicycling community to work with advocates, elected officials, public health officials, business leaders, etc;.
- Encourage social events to increase bicycling awareness;
- Promote cycling in the workplace; and
- Ensure that bike safety data is reported to public works, engineers, and planners.

Attachment 1 includes a copy of the review.

Later in the fall of 2013, the BAC met to outline their review current bicycling conditions and out their committee's goals for the coming few years. They set a long-term goal of increasing the mileage of bike lanes and shared lanes by 20 percent by 2016. Additionally, they set secondary goals of:

- Adding a range of well-marked bike routes and trails that accommodate a range of abilities and are connected to other networks, with maps and signage that clearly identify the routes;
- Educating and training both drivers and bicyclists on road safety and sharing the road through classes, signage, outreach activities, and handouts;
- Supporting outreach events, bicycle benefits programs, and

- Adding safe bike parking throughout the city to encourage and increase bicycle usage.

This spring of 2014, the Pedestrian Advisory Committee (PAC) prepared an application to considered a Walk Friendly Community. The application includes a lot of information on current walking conditions within the City. **Attachment 2** includes a copy of the application.

3. PURPOSE AND NEED OF THE PLAN

The purpose of the *Montpelier in Motion* plan is to serve as a guide for future bicycling and walking improvements within the City. The city needs to responsibly allocate its limited resources and having a walking and bicycling master plan will allow it to do so in the most efficient manner. The *2010 City of Montpelier Master Plan* (*2010 Master Plan*) includes support for creating a Master Plan. **Appendix 3** includes a copy of the Transportation Section of the *2010 Master Plan* with related figures. Additional needs for *Montpelier in Motion* are numerous (listed in no particular order!):

- Mounting congestion in the downtown can be reduced by increasing walking and bicycling as a means of transportation.
- Enhancing the aesthetic experience of walking can increase the number of walkers.
- Knowing what type of walking and bicycling hazards exist and where they are located can help the city eliminate as many of them as possible.
- Prioritizing bicycling and walking construction & repair activities is easier when there is a master plan.
- Walking and bicycling can improve the health of residents.
- Increasing non-motorized connections to popular destinations increases the likelihood that people will walk or bicycle there rather than drive a motor vehicle.
- Understanding where gaps in the current bicycling and walking networks helps fill them faster.
- Providing better bicycling and walking conditions afford transportation to a wider range of residents of all ages and abilities.
- Improving walking and bicycling conditions creates more livable cities.
- Increasing walking and bicycling activities in cities has a very positive economic development affect.
- Walking and bicycling creates less deterioration of City infrastructure than driving motor vehicles.
- Encouraging walking and bicycling activities typically results in more walkers and bicyclists.

4. USERS

The City would like to continually improve walking and bicycling conditions within the City for people of all ages and abilities.

Walkers: People vary significantly in their walking abilities, experience, and willingness to walk different distances. Strong determining factors for walkers are the time and mobility required to reach their destinations. Time and mobility constraints also dictate their usable geographic space; few walkers will venture more than one mile from point to point; most will only undertake trips shorter than one half mile, unless the trip is recreational or there is some visible destination or landmark.

There are three basic types of walkers:

- Active walkers,
- Basic walkers, and
- Restricted walkers.

Active walkers use the road system regularly for transportation, as well as for fitness. They know and generally follow the rules of the road.

Basic walkers include the majority of older children and healthy adult walkers.

Restricted walkers are those whose speed and mobility are extremely limited.

In all cases, for safety and visibility reasons, when walking on roads, people should walk FACING traffic on the left side of the road in the direction of travel. This is also part of Vermont State Law.

Bicyclists: Among bicyclists, there are three typical user groups that can be expected to use the bicycle facilities:

- Advanced bicyclists,
- Basic bicyclists, and
- Beginner bicyclists or children.

Advanced bicyclists are highly experienced bicycle riders who feel comfortable riding their bikes in heavy traffic and typically prefer to ride on roadways.

Basic bicyclists comprise the largest category of bicycle riders, including older children, inexperienced adult riders, occasional bicycle commuters, recreational adult bicyclists and experienced riders who still fear or dislike riding in heavy traffic conditions. Basic bicyclists are reasonably competent in handling their bicycles and they generally understand the rules of the road, but they ride at more moderate speeds and are

generally uncomfortable on busy streets unless a striped, obstacle-free shoulder is provided and traffic volumes are low.

Beginner bicyclists have the weakest bicycling skills. Beginner bicyclists ride more slowly, don't always understand the rules of the road, and are typically uncomfortable riding with motor vehicles. They are best accommodated on low-speed local roads and multi user paths or even sidewalks for the very young where there are few, if any, driveway crossings.

When riding on roadways, bicyclists should always ride with traffic on the right side of the road in the direction of travel. Unless the road is clear, bicyclists should ride single file.

B. TRANSPORTATION FACILITIES

1. WALKING FACILITIES

A. OVERVIEW

Walking facilities include the sidewalks in the City but also includes trails and paths, along with shared use paths that serve both walkers and bicyclists. Walking facilities within Montpelier also include related infrastructure improvements. The following section provides more details on the various elements of the walking facility network along with information on the maintenance and management of these elements.

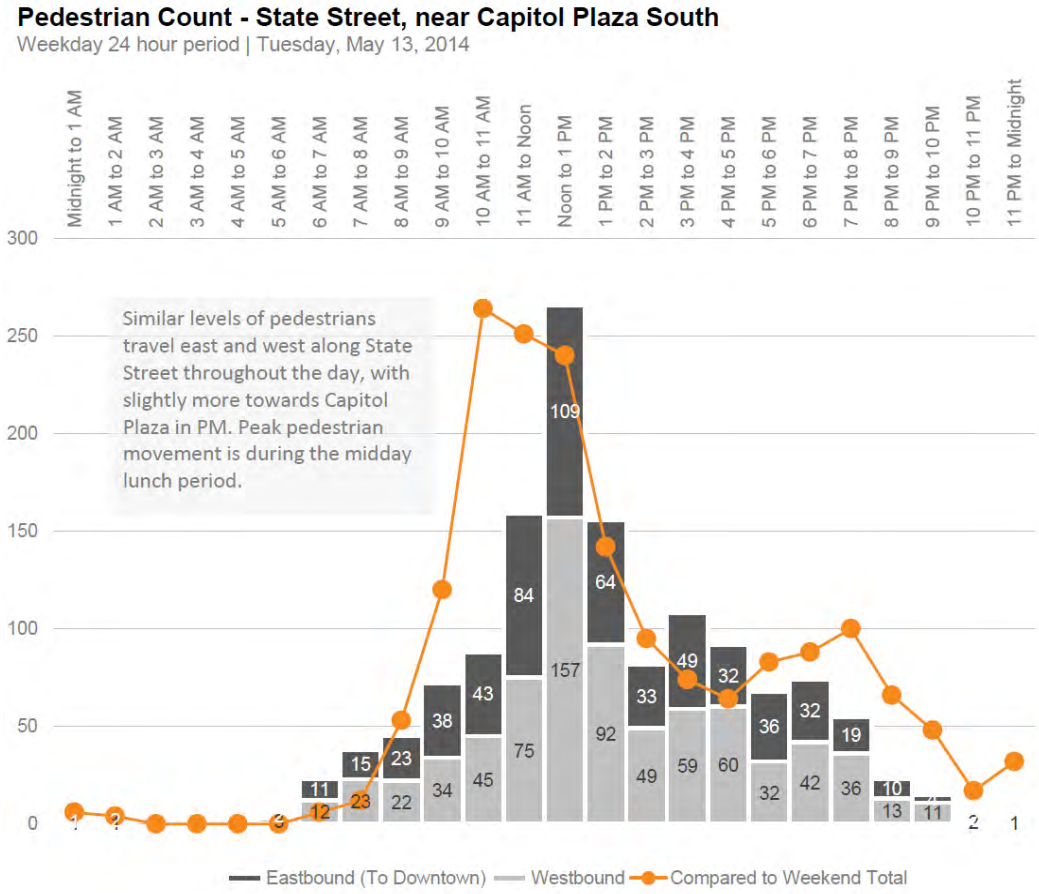
The description of the various issues of the existing sidewalk/walking network in this section is meant only as an objective look. It is not in any way meant to be a judgment of the facilities or management practices.

B. WALKER VOLUMES

Several walker counting stations have been operating in Montpelier for a number of years, accumulating a good set of statistics of the yearly changes in pedestrians at the location of the counting station. The data, along with that collected at other locations, provides the following information.

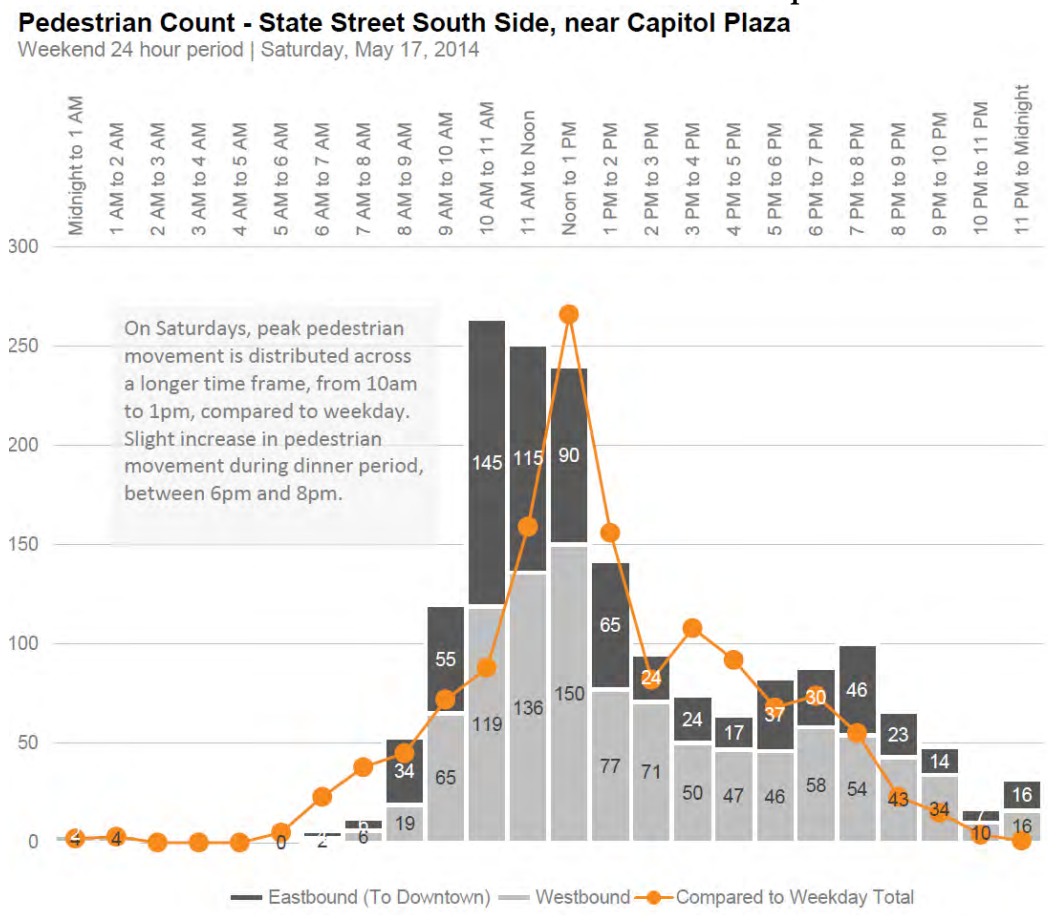
Weekday Pedestrian Count - State Street, near Capitol Plaza (Southside): Counts observed on a typical weekday condition over a 24 hour period showed that the pedestrian levels peaked dramatically during midday, especially between noon and 1 PM, with more pedestrians headed westbound than towards downtown on State Street. **Table 1** graphically presents the results of the count.

Table 1: Weekday Pedestrian Count - State Street Near Capital Plaza South



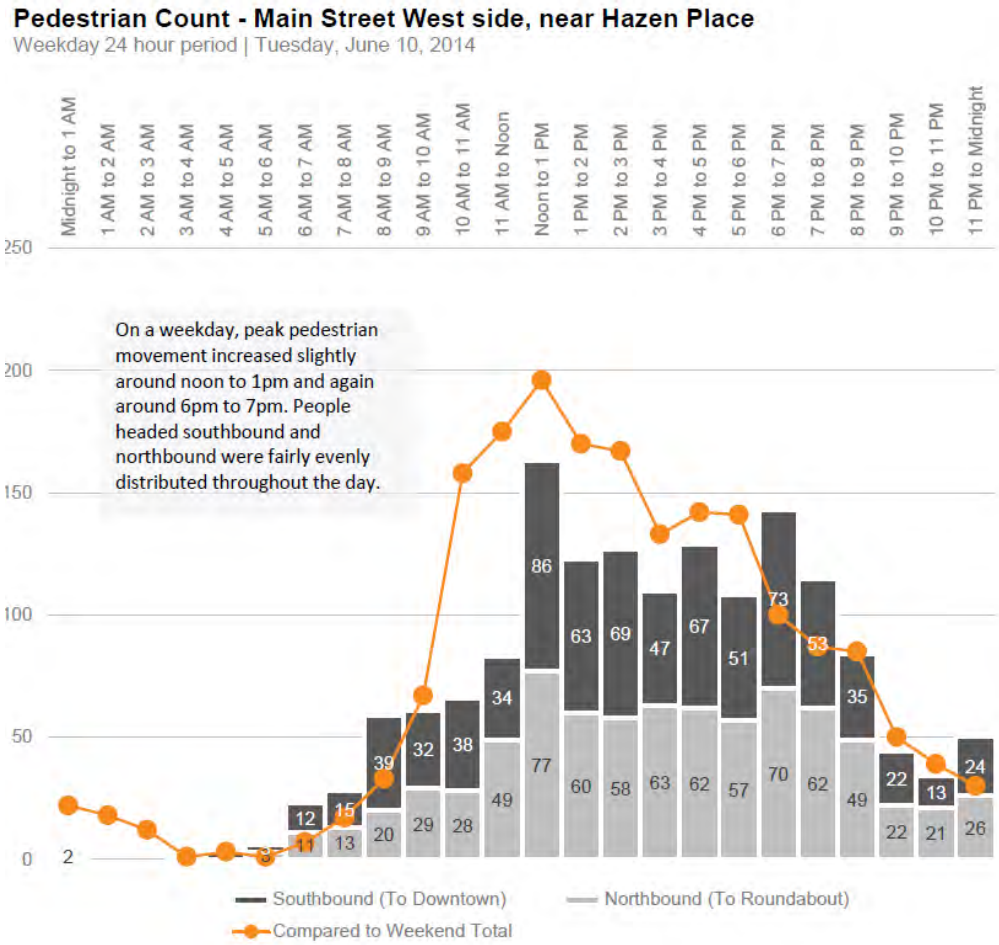
Weekend Pedestrian Count - State Street, near Capitol Plaza (Southside): On Saturday, May 17th, peak pedestrian movement was distributed across a longer time frame compared to the weekday and shifted earlier. This may be due to the Saturday farmer's market that is located on 60 State Street between 9 AM and 1 PM. **Table 2** graphically presents the results of the count.

Table 2: Weekend Pedestrian Counts State Street Near Capital Plaza



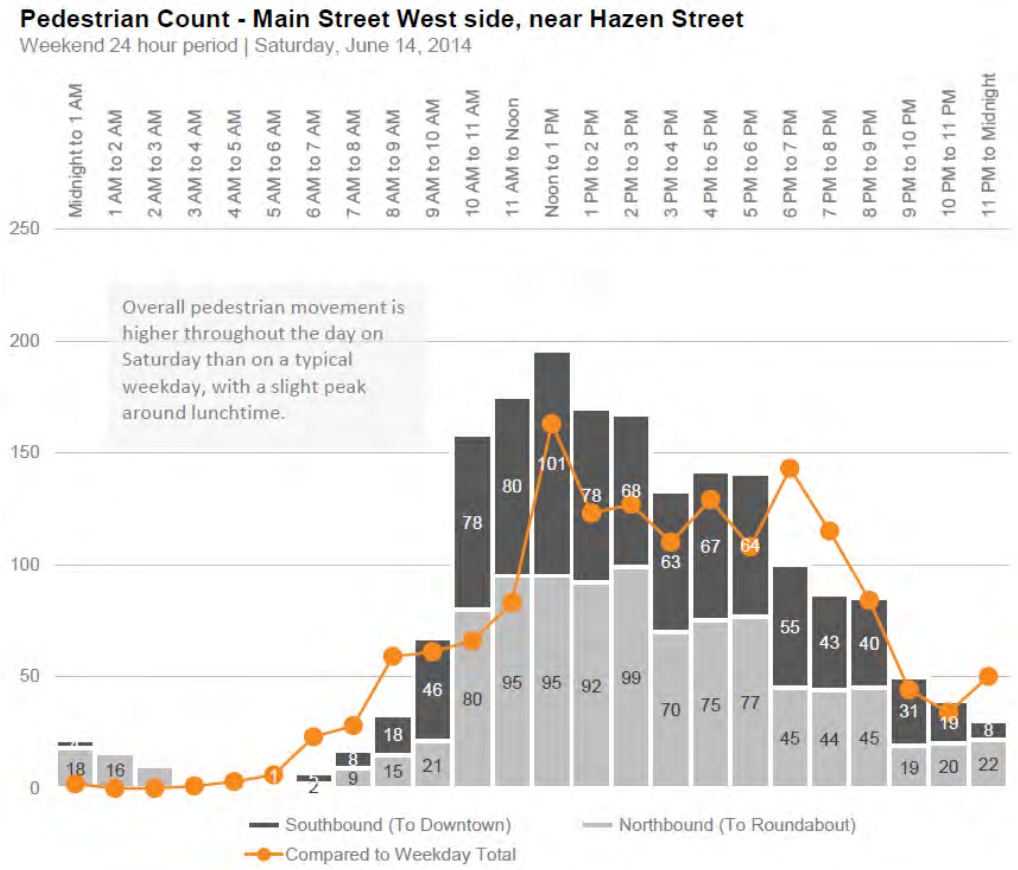
Weekday Pedestrian Count – Main Street, near Hazen Place (Westside): On a weekday, peak pedestrian movement increased slightly around noon to 1 PM and again around 6 PM to 7 PM. The directional movement was distributed fairly evenly, with similar numbers of pedestrians traveling northbound as well as southbound along Main Street throughout the day. **Table 3** graphically presents the results of the count.

Table 3: Weekday Pedestrian Count Main Street Near Hazen Place



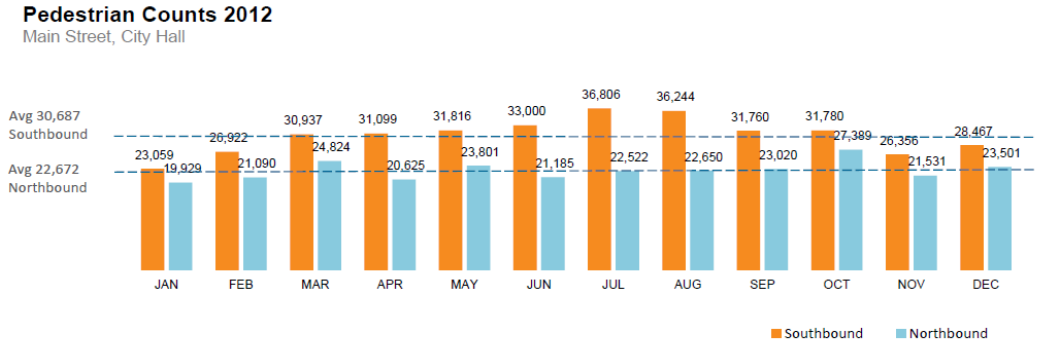
Weekend Pedestrian Count –Main Street, near Hazen Place (Westside): Pedestrian movement along Main Street was generally higher on Saturday than during the weekday and pedestrian volumes remained steady between 10 AM and 7 PM, with a peak midday around noon. **Table 4** graphically presents the results of the count.

Table 4: Weekend Pedestrian Count Main Street Near Hazen Place



Pedestrian Counts – Main Street, City Hall (2012): On average, more pedestrians are heading southbound from City Hall along Main Street than northbound. Interestingly, the peak in southbound movement is during the summer months of July and August, while the peak for northbound movement is in October. Unsurprisingly, pedestrian movement slows slightly during the cold winter months of January and February, but not by much. **Table 5** graphically presents the results of the count.

Table 5: Pedestrian Counts Main Street Near City Hall



The number show a high level of pedestrian activity where the counts were taken, although the multi-year data shows a slight drop in overall pedestrian activity. The BRPD Team is reviewing other pedestrian count information to see if it is possible to understand the trends in the number of walkers in the downtown over the past few years.

The number of crashes that the City's walkers experience is not clear. Police records show that there were:

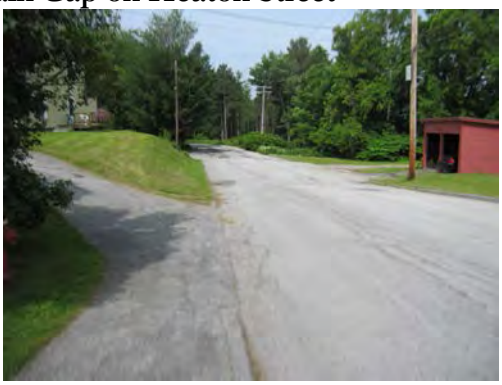
- Four pedestrian-motor vehicle crashes in 2013 with two pedestrian injuries;
- Three pedestrian-motor vehicle crashes in 2012 with two pedestrian injuries;
- Six pedestrian-motor vehicle crashes in 2011 with four pedestrian injuries; and
- Five pedestrian-motor vehicle crashes in 2010 with three pedestrian injuries.

C. EXTENT

Sidewalks line most of the streets in the center of the city and extend outward to the residential areas. **Illustration 1** shows the extent of the nearly 26 miles of sidewalks within the City. Even with the extensive system, there are still some obvious gaps; **Illustration 2** shows such a gap in the sidewalk on Heaton Street. Others gaps are less obvious such as the lack of a sidewalk extending to the Vermont Community College campus on Elm Street (Route 12) or even to the main entrance of the Recreation Fields. **Figure A-2** shows the location of gaps in the pedestrian sidewalk system identified by the BRPD Team.

Illustration 1: Montpelier Sidewalks

Illustration 2: Sidewalk Gap on Heaton Street



D. OTHER WALKING INFRASTRUCTURE

Pedestrian Bridges: Most of the bridges within the City include accommodations for walkers on at least one side. There are also four walking bridges within the City; two of them are also available to bicyclists. There is also a railroad bridge in the downtown area that is regularly, but not legally, used by pedestrians. **Illustration 1** shows the location of the special pedestrian bridges in pink.

Traffic Signals: Almost all traffic signals within the City have pedestrian signals and/or phases included. A pedestrian signal provides a notice to pedestrians as to when they can and cannot cross the street in coordination with the movement of motor vehicles. A pedestrian phase at a traffic signal is a separate time in the traffic signal cycle that is devoted exclusively to pedestrians; motor vehicles are stopped during a pedestrian phase on all approaches to the intersection. **Figure A-3** shows the location of Traffic Signals in Montpelier.

Other Elements: The City's pedestrian system includes other infrastructure elements, including railings, benches, pedestrian signals, signs, rest rooms and lights. The locations of all of these additional infrastructure elements have not yet been tracked, although there is an incomplete record. **Figure A-3** shows the location of the other walking system infrastructure elements that have been located. The figure provides an overview of how extensive the infrastructure is. **Illustration 3** provides an example of one of the infrastructure elements related to the pedestrian facilities in Montpelier.

Illustration 3: Sidewalk Railings

Along with these other infrastructure elements, street trees, planters, and even the Parklet on State Street contribute to the overall experience of walking. Studies have shown that when the walking environment is interesting or aesthetically pleasing, in induces greater numbers of walkers. The overall walking experience in Downtown Montpelier is variable. There are interesting stores and window fronts on Main Street but fewer street trees, especially near City hall, than on State Street. While this is certainly not the only influencing factor, it is interesting to note that there are quite a few more walkers on State Street near the Capital Plaza than on Main Street near City Hall.

While not exactly an infrastructure element, the City has designated a skateboard and in-line skate free zone within the downtown. Skateboard and in-line skate users are not allowed on the sidewalks within this area. The BRPD Team has not yet been able to determine the specific limits of this free zone.

E. WALKING CONDITION

The condition of the sidewalks, the primary element of the pedestrian system, is relatively good. The City reviewed the entire system in the summer of 2013 and created an informal rating system to indicate the current condition of the sidewalks. The review also identified individual hazard areas that needed to be addressed. The official evaluation is also regularly augmented by citizens notifying the Department of Public Works of problem areas on the sidewalks that need to be addressed.

The City did not have a record of the basis of the different rating. Thus, while the rating system provides an excellent overview of the system, it appears to be based on individual subjective judgment that can't be evaluated or updated. The BRPD Team's review of the sidewalk found minor inconsistencies in the ratings but nothing significant enough to discredit the analysis. **Figure A-4** shows the City's informal ratings of their sidewalks. The ratings use a five part systems that divides the sidewalks into:

- Great,
- Good,
- Fair,
- Poor, and
- Horrible.

Illustrations 4, **5**, **6**, **7**, and **8** provide graphic representations of the condition of sidewalks that fall into the different categories.

Part of the rating appears to be related to whether the sidewalk is concrete or asphalt. The asphalt sidewalks typically have lower ratings than the concrete sidewalks. **Figure A-5** shows the location of the asphalt and concrete sidewalks.

Illustration 4: A Great Sidewalk

Illustration 5: A Good Sidewalk

Illustration 6: A Fair Sidewalk

Illustration 7: A Poor Sidewalk

Illustration 8: A Horrible Sidewalk

The hazards list in the City's inventory identifies all of the hazards as trip hazards. A field review of their locations reveals that most appear to be where adjacent slabs are not level with each other, such as **Illustration 9** shows. There are several other types of hazards within the system that were not always identified in the inventory, such as:

- Driveway slopes;
- Full length cracks;
- Erosion onto the sidewalk;
- Ponding and sedimentation, with icing in the winter;
- Irregular patch surfaces;
- Physical or vegetative obstruction;
- Poor delineation between the sidewalk and the road;
- High curbs; or
- Steep grades.

Illustrations 10, **11** and **12** show examples of some of these hazards. **Figure A-6** shows the location of the hazard areas on the sidewalk system identified during the City's 2013 inventory. A complete, comprehensive expansion of this inventory is beyond the scope of this project, but the Pedestrian Advisory Committee could systematically undertake this review.

Illustration 9: Typical Trip Hazard Identified in the Sidewalk Inventory

Illustration 11: Driveway Breaks That Minimize Level Sidewalk Width

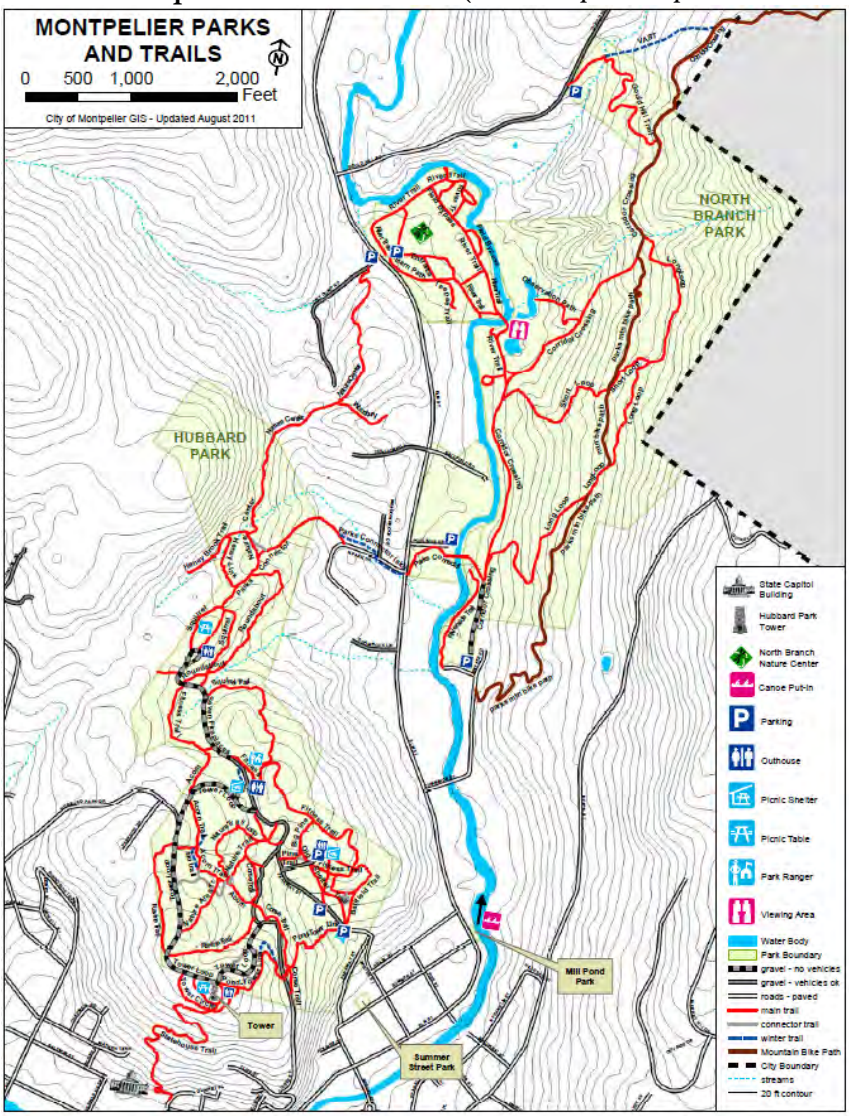
Illustration 12: Irregular Patch Surfaces

Illustration 13: Ponding and Sedimentation

F. PATHS & TRAILS

In addition to sidewalks and associated infrastructure, the walking system includes numerous trails and shared use paths. The shared use paths are discussed in **Section 2.C** with other bicycling facilities. The paths or trails within Montpelier are primarily associated with parks. **Figure 19B** in the *The 2010 Master Plan* (Included in **Attachment 3**) shows the location of paths or trails in Montpelier. The City's Department of Recreation also provides a "Montpelier Parks and Trails" map on their website, shown in **Illustration 14**. The layout of these trails implies that they are primarily used for recreation and not for transportation purposes. A few of the paths in Hubbard Park, however, could be used by residents on the west side of the park to reach the downtown area.

Illustration 14: Montpelier Parks & Trails (from Montpelier Department of Recreation)



E. MAINTENANCE

The City Department of Public Works accepts phone calls from residents to report problems with the sidewalks and other elements of the City's transportation system. The City's Department of Public Works receives the reports. They address those that are high priority due to the nature of the problem often within an hour or less of being reported. Subsequently, they evaluate and prioritize those reports that are not critical. The Department of Public Works strives to responds to most other sidewalk issues within two to three days, as long as the problem can be readily addressed.

The Central Vermont Regional Planning Commission (CVRPC) recently introduced an interactive mapping system as part of their regional Plan update process. While not its original intent, they are allowing the City, and any other municipality in the region, to promote the site as a way of reporting infrastructure issues on line. CVRPC will convey information received on infrastructure through their system to the City or other municipality.

The Montpelier Department of Public Works currently does not have an overall master plan for ongoing sidewalk improvements. With the completion of the first sidewalk inventory in 2013, they are beginning to use the results to direct their work. Their current standard design for sidewalks calls for concrete surfaces and granite curbs when needed, so that the sidewalk should last for a long time. The City is no longer installing asphalt sidewalks, although they still use asphalt for larger shared use paths.

Three sidewalk snowplows currently work to clear snow from the sidewalks after a snowstorm. These snowplows operate concurrently with the road snowplows, but they typically take about one to two hours longer to complete their routes than the road plows do. **Figure A-7** shows the current sidewalk snow plowing routes, which are dictated, in part, by the individual capabilities of each sidewalk snow plow. The Department of Public Works has a Winter Operations Plan that guides its snow plowing efforts and other winter related maintenance activities. **Attachment 4** includes a copy of the current Winter Operations Plan. The first item guiding City snow plowing activities in the Winter Maintenance Plan under safety is: "Snow shall not be plowed, blown or shoveled onto the City sidewalk or street."

City residents have noted that it is not always possible for the City to follow its own guidance. Residents have expressed dissatisfaction with the both the speed and the efficiency of the snow plowing operations. The snowplows cannot always clear all of the snow from the sidewalks because of grade changes, obstacles or other impediments to complete snow removal. Sidewalks that are in the sun are often cleared as the sun melts the snow, but sidewalks in shade often retain the snow, which often turns into ice. Once ice has formed, the snowplows are typically unable to remove it. Additionally, those sidewalk locations that show signs of ponding or sedimentation in the summer are often places where water collects and freezes in the

winter. This is often a particular problem at curb ramps as snow blocks storm drains and the open area at the base of sidewalk curb ramps fills with water that freezes.

2. BICYCLING FACILITIES

A. OVERVIEW

Although there are two dedicated shared use paths for bicyclists and pedestrians in Montpelier, bicyclists in the City travel primarily on the roadways. There are 51.7 miles of roads in City rights-of-way within Montpelier. They present a variable set of riding conditions for bicyclists. Roadway traffic levels, widths, pavement conditions, grade and other factors affect how well the roadways serve the needs of bicyclists.

B. TRAFFIC VOLUME

Motor vehicle traffic: Average Annual Daily Traffic (AADT) is often they way that motor vehicle traffic is measured. It is an averaging of total daily traffic on a roadway in both directions over a year. AADT on the roadways in Montpelier varies significantly from 50 vehicles or less to 12,000 vehicles. **Figure A-8** shows the AADT for the years 2007 to 2012 for the streets and roads in Montpelier. The highest volumes of traffic are along Memorial Drive and VT Route 2, connecting drivers from I-89 and areas east of Montpelier to downtown. Main Street between VT Route 2 and Spring Street also experiences similarly high traffic levels, with near 12,000 vehicles traveling along the central downtown corridor on an average day.

Bicycle traffic: Bicycle counts have not been taken as often or for as long a time as motor vehicle traffic counts. Recent traffic counts on VT Route 2 west of the downtown area included bicycle counts. **Tables 6** and **7** show the results of those counts. The counts show a total of 54 bicyclists westbound and 62 bicyclists eastbound on one day, which is more than two and one half percent of the AADT. This is a significant number of bicyclist on the road, compared to other municipalities in Vermont and the northeast.

Even with these numbers, statistics in the *2010 Master Plan* show that that the number of commuters who bicycled or walked to work peaked in the 1980s. The number declined in the 1990s but grew again in the 2000s. **Illustration 15** shows the *2010 Master Plan* Figure 21 that presents these numbers.

Table 6: State Street Traffic Counts Westbound - June 17, 2014

Car, Truck, and Bike Count - Westbound on State Street near Pump House

Weekday 24 hour period | Tuesday, June 17, 2014

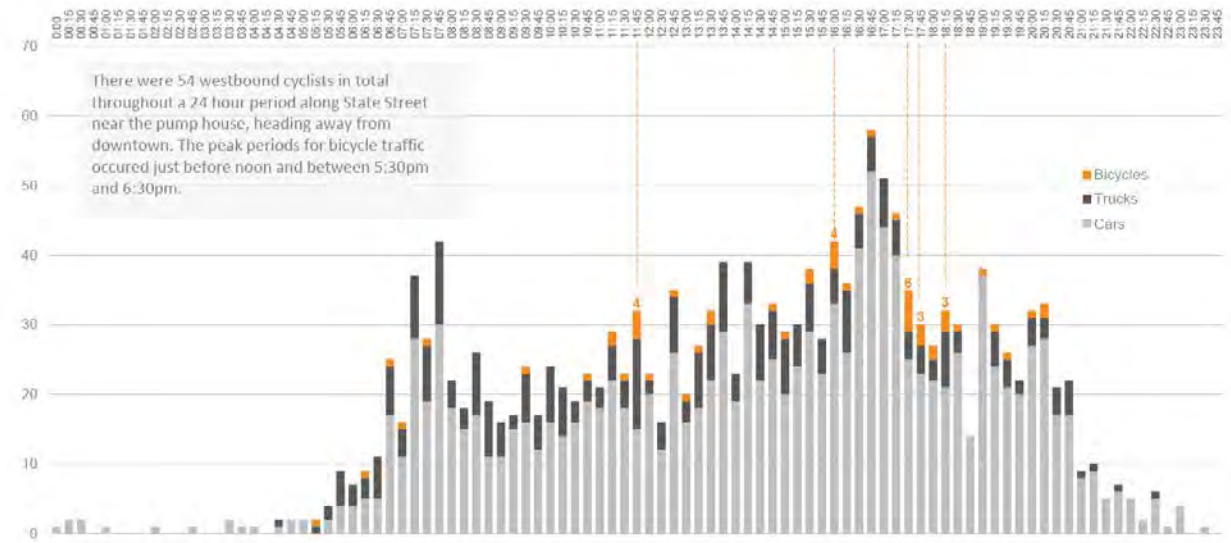


Table 7: State Street Traffic Counts Eastbound - June 17, 2014

Car, Truck, and Bike Count - Eastbound on State Street near Pump House

Weekday 24 hour period | Tuesday, June 17, 2014

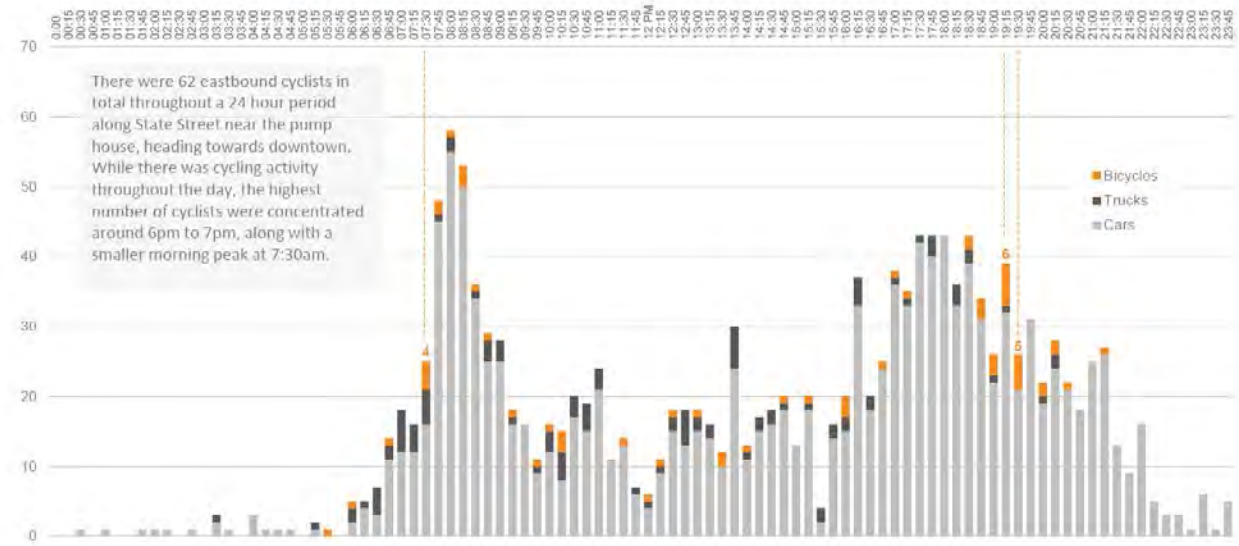
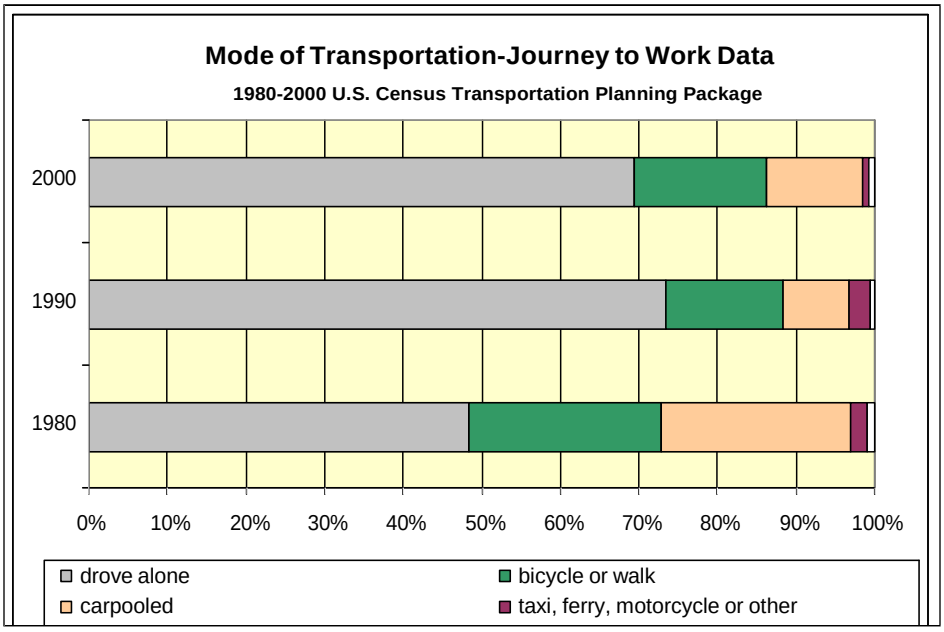


Illustration 15



There are more extensive crash records related to motor vehicles but not for bicyclists. Bicycles and/or pedestrians crashes are often unreported, because many do not meet the criteria for crash reports. Information from the Montpelier Police Department shows there are one to two reported crashes involving bicycles each year.

Between 2009 and 2013, the highest number of motor vehicle crashes occurred in the intersection of Berlin Street and Main Street. Of the eight crashes that occurred at this location, four were due to inattention, two resulted from failure to yield the right of way, one was a rear end from following too closely, and one was from driving too fast for conditions. The second highest number of crashes was located at the intersection of East State Street and Hubbard Street. A significant number of these crashes were due to failure to yield the right of way and inattention, resulting in broadside collisions. **Figure A-9** shows the volume of crashes on the roadway system throughout the City.

The number of crashes has resulted in VTrans designating three High Crash Location (HCL) sections within the City. Two are along Main Street and one is on East State Street between Main Street and just east of Hubbard Street. **Illustration 16** shows the location of the HCLs. VTrans has classified these locations as HCLs because they have had at least five crashes over a five-year period and the number of crashes per million vehicles, the crash rate, is higher than the critical crash rate. VTrans calculates the critical crash rate as the average crash rates of similar roadways in Vermont in relationship to the functional class of a highway and its location in either an urban or rural area.

The VTrans Safety Committee conducted a safety audit of the intersection of State and Main Streets. **Attachment 5** includes a copy of their report.

Illustration 16: High Crash Locations in Montpelier (Shown in Red)

C. RIGHT-OF-WAY & ROADWAY WIDTHS

The right-of-way for most of the streets in Montpelier is 49.5 feet or three rods. The right-of-way is the amount of space either owned or controlled by the municipality within which a road lies. The actual roadway widths range from as narrow as 10 feet of pavement on Graham Terrace and Miles Court, to as wide as 59 feet of pavement along Main Street between State and Spring Street. Main Street is the widest single corridor in Montpelier, with a width ranging between 54 and 59 feet. The pavement of primary thoroughfares in Montpelier, including Memorial Drive, VT 2, West State Street, and the Bailey Avenue connection to State Street, range from 40 to 48 feet wide.

Figure A-10 shows the range of widths of the streets and roads in the City.

Several of the bridges in the City are actually narrower than the roadway pavement leading to them on either side. Such narrower bridges can present conflicts for bicyclists and motorists because of the change in how the two different modes of travel use the road. **Figure A-10** highlights some of these narrow bridges.

The Department of Public Works has records of the rights-of-way of each City street but there is no general database or GIS layer that shows all of the rights-of ways graphically.

D. BICYCLING INFRASTRUCTURE

Bicycle Lanes or Wide Paved Shoulders: Most of the Class 1 roads leading to or from the downtown are lined with wide paved shoulders or bicycle lanes that bicyclists can use. Bicycle lanes are designated lanes for bicyclists on the outer edge of the road, one lane heading in each direction. Vermont state standards call for them to be at least four feet wide, but preferably at least five feet wide. Wide paved shoulders are located on the outside of the white fog line that bicyclists can use that are less than four feet wide.

Shared Use Paths: Winooski East and Winooski West shared use paths stretch east and west through the downtown area of the City. Shared use paths are paved paths reserved exclusively for non-motorized travel, typically by bicyclists and walkers. These paths link with the Central Vermont Regional Path and the Cross Vermont Trail. One bicycle and pedestrian only bridge is associated with the Winooski West Path. There are three more pedestrian and bicycle bridges in the City; **Illustration 1** and **Figure A-11** shows the location of the bicycle and pedestrian bridges, on-road bicycle facilities and shared use paths.

Shared Lane: The City recently added sharrows to State Street, marking it prominently as a shared lane between bicycles and motor vehicles. **Illustration 17** shows what a sharrow looks like. The placement of the sharrow in the lane is the suggested location for bicyclists to ride.

Illustration 17: A sharrow

Mountain Bike Trails: There is currently one mountain bike trail in northern Montpelier in North Branch Park. The Montpelier Area Mountain Bike Advocates have proposed the construction of a second trail in Hubbard Park, but no action has yet been taken on the proposal by the City.

Hazardous Infrastructure: Storm Drain inlets within the paved surface of the roadway can be hazards for bicyclists if the openings in the cover grates are large enough to catch tires. It appears as if most of the storm drain inlets within the City that are in roadways have appropriate covers with holes small enough that bicycles can be safely ridden over them. The exception, as noted by bicyclists in the City, are the inlet covers on Berlin Street in the bike lanes.

Guardrails limit the use of the edge of the road by bicyclists. As the Vermont *Pedestrian and Bicycle Facility Planning and Design Manua*l notes:

> "Due to the low height of guard rails, bicyclists may topple over the rail and be injured by guard rail posts and mounting hardware."

Bicyclists should maintain at least a two-foot separation between themselves and adjacent guardrails. If the guardrails are less than two feet away from the edge of the pavement, bicyclists will need to move further into the road to maintain the minimum separation.

E. ROADWAY CONDITION

Figure A-12 shows the current surface conditions of the roads, based on GIS data supplied by the City. The streets in Montpelier are in variable condition, though most of the highest volume roads are in good to fair condition, with the exception of upper Main Street between State and Spring Streets. There are several segments of predominant side streets that are in poor condition, with a several very poor to failing condition, including North Street from Main Street to North Franklin Street, Baldwin Street between Bailey Avenue and the State House, and Marvin Street between Bingham and College Streets.

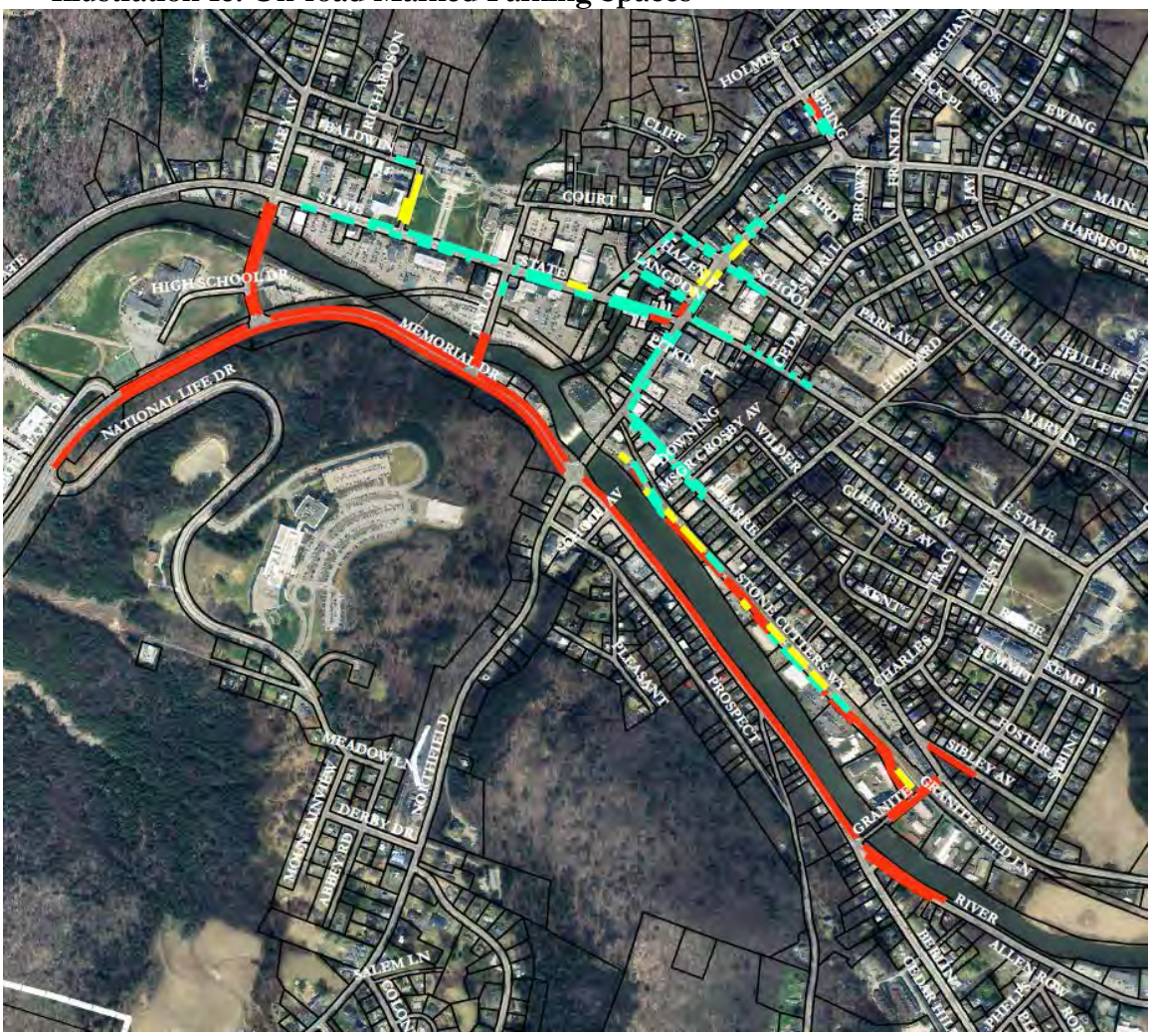
Roadways with narrow lanes or minimal shoulders combined with high vehicle traffic counts create potentially hazardous bicycling conditions for basic or beginner bicyclists and even some advanced bicyclists.

F. PARKING

Bicycle Parking: There are a growing number of bicycle parking locations around the downtown area. The City has used grant money available from VTrans to increase the availability of bicycle parking in the last few years. **Figure A-11** shows the recorded location of know bicycle-parking areas within the downtown. Even with these additions, there are still only limits numbers of public bicycle parking areas either within the City's rights-of-ways or on public property. The BAC has an old bicycle rack reporting form that members can still use to report bicycle parking racks that is not currently on the inventory list. **Attachment 6** includes a copy of the form.

Automobile Parking: City regulations allow on-road parking for motor vehicles on all streets except where specifically prohibited with signs. The frequency and location of parked vehicles can affect the suitability of a roadway for bicycle use. The parked vehicles not only take away from the usable space on the road, but when bicyclist are forced to ride close to parked vehicles, they face the potential of being struck by an opening door when a driver exits their vehicle after parking it. In the downtown area, parking spaces are marked on the street. **Illustration 18** shows those areas where parking spaces are outlined on the road or where parking is prohibited. Delineated parking spaces only occur in the downtown area. Parking is allowed on streets with no mark but parking spaces are not specifically marked.

Illustration 18: On-road Marked Parking Spaces



G. MAINTENANCE

The Department of Public Works uses a Road Surface Management System to keep track of the current conditions of the road and the future scheduled maintenance

needs. They have a master plan for scheduled repaving and repair for the roads in the City, with the exception of the Class 1 roads, which VTrans repaves.

The City attempts to sweep all of the streets in the City twice a year. They have recently added a third street sweeper to their fleet and may be able to provide more street sweeping in the future. Residents have noted the street sweeping efforts but have also mentioned the need for even more street sweeping to maintain the sides of the roads in good condition for bicyclists. The increase in the number of heavy rainfalls in the past few years has led to a greater deposition of silt and debris on the roadways associated with storm water runoff.

The city repaints crosswalks and other pavement symbols each year in the spring using their own maintenance crews. Many of them are fairly worn by the end of winter due to traffic, weather, and snowplowing activities. They are often not able to get to all of them until near Memorial Day or even later. Parents of students noted that many of the crosswalks used by students are consequently in poor condition until near the end of the school year.

Snowplows remove snow from the entire width of each roadway unless there are obstacles in the way that prevent the plows from clearing the full width. There are six plowing routes used by the Department of Public Works, each route takes about three hours to complete. The Winter Maintenance Plan guides the Department in its snow plowing efforts.

C. LAND USE & TRIP GENERATION

Figure 29 in the *2010 Master Plan* shows the current land uses within the City. **Figure 30** shows what the City envisions as future land uses. **Appendix 3** includes copies of both figures. Of particular note are those land uses that could serve as origins and destinations for walking or bicycling trips.

Noting where bicycling and walking trips are generated or completed helps to prioritize which walking routes might be most important to local users. In general, almost everywhere within the City can be considered as a originating site for bicycling or walking trips. There are some sites, however, that serve as larger sources of these trips. **Figure A-13** shows the location of these high trip-generating sites, which in general are recreation areas, local restaurants, public facilities and some service businesses. Green Mountain Access bus routes are also destinations for walkers and bicyclists. **Figure A-13** shows the current bus routes.

Another way of understanding which walking or bicycling routes might be most important to the residents of the City would be to examine existing trip data, to the extent that it is available.

During 2012, VTrans conducted a pilot project to collect bicycle and pedestrian data throughout the state. VTrans staff found that the most used facilities were sidewalks, footbridges, and paved recreational paths and trails, while gravel paths and trails were used less often. Bike lanes and roadway shoulders were used the least.

Strava is an application that allows users to self-track runs and bicycle rides using a GPS device or smartphone. While the data they collect does not represent all routes for cyclists of all abilities, it is one indicator of where people are currently cycling. Among *Strava* users, State Street and Northfield Street (VT Route 2 and VT Route 12) are two of the most popular bike routes in the study area. They both have relatively lower traffic volumes; Northfield Street has a curbed sidewalk along the eastern edge and State Street has both a curbed sidewalk on the north side and a striped bike lane in both directions. **Illustration 19** shows the more popular bicycle routes in Montpelier that the *Strava* data reveals.

Elm Street south of Spring Street is as frequently used as a bicycle route, if not more so, compared to Main Street on block to the east. This may be due to significantly lower traffic and pedestrian volumes and less conflicts with parked cars (parallel on-street parking on one side versus diagonal parking in both directions on Main Street).

D. TOPOGRAPHY

The hilly topography of Montpelier presents challenges to casual walkers and bicyclists. Some of the steeper roads and sidewalks can be difficult to use. **Figure A-14** shows the topography of Montpelier using twenty-foot contours. This figure helps display the grades of the roads.

E. PLANNING

1. MUNICIPAL PLANS

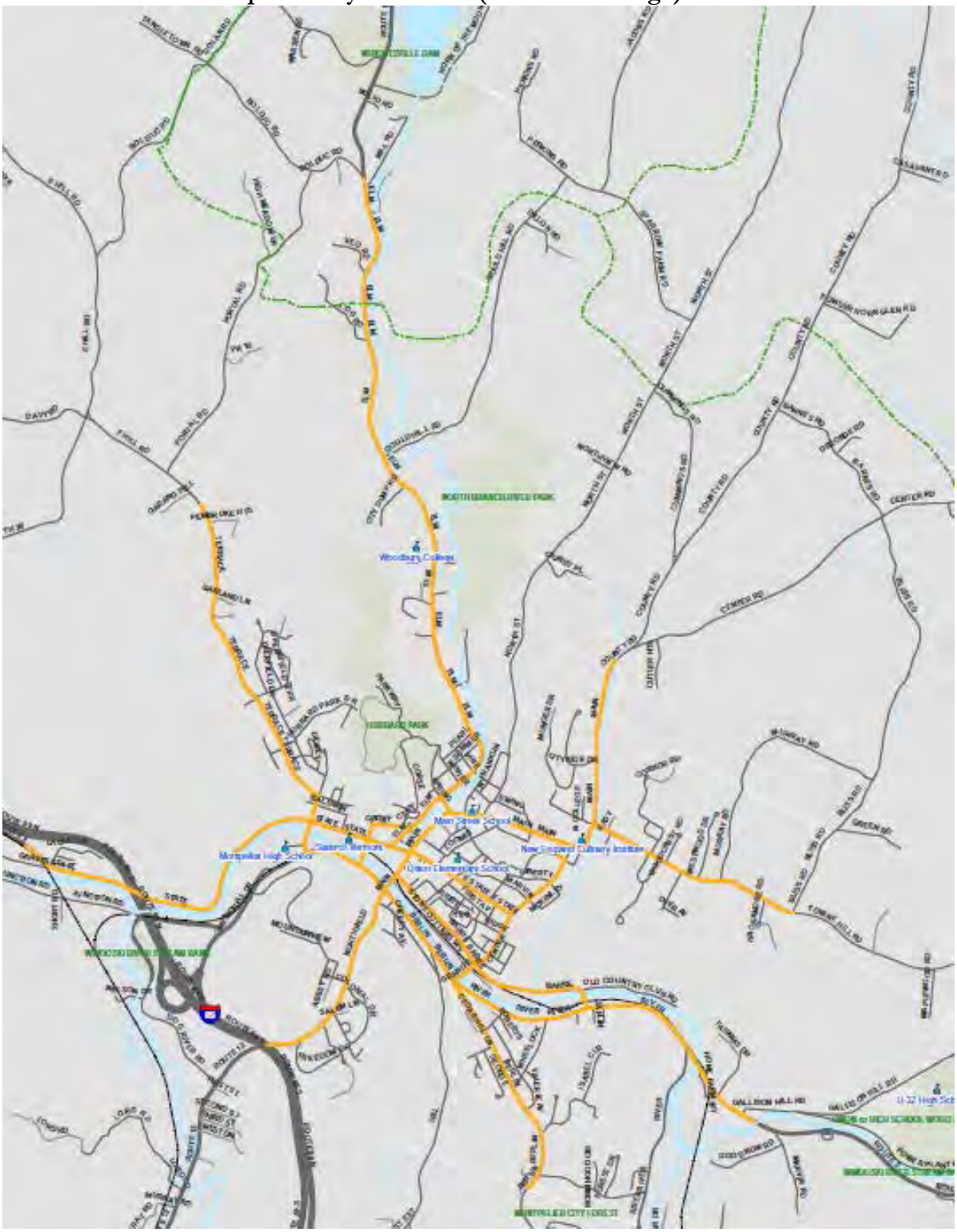
The City of Montpelier 201 Master Plan extensively discusses the advantages of bicycling and walking and provides several ways that conditions can be improved. Attachment C includes the Transportation section of the *2010 Master Plan*, which includes the discussion of walking and bicycling.

The first goal in the transportation section is "By 2015, increase the number of Montpelier residents who commute by walking or bicycling increasing by 40 percent by 2040." It is followed by 14 actions that can help achieve the goal. These actions include:

- The creation of an extensive trail system,
- More secure bicycle parking,
- Better education and encouragement of bicycling and walking,
- Expanding the existing sidewalk system, and

- More traffic calming measures for motor vehicles.

Illustration 19: Popular Bicycle Routes (Shown in Orange)



Goal number four states, "By 2015, Montpelier maintains safe, quality roadways, sidewalks, and bike paths." There are three actions described that are meant to help the City achieve this goal, including a better problem reporting system, the creation of a system wide transportation management plan and the adoption of a complete streets policy.

2. STATE PLANS

The 2008 VTrans Pedestrian and Bicycle Policy Plan include goals and objectives that directly support the extension of the Rutland Creek Path in increase non-motorized travel, including:

Goals

- Cultural Environment: Enhance the human scale and livability of Vermont's communities by improving opportunities for pedestrian and bicycle mobility and access in and between towns, downtowns, villages and rural landscapes.

- Health: Improve the health of Vermonters and reduce health care costs by making it easier, safer and more convenient for citizens to be more physically active by walking and bicycling on a regular basis.

- Transportation Choice**:** Enhance pedestrian and bicycle transportation options in Vermont so that citizens, regardless of location, socioeconomic status or health can choose a seamless, convenient and comfortable mode that meets their needs. Promote a transportation network, including roadways, shared use paths, rail trails, rails with trails, and accessible walker facilities, which allow pedestrians and bicyclists to reach their destinations throughout the State or to connect to other modes of travel.

Objectives

- Objective 8: Work with citizens, municipalities, regional planning organizations, and other State agencies to develop, plan, and implement pedestrian and bicycle plans, projects, and programs.

- Objective 12: Provide a seamless transportation network for pedestrians and bicyclists by improving linkages between walking, bicycling and other modes of transportation.

3. OTHER REPORTS

Capital District Master Plan: This plan includes recommendations for as more comprehensive walking system in the Capital District, the area around the State House.

Illustration 20 highlights some of the walking links recommended in the Capital District Master Plan.

Illustration 20: A Figure Fom The Capital District Master Plan That Shows Walking Links

F. ACTIONS & POLICIES

The City has been supporting several activities to encourage more interest in bicycling and walking, including the closing of State Street to allow only bicycling and walking use for special events. They are also support the schools in their efforts to encourage more walking and bicycling to school.

The schools have developed a travel plan that outlines a series of actions to provide:

- Encouragement for walking and bicycling to school,
- Education on safe walking and bicycling skills as part of the students regular education'
- Enforcement of existing walking and bicycling rules and regulations for both the schools and the City, and
- Evaluation of how well they are doing on increasing the number of students that regularly walk or bicycle to school.

The travel plan also outlined a series of physical improvements around the schools to increase the ability of students to safely walk and ride to school. The City has already installed most of the recommended improvements.

The City has also worked with the Central Vermont Regional Planning Commission and the Vermont Agency of Transportation to undertake periodic walker and bicyclist counts at various locations around the city as well as a long-term walker count at one location on Main Street. These counts provided the data described in **Section B** of this report.

As for enforcement, the City maintains a bicycle police patrol in the summer months as part of its regular police force. This not only reinforces the importance of bicycling in the community but also provides an image of the successful use of a bicycle for transportation purposes.

The City has established a skateboard free zone in the downtown to eliminate conflicts between fast moving skateboards or in-line skaters and walkers so that the sidewalks are safer for all users.

F. SUMMARY

The previous pages present a glimpse of the current state of walking and bicycling in Montpelier. When examined as a whole, it shows that there is a lot of positive aspects to walking and bicycling in Montpelier. The information also indicate that there are still areas that could be improved, which create topics for further discussion, such as:

- There is a well established, fairly comprehensive sidewalk system that still has some gaps and places where it could be expanded or upgraded to be even more comprehensive;
- The existing shared use paths are the start of a good off-road bicycling and walking system but it needs extensive expansion in order to create a City-wide off-road network;
- The City works to maintain the existing walking and bicycling facilities on par with motor vehicle facilities but maintenance issues still limit the use of the system at times, especially in the winter;
- The critical link between the Winooski West and Winooski East shared use path across the North Branch and Main Street is still missing with the result that many pedestrians still illegally use the railroad bridge as a walking link (The City has been focusing efforts on creating this link for some time);
- The on-road bicycle network is only clearly defined on the main road entering and exiting the town with only limited definition of bicycle facility in the downtown area or the surrounding neighborhoods;

- There is a good start at encouraging more walking and bicycling within the City but there is much room to expand efforts and add an educational component; and
- The walking experience is variable within the City, especially the downtown area, and while it is never a really negative experience, there are numerous places where it could be enhanced.

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