

Agenda

Wake Forest, NC Comprehensive Transportation Plan

July 18th, 2018 @ 2 PM, Technical Steering Committee Meeting #4



Meeting Agenda

- Jared Moore, Regional Manager, Global Traffic Technologies will provide a presentation on Advanced Signal Prioritization Systems and their applications in several U.S. markets
- Review of Project Schedule
- Comments Received on Draft Existing Conditions + Directions Report
- Finalize Hot Spots Selection (Attachment 1)
- Review of Storyboard for On-Line Lookbook (Attachment 2)
- Next Steps
 - Launch Preliminary Lookbook On-Line (Internal Only)
 - Continue Hot-Spot Design Studies
 - Provide Preliminary List of Recommendations to Staff
 - Technical Steering Committee Meeting: August 15th at 2pm
- Adjourn

Attachments: (1) Hot Spot Candidate List; (2) Storyboard (draft)

Project Contacts

Project Manager
Suzette Morales, PE

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Erin Puckett, AICP

Stantec Project Team
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Attachment I: Hot Spot Candidate List

#	Location	Issues	High congestion?	High crash location?	High public comment area?	Bike/Ped improvements needed?
1	Rogers Rd & Heritage Lake Dr/Forestville Rd	Unsafe intersection, drivers often go straight from right turn lane when going southwest from Heritage Lake to Forestville.	●	●	●	●
2	Retail Dr/Hampton Way & Durham Rd	Problem intersection that may become worse when construction begins nearby.	●	●	●	●
3	Downtown (Front St, North Ave, South Ave)	High congestion area	●	●	●	●
4	North Main St & North Ave	Issue with people doubling up at stop sign when heading south. Issues with school traffic, pedestrian safety issues.	●	●	●	●
5	Burlington Mills Rd & Ligon Mill Rd	Major sight line issues, may need realignment.	●	●	●	●
6	S Main St (Capital Blvd to South Ave)	Major gaps in bike infrastructure along this route.	●	●	●	●
7	Capital Blvd (Wake Union Church Rd to Stadium Dr)	Citizen-identified problem intersection (Stadium Dr) and high-crash location (along segment and at Wake Union Church intersection)	●	●	●	●
8	Burlington Mills Rd & Capital Blvd	Citizen-identified problem intersection	●	●	●	●
9	S Main St & NC-98	Citizen-identified problem intersection	●	●	●	●
10	S Main St & Falls of Neuse Rd	Citizen-identified problem intersection	●	●	●	●
11	S Main St & Rogers Rd	Citizen-identified problem intersection	●	●	●	●
12	S Main St & Ligon Mill Rd	High-accident location	●	●	●	●

● Yes
● No

High congestion = Over 0.9 V/C in 2015

High crash location = 25+ crashes at intersection or over 200 crashes/mile over 3 years

High public comment area = 50+ survey comments received

Bike/Ped improvements needed = Committee or symposium participants specified bike/ped improvement needed at this location

Attachment 2: Storyboard for On-Line Project Lookbook (v. 7.10.2018)

This page contains few words and introduces the project and content. May also contain “jump to” links to other parts of the site.

This section provides background information about how decisions were made and the planning process generally.

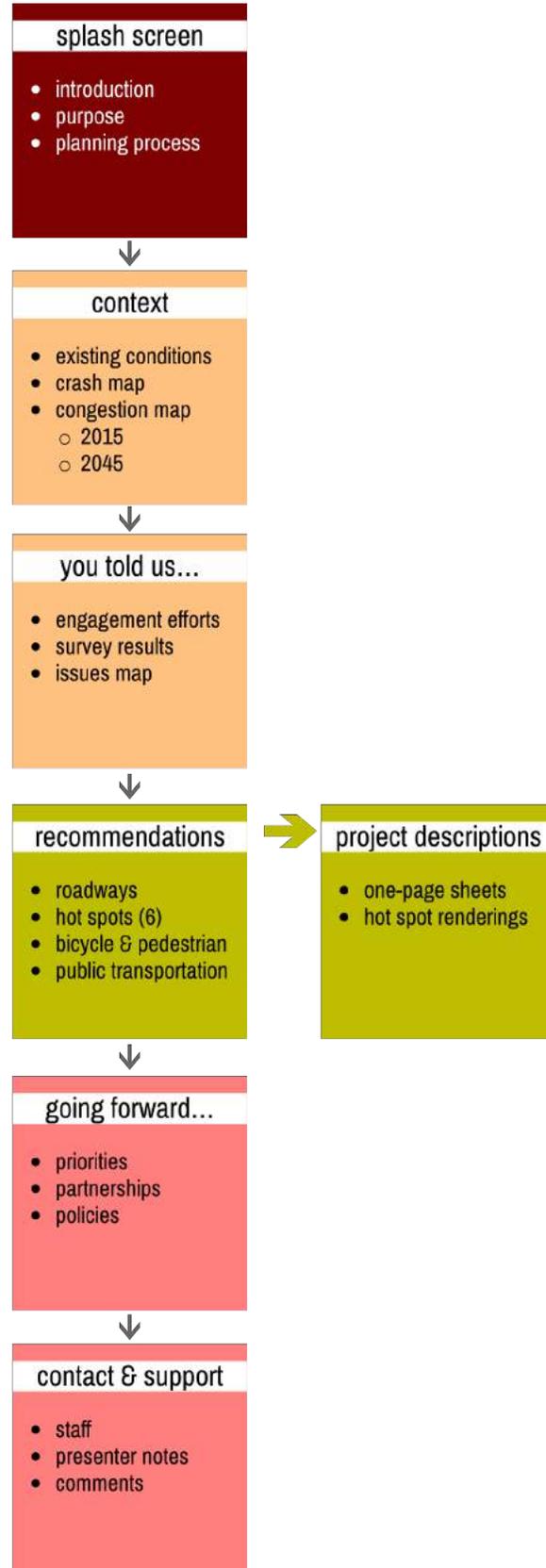
Context relies on infographics and maps to explain the data (fade back-and-forth from 2015 to 2045 congestion maps).

“you told us” should provide clear connections between input and the issues / recommendations. Again, infographics for survey results and map identifying major issues.

This section displays consecutive maps of recommendations by mode; one-page project sheets (printable PDFs) are linked from here.

This section briefly describes the project priority process and factors, as well as policy recommendations.

The contact & support page should provide a PDF document for speaker notes for guided presentations and opportunity for comment or other involvement.



Meeting Notes



Wake Forest, NC Comprehensive Transportation Plan

July 18, 2018 @ 2 PM, Technical Steering Committee Meeting #4

Attendees

Candace Davis, Wake Forest
 Vivian Jones, Mayor, Wake Forest
 Suzette Morales, Wake Forest Project Manager
 Anne Reeve, Commissioner, Wake Forest
 Brendie Vega, Wake Forest
 J. Scott Lane, Stantec Project Manager
 Erin Puckett, Stantec
 Jared Moore, Global Traffic Technologies

Synopsis of Comments

Mr. Lane thanked everyone for attending and, while the presentations were being set up, Mayor Jones noted that the Plan should include a Vision Zero element. She further stated that the cities of Durham and Greensboro were adopting policies, and that the state (NCDOT) had also adopted a Vision Zero policy. Mr. Lane thanked her for her comment, and said that there would be a policy element that considered safety first during planning and design of transportation facilities and services.

Jared Moore, Regional Manager, Global Traffic Technologies

Mr. Jared Moore of Global Traffic Technologies presented information on Opticom software and advanced signal control technologies which his firm owns. His presentation included the following points and responses to questions from those in attendance.

- Raleigh and Durham are moving toward smart cities technologies, as are other municipalities like New Bern and Charleston, SC.
 - Cary is moving that way as well, other east coast cities
 - Other small towns in North Carolina are using GTT technologies, as they can be applied to as large or small an area as needed
 - 3,100 cities worldwide that use GTT technologies
 - 41 of top 50 US cities are using this technology or are considering it
 - Transit can generate green lights based on the number riders and minutes late (i.e., assessing whether the route is revenue-generating to help determine its priority in the traffic stream)
- Benefits - EMS
 - Reduce crashes (up to 70%)
 - Improve response times up to 25%
 - Decrease injuries, liability to client municipalities
- Benefits – public transit
 - Reduce transit delays up to 40%

- Improve travel times up to 20%
- Increase ridership up to 10%
- Decrease fuel costs up to 19%
- Mr. Moore addressed some of the technology underlying the software and hardware platform.
 - He explained about different levels of and limitations to communications technologies, and that the preferred, upcoming system will be a cloud-based platform allowing connection to everything across a city (more efficient, easier to maintain), flexible, rapid deployment.
 - Can be implemented at NCDOT/local intersections with an agreement (NCDOT supports it, and he has met with them this same week).
 - Question of whether Wake Forest could have any control since NCDOT owns all intersections: the response was that it should be possible – may need to be hosted on an Amazon platform to which Wake Forest can be granted access. Additional, related discussion ensued about who manages the system in other places? Cities can choose to give management to GTT (because requires man hours to monitor, analyze data, etc.).
 - Question about the system working in a smaller community like Wake Forest, to which Mr. Moore pointed out that the system is completely scalable – can do a small stretch, small number of lights/vehicles; pointed out several locations where less than 10 signals and 10 vehicles were realizing benefits (e.g., Hutto, TX).
 - Question of whether statistical data can be pulled from system, to which Mr. Moore stated that, yes, the number of calls, speeds, etc. can be provided in a report. He continued by saying that many places choose to hand over some aspects of the control to Global Traffic Technologies so that they don't have to provide the labor to operate the system and respond to issues that arise.

In response to a committee member request, Mr. Lane will provide digital copies of GTT materials pertaining to the Savannah, GA and Memphis, TN case studies to committee members.

Review of Project Schedule

Mr. Lane and Ms. Erin Puckett led the remainder of the discussion, with Mr. Lane discussing the project schedule, noting that everything was generally on-schedule based on discussion at the previous meeting.

Comments Received on Draft Existing Conditions + Directions Report

Mr. Lane and Ms. Puckett briefly touched on the comments received from the staff and committee on the Existing Conditions and Directions report. These comments were generally minor but included some additional work on quality/level-of-service assessments for several additional corridors, obtaining more up-to-date crash data, and re-wording some of the text that may be seen as too negatively representing some of the conditions in the town currently.

Finalize Hot Spots Selection

Mr. Lane led a discussion of the candidate conceptual design / Hot Spot locations with the committee. The Technical Steering Committee determined that the following locations would be preferred for this

study, noting that some of the high-crash locations on Capital Boulevard may be addressed by projects beginning construction in 2021 (see table next page):

Location	Issues	High congestion?	High crash location?	High public comment area?	Bike/Ped improvements needed?
Rogers Rd & Heritage Lake Dr / Forestville Rd	Unsafe intersection, drivers often go straight from right turn lane when going southwest from Heritage Lake to Forestville.	●	●	●	●
Retail Dr / Hampton Way & Durham Rd	Problem intersection that may become worse when construction begins nearby.	●	●	●	●
Burlington Mills Rd & Ligon Mill Rd	Major sight line issues, may need realignment.	●	●	●	●
S Main St & NC 98	Citizen-identified problem intersection	●	●	●	●
S Main St & Rogers Rd	Citizen-identified problem intersection	●	●	●	●
S Main St & Ligon Mill Rd	High-accident location	●	●	●	●

● Yes / ● No

High congestion = Over 0.9 VIC in 2015

High crash location = 25+ crashes at intersection or over 200 crashes/mile over 3 years

High public comment area = 50+ survey comments received

Bike/Ped improvements needed = Committee or symposium participants specified bike/pedestrian improvement needed

Ms. Suzette Morales said that she would like to make sure the concept designs consider all modes of travel; Mr. Lane responded in the affirmative, noting that coordination would need to occur with these locations and corridor-level decisions made on such things as bicycle treatments to ensure consistency.

Review of Storyboard for On-Line Lookbook

Ms. Puckett led a discussion of storymaps that will be used to present information on-line about the Plan. Attention was directed to the storyboard included in the agenda packet. Ms. Puckett illustrated two examples ([Georgetown](#) and [Washington](#)), highlighting the difference in a sequential approach with more text as opposed to a much more graphics-heavy approach with less text. The group, after discussion, preferred the Georgetown (detailed and searchable) story approach of the two.

Next Steps

Mr. Lane discussed the next steps in the project.

- Launch Preliminary Lookbook (project report, including draft by next meeting);
- Commence the Hot Spot Design Studies with list of recommendations / issues to staff;
- Preliminary Recommendations to Staff on other projects; and
- Next Technical Committee Meeting: August 15th at 2pm.

Adjourn

Mr. Lane thanked the Steering Committee for their attendance. The meeting adjourned at approximately 3:45pm.

Action Item:

- I. (Stantec) Copies of Memphis, TN and Savannah, GA case study descriptions from GTT (attached).

attachments: (1) Copies of two GTT case study descriptions.

Traffic Signal Priority Control for emergency vehicle preemption



Opticom™ Traffic Signal Priority Control

- Emergency Vehicle Preemption (EVP) and Transit Signal Priority (TSP) solution
- Precise activation based on estimated time of arrival
- Reduce intersection crash rates up to 70%
- Decrease costs related to crash liability and vehicle replacement
- Cut response times up to 25%

“We recommended a radio-based GPS system because we believed it would be the best platform for expansion throughout the city.”

- Steve Henry, traffic engineer

Municipality: The city of Savannah Traffic Engineering Department, The Metropolitan Planning Organization (MPO), the Savannah fire department and two private ambulance companies in Savannah, Ga.

Challenge: Resolve persistent traffic problems for emergency vehicles traveling through a particularly busy corridor. Preemption was necessary at incredible distances to ensure the intersection was clear when emergency vehicles arrived.

Solution: Savannah deployed a GTT Opticom™ traffic signal priority control system that uses GPS technology to avoid line-of-sight requirements. Oncoming vehicles entering the intersection’s radio range gain precise, safe and efficient movement.

Performance: The GPS solution delivered immediate results. Average emergency response time was reduced by several minutes and traffic congestion queues in the corridor were minimized.

Resolve a seemingly impossible traffic problem

Too often, emergency response vehicles waited with other vehicles in traffic jams along the busy DeRenne Avenue corridor in Savannah. Precious minutes ticked away as drivers waited for lights to change and traffic queues to clear. The need for an emergency vehicle preemption (EVP) system was obvious. But the extended signal range required for preemption rendered traditional IR-based (i.e., line of sight) and audible systems ineffective.

“Our department was asked to investigate the situation and determine the best solution,” said Steve Henry, traffic engineer with the City of Savannah. “We recommended a radio-based GPS system because we believed it would be the best platform for expansion throughout the city.”

After the DeRenne Avenue preemption system was put out to bid, the city’s traffic engineering department performed field testing of both GPS and audible solutions. The goal of the testing was two-fold — to determine the signal range required to trigger the signal at the first intersection and to evaluate system performance through possible obstructions, including tree coverage, for future expansion.

“The test results were conclusive,” Henry said. “The GPS system worked extremely well. In fact, preemption occurred when the vehicle was more than one mile away. With the audible system, however, distances ranged from 400 ft. to 600 ft. before the signal was triggered.”

Part of a larger traffic plan

The Metropolitan Planning Organization (MPO) first considered preemption to mitigate traffic queue congestion along DeRenne Avenue as part of a long-range transportation improvement plan called “Connecting Savannah.” Other possible solutions included re-timing the traffic lights or constructing an elevated section of I-516 to bypass DeRenne Avenue.

The plan introduced a series of east-west improvements to alleviate bottleneck congestion — which was pinched between a rail yard to the north and a large Army base to the south — for traffic approaching Savannah from the west.

Although the population of the Savannah metro area ranked 149th in the 2000 U.S. Census, it has increased 17 percent over the past nine years. In addition, growth in Savannah’s seaport activity is straining the surrounding transportation infrastructure. Every day, up to 9,000 semi trucks serve the port, which is the second busiest on the East Coast and the fourth busiest in the nation. Key city decision-makers realized that a scalable GPS management system would be necessary to effectively manage the city’s expanding traffic demands.



*Building critical
traffic connectionssm*

EMERGING APPLICATIONS



Building critical traffic connectionssm

Global Traffic Technologies, LLC (GTT), formed in 2007 from 3M's pioneering Intelligent Transportation Systems business, is the manufacturer of Opticom™ priority control systems and Canoga™ traffic sensing systems.

After the city's testing confirmed the Opticom™ GPS system was superior, funding was requested and subsequently approved for seven signalized intersections along DeRenne Avenue. Installation took place in November 2007, as one element of the east-west improvements.

Faster, safer trips to the hospital

As part of the DeRenne Avenue implementation, the two private ambulance services authorized to serve the Savannah area (Chatham County) outfitted their ambulances with Opticom™ GPS radio units. The results were impressive.

"This preemption system significantly cut our response time, easily saving five to seven minutes each way along this corridor," said Bengie Cowart, operations chief for MedStarOne, a subsidiary of Memorial University Medical Center that operates 19 ambulances.

Cowart believes ambulances also benefit from a safer journey, because drivers in cars ahead of the ambulance now have an option to get out of the way. "This reduces accidents," he said. "It was just a stalemate before because other drivers had nowhere to go."

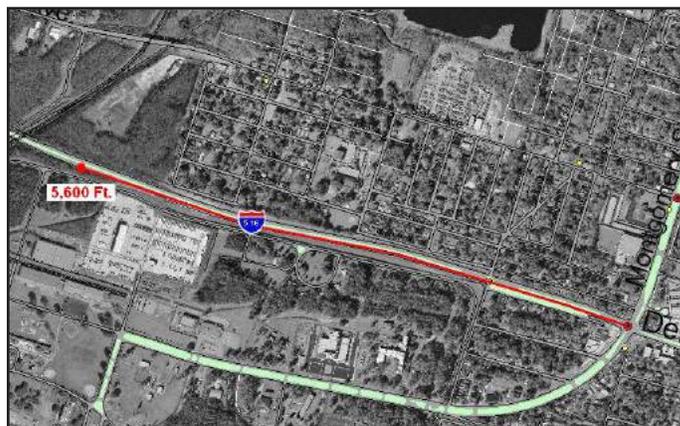
Reduce traffic queues throughout the city

The city of Savannah took a forward-thinking, community-focused approach to streamline emergency response and alleviate traffic congestion queues. A liaison was assigned to ensure collaboration between key stakeholders and constituents to ensure successful implementation of the transportation improvement plan. As a result, the entire community reveled in its success.

"Following the success of the DeRenne Avenue corridor project, many people wanted the preemption system expanded," said Heather Fish, citizen's specialist with the City of Savannah. Fire/emergency responders and police, specifically traffic responders, asked to outfit their vehicles so they could activate the system.

To map out the expansion, a committee met and eventually selected 73 intersections to be included — a mix of east-west and north-south corridors. Deciding factors included the existing signal equipment, communications infrastructure and ease of installation.

As of December 2010, the preemption system has been deployed at the additional intersections. Along with the 41 ambulances outfitted in 2007, the city is in the process of equipping 147 police and fire emergency vehicles with the GPS radio units.



Opticom™ GPS radio units triggered traffic signal preemption at about 5,600 feet to significantly mitigate traffic queues in one of Savannah's most problematic bottlenecked corridors.

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OPTICOM™ | Emerging Applications**Opticom™ Transit Signal Priority improves travel times for bus and trolley riders in Memphis****CHALLENGE: Time-conscious riders left waiting for a solution**

Nearly 11 million trips are taken using Memphis Area Transit Authority (MATA) services every year. About two million of those trips are taken on two primary bus routes through the heart of the city. Unfortunately, they're joined by hundreds of thousands of motorists that bog traffic down, creating longer travel times.

Traffic congestion on Poplar Avenue and Elvis Presley Boulevard — the busiest transit corridors in the city — stymied free-flowing traffic and transit delays were common. Transit riders were frustrated.

"We strive to create a reliable, on-time experience for everyone," said Tom Fox, Interim General Manager for MATA. "But, it's frustrating when you know you're going to be late for work or for an appointment. So, while our customers sat waiting, our buses sat idling — wasting fuel and money. We knew we needed to find a way to improve transit services. And, we had to find a way to pay for it."

SOLUTION: Reduce delays with transit signal priority (TSP)

Opticom™ traffic signal priority control had been implemented in Memphis several years prior to help first responders reach emergency scenes more quickly. MATA upgraded the city's trolley system to take advantage of the technology, too.

"The ability to extend or truncate traffic signals reduces the time spent waiting at red lights unnecessarily and improves our ability to serve the greater Memphis community," said John Lancaster, Manager of Planning for MATA. "So why not use a similar approach for our buses? We could reduce transit delays without compromising everyday traffic flow."

MATA officials sought a grant for installing TSP at key intersections to improve transit operations. Buses include Opticom™ GPS equipment so a green light can be requested from up to 400 feet away or 30 seconds before reaching the intersection — even around corners, obstructions and other intersections. MATA officials were also impressed by Opticom™ CMS, new software that can be used behind the scenes to ensure the TSP system worked consistently.

Opticom™ CMS offers built-in intelligence, from real-time alerts to automated diagnostics to customized reports, so MATA personnel can check activity logs, update firmware and even troubleshoot equipment from a remote location. This means engineers can monitor performance without sending technicians on expensive, time-consuming trips to the field.

"We knew Opticom™ TSP could help us and even be part of the foundation for Bus Rapid Transit (BRT) in the future," said Lancaster. "We were able to demonstrate that we could use it to better serve the community. We feel very fortunate to have been awarded a Bus Livability Grant from the Federal Transit Administration for more than \$800,000."

LOCATION

Memphis, Tennessee

MUNICIPALITY

Memphis Area Transit Authority (MATA)

CHALLENGE

- MATA struggled to maintain on-time performance amid heavy traffic congestion on two major corridors in Memphis
- Longer travel times drove fuel and operating costs higher
- Transit riders grew increasingly weary of longer-than-expected transit commutes

SOLUTION

- Install Opticom™ GPS Transit Signal Priority (TSP) at more than 50 intersections along the city's two most congested transit routes
- Integrate Opticom™ Central Management Software (CMS) for comprehensive monitoring and reporting

PERFORMANCE

- Reduced bus travel times by up to 20 percent
- Desktop reporting tools are expected to expedite maintenance and reduce technician trips to the field
- MATA expects faster travel times to improve ridership rates while reducing the number of buses

OPTICOM™ SOLUTIONS



MATA installed Opticom™ GPS vehicle equipment on 140+ transit buses and placed GPS intersection equipment at 40 intersections over a 13-mile stretch on the Poplar Avenue corridor. MATA also installed equipment at another 17 intersections over a 10-mile stretch on the equally diverse and trafficked Elvis Presley Boulevard.

PERFORMANCE

Right on schedule

It didn't take long before MATA — and most importantly, riders — noticed the difference.

MATA coordinated with GTT, the manufacturer of Opticom™ TSP and Temple, Inc., GTT's authorized dealer in Tennessee, to measure performance before and after installation. Technicians took readings over several especially busy sections of each corridor without Opticom™ TSP in place. The team tried to match volume levels when it measured on-time performance after installation.

"Opticom™ TSP is helping us improve travel times by almost 20 percent," said Lancaster. "That has the potential of saving us five or even ten minutes every trip, every day, so we're able to serve more people more consistently in less time. And we've only begun to tap into the possibilities."

With nearly 50,000 trips down these two corridors every year, MATA expects to cut about 7,000 hours of travel time. The team is looking at other cost-saving options, too. With significantly improved cycle times, fewer buses may be used

to accommodate the same number of riders. Lancaster estimates that removing one bus from the route could save MATA about \$200k annually.

Soon, savings may extend to the City of Memphis maintenance crews, too. MATA and the city expects to be using Opticom™ CMS to obtain detailed activity reports and maintenance alerts in real time. Technicians can receive real-time updates and check the status of equipment at the intersection from a laptop and make adjustments quickly without expensive trips to the intersection.

Reliable and affordable

Opticom™ TSP can do more than help MATA save money. It may even help them make money.

"People are more willing to ride public transit if it's convenient," said Lancaster. "Opticom™ TSP has helped us improve transit service for our riders, which makes them more willing to use it. In fact, if we can continue to improve the on-time accuracy we think we have a real chance to increase our ridership by at least 10 percent in the near future."

There's no reason to stop now. MATA plans to add Opticom™ GPS equipment at more signalized intersections throughout the city and sees it as a critical component in driving higher capacity transit in Memphis.

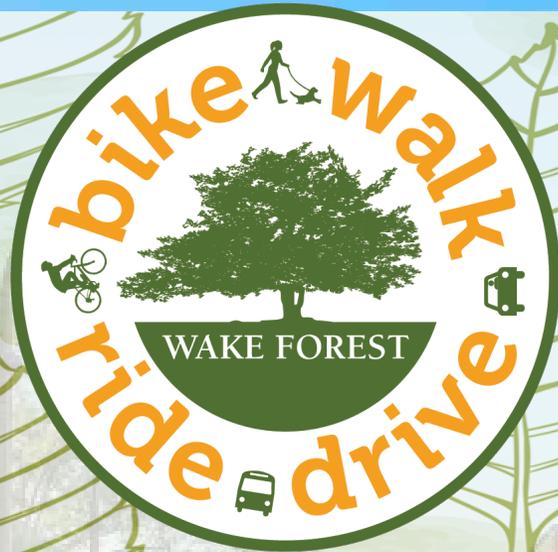
"Opticom™ GPS TSP is helping us improve travel times by almost 20 percent. That's saving us five or even ten minutes every trip, every day, so we're able to serve more people more consistently in less time."

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Memphis Area Transit Authority
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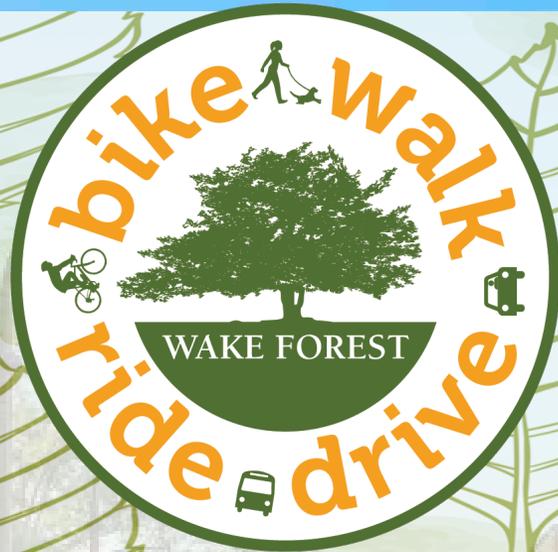
Comprehensive Transportation Plan

technical committee meeting no. 4

Today's Agenda

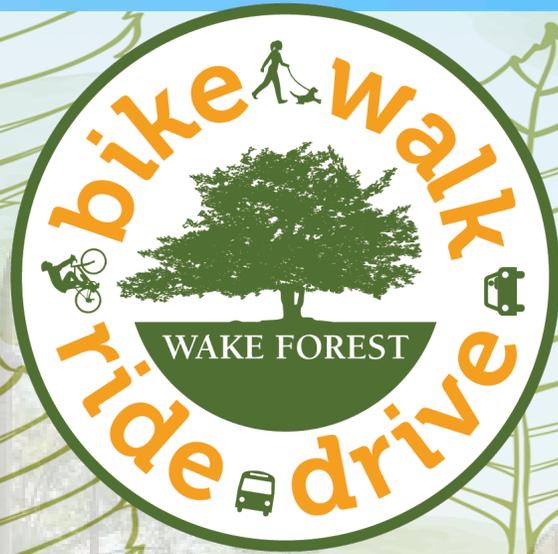
plus your ideas

1. Jared Moore: Advanced Signal Prioritization Presentation
2. Review of Project Schedule
3. Comments Received on Draft Existing Conditions + Directions Report
4. Finalize Hot Spots Selection (Attachment 1)
5. Review of Storyboard for On-Line Lookbook (Attachment 2)
6. Next Steps



Advanced Signal System Technologies

**Jared Moore, Regional Manager, Global
Traffic Technologies**



Project Schedule

where we're at, where we're going

Schedule Status

as of July, 2018



01 Research

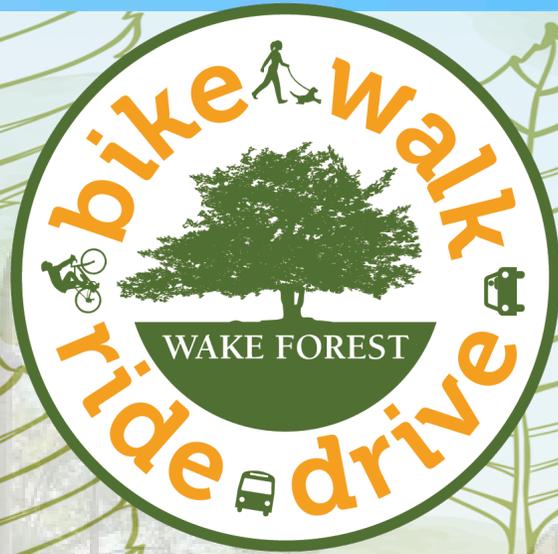
- ✓ Survey 1
- ✓ Base Mapping
- ✓ Develop Website (Town)
- ✓ Research and Data Collection

02 Current Conditions

- ✓ Public Workshop 1
 - ✓ Identify Key Issues
 - ✓ Level-of-Service Analysis
- Directions for Recommendations

03 Reporting

- Survey 2
- Online Summary
- Concept Designs
- Project Lookbook
- Public Workshop 2



Comments Received on Draft Existing Conditions + Directions Report

Existing Conditions Report...

The Directions part gets complete when the hot spots get added...



COMMENTS

- General edits for wording and clarification
- Minor design changes – images, charts, fonts, etc.
- Summarize overall public input takeaways
- *Expand road network for Level of Service maps*
- *Verification of data – V/C, crashes, etc.*

01 Introduction

Includes history, context, and purpose

02 EC+D

Data, public input, and linkage from all that to the recommendations to come (“Directions”)

03 Roadway & Transit

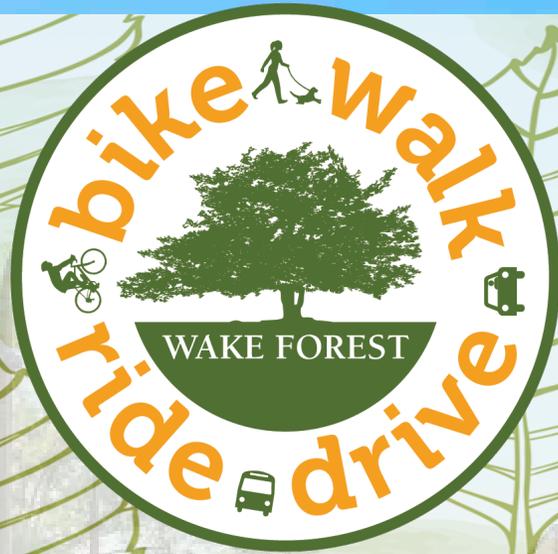
Congestion relief, safety improvements, and transit recommendations (e.g., Wake County Transit Plan and longer-term or complimentary actions)

04 Bicycle & Pedestrian

On-road and Off-Road, Intersections

05 Implementation

Priorities, Funding, Partnerships



Final Input on Hot Spots Concept Designs

Directions: **Concept Designs**

What constitutes a good location for one of our six concept designs?

It can be fixed

Sometimes the solution hurts more than the problem



It's not already being addressed

If there's a study in play we shouldn't duplicate efforts



Might be multi-modal

Biking, walking, public transit should all be considered



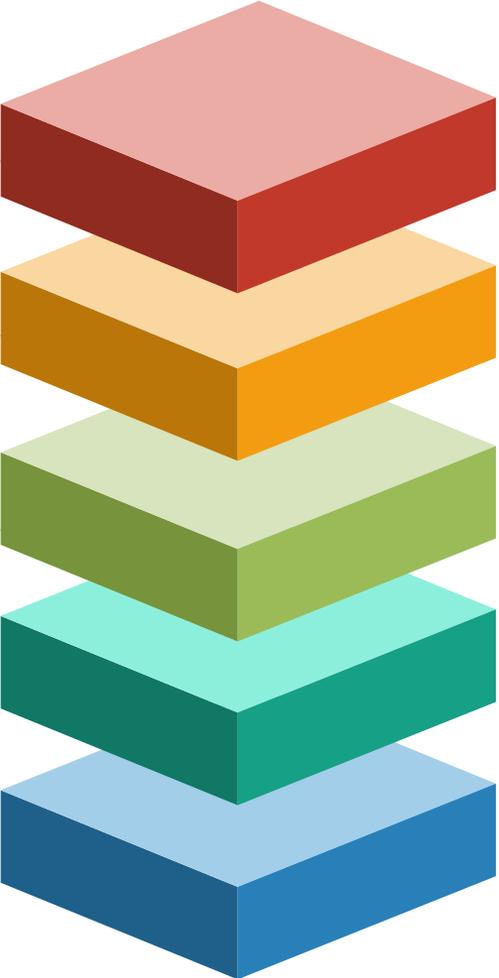
It doesn't require a wizard

This is CONCEPT design – no surveying, etc. is going to happen (yet)



A new problem

If something has been done recently to address the same location then we may want to spread the love around a bit

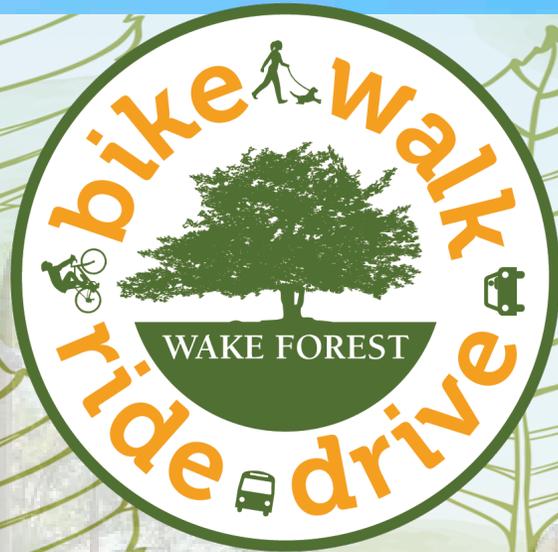


Hot Spots

- Need to Narrow Down to Six
- Input from Public (surveys and meeting)
- Reflects Crash and Congestion Data
- Refer to *Attachment 2*

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11	S Main St & Rogers Rd	Citizen-identified problem intersection	●	●	●	●
12	S Main St & Ligon Mill Rd	High-accident location	●	●	●	●

● Yes
 ● No
 High congestion = Over 0.9 V/C in 2015



Review of Storyboard for On- Line Lookbook

Attachment #2

Sample Online Plan Documents

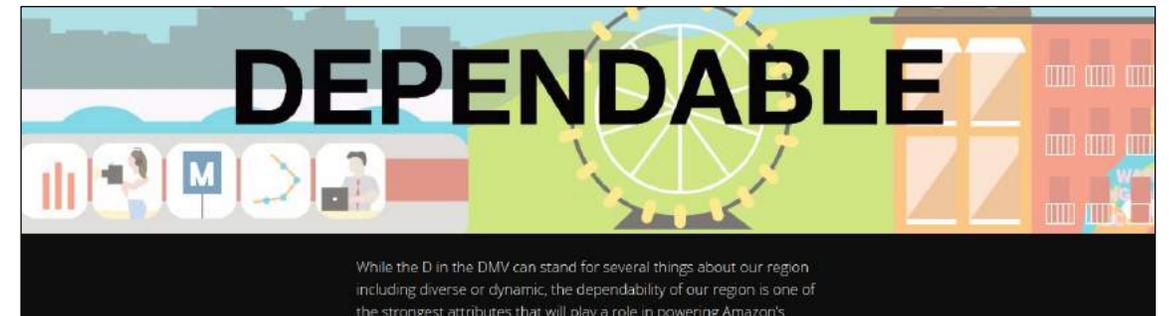
Georgetown Sidewalks

- [Link](#)
- Good Example of Plan Document Migrated into On-line Storymap Format
- Number of Similar Elements to Wake Forest Storyboard

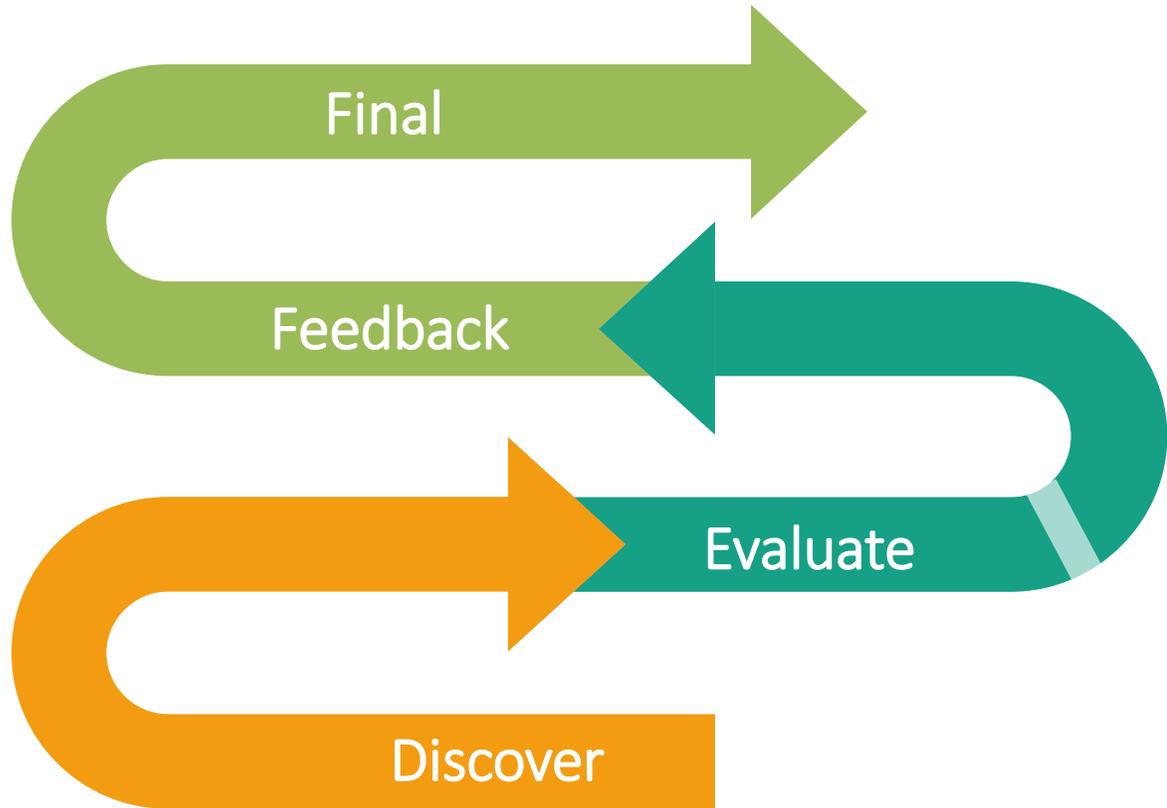


Washington DC: Amazon Pitch

- [Link](#)
- Very Good Examples of Full-Screen Graphics/Telling Story with Graphics
- Communicates Trends and Conditions with Interactive Maps



Steps to Recommendations and Draft



- 01 | **Launch Preliminary Lookbook (project report)**
Present first pass at putting the plan onto the web
- 02 | **Hot Spot Design Studies**
Initiate concept designs
- 03 | **Preliminary Recommendations to Staff**
Develop text list of recommendations for client review, then start CADD on aerial photography, do TMCs, refine (Illustrator)
- 04 | **Next Technical Committee Meeting: August 15 at 2pm**
Early list of recommendations, sample hot-spot design study



CONTACT US

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