Vehicle Miles Traveled in Massachusetts:
Who is driving and where are they going?

A presentation to the
House Committee on Global Warming and Climate Change
Representative Frank Smizik, Chair

April 13, 2010

Timothy Reardon
Metropolitan Area Planning Council
• **MAPC**: Regional Planning Agency for 101 cities and towns in Metro Boston [www.mapc.org](http://www.mapc.org)

• **MetroFuture**: Long-range regional plan for growth and development; adopted 2008; includes detailed land use and planning objectives; specific recommendation for public and private sectors. [www.metrofuture.org](http://www.metrofuture.org)

• **MAPC Data Services**: responsible for scenario modeling, population and employment projections

• **Metropolitan Planning Organization (MPO)**: Regional body consisting of state and municipal officials, charged with programming federal transportation funds; MAPC is a voting member of the MPO.
New VMT Data in Massachusetts

16 million Registry of Motor Vehicles inspection records, 2005 - 2007
Processed, geocoded, and analyzed by MassGIS
4 million passenger vehicles
130 million miles travelled DAILY
Nearly 50 billion miles per year
2.3 billion gallons of gas per year (@ 20 MPG)
22 million metric tons of CO2 annually (@ 0.0092 metric tons per gallon)

Who is driving and where are they going?
Driving Patterns—Location Matters

- In 149 cities and towns, the average household drives more than 75 miles per day; these towns comprise 18% of total population, contribute 26% of total VMT.

- 8 Inner Core cities have 16% of population, generate 8% of total VMT.

Daily VMT per Household, by Municipality

- < 25 miles per day
- 25 - 50 miles per day
- 50 - 75 miles per day
- 75 - 100 miles per day
- > 100 miles per day

Source: US Census, MA RMV, MassGIS, MAPC analysis
Massachusetts Community Types

Inner Core
Regional Urban Centers
Maturing Suburbs & Cape Cod Towns
Developing Suburbs
Rural Towns

Source: MAPC analysis
Where Do People Live?

Households per Square Kilometer

- < 100 households
- 100 - 500 households
- 500 – 1,000 households
- 1,000 – 2,500 households
- >2,500 households

<table>
<thead>
<tr>
<th>Type</th>
<th>% of MA Households</th>
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<tbody>
<tr>
<td>Inner Core</td>
<td>22%</td>
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<tr>
<td>Regional Urban Centers</td>
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<tr>
<td>Maturing Suburbs</td>
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<td>25%</td>
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<tr>
<td>Rural Towns</td>
<td>2%</td>
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</tbody>
</table>

Source: US Census, MA RMV, MassGIS, MAPC analysis
Where Do the Vehicles Live?

Registered Vehicles per Square Kilometer

- < 200 vehicles
- 200 – 400 vehicles
- 400 – 1,000 vehicles
- 1,000 - 2,500 vehicles
- > 2,500 vehicles

<table>
<thead>
<tr>
<th>Category</th>
<th>% of MA Households</th>
<th>% of MA Vehicles</th>
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<td>Rural Towns</td>
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<td>2%</td>
</tr>
</tbody>
</table>

Source: US Census, MA RMV, MassGIS, MAPC analysis
How Many Vehicles per Household?

### Registered Vehicles per Household

- **< 1 car per household**
- **1 - 1.5 cars per hh**
- **1.5 - 2 cars per hh**
- **> 2 cars per household**

<table>
<thead>
<tr>
<th></th>
<th>% of MA Households</th>
<th>% of MA Vehicles</th>
<th>Vehicles per Household</th>
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<td>31%</td>
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<td>Rural Towns</td>
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</table>

Source: US Census, MA RMV, MassGIS, MAPC analysis
How Much is Each Vehicle Driving?

Average VMT per Vehicle

- < 30 miles per day
- 30 - 35 miles per day
- 35 - 40 miles per day
- > 40 miles per day

Source: US Census, MA RMV, MassGIS, MAPC analysis
How Much is each Household Driving?

<table>
<thead>
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<th>% of MA Households</th>
<th>% of MA Total VMT</th>
<th>Average VMT per Household</th>
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<tbody>
<tr>
<td>Inner Core</td>
<td>22%</td>
<td>13%</td>
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<td>Regional Urban Centers</td>
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<td>Rural Towns</td>
<td>2%</td>
<td>2%</td>
<td>79</td>
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</table>

Source: US Census, MA RMV, MassGIS, MAPC analysis
Where Are People Working?

Employment Density (jobs per sq. kilometer)

- < 100 jobs per sq km
- 100 – 500 jobs per km
- 500 – 1,000 jobs per km
- > 1,000 jobs per sq km

Source: Dunn & Bradstreet, MassGIS, MAPC analysis
How Much Are Commuters Driving?

Average auto commute distance (round trip)

- < 15 miles
- 15 – 20 miles
- 20 – 25 miles
- 25 – 35 miles
- > 35 miles

Commute Distances and VMT per HH

Source: US Census, MA RMV, MassGIS, MAPC analysis
What About All Those Errands?

Weighted Average Distance, Common Non-Work Trips

- < 1 mile
- 1 - 2 miles
- 2 - 4 miles
- 4 - 8 miles
- > 8 miles

Household Density and Daily VMT

Source: Dunn & Bradstreet, MassGIS, MAPC analysis
Statistical Analysis indicates Household VMT is highly correlated with:

- Density
- Access to Transit
- Distance to Shops and Services
- Proximity to Employment
- Land Use Diversity
- Income
Model explains about half the variance in daily VMT per household.

Source: MA RMV, MassGIS, MAPC analysis
Driving Patterns—Location Matters

- In 149 cities and towns, the average household drives more than 75 miles per day; these towns comprise 18% of total population, contribute 26% of total VMT.

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Source: US Census, MA RMV, MassGIS, MAPC analysis
New Urban Land Institute transportation cost model based on land use and demographic variables

Estimated transportation costs in Boston Region: $11,927 per household

MetroWest: $14,000 / year

South Coast: $11,400 / year

Inside 128: $9,800 / year
Next Steps

- Update database with RMV data from 2008/2009
- Match VINs to efficiency ratings to develop accurate profile of passenger fleet MPG
- Refine measurements of density, land use diversity, job access, etc.
- Identify applications for local and regional planning
Thank you!

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Data Services Department

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