# MOVING FORWARD

Capital Region
Transportation Planning Agency
CRTPA

## CRTPA Board Retreat

*"Connecting People and Places"*

**April 16, 2012**

Capital Region Transportation Planning Agency
CRTPA
300 S. ADAMS STREET, A-19, TALLAHASSEE, FL 32301
www.crtpa.org

# CRTPA RETREAT

**MONDAY, APRIL 16, 2012**
**9:00 AM – 1:00 PM**
TCC CAPITOL CENTER
300 W. PENSACOLA STREET
TALLAHASSEE, FL 32301

***MISSION STATEMENT***

*"The mission of the CRTPA is to act as the principal forum for collective transportation policy discussions that results in the development of a long range transportation plan which creates an integrated regional multimodal transportation network that supports sustainable development patterns and promotes economic growth."*

## MEETING OBJECTIVES

The objectives for the April 16, 2012 CRTPA Retreat:

- Provide the CRTPA Board with information about Complete Streets and Roundabouts for potential policy development.
- Introduce the Sustainable Communities Calculator and its use in land use and transportation planning.
- Demonstrate and discuss GIS applications that can enhance CRTPA effectiveness in development of long range and strategic transportation plans for the Capital Region.

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***"Plan for the future because that's where you are going to spend the rest of your life."***
**-Mark Twain**

## MEETING SCHEDULE

1. **Bagels and Coffee** ..... **8:45 – 9:00**

2. **Welcome and Introductions** ..... **9:00 – 9:10**

3. **Complete Streets (TAB 1)** ..... **9:10 – 10:00**

   Roger Henderson, AICP, PE, PTOE, will discuss Complete Streets and opportunities to provide safe access for all users on the region's roadways.

4. **Roundabouts (TAB 2)** ..... **10:00 – 11:00**

   Michael Wallwork, PE, President, Alternate Street Design, PA., will make a presentation and discuss the functions and applications of roundabouts.

**BREAK** ..... **11:00 – 11:15**

5. **Sustainable Communities Calculator (TAB 3)** ..... **11:15 – 12:10**

   Bruce Landis, PE, AICP, of Sprinkle Consulting will be demonstrating the use and application of the Sustainable Communities Calculator.

6. **GIS Applications for Long Range and Strategic Transportation Planning (TAB 4)** ..... **12:10 – 12:50**

   Lee Hartsfield, GISP, Tallahassee-Leon County GIS Coordinator and CRTPA staff will be discussing GIS applications for Long Range and Strategic Transportation Planning that can enhance CRTPA's planning coordination efforts for the region.

7. **Wrap-Up and Adjourn** ..... **12:50 – 1:00**

*"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has. "*

**- Margaret Mead**

*April 16, 2012*

Capital Region Transportation Planning Agency
CRTPA

# CRTPA RETREAT AGENDA ITEM 3

# COMPLETE STREETS

| REQUESTED BY: CRTPA Staff | TYPE OF ITEM: Information |
|---|---|

## STATEMENT OF ISSUE

A presentation on Complete Streets will be provided by Roger Henderson, AICP, PE, PTOE consultant for Complete Streets. Mr. Henderson's biography is provided as ***Attachment 1***.

## BACKGROUND

Complete Streets are streets designed to safely allow use by all (pedestrians, bicyclists, motorists and transit users). The following contains information regarding Complete Streets from the National Complete Streets Coalition webpage (www.completestreets.org):

**What are "Complete Streets" and Complete Streets policies?**
Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations.

Creating complete streets means transportation agencies must change their approach to community roads. By adopting a Complete Streets policy, communities direct their transportation planners and engineers to routinely design and operate the entire right of way to enable safe access for all users, regardless of age, ability, or mode of transportation. This means that every transportation project will make the street network better and safer for drivers, transit users, pedestrians, and bicyclists – making your town a better place to live. The National Complete Streets Coalition has identified the elements of an ideal Complete Streets policy to help you write one for your town.

**What does a "complete street" look like?**
There is no singular design prescription for Complete Streets; each one is unique and responds to its community context. A complete street may include: sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more.
A complete street in a rural area will look quite different from a complete street in a highly urban area, but both are designed to balance safety and convenience for everyone using the road

**Why do we need Complete Streets policies?**

Incomplete streets – those designed with only cars in mind – limit transportation choices by making walking, bicycling, and taking public transportation inconvenient, unattractive, and, too often, dangerous. Changing policy so that our transportation system routinely includes the needs of people on foot, public transportation, and bicycles means that walking, riding bikes, and riding buses and trains will be safer and easier. People of all ages and abilities will have more options when traveling to work, to school, to the grocery store, and to visit family.

Making these travel choices more convenient, attractive, and safe means people do not need to rely solely on automobiles. They can replace congestion-clogged trips in their cars with swift bus rides or heart-healthy bicycle trips. Complete Streets improves the efficiency and capacity of existing roads too, by moving people in the same amount of space – just think of all the people who can fit on a bus or streetcar versus the same amount of people each driving their own car. Getting more productivity out of the existing road and public transportation systems is vital to reducing congestion.

Complete Streets are particularly prudent when more communities are tightening their budgets and looking to ensure long-term benefits from investments. An existing transportation budget can incorporate Complete Streets projects with little to no additional funding, accomplished through re-prioritizing projects and allocating funds to projects that improve overall mobility. Many of the ways to create more complete roadways are low cost, fast to implement, and high impact. Building more sidewalks and striping bike lanes has been shown to create more jobs than traditional car-focused transportation projects.

***Attachments 2, 3, 4 and 5*** provide a discussion of Complete Streets related to creating livable communities, economic development, lowering transportation costs and small towns, respectively. ***Attachment 6*** provides an article from the April 2011 Institute of Transportation Engineers (ITE) Journal on the growing need for Complete Streets in America.

**ATTACHMENT**

Attachment 1: Biography of Roger Henderson
Attachment 2: Complete Streets Create Livable Communities
Attachment 3: Complete Streets Spark Economic Revitalization
Attachment 4: Complete Streets Lower Transportation Costs
Attachment 5: Complete Streets in Small Towns
Attachment 6: "America Needs Complete Streets", ITE Journal

# Complete Streets Workshops – Instructor Biography

**Roger Henderson, AICP, PE, PTOE**
Consultant
Raleigh, NC

**Roger Henderson, AICP, PE, PTOE**
Roger is an accomplished leader in forging multi-disciplined teams to enhance how transportation contributes to healthy, vibrant communities. His focus is at the intersection of land use planning and street design. His 30-year employment history includes serving as Senior Transportation Planner with major consulting firms, the Alameda County Congestion Management Agency and most recently as the first Executive Director of a Business Improvement District serving an area where he designed a road diet. His skills include urban traffic engineering and street design, citywide multimodal transportation plans, public engagement, bicycle and pedestrian planning, complete streets and more than 20 years teaching university extension courses. He is a contributing author of "*Context-Sensitive Solutions for Major Urban Thoroughfares in Walkable Communities.*" His expertise is leading teams of planners, engineers and landscape architects with the know-how to design real-life solutions that transform the built environment so that more people walk, bicycle and ride transit.

Implementing Complete Streets 3

# Create Livable Communities

*The streets of our cities and towns are an important part of the livability of our communities. They ought to be for everyone, whether young or old, motorist or bicyclist, walker or wheelchair user, bus rider or shopkeeper. But too many streets are designed only for speeding cars, or worse, creeping traffic jams. They are unsafe for people on foot or bike – and unpleasant for everybody.*

## Incomplete streets deny citizens safety, choice

Most of us think of America as the land of choices. Yet, in just about any community built in the last 50 years, there is pretty much one choice for transportation: the car. The more sprawling our communities – low density, scattered development linked by busy, high-speed, multi-lane roadways – the more we are limited to our cars.[1]

Even where daily destinations are close to home, incomplete streets too often make them inaccessible by foot, bicycle, or public transportation. They are cut off by cul-de-sacs that increase walking distance, or by high-speed roads lacking bike lanes, sidewalks, comfortable transit stations, or safe crossings. While some streets do provide a safe pedestrian environment, it may not be a pleasant one – the absence of benches, scarce landscaping, and storefronts set back from the sidewalk do little to encourage walking.[2]

Photo: Dan Burden

*Residents of Hudson, OH benefit from a commerical district where walking and biking are safe, attractive options.*

The heavy reliance on driving has an impact far beyond today's traffic jam. People of color, who are less likely to own cars and more likely to rely on public transportation, are particularly affected by poor development patterns.[3] Working families who own a car are burdened with associated expenses: purchase cost, maintenance, registration fees, fuel, and others.

Streets designed solely for automobile travel also put people at risk. In 2007, there were 4,654 pedestrian deaths and 70,000 reported pedestrian injuries – that's nearly one every eight minutes. In a poll of people over 50 years old, 47 percent said it was unsafe to cross the street near their home.[4] In neighborhoods where traffic is a nuisance and a threat, residents both young and old are more inclined to stay in their homes. This limits much needed physical activity and social interaction.

## Complete streets foster livable communities

Communities are increasingly embracing smart growth to meet their residents' desire for choices in housing, shopping, recreation, and transportation. Complete streets meet the demand for transportation options, while promoting other community goals. They provide safe and affordable access for everyone, whether traveling to school, work, the doctor, or their favorite restaurant.

More than half of Americans recently surveyed would like to walk more and drive less. Poor community design and lack of pedestrian facilities are the primary reasons people cite for not walking more. An overwhelming number support policies intended to make their communities more livable by reducing traffic speed and creating a safer pedestrian environment.[5]

Complete the Streets

*Complete Streets are designed and operated so they work for all users– pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Communities that adopt complete streets policies are asking transportation planners and engineers to consistently design and alter the right-of-way with all users in mind. Contact the National Complete Streets Coalition (www.completestreets.org) to learn about the diverse groups working together to enact complete streets policies across the country!*



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# Create Livable Communities

Complete streets contribute many benefits to the surrounding community:


Photo: City of Decatur, GA

- Wide, attractive sidewalks and well-defined bike routes, where appropriate to community context, encourage healthy and active lifestyles among residents of all ages.[6]
- Complete streets can provide children with opportunities to reach nearby destinations a safe and supportive environment.
- A variety of transportation options allow everyone – particularly people with disabilities and older adults – to get out and stay connected to the community.
- Multi-modal transportation networks help communities provide alternatives to sitting in traffic.
- A better integration of land use and transportation through a complete streets process creates an attractive combination of buildings – houses, offices, shops – and street designs.
- Designing a street with pedestrians in mind – sidewalks, raised medians, better bus stop placement, traffic-calming measures, and treatments for travelers with disabilities – may reduce pedestrian risk by as much as 28 percent.[7]
- A livable community is one that preserves resources for the next generation: complete streets help reduce carbon emissions and are an important part of a climate change strategy.

In San Diego, where a number of complete streets policy are in place, the La Jolla neighborhood saw its namesake boulevard become something more than an uninteresting strip of shops after recent roadwork. Today, the street is vibrant and alive, with pedestrians, bicyclists, and shoppers. Despite the economic meltdown, the street is outperforming on every factor, from numbers of bicyclists and pedestrians to number of smiles. Communities are also investing in complete streets as a way to attract new residents and young professionals.[8]


Photo: Dan Burden

Complete streets transform the way transportation serves the American people by creating more choices, shortening travel times, and encouraging less carbon-intensive transportation. A community with a complete streets policy values the health, safety, and comfort of its residents and visitors. These policies provide opportunities for people of all ages and abilities to contribute to, and benefit from, a livable community.

*Footnotes on following page or online at www.completestreets.org/factsheets*

**Complete Streets Steering Committee Organizations**

AARP
Alliance for Biking and Walking
America Bikes
America Walks
American Council of the Blind
American Planning Association
American Public Transportation Association
American Society of Landscape Architects
Association of Pedestrian and Bicycle Professionals
City of Boulder
HNTB
Institute of Transportation Engineers
League of American Bicyclists
McCann Consulting
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SvR Design Company

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1707 L St NW, Suite 1050
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# Create Livable Communities


[1] Thomas F. Golob and David Brownstone, "The Impact of Residential Density on Vehicle Usage and Energy Consumption" (February 1, 2005). University of California Energy Institute. Policy & Economics. Paper EPE-011. http://repositories.cdlib.org/ucei/policy/EPE-011

[2] Alfonzo, Mariela, Marlon G. Boarnet, Kristen Day, et al. (2008). "The Relationship of Neighborhood Built Environment Features and Adult Parents' Walking." Journal of Urban Design 12:1, pp 29-51.

[3] Sánchez, Thomas W., Stolz, Rich, and Ma, Jacinta S. (2003). Moving to Equity: Addressing Inequitable Effects of Transportation Policies on Minorities. Cambridge, MA: The Civil Rights Project at Harvard University.

[4] Lynott, Jana. (2009). Planning Complete Streets for an Aging America. AARP Public Policy Institute, Washington DC.

[5] Belden, Russonello & Stewart. (2003). Americans' Attitudes Toward Walking and Creating Better Walking Communities. Poll and Report for Surface Transportation Policy Partnership.

[6] Bell, Judith and Larry Cohen. (2009). The Transportation Prescription: Bold Ideas for Healthy, Equitable Transportation Reform in America. Policy Link and the Prevention Institute, commissioned by the Convergence Partnership.

[7] King, MR, Carnegie, JA, Ewing, R. (2003). "Pedestrian Safety Through a Raised Median and Redesigned Intersections." Transportation Research Board 1828, pp 56-66.

[8] Mason, Bruce. "Stores, transit, walkability: To attract millennials, appeal to their desires," Crain's Detroit Business 12 Aug. 2007.

**National Complete Streets Coalition**
1707 L St NW, Suite 1050
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# Complete Streets Spark Economic Revitalization

*More than a decade ago, streets in downtown West Palm Beach were designed so drivers could quickly pass though without stopping. The properties downtown were 80% vacant, the city was $10 million in debt, and street crime was common. In an effort to revitalize a barren downtown, the mayor looked first to transportation investments, such as pedestrian crossings, traffic calming measures, and streetscaping. Today, West Palm Beach boasts a booming, safe downtown with an 80 percent commercial occupancy rate. Commercial and residential property values along the improved corridors have soared.*[1]

Photos courtesy of Downtown Development Authority, West Palm Beach

*Complete streets transformed West Palm Beach's downtown into a friendly destination during the day, and in the evening.*

## Incomplete streets restrict economic development

In today's landscape, retail and commercial development is often accessible only by automobile along roads that have become jammed even on weekends. Potential shoppers are left with no choice but to fill up the tank and drive. For many, that can mean staying home. This is particularly true for seniors; research shows that that "half of all non-drivers age 65 and over – 3.6 million Americans – stay home on a given day because they lack transportation."[2] The economy cannot reach its maximum potential when buyers are unable to reach retail destinations.

Lack of transportation options also affects the workforce. In a 2006 Airport Corridor Transportation Association report on employment centers outside Pittsburgh, 30% of employers responded that transportation was the number one barrier to hiring and retaining qualified workers.[3] Although bus routes serve a portion of the center, more than 50% of employees responded that there was no bus stop convenient to home or work. Other employees noted that they didn't use public transportation because bus stops in the area had no sidewalks to safely reach their destination. The lack of a network of complete streets in and around this activity center makes it difficult to attract and retain employees.

Incomplete streets hinder economic growth and can result in lost business, lower productivity, and higher employee turnover.

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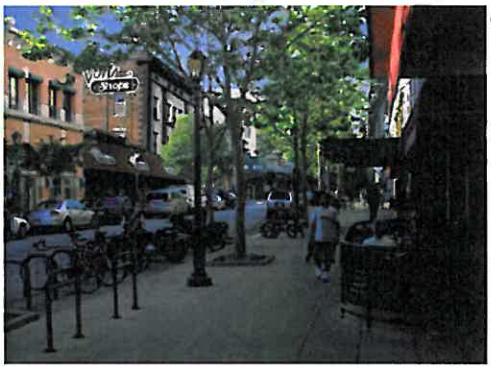
# Complete Streets Spark Economic Revitalization

## Complete Streets create viable, liveable communities

Creating infrastructure for non-motorized transportation and lowering automobile speeds by changing road conditions can improve economic conditions for both business owners and residents. When Valencia Street in San Francisco's Mission District slimmed its traffic lanes to slow down cars and accommodate other users, merchants reported the street changes enhanced the area. Nearly 40 percent of merchants reported increased sales, and 60 percent reported more area residents shopping locally due to reduced travel time and convenience. Overall, two-thirds of respondents described the increased levels of pedestrian and bicycling activity and other street changes improved business and sales.[4] A network of complete streets is more safe and appealing to residents and visitors, which is also good for retail and commercial development.



Right: Dan Burden

*Complete streets in North Carolina attract more tourists: in 2004, NC DOT invested $6.7 million in bicycling infrastructure which brings in $60 million annually from visitors.*

Street design that is inclusive of all modes of transportation, where appropriate, not only improves conditions for existing businesses, but also is a proven method for revitalizing an area and attracting new development. Washington, DC's Barracks Row was experiencing a steady decline of commercial activity due to uninviting sidewalks, lack of streetlights, and speeding traffic. After many design improvements, which included new patterned sidewalks, more efficient public parking, and new traffic signals, Barrack's Row attracted 44 new businesses and 200 new jobs.[5] Economic activity on this three-quarter mile strip (measured by sales, employees, and number of pedestrians) has more than tripled since the inception of the project.

Complete streets also boost the economy by increasing property values, including residential properties, as generally homeowners are willing to pay more to live in walkable communities. In Chicago, homes within a half-mile of a suburban rail station on average sell for $36,000 more than houses located further away.[6] Similarly in Dallas, the new public transportation rail line helped spur retail sales in downtown Dallas, which experienced sales growth of 33 percent, while the sales in the rest of the city grew 3 percent.[7]

[1] *Street Redesign for Revitalization, West Palm Beach, FL Case Study No. 16 http://www.walkinginfo.org/pedsafe/casestudy.cfm?CS_NUM=16.*
[2] *Surface Transportation Policy Partnership. Aging Americans: Stranded Without Options. 2004. http://www.transact.org/library/reports_html/seniors/aging.pdf*
[3] *Airport Corridor Transportation Association (ACTA). Study of Improved Shared Ride Transportation Services to the Robinson/North Fayette Employment Center. October 26, 2006 http://www.acta-pgh.org*
[4] *Drennen, Emily. Economic Effects of Traffic Calming on Urban Small Businesses. 2003. http://www.emilydrennen.org/TrafficCalming_full.pdf.*
[5] *Barrack's Row Annual Report. 2006 http://www.barracksrow.org/public/AnnualReports/BAR-001-AnnualRprtv4.pdf*
[6] *American Public Transportation Association. Public Transportation Means Business. http://www.apta.com/government_affairs/tea21/documents/brochure_transit_means_business.pdf*
[7] *APTA. Public Transportation Means Business*

Complete the Streets

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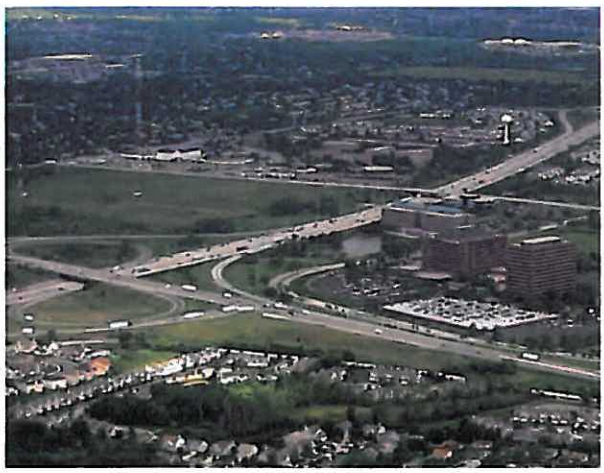
The Benefits of Complete Streets 10

# Complete Streets
## Lower Transportation Costs

*A recent poll by Coldwell Banker revealed a vast majority of the real estate agents - 78% - said their clients are interested in living in areas that help reduce their gasoline bill.[1] Furthermore, the majority of the surveyed agents agree that walkability and access to public transportation are appealing to clients. With increased transportation costs and time spent in gridlock, Americans are starting to realize that the benefits of living in places where they don't always have to drive add up.*



Right: Payton Chung
Left: Eric Richardson

*When the built environment discourages the use alternate modes of transportation, Americans are forced to pay high premiums for transportation.*

## Incomplete streets lead to higher costs

Transportation is the second largest expense for American households, costing more than food, clothing, and health care. Even before the recent run-up in gasoline prices, Americans spent an average of 18 cents of every dollar on transportation, with the poorest fifth of families spending more than double that figure. The vast majority of this money, nearly 98%, is for the purchase, operation, and maintenance of automobiles. Drivers spent $186 billion on fuel last year, and without improvements to fuel economy, Americans will spend an estimated $260 billion in 2020 on gasoline.[2]

This high cost is unavoidable for those who live in sprawling areas that lack sidewalks, bike lanes, and convenient public transit. Incomplete streets leave many commuters with no alternatives. Families living in auto-reliant environments, such as Houston, spend an even larger percentage of their household income on transportation, about 20%. In communities with more transportation options, costs are as low as 14%.[3]

Most families spend far more on transportation than on food, and transportation costs continue to rise. When gas prices rose to $3.00 a gallon, the Brookings Institution estimated this would result in an increase in the average household's transportation spending of 14% per year.[5] With higher energy costs, this means families are cutting back on weekend outings, restaurant meals, and long-distance travel.

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# Complete Streets Lower Transportation Costs

## Complete streets give choices

Transportation expenses can be reduced if local infrastructure encourages active transportation, which helps families replace car trips with bicycling, walking, or taking public transit. Transit use soared across the country as people sought alternatives to high gas prices and has sustained at high levels. Nevertheless, many users may be discouraged by long waits at inadequate bus stops or by dangerous street crossings.

Households that locate near public transportation drive an average of 16 fewer miles per day compared to a similar household without access to public transportation, which results in hundreds of dollars in savings each year. In fact, a two-person adult household that uses public transportation saves an average of $6,251 annually compared to a household with two cars and no public transportation accessibility.[6]

Photo: John LaPlante

*Complete streets allow people to choose how they travel, whether by bus, bike, afoot, or in a car.*

When residents have the opportunity to walk, bike, or take transit, they have more control over their expenses. In Wisconsin, public transit riders save almost $7 per trip over driving. Because of these individual savings, additional money is invested in the economy, resulting in 11,671 new jobs, $163.3 million in tax revenue, and $1.1 billion in total output.[7] Households in auto-dependent communities devote 20% more to transportation than communities with complete streets, which hinders potential economic growth.[8]

When roads are re-designed and maintained to attract pedestrians, the local economy improves and diversifies from increased buyers, which creates job growth and increased investment in the area, including surrounding property values. One study in Lake Worth, FL found that people were willing to pay $20,000 more for homes in pedestrian-friendly communities.[9] In the Chicago area, homes within a half-mile of a suburban rail station on average sell for $36,000 more than houses located farther away.[10] Complete streets create attractive streets, enticing people of all ages and to spend time in communities with active transportation choices.

[1] *Interest in Urban Homeownership Survey, Coldwell Banker, June 2008.*
[2] *Friedman, David et al. "Drilling in Detroit: Tapping Automaker Ingenuity to Build Safe and Efficient Automobiles." Union of Concerned Scientists, June 2001, p. 15, Table 4.*
[3] *Surface Transportation Policy Project (STPP). Transportation Costs and the American Dream: Why a Lack of Transportation Choices Strains the Family Budget and Hinders Home Ownership. STPP, July 2003.*
[4] *Lipman, Barbara. A Heavy Load: The Combined Housing and Transportation Burdens of Working Families. Center for Housing Policy, October 2006.*
[5] *The Center for Transit-Oriented Development and the Center for Neighborhood Technology. The Affordability Index: A New Tool for Measuring the True Affordability of a Housing Choice. Brookings Institution, January 2006.*
[6] *Lipman, 2006.*
[7] *Bekka, Khalid. Economic Benefits of Public Transportation. Wisconsin Department of Transportation, November 2003.*
[8] *McCann, Barbara. Driven to Spend: Sprawl and Household Transportation Expenses. STPP, March 2000.*
[9] *Pollock Shea, Cynthia. Lake Worth: Reclaiming a Small Downtown. Florida Sustainable Communities Network, October 1998.*
[10] *What Happens to a Capital Investment in Public Transportation? American Public Transportation Association.*

Complete the Streets

Complete Streets Steering Committee Organizations

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ATTACHMENT 5

# Complete Streets in Small Towns

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By planning, designing, and constructing Complete Streets, communities of all sizes - whether rural hamlets, small towns, or booming metropolises - are able to provide the quality access to jobs, health care, shops, and schools their residents deserve, while also achieving greater economic, environmental, and public health benefits. A Complete Streets approach can provide a more effective and balanced transportation system for the nearly 49 million Americans who live in rural areas and small towns.

Don Burden

## Dangerous, incomplete roads

Residents of small towns are more likely to be hurt or killed on the transportation system than those in urban areas. In 2006, 23% of the U.S. population lived in rural areas, yet 56% of all traffic fatalities occurred in rural areas. [1] Higher driving speeds on rural roads and arterials are more likely to cause fatalities: 68% of fatal crashes on rural roads occurred when the posted speed limit was 55 mph or higher.[2]

Rural communities and small towns tend to have higher concentrations of older adults and low-income citizens,[3] two populations that are less likely to own cars or drive. Without safer roads, those with limited transportation options have little choice: travel along high-speed roadways with few pedestrian accommodations or stay home. In limiting mobility to automobiles alone, these citizens risk isolation from community and the economy.

## Improve Access

Access to jobs, groceries, healthcare, education, and other destinations is just as vital in rural communities as in suburban or urban areas. More than 1.6 million rural households do not have access to a car.[4] Public transportation, social service van pools, carpooling, and ridesharing services to reach healthcare, employment, and other resources can be a lifeline in rural areas, especially for older adults, people with disabilities, and low-income households.[5] Sixty percent of rural areas have public transportation service, and demand for more options is growing: rural and small urban public transportation systems experienced a 20% rise in ridership from 2002 to 2005.[6] And, just as in urban areas, public transportation trips usually being and end as walking trips. Creating safe walking, bicycling, and public transportation options for rural residents builds a more livable, accessible community for people of all ages, abilities, and income levels.

## Healthy choices for children

Children need safe roads to reach school and activities. Children who live in rural areas are at greater risk for obesity and related disease than children from other areas: children in rural areas are more likely to be overweight or obese than those in urban areas.[7] Providing safe opportunities for walking and biking to and from school is a key strategy to keep kids active and healthy.[8] Roads that are accommodating of children and other vulnerable users will be safer for everyone.

(over)

# Complete Streets in Small Towns



National Complete Streets Coalition
1707 L St NW, Suite 250
Washington, DC 20036
(202) 955-5543
info@completestreets.org





## Sensitive to rural contexts

Complete Streets will look different in rural communities than they do in more urban counterparts. For example, roads surrounded by agricultural use may be "complete" by simply providing wide shoulders to allow safe bicycling and walking and providing connections to regional trail and public transportation networks. Low-speed roads with on-street parking, well-marked crossings, and sidewalks with accessible curb cuts lining one side of the street may best meet the needs of a residential street.

Dan Burden

*Trinity Highway runs through Willow Creek, a community of approximately 2,000 nestled in northern California's Six Rivers National Forest.*

## Powering Main Street

Complete Streets are important in helping town centers and Main Streets thrive, too, by improving street connectivity and allowing everyone, whether on foot, bike, or public transportation, to reach community focal points. Many smaller communities do not control their Main Streets; often, the state Department of Transportation does. Construction or widening of Main Streets that function as state highways takes its toll on pedestrian safety[9] and can have a negative impact on small-town economies. In these cases, Complete Streets policies at the local level help communicate the community's vision, and policies at the state level ensure safe, accessible, and attractive streets. Creating complete streets can facilitate reinvestment and economic development in the heart of a small town.

## Rural communities want Complete Streets

The need for Complete Streets in rural areas and small towns is clear because so many of them have adopted policies. Ulster County, in the far reaches of the New York City metropolitan area, is home to a large state forest preserve as well as communities of varying sizes, like Kingston (pop. 23,000) and Woodstock (pop. 6,200). Its 2009 resolution will create Complete Streets in each of these different contexts. An ordinance in Sedro-Woolley, Washington ensures bicycling and walking are safe, convenient options for its 10,000 residents. De Soto, Missouri's 7,000 residents will benefit from a 2008 ordinance requiring a Complete Streets approach. And the city of Manistique in Michigan's Upper Peninsula recognizes how Complete Streets "support economic growth and community stability by providing accessible and efficient connections between home, school, work, recreation and retail destinations" for its 3,500 residents.

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[1] *Traffic Safety Facts: Rural/Urban Comparison. National Highway Traffic Safety Administration, updated 2008. http://www-nrd.nhtsa.dot.gov/Pubs/810812.pdf*

[2] *Ibid; Pedestrian Safety on Rural Highways. Federal Highway Administration, 2004. http://www.walkinginfo.org/library/details.cfm?id=2104*

[3] *Department of Agriculture Economic Research Service, using data from the U.S. Census Bureau's 2010 Current Population Survey, March Supplement. http://www.ers.usda.gov/Briefing/IncomePovertyWelfare/PovertyDemographics.htm*

[4] *U.S. Population Projections for Selected Age Groups: 2005-2030. U.S. Census Bureau. 2000 Census.*

[5] *Planning Complete Streets for an Aging America. (2009). AARP Public Policy Institute. http://assets.aarp.org/rgcenter/ppi/liv-com/2009-12-streets.pdf*

[6] *Facts on Public Transportation. American Public Transportation Association. http://www.apta.com/media/facts.cfm*

[7] *Overweight and Physical Inactivity among Rural Children Aged 10-17: A National and State Portrait. (2007). South Carolina Rural Research Center.*

[8] *Active Living for Rural Youth. (2008). Maine Rural Health Research Center. http://muskie.usm.maine.edu/ihp/ruralhealth*

[9] *Twaddell, Hannah and Dan Emerine. Best Practices to Enhance the Transportation-Land Use Connection in the Rural United States. National Cooperative Highway Research Program, 2007. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_582a.pdf*

# America Needs Complete Streets

**AN AGING POPULATION;[1] RISING FUEL COSTS; CONGESTION, HEALTH, AND ENVIRONMENTAL CONCERNS; AND CHANGING CONSUMER PREFERENCES ARE ALL INCREASING DEMAND FOR WALKING, CYCLING, AND PUBLIC TRANSIT.[2] THESE TRENDS INDICATE THAT AN INTEGRATED MULTIMODAL TRANSPORTATION SYSTEM IS REQUIRED IF WE ARE TO MEET FUTURE TRAVEL DEMANDS.**

BY DAN BURDEN AND TODD LITMAN

## RESPONDING TO CHANGE

Our current transportation system provides relatively good service for motorists. It is possible to drive to most destinations with reasonable convenience, except under peak conditions. The major transportation problems facing most communities—traffic and parking congestion, excessive energy consumption and pollution emissions, the rate and severity of accidents, and inadequate mobility for non-drivers—can all be addressed by creating multimodal transportation systems that allow the best mode for each trip: walking and cycling for local trips, public transit for travel on congested corridors and for non-drivers, and automobile travel to access dispersed destinations and for carrying loads. Multimodal transportation serves both drivers and non-drivers by allowing mode choice based on the type of trip to be taken. This is the heart of the complete streets movement: Choice is fundamental to improving safety, service, comfort, and performance for all.

Between 1920 and 2000, travel by automobile became the dominant mode of transportation for most communities in the United States. During this period, significant resources were invested in roads and parking facilities in order to accommodate increasing automobile travel demands. However, per capita vehicle travel has stopped growing, and total vehicle travel is projected to be flat in most areas, except those with rapid population or industrial growth.[3] Now that the roadway system is mature and growth rates have declined, there is less incremental benefit from further expansion. (See Figure 1.)

Benefits can, however, be expected from redefining our transportation system. In the past, *transportation* meant *mobility*. When we focus on *mobility*, fast, cheap travel is the desired outcome. This focus is incorrect. The ultimate goal of transportation must be *accessibility*—our ability to reach desired goods, services, and activities safely.[4] Mobility affects accessibility, but so do the quality of transportation options and land development patterns. When we consider accessibility, we see how the modes affect one another. Efforts to improve automobile accessibility, for example, may involve expanding roads and parking facilities and locating activities along major highways, which reduces accessibility for all other modes. Complete streets policies are aimed at balancing access for all modes.

## COMPLETE STREETS POLICY

A complete streets policy

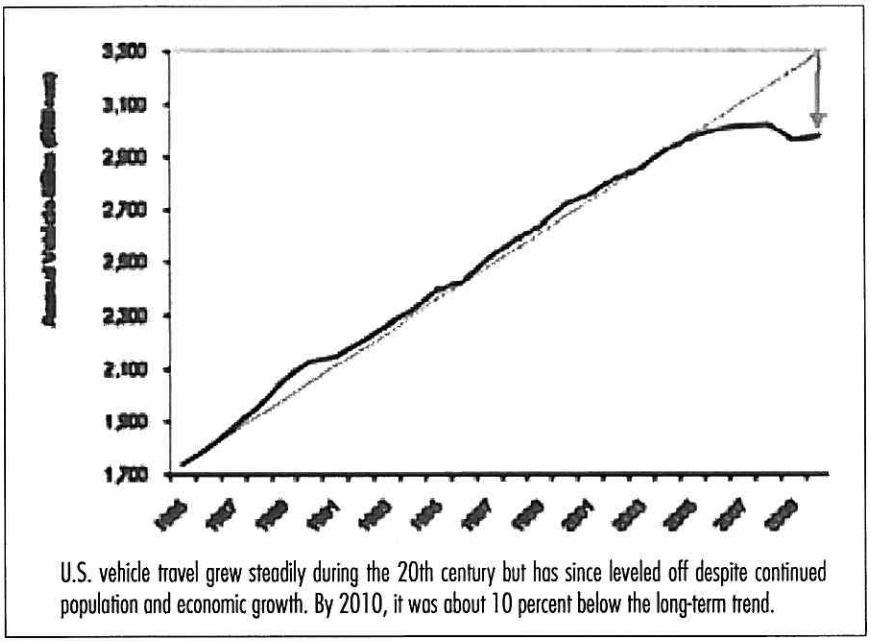
- Includes a vision for how and why the community wants to complete its streets;
- Specifies that the term "all users" includes pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as trucks, buses, and automobiles;
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes;
- Is adoptable by all agencies to cover all roads;
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way;
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions;
- Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs;
- Directs that complete streets' solutions will complement the context of the community;
- Establishes performance standards with measurable outcomes; and
- Includes specific next steps for implementation of the policy.[5]

In a 2008 article in *ITE Journal*, John LaPlante and Barbara McCann explained how complete streets must focus on policy.[6] In this article, they stated:

*"A complete street is a road that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities. The Complete Streets concept focuses not just on individual roads but on changing the decision-making and design process so that all users are routinely considered during the planning, designing, building and operating of all roadways. It is about policy and institutional change."*

Today, more than 200 communities have adopted complete streets policies. In 2010, complete streets policies went into effect in Minnesota, Michigan, and Colorado. Local city councils, regional transportation commissions and state legislatures across the nation are embracing complete streets policies. Some include supportive measures in transportation funding, development policies, and zoning codes to encourage multimodalism. These measures may include reduced parking requirements, development impact fees in multimodal locations, and targeted reductions in vehicle miles traveled.[7] Professional organizations and transportation agencies are producing analyses, tools, and guidelines to support complete streets, such as the multimodal level-of-service standards developed by the Transportation Research Board,[8] which are being incorporated into the new *Highway Capacity Manual*.[9] Beginning in January 2011, new state legislation in California's AB 1358 requires all California local jurisdictions to plan for the development of multimodal transportation networks that allow users to effectively travel by motor vehicle, foot, bicycle, and transit to access key destinations within their community and the larger region. Michigan's state transportation budget gives funding preference to communities with complete streets policies and to projects that further the objectives of complete streets. In doing so, California and Michigan are encouraging local communities to adopt their own complete streets policies.

Complete streets policies are central to addressing the following serious problems we face:




U.S. vehicle travel grew steadily during the 20th century but has since leveled off despite continued population and economic growth. By 2010, it was about 10 percent below the long-term trend.

**Figure 1. U.S. annual vehicles mileage trends (USDOT 2010).**

- Over the past two decades, we have averaged approximately 43,000 fatal accidents annually, with approximately 2.5million people injured on our roadways every year.[10] Of the pedestrians killed in 2007 and 2008, more than 50 percent died on arterial roadways, typically designed to be wide and fast, and more than 40 percent of the pedestrian deaths that occurred were on roadways where no crosswalk was available.[11] Motor vehicle crashes are the leading cause of death for U.S. teens, accounting for more than one in three deaths in this age group. In 2009, about 3,000 teens in the United States aged 15 to 19 were killed, and more than 350,000 were treated in emergency departments for injuries suffered in motor vehicle crashes.[12] While the loss of life should be the most compelling reason to support complete streets, we also know that traffic crashes cost about $164 billion annually in property damage and injuries.[13]
- Rates of individual and community health, fitness, and well-being can increase when we build complete streets. According to the American Public Health Association report *At the Intersection of Public Health and Transportation: Promoting Healthy Transportation Policy*, obesity in the United States is the nation's fastest-rising public health problem. According to the Centers for Disease Control and Prevention, 16 percent of children are obese, 12 million are overweight, and 66 percent of adults are overweight or obese.[14] The cost of obesity and inactivity to society is enormous: In 2004, the total cost of being obese or overweight was estimated at $117 billion, and physical inactivity's healthcare costs are at $76 billion per year.[15] From 1969 to 2001, the percentage of students walking and bicycling to school in the United States declined from 41 percent to 13 percent. The majority of these trips have been replaced by parents driving their childr en to school—resulting in traffic congestion and safety issues around schools and less physical activity for children. The federal Safe Routes to School program, which was created by the 2005 SAFETEA-LU federal transportation bill, provided $600 million between 2005 to 2009 to make it safer for children to walk and bicycle to school; yet this funding is estimated to serve only 7.5 percent of schools in the nation.[16] Safe Routes to School programs allow communities to conduct bicycle and pedestrian safety education and

speed enforcement programs along with assessment for improved planning and engineering around schools. A complete streets policy at the local level can supplement the National Safe Routes to School program to improve conditions around all schools.

- Air pollution is associated with significant health issues, including asthma, respiratory illness, heart disease, and cancer. Asthma is a major public health problem in the United States, with 22 million people currently diagnosed with asthma, 12 million of whom have had an asthma attack in the past year.[17] Four thousand people die each year from asthma-related causes, and asthma is a contributing factor for another 7,000 deaths every year. Asthma prevalence among children has increased an average 4.3 percent per year from 1980–1996.[18] Each year, asthma accounts for 14 million days of missed school days by children.[19] The cost of health issues associated with poor air quality due to transportation is estimated at between $40 billion and $64 billion per year.[20] The Urban Land Institute estimates that carbon emissions from transportation will be 41 percent above today's levels in 2030 if driving is not curbed.[21]
- Nearly one-third of the U.S. population is transportation disadvantaged, which means that they cannot easily access basic needs such as healthy food choices, medical care, gainful employment, and educational opportunities.[22] Research shows that half of all non-drivers age 65 and over—3.6 million Americans—stay at home on a given day because they lack transportation.[23] The economy cannot reach its maximum potential when buyers are unable to reach retail destinations. Additionally, transportation is the second-largest expense for American households, costing more than food, clothing, and healthcare. Even before the recent increase in gasoline prices, Americans spent an average of 18 cents of every dollar on transportation. The poorest fifth of U.S. families, earning less than $13,060 per year, pay 42 percent of their income to own and drive a vehicle. Those families earning $20,000 to $50,000 spend as much as 30 percent of their budget on transportation.[24] The vast majority of this money, nearly 98 percent, is for the purchase, operation, and maintenance of automobiles. Drivers spent $186 billion on fuel last year, and without improvements to fuel economy, Americans will spend an estimated $260 billion on gasoline in 2020.[25]
- A recent study by the Texas Transportation Institute found that congestion was responsible for an annual $78 billion loss in fuel during traffic jams in 2007, an increase from $57.6 billion in 2000.[26] The 2008 National Household Transportation Survey found 50 percent of all trips in the United States are three miles or less, and 28 percent of all trips are one mile or less—distances easily accessible by walking, biking, or taking a bus or train. Yet, 72 percent of the shortest trips are now made by automobile. In part, this is because of incomplete streets that make it dangerous or unpleasant for other modes of travel. Complete streets can convert many of these short automobile trips to multimodal travel. Simply increasing bicycling from 1 percent to 1.5 percent of all trips in the United States would save 462 million gallons of gasoline each year. Using transit has already helped the United States save 1.4 billion gallons of fuel each year, which is a savings of 3.9 million gallons of gasoline every day.[27]

**A RECENT STUDY BY THE TEXAS TRANSPORTATION INSTITUTE FOUND THAT CONGESTION WAS RESPONSIBLE FOR AN ANNUAL $78 BILLION LOSS IN FUEL DURING TRAFFIC JAMS IN 2007, AN INCREASE FROM $57.6 BILLION IN 2000.**

The emphasis on multimodal transportation through complete streets is not an entirely new concept. Roadways historically were designed to accommodate all modes, but complete streets policies provide the opportunity to build the political and community will to truly operationalize multimodal planning at the street and neighborhood level. Our transportation planning priorities must evolve if we are to have a better-functioning transportation system. Transportation policies and practices must ensure that roadways are designed to safely, comfortably, and efficiently accommodate all types of users, including motorists, pedestrians, cyclists, children, disabled, the elderly, and public transit travelers.

## COMPLETE STREETS BENEFITS

Complete streets can contribute to the improvement of traffic performance and provide a number of social, economic, environmental, and health benefits to communities. They respond to and support other efforts to increase transportation system efficiency, including transportation demand management, parking management, improvements to alternative modes, transit-oriented development, and smart growth land use policies. The new FHWA/FTA *Livability in Transportation Guidebook* gives us a clearer picture of the current orientation of federal agencies. The document explores how transportation planning and programs can improve community quality of life, enhance environmental performance, and increase transportation and housing choices while lowering costs and supporting economic vitality. Many of the case studies resolve capacity and operational issues through

a multimodal network and systems approach, reflecting better integration of land use with transportation. The guidebook recommends implementation of complete streets policies for both new facilities and through "re-engineering existing roadways to improve vehicle capacity; pedestrian, bike, and transit service; and requiring new facilities to be complete streets." It also calls for creating more complete street networks by "developing a multimodal network of parallel roadways through existing underused shopping centers and strip commercial development, for local travel and to connect surrounding neighborhoods to jobs, shopping, activities, and each other."[28]

While travel impacts taken individually may seem modest, typically affecting just a few percent of total vehicle travel, the effects are cumulative and synergistic.[29, 30] An integrated complete streets program can reduce per capita vehicle travel by 10 to 30 percent or more compared with data from more auto-dependent communities.[31]

Complete streets policies provide a variety of benefits:[32]

- When automobile travel declines, numerous impacts can occur, including congestion reductions, road and parking cost savings, consumer savings, accident reductions, energy conservation, and emission reductions.
- The community can benefit from investments that improve walking, cycling, and public transit. Such projects, when combined with new land use patterns, support local economies by leveraging public investments and often include a revival in retail activity, private investment, social capital, and tourism. Investments typically increase retail sales by an average of 30 percent and land value from 70 to 300 percent.[33] North Carolina DOT studies (USA) have linked added tourism to the inclusion of bike trails in popular mountain, beach, and city destinations, for example.[34]
- *Livability* refers to the environmental and social quality of an area as perceived by residents, employees, customers, and visitors. This includes safety, health and well-being, economic opportunity, social equity, the local environmental quality, and preservation of valued cultural and environmental resources. Complete streets improve livability.[35] Parents allow their children to walk to school; the elderly and disabled regain their independence; and residents and visitors have access to transportation, housing, shopping, and recreational activities. U.S. Transportation Secretary Ray LaHood said it best: "Livability means being able to take your kids to school, go to work, see a doctor, drop by the grocery or post office, go out to dinner and a movie, and play with your kids at the park—all without having to get in your car."[36]
- Sidewalks and trails are an important component of the public realm because they are the places where the community can interact. Improving walkability tends to increase community cohesion through positive interactions among neighbors, which in turn tends to improve public safety and security.[37]
- Improving walking, cycling, and public transit tends to increase affordability and economic opportunity to disadvantaged people, helping to achieve social equity goals.

**NONMOTORIZED TRAVEL IMPROVEMENTS CAN REDUCE LOCAL CONGESTION PROBLEMS BY REDUCING SHORT TRIPS GENERATED WHEN POOR WALKING AND CYCLING CONDITIONS CAUSE PEOPLE TO DRIVE JUST TO TRAVEL A FEW BLOCKS.**

Conventional roadway evaluation metrics tend to overlook or undervalue many of the benefits of complete streets.[38] In a white paper titled *Evaluating Active Travel: Decision-Making for the Sustainable City*, British researchers point out that current planning practices fail to account for the health benefits that result from more active transportation, resulting in underinvestment in walking and cycling improvements. The researchers go on to state, "Given the need to ensure high-quality decision-making in the transportation sector, it is paramount that contemporary evaluation practices keep pace with the shifting nature of policies that explicitly encourage uptake of walking and cycling."[39]

Overall, conventional evaluation tends to overlook many ways that improving walking, cycling, and public transit travel can help solve traditional traffic engineering problems such as traffic and parking congestion.[40] Nonmotorized travel improvements can reduce local congestion problems by reducing short trips generated when poor walking and cycling conditions cause people to drive just to travel a few blocks. These short trips can create significant congestion since they often involve merging and turning maneuvers that cause traffic friction.

## CASE STUDIES

**Hillsborough Street, Raleigh, NC, USA:** In 1999, a group of more than 500 citizens and other stakeholders mobilized in Raleigh, North Carolina, around Hillsborough Street, the N.C. State University "town/gown" connector, which was then listed as the state's most dangerous street for pedestrians. At that time, the street was run down and home to a few businesses that appeared to be hanging on by a thread. Through a charrette-driven process, the community learned how street making is integral to their development. By the time the first major phase of the street remake was finished in October 2010, four roundabouts had been installed, a road diet was in place, and streetscape improvements included new medians, more parking,

wider sidewalks, and ample crosswalks. Today, the street is complete and alive. Nina Szlosberg-Landis, a former TV documentary producer and the "mother" of the Hillsborough Partnership, noted that more than $200 million in new mixed-use development investments are coming to the street, traffic is flowing well, and students and motorists are safer and more comfortable. A hearty business environment is in place and growing. Even Raleigh's own city councilors have been amazed at how the complete streets movement has affected the entire social and political processes. Russ Stevenson, at-large city councilor, and Mayor Charles Meeker (who is now tied as Raleigh's longest-serving Mayor) attribute their success in politics, as well as their interest in walkability and transit, to the Hillsborough Street remake. These leaders consider themselves well versed in how transportation investments can be leveraged to build a sustainable future and a more enjoyable present for the community.

**Washington DC, Region, USA:** We sometimes assume that there is an inherent conflict between economic, social, and environmental objectives, but this is not necessarily true. By helping to create a more diverse and resource-efficient transportation system, complete streets tend to enhance economic development as well as provide social and environmental benefits. Complete streets can provide the policy and grassroots support to assist in this change by building streets that people want to live on or nearby.

In a recent presentation, Chris Leinberger, an urban land use strategist and visiting fellow with the Brookings Institute, discussed the challenges of translating complete streets policies into successful on-the-ground projects. Leinberger focused on two areas of Washington, DC's Metro Orange Line. Twenty years ago, there were only two neighborhoods in the DC region that could truly be described as walkable urban areas: Georgetown and Old Town in Alexandria, Virginia. The expansion of the Metro system in the 1980s and 1990s, along with enlightened local public sector leadership and an innovative private real estate industry, led to a walkable urban development boom. Now there are 39 walkable urban areas in the region, including areas within the DC limits such as Dupont Circle, downtown, the Capitol Waterfront, and those in the suburbs such as Reston Town Center (Reston, VA), Arlington, Virginia, and downtown Silver Spring in Maryland.

**A MAJOR OBSTACLE TO COMPLETE STREETS IMPLEMENTATION IS THAT MANY CURRENT TRANSPORTATION POLICIES AND PLANNING PRACTICES FAVOR MOBILITY OVER ACCESSIBILITY AND AUTOMOBILE TRAVEL OVER ALTERNATIVE MODES.**

Today, the Orange Line is the single-most instructive metro line in the country. It is on this line that Arlington and Fairfax Counties chose fundamentally different approaches. Fairfax County elected to take the cheapest option available: running the new line down the undevelopable center of the existing I-66 highway. Arlington County chose, at its own expense, the harder placement, inserting transit into the center of a declining corridor, pulling the line from the highway and running it through its then-unwalkable and rapidly decaying commercial areas. Over the following decades, development in Arlington's section exploded, with the price per square foot of real estate increasing 200 to 300 percent, which translated into 10 percent of the county's land mass providing 50 percent of the tax revenues. Just over the county border in Fairfax, the metro line went down the middle of Route 66. Looking at aerial photos of the two areas is telling: one is densely developed; the other is empty save for a sea of park & ride lots. These parking lots may condemn the areas around the stations to perpetual underdevelopment without massive subsidies to deck the parking to free up land (though this land is 100 yards from the mid-highway stations) or even more expensive subsidies to put a buildable lid over the highway.

Complete streets are not simply about street design but rather about combining proper land development patterns and proper street designs that fit together. Street connections, block form, and other patterns matter. Land use development and transportation planning decisions cannot be made in isolation from one another. The standard practice should be toward improvement of accessibility and safety and to build sustainable, economically viable communities.

## PERCEIVED OBSTACLES AND RISKS

A balanced transportation system resulting from multimodal transportation planning is often the most effective way to improve the driving experience while ensuring access to vital resources and reducing the problems drivers face such as traffic and parking congestion, accident risk, and chauffeuring burdens.

A major obstacle to complete streets implementation is that many current transportation policies and planning practices favor mobility over accessibility and automobile travel over alternative modes.[41] For example, a major share of transportation funding is dedicated to roads and parking facilities and cannot be shifted to support other modes or mobility-management strategies, even if they are the most cost-effective transportation system improvement options. The way we traditionally evaluate transportation system performance only considers delays to motor vehicle traffic; the delays that motor vehicle traffic imposes on pedestrians and cyclists (called *the barrier effect* or *severance*) is not generally measured in economic or planning analyses. Generous minimum-parking requirements and other zoning practices force developers to build sprawl rather than compact, mixed-use communities.[42, 43]

Additionally, conventional travel statistics tend to undercount nonmotorized

travel activity, which leads to undervaluation and underinvestment in walking and cycling facilities. Travel surveys also undercount nonmotorized travel because they ignore short trips, non-work travel, travel by children, recreational travel, and the nonmotorized links on trips that involve motorized travel. For example, a bike-transit-walk trip is often coded simply as a transit trip, and a trip that includes walking several blocks from a parked vehicle to a destination is often coded simply as an auto trip. Nonmotorized travel is usually three to six times greater than surveys indicate.[44] The 2009 National Household Travel Survey indicates that walking, cycling, and public transportation represent approximately 15 percent of all travel and often two or three times more on major urban corridors. Inadequate walking and cycling facilities force people to drive for even short trips—sometimes to cross a busy road or to travel a single block—which significantly increases traffic congestion. We need much more investment in pedestrian and cycling improvements on our streets.[45]

A focus on complete streets policy and projects may appear risky because it requires the entire community to set the vision, but it is actually riskier for communities to continue with current planning practices that undervalue and underinvest in all modes and fail to prepare for aging populations, rising fuel prices, climbing obesity rates, and increasing interest in less auto-dependent lifestyles. Americans drove almost three trillion miles in 2008, and many of those trips were very short—yet a vast majority of these trips were by automobile. Congestion is not solely an urban issue. Regions of all sizes have experienced increased congestion, costing the economy $87.2 billion in hours lost to traffic jams and wasted fuel in 2007 alone. An evaluation of auto-dependent transportation systems found that their per capita congestion costs are significantly higher than systems that provide alternatives to driving.[46]

Complete streets can be considered tools for building communities. One issue that can arise when considering complete streets is insufficient integration with other transportation and land development policies. Adding bicycle lanes on one roadway by itself will do little to increase cycling activity; it must be part of an integrated

**A FOCUS ON COMPLETE STREETS POLICY AND PROJECTS MAY APPEAR RISKY BECAUSE IT REQUIRES THE ENTIRE COMMUNITY TO SET THE VISION, BUT IT IS ACTUALLY RISKIER FOR COMMUNITIES TO CONTINUE WITH CURRENT PLANNING PRACTICES THAT UNDERVALUE AND UNDERINVEST IN ALL MODES.**

bicycle program that includes a network of trails and bicycle lanes, bicycle parking and changing facilities, and appropriate education and encouragement programs. Similarly, public transit facilities will provide little benefit unless implemented with other efforts to improve public transit service and encourage transit ridership. However, when properly implemented, an integrated program will provide substantial benefits, providing a high economic return on investment. This is why the emphasis must be on a complete streets policy as opposed to any project-specific undertaking. Communities can spend years battling about one street-improvement project, and when that is complete, they begin the cycle all over again. A complete streets policy, crafted by the community, ensures that the vision is set by the community and that all street-improvement projects align with the vision the community has set for itself.

According to a new report by the Political Economy Research Institute at the University of Massachusetts–Amherst, building bike lanes, pedestrian projects, and bike boulevards creates more jobs per million dollars spent than road repairs and road resurfacing projects.[47] American Recovery and Reinvestment Act investments in public transportation created almost twice as many jobs per billion dollars invested as highway projects—16,419 versus 8,781 job months. Additionally, a $100 million investment in Portland's streetcars helped attract $3.5 billion in private investment.[48] We cannot afford to squander our transportation investments. The benefits of complete streets can be vast. Complete streets can improve safety. Complete streets can target obesity rates by encouraging walking and bicycling for transportation and health. Complete streets can lower transportation costs for families. Complete streets can reduce oil dependence and carbon emissions. Complete streets can foster strong communities and build social capital. Complete streets can offer all people access to goods, facilities and community resources. Syndicated columnist Neal Pierce said it best in a recent column: "The old formula—easy mortgages, pro-sprawl land patterns, almost total automobile dependency—was overturned by the Great Recession. The excessive resources aren't there to go back to."[49]

## CONCLUSION

Jane Jacobs, author of *The Death and Life of Great American Cities,* stated that we were overbuilding our cities for our cars, stretching our cities out, making vehicles required for travel. She wrote:

*"Automobiles are often conveniently tagged as the villains responsible for the ills of cities and the disappointments and futilities of city planning. But the destructive effects of automobiles are much less a cause than a symptom of our incompetence at city building.*

*The simple needs of automobiles are more easily understood and satisfied than the complex needs of cities, and a growing number of planners and designers have come to believe that if they can only solve the problems of traffic, they will thereby have solved the*

*major problems of cities.*

*Cities have much more intricate economic and social concerns than automobile traffic. How can you know what to try with traffic until you know how the city itself works, and what else it needs to do with its streets? You can't."*

This was 1961. Today, a significant portion of our transportation dollars continue to go to roads designed for a single use, exacerbating the problems associated with sprawl and contributing to the health and economic problems we face as a nation. The good news is that communities are starting to realize that transportation must address accessibility rather than mobility and they are looking for solutions to improve their transportation networks. A complete streets policy can help direct those dollars toward streets that support a broader range of social, environmental, and community-building goals while improving accessibility for all. ■

**THE GOOD NEWS IS THAT COMMUNITIES ARE STARTING TO REALIZE THAT TRANSPORTATION MUST ADDRESS ACCESSIBILITY RATHER THAN MOBILITY AND THEY ARE LOOKING FOR SOLUTIONS TO IMPROVE THEIR TRANSPORTATION NETWORKS.**

*References*


1. AARP (2009), *Planning Complete Streets for an Aging America*, American Association for Retired Persons Public Policy Institute (www.aarp.org/ppi); at www.aarp.org/research/housing-mobility/transportation/2009_02_streets.html.

2. Todd Litman (2006), "Changing Travel Demand: Implications for Transport Planning," *ITE Journal*, Vol. 76, No. 9, September, pp. 27–33.

3. Adam Millard-Ball and Lee Schipper (2010), "Are We Reaching Peak Travel? Trends in Passenger Transport in Eight Industrialized Countries," *Transport Reviews*, Vol. 30 (http://dx.doi.org/10.1080/01441647.2010.518291); previous version at www.stanford.edu/~adammb/Publications/Millard-Ball%20Schipper%202010%20Peak%20travel.pdf.

4. Todd Litman (2003), "Measuring Transportation: Traffic, Mobility and Accessibility," *ITE Journal* (www.ite.org), Vol. 73, No. 10, October 2003, pp. 28-32, at Victoria Transport Policy Institute website (www.vtpi.org); at www.vtpi.org/measure.pdf.

5. Complete Streets. Policy Elements. http://www.completestreets.org/changing-policy/policy-elements/

6. John LaPlante and Barbara McCann (2008), "Complete Streets: We Can Get There From Here," *ITE Journal*, Vol. 78, No. 5 (www.ite.org), pp. 24–28.

7. PennDOT & NJDOT (2008), *Smart Transportation Guidebook*, Pennsylvania Department of Transportation and the New Jersey Department of Transportation, Smart-Transportation Partnership (www.smart-transportation.com); at www.smart-transportation.com/guidebook.html.

8. Richard Dowling, et al. (2008), *Multimodal Level Of Service Analysis For Urban Streets*, NCHRP Report 616, Transportation Research Board (www.trb.org); at http://trb.org/news/blurb_detail.asp?id=9470; *User Guide* at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w128.pdf.

9. TRB (2010), *Highway Capacity Manual*, Transportation Research Board (www.trb.org); at http://rip.trb.org/browse/dproject.asp?n=16893.

10. NHTSA, National Center for Statistics and Analysis. Traffic Safety Facts: 2005 Data. Washington, DC: NHTSA; 2005. DOT HS 810 620. Available at: wwwnrd.nhtsa.dot.gov/Pubs/810620.PDF.

11. National Highway Traffic Safety Administration's Fatality Analysis Reporting System. http://www-fars.nhtsa.dot.gov/Main/index.aspx

12. NHTSA[2009]. Fatality Analysis Reporting System (FARS), 2009. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, National Center for Statistics and Analysis

13. AAA. Crashes versus Congestion Report. What's the Cost to Society? Accessed October 2008. Cambridge, MD: Cambridge Systematics, Inc.; 2008. www.aaanewsroom.net/assets/files/20083591910.crashesVscongestionfullreport2.28.08.pdf.

14. Centers for Disease Control and Prevention. Overweight and Obesity. Available at: www.cdc.gov/nccdphp/dnpa/obesity/index.htm

15. Pratt M, Marcera C, Wang, G. Higher direct medical costs associated with physical inactivity. Physician Sports Medicine, 2000;28:63–70

16. Complete Streets and Safe Routes to School are Natural Partners. http://www.completestreets.org/resources/complete-streets-and-safe-routes-to-school-are-natural-partners/

17. American Academy of Allergy, Asthma and Immunology Web site. www.aaaai.org

18. Centers for Disease Control and Prevention. Asthma's Impact on Children and Adolescents. www.cdc.gov/asthma/children.htm

19. Centers for Disease Control and Prevention. National Asthma Control Program. America Breathing Easier 2007. Atlanta, GA: National Center for Environmental Health; 2007. www.cdc.gov/asthma/pdfs/aag07.pdf

20. Federal Highway Administration. 2000. Addendum to the 1997 Federal Highway Cost Allocation Study Final Report, May 2000. www.fhwa.dot.gov/policy/hcas/addendum.htm

21. Urban Land Institute. Growing Cooler Report. http://www.uli.org/ResearchAndPublications/Reports/~/media/Documents/ResearchAndPublications/Reports/GrowingCooler.ashx

22. Surface Transportation Policy Project. Transportation and Poverty Alleviation. Available at: www.transact.org/library/factsheets/poverty.asp.

23. Complete Streets. Economic Revitalization. http://www.completestreets.org/complete-streets-fundamentals/factsheets/economic-revitalization/

24. Policy Link. Equitable Development Toolkit: Building Regional Equity, Transit Oriented Development. Oakland, CA: Policy Link; 2008. www.policylink.org/documents/TOD-Tool_FINAL.pdf

25. Complete Streets. Transportation Costs. http://www.completestreets.org/complete-streets-fundamentals/factsheets/transportation-costs/.

26. Representative Doris Matsui. U.S. Senate and House Introduce Bill to Make Streets Safe and Encourage Healthier America. http://www.

matsui.house.gov/index.php?option=com_content&task=view&id=1567&Itemid=98

27. Complete Streets. Complete Streets Policies. http://www.completestreets.org/changing-policy/policy-elements/

28. FHWA (2010), *Livability in Transportation Guidebook: Planning Approaches that Promote Livability*, FHWA-HEP-10-028, Federal Highway Administration. USDOT (www.fhwa.dot.gov); at www.fhwa.dot.gov/livability/case_studies/guidebook.

29. Reid Ewing and Robert Cervero (2010), "Travel and the Built Environment: A Meta-Analysis," *Journal of the American Planning Association*, Vol. 76, No. 3, Summer 2010, pp. 265-294; at http://pdfserve.informaworld.com/317792__922131982.pdf.

30. Todd Litman (2007), *Land Use Impacts On Transport: How Land Use Factors Affect Travel Behavior*, VTPI (www.vtpi.org); at www.vtpi.org/landtravel.pdf.

31. Reid Ewing, Keith Bartholomew, Steve Winkelman, Jerry Walters and Don Chen (2007), *Growing Cooler: The Evidence on Urban Development and Climate Change*, Urban Land Institute and Smart Growth America (www.smartgrowthamerica.org/gcindex.html).

32. Todd Litman (2010), *Transportation Cost and Benefit Analysis Guidebook*, Victoria Transport Policy Institute (www.vtpi.org/tca).

33. Todd Litman (2010), *Evaluating Non-Motorized Transport Benefits and Costs*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/nmt-tdm.pdf.

34. NC Department of Transportation, Division of Bicycle and Pedestrian Transportation. *The Economic Impact of Investments in Bicycling Facilities.* http://www.ncdot.org/bikeped/download/bikeped_research_EIAconclusion.pdf

35. FHWA (2010), *Livability in Transportation Guidebook: Planning Approaches that Promote Livability*, FHWA-HEP-10-028, Federal Highway Administration. USDOT (www.fhwa.dot.gov); at www.fhwa.dot.gov/livability/case_studies/guidebook.

36. United States Department of Transportation. DOT Livability. http://www.dot.gov/livability/

37. Todd Litman (2006), *Community Cohesion As A Transport Planning Objective*, Paper 07–0550, Transportation Research Board 2007 Annual Meeting; at www.vtpi.org/cohesion.pdf.

38. Todd Litman (2010), *Evaluating Non-Motorized Transport Benefits and Costs*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/nmt-tdm.pdf.

39. James MacMillen, Moshe Givoni And David Banister (2010), "Evaluating Active Travel: Decision-Making for the Sustainable City," *Built Environment*, Vol. 36, No. 4, Dec. pp. 519–536; summary at www.atypon-link.com/ALEX/doi/abs/10.2148/benv.36.4.519.

40. Md Aftabuzzaman, Graham Currie and Majid Sarvi (2010), "Evaluating the Congestion Relief Impacts of Public Transport in Monetary Terms," *Journal of Public Transportation*, Vol. 13, No. 1, pp. 1–24; www.nctr.usf.edu/jpt/pdf/JPT13-1.pdf.

41. Todd Litman (2007), *Comprehensive Transport Planning Framework: Best Practices For Evaluating All Options And Impacts*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/comprehensive.pdf.

42. "Barrier Effect," in Litman 2010.

43. DfT (2009), *Transport Analysis Guidance: 3.6.2: The Severance Sub-Objective*, Department for Transport (www.dft.gov.uk); at www.dft.gov.uk/webtag/documents/expert/unit3.6.2.php.

44. P. Rietveld (2000), "Nonmotorized Modes in Transport Systems: A Multimodal Chain Perspective for The Netherlands," *Transportation Research D*, Vol. 5, No. 1, January, pp. 31–36.

45. Todd Litman (2010), *Short and Sweet: Analysis of Shorter Trips Using National Personal Travel Survey Data*, VTPI (www.vtpi.org); at www.vtpi.org/short_sweet.pdf.

46. National Complete Streets Coalition. Complete Streets Ease Traffic Woes. http://www.completestreets.org/complete-streets-fundamentals/factsheets/ease-congestion/

47. Estimating the Employment Impacts of Pedestrian, Bicycle and Road Infrastructure. Case Study: Baltimore. December 2010. http://www.bikeleague.org/resources/reports/pdfs/baltimore_Dec20.pdf

48. New Urban Network. Growing Wealthier with smart growth. January 2011. http://newurbannetwork.com/article/%E2%80%98growing-wealthier%E2%80%99-smart-growth-13902

49. The Seattle Times. It's Time to Return to a Robust Urbanism. January 1, 2011. http://community.seattletimes.nwsource.com/mobile/?type=story&id=2013808392&st_app=ip_news_lite&st_ver=1.2

**DAN BURDEN**

*is co-founder and executive director of The Walkable and Livable Communities Institute (www.walklive.org), located in Port Townsend, Washington, USA. Dan's efforts to get the world "back on its feet" have earned him lifetime-achievement awards from the New Partners for Smart Growth and the Association of Pedestrian and Bicycle Professionals. The League of American Bicyclists named Dan as "one of the 25 most significant leaders in bicycling for the past 100 years." In 2001, Dan was named by* TIME *magazine as "one of the six most important civic innovators in the world." Also that year, the Transportation Research Board of the National Academy of Sciences honored Dan by making him its Distinguished Lecturer. In 2009, a user's poll by Planetizen.com named Dan as one of the top 100 urban thinkers of all time. Dan's work has been featured in coverage by* Newsweek, CNN *and* Men's Health. *Dan has nearly four decades of experience helping create livable communities with a focus on non-motorized transportation. He served as the first state bicycle and pedestrian coordinator for the Florida Department of Transportation (1980–1996) and this became the model for other statewide programs. He is a member of ITE.*

**TODD LITMAN**

*is founder and executive director of the Victoria Transport Policy Institute (www.vtpi.org), an independent research organization dedicated to developing innovative solutions to transport problems. His work helps expand the range of impacts and options considered in transportation decision making, improve evaluation methods, and make specialized technical concepts accessible to a larger audience. His research is used worldwide in transport planning and policy analysis. Mr. Litman has worked on numerous studies that evaluate transportation costs, benefits, and innovations. He authored the* Online TDM Encyclopedia, *a comprehensive Internet resource for identifying and evaluating mobility management strategies;* Transportation Cost and Benefit Analysis: Techniques, Estimates and Implications, *a comprehensive study which provides cost and benefit information in an easy-to-apply format; and* Parking Management Best Practices, *a comprehensive book available on management solutions to parking problems. He is a member of ITE.*

*April 16, 2012*

Capital Region Transportation Planning Agency
CRTPA

# CRTPA RETREAT AGENDA ITEM 4

# ROUNDABOUTS

| REQUESTED BY: CRTPA Staff | TYPE OF ITEM: Information |
|---|---|

## STATEMENT OF ISSUE

A presentation and discussion of the functions and applications of roundabouts will be provided by Michael Wallwork, PE, President, Alternate Street Design, PA. Mr. Wallwork's biography is provided as ***Attachment 1***.

## BACKGROUND

The CRTPA Board has expressed an interest in learning more about roundabouts and their application. Staff has been fortune in having one of the industry's noted roundabout design experts come to make a presentation on roundabouts. Roundabouts offer unique solutions to traffic operations and safety problems at intersections. Generally, for the same traffic volume, delays are less at roundabouts as compared to other controlled intersections (typical delay reductions are 30-70%). Roundabouts will accommodate large volumes of left turn movements with less delay than signalized intersections. If left turns are minimal, or most of the traffic is making similar moves (i.e., there is a significantly dominant direction of traffic), then a conventional controlled intersection may offer less vehicular delay. With regard to safety, roundabouts reduce vehicle speeds and result in significantly fewer accidents. A study by the Insurance Institute for Highway Safety found that construction of roundabouts resulted in a 39% overall reduction in accidents; a 76% reduction in injury accidents and an 89% reduction in fatal or incapacitating accidents. No other intersection type has been found to provide that magnitude of safety improvement.

Because of the aforementioned benefits, roundabouts are being constructed more and more throughout the country. The Lafayette Louisiana MPO has embarked on a comprehensive program by developing a 2035 Lafayette MPO Roundabout Plan ***(Attachment 2)*** to construct roundabouts in numerous locations in Lafayette Parish. In Louisiana, a parish is the same as a county in Florida. The MPO has also adopted a policy document for proposing roundabout locations ***(Attachment 3).***

***Attachment 4*** is a report entitled "Are Roundabouts Good for Business?"

## ATTACHMENT

Attachment 1: Biography of Michael Wallwork
Attachment 2: 2035 Lafayette MPO Roundabout Plan
Attachment 3: Lafayette MPO Roundabout Policies
Attachment 4: Are Roundabouts Good for Business?

Michael Wallwork, PE
Traffic Engineer
40 Years Experience
Education
BS, 1972, Civil Engineering
Registration
1991/Professional Engineer: South Carolina, Florida, Virginia, North and South Carolina, Washington

My 40 years of engineering experience includes traffic engineering, road construction, transportation design, and traffic calming for a wide range of projects ranging from single intersection design to large-scale road projects that integrate attractive landscaping with transit, pedestrian, bicycle and vehicle facilities. My perspective is that streets and highways are transportation corridors that serve all people and therefore should be designed to benefit motorists, transit, pedestrians, bicyclists, and people with disabilities. I have developed and presented many training courses that include designing for pedestrians, roundabout design, traffic calming and street and subdivision design.

Over the years, I have developed a set of principles based on first-hand experience and post construction reviews. These principles form the foundation for my work. I share my expertise with local engineers as I assist them in their design work, in training courses, charrettes, workshops, and presentations so people can make informed decisions regarding transportation.

**Roundabouts**
I have been instrumental in helping many engineers design roundabouts and have promoted roundabouts I the US for 20 years. Although not the solution in all cases, roundabouts have far more uses than signalized intersections. My 35 years of roundabout experience enables me to provide appropriate advice about the feasibility and layouts for successful roundabouts for pedestrians, vehicles, bicyclists, trucks, oversize trucks and emergency vehicles. During this time I assisted in the design and evaluation of more than 700 roundabouts mostly in Australia, Bahamas, and the US.

During that time I have been involved with almost every type and shape of roundabout from local street roundabouts, freeway interchanges and three lane roundabouts with light rail through the center.

I have presented more than 1,300 roundabout presentations, 53 roundabout training courses to public sector agencies and commissions, political leaders, and citizens in more than 40 states.

**Design Charrettes, Community Consensus Building**
In keeping with my philosophy of providing community involvement in community projects, I participate in an increasing number of projects that involve building community consensus. In these projects, I provide citizens and processionals with latest design philosophies and opportunities so they can prepare their own designs.

**Main Streets**
I have taken the National Main Street Training program and worked with approximately 30 Main Streets in Florida, California, Hawaii, Asheville, NC, Kansas, Missouri, etc. Some notable designs I worked on were College Street, Asheville, NC, La Jolla Boulevard, San Diego, CA, Main Street in Zephyrhills, FL and Santa Monica Boulevard, West Hollywood, CA.

**Traffic Calming**
My involvement began with in the development of Local Area Traffic Management (LATM) projects in Australia in the early 1970's when traffic calming was a new concept. We developed a community process and traffic calming treatments by trial and error. In the US I have helped more than 90 communities prepare traffic calming concept plans across the US and assisted in the preparation of calming guidelines and procedures for two cities.

**Walkable Communities**
I assisted in the writing and presentation of more than 100 Walkable Community Design courses.

**Access Management**
As Access Management Engineer for the Florida Department of Transportation in District 2, and served as an expert witness for the department that defeated a 1995 challenge to the rewrite of the FDOT Access Management Rule 14-96 that made median openings a traffic control device.

**Traffic Signal Design**
During my 14 years as a traffic engineer in Australia I have designed or redesigned more than 500 signalized intersections ranging from simple two-phase to major intersections to more than 120,000 vehicles per day.

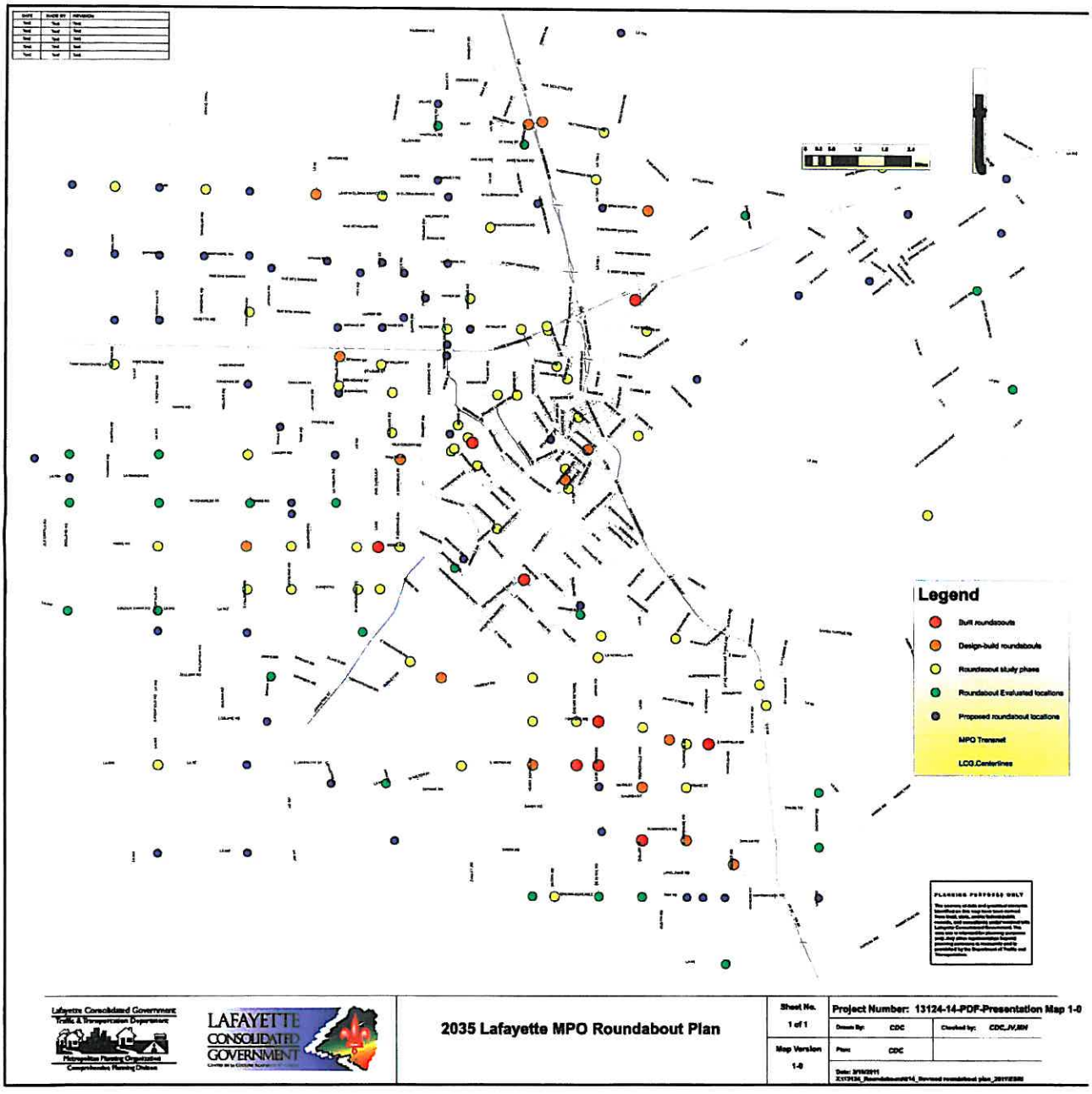
**Road Diets**
A growing number of road projects I have been involved in include lane reductions from eight to four, six to four, and many four land five lane roads converted to two lane roads with roundabouts all of which gained significant operational improvements.

**Transit Design**
As a Traffic Engineer in Melbourne, Australia I was heavily in all forms of transit design that included transit priority at intersections, signal coordination with transit priority, extensions of three on-road light rail routes where the light rail was either was in a median or shared a travel lane with motor vehicles.

**Publications**
I have authored, co-authored or assisted in the writing of many articles that include Traffic Signal Analysis and Design, Analysis of Pedestrian Crashes, Traffic Calming, A New Direction in Road Design, Traffic calming, Roundabouts, and helped to develop the Mini-roundabout Standards for the FHWA, a Street Design Manual, A Model Street Manual and Quality of Roundabout Design in the US.

**Honors and Recognition**
A growing number of projects that I worked on in various capacities have won various awards across the US.

**Membership**
Fellow of the Institute of Transportation Engineers


Legend
Built roundabouts
Design-build roundabouts
Roundabout study phase
Roundabout Evaluated locations
Proposed roundabout locations
MPO Transnet
LCG.Centerlines
PLANNING PURPOSES ONLY
Lafayette Consolidated Government
Traffic & Transportation Department
Metropolitan Planning Organization
Comprehensive Planning Division
LAFAYETTE
CONSOLIDATED
GOVERNMENT
2035 Lafayette MPO Roundabout Plan
Sheet No.
1 of 1
Map Version
1-0
Project Number: 13124-14-PDF-Presentation Map 1-0
Drawn By: CDC
Checked by: CDC_JV_BH
Plan: CDC

# Exhibit One

# Lafayette MPO

# Roundabout Policies

**Final 5.0**
**February 27, 2007**

***PREPARED BY***

**Lafayette Consolidated Government**
**Traffic and Transportation Dept.**
**Metropolitan Planning Organization &**
**Comprehensive Planning Division**

**PROJECT 09040-005-06**

## 1.0 Introduction

Roundabouts offer unique solutions to traffic operations and safety problems at intersections. Generally, for the same traffic volume, delays are less at roundabouts as compared to other controlled intersections (typical delay reductions are 30-70%). Roundabouts will accommodate large volumes of left turn movements with less delay than signalized intersections. If left turns are minimal, or most of the traffic is making similar moves (i.e., there is a significantly dominant direction of traffic), then a conventional controlled intersection may offer less vehicular delay. With regard to safety, roundabouts reduce vehicle speeds and result in significantly fewer accidents. A study by the Insurance Institute for Highway Safety found that construction of roundabouts resulted in a 39% overall reduction in accidents; a 76% reduction in injury accidents and an 89% reduction in fatal or incapacitating accidents. No other intersection type has been found to provide that magnitude of safety improvement. See Figures No. 1-1, 1-2, and 1-3 for examples of a one-lane roundabout, a two-lane roundabout, and a roundabout corridor.

## 2.0 Proposed Roundabout Policies

The Lafayette Metropolitan Planning Organization (MPO) advises that:

1) When a transportation improvement project includes reconstructing or constructing new intersections, a roundabout alternative is to be analyzed to determine if it is a feasible solution based on site constraints, including ROW, environmental factors, and other design constraints. Exceptions to this requirement are where the intersection:

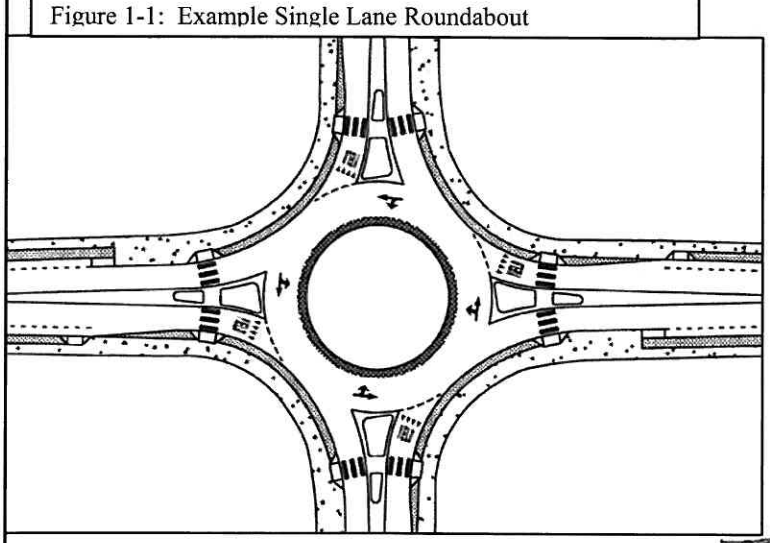
1. Has no current or anticipated safety, capacity, or other operational problems.
2. Is within a well working coordinated signal system in a low-speed (<49 mph) urban environment with acceptable accident histories.
3. Is where signals will be installed solely for emergency vehicle preemption.
4. Has steep terrain that makes providing an area, graded at 5% or less for the circulating roadways, infeasible.
5. Has been deemed unsuitable for a roundabout by the Design engineers.

When the analysis shows that a roundabout is a feasible alternative, it should be considered the preferred alternative due to the proven substantial safety benefits and other operational benefits.

2) The Lafayette Metropolitan Planning Organization shall maintain a comprehensive long range Roundabout Plan for the MPO Study Area. The MPO Roundabout Plan shall be updated and expanded on a minimum five year cycle or as determined necessary by a MPO advisory committee.

3) Landscaping and related facilities (fountains, lighting, statuary, etc.) shall also be considered upon design of a roundabout, and the required infrastructure shall be extended to the roundabout if landscaping appears to be a feasible option.

Figure 1-1: Example Single Lane Roundabout



**Lafayette MPO**
**Roundabout Intersections**
**Figures 1-1 to 1-3**
See Footnote 1 below

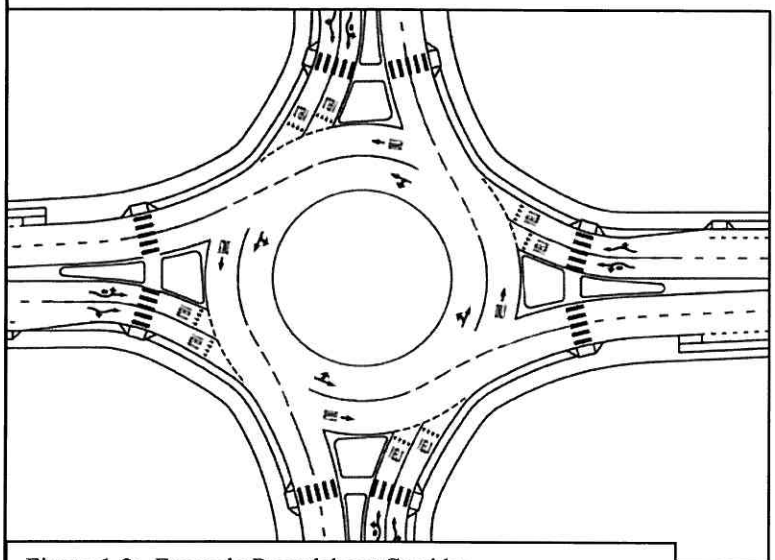


Figure 1-2: Example Roundabout Corridor

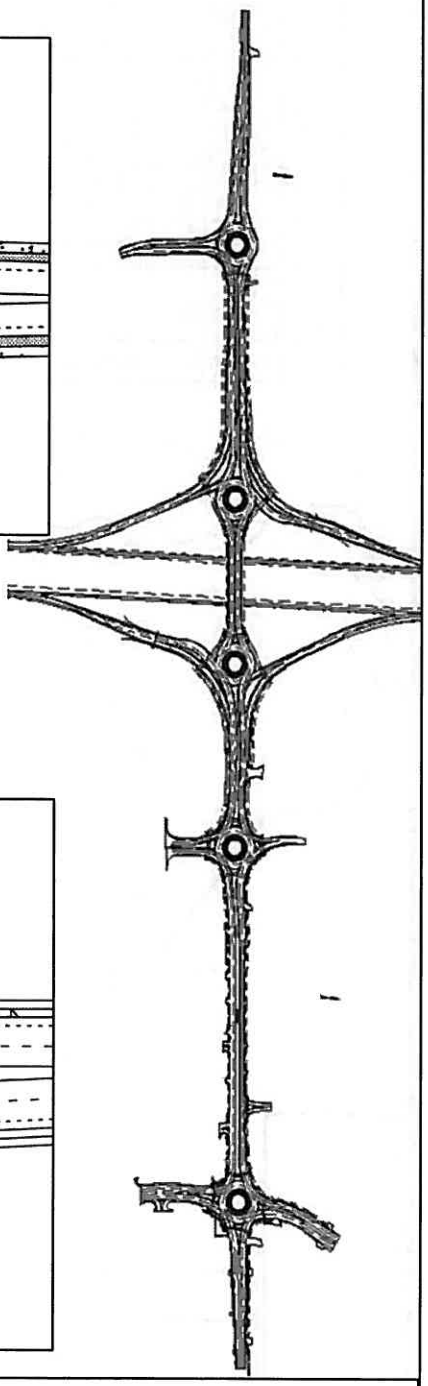


Figure 1-3: Example of Roundabout Corridor

Footnote 1: New York State Department of Transportation (NYSDOT), Highway Design Manual, Chapter 5, Basic Design, Section 5.1.9.C, Page 5-100, Exhibit 5-19, Roundabout Intersections, (Revision 50, dated 8/23/2006).

Support Document 6

| # | REVISION | PLAN | DATE |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
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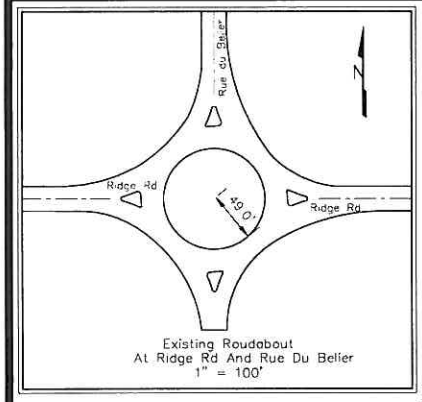



Existing Roudabout
At Ridge Rd And Rue Du Belier
1" = 100'

# EXHIBIT ONE

ROUNDABOUT NUMBERING SYSTEM & LOCATIONS
Note: Not Listed By Priority

| YEAR | SERIAL No. | NEED | EAST/WEST ROADWAY | NORTH/SOUTH ROADWAY |
|---|---|---|---|---|
| 03 | 101 | ■ | Gloria Switch Rd | LA 93 |
| 03 | 102 | ▲ | Gloria Switch Rd | Amb. Caffery North |
| 03 | 103 | ▲ | Gloria Switch Rd | Louisiana Ave |
| 03 | 104 | ■ | Butcher Switch Rd | LA 182 |
| 03 | 105 | ■ | I-10 Exit Ramp North | Amb. Caffery Prkwy |
| 03 | 106 | ■ | I-10 Exit Ramp South | Amb. Caffery Prkwy |
| 03 | 107 | ▲ | Dulles Dr | Le Violon Rd |
| 03 | 108 | ■ | Hospital Dr | Girard Park Dr |
| 03 | 109 | ■ | Ridge Rd | South Fieldspan |
| [illegible] | [illegible] | ● | [illegible] | [illegible] |
| 03 | 111 | ▲ | North/South Beltway | South Fieldspan |
| 03 | 112 | ■ | Tolson Rd | Bonin Rd |
| 03 | 113 | ■ | La Neuville | Bonin Rd |
| 03 | 114 | ■ | E. Broussard | Robley Dr |
| 03 | 115 | ■ | E. Broussard | Kaliste Saloom |
| 03 | 116 | ▲ | Fortune Rd | Verot School Rd |
| 03 | 117 | ▲ | Fortune Rd | Bonin Rd |
| 03 | 118 | ■ | LA 92 | E. Broussard Rd |
| 03 | 119 | ■ | LA 92 | Verot School Rd |
| 03 | 120 | ▲ | LA 92 | Bonin Rd |
| 04 | 121 | ■ | Landry Rd | S. Fieldspan |
| [illegible] | [illegible] | ● | [illegible] | [illegible] |
| 04 | 123 | ▲ | Albertsons Pkwy | Morgana Ave |
| 04 | 124 | ▲ | Duhon Rd | Rue Du Belier |
| 04 | 125 | ▲ | Ridge Rd | LA 343 |
| 04 | 126 | ■ | North/South Beltway | LA 343 |
| 04 | 127 | ▲ | Lewis St | Girard Park Rd |
| 04 | 128 | ▲ | W. Congress St | Lagneaux Rd |
| 04 | 129 | ▲ | Tolson | Artisan |
| 07 | 130 | ● | LA 92 | LA 89 |
| [illegible] | [illegible] | ● | [illegible] | [illegible] |
| [illegible] | [illegible] | ● | [illegible] | [illegible] |
| 07 | 133 | ● | E. Taft St. | Gen. Mouton Ave. |
| [illegible] | [illegible] | ● | [illegible] | [illegible] |
| 07 | 135 | ● | North Domingue Dr. | Dulles Dr. |
| 08 | 136 | ● | LA 93 | I-10 |

1" = 2.5 MILES

2009


LEGEND
- PHASE 1 – EXISTING
- PHASE 2 – CURRENT NEED
- PHASE 3 – FUTURE NEED
- NEW PROPOSED ROUNDABOUT

COLOR LEGEND
COLOR = NOT YET FUNDED
COLOR = COMPLETED
COLOR = FUNDING SOURCE IDENTIFIED

EXISTING & PROPOSED ROUNDABOUTS

Lafayette Consolidated Government
Traffic & Transportation Department
Metropolitan Planning Organization
Comprehensive Planning Division

| | | |
|---|---|---|
| Disk: X:\13124_Roundabouts\001_Roundabout_ maps\2009_Drawings\ACAD | | |
| eFile: Lafayette_Parish_Roundabout.dwg | | |
| Ok: FMH | Dwg: CDC | Proj: 13124-001 |
| Date: 4/15/09 | | Plan: CDC |

# Are Roundabouts Good for Business?

December 1, 2004

4,573 Words

Alex J. Ariniello
LSC Transportation Consultants, Inc.,
1889 York Street
Denver, CO 80206
Phone: 303-333-1105
FAX: 303-333-1107
email: aja@lscdenver.com

**ABSTRACT**

This paper discusses the implementation of a series of four roundabouts on a suburban arterial serving a strip commercial area. The project is located on South Golden Road which is one of Golden, Colorado's primary commercial arterial corridors. With four through lanes and a center turn lane, it handled through traffic, but access from business and side streets was a significant problem. Plans for a new shopping center elevated citizens concerns about traffic in the corridor. In designing improvements for the corridor, the City wished to slow traffic, improve access, safety and aesthetics. The roundabouts were constructed in 1998 - 1999 and were fully operational in late 1999. This paper shows how a series of roundabouts can be implemented in a commercial arterial corridor to provide a more aesthetically pleasing area, while maintaining traffic flow and providing additional pedestrian protection. Before and after data demonstrates the changes in traffic volumes, accidents and economic activity. The series of urban roundabouts in series resulted in a corridor where traffic moves slowly, vehicles experience little delay at major intersections, and pedestrians can readily access the many businesses in the area. The net result is a vibrant commercial corridor.

## INTRODUCTION

The Golden, CO business community was skeptical about the City's proposal to build a series of roundabouts on a suburban arterial serving strip commercial development. The City even had to promise to tear the roundabouts out if a planned neighborhood grocery store didn't meet sales projections. But four years after the four roundabouts were completed, the South Golden Road corridor is the only area in the City reporting continued growth in sales tax revenues in the face of a metro-wide economic slowdown. The evidence of sales growth and building space redeveloped suggests that businesses along South Golden Road would answer "Yes, roundabouts are good for business". This paper will show that the many benefits of roundabouts -- which include reduced accidents, slower speeds but reduced delay, and an aesthetically pleasing roadway corridor – can translate into a healthy business environment.

## BACKGROUND

The City of Golden is nestled into the foothills of the Rocky Mountains on the west side of the Denver metro area. The City contains about 17,000 people and has a traditional down-town bordered by the Colorado School of Mines and the Coors Brewery. South Golden Road is located 2 miles southeast of the Old Town and was originally constructed as a suburban highway with four travel lanes, center turn lane (suicide lane), and wide parking/shoulders. At places, it measured 84 feet in width and had bits and pieces of attached and detached walks. Driveways were allowed indiscriminately and many had continuous access along their entire frontage. Traffic signals were installed at the main inter-sections including Ulysses Street and Johnson Road. The corridor served several residential areas, many businesses including several fast-food restaurants, and a small shopping center.

South Golden Road before Improvements

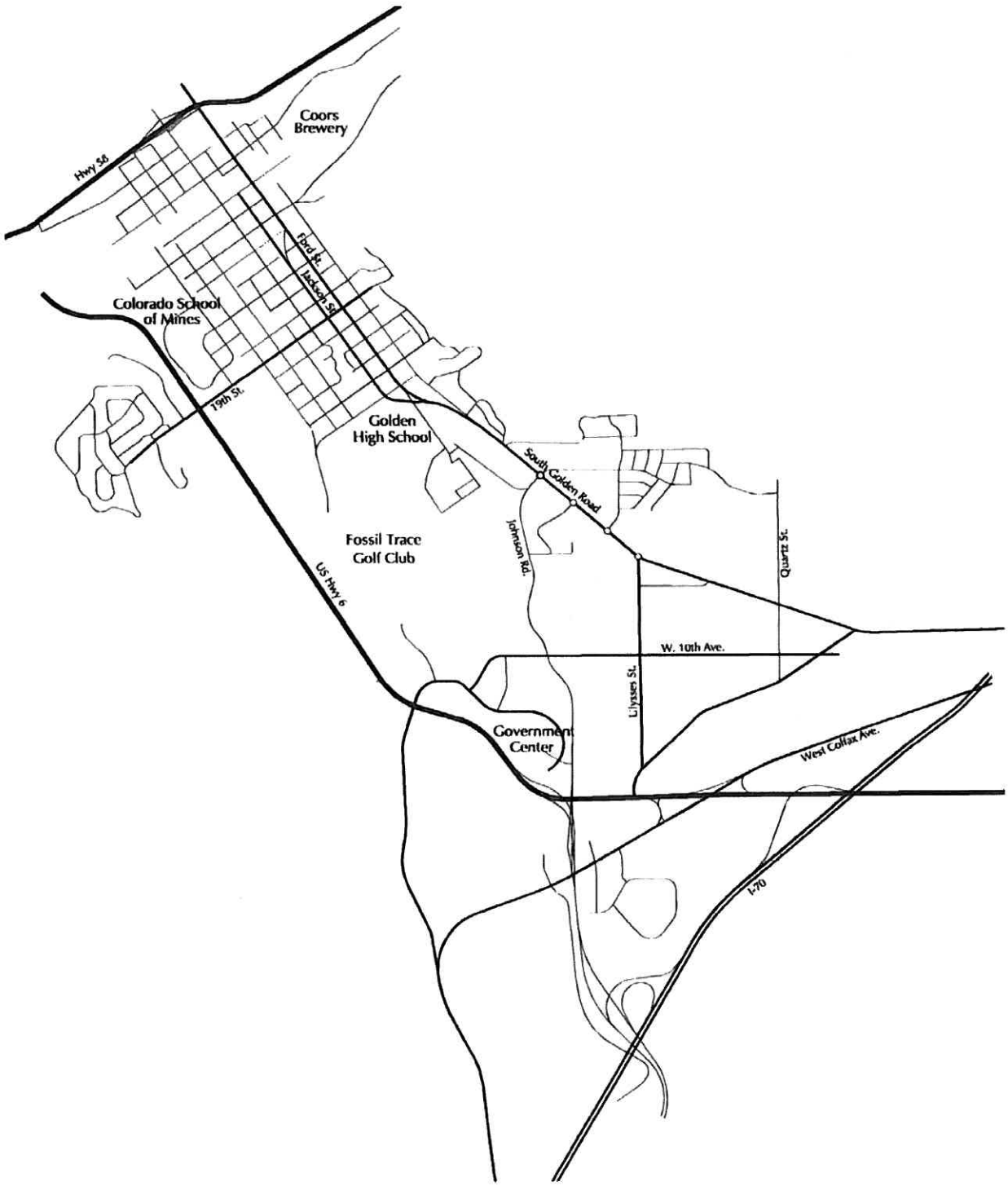
The unrestricted access created a safety concern with the center turn lane due to numerous conflicting left-turn movements. The width of the roadway encouraged speeding and was difficult to cross, especially for elderly pedestrians. Traffic volumes were in the range of 11,000 to 12,000 vehicles per day.

Due to these concerns, the City began investigating ways of creating a safer, more pedestrian-friendly and aesthetically appealing environment. In 1993, a series of open house meetings with local businesses and area residents was held to develop urban design solutions for the corridor. The intent was to narrow the pavement width by eliminating the parking/shoulder lanes, installing medians and detached walks, and providing other amenities. Consensus was never reached on any plan due to access concerns of businesses and the effort died.

## IMPETUS TO PROJECT START

In 1998, the City received a development proposal for a shopping center that included a 70,000 square foot grocery store to be located on South Golden Road. This triggered a reaction from residents of the area about the traffic on South Golden Road, especially the need for a traffic signal at Utah Street. Residents felt that the additional shopping center traffic would make it

impossible to get out of Utah Street onto South Golden Road. This reopened the South Golden Road improvement issue and the City staff asked its traffic engineer to develop alternative improvement concepts.



## CITY OBJECTIVES

The City articulated several objectives for any improvements to South Golden Road:

- Reduce vehicular conflicts and increase safety;
- Create a more aesthetically pleasing area;
- Create a more pedestrian-friendly environment;
- Reduce delays for entering traffic at Utah Street;
- Reduce queue delays to reduce travel time.

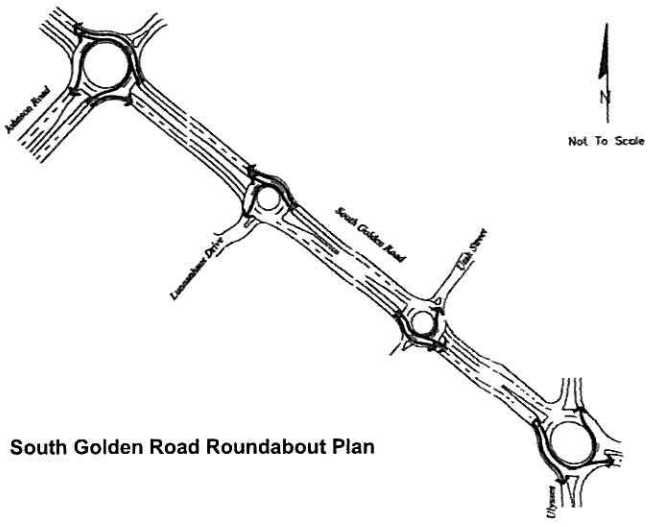
Two alternative concepts for South Golden Road were developed:

1. Narrow the roadway, provide medians and wide detached sidewalks, and install a new traffic signal at Utah Street.
2. Narrow the roadway, provide medians and wide detached sidewalks, and construct two roundabouts at Utah Street and Ulysses Street. This would involve removing the existing traffic signal at Ulysses Street.

City staff and elected officials were immediately receptive to the roundabout concept. The traffic calming aspects combined with the obvious qualities of the roundabout concept met the City objectives for the corridor. Moreover, the ease of U-turns at the roundabouts appeared to actually improve access to businesses in the corridor. The staff was so impressed with the concept that they requested the addition of a third roundabout at Johnson Road.

## DEVELOPING THE CONCEPTS

The City staff enthusiastically took on the task of presenting alternatives including the traditional traffic control and the roundabout version to the City Council, residents, and businesses in the area. After learning about the potential benefits of roundabouts, several businesses and city council embraced the concept. The biggest opponent was the developer and major tenant of the new shopping center. King Soopers, one of the major grocery chains in the state, balked at having their major entrance on the proposed Ulysses roundabout. None of their stores was served by a roundabout and they were wary of potential negative public reaction. City officials presented the round-about concept to the President of King Soopers. The City offered to tear the roundabout out if it appeared to affect the new store's sales. King Soopers agreed to try the concept and the project quickly moved into design.




**South Golden Road Roundabout Plan**

The City then began meeting with the local merchants to define their specific design concerns and review the roundabout concept. Most were neutral on the concept and more concerned on changes affecting their properties and disruption during construction. A car-wash owner, however, had worked in Vail and was a big proponent of the roundabout concept. The Pizza Hut manager, who had studied the gridlock that occurred at peak hour in the parking lot of the Wendy's across the street, concluded that the delay that occurred waiting for a gap sufficient to make a left turn was the problem. The result was his insistence that a fourth roundabout be added and that their access be only right in and right out. This fourth roundabout was the hardest to sell as the veterinary clinic across the street strenuously objected because they thought vehicles with horse trailers wouldn't be able to get around the circle and into their driveway. Numerous meetings and AutoTurn sketches never did overcome their skepticism.

## IMPLEMENTATION

While the shopping center development schedule dictated construction and opening of the roundabout by late fall 1998, the City intended to phase the rest of the project the following years when funds became available. The Ulysses roundabout was constructed on a fast track schedule and opened in November 1998. The initial public reaction was mixed, but positive response appeared to outweigh negative response. More importantly, King Soopers exceeded its sales projections and has had no further opposition to the project.

South Golden Road/Ulysses Street Roundabout

After considering the initial public reaction to the roundabout concept, city council decided to accelerate completion of the entire project to 1999 by shifting funding to this project. The other three roundabouts and roadway reconstruction were designed in the spring of 1999, and construction commenced in mid-1999.

The construction reached a stage where the other three roundabouts could be opened to the public in early December, 1999. Despite freezing temperatures, a crowd of several thousand attended the merchant-sponsored grand opening on December 4, 1999.

| S. Golden Road Roundabouts | Inside Diameter | Outside Diameter |
|---|---|---|
| Ulysses Street | 90 | 145 |
| Utah Street | 50 | 105 |
| Lunnanhaus Drive | 50 | 105 |
| Johnson Road | 100 | 155 |

## PROJECT COSTS

The mile-long project cost $1.3 million. This includes the four roundabouts, roadway reconstruction, medians, detached sidewalks, utility relocations, design and landscaping. There is no indication that the roundabouts added to the cost of the project and actually saved the cost of traffic signal reconstruction.

## ACCIDENT HISTORY

As shown in several other roundabout studies, the South Golden Road roundabouts experienced a significant drop in both the number and severity of accidents. The City has tracked accidents along the corridor since 1996, a period of 3 years prior to installation and now (excluding the construction period) for five years after. Figure 1 displays the number of accidents and the number of injuries for the 3 years prior to installation and the 5 years after. Total annual accidents have been reduced from a pre-installation high of 123 accidents to 19 in 2003, the last full year of reporting. More significantly, there were 31 injuries in the 3-year pre-installation period and only 1 injury in the 4½ years afterward. Note that few of the post installation accidents occurred at the roundabouts.

Accident rates have shown an even greater improvement since traffic volumes have increased from 11,500 vehicles per day in 1996 to 15,500 vehicles per day in 2004. As shown in Figure 2, the total accident rate has declined from 5.9 accidents per million vehicle miles in 1997 to 0.2 in 2004, a reduction of 88%. The injury accident rate has declined from 0.57 injury accidents per million vehicle miles in 1997 to 0.04 in 2003, a decrease of 93%. While some of this decline can be attributed to better access control, the more important factors are the safer roundabout concept of traffic control and the decline in vehicle speeds. With 4 roundabouts located within the half-mile corridor, 85% percentile speeds declined from 47 mph to 33 mph (as measured at points midway between the roundabouts).

## SLOWER SPEEDS BUT FASTER TRAVEL TIMES

While average speeds have gone down, travel time has also gone down. Prior to the roundabouts, the corridor had 2 traffic signals and average travel time through the corridor was calculated to be 78 seconds. A third traffic signal was being considered which would have increased travel time to 103 seconds. Since the roundabouts service vehicles with less delay per vehicle than traffic signals, the current travel time through the corridor is estimated to be 68 seconds.

More significant for businesses is the delay experienced entering or exiting their sites. Before installation of the roundabouts, the average delay at business access points was 28 seconds, with maximum delays of 118 seconds. After installation of the roundabouts, average delay was reduced to 13 seconds and maximum delay to 40 seconds.

Some of this reduction in delay is due to improved access control due to the installation of medians. Most driveway access points were converted to right-turn-only accesses and only four full movement access points were constructed. The presence of the roundabouts allows

convenient U-Turns near most of the business access drives. The right-turn/U-Turn movement has proven much quicker and safer than the previous left-turns onto the old high-speed South Golden Road.

## ARE ROUNDABOUTS GOOD FOR BUSINESS?

While the aesthetic improvements, including underground utilities, wider sidewalks and landscaping, certainly have contributed to a vibrant business community along South Golden Road, the traffic and safety improvements are probably more significant in the revitalization of the area. Faster travel times, better access control, fewer accidents, and lower delay at business access points have contributed to an increase in economic activity. Figure 3 shows the growth in sales tax revenues along the corridor, which have increased 60% in six years. This area is the only portion of the City that has seen a year over year increase in sales tax revenues during this period which witnessed an economic slowdown in 2002-03. In addition, over 75,000 square feet of retail/office space has been built in the corridor since the installation of the roundabouts.

## SUMMARY AND CONCLUSIONS

South Golden Road is a typical suburban strip commercial corridor. The installation of four roundabouts within this half-mile long arterial has resulted in slower speeds, but lower travel times and less delay at business access points. Accident rates have dropped by 88% and injury accidents have declined from 31 in the 3 years prior to installation to only 1 in the 4½ years after – a decline in injury accidents rates of 93%. The improvement in traffic flow, vehicular safety and access to businesses combined with amenities such as landscaped medians and pedestrian walkways has stimulated economic activity. Sales tax revenues have increased 60% since installation of the roundabouts and 75,000 square feet of retail/office space has been built. In Golden, CO, businesses have said "Yes, roundabouts are good for business."

## LIST OF TABLES AND FIGURES

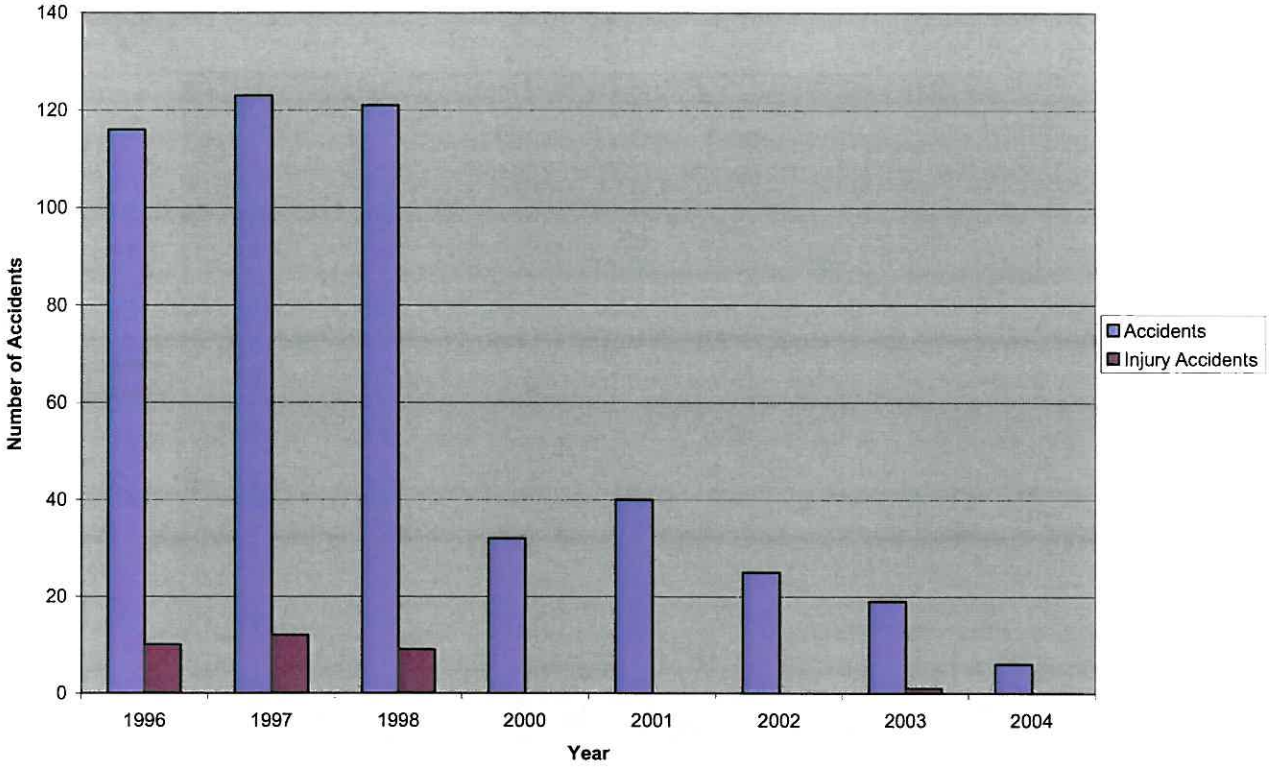



**FIGURE 1**
**Accident History**

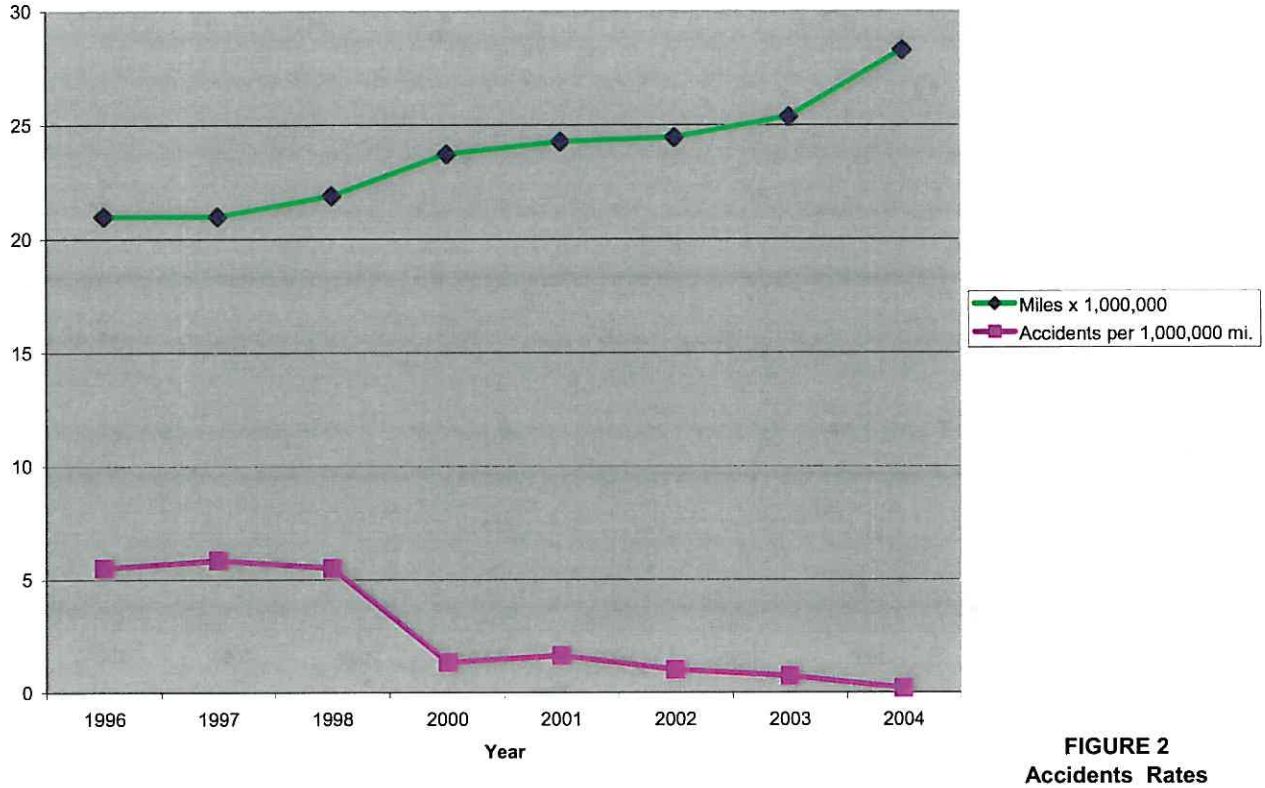



**FIGURE 2**
**Accidents Rates**

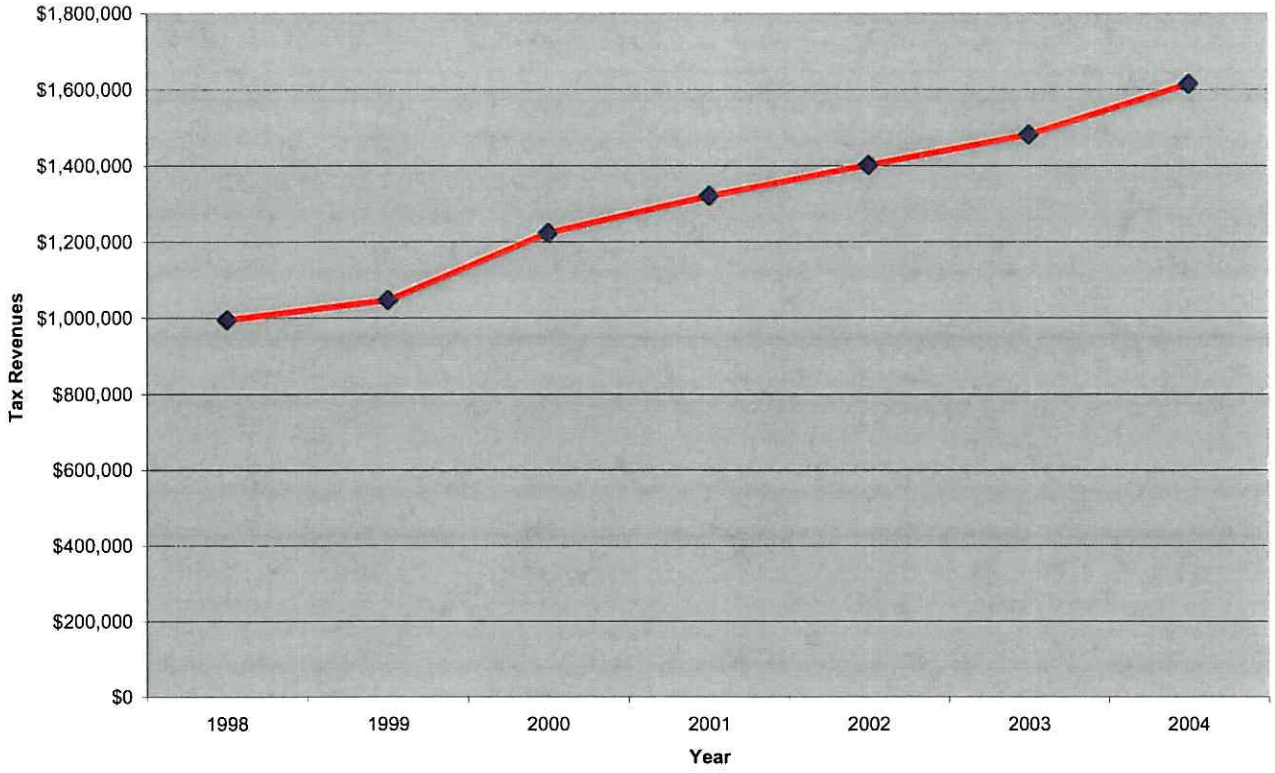



**FIGURE 3**
**Yearly Sales Tax Revenue**

## ROUNDABOUTS

## Lakeside Mall, New Orleans

## Killearn Estate

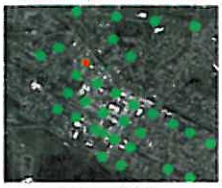
## Topics

- Roundabouts what are they and why use them?
- Roundabout safety
- Pedestrians and bicyclists
- Roundabout design – the good, the bad and the ugly

## Uses

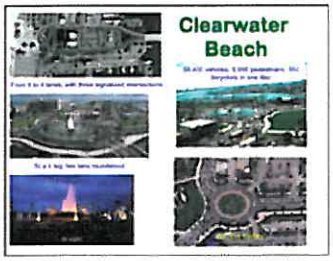
- Replace signals and stop control
- Reduce the number of vehicle lanes
- Fix dysfunctional intersections, skewed, 5 or more leg intersections
- Create a focal point, a town center
- Provide transit priority
- Etc., all you need is imagination

## Downtown Warnambool, Victoria, Australia, 38 roundabouts



Population 34,600

## Clearwater Beach



## Road Diet - 5 to 2 lanes
## La Jolla Boulevard San Diego, CA 22,000 vpd

## Five-leg Signalized Intersection to a Six-leg Roundabout

## Freeway Interchanges

## Most Obvious Locations

- Two lane roads, especially near schools or high pedestrian areas
- Interchanges
- Entrances to and within subdivisions
- High crash locations
- In series to aid access management
- Rail crossings
- Approaches to towns to slow traffic and create gateways

## Rectangular Cape Coral

## Closest - Twin Roundabouts

## Peanut Roundabout

Depot Ave at SE 11th St.

Is a roundabout possible?

## Yes, With Imagination

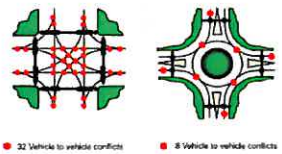
## Safety

Insurance Institute for Highway Safety

- 90% fewer fatal crashes,
- 75% fewer injury crashes
- 39 % overall crashes

- But crashes can also go up

## Fewer Conflicts



32 Vehicle to vehicle conflicts
24 Vehicle to pedestrian conflicts
8 Vehicle to vehicle conflicts
8 Vehicle to pedestrian conflicts

## Single Most Important Design Element Speed Control

Daytona Beach East Approach
Lots of deflection

Daytona Beach - West Approach
No deflection


North - no crashes
East - 3 minor crashes

South - no crashes
West - 19 right angle crashes

## But Crashes Can Go Up

Table 1 Collisions before Roundabout Construction (partial)

| Year | | | | Years of Data |
|---|---|---|---|---|
| PDO | 6 | 4 | 1 | 1 |
| Injury | 3 | 1 | 1 | 2 |
| Fatal | 0 | 0 | 0 | 0 |
| Total | 7 | 5 | 2 | 3 |

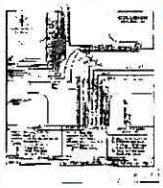
Table 2 Collisions after Roundabout Opened

| Year | 2000* | 2001 | 2002 | 2003 |
|---|---|---|---|---|
| PDO | 8 | 4 | 2 | 8 |
| Injury | 4 | 2 | 5 | 5 |
| Fatal | 0 | 1 | 0 | 0 |
| Total | 12 | 7 | 7 | 13 |

## Other Sites Crash Data

- 7.8 to 45.7 crashes a year
- 9.6 to 38.3 crashes a year.
- Police Chief – "All of the crashes are happening because drivers entering the roundabout too fast."
- Common cause – lack of deflection – drivers entering too fast and not yielding

## Before / After



Hutchison, Kansas

19 crashes in one year before - one after

## Bradenton Beach, FL – 17,000 vpd

Before
- 36 months
- 5 crashes
- 0 injury crashes

After
- 63 months
- 0 crashes
- 0 injury crashes

## Hilton Head, SC

| Before | After |
|---|---|
| 36 months | 46 months |
| 48 crashes | 9 crashes |
| 15 injury crashes | 0 injury crashes |

## Crash Data Rural Intersection

## Rural Roundabouts - Same design criteria

## K-68 & Old KC Road

(Before and After Crash Data)

| Years | Crashes | Injuries | Property Damage Only |
|---|---|---|---|
| 1995-2000 | 33 | 42 | 17 |
| 2001-2006 | 9 | 0 | 9 |
| % Change | -73% | -100% | -53% |

Rural roundabouts may not have as many crashes per year but they are usually more severe

## Pedestrian Safety

- Most important change for pedestrians at roundabouts is
  - Pedestrians now have the right-of-way over vehicles. They are no longer subservient to vehicles
- US drivers are not used to yielding to pedestrians
- Roundabouts also:
  - Reduce conflicts with vehicles 24 to 8
  - Lower speed at conflict points – MOST CRITICAL ELEMENT
  - Pedestrians only have to look one way at a time per crossing
- But pedestrians must take care – select gaps and remember not to walk in front of moving vehicles

## Pedestrian Safety

About 20-feet from yield line to pedestrian crossing

One physical vehicle length, measured when the vehicle is on an angle so that the crosswalk is open for pedestrians to use when a vehicle is stopped.

## Pedestrian Safety

- Melbourne, Australia Pedestrian Study*
- Pedestrians at all signalized intersections (about 2,500) Metro area for 2002-2006:
  - * Fatal: 27
  - * Serious Injury (hospital): 614
  - * Other (medical): 791
- Pedestrians at roundabouts (over 4,000) in the Melbourne Metro area for 1998-2000
  - * Fatal: 0
  - * Serious Injury (hospital): 18
  - * Other (medical): 39

## Pedestrian Safety

Roundabouts generally have few pedestrian crashes provided:

- Vehicle speeds are low – the lower the speed the higher the yield rate
- Adequate size splitter islands
- Move crossings back from yield line
- Define crossing areas
- Discourage crossings to central island – fence, tactile strip or planter strip – A.D.A Requirement

Highest Vehicle/Pedestrian Volume
Up to 58,500 Vehicles and
2,000 to 8,000 Pedestrians a Day
No pedestrian crashes in 13 years

## Multi-lane Roundabouts and Pedestrians

- A.D.A considers low speed one lane roundabouts accessible
- Pedestrian assistance needed at two lane roundabout – type of assistance being researched

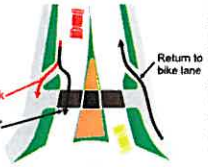
# Bicyclists

## Bicyclists Are Given a Choice

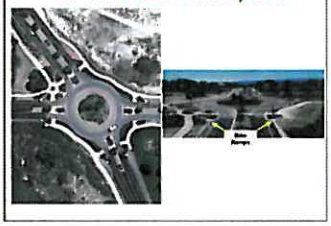
Do not extend bike lane to yield line

Use the sidewalk
or
"Claim the Lane"

Return to bike lane



## Grand Junction, CO



## Jensen Beach, FL Major Train Crossing

## Geometric Design

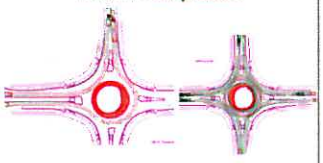
- Design philosophies
  - Radial
  - Offset Left
- Speed control
- Truck templates
- Pedestrian crosswalk locations
- Bike ramps
- Landscaping and Lighting
- Pavement markings
- Peer reviews

## Speed Control

- Single most important design criteria
- FHWA Design speed recommendation - less than 25 all movements, I use 23 mph
- Entry and exit speeds the same or exit slightly faster - 1 to 2 mph
- Must also limit right turn speeds

## Two-lane Roundabout

## Truck Templates



## A 143 foot truck roundabout - Canada

## Driving Roundabouts

Vehicle A - Right Turn

Vehicle B - Through, either lane

Vehicle C - Left, U-turn or complete circle

No other movements are legally possible

## Roundabout Capacity

## Roundabout Capacity

- Up to 30 percent higher capacity than signals even with fewer lanes – eliminate left turn lanes
- Reasons
  - No lost time
  - Drivers can use all available gaps
  - Low speed + small gaps = higher capacity

## Signals Compared to Roundabouts

- Vehicle queues are typically twice as long
- Delays double may be double
- Crashes about four times greater
- Crash severity is greater
- More expensive to maintain and can be more expensive to construct with roadwork
- Ugly
- However, in many cases they are the only option

## Small


## Outstanding Center

## Cautions

## Common Problems



Almost straight through

Trucks run over curb



Almost straight through



Pedestrian crossing too close



Lack of deflection – Tee intersections


Trucks running over curb and gutter


Lack of deflection


See through

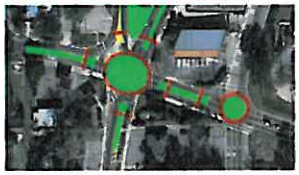

Vehicles running over paint

## Lighting - Amelia Island at night

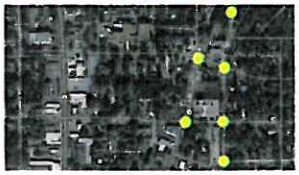
## Summary

- Roundabouts are the safest form of traffic control - if designed, lit and landscaped well
- Versatile
- Capacity typically higher than signals with fewer lanes
- Almost no maintenance cost and can last 100 year or more
- Pedestrians have priority over vehicles
- Can be beautiful

**Tallahassee Possibilities**
**Meridian, Gladsden and 7th**



**Another Possibility**
**Eliminate one-way pair of 6th and 7th**



**Three lane Treatment**

*April 16, 2012*

Capital Region Transportation Planning Agency
CRTPA

# CRTPA RETREAT AGENDA ITEM 5

## SUSTAINABLE COMMUNITIES CALCULATOR

| REQUESTED BY: CRTPA Staff | TYPE OF ITEM: Information |
|---|---|

### STATEMENT OF ISSUE

Bruce Landis, PE, AICP, of Sprinkle Consulting will demonstrate the use and application of the Sustainable Communities Calculator.

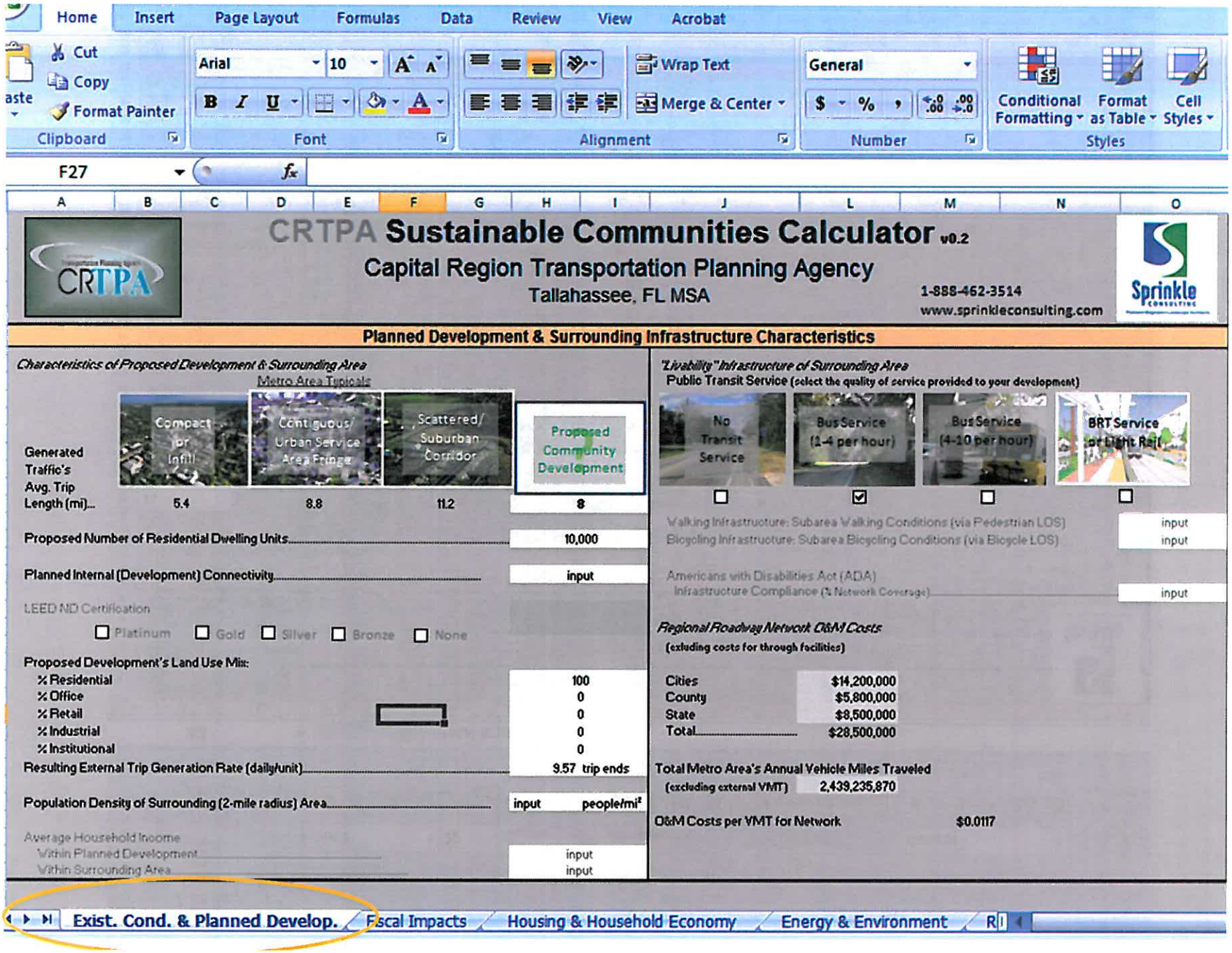
### BACKGROUND

The basis for the Sustainable Communities Calculator was developed as an element of the Regional Mobility Plan. With the authorization of the CRTPA, Sprinkle Consulting was contracted under CRTPA's General Planning Consultant contract with URS Corporation to complete the attributes of the calculator so that it could become fully functional. The calculator will be able to determine future fiscal impacts to the community infrastructure based on inputs about planned developments and surrounding infrastructure characteristics. In addition, the calculator will be able to provide individual household impacts and cost associated with new development characteristics, community wide energy and environmental impacts and costs, and effects on the regional economy of planned development.

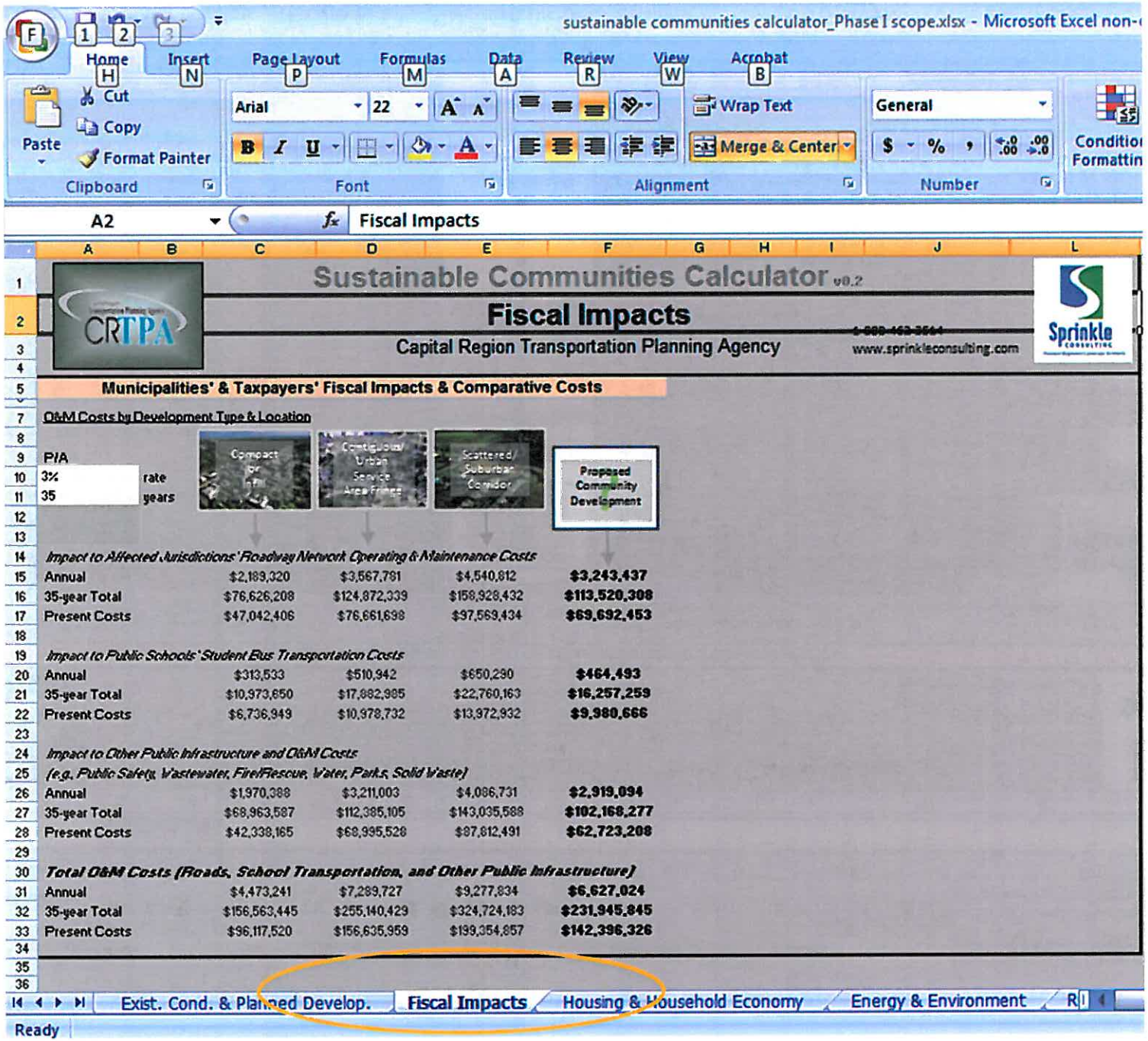
***Attachment 1*** shows the screens and levels of input and output that are part of the Sustainable Communities Calculator. ***Attachment 2*** is an article about the cost of housing and transportation related to development patterns and federal governments Sustainable Communities program.

### ATTACHMENT

Attachment 1: Sustainable Communities Calculator Screen Shots
Attachment 2: The 52-Cent Case for 'Sustainability'




Attachment 1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Fiscal Impacts
Capital Region Transportation Planning Agency
www.sprinkleconsulting.com
Sprinkle
Municipalities' & Taxpayers' Fiscal Impacts & Comparative Costs
O&M Costs by Development Type & Location
PIA
3%
rate
35
years
Compact or Infill
Contiguous/ Urban Service Area Fringe
Scattered/ Suburban Corridor
Proposed Community Development
Impact to Affected Jurisdictions' Roadway Network Operating & Maintenance Costs
Annual $2,189,320 $3,567,781 $4,540,812 $3,243,437
35-year Total $76,626,208 $124,872,339 $158,928,432 $113,520,308
Present Costs $47,042,406 $76,661,698 $97,569,434 $69,692,453
Impact to Public Schools' Student Bus Transportation Costs
Annual $313,533 $510,942 $650,290 $464,493
35-year Total $10,973,650 $17,882,985 $22,760,163 $16,257,259
Present Costs $6,736,949 $10,978,732 $13,972,932 $9,980,666
Impact to Other Public Infrastructure and O&M Costs
(e.g. Public Safety, Wastewater, Fire/Rescue, Water, Parks, Solid Waste)
Annual $1,970,388 $3,211,003 $4,086,731 $2,919,094
35-year Total $68,963,587 $112,385,105 $143,035,588 $102,168,277
Present Costs $42,338,165 $68,995,528 $87,812,491 $62,723,208
Total O&M Costs (Roads, School Transportation, and Other Public Infrastructure)
Annual $4,473,241 $7,289,727 $9,277,834 $6,627,024
35-year Total $156,563,445 $255,140,429 $324,724,183 $231,945,845
Present Costs $96,117,520 $156,635,959 $199,354,857 $142,396,326
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Fiscal Impacts
Housing & Household Economy
Energy & Environment
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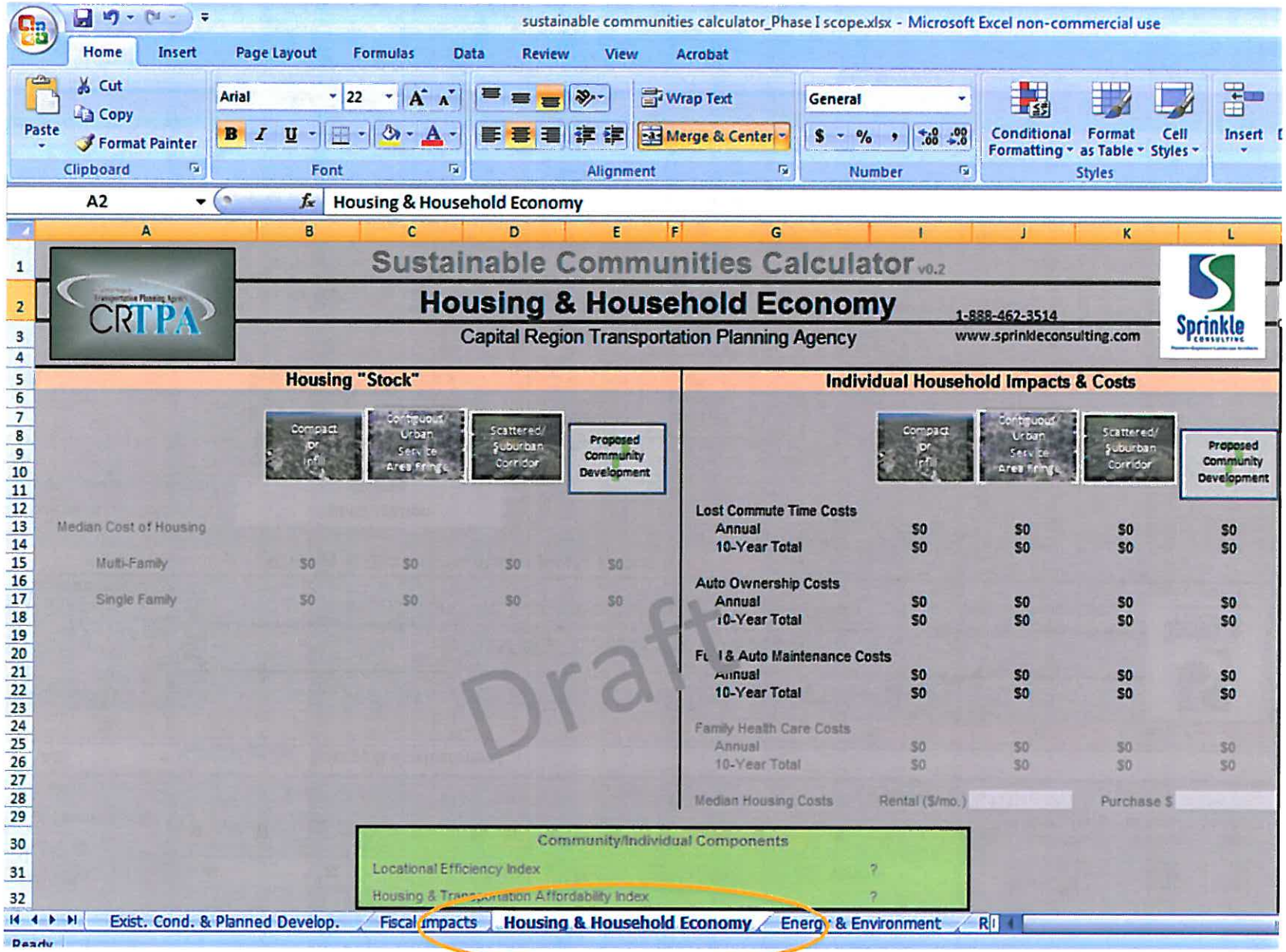
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Multi-Family
Single Family
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Individual Household Impacts & Costs
Lost Commute Time Costs
Annual
10-Year Total
Auto Ownership Costs
Annual
10-Year Total
Fuel & Auto Maintenance Costs
Annual
10-Year Total
Family Health Care Costs
Annual
10-Year Total
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Purchase $
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Housing & Transportation Affordability Index
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Fiscal Impacts
Housing & Household Economy
Energy & Environment
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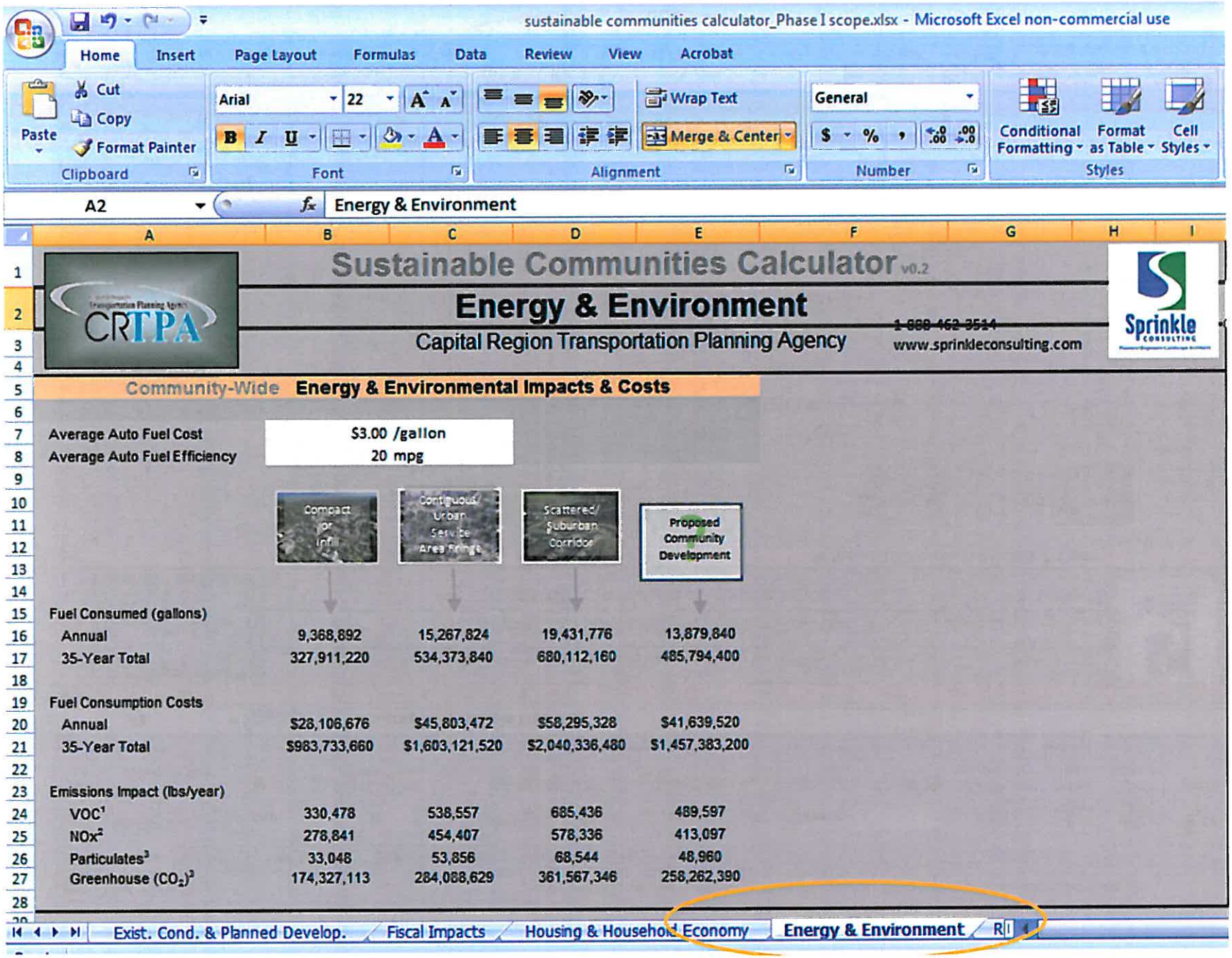
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Proposed Community Development
Fuel Consumed (gallons)
Annual
9,368,892
15,267,824
19,431,776
13,879,840
35-Year Total
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534,373,840
680,112,160
485,794,400
Fuel Consumption Costs
Annual
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35-Year Total
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$2,040,336,480
$1,457,383,200
Emissions Impact (lbs/year)
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538,557
685,436
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NOx[2]
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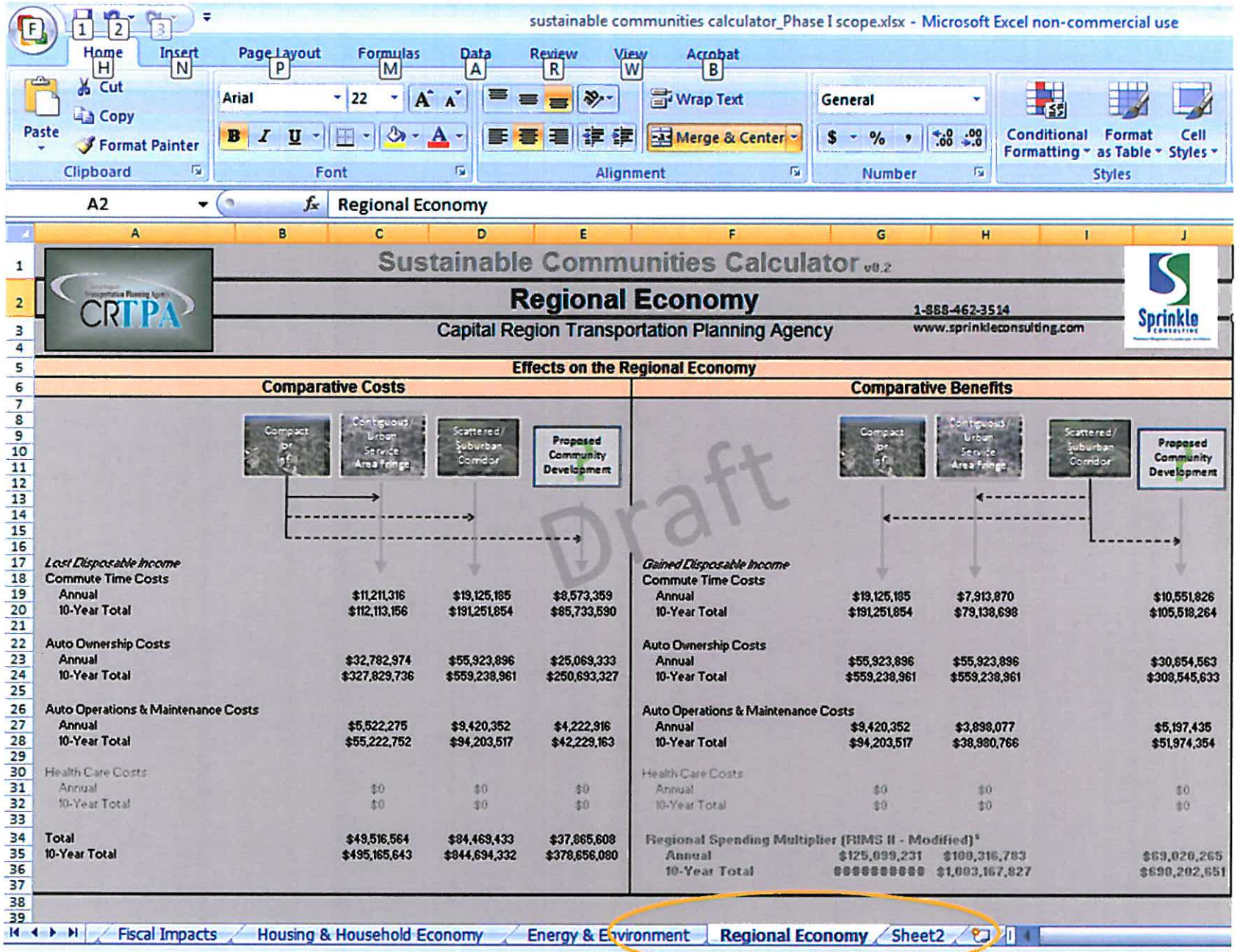
454,407
578,336
413,097
Particulates[3]
33,048
53,856
68,544
48,960
Greenhouse ($CO_2$)[3]
174,327,113
284,088,629
361,567,346
258,262,390
Exist. Cond. & Planned Develop.
Fiscal Impacts
Housing & Household Economy
Energy & Environment


sustainable communities calculator_Phase I scope.xlsx - Microsoft Excel non-commercial use
Home
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Clipboard
Arial
22
Font
Wrap Text
Merge & Center
Alignment
General
Number
Conditional Formatting
Format as Table
Cell Styles
Styles
A2
Regional Economy
Sustainable Communities Calculator v0.2
Regional Economy
Capital Region Transportation Planning Agency
1-888-462-3514
www.sprinkleconsulting.com
CRTPA
Sprinkle
Effects on the Regional Economy
Comparative Costs
Comparative Benefits
Compact or Infill
Contiguous/ Urban Service Area Fringe
Scattered/ Suburban Corridor
Proposed Community Development
Draft
Lost Disposable Income
Commute Time Costs
Annual $11,211,316 $19,125,185 $8,573,359
10-Year Total $112,113,156 $191,251,854 $85,733,590
Auto Ownership Costs
Annual $32,782,974 $55,923,896 $25,069,333
10-Year Total $327,829,736 $559,238,961 $250,693,327
Auto Operations & Maintenance Costs
Annual $5,522,275 $9,420,352 $4,222,916
10-Year Total $55,222,752 $94,203,517 $42,229,163
Health Care Costs
Annual $0 $0 $0
10-Year Total $0 $0 $0
Total
10-Year Total $49,516,564 $84,469,433 $37,865,608 $495,165,643 $844,694,332 $378,656,080
Gained Disposable Income
Commute Time Costs
Annual $19,125,185 $7,913,870 $10,551,826
10-Year Total $191,251,854 $79,138,698 $105,518,264
Auto Ownership Costs
Annual $55,923,896 $55,923,896 $30,654,563
10-Year Total $559,238,961 $559,238,961 $308,545,633
Auto Operations & Maintenance Costs
Annual $9,420,352 $3,898,077 $5,197,435
10-Year Total $94,203,517 $38,980,766 $51,974,354
Health Care Costs
Annual $0 $0 $0
10-Year Total $0 $0 $0
Regional Spending Multiplier (RIMS II - Modified)
Annual $125,099,231 $100,316,783 $69,020,265
10-Year Total $1,250,992,310 $1,003,167,827 $690,202,651
Fiscal Impacts
Housing & Household Economy
Energy & Environment
Regional Economy
Sheet2

# The 52-Cent Case for 'Sustainability'

Neal Peirce / Dec 04 2011

For Release Sunday, December 4, 2011


"Sustainability." It's 14 letters, six syllables. Small wonder many people blanch when they read or hear the word. Some may ask — "Is it something about the environment?"

For clarity and to stress the timeliness of their work, the managers of the Obama administration's "Sustainable Communities" program are switching strategies. Competitive planning grants for cities and regions are still the top goals. But instead of talking first about more efficient land use, transit or town planning, the new focus is now on raw economics.

Check the 52 cent figure, they say. Research shows that for every dollar the average American family has to spend, 52 cents is taken up right away for housing and transportation. That means everything else gets squeezed, sometimes dangerously. And not the least, such essentials as food and clothing.

So what's a promising cure? It's clearly to push the 52 cents figure down by helping workers and families gain easier, more affordable access to jobs and schools. And that does dictate that communities pivot away from yesterday's sprawl patterns, embracing instead such smart development strategies as housing closer to real work centers, homes closer to schools, and transit services to help households spend less on car travel.

Plus, it means a need to supply more compact, efficiently located housing units as American family sizes keep shrinking and the population ages.

Clearly, more and more local communities "get" the saliency of this approach. Shaun Donovan, Secretary of Housing and Urban Development, cites the outpouring of interest in HUD's must recent Sustainable Communities nationwide competition, announced Nov. 21. There were eight times as many applicants as awardees, $500 million in funding requests but only $96 million to distribute among all winners.

Significantly, Donovan noted, this awards process is evoking growing interest among chambers of commerce and economic development corporations that are glad to become "core partners" in the local applicant coalitions.

The grants — 27 for individual communities, 29 for regions — are spread from from Boston to Denver to Seattle, from the deeply depressed city of Opa-locka, Fla., to heavily rural Fremont County, Idaho. All provide federal stimulus money to challenge local areas to create high quality, interconnected housing, transportation and workforce development plans which show clear potential economic payoffs.

Each project has to incorporate clear fact-based assessments; all are followed closely in implementation by the HUD Office of Sustainable Housing and Communities, headed by Shelley Poticha. "We're unusual for the federal government," notes Poticha, "by investing in proactive strategies to shape the future and not just the historic pattern of federally-supported capital projects."

The HUD effort doesn't stand alone: it's one section of the Obama administration's Partnership for Sustainable Communities (www.sustainablecommunities.gov). It's an initiative that works to coordinate smart growth, sustainable and economically promising initiatives and policies across historically rigid departmental lines. Encouraged and endorsed by the White House Domestic Policy Council, the three official players are HUD, the Department of Transportation and the Environmental Protection Agency.

Key personnel from the three agencies meet not just occasionally but every week to mesh their policies and approaches. They're regularly joined by the Agriculture Department, which isn't officially part of the partnership yet with $20 billion a year in rural development is a significant player. Transportation adds heft, especially through its series of highly competitive "TIGER" grants for local transportation projects that are designed both for sustainability and high economic impact.

Ideally, all these efforts would be praised and advanced by Congress as harbingers of a smart and engaged federal government, one that dictates less and listens more to communities' needs, encourages local ingenuity, and that helps to position the nation for a stronger joined economy and livable communities to come.

Sadly, it's not happening. While Congress is willing to keep TIGER rolling with $500 million for the next fiscal year (enough to fund about 10 percent of its applications), the HUD Sustainable Communities program is in deep trouble.

Evidence: House Republicans originally prepared legislative language that actually would forbid a dollar of government expenditure if the related federal departments were to talk, plan, research, or manage grants cooperatively. And in relation to what activities? The language left no doubt on it intent: specified cited was "interagency coordination on livable communities or sustainable development."

Geoffrey Anderson, president of Smart Growth America, commented: "What business would ever tell its units not to talk to each other?"

Later, cooler heads prevailed and that language was dropped by the House committee. But still, the final House-Senate conference report, while it did endorse the concept of interdepartmental coordination to integrate housing and transportation, failed to fund HUD's Sustainable Communities program awards for the next year. Poticha's office will be able to administer the grants already made, but not to issue new ones.

There's just slim hope that funding will be restored in future years. Which would be sad — the demise of one of the most imaginative federal system innovations in many decades.

But then again, sometimes there's an idea just too good to stay dead long.

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Neal Peirce's e-mail is npeirce@citistates.com.

*April 16, 2012*

Capital Region Transportation Planning Agency
CRTPA

# CRTPA RETREAT AGENDA ITEM 6

# GIS APPLICATIONS FOR LONG RANGE AND STRATEGIC TRANSPORTATION PLANNING

| **REQUESTED BY**: CRTPA Staff | **TYPE OF ITEM**: Information |
|---|---|

## STATEMENT OF ISSUE

Since the completion and the adoption of the Regional Mobility Plan (RMP), staff has been investigating ways to represent the outcomes of the RMP in a more visual format that could be provided to the public and enhance CRTPA's analysis capabilities in future planning efforts. CRTPA staff began meeting with Tallahassee-Leon County GIS staff in March 2012 to discuss the possibly of providing GIS services for the CRTPA region in terms of transportation planning. Based on these discussions, CRTPA staff is seeking to bring back further details regarding these efforts, including a timeline for implementation.

## BACKGROUND

### Tallahassee-Leon County GIS (TLC GIS)

As you are aware, a geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. In the simplest terms, GIS is the merging of cartography, statistical analysis, and database technology. In a general sense, the term describes any information system that integrates, stores, edits, analyzes, shares, and displays geographic information for informing decision making.

The Tallahassee-Leon County GIS was formed when the City of Tallahassee, the Leon County Board of County Commissioners, and the Leon County Property Appraiser's Office entered into an Interlocal Agreement in May, 1990 to create a joint Geographic Information System. The mission of this GIS is to

- Develop a common base map
- Promote sharing of resources
- Reduce redundancy of data collection and creation
- Provide a mechanism to maintain the base map and other data layers
- Encourage enterprise information management solutions
- Enhance decision making for public officials

## CRTPA Connection

Many of the City of Tallahassee and Leon County departments with whom the CRTPA works and coordinates with rely on the TLC GIS to provide such services as data analysis and mapping. So rather than the CRTPA creating a separate GIS system, it could be better served by working with the existing resources available for TLC GIS. However, the CRTPA represents a four-county area that has not been expanded into by the TLC GIS due to the lack of a request to do so and more notable a lack of data similar to that of Leon County. Additionally, these services would be used to provide on the CRTPA website additional public input and outreach to all partners.

This effort is not intended to replace any existing personnel in any member jurisdiction; it is exclusively an effort to provide transportation planning information for which the CRTPA is responsible. Should this effort create a better relationship between Leon County and the surrounding counties then the effort is well worth the expansion.

## Why Now

There are several reasons as to why now is a good time to initiate this effort.

1. The recently completed Regional Mobility Plan was created in a GIS format.
2. The CRTPA staff is currently in review of updates to the CRTPA website and is seeking to incorporate this effort into that realm.
3. The TLC GIS is a bright star in the GIS world and can get the data for surrounding counties that will benefit the region as a bundled package, most notably the through the Community Map and Analyst software packages.
4. All of the CRTPA GPC contracts will be providing data in a GIS format.
5. This will lead to better coordination amongst internal and external partners.

## Timeline

With CRTPA Board direction, staff would like continue discussions with TLC GIS to formulate a cost proposal and bring the proposal to the May 2012 CRTPA Board meeting for discussion.

***Attachment 1*** is a presentation provided by TLC GIS about the ESRI software package being considered for use by CRTPA for its GIS needs. ***Attachments 2, 3, and 4*** are sample maps for analysis that could be produced by the GIS program.

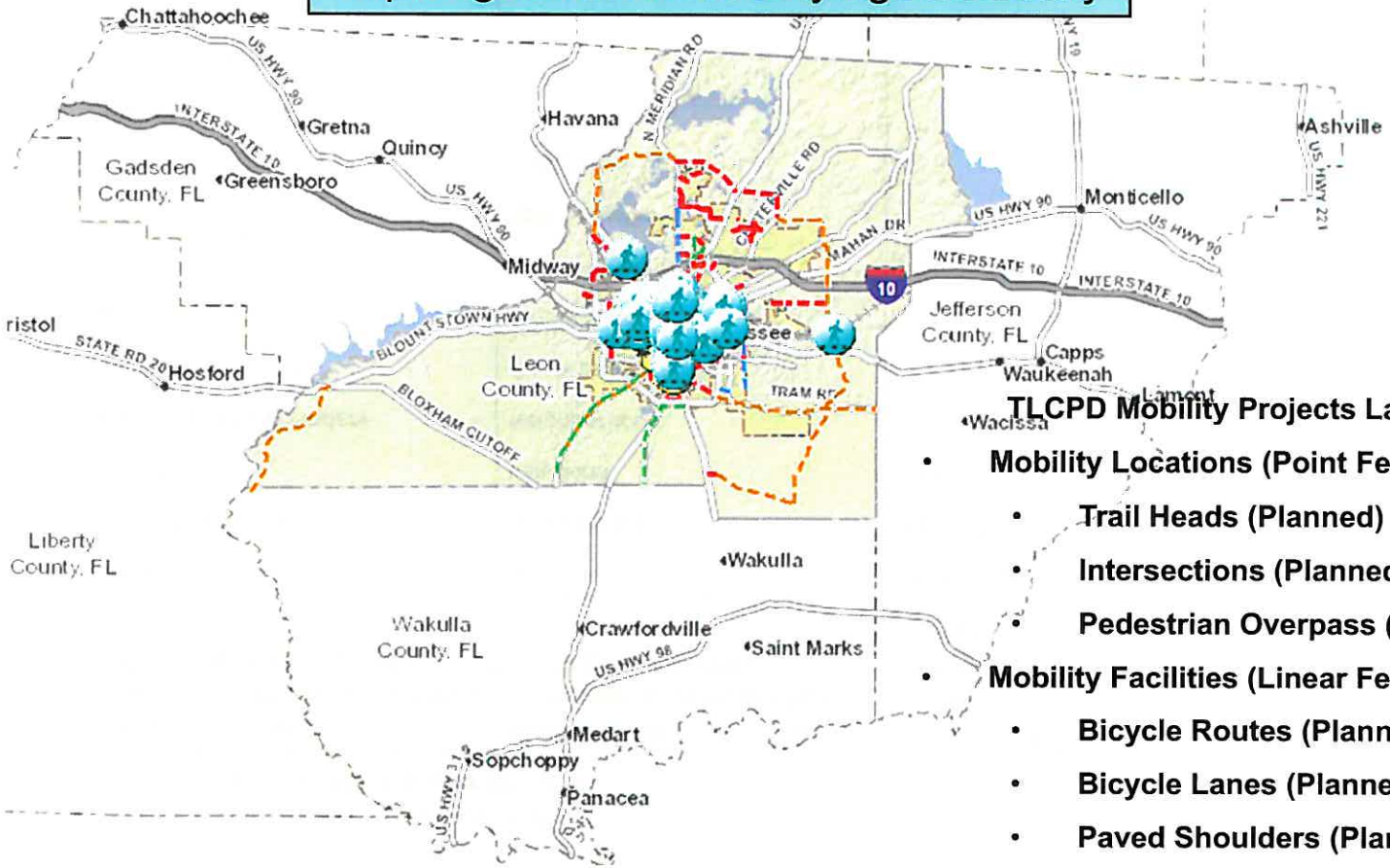
## ATTACHMENTS

Attachment 1: ESRI Transportation Maps presentation
Attachment 2: ESRI Project Status Map
Attachment 3: ESRI Bike Master Map
Attachment 4: ESRI Highway Capacity Map

Attachment 1

# CRTPA Project & TLC GIS

## Mobility Projects Map
## http://agsinter.leoncountyfl.gov/mobility




**TLCPD Mobility Projects Layers**

- **Mobility Locations (Point Features)**
  - **Trail Heads (Planned)**
  - **Intersections (Planned)**
  - **Pedestrian Overpass (Planned)**
- **Mobility Facilities (Linear Features)**
  - **Bicycle Routes (Planned)**
  - **Bicycle Lanes (Planned)**
  - **Paved Shoulders (Planned)**
  - **Trails (Planned)**
  - **Sidewalks (Planned)**
  - **Bicycle Boulevard (Planned)**

# CRTPA Project & Community Maps

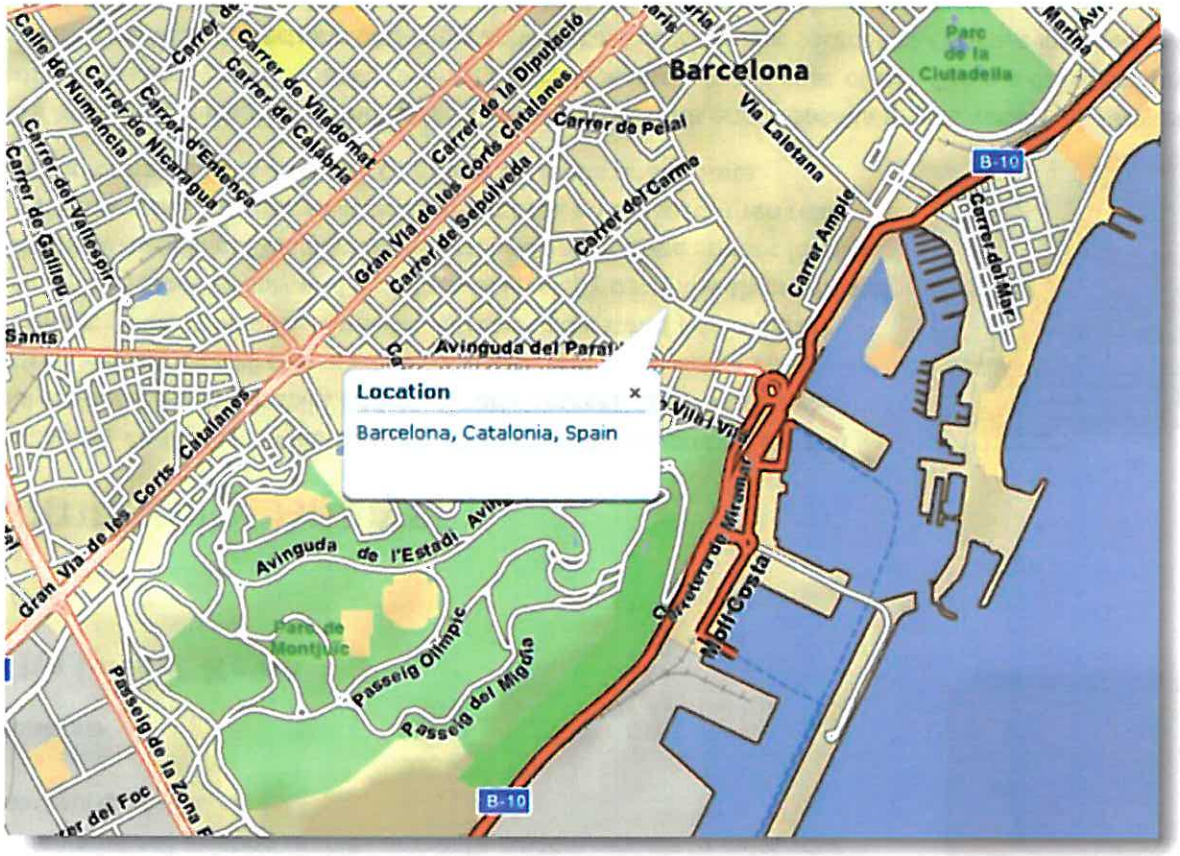
**Desired Content for the Topographic Basemap**

The table below lists some of the key datasets your organization will need to assemble when building and maintaining a high quality topographic basemap for incorporation within the World Topographic Map. Chances are that your organization collects data for key data themes at a number of appropriate large and medium scales, which can be incorporated and shared using the World Topographic Map.

| **Required:** Minimum required layers necessary for a Community Map topographic map cache | **Preferred:** Recommended layers for an optimal Community Map topographic map cache | **Preferred - AOI only:** Recommended layers may be restricted to highlight an Area of Interest |
|---|---|---|
| Contour | Airport | Parking Lot |
| County Boundary | Building Footprint | Sidewalk |
| Hillshade | Landform | Tree |
| International Boundary | Neighborhood | |
| Landmark | Openspace | |
| Municipal Boundary | Owner Parcel | |
| National Park | Point of Interest | |
| Park | Spot Elevation | |
| Railroad | Vegetation | |
| Road Centerline | | |
| State Boundary | | |
| State Park | | |
| Waterbody | | |
| Waterline | | |

# Street Map

This worldwide street map presents highway-level data for the world and street-level data for the United States, Canada, Japan, Southern Africa, and a number of countries in Europe and elsewhere.




*Streetmap content for Barcelona, Spain from TeleAtlas Dynamap®.*

This comprehensive street map includes highways, major roads, minor roads, railways, water features, administrative boundaries, cities, parks, and landmarks, overlaid on shaded relief imagery for added context. The street map was developed by Esri using Esri basemap data, AND road data, USGS elevation data, and UNEP-WCMC parks and protected areas for the world, and Tele Atlas Dynamap® and Multinet® street data for North America and Europe.

# Esri Business Analyst Online

Business Analyst Online is a Web-based solution that applies GIS technology to extensive demographic, consumer spending, and business data to deliver on-demand analysis, presentation-ready reports, and maps. Select from a wide variety of existing reports or create custom reports to meet your marketing needs.

LOG IN

**The Latest News**

# Community Analyst

Community Analyst is a Web-based system that allows you to view and analyze demographic, public, and third-party sources of data to better understand the overall community in question and make better policy decisions. With Community Analyst, you can understand and compare communities more deeply and on a factual level. By using the thousands of variables available in Community Analyst, you can analyze specific locations, geographic areas, or custom regions you create on the map, then relay critical information and analyses to others via maps and reports.


Esri's business, consumer spending, and demographic data encompasses a wide variety of datasets that are updated quarterly, semiannually, annually, and decennially in the case of U.S. Census data. Esri provides current-year and five-year projections of demographic data. Several public sources of data are included in Community Analyst as well. For more details, see the Community Analyst Data Descriptions page.

# Esri Data

| Database Name | Source | Vintage | Description | Updated |
|---|---|---|---|---|
| **Updated Demographics** | Esri | 2010/2015 | Esri offers **current-year updates** and **five-year projections** of population; age by sex, race, and Hispanic origin; households and families; housing by occupancy, tenure, home value, and household and family income; households by income and age of householder; per capita income; employed population 16 years or older by occupation and industry; current-year age by sex and race; current-year disposable income; current year net worth, and current-year and previous-year quarterly population and household updates. | Annually |
| **Census Data** | Esri and US Census Bureau | 2010 & 2000 | Esri provides Census data for geographies not supplied by the Census Bureau including ZIP Codes, DMAs, rings, drive times, and hand drawn areas. Esri also provides data for States, Counties, Tracts, Block Groups, Places, CBSAs, Congressional Districts, and County Subdivisions. | Decennially |
| **Tapestry™ Segmentation** | Esri | 2010 | Tapestry segmentation provides an accurate, **detailed description of America's neighborhoods**. US residential areas are divided into **65 distinctive segments** based on their socioeconomic and demographic composition. | Annually |
| **Retail MarketPlace** | Esri | 2010 | This database includes retail sales by industry to households and retail potential or spending by households. The database provides a direct comparison between retail sales and consumer spending by industry and measures the gap between supply and demand. | Annually |
| **Business Locations** | Esri and Infogroup | January 2011 | Esri's business locations data is extracted from a comprehensive list of businesses licensed from Infogroup®. The business list contains data for more than 12 million US businesses including name and location, franchise code, industrial classification code, number of employees, and sales. | Annually |
| **Business Summary** | Esri and Infogroup | January 2011 | This geographic database summarizes the **comprehensive list of businesses** from Infogroup for select NAICS and SIC summary categories and includes total number of businesses, total sales, and total number of employees for a trade area. | Annually |
| **Consumer Spending** | Esri and Bureau of Labor Statistics | 2010 | This comprehensive database, developed by Esri, is based on a combination of the latest Consumer Expenditure Surveys (CEX) from the Bureau of Labor Statistics. Data is reported by product or service and includes **total expenditures, average spending per household, and a Spending Potential Index** (SPI). | Annually |
| **Market Potential** | Esri and GfK MRI | 2010 | The Market Potential database includes data representing goods, services, attitudes, and activities and is collected from the GfK MRI consumer survey. The database **provides the expected number of consumers and a Market Potential Index** (MPI). | Annually |
| **1990 Data in 2000 Geography** | Esri | 1990 | To compare 1990 and 2000 data for a given site, Esri created a 1990–2000 block group correspondence file and converted 1990 data in 1990 geography into 1990 data in 2000 geography. | Not Updated |

# Esri Data

| Database Name | Esri Business Analyst Online™ | Esri Community Analyst | Esri Business Analyst™ Desktop | Esri Business Analyst Server | Ad Hoc Database Orders |
|---|---|---|---|---|---|
| **Updated Demographics** | • | • | • | • | • |
| **Census 2010 Data** | • | • | • | • | • |
| **Tapestry Segmentation** | • | • | • | • | • |
| **Retail MarketPlace** | • | • | $ | $ | • |
| **Business Locations** | • | • | • | • | • |
| **Business Summary** | • | • | • | • | • |
| **Consumer Spending** | • | • | • | • | • |
| **Market Potential** | • | • | • | • | • |
| **Census 2000 and 1990 Data** | • | • | • | • | • |

• Indicates entire database or subset of database is available in the product

$ Indicates database can be added to the product for an additional cost

esri

For more information about Esri's data products, call 1-800-447-9778 or visit esri.com/data.



July 2011

# Fact Sheet

## Esri® Data

| Database Name | Source | Vintage | Description | Updated |
|---|---|---|---|---|
| **Traffic Counts** | Market Planning Solutions Inc. | Q2, 2011 | Esri's traffic count data comes from MPSI/DataMetrix and provides the most current and extensive **US traffic data for trade analysis, routing, or mathematical modeling**. | Quarterly |
| **Major Shopping Centers** | Directory of Major Malls, Inc. | June 2011 | The Major Shopping Centers data from the Directory of Major Malls (DMM) database includes **information about shopping centers** with a gross leasable area (GLA) of 250,000 square feet or more. | Semiannually |
| **Bank Branches** | RPM Consulting | 2010 | The Bank Branches database is derived from RPM Consulting's BranchInfo™ data and is a value-added database about every bank location in the United States, carefully standardized and address matched and containing **branch-level information** matched by institution and site over a five-year time frame. | Annually |
| **Banking Potential** | RPM Consulting | 2010 | The Banking Potential data is derived from RPM Consulting's MarketBank™ database and **estimates market penetration and potential** for 15 specific savings, investment, and lending products for every US block group. | Annually |
| **Crime Indexes** | Applied Geographic Solutions | 2010B | Crime Indexes data is derived from CrimeRisk, a block-group-and-higher-level geographic database consisting of a series of standardized indexes for **a range of serious crimes against both persons and property**. It is derived from an extensive analysis of several years of crime reports from the vast majority of law enforcement jurisdictions nationwide. | Semiannually |
| **Cable Boundaries** | EMSi/The Janus Group, Inc. | Q3, 2011 | The Cable Boundaries geodatabase is derived from MediaPrints™ cable boundary data from EMSi/The Janus Group, Inc., which is the premier source for US cable system boundaries and data. MediaPrints includes data for **digital service areas** and **high-speed Internet access areas**, with cable overbuilds and wireless cable systems represented as separate mapping layers. | Quarterly |
| **Employment by Occupation** | Applied Geographic Solutions | 2010B | This geographic database provides counts for the daytime working population by 17 specified occupation classifications, plus white- and blue-collar summarizations. | Semiannually |

## Esri Data

| Database Name | Esri Business Analyst Online® | Esri Community Analyst | Esri Business Analyst Desktop | Esri Business Analyst Server | Ad Hoc Database Orders |
|---|---|---|---|---|---|
| **Traffic Counts** | • | • | $ | $ | • |
| **Major Shopping Centers** | • | • | • | • | • |
| **Bank Branches** | | | $ | $ | • |
| **Banking Potential** | | | $ | $ | • |
| **Crime Indexes** | • | • | $ | $ | • |
| **Cable Boundaries** | | | $ | $ | • |
| **Employment by Occupation** | | | $ | $ | • |

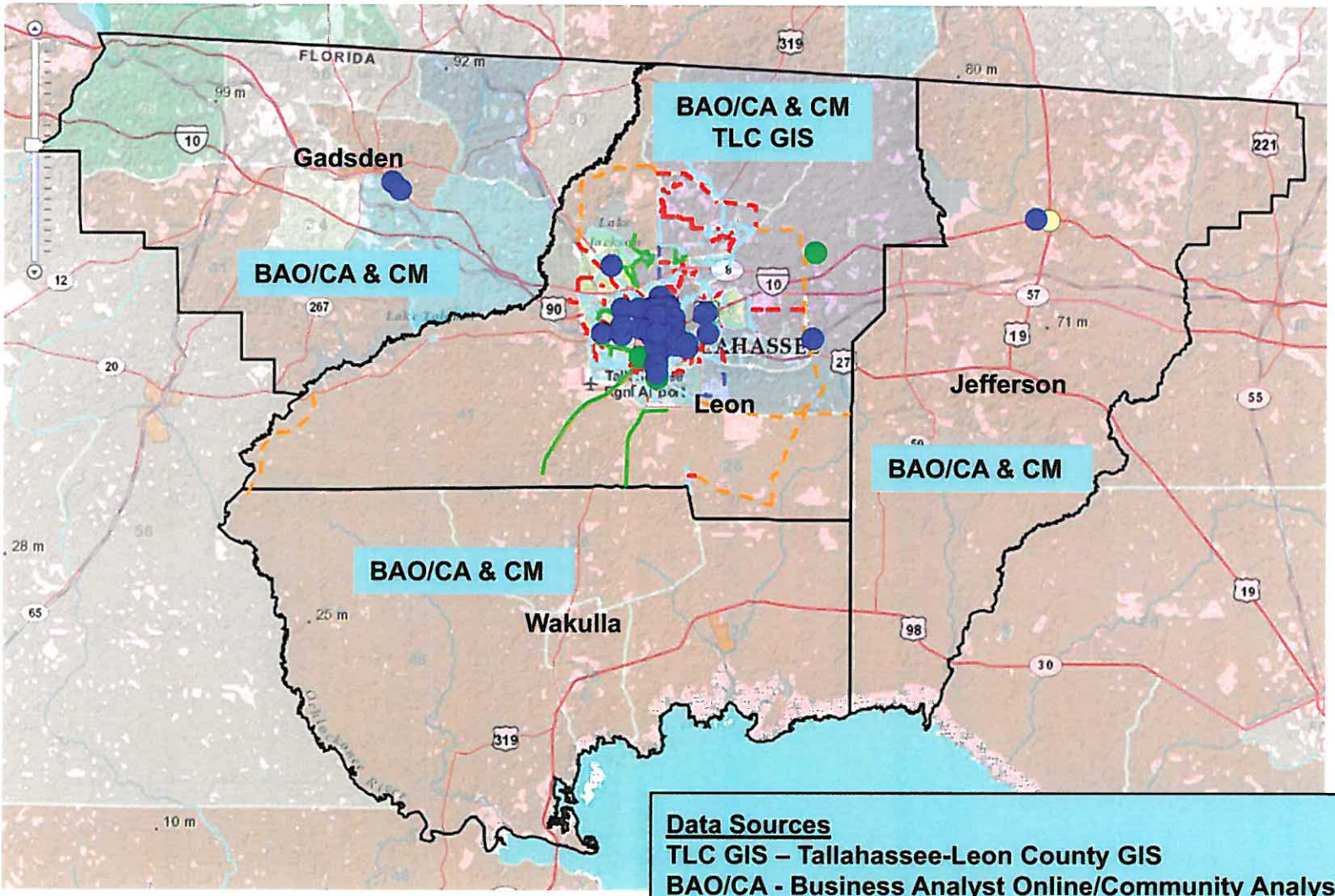
• Indicates entire database or subset of database is available in the product

$ Indicates database can be added to the product for an additional cost

esri

For more information about Esri's data products, call 1-800-447-9778 or visit esri.com/data.

# CRTPA Project




**Data Sources**

**TLC GIS – Tallahassee-Leon County GIS**

**BAO/CA - Business Analyst Online/Community Analyst**

**CM- Community Maps**

Attachment 2

esri Understanding our world.

## Map Book Gallery Volume 23

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Transportation

### Transportation Projects—Conception to Completion

**City of High Point Department of Transportation**


High Point, North Carolina, USA

*By City of High Point Department of Transportation*

**Contact**
Gwen Ford
**Software**
ArcGIS Desktop 9.1
**Printer**
HP Designjet 5500ps
**Data Sources**
North Carolina Department of Transportation, City of High Point

From conception to completion, building a road should take between 5 and 21 years, depending on perceived need, technical issues, growth rate, and available funding. However, controversial projects and orphan projects can take much longer to deliver. The major phases in building a road include a feasibility study, obtaining initial funding, planning, design, purchasing right-of-way, and construction. All projects begin in the Long-Range Transportation Plan (LRTP) where the initial need, local consensus, and local support are developed. Obtaining initial funding is critical in moving a road project from the LRTP to the Transportation Improvement Plan (TIP), where the project can then proceed through a planning process that involves environmental mitigation, traffic forecast, permit application, and public involvement. This map of transportation projects within the High Point Metropolitan Planning Organization area illustrates the updates in project status for the 2007–2013 TIP. The symbology was designed to allow for quick identification of project status changes and projects that were unfunded or under construction.

Courtesy of City of High Point Department of Transportation.

Industry Maps 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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Attachment 3

esri Understanding our world.

## Map Book Gallery Volume 23

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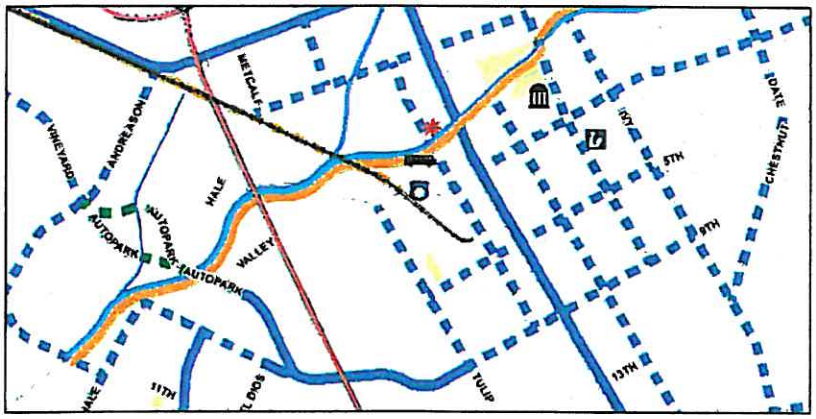
### City of Escondido Bicycle Master Plan

Transportation

**City of Escondido**




Escondido, California, USA

*By Jennifer Kay*

**Contact**
Jennifer Kay
**Software**
ArcGIS Desktop 9.2
**Printer**
HP Designjet 2500cp
**Data Sources**
SanGIS, City of Escondido

The City of Escondido Bicycle Master Plan's key tasks are to identify existing circulation patterns for bicyclists, identify problem areas and safety concerns, and to develop a Bikeway Master Plan that will be a tool for further implementation of bikeways throughout Escondido. The Bicycle Master Plan includes California Department of Transportation bikeway standards, conceptual designs for bicycle paths and trails, maps of existing and proposed bicycle facilities, a phasing plan for improvements, funding sources, and an implementation plan.

Preparation of the Bicycle Master Plan Update was conducted with a working group of city staff members consisting of planners, engineers, and GIS professionals. The group was directed by community input received at a public workshop held in January 2007, as well as from surveys and Internet responses. The plan identifies a bicycle facility network, both on the road (Class II and III) and off-road (Class I). Upon completion, the plan will create a comprehensive network of bicycle lanes, routes, and paths.

Courtesy of the City of Escondido.

**Industry Maps** 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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Attachment 4

esri Understanding our world.

## Map Book Gallery Volume 23

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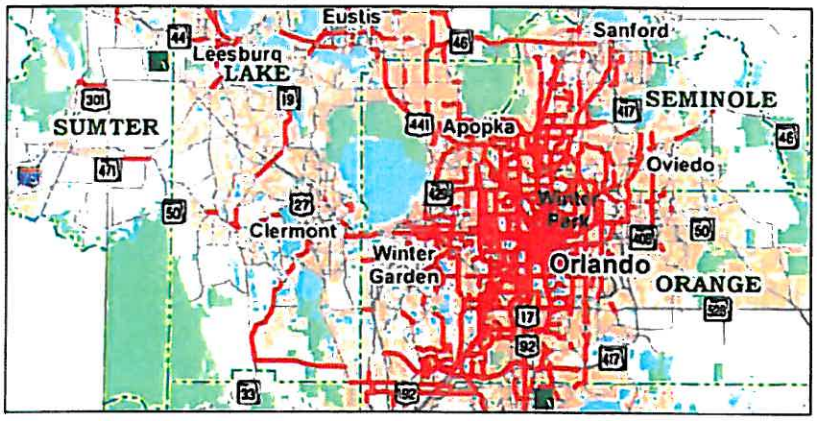
### Central Florida Year 2050 Highway Capacity Analysis

Transportation

**Florida Department of Transportation District Five**




Orlando, Florida, USA

*By John Zielinski (Florida Department of Transportation) and Michael Schmedt (HDR Engineering)*

**Contact**
John Zielinski
Michael Schmedt
**Software**
ArcGIS Desktop 9.2
**Printer**
HP DesignJet 4000ps
**Data Sources**
Florida Geographic Data Library, Central Florida Geographic Informations Systems, Central Florida Regional Planning Model version 4.02

Central Florida is not only one of the fastest growing regions in the country but is also a world famous tourist destination attracting millions of visitors every year. To accommodate the increased demand resulting from this growth, the Florida Department of Transportation (FDOT) District Five Planning Office began to project traffic conditions and regional land use for the year 2050 (as opposed to a more traditional 20–25 year plan).

Based on the land use projections, FDOT produced a series of maps identifying transportation needs in the area. For the existing (2006) and future conditions (2025 and 2050), a map series was created showing number of lanes, network deficiencies, and required improvements. Deficiencies in the network were identified as roads that are congested or over capacity. As the maps indicate, the number of deficient roads increases drastically from 2006 to 2050, and so do additional road miles needed to meet this demand. For 2050, more than 7,500 unfunded lane miles at a cost of $38 billion will be needed.

These maps have led officials and citizens to think out of the box, focusing on transit-oriented and transit-friendly developments, introducing transit at a higher level in the community, using other transportation management strategies (telecommuting, flexible work hours, carpooling), and incorporating other modes of transportation (commuter rail, bus, bikes) as viable options.

Courtesy of Florida Department of Transportation.

**Industry Maps** 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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