Transportation Design for Communities
Hosted by the Center for Quality Growth and Regional Development at the Georgia Institute of Technology

Lunch Presentation: The Long-View - Integrating Land Use & Transit – A Story from Charlotte, N.C.
May 12, 2006  Atlanta, GA
Presenter: Troy Russ, AICP, Principal – Glatting Jackson Kercher Anglin Lopez Rinehart, Inc.

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Transportation Design for Communities
Executive Seminar

TAKING THE LONG VIEW
Integrating Land Use & Transit

Prepared by:
TROY RUSS, AICP
Principal, Glatting Jackson

Georgia Institute of Technology
Center for Quality Growth & Regional Development
May 12, 2006
TRANSIT PILL? NO THANKS... I'LL JUST LIVE WITH THE CARS A WHILE LONGER.
One Man’s Journey to Transit
One Man’s Journey to Transit
One Man’s Journey to Transit
One Man’s Journey to Transit
One Man’s Journey to Transit
One Man’s Journey to Transit
One Man’s Journey to Transit
Chain of Impacts - Widen Road

Widen Road

FIRST ORDER
- Reduce Delay
  - Move Home
  - Range Farther
SECOND ORDER
- Move Business
- Move Jobs
- Mega Boxes
- More Strip
- More Lane Miles
THIRD ORDER
- Drive More
- Less Personal Wealth
- Own More Cars
- New Construction

Less Personal Wealth
The Statistic
### Increasing demand for the automobile

<table>
<thead>
<tr>
<th></th>
<th>1983</th>
<th>1990</th>
<th>1995</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Work Trip Length (Miles)</td>
<td>8.5</td>
<td>10.6</td>
<td>11.6</td>
<td>36.5</td>
</tr>
<tr>
<td>Average Work Travel Time (Minutes)</td>
<td>18.2</td>
<td>19.7</td>
<td>20.7</td>
<td>13.7</td>
</tr>
<tr>
<td>Average Work Trip Speed (MPH)</td>
<td>28</td>
<td>32.3</td>
<td>33.6</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: 1995 NPTS: Federal Highway Administration
### Commute Times within the Orlando MSA

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>557,448</td>
<td>786,243</td>
</tr>
<tr>
<td>Less Than 10 minutes</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>10 to 29 minutes</td>
<td>53%</td>
<td>49%</td>
</tr>
<tr>
<td>30 to 60 minutes</td>
<td>30%</td>
<td>34%</td>
</tr>
<tr>
<td>60 of more minutes</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Worked at home</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau 1990 & 2000 Census
### Journey to Work - Orlando MSA

<table>
<thead>
<tr>
<th>Mode</th>
<th>1990</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>557,448</td>
<td>786,243</td>
</tr>
<tr>
<td>Car, truck, or van:</td>
<td>91.3%</td>
<td>92.7%</td>
</tr>
<tr>
<td>Drove alone</td>
<td>78.1%</td>
<td>80.6%</td>
</tr>
<tr>
<td>Carpooled</td>
<td>13.3%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Public transportation:</td>
<td>1.5%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Bus or trolley bus</td>
<td>1.4%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Streetcar or trolley car (público in Puerto Rico)</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Subway or elevated</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Railroad</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Ferryboat</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Taxicab</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>0.4%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Walked</td>
<td>3.5%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Other means</td>
<td>0.7%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Worked at home</td>
<td>2.0%</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau 1990 & 2000 Census
### Vehicles per household

<table>
<thead>
<tr>
<th></th>
<th>1969</th>
<th>1995</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 car households</td>
<td>21%</td>
<td>68%</td>
<td>68%</td>
</tr>
<tr>
<td>1 car households</td>
<td>48%</td>
<td>31%</td>
<td>39%</td>
</tr>
<tr>
<td>2 car households</td>
<td>27%</td>
<td>41%</td>
<td>32%</td>
</tr>
<tr>
<td>3 car households</td>
<td>5%</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

**Average number of cars per household**

1.8

**Source:** 1995 NPTS: Federal Highway Administration
<table>
<thead>
<tr>
<th>YEAR</th>
<th>COST PER YEAR</th>
<th>COST PER MILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>$7,533</td>
<td>50.2 cents</td>
</tr>
<tr>
<td>2001</td>
<td>$7,654</td>
<td>51.0 cents</td>
</tr>
<tr>
<td>2000</td>
<td>$7,363</td>
<td>49.1 cents</td>
</tr>
<tr>
<td>1999</td>
<td>$7,050</td>
<td>47.0 cents</td>
</tr>
<tr>
<td>1998</td>
<td>$6,908</td>
<td>46.1 cents</td>
</tr>
<tr>
<td>1997</td>
<td>$6,723</td>
<td>44.8 cents</td>
</tr>
<tr>
<td>1996</td>
<td>$6,389</td>
<td>42.6 cents</td>
</tr>
<tr>
<td>1995</td>
<td>$6,185</td>
<td>41.2 cents</td>
</tr>
<tr>
<td>1994</td>
<td>$5,916</td>
<td>39.4 cents</td>
</tr>
<tr>
<td>1993</td>
<td>$5,804</td>
<td>38.7 cents</td>
</tr>
<tr>
<td>1992</td>
<td>$5,824</td>
<td>38.8 cents</td>
</tr>
</tbody>
</table>

Source: AAA
Household Expenditures

- Shelter: 19%
- Transportation: 17.9%
- Food: 13.7%
- Insurance & Pensions: 9.6%
- Other Household: 7.5%
- Utilities: 6.8%
- Health Care: 5.4%
- Entertainment: 5.0%
- Apparel & Services: 4.8%
- Education: 2.1%
- Misc.: 8.2%

Source: Surface Transportation Policy Project: Driven to Spend – The Impact of Sprawl on Transportation Expenditure
Some Solutions
Future Transportation and Land Use Strategy

Accept Congestion

FIRST ORDER
- Increase Delay
  - Improve Home
  - Use Alternative Modes

SECOND ORDER
- Keep Business
- Keep Jobs
- Main Street
- Less Strip

THIRD ORDER
- Less VMT
- Personal Wealth
- Community Reinvestment
- Drive Less
- Own Fewer Cars
Balanced transportation systems require less resources

Source: Surface Transportation Policy Project: Driven to Spend – The Impact of Sprawl on Transportation Expenditure
Provide a variety of transportation choices

- Bike network
- Transit service
- Sidewalk network
- Intermodal connections
Sprawl development increases transportation costs

Source: Surface Transportation Policy Project: Driven to Spend – The Impact of Sprawl on Transportation Expenditure
Trip Purpose – Percentage of Total Trips

<table>
<thead>
<tr>
<th>Trip Type</th>
<th>% By Trip Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>18.0%</td>
</tr>
<tr>
<td>Work Related</td>
<td>2.6%</td>
</tr>
<tr>
<td>Shopping</td>
<td>20.2%</td>
</tr>
<tr>
<td>Doctors &amp; Dentist</td>
<td>1.5%</td>
</tr>
<tr>
<td>Family &amp; Personal</td>
<td>24.2%</td>
</tr>
<tr>
<td>Church &amp; School</td>
<td>8.8%</td>
</tr>
<tr>
<td>Social Recreational</td>
<td>24.5%</td>
</tr>
<tr>
<td>Other</td>
<td>0.2%</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
</tr>
</tbody>
</table>

"Errandsville" approximately 70% of all trips occur within 3 miles of the household.

Create pedestrian scaled mixed use environments
Reduces vehicular trips the need for parking: Park once district
The responsibility lies with new development & redevelopment
The Bottom Line
Create Affordable Transportation

Source: Surface Transportation Policy Project: Driven to Spend – The Impact of Sprawl on Transportation Expenditure
CAR SHEDDING

Annual Cost of a Car $ 7,533.00
Monthly Cost of a Car $ 627.75

Average Interest Rate ?? 7%

Present Value of a 30-Year Loan $94,905.98

Mattress (30-Years) $ 225,990.00
5% Investment (30-Years) $522,450.36
10% Investment (30-Years) $1,419,021.29
Build Individual and Community Equity

Source: Surface Transportation Policy Project: Driven to Spend – The Impact of Sprawl on Transportation Expenditure
Charlotte
North Carolina
Charlotte’s Shared Vision

Planning Milestone: “How Shall We Grow?” - 1954

1940 CITY: 100,899
1940 COUNTY: 151,826

1945 - 1959

Cotswold Shopping Center
Park Road Shopping Center
Charlotte’s Shared Vision

1960 - 1974

1960 CITY
1960 COUNTY
201,564
272,111

1995 Comprehensive Plan adopted - 1975
Charlotte’s Shared Vision

1975 - 1996

Airport Expansion
Eastland Mall
Carolina Place Mall

1980 CITY: 315,474
1980 COUNTY: 404,270
1980 TOWNS: 16,983

2005 Plan adopted - 1985
Charlotte’s Shared Vision

1997 - 2009

1997 CITY: 513,000
1997 COUNTY: 610,000
1997 TOWNS: 65,000

2015 Plan Adopted 1997

Concord Mills Mall
Charlotte’s Shared Vision

2020

2020 EST. CITY  800,000
2020 EST. COUNTY  952,110
2020 TOWNS  114,000
Centers & Corridors Vision
Implementing Cats System Plan
• 5 Transit Corridors (58 Stations)

• South Corridor – LRT – Under Construction
  - 15 stations

• 4 Transit Corridors in DEIS
  - North Corridor – Commuter Rail (12 Stations)
  - Northeast Corridor – LRT (13 Stations)
  - Southeast Corridor – LRT/BRT (13 Stations)
  - West Corridor – LRT/BRT (9 Stations)

1 Street Car Corridor in DEIS
2025 Centers & Corridors
The CATS System Plan
Transit Station Area Principles

Draft Environmental Impact Statement (DEIS)
Alignment,
Corridor Urban Design Framework,
Station Types & Locations,
TOD Assessment, and
Station Area Concepts.

Defines:
- Roles of Stations
- Area’s Context

Informs:
- TOD Opportunities
- Joint Development Roles
- Infrastructure Needs
- Amenity Needs

Implements the Program to Build a Community

Transit Engineering & Design
Station Area Planning & Design
Implementing the Program to Build a Community

Schedule

[Diagram showing tasks and timelines related to implementing a program to build a community]
Implementing the Program to Build a Community
Implementing the Program to Build a Community
Station Service Area – All Modes

**½ - Mile Service Area**
- Only serve a localized area immediately around the station
- Stations can be grouped to provide better service area overlay in the densest of areas
- Locate near minor thoroughfare

**1 - Mile Service Area**
- Most common transit stations
- Reliant on bus connections to the station
- Some customers will arrive by car - need for adequate parking and Kiss & Ride areas.
  - Locate near thoroughfare

**3-Mile Service Area**
- Access by a more limited feeder bus network and a larger number of private vehicles
- Provide adequate facilities for all modes of travel
  - Locate near major thoroughfare

**5 - Mile Service Area**
- Typically the station’s toward the end of the line.
- Access primarily by private vehicles
- Access to major thoroughfare or freeways.
Station Service Area – All Modes

½ - Mile Service Area
- Only serve a localized area immediately around the station
- Stations can be grouped to provide better service area overlay in the densest of areas
- Locate near minor thoroughfare

1 - Mile Service Area
- Most common transit stations
- Reliant on bus connections to the station
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- Locate near thoroughfare

3-Mile Service Area
- Access by a more limited feeder bus network and a larger number of private vehicles
- Provide adequate facilities for all modes of travel
- Locate near major thoroughfare

5 - Mile Service Area
- Typically the station’s toward the end of the line.
- Access primarily by private vehicles
- Access to major thoroughfare or freeways.
Station Service Area – All Modes

1/2 - Mile Service Area
- Only serve a localized area immediately around the station
- Stations can be grouped to provide better service area overlay in the densest of areas
- Locate near minor thoroughfare

1 - Mile Service Area
- Most common transit stations
- Reliant on bus connections to the station
- Some customers will arrive by car - need for adequate parking and Kiss & Ride areas.
  - Locate near thoroughfare

3-Mile Service Area
- Access by a more limited feeder bus network and a larger number of private vehicles
- Provide adequate facilities for all modes of travel
  - Locate near major thoroughfare

5 - Mile Service Area
- Typically the station’s toward the end of the line.
  - Access primarily by private vehicles
  - Access to major thoroughfare or freeways.
**Transit Service Area – All Modes**

1/2 - Mile Service Area
- Only serve a localized area immediately around the station
- Stations can be grouped to provide better service area overlay in the densest of areas
- Locate near minor thoroughfare

1 - Mile Service Area
- Most common transit stations
- Reliant on bus connections to the station
- Some customers will arrive by car - need for adequate parking and Kiss & Ride areas.
- Locate near thoroughfare

3-Mile Service Area
- Access by a more limited feeder bus network and a larger number of private vehicles
- Provide adequate facilities for all modes of travel
- Locate near major thoroughfare

5 - Mile Service Area
- Typically the station’s toward the end of the line.
- Access primarily by private vehicles
- Access to major thoroughfare or freeways.
High Intensity Urban Core

- Uptown
  Most accessible place in the region
- Well-established and connected street pattern
- Densities supportive of transit
- Transit ranges from small local stations to large multi-modal stations
- Strong TOD development market

Established Urban Neighborhoods & Historic Communities

- Includes South End, NoDa, Plaza Midwood, Elizabeth, and West Morehead
- Also includes Mooresville, Davidson, Cornelius, and Huntersville
- All have individual character built-up over time
- All feature a connected block system and transit-supportive densities
- TOD development market varies, may need assistance.

Industrial Communities

- Important Centers of Employment
- Many have individual character built-up over time
- Generally well connected street network
- Often there are physical barriers to TOD Development
- TOD development market varies, and may need assistance.

Established Suburban Neighborhoods

- Most common built form
- These areas are well developed, but lack orientation to the public realm
- Access usually comes from a fewer large roads
- Densities tend to be below transit-supportive levels.
- Few centers of activity
- TOD development market varies, may need assistance.

New Suburban and Greenfields

- Outermost edge of the transit region
- Areas are quickly developing
- Connections are limited; but opportunities abound
- Densities are well below transit-supportive levels
- Stations located here will attract riders from a larger area
- No existing centers of activity
- TOD development varies.
Role of Transit and Land Use within the Regional Context

Transit’s Role:
- Mobility
- Placemaking
- Development

Station Plan’s Role:
- Concentration
- Mixture of Uses
- Focal Point

Transit’s Role
- Mobility Infrastructure

Station Plan’s Role
- Context
- Stabilization
- Redevelopment
Roles of a Transit Station - Mobility

Station Service Area

- N/A
- Regional Servicing
  - Large service area
  - Car-oriented
- Serves existing nodes of activity
- Larger service area
  - Fewer stations
- Local service
  - Small stations
  - Small service areas
- Specialized Stations
  - Multiple transit connections

Station Area Context

Mobility
Roles of a Transit Station - Placemaking

Station Area Context

- N/A
- Station should develop into "place"
- Station adds to existing fabric
- Station is purely functional: Place is established by surrounding fabric
- Station as focal point

Station Service Area

- Mobility
- Placemaking
Roles of a Transit Station-Economics

Station Area Context

Station Service Area

N/A
Privately driven
Long-term potential as
a catalyst for
surrounding area
Station is incentive

Public/private partnership
for redevelopment

Responsive to
surrounding
land uses

Public driven
economic catalyst
Station plus public
incentives
Roles of a Transit Station-Composite

Station Area Context

Station Service Area

Mobility
Placemaking
Economics
Creating a TOD

- Transit Facility Design
- Great Public Spaces
- Organized Street Network
- Land Use & Development

VISION
Transit Facility Design
How does a station sit in the environment?
Great Public Spaces
Organize the TOD around Public Spaces
Organize the TOD around Public Spaces
Organize the TOD around Public Spaces
Organize the TOD around Public Spaces
Organize the TOD around Public Spaces
Land Use & Development
Non-Transit Supportive Land Uses & Building Form

Legend
- Non-Transit Supportive Building Form
- Area of Special Concern (Residential Area is Threatened by the Sloan to Potts Connection & Proximity to Transit Platform)

Area of Special Concern
Site Vacant
Non-Transit Supportive Land Uses or Building Form

1/2 Mile (2,640 feet)
Recommended Zoning Modifications

Legend
- TOD M - Mixed Use
  - At least 50% Residential
  - Up to 50% commercial
  - (No more than 20% Retail)
- TOD R - Residential Mixed-Use
  - At least 80% Residential
  - Up to 20% Commercial
- Enhanced AHO -
  - Recommend increasing the Affordable Housing Requirement above
  12.5%
- No Change
- Recommended
- Connections

1/2 Mile (2,640 feet)
Redevelopment Opportunities
1. **Town Parking Lot**  
   80k s.f. com/off.  
   220 Res units  
   +/- 400 parking (70 town, 125 CATS, + Dev.)

2. **Metrolina**  
   25k s.f. com/off.  
   400 Res units

3. **Sadler Square**  
   30k s.f. com/off  
   250 Res. units

4. **“Sadler” Property**  
   20k s.f. com/off.  
   200 res. Units

**Totals:**  
+/- 155k s.f. com/off.  
+/- 970 Residential units
Northeast Corridor
Charlotte, USA
NE Corridor Station Areas

US 29 Bypass

Rocky River Station

Rocky River
1) State DOT Commit to:
   - At-grade Intersection Solution
   - 4 lanes, not 6 lanes

2) Transit Commit to:
   - Build Urban Boulevard
   - Rocky River Station

3) MSD Commit to:
   - Additional Capital for Urban Boulevard
   - Maintain Landscape

4) City Commit to:
   - Street Network Requirements
   - TOD Zoning Ordinance
   - Pedestrian Oriented Design Guidelines

5) Land Owners Commit to:
   - Build Local Street Network
   - Minimum of 50 Units / Acre