

## **Cobb County Department of Transportation Intelligent Transportation System**

**Overview** - Cobb County's Intelligent Transportation System provides safe and efficient transportation mobility for Cobb County commuters by managing congestion, reducing delay, improving traffic flow and assisting with incident management. The system includes optimized traffic signal timing, the Georgia Navigator System, closed circuit television cameras, changeable message signs, a Cobb County website, a local cable television program and miles of fiber optic cable.

**Traffic Signal Timing** - Cobb County Department of Transportation retimes traffic signal systems routinely because traffic patterns change due to growth, development and roadway infrastructure improvements. Traffic signal timing projects consist of developing, installing and field adjusting new signal timing plans for each corridor and then reviewing travel data to determine the effectiveness of the project.

The development of new signal timing plans begin with the collection of traffic count data, field inventory of signal controllers and geometric conditions of the intersections and corridors. The data is utilized in the development of signal timing plans using the Synchro traffic optimization and simulation software package. Once the traffic plans are optimized they are entered in the local controllers remotely from the Traffic Control Center. All traffic signal timing plans require field fine tuning by the engineers. Travel time data is collected before the new signal timing plans are implemented for typical conditions during periods of the day that are used to compare with after travel time data for accuracy and benefit analysis.

By comparing the before and after data, the measures of effectiveness are determined for the new signal timing plans. Typical travel data includes the average travel time per vehicle improvement during three time periods for both directions of travel for each corridor and a total for all corridors. This data provides several improvements including a percentage of travel time reduction, reduction in total delay, reduction in the number of stops, increase in average speed, reduction in fuel consumption, reduction in hydrocarbons, reduction in carbon monoxide and reduction in nitrous oxide.

A benefit to cost analysis is also completed for each system. An annual reduction cost of the new signal timing and the annual cost of producing, implementing, and maintaining the signal timing is calculated using travel time savings compared to the implementation and maintenance cost. This analysis provides a ratio of the benefit of the signal timing improvements over the cost of the signal timing. The benefit analysis does not include the user and non-user cost reduction attributed to reduction in accidents and pollutants emission which have been directly linked to health costs.

**Adaptive Signal Control** - Cobb County Department of Transportation implemented Georgia's first SCATS adaptive traffic signal control system. SCATS, an acronym for Sydney Coordinated Adaptive Traffic System, is an adaptive traffic signal control system originally developed in the early 1970s for Sydney, Australia by the Roads and Transport

Authority of New South Wales. This system controls more than 10,000 intersections in over 50 cities around the world and more than 600 intersections in 10 jurisdictions in the United States.

SCATS' adaptability is especially useful in areas where traffic fluctuations make it difficult to optimize flow using traditional signal coordination and time-of-day scheduling. SCATS reacts to existing traffic conditions to adjust the timing plans for each intersection approach. The system determines congestion by the gaps between vehicles as detected by video detection cameras. Thresholds are set for cycle lengths and the amount of change allowed between cycles at each intersection, however, a significant improvement with SCATS is that signal groupings can also adapt to current conditions.

Traffic management in the Cumberland CID area is critical to the success of the businesses in the areas, as well as a critical quality-of-life issue to both those persons that work in the area or pass through it frequently. While the roadway network has been significantly expanded during the past ten years, congestion on key routes is still a likely occurrence during peak periods. Further physical expansion of the area roadway network is unlikely, due to funding and environmental constraints.

In light of this scenario, the ability to operate the roadway network as efficiently as possible is critical. Cobb County has gone to great lengths to ensure that the roadway traffic management, accomplished principally through traffic signal control, best met the traffic patterns that occur on CID areal roads. However, it appears that these tried-and-true methods of signal timing plan development may not be able to keep up with the changes in traffic flow.

The adaptive system in the Cumberland CID area is a more flexible type of traffic signal control that has gained considerable acceptance across the United State because it typically reduces travel time and delay and achieves system payback quickly based on the costs saved in delays and pollution reduction.

The traffic flow in the Cumberland CID area benefits from the adaptive system because the system recognizes traffic pattern changes during from typical weekday peak periods to relieving congestion on major corridors due to traffic events or incidents on the nearby interstates. The weekend plans also benefit because the adaptive system is able to adjust to all types of traffic patterns due to various activities and events in the area throughout the year.

**Smart Corridor** - The Georgia Department of Transportation is currently installing a Smart Corridor along SR 3 in Cobb County and Fulton County. The project will install SCATS adaptive traffic signal system on the SR 3 Corridor. Twenty-nine intersections are included in the project limits. Each intersection will receive pedestrian accommodation upgrades and transit priority emitters. The transit priority system will assist Cobb County Transit buses by keeping them on schedule during congested times along the corridor. The Cobb Traffic Control Center will be the main server for the entire system. Some of the benefits anticipated from the project include cross-jurisdictional traffic signal coordination, upgraded pedestrian accommodations and transit priority.

**Georgia Navigator System** - Cobb County is a partner of the Georgia Department of Transportation's Navigator System. This system allows the Metro-Atlanta area to share traveler information with surrounding jurisdictions for traffic monitoring, incident management, travel times, travel speeds, and construction projects. Cobb County Department of Transportation maintains nearly 60 Closed Circuit Television (CCTV) cameras that are viewable through the Georgia Navigator System. Although Cobb County retains primary control of these cameras, other entities with access to the Georgia Navigator System are also able to view and control them. The Traffic Management Center at the Georgia Department of Transportation often takes control of the Cobb County CCTV cameras along the interstate systems when observing traffic incidents. This access allows for a quicker response time on the part of GDOT and Cobb County Public Safety to incidents on interstate routes.

Incident information is also provided through the Georgia Navigator and is updated for the duration of the incident. This information can be sent by email or page for those incidents that are elevated to high level status. A map displaying congestion levels, current incidents, construction zones, travel speeds, changeable message signs, and other devices is available through the Navigator system. Traffic congestion can often be detected on this map and the cause can quickly be determined using the CCTV cameras in the congested area.

**Changeable Message Signs** - Cobb County maintains 4 changeable message signs that display current travel times and travel speeds, provided by the Georgia Department of Transportation, along adjacent interstates. Each changeable message sign is located strategically near an interstate route and a major thoroughfare so that travelers are able to use the information provided on the sign to make route decisions. The CMS system is also used locally to inform motorists of traffic incidents, road closures or special event traffic delays for alternate route information. Should travel lanes on the interstate or nearby local roads be blocked due to an incident or construction, the travel information messages can be overridden by staff at Cobb County TCC or at the GDOT TMC so that pertinent information can be provided to motorists. The messages can also warn motorists of current or potential inclement weather in the surrounding area, such as ice on the roadways or tornado warnings in the area. The CMS signs are an integral part of traffic plans for special events, providing information about possible traffic delays or instructions for special event traffic. Messages are controlled and board status, lamp status and other operational information is obtainable through the Georgia Navigator system.

**Cobb County Website** - Cobb County traveler information is available on the Cobb County website. Road closure and detour information is provided to the public. Information on transportation projects can be found on the website. The public is introduced to newer traffic control devices, such as the recently installed roundabout and ramp meters. Users can watch information videos on these traffic control devices to help them understand how they work and the role they can play in improving traffic flow or in traffic congestion migration. A link to our Cobb County Transit website is included where travelers can view bus schedules or purchase transit passes online.

Video images from our closed circuit television cameras are available with current roadway conditions. A link to the Georgia DOT website is easily accessed from the Cobb County website for current road conditions for the entire Metro-Atlanta area. Snapshots of the CCTV cameras throughout Cobb County can be viewed on this site. These CCTV camera images are updated approximately every 3 minutes.

**Channel 23** - Cobb County produces a live video feed for the local cable television station of traffic conditions from closed circuit television cameras. The production airs weekdays during the morning and afternoon peak travel times. Along with the live streaming video the production provides a live crawler message informing commuters of any traffic incidents or road closures in the area. The program provides an opportunity for notifying travelers and residents of long-term road closures due to construction. The public is also alerted about special events that may have an impact on traffic conditions. This broadcast can also be viewed seven days a week/24 hours a day at our Cobb County DOT website.

**Traffic Control Center** – The Traffic Control Center (TCC) at the Cobb County Department of Transportation is the hub of communications with our ITS devices. Within the center, we maintain 2 traffic signal systems connected by fiber optic cables. Cobb Department of Transportation CCTV cameras are controlled and monitored from this central location. The staff of the TCC takes reports of malfunctioning traffic signals and attempts to verify the reports. The ability to troubleshoot from the TCC improves the efficiency and reduces unnecessary trips for the traffic signal maintenance staff.

Cobb County School Flasher Signs are programmed and controlled from the TCC. Weekly schedules are sent to the school flashers remotely through a paging system. This system provides quick adjustments to schedules for events such as early release or school closings due to inclement weather.

The staff of Cobb County's Traffic Control Center monitors GDOT and Cobb County CCTV cameras to provide incident information to staff and the public. The distribution of this information is determined by the severity and estimated longevity of the incident. Methods of dissemination include placing a crawler message on the traffic broadcast, sending email to staff, and placing messages on the changeable message signs.

A remote TCC station is located at our Cobb County Transit (CCT) facility. Workstations in Customer Service, Bus Dispatch and the Operations Manager office provide access to most aspects of the Georgia Navigator system. In addition, several monitors are located throughout the CCT facility that can the display a congestion map, incident page, or real time CCTV camera images. Access to this system can help alert CCT staff in advance of possible delays due to incidents or congestion, allowing them to make critical routing decisions when necessary.