

KEENE COMPLETE STREETS

DESIGN GUIDELINES • 2015



KEENE COMPLETE STREETS

PLANNING & DESIGN GUIDELINES

ACKNOWLEDGEMENTS

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PREFACE

In the summer of 2015, the City of Keene worked with Southwest Region Planning Commission to develop a Complete Streets policy, which was adopted in November of 2015. This policy has the City consider and incorporate all modes of transportation and the safety needs of all users including, motorists, transit, pedestrians, bicyclists, seniors, youth, and persons with disabilities, when making improvements to existing infrastructure or building new projects. In addition, it encourages street design that will be constructed in a manner that supports the surrounding land use and transportation context.

The policy establishes that the City will utilize planning and design guidelines for Complete Streets. This document represents these guidelines, and serves as a resource for City staff when planning, designing, rehabilitating, constructing, reconstruction, or maintaining the public right of way.

This document also serves as guidance for residents, businesses, and others to better understand Complete Streets concepts and design elements and how safety measures can be incorporated into the City's different roadway types and land use contexts.

"Members of the community expressed a desire, as part of creating Keene's walkable community, to strive for "complete streets." Complete Streets is a national program that encourages local municipalities across the country to build road networks that are safer, more livable and welcoming to everyone. Keene should make it a consistent policy to design streets with all users in mind, including drivers, public transport riders, pedestrians, and bicyclists as well as older people, children, and those with disabilities..."

- City of Keene Comprehensive Master Plan 2010

WHAT ARE COMPLETE STREETS?

Complete Streets are streets that are designed and operated for everyone, regardless of age, ability, or how people get around.

- Complete Streets make it safe and easy to walk to the store, cross the street, ride a bike to school, and drive to work. Complete Streets incorporate design elements that emphasize safety, mobility and accessibility for those using a variety of travel modes. They can include features such as wide and safe sidewalks or shoulders, clearly marked crosswalks, space for bicyclists to travel, places to sit, street trees, and more.
- What a Complete Street looks like will largely depend on where it is and who is using it. For example, a Complete Street in the downtown will look differently from one in a more rural area of Keene. In areas where many people walk, vehicle speeds should be slower and there should be highly visible and frequent places to cross the street. These areas should also have wide sidewalks, places for people to sit and rest, and landscaping to make it a desirable place to walk. If many large trucks are using the street, travel lanes will need to be wide enough so that these vehicles can pass each other and make safe turns. If mostly cars and bicyclists are using the street, the lanes can be narrower, which will help slow down vehicle speeds and make it safer for all users.







NEIGHBORHOOD

RURAL AREA

COMPLETE STREETS BENEFITS

- Increase Safety By designing the road for all users, Complete Streets improve safety for everyone.
- Reduce Barriers for Seniors and Persons with Disabilities Complete Streets can include curb ramps at crosswalks, audible or
 tactile signals that can be used by blind pedestrians, longer
 crosswalk times, smooth and unobstructed sidewalks, and places
 to sit and rest.
- Increase Economic Vitality People can save money when they switch to biking, walking, and taking public transportation, which allows them to spend this money in other ways. In addition the presence of sidewalks, bike paths, and other elements that make neighborhoods more walkable has been shown to increase property values, stimulate the local economy, and attract new businesses and investment, especially in retail and downtown areas.
- Improve Community Health Complete Streets make active living an easy option by providing safe and convenient opportunities for people to walk and ride bikes. Studies have shown that people who live in walkable areas are substantially less likely to be overweight or obese than people who lived in neighborhoods where walking was unsafe.
- Reduce Air Emissions Walking and bicycling are zero-emission transportation modes, and public transportation has much lower emissions than driving in a single occupancy vehicle. This helps to reduce heat-trapping pollution and makes the air we breathe cleaner.

COMPLETE STREETS DESIGN GUIDELINES

There is no single design prescription for "complete streets." Ingredients may include side-walks, bike lanes or wide paved shoulders, special bus lanes, comfortable and accessible public-transportation stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, and more. A complete street in a rural area will look quite different from one in an urban area. However, both are designed to balance safety and convenience for everyone using the road. As Keene's existing roads are repaired or reconstructed, it should be a policy of the city to incorporate these ingredients to the scale and degree appropriate for the location and type of roadway..."

- City of Keene Comprehensive Master plan 2010

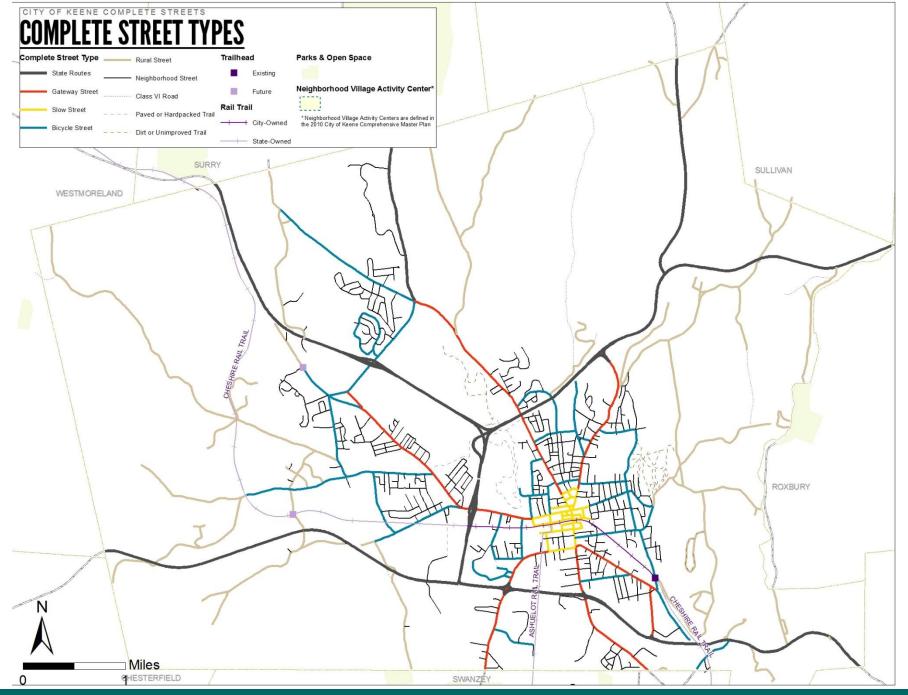
STREET DESIGN CONSIDERATIONS

The following sections outline a series of street design recommendations for City staff and others to consider when working in the public right of way. The intent of these recommendations is to provide flexible guidance for accommodating and balancing the needs of multiple users of the roadway when making decisions. These considerations are intended to provide a simple and effective means to weigh and consider street design options, given a range of conditions.

STREET TYPOLOGY

Typology classifies streets by roadway function and surrounding context, including right of way width, building types, predominant travel modes and land uses. The designation of Keene's roadways as different street types serves as a methodology to ensure that the design and use of a street complements the surrounding area and vice versa. The design recommendations included on the following pages are organized by the street types shown to the right. The following sections of this document define and describe these street types and provide a range of complete streets considerations for each.





SLOW STREETS

Located within Keene's pedestrian-oriented downtown, Slow Streets are places where all travel modes are in high demand and vehicular traffic must proceed at slow speeds for safety. Mixed use activities in this high density commercial core require greater attention to accommodating all modes of transportation. In this area cars, buses and bicycles all share the right of way, pedestrian convenience is of the utmost importance, crossings are frequent, and cars easily pull in and out of curbside spaces. The rich mix of activity is facilitated by the slow speed of traffic on these streets.





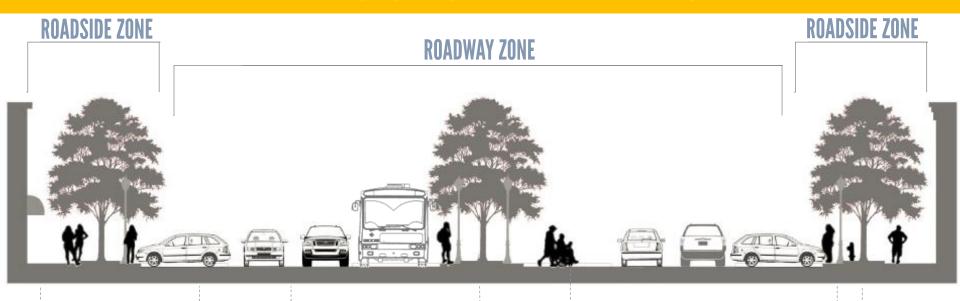
Where are Slow Streets in Keene?

☐ Central Sq □ Railroad St. ☐ Church St ☐ Ralston St. ☐ Court St* □ Roxbury St* ☐ Cypress St ☐ School St ☐ Eagle Ct ☐ St. James St. ☐ Emerald St. □ Vernon St. ☐ Elm St ☐ Washington St* ☐ Federal St □ Wells St ☐ Gilbo Ave □ West St* □ Lamson St ☐ Wilson St ☐ Main St* ☐ Winchester St* ☐ Mechanic St.

^{*}Street type changes along roadway segment.



SLOW STREET ELEMENTS



Angled Parking On-Street

Unobstructed Pedestrian Pathway Narrow Vehicular Travel Lanes Landscaped
Pedestrian
Refuge Island

ADA Compliant Crosswalks Pedestrian Scale Lighting

Green Buffer with Street Trees







SLOW STREET CONSIDERATIONS

ROADSIDE ZONE

ROADWAY ZONE

Sidewalk 8' - 10 ' minimum	Vehicle Travel Lanes □ 10' minimum; 12' maximum
☐ 5' minimum unobstructed walking area	i i i i i i i i i i i i i i i i i i i
□ Located on both sides of the street	Pedestrian Crossings
Consider curb extensions at intersection with crosswalks	☐ Special pavement treatment at high volume pede
 Ramped at all driveway entrances and street intersections with a slope not to exceed 1·12 	integral colored pavement, special pavers, high v
☐ Located at least 5' from edge of street pavement right-of-way permitting	raised, etc.) □ 6-10' wide
☐ Consider use of pervious materials	☐ 6-10' wide ☐ Longitudinal ladder markings per MUTCD requirer
A	☐ Comply with ADA for smoothness and visibility
Green Buffer	☐ Placed at every intersection
□ 5; minimum	☐ In areas of high pedestrian volume consider mid-
☐ 2' minimum area for snow storage	☐ If speeds and volume warrant, consider signage
 □ Located adjacent to sidewalk □ Deciduous trees of a minimum 2" caliper planted every 40' - 50" 	Medians / Refuge Islands
□ Native trees, shrubs and perennial plantings that are wet/dry/salt tolerant	☐ 6' minimum width with 7" minimum reveal, 5' ped
(avoid species susceptible to disease)	☐ The cut-through or ramp width should equal the
☐ Consider grates or mulch around tree bases in high volume pedestrian areas;	where this cannot be achieved crosswalks shou
6' x 6' minimum	cut-through area
Furniture / Amenites	☐ Landscape with native shrubs, and perennial plan
□ Benches	tolerant □ Plantings should not exceed 2'-3' high
☐ Bicycle Racks	Plantings Should not exceed 2.3 high
☐ Parking meters placed behind green buffer	Parking
☐ Consider using multi-space pay stations	☐ Angled parking on-street in low-speed commercial
□ Waste receptacles	at a 45 degree angle perpendicular to curb)
Note: Furniture should not obstruct 5' pedestrian walking area	☐ Parallel parking on-street (7' minimum width, 8' p
Lighting	□ Consider back in angled parking□ Consider use of pervious pavement
☐ Pedestrian scale fixtures placed 50' if space allows	- Consider ase of pervious pavernette
 □ Vehicular fixtures at all intersections and 28' high 	
☐ Consider energy efficient lighting (e.g. LED, solar fixtures, etc.)	

- estrian intersections (e.g. isibility paint, curb extensions,
- ments
- -block crossings
- destrian path;
- width of the crosswalk. uld be striped wider than the
- intings that are wet/dry/salt
- ial areas (17' long and 8" wide
- oreferred)

GATEWAY STREETS

Roads classified as Gateway Streets are primarily arterials streets emanating out from the City's downtown to state routes within and outside Keene. These streets contain a mix of land uses and destinations including but not limited to retail and commercial centers, professional offices, educational institutions, human service agencies, residences, gas stations, and grocery stores. These streets are the primary travel corridors in the City and should be accommodating of all modes of transportation.





Where are Gateway Streets in Keene?

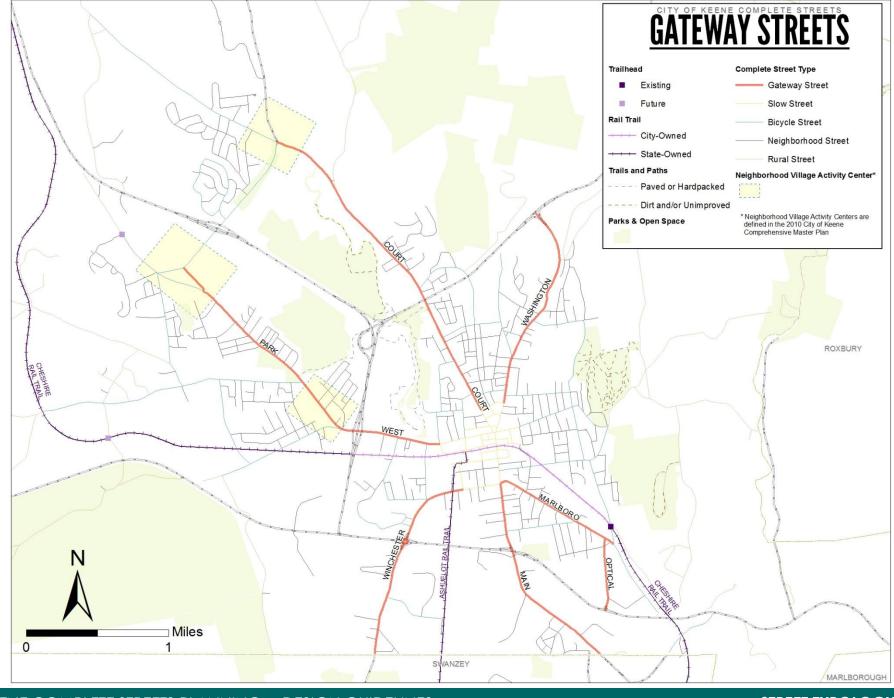
- ☐ Court St*
- ☐ Main St*
- ☐ Marlboro St*
- ☐ Optical Ave
- □ Park Ave

☐ Washington St*

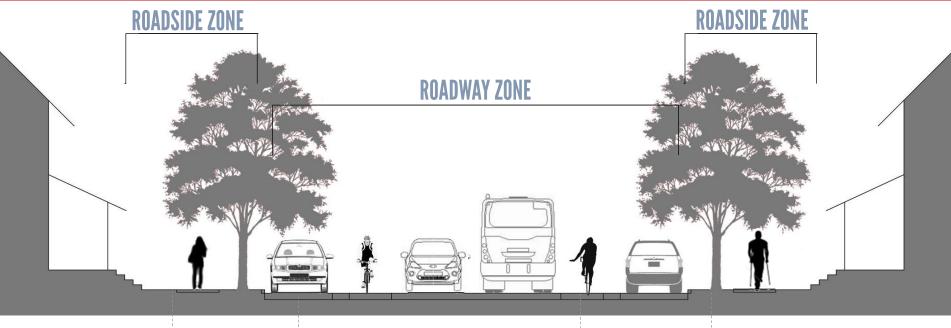
☐ Winchester St*

□ West St*

^{*}Street type changes along roadway segment.



GATEWAY STREET ELEMENTS



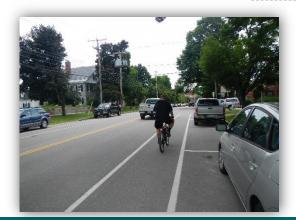
Unobstructed Pedestrian Pathway

Parallel Parking On-Street

Marked Bike Lanes or Sharrows

Green Buffer with Street Trees and Space for Bioswales or Rain Gardens







GATEWAY STREET CONSIDERATIONS

ROADSIDE ZONE

ROADWAY ZONE

Sidewalk	Vehicle Travel Lanes
□ 5' minimum; 8' − 10 ' preferred width	□ 10' minimum; 12' maximum
□ 5' minimum unobstructed walking area	Dadactrian Oraccines
□ Located on both sides of the street	Pedestrian Crossings
□ Consider curb extensions at intersection with crosswalks	☐ Special pavement treatment in high volume pedestrian areas (e.g. integral colored
□ Ramped at all driveway entrances and street intersections with a slope not	pavement, special pavers, high visibility paint, raised, etc.)
to exceed 1:12	6-10' wide
□ Located at least 5' from edge of street pavement right-of-way permitting	Longitudinal ladder markings per MUTCD requirementsComply with ADA for smoothness and visibility
□ Consider use of pervious materials	□ Placed at every intersection
Green Buffer	☐ In areas of high pedestrian volume consider mid-block crossings
	☐ If speeds and volume warrant, consider signage
□ 5; minimum □ 2' minimum area for anouy eterage	
□ 2' minimum area for snow storage□ Located adjacent to sidewalk	Bike Lanes/ Sharrows
☐ Deciduous trees of a minimum 2" caliper planted every 40' – 50"	☐ 4' minimum; 5'-6' preferred
□ Native trees, shrubs and perennial plantings that are wet/dry/salt tolerant	☐ Use bike safe drain grates
(avoid species susceptible to disease)	☐ Minimum visibility treatment of white line, bicycle icon and directional arrow
Consider grates or mulch around tree bases in high volume pedestrian areas;	 □ Consider integrating color pavement (e.g. green) for complex areas □ Place on both sides of street or a minimum of one side of the street
6' x 6' minimum	☐ Place on both sides of street or a minimum of one side of the street ☐ Consider sharrows as alternative to bike lanes (minimum visibility treatment of
☐ Consider use of bioswales or rain gardens for stormwater infiltration.	white chevron / bicycle symbol directing bicyclists to ride in the safest location
	within the travel lane)
Furniture / Amenites	☐ Markings should be located outside of door zone of parked cars
□ Benches	
□ Bicycle Racks	Medians / Refuge Islands
Parking meters placed behind green buffer	☐ 6' minimum width with 7" minimum reveal, 5' pedestrian path, and 40" long;
☐ Consider using multi-space pay stations	☐ The cut-through or ramp width should equal the width of the crosswalk,
□ Covered transit shelters at bus stops Note: Furniture should not obstruct 5' pedestrian walking area	☐ Landscape with native trees, shrubs, and perennial plantings that are wet/dry/salt
Note: Furfilline Should not obstruct a pedestrian walking area	tolerant (plantings should not exceed 2'-3' high)
Lighting	Parking
	Angled parking on-street in low-speed commercial areas (17' long by 8" wide at a 45
 Pedestrian scale fixtures placed 50' if space allows in high volume pedestrian areas 	degree angle perpendicular to curb)
□ Vehicular fixtures at all intersections and 28' high	☐ Parallel parking on-street (7' minimum width, 8' preferred)
☐ Consider energy efficient lighting (e.g. LED, solar fixtures, etc.)	☐ Consider back in angled parking
5,	☐ Consider use of pervious pavement

BICYCLE STREETS

This street type gives bicycles priority treatment through street improvements intended to enhance bicycle convenience and safety (e.g. bike lanes, sharrows, bicycle racks, etc.). Bicycle Streets, together with Gateway Streets, Slow Streets and off-road paths, provide a bicycle network that traverses the City and provides safe space for bicyclists.

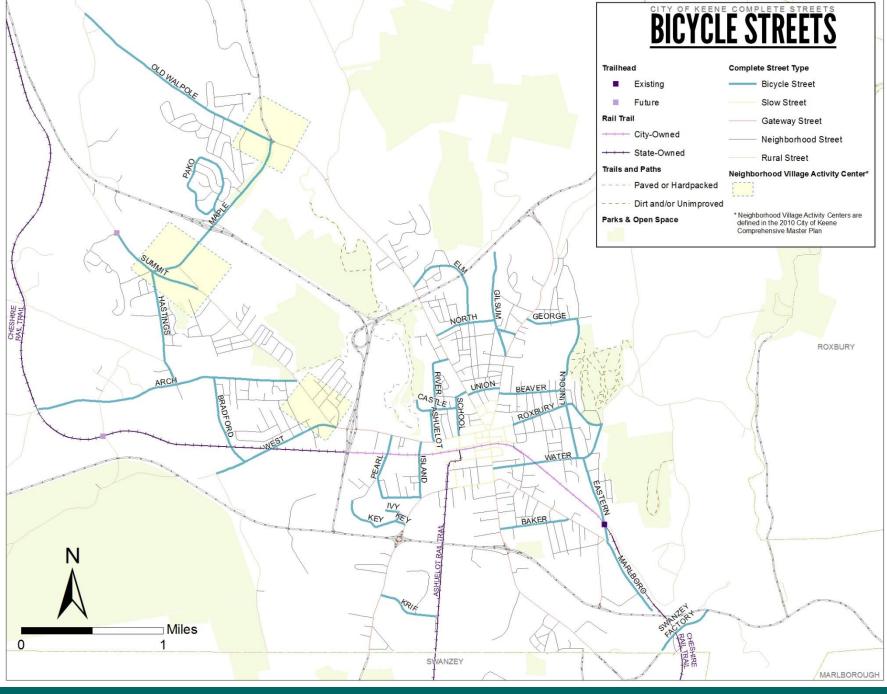




Where are Bicycle Streets in Keene?

☐ Arch St. □ N Lincoln St. ☐ Ashuelot St □ North St □ Baker St ☐ Old Walpole Rd* □ Beaver St □ Pako Ave ☐ Bradford St □ Pearl St □ Portland St ☐ Castle St □ Fastern Ave □ River St □ George St* □ Roxbury St* ☐ Gilsum St ☐ S Lincoln St. ☐ School St. ☐ Hastings Ave ☐ Hurricane Rd* ☐ Summit Rd* ☐ Island St □ Swanzey Factory Rd ☐ Union St. □ Ivy Dr □ Kev Rd □ Water St □ Krif Rd □ West St* ☐ Maple Ave ☐ Marlboro St*

^{*}Street type changes along roadway segment.



BICYCLE STREET ELEMENTS



Unobstructed Pedestrian Pathway Parallel Parking On-Street

Marked Bike Lanes or Sharrows Green Buffer with Street Trees







BICYCLE STREET CONSIDERATIONS

ROADSIDE ZONE

ROADWAY ZONE

 Sidewalk 5' minimum; >5' in neighborhood centers and high volume pedestrian areas 5' minimum unobstructed walking area Located on at least one side of the street, both sides is preferred Consider curb extensions at intersection with crosswalks Ramped at all driveway entrances and street intersections with a slope not to exceed 1:12 Located at least 5' from edge of street pavement right-of-way permitting Consider use of pervious materials 	Vehicle Travel Lanes □ 10' minimum; 12' maximum Bike Lanes □ 4' minimum; 5'-6' preferred □ Use bike safe drain grates □ Minimum visibility treatment of white line, bicycle icon and directional arrow □ Consider integrating color pavement (e.g. green) for complex areas □ Place on both sides of street or a minimum of one side of the street
Green Buffer 5;' minimum 2' minimum area for snow storage Located adjacent to sidewalk Deciduous trees of a minimum 2" caliper planted every 40' - 50" Native trees, shrubs and perennial plantings that are wet/dry/salt tolerant (avoid species susceptible to disease) Consider grates or mulch around tree bases in high volume pedestrian areas; 6' x 6' minimum Furniture / Amenities Bicycle Racks Note: Furniture should not obstruct 5' pedestrian walking area Lighting Vehicular fixtures at all intersections and 28' high Consider energy efficient lighting (e.g. LED, solar fixtures, etc.)	Marked Shared Lane / Sharrows Consider as alternative to bike lanes Use bike safe drain grates Minimum visibility treatment of white chevron / bicycle symbol directing bicyclists to ride in the safest location within the travel lane Markings located outside of door zone of parked cars Pedestrian Crossings Special pavement treatment at high volume pedestrian intersections (e.g. integral colored pavement, special pavers, high visibility paint, curb extensions raised, etc.) G-10' wide Longitudinal ladder markings per MUTCD requirements Comply with ADA for smoothness and visibility Placed at every intersection In areas of high pedestrian volume consider mid-block crossings If speeds and volume warrant, consider signage
Signage ☐ Consider installing Share the Road signs per MUTCD requirements along routes where bike lanes or sharrows are not feasible	Parking □ Parallel parking on-street (7' minimum width, 8' preferred) □ 13' minimum combined bike and parking lane width □ Consider back in angled parking □ Consider use of pervious pavement

NEIGHBORHOOD STREETS

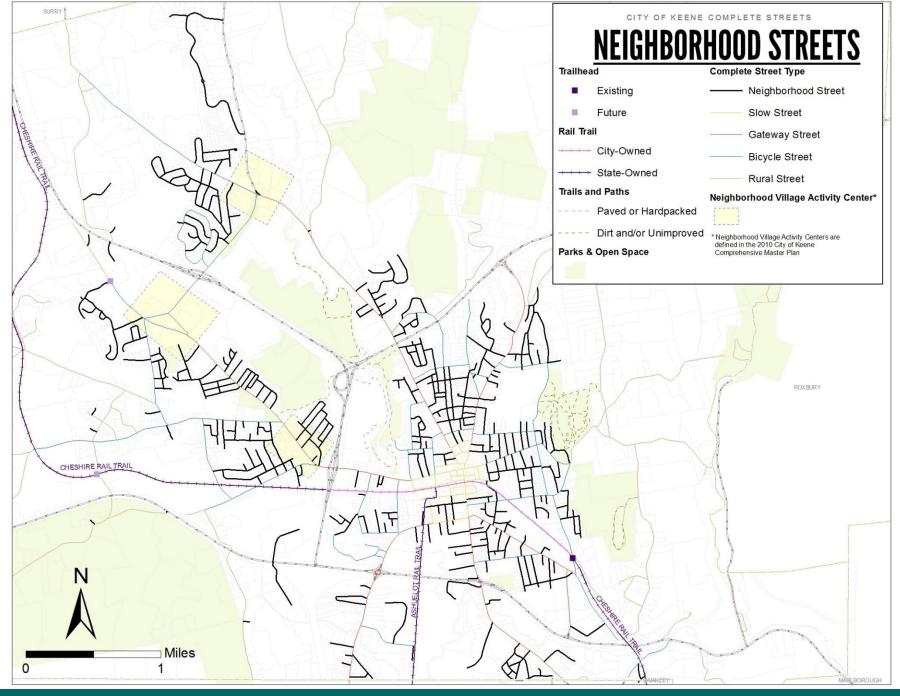
Neighborhood Streets are local streets located in medium to high density residential areas of the City. In these areas, houses are located close together, traffic volumes and speeds are low, and the predominant land use type is residential. Many of the City's Neighborhood Streets connect to collector roads, which are designated as either Bicycle or Complete Streets.



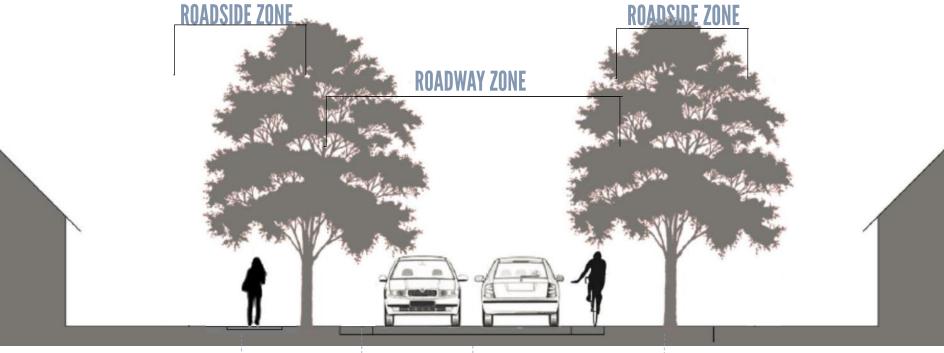








NEIGHBORHOOD STREET ELEMENTS



Unobstructed Pedestrian Pathway

Paved Shoulder

Narrow Vehicular Travel Lanes





Green Buffer



NEIGHBORHOOD STREET CONSIDERATIONS

ROADSIDE ZONE

ROADWAY ZONE

Sidewalk

- 5' minimum; >5' in neighborhood centers and high volume pedestrian areas
 - 5' minimum unobstructed walking area
- Located on at least one side of the street
- Consider curb extensions at intersection with crosswalks
- Ramped at all driveway entrances and street intersections with a slope not to exceed 1:12
- Consider use of pervious materials

Green Buffer

- 5. minimum
- 2' minimum area for snow storage
- Native trees, shrubs and perennial plantings that are wet/dry/salt tolerant (avoid species susceptible to disease)

Lighting

- Vehicular fixtures at intersections and 28' high
- Consider energy efficient lighting (e.g. LED, solar fixtures, etc.)

Vehicle Travel Lanes

10' minimum: 11' maximum

Shoulder

- 2'-3' minimum, paved shoulder
- Clear of debris

Pedestrian Crossings

- Special pavement treatment at high volume pedestrian intersections (e.g. integral colored pavement, special pavers, high visibility paint, curb extensions, raised etc)
- 6-10' wide
- Longitudinal ladder markings per MUTCD requirements
- Comply with ADA for smoothness and visibility
- Placed at every intersection
- In areas of high pedestrian volume consider mid-block crossings
- If speeds and volume warrant, consider signage

Parking

- Parallel parking on-street (7' minimum; 8' preferred)
- Consider use of pervious pavement

RURAL STREETS

Rural Streets are local and collector streets that are located in low-density suburban and rural areas of the City. There are far distances between destinations and land use in this area is primarily residential.

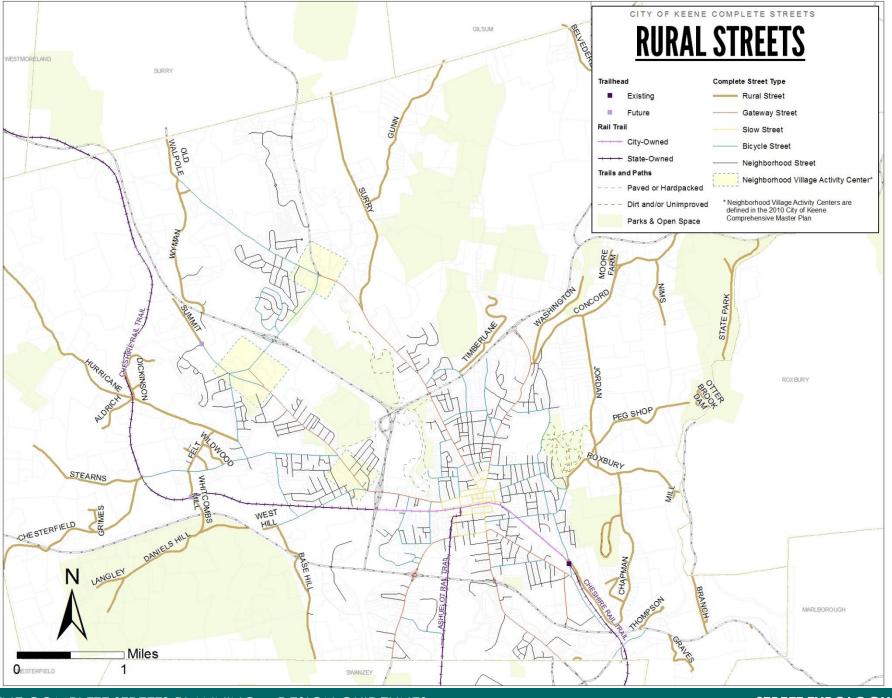


Hurricane Road

Where are Rural Streets in Keene?

 □ Abbot Rd □ Aldrich Rd □ Base Hill Rd □ Belvedere Rd □ Blackberry Ln □ Branch Rd □ Chapman Rd □ Chesterfield Rd □ Concord Hill Dr □ Concord Rd □ Cranberry Rd □ Dickinson Rd □ East Surry Rd □ Felt Rd □ Ferry Brook Rd □ Forestview Rd □ Graves Rd □ Graves Rd □ Grimes Rd □ Gunn Rd □ Hurricane Rd* □ Jordan Rd □ Langley Rd □ Marlboro Rd □ Meetinghouse Rd □ Mill Rd 	 Moore Farm Rd Nims Rd No Name Rd Old Walpole Rd* Otter Brook Dam Rd Peg Shop Rd Pheasant Hill Rd Price Rd Red Oak Dr Roxbury Rd Stearns Rd Sullivan Center Rd Sullivan Rd Summit Rd* Thompson Rd Timberlane Dr Village Dr West Hill Rd Whitcombs Mill Rd Wildwood Rd Wyman Rd
☐ Minerva Ln	

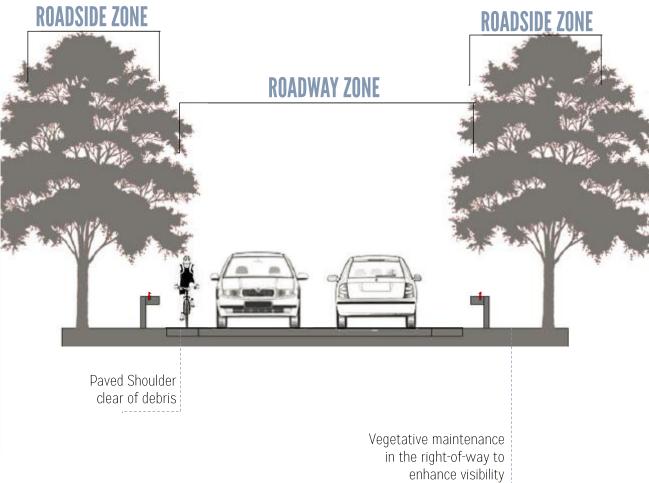
^{*}Street type changes along roadway segment.



RURAL STREET ELEMENTS







RURAL STREET CONSIDERATIONS

ROADSIDE ZONE

ROADWAY ZONE

Vegetation Maintenance

Annual maintenance of roadside vegetation to improve visibility

Lighting

- Vehicular fixtures at intersections and 28' high
- Consider energy efficient lighting (e.g. LED, solar fixtures, etc.)

Signage

Consider installing Share the Road signs per MUTCD requirements along routes frequently travelled by bicyclists

Vehicle Travel Lanes

10' minimum; 12' maximum

Shoulder

- 2'-3' minimum, paved shoulder
- Clear of debris

TRANSIT OVERLAY

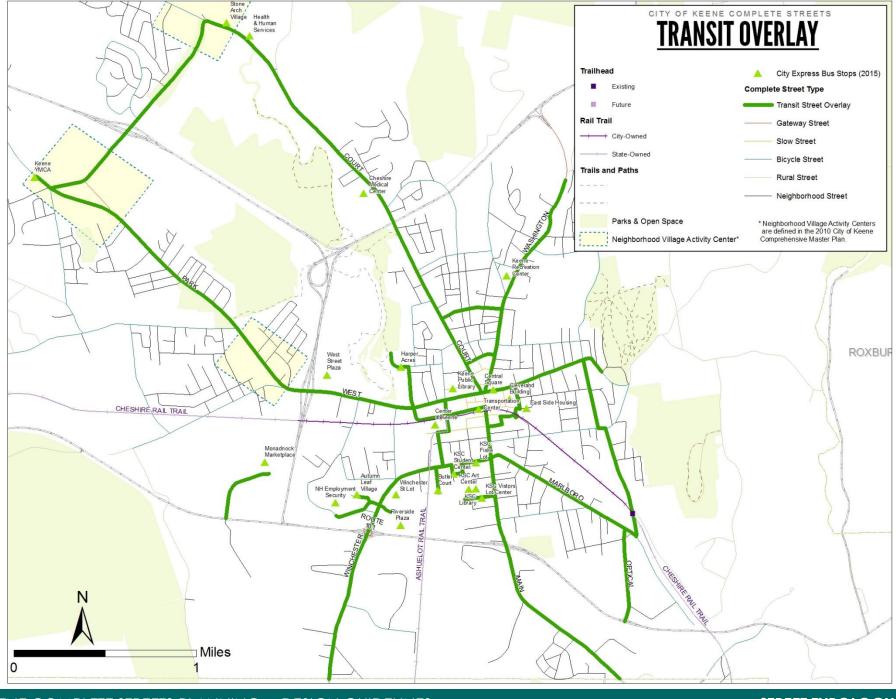
In areas of the City that are either currently served by fixed-route public transportation services or where transit services would be ideally located in the future, special considerations should be made for accommodating transit vehicles and users. In 2015, the primary provider of fixed-route bus service in Keene is the City Express. The City Express' 2015 bus stop locations are located on the map on page 27. The recommendations outlined for Transit Streets on the following pages should be considered in addition to those associated with the underlying Complete Street type.





Transportation Center on Gilbo Avenue





TRANSIT OVERLAY CONSIDERATIONS

ROADSIDE ZONE ROADWAY ZONE

Transit Stop Amenities

- Covered transit shelters at bus stops
- Covered Bicycle Racks
- Covered benches
- Pedestrian scale fixtures at transit stops. Consider energy efficient lighting (e.g. LED, solar fixtures, etc.)
- Pedestrian scale signs with bus route information

Note: Furniture or shelters should not obstruct 5' pedestrian walking area

Transit Stops

- Placed in front of crosswalks
- 100' 140' curbside for streets
- Consider bus bulbs (6' X 35') for streets with higher traffic volume, high transit ridership, crowded sidewalks and/or inadequate space for transit stop amenities
- 100' 140' bus turnouts for transit stops with longer dwell times

Vehicle Travel Lanes

10' minimum: 12' maximum

Pedestrian Crossings

- Consider placing In areas near transit stops
- Special pavement treatment in high volume pedestrian areas (e.g. integral colored pavement, special pavers, high visibility paint, raised, etc.)
- 6-10' wide
- Longitudinal ladder markings per MUTCD requirements
- Comply with ADA for smoothness and visibility
- If speeds and volume warrant, consider signage

Parking

Remove on-street parking at transit stop locations

ADDITIONAL RESOURCES

For additional information on Complete Streets, visit the following organizations' websites and web-based resources.

- National Complete Streets Coalition http://www.smartgrowthamerica.org/complete-streets
- Healthy Eating Active Living (HEAL) NH http://www.healnh.org/index.php/complete-streets-policies
- American Planning Association https://www.planning.org/research/streets/resources.htm
- American Association of Retired Persons (AARP) http://www.aarp.org/livable-communities/archives/info-2014/complete-streets.html
- U.S. Department of Transportation http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/d esign_nonmotor/highway/index.cfm#s3