COLUMBIA MISSOURI

GRINDSTONE CORRIDOR

VALIDATION STUDY BRIEF

PROJECT DESCRIPTION

The Grindstone corridor is a 2.6 mile long arterial corridor with 9 traffic signals. This study compares the operation of the Grindstone corridor under its existing timing scheme with its operation under the InSync adaptive traffic control system.

OBJECTIVE

Reduce stops, travel time, delay and fuel consumption along the artery by optimizing traffic signal operations using InSync.

CHALLENGE

A major challenge of coordinating the Grindstone corridor is the large outflow of traffic after Mizzou football games. During these periods, the system priority is the coordination of southbound traffic on Providence, making the eastbound turn onto Grindstone to leave on US-63. For day-to-day operation, the system focuses on moving traffic east-west along the Grindstone Parkway portion, with a secondary north-south movement at Providence Road.

SOLUTION

Rhythm Engineering installed the adaptive traffic signal system at 9 signals along the 2.6 mile corridor during January of 2010. By early February, Rhythm Engineering had configured the system, monitored its performance, and made the appropriate adjustments to the system to optimize traffic flow.

DATA COLLECTION

Field data were collected along the study corridor during two study periods. The first was conducted January 19, 2010, prior to the installation of the InSync system. The second was conducted February 17, 2010, 4 weeks after InSync was deployed. Each study was conducted during normal weekday travel conditions to ensure similar travel patterns between studies. This corridor has 27,246 ADT (average daily traffic).

Between 5-10 before and after travel time runs were conducted through the corridor in both directions during three time-of-day periods (AM peak, noon and PM peak) on Tuesday, Wednesday, and Thursday.

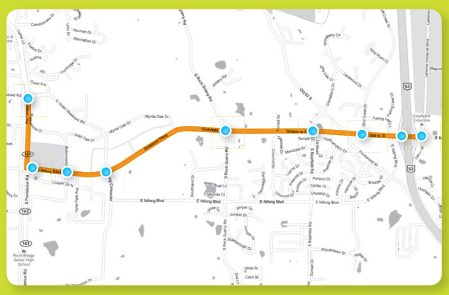
The drivers conducting the travel time used the "floating car method," in which the drivers attempt to travel with the flow of traffic, changing lanes so as to pass as many cars as they are passed by. This method is used so that the travel times collected are representative of the travel time of the average vehicle traveling through the corridor.

Data were gathered by driving the corridor utilizing GPS equipment and software, collecting data, then processing the data using PC-Travel software.

BENEFITS

Calculations are based on an ADT of 27,246 vehicles and an assumption that the change impacts 70% of the ADT. All calculations are based on normal weekday travel and the results indicate approximate benefits to drivers.

	DAILY BENEFIT	ANNUAL BENEFIT
Vehicle Hours of Travel (reduction)	198 hours	62,066 hours
Fuel Consumption (decrease)	208 gallons	65,060 gallons
Stops (eliminated)	28,472 stops	8,907,690 stops
Total Economic Benefit (fuel *$2.50+stops*$0.10+time*$15.00)	**$6,342**	**$1,984,411**



The blue markers indicate the intersections where InSync is deployed. The Grindstone corridor is highlighted in orange.

I've lived in Lenoir Woods for nine years and I drive Grindstone Parkway several times a week. Yesterday a minor miracle occurred. I drove that distance without having to stop for a red light. That contrasts with the thousands of times that I have stopped at each light, or more than 50% of them. When I multiply my past frustrations, time and gasoline times the number of cars that drive that stretch daily, it amounts to an amazing number of hours and dollars. Thank you, thank you to whomever made the changes. Please do not change it back.

Citizen of Columbia, Missouri
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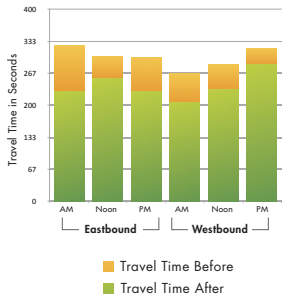
RESULTS

The study evaluates and compares the travel time, number of stops, speed, delay, emissions and fuel consumption before and after the implementation of the InSync system.

Travel Time Reductions



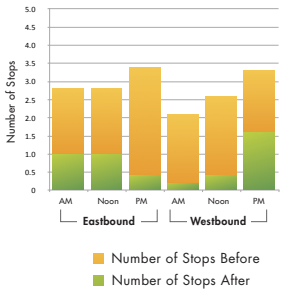
Eastbound

AM Peak	94.9 secs	**29% reduction**
Noon	45.0 secs	**15% reduction**
PM Peak	71.2 secs	**24% reduction**

Westbound

AM Peak	59.6 secs	**22% reduction**
Noon	51.8 secs	**18% reduction**
PM Peak	33.2 secs	**10% reduction**

Stop Reductions



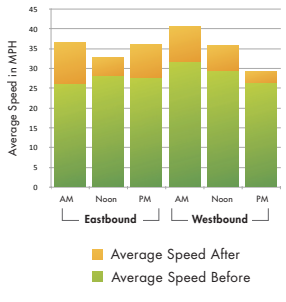
Eastbound

AM Peak	1.8 stops	**64% reduction**
Noon	1.8 stops	**64% reduction**
PM Peak	3.0 stops	**88% reduction**

Westbound

AM Peak	1.9 stops	**90% reduction**
Noon	2.2 stops	**85% reduction**
PM Peak	1.7 stops	**52% reduction**

Average Speed Increase



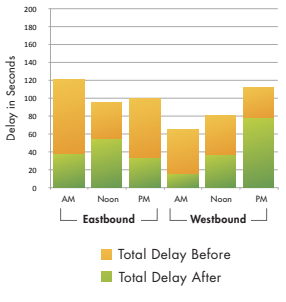
Eastbound

AM Peak	10.7 mph	**41% increase**
Noon	4.9 mph	**18% increase**
PM Peak	8.6 mph	**31% increase**

Westbound

AM Peak	9.1 mph	**29% increase**
Noon	6.5 mph	**22% increase**
PM Peak	3.1 mph	**12% increase**

Delay Reductions



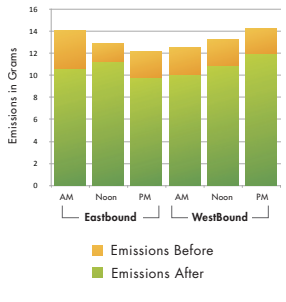
Eastbound

AM Peak	83.5 secs	**69% reduction**
Noon	42.1 secs	**44% reduction**
PM Peak	66.2 secs	**67% reduction**

Westbound

AM Peak	50.0 secs	**77% reduction**
Noon	44.0 secs	**55% reduction**
PM Peak	34.6 secs	**31% reduction**

Hydrocarbon Emission Reductions



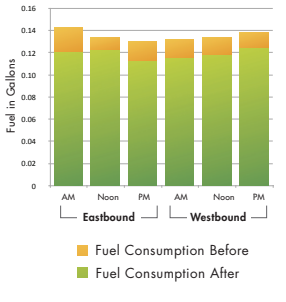
Eastbound

AM Peak	3.5 grams	**25% reduction**
Noon	1.7 grams	**13% reduction**
PM Peak	2.4 grams	**20% reduction**

Westbound

AM Peak	2.5 grams	**20% reduction**
Noon	2.5 grams	**19% reduction**
PM Peak	2.3 grams	**16% reduction**

Fuel Reduction



Eastbound

AM Peak	0.02 gallons	**16% reduction**
Noon	0.01 gallons	**9% reduction**
PM Peak	0.02 gallons	**14% reduction**

Westbound

AM Peak	0.02 gallons	**13% reduction**
Noon	0.02 gallons	**12% reduction**
PM Peak	0.01 gallons	**10% reduction**

MOST NOTEWORTHY IMPROVEMENTS:

- 90% reduction in stops
- 77% reduction in delay
- 41% increase in average speed
- 16% reduction in fuel consumption
- 29% reduction in travel time
- 25% reduction in emissions

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