

**BICYCLE TRANSPORTATION PLAN
TOWN OF WATERTOWN**

WATERTOWN BICYCLE COMMITTEE

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TOWN OF WATERTOWN

BICYCLE TRANSPORTATION PLAN

Table of Contents

		Page
Section I	Executive Summary	1-2
Section II	Governing Standards for Bicycle Accommodation	3-5
Section III	Recommendations	6-37

Appendix A - MassHighway Policy on Bicycle and Pedestrian Accommodations

Appendix B - MassHighway Bicycle Route and Share the Road Signing Policy

Appendix C - FHWA Abstract – Bicycle Lanes vs. Wide Curb Lanes

TOWN OF WATERTOWN

BICYCLE TRANSPORTATION PLAN

List of Figures

Figure 1 – Minimum Recommended Pavement Widths per AASHTO

Figure 2 – Minimum Recommended Pavement Widths per AASHTO

Figure 3 – Watertown Bike Routes

Figure 4 – Cross – Section – Arsenal Street

Figure 5 – Cross – Section – Main Street

Figure 6 – Cross – Section – Main Street (Commercial Area)

Figure 7 – Cross – Section – Mt. Auburn Street

Figure 8 – Cross – Section – Mt. Auburn Street (Commercial Area)

Figure 9 – Cross – Section – Pleasant Street

Figure 9A – Cross – Section – Waltham Street (West of Bridge Street)

Figure 10 – Cross – Section – Watertown Street

Figure 11 – Cross – Section – Arlington Street

Figure 12 – Cross – Section – Common Street

Figure 13 – Cross – Section – Coolidge Ave.

Figure 14 – Cross – Section – Coolidge Ave.

Figure 15 – Cross – Section – Grove Street

BICYCLE TRANSPORTATION PLAN

EXECUTIVE SUMMARY

Greenman-Pedersen, Inc. (GPI) has been retained by the Town of Watertown Department of Public Works to assist the Town in the preparation of a Bicycle Transportation Plan. The purpose of the plan is to recommend bicycle accommodations including but not limited to on road bike lanes, signing and directional devices, other lane improvements and safety improvements.

This plan contains the following elements:

- ◆ Meetings/liaison with local officials and groups, and state agencies to coordinate their activities with the goals of the plan.
- ◆ Review existing conditions for bicycle accommodations on selected roadway corridors.
- ◆ Identify key destination points and establish a town wide bicycle “network”.
- ◆ Identify and evaluate potential bicycle accommodations.

This Bicycle Transportation Plan was prepared in coordination with the Watertown Bicycle Committee and the Watertown Department of Public Works.

Study corridors have been provided by the Watertown Bicycle Committee. A summary of recommendations for improved bicycle accommodations follows:

East – West Routes:

1. Arsenal Street (2 lane section) – Add 5 foot bike lanes.
2. Arsenal Street (4 lane section) – Leave as is, future reconstruction should consider wider shoulders.
3. Main Street (west of Waverley Street) – Provide an 11foot combined bike/parking lane on both sides leaving two 12 foot travel lanes.
4. Main Street (east of Waverley Street) – Provide a 5 foot bike lane on both sides leaving two 11 foot travel lanes.
5. Mt. Auburn Street – Study the potential for eliminating one travel lane in each direction. If a lane reduction is feasible, stripe two 14 foot travel lanes with two eight foot parking lanes and two five foot bike lanes offset one foot from the parking lane. Sign for Bike Lanes.
6. Mt. Auburn Street – (commercial district) – Study the potential for eliminating one travel lane in each direction. If a lane reduction is feasible, stripe two 14 foot travel lanes with two eight foot parking lanes and two five foot bike lanes offset one foot from the parking lane. Sign for Bike Lanes.
7. North Beacon Street – Add “Share the Road” signs to supplement existing bike lanes.
8. Orchard Street – This is a low volume residential street. Use “Share the Road” signing in the vicinity of the school. Paint shoulder stripe at a 5 foot offset from the curb.

9. Pleasant Street – Reconstruct to minimum 29.5 foot width by widening each side. Stripe for two 12 foot travel lanes and two 3 foot minimum shoulders. Add “Share the Road” signing.
10. Summer Street – This is a low volume residential street which would not require bicycle signing or pavement markings.
11. Walnut Street - This is a low volume residential street which would not require bicycle signing or pavement markings.
12. Waltham Street- Post “ Share the Road” signing east of Bridge street. West of Bridge street, add bike lanes both sides.
13. Watertown Street – Presently striped with parking/bicycle space at 10-11 feet from curb both sides, but is not signed. Leave pavement markings as is. Post “Share the Road” signing.

North – South Routes:

1. Arlington Street – Provide delineation of parking lane 8.5 feet from curb both sides, leaving 22 feet for two lanes. Post “Share the Road” signing.
2. Church Street - Post “Share the Road” signing
3. Common Street – Limit parking to one side (where applicable). Place shoulder stripe 7 feet from curb leaving a 3 foot shoulder on other side and two 11 foot lanes. Post “Share the Road” signing.
4. Coolidge Avenue (east of Grove Street) – Widen to uniform 30 foot width. Stripe for two 11 foot lanes and two 4 foot shoulders. Sign as a Bike Route.
5. Coolidge Avenue (west of Grove Street) – Paint 9 foot shoulder/parking lanes both sides. Sign as a Bike Route.
6. Dexter Street – This is a low volume residential street which would not require bicycle signing or pavement markings.
7. Galen Street – Post “Share the Road” signing
8. Grove Street (Coolidge Avenue to Kandazian Street) – Maintain 30 foot width. Stripe as two 11 foot thru lanes and two 4 foot shoulders. Sign as a Bike Route.
9. Grove Street (north of Kandazian Street) – Maintain 30 foot width. Stripe as two 11 foot thru lanes and two 4 foot shoulders. Sign as a Bike Route.
10. Lexington Street (north of Main Street) – Maintain 27 foot width. Stripe as two 11 foot thru lanes and two 2.5 foot shoulders. Post “Share the Road” signing.
11. School Street (Arsenal Street to Putnam Street) – Maintain 30 foot width. Post “Share the Road” signing.
12. School Street (Putnam Street to Mt. Auburn Street) - Post “Share the Road” signing
13. School Street (north of Mt. Auburn Street) – Post “Share the Road” signing
14. Waverley Street – Post “Share the Road” signing. Paint shoulder stripe at five foot offset from curb.

The installation of “Share the Road” signing is recommended in many areas to increase driver awareness of the presence of bicycles. Share the road signing can be especially effective near schools, on frequently used bicycle routes and at steep grades or other areas where there is potential for bicycle/motor vehicle conflicts. The Town should be judicious

in the use of “Share the Road” signing as saturation can reduce the positive impact of the signs.

Other recommendations include various design treatments used to facilitate safer bicycle travel, safety education and regular contact between the Bicycle Committee and the police department to identify problem areas where increased enforcement would be effective.

Alternatives were evaluated for practicality, given political and budgetary constraints. For example, although roadway widenings and parking prohibitions often enhance the level of bicycle accommodation, they are often expensive, disruptive and controversial. Therefore, many of the recommendations in this study are based on the most practical, cost effective and immediately attainable solutions. An effort was made to meet minimum bicycle accommodation criteria for major north-south and east-west routes in order to provide for a more bicycle friendly “network” in Watertown.

GOVERNING STANDARDS FOR BICYCLE ACCOMMODATION¹

Governing standards for bicycle facilities are cited from the following sources:

1. American Association of State Highway and Transportation Officials (AASHTO) 1999 Guide for the Development of Bicycle Facilities.
2. Massachusetts Highway Department (MassHighway) – 1995 Highway Design Manual (metric edition).
3. Massachusetts Highway Department Engineering Directive 98-003 in response to MGL Chapter 87 ACTS of 1996 Bicycle and Pedestrian Accommodation (Appendix A).
4. Federal Highway Administration Publication No. FHWA-RD-92-073 Selecting Roadway Design Treatments to Accommodate Bicycles dated January 1994.
5. Massachusetts Highway Department Policy Directive P-98-003 - Bicycle Route and Share the Road Signing Policy (Appendix B).

Class I – Shared Use Paths

Shared use paths are defined in the 1999 AASHTO guidelines as “facilities on an exclusive right-of-way with minimal cross flow by motor vehicles.” Users may include bicyclists, pedestrians, roller bladers, wheelchairs, etc.

¹ American Association of State Highway and Transportation Officials (AASHTO) – Draft Guide for the Development of Bicycle Facilities – September 1998.

AASHTO guidelines recommend a minimum 3 meters (10 foot) width with two 0.6 meters (2 foot) graded shoulders for shared use paths on an exclusive right-of-way.

Class II – Bike Lanes

Bike lanes can be provided when it is desirable to delineate available road space for preferential use by motorists and bicyclists. For roadways with no curb and gutter, the minimum width of a bike lane should be 1.2 meters (4 feet). If parking is permitted, the bike lane should have a minimum width of 1.5 meters (5 feet). If parking is permitted, but a parking stripe or stalls are not utilized, the shared area should be a minimum of 3.3 meters (11 feet) without a curb face and 3.6 meters (12 feet) adjacent to curb face. If the parking demand/turnover is high, an additional 0.3 meters – 0.6 meters (1-2 feet) is desirable.

Class III – Signed Shared Roadways – Bike Routes

Signed shared roadways are identified as bike routes. Current MassHighway policy regarding bike routes can be found in Appendix B. According to the (AASHTO) guidelines, there are several reasons for signing/designating preferred bike routes.

1. The route provides continuity to other bicycle facilities.
2. The road is a common route for bicyclists through a high demand corridor.
3. In rural areas, the route is preferred for bicycling due to low motor vehicle volumes or paved shoulder availability.
4. The route extends along local neighborhood streets and collectors that lead to an internal destination such as a park, school or commercial district.



When considering signing as a “Bike Route,” jurisdictions should take action to ensure suitability and maintenance by implementing the following:

1. Provide at least the AASHTO minimum outside curb lane width of 4.2 meters (14 feet). 4 and 1/2 meters (15 feet) is preferred. For full depth reconstruction projects to be eligible for MassHighway or Chapter 90 funding, a minimum outside lane width of 4.5 meters (14.76 feet) must be maintained (see Appendix A) unless a “waiver” is granted. A maintenance (not full depth reconstruction) project can be funded under the Chapter 90 program without a waiver.
2. Remove or restrict on-street parking in areas of critical width. Where bicyclists are subjected to opening car doors, vehicles exiting parking spaces, mirrors and obscured views due to parked vehicles, a minimum of 3.6 meters (12 feet) of combined bicycle travel and parking width is recommended.

3. Adjust traffic control devices (stop signs, signals) to give greater priority to bicycles. This may include extending clearance intervals or installation of detection for bicycles.
4. Provide a smooth riding surface including bicycle safe drainage grates.
5. Maintain the route through regular street sweeping to prevent accumulation of debris.
6. Provide “Bike Route” signing with destination information.

Class IV – Shared Roadways – “Share the Road Signing”

Bicycles will be ridden on most roadways where they are permitted. Roadway designs should account for bicycle safe practices. The most critical parameter is outside lane width. AASHTO recommends a minimum of 4.2 meters (14 feet) of usable lane width in a wide curb lane. MassHighway standards where applicable, recommend that outside lanes for roadway sections without designated bikeways should be at least 4.5 meters (14.76 feet) in width. Additional width is desirable so motorists will not need to cross centerlines nor lane lines to pass a bicyclist. In on street parking areas, a minimum of 3.6 meters (12 feet) of combined bicycle travel and parking is recommended.



Many jurisdictions have utilized edge striping on local streets to delineate shoulders where bicycle travel is expected. MassHighway policy discourages the use of edge lines on local streets unless the delineated shoulder is of adequate width for a parked vehicle (7-8 feet, 2.1 – 2.4 meters) or a parking prohibition is in place. Where on-street parking demand is minimal but allowed, some jurisdictions have chosen to delineate shoulders less than the width of a parked vehicle in order to define bicycle space. This technique is utilized to channelize motor vehicles toward the center of the roadway away from bicycle traffic, and to “calm” traffic by narrowing perceived lane widths.

Shared roadways where bicycle traffic is expected are often supplemented with “Share the Road” signing. “Share the Road” signing can be posted without absolute conformance to the above Shared Roadway minimum width requirements. Current MassHighway policy regarding the use of “Share the Road” signing can be found in Appendix B.

Summary of Minimum Recommended Pavement Widths (Two Lane Roads, Volume > 2000 ADT) – Per AASHTO Guidelines

1. Class II Bike Lanes with no parking – 32 feet
2. Class II Bike Lanes with parking on one side – 38-40 feet

3. Class II Bike Lanes with parking both sides – 46-50 feet

4. Class III Signed Shared Roadway with no parking – 28 feet (29.5 feet per MassHighway)
5. Class III Signed Shared Roadway with parking on one side – 37 feet (37.76 feet per MassHighway)
6. Class III Signed Shared Roadway with parking both sides – 46 feet

7. Class IV Shared Roadway with no parking – 28 feet (29.5 feet per MassHighway)
8. Class IV Shared Roadway with parking on one side – 37 feet (37.76 feet per MassHighway)
9. Class IV Shared Roadway with parking both sides – 46 feet (desirable)

RECOMMENDATIONS

Bicycle Safety

The majority of bicycling accidents (65% to 85%) do not involve collisions with motor vehicles and typically involve collisions with fixed objects, falls or collisions with other cyclists and pedestrians. In general, bicycle accidents involving motor vehicles are categorized as follows (in descending order of approximate frequency):

- Intersections – Motorist or bicycle fails to yield at a stop, signal or turn.
- Mid – block – Motorist or bicycle left or entered roadway.
- Wrong way bicycle riding.
- Bicycle or motorist turning or swerving.
- Bicyclist hit from behind by a motorist.
- Motorist opening car doors in the path of a bicyclist.

Most crashes involve disobeying the rules of the road, either by the motorist or bicyclist. Many communities such as Lexington and Cambridge provide bicycle safety programs to give bicyclists the knowledge and tools to safely coexist with motor vehicles. The Town of Watertown should consider adopting a bicycle education and training program.

The *Massachusetts Bicycle Safety Alliance* is an important resource which promotes programs and activities to enhance bicycle safety.

Enforcement is a key component of bicycle safety. Frequent contact between bicycle advisory committees and local police departments is encouraged to identify problem areas.

Design Solutions

Properly designed roadways encourage lawful behavior, thus decreasing the frequency of accidents. Many jurisdictions have found a correlation between good bicycle facilities,

higher use and increased obedience with the rules of the road. As the Town of Watertown embarks on a program to upgrade its bicycle facilities, there are common engineering solutions which should be considered to improve bicycle safety. Improving outside lane/shoulder width is a key element contributing to enhanced bicycle safety and is a major focus of this study. Signing and pavement markings is another. Other than following established design criteria, there are also other techniques which are commonly used to enhance bicycle safety:

- Include directional arrows with bike lane markings to discourage riding against traffic.
- Provide equal width shoulders to discourage riding against traffic.
- Provide more crossing opportunities on wide streets.
- Avoid bike lanes which end at mid block. Stripe bike lanes to a marked crosswalk or a point where moving vehicles would expect a crossing.
- Improve sight distance by restricting excessive on street parking at intersections.
- Remove excess vegetation or other obstructions at intersections.
- Design/maintain bicycle safe drainage grates and repair sunken grates.
- Increase awareness of the presence of bicycles through “Share the Road” signing.
- Provide bicycle detection when upgrading signalized intersections to reduce the incidence of bicyclists running red lights while waiting for a signal phase to be called (detection for bicycles is current state policy).
- Evaluate traffic signal clearance intervals for bicycle traffic.
- Post “No Parking in Bike Lane” signing where appropriate.

Traffic Calming

Traffic calming (reducing traffic speeds) can be effective in enhancing bicycle safety. Traffic calming can be accomplished through physical constraints (speed humps, chicanes, alternating on street parking, neckdowns, etc.) or by creating an “illusion of less space”. Physical constraints should be applied judiciously, as most require capital investment and often provide unexpected obstructions to bicyclists thus defeating the purpose of enhanced bicycle safety. In an urban environment such as Watertown, the most effective method of calming traffic is by striping narrower vehicular lanes. Most drivers will adjust their speed in accordance with the available space.

Bike Lanes vs. Wide Curb Lanes

There has been ongoing discussions regarding the effectiveness of bike lanes vs. wide curb lanes. The most recent study sponsored by the Federal Highway Administration (FHWA) entitled *Bicycle Lanes Versus Wide Curb Lanes: Operational and Safety Findings and Countermeasure Recommendations*, dated October 1999 (see Appendix C for abstract) indicates that both wide curb lanes and bike lanes can be beneficial in improving riding conditions. With regard to accidents between vehicles and bicycles at intersections, the study concludes that “the identified differences in operations and conflicts appeared to be related to the specific destination patterns of bicyclists riding through the intersection

areas studied and not to the characteristics of the bicycle facilities.” As a result, it appears that good design practice at intersections, education and enforcement are at least as important as the choice of whether to provide bike lanes or wide curb lanes.

The FHWA report also discusses conflicts that arise in areas with on-street parking which is a concern in Watertown. High parking turnover and illegal “double parking” in bicycle facilities are the most common cause of conflicts. Placement of “No Parking in Bike Lane” signing along with increased enforcement is the best solution to prevent double parking. The best way to prevent conflicts due to opening of car doors (dooring) is proper design practice. Bike lanes should be 5 feet in width where parking is permitted. Where the parking demand/turnover is high, a 13-14 foot combined parking/bike lane space is desirable. As a parked vehicle usually occupies 7 feet, a shared parking/bike lane area of 12-13 feet leaves a space of 6-7 feet for bicycles. As a 3 foot offset from parked vehicles is usually considered a minimum safe distance for bicycles, a properly designed bike lane should minimize the potential for dooring conflicts. Where combined parking/bicycle space is utilized in lieu of a bike lane, a minimum 12 foot distance from face of curb to edge of travel lane is recommended. This will also provide for a minimum 3 foot distance between a parked vehicle and a bicycle.

Improvements to Roadway Cross - Sections

Recommended roadway treatments are based upon the minimum AASHTO requirements as defined in *American Association of State Highway and Transportation Officials (AASHTO) 1999 Guide for the Development of Bicycle Facilities* and as detailed herein.

All alternatives assume minimum 11 foot travel lanes and 8 foot parking lanes, unless otherwise stated.

In formulating recommendations for the various corridors, potential alternatives were evaluated for meeting minimum standards for Exclusive Bike Lanes and Bike Routes as the preferred options. Where minimum standards could not be met, most roadways qualified for “Share the Road” signing, used to increase awareness that bicycles are present.

Roadway geometry data was collected at representative locations for each street including lane configuration and pavement/shoulder widths; observed on-street parking demand and parking regulations; widths of sidewalks and grass strips; right of way widths; posted speed and Average Annual Daily Traffic Volume (AADT). If there is no posted speed, 30 mph is assumed.

Traffic counts were compiled based upon historic records supplemented by Automatic Traffic Recorder (ATR) counts taken in the field.

An analysis of selected roadway cross-sections with recommendations for bicycle accommodations follows:

EAST – WEST ROUTES

Arsenal Street (two lane section)

Existing Conditions

Corridor Description: commercial
Average Daily Traffic (AADT): 13,870
Number of travel lanes: 2
Posted speed: 30
Pavement width (feet): 52
Parking: both sides, high demand
Sidewalks: both sides, no grass strips
Right-of-way width (feet): 64



Recommendations

The objective would be to match the two lane portion of Arsenal Street already constructed. Paint 5 foot bike lanes with one foot offset to parking lanes leaving two 12 foot lanes for vehicular traffic. End bike lanes at turning lane approaches to Watertown Square. No widening required.

Arsenal Street (four lane section)

Existing Conditions

Corridor Description: commercial
Average Daily Traffic (AADT): 13,870
Number of travel lanes: 4
Posted speed: 30
Pavement width (feet): 52
Parking: none
Sidewalks: both sides, no grass strips
Right-of-way width (feet): 64



Alternatives (preferred alt. in bold)

1. Paint shoulder stripe 4 feet from face of curb. Narrow travel lanes to 11 feet. No widening required. Maintain signing as Class IV Shared Roadway.
2. Narrow sidewalks from 6 feet to 5 feet each side, allowing for 16 foot outside lanes. Paint shoulder stripe 5 feet from face of curb. Narrow travel lanes to 11 feet. Sign as Class III Bike Route.
3. **Leave current lane configuration and Share the Road signing as is.**

Recommendation

Although minor widenings and/or narrower travel lanes would provide more space for bicycles, this section of roadway was recently reconstructed and should remain as is. The “Share the Road” signing will raise awareness of the presence of bicycles in the roadway. In the future when this roadway is scheduled for repaving or reconstruction, Alternatives 1 or 2 should be considered to provide a wider shoulder for bicycles.

Main Street (west of Waverley Street)

Existing Conditions

Corridor Description: mostly residential
Average Daily Traffic (AADT): 26,688
Number of travel lanes: 2
Posted speed: 30-35
Pavement width (feet): 46
Parking: both sides, low demand
Sidewalks: both sides with grass strips
Right-of-way width (feet): 60



Alternatives (preferred alt. in bold)

1. Stripe for 16 foot outside lane by painting shoulder/parking stripe at 7 foot offset from curb. This provides effective outside lane width of 15 feet. Sign as Class III "Bike Route".
2. Widen roadway by two feet each side by narrowing grass strips. Paint 5 foot bike lane with one foot offset to parking/shoulder stripe offset 7 foot offset to curb. This would leave two 12 foot vehicular lanes. Sign as Class II Bike Lanes
3. **Provide an 11 foot combined parking/bicycle lane (striped) on both sides leaving two 12 foot travel lanes. Sign as Class III Bike Route.**
4. Provide a 5 foot bike lane within a 12 foot shared bicycle/parking area. Travel lanes would be 11 feet in width. Sign for Class II Bike Lanes.

Recommendation

This segment of Main Street is State Highway and is high volume with significant truck traffic. One option would be to provide edge striping to delineate parking/bicycle area, similar to treatment on Watertown Street (Alt. 3). Since parking demand is low, there is little edge friction created by parked vehicles. This is solution would most likely be accepted by MassHighway.

Should the Town consider taking over ownership of Main Street from MassHighway through a discontinuance, bike lanes (Alt. 4) would provide better accommodations for bicycles and would provide continuity with proposed bike lanes recommended for Main Street east of Waverley Street. This option would require narrowing travel lanes to 11 feet.

Main Street (east of Waverley Street)

Existing Conditions

Corridor Description: commercial
Average Daily Traffic (AADT): 26,688
Number of travel lanes: 2
Posted speed: 30-35
Pavement width (feet): 48
Parking: both sides metered stalls, high demand
Sidewalks: both sides, no grass strips
Right-of-way width (feet): 90



Alternatives (preferred alt. in bold)

1. Widen roadway by one foot each side or two feet on one side by narrowing sidewalks. Paint 5 foot bike lane with one foot offset to 7 foot parking stalls. Sign as Class II Bike Lanes.
2. **Restripe parking lanes to uniform 7 foot offset from curb. Provide four foot bike lane with one foot offset to parking stalls. Sign as Class II Bike Lanes.**
3. Restripe parking lanes to uniform 8 foot offset from curb on both sides. This will provide for two 16 foot outside lanes without widening. Sign as Class III Bike Route.

Recommendations

Narrowing sidewalks is not practical in this commercial area because of heavy pedestrian activity and the expense of relocating street lighting. A 16 foot outside lane which meets minimum standards for a signed Class III Bike Route would be the preferred option. Should bike lanes be considered on the state owned section of Main Street west of Waverly Street, Alt. 2 would be a more desirable option for this segment.

Mt. Auburn Street

Existing Conditions

Corridor Description: commercial/residential
Average Daily Traffic (AADT): 15,240
Number of travel lanes: 4
Posted speed: 30
Pavement width (feet): 56
Parking: south side, moderate demand
Sidewalks: both sides
Right-of-way width (feet): 80



Alternatives (preferred alt. in bold)

1. Eliminate on street parking. Stripe four 11 foot lanes with 2 five foot bike lanes offset one foot from the curb.
2. Widen roadway by three feet each side or six feet on one side by narrowing/eliminating grass strips or narrowing sidewalks. Stripe for two 16 foot outside lanes and two 11 foot inside lanes. Retain one 8 foot parking lane. Sign as Class III Bike Route.
3. Widen roadway by four foot each side by eliminating grass strips. Paint 5 foot bike lane with one foot offset to parking or curb. Sign as Class II Bike Lanes.
4. **Stripe 7 foot parking lane on one side and four foot shoulder on opposite side. Stripe 3 - 10 foot lanes and one 15 foot lane (parking side). Sign as Class IV Shared Roadway**
5. **Eliminate one travel lane in each direction. Stripe two 14 foot travel lanes with two eight foot parking lanes and two five foot bike lanes offset one foot from the parking lane. Sign for Class II Bike Lanes.**

Recommendations

The average daily traffic of 15,240 makes Arsenal Street a candidate for reducing the present configuration of four vehicle lanes to two. This would create space for Class II Bike Lanes in both directions, thus accommodating bicycle traffic on this important east-west route. Should a corridor study indicate the two vehicle lane alternative (Alt. 5) is not feasible, Alternative 4 would provide additional shoulder/outside lane width to better accommodate bicycle traffic. This alternative, however, will not meet minimum AASHTO standards for bicycle accommodation. The narrowing of lanes would have a traffic calming effect which would tend to reduce speeds.

Mt. Auburn Street (commercial district)

Existing Conditions

Corridor Description: commercial
Average Daily Traffic (AADT): 15,240
Number of travel lanes: 4
Posted speed: 30
Pavement width (feet): 56
Parking: both sides metered, high demand
Sidewalks: both sides
Right-of-way width (feet): 84



Alternatives Alternatives (preferred alt. in bold)

1. Narrow sidewalks from 14 feet to nine feet. Stripe for two 15 foot outside lanes. Sign as Class III Bike Route.
2. Narrow sidewalks from 14 feet to seven feet. Provide five foot bike lanes both sides with one foot offset to parking stalls. Sign as Class II Bike Lanes.
3. Eliminate parking lane one side. Widen roadway by two feet each side by narrowing sidewalks from 14 feet to 12 feet. Provide 5 foot bike lanes both sides with one foot offset to parking or curb. Sign as Class II Bike Lanes.
4. **Stripe 10 foot inside lanes and 12 foot outside lanes. Delineate parking stalls at 7 feet from curb.**
5. **Eliminate one travel lane in each direction. Stripe two 14 foot travel lanes with two eight foot parking lanes and two five foot bike lanes offset one foot from the parking lane. Evaluate the need for turning lanes at intersections.**

Recommendations

Treatments for the commercial districts on Mt. Auburn Street should be considered in conjunction with the rest of the corridor. Should a corridor study indicate a reduction to two travel lanes is feasible, Alternative 4 would provide for marked bike lanes. Without a lane reduction, it is not possible to create additional space for bicycles that would meet minimum standards unless parking is eliminated on one side and/or sidewalks are narrowed. Both of these options would most likely be seen as unduly disruptive and undesirable in a commercial district with heavy parking and pedestrian demand.

North Beacon Street

Existing Conditions

Corridor Description: commercial/residential

Average Daily Traffic (AADT): >10,000

Number of travel lanes: 2

Posted speed: 30

Pavement width (feet): 56

Parking: both sides, moderate demand

Sidewalks: both sides

Right-of-way width (feet): 70



Alternatives

North Beacon Street presently has 5 foot bike lanes in both directions. “Share the Road” signing will be added to supplement bike lane markings.

Orchard Street

Existing Conditions

Corridor Description: single and multi-family residential

Average Daily Traffic (AADT): <10,000

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 33

Parking: intermittent, low demand

Sidewalks: both sides with grass strips

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

1. Enact parking prohibition (both sides) and maintain existing width creating two 16.5 foot lanes. Stripe shoulder at 4.5 feet from curb. Sign as Class III Bike Route.
2. Allow parking one side only and widen roadway by 5 feet by eliminating grass strips. Stripe parking lane 7 feet from the curb, leaving two 15 foot lanes. Sign as Class III Bike Route.
3. Allow parking one side only and widen roadway by 6 feet by eliminating grass strips. Stripe one 7 foot parking lane leaving two 11 foot travel lanes and two five foot bike lanes. Sign as Class II Bike Lanes.
4. Enact parking prohibition (one side) and paint shoulder stripe 10 feet from curb to delineate parking/bicycle space. Post Class IV "Share the Road" signing.
5. **Maintain existing width. Paint shoulder stripe at a five foot offset to curb. Sign as Class IV Shared Roadway.**

Recommendation

Use "Share the Road" signing or bike symbols in the vicinity of the school. **Paint shoulder stripe at a five foot offset to curb.**

Pleasant Street

Existing Conditions

Corridor Description: mostly commercial
Average Daily Traffic (AADT): 13,450
Number of travel lanes: 2
Posted speed: none
Pavement width (feet): 28
Parking: none
Sidewalks: both sides
Right-of-way width (feet): 40



Alternatives (preferred alt. in bold)

1. Narrow sidewalks from 6 feet to 5 feet both sides. Widen roadway from 28 to 32 feet. Two foot strip taking is required. This will provide two 16 foot outside lanes. Paint 5 foot shoulders each side. Sign as Class III Bike Route.
2. **Narrow sidewalks from 6 feet to 5 feet both sides. Widen roadway from 28 to 29.5 feet. Provide two 11 foot outside lanes with striped shoulders. Sign as Class IV Shared Roadway.**
3. Maintain current roadway width. Post “Share the Road” signing.

Recommendations

Pleasant Street is a narrow, high volume roadway within a restrictive right-of-way. Improved bicycle accommodations will be provided by widening shoulders as MassHighway has scheduled this roadway for reconstruction. Providing “Share the Road “ signing to increase driver awareness would be an alternative which could be immediately implemented.

Summer Street

Existing Conditions

Corridor Description: residential
Average Daily Traffic (AADT): <10,000
Number of travel lanes: 2
Posted speed: none
Pavement width (feet): 23
Parking: none but vehicles pull up on grass strip, low demand
Sidewalks: both sides
Right-of-way width (feet): 40



Alternatives (preferred alt. in bold)

1. Widen to 30 feet by eliminating grass strips. This would accommodate two 15 foot outside lanes. Sign as Class III Bike Route.
2. Widen to 32 feet by eliminating grass strips. This would accommodate two 5 foot bike lanes. Sign as Class II Bike Lanes.
3. Post Class IV "Share the Road" signing

Recommendations

This is a low volume residential street which does not qualify as a major east-west route and would not require bicycle signing or pavement markings.

Walnut Street

Existing Conditions

Corridor Description: commercial/multi – family residential

Average Daily Traffic (AADT): <10,000

Number of travel lanes: 2

Posted speed: 30

Pavement width (feet): 32

Parking: intermittent, high demand in some sections

Sidewalks: both sides

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

1. Enact parking prohibition (one side) and stripe parking lane 7 feet from the curb. Maintain existing width creating 14 and 11 foot lanes. Sign as Class IV Shared Roadway.
2. Enact parking prohibition (both sides) and maintain existing width creating two 11 foot lanes and two 5 foot shoulders. Sign as Class III Bike Route.
3. Sign as Class IV Shared Roadway.

Recommendations

Improved bicycle accommodations would require widening at the expense of grass strips and/or front yards. A parking prohibition on one or both sides would be controversial in a residential area. Walnut Street does not qualify as a major north-south or east-west route and would not require bicycle signing or pavement markings.

Waltham Street

Existing Conditions

Corridor Description: multi-family residential;
commercial west of Bridge Street

Average Daily Traffic (AADT): <10,000

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 27 east of Bridge St.,
36 west of Bridge Street

Parking: one side, low demand east of Bridge
Street, mostly no parking west of Bridge
Street

Sidewalks: both sides

Right-of-way width (feet): 40



Alternatives – East of Bridge Street (preferred alt. in bold)

1. Ban parking both sides. Post Class IV “Share the Road” signing.
2. Enact parking prohibition (both sides) and widen 3 feet creating two 15 foot lanes. Sign as Class III Bike Route.
3. Enact parking prohibition (both sides) and widen 5 feet. Install 5 foot bike lanes. Sign as Class II Bike Lanes.
4. **Post Class IV “Share the Road” signing.**

Alternatives – East of Bridge Street (preferred alt. in bold)

1. Post Class IV “Share the Road” signing.
2. Stripe for two 12 foot lanes and two five foot shoulders. Post Class IV “Share the Road” signing.
3. **Stripe for two 12 foot lanes and two five foot bike lanes. Post Class II “Bike Lane” signing.**

Recommendations – East of Bridge Street

This segment of Waltham Street is narrow and minimum bicycle accommodations would require widening at the expense of grass strips and/or front yards. A parking prohibition both sides would be controversial in a residential area. “Share the Road” signing would increase driver awareness of the presence of bicycles.

Recommendations – West of Bridge Street

West of the lumber yard, the roadway width is 36 feet with no parking. Stripe for two 12 foot lanes and two five foot bike lanes to the Waltham line. Sign as a Class II Bike Route.

Watertown Street

Existing Conditions

Corridor Description: commercial/residential

Average Daily Traffic (AADT): 12,018

Number of travel lanes: 2

Posted speed: 30

Pavement width (feet): 44

Parking: both sides, low demand

Sidewalks: both sides

Right-of-way width (feet): 60



Alternatives (preferred alt. in bold)

1. Eliminate parking on one side. Stripe for two five foot bike lanes. Sign as Class II Bike Lanes.
2. Narrow sidewalks from 8 feet to 6 feet both sides. Stripe for two 14 foot outside lanes with shoulder/parking stripe at 10 foot offset from curb, effectively providing for two 16 foot outside lanes. Sign as Class III Bike Route.
3. Narrow sidewalks from 8 feet to 5 feet both sides. Stripe for two 5 foot bike lanes at one foot offset from parking lane and paint shoulder/parking stripe at 8 foot offset from curb. Sign as Class II Bike Lanes.
4. **Presently striped with parking/bicycle space at 10-11 feet from curb both sides, but is not signed. Leave pavement markings as is. Post Class IV "Share the Road" signing.**

Recommendations

Although not meeting minimum bicycle accommodation requirements for two lanes plus parking on both sides, the present configuration of Watertown Street is bicycle friendly. This is due to the wide (44 foot) pavement section and the low demand for on-street parking. The delineation of the parking/bicycle space channelizes vehicles toward the middle of the road which benefits the bicyclist. The only recommendation here would be to post "Share the Road" signing to increase driver awareness of the presence of bicycles.

NORTH – SOUTH ROUTES

Arlington Street

Existing Conditions

Corridor Description: commercial/residential

Average Daily Traffic (AADT): 15,300

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 39

Parking: both sides, high demand

Sidewalks: both sides, grass strips

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

1. Enact parking prohibition on one side. Stripe 5 foot shoulder on one side and 8 foot parking lane on other side leaving one 11 foot lane and one 15 foot lane. Sign as Class III Bike Route.
2. Enact parking prohibition on one side and install 5 foot bike lanes. This would leave two 11 foot vehicle lanes. Would require widening from 39 to 42 feet and a 3 foot strip taking. Sign as Class II Bike Lane.
3. **Provide delineation of parking lane 8.5 feet from curb both sides, leaving 22 feet for two lanes. Post Class IV “Share the Road” signing.**

Recommendations

Of the three above alternatives above, Alternative 3 is the most realistic and immediately attainable. As the corridor is primarily multi-family residential and commercial a parking prohibition is undesirable. As this is a relatively high volume north-south route, delineation of the parking lanes will channel through vehicles toward the center of the road thus better defining the parking/bicycle area. Upgrading should be prior to or in conjunction with the planned MDC Watertown Bikeway on the abandoned rail right-of-way.

Church Street

Existing Conditions

Corridor Description: multi-family residential

Average Daily Traffic (AADT): 7,730

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 23

Parking: none

Sidewalks: both sides with grass strips

Right-of-way width (feet): 40



Alternatives (preferred alt. in bold)

1. Eliminate 3 foot grass strip both sides. Widen roadway to 30 feet. Stripe 4 foot shoulders both sides. This would accommodate two 15 foot outside lanes. Sign as Class III Bike Route.
2. Eliminate 3 foot grass strip both sides. Widen roadway to 32 feet, requiring two foot strip taking. This would accommodate two 5 foot bike lanes. Sign as Class II Bike Lanes.
3. **Post Class IV "Share the Road" signing**

Recommendations

Church Street is narrow and does not come close to minimum bicycle accommodation criteria. Improved bicycle accommodations would require widening at the expense of grass strips and/or front yards. This is probably not justified given the relatively low volume of traffic and the absence of parked vehicles. "Share the Road" signing would increase driver awareness of the presence of bicycles.

Common Street

Existing Conditions

Corridor Description: mostly residential
Average Daily Traffic (AADT): <10,000
Number of travel lanes: 2
Posted speed: none
Pavement width (feet): 32
Parking: varies, one or both sides, moderate demand
Sidewalks: both sides, no grass strips
Right-of-way width (feet): 40



Alternatives (preferred alt. in bold)

1. Enact parking prohibition both sides. Sign as Class III Bike Route.
2. Enact parking prohibition both sides. Paint bike lanes. Sign as Class II Bike Lanes.
3. **Limit parking to one side (where applicable). Place shoulder stripe 7 feet from curb leaving a 3 foot shoulder on the other side and two 11 foot lanes. Post Class IV “Share the Road” signing.**

Recommended Options-Locke to Mt. Auburn

Short Term: There is an existing parking prohibition on the southbound side (occasionally northbound) only. Where parking is allowed, stripe at 7 foot offset from curb, leaving a 3 foot shoulder on the other side and two 11 foot lanes. Post Class IV “Share the Road” signing.

Long Term: This roadway is in need of reconstruction. Bicycle accommodations and geometric improvements, especially at Orchard Street, should be analyzed during the design phase.

Coolidge Avenue (east of Grove Street)

Existing Conditions

Corridor Description: commercial/residential (apt. buildings)

Average Daily Traffic (AADT): <10,000

Number of travel lanes: 2

Posted speed: 30

Pavement width (feet): 27-30

Parking: westbound side, in front of apartment building only, low demand

Sidewalks: none

Right-of-way width (feet): 40



Alternatives (preferred alt. in bold)

1. Restrict parking to one side only. Place Class IV “Share the Road” signing.
2. Widen to uniform width of 30 feet. Eliminate parking and stripe 4 foot shoulders. Sign as Class III Bike Route.
3. Widen to uniform width of 32 feet. Paint 5 foot bike lanes and eliminate parking. Sign as Class II Bike Lanes.
4. **Widen to uniform 30 foot width. Stripe for two 11 foot lanes and two 4 foot shoulders. Post as Class III Bike Route.**

Recommendations

Minor widening in certain areas to attain a uniform 30 foot width can be accomplished without major disruption to sidewalks or abutting properties. Since eliminating on-street parking at the apartment complex is probably not viable, attaining bike lanes the full length of this segment is not practical. In general, a uniform 30 foot roadway width would eliminate some of the narrower sections and improve bicycle accommodations by providing a full 15 foot outside lane.

Coolidge Avenue (west of Grove Street)

Existing Conditions

Corridor Description: commercial/residential (apt. buildings)

Average Daily Traffic (AADT): 3,700

Number of travel lanes: 2

Posted speed: 30

Pavement width (feet): 40

Parking: none, except in front of Charles River Towers

Sidewalks: both sides, grass strip one side

Right-of-way width (feet): 55



Alternatives (preferred alt. in bold)

1. Paint five foot bike lanes both sides, offset one foot from curb. Eliminate parking in front of Charles River Towers. Sign as Class II Bike Lanes.
2. **Paint 9 foot shoulder/parking lanes both sides. Post as Class III Bike Route.**

Recommendations

The wide cross section of Coolidge Street in this area provides for a bicycle friendly environment. Since eliminating parking in front of Charles River towers is not a viable option, attaining bike lanes the full length of this segment is not practical. Sign as Class III Bike Route.

Dexter Street

Existing Conditions

Corridor Description: commercial/multi-family residential

Average Daily Traffic (AADT): <10,000

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 32

Parking: one side alternating, moderate to high demand

Sidewalks: both sides with grass strips

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

1. Enact parking prohibition both sides. Paint five foot shoulders both sides. Sign as Class III Bike Route.
2. Enact parking prohibition both sides. Paint five foot bike lanes both sides. Sign as Class II Bike Lanes.
3. Remove grass strips and trees and widen from 32 to 38 feet. Restrict parking to one side and stripe parking lane at an eight foot offset from the curb. This would provide for two 15 foot outside lanes to accommodate cyclists. Sign as Class III Bike Route.
4. Post Class IV "Share the Road" signing.

Recommendations

This is a low volume residential street which would not require bicycle signing or pavement markings.

Galen Street

Existing Conditions

Corridor Description: commercial
Average Daily Traffic (AADT): 23,920
Number of travel lanes: 4
Posted speed: none
Pavement width (feet): 60
Parking: both sides, high demand
Sidewalks: both sides with neckdowns; no grass strips
Right-of-way width (feet): 70
MBTA Bus Route



Alternatives (preferred alt. in bold)

1. Eliminate a parking lane on one side. Stripe with 11 foot outside lane plus 5 foot shoulder. Sign as Class III Bike Route.
2. Post **“Share the Road”** signing.

Recommendations

Creating more room in the outside lane for bicycles in this corridor would require the elimination of parking on one side. This is undesirable in this primarily commercial area where parking demand is high. Since this corridor was recently reconstructed, funding would not be readily available for additional improvements. Posting of “Share the Road” signing is the most immediately available option for raising awareness of the presence of bicycles, especially since this is a heavy MBTA bus route.

Grove Street (Coolidge Avenue to Kandazian Street)

Existing Conditions

Corridor Description: commercial west side,
cemetary east side

Average Daily Traffic (AADT): <10,000

Number of travel lanes: 2

Posted speed: 30

Pavement width (feet): 30

Parking: none

Sidewalks: west side, no grass strip

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

1. Maintain 30 foot width. Sign as bike route. This would accommodate two 15 foot outside lanes. Sign as Class III Bike Route.
2. Widen from 30 feet to 34 feet on cemetary side. Install five foot bike lanes both sides offset one foot from curb, leaving two 11 foot vehicle lanes. Sign as Class II Bike Lanes.
3. **Maintain 30 foot width. Stripe as two 11 foot thru lanes and two 4 foot shoulders. Sign as Class III Bike Route.**

Recommendations

Absence of parking along this corridor makes this an excellent route for bicycles. Shoulder striping will channelize vehicles toward the middle of the road.

Grove Street (North of Kandazian Street)

Existing Conditions

Corridor Description: commercial/residential
Average Daily Traffic (AADT): <10,000
Number of travel lanes: 2
Posted speed: 30
Pavement width (feet): 30
Parking: minor demand on west side in front of a few residences
Sidewalks: west side
Right-of-way width (feet): 50

Alternatives (preferred alt. in bold)

1. Enact parking prohibition both sides and widen from 30 feet to 32 feet. Install 5 foot bike lanes. Sign as Class II Bike Lanes.
2. **Maintain 30 foot width. Stripe as two 11 foot thru lanes and two 4 foot shoulders. Sign as Class III Bike Route.**

Recommendations

Absence of parking along this corridor makes this an excellent route for bicycles, meeting minimum criteria for a Class III Bike Route. Shoulder striping will channelize vehicles toward the middle of the road. Treatment will be consistent with the rest of Grove Street. Upgrading should be prior to or in conjunction with the planned MDC Watertown Bikeway on the abandoned rail right-of-way.

Lexington Street (north of Main Street)

Existing Conditions

Corridor Description: single and multi-family residential

Average Daily Traffic (AADT): 5,960

Number of travel lanes: 2

Posted speed: 25

Pavement width (feet): 27

Parking: none

Sidewalks: both sides, grass strip on east side

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

- Widen from 27 feet to 30 feet by narrowing grass strip and/or sidewalks. Stripe five foot shoulders both sides. Sign as Class III Bike Route.
- **Maintain 27 foot width. This would accommodate two 11 foot lanes and 2.5 foot striped shoulders. Sign as Class IV "Share the Road".**

Recommendations

Lexington Street is narrow and minimum bicycle accommodations would require widening at the expense of grass strips and/or front yards. This is probably not justified given the moderate volume of traffic and the absence of parked vehicles. "Share the Road" signing would increase driver awareness of the presence of bicycles, particularly since Lexington Street is a major north-south route in Watertown.

School Street (Arsenal Street to Putnam Street)

Existing Conditions

Corridor Description: commercial
Average Daily Traffic (AADT): 9,000
Number of travel lanes: 2
Posted speed: none
Pavement width (feet): 32
Parking: both sides, high demand
Sidewalks: both sides with grass strips
Right-of-way width (feet): 50

Alternatives (preferred alt. in bold)

1. Enact parking prohibition (one side) and stripe parking lane 7 feet from the curb. Maintain existing width creating 14 and 11 foot lanes. Sign as Class IV Shared Roadway.
2. Enact parking prohibition (both sides) and maintain existing width creating two 16 foot lanes. Paint 5 foot bike lanes. Sign as Class II Bike Lanes.
3. Allow parking one side only and widen roadway by 6 feet by eliminating grass strips. Paint 8 foot parking lane on one side leaving two 15 foot lanes. Sign as Class III Bike Route.
4. Allow parking one side only and widen roadway by 7 feet by eliminating grass strips. Stripe one 7 foot parking lane leaving two 11 foot travel lanes and two five foot bike lanes. Sign as Class II Bike Lanes.
5. **Maintain existing roadway width. Sign as Class IV Shared Roadway.**

Recommendations

Widening is not an option due to the restrictive right-of-way in a commercial area. The high demand for parking makes parking restrictions unrealistic. "Share the Road" signing would be consistent with the other sections of School Street. Upgrading should be prior to or in conjunction with the planned MDC Watertown Bikeway on the abandoned rail right-of-way.

School Street (Putnam Street to Mt. Auburn street)

Existing Conditions

Corridor Description: residential/some commercial

Average Daily Traffic (AADT): 9,000

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 26-32

Parking: both sides, low demand

Sidewalks: both sides

Right-of-way width (feet): 50

Alternatives (preferred alt. in bold)

- Enact parking prohibition (one side) and stripe parking lane 7 feet from the curb. Maintain existing width creating 14 and 11 foot lanes. Sign as Class IV Shared Roadway.
- Enact parking prohibition (both sides) and maintain existing width creating two 16 foot lanes. Stripe 5 foot shoulders. Sign as Class III Bike Route.
- Enact parking prohibition (both sides) and maintain existing width creating two 16 foot lanes. Install 5 foot bike lanes. Sign as Class II Bike Lanes.
- Allow parking one side only and widen roadway by 5 feet by eliminating grass strips. Stripe a 7 foot parking lane, leaving two 15 foot vehicle lanes. Sign as Class III Bike Route.
- Allow parking one side only and widen roadway by 7 feet by eliminating grass strips. Stripe one 7 foot parking lane leaving two 11 foot travel lanes and two five foot bike lanes. Sign as Class II Bike Lanes.
- **Sign as Class IV Shared Roadway.**

Recommendations

This segment of School Street is narrow and improved bicycle accommodations would require widening at the expense of grass strips and/or front yards. A parking prohibition on one or both sides would be controversial in this residential area as most houses are multi-family. "Share the Road" signing would increase driver awareness of the presence of bicycles and be consistent with the other sections of School Street.

School Street (North of Mt. Auburn Street)

Existing Conditions

Corridor Description: single family residential

Average Daily Traffic (AADT): 9,000

Number of travel lanes: 2

Posted speed: none

Pavement width (feet): 26-32

Parking: intermittent, low demand

Sidewalks: both sides with grass strips

Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

1. Enact parking prohibition (both sides) and attain uniform width of 30 feet creating two 15 foot lanes. Sign as Class III Bike Route.
2. Widen to 32 feet. Enact parking prohibition (one side) and stripe parking lane 7 feet from the curb. Maintain existing width creating 14 and 11 foot lanes. Sign as Class IV Shared Roadway.
3. Enact parking prohibition (both sides) and widen to 32 feet creating two 11 foot lanes and two 5 foot shoulders. Sign as Class III Bike Route.
4. Enact parking prohibition (both sides). Sign as Class IV Shared Roadway.
5. Enact parking prohibition (both sides) and attain uniform width of 30 feet creating two 15 foot lanes. Sign as Class III Bike Route.
6. **Maintain existing width. Sign as Class IV Shared Roadway.**

Recommendations

This segment of School Street is narrow and improved bicycle accommodations would require widening at the expense of grass strips and/or front yards. A parking prohibition on one or both sides would be controversial in a residential area. "Share the Road" signing would increase driver awareness of the presence of bicycles and would be consistent with the other sections of School Street.

Waverley Street

Existing Conditions

Corridor Description: mostly residential
Average Daily Traffic (AADT): <10,000
Number of travel lanes: 2
Posted speed: none
Pavement width (feet): 35
Parking: intermittent, low demand
Sidewalks: both sides
Right-of-way width (feet): 50



Alternatives (preferred alt. in bold)

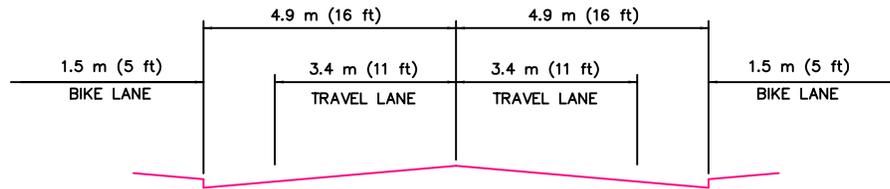
1. Enact parking prohibition (both sides) and maintain existing width. Install 5 foot bike lanes. Sign as Class II Bike Lanes.
2. Allow parking one side only and widen roadway by 2 feet. Stripe 7 foot parking lane leaving two 15 foot lanes. Sign as Class III Bike Route.
3. Allow parking one side only and widen roadway by 4 feet. Stripe 7 foot parking lane leaving two 11 foot lanes and two 5 foot bike lanes. Sign as Class II Bike Route.
4. Enact parking prohibition (one side) and maintain existing width. Stripe one 7 foot parking lane, leaving two 14 foot lanes. Sign as Class IV Shared Roadway.
5. **Stripe two 6 foot shoulders. Post Class IV "Share the Road" signing.**

Recommendations

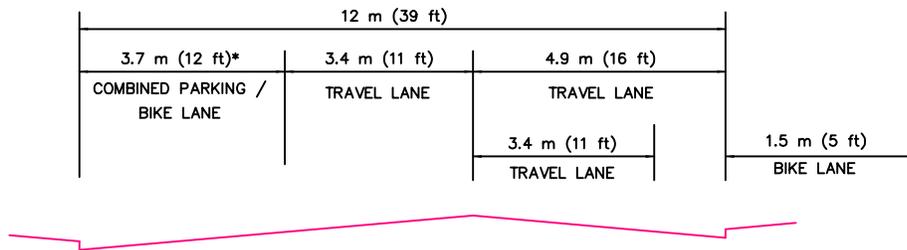
Improved bicycle accommodations would require widening at the expense of grass strips, mature trees and/or front yards or parking restrictions. A parking prohibition on one or both sides would be controversial in a residential area. Residents have removed curbing in areas to facilitate use of grass strips for parking. "Share the Road" signing would increase driver awareness of the presence of bicycles on this primary north-south route through Watertown.

Use "Share the Road" signing or bike symbols in the vicinity of the school. Paint shoulder stripe at a five foot offset to curb.

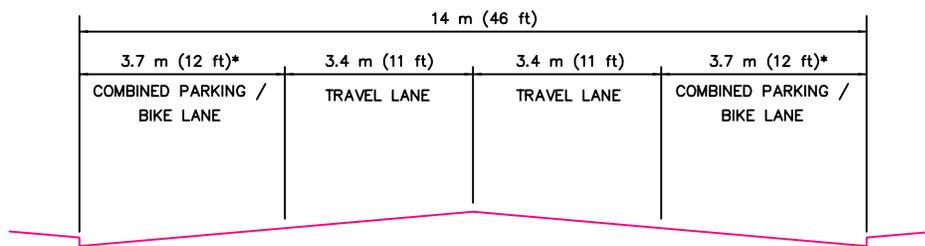
MINIMUM RECOMMENDED PAVEMENT WIDTHS PER AASHTO
(TWO LANE FACILITY, VOLUME > 2000 ADT)



CLASS II BIKE LANES – NO PARKING



CLASS II BIKE LANES – PARKING ONE SIDE

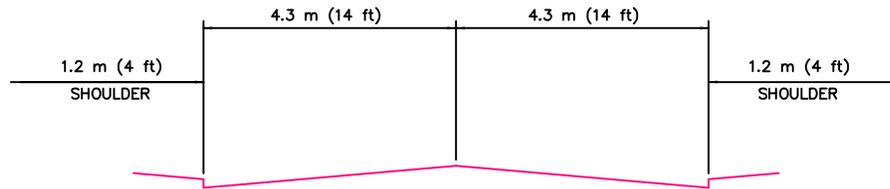


CLASS II BIKE LANES – PARKING BOTH SIDES

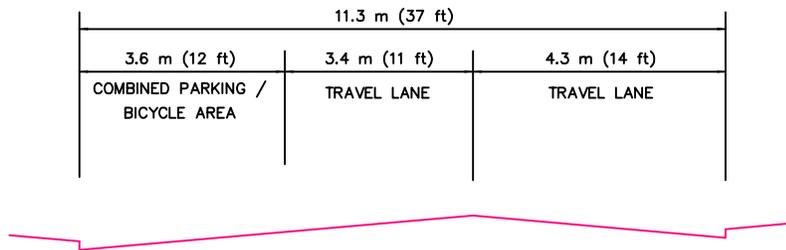
* 13 FT IN COMMERCIAL AREAS WHERE PARKING TURNOVER IS HIGH

FIGURE 1

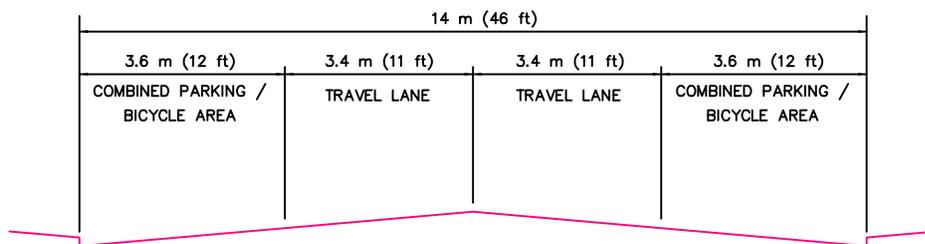
MINIMUM RECOMMENDED PAVEMENT WIDTHS PER AASHTO
(TWO LANE FACILITY, VOLUME > 2000 ADT)



CLASS III/CLASS IV – NO PARKING

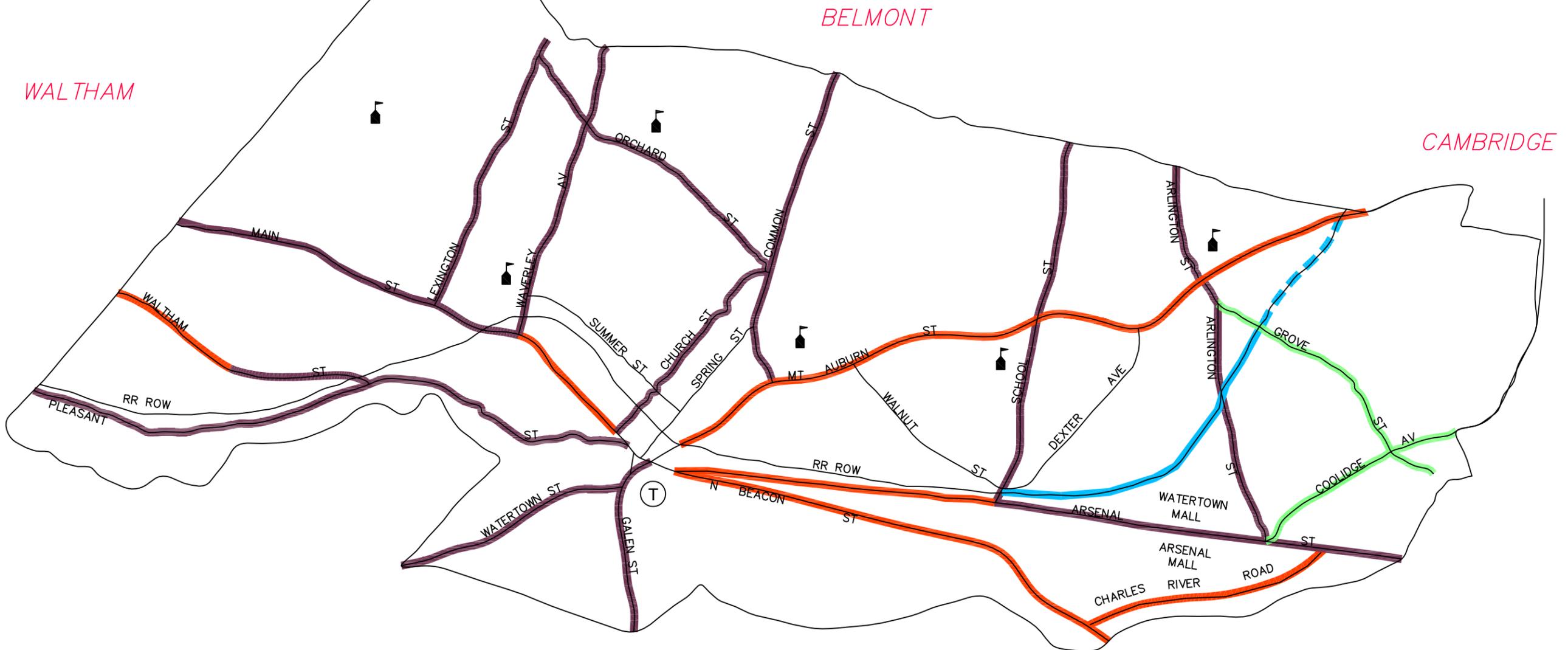


CLASS III/CLASS IV – PARKING ONE SIDE



CLASS III/CLASS IV – PARKING BOTH SIDES

FIGURE 2

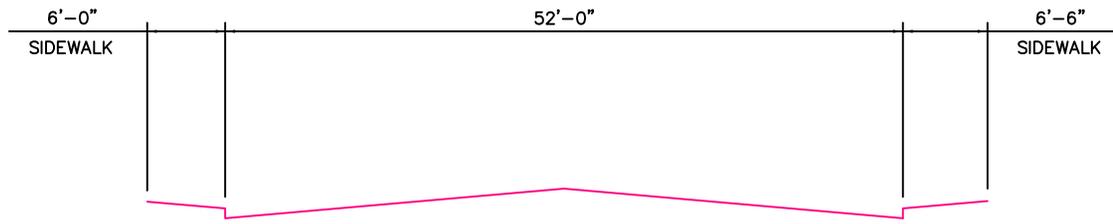


WATERTOWN BIKE MAP

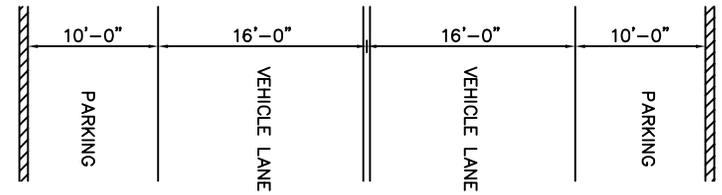
WATERTOWN MA.
N.T.S.

FIGURE 3

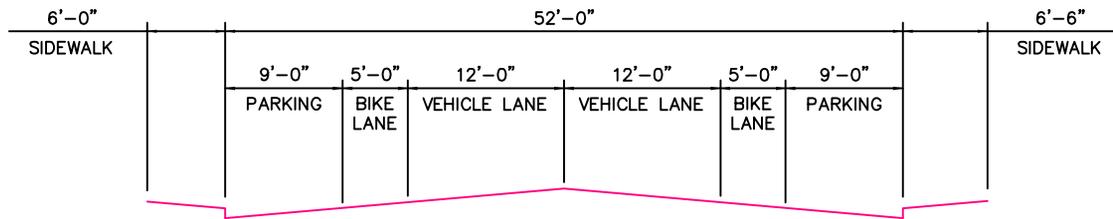
-  - SCHOOL
- CLASS I - BIKE PATH 
- CLASS II - EXCLUSIVE BIKE LANES 
- CLASS III - BIKE ROUTE 
- CLASS IV - SHARE THE ROAD 



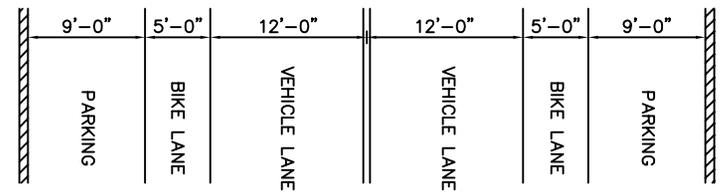
ARSENAL STREET (TWO LANE SECTION) – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

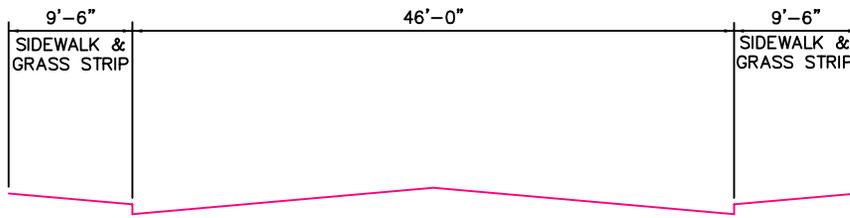


ARSENAL STREET (TWO LANE SECTION) – PROPOSED CLASS II BIKE LANES

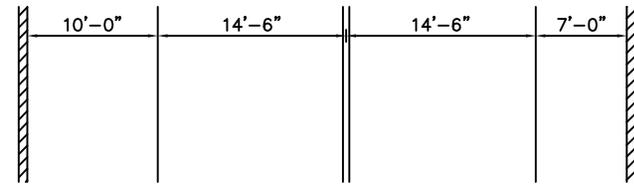


PROPOSED STRIPING LAYOUT

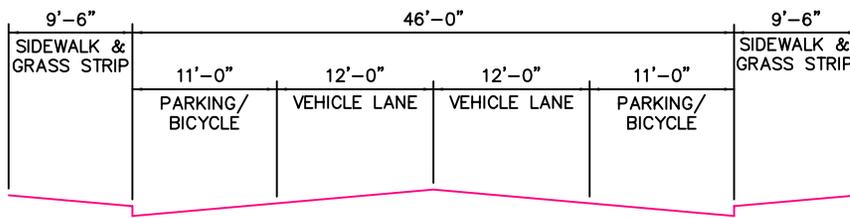
FIGURE 4



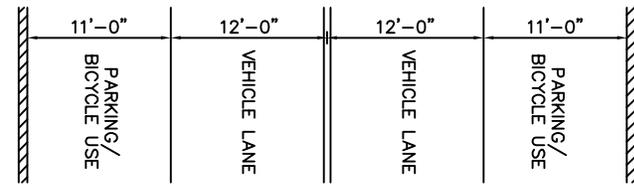
MAIN STREET (WEST OF WAVERLY STREET) – EXISTING CONDITIONS



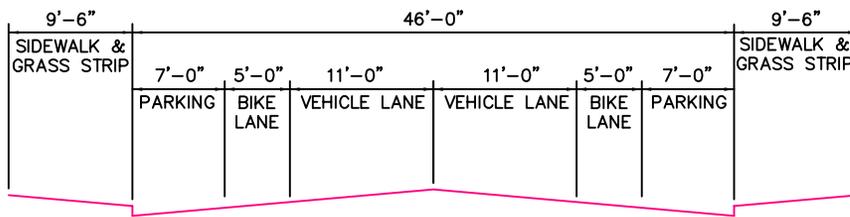
EXISTING STRIPING LAYOUT



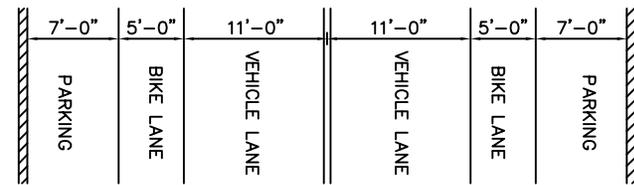
MAIN STREET (WEST OF WAVERLY STREET) – PROPOSED CLASS III BIKE ROUTE – ALT. 3



PROPOSED STRIPING LAYOUT – ALT. 3

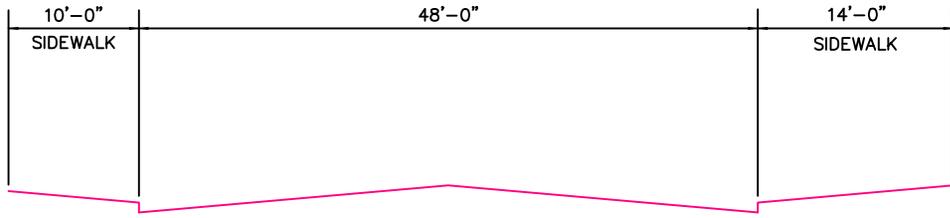


MAIN STREET (WEST OF WAVERLY STREET) – PROPOSED CLASS II BIKE ROUTE – ALT. 4

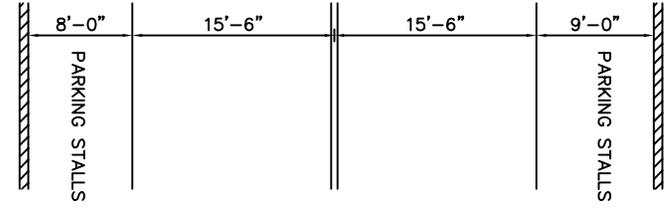


PROPOSED STRIPING LAYOUT – ALT. 4

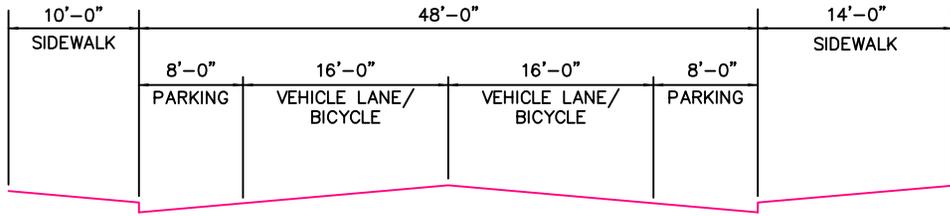
FIGURE 5



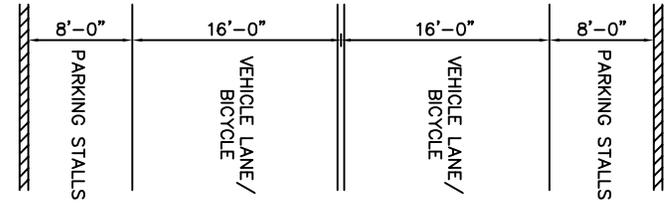
MAIN STREET (EAST OF WAVERLY STREET) – EXISTING CONDITIONS



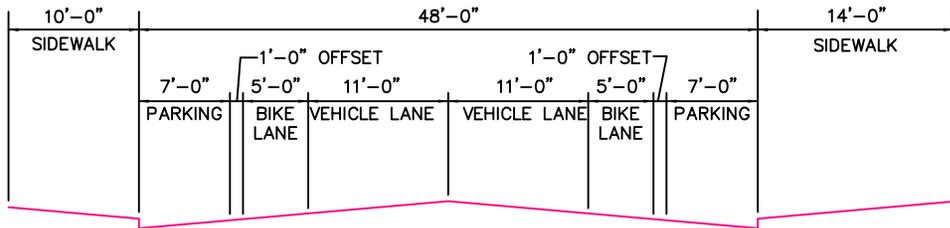
EXISTING STRIPING LAYOUT



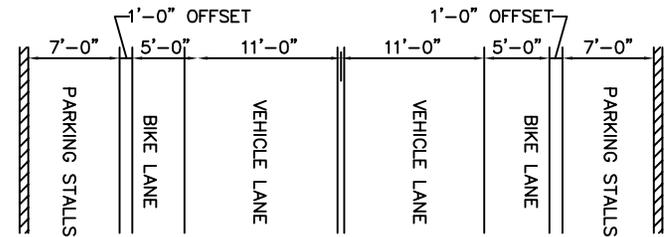
MAIN STREET (EAST OF WAVERLY STREET) – PROPOSED CLASS III BIKE ROUTE – ALT. 3



PROPOSED STRIPING LAYOUT – ALT. 3

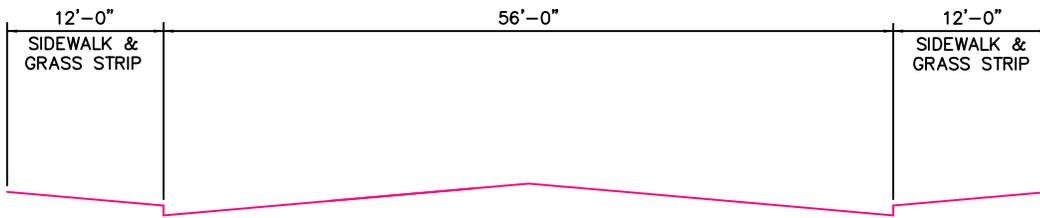


MAIN STREET (EAST OF WAVERLY STREET) – PROPOSED CLASS II BIKE LANES – ALT. 2

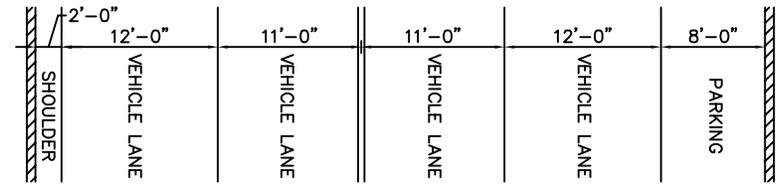


PROPOSED STRIPING LAYOUT – ALT. 2

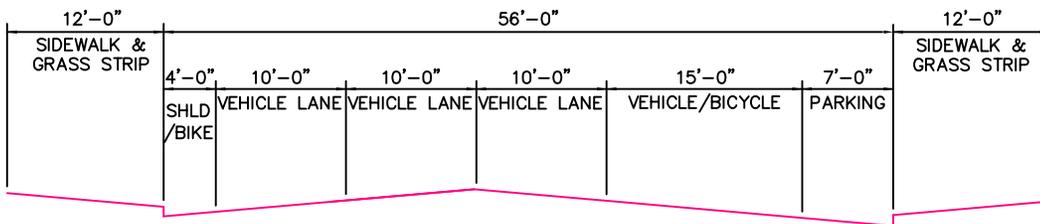
FIGURE 6



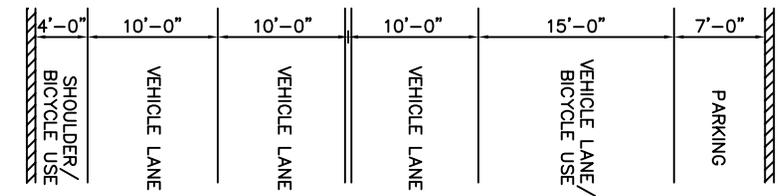
MT. AUBURN STREET – EXISTING CONDITIONS



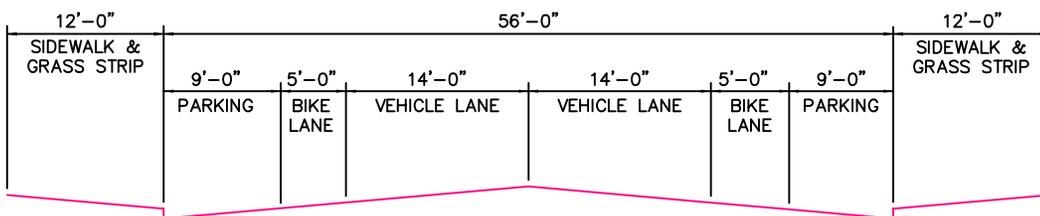
EXISTING STRIPING LAYOUT



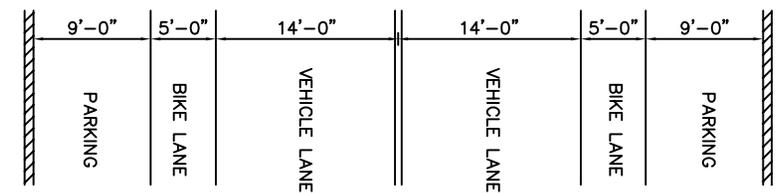
MT. AUBURN STREET – PROPOSED CONDITIONS – ALT. 4



PROPOSED STRIPING LAYOUT – ALT. 4

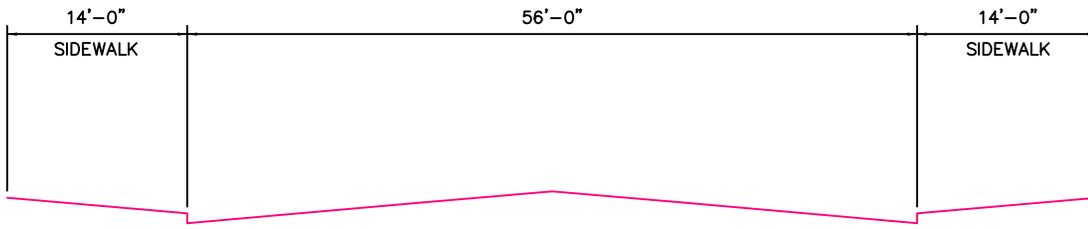


MT. AUBURN STREET – PROPOSED CONDITIONS – ALT. 5

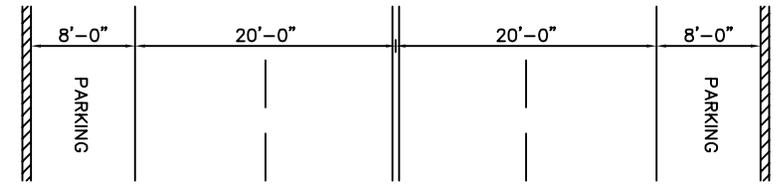


PROPOSED STRIPING LAYOUT – ALT. 5

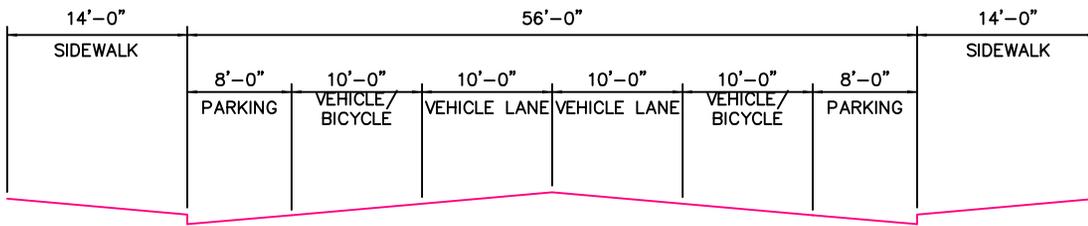
FIGURE 7



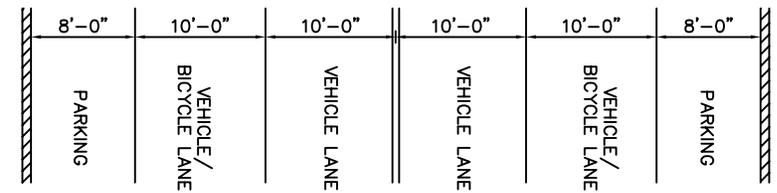
MT. AUBURN STREET (COMMERCIAL DISTRICT) – EXISTING CONDITIONS



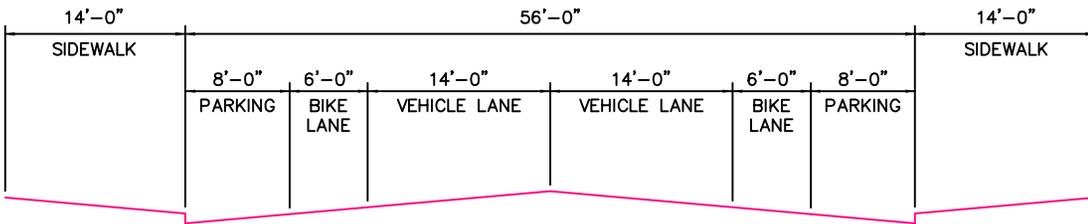
EXISTING STRIPING LAYOUT



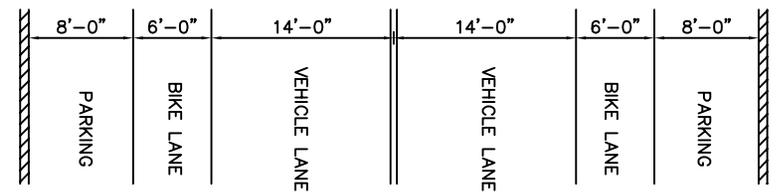
MT. AUBURN STREET (COMMERCIAL DISTRICT) – PROPOSED CONDITIONS – ALT. 4



PROPOSED STRIPING LAYOUT – ALT. 4
(SAME AS EXISTING)

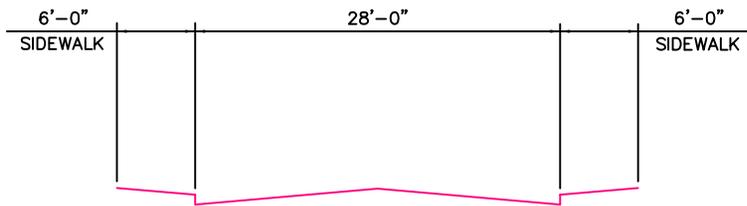


MT. AUBURN STREET (COMMERCIAL DISTRICT) – PROPOSED CLASS II BIKE LANES – ALT. 5

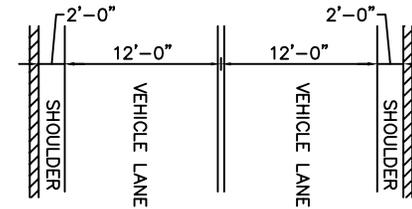


PROPOSED STRIPING LAYOUT – ALT. 5

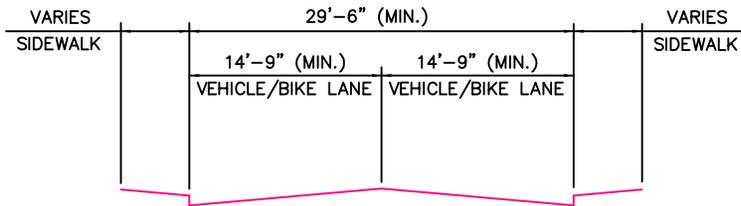
FIGURE 8



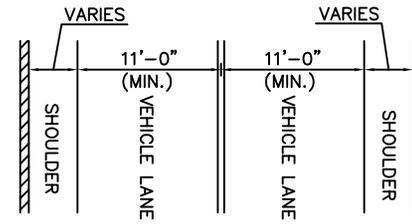
PLEASANT STREET – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

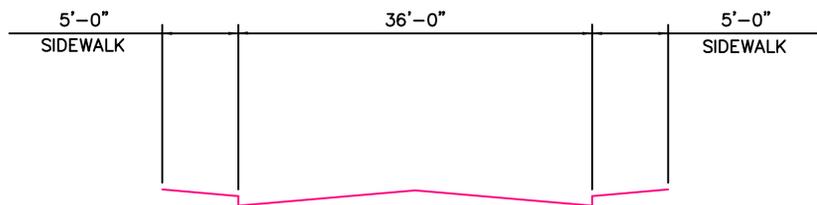


PLEASANT STREET – PROPOSED CLASS IV SHARE THE ROAD – ALT. 2

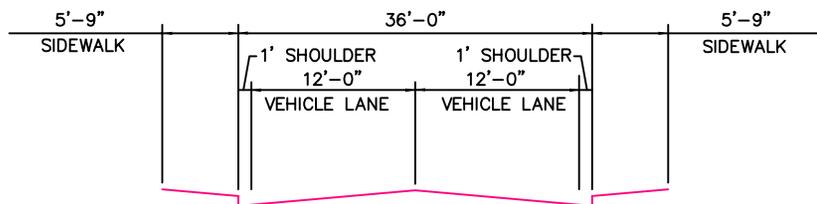
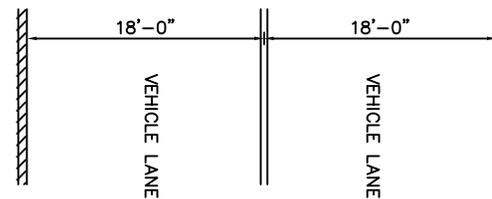


PROPOSED STRIPING LAYOUT – ALT. 2

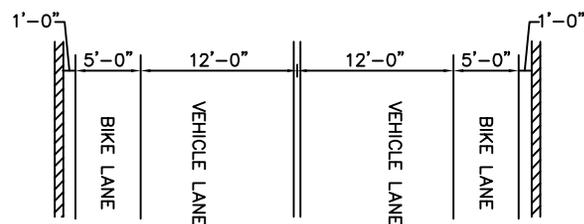
FIGURE 9



WALTHAM STREET (WEST OF BRANCH) – EXISTING CONDITIONS

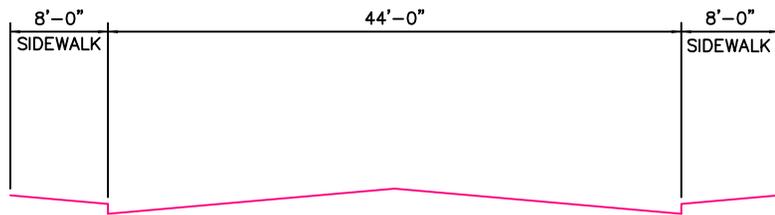


WALTHAM STREET (WEST OF BRANCH) – PROPOSED CLASS II BIKE LANE

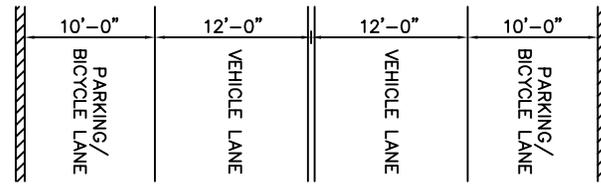


PROPOSED STRIPING LAYOUT

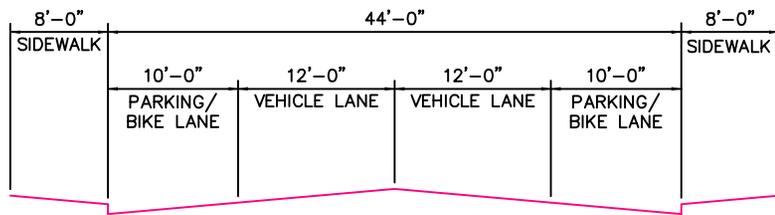
FIGURE 9A



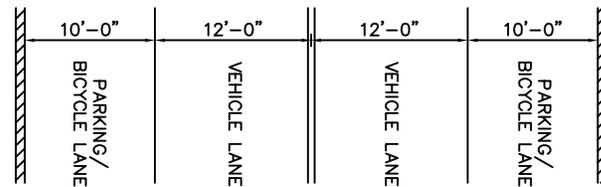
WATERTOWN STREET – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

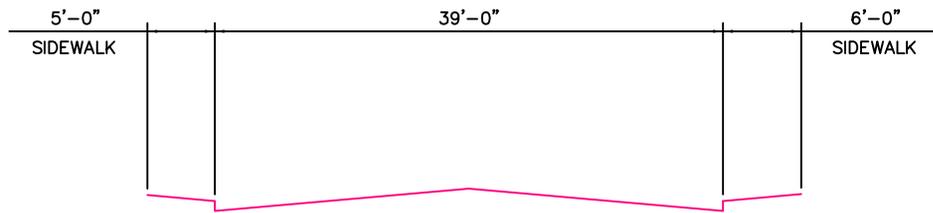


WATERTOWN STREET – PROPOSED CLASS IV SHARE THE ROAD

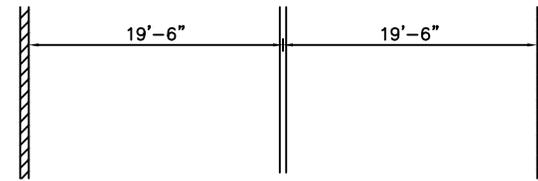


PROPOSED STRIPING LAYOUT

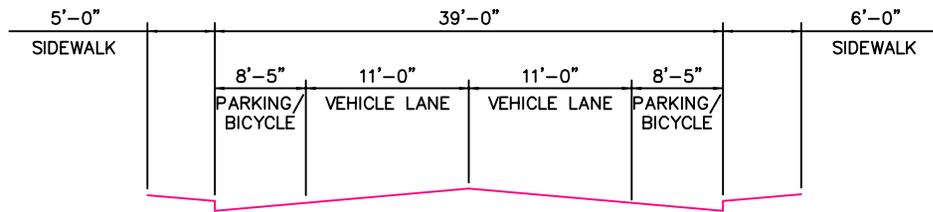
FIGURE 10



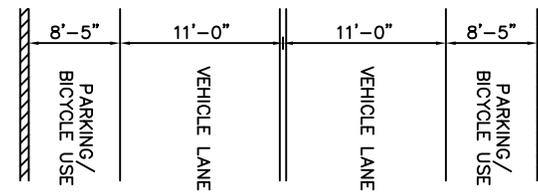
ARLINGTON STREET – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

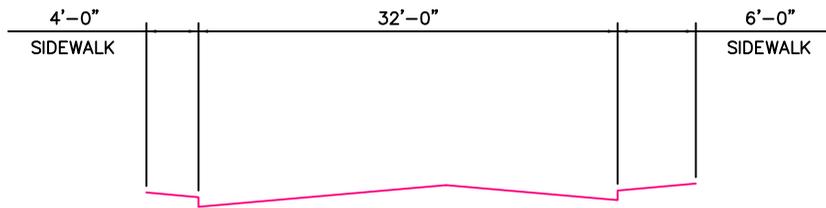


ARLINGTON STREET – PROPOSED CLASS IV SHARE THE ROAD

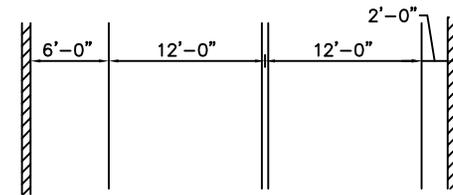


PROPOSED STRIPING LAYOUT

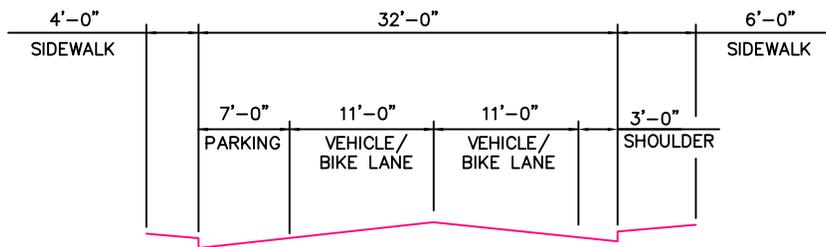
FIGURE 11



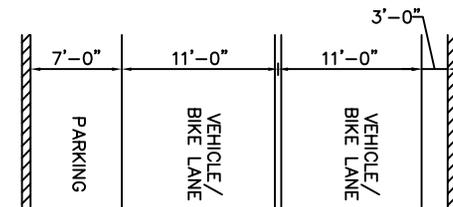
COMMON STREET (LOCKE TO ORCHARD)– EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

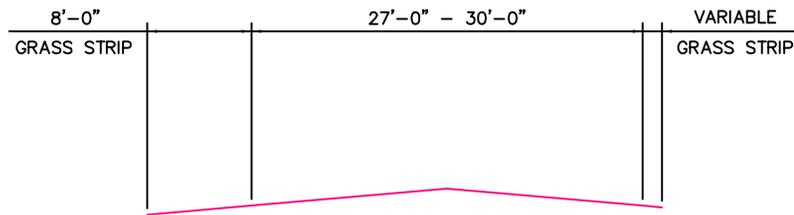


COMMON STREET (LOCKE TO ORCHARD) – PROPOSED CLASS IV SHARE THE ROAD

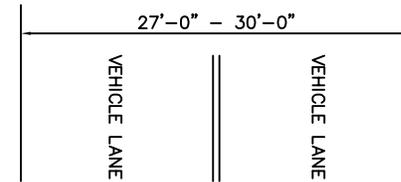


PROPOSED STRIPING LAYOUT

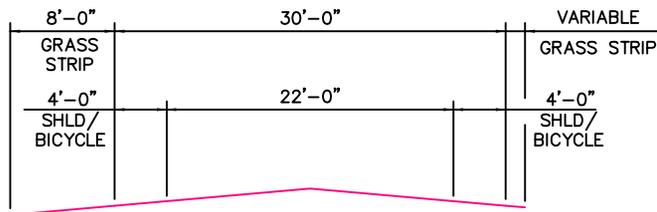
FIGURE 12



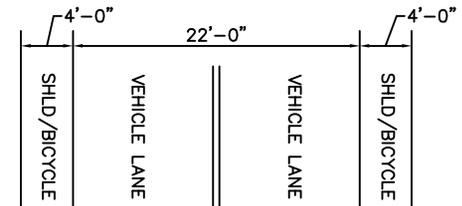
COOLIDGE AVENUE (EAST OF GROVE STREET) – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

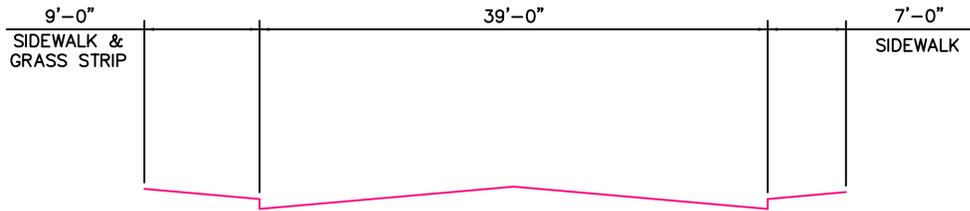


COOLIDGE AVENUE (EAST OF GROVE STREET) – PROPOSED CLASS IV SHARE THE ROAD

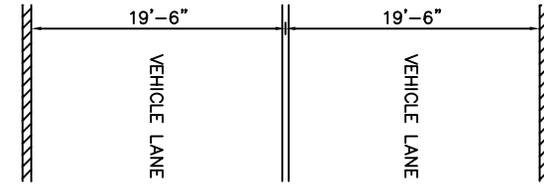


PROPOSED STRIPING LAYOUT

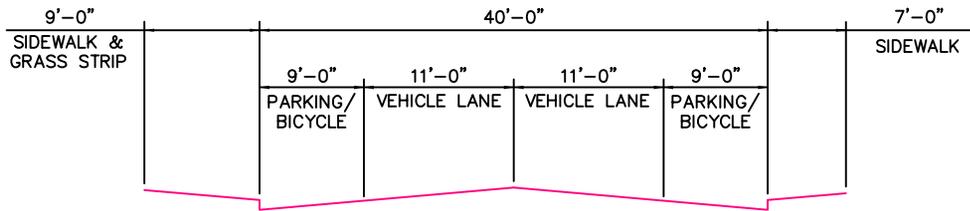
FIGURE 13



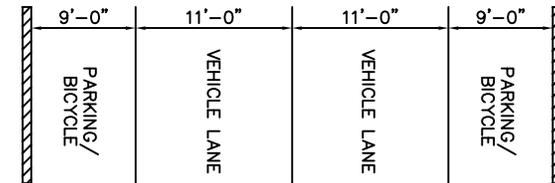
COOLIDGE AVENUE (WEST OF GROVE STREET) – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT

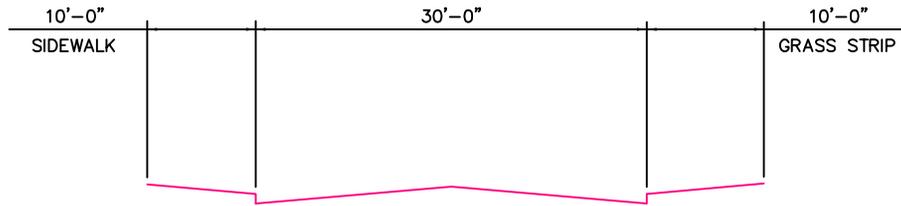


COOLIDGE AVENUE (WEST OF GROVE STREET) – PROPOSED CLASS III BIKE ROUTE

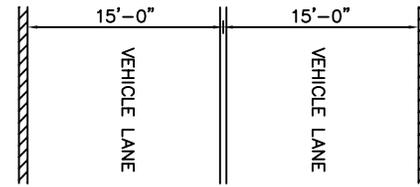


PROPOSED STRIPING LAYOUT

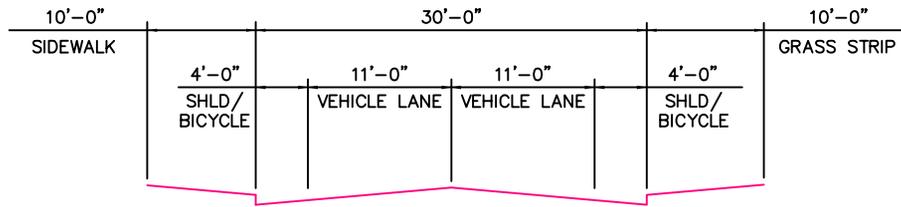
FIGURE 14



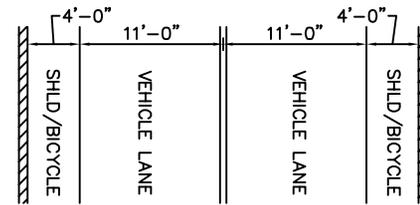
GROVE STREET – EXISTING CONDITIONS



EXISTING STRIPING LAYOUT



GROVE STREET – PROPOSED CLASS III BIKE ROUTE



PROPOSED STRIPING LAYOUT

FIGURE 15