Transportation investments are powerful and far-reaching.

“We’re gonna need roads...lots of 'em!”
The Size and Character of Road Influences the Quality of Built Environment
“The problem is people want to go 70 miles an hour. And for what? To get to Saginaw in 7 minutes instead of 10?”

From: Steve Saginaw, MI
The Size and Character of Road Influences the Quality of Built Environment
Conventional Approach

- More Lanes
- More Roads
- System Management
  - More Efficiency
  - ITS
- More Pavement
- More Cars
Anticipate Forecast (Based on Speed)
Reframing Key Transportation Conventions
DESIGN TRAFFIC – The Role Of The Regional Model

MDOT Traffic Needs

Plan

Local Plans

Widen

Program

Other

Project

Words

Local Input

Public Information

Engineer

Build

1 2 3 4 5
Widen 20-Year Forecast

Land Use & Transportation - Ideal Traffic Planning

[Graph showing a 20-Year Forecast with Capacity and Years on the axes]
Land Use & Transportation - The Reality

Diagram showing the relationship between capacity, induced traffic, and forecast over years.
Transportation Investment Change Land Use Patterns
Transportation Investment Change Land Use Patterns
Land Use & Transportation - “Induced Demand”

- Congestion
- Widen
- Capacity
- Years
- Traffic
- Years

Graph showing traffic and capacity over years, indicating induced demand.
Can’t Be “Improved” Further
Road Size, Not Congestion, is the Choice

No Option

Congestion

Traffic

Capacity

Years
Chain of Impacts

FIRST ORDER
- Widen Road
  - Reduce Delay
  - Reduce Cost

SECOND ORDER
- Move Home
- Range Farther
- Drive Home
- Own More Cars

THIRD ORDER
- Move Business
- Move Jobs
- Mega Boxes
- More Strip
- More Lane Miles
- New Construction
Results Over the Last 50-Years

1) Vehicle Miles of Travel (VMT) Growing Faster Than Population Growth
2) Longer Commute Times
3) Decreased Transit Ridership
Charlotte’s Population Per Acre
1950-2005

Land Use Statistics

Decreased Density . . Increased Sprawl

Persons Per Acre

Charlotte’s Population Per Acre
1950-2005
The physical impacts of all this inactivity

- Increased risk of obesity
- Increased risk of major diseases
  - Diabetes
  - Cardiovascular disease
  - Colon cancer
- Increased symptoms of depression and anxiety
- Poorer development and maintenance of bones and muscles

Health care costs for obesity now top those related to smoking!!!
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%
Apparel & Services 4.8%
Education 2.1%
Miscellaneous 8.2%

Source: Surface Transportation Policy Project: Driven to Spend – The Impact of Sprawl on Transportation Expenditure
Cultural Statistics
The problems we have created cannot be solved with the same thinking that created them.
DEFY THE GODS
“…the possible benefits of required seat belts would not justify the costs to the manufacturers and the public.”
“...the possible benefits of required seat belts would not justify the costs to the manufacturers and the public.”

National Highway Traffic Safety Administration, 1970
MORE OF THE SAME
NEXT RIGHT
The Possibility
Lateral Approach

Improve Quality of Travel

User View and Comfort

Context-Sensitive Design

Traffic Calming

Personal Security

Move Less People, Fewer Miles

Mixture of Uses

Road Network

Pedestrian-Oriented Environment

Compact Development

Lane Limits

Change Standards

Conventional Approach

More Efficiency

System Management

ITS

More Pavement

More Cars

Move People, Not Cars

Move Less People, Fewer Miles

Manage, Not “Solve”

Transit

Bicycling

Walking

HOV/HOT Lanes

User View and Comfort

Context-Sensitive Design

Traffic Calming

Personal Security

Mixture of Uses

Road Network

Pedestrian-Oriented Environment

Compact Development

Lane Limits

Change Standards
Reframing Key Transportation Conventions

Context

Evolution of Integrated Land Use and Transportation Plans
Principles of Livable Transportation
No Network - BIG ROADS
Reframing Key Transportation Conventions

DESIGN TRAFFIC - Defining the Context

Benefits of Network

- Same Total Lanes
- More Capacity
- VMT
- Turns
- Clearance Time
- Signal Phase
Reframing Key Transportation Conventions
DESIGN TRAFFIC - Defining the Context

Lane Capacity
Reframing Transportation Conventions
DESIGN TRAFFIC – Speed / Flow Relationship

![Graph showing the relationship between speed (MPH) and hourly vehicles per lane. The graph indicates a maximum volume of 25-30 miles per hour.]
Reframing Transportation Conventions
DESIGN TRAFFIC - Understanding Travel Patterns
Reframing Transportation Conventions
DESIGN TRAFFIC - Understanding Travel Patterns
Real Loss in Capacity

- 6 Lanes
- 4 Lanes
- 2 Lanes

Apparent Loss
Effective Loss

Traffic (VPH)
• Internal Travel – Preserve the capacity and quality of local streets for travel made entirely within the City.

• Local Travel – Make selective, precisely targeted capacity improvements, on the City’s own terms, for trips beginning in (by residents of) Roswell and trips ending in (by visitors to) Roswell.

• Through Travel – For regional through trips - neither beginning nor ending in the City.
Through Traffic Needs
- Land Use Context less important
- Higher travel speeds
- Controlled Access
- Limited connectivity
- Walking and bicycling not alternatives
- Transit could be an alternative
Local Traffic Needs
- Land Use Context Very Important
- Lower travel speeds
  - Open Access
  - Good connectivity
- Walking, bicycling, & Transit are alternatives
Select Link Analysis
Westbound Sprague at Freeway Overpass

PM Peak Hour volume at end of corridor: 2760
Same volume from this link at end of corridor: 110 (4%)
University City Area
NE Corridor Station Areas
Reframing Transportation Conventions
DESIGN TRAFFIC - Design Speed & Geometrics

![Graph showing the relationship between design speed and stopping sight distance.](image)
<table>
<thead>
<tr>
<th>SPEED</th>
<th>(p) (killing pedestrian)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 mph</td>
<td>3.5%</td>
</tr>
<tr>
<td>31 mph</td>
<td>37.0%</td>
</tr>
<tr>
<td>44 mph</td>
<td>83.0%</td>
</tr>
</tbody>
</table>
TRAFFIC CALMING
Measuring Success
Capacity of Streets
LEVEL OF SERVICE DEFINITIONS

SERVICE

LEVEL DEFINITION – Operating Speed

A Free Flow: Users unaffected by others in the traffic stream.

B Stable Flow: Slight decline in the freedom to maneuver from LOS “A”

C Stable Flow: Operation of the vehicle becomes significantly affected by the interaction of others in the traffic system.

D Approaching Unstable Flow: High volumes of traffic, speeds adversely affected, and the freedom to maneuver is severely restricted.

E Unstable Flow: Operating conditions are at, or very near capacity. All speeds are low and the freedom to maneuver is extremely difficult.

F Exceeding Capacity: Point at which arrival flows exceed discharge flows causing queuing delays. Stoppages may occur for long periods of time because of the downstream congestion. Travel times are also substantially increased.
Reframing Key Transportation Conventions
DESIGN TRAFFIC - Interpreting the Results

VEHICULAR SERVICE

Seconds

Large Gain

LIVABILITY
What If?
Plan Program

Engineer

Traffic Needs

Local Plans

Typical Input Model

Widen

Other

1 2 3 4 5

Project

Words

Local Input

Public Information

Engineer

Build

Technicians Input

Public Input
Chain of Impacts

First Order: Accept Congestion
- Increase Delay
  - Improve Home
    - Keep Business
    - Keep Jobs
  - Use Alternative Modes
    - Main Street
    - Less Strip
- Increase Cost
  - Drive Less
  - Own Fewer Cars
  - Less VMT
  - Community Reinvestment
People will get sick and tired of traffic congestion and...

Karl Rasmussen
State Traffic Engineer, Minnesota
... and move into the city.

Karl Rasmussen
State Traffic Engineer, Minnesota
When you have eliminated the impossible whatever remains, however improbable, must be the truth.
Integrated Process

Public Input Throughout

Business
Neighborhoods
Visitor Needs

Traffic Needs

Partners

Vision Plan

Plan

Program

Widen / or Network

Other

Project

1  2  3  4  5

Project

Vision

Design

Dialogue

Business

Neighborhoods

Visitor Needs

Connections
More Small Roads
Less Travel
Bike Routes
Sidewalks, Trees
Great Streets
Great Neighborhoods
Traffic Calming

Local Plans

Local Input

Words

Public Information

Public Input Throughout
Plan

Traffic
Needs

Local Plans

Public
Input

Technicians
Input

Typical Input
Model

Engineer

Build

Public
Information

Other

Widen

Words

Project

Local Input