Traffic Signal Warrants: An Overview

John Less, PE, PTOE
Road Design Office / Traffic Squad
Presentation Goals:

- Background
- Structure
- Description
The Source in the USA:

Manual on Uniform Traffic Control Devices for Streets and Highways
2009 Edition
Purpose

- Standardization
- Efficiency
- Evolving
- mutcd.fhwa.gov
Authority

- Engineers
  - Ethics
  - Malpractice

- Public Agencies
  - Liability
  - Loss of Federal Funding
Traffic Signal Warrants

Traffic Volumes

Safety

Special Cases
Traffic Volume Warrants

- Total Intersection Volume (1A & 2)
- Delay on Side Road (1B)
- Combination Warrant (1C)
Safety Warrants

- Pedestrian Volume Warrant (4)
- School Crossing Warrant (5)
- Crash Experience Warrant (7)
- Railroad Crossing Warrant (9)
Special Cases

- Peak Hour Warrant (3)
- Coordinated Signal System Warrant (6)
- Roadway Network Warrant (8)
US16B (Elk Vale Rd.) & E. Minnesota St. Traffic Signal Warrant Study

Jon Suomala
Acting Rapid City Region Traffic Engineer
Intersection History

- 2007 – Elk Vale Rd Construction Completed
- 2010-2012 – E Minnesota St Completed
- 2011 – New Subdivision Construction Begins
- 2013 – Apartment Construction Begins
Turning Movement Counts Taken

- April 24, 2013
- June 10, 2014
- April 14, 2016
- August 24, 2016
Signal Warrant Study Results

- April 24, 2013 – Signal Not Warranted
- June 10, 2014 – Signal Not Warranted
- April 14, 2016 – Signal Not Warranted
- August 24, 2016 – Signal Warranted
Signal Warrant Study Results

- August 24, 2016 – **Signal Warranted**
- **Safety Warrants**
  - Warrant 4 – Pedestrian Volume: **Not Applicable**
  - Warrant 5 – School Crossing: **Not Applicable**
  - Warrant 7 – Crash Experience: **Not Satisfied**
  - Warrant 9 – Railroad Crossing: **Not Applicable**
Signal Warrant Study Results

- August 24, 2016 – **Signal Warranted**
- Special Cases
  - Warrant 3 – Peak Hour: **Not Applicable**
  - Warrant 6 – Coordinated Signal System: **Not Applicable**
  - Warrant 8 – Roadway Network: **Not Applicable**
Signal Warrant Study Results

• August 24, 2016 – **Signal Warranted**
  • Traffic Volume Warrants:
    • Warrant 1A – 8 Hour Vehicular Volume: **Not Satisfied**
    • Warrant 1B – Delay on Side Road: **Not Satisfied**
    • Warrant 1C – Combination of 1A and 1B: **Not Satisfied**
    • Warrant 2 – 4 Hour Vehicular Volume: **Satisfied**
Signal Warrant Study Results

- **August 24, 2016** – **Signal Warranted**
- **Warrant 2** – Total Intersection Volume: **Satisfied**
  - The Four-Hour Vehicular Volume signal warrant is applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal. This warrant is satisfied when, for any four hours of the day, the plotted points representing the total vehicles per hour on both the approaches of major road and the corresponding vehicles per hour on the higher-volume approach of minor road (one direction only) fall above the appropriate curve of Figure 4C-2 of the 2009 MUTCD. Four hours of the existing traffic volumes are above the appropriate curve therefore, this warrant is satisfied.
Signal Warrant Study Results

- August 24, 2016 – **Signal Warranted**
- Warrant 2 – Total Intersection Volume: **Satisfied**
- Four hours of the existing traffic volumes are above the appropriate curve

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**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**

*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.*
Signal Warrant Study Results

- August 24, 2016 – **Signal Warranted**
- Warrant 2 – Total Intersection Volume: **Satisfied**
- Four hours of the existing traffic volumes are above the appropriate curve
Thank You!

John Less  
john.less@state.sd.us

Jon Suomala  
jon.Suomala@state.sd.us