

# Highway-Rail Grade Crossings: Prioritization and Next Steps in the Chicago Region

January 28, 2020

# Grade Crossings

The Grade Crossing Issue  
Research and Analysis  
Prioritization  
Next Steps



# The Grade Crossing Issue



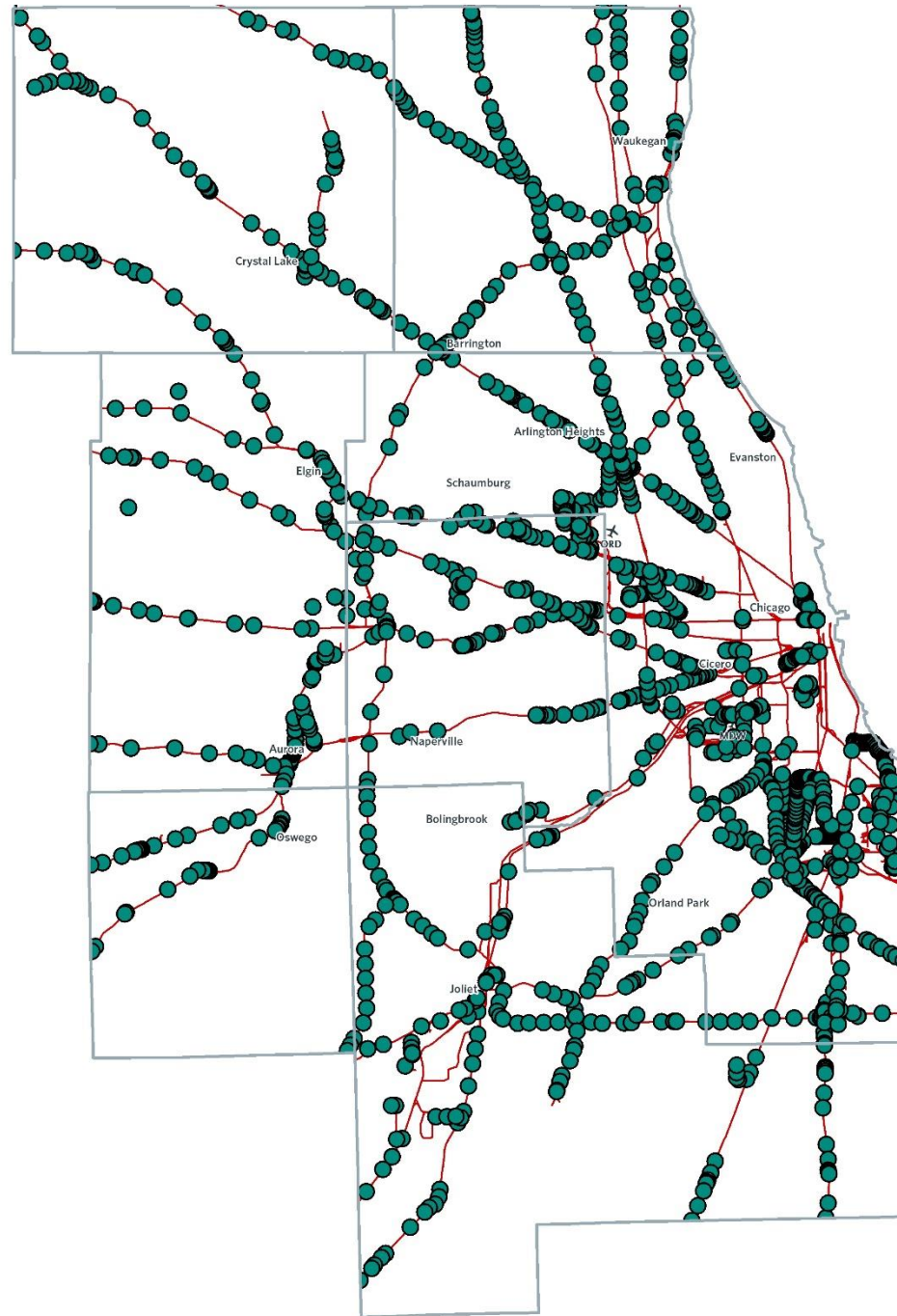


# Highway-Rail Grade Crossings

- Grade Crossings
- Railroads

Sources: ICC, FRA, CMAP

**There are 1,646 highway-rail grade crossings and more than 1200 daily trains in the 7-county Chicago region.**



# Regional Indicator: Motorist Delay

Indicator:  
Motorist delay at highway-rail  
grade crossings

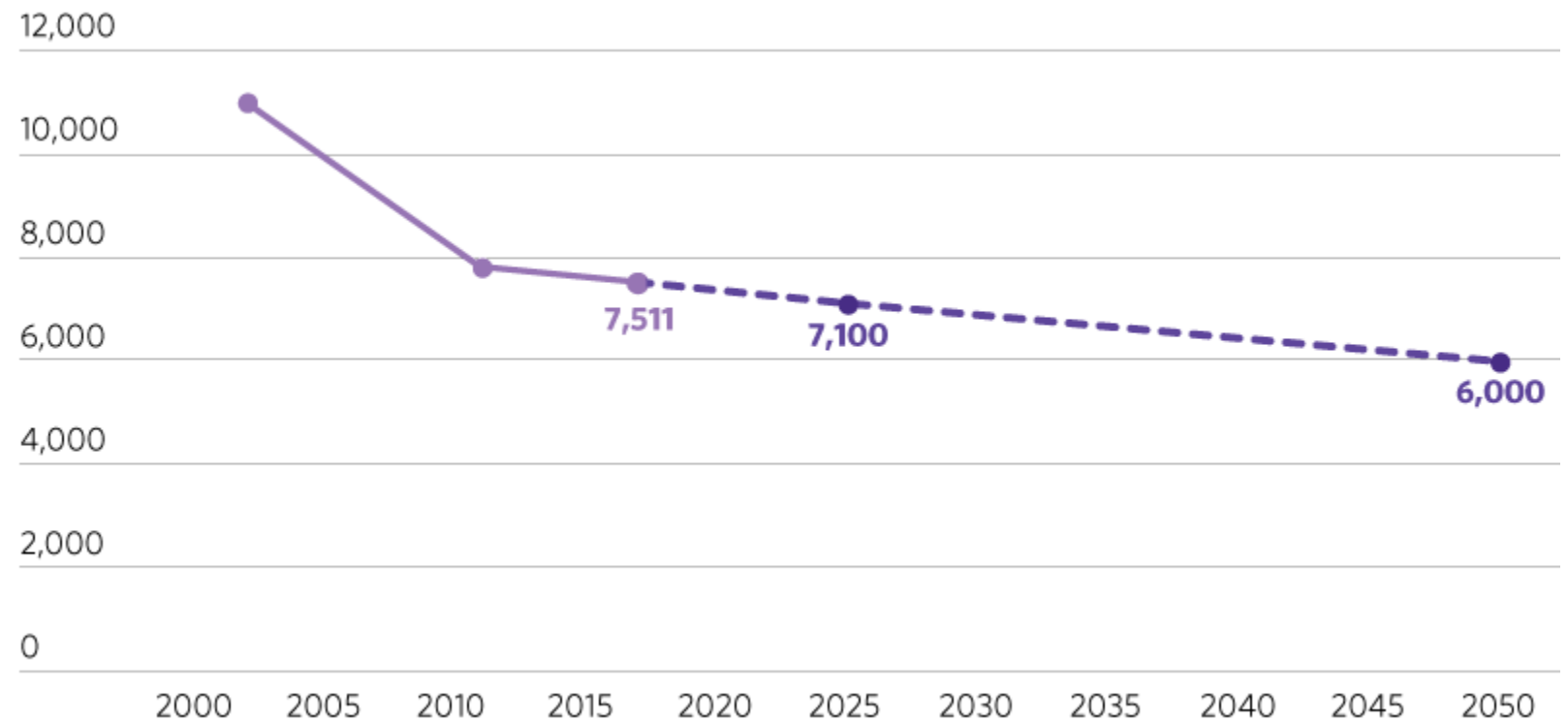
Key:

Actual

Target

Source: CMAP analysis of Illinois  
Commerce Commission data

Hours of Delay per Weekday



# Long Closures Are a Major Issue

- Regional policy and investment is geared toward reducing average delay
- But gate blockages that are longer than 10 minutes are commonplace.
- There are few policy levers available to address such long blockages.
- There is no mechanism in place to identify these regionwide
- CN data (required by STB) provided insight, but only for a short time.

# Long Closures Are a Major Issue

Number of 2015 CN/EJE Closures Longer than 10 Minutes for Selected Crossings:

- Washington St (Joliet) 1,231
- Liberty Street (Aurora): 971
- Main Street (Matteson): 632
- Rowell Lane (Joliet): 611
- Oakland Ave (Joliet): 597
- Hawthorne Lane (West Chicago): 550
- Church Street (West Chicago): 392
- Washington Street (West Chicago): 352

# Pedestrian Safety and Delay





# Research and Analysis



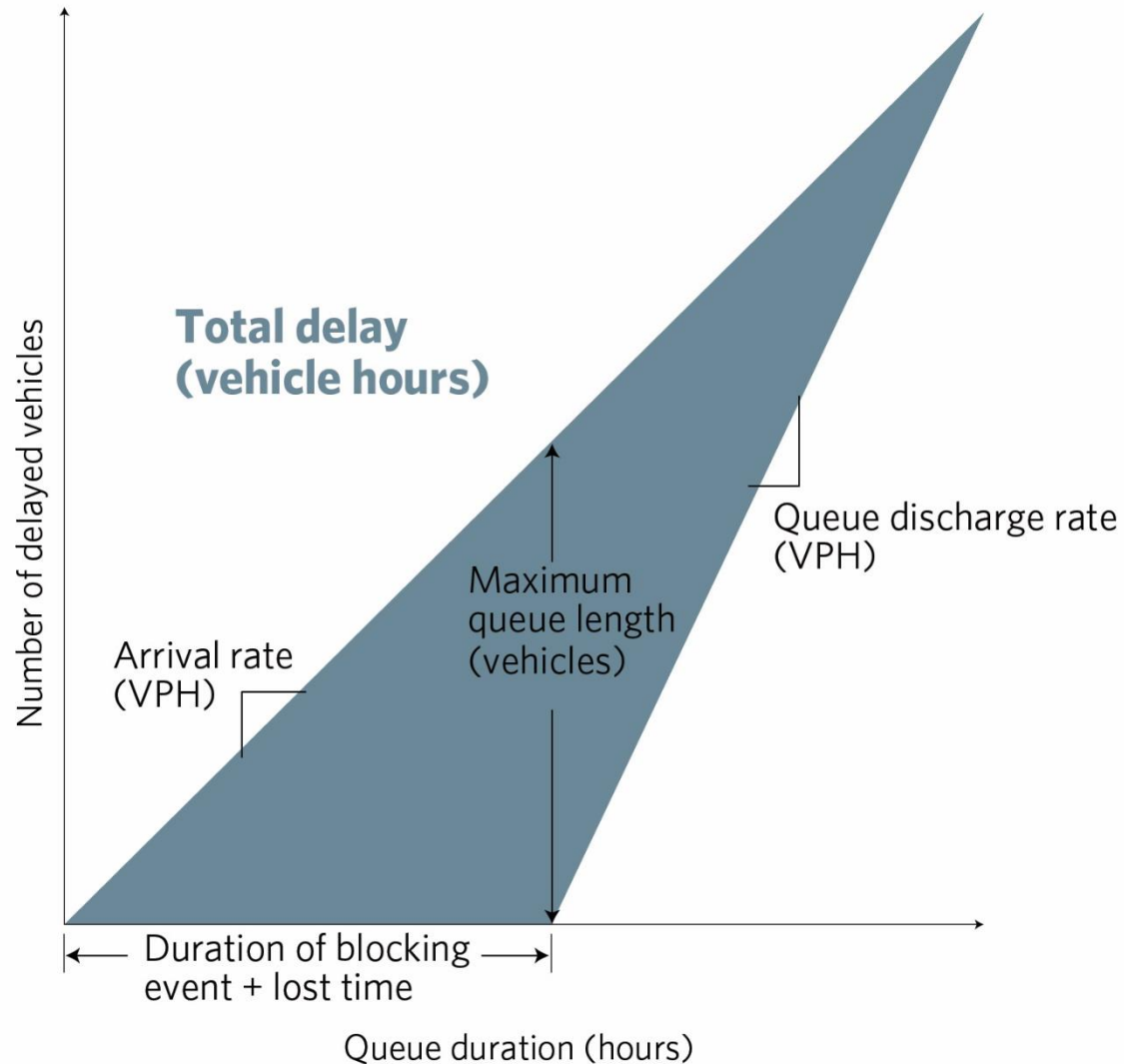


# New Method for Estimating Delay

## Estimating grade crossing delay

Note: VPH means "vehicles per hour."

Source: Chicago Metropolitan Agency for Planning analysis of Okitsu, Louie, and Lo, "Simulation-Free Railroad Grade Crossing Delay Analyses," 2010.



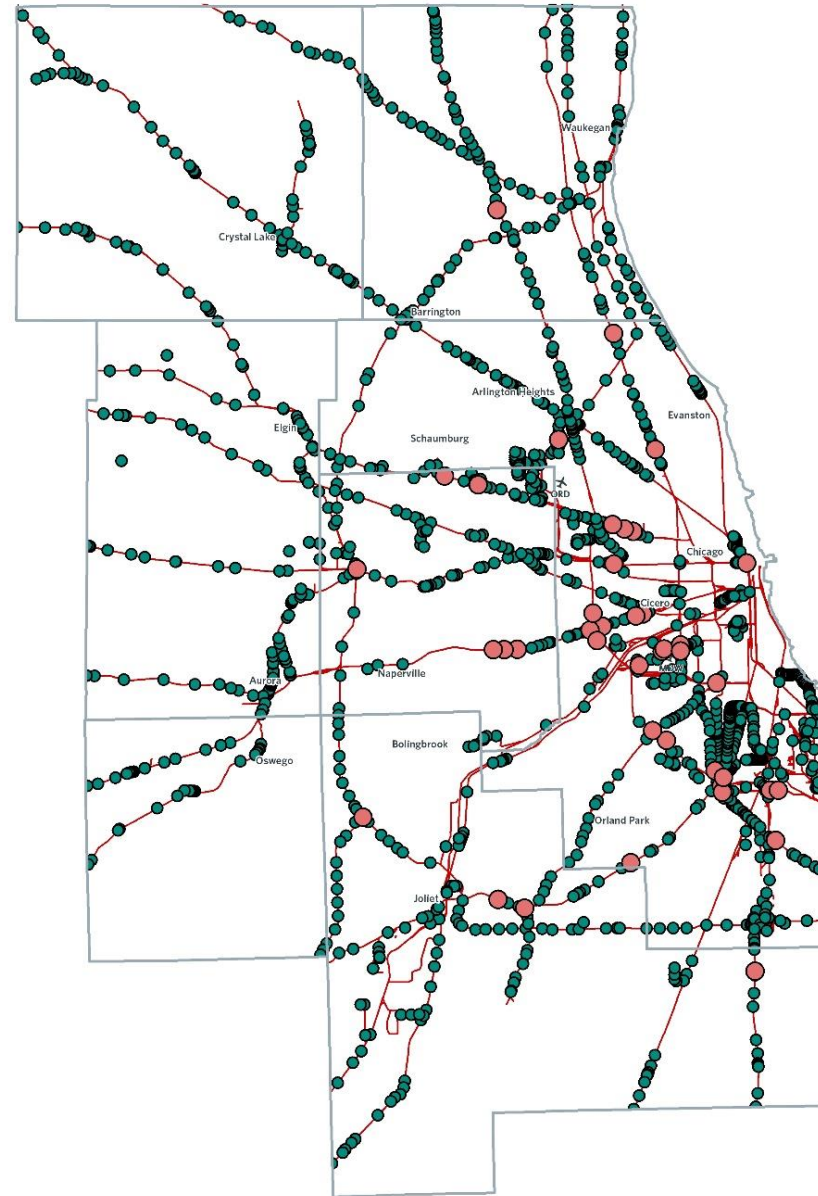
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## Highway-Rail Grade Crossings

- Grade Crossings
- Data Collection Sites
- Railroads

Sources: ICC, FRA, CMAP

Data was collected over two summers at 40 sites, primarily by summer interns.



# Crossing Performance Data

- Saturation flow rate, a measure of capacity, is approximately 1,348 passenger cars per hour (682 observations).
- Actual queue discharge rates for freight train blockages, taking into account the traffic mix, are 1,317 passenger car equivalents per hour for one lane per direction (268 observations) and 2,249 passenger car equivalents per hour for two lanes (323 observations).
- The average duration of the crossing blockages for freight trains was 6:39; the average queue clearance duration was 1:21 (601 observations).

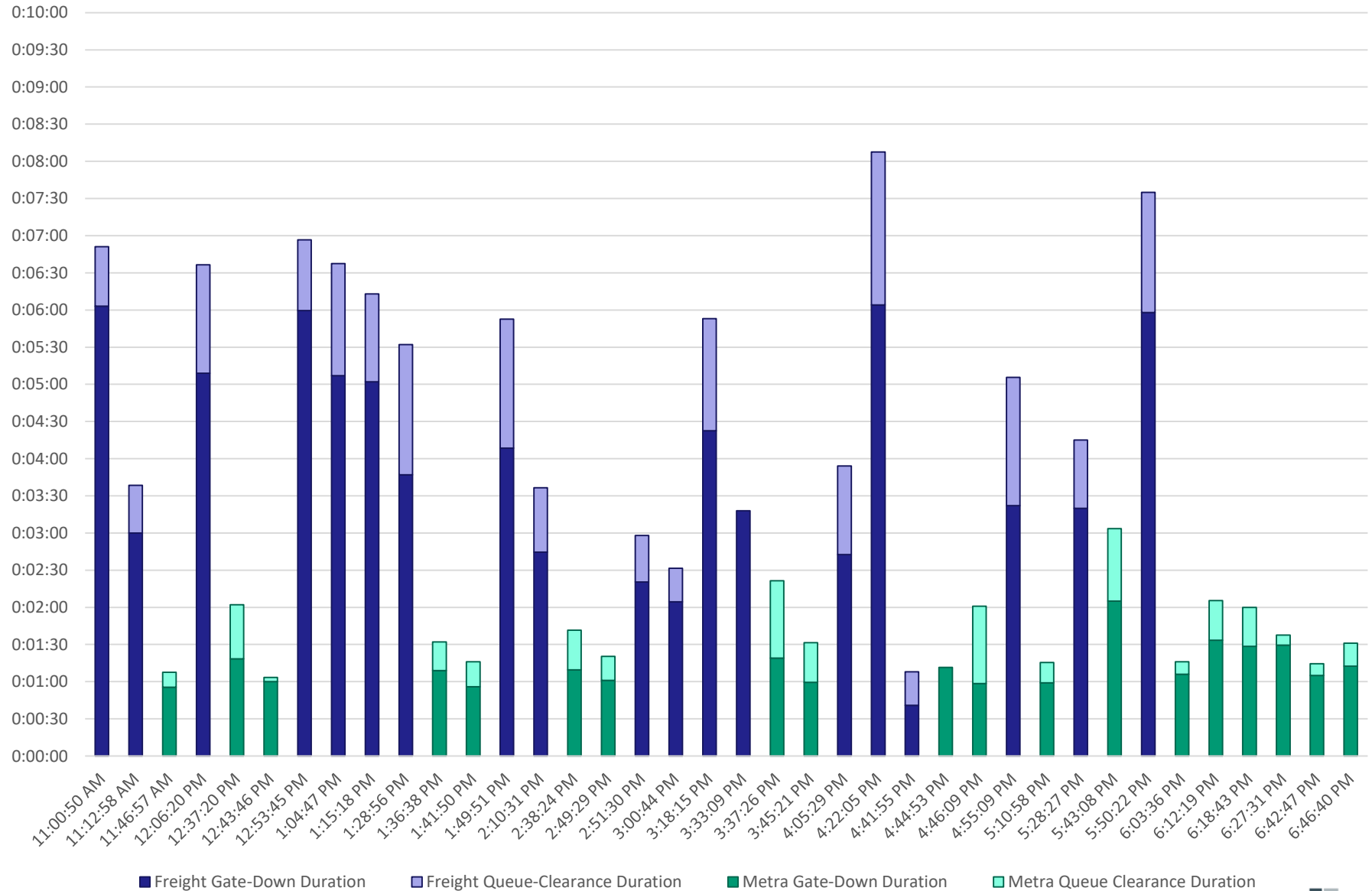


Crossings 174973G, 260541T - Washington St. UP/CN (West Chicago)  
 Gate-Down and Queue-Clearance Durations by Type (Minutes, 2017)

Freight trains are slower than expected.

Queue-clearance times are substantial.

At this crossing, ICC-estimated average gate-down times were 1:00 for Metra trains and 2:24 for freight trains.



■ Freight Gate-Down Duration   ■ Freight Queue-Clearance Duration   ■ Metra Gate-Down Duration   ■ Metra Queue Clearance Duration

# FRA Data Collection

- Crowd sourcing blocked-crossing data
- “FRA will share the information with stakeholders, using it to help facilitate local solutions to blocked crossing issues.”
- [www.fra.dot.gov/blockedcrossings](http://www.fra.dot.gov/blockedcrossings)

# Results: Motorist Delay per Crossing

Average of Old Estimates of Delay

**46 hours**  
**per**  
**weekday**

Range 2 - 182

Average of New Estimates of Delay

**120 hours**  
**per**  
**weekday**

Range 2 - 430

Percent Change

**↑ 160%**



# Prioritization

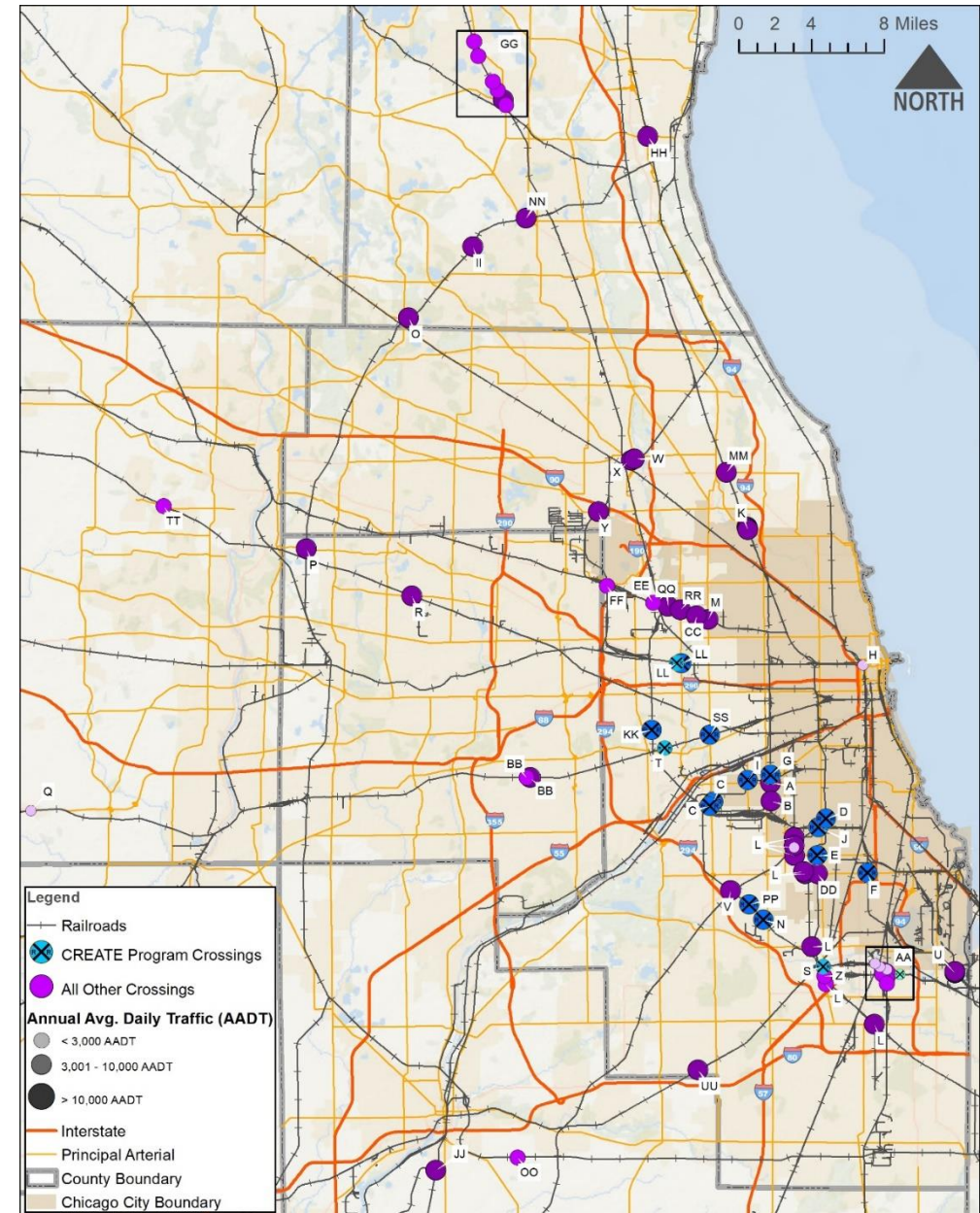




# Grade Crossing Prioritization

Numeric analysis of all 1646 crossings:

- estimate of crossing delay
- estimate of crash risk
- truck exposure
- transit impact
- initial analysis of likely impacts
- status of project development

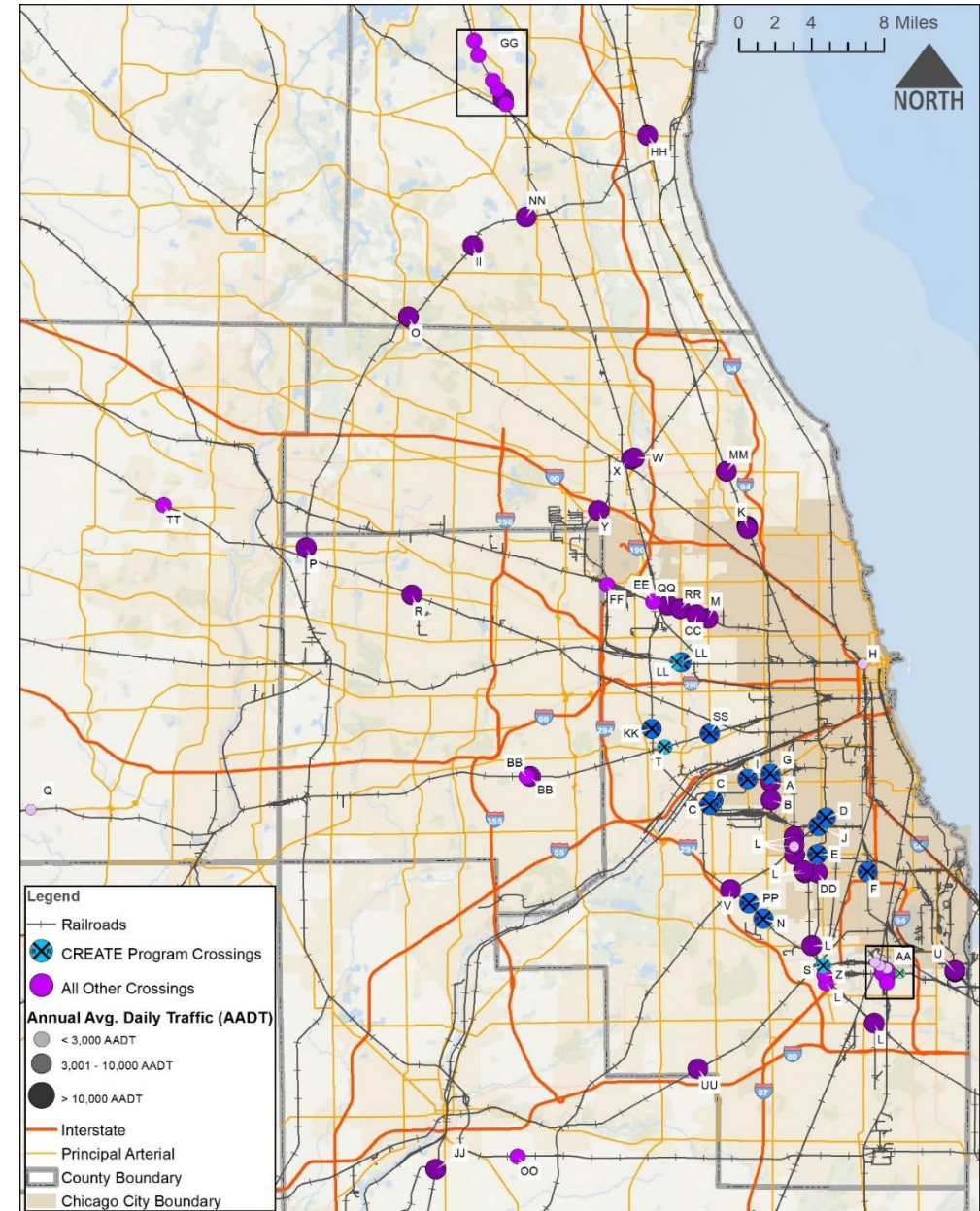


# Grade Crossing Prioritization

Qualitative review of top 150 crossings:

- focus on grade separations
- detailed review of each crossing by five public agencies
- initial analysis of likely impacts
- status of project development, if any
- review and comment by stakeholders

Result: 47 prioritized locations





# Next Steps





# How to Reduce Crossing Delay (1)

Improve rail-system performance (speed up trains).

- High-capital investment rail-to-rail separations
- Low-capital investment track, rail traffic signals, and crossovers, e.g., WA-11 in Dolton and Riverdale
- Terminal improvements to reduce switching and dead-heads
- Operations (Chicago Transportation Coordinating Office)

Carload transit times have been reduced to 29 hours in 2019 (*AAR*), down from 43 hours in 2003 (*Thompson Interview, DC Velocity*).



# How to Reduce Crossing Delay (2)

## Highway improvements:

- Consolidate problematic crossings
- Reroute highway traffic to better-performing crossings (ITS)
- Traffic flow improvements near grade crossings
- Access management near grade crossings
- Highway traffic signal improvements, focusing on central communications

## Pedestrian separations

Full grade separations (but full separations for all prioritized crossings would cost billions of dollars)

# Next Steps

Initiate grade crossing feasibility studies:

- Public engagement
- Define purpose and need
- Identify alternatives
- Screen alternatives
- Using Planning and Environmental Linkages process.

Because of the cost and disruption association with grade separations, some of these studies will likely recommend lower levels of investment than full grade separations.



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[www.cmap.illinois.gov/onto2050](http://www.cmap.illinois.gov/onto2050)

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