

# **CONCORD PUBLIC WORKS**

## **Americans with Disabilities Act Transition Plan for Public Rights Of Way**



**Concord Public Works  
133 Keyes Road  
Concord, Massachusetts  
01742**

**October 2016**

## 1. **INTRODUCTION & LEGISLATIVE MANDATE**

After the implementation of the Rehabilitation Act of 1973, which requires that all organizations receiving federal funds make their programs available without discrimination toward people with disabilities, congress passed the Americans with Disabilities Act in 1990. The Americans with Disabilities Act (ADA) is a comprehensive civil rights law for people with disabilities in both employment and provision of goods and services such as but not limited to public accommodation, transportation, and telecommunications. As stated by the ADA, its purpose is to provide a “*clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities.*”

Title II of the ADA mandates that state and local governments and/or public entities ensure that persons with disabilities can fully participate in all services, programs or activities. These federal and state statutes also prohibit discrimination in services performed by contractors or sub-contractors on the town’s behalf, such as work within the town’s rights of way (ROW).

This revised ADA Self-Evaluation and Transition Plan, specific to pedestrian access within the public ROW, is being prepared as outlined in Title II of the ADA. Accessible pedestrian access routes and civic life by people with disabilities is a fundamental right the Town of Concord recognizes and is the ultimate goal of the ADA.

In 2006, the Town along with consultant Adaptive Environments prepared the Town’s current Transition Plan (Plan) entitled Town of Concord – Assessment of Properties and Policies & Procedures for Accessibility. Although the Town has routinely demonstrated its commitment to ensure compliance and inclusiveness by investing resources in improvements, a recent review of the Plan, as required by ADA, proved that a more comprehensive analysis was necessary to ensure the document is up to date and in line with the most recent laws, regulations, and design standards as it relates to the public ROW.

The self-evaluation process and revising the Plan creates the opportunity for public entities and the town to identify barriers to accessibility and develop action plans to remove existing barriers. Additionally, this report describes the overall process and findings of the self-evaluation for programs, policies, and practices of the Concord Public Works (CPW) for the maintenance and improvement to the Town’s ROW infrastructure as well as a comprehensive review of the individual public ROW infrastructure including sidewalks, curb ramps, signals and on-street parking. An overview of the requirements for developing a Plan per federal regulations is provided. Subsequent sections describe the self-evaluation process, summarize findings, provide recommendations and identify plans to remove barriers over time.

## **2. SELF-EVALUATION OF POLICIES, PRACTICES, & PROCEDURES**

This self-evaluation report on CPW's policies, practices, and procedures (PP&P) is based on guidance found in the US Department of Justice Title II Technical Assistance Manual. The self-evaluation within this report only focuses on the PP&P that pertain to CPW given that the study was limited to the ROWs and CPW jurisdiction.

The findings based on a review of PP&P demonstrate CPWs commitment to ensuring compliance with the ADA, ADAAG, PROWAG, MAAB, and the town's Standards. Although many PP&P have long been established, some others have been recently updated or are ready for adoption. In order to ensure Concord moves toward an organizational culture of compliance, strategies are presented in some areas that could assist CPW to improve accessibility for people with disabilities. These strategies are intended to initiate discussion on how to expand on CPW's PP&P to improve the quality of life for those with disabilities while also meeting the Department needs and responsibilities.

### **2.1 Notice of ADA Compliance**

All public entities, regardless of size, must provide information about the rights and protections of Title II to applicants, participants, beneficiaries, employees, and other interested persons. CPW's notice falls under the Town's [Administrative Policy and Procedure #41 – Employment and Services for Disabled Persons](#) which was adopted 05/27/1986 and rev. 2/2011. As the policy states, "*The Town of Concord is an Equal Opportunity employer, and does not discriminate against the handicapped in its employment practices or services*". APP#41 is included as *Appendix B*. Although CPWs commitment to ADA protections is a widely accepted practice and expectation it would be beneficial to have this commitment be at the forefront of the Town's "Accessibility" webpage to demonstrate that charge.

### **2.2 Town ADA Coordinator**

As required by the ADA, public agencies with 50 or more employees must designate at least one responsible employee to coordinate ADA compliance and investigate complaints. The public entity must provide the ADA coordinator's name, office address, and telephone number to interested parties. The Town Manager has designated the Assistant Town Manager to act in this capacity as the Town Representative and the Public Works Director to act in this capacity for all matters pertaining to Concord Public Works and the Public Right of Way.

ADA Coordinator - Town

Kate Hodges  
Assistant Town Manager  
Town House  
22 Monument Square  
Concord MA 01742  
Phone: 978-318-3000

ADA Coordinator – CPW

Richard Reine  
Public Works Director  
133 Keyes Road  
Concord, MA 01742  
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**2.3 Standards in Design**

As required by ADA, pedestrian access routes (PARs) and pedestrian access facilities (PAFs) such as sidewalks and curb ramps, or portions thereof within the town’s ROW that are constructed or altered shall be designed and constructed in such manner that they are readily accessible to and usable by individuals with disabilities in accordance with ADA, ADAAG, PROWAG, and MAAB. To the maximum extent practicable all projects constructed within the Town of Concord conform to the Concord Public Works Design and Construction Standards & Details (This document currently being revised and will be available shortly). The Standards were updated in 2016 to include Section 4 – Pedestrian Accessibility Standards which established written criteria for accessible design within the ROW sidewalks, street crossings, curb ramps, blended transitions, detectable warning surfaces, and on-street parking. These Standards are included as *Appendix C*. These Standards are applied to:

- Projects designed or constructed by CPW, their contractors or their consultants. All projects are required to meet the criteria outlined within the Standards.
- Projects submitted to the Department of Planning and Land Management for site plan or subdivision reviews. Site plan designs are required to meet the criteria outlined within the Standards. Site Plan designs are reviewed by CPW-Engineering Division or an approved third-party with the requisite skills and knowledge during the permitting phase to ensure compliance to Standards.
- Row of Way Permit Applications. Any work performed by public or private entities which disturbs the Town’s ROW requires a ROW or Driveway Permit. Permit applications are reviewed and processed by the CPW-Engineering Division. Permit applications are required to be submitted consistent with the

Standards and reviewed by Engineering Division staff to ensure compliance to the Standards.

## **2.4 Provisions during Construction**

It is understood that construction activities within the ROW will impact PARs and impede pedestrian travel from time to time. The PROWAG states: “*When a pedestrian circulation path is temporarily closed by construction, alterations, maintenance operations, or other conditions, an alternate pedestrian access route complying with the MUTCD shall be provided.*” In order to ensure that alternative PARs comply with standards, CPW has included written criteria for Alternate Pedestrian Access Routes in Section 4.3.3 of the aforementioned Standards. In short, no closures, disruptions, or relocations of PARs are permitted without providing the most convenient and compliant alternative possible. Alternate PARs shall be provided when existing PARs are temporarily closed, disrupted, or relocated due to construction, alterations, maintenance operations, and other conditions for the protection of safety and welfare of the public. Alternate PARs shall comply with sections 6D.01, 6D.02, and 6G.01 of the MUTCD 2009 edition. These accommodations are required to be submitted in the form of a Traffic Management Plan (TMP). The TMP is submitted with a Right Of Way/Driveway Permit for private work within the ROW or as required as part of the contractual obligation in the event the Town is the project proponent. These standards are included as *Appendix C*.

## **2.5 ADA Maintenance Policy**

CPW and the Town of Concord recognize that the importance of maintenance of PARs and pedestrian access facilities PAFs such as sidewalks and curb ramps to provide service. As a matter of practice, CPW ensures that PARs and PAFs are readily accessible to those with disabilities and the general public through spot repairs and minor improvements. Maintenance requests are put into an internal database for future prioritization. The internal database is periodically reviewed to plan construction efficiency. Maintenance areas within planned capital project limits or requiring larger scale improvements are prioritized within the Town’s capital plan. CPW plans to develop a written Maintenance Request Policy to supplement the current maintenance operations and provide transparency and more efficient service by early 2017.

Snow removal is also a main component of PAR maintenance. In 2016 Concord Public Works updated the existing Sidewalk Plowing Program policy to more accurately depict current snow removal practices and technologies, including the use of pretreatment techniques. The Policy also requires the removal of snow and ice from PARs at the beginning of winter maintenance operations consistent with Federal ADA guidelines.

Additionally, the policy includes a clause to provide individuals with disabilities a service request procedure. The Policy is included as *Appendix D*.

## **2.6 ADA Variance Policy**

There are almost always unique circumstances where complete compliance with all the applicable Title II ADA Regulations and Standards may not be possible. The 2010 ADA Title II Regulations define this circumstance as “structural impracticability”. The 2004 ADAAG published by the U.S. Access Board, defines this circumstance as “technically infeasible”. In relation to CPW practices in the public ROW, it is recognized that there are times when full compliance with federal and state laws and the Standards cannot be achieved due to technical infeasibility or would result in excessive and unreasonable costs without any substantial benefit to individuals with disabilities, collectively referred as “needing a variance”.

Both the ADA and ADAAG regulations clearly acknowledge that if complete compliance with the ADA, ADAAG, PROWAG, MAAB, and the Town Standards is determined to be unachievable due to technical infeasibility the site conditions, reasons leading to this determination must be documented and approved as detailed in the variance policy prior to proceeding with the Project.



**Figure 1:** *An example of a potential variance needed because of a limited ROW width.*

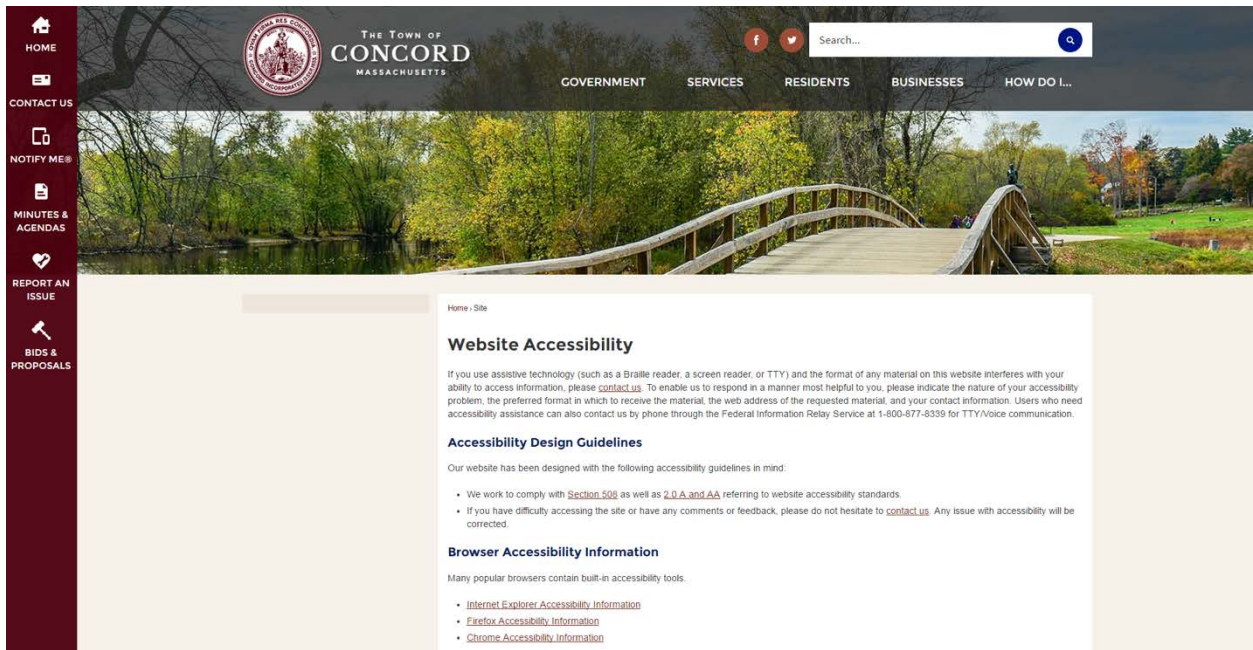
CPW has written the Technical Infeasibility Determination Process and Policy to review and approve such variances. The policy is an appendix to the aforementioned Standards. The policy is meant to ensure that all pedestrian facilities within the town’s right-of-way are designed, altered, and/or constructed, for the use of public entities, in accordance with the ADA, ADAAG, PROWAG, MAAB, and the Standards and to ensure that the

construction and design is compliant to the **maximum extent practicable** as determined by the Town Engineer and Massachusetts Architectural Access Board (MAAB). The policy covers both private work within the ROW and work by the town and its contractors. This policy was adopted with the revised Standards in 2016 and included as *Appendix E*.

## **2.7 ADA Grievance Policy**

As required by the ADA, public agencies that employ 50 or more persons shall adopt and publish a grievance policy/procedure providing for prompt and equitable resolution of complaints that act as a barrier to accessibility.

The Grievance Policy for CPW falls under the Town’s [Administrative Policy and Procedure #5 – Municipal Grievance Procedures Relating to the Americans with Disabilities Act](#) which was adopted 07/21/1997 and rev. 9/2012. As the policy states, “*It may be used by anyone who wishes to file a complaint alleging discrimination on the basis of disability in employment practices and policies or the provision of services, activities, programs and benefits by the Town of Concord*”. It is recommended that the special “Accessibility” webpage on the Town’s website be expanded to include much of this information. The Grievance Policy is included as *Appendix F*.



**Figure 2:** *The Town's Accessibility Webpage*

## **2.8 Accessibility to Public Meetings and Effective Communication**

As required by the ADA, CPW shall ensure that all public meetings and sponsored events are readily accessible to persons with disabilities. CPW's practices are consistent with this guidance by ensuring that all of its public meetings, hearings, or comment periods are readily accessible. These locations are accessible and equipped with wheelchair accessible paths of travel, accessible restrooms, elevators, accessible parking etc.

According to ADA "A public entity shall take appropriate steps to ensure that communications with applicant, participants and members of the public with disabilities are effective as communication with others". Currently, everything on the Town's website, including CPW webpages are fully equipped with the most up to date technology to accommodate persons with disabilities. As a matter of practice, CPW ensures that communications with member of the public with disabilities are effective by offering auxiliary aids and services when requested in advance by qualified individuals with disabilities. Examples of these services for individuals who are hearing impaired include TTY/TDD. CPW is receptive to exploring and providing service for qualified individuals with disabilities by providing large print material, material in electronic format on CD or email, audio recordings and assistance in filling out forms or a variety of other methods of effective communication upon request.

In order to more effectively communicate CPW's commitment to accessibility in both areas of location and effective communication the following shall appear with public notices: *"In compliance with the Americans with Disability Act, this location is accessible to people with disabilities. CPW provides reasonable accommodations and/or language assistance free of charge upon request. If you are a person with a disability and require information or materials in an alternate format; or if you require any other accommodation, please contact Public Works Director Richard K. Reine at (978)318-3201 or email rreine@concordma.gov at least 5 days in advance of the event. Every effort will be made to grant your request. Advanced notification will enable CPW to make reasonable arrangement to remove an accessibility barrier for you."*

## **2.9 Determination of Undue Burden**

As required by the ADA, CPW makes periodic and reasonable modifications to policies, practices, and procedures that have been determined to deny equal rights to those with disabilities unless the proposed modification would fundamentally alter the program's result. CPW is responsible for fiscal equity and authorization in the planning, design, construction, operation and maintenance of public ROW and the infrastructure therein. As previously stated, these activities are done so with careful consideration of the laws and regulations found in the ADA, ADAAG, PROWAG, MAAB, and the Town's Standards.

The ADA permits municipalities such as Concord to defer upgrades of existing programs and facilities if it causes “undue financial and administrative burden.” It states: “*A public entity does not have to take any action that it can demonstrate would result in a fundamental alteration in the nature of its program or activity or in undue financial and administrative burdens. This determination can only be made by the head of the public entity or his or her designee and must be accompanied by a written statement of the reasons for reaching that conclusion. The determination that undue burdens would result must be based on all resources available for use in the program. If an action would result in such an alteration or such burdens, the public entity must take any other action that would not result in such an alteration or such burdens but would nevertheless ensure that individuals with disabilities receive the benefits and services of the program or activity.*”

As described in Title II [28 CFR §35.150(a)(3)], CPW should explore a definitive system to equitably address accommodation requests from a qualified person with a disability and to appropriately determine when such a request would fundamentally alter the program and result in an undue burden. This decision that pedestrian access would be unduly burdensome must be made by the head of a public agency, accompanied by a written statement of the reasons for the decision.

### **3. SELF-EVALUATION OF INFRASTRUCTURE**

The ADA requires every state and local government to prepare a self-evaluation plan to identify the programs barriers to accessibility. CPW undertook a comprehensive self-evaluation on its sidewalks, curb ramps, signals, and parking areas to assess its program accessibility responsibilities in the ROW.

This section of the report is a comprehensive analysis of the town's pedestrian access routes (PARs) which includes sidewalks and ramps, signals, and accessible parking. The data collected and self-evaluation will allow the town to:

- 1) determine the extent of physical barriers;
- 2) document the location and feature relationship of barriers;
- 3) include all data in the town's centrally located Geographic Information Systems (GIS) database;
- 4) develop a prioritization schedule for accessibility improvements.

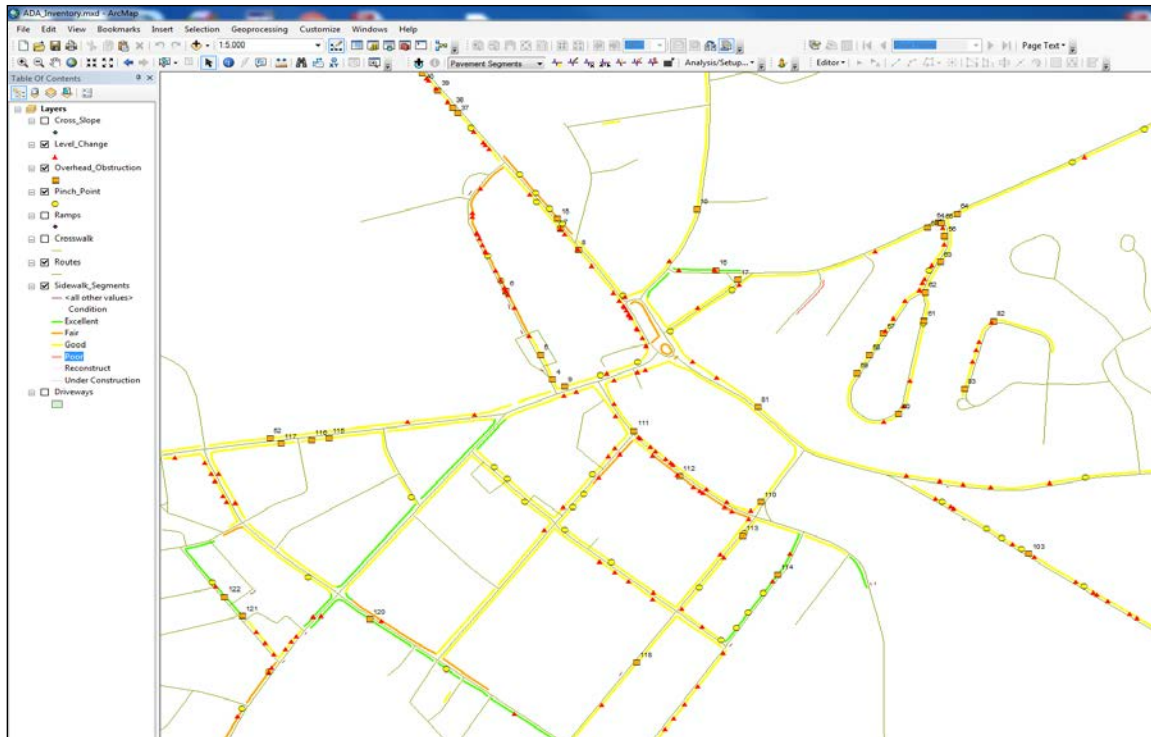
The following pages summarize the findings of the self-evaluation, and include graphics that demonstrate feature locations and conditions.

#### **3.1 Data Collection & Methods of Analysis**

Historically, the ADA inventory process in the public ROW was labor intensive and cost-prohibitive while still offering inexact information. As technology has improved significantly in recent years, the town wanted to utilize these new techniques to ensure the most accurate and up-to-date information on accessibility barriers. In order to accomplish this, the town retained Vanasse Hangen Brustlin, Inc. (VHB) in the summer of 2016 to perform this self-evaluation of PAR and facilities. In order to perform the study, VHB augmented the town's existing sidewalk inventory by measuring the cross-slope of each sidewalk at frequent intervals (including driveways), and by recording the location of all pinch points, trip hazards, and overhead obstructions. The inventory was done in the field using GPS enabled tablet PC's to accurately locate the features and to record the attributes. A Geographic Information System (GIS) database was developed to store the recorded information so that the analysis could be performed by VHB and also so that the information could be delivered to the Town in a format compatible with the town's GIS systems. This will allow the town to periodically analyze the data and revise capital planning seamlessly with existing capital improvement planning.

Once the field data collection and quality control were performed, the raw data was post processed so that it could be utilized in the town's centralized GIS database for analysis

and reporting. GIS will be the key software in the data management, capital improvement planning, and periodically revising the transition plan as required by ADA.



**Figure 3:** *GIS User Interface*

### **3.2 Sidewalk Inventory**

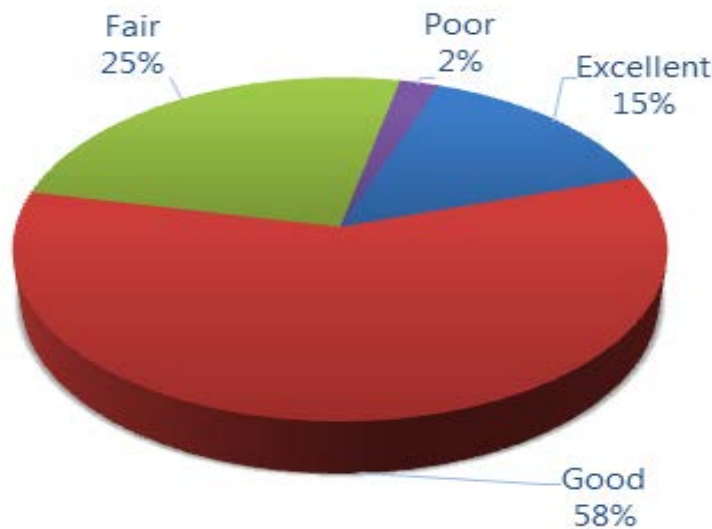
a) Existing Sidewalk Summary: As part of the town’s pavement management system, Concord has long maintained an inventory of its sidewalk network of over 60 miles. In order to track changes in the overall condition of the town’s sidewalk network, every sidewalk was assigned a Sidewalk Condition Index (SCI) so that the town can target areas in need of repair as well as provide a metric for overall network improvement. The SCI was assigned based on the condition rating:

- Excellent = 100
- Good = 85
- Fair = 70
- Poor = 55

In this inventory, descriptive information existed in only summary form for each sidewalk segment. A sidewalk segment is defined as a contiguous length of sidewalk with similar characteristics. Each sidewalk segment was characterized with the following information:

- Length
- Average Width
- Material
- General Condition (Excellent, Good, Fair, or Poor)
- An estimate of the percentage of area needing repair

This rating system puts the sidewalks on a compatible scale to the Town’s Road Manager Pavement management system. The average SCI weighted by sidewalk area is an 83.



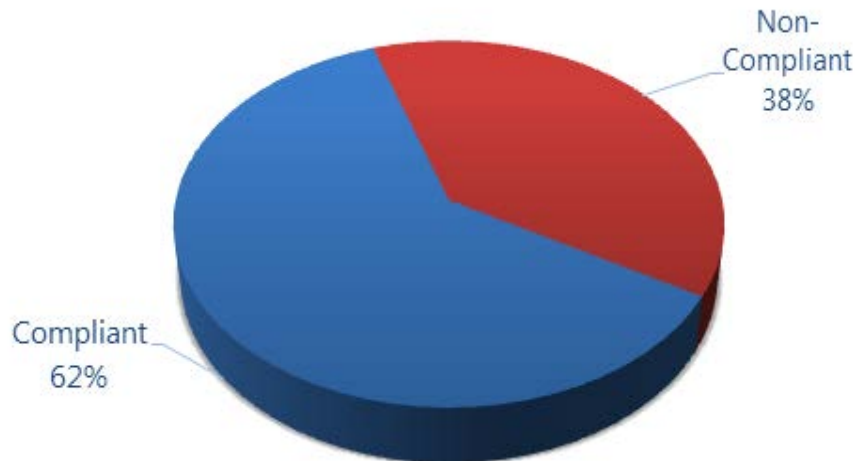
**Figure 4:** *Sidewalk Percentage by Condition*

b) New Inventory Summary: To comply with ADA requirements the sidewalks must meet specific standards with respect to slope, surface obstructions, overhead obstructions, level changes/trip hazards, etc. These features were not being captured with the previous inventories and field surveys. For this reason, VHB was tasked with walking the entire sidewalk network to survey, document, and store a more comprehensive data set than ever before.

i) Sidewalk Cross-Slope: To meet ADA compliance the cross-slope a sidewalk cannot exceed 2%. Therefore, sidewalk cross-slopes were measured with a digital level taken at intervals between 50 to 100 feet. In addition, it has been observed that PARs can routinely fall out of compliance due to excessive cross-slopes through driveways. Therefore VHB was tasked to record a cross-slope measurement at each home and commercial driveway. For each measurement the following information was recorded:

- Unique Data Point Number
- GPS Location
- Location Type (Sidewalks, Residential Driveway, Commercial Driveway)
- Measured Cross Slope (% slope)

If a sidewalk had a non-compliant (>2%) cross slope measurements, the percentage of sidewalk area exhibiting non-compliant cross slopes was calculated using the multiple measurements along each sidewalk segment. Using this method, CPW can make better estimates as to the resources that will be needed to bring a sidewalk segment up to compliance.

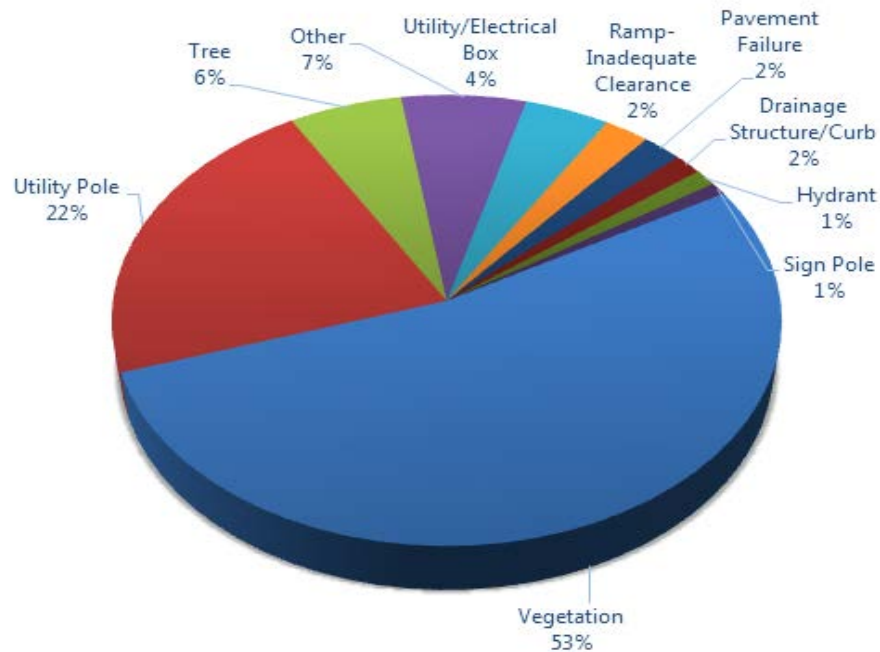


**Figure 5:** *Sidewalk Network Cross-slopes*

ii) Sidewalk Surface Obstructions: Obstructions can come in a variety of forms, ranging from shrubs encroaching into the path of travel or something more significant like a utility pole. In order to meet ADA/PROWAG compliance the minimum width of a sidewalk cannot be less than 48 inches. Therefore, for any sidewalk having an average width of greater than 48 inches (81%), VHB recorded any location where the PAR was decreased to less than 48 inches due to an obstruction or narrowing of the sidewalk. For each location the following was recorded:

- Unique Data Point Number
- GPS Location
- Type (e.g. signs, trees, mailboxes, utility poles, etc.)
- Reduced Width in inches

The number of existing pinch points was summarized and recorded as an attribute for each sidewalk or sidewalk segment. Similar to the sidewalk cross-slope data, CPW can make better estimates as to the resources that will be needed to bring a sidewalk segment up to compliance. As can be seen in the chart below, Vegetation accounts for over half of the obstructions within the town's PARs.

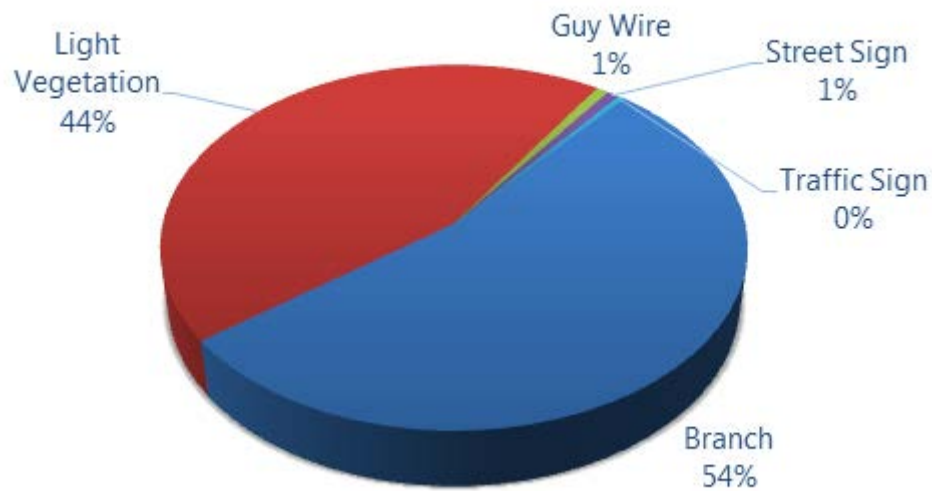


**Figure 6:** Pinch Point Percentage by Obstruction Type

iii) Overhead Obstructions: According to §307.2 of the PROWAG, protrusion limits pose VHB recorded the presence of any obstruction above sidewalks that were between 2.25 and 6.67 feet above the sidewalk surface, and extended more than 4 inches into the path of travel. The limit of 2.25’ or 27” is considered part of the “Area of Cane Detection” while the 6.67’ or 80” measurement does not pose hazards and can protrude any amount, notwithstanding areas of the aforementioned pinch-points. For each location the following was recorded:

- Unique Data Point Number
- GPS location
- Type (e.g. tree branches, guy wire, signs, etc.)
- Reduced Width in inches

Again the number of overhead obstructions was summarized and recorded as an attribute for each sidewalk in order to manage the data and more effectively plan town resource allocation. As can be seen by the graph below, the vast majority of overhead obstructions are a combination of light vegetation and branches.



**Figure 7: Overhead Obstructions by Type**

iv) Level Changes/Trip Hazards/Opening: Changes in level and other abrupt transitions affect the continuity of sidewalk surfaces and have a significant impact to those with wheelchairs, crutches, canes or walkers. According to §302.3 and §303 of the PROWAG, abrupt level changes and openings greater than 1/4” are non-compliant. Therefore, VHB recorded the presence of any barrier, which met the criteria. Sidewalks, which received a rating of “poor”, were omitted from the survey due to the fact that those sidewalks had numerous level changes/trip hazards and/or cracks that would be redundant to note. For each location the following was recorded.

- Unique Data Point Number
- GPS location
- Type (e.g. crack, root, etc.)
- Change in level in inches

Again the number and type of level change was surveyed and recorded as an attribute for each sidewalk in order to manage the data and more effectively plan town resource allocation. The table below summarizes those findings

**Table 1: Summary of Level Changes, Trip Hazards and Opening**

Percentage	Level Change (inches)	Level Change Severity
10%	.5 to 1.0	Low
69%	1.0 to 2.0	Medium
17%	2.0 to 5.0+	High
4%	5.0+	Severe

v) Sidewalk Priority Index: In order to prioritize the backlog of PAR deficiencies, Concord and VHB jointly developed the following prioritization plan. The prioritization is based on 3 factors:

1. Sidewalk Condition Priority Factor (CPF) (50%)
2. Location Priority Factor (LPF) (25%)
3. Sidewalk/Ramp Compliance Priority Factor (SWCF) (25%)

The Sidewalk Condition Index (SCI & CPF) is based directly on the General Condition Rating

- Excellent = 0
- Good = 33
- Fair = 66
- Poor/Reconstruct = 100

The Location Priority Factor (LPF) was determined by locating sidewalks with a prescribed radius of high pedestrian traffic generators, such as schools, commercial areas, churches, etc...

- ½ mile radius of pedestrian generator = 100
- 1 mile radius of pedestrian generator = 66
- Other Sidewalks = 33

The Sidewalk Compliance Priority Factor (SWCF) is equal to the percentage of the sidewalk with a non-compliant cross slope. The equation for Sidewalk Priority Index (SPI) is thus

$$\text{SPI} = .5 (\text{CPF}) + .25 (\text{LPF}) + .25 (\text{SWCF})$$

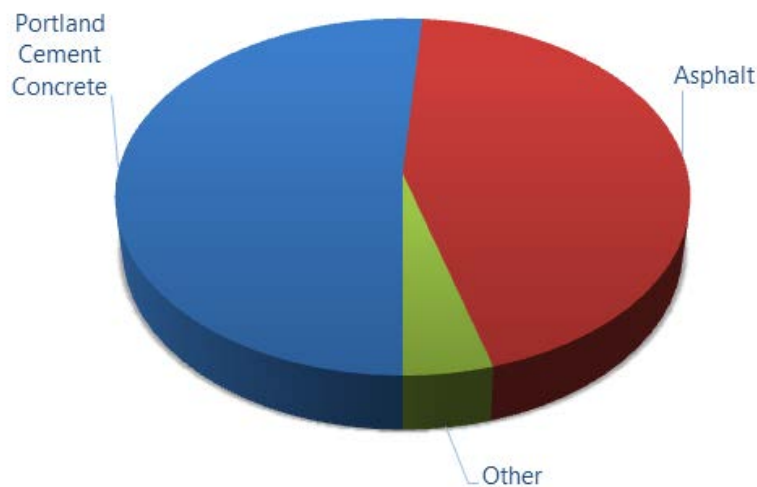
This prioritization formula will serve as the first step in prioritizing projects as the town develops its Transition Plan, and is used to sort projects in Appendix C

### **3.3 Accessible Ramp Inventory**

a) Ramps are the primary structural feature that provides access to and from sidewalks across vehicular travel ways. For this reason, ramps are one of the most vital PAFs within the network to provide accessibility. VHB first performed an inventory and evaluation of the town's curb ramps in 2010. Since that time, VHB and town staff have supplemented and updated the original study with additional surveys. For the purposes of this self-evaluation, no new ramp data was collected since the supplementary surveys were complete and up-to-date. The pre-existing ramp inventory is described and summarized below.

Ramp Material consisted of the following types:

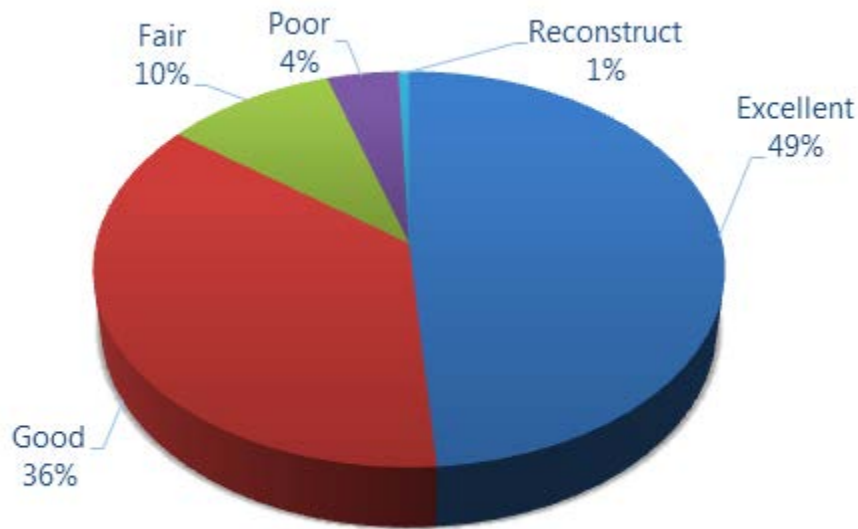
- Bituminous Concrete
- Portland Cement Concrete
- Brick
- Stone Dust
- Other (Gravel, Grass)



**Figure 8: Ramp Material**

The ramp's condition value was established to quickly categorize ramp conditions into a repair strategy schema. Ramps were graded by the following:

- Excellent (like new condition)
- Good (light wear)
- Fair (considerable wear, cracking, or distortion)
- Poor (wear, cracking or distortion significantly impacts serviceability)

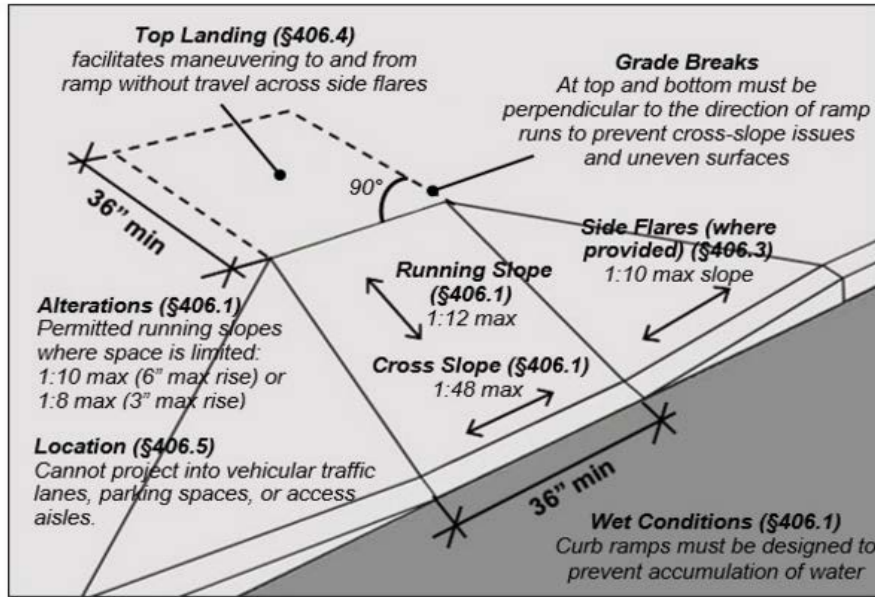


**Figure 9: Ramp Condition**

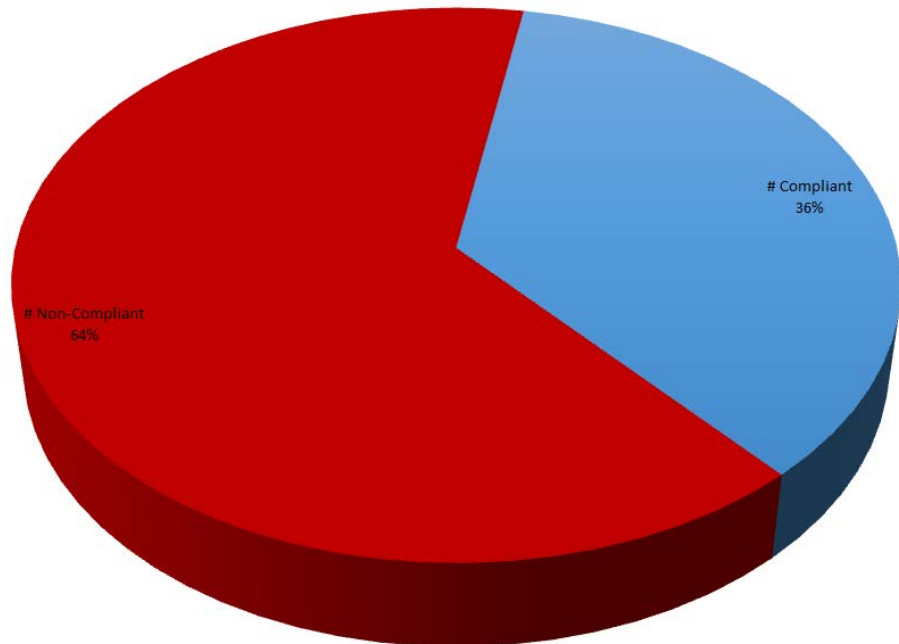
The ramp's compliance (ADA, PROWAG, etc.) was measured for a variety of fields. The features collected for each ramps were as follows:

- Ramp Running Slope – Slope measured parallel to the direction of pedestrian travel. *(8.3% or less)*
- Cross Slope – Slope measured perpendicular to path of travel. *(2.0% or less)*
- Width – Width of ramp path of travel. *(36" min with 60" level landings)*
- Level Landing Areas – Level panels at the top of a perpendicular or directional ramp and at the bottom of a parallel ramp. *(2.0% or less)*
- Detectable Warning Strip – are textured pads that provide pedestrians who are visually impaired a mechanism to warn them they are transitioning from a pedestrian to vehicular way. *(Must be present)*
- Transitions- The area where the ramp crosses the curb area to meet the gutter line in the vehicular travel way. *(Smooth transitions)*
- Flared Side Slope – Panels on either side of the ramp to mediate the difference between the sidewalk level and the descending ramp. *(10% or less)*
- Gutter Slope – Slope measured in the gutter at the base of the ramp, perpendicular to the path of travel. *(2.0% or less)*

**Curb Ramp Requirements [§406]**



**Figure 10: Curb Ramp Features**



**Figure 11: Percentage of Compliant vs. Non-Compliant Ramps**

In order to prioritize the backlog of Pedestrian Accessible Routes (PAR) deficiencies, CPW and its consultant VHB jointly developed the following prioritization plan for the accessible curb ramps.

The prioritization is based on 3 factors.

1. Ramp Condition Priority Factor – “CPF” (50%)
2. Location Priority Factor – “LPF” (25%)
3. Ramp Compliance Factor – “RCPF” (25%)

The Ramp Condition Index (CPF) is based directly on the General Condition Rating.

- Excellent = 0
- Good = 33
- Fair = 66
- Poor/Reconstruct = 100
- Proposed Ramp = 0
  - Proposed Ramps were given the lowest CPF so that the construction of new ramps would be prioritized behind the replacement of deficient ramps.

The Location Priority Factor (LPF) was determined by locating ramps with a prescribed radius of high pedestrian traffic generators, such as schools, commercial areas, churches, etc...

- High: ½ mile radius of pedestrian generator = 33
- Medium: 1 mile radius of pedestrian generator = 66
- Low: Other Sidewalks = 100

The Ramp Compliance Priority Factor (RCPF) was determined by considering the drop height of each ramp approach, the presence of a warning strip, the running slope, and the cross slope of the ramp. The Ramp Compliance Priority Factor for proposed ramp locations were given a value of 50.

The equation for the Ramp Compliance Priority Factor is as follows:

$$\text{RCPF} = \text{DropF} + \text{WarnF} + \text{RunF} + \text{CrossF}$$

Where:

**Drop Factor (DropF)** was assigned based upon the severity of the level change at the approach of the ramp. The less extreme the level change, the lower the assigned Drop Factor. The values consisted of 0, 10, 20, and 25.

<b>Drop Height (inches)</b>	<b>Factor</b>
<0.5	0
0.5-2	10
2-5	20
5+	25

**Warning Strip Factor (WarnF)** was determined by whether or not the ramp was equipped with a detectable warning strip. Ramps that are equipped with a warning strip were assigned a value of 0 and the ramps without a warning strip were given a value of 25.

<b>Warning Strip</b>	<b>Factor</b>
Yes	0
No	25

**Running Slope Factor (RunF)** was determined by developing various ranges of recorded running slopes and assigning factors to the range. A running slope between the values of 0% to 8.33% was assigned a value of 0 because values within this range are considered compliant running slopes. The following table describes the ranges used and the associated Running Slope Factors.

<b>Running Slope (%)</b>	<b>Factor</b>
0-8.33	0
8.33-10	10
10-15	20
15+	25

**Cross Slope Factor (CrossF)** was determined by developing various ranges of recorded cross slopes and assigning factors to each range. A cross slope between the values of 0% to 2% were assigned a value of 0 because all values within this range are considered compliant for this particular parameter. The following table further describes the ranges that were used the associated Cross Slope Factors.

<b>Cross Slope (%)</b>	<b>Factor</b>
0-2	0
2-4	10
4-6	20
6+	25

The equation for Ramp Priority Index (RPI) is as follows:

$$\text{RPI} = .5 (\text{CPF}) + .25 (\text{LPF}) + .25 (\text{RC PF})$$

Higher RPI values represent high rehabilitation or reconstruction prioritization.

### **3.4 Accessible Pedestrian Signal Inventory**

a) Concord has five (5) pedestrian accessible signalized intersections. Accessible Pedestrian Signals (APS) are integrated devices that communicate information about the WALK vs. DON'T WALK pedestrian phases at signalized intersections in both visual and non-visual formats. Pedestrian signals and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrian can navigate the PAR safely and independently. "APS: A Guide to Best Practices" serves as a single source of information on most issues surrounding APS. It incorporates PROWAG and MUTCD (Chapter 4E) specifications in new construction and reconstruction where pedestrian signals are installed.

The ramp's compliance (ADA, PROWAG, etc.) was measured for a variety of fields.

The features collected for each ramps were as follows:

- Pushbutton Height– The mounting of the pushbutton shall be mounted 42” -48” above the clear ground space for approach to the device
- Pushbutton Contrast– The pushbutton contrast in the pedestrian environment provides for a visual contrasting button compared to the background housing the button. (MUTCD 4E.12)

- Locator Tone – A repeating sound that informs approaching pedestrians that they are required to push a button to actuate the pedestrian phase as opposed to passive actuation. (MUTCD 4E.12)
- Vibrotactile Arrow – A vibrating arrow which points the pedestrian in the correct path of travel. (MUTCD 4E.12)
- Clear Space and Level Landing – (MUTCD 4E.08)

**SELF EVALUATION RESULTS**

<b>Main Street and Nashawtuc Intersection</b>				
<b>Inventory Feature</b>	<b>NE</b>	<b>SE</b>	<b>SW</b>	<b>NW</b>
<b>Push Button Height (42"-48")</b>	Yes	Yes	Yes	Yes
<b>Push Button Contrast (MUTCD 4E.12)</b>	Yes	Yes	Yes	Yes
<b>Locator Tone (MUTCD 4E.12)</b>	No	No	No	No
<b>Vibrotactile Arrow (MUTCD 4E.12)</b>	No	No	No	No
<b>Clear Space and Level Landing</b>	Yes	Yes	No	No
<b>Speech Walk Message</b>	No	No	No	No
<b>Speech Information Message</b>	No	No	No	No

<b>Main, Church, and Pine Street Intersection</b>				
<b>Inventory Feature</b>	<b>NE</b>	<b>SE</b>	<b>SW</b>	<b>NW</b>
<b>Push Button Height (42"-48")</b>	No	No	Yes	Yes
<b>Push Button Contrast (MUTCD 4E.12)</b>	No	Yes	No	No
<b>Locator Tone (MUTCD 4E.12)</b>	No	No	No	No
<b>Vibrotactile Arrow (MUTCD 4E.12)</b>	No	No	No	No
<b>Clear Space and Level Landing</b>	No	No	No	No
<b>Speech Walk Message</b>	No	No	No	No
<b>Speech Information Message</b>	No	No	No	No

<b>Main Street and Commonwealth Ave Intersection</b>							
<b>Inventory Feature</b>	<b>N</b>	<b>S</b>	<b>W</b>	<b>Island</b>	<b>N</b>	<b>S</b>	<b>W</b>
<b>Push Button Height (42"-48")</b>	Yes	Yes	No Button		Yes	Yes	No Button
<b>Push Button Contrast (MUTCD 4E.12)</b>	Yes	Yes			Yes	Yes	
<b>Locator Tone (MUTCD 4E.12)</b>	No	No			No	No	
<b>Vibrotactile Arrow (MUTCD 4E.12)</b>	No	No			No	No	
<b>Clear Space and Level Landing</b>	No	Yes			Yes	Yes	
<b>Speech Walk Message</b>	No	No			No	No	
<b>Speech Information Message</b>	No	No			No	No	

<b>Sudbury Road and Thoreau Street Intersection</b>				
<b>Inventory Feature</b>	<b>NE</b>	<b>SE</b>	<b>SW</b>	<b>NW</b>
<b>Push Button Height (42"-48")</b>	No	Yes	No	Yes
<b>Push Button Contrast (MUTCD 4E.12)</b>	Yes	Yes	Yes	Yes
<b>Locator Tone (MUTCD 4E.12)</b>	No	No	No	No
<b>Vibrotactile Arrow (MUTCD 4E.12)</b>	No	No	No	No
<b>Clear Space and Level Landing</b>	Yes	Yes	Yes	Yes
<b>Speech Walk Message</b>	No	No	No	No
<b>Speech Information Message</b>	No	No	No	No

<b>Main Street and Baker Ave Intersection</b>						
<b>Inventory Feature</b>	<b>NE</b>	<b>SE-E</b>	<b>SE</b>	<b>SW</b>	<b>NW</b>	<b>Island</b>
<b>Push Button Height (42"-48")</b>	Yes	Yes	Yes	No	Yes	Yes
<b>Push Button Contrast (MUTCD 4E.12)</b>	No	No	Yes	Yes	No	No
<b>Locator Tone (MUTCD 4E.12)</b>	No	No	No	No	No	No
<b>Vibrotactile Arrow (MUTCD 4E.12)</b>	No	No	No	No	No	No
<b>Clear Space and Level Landing</b>	Yes	No	No	Yes	No	Yes
<b>Speech Walk Message</b>	No	No	No	No	No	No
<b>Speech Information Message</b>	No	No	No	No	No	No

### **3.5 On-Street Parking Inventory**

a) The town has four (4) areas that can be designated as “blocks”. Where on-street parking is provided on the block and the parking is marked or metered, accessible parking spaces complying with ADA and PROWAG (R309) shall be provided in accordance with the following Table. Where parking pay stations are provided and the parking is not marked, each (20 ft.) of block perimeter where parking is permitted shall be counted as one parking space.

**Table 2: *Parking Requirements***

<b>Total Number of Marked or Metered Parking Spaces on the Block Perimeter</b>	<b>Minimum Required Number of Accessible Parking Spaces</b>
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 and over	4% of total

**Table 3: Parking Self Evaluation Results**

Parking Block	Total Spaces	Accessible Spaces*	Required Spaces	Compliant
Down Town	195	6	6	Y
Thoreau St.	58	3	3	Y
West Concord	71	3	3	Y
Monument Sq.	97	0	4	N

\*CPW in conjunction with several Town Departments is undertaking a parking improvement plan which was procured in August of 2016. The project is ongoing and the Accessible Spaces listed under this heading will be upon the completion of the project which is anticipated to be November 18<sup>th</sup>, 2016.

### **3.6 Public Outreach:**

A major component of the Self-Evaluation process is Public Outreach. CPW utilized several mechanisms to seek input on the Transition Plan. The Division developed an ADA questionnaire which was mailed to interested parties including: the Council on Aging, Minuteman Arc, the Housing Authority, West Concord Advisory Committee, Concord Greene and Concord Park. CPW received responses from the Concord Park and West Concord Advisory Committee. The sample questionnaire and responses are included within *Appendix G*.

In addition to the mailing to interested parties the questionnaire was highlighted within the Concord Public Works – Project and Events ad within the Concord Journal. The CPW ad ran weekly from June 23, 2016 to September 8, 2016. An information notice was also provided within the Town Managers Report for the week of June 13, 2016. The Town Manager report is posted weekly on the Town website and emailed to residents signed up for the Town’s news and notices bulletins. The Town Manager Report and accompanying News and Notice as well as a sample Concord Public Works Projects and Events ad are included within *Appendix G*.

The Division also attended the September 6, 2016 Committee on Disability and presented the Self Evaluation results and the preliminary Transition Plan. The meeting was well attended and feedback on the plan was requested. The Committee on Disability Presentation and Meeting Minutes are included within *Appendix G*.

#### 4. TRANSITION PLAN

The Transition Plan portion of this report combines the results of the self- evaluation and community review/comment to define a schedule of implementation over time.

The overall Pedestrian Access Route (PAR) network in the Town of Concord is currently in fair to good condition. Using average reconstruction costs, it was calculated that the cost for repairing the backlog of non-compliant sidewalks in Concord is approximately \$3.5 Million. This total is exclusive of the three village areas: Downtown, Thoreau Depot and West Concord Center. These three areas would require significantly more work to become compliant. Existing site constraints and the strict grading requirements of the PROWAG necessitates the need for a full depth reconstruction of the roadway within the village areas. The estimated a cost to reconstruct the three village areas is approximately \$13.5 Million Dollars. The following pictures depict the examples of the ROW constraints and excessive cross slopes within the village areas.



**Figure 12:** *Excessive sidewalk cross-slopes within Main Street (3.7%)*



**Figure 13:** *Excessive roadway cross-slopes within Main Street (7.1%)*

The overall pedestrian ramp network in the Town of Concord is currently in fair condition. The data gathered from this study shows a “high-probability” that about 36% of Concord’s pedestrian ramps are in compliance with ADA standards. This study shows that future diligence with respect to ADA standards will be necessary to improve Town-wide ramp conditions. The cost to reconstruct the backlog of non-compliant ramps in Concord is \$616,500. Additionally, the cost to construct missing pedestrian ramps is estimated to be additional \$181,500. As with the sidewalks, these costs are based on typical reconstruction costs, and does not account for major sidewalk realignment or roadway reconstruction.

It’s important for the Town to have a balanced strategy to address the deteriorating and non-compliant sidewalk and ramp infrastructure. Within the transition plan CPW will developed two distinctive sidewalk repair programs. The Capital Repair Program will focus on the larger scale rehabilitations and the Small Repair Program will address smaller scale and localized repair needs.

#### **4.1 Designation of Public Works ADA Official**

The Director of Public Works has been assigned by the Town Manager to be the person responsible for implementing the Transition Plan relative to improving ADA compliance for pedestrian access in the public ROW.

The current contact is:

Richard Reine, PWLF  
Director of Public Works  
133 Keyes Rd.  
Concord, MA 01742

#### **4.2 Barrier Removal Prioritization**

The barriers identified in the previous sections shall be removed over time. The policy barriers and improvements are minor in nature and will take high prioritization. CPW expects to remove these barriers and make the improvements to its Policies, Practices and Procedures by January 2017. Due to the backlog of infrastructure improvements necessary to be compliant, those barriers will be evaluated periodically but at least once a year, to ensure that barriers are being removed effectively and efficiently. It is understood and should be noted that the prioritization ranking for the town’s infrastructure is a calculated guide and not meant to circumvent sound planning and engineering judgment. This ensures that the areas of highest priority will be given the attention it deserves. The need to revise the plan accordingly is required and CPW expects that this comprehensive self-evaluation in conjunction with the current emphasis CPW places on accessibility, the Town will achieve 100% compliance.

### **4.3 Funding Opportunities**

Eliminating the barriers is limited only by resources and feasibility. The backlog noted above demonstrates the estimated level of investment necessary. The Town will move towards compliance utilizing existing funding mechanisms. The following table provides a list of funding sources and their approximate annual appropriation for accessibility improvements:

<b>Funding Source</b>	<b>Annual Appropriation</b>
Roadway Funding (Various Sources)	\$61,500+/-
Sidewalk Capital Funding	\$100,000
ADA Compliance Capital Funding	\$7,500
Sustainable Infrastructure	\$7,500
Traffic Signal Improvements	\$10,000
<b>Total:</b>	<b>\$186,500</b>

It assumed that the three downtown areas would be constructed as standalone projects outside of the Town’s capital planning process. The Town will evaluate utilizing available state and federal funding through the Transportation Improvement Program or Complete Streets Program to construct the needed improvements. The Town plans to further refine the project scopes and explore these funding options through the transition plan. The Town will also continue to seek funding opportunities for ADA compliance work.

### **4.4 Cost Estimates and Implementation Schedule**

To estimate the cost of repairing sidewalk, CPW and its consultant VHB made the following assumptions.

- Full repair of all “Poor” Sidewalks
- All Fair and Good Sidewalks would be partially repaired based on the “Percent Repair Needed” Field
- All Poor and Non-Compliant Ramps would be reconstructed
- All Pinch Points and Obstructions would be corrected
- Due to the overlapping nature of the condition and cross slope data, extra cost is not being generated for non-compliant cross slopes and trip hazards.

<b>Work Type</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Cost</b>
Sidewalk Full Repair	10,183 SY	\$65/SY	\$661,895
Sidewalk Partial Repair	15,523 SY	\$120/SY	\$1,862,760
Pinch Points (non-vegetative)	157	See Below	\$127,300
Overhead Obstruction (non-vegetative)	145	Varied	\$15,300
Non-Compliant, Poor, Missing Ramps	553	\$1,500/ea	\$829,500
<b>Total:</b>			<b>\$3,496,755</b>

Unit costs used for pinch points in the previous table are shown here:

<b>Pinch Point Types</b>	<b>Cost</b>
Drainage Structure	\$500
Hydrant	\$500
Mailbox	\$500
Other	\$500
Ramp Clearance	(included with ramp item)
Sign Pole	\$100
Tree	\$1,000
Utility Pole	\$1,000
Utility/Electrical Box	\$1,000

It is estimated that it would cost the town just under \$3.5 Million to bring the current sidewalk network to full ADA and PROWAG compliance. Based on funding opportunities and actual costs for large scale capital improvements projects at the current annual funding allowance of \$186,500/yr. it would take the Town approximately 20-25 years to be compliant with current standards, exclusive of project cost escalation and infrastructure deterioration. To view the implementation schedule and cost summary for these items please see [Appendix H](#).