The Role of Transportation Demand Management in Climate Action Planning

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What is Transportation Demand Management (TDM)?

Transportation Demand Management is: Reducing Drive Alone Commuting

The “art of influencing travel behavior for the purpose of redistribution travel demand”
- North Carolina DOT

Transportation Demand Management (TDM) also called Mobility Management is a general term for strategies that result in more efficient use of transportation resources
- Victoria Transport Policy Institute
Multiple Benefits of Reducing Drive Alone Commuting

- Lower GHG emissions
- Reverse global warming
- Save energy
- Reduce peak period traffic congestion
- Reduce parking demand
- Manage land-use
- Increase choice
- Regulatory requirements
- Support broader environmental policies
- Develop a more livable community
- Improve health
- Change behavior and lifestyle
Transportation Contribution to GHG Inventory

- GHG from Transportation is 28% of total US emissions
- Transportation (commuting, air travel, fleet) is a significant contributor to Campus GHG inventories
- Commuting GHG emissions averages can range from over 50% to 10% depending on type of educational institution
- The GHG emissions from commuting can range from 1% to 99% of transportation related emissions
  - Number of residential students
  - Number of commuting students
  - Size of faculty and staff residential catchment area
Example: Emissions by Scope

### Emissions by Scope

- **Purchased Electricity** 52%
- **Steam Plant** 24%
- **Transportation** 23%

![Graph showing emissions by scope from 1990 to 2006](image)
Example: Transportation-Related Emissions

- Commuters: 12%
- Air Travel: 10%
- Fleet: 1%
- Other Emissions: 77%

- Air Travel: 43%
- Fleet: 5%
- Commuters: 52%
### Approach to Reducing Drive Alone Commuting

**Transportation Key Campus User Groups**

<table>
<thead>
<tr>
<th>Group</th>
<th>Travel Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty/Staff</td>
<td>Commute, Mid-day, Intra-campus, Long-distance travel</td>
</tr>
<tr>
<td>Grad Students</td>
<td>Commute, Mid-day, Intra-campus, Long-distance travel</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>Recreational/Lifestyle, Student Activity-related, Intra-campus, Long-distance travel</td>
</tr>
<tr>
<td>Visitors</td>
<td>University, Hospital, Events</td>
</tr>
</tbody>
</table>
**Example:**
Mode Shares of Commuting Trips and Targets for University Faculty and Staff

<table>
<thead>
<tr>
<th>Mode</th>
<th>Existing</th>
<th>Target #1</th>
<th>Target #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Alone</td>
<td>78%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>Rideshare</td>
<td>10%</td>
<td>17%</td>
<td>13%</td>
</tr>
<tr>
<td>Transit</td>
<td>8%</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>Bicycling</td>
<td>2%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Walk</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Telecommute</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>
### Example: Drive-Alone Reduction Packages

<table>
<thead>
<tr>
<th></th>
<th>Drive Alone</th>
<th>Carpool</th>
<th>Long-Distance Transit</th>
<th>Local Transit</th>
<th>Walk</th>
<th>Bicycle</th>
<th>Telecommute</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Package 1</strong></td>
<td>-11.0%</td>
<td>7.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Package 2</strong></td>
<td>-9.5%</td>
<td>5.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Package 3</strong></td>
<td>-10.0%</td>
<td>4.0%</td>
<td>0.5%</td>
<td>3.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Package 4</strong></td>
<td>-9.0%</td>
<td>5.0%</td>
<td>0.5%</td>
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<td>0.5%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Package 5</strong></td>
<td>-10.0%</td>
<td>5.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>0.5%</td>
<td>2.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Package 6</strong></td>
<td>-10.5%</td>
<td>5.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>0.5%</td>
<td>1.0%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>
Approach to Reducing Drive Alone Commuting

Key Factors Influencing Commuting Choices

- Availability
- Attractiveness
  - Travel Distance
  - Travel Time
  - Cost
  - Reliability
  - Flexibility/Frequency
  - Convenience
  - Comfort

- Market catchment area for each mode
- Size of commuting population in each catchment area
What is a TDM Plan?

- Comprehensive
- Supportive of an organization’s vision and policies
- Tailored for different land uses and user groups
- Coupled with parking management
- Encourages investment in and use of alternative modes
- Reinforced by physical design elements
- Periodically monitored and modified
Developing a TDM Plan

- Define the Right Questions
  - Key Issues
  - Key Stakeholders
  - Strengthens
  - Weaknesses
  - Opportunities
  - Constraints
  - Hoped for Outcomes
Approach to Reducing Drive Alone Commuting

TDM Plan and Program Development

1. Define the Right Questions
2. Understand the Existing Context
3. Evaluate the Future Context
4. Develop TDM Options and Programs
5. Develop Implementation Element
TDM Plan Inputs and Considerations

Approach to Reducing Drive Alone Commuting

Planning

Policy

Implementation

Engineering/Design

Operations

Financing
Rideshare

- Rideshare Matching
  - Traditional Rideshare Agency
  - Using Social Networking
- Informal Get-togethers
- Flexible Work Hours
- Guaranteed Ride Home
- Preferential/Preferred Parking
- Occasional Parking
- Park and Ride
  - Locations
  - Availability
  - Cost
- Subsidy for ridesharing
Approach to Reducing Drive Alone Commuting

Transit

- Informational/Promotional
  - Maps/Routes/Information Kiosks
  - Employee orientation
  - Online transit routing
  - Real-time transit information
- Fixed Routes
- Shuttle Connectors and Circulators
  - Frequency
  - Reliability
  - Comfort
  - Travel Time
- Park & Ride
- Bus Shelters
- Bikes on Buses
- Campus Transit Center
- Fare-free/Subsidy
- Incentive Programs
- Transit advocacy/coordination with public agencies/service providers
Bicycle and Pedestrian

- Bicycling Facilities
  - On-Road/Off-Road
  - Bikes on buses
  - Covered Storage
  - Rack Locations
  - Showers
  - Incentives
  - Repair services

- Pedestrian Facilities
  - Sidewalk continuity
  - Crossing locations
  - Lighting
  - Incentives
  - Sense of Place
  - Security
  - Traffic calming
Parking Management

- Parking supply limitations
- Parking pricing
- Parking permit buyback
- Preferential/Preferred parking for van/carpools
- Occasional parking
- Remote parking
Incentives and Other Programs

- Financial incentives
- Commuter membership program
- Pre-tax payment for alternatives
- Housing Incentives
  - On-campus housing
  - Mortgage Programs
  - Retail/Mixed Use
- Telecommuting
- Low emitting vehicles
- Flexible work hours
Marketing and Promotion

- Commute Options Programs
- Member Rewards
- Comprehensive Website
- Transportation Events
- Newsletters
- Kiosks
Context Sensitive Design

- Consistency with TDM Goals
  - Street and Intersection Design
  - Parking Location and Physical Design
  - Walkways and Bikeways
  - Transit pick-up/drop-off areas
  - Historic Preservation
  - Sustainability
Implement TDM Options and Programs

- Programs and Services: level, quality, attractiveness
- Phasing
- Implementers
- Partnerships
- Stakeholder Involvement
- Approvals
- Budget
- Funding
- Monitoring
- Modifications
TDM Success to Reducing Commuting GHG Emissions

- Integral part of broader vision and policies
- Behavior change
- Lifestyle change
- Tailor for different land uses and user groups
- Attractive commuting options
- Both incentives and disincentives
- Communicate and promote
- Couple with parking management
- Reinforced by physical design elements
- Periodically monitor and modify