

**F**orest Home is an unincorporated residential hamlet of 107 houses situated in the Town of Ithaca, Tompkins County, New York (see Figure 1). Settled along Fall Creek in 1794, it served as a milling center for more than a century, before evolving into the primarily residential neighborhood that it is today. During the last one hundred years, the hamlet has been profoundly influenced by Cornell University, which has grown up around it. Forest Home is now completely surrounded by the open lands of the University's Plantations and Golf Course. This physical separation from other residential areas has allowed Forest Home to retain its distinct identity, and to preserve the character of a small rural settlement. Forest Home has been designated as an historic district, listed on both the New York State and National Registers of Historic Places. In addition, Forest Home Drive has been named as a scenic road in the New York State Scenic Roads Program.

The traffic situation in Forest Home has been a concern for quite some time. As long ago as 1910, Forest Home residents expressed concern about the detrimental effects of automobile traffic on their hamlet (see Appendix I). Traffic volumes have increased substantially since then, especially during the last several decades, with residential, commercial and institutional developments to the north and south contributing to the traffic stream. The only two vehicular crossings of Fall Creek in the Town of Ithaca are in Forest Home. As a consequence, Forest Home's roads and bridges are popular routes for "through" traffic, that is, traffic with neither origin nor destination within Forest Home. With over 10,000 vehicle trips through the hamlet each day, noise, speeding, and pedestrian and bicyclist safety are constant concerns. Neighborhood livability is compromised, as is the value of the neighborhood as an historic resource.

Forest Home residents are keenly aware of their responsibility to preserve the unique character of their neighborhood. The Town of Ithaca has supported earlier measures in this regard, including the preservation and restoration of the hamlet's two historic single-lane bridges. Community residents are clearly eager to build on past successes by preserving historic character throughout the hamlet, and by improving livability and quality of life for current and future generations. This Traffic Calming Plan seeks to accomplish these goals while acknowledging the continued use of community roads for through traffic.

## **GOALS**

The goals of the Forest Home Traffic Calming Plan can be summarized as follows:

- Reduce speed and volume of vehicular traffic
- Reduce attendant problems of noise and air pollution
- Improve safety for residents, pedestrians, joggers and bicyclists
- Provide continuous pedestrian facilities
- Improve streetscape aesthetics
- Enhance community identity
- Complement Forest Home's historic character

The overarching purpose is to reduce the negative impacts of traffic on Forest Home, and to make the roads more compatible with the neighborhood.

Special mention should be made of the goal of reducing the volume of vehicular traffic. This is a laudable goal, as most of the problems that the community faces are a direct result of the sheer volume

of through traffic. However, major volume reduction is beyond the scope of a traffic calming plan that concentrates its efforts within the hamlet of Forest Home. The problem of through traffic originates beyond the boundaries of Forest Home, and the corresponding solution must also be implemented beyond the boundaries of the hamlet. Even strenuous traffic calming efforts within Forest Home would not likely lead to a major reduction in through traffic, since drivers can not readily deviate to alternate routes. Simply put, there are not many good alternate routes available. The creation of an alternate route seems entirely appropriate in this situation. In fact, it is hard to imagine a neighborhood more deserving of this sort of protection than Forest Home. Traffic reduction therefore remains a priority, and would nicely complement the effects of this Traffic Calming Plan, allowing it to realize its full potential.

Note, also, that successful implementation of this Plan should not be seen as a “green light” to allow increased traffic volumes in the future. Even with an appropriately designed traffic calming plan in place, each additional vehicle will inevitably cause an additional impact on the neighborhood.

Even without significant traffic reduction, this Traffic Calming Plan is well suited to reducing the impacts of traffic on the community. Livability will be greatly improved, and safety concerns will be addressed, while through traffic will still be accommodated. This Plan is therefore an appropriate and measured response to the traffic situation in Forest Home.

## **CURRENT SITUATION**

This Forest Home Traffic Calming Plan responds to several important issues and opportunities:

### **Existing Single-Lane Bridges**

Forest Home Drive crosses Fall Creek twice within the hamlet of Forest Home. Each crossing is via an historic, single-lane steel truss bridge, built by the Groton Bridge Company. The downstream bridge dates from 1904, and the upstream bridge dates from 1909. Vehicle speeds are low near the bridges, and drivers seem quite attentive. Drivers are generally good about waiting their turn, with the direction of flow alternating after several vehicles have passed in a given direction. This results in the additional benefit of “platooning,” in which vehicles that have crossed over a bridge are clustered into small groups, separated by several seconds between groups. The resulting gaps in the traffic stream facilitate turning movements into and out of driveways and side streets, and allow residents to more easily cross the road.

These single-lane bridges, preserved through strenuous efforts of the Forest Home residents in the recent past, are a remarkable and highly effective foundation for a traffic calming program, with few precedents throughout the U.S. In fact, the two single-lane bridges over Fall Creek, a highly unusual and carefully defended feature of Forest Home, could be considered a “signature” of this hamlet.

### **Alternate Routes**

There are few alternate routes for the through traffic currently passing through Forest Home. Traffic flows in the area are primarily north-south, crossing Fall Creek on the hamlet’s two single-lane bridges. The closest alternative creek crossings are Thurston Avenue to the west, and Freese Road to the east. Thurston Avenue provides direct access to central campus, but is located too far west to

provide convenient access to the eastern part of campus, or to serve cross-town traffic which is not campus-bound. Freese Road is too far east to readily serve either the campus or major north-south cross-town traffic flows. These two alternate routes are therefore of only marginal use to those motorists who currently utilize Forest Home's bridges to cross Fall Creek.

### **Historic Character**

Many factors contribute to Forest Home's historic charm. Prime examples include the historic houses, the two single-lane bridges, the old mill remnants, and the other structures that are listed in the Forest Home Historic District. Just as important are the meandering roads that follow old wagon routes, the trees that arch over the roads, and the general human scale of the hamlet. Also contributing are the neighborhood's picturesque setting along Fall Creek, and the relative seclusion provided by the topography and the park-like surroundings of the Cornell Plantations and Golf Course. These elements all combine to confer a deeply historic atmosphere on the hamlet.

### **Pedestrians**

There are many pedestrians in Forest Home, including both residents and nonresidents. The community's proximity to the Cornell campus and to the Plantations' trails, combined with the attractiveness of the neighborhood, contribute to an appealing walking environment within the hamlet. On the other hand, the neighborhood's busy streets (see Appendix II) and intermittent pedestrian facilities (see Appendix IV) compromise the situation, putting pedestrians at risk. In some places the side paths end, and pedestrians are forced to share the pavement with vehicular traffic. The facilities that do exist are often blocked by snow in the winter. Improvements in the continuity and quality of the pedestrian facilities are therefore important considerations.

### **Speed and Volume of Traffic**

The speed and volume of traffic in Forest Home (see Appendix II) are both of concern. Traffic volumes are highest on the north-south roads (Pleasant Grove Road, Warren Road, Judd Falls Road and Caldwell Road), and on the portion of Forest Home Drive that links them together. Vehicle speeds are highest on straight sections of road (Warren Road, Judd Falls Road and the 300 block of Forest Home Drive). Speed limits are regularly exceeded at the community boundaries, by vehicles both entering and leaving the hamlet. Vehicle speeds are lowest at intersections, near the bridges, and on curving sections of road.

### **Physical Condition of Street**

A curbless street, with simple unpaved shoulders, would be an adequate street design for a hamlet with historic character and primarily local traffic. Pedestrians could safely walk in the street, and residents would be able to park in the road or on the shoulder without disrupting traffic. However, in today's Forest Home, the realities of through traffic and its speed have eroded these qualities. Consequently, the pavement edge is more battered than rustic in appearance, the occasional parking areas are not well defined, and pedestrian areas are not clearly discernible. Roads are of inconsistent size (see Appendix V), with some being scaled to the neighborhood, while others are wider than strictly necessary, which undoubtedly contributes to vehicle speeds. One intersection (Forest Home Drive at Pleasant Grove Road) is so large that much of the pavement goes unused. This unnecessary blacktop takes space that could be productively used for other purposes, such as pedestrian side paths or greenspace.

## **TRAFFIC CALMING**

For decades, transportation engineers have been increasing the design speed of roads by increasing roadway width, removing objects near the road, straightening curves, and eliminating bumps. However, the resulting high speeds and driver complacency are not appropriate for all environments. Residential areas, in particular, are feeling the negative effects, which can compromise the quality of neighborhood life. Traffic calming responds to these very real impacts by redesigning roads to reduce the speed at which drivers feel comfortable. This approach is ideally suited for neighborhood streets that have been “over-engineered” and are experiencing speeding or safety problems. The general concepts are quite straightforward, and involve modifying the roadway environment in order to keep motorists’ attention focused on their driving, and to heighten their sensation of speed. A broad range of techniques can be utilized, including physical and visual narrowings, vertical and horizontal deflections, and varied roadway textures, among others. Many of these features can be “tuned” to achieve the desired travel speed. Drivers who traverse a traffic calming feature at higher than the target speed find it to be uncomfortable, and therefore slow down. In this way, traffic-calmed streets tend to be “self-enforcing.”

Traffic calming is now widely recognized as an effective means of reducing vehicle speeds and increasing driver attentiveness. Successful traffic calming efforts result in improved pedestrian, bicycle and vehicular safety, and a more livable residential environment.

## **PROCESS**

Since the early 1990s, Glatting Jackson has specialized in the creation and preservation of livable neighborhoods, particularly in regards to managing transportation impacts on communities. The narrow transportation planning goals of the past few decades – moving the most vehicles at the greatest possible speed – are finally giving way to a far more inclusive view of what a street should be. In this new view of transportation engineering, traffic performance is just one of many goals, and is often outweighed by other desired qualities of the street, such as its historic heritage and its value to the neighborhood as the premier public space of the community.

An underlying premise of any successful traffic management plan is that it must be acceptable to all stakeholder groups. This helps to ensure that the plan is not only effective from a traffic engineering standpoint, but is also politically and economically feasible. To this end, Glatting Jackson’s planning and design work is focused on involving the greater community in an open, collaborative, and interactive process, in order to ensure that all viewpoints are taken into account. This local knowledge helps us to custom-tailor a plan to the specific situation, thereby achieving the best possible results.

During April 2001, Glatting Jackson was retained by Historic Ithaca, on behalf of the Forest Home Improvement Association, to devise a traffic calming / traffic management plan for the Forest Home community. Later that month, one of our Associate Transportation Planners made a fact-finding trip to the area. He walked through Forest Home, drove the surrounding road network, and collected pertinent data and information. He also met with neighborhood and stakeholder representatives to clarify the problems and to begin to discuss the range of potential solutions.

Following the orientation achieved during this lead trip, Glatting Jackson reviewed the materials assembled by the Forest Home Traffic Calming Committee, began the analysis of traffic flow, and

outlined the range of reasonable actions that could be taken for managing traffic in the Forest Home area. Actions considered included pavement narrowings, visual crowding, vertical and horizontal deflections, pavement texturing options, changes in street configuration, turning movement restrictions, operational changes such as one-way, traffic control devices such as traffic circles or roundabouts, restrictive signals, and gateway treatments.

In September 2001, Glatting Jackson sent two key personnel (the Principal-In-Charge/Project Manager, and the Associate Transportation Planner) to Forest Home to formulate the framework of a traffic calming plan that would meet with widespread public acceptance. Highly-focused, individual meetings were held with stakeholder representatives in order to collect all possible relevant information and input from those knowledgeable about the Forest Home situation. Participants included representatives from the Town of Ithaca, Tompkins County, the Ithaca-Tompkins County Transportation Council (ITCTC), Cornell University (including the Plantations and Golf Course), Tompkins Consolidated Area Transit (TCAT), emergency response agencies, Historic Ithaca, Forest Home and other neighborhoods, runners and bicyclists, and other interested parties. (See Appendix VI for the complete list of invitees.) Stakeholders seemed quite agreeable to the development of a traffic calming plan for Forest Home.

At a community-wide meeting, the Principal-In-Charge/Project Manager gave a presentation on traffic calming, and illustrated issues and opportunities within the Forest Home neighborhood. Residents provided feedback, and shared their observations and concerns relative to the traffic situation. Forest Home residents also generated ideas and provided initial direction for the project.

The next day was devoted to conducting a participatory design workshop, open to all stakeholders and the entire Ithaca community. Three different alternatives (referred to as Alternatives A, B and C) were outlined, each representing a different approach for how to handle traffic flow through the neighborhood. With input from the public, and targeted on-site visits, concepts for traffic calming features at various locations gradually took form throughout the day. A wrap-up session followed, during which we publicly explained the plans and sketches developed during the workshop, and sought further suggestions for refinements to the Plan.

As a follow-up to the September meetings, Glatting Jackson performed a general analysis of each of the alternatives (see Appendix VII), focusing primarily on delay and diversion potential, plus other factors.

The three alternatives considered were:

**Alternative A:** Light traffic calming combined with a one-way routing. Delays would be caused largely by making traffic take a prescribed (longer) route through Forest Home.

**Alternative B:** Moderate traffic calming. Delays would be comparable to Alternative A, but would be caused by making traffic travel more slowly, while still allowing it to choose its own (shortest) route.

**Alternative C:** One-way routing combined with aggressive traffic calming to create a “maximum impedance” alternative. Delays would be greater than those caused by either Alternative A or B.

After exploring various options for a one-way system to consider under Alternatives A and C, it was decided, in conjunction with the Forest Home Traffic Calming Committee, to evaluate a plan which would route cars on Judd Falls Road one-way southbound between Forest Home Drive and the Plantations Road “Jug Handle.” This would be coupled with a one-way north-bound segment on Caldwell Road between Plantations Road and Forest Home Drive. This routing meets the imperative of retaining two-way traffic flow on both bridges, in order to preserve their existing traffic calming benefits. In addition to one-way routing, Alternative A would include light traffic calming efforts, and Alternative C would include aggressive traffic calming.

Our analysis indicated that, due to the lack of suitable alternate routes, significant diversion of traffic would be unlikely for any of the alternatives. Even the long delays associated with Alternative C would be largely ineffective at reducing traffic in the community. Costs associated with Alternative C would also be considerable, and the long delays would likely erode public support for traffic calming in Forest Home. Alternative C was dropped from further consideration.

The major distinction between Alternatives A and B was that Alternative A included a one-way component. The chief benefit of such a one-way system is that, with only a single lane of traffic, the affected road can be made narrower, down to a minimum pavement width of 16 ft. This would yield at least 2 ft of additional space along Judd Falls Road. While welcome, this rather limited benefit for one street is overshadowed by the drawbacks of one-way operation.

Alternative A had the disadvantage of forcing drivers to follow the prescribed one-way routing, rather than allowing them to choose their own shortest route. This has the unfortunate effect of increasing the number of vehicle-miles driven within the community each day. Because the route is longer, on average, vehicle speeds would also be higher for a given amount of delay. This delay would be incurred only by re-routed drivers, while the others would experience little change with the one-way system. Furthermore, this re-routing would not improve driver behavior, in spite of the delay. This is in sharp contrast to a typical traffic calming system, in which all drivers experience delays as a result of being obliged to drive more slowly and carefully.

A one-way system would redistribute traffic within Forest Home, essentially equalizing flow on the two one-way routes. However, we advise against this “balancing” of traffic within an existing community as part of a neighborhood traffic management program. Balancing, by definition, means that traffic volumes must increase in some parts of the neighborhood in order to offset the decrease in other parts of the neighborhood. This is always a divisive and contentious measure, and best avoided.

In contrast to Alternative A, Alternative B would produce the desired low traffic speeds without causing undue delays, and without the negative consequences of a one-way system. Alternative B was therefore our clear recommendation. After considerable debate and consultation, the Traffic Calming Committee voted to support our recommendation, and the Forest Home community concurred. With Alternative B selected as the preferred option, subsequent efforts focused on optimizing the design and location of the various traffic calming elements.

Space is at a premium in the crowded streetscapes of Forest Home. Some rights-of-way are limited, and many homeowners have trees, bushes, decorative plantings or stone walls which are in close proximity to the road. These existing streetscape design elements make a valuable contribution to the

community's character and historic feel, and should be preserved wherever possible. The design and placement of any traffic calming features must therefore take these amenities into account.

In order to accurately judge the space available for such features, members of the Traffic Calming Committee made an extraordinary effort to survey and map all relevant streetscapes in the community. This painstaking and time-consuming effort resulted in maps with a level of precision and detail which far exceeded that of any previously available maps of the community. The Town of Ithaca has been provided with copies of these maps to assist in its own planning efforts.

With these maps, the Traffic Calming Committee was able to accurately assess the feasibility of a range of traffic calming features, and to propose sizing and placement options. With the Committee's useful input and local knowledge, we were able to fashion a plan which was comprehensive and implementable, and true to the concept outlined at the 2001 meetings. This Plan included entrance features at all six entrances to the community, mid-block speed tables where appropriate, 18 ft wide pavement with a distinctive edge treatment, and continuous pedestrian facilities along all major streets.

In March 2005, Glatting Jackson's Principal-In-Charge/Project Manager returned to Forest Home to refine and finalize the Traffic Calming Plan for the Forest Home neighborhood. The detailed proposal was presented using colored overlays on the large-scale base maps of the community. With over 100 ft of maps on display, stakeholders were able to examine and accurately assess what had previously been abstract concepts.

Once again, a wide range of stakeholder groups participated in the process, including representatives from the Town of Ithaca, Tompkins County, the Ithaca-Tompkins County Transportation Council (ITCTC), Cornell University (including the Plantations and Golf Course), emergency response agencies, Historic Ithaca, Forest Home, bicyclists, and other interested parties (see Appendix VI).

Response to the Plan was quite positive. After discussing various design elements with stakeholders, minor adjustments were made to the Plan, primarily at the periphery of the community. The entrance features, originally conceived of as splitter islands, were revised to be gateway treatments. Further site-visits helped to finalize the details.

In a community-wide meeting, Forest Home residents expressed strong support for the Plan. Discussions with the Traffic Calming Committee then turned to the topic of Plan implementation, including the issues of priorities and funding.

Even before this Final Report has been submitted, implementation has already begun. Two stone-dust side paths have already been constructed, one a 230 ft segment of path along the 200 block of Forest Home Drive, and another extending the full length of Judd Falls Road within the hamlet. Preliminary plans for the reconstruction of the Warren Road hill are essentially complete, and are taking this Traffic Calming Plan into account. These cooperative and collaborative efforts are being undertaken by the Town, the County, and private homeowners, and demonstrate the widespread acceptance of this Plan.

## **TRAFFIC CALMING DESIGN ELEMENTS**

The Traffic Calming Plan that was developed in consultation with the stakeholders calls for a variety of features to be incorporated into the streetscapes of Forest Home. The neighborhood's signature single-lane bridges, which already perform a powerful traffic calming function, are retained as the foundation of this Plan. The new features to be added are discussed below. These design elements are the specific "active ingredients" that will improve conditions in the neighborhood while strengthening the hamlet's historic character.

### **Entrance Features**

Entrance features are arguably among the most important design elements of any traffic-calmed zone. They announce the beginning of the traffic-calmed area, and introduce drivers to the roadway design standards that follow. In general, entrance features are designed to be uncomfortable when driven too quickly, thereby encouraging in-bound drivers to slow to the appropriate speed before entering the traffic-calmed environment. Similarly, out-bound drivers will choose to not resume speed until after they have left the calmed zone.

The symbolic importance of entrance features should also not be underestimated. Even at those community entrances where vehicle speeds may already be low, it is still necessary to have a clearly identifiable community boundary. In this manner, drivers are always aware of when they are entering or leaving the area of special significance, and therefore know when they are expected to be on their best behavior.

This Forest Home Traffic Calming Plan calls for a gateway entrance feature at each of the six roadway entrances to the hamlet: Forest Home Drive (both east and west entrances), Judd Falls Road, Pleasant Grove Road, Warren Road, and Caldwell Road. The appropriate location of the proposed entrance feature on each of these roads is near the "Forest Home" sign already posted at each of the hamlet's entrances. This roughly corresponds to the boundary of the Forest Home Lighting District, and is generally outside the boundary of the Forest Home Historic District. Specific locations have been adjusted to accommodate overhead wires, existing trees, visibility and sight distance considerations, as well as space requirements for feature placement, while corresponding to the perceived visual edge of the community.

Each of these entrances includes a vertical deflection and visual narrowing in order to reduce the design speed of the road. This takes the form of a speed table marked by lamp posts mounted on low stone pedestals, as illustrated in Figures 4 through 11. The speed table is designed to be comfortable when driven at speeds of up to 20 mph. (A speed of 20 mph is often recommended for areas with high pedestrian activity, because danger for pedestrians rises sharply as vehicle speeds rise above 20 mph.) The speed table's ramps are to be paved in a contrasting material, such as concrete, to help draw attention to the feature. Smooth, rather than textured, pavement is specified for the speed table, so that no unnecessary noise is created. The top surface of the speed table should be constructed with exposed granite aggregate, in order to differentiate it from the ramps and from the normal roadway pavement, and to coordinate with other design elements of this Plan. As with all speed tables, bicycles are easily accommodated, and snowplowing presents no special difficulties.



Each entrance is marked by a pair of gothic lamp posts, one on each side of the road, aligned with the center of the speed table. These lamp posts draw drivers' attention to the entrance feature, and are visible well in advance, even at night. Traditional, gothic-style lamp posts are a recognized historic design element in the Ithaca area, with examples on the Cornell campus, on selected City of Ithaca bridges, and flanking the entrance to Ithaca Town Hall. Forest Home's lamp posts will be dark green, the same color as the hamlet's two steel truss bridges, in order to tie the entrances in with the community's most defining visual feature. These lamps can be added to the Forest Home Lighting District and will delineate the ends of the new pedestrian-scale walkway illumination system (see "Pedestrian Facilities" below).

This Plan calls for each lamp post to be mounted on a square base, 3 ft high and 3 ft across, constructed of stones. Mounting lamp posts on these stone pedestals adds height and visual impact, without the need for tall stone columns. Having the pedestals only three feet tall means that they are below drivers' eye height, and it is possible to see over them. Slender lamp posts should also not interfere with visibility any more than do standard utility poles. Stone pillars have traditionally been used to mark the entrance to a special place, such as a park, and these low stone pedestals would serve that purpose. This design would also tie in with the low stone walls that already grace the Forest Home community, such as on Judd Falls Road, Caldwell Road, and the 100 and 300 blocks of Forest Home Drive. Lamp posts and stone pedestals are to be located as close to the road as possible in order to provide the appropriate visual narrowing. The pedestrian side path is therefore routed around the outer side of this feature. The pedestals will be protected by barrier curbs, with the stonework beginning 18 inches behind the face of the curb.

These gateway entrance features will be preceded by appropriate signage (Traffic Calmed Zone, 20 mph advisory, etc), and curbing will be provided in the vicinity of the entrances in order to contain vehicle movements. A streetscape design appropriate for an historic hamlet will commence at the entrance feature and extend throughout Forest Home.

### **Pavement Narrowing**

Much of the historic charm and ambiance of the Forest Home neighborhood is attributable to its winding roads of modest width. Unfortunately, some roads have become bloated over time, and no longer fit in with the scale of the community. These roads should be redesigned and re-sized to better reflect the hamlet's historic heritage.

We understand that the Town of Ithaca and Tompkins County typically specify road widths in the 20 - 22 ft range. However, a major recommendation of this Traffic Calming Plan is to have the roads in Forest Home *not* be typical. Standard procedures yield standard results, which have been found to be unacceptable in this context. Instead, the roads should be sized to encourage the low speeds and driver attentiveness which are appropriate for a densely settled residential hamlet. Roads within Forest Home will all be similar to each other, whether they be Town- or County-owned roads, but will all be distinctly different from roads outside of the traffic-calmed zone.

Road widening is often used in capacity-improvement projects because it is known to encourage drivers to travel more quickly and to leave less headway between vehicles. Unfortunately, what is often overlooked is the danger this poses to pedestrians crossing the street, as risks go up exponentially with increased pavement width. There are several factors contributing to this phenomenon. First, it

takes longer to cross a wider road, thereby increasing a pedestrian's exposure time. Second, with reduced vehicular headway, the gaps in traffic are smaller, which results in less time available for a pedestrian to cross the road. Third, with increased vehicle speeds, it takes longer for a vehicle to slow down should that be necessary to avoid striking a pedestrian in the road. And fourth, if a pedestrian is struck by a motor vehicle, the risk of receiving grave injuries is far greater if struck at higher speed. The overall result is that even a minor reduction in pavement width can result in a major increase in pedestrian safety. Pavement narrowing is therefore highly appropriate for a densely settled residential area with significant pedestrian activity, such as Forest Home.

Within the traffic-calmed zone delineated by the gateway entrance features, this Forest Home Traffic Calming Plan calls for consistently narrowing the pavement width to 18 ft, flaring at intersections as necessary. This width of pavement, characteristic of the historical environment of the hamlet, is a major factor in reducing vehicle speed and improving the pedestrian atmosphere.

While an argument could be made for even narrower streets, an 18 ft pavement width (two 9 ft lanes) suggests itself for a number of reasons:

- Some of the roads in Forest Home (including Judd Falls Road and parts of Forest Home Drive) are currently 18 ft wide, and yet carry high volumes of traffic without creating noticeable problems for motorists. In fact, most vehicle trips through the hamlet involve driving on at least one segment of 18 ft wide road. Therefore, standardizing the narrower 18 ft pavement width throughout Forest Home does not create more stringent obstacles to through traffic. Rather, it utilizes a design width that has been tested and found adequate, even for the oversized vehicles that sometimes pass through the hamlet.
- Even on some of Forest Home's wider roads, an examination of the pavement reveals that drivers tend to utilize a width of only 18 ft. Any loose gravel on the road tends to be kicked up when driven over, and rolls off to the side where it accumulates in undriven areas. Measuring the clear, driven width of pavement reveals that drivers routinely use only 18 ft of roadway. Since space is at a premium in Forest Home, it is a waste to assign extra width to drivers who may use it only rarely, when it could instead be allocated to pedestrians who would use it on a daily basis.
- A lane width of 9 ft corresponds to the width cleared by standard municipal snow plows. This simplifies winter maintenance operations.
- AASHTO's Green Book (*A Policy on Geometric Design of Highways and Streets*), a common highway design reference, makes allowances for 9 ft travel lanes, even on collectors and arterials, where there are truck restrictions (as in Forest Home).

Note that even though pavement width is specified as 18 ft, motorists will still be able to drive on the adjoining shoulder band, should that become necessary (see "Pavement Edge Treatment" below).

### **Pavement Edge Treatment**

This Forest Home Traffic Calming Plan calls for pavement within the hamlet to be bordered by a cobbled band, 12 - 18 inches wide (see Figure 3). Ideally, this textured shoulder band would be constructed with several rows of granite "Belgian" block. A less expensive, but still functional,

alternative would be to substitute exposed aggregate concrete (made with crushed granite aggregate), stamped to look like separate blocks. This shoulder banding, whatever the material, will have a rough texture, to discourage its unnecessary use by cars and bicycles. Vertical granite curbing will be installed outside of the shoulder banding at various locations, including at entrances, intersections, and where needed to direct surface drainage or to protect pedestrian side paths.

The cobbled shoulder band accomplishes several functions. It contains the edge of the asphalt pavement, thereby preventing its raveling (cracking) due to wear near the edge. It serves as a permanent edge marker for the pavement, and is unaffected by plowing, abrasion, etc, unlike edge stripes which need to be repainted on an annual basis. It also serves as a clear edge for the adjoining lawns, providing a tidier appearance than is possible with a common gravel shoulder. Another problem with gravel shoulders is that they are susceptible to being torn up when driven on, which can scatter loose gravel onto the road. The use of cobbled shoulders avoids this problem as well.

A key feature of a cobbled shoulder band is that it is a hard, driveable surface, and yet is not perceived as being a regular part of the driving lane, because it is made of a contrasting material. Drivers only “see” a 9 ft wide asphalt lane, and drive accordingly (lower speeds, greater care). But the adjacent 1 ft wide (or wider) cobbled band increases the effective driveable lane width to at least 10 ft, if and when needed. This combination of narrow-looking lanes and an extra foot of driveable safety margin therefore provides the advantages of both 9 ft and 10 ft lanes, without the disadvantages of either.

The effective functioning of the cobbled shoulder band depends not only on its contrasting color, but also on its rough texture. This rough edge treatment actually serves to make the road user-friendly for motorists. Inattentive drivers who wander out of the travel lane will be able to both feel and hear, as well as see, that it is time to make a steering correction. This reduces the chances of unexpectedly scrubbing a vertical curb or scraping a guiderail, which happens occasionally on even the widest of roads.

More importantly, this resulting lane discipline increases the margin of safety for pedestrians on an adjoining side path. The cobbled band acts as a narrow but important buffer between the travel lane and side path, thus keeping traffic from crowding the pedestrians. In particular, if vehicles are discouraged from driving adjacent to the curb, their mirrors are far less likely to overhang the side path. This is already a welcome feature on some neighborhood streets, including Judd Falls Road and part of Forest Home Drive, although shoulder roughness is currently insufficient to ensure that all vehicles stay within the travel lane. This shortcoming will be corrected, and the benefits of a textured buffer will be extended to the entire community.

Note that the cobbled shoulder band is not intended for use as an undersized bicycle lane. Rather, bicyclists are encouraged to ride in the travel lane, and the modest vehicle speeds in a traffic-calmed Forest Home will be more conducive to this than now. The rough texture of the shoulder banding will also discourage bicyclists from riding too close to a vertical curb, so that they do not accidentally catch their pedals on the curb. This is a recognized problem for bicyclists, for which the cobbled edge band represents a straightforward solution.

While bicycles can certainly ride across the cobbled shoulder, and pedestrians can easily walk across it, and cars can drive across it as necessary (to access driveways, for example), the intent is that the textured banding not be any user-group’s preferred travel surface. By making the shoulder band

slightly unpleasant to use, it remains an open buffer, and a valuable contingency area available to all. This cobbled roadway edging thereby contributes to the safety of the community, as well as serving as a visually attractive streetscape design element.

Just as the cobbled shoulders provide a little extra leeway for errant automobile drivers, they will also provide a bit of extra room for municipal snow plow operators. If the plow blade inadvertently rides over the cobbled shoulder, it will simply clear it off as if it were an extension of the pavement. Since any vertical curbing will be located beyond the cobbled band, this provides extra room for maneuvering without striking the curb.

Cobbled shoulders allow water to sheet off the road, as it does now in most parts of Forest Home, rather than requiring additional catch basins and accompanying subsurface drainage systems. Where curbing is already being used to control surface water drainage, its use will be continued, with vertical granite curbing located outboard of (behind) the shoulder band. The resulting gutter should have enough capacity to carry runoff water outside of the travel lane, so that pedestrians are not splashed by passing cars. Therefore, the shoulder banding will be a full 18 in wide in this situation, rather than the 12 in allowed in some other locations. Existing catch basins will have their inlet grates relocated to be within the cobbled shoulder band. By keeping the inlet grates out of the travel lanes, passing traffic will be quieter, and bicyclists won't have to make a point of avoiding the grates. Visually, the grates will also blend in better with the rough texture of the cobbled banding.

The Forest Home community already has curb-and-gutter sections built to this recommended scale, such as along Judd Falls Road, and they undoubtedly work as intended. However, the material currently used (standard concrete) has no historic feel, with the result that Judd Falls Road looks more like a city street, and less like part of an historic rural hamlet. Motorists can also drive in the smooth gutter without being aware that they are doing so. The design called for in this Plan will continue the water management practices of the Judd Falls Road system, while correcting its aesthetic and functional shortcomings.

This Plan calls for vertical (standard 10 degree batter) granite curbing to be introduced in several key areas, where curbing does not currently exist. In these cases, the curbing would not serve a water management function, but would instead help to discipline vehicle movements. Curbs will be used at the community entrances to protect the stone pedestals and lamp posts, at intersections to improve driver behavior, at the sharp curve at 228 Forest Home Drive to protect the retaining wall, and adjacent to side paths where needed to protect the pedestrians. Although storm water will be redirected for a short distance by these new curbs, it will typically still leave the road as surface runoff. The 200 block of Forest Home Drive between Pleasant Grove Road and Warren Road provides a local example of a road section which is pitched to one side, so that all surface water sheets off one side of the road. The addition of a curb on the uphill side of the road (to protect a side path) would not change this drainage pattern. This is an example that can be replicated elsewhere in the community. With suitable design, it is anticipated that few, if any, new catch basins will be required.

New granite curbing is often characterized by a polished top surface. Although this may look fine in a modern urban setting, it looks too "slick" for inclusion in a rustic hamlet. The polished top surface can also be slippery, which is a problem for pedestrians, especially when there is an adjacent side path. In some cases, the polishing creates a sharp upper edge on the curb which can cut tires, especially if the curb is set with insufficient batter. It is therefore recommended that granite curbing with a fractured

top surface be used, or curbing with a sawn but un-polished top (like the granite curbing used on Judd Falls Road south of the hamlet). Concrete curbing would be a cheaper alternative, although it lacks the charm and durability of granite. If slip-formed concrete curb-and-gutter were to be used instead of granite, it is important that the gutter have exposed granite aggregate and be stamped to look convincingly like cobblestones, and the curbing could be similarly treated.

In summary, a narrow shoulder band, made of several rows of granite block, would be a very functional and historic-looking roadway edge treatment for Forest Home. Some parks dating from a century ago used several rows of stone block along the edge of the roads, either as a shoulder, or as a drainage swale. The result is quite striking, and still gives these places a special feel today. This edge treatment would have a similar effect if applied to the streets of Forest Home. Stone (or brick) edging was employed in the Ithaca area, with surviving examples still visible in parts of the Cornell Plantations and the City Cemetery. Stone block edging has also been used to lend a more established feel to modern projects, such as Ho Plaza on the Cornell campus, and it is quite effective. While brick has been used on some City streets, its use in Forest Home would jar with the rural atmosphere of the hamlet. Stone is more rustic than brick, and therefore fits in better with the rural character of the neighborhood. Brick is also too smooth to effectively perform its desired function of alerting inattentive drivers who have deviated from the travel lane. If a less expensive material than stone were to be used (for example, stamped concrete with an exposed aggregate finish), it is important that it still be constructed to high enough standards to perform its functions well. Imprinted concrete sometimes has only superficial surface markings, which would achieve neither the appropriate look nor the necessary surface roughness. Care must therefore be exercised in selecting the forms, specifying the aggregate, and washing the concrete, if this material is used. It should be kept in mind, however, that while a concrete-based material may have a lower initial cost than genuine granite block, it does not provide granite's durability or longevity. Authentic-looking and functionally-effective cobbled shoulder banding is specified for all major roads in Forest Home. Its use on low-traffic, low-speed side streets is not necessary to calm traffic, but may be pursued if funding allows.

### **Intersection Restoration**

This Traffic Calming Plan calls for limiting the size of major intersections in Forest Home to more closely resemble their historic dimensions. While some intersections will remain roughly the same size as now, the largest intersections will be reduced in size. By making all of the major intersections approximately the same size as the current compact ones, there will be no new restrictions placed on the size of vehicles that can traverse the hamlet. The design calls for a 25 ft curb radius, which is already successfully used in Forest Home. This corresponds to a 10 - 12 mph design speed, which is appropriate for encouraging stop sign compliance and for limiting the acceleration rate away from the stop signs. Controlling intersection size is a key factor in improving the hamlet's pedestrian environment.

Intersections in Forest Home were not always as large as they are now. The inherited street layout predates the automobile, and tight corner radii would have been adequate for the low speed, non-motorized traffic of the period. As automobile travel became more common, and as drivers demanded higher speeds and fluidity, the edge-of-pavement radius at intersections was increased. This is particularly evident along Forest Home Drive, a former State route which was modified in order to provide smooth-flowing alignments for through traffic. Now that Forest Home Drive is no longer part of State Route 392, and now that intersections are predominantly stop sign controlled, this free-flowing

geometry no longer serves a legitimate purpose. It is therefore entirely appropriate to restore these intersections to a more historically valid 25 ft radius, thereby undoing concessions made, over the years, to high-speed automobile traffic. This more compact intersection design is very much in keeping with the historical character of the hamlet.

Re-establishing smaller, more compact intersections will produce several benefits, including: less asphalt, more greenspace, more room for pedestrian facilities, shorter crosswalks, improved stop sign compliance, and lower vehicle speeds through the intersections. Since intersections are the point of greatest pedestrian/vehicle conflict, reducing intersection size will result in a significant increase in pedestrian safety.

Another, often overlooked, benefit of making all-way stop intersections more compact is that drivers can be close enough to actually see each others' faces, rather than just each others' cars. In this manner, drivers are reminded that they are dealing with other human beings, and decisions about when to proceed are made on more of a face-to-face basis. This can inject a measure of civility into an otherwise impersonal encounter, thereby encouraging better driver behavior.

Some existing intersections in Forest Home are unnecessarily large, or at least inappropriately shaped, in that they have areas of pavement which are rarely if ever driven on. This is evidenced by the areas of gravel that lie undisturbed in the undriven sections, or the mounds of snow that cover the edges of the pavement for a month or more without affecting traffic flow. By carefully paring away the unnecessary parts of these intersections, it is possible to reduce their physical size without reducing their functional size. This improves pedestrian safety and streetscape aesthetics, without causing difficulties for drivers. In this way, many intersections in Forest Home can be trimmed of nonessential asphalt to achieve a better result.

All four major intersections in Forest Home will receive some modification. These are the intersections of Forest Home Drive with: Judd Falls Road, Pleasant Grove Road, Warren Road, and Caldwell Road. The largest of these is the intersection of Forest Home Drive with Pleasant Grove Road, which has a curb radius of 100 feet on the right-hand turn from the downstream bridge, which allows for unnecessarily high vehicle speeds through the intersection. The vast expanse of asphalt undoubtedly contributes to the poor lane etiquette observed at this location. In fact, this intersection is so large that it is actually possible to park a car on the pavement without significantly influencing traffic flow. Reducing this intersection to the approximate size of other intersections in the hamlet will improve both its functioning and its aesthetics. Other intersections will receive minor trimming, in order to achieve a look and function more befitting the neighborhood.

In addition to reducing their size, it is recommended that the geometry of these four intersections be revised. By redesigning an intersection to be more of a "Y" than a "T," there will no longer be a "straight-through" movement, so all drivers will be required to proceed slowly enough through the intersection to negotiate a turn. This will make stop sign running less rewarding, and should improve stop sign compliance. Also, the stop signs will be positioned directly next to the curb, rather than being on the far side of the pedestrian side path, as is currently the case at many intersections. This repositioning of the stop signs will make them more prominent, and harder to ignore.

Vertical granite curbing is specified at all intersections where needed to keep drivers from cutting corners (a practice associated with higher speeds), or to protect pedestrians. The curbs are positioned

outboard of the cobbled shoulder band edge treatment, in order to allow for a slightly roomier intersection, and to provide drivers with a textural warning before their tires scuff the curb. The vertical curbs will extend a short distance from the intersection (one curb radius, 25 ft in this case, is a common rule of thumb), unless curbs are specified to continue further in order to contain surface water, or to protect a pedestrian side path. Curb cuts will be provided at intersections in order to facilitate use of the pedestrian crosswalks.

There is one more intersection that lies outside the bounds of Forest Home for which we have a recommendation. This is the intersection of Forest Home Drive with Plantations Road, located near Beebe Lake. By making this intersection a bit more compact and converting it to an all-way stop, it will be possible to create a safe pedestrian crossing at the intersection. This will replace the unmarked mid-block crossing of Forest Home Drive that occurs near the City line.

The passenger car (P) is the appropriate “design vehicle” for streets within Forest Home. Although the modified intersections will be relatively compact, they have been designed to accommodate all standard passenger cars and light trucks without encroaching on other lanes. Large single unit (SU) trucks as well as conventional school buses (S-BUS-11) and city transit buses (CITY-BUS) will still be able to negotiate the intersections, with encroachment allowed, as is currently the case. Vehicles of this size are in excess of the 5 ton weight limit that is legislated for much of the hamlet (see Appendix III). Nevertheless, school buses, delivery vans, solid waste trucks, snow plows and other similarly-sized vehicles can be expected to use neighborhood streets on a regular basis. Therefore, the intersections are designed to accommodate them without encroaching on the curbs, although they may make use of the cobbled shoulder band.

Tractor trailers, on the other hand, are a rare visitor to the hamlet, and they will continue to experience some difficulties when negotiating the neighborhood’s intersections. Any concession toward fully accommodating these oversized vehicles would come at the expense of traffic calming in general and pedestrian safety in particular. We would far rather see the occasional need for a tractor trailer to have a rear wheel track over the curb, than see a “solution” through pavement widening that encourages careless behavior from thousands of drivers every day, and erodes permanently the historical character of the community.

### **Mid-Block Features**

Vehicles which enter Forest Home will be slowed to a responsible speed by the gateway entrance features. Once within the hamlet, speeds will be controlled by the modest 9 ft lane widths, the reduced size of intersections, and the streetside plantings. However, it may be necessary to do more to prevent vehicles from picking up speed again while they travel within the community. This Forest Home Traffic Calming Plan therefore calls for raised speed tables to be located within the hamlet: one on Warren Road, one on the 300 block of Forest Home Drive, and two on Judd Falls Road. These long, open stretches of straight road have an inherently high design speed (i.e., the speed at which the typical motorist feels invited to drive). This high design speed derives from the width of the street, the lack of horizontal or vertical curvature, and the lengthy sight distance (distance that a motorist is able to see unobstructed down the road). Speeding is generally not a problem on the winding roads in the community.

The preferred remedy for high design speed is to break the continuity of the road by introducing vertical and horizontal deflections, reducing lengthy sight distances, establishing prominent streetside features, and reducing the perceived and actual width of the road. Ideally, drivers would be encouraged to drive at a slow, uniform speed, rather than being obliged to stop and start as they are with other, more severe traffic calming measures.

This Plan calls for the design speed of neighborhood streets to be reduced by constructing speed tables on those road segments where other measures have proven ineffective at controlling vehicle speeds. A speed table is a raised section of roadway, with a ramp at each end. The effectiveness of this feature is determined primarily by the height of the table and the steepness of the ramps. A typical speed table design calls for a 4 - 6 inch elevation for the top of the table, which is typically 10 - 18 feet in length. The ramps up to the speed table, typically 8 - 10 feet in length, are usually done in concrete. As with the speed tables at the neighborhood entrances, there is a community preference for avoiding textured paving material in the driving lane, in order to reduce the potential for noise. Thus, this Plan calls for speed tables with smooth concrete ramps and smooth (non-textured) tops. The tops should be of a color that contrasts with both the ramps and the predominant asphalt paving used throughout the community. It is recommended that exposed granite aggregate be used on the flat tops of the speed tables, so as to echo the color (although not the texture) of the cobbled shoulder band. This will help signal to drivers that the speed tables are not normal pavement, and should be driven accordingly.

Speed tables can be quite effective at controlling vehicle speeds, yet the ramps are gradual enough that they pose no special problems for bicyclists or snow plows. They also do not require any more width than a standard roadway, and therefore do not intrude on pedestrian facilities or front lawns. Consequently, they can be fit in practically anywhere that they are needed. Exact locations of these speed tables will be determined at the time of their construction, and, in order to be most effective, should roughly correspond to the point of highest vehicle speed. Current “best guess” locations are just north of 127 Warren Road, between 310 and 312 Forest Home Drive, between 117 and 118 Judd Falls Road, and on Judd Falls Road just north of McIntyre Place.

There is an opportunity to improve on the standard speed table design, especially on Judd Falls Road. The width of a typical speed table extends all the way out to the edge of the roadway. However, on streets with a curb-and-gutter, such as on Judd Falls Road, the speed table would interrupt the flow of surface runoff water. This problem is generally addressed in one of two ways: by installing a new catch basin to accommodate the water that would accumulate, or by constructing the speed table with a vertical step at the edge of the pavement, adjacent to the gutter, in order to allow the curb-and-gutter to continue uninterrupted past the speed table. Neither of these solutions is ideal, in that catch basins are expensive, and the abrupt dropoff at the edge of the pavement can be a problem for bicyclists who ride there.

A possible solution is to design the top “table” part of the speed table so that it is two inclined planes, one in each lane. Each plane would extend from the raised center line down to the edge of the pavement, adjacent to the cobbled shoulder band (gutter). The gutter would continue uninterrupted past this modified speed table. In other words, instead of simply raising the entire surface of the road, each lane would be tilted up, creating a short section of road with increased crown. The left side of the car, where the driver sits, rides close to the road center line, where the vertical deflection is greatest. Drivers would therefore experience the up-and-down motion caused by this vertical deflection, and would moderate their speed accordingly. Yet this design would not interrupt the flow of surface runoff



water in the gutter, and should be as easily plowed as a regular speed table. More importantly, there would be no step down at the edge of the pavement to threaten bicyclists who are riding too close to the edge of the road, as there is with a standard speed table design. But regardless of the design used, any speed table would slow traffic and therefore improve the safety situation for bicyclists.

In the case of Warren Road, examination of the adjacent rolling road-side topography, especially within the golf course, indicates that this road was not always so flat and level, but was subject to a major regrading project sometime in the past. An ideal solution would be to re-establish the original ground contours, in order to give the road a more natural vertical alignment, rather than the modern “engineered” look that it has today. Having several “crests” in the road visible at once gives a road a very positive, rural feel. Although this could serve very well to control traffic speeds, it would also require a major amount of work to un-do the excessive cut and fill performed in the past. The required amount of work far exceeds reasonable expectations for inclusion in a modest traffic calming plan such as this. However, if a major rebuilding of Warren Road is anticipated some time in the future, it would be well to re-establish some of the rolling nature that the road once enjoyed.

As far as the horizontal alignments of roads in Forest Home is concerned, it would be desirable to introduce curves into the straighter roadways, while retaining the winding nature of others. Unfortunately, there just is not enough room within established roadway boundaries to introduce curves sufficient to reduce the design speed of the straighter roads. Therefore, any modest curvature introduced will serve instead to recapture the evolved look that even the straightest roads undoubtedly once had. This Plan therefore recommends retaining the existing roadway alignments, with only minor enhancements.

Forest Home already has one notable mid-block traffic calming feature in the form of the sharp curve at 228 Forest Home Drive. This acts as a mid-block slow-point, and drivers take evident care as they proceed cautiously through the corner. Although clearly effective at limiting vehicle speed, this feature is less stringent than a single-lane choker (like the bridges), in that it typically still allows two-way traffic flow, and is therefore a minor inconvenience for through traffic. This curve should be retained as is, while incorporating the same pavement edge treatment that is planned for the rest of the community. The installation of the cobbled shoulder band along the pavement edge will serve to inform drivers that they are venturing too near the retaining wall, and the accompanying curb should practically eliminate the potential for accidentally scraping the wall. This will benefit both the vehicles and the wall itself. The wall is in deteriorating condition, and the concrete does not fit in with the character of the rest of the neighborhood. It is recommended that this retaining wall be rebuilt *in situ* as a stone wall to more closely match the existing stone retaining walls on Judd Falls Road, Caldwell Road and elsewhere in the hamlet. This sharp curve is already accepted by drivers, and will complement nicely the speed tables envisioned for the rest of the neighborhood.

The purpose of the mid-block speed tables called for in this Plan is to maintain a smooth, slow flow of traffic through Forest Home. Unlike the speed tables at the community entrances, these mid-block speed tables serve no ceremonial role. Their number and siting depends solely on the need to reduce vehicle speed, and their ability to do so. If vehicle speeds are still found to be a problem after all of the recommended mid-block speed tables have been constructed, then it would be appropriate to add more speed tables until vehicle speeds are satisfactorily slowed throughout the hamlet. Conversely, if vehicle speeds are found to be adequately controlled by the entrance features and roadway and intersection narrowings, then these mid-block speed tables would be considerably less important.

In any case, this Plan cannot be considered to have been fully implemented until vehicle speeds in Forest Home are sufficiently slow.

### **Pedestrian Facilities**

This Forest Home Traffic Calming Plan calls for new or improved pedestrian side paths, 3 - 4 ft wide, to be located along one side of all major streets in the hamlet. These side paths will serve the internal circulation needs of the neighborhood, as well as connecting to the existing sidewalk and walkway network on the adjoining Cornell campus and Plantations. New connections between Forest Home and the surrounding areas will be made (Pleasant Grove Road, the 300 block of Forest Home Drive), existing connections will be retained (Judd Falls Road, the 100 block of Forest Home Drive), and future connections are possible in other locations (Warren Road, Caldwell Road).

An important function of a pedestrian system is to knit together the community socially, as well as physically. If safe and convenient pedestrian facilities exist, then residents are more likely to visit each other. They are also more likely to walk, rather than drive, to their various destinations, and this leads to chance encounters among neighbors. The resulting increase in social interactions is a major contributor to creating and sustaining a heightened sense of community.

There are already some good pedestrian facilities in Forest Home. One example is the Forest Home Walkway, owned and maintained by the Town of Ithaca, which links Warren Road to Forest Home Drive near the downstream bridge. There are also some short sections of privately maintained pedestrian facilities at various points in the hamlet. But there are major gaps in the network, and the existing internal neighborhood footpaths do not always connect to established pedestrian facilities beyond the neighborhood's boundaries. This Plan calls for constructing the missing links, and upgrading the existing facilities, where necessary, to a scale and design appropriate to the community.

Finding room for these proposed side paths can be a challenge. But some neighborhood roads are wider than strictly necessary, and when narrowed to a uniform 18 ft, will free up space that can be used for side paths. Other neighborhood roads currently have a narrow gravel shoulder on each side. By rebuilding the road so that the pavement is shifted laterally 1 - 2 ft to the edge of the roadbed, the width of the two existing shoulders can be combined on one side of the road, and this space used to construct a pedestrian facility.

In developing this Plan, every effort has been made to locate side paths either where informal pedestrian footpaths already exist, or within the existing road and shoulder area. In this way, residents' yards, trees, shrubs, plantings, fences, and stone walls are preserved. Residents are not being asked to make any unreasonable sacrifices for the benefit of pedestrians, many of whom are not their Forest Home neighbors, but are instead commuters, joggers, Plantations visitors, or recreational walkers. This solution therefore avoids the usual conflicts between pedestrian mobility and neighborhood ambiance.

Side paths 4 ft wide are specified for those areas where the pedestrian facility will be immediately adjacent to the road. This provides enough room for two people to walk comfortably side by side. Where the side path will be separated from the road edge by a tree lawn (as on the 200 block of Forest Home Drive between Warren Road and the upstream bridge), a path width of 3 ft is allowed. This is because pedestrians can utilize the full width of such a path without being crowded by vehicular

traffic. Also, in the winter, snow can be plowed onto the tree lawn without reducing the usable width of the path.

At community entrances, side paths will deviate from the edge of the road in order to go around the lamp posts mounted on stone pedestals. In some locations, there is enough room to continue this separation outside of the community boundary. This separation of the path from the road already exists on the 100 block of Forest Home Drive, and will also be instituted on Caldwell Road (with the cooperation of the Cornell Plantations) and on Warren Road (with the cooperation of the Cornell Golf Course).

The side paths in Forest Home are envisioned as being multi-use facilities, in that their use is not strictly limited to pedestrians. Bicycles are expected to ride in the regular travel lane, but when ascending hills, their speed can decrease to approximately that of a pedestrian. They may therefore prefer to use the adjoining side path as a climbing lane. We believe that this use should be allowed, and there has been an effort to locate the side path on the “up-bound” side of the road on hills in order to accommodate this use. Curb cuts will be provided at the base of each hill in order to provide access to the climbing path.

While some might argue for dedicated bicycle climbing lanes in Forest Home, there simply is not room for both a pedestrian side path and a bicycle climbing lane, even with roads of modest width. Since the number of pedestrians far exceeds the number of bicyclists, it is only logical that the facilities be designed to accommodate pedestrians first and foremost, and that bicyclists be allowed to use them too, if they so choose. Furthermore, bicyclists have the legal right to use the travel lane, even on hills. Providing accommodations for pedestrians should be considered a responsibility, whereas providing dedicated facilities for bicyclists, however laudable, is a luxury that can not realistically be achieved within the constrained environment of Forest Home. Outside of the community boundary, however, there is sufficient room for a bicycle climbing shoulder on Pleasant Grove Road. We recommend this feature as a means of allowing bicyclists to move out of the travel lane when ascending the steepest part of this hill.

The 3 - 4 ft wide side paths specified for Forest Home comply with Americans with Disabilities Act (ADA) width requirements. These permit a running width of 36 in (32 in minimum for short distances to go around obstacles), with a 5 ft wide section every 200 ft to allow for two wheelchairs to pass. Pre-existing driveways can provide this necessary passing space. Gradient requirements, however, are a different matter. The steep topography of the Fall Creek valley does not always allow for level side paths. Even the relatively level Forest Home Drive exceeds a 5% gradient in places. In fact, every road in Forest Home, with the exception of the Byway and Fairway Drive, exceeds the ADA’s 5% gradient limit at some point. If the roads are steep, so too will be their adjoining side paths. Thus, the community’s network of side paths will not be completely ADA compliant for gradient. Nevertheless, the relatively level sections of path can be ADA compliant, and would allow for wheelchair mobility along their lengths.

It is recommended that these Forest Home side paths be constructed and maintained by the Town of Ithaca as part of its growing network of walkways and multi-use trails. Most pedestrian traffic in Forest Home seems to be commuters and recreational runners, rather than local residents. Consequently, the benefits of a side path network in the neighborhood would be enjoyed by many people who live beyond the bounds of the hamlet. It is therefore appropriate that the costs associated

with the side paths be borne by the population at large. Failing this, a Forest Home Sidewalk District could be established, similar to the existing Forest Home Lighting District, to fund side path maintenance. In this case, the cost would be paid by all Forest Home residents, as part of their regular property tax bills. It is important that side path maintenance not be the responsibility of individual adjoining landowners (many of whom are not equipped to deal with heavy snow removal). That would place an inequitable burden on those residents who happen to live on the side of the road on which the path is located, while other residents would bear no responsibility whatsoever. Experience has shown that in neighborhoods where the maintenance costs are borne by all, walkways are much more readily accepted by the affected home owners.

The material selected for the side paths in Forest Home must serve the structural role of supporting foot traffic and occasional bicycles, while reflecting the rural nature of the community. Although many materials could be considered valid in this situation, it is recommended that side paths consisting of a crushed stone base with a stone dust surface be the initial choice. Stone dust packs down well to a hard, smooth surface, and is cost effective to construct. This material is also easily regraded, which simplifies repairs and facilitates blending together sections of path that are constructed at different times. The relatively modest cost of stone dust also means that the community can get the most side path for a given amount of funding. Once the side path network is complete, consideration can be given to upgrading to more expensive materials, such as brick. It is best, however, to avoid materials which are non-historic or associated with urban sidewalks, such as concrete or asphalt.

One other use that side paths may have to support is that of mail trucks. The opportunity exists in many places in the community to position the mail boxes between the side path and the adjoining yards. The main advantage of this location is that it would allow the residents to check their mail while standing on the side path, rather than standing on the cobbled shoulder. This provides an extra margin of safety, as it moves the residents farther from the vehicular travel lane. Since the side path is typically placed on the side of the road with the greatest number of houses, it would be desirable to locate the mail boxes on this side of the road as well. On uncurbed streets, the mail truck should be able to easily access the mail boxes. On curbed streets, driveway curb cuts would likely provide the necessary access points. If this use is envisioned, then the structural base of the side paths should be constructed accordingly.

This Plan calls for conspicuous marking of all crosswalks. These crosswalks will be located at intersections where side paths cross the road. There will also be two mid-block crosswalks, one on Warren Road at the top of the Town's Forest Home Walkway, and the other on Judd Falls Road where a Plantations path crosses the road. These crosswalks are all envisioned as being flush with the pavement, not raised. "Zebra-striped" crossings are more attention-getting than the more typical two parallel stripes, and are therefore recommended. The community may wish to upgrade to brick crosswalk material at some point in the future, if funding becomes available, and if noise issues can be resolved. There are several brick crosswalks on the Cornell campus, so drivers and pedestrians are already familiar with this use of material. Curb cuts will be provided at all pedestrian crosswalks.

In addition to the crosswalks within Forest Home, there will also be four crosswalks located outside of the community boundaries, which will have a direct effect on the utility of the pedestrian network. One is located on Caldwell Road, southeast of the community entrance feature. This crosswalk will be located where a planned Plantations path is expected to cross Caldwell Road, connecting the Herb Garden to the Arboretum. It is anticipated that the exact placement of this crosswalk, as well as the

timing of its construction, will be influenced by the Plantations' evolving plans for its path. A second crosswalk is located on Warren Road north of the community boundary, at the current golf course crossing. This existing crosswalk will allow north-bound pedestrians who have been following the new Warren Road side path to safely access the appropriate road shoulder, once they have left the community. The Golf Course has expressed an interest in possibly pursuing a more elaborate crossing at this location, which could include a raised crosswalk or a refuge island for pedestrians and carts. This would be perfectly compatible with our recommendations for Warren Road, but is beyond the scope of this Forest Home Traffic Calming Plan. It should be kept in mind that any enhanced pedestrian crossing located outside of the Forest Home traffic-calmed zone should be designed to be driven at a higher travel speed (30 mph) than the features located within Forest Home (20 mph).

Another contributing crosswalk will be located on the 300 block of Forest Home Drive east of the community boundary, where a Plantations path joins the road. This recommended crosswalk will allow the new side path on the 300 block of Forest Home Drive to connect to the existing Plantations path, thereby greatly improving pedestrian connectivity in the area. The fourth contributing crosswalk is to be located at the intersection of Forest Home Drive and Plantations Road, to the southwest of the community boundary. It is proposed that this intersection be reconfigured as an all-way stop, and this new crosswalk would be created as part of that process. This crosswalk would replace an existing unmarked mid-block crossing currently located at the Town/City line. The safety of the existing pedestrian crossing has been a concern for some time, due to short sight distances.

This Plan calls for pedestrian-scale lighting along all of the side paths within Forest Home, to replace the existing street lights in the Forest Home Lighting District. The existing lights are automotive-scale, not in character with an historic hamlet, and do not provide consistent illumination of the walkways. It is recommended that the design of the new lighting fixtures be in keeping with the historic character of the neighborhood. They could be traditional gothic style lamp posts, as at the entrances, or a more modern bollard design. An advantage of the bollard-style fixtures is that they have less light scatter, and a smaller footprint, for minimal intrusion into the side path (which must maintain a 32 in width at the fixtures, for ADA compliance). It is anticipated that the lighting fixtures would be installed along the border between the edge of the side path and the adjoining yards. The use of stone dust side paths would simplify installation, as the wiring could be routed under the path itself. Regardless of the style of fixture chosen, they could be painted dark green to match the bridges and the lamp posts at the entrances, thereby tying the community together visually, by day as well as by night. It is assumed that the Forest Home Lighting District would pay for the operation of these lights, as a service to all pedestrians, unless other arrangements are made.

While the physical facilities provided for pedestrians are clearly important, there are other aspects of this Plan which will also serve to benefit pedestrians. For example, the vertical curbs and the rough texture of the cobbled shoulder bands will help to protect pedestrians from vehicular traffic. Narrower roads and more compact intersections will allow for shorter crosswalks, which improve safety when crossing the road. Pedestrians will also be one of the main beneficiaries of neighborhood beautification efforts, and will enjoy the increased shade that results from additional trees. But overall, reduced vehicle speed is perhaps the most important contributor to improving the pedestrian atmosphere in the hamlet.

## **Vegetation**

This Traffic Calming Plan calls for ample plantings to be located adjacent to the roads in Forest Home. This will involve preserving existing vegetation along the road right-of-way, and planting new trees and bushes within the right-of-way and on private property, with owner permission.

The presence of trees and bushes adjacent to a roadway is one of the most compelling features of a streetscape. A street without vegetation can feel barren and hostile, whereas the incorporation of trees and bushes can create a far more inviting environment for all street users. The street also functions better, producing real benefits for residents, pedestrians, bicyclists, motorists and even municipalities.

Tree-lined streets have long been a defining characteristic of established towns and villages. Forest Home is no exception. Early residents planted trees along their road frontage, providing shade and comfort for passing travelers. One of the early initiatives of the Forest Home Improvement Association, shortly after it was formed a century ago, was the planting of more trees along the roads in the hamlet. A number of these trees remain, although many are now gone (including the elms). It is therefore entirely appropriate to recapture the historic feel of this long-settled hamlet by increasing the number of trees and bushes planted along the neighborhood's streets.

Tree-lined streets offer a superior driving environment. The trees provide shade, which reduces glare for drivers, and the beautification of the streetscape is appreciated as well. In fact, street trees result in "friendlier" streetscapes, which in turn result in less aggressive driving. It has been documented that there are fewer mid-block vehicle accidents on tree-lined streets.

The specific configuration of streetside vegetation also influences drivers. Framing a street with trees tends to focus drivers' attention on the street. Reducing the clear width between trees produces visual narrowing, which leads to reduced vehicle speed and increased driver care. And having distinct objects near the road, such as individual bushes or tree trunks, helps contribute to a heightened sense of speed. Distinct roadside features can also act as "landmarks" to assist drivers in accurately gauging the location and speed of other roadway users. All of this helps to produce safer driver behavior, which is highly desirable in a residential neighborhood like Forest Home.

Attractive, tree-lined streets are also far more welcoming to pedestrians and bicyclists. Shade provided by trees is an important consideration during the summer months. It shields people from direct sunlight, and prevents the facilities from getting overly hot and re-radiating heat back at the users. Leaves in the tree canopy also absorb the first part of a rain shower, keeping pedestrians and bicyclists from getting as wet, or from getting wet as quickly. Trees filter noise and pollution, thereby making ambient conditions more pleasant. These improved conditions will be especially appreciated by pedestrians and bicyclists, in that they are more directly in contact with their surroundings (not being enclosed in a motor vehicle), and for longer periods of time (because they travel more slowly than motorists).

Street trees offer additional practical benefits for pedestrians and bicyclists. As with drivers, trees can be used as landmarks to assist in judging the location and speed of oncoming vehicles. And, of course, the drivers of these vehicles will be exhibiting improved behavior, which is itself partially attributable to the roadside vegetation, as discussed above. All of these benefits of a tree-lined street combine to

make non-motorized travel safer and more enjoyable. This, in turn, contributes to an increase in pedestrian and bicycle activity.

The presence of trees and bushes adjacent to a roadway can also have a profound effect on the livability and cohesiveness of a neighborhood. Significant streetside vegetation results in a more desirable place to live, and this is reflected in higher property values. Street trees in particular provide a sense of place, and endow a neighborhood with a feeling of enduring importance. Motorists respect this, and drive more carefully, as noted above. Streetside vegetation also serves to absorb tailpipe emissions, to buffer residences from vehicular traffic noise, and to screen the view of passing traffic from adjacent houses. The improved pedestrian environment leads to more walking by neighborhood residents, which in turn leads to more neighbor-to-neighbor social interactions and a stronger sense of community.

Municipalities themselves are realizing the multiple benefits provided by street trees. Trees shade the pavement during the summer, significantly reducing peak road surface temperatures, thus leading to increased pavement life. This savings alone can in some cases completely compensate for the cost of planting and maintaining the trees. Yet deciduous trees still allow winter sun to reach the pavement, assisting with the melting of snow and ice. A row of trees or bushes can also act like a living snow fence, reducing the amount of snow drifting across the road, thereby reducing the amount of plowing and salting required. Since trees absorb rain water through both their leaves and roots, there is less runoff to be dealt with, and soil saturation is less of a problem. And of course, the safer driving elicited by a tree-lined street is also in the municipality's interests. For these reasons alone, trees should automatically be included in street reconstruction plans, as many cities and villages are now doing. We have come a long way since the time when trees were considered a luxury item to be tolerated by municipal engineers and budget-conscious administrators.

For maximum benefit, trees should be of substantial size, and located as close to the edge of the pavement as possible. In the low-speed context of Forest Home, there is no need for a wide "clear zone" between the edge of the pavement and the trees. New plantings can therefore be made at a distance from the pavement edge considered adequate for the long-term health of the tree, typically 4 - 8 ft. (Indeed, many utility poles are already located in closer proximity to the pavement, but they do not offer the multiple benefits of trees.) Small caliper trees, up to 4 in diameter, are considered to be "break-away" roadside features (like street signs), and can therefore be located immediately adjacent to the road. Most bushes also have a small enough stem to be considered break-away, and can consequently be planted quite close to the pavement edge, with their branches almost reaching to the passing cars. Bushes and small tree branches only need to be trimmed back if they physically interfere with vehicle or pedestrian movements, or block necessary visibility. Maintenance of streetside vegetation, whether undertaken by the municipality or adjoining homeowners, should be performed with the understanding that proximity to the road is important in order to achieve the desired traffic-calming effects.

Most new trees will be planted within existing rights-of-way. However, in some locations, the right-of-way may be narrow enough that a tree situated immediately adjacent to the road or side path would be outside of the right-of-way. This is particularly true on Judd Falls Road. In this case, the permission of the affected landowner would be needed prior to planting street trees.

In general, street trees do not interfere with necessary visibility to any appreciable extent. The exception is at intersections, where drivers should be able to see each other's vehicles far enough in advance to make sound decisions about when it is safe to proceed. With the predominance of all-way stop intersections in Forest Home, this is not much of a problem. As long as the streetside vegetation at intersections does not interfere with the ability of a driver at one stop sign to see a vehicle at another stop sign, then sight distance is adequate. At intersections where there is one through street and a stop sign controlled side street, it is important that the driver waiting at the stop sign be able to see approaching vehicles at least 150 ft away. Drivers should therefore be able to see over any bushes and under any tree branches located within the sight triangles. Tree trunks are often narrow enough that they don't interfere appreciably with visibility, although this depends on specific circumstances. Driveways can be considered as minor side streets, with similar visibility concerns. Maintenance of vegetation to allow adequate visibility when exiting a driveway is typically the responsibility of the individual homeowner.

One concern that is often voiced is that street trees can interfere with overhead utility wires. But there are actually so many solutions to this problem that it need not compromise a successful tree-planting program. Utility companies maintain lists of tree species that are short enough that they recommend planting them under their wires. Bushes, too, are typically short enough that they do not interfere with overhead wires. In either case, taller overarching trees can still be planted on the opposite side of the road in order to achieve much of the desired tree tunnel effect, even if the trees on one side of the road have to be short. In situations where tree-to-wire interference becomes an issue, the wires can typically be raised. For taller trees, wires can be moved laterally, either by moving the poles, or by offsetting the wires from the poles. In some municipalities, the wires run over the road, rather than beside it, thereby reducing interference with streetside trees. On Warren Road, between Forest Home and the airport, there is an example of wires which zig-zag across the road in order to avoid some stately trees. Wires can also be moved closer to trees, being routed near their stems (which are relatively stationary in a wind), rather than near their branches (which move around much more). If contact with trees is unavoidable, wires can be double insulated, as is already done at some locations in Forest Home. A more expensive solution is to bury the offending wires as underground utilities, but this is rarely necessary. In any event, street trees are so beneficial that they should be specified even where there are overhead wires.

Specifically for Forest Home, street trees or other suitable roadside vegetation should be used essentially continuously within the community boundaries, as demarcated by the entrance features. The hamlet is already well on its way to achieving this objective, although some notable gaps remain. It would also be beneficial to have street trees extend some distance outside the entrance features, in order to begin slowing inbound traffic before it enters the community proper.

Maples, oaks and elms have been traditional favorites, but many tree species are suitable for use in a suburban streetscape setting. In general, deciduous trees tend to have a better shape than conifers, with branches that reach out over the road, helping to form a tree-tunnel effect. In addition, the relatively narrow trunks of deciduous trees create minimal interference with visibility, and take little space at ground level, preserving room for lawns, side paths and roads. Deciduous trees also provide shade in the summer, while allowing sun to shine through in the winter, as discussed above.

There is no one tree species which is best for all locations. Selection should be tailored to the specific situation, whether it calls for trees with large crowns that arch over the road, or short trees under wires.



In some cases, the best tree might be a bush. Lilacs and forsythia have long been a staple of historic settlements, and their further use would suit Forest Home well.

Forest Home is fortunate to have access to the expertise of so many local specialists, including those at the Cornell University Urban Horticulture Institute, the staff of the Cornell Plantations, the City of Ithaca forester, and others. These people can provide guidance as to which trees grow well in Ithaca's climate and are tolerant of the harsh environments typical of a suburban streetscape setting. Forest Home would do well to consult with these experts prior to selecting which trees to plant.

Shorter vegetation plays an important role as well. Ground cover should extend as close to the pavement edge as possible. This provides a tidier appearance, minimizes the road's footprint, and brings the scenery right up to the edge of the road. This helps to create a feeling of driving *through* a neighborhood, rather than merely driving *past* a neighborhood.

In some cases, converting open ditches to shallow swales would facilitate maintaining a ground cover that extends to the edge of the road. Grass swales work well, and are attractive. Myrtle is also an historically appropriate ground cover that has local precedent.

Flowers have been planted along road edges for centuries. The Forest Home neighborhood is already quite attractive in this regard, and these beautification efforts should be continued and expanded. Day lilies and daffodils are obvious choices due to their traditional presence in long-established residential areas, including Forest Home.

### **Legislative Actions**

It is our recommendation that the speed limits on all roads within Forest Home be reduced to 25 mph, rather than the current mix of 25 and 30 mph limits. This is more consistent with the target vehicle speed which is envisioned for the hamlet. It should be kept in mind, however, that posted speed limits are determined by New York State, and the State may be more amenable to lowering the speed limits once this Traffic Calming Plan has been implemented and 85th percentile speeds have been successfully reduced. The State could also be asked to reconsider the speed limit on Forest Home Drive east of the community boundary (300 block), in light of the number of joggers and bicyclists, the potential conflict with cars backing into traffic at the Flat Rock parking area, and the general park-like use of the Arboretum.

We fully support the existing truck weight limit restriction in Forest Home (see Appendix III). Although the current legislation does not cover all roads within the hamlet, most through-truck movements are affected. However, consideration could still be given to extending the legislation to include the entire community. Increased enforcement may also be beneficial, as there are few physical limitations to restrict through-truck traffic.

### **Phasing**

Implementation of this Forest Home Traffic Calming Plan can begin immediately, on a variety of actions throughout the hamlet. Roadway reconstruction opportunities that are in compliance with this Plan should be seized as they present themselves. However, it may be useful to have an overall framework to guide the phasing of major new projects.

Our general advice is to begin by constructing the gateway entrance features. This will clearly establish the boundaries of the traffic-calmed area, address the most severe speeding problems (which occur at the periphery of the hamlet), and enhance community identity. As a rule, entrance features provide the “biggest bang for the buck.”

Intersections would be dealt with next. This will bring implementation of this Traffic Calming Plan into the heart of the community. Revising the intersections will improve driver behavior at the point of greatest vehicular/pedestrian conflict. The shortened, clearly marked crosswalks are integral to this phase of implementation.

The roadway segments that link the various intersections to each other and to the entrances should then be upgraded by installing the cobbled shoulder bands and the pedestrian side paths. In some locations there is already more than enough road width, and the existing pavement can simply be trimmed to allow the installation of the shoulders and path. In other locations, the road centerline will need to be shifted slightly in order to make room for the pedestrian facilities. In either case, if a road is already scheduled for repaving, that would be an ideal time to bring the road into compliance with this Plan.

Trees and other vegetation can be planted as soon as the final roadway footprint has been established. After the side paths are in place, the final design and placement of the pedestrian-scale lighting can be determined, and the lamps installed. In the meantime, the existing automobile-scale lighting will continue in use.

Mid-block speed tables can be installed as necessary to further reduce vehicle speeds in problem areas.

Finally, after vehicle speeds have been sufficiently slowed, the Town can request that the State lower speed limits to 25 mph throughout the community.

Although this is our broad recommendation, there is enough flexibility in the implementation phasing that essentially any opportunity for improvement should be embraced. For example, the 200 block of Forest Home Drive and the Warren Road hill can be rebuilt to their final specifications before the community entrances are constructed. Mid-block speed tables, on the other hand, are more stringent features and should preferably be constructed at the same time or after gateway entrance features have been completed, establishing Forest Home as a traffic-calmed zone.

In most cases, the components of this Plan that extend beyond the neighborhood boundaries contribute to the successful functioning of the traffic calming program within Forest Home. In the case of the 100 block of Forest Home Drive, however, the modifications envisioned outside of the community boundary do not have a direct effect on operations within the hamlet itself, but are merely good design applied to an adjoining problem area. Implementation of this Plan’s recommendations for this specific area would therefore be a lower priority for Forest Home, although not necessarily for Cornell or the Town of Ithaca.

It has been our experience that traffic calming measures that are implemented on a temporary or trial basis do not always allow for an accurate assessment of the benefits that the final features would provide. First, temporary measures are not always realistic portrayals of the planned final features. For example, a temporary speed hump is liable to be far more abrupt than a built-in speed table, and can introduce unrepresentative problems with snow plowing and noise that the final constructed

version would not. Temporary measures also tend to be unattractive. Orange construction barrels next to a road can not begin to convey the same “feel” as stone pillars of comparable size and position. The placement of the temporary features can also seem arbitrary and capricious when not seen in the context of the redesigned streetscape. Placing traffic cones along the edge of the pavement may model narrower lane widths, but it does not create the pedestrian facilities, street trees and greenspace that the narrower lane widths would allow. Therefore, while the “costs” to drivers are obvious, the “benefits” to the streetscape go largely unrealized. If drivers are not allowed to use the full width of the road when they know that it still exists, then they can become frustrated, which is not conducive to improving their behavior or to building support for a traffic calming program. If, on the other hand, a road is rebuilt to incorporate all of the final design elements called for in the traffic calming program, then the overall impression will be positive. This is why we typically recommend dispensing with trial measures, and instead going straight to final implementation.

## **STREETSCAPE DESIGN**

A distinctive streetscape design is specified for Forest Home, using a consistent design language to combine the traffic calming elements discussed above. Each community entrance consists of a speed table flanked by lamp posts mounted on low stone pedestals. Within the hamlet, streets follow existing alignments and are paved 18 ft wide, banded by cobbled shoulders. Cobbled shoulders are typically 18 in wide, including: at intersections, where a side path is adjacent to the road, or where significant amounts of water run in the shoulder. Shoulder width is reduced to 12 in where space is at a premium. Streets are generally uncurbed, with vertical (standard 10 degree batter) granite curbs used at entrances and intersections, and where necessary to direct the flow of surface runoff water or to protect pedestrian side paths. Side paths are typically 4 ft wide, located on one side of the road only, and usually adjacent to the shoulder or curb. Curb cuts are understood to be included for all crosswalks and driveways. Mid-block speed tables are included where necessary to control vehicle speeds, and trees are planted along the roadway throughout the hamlet.

A general schematic representation of this Plan is shown in Figure 2. This map indicates the location of key traffic calming elements recommended for Forest Home. A more detailed street-by-street description of this Traffic Calming Plan can be found in Appendix VIII, which specifies the recommendations for each street and intersection within the Forest Home community. This listing is intended to serve as a guide for implementation, and should prove useful for envisioning the final streetscape design. Detailed, annotated maps which depict the streetscape design described in Appendix VIII are also being prepared in accordance with this Traffic Calming Plan, and will be submitted under separate cover.

## **EVALUATION OF THIS TRAFFIC CALMING PROGRAM**

It is well worth considering the effects of this Traffic Calming Plan, and its influence on the operational characteristics of the hamlet.

### **Effects on Drivers**

The cumulative effect of the various elements of this Traffic Calming Plan should be a quite striking improvement in driver behavior. The gateway entrance features will “grab” drivers’ attention, and make it clear that they are entering a special area. Speed tables at the entrances will ensure that drivers

shed any excess speed before entering the community, and begin their traverse of Forest Home at a suitable pace. Drivers will feel comfortable proceeding through the hamlet at this lower speed, due to the combined effects of the overarching street trees and the modest road width. The modified intersection designs should encourage better stop sign compliance. The cobbled shoulder bands will help drivers to stay in their lanes, keeping them away from guiderails and pedestrians. Most side paths will be clearly visible from the street, which will help to reinforce that this is a pedestrian environment. The multiple crosswalks will serve as conspicuous reminders that the streets are not solely for motorists, and this, too, should encourage drivers to moderate their speeds. If some drivers persist in traveling too quickly, then mid-block speed tables will bring a measure of discomfort to high speed driving, thereby effectively disciplining vehicle speeds. Drivers will be motivated to control their speeds until they have traversed the speed table at the gateway entrance feature at the far side of the community. This gateway signifies the end of the traffic-calmed zone, where drivers are allowed to resume their typical driving behavior. This Traffic Calming Plan therefore presents a highly effective methodology for improving driver behavior within the hamlet of Forest Home.

The speed limits in Forest Home are currently 25 to 30 mph. With implementation of this Plan, drivers will be encouraged to travel at closer to 20 mph. A speed reduction of 5 or even 10 mph may not seem like much, and should not be a major inconvenience for law-abiding drivers. However, the drivers who routinely exceed 40 mph at the hamlet's boundaries will have their speeds cut in half. This will have a tremendous influence on neighborhood atmosphere and livability. It only takes a few high-speed vehicles to make a street feel unsafe, and traffic calming is an ideal means of controlling these drivers without unduly impacting the majority of responsible motorists.

The emphasis of this Traffic Calming Plan is on reducing the impacts of traffic, rather than on restricting traffic volumes in the hamlet. Consequently, all cars, SUVs and pickup trucks will be able to readily pass through the community. Roads and intersections will also still accommodate the larger vehicles that are regularly and appropriately on streets within a residential area. These vehicles include UPS and FedEx delivery trucks, school buses, garbage and recycling trucks, snow plows, and fire and rescue equipment. Furthermore, this Plan will not exclude the occasional tractor trailer truck, which may enter the community in connection with household moving, construction, or other infrequent activities. Overall, then, in spite of the measures taken to improve driver behavior, the roads in Forest Home will continue to support the mobility needs of the Ithaca area.

### **Effects on Pedestrians**

This Plan will dramatically improve the pedestrian environment within Forest Home. Reduced vehicle speeds, and attendant reductions in noise and pollution, are key factors, as are the protection offered by curbs and cobbled shoulder bands, the conspicuous crosswalks, and the shade provided by street trees. Most importantly, there will finally be complete and continuous pedestrian facilities in Forest Home. The new or upgraded pedestrian side paths, interconnecting with existing pedestrian facilities, will open up new opportunities for walking in and through the hamlet. This new side path network in Forest Home will benefit many different user groups, including residents, commuters, joggers, and Plantations visitors.

Forest Home residents will enjoy improved access to each others' homes, as well as to the Forest Home Chapel (which serves as the community center), and to the important greenspaces in and around the community (Beebe Lake, Isabel's Park, the Wildflower Garden, the Arboretum, Flat Rock, the

Golf Course, etc). This Plan also creates new routes for Forest Home residents to use when walking to the Community Corners, the Cayuga Heights School (the elementary school attended by Forest Home children), and to the Cornell campus.

Pedestrian commuters should also be able to make good use of these facilities, particularly those who walk to the Cornell campus from the residential areas in the northeast part of the Town of Ithaca. This fits in well with recent Town and University efforts to encourage increased pedestrian commuting as an alternative to reliance on the automobile. Cornell students who live on North Campus (including Hasbrouck Apartments) can also be considered to be pedestrian commuters, particularly those who travel by foot through Forest Home to the “upper” campus. The Arboretum and Flat Rock are popular destinations for students, particularly in the spring, and these new side paths will provide improved access to these areas. Numerous joggers run through the Forest Home community on a daily basis, and they, too, will benefit from the improved and extended pedestrian facilities, as well as from the reduced vehicle speeds and more-attentive driver behavior which will result from the implementation of this Plan.

The continuous side path along Forest Home Drive will provide Plantations visitors with a level route connecting Beebe Lake to the Wildflower Garden, the Arboretum and Flat Rock. This route crosses both bridges in Forest Home, whose pedestrian walkways offer splendid views of Fall Creek, which might be considered the centerpiece of the Plantations. Two new facilities, the side path along Pleasant Grove Road and the RiverWalk along the 300 block of Forest Home Drive, will also offer views of Fall Creek, and could attract more visitors to the area. Those who are visiting Forest Home in order to absorb the historic ambiance of this National Landmark will undoubtedly find the complete side path network to be an invaluable resource. Cornell Plantations staff, who work out of three buildings in Forest Home (Lewis Education Center, Ramin Administration Center, Horticultural Center), will also benefit from the improved connections that this new side path network will offer.

All existing formal and informal pedestrian facilities in Forest Home have been incorporated into this new pedestrian network, taking full advantage of existing infrastructure. The new side path segments will not only be useful in themselves, but will provide the connectivity necessary to improve the operation of the whole pedestrian network. Not only does this Plan fulfill the goal of providing safe, continuous pedestrian facilities within Forest Home, but it is consistent with the Town of Ithaca’s preliminary plans to expand its Town-wide walkway system (see Appendix XI).

### **Effects on Bicyclists**

A century ago, bicycles would have been able to keep up with other traffic in Forest Home. Now, however, vehicles are moving too quickly. The speed differential between cars and bicycles is so great that most drivers want to pass bicycles. Many roads in the community are wide enough to encourage overtaking of bicycles even in the presence of oncoming traffic. This can lead to some uncomfortable “close calls.” This Plan addresses the problem by reducing vehicle speeds to more closely approximate bicycle speeds, which will result in fewer incidences of passing, and will also make it more feasible for bicyclists to ride in the travel lane. When bicyclists take their rightful position as part of the traffic stream, then drivers who wish to pass are more likely to wait until there is a sufficient break in opposing traffic, at which time they can give the bicycle much wider berth. This combination of more compatible speed and more respectful passing should do much to improve the safety and

comfort of bicycling in the hamlet. In fact, traffic calming professionals often recommend this inter-mixing of cars and bicycles in the traffic stream as part of a traffic calming program.

A well-known benefit of bicycling in the travel lane is that left turns are easier and safer, because cyclists do not have to cross the stream of traffic. At all-way stop intersections, such as those in Forest Home, bicyclists who are riding in the lane are more likely to be noticed by drivers and treated as equals. Riding in the lane also avoids the debris that can accumulate along the edge of the road outside of the travel lane. Water often runs adjacent to the curb when it is raining, making the edge of the road an unpleasant place to ride a bicycle. And of course riding too close to a curb can be hazardous for bicyclists, due to the risk of catching the pedals on the curb and being tipped into traffic. For all of these reasons, riding adjacent to the curb should be discouraged. The cobbled shoulder band specified in this Plan is a key component in encouraging good bicycling behavior.

Hills typically present a special challenge, since up-bound bicycles will likely slow to a speed lower than most drivers would wish to travel. Fortunately, the significant gradients in Forest Home all begin at intersections with low design speeds. This means that drivers beginning up the hill will be traveling slowly, and will have the opportunity to see any bicycle in front of them before resuming speed. This guards against the problem usually associated with hills, that of high-speed cars coming up behind low-speed bicycles.

Many drivers will undoubtedly pass bicycles on the hills, and when they do, it is just as important to give the bicyclists wide berth, rather than trying to “sneak past” when there may not be adequate room. Having bicycles ride fully in the travel lane, rather than near the edge, therefore offers distinct safety advantages, even on hills. It is anticipated that down-bound bicycles will have little difficulty keeping up with automotive traffic.

A notable feature of this Plan is that bicyclists who do not wish to hold up traffic when ascending a hill will have the option of using the adjoining side path as a climbing lane. This will remove them completely from the road, and will put them on a facility with others moving at approximately the same (walking) speed. Once at the top of the hill, they can switch back into the travel lane whenever they choose. Those who wish to dismount and walk their bicycles up the hill will also make use of the adjoining side path. In order to facilitate use by bicyclists, the side path has generally been located adjacent to the up-bound lane. The exception is on Pleasant Grove Road, where the side path is not on the up-bound side of the road, but is on the creek side, in order to provide a superior pedestrian environment, and in order to better connect to exiting pedestrian infrastructure on North Campus. On this road, a standard bicycle climbing shoulder has been provided once outside of the community boundary, where space becomes available. This will allow bicyclists to get out of the traffic stream for the steepest part of the hill.

Side paths are provided along all major roads in Forest Home, not just on hills. This means that tentative cyclists, particularly children and the elderly, will have a place to ride that is out of the traffic stream. This has heretofore been unavailable, and is very appropriate for a residential area such as Forest Home, where there are riders of all ages and abilities. But most bicyclists will make use of the traffic-calmed streets, as discussed above. With storm water inlet grates removed from the travel lane, bicycling through the hamlet will be easier, and speed tables will be gradual enough to be comfortable at bicycling speeds. And of course all cyclists, whether riding a bicycle on the road or a tricycle on the

side path, will benefit from the increased shade, and the reduced noise and pollution associated with the lowered vehicle speeds in the hamlet.

### **Effects on Residents**

Forest Home residents are all of the above – drivers, pedestrians, and bicyclists – and they will therefore experience the full spectrum of improvements anticipated for each of these travel modes. But they are also homeowners, and this gives them an additional perspective beyond those of people who spend only a few minutes per day in the hamlet. With increased exposure time, the improvements in ambient noise and air quality become much more evident. These effects will be felt well beyond the borders of the streetscape, and will reach into the yards and homes of the residents.

In a densely settled neighborhood such as Forest Home, it is inevitable that sooner or later a ball will bounce into the street and a child will run after it. It is in situations such as this that traffic calming really proves its worth. But the lower speeds and more attentive driving will actually be appreciated every day. Even the simple act of checking the mail or collecting the newspaper will be less harrowing.

The secondary effects of traffic calming should also be considered. The improved pedestrian atmosphere will lead to increased social interactions within the neighborhood, for children as well as for adults. This, coupled with the better delineation of the neighborhood's boundaries, will lead to a renewed sense of community. Experience has shown that traffic calming programs often have a catalytic effect, in that improvements to the streetscape trigger private beautification initiatives. In this way, a modest investment in a neighborhood can result in a quite substantial transformation. In the case of Forest Home, we are starting on a much higher plane, in terms of scenic beauty, historic significance, maintenance standards, and community involvement. It is anticipated that these characteristics will be continued and enhanced by this Traffic Calming Plan.

An important consideration for residents is not only what this Plan will do, but also what it will not do. Implementation will not involve the removal of any fences or stone walls, nor the loss of any trees, shrubs, or flowers. While some bushes will need to be trimmed a bit, much of this trimming has already been accomplished. Roads and side paths will not only be located within the existing rights-of-way, but will also be located on the footprints of the existing facilities, so that any intrusion onto residents' yards will be negligible (a few inches, if at all). Indeed, some lawns may get a bit larger. All existing private on-street parking spaces will be retained, and residents will still be able to access their homes from any direction, due to the retention of two-way operation on all of the neighborhood's streets. Textured pavement has been kept out of the travel lane in order to avoid the creation of new noises. Similarly, harsh new traffic calming features which would have required stop-and-go driving have been excluded from this Plan, since they would have resulted in unnecessary noise and pollution. Overall then, implementation of this Traffic Calming Plan should not create any significant problems or hardships for Forest Home residents.

The overwhelming effect of this Traffic Calming Plan should be a marked improvement in neighborhood livability. This should ensure the continued viability of Forest Home as an owner-occupied residential community, and a good place to raise a family.

## **Effects on Maintenance**

There is a tendency to assume that traffic calming projects can be expensive, not only in terms of initial construction costs, but also in terms of ongoing maintenance expenses. In the case of Forest Home, however, the maintenance costs are likely to be significantly less than one might imagine. There are several reasons for this. One is the modest width of the roads and side paths in the community, which will mean less snow to plow and less area to salt, compared to wider facilities. The specified roadway lane width is 9 ft, the width cleared by a typical municipal snow plow blade, which should simplify snow removal operations. Curbs are to be set back from the edge of the pavement, by the width of the cobbled shoulder, which will allow snow plow operators some room to maneuver without having the blade contact the curb. Although the presence of curbs at the entrances and intersections, as well as along some sections of road, will require a bit of extra care when plowing snow in these areas, plow operators are already successfully dealing with curbs in Forest Home. In fact, roads with the proposed cross section (18 ft pavement, 21 ft curb-to-curb) already exist in the community, notably Judd Falls Road and part of Forest Home Drive. It is anticipated that some side paths, particularly on the 300 block of Forest Home Drive and on Warren Road, can be “winged off,” that is, cleared of snow by making use of the snow plow’s wing blade, which should limit snow removal efforts for the side paths. Finally, the speed tables which are specified in this Plan can be readily traversed by snow removal equipment. This is in contrast to the entrance islands and dual-radius curbs at intersections which were originally proposed for Forest Home. These, and other obstacle-course-like treatments which would have made snow plowing operations more awkward, have been excluded from this Plan.

There are already many trees along the streets in the hamlet, so the call for street trees is not a fundamental change, just an expansion of current practice. Furthermore, this Plan does not specify any trees planted in islands (as originally envisioned), where they might require special care in order to survive. A benefit of street trees is that they could reduce the drifting of snow, and therefore help to moderate winter maintenance costs. Warren Road, with its western exposure, would appear to be one such road where drifting snow could be a concern. During the summer, the increased shade that additional trees provide should prolong pavement life. Finally, if the Forest Home Lighting District continues to absorb the cost of operating the street lights in the hamlet, then this is another expense which would not have to be borne by the Town.

## **Effects on Historic Character**

What distinguishes Forest Home from other residential areas in the Town of Ithaca is not only its picturesque setting, its distinct identity, and its human scale, but also its rich history. Preserving and restoring the neighborhood’s historic character is an important goal of this Traffic Calming Plan. The Forest Home Historic District is listed on both the State and National Registers of Historic Places, and therefore the State Historic Preservation Office (SHPO) was consulted in the development of this Plan. SHPO expressed a clear preference for natural-looking roads with flowing alignments and believable features within the boundaries of the existing (or potential future) historic district. Various surface textures and colors are allowed (provided that they are not too garish), as are vertical deflections, narrow roads, meandering alignments, visual narrowings and plantings. On the other hand, prominent obstacle-course-like treatments such as bulb-outs, chokers, islands, jogs, chicanes, and other harsh or arbitrary looking artifacts of modern urban design are all undesirable, and have therefore been avoided in this Plan. There is more flexibility in the design of entrance features, as these are located at or near



the boundaries of the community, but these, too, have been developed with an eye toward compatibility. SHPO's desire to "maintain and restore an earlier appearance" is quite understandable, and this has called for a more subtle approach to traffic calming than is typically used. The resulting Plan should ensure that Forest Home is preserved as an historic resource, and will continue to be a special place for generations to come.

### **Viability of This Traffic Calming Plan**

During the development of this Plan, the Forest Home Traffic Calming Committee wisely decided to treat all major roads and intersections within Forest Home equitably. The advantage of using equally effective treatment throughout the hamlet is that the livability benefits are widespread and universal. As a result, this Plan should work for "anyone, anywhere, anytime." That is, anyone should be able to live anywhere in Forest Home, any time, now or in the future, and still be adequately served by this Plan. As new families move in to Forest Home, or as current residents age and go through different life phases, the traffic calming measures called for in this Plan will continue to be useful and appropriate. This will ensure that the implemented Plan remains relevant and beneficial long into the future.

To be socially acceptable and politically viable, a plan cannot cause significant negative impacts. This Traffic Calming Plan was developed with this necessity in mind, and therefore seeks to create the maximum possible benefit without imposing a significant hardship on anyone. Consequently, no one is being asked to make unreasonable sacrifices for anyone else, and no user group (residents, pedestrians, commuters, etc.) is being asked to make unreasonable sacrifices for any other group. Members of the Forest Home neighborhood are local residents, of course, but they are also drivers, pedestrian and bicyclists, and therefore have much in common with the commuters who pass through the hamlet every day. By pursuing the common interest rather than competing interests, we have been able to fashion a plan with broad appeal and universal acceptability, which responds to the critical issues facing Forest Home.

There may well be those within the Forest Home community who think that this Traffic Calming Plan is not stringent enough. And they may have a point, especially in terms of controlling traffic volumes. However, the implementation of this Plan will create neighborhood conditions that are undeniably better than they are now, while meeting the constraint of allowing continued through traffic. Once this Plan has been implemented, there will no doubt be a few commuters who complain that it is no longer as easy to speed through Forest Home. This is a good indication that the Plan was necessary, and is working as intended. For most drivers, however, the few seconds added to their commute should not be a major concern. And with the more attractive streetscapes, some drivers may find their trip through the hamlet to be a more pleasant motoring experience. On the whole, then, the most noticeable change may be the overall feeling of renewal for the neighborhood of Forest Home.

