

# Dr. John M. DeGrove Webinar Series: Induced Traffic Demand: You can't build your way out of traffic congestion

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Due to constraints on staff time,
we only apply for professional certification credits
and provide confirmation of attendance
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Educate, advocate and negotiate to protect Florida's high quality of life

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### Dr. John M. DeGrove

May 4, 1924 – April 13, 2012

Icon of comprehensive planning both in Florida and across the nation

Co-founder of 1000 Friends of Florida

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- January 2021 Florida Legislative Preview
- March 2021 Florida Legislative Update
- May— 2021 Florida Legislative Wrap Up



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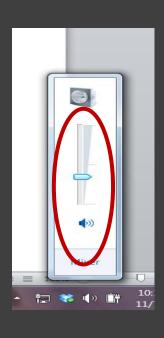
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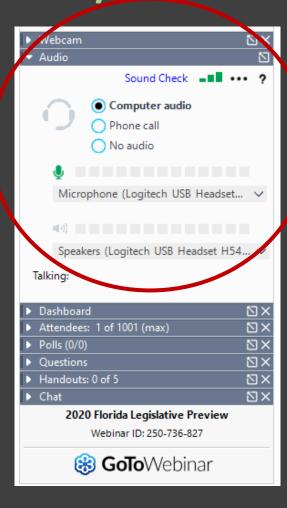
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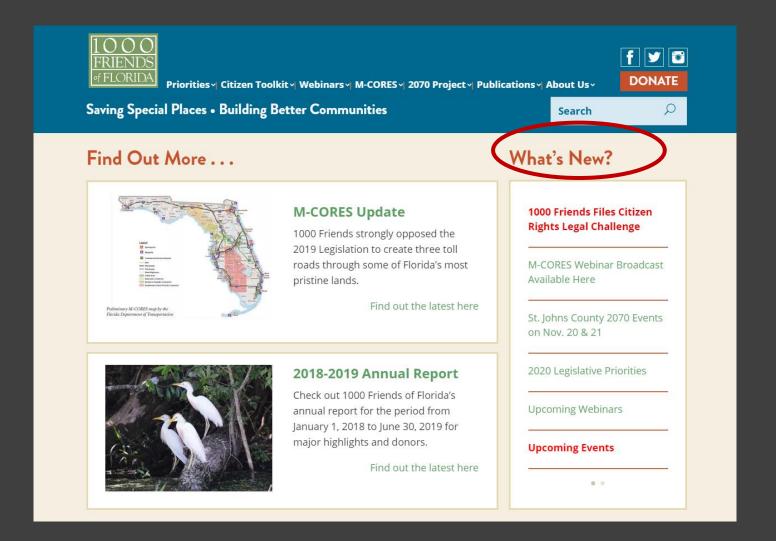
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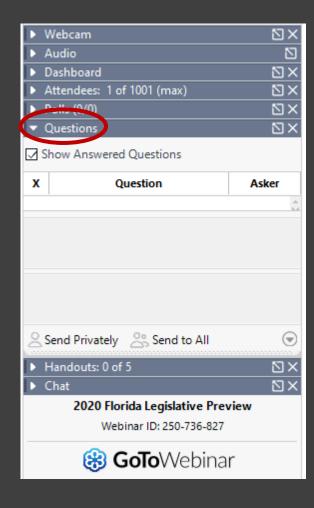
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## Please ask questions!

- Your webinar control panel includes a "Questions" box
- Please click on "+" sign and type any questions in this box
- Please refer to the slide number and/or speaker when you post your question
- Please keep your questions succinct!
- •Staff will ask the presenters questions, as time permits





## Presenters



## Walter Kulash, P.E.

More than 30 years of experience as a traffic engineer, for engineering consultants and currently as an independent public-interest traffic engineer.

His approach to traffic engineering reaches for a new balance point, between the long-held engineering goal of moving as much traffic as efficiently as possible, and the evolving view of streets as valuable for all users, particularly the non-motorized modes of walking and bicycling.

Reaching this new balance point typically involves redefining the acceptable level of traffic service, establishing a (usually lower) vehicular design speed reflecting shared use of a street, reallocating the street space between motorized and non-motorized users, adding to the quality (not merely quantity) of pedestrian and bicycle accommodations and dispelling widely-held but obsolete notions of safety.

Typical sponsors for striking this new balance point are cities, community development groups, complete streets advocacy groups, new urbanist designers, non-governmental organizations, the retail industry and, increasingly, the transportation planning field itself.





### G. Wade Walker, P.E., Hon. ALSA

A Senior Principal Engineer at Kittelson Associates based in the Orlando office.

For the past 27 years, has worked in the realm of complete streets and context sensitive solutions, focusing on the restoration of livability to streets, smart growth, and walkability, often working in an intense collaborative charrette setting.

Ascribes to a multidisciplinary design approach, often working closely with planners, landscape architects, and urban designers to focus on creating active, vibrant, and great communities where people have real choices of how they move about.

Notable projects include Virginia's Route 50 Traffic Calming Plan in Northern Virginia; Plan Baton Rouge Downtown Revitalization Strategy; and the Scenic and Historic A1A Coastal Byway Master Plan in St. Johns County, Florida.

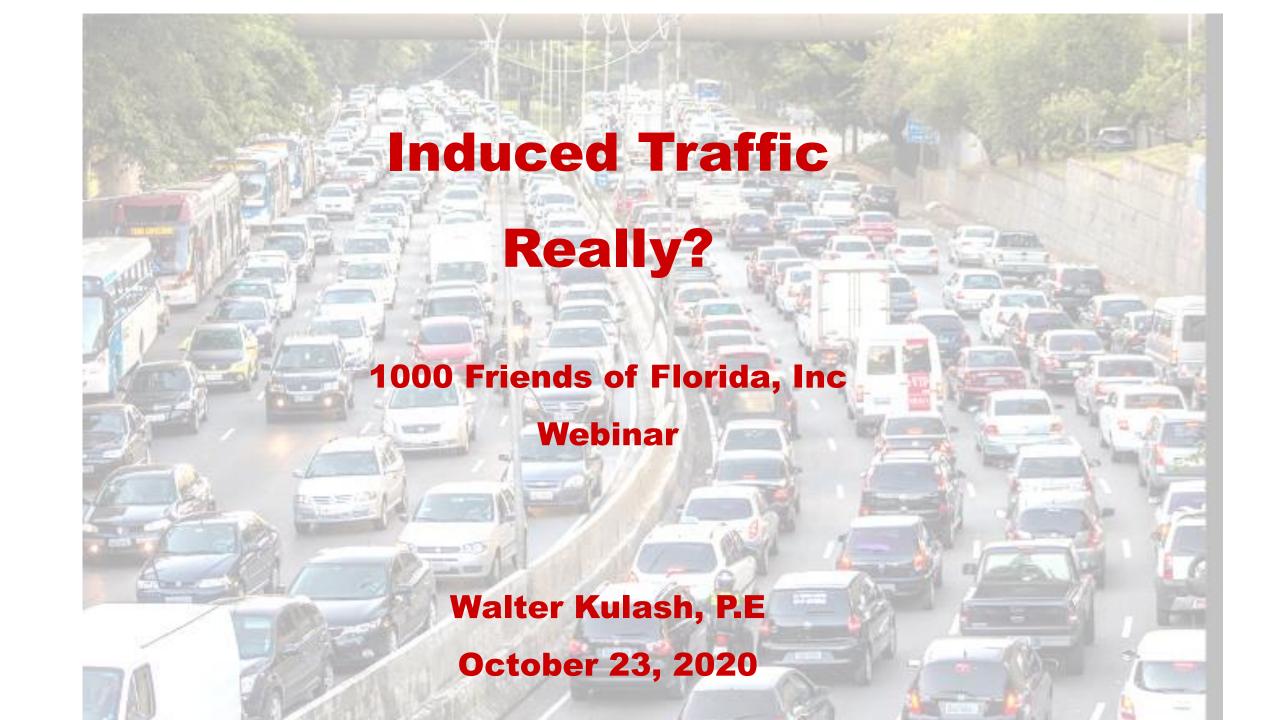
A registered professional engineer in seven states, including original licensure in Florida, and a member of the Congress for New Urbanism.

Conferred the title of Honorary ASLA by the American Society of Landscape Architects

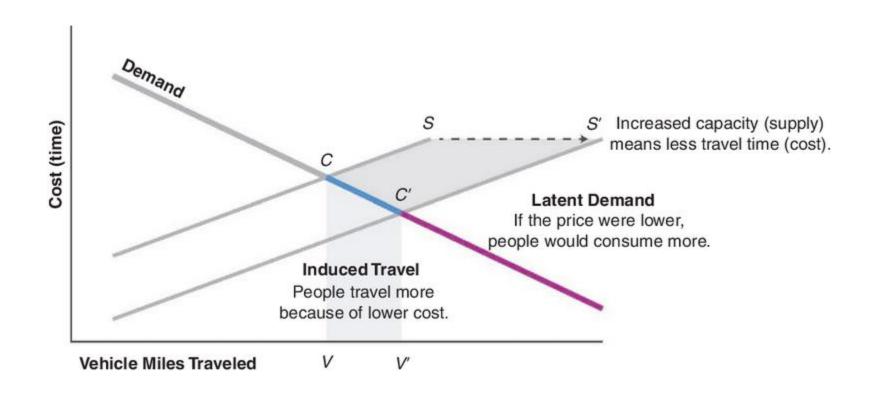


## Walter Kulash, P.E.



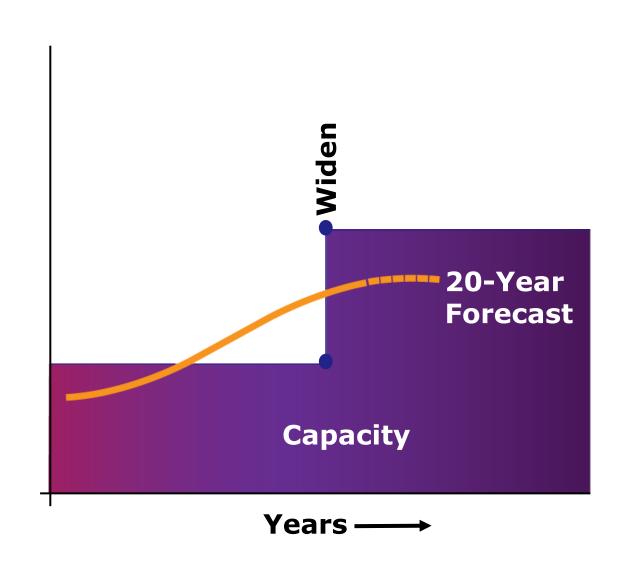


## Induced Traffic: Simply Supply and Demand in Action

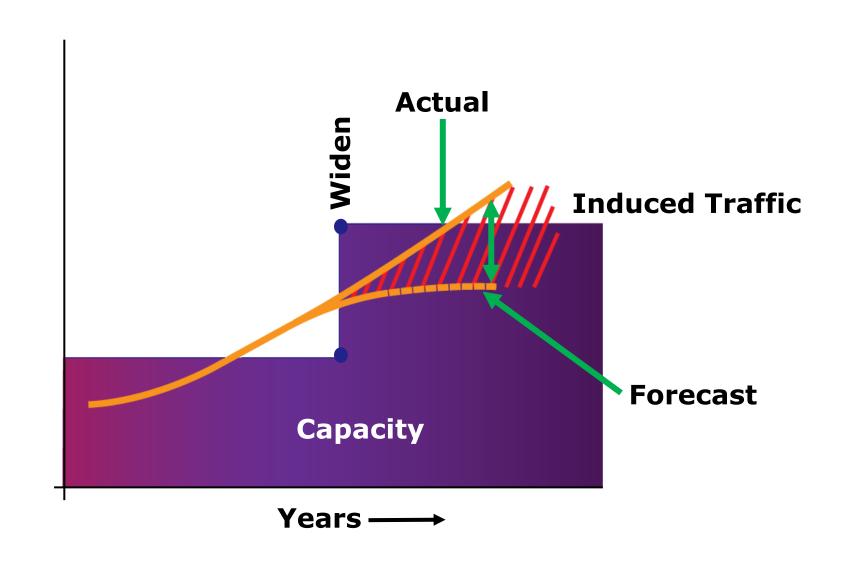


Transportation Research Board, Transportatioin Engineering Record, 2017, R. Milam, M Birbaum et al

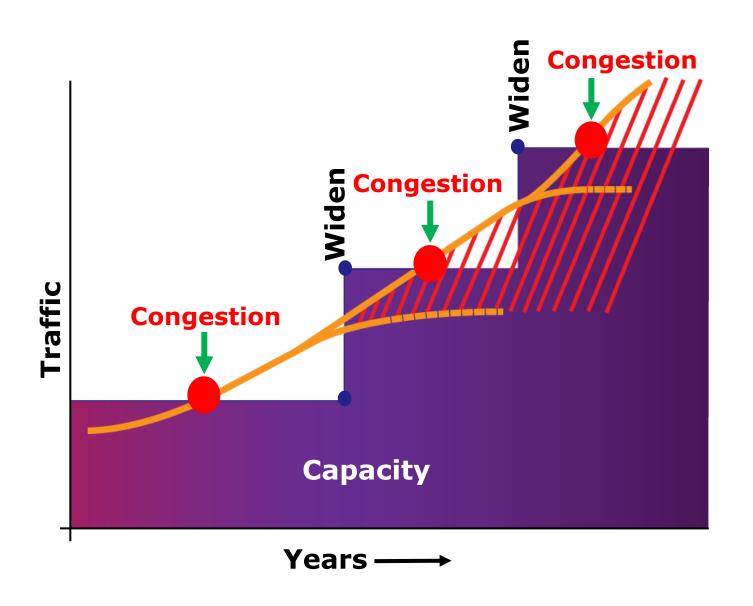
#### **Ideal Traffic Planning**



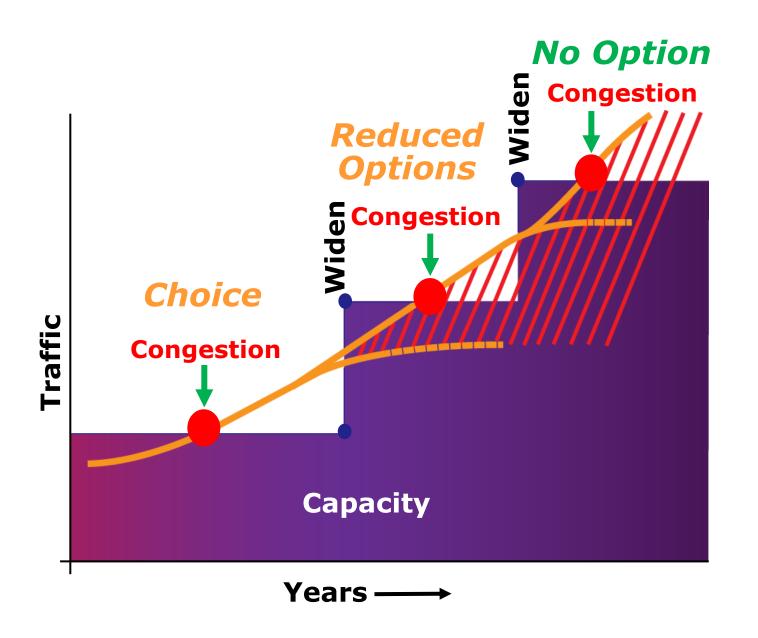
#### **Ideal Traffic Planning**



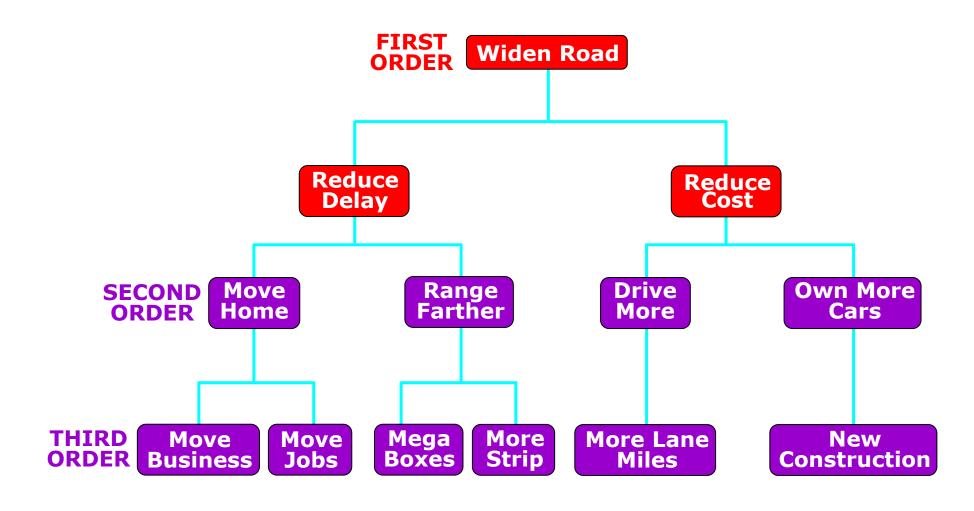
#### **Road Size, Not Congestion is the Choice**



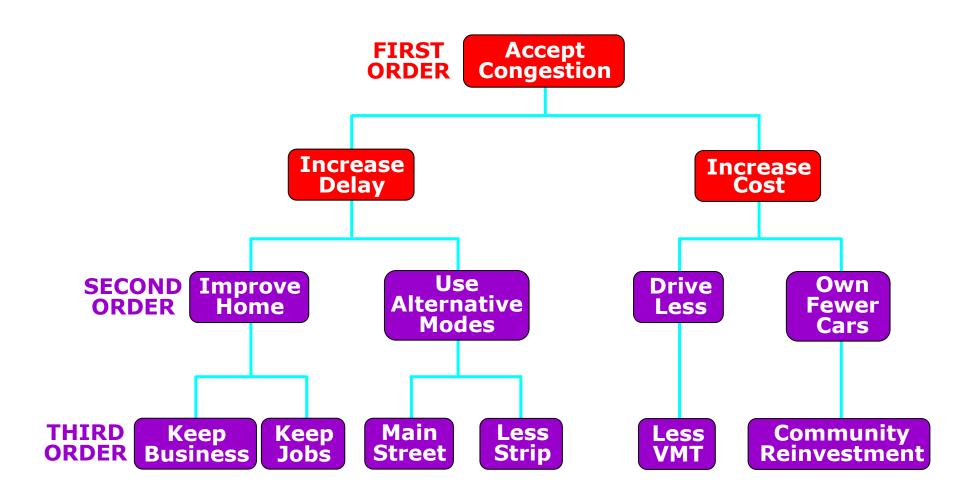
#### **Road Size, Not Congestion is the Choice**



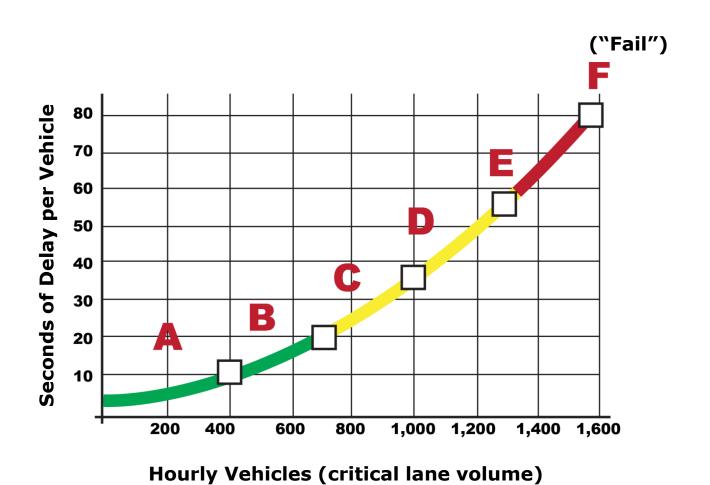
#### **Chain of Impacts**



#### **Chain of Impacts**

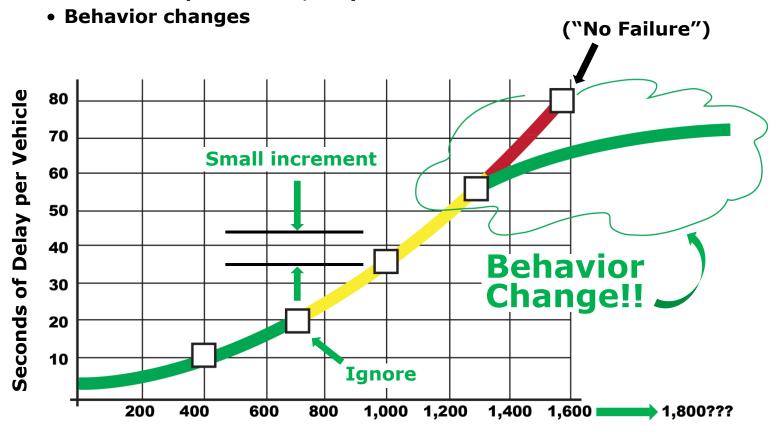


#### **Traffic Service (Theoretical)**



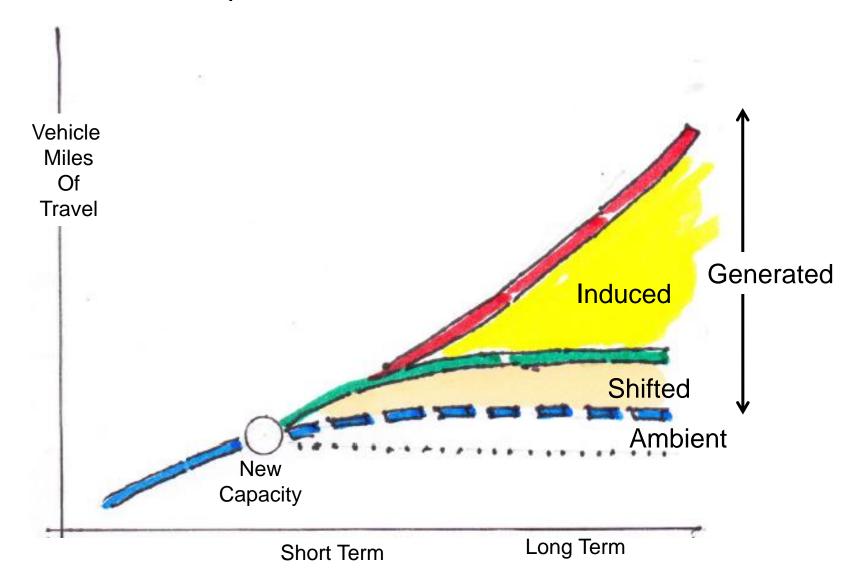
#### **Traffic Service (Actual)**

- NOT a school grade!
- No catastrophic failure, only small increments



**Hourly Vehicles (critical lane volume)** 

#### Components of Generated Traffic



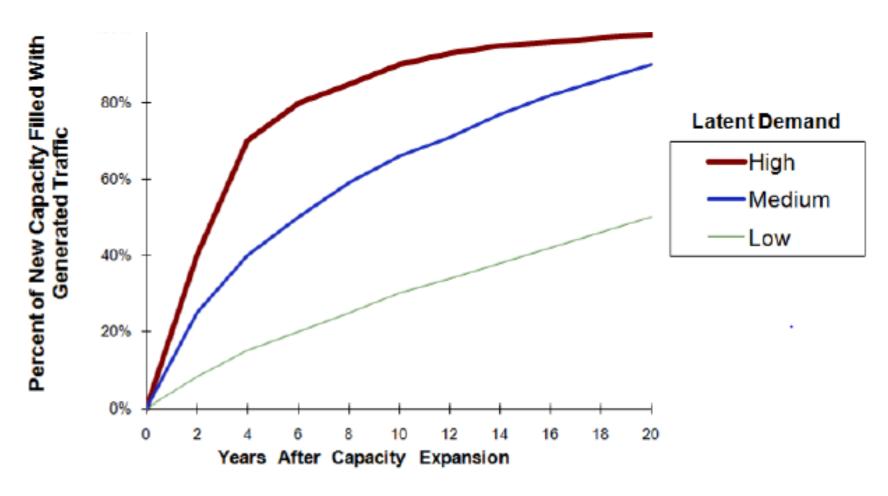
#### **Generated Traffic and Induced Travel**

Implications for Transport Planning 18 March 2019

> Todd Litman Victoria Transport Policy Institute



## Elasticity of Traffic Volume Versus Capacity Expansion Composite of Studies



Source: Todd Littman, *Generated Travel and Induced Traffic*, 2019, Figure 5

#### **Generated Traffic and Induced Travel**

Implications for Transport Planning 18 March 2019

> Todd Litman Victoria Transport Policy Institute





#### National Association of City Transportation Officials

#### NACTO Design Guide

APPENDIX B

INDUCED TRAFFIC AND INDUCED DEMAND

Douglass B. Lee, Jr.

#### Vanderbilt University Law School Scholarship@Vanderbilt Law

Vanderbilt Law School Faculty Publications

Faculty Scholarship

2004

### Induced Litigation

Chris Guthrie

Tracey E. George

rightly reasoned, compelling

#### FHWA Induced Traffic Guidance

Time frame of impact	Induced Demand Components	Effects on Forecasting Analysis	Effectiveness of Model
Short-run Impacts	Change in number of trips	The net addition of trips will affect traffic, noise, and emissions impacts	Poor – Trip generation models are typically based on demographic factors such as household size, income and auto ownership, and are insensitive to changes in travel time or accessibility.
	Change in length of trips	Change in trip length will affect duration of use of facility and emissions	Fair – Trip distribution models use an aggregate measure of impedance based largely on travel times. Feedback of travel impedances from assignment to distribution enables distribution models to be sensitive to congestion effects.
	Change in mode of travel	Change in mode to or from auto will affect noise and emissions	Good – Disaggregate mode choice models estimate mode choice probabilities based on relative attractiveness of alternative modes with respect to travel times, costs, and other factors.
	Change in route	Changes in route will affect traffic volumes on facility and emissions	Good – Equilibrium traffic assignment models reallocate trips to alternative routes based on travel impedances and volumedelay functions.
	Change in time of travel	Changes in time of travel will affect levels of congestion	Poor – Most travel models partition daily trips into fixed time periods with no option for adjustment between periods based on traffic volumes.
Long-run Impacts	Change in development patterns	Net addition of trip-generating land uses will increase traffic volumes, may increase trip lengths	Poor – Most travel models use population and employment forecasts developed outside the model and have little or no feedback between the travel model and land use forecasts.
	Change in behavior (e.g., vehicle ownership)	Changes in behavior have long run- impacts on number of trips, length of trips, mode of travel and hence affect traffic volumes	Poor – Most travel models use static assumptions about future residential locations, vehicle ownership, and mode preferences.

Deniers - Disbelieve induced Tramic, but say we wouldn't have it if we would just toll.

JUNE 18, 2014 4:26PM

## Debunking the Induced-Demand Myth

BY RANDAL O'TOOLE





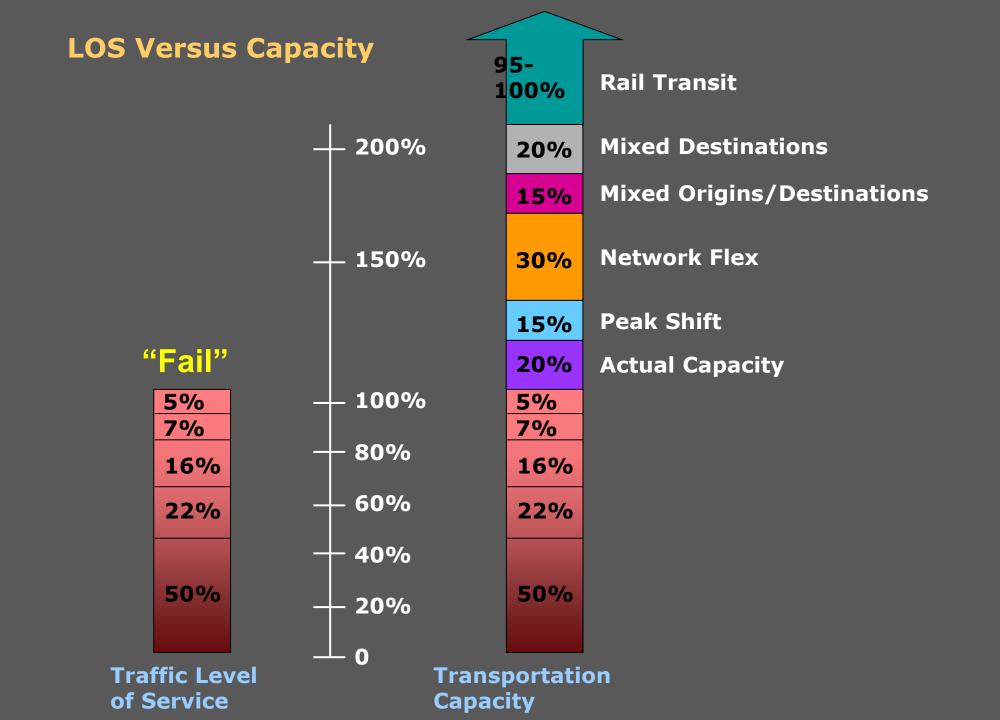


## SR 836 Extension Miami-Dade

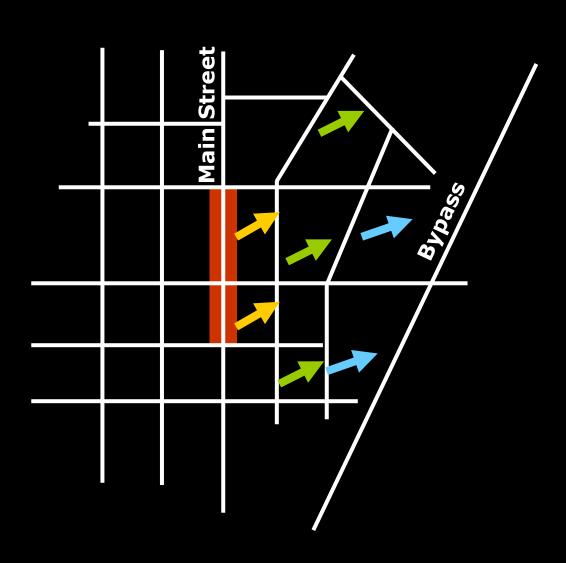
#### Total denial of induced traffic

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Administrative Law Judge
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#### **Rerouting "Chain Reaction"**





#### For America's Big Retailers, Small Is Beautiful, Sometimes



Tom Ewart/NW

#### How Wal-Mart Became Small-Mart

Pushed by smaller rivals, Wal-Mart created Neighborhood Markets to offer more convenient shopping to those too rushed or too weary to roam the much larger Wal-Mart stores.

AVERAGE SQUARE FEET	40,000	200,000
AVERAGE NUMBER OF ITEMS	24,000	100,000
NUMBER OF STORES	46 in 8 states	1,244 in 44 states
STORES OPENING	20-25	200-210

Source: Wal-Mart

The New York Times

#### By CONSTANCE L. HAYS

After carpeting the country with stores measuring 150,000 square feet or more, retailers are discovering that people do not always have the time or the inclination to get all the way through them.

Yes, the abundance of a 200,000-square-foot Wal-Mart Supercenter is impressive: the equivalent of four football fields of stuff. And sure, it's handy to be able to buy just about everything at a single 175,000-square-foot SuperTarget. But at the same time, time-pressed shoppers, particularly millions of aging baby boomers, are sometimes finding these stores to be too large, too inconvenient and too tiring to get all the way through.

And the big-box retailers have noticed. Wal-Mart Stores has been aggressively opening scaled-down versions of its Super-



centers — less than one-quarter their size — called Neighborhood Markets. So far the company has built 46 smaller stores scattered through Oklahoma, Arkansas, Texas, Mississippi and Tennessee; a handful opened in Florida, Alabama and Utah in the past week. Retail analysts have taken to calling them Small-Marts.

In Brooklyn, **Home Depot** has opened a shrunken version of its usual model. Other retailers, including **Toys** "R" Us and **Staples** are retrofitting stores to make them smaller, cozier and more intimate, qualities the big-box format was supposed to displace.

"Customers are demanding respect for their time," said David M. Szymanski, director of the Center for Retailing Studies at Texas A&M University. "One way to respond to that is to offer formats that cater to that."

Leisa Still suffers at times from big-store fatigue. Ms. Still,

Continued on Page 2

#### P HEAT 3, TAKE LEAD

LAZERS FINISH JNS, NBA, 1,12C

JR. ROARS RAND PRIX YCLE SCENE 13C

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NO. 1 IN THE USA . . . FIRST IN DAILY READERS

**MEET USA TODAY'S** H.S. ACADEMIC ALL-STARS 1,6-7D



**COVER STORY** 

#### Grab your coffee for an earlier morning rush

By Scott Bowles USA TODAY

Never before have so many drivers been on the road so early.

Gridlock is creeping into the predawn hours as traffic tie-ups begin in some cities as early as 5 a.m. More than 10% of the nation's morning commuters leave for work between 5 and 6 a.m., the largest percentage ever, according to a USA TODAY analysis of Department of Transportation statistics. By some esti-hour as 7 a.m. to 9 a.m.," Dallas traffic evident in growing regions where sub-

"We used to classify the morning rush 
The new morning rush is especially ways clogged earlier than ever.



5-6 a.m. rush: Bumper-to-bumper along the Riverside Freeway toward Los Angeles

dawn."

mates, more than 12 million motorists engineer Benjamin Harris says, "Now urbs are thriving, in places like Dallas are making the morning drive before we look at serious traffic peaks before and Atlanta and Los Angeles. But drivers everywhere are finding their road-

"Five years ago I'd leave the house at 5:45 a.m., and maybe I'd see another car or two, but the road was mine," says Paul Naour, 47, of Columbus, Ohio. "Now, I see headlight after headlight."

Among forces driving the trend:

More drivers on the road. A booming economy has created the nation's largest workforce. More workers mean more commuters. A surging computer industry, especially, has created a workforce of millions who go to work early to do business with people in time zones around the globe.

More time spent on the road.

See COVER STORY next page ▶

easury secretary vina post 1B

new challenge, 1,2B

► Nominee Summers' ► Strong economy best politics, 3B

**Senate: No to** 





#### 15 of the (mostly recent) 41 Light Rail Systems in the US













LACMTA Gold Line

Muni Metro's T Third line MAX Light Rail

DART Green Line

TRAX Green Line













METRO Blue Line

St. Louis MetroLink Train RTD Denver Light Rail

TECO Line Streetcar in Tampa, Florida

KC Streetcar in Kansas City, Missouri

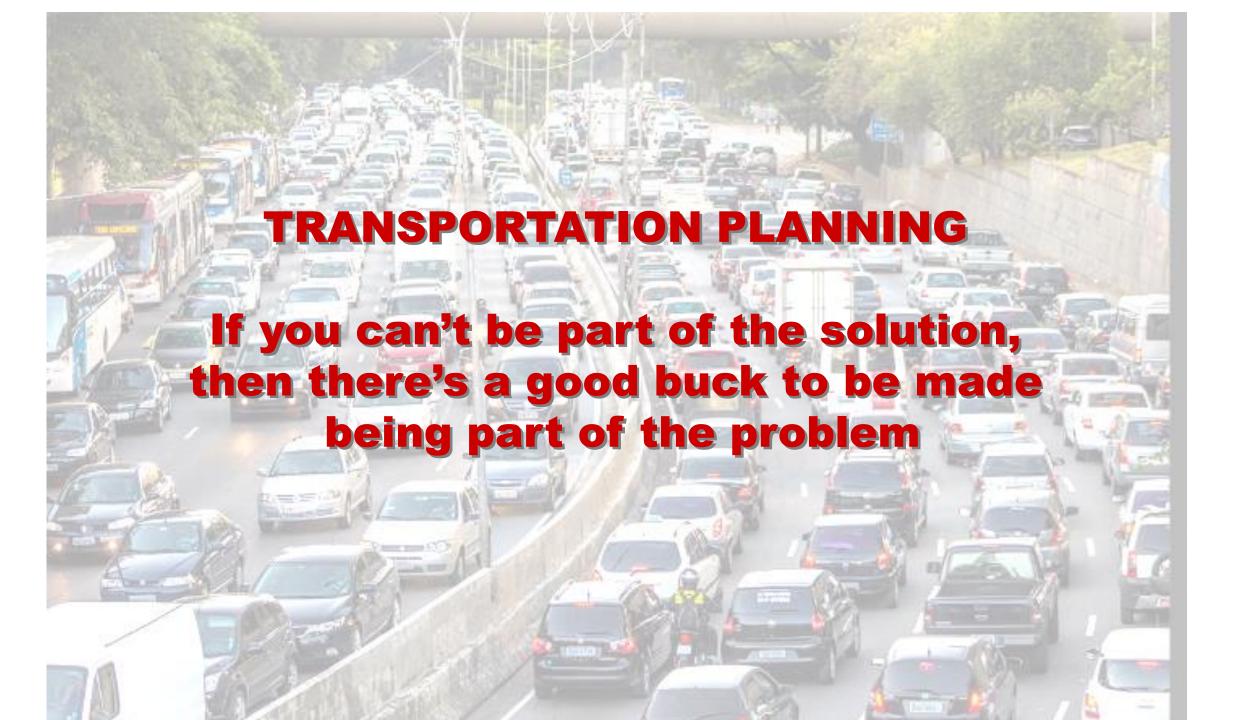
Houston METRORail Red Line











#### Where Induced Traffic Goes, continued



Richard Driscoll, University of South Florida
Factors Explaining Changes in Household Vehicle Miles of Travel, 2018



LAWTON CHILES GOVERNOR Street, Tallahassee, Florida 32301 BEN G. WATTS SECRETARY

November 14, 1991

Governor Lawton Chiles The Capitol Tallahassee, Florida 32399-0001

#### Dear Governor Chiles:

As we near completion of our Interstate Highway System, we come to the end of an era in American transportation history. Over the past thirty-five years, the Interstate system has profoundly influenced the lifestyles, work choices, and leisure activities of al Americans. The new era that we are now entering will focus on preservation and, where appropriate, expansion of this system which constitutes only 1 % of the nation's highway mileage but carries 22% of all the highway travel.

The Interstate is the backbone of our transportation system in Florida. Our continued growth in population and tourism has far surpassed the design capacity of many section of Florida's 1,469 mile system. It is imperative that we provide additional capacity to preserve the vitality and economic prosperity of our State. However, the needs and priorities of twenty-first century Florida are far different from those of the 1960's, and the policies of the sixties would be inadequate and inappropriate to guide our future decisions. As we move into the next era of Interstate preservation and expansion, we must have new policies to guide us. These new policies must be as innovative and visionary as the original policies that guided development of the system that is often cited as the greatest public works project in history. Our decisions about where and how to add new lanes or new interchanges to the Interstate System will support the future development of Florida to the same degree that construction of the original system shaped the Florida we know today.

On the attached policy statement, I have reduced to writing the Interstate policies that I believe Florida must follow if we are to effectively guide this state into the twenty-first century. The policies direct the Department to initiate an interim expansion of the Interstate system to six lanes in severely congested corridors while we develop a new comprehensive plan for the entire system. All existing Interstate "Master Plans", including those for our metropolitan areas, will be withdrawn to incorporate major revisions.

we come to the end of an era

However, the needs and priorities of twenty-first century Florida are far different from those of the 1960's, and the policies of the sixties would be inadequate and inappropriate to guide our future decisions.

# People will get sick and tired of traffic congestion and...

**Karl Rasmussen**State Traffic Engineer, Minnesota



## G. Wade Walker, P.E., Hon. ASLA







#### **Complete Streets**

- Balanced for all users
- Gap Closure Seamless among modes
- Transit Ready
- Context Sensitive
- Contributes to Healthy Community
  - Personal health
  - Economic health
  - Ecological health

#### The Case for a 4 to 3 Conversion

(or why 2+2 does not =4)

- Volume and capacity are two different things
  - Capacity for 4-lane undivided road is in the range +/-25,000 vpd;
     capacity for 3-lane road +/-18,000 vpd
  - Can usually realize volume growth potential on candidate streets
- On urban streets, capacity is dictated by turns at intersections and into driveways (can significantly affect numbers above)
- Addition of turn lane removes left turning vehicles from travel lanes
- In most peer cases, volumes stay steady or vary slightly with road diet; in no cases does a road "lose" half its volume



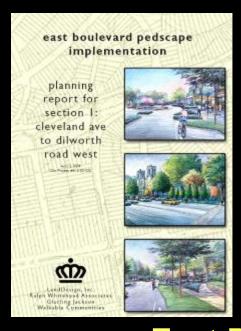


**De Facto Two Lane Section** 

#### Traffic Data – Road Diet Cases

Location	Road	<b>ADT: Before</b>	<b>ADT: After</b>
San Leandro, CA	East 14th Street	17,700	16,700
Duluth, MN	21st Ave. East	17,000	17,000
Ramsey County, MN	Rice Street	18,700	16,400
Toronto, Canada	St. George Street	15,000	15,000
Kirkland, WA	Lake Washington Blvd	23,000	25,900
Seattle, WA	North 45th Street	19,400	20,300
Covington, WA	SR 516	29,900	32,800
Bellevue, WA	Montana Street	18,500	18,500
East Lansing, MI	Grand River Blvd.	23,000	23,000
Santa Monica, CA	Main Street	20,000	18,000
Helena, MT	US 12	18,000	18,000
San Francisco, CA	Valencia Street	22,200	20,000
Oakland, CA	High Street	22,000	24,000
Orlando, FL	Edgewater Drive	20,500	21,000
Seattle, WA	Madison Street	17,000	18,000
Reno, NV	South Wells Ave	18,000	17,500
University Place, WA	67th Ave	17,000	15,000
University Place, WA	Cirque Ave	16,900	14,400
East Lansing, MI	West Grand River Ave	18,000	18,000
East Lansing, MI	Abbott Road	15,000	21,000

## **Road Diet Case Studies**







East Boulevard: Charlotte, North Carolina

5-lane to 3-lane road diet to add bike lanes and streetscape

**Edgewater Drive: Orlando, Florida** 

4-lane to 3-lane road diet to add bike lanes and streetscape





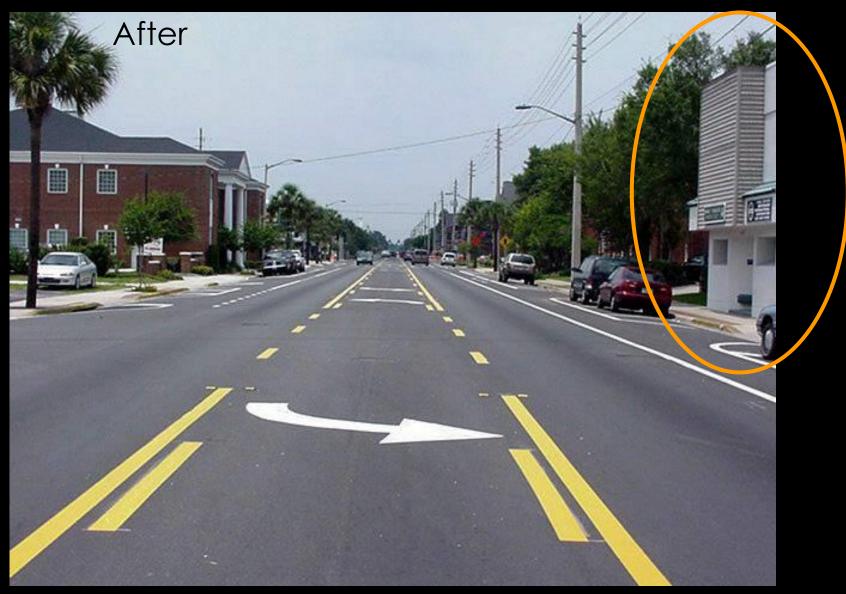
"Poster Child" - East Boulevard Road Diet, Charlotte, NC



# Reinvented Edgewater Drive



## Edgewater Drive – Orlando, FL

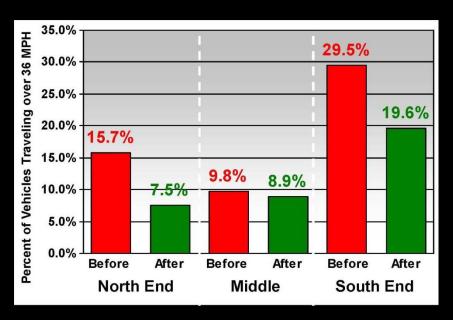


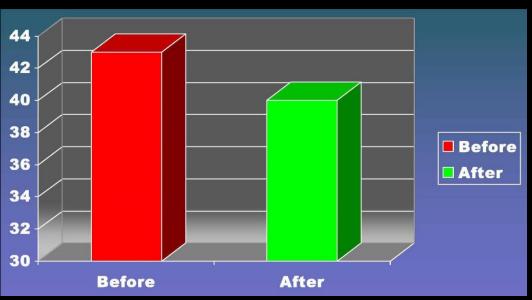
**Traffic Volume 17,000 – 19,000 ADT** 

## Traffic speeds slow with street "right sizing"

- Reduction of excess capacity slows traffic speeds
- Slaloming eliminated with addition of turn lane/median
- Presence of bicycles and pedestrians increases driver awareness
- Slower traffic = opportunity to "see what's beyond the curbs"

## Speeding Analysis

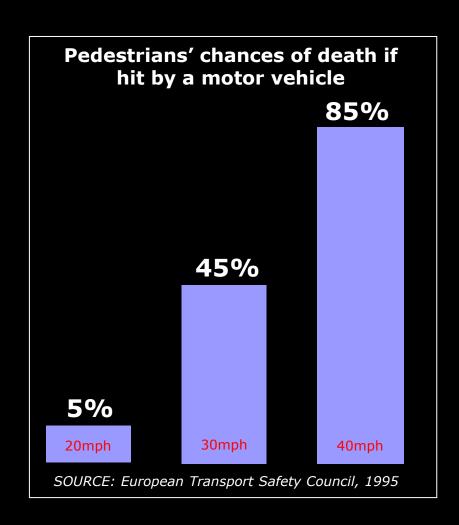




**Edgewater Drive** 

**East Boulevard** 

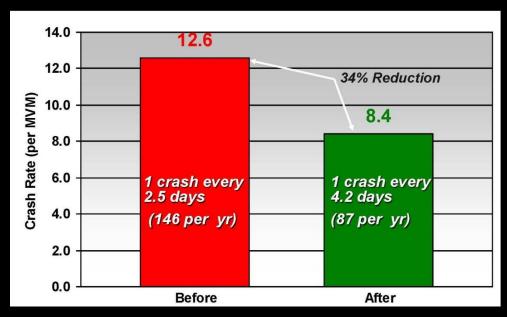
# Speed Kills (literally)

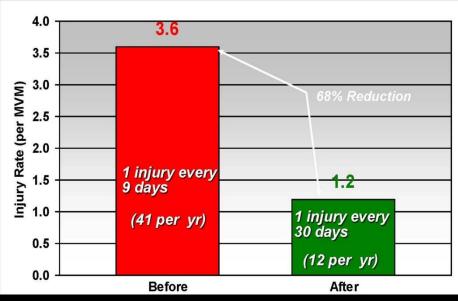


# Providing turn lane significantly reduces certain accident types

- Many rear-end and sideswipe accidents on undivided roads are caused by motorists trying to weave out from behind left turning vehicles
- In 2008, these type crashes accounted for 36% of all accidents along the subject stretch of Madison Avenue
- By providing turn lane, these type accidents are significantly reduced
- Data on converted facilities bears this fact out between 17% and 75% reduction on multiple case studies (Knapp & Rosales, 2006)

## Crash Rate and Injury Rate-Edgewater Drive

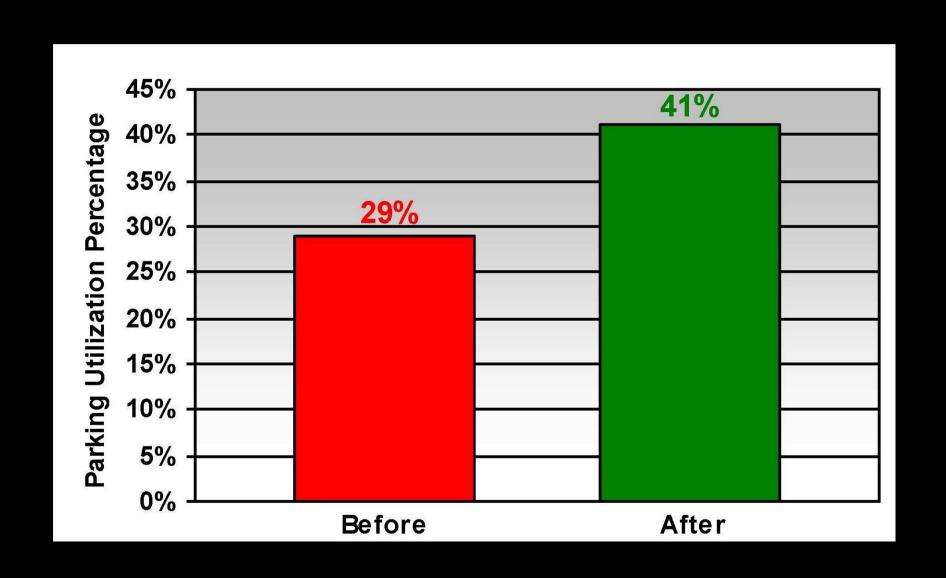


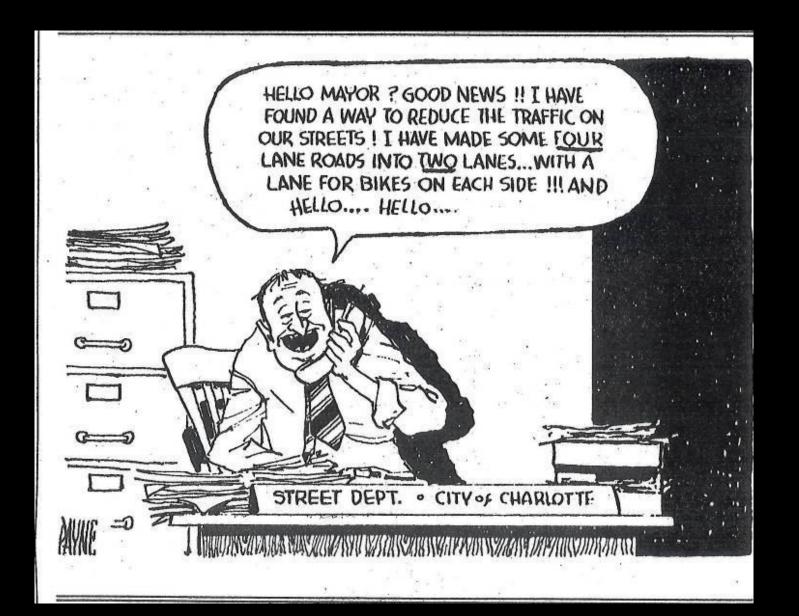


## Catering to multiple users enhances economic vitality

- Case studies where diets have been accomplished show increases in pedestrian and bicycle activity
- By making the road easier to cross, pedestrians are likely to shop both sides of the street
- Data and redevelopment on converted facilities bears this fact out

## On-Street Parking Utilization-Edgewater Drive





From: Jim Hock [	
Sent: Thursday, July 13, 2006 4:5	1 PM
To:	7.5.30
Cc:	
Subject: Fast Blvd. Kudos	

Just wanted to let you know how well I think the East Blvd. conversion is going. I travel that road probably 6 times per day at various hours, and it seems the pedestrian islands and lane reduction has helped things tremendously on the street. Today I saw 2 ladies, in skirts and high heels, crossing the street while they talked, arriving at the middle island, and then continuing to cross. There is NO way that they would've been able to cross in high heels before. If they'd bled, it would've been a mad dash, not a leisurely walk while conversing.

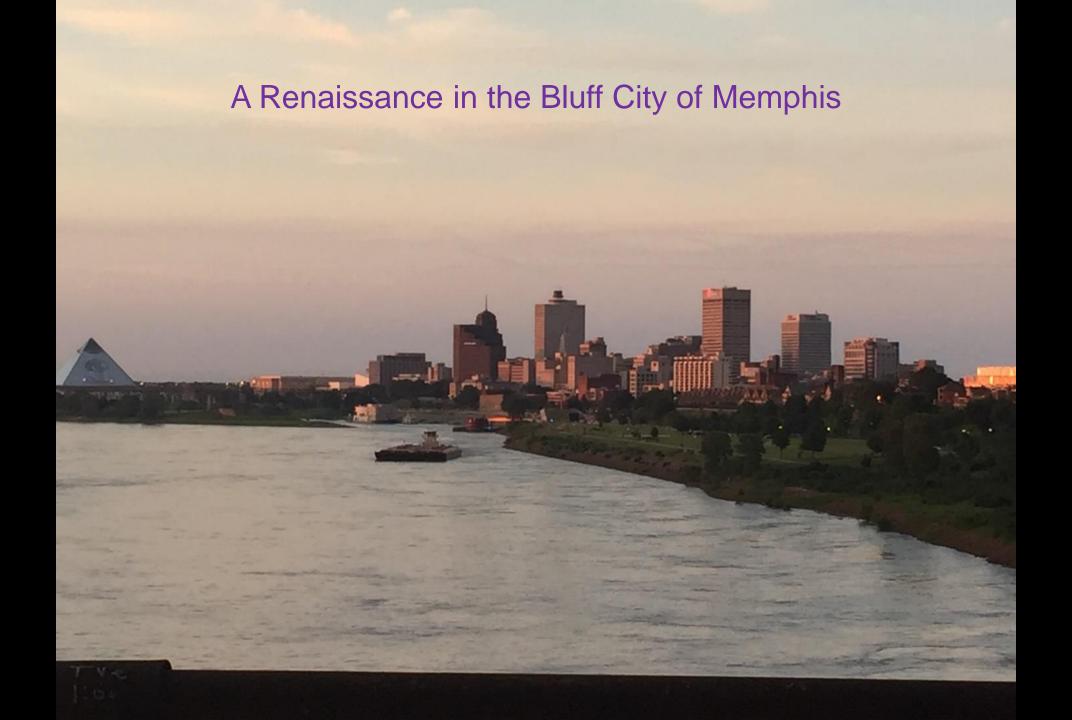
The traffic has slowed considerably, but it still flows fine. I've gotten stuck behind a bus a couple of times and grumbled I couldn't pass, but the 15 seconds it took for the bus to stop really wasn't so bad after all.

If the goal was to slow down traffic, improve pedestrian safety and quality of life, while allowing traffic to flow smoothly, you've succeeded!

Thanks again.

Jim

Special thanks to Dan Gallagher, retired Deputy Director of Charlotte Department of Transportation for his contribution to this presentation!



#### A Tale of Two Cities

#### Before 2010

- Memphis named Worst City for Cycling
  - -2008 Bicycling Magazine
  - -2010 Bicycling Magazine
- •Bikes relegated to "Wide Outside Lanes"
  - -50 miles Shared Bike Routes, 2003
- •2 miles of existing bike lanes
  - -Installed in 2008



# The Turning Point

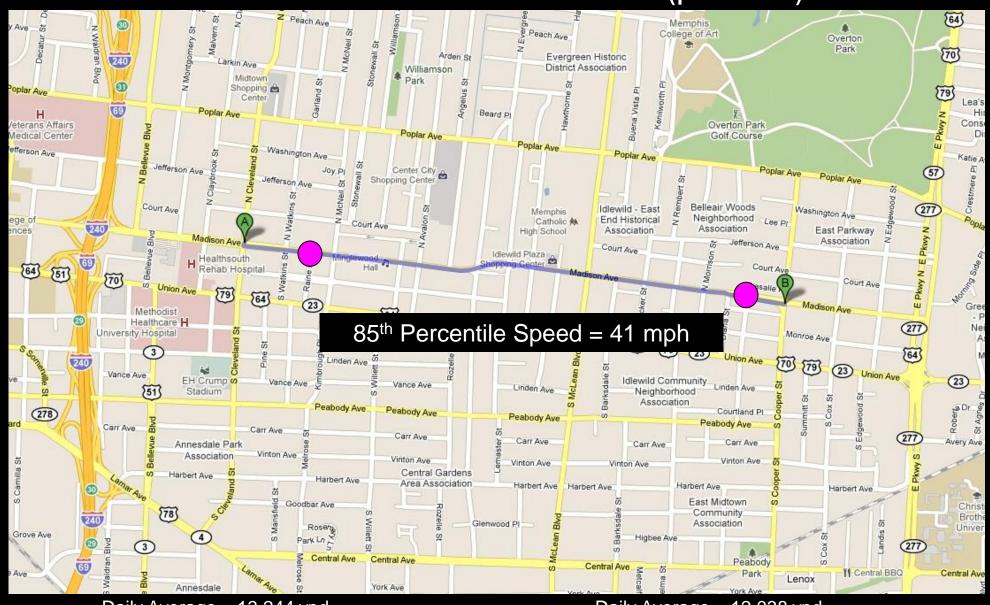


- Mayor AC Wharton elected in October 2009
- Pledges 55 miles of bike lanes within 2 years
- Hires city's first bike/ped coordinator in 2010 and installs Kyle Wagenschutz in City Engineering
- Leverages ARRA funding with RRR to implement facilities

# Madison Avenue, Memphis (pre-diet)

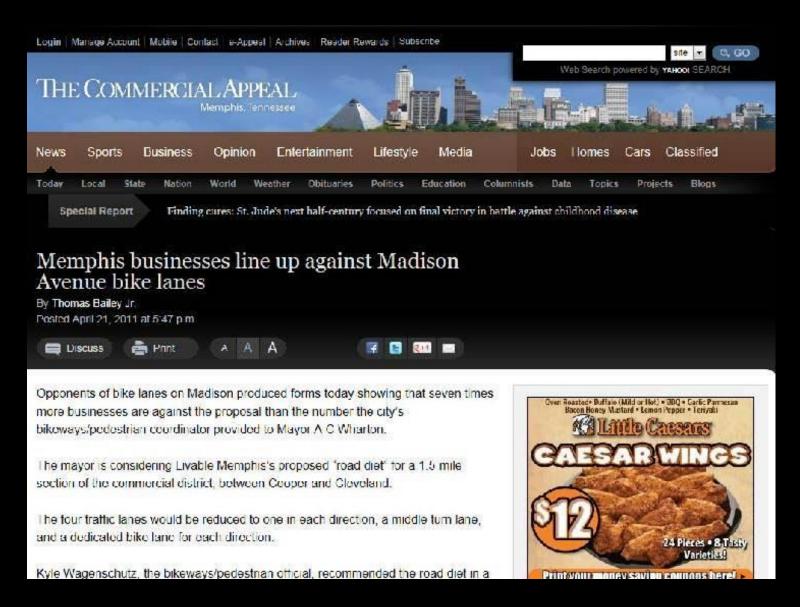


#### Traffic Data – Madison Avenue (pre-diet)



Daily Average – 13,244 vpd AM Peak Directional – 497 (WB) PM Peak Directional – 610 (FB) Daily Average – 12,038 vpd AM Peak Directional – 547 (EB) PM Peak Directional – 687 (FB)

#### Half the lanes, half the traffic?



### Comprehensive Analysis

Two community forums for education on road diets

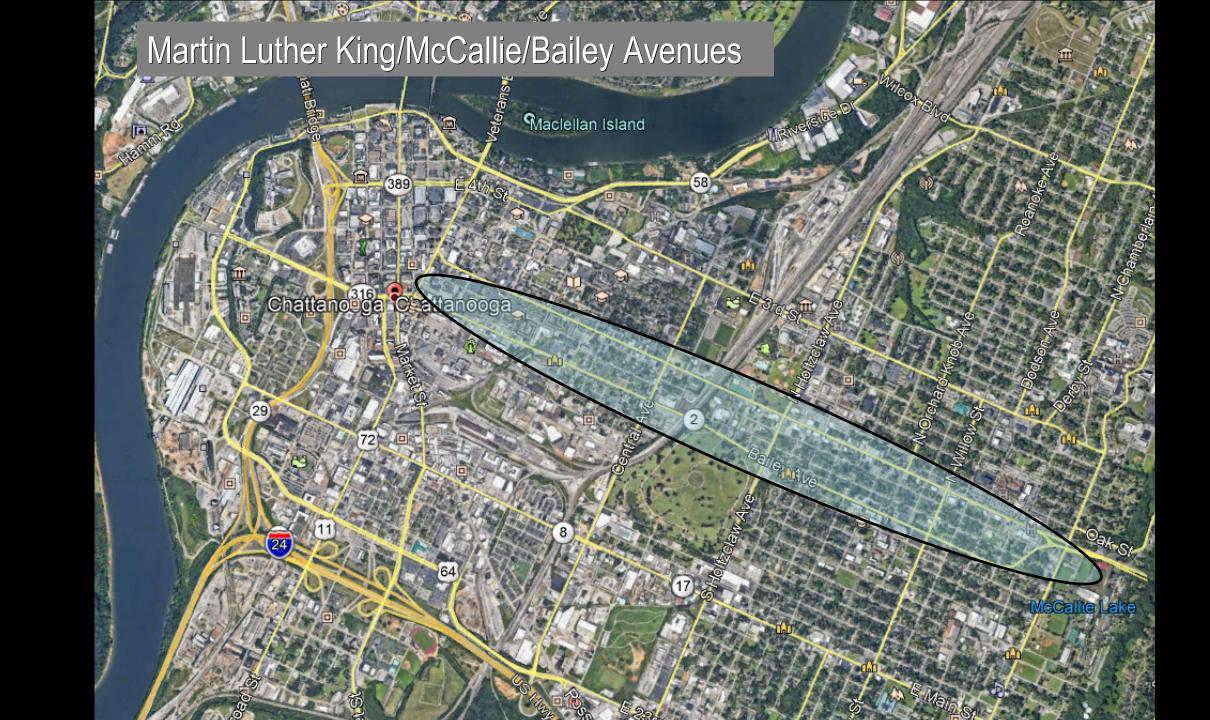
- Technical analysis (counts, modeling in SimTraffic) showed increase in delay was negligible
- Modeling demonstrated no diversion to parallel routesdue to delay
- Mayor agreed to "pilot" project

### Madison Avenue, after



Traffic volumes today are within 500-700 vpd pre-diet (12,500 ADT)







#### **One-Way Pair Transportation Analysis**

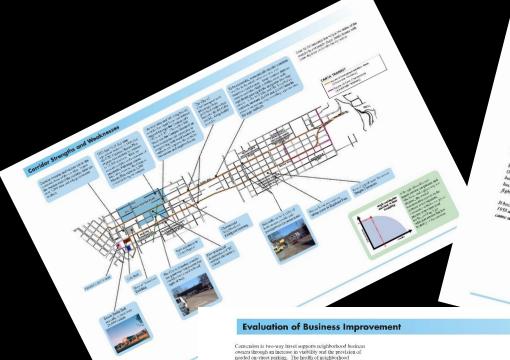
Martin Luther King Boulevard/Bailey Avenue & McCallie Avenue



Prepared for: Planning & Design Studio City of Chattanooga, TN

Prepared by:

Glatting Jackson Kercher Anglin Lopez Rinehart, Inc.



# Chattanooga Times, 9-23-1956, pg 6.

#### BATTLE SMOKE LIFTS; OVERPASS GOING UP

500 Districter-Bridge strang- July in programming pages 1 file restranger page 1 file restranger pages	Companion Pr	New ToppeTa Locati oject Started in '48	os,
where it will be read to pre- gram for an exemption to a com- paner. Soil enterprises to the exemption to the exemption of the committee of the exemption of the term of the exemption of the term of the exemption of the term of the exemption of the exemption of the pre- sent of the exemption of the exemption of the term of the exemption of the exemption of the pre- sent of the exemption of the exemption of the exemption of exemption of the exemption of the exemption of exemption o	It is the type of point on the character in a character in character i	the bends of Chemisterian property of the State of the St	FUN DICKES drawn by- La Whele and Pright III.  La Whele and III.  La



needed on-street parking. The health of neighborhood businesses is critically important since they represent a large presence in the corridor and their redevelopment will be necessary to transform it.

Hundreds businesses front McCallie Avenue and MI. King Blvd/Bailey Avenue. MI. King Blvd. already has significant inversionly accesses, in, sing Bow, arrawy has significant on-street parking serving the struggling retail business. The ML King Blvd on-street parking remains after conversion. The introduction of new on-street parking on McCallie Avenue helps to relieve the shortage of parking on that street. On-street parking is visible parking, critical to street. Offsittle: parking a vision parking crision a streeting the drive-by customer. No on-street parking spaces are now available on McCallie Avenue. After conversion, with each of the 383 new on-street parking space valued at \$20-30,000 in annual retail sales (U.S. Chamber of Commerce), the annual value in retail sales for the corridor could increase \$7.66 to \$11.49 million.

On-street parking encourages business activity not only through the provision of needed parking spaces, but also through the creation of a more pleasant and safer pedestrian environment. The parked vehicles act as a buffer between the sidewalk and the moving vehicles. The more pleasant. the sidewalk experience, the more likely that shoppers will visit and window-shop along a revitalized McCallie and Ml. King business corridors.

The shortage of parking in the McCallie Avenue corridor could also be relieved through the construction of an off-street parking garage. Cost and equity support the creation of on-street parking instead. A structure that could accommodate the same number of vehicles would require a capital outlay of approximately \$4.2 million. In addition, while a garage is centralized and provides parking only to those businesses that are within a reasonable walking distance, on-street parking evenly distributes parking throughout the 2.6-mile corridor.





Conversion History



The slower speeds will bring more visibility to retail signs and storefronts. With slower speeds, drivers are more aware of their surroundings, and are more likely to stop and sloop in the corridor. In addition, with the confusion of the one-way network removed, tourists and infrequent visitors are more likely to visit the business districts.

#### Francisco Implications of Budavalonment of Frantise Detail

	Existing	After Conversion and Redevelopment	Tax increment for City of Chattonoogo
Average Retail Rental Rates	S2 to S4 per square foot/month	\$10 to \$12 per square foot/month	
79 Retail businesses that front McCallie and ML King/Bailey	\$395,000-\$790,000 /month	\$1.975,000 to \$2,370,000 /month	\$118,000 per year

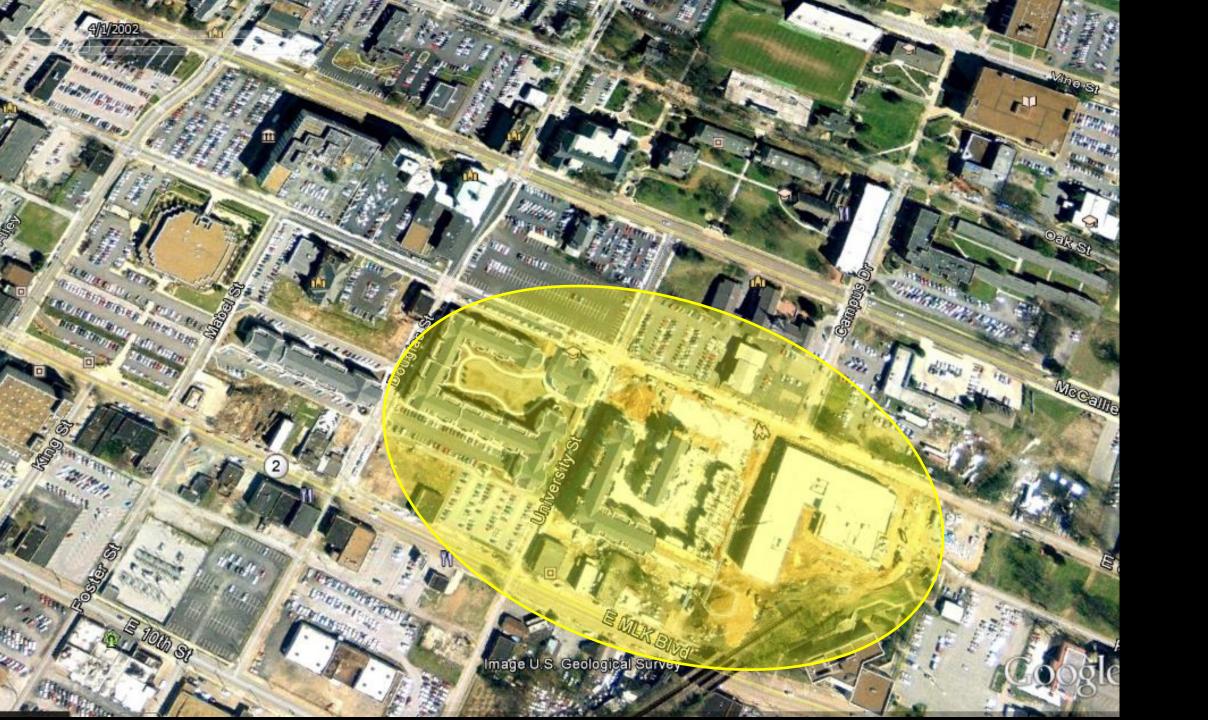
The economic impact for retail redevelopment on retail rent and thus city tax revenues is significant. Improvements in the other 69 offices, 38 churches, 18 hospitals and clinics, 8 schools/colleges, and 3 cultural institutions properties that front McCallie Avenue and ML King Blvd/Bailey Avenue will be similar.

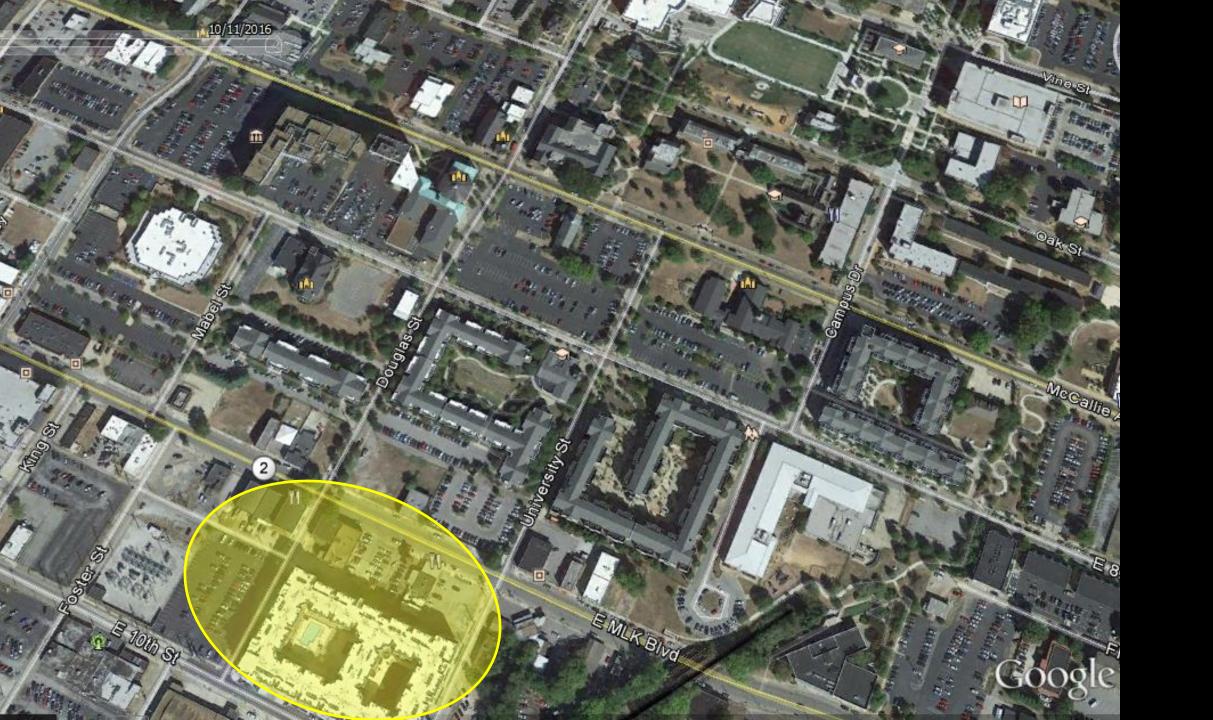


Before the construction of the Interstate system, McCallie Avenue was the traditional connection between Brainerd and Downtown Chattancoga. Like most intracity corridors, McCallie Avenue was lined with offices and stores, attracting the committing drivers. Virtually all parcels along McCallie Avenue between Palmetto Street and Watkins Street are still zoned commercially (retail, office, and clinics), yet the speed and nature of traffic on McCallie Avenue and the lack of adequate parking has in nart caused these businesses to become deroticl and dilapidated. Wost of Palmetto Street is UTC and a variety of churches, all of which also have expressed the need for additional parking.









#### The Takeaways

 Accommodate vehicular traffic but don't let it be the only driver for decision-making

 Use the "usual" accepted analysis tools, but consider other factors (quantitative and qualitative)

Use complete street principles, create place, set the table

Get before and after data

Expect success!!!

### Thank You!

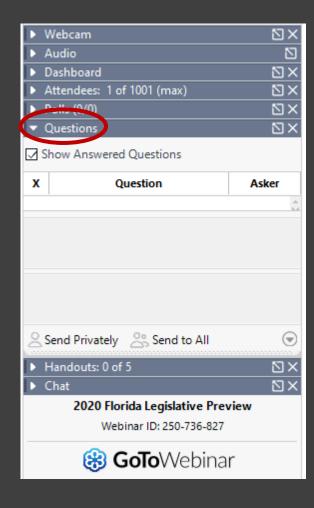


# Questions and answers



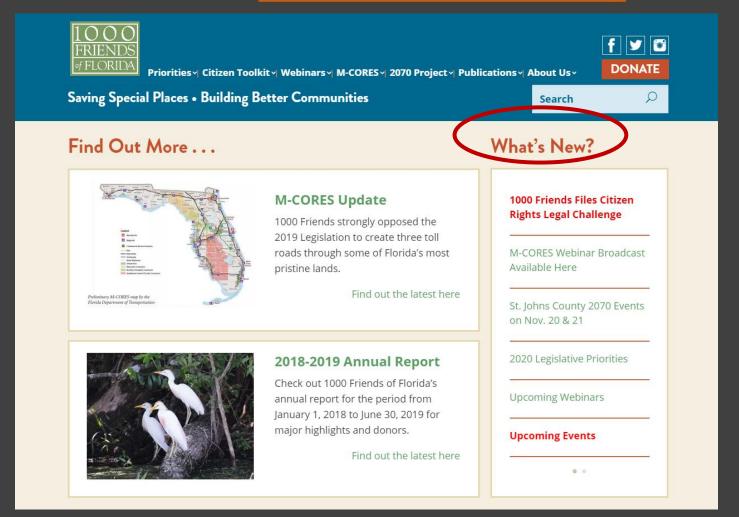
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- Please keep your questions succinct!
- •Staff will ask the presenters questions, as time permits





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