

Traffic Calming Program



Revised January 2010

Traffic Calming in Windsor

Neighborhood traffic is a hot button issue in communities nationwide. Communities have struggled to find creative ways to successfully affect drivers' behavior, slowing them down or encouraging them to use preferred routes. It is a vexing and constant issue. In fact, Town of Windsor public documents show that residents have voiced concerns about traffic issues for over a hundred years. This manual provides an overview of traffic calming methods that can be used to mitigate neighborhood traffic issues.

The Institute of Transportation Engineers (ITE), which is the preeminent authority on traffic matters, defines traffic calming as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users." ITE summarizes the goals of traffic calming as:

- Increasing the quality of life;
- Incorporating the preferences and requirements of the people using the area (e.g., working, playing, residing) along the streets, or at intersections;
- Creating safe and attractive streets;
- Helping to reduce the negative effects of motor vehicles on the environment (e.g., pollution, sprawl, noise); and
- Promoting pedestrian, cycle and transit use.

These broad goals, ITE believes, can be achieved through the following:

- Achieving slow speeds for motor vehicles,
- Reducing collision frequency and severity,
- Increasing the safety and the perception of safety for non-motorized users of the streets,
- Reducing the need for police enforcement,
- Enhancing the street environment (e.g., streetscaping),
- Encouraging water infiltration into the ground,
- Increasing access for all modes of transportation, and
- Reducing cut-through motor vehicle traffic (or spillover traffic from arterials to other streets).

The Town of Windsor's traffic calming program manual describes the town's process for implementing traffic calming actions in such a way as to achieve as many of the goals ITE describes above, but so as to limit significant detrimental effects on emergency response and the functionality of the street network. This manual also sets forth a protocol for evaluating traffic calming needs and prioritizing their implementation.

Critical Elements of Traffic Calming

Experts believe that a good traffic calming solution to any neighborhood traffic problem has four parts:

1. Engineering
2. Enforcement
3. Education
4. Enhancement

Engineering involves designing the roadway and calming measure to fit the situation. Enforcement includes providing police or other community or regulatory resources to support calming measures. Education is an important third element because traffic calming's success rests with our ability to alter drivers' behavior and because neighborhood involvement in the process is critical. Lastly, enhancement has become an important component of an effective, integrated traffic calming approach. Enhancement includes selecting a design that has landscaping or other design features that are aesthetically pleasing and that improve the livability of the neighborhood. Traffic calming methods that have the enhancement element change the feel of a roadway by creating visual breaks in the streetscape.

Determining the Right Traffic Calming Method

Each traffic calming device has appropriate applications, includes one or more of the engineering, enforcement, education or enhancement approaches outlined above, and has disadvantages or negative impacts. Very few devices or methods that rely on only a single approach are sufficiently effective. The best traffic calming solutions combine approaches.

Each traffic condition has unique aspects. Selecting a suitable traffic calming device or strategy for a particular street requires examining several variables. These variables include:

- Traffic volumes
- Accident history
- Speeds (design and operating)
- Presence of cut-through traffic
- Presence of schools or public facilities
- Number of streets in the neighborhood affected
- Emergency response primary and secondary routes
- Classification of street (e.g., local, collector and arterial)

A Note on Stop Signs and Regulatory Measures

Regulatory measures such as traffic signals and stop signs are not traffic calming measures, but are important devices used to determine right-of-way. Laws and national standards govern the use of these regulatory measures.

Residents frequently request stop signs at neighborhood intersections to slow down traffic and to improve intersection safety. However, stop signs that are placed at inappropriate locations do not have the intended affect and often create more problems. Numerous studies have shown that drivers tend to accelerate out of stops and reach speeds within 100 feet of a stop sign that are greater than they travel at when stop signs are not present. Simply put, most drivers try to compensate for "lost time" between stops. Traffic studies also show that stop signs are less effective at controlling speed and traffic volumes than effective traffic calming devices. Many drivers also disregard stop signs if the cross-street traffic is not significant. Some studies have shown that as few as 7% of drivers come to complete stops at "unwarranted" stop sign intersections. Stop signed intersections can also be considered nuisances by adjacent residents due to the polluting emissions and noise generated by vehicles at the stop signs. For these reasons, it is incredibly important that

regulatory devices, such as stop signs, are located in appropriate places and that we use suitable traffic calming devices to address vehicle speed and volume issues.

Places where all-way stops are appropriate:

- High number of accidents (for example, 6 or more reported crashes or 1 or more fatalities in a three-year period), if an engineering study shows that a stop sign would have prevented the accident or corrected a contributing problem
- High volume of vehicles (as defined by the Federal Highway Administration, FHWA; for example, in areas where a traffic signal is anticipated but not yet warranted)
- No or very low visibility (driver, after stopping, can't see conflicting traffic unless the cross-traffic stops)
- Where the FHWA warrants would be met.

Two-way stop signs are appropriate in some locations and often have similar requirements. They are especially appropriate when right-of-way is in question.

Engineering and enhancement traffic calming methods and applications

There are many traffic calming methods or devices. Each has characteristics that lend themselves to work more effectively in particular situations and under particular conditions. For example, some methods work better on lower volume, local or neighborhood streets and others may work better on higher volume collector roads. The Town of Windsor's Plan of Conservation and Development defines arterial roads as "primarily intended to carry regional traffic and serve major activity centers." Collector roads are "intended to serve business areas and/or distribute traffic between arterials roads and neighborhoods." Local streets are "intended to provide access to abutting properties and not serve major through traffic."

There are four primary engineering and enhancement methods of calming traffic:

1. Vertical deflections
2. Horizontal shifts
3. Roadway narrowings

The three methods above are intended to reduce speed and enhance the street environment for non-motorists.

4. Closures (such as diagonal diverters, half closures, full closures, and median barriers)
Closures are intended to reduce cut-through traffic by obstructing traffic movements in one or more directions. Closures are rarely required and recommended.

The following is a list of possible devices, best applications and possible advantages and drawbacks.

Vertical deflections

Undulations (such as speed humps, speed tables, raised intersections)

- Best application: in places where very low speeds are desired and reasonable; used to discourage cut-through traffic; more appropriate on local roads versus collector streets
- Advantages: relatively inexpensive; effective at slowing vehicles; easy for pedestrians and bicycles to navigate; may decrease accidents up to 25%; decreases speeds up to 25% for a distance

- Drawbacks: can create some noise and emissions; can create physical discomfort for some drivers; can impede large vehicles including emergency vehicles unless designed appropriately; may have questionable aesthetics

Rumble strips, textured pavement

- Best application: in main street locations; areas of heavy pedestrian use
- Advantages: relatively inexpensive; alerts distracted drivers; may decrease accidents up to 25%; decreases speeds for a varying distance depending on the length and type of application; fewer negative effects on emergency vehicles
- Drawbacks: often creates noise; rumble strips may have questionable aesthetics but textured pavement may have positive effects; can be difficult for bicyclists or the disabled

Horizontal shifts

Gateway treatments (such as signs, different curb alignments and landscaping)

- Best application: in areas that are transitions from different land uses
- Advantages: can signal a change in the driving conditions; if constructed accordingly, may narrow the roadway at the entrance to the residential area or interrupt a long viewpath; may reduce cut-through traffic
- Drawbacks: may not affect speeds beyond the sign; requires periodic maintenance

Chicanes (typically S-shaped curves)

- Best application: in places where lower speeds are desired and where noisier alternatives or other methods would not be acceptable
- Advantages: discourages high speeds; easily negotiated by bicyclists and vehicles of any size
- Drawbacks: may require greater amount of right-of-way; must be designed appropriately to keep drivers from veering out of travel lane; can be expensive (especially if drainage or utilities are affected); speed reduction is less than some other methods; has little or no impact on cut-through traffic

Traffic circles or roundabouts

- Best application: in neighborhood intersections; locations with a history of accidents; intersections where queues need to be minimized; intersections with irregular geometry; places where lower cost traffic control (than a signalized intersection) is desired; where a high number of u-turns occur or are desired
- Advantages: moderates speeds (up to 15%) and improves safety (up to 80%; typically 30%); can be aesthetically pleasing; can calm two streets at once; minimizes traffic stacking; breaks up sight lines on long roadways
- Drawbacks: can be more difficult for large vehicles to navigate; require greater amount of right-of-way; must be maintained; high cost; may require bicyclists to merge with traffic; pedestrians need to be considered; snow removal can be difficult

Roadway narrowings

Striping (including adding pedestrian/bicycle lanes)

- Best application: long, wide residential streets where speeding is a problem; used to create an impression of a narrow roadway

- Advantages: may reduce speeds; may increase pedestrian and bicyclist safety; low cost and easy to implement
- Drawbacks: relies on self-enforcing behavior

Chokers (chicanes with directly opposed bulbouts instead of alternating)

- Best application: in places where substantially lower speeds are desired or where there are cut-through problems; and where noisier alternatives or other methods would not be acceptable
- Advantages: discourages high speeds; easily negotiated by bicyclists and vehicles of any size; reduces the distance pedestrians have to cross
- Drawbacks: may require greater amount of right-of-way; must be designed appropriately to keep drivers from veering out of travel lane; speed reduction depends on design (e.g., one lane passage or two; up to 15% reduction), can be expensive (especially if drainage is affected); may require bicyclists to briefly enter the vehicle travel lane

Neckdowns (bulbouts, intersection narrowings, etc.)

- Best application: in areas with substantial pedestrian activity
- Advantages: improve the pedestrian space and crossing distance; through and left turns are easily negotiated; can create protected parking; can reduce speeds especially for right turn movements
- Drawbacks: right turns are more difficult to negotiate; limited affect on speeds; can be expensive; can create a visibility hazard for bicyclists

Medians

- Best application: in entrances to neighborhoods; wide streets where pedestrians need to cross; and to create visual corridors
- Advantages: can be designed as a pedestrian refuge; can be aesthetically pleasing, often reduces traffic volumes; may reduce speeds depending on the design
- Drawbacks: speed reduction depends on design (up to 15%); requires greater amount of right-of-way or reduced lanes; construction and maintenance costs can be expensive; long medians can affect emergency and residents' access to driveways

Closures (Partial, full or diverters, one-way)

- Best application: to be used to resolve only the most serious traffic concerns, and when other approaches are not possible or effective and where drawbacks are minimal
- Advantages: restricts some or all traffic; can eliminate conflicts at intersections or improve pedestrian crossing abilities; can provide landscaping and visual enhancement opportunities
- Drawbacks: may redirect traffic onto other local streets; may increase travel time for residents and local businesses; can impair emergency response

Other Enhancement Features

Enhancements can include planting shrubs or trees along the roadway, installing public art or banners, constructing pedestrian crossings, varying building set-backs, creating

sidewalks or multi-use paths, including bike lanes, constructing decorative pavement markers or materials, installing lighting, introducing or altering on-street parking, etc.

Education and enforcement traffic calming methods and applications

The Town of Windsor also uses police traffic enforcement as a critical traffic calming tool. Targeted enforcement in areas where traffic volumes are great, where speeds are high, where the probability for serious accidents is present, or where complaints have been made can lead to dramatic, but often short-term reductions in speeds or volumes.

In addition to periodically assigning district officers to traffic enforcement hot spots and their normal enforcement of traffic rules throughout their shifts, the Windsor Police Department participates in regional traffic teams that perform targeted enforcement in Windsor.

While a comprehensive public education campaign on neighborhood speeding has not yet been developed, town staff have used various publications and the WG-TV channel to promote safe driving behavior. The police department has, in the past, emphasized speeding awareness in school zones.

Digital Speed Display Signs (DSDS) and a speed trailer are used throughout town to collect traffic data and to remind motorists to slow down.

Digital Speed Display Signs (DSDS)

- Best application: arterial and collector roadways, but can be used on all local roadways for collecting speed and volume data and for educating motorists about the speeds they are travelling
- Advantages: can operate in stealth mode to collect data and then in display mode to collect data and display speeds. Data results will demonstrate the effectiveness of the DSDS at that location. Can easily be relocated and reinstalled as part of a non-static traffic calming plan for a specific roadway.
- Drawbacks: requires development of a plan and personnel resources to implement and manage. DSDS, if left in place for an extended period of time may lose their effectiveness.

Procedure for traffic calming request and implementation

In order to ensure the effective use of traffic calming methods and limited public funding, the town uses an analysis and prioritization process to determine where and what traffic calming installations are warranted.

Who can make a request?

1. Town staff can initiate and pursue traffic calming installations (typically as part of the Capital Improvement Program's street-related projects), if they feel traffic calming is warranted. Town staff will communicate the intent to implement traffic calming during the project's neighborhood meetings (if applicable), town council appropriation discussions, etc. In addition, town staff has a Traffic Committee that meets on a regular basis to discuss neighborhood traffic issues and to monitor the

Digital Speed Display Sign program. The committee discusses engineering, education, enforcement and enhancement ways to address neighborhood traffic issues that staff have witnessed.

2. Town residents can also suggest or request traffic calming projects using the following procedure.

Which streets are eligible?

Priority is given to funding traffic calming projects that address traffic and safety concerns in these areas:

- Streets that provide access to a school, or represent major bike/walk-to-school or bike/walk-to-school routes
- Streets that are/could be heavily traveled by pedestrians and bicyclists seeking access to a public park, public building, downtown or commercial area, or a major private facility
- Streets that have been programmed by the Department of Public Works for reconstruction in the near future
- Streets for which the town receives a high number of residents' complaints
- Streets that score highly on the needs assessment

Only local and collector residential streets that have at least 50% of the total street frontage developed or zoned as single or multi-family housing can be considered under this procedure. (See Appendix A for a list of the town's local and collector streets.)

Step One - Petition

Residents need to circulate and submit the Traffic Calming Request Petition (signed by 25% of households on a local or collector street) and return it to the Design Services (Engineering) Division to be considered in the development and funding for the six-year Capital Improvement Plan or for separate consideration by the town council. Town staff will verify the petition signatures and determine an appropriate timeframe for completing the remaining steps. One or more residents should be named on the petition as sponsors of the request.

Petition sponsors are strongly encouraged to speak with Engineering prior to initiating a Traffic Calming Request Petition. Engineering staff will meet with the petition sponsors to discuss the petition process, the neighborhood's traffic concerns, geographic limits for the project (if needed) and the town's traffic calming program and strategies. By meeting with Engineering prior to initiating the petition process, petition sponsors will alert Engineering (and the staff Traffic Committee) that a neighborhood has traffic concerns. It may be possible for the Traffic Committee to address those traffic concerns through non-engineering means and, therefore, help the neighborhood avoid the petition process. In addition, the Traffic Committee will have an opportunity to review any existing data (from traffic counts, dispatch records, etc.) to initially validate neighborhood claims prior to the petition's circulation.

Step Two – Initial Data Collection and Evaluation

After receiving a petition, the town's Engineering staff will meet with the petition sponsors to discuss the petition, including traffic concerns raised, geographic limits for the project (if

needed), any existing data about traffic conditions on the street, and the town's traffic calming program and strategies.

Following the meeting with the petition's sponsors, Engineering staff will conduct traffic counts to collect data on vehicular speeds, vehicle classification and volumes. Digital Speed Display Signs may be used for this purpose. In addition, staff will consider the street's pedestrian and bicycle activity and will collect other data needed for Step Two.

Potential projects should¹ meet at least two of the following six criteria to proceed to Step Three:

1. Minimum 85th percentile speed is 10 miles per hour (mph) or more over the posted speed limit for local streets;
2. Minimum volume of 1,200 vehicles per day (vpd) for local streets and 4,000 vpd for collector streets;
3. Location within 1,000 feet walking distance of a public park, public building, downtown or commercial area, or a major private facility;
4. Evidence (survey or field evaluation) of significant cut-through (i.e., non-neighborhood) traffic if the street is a local street;
5. Unusual accident history (for example, six or more reported crashes, or one fatal crash, in the prior three consecutive years — crashes due to parking, vehicle equipment, drug/alcohol, and certain other causes clearly not solvable by traffic calming will usually not be counted);
6. Truck traffic is equal to or greater than 4% of average vehicles per day on local streets and 6% on collector streets.

Regardless of whether the project meets the criteria listed above, town staff will evaluate whether the road's traffic conditions and neighbors' concerns might be addressed first or entirely through lower-cost actions such as increasing short-term traffic enforcement activities, enhancing public education efforts in the area or using Digital Speed Display Signs to heighten awareness.

Step Three – Rating and Prioritizing

Potential projects that are likely to require physical improvements or appropriations will then be scored (upon the initial submittal by residents and subsequently as Engineering deems appropriate) according to this needs assessment:

- Speeds are 10 miles per hour over the posted speed limit: 3.0 points
- Speeds are 15 miles per hour over the posted speed limit: 4.0 points
- Speeds are 20 miles per hour over the posted speed limit: 5.0 points
- Volume at, or up to, 20% above, the minimum volume criterion: 1.5 points
- Volume more than 20% above the minimum volume criterion: 2.0 points
- Within 1000 feet walking distance of a school, senior citizen facility, facility for the disabled, park, community center, or other site with significant pedestrian activity: 2.5 points
- Evidence of significant cut-through traffic on a local street: 1.0 points

¹ The Traffic Committee will assess whether petitioned projects that do not meet two of the six criteria have unusual factors that would warrant them being further considered for prioritization and funding, or whether these petitions might be addressed through actions that do not require expenditures or significant amounts of staff time.

- Unusual accident history: 2.0 points
- Truck traffic is ½% greater than the criteria for the street: ½ point for each ½%
- Request supported by more than 50% of households on problem street: 2.0 points

Step Four – Neighborhood Meeting

In order to develop a Capital Improvement Plan project or seek town council approval or funding for a project, town staff will meet with residents to discuss recommended traffic calming methods. Visuals and statistics will be used to help illustrate the recommended methods. Town staff may also recommend trial or temporary measures so that residents can experience potential designs or so that additional data can be collected. Input from emergency services, the Public Works Department and other stakeholders will be sought.

Step Five – Neighborhood Consent

Residents will circulate and submit the Recommended Traffic Calming Plan Petition, which describes the neighborhood meeting and the resulting, recommended traffic calming method. To proceed, affirmative signatures from 67% of the households on the affected street are required.

Step 6 – Project and Funding Approval

Town staff will request approval of necessary design and construction funds from the town council as part of the Capital Improvement Program's approval. Town council's approval and appropriation may be sought separately from the CIP's approval if other funding sources are set aside for the traffic calming program or if traffic conditions warrant taking action more quickly. Traffic calming projects will be installed as funding becomes available.

The Traffic Calming Manual's Endorsement and Amendments

The manual was endorsed by the town council on _____ as a guidance tool for residents, staff, committees and the council.

The manual will be amended from time to time by town staff as needed.

Appendix A: Section from the Plan of Conservation and Development

Address Road Network Issues

As an older inner-ring suburb, Windsor has a well connected road network. With the Connecticut River as a barrier to east-west movement, the predominant flow of traffic is north-south along Interstate 91 and to a lesser degree, Routes 75, 159 and 187. Day Hill Road, Routes 178, 218, 305 and Interstate 291 carry east-west traffic with Interstate 291 being the sole route across the Connecticut River in Windsor.

Maintain Roadway Function

Access to public streets should be tailored to the function of the street. Direct access to arterials should be discouraged or prohibited, requiring shared driveways, interconnected parking lots, access roads and similar measures to reduce curb cuts and maximize the movement of through traffic. Acceleration/deceleration lanes could also be required at access points to facilitate the efficient flow of traffic. Collector roads can provide both direct and indirect access to adjacent land but access management measures should be encouraged. Local Streets are meant for direct access by residential uses and should not be used to accommodate high speed through traffic.

Maintain Traffic Circulation

As the name “arterial” suggests, Windsor’s road network is its circulatory system and traffic must flow freely within that system if the town is to remain healthy. Windsor’s eight arterial roads are the most critical links in the road network, conveying large amounts of traffic to and from local and collector streets as well as providing access to most of Windsor’s businesses. All of Windsor’s arterial roads are State roads except for Day Hill Road and International Drive.

Road Classifications	
Limited Access	<ul style="list-style-type: none"> Interstate 91 Route 20 Interstate 291
Arterials	<ul style="list-style-type: none"> Route 75 Route 159 Route 178 Route 187 Route 218 Route 305 Day Hill Road International Drive
Collectors	<ul style="list-style-type: none"> Addison Road Archer Memorial Drive Basswood Road Bina Avenue Capen Street Center Street Cook Hill Road Deerfield Road Dudley Town Road Hayden Station Road Kennedy Road Macktown Road Marshall Phelps Road Matianuck Avenue Mountain Road Pigeon Hill Road Rainbow Road River Street Rood Avenue Prospect Hill Road Sage Park Road
Local	<ul style="list-style-type: none"> All remaining roads

Classifying Roads

Roads are typically classified based on their:

- function (through traffic versus access),
- major land use (business or residential),
- traffic volumes, and
- overall location.

Road Classification

Limited Access Highway – A regional, high speed road with controlled access points.

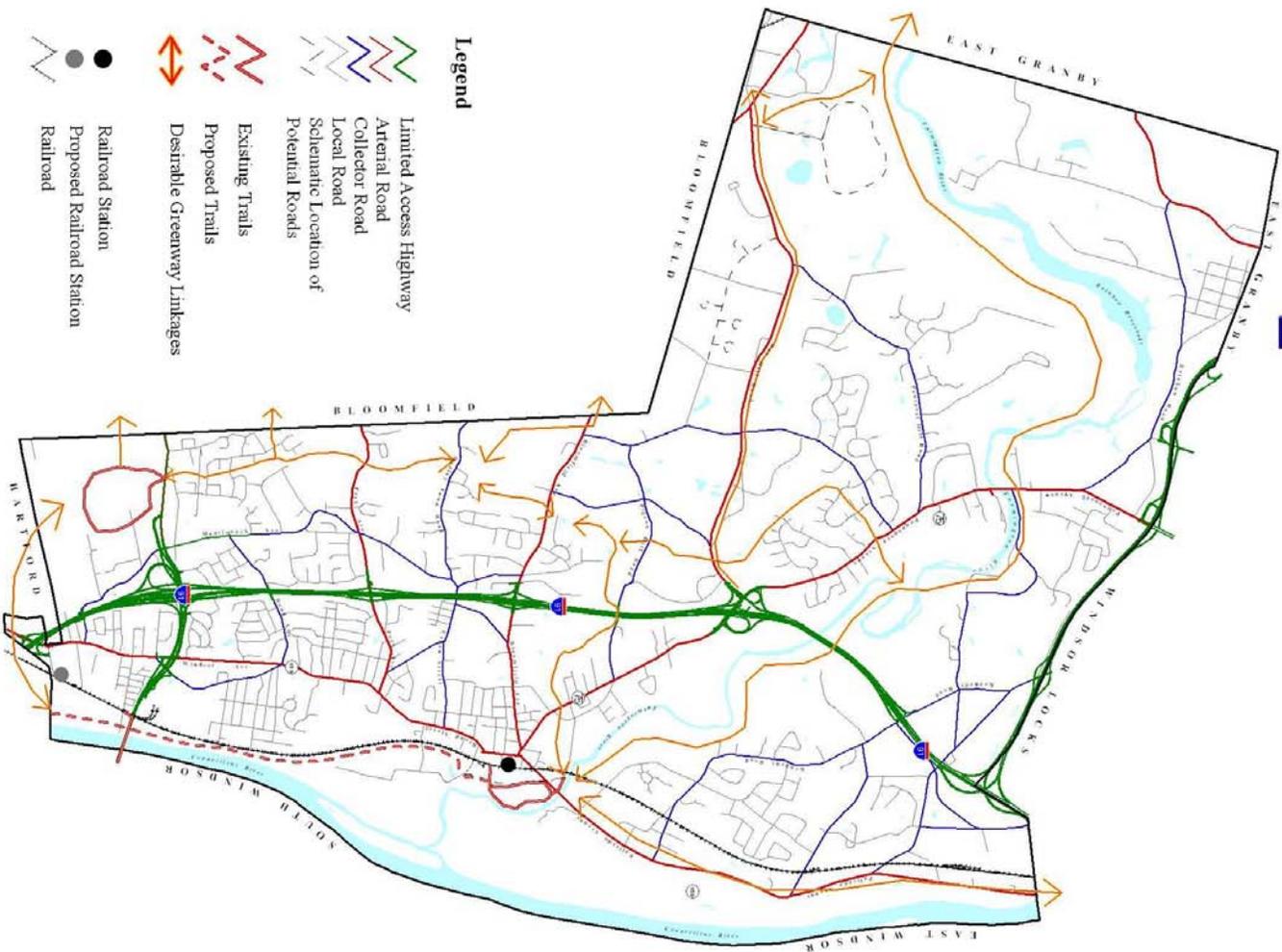
Arterial Road - A road primarily intended to carry regional traffic and serve major activity centers.

Collector Road - A road intended to serve business areas and/or distribute traffic between arterial roads and neighborhoods.

Local Street - A road primarily intended to provide access to abutting properties and not serve major through traffic.

Transportation Plan

Town of Windsor, CT



Legend

-  Limited Access Highway
-  Arterial Road
-  Collector Road
-  Local Road
-  Schematic Location of Potential Roads
-  Existing Trails
-  Proposed Trails
-  Desirable Greenway Linkages
-  Railroad Station
-  Proposed Railroad Station
-  Railroad

0 4000 Feet