

# DAY HILL CORPORATE AREA

# 10

## Overview

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When Combustion Engineering broke ground in the 1950s, Day Hill and Prospect Hill Roads were little more than farm roads and I-91 had yet to be built. By 1960, the first segments of I-91 were completed, opening Windsor and the Day Hill Corporate Area (DHCA) to further expansion. Foreseeing the tremendous potential for economic development in the DHCA, Windsor zoned several thousand acres of land for industrial development and made substantial investments in the infrastructure and appearance of Day Hill and Prospect Hill Roads. In doing so, Windsor helped facilitate the development of over 9.3 million square feet of floor area that exists today, making it a corporate and industrial powerhouse that is the envy of most suburban communities.

Since floor area data was gathered for the 2004 Plan of Conservation and Development, there have been nearly 2.5 million square feet of new commercial and industrial floor area built in the DHCA, achieving a 36% increase in floor area in only six years, far outpacing anticipated growth and bringing long term goals and strategies to the forefront. This plan update is intended to assess current conditions and future potential of the area by providing a statistical as well as strategic update to reflect recent changes and maintain the DHCA's competitiveness in the face of growing traffic issues and competition from other corporate areas within the region.

*Maintain and enhance the Day Hill Corporate Area's role as the region's preeminent suburban business location by maximizing its economic development potential and strengthening its quality corporate image.*

**Griffin Office Park**



**Day Hill Road**



**Hotel Development**



## **Expand Traffic Capacity**

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The Day Hill Corporate Area (DHCA) is comprised of approximately 3,000 acres of industrially and commercially zoned land stretching from Day Hill Road south to Bloomfield Avenue and from I-91 west to the Bloomfield town line (see following map). To date, roughly 1,400 of these acres have been developed with over 9.3 million square feet of commercial and industrial floor area. Under current zoning requirements and assuming a similar mix of land uses to what already exists, there is potential for an additional 4.2 million square feet on the many underutilized parcels.

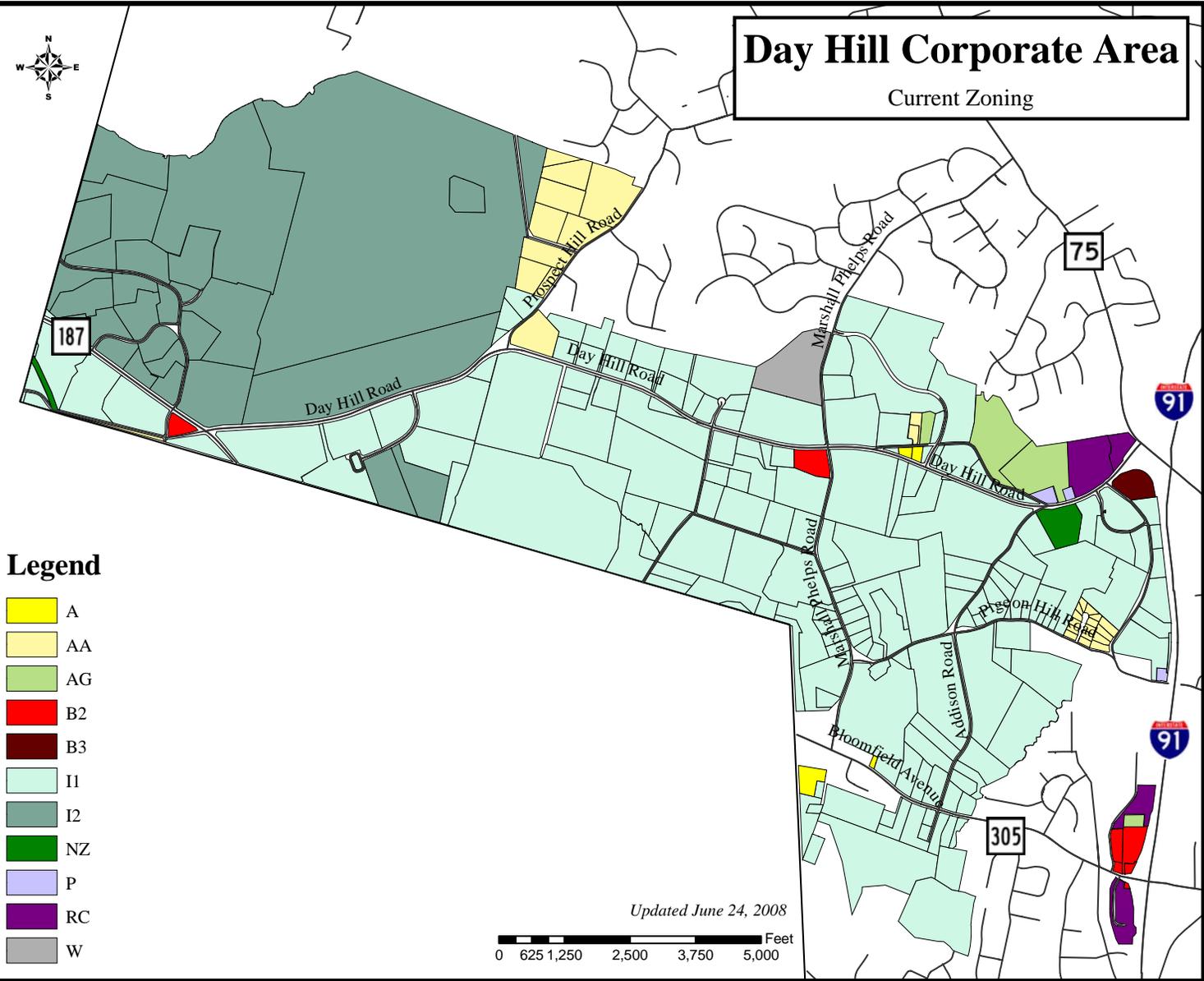
The remaining 1,100 acres of undeveloped land can accommodate 9.5 million square feet of floor area under current zoning requirements. Combining existing and potential new floor area results in the potential for over 22 million square feet of total floor area. To put this into perspective, the 13.5 million square feet of potential new floor area is nearly equivalent to the current total office floor area of the City of Hartford. Despite this tremendous potential based on zoning requirements and available acreage, the ability to achieve that potential is dependent on other factors.

With the suburbanization of jobs and housing since the 1950s, traffic in the I-91 corridor has increased significantly. Less than 30 years after opening to traffic, the Connecticut Department of Transportation (ConnDOT) recognized that I-91 was destined to exceed capacity and reconstructed it. Although substantial improvements were made to Exits 37 and 38, compromises were made to save money and comply with current highway standards. With continuing growth, both State and Town investments in traffic capacity will reach the end of their useful life unless consideration is given to significant reinvestment and/or changing the course of development in the area.

Traffic capacity, both within and at major access points to the DHCA, is a potential constraint on development. If traffic congestion is not addressed in a timely fashion, opportunities for development may be lost to more accessible locations. With the fate of the DHCA firmly in the hands of the Connecticut Department of Transportation (ConnDOT) due to their control of Routes 75, 187, 189, 305 and I-91, significant lead time is necessary to lobby, secure funding, design, approve and build improvements to these roads. A number of factors contribute towards the overall traffic conditions within the DHCA including: the capacity of the road network; the availability of transportation alternatives (buses, vanpools, telecommuting, traffic demand management, etc.); the mix of uses utilizing the road network; and pass through traffic between I-91 and Bloomfield as well as other northwestern suburbs.

# Day Hill Corporate Area

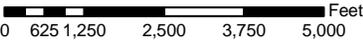
Current Zoning



## Legend

- A
- AA
- AG
- B2
- B3
- I1
- I2
- NZ
- P
- RC
- W

Updated June 24, 2008



The first steps in addressing the traffic situation in the Day Hill Corporate Area (DHCA) identified in the 2004 POCD were to make minor improvements to the intersection of Bloomfield Avenue and Addison Road and adjust signal timing throughout the DHCA. These improvements will buy the time necessary to address the more serious problems on the horizon. That intersection was partially improved with the addition of a second eastbound Bloomfield Avenue travel lane between Addison Road and the Mill Brook to accommodate double left-turns from a re-stripped southbound Addison Road approach. Additional improvements are needed to make this intersection function efficiently.

In originally preparing this chapter in 2003, a traffic analysis was performed to determine potential traffic bottlenecks around the perimeter of the DHCA. Major improvements identified at that time as critical to keeping DHCA traffic flowing smoothly are mapped on the following page and described below:

- 1 adding an additional westbound (WB) Day Hill Road left-turn lane onto Blue Hills Avenue in the near term; adding a roundabout or interchange at the intersection of Day Hill Road and Blue Hills Avenue in the long term;
- 2 adding a northbound (NB) Blue Hills Avenue auxiliary (short) through-lane at the Griffin Road North intersection;
- 3 adding an eastbound (EB) Day Hill Road auxiliary through-lane at the Lamberton Road intersection, converting a WB Day Hill Road exclusive right-turn lane at the Lamberton Road intersection to a through/right-turn lane or adding a WB Day Hill Road short through-lane to the intersection;
- 4 adding EB and WB Bloomfield Avenue auxiliary through lanes to the Addison Road intersection;
- 5 adding EB and WB Bloomfield Avenue auxiliary through lanes to the Marshall Phelps Road intersection and adding one auxiliary lane to NB Marshall Phelps Road;
- 6 constructing a flyover from EB Day Hill Road to NB I-91 and add NB and SB I-91 travel lanes between Exits 38 and 40 to accommodate merging traffic;
- 7 adding third EB and WB Bloomfield Avenue auxiliary through lanes to the Dunfey Lane intersection (may be impractical due to land-use and geometric constraints); and
- 8 adding third EB and WB Bloomfield Avenue auxiliary through lanes to the Mountain Road intersection (may also be impractical due to land-use and geometric constraints).

**Day Hill Road at Blue Hills Avenue**



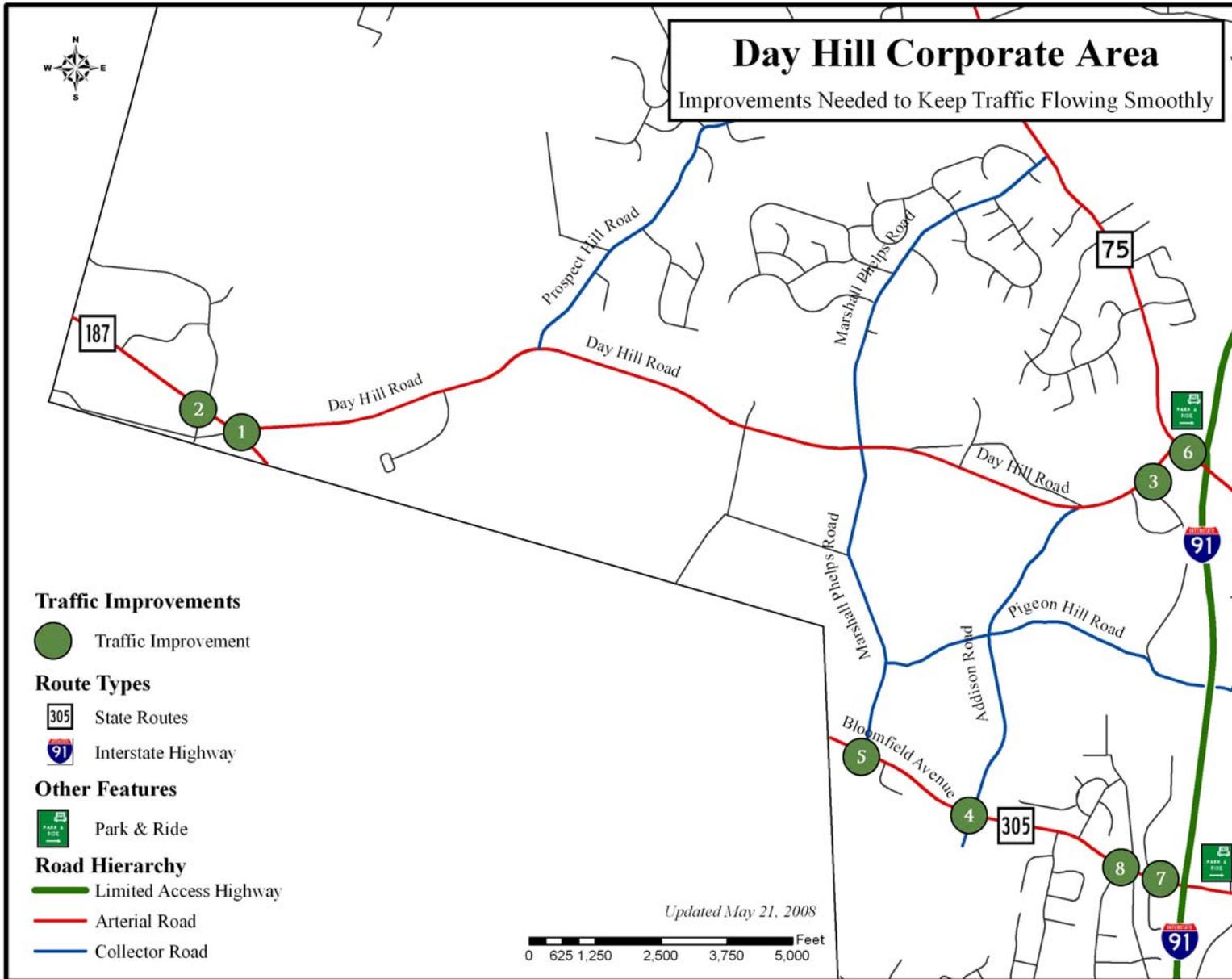
**Day Hill Road at I-91**



**Bloomfield Avenue at I-91**



USGS satellite imagery



Some of these recommended improvements have been partially implemented as conditions of State Traffic Commission (STC) Certificates for major traffic generators such as ING, The Hartford, and Price Chopper. While not always directly addressing needed improvements (i.e. lengthening a left-turn lane to accommodate site generated traffic when a second left-turn lane is necessary to provide future capacity), their cumulative effect is to maintain or modestly improve existing intersection levels of service throughout the DHCA. These and other improvements made within the DHCA over the last six years are mapped on the following page and described below:

- ① adding an exclusive NB Blue Hills Avenue right-turn lane onto Griffin Road North;  
lengthening the southbound (SB) Blue Hills Avenue left-turn lane onto Griffin Road North;
- ② adding an exclusive NB Blue Hills Avenue right-turn lane onto Day Hill Road;  
lengthening the WB Day Hill Road left-turn lane onto Blue Hills Avenue;
- ③ adding an exclusive WB Day Hill Road right-turn lane onto Marshall Phelps Road;  
adding exclusive NB and SB Marshall Phelps Road right-turn lanes onto Day Hill Road;  
adding an exclusive EB Day Hill Road left-turn lane onto Marshall Phelps Road;
- ④ adding an exclusive WB Day Hill Road right-turn lane onto Northfield Drive;  
re-striping SB Northfield Drive to add a combination through-left-turn lane onto Day Hill Road;
- ⑤ re-aligning and signaling Addison Road at Day Hill Road;
- ⑥ adding a third SB Poquonock Avenue through lane from Day Hill Road to the SB I-91 HOV ramp;  
adding an exclusive NB Poquonock Avenue right-turn lane onto NB I-91;  
adding a second NB I-91 off-ramp left-turn lane onto SB Poquonock Avenue;
- ⑦ adding an exclusive NB Poquonock Avenue left-turn lane onto SB Marshall Phelps Road;  
adding an exclusive SB Poquonock Avenue right-turn lane onto SB Marshall Phelps Road;  
adding exclusive NB Marshall Phelps left and right-turn lanes onto Poquonock Avenue; and
- ⑧ adding an EB Bloomfield Avenue auxiliary lane between Addison Road and the Mill Brook to accommodate re-striped double left-turns from SB Addison Road.

**ING**

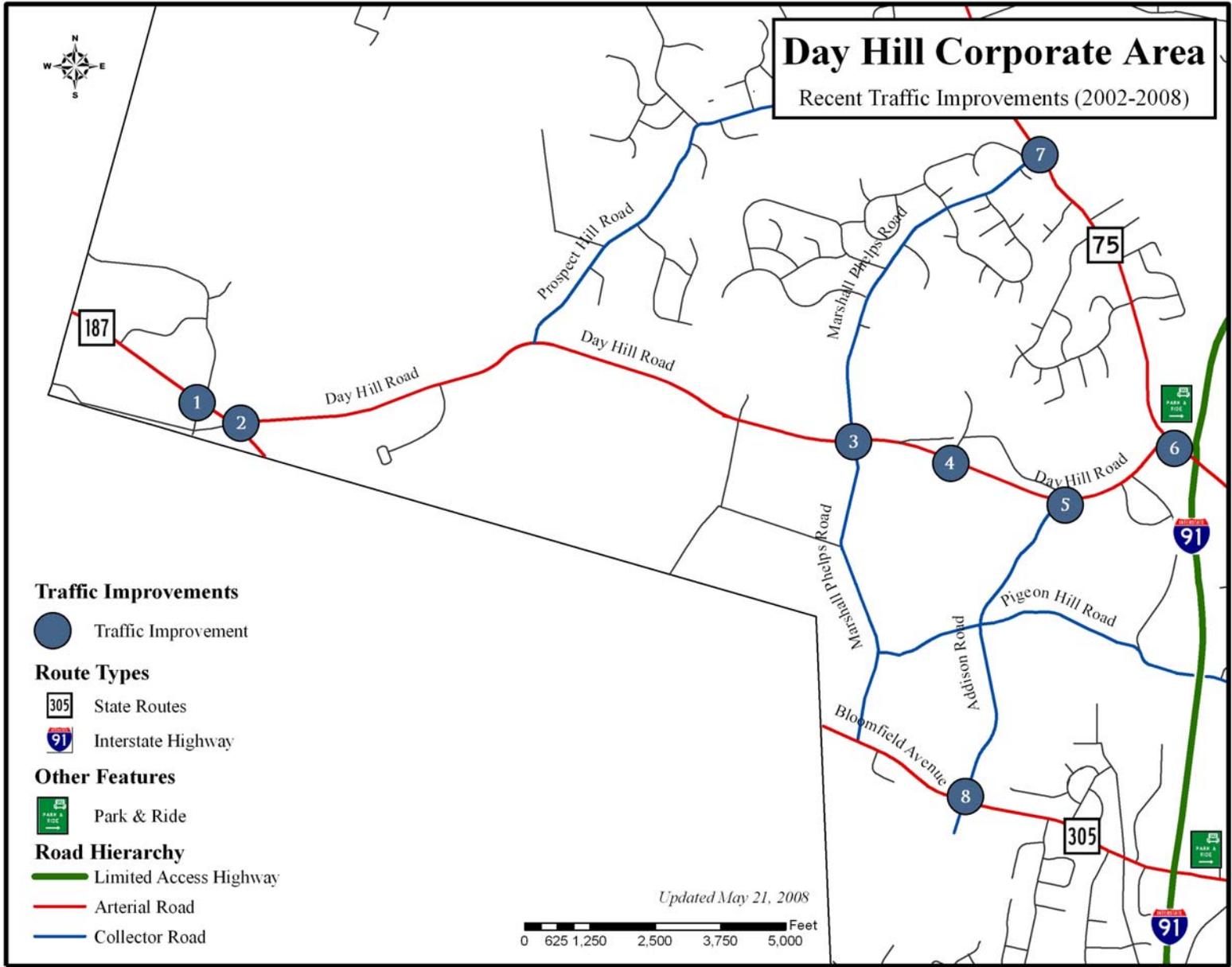


**The Hartford**



**Traveler's Claim University**

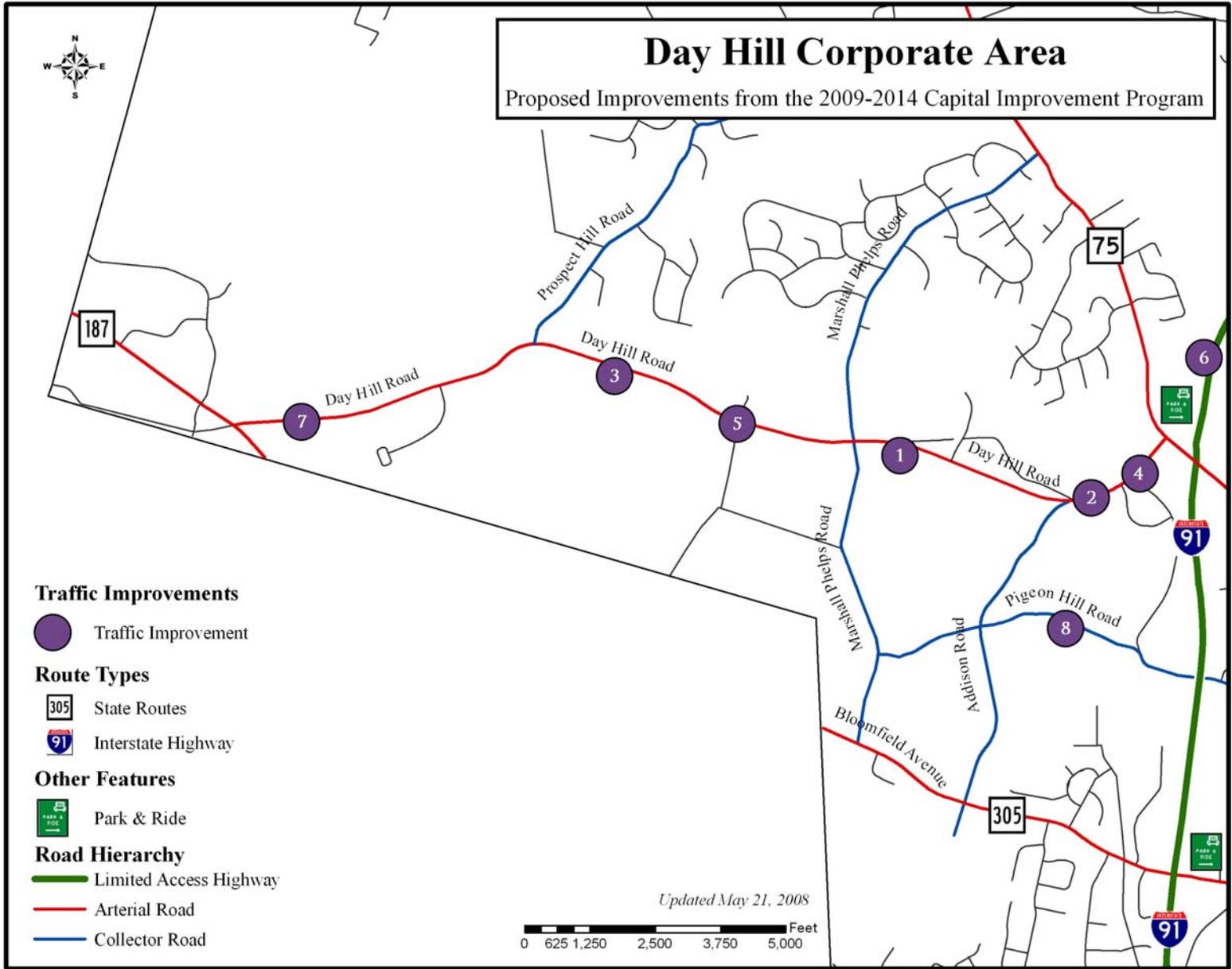




The 2009-2014 Capital Improvement Program proposes further improvements over the next five years that should improve traffic flow and mobility in general throughout the DHCA. Some of these improvements will directly address the needs identified above and are mapped on the following page and described below:

- 1 reconstructing older portions of Day Hill Road;
- 2 adding an exclusive right-turn lane from EB Day Hill Road onto the Public Works Department driveway, Corporate Drive, and Lamberton Road;
- 3 adding exclusive right-turn lanes from WB Day Hill Road onto the LIMRA driveway, Helmsford Way, Prospect Hill Road, and both Alstom driveways;
- 4 adding a WB Day Hill Road travel lane between the SB I-91 off ramp and Addison Road;  
adding an EB Day Hill Road travel lane between Addison Road and Poquonock Avenue;  
constructing a flyover from EB Day Hill Road to NB I-91;
- 5 adding an exclusive right-turn lane from EB Day Hill Road onto Baker Hollow Road;  
adding an exclusive right-turn lane from NB Baker Hollow Road onto Day Hill Road;
- 6 adding NB and SB I-91 travel lanes between Exits 38 and 40;
- 7 constructing pedestrian circulation enhancements throughout the Day Hill corridor including up to 20,000 feet of walking trails and sidewalks; and
- 8 reconstructing Pigeon Hill Road from Addison Road to Lamberton Road.

One improvement not listed above that would help keep traffic flowing throughout the Day Hill Road corridor is a progressive traffic control system that coordinates the timing of traffic signals along the entire length of Day Hill Road to facilitate progressive traffic flow in the prevailing direction of peak-hour traffic (i.e. signals are coordinated to turn green in succession as traffic moves westbound in the morning and eastbound in the evening). Windsor owns and operates most of the traffic signals in the Day Hill corridor and continually adjusts signal timings to optimize intersection capacity, but since each intersection operates independently, there is only so much that can be done. ConnDOT owns and operates the traffic signals on Routes 187 and 75 (Blue Hills and Poquonock Avenues). For a progressive traffic control system to be truly effective, the Town and State systems would have to be coordinated under one system so that the benefit of efficient traffic flow along Day Hill Road is not negated by uncoordinated signals at either end of the corridor. Such intergovernmental cooperation would be especially critical between Day Hill Road and northbound I-91 until the Exit 38 flyover is constructed.



## **Comprehensive Traffic Study**

What is needed before the more serious traffic problems can be addressed is a detailed traffic study of the DHCA that models the entire road network, allowing the creation of a comprehensive improvement program with detailed cost/benefit analysis for each improvement. Such a study will help prioritize improvements and assign costs to them. Given the regional importance of Day Hill Road as a major route to Bloomfield, Simsbury and other northwest suburbs, the Capitol Region Council of Governments (CRCOG) and the Connecticut Department of Transportation (ConnDOT) should participate both officially and financially in such a study. While not the desired comprehensive study of the entire DHCA, significant planning steps have been or are being made in cooperation with CRCOG, ConnDOT, and surrounding communities.

CRCOG, in cooperation with the towns of Windsor and Bloomfield, is conducting a Route 305 Corridor Study to address another critical access route into the DHCA: Bloomfield Avenue. This study will compile existing highway infrastructure and traffic conditions in the corridor, study the feasibility of extending Route 305 (Bloomfield Avenue) to Route 189 (Tunxis Avenue) in Bloomfield, project future traffic growth in the corridor, and recommend improvements to Route 305 (Bloomfield Avenue/Old Windsor Road) to correct deficiencies and accommodate anticipated growth in both towns.

In order to accurately project traffic in the Route 305 corridor, a future land use and traffic generation model is being created that models the entire DHCA, as well as Bloomfield's adjacent commercial/industrial areas. This model may prove valuable in studying Day Hill Road in the near future.

## **Bradley Airport Loop Road**

A Bradley Airport loop road, connecting Routes 187 and 189 with I-91 in Enfield is a concept supported by several recommendations of CRCOG's Bradley Area Transportation Study. Such a road would enhance access, provide additional traffic capacity, and divert traffic to and from Bloomfield and the western end of the DHCA away from Day Hill Road and Bloomfield Avenue. International Drive and Seymour Road (in East Granby) would represent the southernmost segment of the loop road. Although not contiguous, recommended improvements to Bradley Park Road in East Granby and a new Northern Bradley Connector Roadway between Routes 75 and 190 in Suffield would complete the loop road.

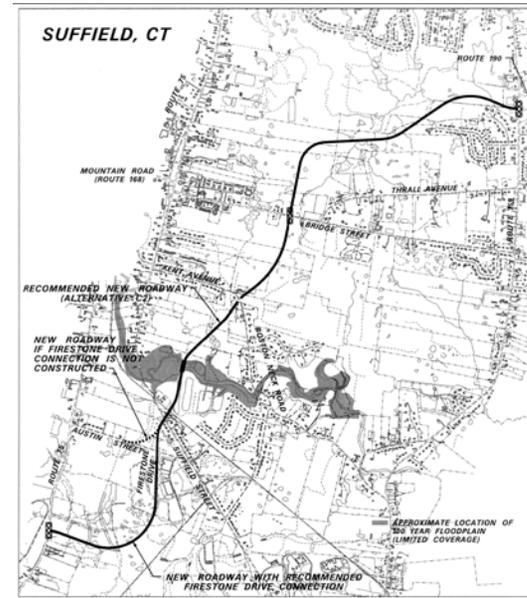
To improve traffic capacity in the western extent of the New England Tradeport, Windsor has widened International Drive from the East Granby town line to Rainbow Road to complete a four-lane boulevard between Seymour Road and Route 20 in East Granby, but East Granby requested a roundabout at the town line, effectively discouraging through-truck traffic to and from Route 187 in East Granby. If the Northern Bradley Connector Roadway is to be completed, an alternative to the

route identified in the CRCOG Bradley Area Transportation Study will have to be found due to a new residential development directly in the path of the preferred route. Route 187 and International Drive may still have some utility as part of a circulating bus system between the DHCA, Bradley Airport and potential Springfield-New Haven commuter rail stops in Windsor Center and Windsor Locks.

The Town of Windsor believes that the Bradley Area Transportation Study's recommended addition of westbound left- and right-turn lanes on Route 20 at the intersection of International Drive and Bradley Park Road may be insufficient to handle anticipated truck traffic in the long term and the intersection should be studied for a possible grade separated interchange or other high-capacity configuration to handle anticipated traffic within the New England Tradeport. Such an improvement would help to mitigate traffic impacts on neighboring residential areas.

### Exit 38 Flyover

By omitting a northbound flyover as a cost saving measure when reconstructed over a decade ago, Exit 38 currently must rely upon a dog-legged traffic movement (a right-turn followed by an immediate left-turn) between Day Hill Road and I-91 north during the evening rush hour. As an offshoot of the Bradley Area Transportation Study, CRCOG and the Town completed a Day Hill Road Interchange Study, which recommended Alternative 3A, a flyover from eastbound Day Hill Road to northbound I-91, as the preferred alternative (see graphic on Page 10-12). To mitigate traffic "turbulence" from increased high-speed traffic entering northbound I-91 from Day Hill Road as well as weaving movements between southbound traffic entering from Route 20 and exiting onto Day Hill Road, additional northbound and southbound travel lanes are also proposed on I-91 between Exits 38 and 40. Funding is in place for environmental analysis and design, but the anticipated construction cost for the minimum build is over \$17 million (2005 dollars). Given the regional significance of Day Hill Road as an inter-town arterial and the DHCA as a regional economic engine and the time frame needed to complete such a project, Windsor and CRCOG should intensify efforts to construct a flyover so that it can be completed before traffic exceeds the capacity of one or more of the three intersections currently needed to convey northbound commuter traffic.

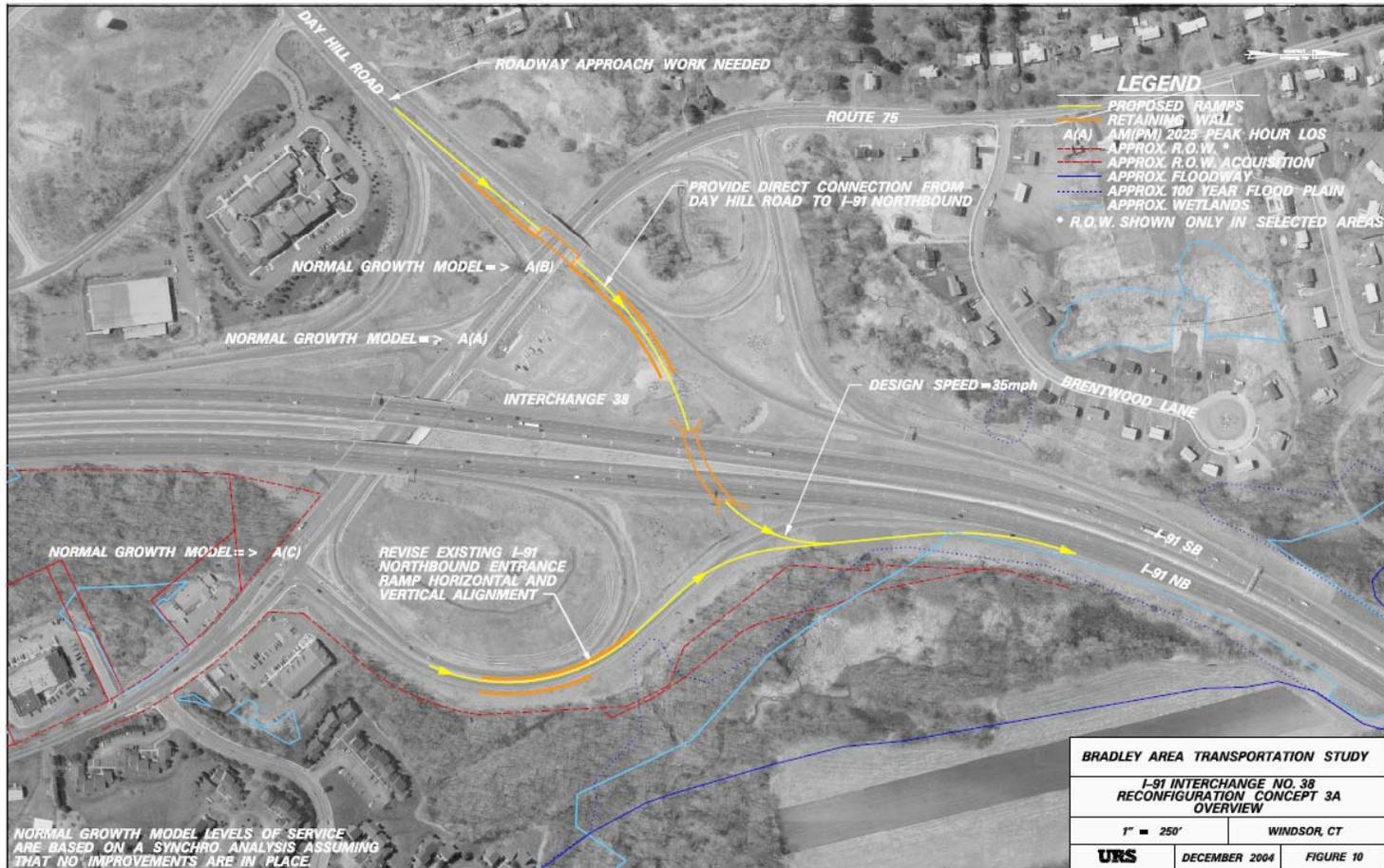


### Strategies for Preserving and Expanding Traffic Capacity

1. Continue to make incremental improvements to buy time for further study and implementation of a comprehensive improvement program.

**Strategies for Preserving and Expanding Traffic Capacity (continued)**

2. Conduct a comprehensive traffic study of the entire DHCA to model the entire road network and allow the creation of a comprehensive improvement program with a detailed cost/benefit analysis for each improvement.
3. Aggressively pursue identified capacity improvements through both the Town's CIP and the State Traffic Commission process as new development occurs.
4. Continue to petition for the accelerated completion of a Day Hill Road northbound flyover at Exit 38.



## Encourage Traffic Demand Management

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From a total daily traffic standpoint, Day Hill Road and other roads serving the DHCA would have tremendous traffic capacity if traffic could be spread evenly over a 12- to 18-hour period. Unfortunately, the majority of traffic seeks to enter and exit the DHCA during the morning and evening peak travel hours, creating congested conditions while traffic on Day Hill Road remains relatively light for most of the remaining hours of the day. Traffic demand management (TDM) can be an affordable, flexible, and effective means of preserving existing traffic capacity and increasing growth potential within the DHCA. Rather than increasing traffic capacity solely through costly physical improvements, TDM seeks to alter travel behavior through a number of alternative strategies designed to take vehicles off the road at the most congested times of the day: the morning and evening rush hours.

Some strategies such as staggered schedules, flexible work hours, compressed work weeks, and telecommuting are simple no- or low-cost solutions that can disperse peak-hour traffic and even take significant numbers of cars off the road altogether. Variable work hours can be implemented on an individual or corporate-wide basis. Flexible work hours let individual employees choose their start time (within certain parameters), with the theory being that traffic will seek its own optimal levels and employees will adjust their schedules to avoid the most congested travel times.

Staggered work schedules can be applied both within a work site and among employers in the DHCA. Under staggered work hours, employers break their workforce into large fractions and give each fraction a staggered start time, which could vary by as little as 10 or 15 minutes to an hour or more. For example, an employer could start one-third of its workforce at 7:30am, one-third at 8:00am, and one-third at 8:30am, thus reducing its traffic impact by two-thirds at any given time. In another example, two or more major employers could collaborate with one starting its workday for all employees at 8:00a.m., while another might start at 8:30am or 9:00am, cutting their collective traffic impact in half or more depending on how many employers participate.

Telecommuting and compressed work weeks have the potential to remove cars from the road altogether. Telecommuting allows employees to work from home one or more days a week, removing one car per day for each participating employee. For example, if a worksite with 1,000 employees allowed 20% of their workforce to telecommute one day a week, it could remove 40 to 200 cars on a given day from rush hour traffic.

Compressed work weeks allow employees to work longer shifts for fewer days per week, removing one car per employee for one to two days per week. For example, an employer may schedule employees to work four ten-hour shifts, earning one additional day off per week. The employer can stagger those days off across its workforce to reduce its overall traffic impact by 20% per day, or if feasible, close entirely one day per week, reducing their traffic impact by 100% on that day and cutting their weekday utility costs by up to 20%.

### Traffic Demand Management

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Traffic Demand Management or TDM is a series of strategies designed to modify travel behavior in congested areas, particularly during the morning and evening rush hours.

TDM can range from adjusting employers' work hours to providing high-occupancy toll lanes. Common TDM strategies include: staggered or flexible work hours; compressed work weeks (e.g. four 10-hour workdays; telecommuting, where employees work from home one or more days a week; congestion pricing (i.e. drivers are charged to enter a congested area or to bypass congestion in a toll lane); increased availability of public transit and/or reduced/subsidized fares to encourage ridership; transit-oriented and mixed-use development (i.e. employee housing convenient to public transit or to work); pedestrian improvements (e.g., sidewalks/trails and bus shelters); and travel information/traffic incident management systems that inform motorists of accidents/congestion and recommend alternate routes.

Car and van pools are another effective way to reduce the number of vehicles on the road. The Rideshare Company, in conjunction with ConnDOT, operates two convenient programs for matching commuters with drivers. NuRide is an employer-based program that rewards employees who ride to work together with frequent flyer type points that can be redeemed for prizes from corporate sponsors. Employees offering or seeking rides within a workplace can post their offer or request on an online system, which tracks their participation and awards points. Major employers in the DHCA such as ING, LIMRA International and The Hartford already participate in this program.

Easy Street Vanpools are another service of the Rideshare Company that provides affordable vans and helps organize routes for six to twelve commuters. Drivers can reduce their commuting cost to zero (for full-size van routes) and riders can save significant money by trading the total cost of owning a car (averaging over \$7,800 per year in 2007 or \$30 per workday according to the Consumers Union) for a nominal fare. The Town is working in cooperation with the Windsor Chamber of Commerce to actively promote Rideshare and other TDM programs.

#### **Strategies for Encouraging Traffic Demand Management**

5. Continue to work with the Chamber of Commerce, Rideshare and DHCA employers to promote Traffic Demand Management strategies.
6. Develop policy-, regulatory-, and incentive-based approaches to promote implementation of TDM strategies.

**Springfield-New Haven Commuter Rail**



**CT Transit Bus Service**



**Easy Street Vanpools**



## Promote Multi-Modal Transportation Options

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While considered a form of traffic demand management, public transit and other transportation alternatives are worthy of separate attention in the context of a comprehensive multi-modal transportation strategy. In its simplest form, a multi-modal transportation system integrates multiple transportation modes such as buses and trains into one system, allowing commuters to get from Point A to Point B using one or more modes. At its best, a multi-modal transportation system is a highly accessible, seamlessly integrated system with extensive node to node routes and frequent headways (departure times) between vehicles, allowing commuters to efficiently get where they want, when they want, paying one fare and transferring between modes with little or no waiting. While the latter system sounds ideal, the cost of implementing and operating such a system is prohibitive unless there is a major societal shift back to pre-World War II style public transit.

What the DHCA needs to help reduce traffic demand is a bus-based system that: maximizes flexibility during the peak travel hours; makes stops at or near major employers, hotels and retail centers; is integrated with the proposed Springfield-New Haven commuter rail line and improved bus service to Bradley Airport; and would eventually integrate into a future Griffin Busway if population density or demand justifies such an investment. Like the proposed commuter rail station in Windsor Center, the terminus of a future Griffin Busway could serve as a local hub for more frequent shuttle bus or van pool service within the DHCA.

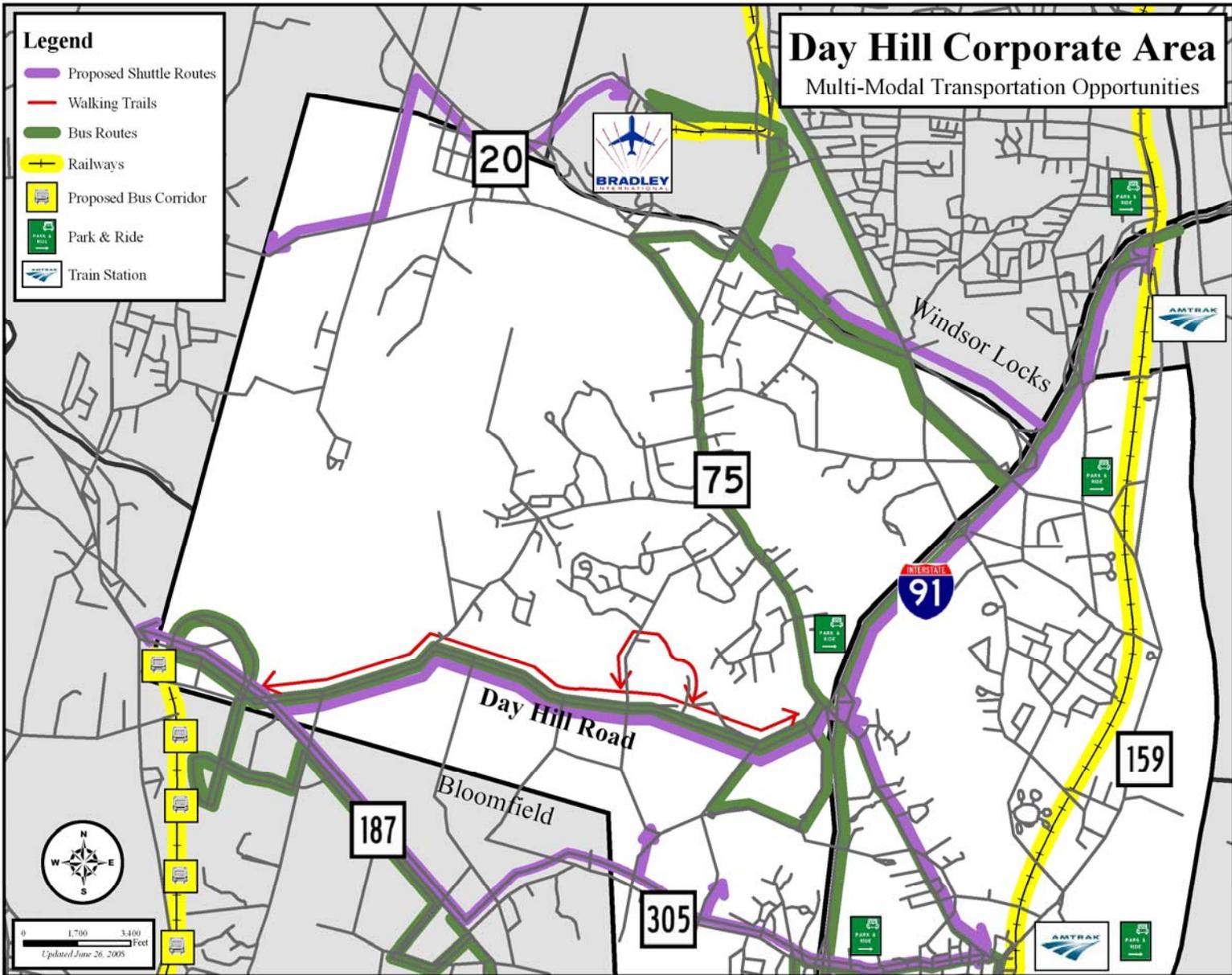
Recognizing that the Griffin Busway is not financially feasible at this time, CRCOG is conducting a broader Northwest Transit Corridor Study, which is intended to: develop strategies to build transit ridership in the Griffin Corridor, the DHCA and between Bradley Airport and Union Station in Hartford; ensure the viability of Union Station as a busway terminus; and examine downtown Hartford transit circulation/transfer patterns to ensure that riders can reach their destinations. Building public transit capacity and other traffic demand management (TDM) strategies will play a vital role in extending the development potential of the DHCA beyond our ability to physically or financially expand traffic capacity through roadway improvements.

In order for any multi-modal transit system to be effective, it must be convenient and easily accessed by its users (see sidebar). With few exceptions, most roads within the DHCA lack sidewalks, discouraging employees from walking, jogging or biking between bus stops and work; walking to a nearby restaurant; or simply walking for recreation during lunch breaks. During pleasant weather, DHCA roadsides are dotted with employees avoiding cars and trucks as they walk, jog or bike along the shoulders. Even during winter months, hardier employees will venture out despite piles of snow filling the shoulders of roads, forcing them into the travel lanes.

### The Last Quarter-Mile

There is an established axiom in the telecommunications industry that a network is only as good as the last mile, meaning that investment in a state-of-the-art network backbone can be wasted if the connections to the end users are slow and antiquated. The same axiom can be applied to the last quarter-mile of a multi-modal transportation network (the practical limit that a typical commuter will walk). If commuters cannot get to and from the system easily, the system will not be used effectively and investments in infrastructure and equipment may be wasted.

Because a transit system cannot effectively provide door-to-door service to every home or business, extensive pedestrian and bicycle facilities must be used to close the last quarter-mile gap in the transportation network and amenities such as bus shelters, bicycle racks, and commuter parking lots must be integrated into the system for the comfort and convenience of its riders.



A system of sidewalks and trails is needed throughout the DHCA to provide a safe location for commuters and others to walk, jog or bike if we are to separate employees from their cars. To enhance recreation opportunities, this sidewalk/trail system should be linked wherever possible with a townwide system of open space greenways and trails (see Chapter 4), allowing residents of surrounding areas to enjoy the trail system in the relative quiet of the corridor after hours and on weekends. Ideally, the trail should be between eight and twelve feet wide and may be paved with bituminous concrete (or stone dust or other form of porous pavement, depending on its location and seasonal use). Once planned, the trail can be implemented piecemeal as new development occurs by requiring a trail segment as part of a site plan approval or even major site plan revisions. Existing employers can be asked to voluntarily participate by providing a trail segment or equivalent funding for the benefit of their employees in much the same way that Combustion Engineering did along the south side of Day Hill Road between Blue Hills Avenue and their credit union.

#### **Strategies for Promoting Multi-Modal Transportation Options**

7. Continue to pursue multi-modal transportation initiatives including integrated bus and commuter rail service.
8. Construct a sidewalk and trail system for the DHCA to provide a safe alternative to using roads and tie into a townwide trail system.
9. Require trail segments for new developments where appropriate as part of the site plan approval process and request current employers within the DHCA to provide or contribute rights-of-way and/or funds towards trail segments to help complete the network.

## Maximize Revenue Potential

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TDM, mass transit, and physical road improvements are not the only means of preserving or extending traffic capacity. Changes in land uses utilizing the road network can also significantly impact the amount of traffic in the DHCA.

Not surprisingly, an analysis of tax revenue in the DHCA revealed that offices generate almost twice the taxes per square foot than warehouses and nearly 20 percent more than manufacturing. However, given that available land is abundant and traffic capacity is the more limiting factor with capacity improvements costing significant tax dollars, pursuing a high proportion of office space may not be the best way to maximize tax revenue.

As the following table illustrates, offices generate more than twice the peak-hour traffic of manufacturing uses and nearly four times that of warehouse uses. Because of this, manufacturing and warehouse space can generate twice the tax revenue of office space within the available traffic capacity, while minimizing capacity improvements. There may be other uses such as hotels and recreational uses that produce significant revenue while generating a significant portion of their traffic during off-peak hours, or in the case of hotels, practicing traffic demand management by providing shuttle bus service for guests to nearby major employers such as Travelers, ING and The Hartford.

Use	Mean Taxes Per Square Foot	AM Peak Trips Per Square Foot	Taxes Per AM Peak Trip	Tax Ratio Per AM Peak Trip Relative to Office	Tax Ratio Per Sq. ft. Relative to Office
Data Center	\$10.58	NA	NA	NA	\$5.71
Hotel	\$2.64	NA	NA	NA	\$1.42
Office	\$1.86	0.00222	\$835.59	\$1.00	\$1.00
Manufacturing	\$1.51	0.00092	\$1,636.67	\$1.96	\$0.81
Warehouse	\$0.96	0.00057	\$1,684.51	\$2.02	\$0.52
Other	\$1.57	NA	NA	NA	\$0.85

Source: Windsor Assessor's Office, Institute of Traffic Engineers Trip Generation Manual

Windsor should cautiously place more emphasis on manufacturing, research and development facilities and small-scale warehouse uses in appropriate locations, especially those that are more likely to experience traffic congestion in the future. One reason for caution with this strategy is that if Windsor curtails office development to optimize tax revenue relative to traffic capacity but surrounding towns using Windsor's industrial roads to access 1-91 do not adhere to this policy, they could continue to develop office buildings, using up Windsor's road capacity at a high rate. As a result, Windsor could end up with warehouses, traffic congestion and increased road maintenance while surrounding towns end up with office buildings in park-like settings. Because of this, Windsor should not exclusively pursue lower traffic generating uses.

Another reason for caution is that while manufacturing and warehousing generate one-quarter to one-half of the employee trips of an equivalent floor area of office, at least one comprehensive study has shown that heavy truck traffic associated with these uses can have a tremendous negative impact on road maintenance relative to light trucks and passenger vehicles (see sidebar).

The Transportation Research Board's Traffic Capacity Manual has attempted over the years to quantify the capacity impact of truck traffic in terms of passenger car equivalents (PCEs), but numerous studies have shown that these PCEs are understated in many cases due to factors such as the percentage of trucks in the traffic mix, the grade of the road, flow conditions, the number of lanes, and the location of trucks in traffic signal queues (i.e. a heavy truck near the front of the line will significantly reduce the number of vehicles able to make it through the intersection) can all affect the calculation of PCEs. The result is that peak-hour heavy trucks have the potential to significantly impact traffic capacity far beyond the number of passenger and light trucks displaced by their greater length.

As development occurs in either town, Windsor and Bloomfield should work cooperatively with the Connecticut Department of Transportation (ConnDOT) and the State Traffic Commission (STC) to pursue improvements to Bloomfield Avenue, Day Hill Road, Poquonock Avenue and the I-91 interchanges for both towns' mutual benefit.

#### **Strategies for Maximizing Revenue Potential**

10. Carefully consider focusing economic development activity on manufacturing, warehousing and other uses with low- or off-peak traffic demand in appropriate locations where traffic congestion is critical.
11. Windsor and Bloomfield should work cooperatively with the Connecticut Department of Transportation (ConnDOT) and the State Traffic Commission (STC) to pursue improvements to Bloomfield Avenue, Day Hill Road, Poquonock Avenue and the I-91 interchanges for both towns' mutual benefit.

#### **Impact of Truck Traffic**

In 1990, the University of California-Davis studied 1,100 randomly sampled one-mile sections of California highways and created a model of pavement maintenance costs using an integrated database of traffic, weather, pavement and geometric conditions, as well as maintenance costs for the sample sections. The results indicated that each additional heavy truck (per day) would cost an additional \$3.73 per mile of roadway annually for pavement maintenance compared to \$0.04 for each additional light truck or passenger vehicle. Put simply, each additional heavy truck added to the traffic stream has a roadway maintenance impact equivalent to over 90 light trucks or passenger vehicles.<sup>1</sup>

<sup>1</sup>Gibby, A. R., Ryuichi Kitamura, Huichun Zhao (1990) Evaluation of Truck Impacts on Pavement Maintenance Costs. *Transportation Research Record* (1262), 48 – 56.

## **Workforce Housing**

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Workforce housing is not just another euphemism to avoid the undeserved stigma of affordable housing. Workforce housing is housing that is affordable to often young, well-educated, entry-level employees who might otherwise choose to leave the state in search of jobs in more affordable metro areas due to the high cost of housing in Connecticut.

According to Home Connecticut, the State's leading proponent of workforce housing, CT is losing a higher percentage of our 25-34 year olds than any other state. Connecticut is also a net-exporter of college students, many of whom never return from college to CT, which is compounded by resident students who take their state subsidized education out of state to work in more affordable areas of the country. These young adults represent the future of our State's economy.

## **Increase the Competitiveness of the Day Hill Corporate Area**

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While the Day Hill Corporate Area is a model for many communities in the Capitol Region to aspire to, the demand for space in the DHCA still lags behind some areas and rents are significantly lower than in comparable locations in towns like Farmington, Glastonbury, Rocky Hill and West Hartford. Despite transportation access unparalleled in the state (three expressways, bus transit service, passenger and freight rail service, and easy access to adjacent Bradley Airport), Windsor's location north of Hartford places several commuting obstacles between the DHCA and the bulk of the region's population (traffic congestion in Hartford to the south, limited Connecticut River crossings to the east, and the Metacomet Ridge to the West. Unless a company's executives or employee base live generally north of Hartford, relocating a Connecticut company to Windsor can be difficult without leaving behind employees unwilling to relocate with their company or face a long commute. Another factor that may contribute to the rental disparity is a lack of ancillary services such as convenience retail and restaurants to meet the needs of employers and their employees within the DHCA, something that towns like West Hartford and Rocky Hill have in abundance.

### **Provide a Variety of Housing Opportunities**

To attract and retain a skilled labor force to meet the needs of existing and prospective businesses, Windsor must provide an array of quality housing opportunities that are attractive to everyone from corporate executives to entry level employees. At the same time, we do not want to promote suburban sprawl that consumes our remaining farmland and open spaces in existing neighborhoods, nor do we want to create isolated enclaves of high-density housing with little or no social fabric or sense of community. One strategy offers the potential to provide a variety of workforce housing in a vibrant mixed-use setting that appeals to residents of all ages and provides some of the needed ancillary services within the DHCA, all while minimizing sprawl and the resulting traffic congestion.

Traditional Neighborhood Design (TND) is a design philosophy that combines the best aspects of a traditional mixed-use village like Windsor Center with the modern realities of stricter codes and an automobile-oriented society. By mixing land uses in close proximity, mitigating potential conflicts between uses and placing emphasis on pedestrians, TND can:

- significantly reduce dependency on automobiles;
- promote a healthier, greener lifestyle;
- accommodate higher densities in attractive settings;
- provide a captive market or critical mass of residents to support retail/service establishments; and
- allow residents to live within walking distance of employment, shopping, dining and more.

In order for TND to be successful, it must be comprehensively planned to:

- ensure the appropriate location and mix of uses;
- mitigate both internal and external land use conflicts;
- provide an orderly transition between higher and lower intensity uses and/or residential densities;
- ensure an efficient transportation network that manages access to major arterials and accommodates pedestrians, mass transit, and private motor vehicles;
- provide for the meaningful arrangement of open spaces and more heavily utilized public spaces; and
- provide varied, yet cohesive architectural and landscape designs that create a vibrant sense of place.

By implementing TND in one or more of the larger undeveloped areas along Day Hill Road, Windsor can meet the demand for workforce housing with minimal increases in traffic by placing employee housing within walking or biking distance of employers (or a bus route) and/or by allowing residents to commute to jobs outside of the DHCA, creating a reverse peak-hour traffic flow using underutilized travel lanes into and out of the area.

Like active-adult development, traditional neighborhood design is not for everyone. Its recurring themes of mixed-uses, back alley garages, prominent front porches and common spaces are often criticized as social engineering, and a single-family house on a large lot remains the “American dream” for many. Despite this, TND has been very successful in communities around the country as many people find various aspects of the lifestyle attractive.

An ideal TND development in the DHCA might consist of the following:

- one or more boulevard-style main streets that limit curb and median cuts along Day Hill Road to maximize traffic flow;
- corporate office and mixed-commercial development along Day Hill Road, accessed from the rear by an internal road system and offering needed ancillary services to area businesses and their employees;
- a mixed-use core consisting of ground floor retail, services and restaurants, with two or three upper floors of professional offices and residences, perhaps served by concealed structured parking to the rear;
- a succession of high-density mid-rise to moderate-density single-family detached housing radiating out from the mixed use core and away from the corporate and mixed-commercial development along Day Hill Road;
- a network of public spaces and small parks in developed areas linked to open space greenbelts separating less compatible uses as well as along waterfronts, steep ravines and other sensitive natural areas;
- a network of sidewalks and trails connecting residents with employment areas, transit stops, shopping and recreation facilities.

The true elegance of this TND strategy lies in its ability to simultaneously achieve housing and transportation goals while preserving open space and community character in other areas of Windsor. Chapters 4 and 5 recommend expanding transfers of residential density between agricultural and residential properties to include transfers to non-residential

### **Is Density a Bad Word?**

An informal visual preference survey of 30 public workshop participants in January 2008 found that four out of the five most preferred residential views in the survey had densities of over five units per acre, with the highest preference score given to a 24 unit per acre apartment complex (see Washington, DC photo on opposite page). Ironically, a traditional neighborhood design of detached homes at half of that density (12 units per acre) received the lowest score due to appearing overcrowded and unsafe.

On the commercial/industrial side, four of the five top scoring views were pedestrian-friendly, mixed-use and “Main Street” type developments, outscoring several attractive signature buildings. The lowest scoring view was a relatively high-quality, though ubiquitous strip commercial development. The conclusion arrived at among participants was that good design can overcome preconceived negative notions about high residential densities and mixed-use development, but that bad design produces negative impressions at any density.

## **Land Use and Traffic**

Different land uses vary significantly in the amount of traffic that they generate and when they generate the most or reach their peak demand. Traffic engineers are most concerned with the periods known as weekday A.M. and P.M. peak-hours, when most people are commuting to and from work and traffic congestion is typically at its worst.

Restaurants and retail stores can be two of the most intense land uses in terms of traffic generation. For example, grocery stores have the double impact of up to 12 trips per 1,000 square feet during the P.M. peak-hour combined with floor areas as large as 60,000 to 70,000 square feet or more, for a potential impact of 720 to 840 P.M. peak-hour trips.

While significantly smaller in floor area, fast-food restaurants with drive-through windows such as coffee, donut or bagel shops can generate more than 70 A.M. peak-hour trips per 1,000 square feet of floor area or more than 40 times the traffic per square foot of office development.

properties, possibly under different ownership, thus directing development away from active farmland and preserving open space in established residential neighborhoods. To continue the present practice of keeping transfers of residential density on a unit-for-unit basis offers little incentive to developers looking to reduce the cost of workforce housing through increased density if they must purchase equivalent residential density elsewhere in Windsor. However, automatically allowing significantly higher residential densities in industrial zones than those already permitted in actual residential zones through the design development process would be not only inequitable but possibly counterproductive. The TND master planning process (perhaps also regulated through the design development process) should include layers of density incentives to achieve numerous community goals. Transfers of residential density to the DHCA or even Windsor Center could receive additional density bonuses if the developer:

- protects active farmland and/or prime agricultural soils elsewhere in Windsor;
- provides workforce housing in the DHCA;
- supports mass transit initiatives such as the Griffin Busway or Springfield-New Haven Commuter Rail project;
- creates vertically mixed-use development that allows for shared parking and reduced dependency on automobiles;
- builds structured parking that provides reduced impervious coverage and other benefits; and/or
- creates or enhances a critical mass of residents living within walking distance of local businesses, thus creating more vibrant villages.

## **Provide Ancillary Goods and Services**

Despite the abundance of available land in the DHCA, Windsor must resist the urge to allow significant amounts of commercial retail development that could become traffic destinations in their own right and compete for limited traffic capacity. Retail and restaurant developments are among the most intense traffic generators of any land use (see sidebar). While a significant portion of the traffic to and from these developments could be drive-by traffic that is already on the road, additional traffic lights and the friction caused by high volumes of cars entering and exiting the flow of traffic can increase congestion.

**Kentlands, MD**



**Beaufort, SC**



**Washington, DC**

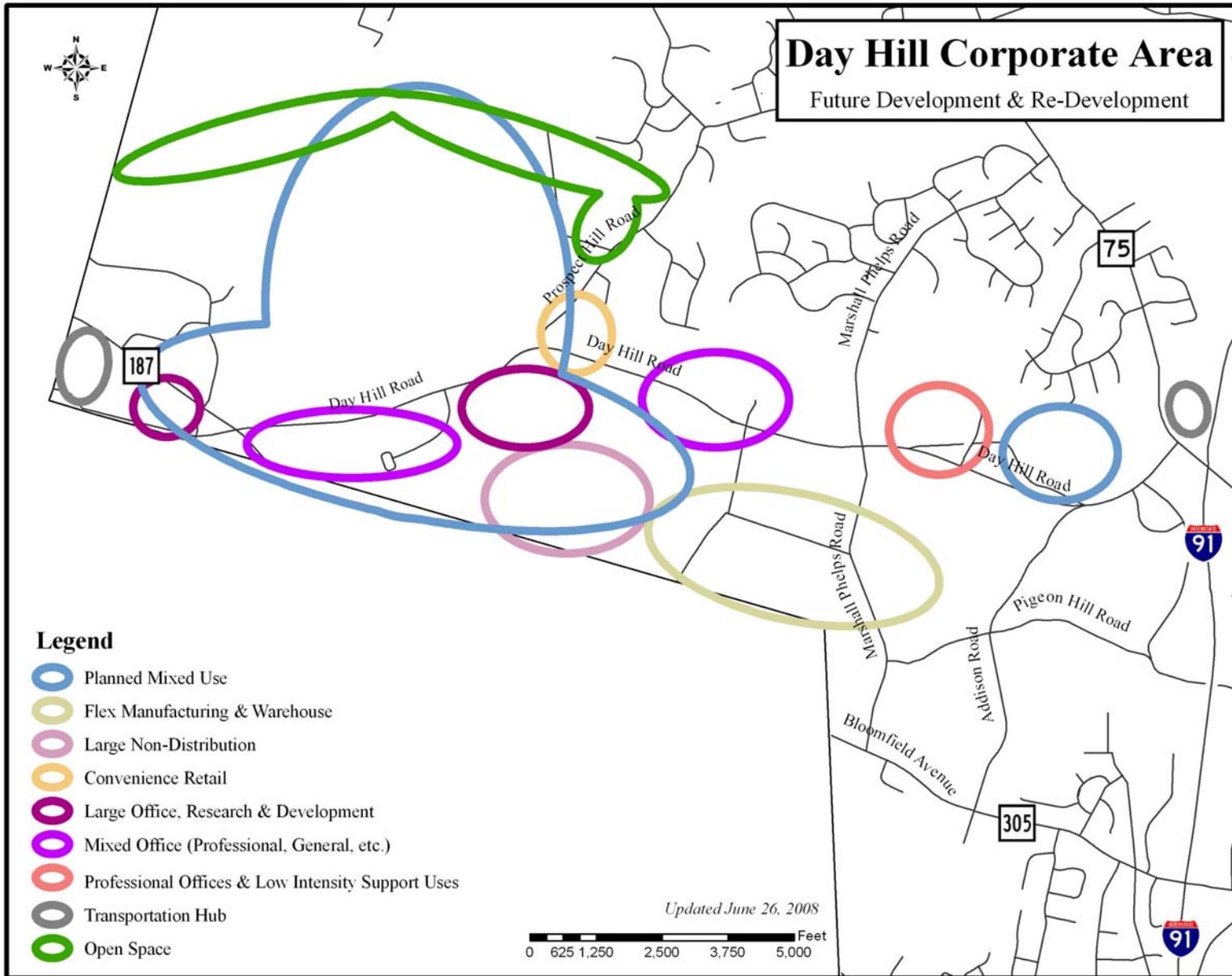


Regardless of the traffic implications, the DHCA still needs to provide retail, restaurant and service establishments to meet the expectations of current and prospective employers and their employees and put the DHCA on even footing with competing employment centers. To balance the need for basic goods and services with the need to protect traffic capacity, retail commercial development should be limited to establishments that provide ancillary goods and services that meet the daily needs of DHCA employers and their employees. These might include: office supplies, postal/shipping/copy services, banking, specialty goods (e.g., cards/gifts, prescription drugs, flowers, jewelry, books), convenience food/goods, personal services (e.g., barber/salon, fitness, dry cleaning, tailor/shoe repair, travel planning), day care, computer sales/service, and professional services (e.g., accounting, engineering, medical), some of which already exist in the DHCA. In addition to these ancillary uses, limited neighborhood commercial developments serving residents in or adjacent to the DHCA might include stores such as a small/specialty grocer, a video store, a liquor store, a bakery, a hardware store, etc. Together, these ancillary and neighborhood commercial establishments could meet the daily needs of employers, employees and neighboring residents without becoming a significant weekday draw to customers outside of the DHCA.

Once ancillary and neighborhood commercial development is in place, either as part of a TND or stand-alone development, opportunities for additional carefully planned residential development could arise, taking advantage of and perhaps contributing to the amenities that these developments offer, provided that they do not preclude future industrial development on adjacent land. Suggested future land uses designed to maintain/increase the competitiveness of the DHCA are shown on the following page.

**Strategies for Increasing the Competitiveness of the Day Hill Corporate Area**

12. Provide a variety of housing opportunities for employees within the DHCA in master-planned mixed-use communities that are compatible with surrounding commercial and industrial development.
13. Provide density incentives for transfers of residential density that achieve desirable community goals such as creating workforce housing, protecting farmland and open space, or creating vibrant residential villages.
14. Provide opportunities for limited ancillary and neighborhood level retail services designed to attract, retain, and meet the daily needs of employers, employees, and residents in and around the DHCA, preferably as part of master-planned mixed-use developments.
15. Provide opportunities for additional housing that creates mutually beneficial relationships with adjacent mixed-use and stand-alone retail commercial developments.



## **Rezone Excess Industrial Land**

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If the comprehensive traffic study of the Day Hill Corporate Area (DHCA) recommended earlier in this chapter reveals a point of diminishing return on infrastructure investment, where the cost of infrastructure improvements exceeds the tax revenue benefits, there will be a surplus of industrial land. In this instance, the least desirable industrial land (or most suitable for alternative uses) should be rezoned with emphasis on preserving traffic capacity and limiting future transportation expenditures.

Much of the vacant land within the DHCA is currently under cultivation or contains remnants of shade tobacco production that would facilitate their use if the fortunes of that industry improve again or if local food production becomes a priority in the face of rising energy prices. Rezoning these areas to the agricultural AG Zone would be logical since they are already being put to productive use and would also help to preserve agricultural activities as recommended in Chapter 5.

Residential use is another alternative to industrial zoning, but attempts to rezone would have to be carefully considered so that when housing becomes established, new residents do not oppose the continued industrial development of adjacent areas. As mentioned during the discussion of traditional neighborhood design developments, residential development can have a twofold impact on traffic patterns in the DHCA. Considering that the most critical movements of traffic are the A.M. peak-hour commute into the area and the P.M. peak-hour commute out, residential uses could create a reverse traffic flow during these times, using relatively underutilized travel lanes. Better still, residents might also live and work in the area, requiring only a short commute, bicycle ride or walk to work. Higher-density multi-family housing might be used as a buffer between higher intensity commercial/industrial uses and the single-family developments that surround the area.

### **Strategies for Rezoning Excess Industrial Land**

16. If a comprehensive traffic study determines that traffic capacity will limit the full potential of industrial zoned land within the DHCA, consider rezoning actively farmed land that exceeds anticipated traffic capacity to the AG Zone.
17. If a comprehensive traffic study determines that traffic capacity will limit the full potential of industrial zoned land within the DHCA, carefully consider rezoning to residential use where appropriate and encourage revenue positive housing such as active adult housing.

## **Maintain Quality Corporate Image**

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Contributing to the Day Hill Corporate Area's image as one of the premier business locations in the region is the quality of development that has occurred along Day Hill Road. While many towns have settled for ubiquitous metal buildings that have set the tone for all development to follow, Windsor has tried to maintain a higher standard, insisting on quality designs and materials, especially along the frontage of Day Hill Road.

As the nation and region continue to shift towards a service based economy and warehousing becomes more prevalent, maintaining high architectural standards along Day Hill Road will remain a challenge. Warehousing and manufacturing buildings often require utilitarian designs with long high walls and few or no windows. Allowing such buildings to be built along the frontage of Day Hill Road will undermine future attempts to attract quality office development to the Day Hill Road corridor.

To maintain a quality corporate image, the plan recommended in 2004 that a Day Hill Road Overlay District be created to limit the frontage of Day Hill Road to corporate office development within 500 feet of the road. The less visible areas to the rear and elsewhere within the Day Hill Corporate Area would remain open to manufacturing and warehousing facilities where the architectural standards need not be as stringent. Changes were made to the Zoning Regulations to this effect without creating an actual overlay zone. The effectiveness of these amendments should be monitored to determine whether a more comprehensive overlay district needs to be created.

An added benefit of this strategy is that office development, while not prohibited in other areas, will tend to locate along the frontage of Day Hill Road, creating an artificial limit on office development, which has significantly higher traffic generation rates than warehousing and manufacturing. The result is that a limited amount of high-quality office development will be concentrated in the most appropriate location.

Mixed use developments recommended on page 10-20 will have their own specific standards governing retail, office, residential and other uses. These will likely supersede the architectural requirements currently in place within 500 feet of Day Hill Road.

### **Strategy for Maintaining Quality Corporate Image**

18. Monitor the effectiveness of current development standards within 500 feet of Day Hill Road to determine whether a Day Hill Road Office Overlay District is still needed to foster high-quality corporate office development in this area.