Getting where we need to be: the imperative of sustainable transportation

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METROPOLITAN PLANNING ORGANIZATION

MPO
Transportation

- Affects everyone – we all ‘transport’
- Individualized needs – therefore, no one-system can address all needs
- Car based transportation system:
  - the 20\textsuperscript{th} century solution of choice in the U.S.
  - everyone has a car, each gets their needs met…..but at what cost?…is it sustainable?…and who can afford it?
ROLE OF FOSSIL FUELS IN U.S. TRANSPORTATION

US-TRANSPORTATION:

~29% OF GHG AND RISING

~28% OF ALL ENERGY USE
Total U.S. Greenhouse Gas Emissions by Economic Sector in 2017

- Total Emissions in 2017 = 6,457 Million Metric Tons of CO₂ equivalent. Percentages may not add up to 100% due to independent rounding.
1990 to 2017
- total transportation emissions increased due, in large part, to increased demand for travel, even when accounting for increases in fuel efficiency since 2005.

-Late 2000’s economic downturn had a significant impact.
LIGHT VEHICLES ≈

- 89% of VMT
- 72% of fuel used
- 60% of GHG Emissions
WE HAVE MET THE ENEMY AND HE IS US.

...Pogo
LOCAL TRANSPORTATION DYNAMICS

LAND USE

Household transportation costs vary with land settlement pattern

\[ \text{Transp.} \approx 9\% \text{ of HH income in Urban Areas} \]
\[ \approx \text{up to 25\% in auto dependent exurbs} \]

Source: FHWA

Such that.........
• City of Ithaca, ~60% of HH pay more than the 30% target of income for housing.
• Outside city, ~40% of HH in Tompkins County pay more than the 30% target of income for housing.

However-
• City of Ithaca median combined cost of (housing+transp.) is ~46% of HH income
• Tompkins County median combined cost is ~54% of HH income.
Mode to Work - White, non-Hispanic 2010 5 CTPP Tompkins County NY

- Drove: 61%
- Carpool-2: 5%
- Carpool-3+: 10%
- Bus: 6%
- Bicycle: 14%
- Walk: 29%
- Taxi-MC: 1%
- At Home: 1%

Mode to Work - Minority Population 2010 5 CTPP Tompkins County NY

- Drove: 33%
- Carpool-2: 1%
- Carpool-3+: 11%
- Bus: 3%
- Bicycle: 15%
- Walk: 29%
- Taxi-MC: 6%
- At Home: 1%
Household Income by Mode to Work
2010 5 CTPP Tompkins County NY

- Drove Alone
- Carpool
- Bus
- Bicycle or Walk

Income brackets:
- Less than $10K
- $10-14,999K
- $15-19,999K
- $20-24,999K
- $25-34,999K
- $35-49,999K
- $50-74,999K
- $75-99,999K
- $100K+
SOMETIMES THE OBVIOUS IS TRUE

Feasibility of alternatives modes to the car is highly related to land development patterns
Trip Distribution – more than just rush hour

- Work based: 17.8%
- Family and personal business: 42.8%
- Educational/Religious: 11.5%
- Social/Recreational: 26.7%
- Miscellaneous: 1.17%

Tompkins County
All Workers Mode:

≈ 57% drive alone (33,959)  
empty seats: (x 2=66,959 x 3=200,877)
Also, 80% of 15K in-commuters drive alone

≈ 12% carpool/rideshare (20% in 1980)

≈ 7% bus

≈ 16% walk

≈ 6.5% work at home

≈ 1.3% bicycle

≈ .8% other (taxi, motorcycle, other)
Environmental Costs

- Drive alone car transport is least energy efficient mode - (high embedded energy, wasted capacity-empty seats, high infrastructure requirements)
- Transportation in Tompkins ≈
  - 42% of energy use
  - 34% of CO2 emissions
- Huge investment of land resources – i.e. approx. 1.1 sq.mi. (~19% land area) of City of Ithaca is parking and roads.
Dollar Costs

○ Annual transportation sector public expenditures in Tompkins County ≈ $35 million

○ Personal Transportation Costs
  Annual Car ownership cost:
  - low ≈ $5,300 (Honda Fit)
  - high ≈ $13,000 (large, luxury SUVs)
Safety Costs

- Property damages
- Injuries ≈ 3 million/yr = 8,200/day
- Deaths ≈ 37,000/yr = 101/day

U.S. 2010 total economic cost = $242 billion. (NTSA)

When quality-of-life valuations are considered, the total value of crashes was $871 billion. (Substantially more than the US military budget - which is already ridiculous).
Transportation Scenario Analysis

- No silver bullets, but synergies abound
- Need to reduce VMT
- Need clean, energy efficient vehicles

These are critical & both are needed

To reduce VMT:
- Need ‘smart’ land development – promote development in existing urban areas
- Need to support alternatives to drive-alone: transit, bicycles, pedestrian, rideshare, car share, telecommute, vanpools, TDM, MaaS, etc.- mobility/integration
- National and State policy coordination and support for local program/project implementation
WHAT TO DO?
-TOP DOWN-
BIG IDEAS

-INTER-CITY RAIL
-CARBON TAX
-MASSIVE EV SUBSIDIES
-RAISE MPG REQUIREMENTS
-TAX FOSSIL FUELED VEHICLES
-FUND TRANSIT AT THE SAME RATE AS CARS/HIGHWAYS
-SUPPPOT PROGRESSIVE TRANSIT/MOBILITY AGENDA
-TRANSPORTATION & CLIMATE (TCI) -
  https://www.transportationandclimate.org/main-menu/tcis-regional-policy-design-process-2019
-OTHERS.......
-ACT LOCAL-

KNOW YOUR COMMUNITY
GO Electric

Over the life of a vehicle, EVs are more efficient and produce less GHG emissions, even when taking into account higher vehicle manufacturing energy and emissions.

Union of Concerned Scientists – Cleaner Cars from Cradle to Grave Report

EVs Mostly Need:
Charging infrastructure
Purchasing incentives

Then let the invisible hand do its thing.
MaaS – A different approach to transportation

Annual Car ownership cost:
- low $≈5,300 (Honda Fit)
- high $≈13,000 (large, luxury SUVs)

How else could that money be spent in personal transportation?
## MaaS Transportation Menu

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual bus pass</td>
<td>$600</td>
</tr>
<tr>
<td>New Bicycle</td>
<td>$1,000</td>
</tr>
<tr>
<td>Good sneakers</td>
<td>$150</td>
</tr>
<tr>
<td>Rideshare</td>
<td>$900</td>
</tr>
<tr>
<td>Carshare</td>
<td>$300</td>
</tr>
<tr>
<td>Carshare Use</td>
<td>$1,000</td>
</tr>
</tbody>
</table>

**Total** $3,950

**Diff. vs. car** $+1,350

Where every household selects the services they need.

Handled via a single payment, automated system.

More services added as they emerge.

Low Cost Car ≈ $5,300 annually
DIVERSIFY MOBILITY

PROMOTE

- Planning
- Education
- Infrastructure
- Programs
- Initiatives

SUPPORT

Bicycling
Walking
Transit
Transportation Land use
Shared transport-all forms
Car autonomous features - safety

DEMAND

REQUIRE

Opportunity: 53% of all trips < 2 miles (Tompkins County)
Work at the Margins

• Traffic Congestion is non-linear. A small reduction can cause a disproportionately large reduction in delay.

• Every diverted drive-alone trip counts.

• Changing transportation attitudes and habits will take a while. More a political challenge than a technical one.

• Celebrate the small victories. Have fun.
Summary

• Mobility is proportionately related to Urbanity
  Rural > Hamlet > Village > City

• Drive Alone trips are least efficient –
  Promote all other modes & combinations

• Be ready to meet the needs of individuals
Summary - continued

- Multiple synergistic benefits from mode shift:
  Equity, health, safety, environmental, operational, financial, community wellbeing

- Go electric – when you need to drive

- Act Local – (it’s cliché but so what!?) – much can be done locally when the State and Feds are indecisive. In fact, it may be our only effective approach…..

- Work at the margins - Don’t panic and carry on.
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