Sustainable Transportation - Mobility in the 21st Century

Creating Mode Shift Toward Active Transportation

Presented by:
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Transportation Planning Consultant
Champaign-Urbana Mass Transit District
Convergence of Issues Impacting Transportation

- Foreign policy and foreign oil dependence
- Global warming and environmental issues
- Obesity and health epidemic related to inactivity
- Aging transportation infrastructure
- Transportation congestion and capacity inadequacies
- Aging population and mobility issues
- Lack of local government funding
Transportation accounts for approximately 30% of carbon emissions nationally\textsuperscript{1} and regionally\textsuperscript{2}.

1. Energy Information Administration
2. CMAP Regional Emissions 2000 by Activity Chicagoland Region, Center for Neighborhood Technology
Carbon Footprint of Single Occupancy Vehicle

The Private Vehicle is the Largest Contributor to a Household's Carbon Footprint

- Private Vehicles: 55%
- Electricity: 25%
- Natural Gas: 20%

“Substituting driving daily distances with active transportation modes, e.g. walking and biking, would reduce U.S. oil consumption by up to 38%. This savings exceeds the amount of oil recoverable from the Arctic National Wildlife Refuge and would significantly reduce our dependence on foreign oil.”

Exercise-based transportation reduces oil dependence, carbon emissions and obesity; Paul A. T. Higgins, Cambridge Journals, Cambridge University Press, 2005
For every passenger mile traveled, public transportation uses about $\frac{1}{2}$ the fuel of private autos, Sports Utility Vehicles and light trucks.

For every passenger mile traveled, public transportation produces only 5% as much carbon monoxide and nearly half the carbon dioxide of private vehicles.
If 10% of Daily Trips were by Transit the U.S. would:

- Reduce dependence on imported oil by 40%
- Reduce carbon dioxide emission by more than 25% of those directed under Kyoto Agreement
- Save more energy every year than all the energy used by the U.S. petrochemical industry

Conserving Energy and Preserving the Environment: The Role of Public Transportation; Shapiro, Hassett, and Arnold, July 2002
Switching to public transportation reduces individual carbon emissions by 20 pounds per day or 4,800 pounds per year.

Report recommends combining strategies to significantly reduce GHG emissions:

- Local and regional pricing/reg. that increase cost of SOV travel
- Regulations to encourage eco-driving behavior/better fuel efficiency
- Land use/smart growth that reduce travel distances
- Expansion of multimodal travel options

*Moving Cooler: An Analysis of Transportation Strategies that Reduce Green House Gas Emissions; Cambridge Systematics; July 2009*
WHAT if We Do Not Plan for Mobility Choices?

✓ Commute to work times increase
  ➡ Rockford and Peoria average commute time=19.62 min. and 19.02 min.
  ➡ Austin, TX avg. com. Time=22.86
  ➡ Ann Arbor avg. com. Time=24.61

✓ Population Reference Bureau says:
  Flexibility will be key...with respect to housing, work location, work hours, commuting, and means of transportation.

✓ Communities that provide for choices in housing and transportation will be more attractive.
How Do We Enable Mode Shift?

- Infrastructure
- Appropriate land-use and design
- Interconnect modes, land-use, and infrastructure
- Social Marketing – encourage behavior change
Champaign-Urbana, IL

Typical Midwestern Community

- Located in the center of Illinois amid soybean and corn fields
- Home to the University of Illinois
- Urbanized area has approximately 131,213 residents
- University has over 42,000 students and 12,000 faculty and staff
- UIUC geographically located in the middle of the two cities; University is split down the middle
Community Characteristics

- Intensely urban campus
- Urbana 35% of the work trips are non-SOV
- Community as a whole: non-SOV commute to work rate is 23%
- Average work commute is 15 minutes
- Excellent transit system
- Quality neighborhoods adjacent to the campus many faculty/staff use alternative modes to work (walk, bike)
- Universal transit access for students/faculty/staff
Community Transportation Plans

Long Range Transportation Plan 2025 (LRTP 2025) adopted in 2004 by Champaign-Urbana Urbanized Area Transportation Study (CUUATS)

big.small.all - Countywide visioning process called for more housing and mobility choices, less sprawl

miPLAN – Mobility Implementation Plan to implement LRTP 2025
More Community Transportation Plans

Champaign Moving Forward – Transportation Master Plan 2008 – Update to Champaign’s Comprehensive Plan

Urbana Bicycle Plan – Adopted plan becomes part of Comprehensive Plan
LRTP 2025 Preferred Scenario Calls For:

- Express bus service between core and fringe areas of the community
- An enhanced arterial fringe road system that provides improved mobility around the community
- Transit-intensive corridors
- High capacity transit system in the University District
- Mixed use, denser development and redevelopment
When Implemented LRTP 2025 will:

- Create higher population density, less sprawl
- Promote alternative transportation modes
- Save money on infrastructure
- Create walkable activity centers and reduce reliance on SOVs
- Make travel safer for pedestrians and bicyclists
- Increase mobility for motorists
- Educate residents about alternative transportation modes, safety, and new transportation concepts
Implementing LRTP 2025 would Reduce Infrastructure Costs

<table>
<thead>
<tr>
<th>New Infrastructure Costs</th>
<th>Cost ($)</th>
<th>Per</th>
<th>1 mile cost ($)</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Pavement</td>
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<td>1,848,000</td>
<td>Assumes street mileage</td>
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<tr>
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<td>ft</td>
<td>264,000</td>
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<tr>
<td>Sidewalk</td>
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<td>sq ft</td>
<td>253,440</td>
<td>Assumes sidewalks on both sides of street, 4’ wide</td>
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<tr>
<td>Street Lights</td>
<td>250,000</td>
<td>mile</td>
<td>250,000</td>
<td>Assumes street mileage</td>
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<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>2,615,440</td>
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</table>

<table>
<thead>
<tr>
<th>New roadway mileage</th>
<th>1 mile cost ($)</th>
<th>Total cost ($)</th>
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</thead>
<tbody>
<tr>
<td>Alternative A</td>
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<td>2,615,440</td>
</tr>
<tr>
<td>Alternative C</td>
<td>45.31</td>
<td>2,615,440</td>
</tr>
<tr>
<td>Difference</td>
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Cities would save a minimum of $94,338,921 in infrastructure. This does not include the costs of services or education.
miPLAN's Purpose – Identify what mobility options the community wants, both now and in the future.

To implement the LRTP 2025. LRTP found:

✓ Cities do not have the $ to build and/or maintain new arterial roads serving fringe development. (Champaign has $50 million deficit in funding for arterial construction.)

✓ If we continue with our current growth design, i.e. travel by auto, our community will face serious roadway congestion problems in less than 20 years.
Do you know what mobility options are currently available?

What kinds of transportation services do we want in our community right now?

How will we want to move around in the future?
Neighborhood Transopoly

miPLAN
Mobility Implementation Plan

When you think about traveling in the future, do you think Jetson™-style spaceships or Disney’s™ Futureland?

Whoa. Don’t get ahead of yourself. There are a lot of mobility options now that we as a community need to talk about.

Your ideas will be used to create a plan.

miPLAN is simply a way for you to tell us what transportation choices you want and need. That input will help create a workable mobility plan for Champaign, Urbana & Savoy’s future.

show us how you want to get from Here to There... play Transopoly!

what is it?

• A map of your neighborhood in Champaign, Urbana, & Savoy serves as the “gameboard.”
• Realistic budgets ensure good decision making.
• A trained facilitator guides small group discussions.
• You identify realistic solutions to local transportation problems.

Transopoly is fun, and allows community members to share their own mobility & transit ideas.

dates & locations for Transopoly

**RSVP required**

<table>
<thead>
<tr>
<th>Central Champaign</th>
<th>Oct 10 6:30pm</th>
<th>Illinois Terminal</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>45 E University, Champaign</td>
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**North Champaign**

Oct 16 6:30pm
Spalding Recreation Center
910 N Harris, Champaign

**City Line South**

Oct 17 6:30pm
Illinois Terminal
45 E University, Champaign

**Northeast Urbana**

Oct 18 5:30pm*
Urbana Free Library
210 W Green, Urbana

* please note—different meeting time

**Southwest Urbana**

Oct 19 6:30pm
Urbana Middle School
1201 S Vine, Urbana

**City Line North**

Nov 28 6:30pm
MLK Elementary School
1108 Fairview, Urbana

**West Champaign**

Nov 29 6:30pm
Bresnan Meeting Center
706 Kenwood, Champaign

**South Champaign**

Nov 30 6:30pm
Bresnan Meeting Center
706 Kenwood, Champaign

you must RSVP to guarantee a seat (dinner included).
if you can’t attend a meeting in your neighborhood, please join another meeting!
RSVP at rsvp@ihavemiPLAN.com or 217.378.9669

more info online at: www.ihavemiPLAN.com
Public’s Priority Recommendations –
• Direct bus service along major arteries
• Bicycle routes
• Street lighting

Neighborhood Transopoly Input
E-Survey Results

- April 2007- e-surveys went out to employees (communitywide) and students (UIUC only)
- 3,262 responses from 22,384 employees - 14.5% response rate
- 3,319 responses from 41,342 students - 8%

MiPlan Employee Web Questionnaire

1. In the past month, how have you commuted to work most often?
   - Driven alone (including alone or with a child you drop off or pick up)
   - Driven, taking another adult along
   - Taken a ride with others/carpooled
   - Taken the Bus
   - Walked
   - Bicyced
U of I Student Mode Choice

Figure 2 - Student Mode Choice

- **SOV**: 43%
- **Vehicle w/driver and 1 passenger**: 34%
- **Carpooled**: 9%
- **Bus**: 11%
- **Bicycled**: 2%
- **Walked**: 3%
Employee Mode Choice (Champaign, Urbana, Savoy)

Figure 3 - Employee Mode Choice

- 74% - SOV
- 8% - Vehicle w/driver and 1 passenger
- 8% - Carpooleed
- 4% - Bus
- 3% - Bicycled
- 3% - Walked
Summary of E-Survey Results

- Non-SOV modes are the primary mode of transportation for students (87%) even if they own a vehicle
- U of I students utilize transit at about twice the rate of peer institutions
- SOV is the primary mode for employees at 73%
- Users are satisfied with level of transit service - overall 80% were satisfied or better
- Market segmentation was done to assess potential to increase use of non-SOV mode choices. Asked what would encourage them to switch modes.
Identified opportunities for mobility enhanced development, e.g. development with mobility choices such as walking, bicycling, and transit.

Analyzes costs of housing and transportation to households.

**Affordability Index Formula**

\[
\text{Affordability Index} = \frac{\text{Housing Costs} + \text{Transportation Costs}*}{\text{Income}}
\]

*Transportation Costs include the modeled cost of Auto Ownership, Auto Use, and Transit Use*
Transportation costs in core significantly less than fringe. Average $/month spent on transportation: 
Core=$832 or less           Fringe=$1372 or less

MED Recommendations:
✓ Build on current density and urban form
✓ Maximize options and choices in alternative forms of mobility
✓ Provide tools to create mixed-use, mixed-income market-rate developments through infill and redevelopment
✓ Maintain affordability through community development programs and by factoring in both household housing and transportation costs
Summary of Input to Date:

Strong consistency found for the following top priority mobility improvements:

- Improved bicycle infrastructure and routing
- Better street lights
- Additional sidewalks
- Later evening MTD service
- Additional direct MTD routes along major arterials
Noteworthy

The consistency of the message among the stakeholder interviews, focus groups, Neighborhood Transopoly, and the on-board survey for improvements is very noteworthy.
Implementation of High Frequency Routes by CUMTD August 2009
Encouraging Mode Shift

- Zipcar- car share program launched with 6 cars (now have 8 cars) and nearly 375 members
- Safe Routes to School
- Bike route maps, bus wrap, bike counts, etc. work with cycling community
- Marketing to public on options for mode choice
1. Develop Overall Development and Mobility Scenario Framework
2. Public Participation
3. Develop an Econometric Model
4. Enhance the CUUATS Mode Choice Model
5. Develop and run LEAM (Land Evaluation and Assessment Model) for Four Scenarios
6. Develop Interface Between the LEAM and CUUATS models
7. Run CUUATS model for four scenarios
8. Corridor Level Analysis
Corridor Analysis – Green Corridors

White-Springfield Corridors

Land use & economic analysis:
- Land use and building conditions survey
- Potential for mixed-use development
- Opportunities for pedestrian oriented community development
- Market & business analysis
- Market demographic characteristics

Transportation Extension

Transportation analysis:
- Existing & potential transit connections
- Bicycle & other pedestrian amenities
Green Corridors – Creating Sustainable Neighborhoods

What might a transit intensive corridor look like?

First & White

Second & White

Visualization of the White Street Corridor
Champaign Urbana Mass Transit District
miPLAN - Phase III

- Benefit-Cost Analysis
- Preferred Investment
  Plan Development
- 5-10 Year Plan
- Final Report (2009)
There's demographic evidence; there's consumer research evidence; but probably the most compelling evidence is the price premium people are willing to pay to live in a walkable urban place, that the survey's show anywhere from a 40% to 200% price premium on a price per square foot basis for a walkable urban place as opposed to a competitive nearby drivable suburban place.

Christopher B. Leinberger, Visiting Fellow, Brookings Institute
Achieving sustainability will require significant mode shift

Mode shift requires proper infrastructure, land-use, development, policies, and education

Creating a livable community with choices in mobility and housing will provide economic benefits and give U of I a competitive advantage in recruitment/retention
Conclusion

The point of cities is multiplicity of choice. Jane Jacobs

A seamless multimodal transportation system is one of the goals for the miPLAN project
Resources:
www.ihavemiplan.com
www.cu-srtsproject.com
www.cumtd.com

There are no passengers on Spaceship Earth. We are all crew.
Marshall McLuhan