

6.1 – Highland Park Today

The Borough

New Jersey, as the most densely populated State in the nation, contains about 1,134 people per square mile, compared to 79 people per square mile nationwide (U.S. Census 2000). Middlesex County has more than 750,000 residents or about 9 percent of the State population of 8.6 million (U.S. Census, 2000). With a relatively small population of 13,999 residents and few medium and large commercial enterprises, the Borough of Highland Park suffers from a disproportionate amount of traffic congestion induced by its larger municipal neighbors.

The Borough of Highland Park, as a primarily a residential community, sees few local traffic generators of its own. Traffic volumes are heaviest along State Highway 27, known locally as Raritan Avenue. State Highway 27 is a conduit for traffic destined for downtown New Brunswick to the south and the Borough of Metuchen to the north.

Three bus routes serve Highland Park, operating through the central business district on Raritan Avenue and along River Road and Cedar Lane. A total of 33 bus stops are designated within the Borough the primary concentration along Raritan Avenue (NJ TRANSIT (a), 2004). There are two bus shelters that accommodate transit users in the New Brunswick-bound direction.

NJ Transit bus route #810 serves New Brunswick, Highland Park, Edison, Metuchen, and Woodbridge, with a final stop at the Woodbridge Center Mall. Service operates on an hourly frequency, seven days per week (NJ TRANSIT (b), 2004)

NJ Transit bus route #814 serves North Brunswick, New Brunswick, Highland Park, and Edison, with a final stop at Middlesex County College. Service to and from Highland Park operates on an hourly frequency on weekdays and hourly service until 1 PM on Saturdays.

Rutgers University campus buses provide service to the Busch Campus in Piscataway and to the College Avenue and Douglas/Cook Campuses in New Brunswick. These routes operate along the southwest border of Highland Park on River Road and Cedar Lane (Rutgers University, 2004).

In New Jersey, development and land use are the purview of municipal government. As such, Highland Park has little influence over development and land use controls instituted elsewhere. This is compounded by the lack of jurisdiction over State Highway 27, its most heavily traveled arteriole. In these and other respects, municipal government is limited in its ability to respond to traffic congestion and the resulting externalities.

Travel Patterns

Data from the U.S. Census Transportation Planning Package identifies the current modal split of Highland Park residents traveling to work (U.S. Census, 2000). Although the percentages for Highland Park are generally consistent with the travel behavior of New Jersey and Middlesex County residents, the data indicates that slightly lower percentages of Highland Park residents drive alone or carpool and slightly higher percentages of residents

take public transit, walk to work or travel by other means. The mean travel time to work for Highland Park residents is lower than the mean travel time for Middlesex County or New Jersey residents.

Exhibit 6.1 – Commuting to Work – Modal Split			
Workers 16 years and over	New Jersey	Middlesex County	Highland Park
Car, truck, or van – drove alone	73.0%	74.4%	72.5%
Car, truck, or van – carpooled	10.6%	11.1%	8.9%
Public transportation (including taxicab)	9.6%	8.7%	10.9%
Walked	3.1%	2.8%	3.9%
Other means	0.9%	0.9%	1.2%
Worked at home	2.7%	2.1%	2.5%
Mean travel time to work (minutes)	30.0	31.5	28.1

Source: US Census - DP-3. Profile of Selected Economic Characteristics: 2000

6.2 – Employment

According to the 2000 U.S. Census, 7,465 of 13,999 Highland Park residents held jobs. Of the working population, 837 residents (or 11.2 percent) live and work in Highland Park and another 2,694 residents (or 36.1 percent) travel relatively short distances to jobs in New Brunswick, Piscataway, and Edison. The remaining of 3,531 residents travel beyond Highland Park and its environs for employment, accounting for the majority of vehicle miles traveled by Highland Park residents.

Vehicle Miles Traveled

Estimates of vehicle miles traveled (VMT) are used to estimate the amount of air pollution generated by mobile sources. The identification of VMT by destination and trip purpose provides the data needed to develop solutions for reduction of daily VMT and resulting air pollution. Air quality is greatly influenced by regional factors located largely outside the immediate span of influence of an individual municipality. At the same time, air pollution generated by residents and workers in Highland Park will affect regional air quality, not only the air quality within the borough. The entire pollution output from residents must be considered to devise municipal strategies for sustainability.

Pass Through Traffic. A Middlesex County Traffic count conducted in 2003 estimated the all day pass through traffic on Route 27 in Highland Park at 18,383 all day vehicle trips (Middlesex County, 2003). The total distance of Route 27 in Highland Park is estimated at 1.3 miles. Daily VMT generated from pass through traffic is estimated at 23,898 by factoring the 1.3-mile distance by 18,383 all day vehicle trips.

Journey to Work Travel. A weighted matrix for travel distance for Highland Park residents on the journey to work can be viewed in Exhibit 6.2. The VMT estimates for workers coming to the Borough are shown in Exhibit 6.3. For the shorter distance trips both estimates are based on the round trip travel distance from municipal centroids. Travel distance estimates for longer trips are calculated using the average travel time for Highland Park residents and the average highway speed.

Exhibit 6.2 – Highland Park Residential Miles Traveled (Journey to Work)			
Travel Pattern	Residents	Est. Round Trip Commute Distance (Miles)	Daily Commute Miles Traveled
Local Commute	837	2.6	2,176
Short Distance Commute (New Brunswick)	1,103	3.8	4,191
Short Distance Commute (Piscataway)	965	13.4	12,931
Short Distance Commute (Edison)	626	2.4	1,502
Average Long Distance Commute	3,934	51.7	203,388
Total	7,465		224,189

Exhibit 6.3 – Highland Park Worker Miles Traveled (Journey to Work)*			
Travel Pattern	Workers in Highland Park	Est. Round Trip Commute Distance (Miles)	Daily Commute Miles Traveled
Short Distance Commute (New Brunswick)	269	3.8	1,022
Short Distance Commute (Edison)	296	2.4	710
Avg. Long Distance Commute	2,312	51.7	119,530
Total	2,877	-	121,263

*Excludes Highland Park residents who work in Highland Park (shown under Highland Park Residential Miles Traveled to Work)

Vehicle Miles Traveled Adjusted for Modal Split. For the purposes of estimating air pollution, miles traveled to work must be adjusted for modal split. Drive alone commuters have a base pollution output per vehicle mile traveled. In comparison, two-person carpool pollution outputs should be adjusted by one-half to reflect the higher occupancy (as opposed to each occupant driving alone). Bikers and walkers do not contribute to pollution output regardless of how many miles are traveled to work. The modal split for journey to work data can be used to adjust VMT output for both Highland Park residents and workers. Exhibit 6.4 and 6.5 show the estimated VMT for the journey to work. Adjusted for travel distance and modal splits, Highland Park residents generated 179,000 vehicle miles traveled (Exhibit 6.4). Although local residents that commute either within Highland Park or to nearby communities do not generate high levels of VMT, a majority of the borough's residents travel longer distances and drive alone

By contrast workers originating from outside of Highland Park generated 97,066 vehicle miles traveled (adjusted for modal split and travel distance). Similar to the Borough's residents, a majority of the out of town workers travel long distances and driving alone is the predominant travel mode.

In Highland Park, the daily VMT on a typical weekday including residential journey to work, incoming workers to Highland Park, and all day pass-through traffic was estimated at 300 thousand miles (Exhibit 6.6).

Daily VMT provides a basis to calculate air pollution and assess the effectiveness of strategies to reduce VMT and resulting air pollution. Journey to work travel by Highland Park Residents is the most significant source of VMT (approximately 60 percent) and the second highest source of daily VMT was from out of town workers traveling to work Highland Park (approximately 32 percent of VMT generated). By comparison, pass through traffic on Route 27 generates approximately 8 percent of daily VMT.

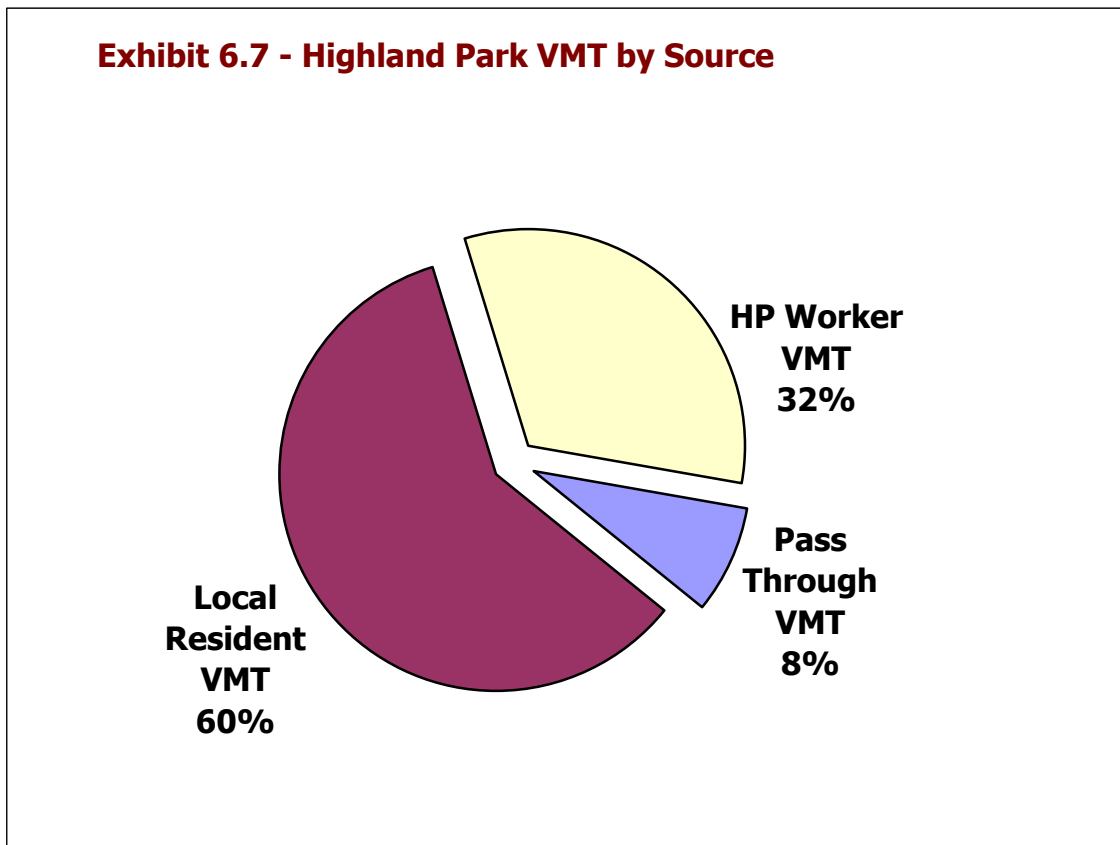
Sustainable transportation solutions for Highland Park should focus on reduction of VMT for longer distance commutes. Reducing VMT for local commutes may be beneficial from a quality-of-life perspective, but would not significantly impact overall VMT.

Exhibit 6.4 – Highland Park Residential VMT (Journey to Work)						
Travel Pattern	Daily Commute Miles Traveled	VMT with Emissions Impact				Est. VMT Adjusted for Modal Split
		Drive Alone	Carpool	Transit	Walk, Bike & Work At Home	
Local Commute (Highland Park to Highland Park)	2,176	1,578	97	9	0	1,685
Short Distance Commute (New Brunswick)	4,191	3,040	187	18	0	3,245
Short Distance Commute (Piscataway)	12,931	9,378	576	56	0	10,010
Short Distance Commute (Edison)	1,502	1,090	67	7	0	1,163
Avg. Long Distance Commute (Highland Park to Outside)	203,388	152,729	9,059	884	0	162,672
Local Resident VMT						178,775

Exhibit 6.5 – Highland Park Worker VMT (Journey to Work)*						
Travel Pattern	Daily Commute Miles Traveled	VMT with Emissions Impact				Est. VMT Adjusted for Modal Split
		Drive Alone	Carpool	Transit	Walk, Bike & Work At Home	
Short Distance Commute (New Brunswick)	1,022	741	46	4	0	791
Short Distance Commute (Edison)	710	515	32	3	0	550
Average Long Distance Commute (Outside Highland Park to Highland Park)	119,530	89,759	5,324	642	0	95,725
Local Resident VMT						97,066

*Excludes Highland Park residents who work in Highland Park (shown under Highland Park Residential VMT)

Exhibit 6.6 – Pass-Through Vehicle Miles Traveled	
Local Resident VMT	178,775
Highland Park Worker VMT	97,066
Pass Through VMT	23,898
Daily VMT	299,739



Pollution Generated

The U.S. Environmental Protection Agency calculated average pollution levels and gasoline consumption per vehicle mile traveled. These averages reflect a broad cross section of vehicle types and may differ markedly from individual vehicles (U.S. EPA, 2004). Estimates of community averages are used for illustrative purposes but may not reflect the actual pollution output.

Daily pollution and fuel consumption estimates are calculated by factoring the VMT estimate by the EPA averages. For estimation purposes, half of the VMT has been attributed to passenger vehicles and half to light trucks. This approximates the typical distribution of sedans and SUVs on the street. Primary air pollutants generated by motor vehicles includes

hydrocarbons, carbon monoxide, oxides of nitrogen and carbon dioxide. A further discussion of the health impacts of these air pollutants can be found in Chapter 3.

Exhibit 6.8 – Estimated Pollution and Gasoline Consumption (Journey to Work)			
Passenger Cars			
VMT	Pollutant	Average Daily Pollution & Fuel Consumption	
149,870	Hydrocarbons	924.3	Pounds of Hydrocarbons
149,870	Carbon Monoxide	6899.3	Pounds of Carbon Monoxide
149,870	Oxides Of Nitrogen	458.9	Pounds of Oxides Of Nitrogen
149,870	Carbon Dioxide	137280.5	Pounds of Carbon Dioxide
149,870	Gasoline	6968.9	Gallons of Gasoline
Light Trucks			
149,870	Hydrocarbons	1158.7	Pounds of Hydrocarbons
149,870	Carbon Monoxide	9144.0	Pounds of Carbon Monoxide
149,870	Oxides Of Nitrogen	597.5	Pounds of Oxides of Nitrogen
149,870	Carbon Dioxide	172,350	Pounds of Carbon Dioxide
149,870	Gasoline	8,707.4	Gallons of Gasoline

6.3 – Recommendations

Strategies to be considered include:

1. Increase ridesharing and transit usage, especially for long distance commuters.
2. Institute a community shuttle to the New Brunswick train station to increase the percentage of long distance commuters that use public transit. This strategy would be effective for both Highland Park residents and workers traveling to the borough.
3. Establish employer based ridesharing efforts and enhanced employer access to public transit.
4. Institute municipal policies and programs that support sustainable transportation and serve as role model for residents, businesses, and other communities

Residential

For purposes of this report, residential transportation shall be defined as transportation from private residences.

Highland Park residents may choose among the following options to pursue a sustainable transportation strategy. Municipal government, non-profit transportation management associations, and public transit officials should also support these resident actions.

Ride Sharing. Ride sharing, also known as carpooling, provides a way for residents to reduce auto usage and the negative externalities associated with driving. An effective carpooling strategy requires knowledge of trip origins and destinations and dissemination of these data to potential users. Highland Park resident activists should use existing web sites such as www.erideshare.com or local ridesharing groups such as Keep Middlesex Moving (www.kmm.org) to solicit ride share partners. Residents may also choose to work with municipal officials to develop an official inventory of resident trip destinations to facilitate the matching of potential ride share partners.

Trip Chaining. In addition to ride sharing, individuals should make a concerted effort to reduce the number of daily trips, particularly cold-start trips from their residence. Trip chaining represents the notion of stringing multiple trip destinations together into one longer trip without returning home multiple times. With advanced planning, individual residents can initiate trip-chaining practices without any type of ride matching or outside coordination.

Vehicle Choice. With the latest generation of alternative fuel and hybrid electric vehicles, residents have more options than ever to choose an efficient and environmentally compatible car. The gradual replacement of a portion of the private vehicle fleet has the potential to reduce fuel consumption and emissions substantially, though the net air quality improvement in Highland Park would be immeasurable. The volume of vehicles passing through and proximity of Highland Park to the New Jersey Turnpike, State Highway Route 1, and other highway corridors overwhelms the incremental improvements resulting from purchase of alternative fuel vehicles.

Vehicle Maintenance. The state of repair of a vehicle corresponds to the pollution output of that vehicle. Vehicles that are poorly maintained emit higher levels of pollutants and leak fluids that contribute to groundwater and stormwater contamination. Residents should rigorously maintain vehicle condition.

Commercial

For purposes of this report, commercial transportation shall be defined as transportation for employees of commercial businesses and industry. While an individual may choose sustainable transportation alternatives, the support of the business community is also necessary. Small businesses account for the preponderance of employment in Highland Park. These types of businesses are usually least able to afford the incentives and programs that larger corporations employ to reduce traffic congestion. Nonetheless, the following sustainable commercial transportation alternatives are presented for consideration.

Work-Based Ride Sharing. In 1990, amendments to the Clean Air Act required companies with more than 100 employees to establish a program to reduce single-occupancy vehicles. This component of the legislation lapsed in the late 1990s, though lessons may be learned from its brief implementation. Many employers designated a coordinator to monitor compliance with the legislative mandate and establish parameters for achieving required Single-Occupant Vehicle reductions. Companies used incentives such as preferential parking, subsidization of auto expenses, and company-sponsored shuttles to encourage employees to reduce reliance on their autos. The company-designated transportation coordinator also matched potential carpoolers.

Flex time. Flexible work hours are another method to reduce traffic congestion during peak travel times. Employers designate a window during which employees may report to work, the notion being that employees will choose the most convenient work hours to avoid traffic and meet family obligations.

Local delivery. Businesses in the retail sector including restaurants, florists, and dry-cleaning businesses often use delivery service to attract customers. In addition to serving a business purpose, product delivery may also be used as a method to reduce home-based discretionary trips. The average U.S. household makes more than eight trips per day, almost all of which are less than five miles. Local delivery by businesses would provide residents with an alternate means for acquiring goods and services, thereby potentially reducing local traffic volumes. Businesses would make multiple deliveries, otherwise known as trip chaining to achieve this.

Bicycle & Pedestrian Facilities. Whereas most traffic reduction strategies for businesses require subsidization or operational accommodations, bicycle and pedestrian facilities offer a low cost alternative to inducing employees to use alternate means for travel to work. The provision of bicycle facilities on company property is a low cost, maintenance-free option that provides benefits to employees and the municipality through reduced traffic congestion. Businesses frequently subsidize parking for employees by offering free parking or acquiring local parking permits at discounted rates. Alternately, businesses can offer the equivalent parking subsidy in credits for purchase of a bicycle.

Municipal

For purposes of this report, municipal transportation shall be defined as transportation services, equipment and infrastructure provided by local government.

Sustainable transportation solutions are best advanced by local government policy. Municipal government may also encourage positive behaviors, acquire environmentally friendly fleet vehicles and install bike and pedestrian facilities. These actions are unlikely, however, to have a measurable impact on overall congestion and environmental quality. The Borough of Highland Park should undertake the following actions to support its sustainable community initiatives.

Community shuttle. Community shuttles are used extensively in northern New Jersey communities to transport residents to rail stations. The shuttles serve a vital alternative to scarce parking and reduce travel time for those too far to walk to public transit.

Municipalities and non-profit organizations also use shuttles to transport seniors to shopping destinations and medical appointments, so there is ample precedent for their implementation exists in Highland Park. Market demand for a shuttle to a local train station was identified in the recent Resident Transportation Study (Keep Middlesex Moving, 2003). Operation of community shuttle creates an ongoing operating expense for the municipality that must be balanced with the potential gains in quality of life issues. Prior proposals have focused on an alternative fueled vehicle to serve as a community shuttle. It is recommended that the fuel platform for a community shuttle should be considered separately (see below) from the issue of shuttle demand. Alternate fueled vehicles large enough to perform shuttle duties are not widely commercially available, may require additional fueling infrastructure, and may have limited duty cycles.

Bus Stop and Shelter Enhancements. Although a number of bus stops are located along Raritan Avenue in the central business district, only two bus stops have shelters. The municipality should inventory the existing stops and work with NJ TRANSIT or a private vendor to add shelters at key locations. These shelters would encourage the use of existing public transit and could also be used by the community shuttle.

Alternative Fuel Vehicles. The availability of alternative fuel vehicles has proliferated in recent years. While not strictly an alternative fuel vehicle, hybrid electric cars have gained wider acceptance in recent years. The durability and versatility of hybrids have made them more popular than their electric and natural gas predecessors and better fuel economy has led to wider adoption with increases in gas prices. Highland Park should examine the feasibility of acquiring hybrid vehicles as existing municipal vehicles become due for replacement. The fuel savings and reduction in pollution output will not dramatically improve local environmental conditions, but will enhance the Borough's image as a sustainable community.

Vehicle Maintenance. Vehicle maintenance is essential to keep vehicle exhaust emissions within acceptable limits and to reduce potential leakage of fuel that would contribute to stormwater and groundwater contamination. Highland Park should undertake a review of municipal vehicle maintenance procedures. The maintenance schedule and repairs should be performed in accordance with manufacturer specifications.

Local Advocacy for Public Transit. The quality of public transit operations depends on strong advocacy for funding. The Transportation Trust Fund (TTF), the source of capital funds for new equipment and transit facilities, is nearly bankrupt, yet state officials have historically been unwilling to raise motor fuel taxes to increase revenues. NJ Transit recently announced a projected operating deficit in 2005 and a potential fare increase. Without maintaining or increasing current funding levels, it remains unlikely that additional investment will be available for local public transit projects or services. Municipal officials should support greater investment in public transit by adopting resolutions and working collaboratively with County and State elected officials.

Land Use Controls. Unlike any other municipal action, land use regulation has the greatest potential to effectuate sustainable transportation solutions. Land use law not only determines how a community will look in the future, but how it will function. For example,

building setbacks and parking ratios determine if a place will be friendly to pedestrians and cyclists. Municipal officials including Planning Board and Zoning Board officials should enforce compliance with the Highland Park Master Plan. Municipal land use ordinances should require pedestrian and bicycle facilities.

6.4 – Useful Links

- U.S. Environmental Protection Agency – Transportation and Air Quality
 - <http://www.epa.gov/otaq/>
- Handi-Hut, Inc – Private Bus Shelter Manufacturer
 - <http://www.handi-hut.com>
- Keep Middlesex Moving – Traffic Reports, Auto Alternatives and Ridesharing
 - <http://www.kmm.org>
- NJ TRANSIT – Bus and Rail Schedules/Routes)
 - <http://www.njtransit.com>
- State of New Jersey – Traffic Reports, Auto Alternatives and Ridesharing
 - <http://www.njcommuter.com>
- eRide-Share – National Database of Rideshare/Carpool Options
 - <http://www.erideshare.com>

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