APPENDIX 3

TOWN OF WELLESLEY SUSTAINABLE ENERGY PLAN

EFFICIENT TRANSPORTATION

Transportation, which accounts for 36% of GHG emissions in Wellesley, must be addressed by the climate action plan. There are two primary ways to reduce transportation energy use and emissions:

- Reduce the number of miles driven by all motorized vehicles
- Reduce the emissions for each mile traveled

We can *reduce miles driven* by leaving a car at home for some trips and, instead, walking, bicycling, car-pooling or taking public transport. Reducing vehicle miles traveled (VMT) benefits everyone. Money, time and effort spent on public transport and walking or biking benefits those who remain in their cars through decreased congestion on the roads.

We can *reduce emissions* from a vehicle by driving more economically, keeping the vehicle well-maintained, and when replacing a vehicle, choosing the most fuel-efficient one that meets needs. Hybrid gasoline-electric vehicles are one option, as is choosing the most fuel efficient conventional vehicle within a class, or considering the next smaller class of vehicle.

If all Wellesley residents and businesses were to undertake these actions, the greenhouse gas emissions due to transportation could be reduced dramatically. For instance, if everyone eliminated 1 in 10 single-driver car trips (think of car pooling or telecommuting one day a week) and chose a 30% more fuel efficient vehicle when time for replacement, GHG emissions from transportation would be 20% lower by 2013 and 40% lower by 2020.[1]

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[1] Emissions reduced 20% by 2013 and 40% by 2020.
Assumptions:

- Vehicles are replaced every 8 years with vehicles that have 30% lower emissions. For example, the average reduction through the Car Allowance Rebate System ("Cash for Clunkers" program) in GHG emissions per mile traveled was 36%. http://www.cars.gov/files/reports/summary-statistics.pdf
- Zero population growth. The Comprehensive Plan Update quotes MISER projecting a 0.44% yearly population decline and MAPC projecting a 0.47% yearly population increase from 2000 to 2020.
- In town traffic component of motorized vehicle trips (i.e. VMT within Wellesley) reduces 10% by 2013 and stays fixed afterwards.

A more conservative set of assumptions (replacement vehicle efficiency is 15% better, and only 5% of single occupant trips are eliminated) reaches a 10% reduction target for transporation GHG emissions by 2013 and a 20% reduction by 2020.

If a commuter switched from a single occupancy vehicle to public transport, their yearly GHG emissions would be reduced by up to 4800 pounds of CO_2 equivalents, or about 12% of a Wellesley resident's climate change footprint.[2]

In the 2007-2017 Comprehensive Plan Update considerable thought and discussion went into the chapter on transportation issues.[3] Many of the goals of the Comprehensive Plan are consistent with reducing greenhouse gas emissions. Specifically, the plan aims to reduce traffic volume and encourage alternative means of transportation. Many of the recommendations in this report are drawn from or reinforce recommendations targeting these goals from the Comprehensive Plan.

The question is not whether such reductions are possible, but what actions we as a community can take to encourage residents, businesses and organizations to reduce our transportation-related GHG emissions. The highest impact measures form the recommendations below.

Improve Vehicle Efficiency of Operation

Improving vehicle efficiency is something that everyone who owns or operates a vehicle in Wellesley can do. Significant GHG emission reductions are possible with little or no inconvenience or behavior change.

When it is time to purchase a replacement vehicle, choosing the one with the least fuel consumption can have a significant effect. When given a choice, one should replace the highest consuming vehicle with a more efficient one.[4] Hybrid electric vehicles may be a

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[2] Switching from car to public transport reduces individual carbon footprint 12%.
Assumptions:

- Single occupancy 20 mile round trip commute switched to existing public transport infrastructure saves about 4,800 pounds of e-CO_2 per year. (See *Public Transport's Contribution to U.S. Greenhouse Gas Reduction*, September 2007. http://www.apta.com/resources/reportsandpublications/Documents/climate_change.pdf)
- Wellesley e-CO_2 emissions per resident is approximately 17 tons or 38,000 pounds per year.

[3] *Town of Wellesley. Comprehensive Plan Update 2007–2017*, Chapter 9. http://www.ci.wellesley.ma.us/pages/FOV1-0001FDAB/draftfinal

[4] MPG is the standard unit of fuel consumption in the U.S., but it can be misleading. For instance, replacing a 10 MPG vehicle with one getting 15 MPG saves more fuel than doubling fuel efficiency from 25 to 50 mpg.

	Miles per Gallon	MPG Increase	Gallons per 100 Miles	Gallons Saved per 100 Miles
Old SUV	10		10	
New SUV	15	5	6.7	3.3
Old Car	25		4	
New Car	50	25	2	2.0

good choice, but if funds are limited, a smaller class of vehicle will save both purchase price and operating costs.

For both existing and new vehicles, an immediate improvement in efficiency can be gained by regularly maintaining vehicles (including properly inflating tires), using fuel-saving driving techniques, and using the most fuel efficient vehicle in the family for most trips.

Of course the greatest savings occur when combining efficient operation with a reduction in vehicle miles traveled (VMT).

Recommendations

- Encourage residents and business to purchase more efficient vehicles and to use vehicles more efficiently. Through the outreach efforts described in Appendix 4, educate town residents on the climate benefit and cost savings of choosing more efficient vehicles and driving more efficiently.
- Advocate for tax changes to encourage more efficient vehicles, for instance via higher gasoline taxes or a graduated revenue-neutral excise tax based on a vehicle's EPA carbon footprint.[5]
- Establish a municipal vehicle purchase and use policy, including a vehicle replacement policy that strives to purchase the most efficient practical vehicle appropriate to need; education on efficient driving techniques; and attention to maintenance. Investigate the applicability of alternative fuel vehicles (LPG, CNG, plug-in hybrid and all-electric vehicles) to municipal needs. All these actions can serve as models for the wider Wellesley community.

- Encourage compliance with Massachusetts' anti-idling law by working with businesses to post signs reminding customers and vendors of the anti-idling law, and by outreach and education. A good start has been made with the Town government, especially the schools, in education on reducing idling.

Increase Public Transport and Ridesharing

Public transport and ridesharing are key elements in reducing greenhouse gas emissions. Wellesley benefits from excellent public transport options to and from Boston with three commuter rail stations within the town and the "T" stations at Woodland and Riverside. The Riverside bus station provides additional public transport options. However public transport within the town and to neighboring towns is limited. The MetroWest Regional Transport Association (MWRTA) bus has a route that runs from the Woodland station to the Natick / Framingham mall area with stops on Cedar St. and Overbrook Dr. in Wellesley.

Some of the gaps are filled by a variety of independent, mostly uncoordinated, services. Door-to-door transport is provided by the MBTA's "The Ride" (for the disabled) and the Wellesley Council on Aging minibus service. Babson, MassBay, and Wellesley colleges provide shuttle services for their students to locations such as Cambridge / Boston,

[5] The *fueleconomy.gov* data for vehicles sold in the U.S. calculates the carbon footprint in tons of e-CO_2 for the fuel cycle (extraction, production, delivery and use in the vehicle). It does not include the vehicle production and disposal cycle. http://www.fueleconomy.gov/

Framingham / Natick, the Woodland or Riverside T stations, and within Wellesley. During the holiday shopping season, the Wellesley Chamber of Commerce operates the Holley Trolley to take shoppers to Wellesley center.

The school bus system is an important component of the Wellesley transportation mix. Multiple high school, middle school and elementary school routes are offered. Those living less than 2 miles from school, or in 7th or higher grade, must pay a yearly fee of several hundred dollars to use the bus.[6] The 2009-2010 school year saw the beginning of construction of the new high school, and the elimination of student parking during construction. In response to this, the Town increased the number of high school buses, provided a more convenient schedule and decreased fees from $473 to $250. Budget pressure for FY2011 has reduced the number of high school buses and raised the fees planned for next school year.

Given Wellesley's suburban setting and the fact that many town residents or employees commute between low density communities, ridesharing or carpooling may be more convenient than public transport in many cases. Many of the same initiatives that support increased usage of public transport also encourage ridesharing.

Recommendations

- Add MWRTA bus stops within Wellesley by joining the MWRTA. This could connect Wellesley more easily to the Woodland T station and the Natick / Framingham mall and business area.
- Improve school bus ridership by re-examining bus rate structure and schedule, and the WHS student parking policy and fees. School bus planning and budgeting should also consider GHG reductions and congestion reduction. The experiences during the beginning of the WHS construction project and corresponding improved high school bus service should be studied.
- Continue and expand planning actions that promote public transport. These include continuing "smart growth" zoning that provides higher density residential development within walking distance of commuter rail stations; and investigating new concepts such as a bus / high occupancy vehicle (HOV) lane on Route 16 during morning and evening rush hour which would promote carpooling and make bus service more convenient.
- Promote ridesharing and public transport by local employers and colleges. Encourage businesses, colleges and town offices to adopt commuter-friendly policies[7] such as "emergency ride home", covered bicycle racks and preferential parking for carpools. Employers could offer subsidized ZipCar service; Babson and Wellesley colleges already do so for their faculty and staff. Wellesley businesses should be encouraged to join the 128 Business Council[8] which

[6] Approximately 200 elementary school students and 400 middle school students are paying for bus service. (This does not include elementary and middle school students eligible for free transport.) At the high school, 379 students paid for bus transport in the 2009/2010 year—the first year of construction—compared with 266 in the 2008/2009 year. However observations on how many students are actually taking the bus shows a more modest increase.

[7] Best Workplaces for Commuters. http://www.bestworkplaces.org/

[8] "128" Business Council. http://www.128bc.org/

provides member companies with services such as shared shuttle buses, and carpool matching services.

- Develop an in-town bus proposal, as recommended in the 2007-2017 Comprehensive Plan Update[9] and act on its findings. The vision is for a bus that serves employees that live and work in Wellesley or neighboring communities, students in local colleges, high schoolers with after school activities, and residents traveling to and from commuter rail or T stations. To be effective, it is likely that coordination with Town businesses, colleges and neighboring communities will be needed. The study must include cost / benefit analysis encompassing ridership, financial cost, and GHG reduction estimates. Compared to single occupancy car travel, a small minibus or van will typically begin to save GHG emissions if it carries more than two passengers on average. For a typical bus, more than six passengers begins to save on GHG emissions.[10]
- Consider reducing parking requirements in commercial office zoning and apply similar policies for employee parking at Town offices.

Increase Walking and Biking

A town in which adults and children can walk or bike to nearby businesses, schools and activities is an ideal for many people. Nationwide, 24% of trips by adults are less than one mile.[11] Transforming more of these from vehicle trips into walking or biking trips can

[9] *Comprehensive Plan Update*, p136.
http://www.ci.wellesley.ma.us/pages/FOV1-0001FDAB/draftfinal

[10] Single occupancy car GHG emissions are equivalent to two-passenger van or six-passenger bus.
This illustration uses U.S. car average mpg (combined city / highway) and typical city mpg for a van or small bus and a regular bus.

	Miles per Gallon	Pounds e-CO_2 per Mile	Number of Riders	Pounds e-CO_2 per Rider-Mile
Car	22	0.93	1	0.93
Van / Small bus	10	2.04	2	1.02
Bus (diesel)	4	5.84	6	0.97

This conclusion is consistent with the following data on actual public transit emissions per-rider.

	Pounds CO_2 per Passenger-Mile
Bus	0.24
Transit rail	0.37
Intercity rail	0.41
Car and light truck (single occupancy)	1.01

(See: *Household Emissions Calculator Frequent Questions,* Nov 2009,
http://www.epa.gov/climate/climatechange/emissions/ind_calc_faq.html#publictransit
and *Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle*, Feb 2005.
http://www.epa.gov/OMS/climate/420f05004.htm)

[11] *The 'Carbon Footprint' of Daily Travel. National Household Travel Survey,* March 2009.
http://nhts.ornl.gov/briefs/Carbon%20Footprint%20of%20Travel.pdf

improve the quality of life as well as help the global environment. Further, money spent to make walking and biking routes safe and convenient benefits car drivers too, since fewer cars on the road means less congestion.

Wellesley already has many of the requirements for creating a walkable / bikable infrastructure along with some notable problem areas. Most Wellesley main streets are wide and have sidewalks; most side streets are relatively quiet and many of them have sidewalks. The trail system, a Wellesley gem, interconnects many areas of the town. On the other hand, Route 9, with its 50 mph speed limit and limited pedestrian crossing points, has been identified as a major impediment. Further, there are many minor "cut through" roads that have high traffic flow and are challenging to walk or bike on.

The MassHighway Development and Design Guide[12] is a nationally recognized, award-winning specification that includes many design elements to improve the safety of pedestrian and cyclists. The Wellesley Planning Department has incorporated the guide in its development standards and uses it "when and where appropriate" in street design and reconstruction.

Recommendations

- Complete the work of the Walkways Task Force, including submission of a comprehensive Pedestrian Plan with recommendations specific to Wellesley's unique conditions and trouble spots. The task force has done an excellent job of gathering resident input; the Town should continue and complete this effort. Particular attention is needed to the Route 9 corridor and busy cut-through side-streets.
- Create a Bicycle Task Force comprising residents with an interest in bicycling and representatives from relevant Town departments such as Planning, Public Works and Wellesley Police. The charter of this group would be to document bicycling needs and recommend improvements. Ideas to evaluate might include bike detectors on traffic lights, street and intersection design (including bike lanes), enhancements to the Town trail system for bicycling (in such areas as grading, paving, and street crossings), and covered bicycle parking.
- Recognize and encourage efforts by school communities to improve walking / biking. Efforts are already underway at a grass roots level in the schools to increase the percentage of students that walk to school. Examples include more frequent walk-to-school days, the "walking school bus" concept in many neighborhoods, and efforts to reduce backpack load for students within walking distance of the middle school.
- Formally adopt "Complete Streets" policy by which roads are designed to meet the needs of all users: pedestrians, bicyclists and motor vehicles. These goals are broadly in line with the guidelines of the MassHighway design guide. Adopting this policy and collaborating with the National Complete Streets Coalition,[13] would provide the incentive to more consistently apply good design practice and allow Wellesley to share experiences with other communities.

[12] *Massachusetts Highway Department. Project Development & Design Guide.* 2006. http://www.mhd.state.ma.us/default.asp?pgid=content/designGuide&sid=about

[13] National Complete Streets Coalition. http://www.completestreets.org/

By reinforcing the positive efforts already underway, and ameliorating the problem areas in Wellesley's street system, the goal of a walkable, bikable Wellesley can be achieved.

Cooperate in Regional Transport Planning

A large percentage of travel in Wellesley is to or from other towns, so it is important for the Town to participate actively in regional transport planning groups. These organizations collect valuable data on traffic trends and author planning documents that drive state and local initiatives. Several of these organizations allocate funds for transport related projects. Key organizations include the Metropolitan Area Planning Council (MAPC),[14] the Boston Area Metropolitan Planning Organization (MPO),[15] MassHighway, and the MBTA.

Currently Wellesley's Planning Department has limited resources to devote to these bodies' meetings. We are fortunate that one Town resident volunteers as Wellesley's representative on the MAPC, the Regional Transport Advisory Council of the MPO and the MBTA Advisory Board.

Recommendation

- Participate more actively in regional planning organizations to represent Wellesley interests and cooperate with other towns and cities and state government on regional transport issues that affect Wellesley.

Summary

Reducing greenhouse gas emissions due to transportation is essential if Wellesley is to meet its emissions reduction goal. Because of the way our community and the metrowest region has developed over time, our current transport patterns are hard to change overnight. This plan addresses this challenge by advocating for a balanced approach which combines improving the efficiency of existing road vehicle usage, with improvements in infrastructure to move a proportion of private motor vehicle trips to walking, biking, shared rides and public transport. Many of the elements are self-funding and have long term positive economic paybacks through reduced fuel costs and reduced dependence on foreign fossil fuel supplies. Other elements improve livability and desirability so that Wellesley can continue to be an attractive community.

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[14] http://www.mapc.org/

[15] http://www.ctps.org/bostonmpo/index.html