Illinois Statewide Congestion Analysis Study - Transit Performance

CLIENT:
Illinois Department of Transportation

CONTACT:
Karen Shoup, AIA, LEED AP
Bureau Chief, Urban Program Planning

CONTRACT:
PTB 168, Item 29 - $1.49 million

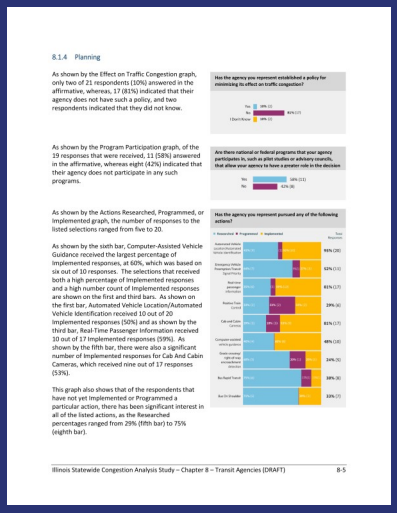
PROJECT PURPOSE:

- Identify Use and Application of Transit Performance Measures
- Assess Use and Application of Performance Measures by Transit Agencies
- Evaluate Travel Time Differences Between General Traffic and Transit Routes
- Evaluate How Travel Time is Affected by Transit Service Types
- Identify Opportunities to Improve Transit Performance Using Travel Time Data

DAMA Consultants, Inc., conducted surveys of transit agencies in Illinois to determine how performance measures are calculated for the agencies and how performance measures are used by the agencies to improve on-time performance; evaluate capital planning, scheduling, and operational decisions; develop required reporting for state and federal agencies; and promote their services to commuters and other potential users.

DAMA developed transit travel time (TTR) performance measures using GPS-based automated transit vehicle locator (AVL) data and the FHWA National Performance Management Research Data Set (NPMRDS) to compare travel times between general traffic and fixed route bus services. NPMRDS provided estimates of travel times in each direction for roadway segments around the state at 5 minute intervals; AVL data provided estimates of the running time between route timepoints on CTA and Pace fixed route bus runs. DAMA also estimated the ratios for Pace routes operating on Chicago-area expressways.

The initial analysis of these data sources suggest that CTA AVL data is estimating higher bus speeds than general traffic speeds along several routes during peak hours. Some of these results might align with transit signal priority installations and other factors. Pace AVL data estimates that most routes are operating slower than general traffic speeds during peak hours—including some segments that are operating as part of bus-on-shoulder services on Chicago-area expressways. The time periods covered by the available Pace AVL data did not provide estimates for all fixed routes. Pace also implemented operational changes during the study Periods including bus-on-shoulder services.


8.1.4 Planning

As shown by the Effect on Traffic Congestion graph, only two of 21 respondents (10%) answered in the affirmative, whereas, 17 (81%) indicated that their agency does not have such a policy, and two respondents indicated that they did not know.

Has the agency you represent established a policy for minimizing its effect on traffic congestion?

As shown by the Program Participation graph, of the 19 responses that were received, 11 (58%) answered in the affirmative, whereas eight (42%) indicated that their agency does not participate in any such programs.

Are there national or federal programs that your agency participates in, such as pilot studies or advisory councils, that allow your agency to have a greater role in the decision

As shown by the Actions Researched, Programmed, or Implemented graph, the number of responses to the listed selections ranged from five to 20.

As shown by the sixth bar, Computer-Assisted Vehicle Guidance received the largest percentage of Implemented responses, at 60%, which was based on six out of 10 responses. The selections that received both a high percentage of Implemented responses and a high number count of Implemented responses are shown on the first and third bars. As shown on the first bar, Automated Vehicle Location/Automated Vehicle Identification received 10 out of 20 Implemented responses (50%) and as shown by the third bar, Real-Time Passenger Information received 10 out of 17 Implemented responses (59%). As shown by the fifth bar, there were also a significant number of Implemented responses for Cab And Cabin Cameras, which received nine out of 17 responses (53%).

This graph also shows that of the respondents that have not yet Implemented or Programmed a particular action, there has been significant interest in all of the listed actions, as the Researched percentages ranged from 29% (fifth bar) to 75% (eighth bar).

Has the agency you represent pursued any of the following actions?

Illinois Statewide Congestion Analysis Study – Chapter 8 – Transit Agencies (DRAFT) 8-5

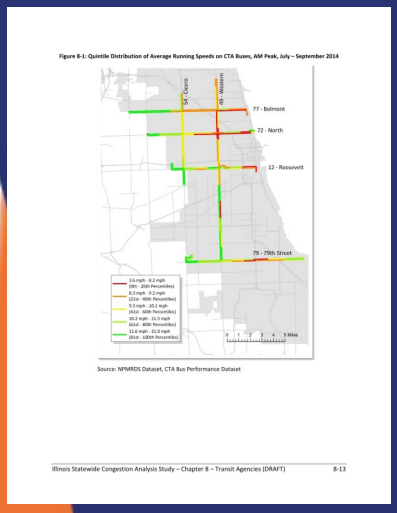


Figure 8-1: Quintile Distribution of Average Running Speeds on CTA Buses, AM Peak, July – September 2014

Illinois Statewide Congestion Analysis Study – Chapter 8 – Transit Agencies (DRAFT) 8-13

Pace Local Bus Routes					TTR Values – PM Peak		
Route	Route Name	Segment ID	From	To	JUL 2014	AUG 2014	SEP 2014
307	Harlem Avenue	2002	63rd Street	Archer Avenue	1.56	1.48	1.51
307	Harlem Avenue	2003	Archer Avenue	Ogden Avenue	1.37	1.40	1.40
307	Harlem Avenue	2005	Ogden Avenue	Cermak Road	1.75	1.78	1.66
307	Harlem Avenue	2006	Cermak Road	CTA Green Line	1.40	1.43	1.35
307	Harlem Avenue	2007	CTA Green Line	North Avenue	1.77	1.70	1.67
307	Harlem Avenue	2008	North Avenue	Grand Avenue	1.47	1.47	1.23
307	Harlem Avenue	2502	Grand Avenue	North Avenue	0.94	0.89	0.85
307	Harlem Avenue	2503	North Avenue	CTA Green Line	1.66	1.66	1.63
307	Harlem Avenue	2504	CTA Green Line	Cermak Road	1.54	1.53	1.52
307	Harlem Avenue	2506	Cermak Road	Ogden Avenue	1.60	1.67	1.60
307	Harlem Avenue	2507	Ogden Avenue	Archer Avenue	1.30	1.40	1.33
307	Harlem Avenue	2508	Archer Avenue	63rd Street	1.19	1.23	1.15

	JUL 2014	AUG 2014	SEP 2014	Overall
AM Peak	1.35	1.32	1.24	1.30
PM Peak	1.39	1.36	1.33	1.36

Source: Pace Bus Performance Dataset

The above TTR values appear to correspond to TCQSM expected values, with only one segment (1099) observing values higher than 2.0 in this analysis. As shown, during the months of July 2014 and August 2014, the AM Peak values for this Golf Road to Lake Road segment recorded values of 2.47 and 2.42, respectively. However, as this segment was artificially assembled by assuming constant speed and extracting values only from the portions of route No. 270 that fell on Milwaukee Avenue (the route deviates from the arterial road system and TMC coverage), these values may be suspect.

Five segments recorded values lower than 1.0, during the AM Peak. For route No. 270 (Milwaukee Avenue), these are segments 1002 (0.97 in September 2014), 1003 (0.91 in September 2014), 1006 (0.99 in July 2014 and 0.88 in September 2014), and 1505 (0.82 in July 2014, 0.74 in August 2014, and 0.66 in September 2014). For route No. 307 (Harlem Avenue), the applicable segment is 2502 (0.94 in July 2014, 0.92 in August 2014, and 0.86 in September 2014).

Three segments recorded values lower than 1.0, during the PM Peak. For route No. 270 (Milwaukee Avenue), these segments are 1006 (0.98 in August 2014) and 1505 (0.70 in July 2014, 0.66 in August 2014, and 0.73 in September 2014). For route No. 307 (Harlem Avenue), the applicable segment is 2502 (0.94 in July 2014, 0.89 in August 2014, and 0.85 in September 2014).

Values less than 1.0 indicate that bus speed is faster than general traffic speed, which could suggest that a low number of stops are being made in those locations or that field conditions favor the lane of bus travel (right lane) compared to the other general traffic lane. These conditions could potentially exist on four lane roads with high volumes of left turning vehicles but without dedicated left turn lanes. However, upon observation there was no obvious relationship between low TTR values and the geometric layout of the road. PM Peak TTR values are slightly greater in value compared to AM Peak TTR values, with an overall average value 4.6% higher (1.36/1.30).

Illinois Statewide Congestion Analysis Study – Chapter 8 – Transit Agencies (DRAFT) 8-24