



104th Avenue traffic signal retiming project: Lowell Boulevard to McKay Road

November 2023

The Denver Regional Council of Governments (DRCOG) leads multijurisdictional partnerships to implement optimized traffic signal timing and coordination on area roadways. Optimized signal timing considers several factors, such as traffic volumes, heavy trucks, pedestrian and bicycling activity, bus stops, hills, turning movements, and time-of-day variations.

Signal timing coordination relies on the use of a common cycle length by a series of signals. The cycle length is the total time to complete one sequence of all movements around an intersection. The start of each intersection's signal cycle is then offset from the previous intersection. The offset is generally equal to the travel time between the intersections. Signal timing coordination progresses vehicle flow at a consistent and safe travel speed. Additionally, it provides predictable gaps in traffic flow to allow cross-street movement.

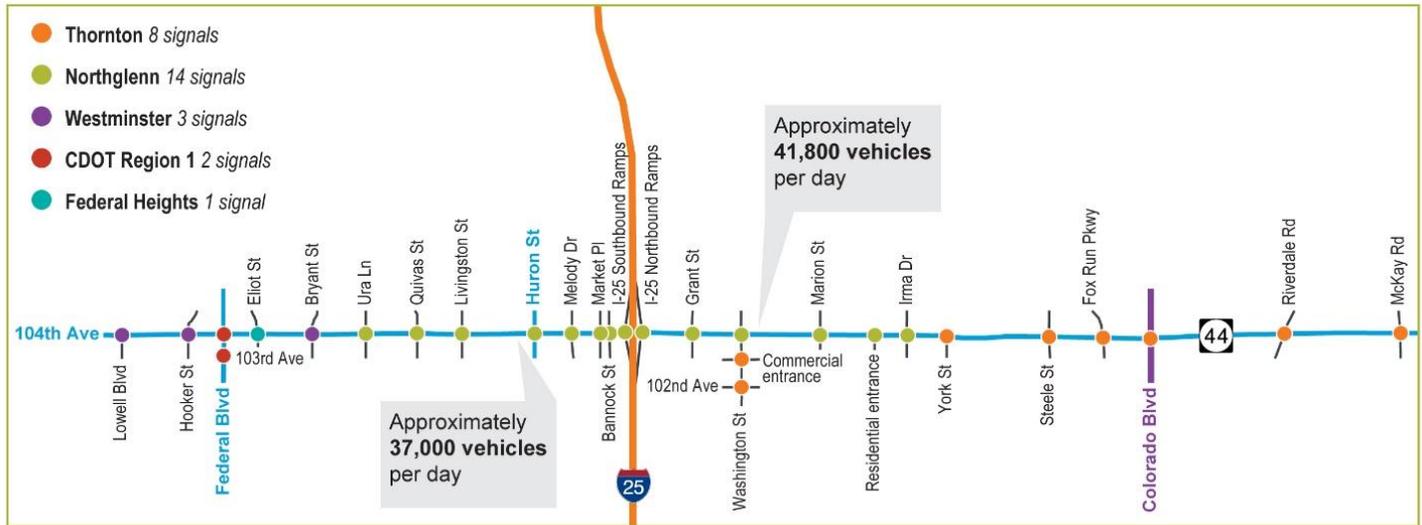
Signal timing optimization reduces fuel use, saves drivers time and money, minimizes greenhouse gas and pollutant emissions, and enhances air quality. The demand and movements of all travelers passing through or crossing at intersections is considered, so that safety is enhanced for all users, including pedestrians, bicyclists and transit patrons.

Federal Funding

DRCOG allocated \$960,000 in federal funds for equipment upgrades within the City of Northglenn. The equipment upgrades provide jurisdiction greater capability to monitor and manage the transportation network.

DRCOG engineering staff used federal funding to develop the signal timing and coordination plans in partnership with the cities of Northglenn, Thornton, Westminster, Federal Heights and the Colorado Department of Transportation.

Project Scope



Project Improvements

To account for variability of traveler volumes (vehicles, pedestrians and cyclists) throughout the day, three signal timing and coordination plans were implemented along the corridor based on time-of-day. Comparing data collected before and after implementation shows marked reduction in delay and the number of stops due to signal operations.

Time Period	Eastbound Delay Reduction	Westbound Delay Reduction	Eastbound Reduction in Stops	Westbound Reduction in Stops
6:00 - 9:00 a.m.	3%	18%	22%	41%
9:00 a.m. - 3:00 p.m.	18%	23%	45%	70%
3:00 - 7:00 p.m.	17%	9%	42%	32%

The operations improvements resulted in the following benefits.

Performance Measures	Annual Reduction
Intersection delay	304,000 Hours
Fuel consumption	232,000 Gallons
Time and fuel costs	\$10.11 million
Greenhouse gas emissions	2,021 tons
Pollutant emissions	24 tons

