Identifying Potential Carsharing Locations in Central Florida Using GIS

Presented By:
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2009 ESRI Int’l Users Conference
Identifying Potential Carsharing Locations in Central Florida Using GIS
2009 ESRI Int’l Users Conference – San Diego, CA
Transportation Issues Facing Central Florida

- **Growing Population**

- **Lack of Multi-Modal Options**
  - Light Rail
  - Commuter Rail
  - Streetcar / Bus Rapid Transit (BRT)

- **Decreased Funding and Land for Road Improvement**

- **Increased Demand for Transportation Demand Management (TDM)**. TDM is focus of new Regional CAP.
TDM Strategies FDOT District 5 Uses

- Commuter Assistance Program (CAP) Coordination between SCAT, Votran, and LYNX
- Park & Ride Program
- Share-A-Ride Program
- Ridematching
- Alternative Transportation Campaigns ("Dump The Pump")

Additional new strategy that is now being implemented is Carsharing.
What is Carsharing?

car-sharing (carsharing)

Definition:
A short-term car use arrangement - a car use service whereby customers who sign up as members can reserve a car for periods of time for an hourly fee, can pick up the car at a designated place in the community, and then return the car to the same location.
Carsharing in Florida – Why Does Central Florida Need It?

- Alleviate Traffic Congestion
- Mitigate Traffic Impacts Due to Road Construction
- Provide the “Missing Link” for Transit
- Trip Chaining and Support for Rail / Transit Projects (TOD)
- Increase Quality of Life
- Provides “Snow Birds”, RV Travelers, and Part-Time Residents with a Transportation Alternative
- Supports “Green” Initiatives and Goals set by the Governor

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FDOT District 5 decided to use GIS as the means to identify the most suitable potential carsharing parking locations.

- Good, reliable geospatial data to rely on (Decision Support System)

Carsharing suitability model to integrate these variables:

- Employment Density
- Population Density
- AADT (Daily Traffic Volume) Density
- Developments of Regional Impact (DRI) Locations
- Existing Land Use – Developed Lands (High Density Residential, and Commercial)
- Proximity to Transit Bus Stop locations and potential Commuter Rail Stations (SunRail) – TOD Impact
Utilized 2000 ZData (Districtwide)
- Socioeconomic Data by TAZ for employment density (persons/acre)

Used Spatial Analyst to create grid and reclassed using the following Employment Density to Carsharing Suitability Comparison:

- Greater than 10.0 = 5 (High)
- 5.1 – 10.0 = 4
- 3.1 – 5.0 = 3
- 1.1 – 3.0 = 2
- Less than or = to 1.0 = 1 (Low)
Utilized 2000 ZData (Districtwide)

- Socioeconomic Data by TAZ for population density (persons/acre)

Used Spatial Analyst to create grid and reclassed using the following Population Density to Carsharing Suitability Comparison:

- Greater than 10.0 = 5 High
- 5.1 – 10.0 = 4
- 3.1 – 5.0 = 3
- 1.1 – 3.0 = 2
- Less than or = to 1.0 = 1 Low
2008 Annual Average Daily Traffic (AADT) Density Input

Utilized 2008 FDOT AADT Data

- Focus was to determine cluster areas of most traveled roadways in District 5

Used Spatial Analyst to create grid and reclassed using the following AADT Density to Carsharing Suitability Comparison:

<table>
<thead>
<tr>
<th>AADT Density Interval</th>
<th>Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than 75,000</td>
<td>High</td>
</tr>
<tr>
<td>50,001 – 75,000</td>
<td></td>
</tr>
<tr>
<td>30,001 – 50,000</td>
<td></td>
</tr>
<tr>
<td>15,001 – 30,000</td>
<td></td>
</tr>
<tr>
<td>Less than or = to 15,000</td>
<td>Low</td>
</tr>
</tbody>
</table>
Developments of Regional Impact (DRI) Input

**Utilized DRI locations**
- Determined whether the lands are a DRI location or not in District 5.

**Used Spatial Analyst to create grid and reclassed using the following DRI Location to Carsharing Suitability Comparison:**

- **DRI Location = 5** High
- **Not a DRI Location = 1** Low

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Existing Land Use Input

Utilized Existing Land Use Data
- Developed Lands (Parcel Level)

Used Spatial Analyst to create grid and reclassed using the following Existing Land Use to Carsharing Suitability Comparison:

- Developed Land Use = 5 High
- Undeveloped or Undevelopable = 1 Low

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Proximity to Transit Input

- **Utilized Proximity to Transit Data**
  - ¼ Mile Buffer of Bus Stop Locations
  - ¼ Mile Buffer of Potential Commuter Rail Train Stations (CRT) - SunRail

- **Used Spatial Analyst to create grid and reclassed using the following Proximity to Transit to Carsharing Suitability Comparison:**

  Within ¼ mile of Stop/CRT Station = 5 High

  Outside ¼ mile of Stop/CRT Station = 1 Low

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FDOT District 5 decided Population and Employment Density should be weighted higher than the other variables.

Go into ArcToolbox\Spatial Analyst Tools\Overlay

Setup % influence of reclassed rasters

Run Suitability Model process......
GIS Results conveyed that the Urban Core of Orlando could best support new Carsharing programs in District 5.

Based upon 1-5 Ranking System

The next steps were to begin focusing a micro-level look at specific areas such as:

- City Hall
- Medical Districts
- Central Business District
- Urban Villages
Select Potential Sites

- Developed a map showing all potential Carsharing parking lot locations that were identified by FDOT District 5

- Micro-level GIS analysis of all potential locations (¼ Mile Buffer)
  - Employment Density
  - Population Density
  - DRI and Planned Unit Developments
  - Existing Land Use
  - Future Land Use
  - Transit Service (Existing and Future)
Micro-Level Analysis Map Examples

Future Land Use

Transit Facilities

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Report focused on identifying most suitable location based upon additional carsharing dependent variables.

### TABLE 1 • CARSHARING PARKING LOCATION SUITABILITY MATRIX

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
<th>Notes</th>
<th>Weighted Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Density</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Duration of Activity</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Proximity to Transit</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Signage Potential</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Accommodating Land Uses (Retail/Ram Keller)/Traffic</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Opportunity to Cluster Car Share Vehicles</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Safety and Security</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Proximity to Activity</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Wayfinding Signage Potential</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Parking Space Usability</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Vehicular Accessibility (To and From Space)</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Parking Space Stability/Ownership</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**Weighted Average Score:** 100.3

**Note:** Scoring is based on a 0-5 scale with 0 being the least desirable and 5 being the most desirable.

*Criteria will be revised as specific spaces are identified.

Prepared for: Florida Department of Transportation District 5
Public Transportation Office

Prepared by: TranSys

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Next Steps...

- FDOT District 5 to determine priority carsharing parking lot location based upon Carsharing Suitability Report.
- Identify vacant on-street parking sports that is owned by the City of Orlando within target area of prioritized carsharing parking lot location from GIS analysis.
- Gain synergy from stakeholders (LYNX, etc.)
- Utilize FDOT District 5 CAP Program to begin the Carsharing Program in Central Florida!!!!!
Conclusions

- GIS is a powerful tool that determined priority parking lot locations suitable for implementing a Carsharing Program.

- Good, reliable data is critical to achieving desirable and useful results.

- For the project to be successful it requires a thorough understanding of all data used for the inputs and rigorous quality control checks on the data and GIS processes from the GIS professional.
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QUESTIONS???

Thank You!!!

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