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## **MEMORANDUM**

**To:** Mayor and City Council

**From:** Michael Smith, Public Works Director

**Date:** 9/9/2013

**Subject:** **Presentation of Perimeter Traffic Operations Program**

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### **ITEM DESCRIPTION**

Presentation of the first year activities and accomplishments of the Perimeter Traffic Operations Program (PTOP)

### **BACKGROUND**

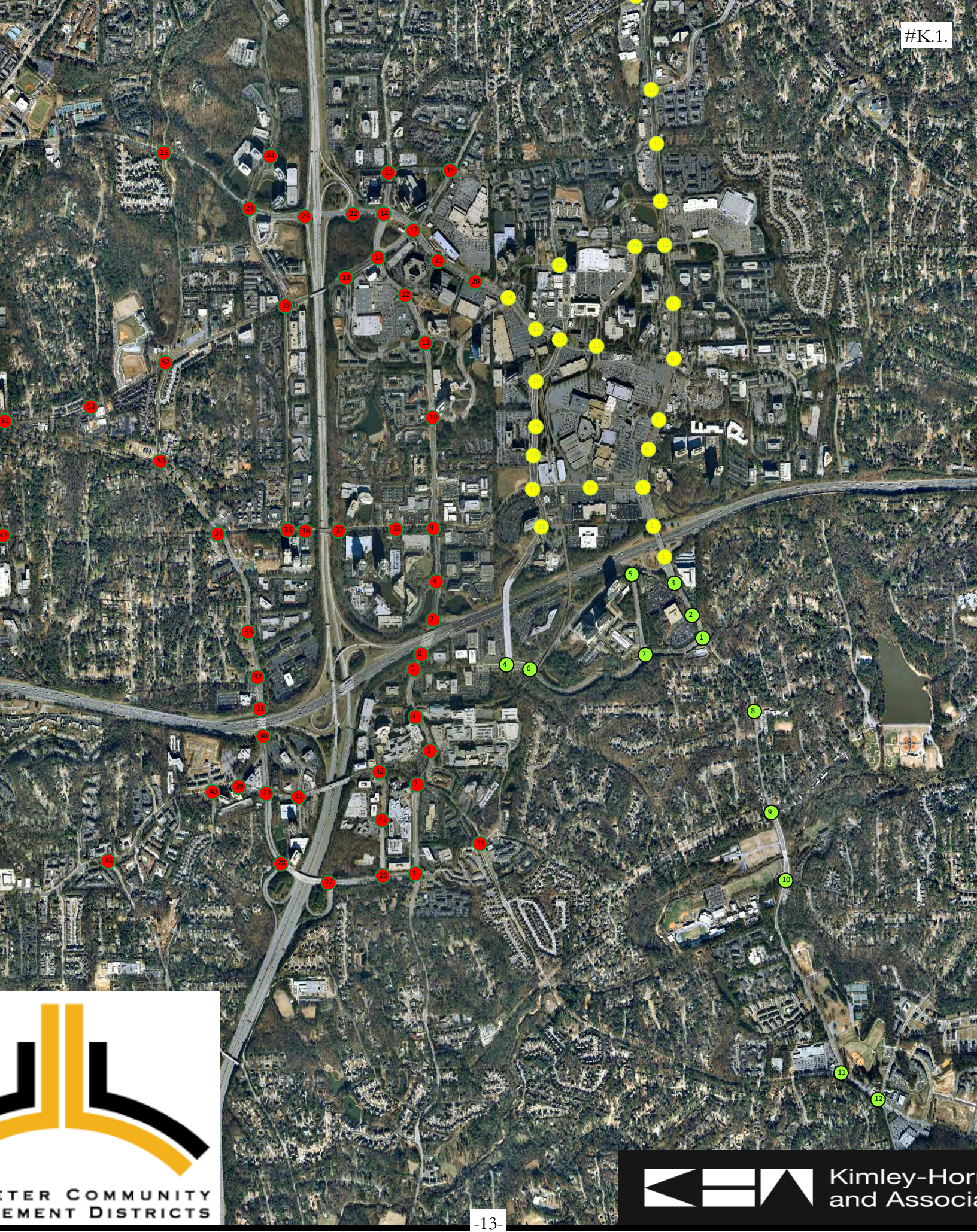
In 2012 the Dunwoody partnered with the Georgia Department of Transportation (GDOT), Perimeter Community Improvement Districts (PCIDs), the City of Sandy Springs, and DeKalb County in a pilot program to actively monitor and manage traffic signal timing in the central perimeter area (see attached map). The program which has become known as PTOP (Perimeter Traffic Operations Program) is one of only two in the entire state that GDOT has funded to manage signals on multiple local roads across multiple jurisdictions.

GDOT is providing \$2.78 million in funding over 3 years for PTOP with no local match required. In the first year of the program the funding has provided for daily active signal monitoring and routine adjustment as well as the improvements summarized below and in the attached Executive Summary:

1. Timing and coordination of 9 corridors including Ashford Dunwoody Road, Perimeter Center Parkway, Perimeter Center West and Dunwoody Village in Dunwoody. For each corridor timing plans have been developed for the normal morning commute, afternoon commute, and mid-day traffic. Additionally, summer and holiday shopping season plans have been developed for Ashford Dunwoody and Perimeter Center West. Before and after travel time comparisons on several corridors demonstrate a 29% reduction in vehicle delay or stopped time.
2. Established communication between Dunwoody and Sandy Springs signals providing Dunwoody internet access to view and monitor its signals in the Perimeter area. The communication link also facilitates signal coordination on intercity corridors like Perimeter Center West.
3. Improved vehicle and pedestrian detection performance.
4. Safety and operational improvements at several intersections.

At the Council Meeting, the PTOP corridor manager, Alvin James with Kimley-Horn, will provide an overview of the attached presentation and answer any questions about the program.







# Executive Summary

July 2013



## Key Project Results

- Benefit/Cost Ratio=64.9 to 1
- 233,680 hours of travel time and 160,290 gallons of gasoline saved each year
- Project pays for itself every 3.9 work days



The Perimeter Community Improvement Districts (PCIDs) selected Kimley-Horn and Associates, Inc. (KHA) for the Perimeter Traffic Operations Program (PTOP), which includes the optimization and

maintenance of the traffic signals throughout the PCIDs. The 99 traffic signals that are included in PTOP are along major, arterial corridors in the PCIDs, which encompass portions of the Cities of Brookhaven, Dunwoody, and Sandy Springs. The project is funded through a grant from the Georgia Department of Transportation (GDOT).



Kimley-Horn  
and Associates, Inc.

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# Executive Summary

July 2013

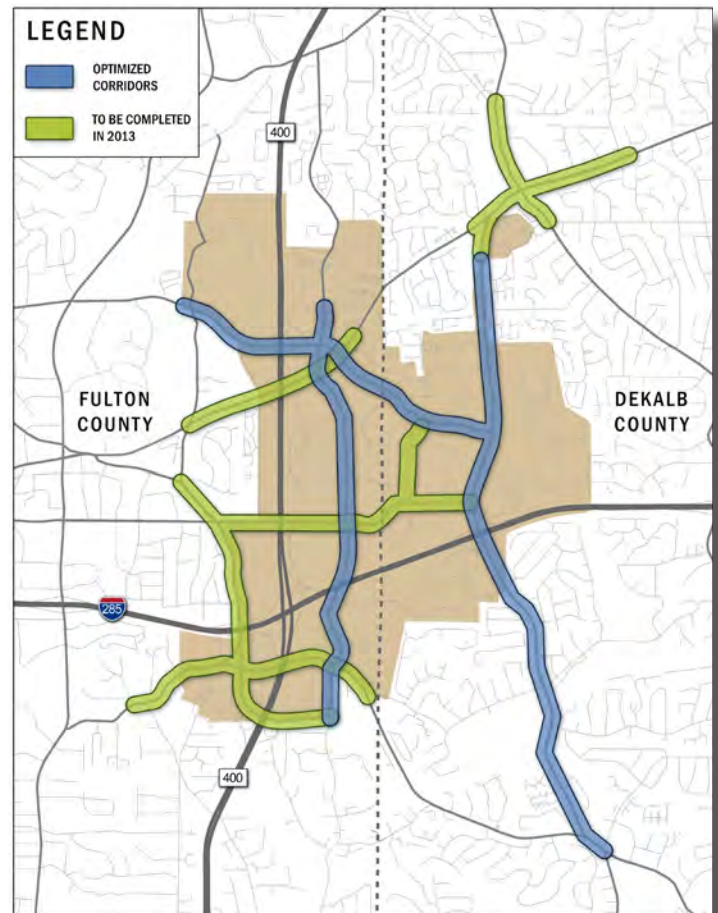


One of the primary tasks associated with PTOP was the development of base traffic signal timing plans, and the purpose was to improve traffic signal timing along the signalized corridors, which in turn reduces travel time, vehicle emissions, driver delay, driver stops and starts, and fuel consumption. KHA completed the optimization of 3 of the corridors in May 2013:

- Ashford Dunwoody Road
- Peachtree Dunwoody Road
- Perimeter Center West / Abernathy Road

In addition, the following corridors are scheduled to be implemented with optimized signal timings in 2013;

- Hammond Road
- Mt Vernon Road
- Chamblee Dunwoody Road
- Johnson Ferry Road
- Glenridge Road



Together with the innovative Diverging Diamond Interchange (DDI) at I-285 and Ashford Dunwoody Road and the Hammond Half-Diamond Interchange at GA 400, PTOP helps to mitigate traffic and positively impact commute times for drivers within the Perimeter market.



# Executive Summary

July 2013

In order to determine the effectiveness of the timing plans implemented along the 3 corridors, travel time studies were conducted to evaluate and document the results of the timing plan development process. The before and after travel time studies were conducted on typical weekdays for both directions of travel during three time periods of the day: AM Peak, Mid-day (MD) and PM Peak. The following summary tables show the overall project results:

**Table 1:** Travel Time Study Results by Corridor

		AM Peak			MD Peak			PM Peak		
		Travel Time (sec)	Total Stopped Time (sec)	Avg. Speed (mph)	Travel Time (sec)	Total Stopped Time (sec)	Avg. Speed (mph)	Travel Time (sec)	Total Stopped Time (sec)	Avg. Speed (mph)
Ashford Dunwoody Rd. <sup>1</sup>	Difference	-75	-71	4.3	-84	-89	2.6	-51	-59	-0.4
	% Change	-16%	-57%	18%	-16%	-46%	12%	-9%	-24%	-2%
Peachtree Dunwoody Rd. <sup>2</sup>	Difference	-170	-137	2.8	-42	-55	0.6	-19	-18	0.3
	% Change	-20%	-33%	18%	-5%	-12%	4%	-5%	-7%	5%
Perimeter Center W/ Abernathy Rd. <sup>3</sup>	Difference	-56	-35	1.6	-150	-142	3.9	-220	-215	3.2
	% Change	-8%	-13%	8%	-17%	-31%	22%	-20%	-30%	24%

**FOOTNOTES**

- 1 Data collected from Ashford Center Parkway to Lake Hearn Drive.
- 2 Data collected from Northpark Place to Crestline Parkway. Data is currently being gathered for the south section of Peachtree Dunwoody Road.
- 3 Data collected from Ashford Dunwoody Road to Glenridge Drive.

**Table 2:** Overall Travel Time Study Results

	AM Peak			MD Peak			PM Peak		
	Travel Time (seconds)	Total Stopped Time (seconds)	Avg. Speed (mph)	Travel Time (seconds)	Total Stopped Time (seconds)	Avg. Speed (mph)	Travel Time (seconds)	Total Stopped Time (seconds)	Avg. Speed (mph)
Difference	-187	-156	3.2	-306	-315	2.8	-291	-292	0.7
% Change	-12%	-27%	16%	-17%	-35%	15%	-14%	-24%	5%



# Executive Summary

July 2013

**Table 3: PTOP Project Summary (To-Date)**

Daily Vehicle-Hours of Travel Reduced by:	935	Vehicle-Hours
Daily Fuel Consumption Reduced by:	640	Gallons
Daily Pollutant Emissions Reduced by:	1,490	Pounds VOC, NOx
Daily Time and Fuel Cost Savings:	\$15,700	Dollars
Annual Time and Fuel Cost Savings:	\$3,926,070	Dollars
Equivalent Annual Project Cost	\$60,500	Dollars
Average Daily Traffic:	215,000	Total Vehicles per Day
Annual Benefit/Cost Ratio	64.9	



Delay incurs direct costs upon motorists in the form of increased fuel consumption and the value of their time wasted while waiting in traffic. **Average vehicular delay (stopped time) has been reduced on the corridors by 29%.** Motorists using the corridors during the three peak periods will **save 233,680 hours of travel time** and **160,290 gallons of gasoline each year** because of improved traffic flow due to the new timing plans. Conservatively assuming a vehicle occupancy rate of 1.2, \$12.00 per hour for the value of motorists' time and \$3.50 per gallon for gasoline, the calculated annual benefits of reduced delay is \$3,365,050 and fuel consumption is \$561,020.

**Therefore, the total annual savings to motorists due to improved signal timing plans will be \$3,926,070.** Based on an equivalent annual cost of approximately \$60,500 for the signal timing portion of the project the improved timing plans has a benefit/cost ratio of 64.9 : 1. **Expressed in another way, the new timing plans pay for themselves approximately every 3.9 workdays.**





# Executive Summary

August 2013 - Communications Update

A primary first year goal associated with PTOP was the establishment of communications links between a central Traffic Control Center (TCC) and 76 signals within the boundaries of the Perimeter Community Improvement Districts (PCIDs). This allows for the active management of the traffic operations within the PCIDs from a central location, through the use of fiber optic communications, traffic signal controller coordination, and video surveillance.

## Goals:

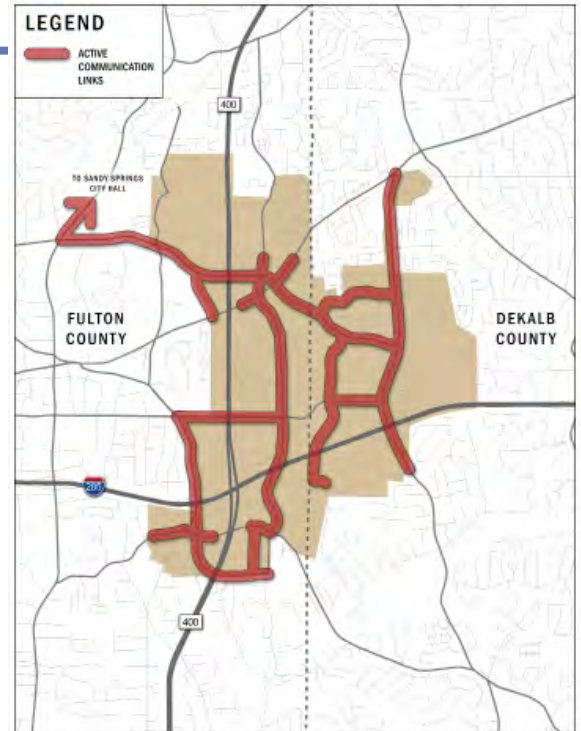
- Establish communication and actively monitor and manage 76 signals within the PCIDs
- Provide central access from a Traffic Control Center (TCC)
- Provide remote access (via VPN) to system managers for improved interaction with signals and efficient troubleshooting

## Initial Communication Stats:

- No interconnect between the existing City of Sandy Springs TCC and the Cities of Dunwoody and Brookhaven
- Approximately 75% of the system was online at the start of the project, with the overwhelming majority being in the City of Sandy Springs
- Intermittent communication with Brookhaven and Dunwoody signals (via DeKalb TCC).
- No remote access or monitoring capabilities to Brookhaven or Dunwoody signals
- No camera access for Brookhaven or Dunwoody

## Current Communication Stats:

- 76 Total Signals Interconnected within PCIDs (Brookhaven, Dunwoody, & Sandy Springs) = **CONNECTED SYSTEM!**
- 13 cameras are online in the City of Sandy Springs with remote access and monitoring capabilities = **VISIBILITY AND SAFETY!**
- 8 cameras in the City of Brookhaven and Dunwoody online early Fall 2013 = **INCREASED COVERAGE AND IMPROVED SAFETY!**



**Table 4:** PTOP Communication Plan

	PTOP		Within PCID Boundary	
Total Number of Signals:	99	-	76	-
Total Number of Signals (Upgradeable):	86	-	75	-
Existing Online Signals:	65	75%	57	76%
Currently Online Signals:	72	84%	72	96%





## Perimeter Traffic Operations Program (PTOP)



September 9, 2013  
PTOP Committee Meeting



Perimeter Community  
Improvement  
Districts



Kimley-Horn  
and Associates, Inc.



# INTRODUCTION

- PTOP INTRODUCTION
- SIGNAL INFRASTRUCTURE
- SIGNAL TIMING
- COMMUNICATION PLAN



# PTOP INTRODUCTION

- PTOP TEAM:
  - PROJECT TEAM (KHA, WILBURN, & BBH)
  - APPROXIMATELY 100 SIGNALS IN MULTIJURISDICTIONAL AREA
    - 2 SYSTEM MANAGERS & 1 SIGNAL TECHNICIAN
- PTOP GOALS:
  - REPAIR INFRASTRUCTURE
  - RETIME SYSTEM
  - ESTABLISH SYSTEM COMMUNICATION



# SYSTEM INFRASTRUCTURE

## PEDESTRIAN DETECTION DEVICES

Month/Year	Percentage	Total Devices	Operational Devices
Initial PTOP Inventory	95	288	274
July 2013	99	295	294
Program Goal	95		

## VEHICLE DETECTION DEVICES

Month/Year	Percentage	Total Devices	Operational Devices
Initial PTOP Inventory	84	620	518
July 2013	89	629	561
Program Goal	95		



# SIGNAL TIMING

TIMING SCHEDULE								
DATE	SYSTEM	AM	MD	PM	OFF	WKEND	HOLIDAY	SPECIAL
SPRING 2013	ASHFORD DUNWOODY	✓	✓	✓	✓	✓	✓	
	PERIMETER CENTER WEST/ABERNATHY	✓	✓	✓	✓	✓	✓	
	PEACHTREE DUNWOODY	✓	✓	✓	✓	✓		
FALL 2013	PERIMETER CENTER PKWY	✓	✓	✓	✓	✓		
	HAMMOND	✓	✓	✓	✓	✓		
	JOHNSON FERRY	✓	✓	✓	✓	✓		
	MT. VERNON	✓	✓	✓	✓	✓		
	CHAMBLEE	✓	✓	✓	✓	✓		
	GLENRIDGE	✓	✓	✓	✓	✓		



# SIGNAL TIMING

## TRAVEL TIME RESULTS

		AM Peak			MD Peak			PM Peak		
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