Transit Data and Performance Measurement

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Telling the transit story with data

• Our customers tell us that speed and reliability are vitally important
• How do we use data and performance measures to address these needs?
• How do we use data to partner with cities?

1. Headway performance
2. Transit mode split / throughput
3. Transit vehicle speed analysis tools
Alternative measures of service reliability

• On-time performance tells only part of the story
• What other options do we have?
• Key considerations
  – Reveal a different perspective
  – Reflect customer experience
  – Easy to understand
  – Feasible with available data
Headway Performance

• Focus on **Gaps** in service

• Metric: Percent of observed headways within 140 percent of scheduled headway

• Example: 10 minute service, less than 14 minute gap
Metro Transit High Frequency Bus Service
Service Reliability

On-Time Performance
Gap < 140% of headway
Gap < 120% of headway
Metro Transit A Line Rapid Bus Service Reliability

Gap < 140% of headway
Gap < 120% of headway
On-Time Performance

Construction

Gap < 140% of headway
Gap < 120% of headway
On-Time Performance
Downtown Minneapolis Express Bus Network

- **I-35W North**
  - 185 trips
  - 5,500 rides

- **I-35W South**
  - 606 trips
  - 13,750 rides

- **I-94 West**
  - 436 trips
  - 12,750 rides

- **I-94 East**
  - 183 trips
  - 5,500 rides

- **Marq2 corridor**

- **4th Street**

- **11th Street**
4th Street at 2nd Ave N.
4th Street
Bus mode split

6:45 a.m. –
8:45 a.m.:
4th St

52% of
corridor
users

4% of
corridor
vehicles

4th Street at 2nd Ave N.
11th Street
Bus mode split

4 p.m. – 6 p.m.: westbound 11th St

51% of corridor users

4% of corridor vehicles

11th Street at Hennepin
Hennepin Avenue Corridor
Hennepin Avenue – Peak Mode Split

49% of corridor users

8 a.m.:
- northbound Hennepin at 26th St
- 3% of corridor vehicles

45% of corridor users

4 p.m.:
- southbound Hennepin at 25th St
- 2% of corridor vehicles
Transit Vehicle Speed Calculation

- Vehicle locations reported every 6 to 20 seconds
- Calculate distance and speed along route section
- Aggregate observations to see average speeds
- Requires significant investment in data management

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\begin{align*}
\text{Distance} & = \frac{50 \text{ m}}{6 \text{ sec}} = 30 \text{ kph} \\
\text{Distance} & = \frac{30 \text{ m}}{6 \text{ sec}} = 18 \text{ kph}
\end{align*}
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Northbound Hennepin Average Speed

Morning Peak

Midday
Direction of travel

Speed by Distance - Median and 60% Confidence Interval

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