Appendix B

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Memo

To:	City of Rapid City, South Dakota Department of Transportation		
From:	Mark Tuch, EI; Courtney Sokol, PE Tara Kramer, PE	Project:	Sheridan Lake Road- Jackson Boulevard to Deadwood Avenue
CC:			
Date:	June 29, 2007	Job No:	54618

RE: Sheridan Lake Road Traffic Volume Forecasts and Operational Analysis

Introduction

This memo summarizes the traffic forecasts and analysis performed for the Sheridan Lake Road proposed extension to Deadwood Avenue in Rapid City, South Dakota. Both the off-peak season and the peak season were analyzed during the AM and PM peak hours for 14 study area intersections. Existing conditions (2007) and future conditions (2030) were analyzed, including two build scenarios and a No-Build scenario. Additionally, improvements were recommended, including turn lane storage needs. The build scenarios include the Extension of Sheridan Lake Road to W. Chicago Street and the Extension of Sheridan Lake Road to Deadwood Avenue.

Traffic Volume Data Collection and Forecasting Methodology

Existing 2007 AM and PM peak hour volumes for the 14 study area intersections were counted by HDR during the month of February. The AM peak hour was determined to be 7:30-8:30 while the PM peak hour was determined to be 3:45-4:45. These counts were balanced between intersections as necessary for continuity. The balanced counts were then adjusted using 2006 seasonal factors obtained from the South Dakota Department of Transportation (SDDOT) to develop the off-peak season and peak season AM and PM peak hour volumes. The seasonal factors used for these adjustments are shown in **Table 1**. The factors listed for the month of June were selected to represent the peak season.

Table 1. 2006 Seasonal Factors

Month	Urban Arterials	Urban Collectors
February	0.98	0.98
June	0.86	0.89

Year 2007 AM and PM peak hour traffic volumes were developed for 6 scenarios:

- 2007 AM and PM Peak Hour Off-Peak Season, No-Build
- 2007 AM and PM Peak Hour Peak Season, No-Build
- 2007 AM and PM Peak Hour Off-Peak Season, Sheridan Lake Road Extension to W. Chicago Street
- 2007 AM and PM Peak Hour Peak Season, Sheridan Lake Road Extension to W. Chicago Street
- 2007 AM and PM Peak Hour Off-Peak Season, Sheridan Lake Road Extension to Deadwood Avenue
- 2007 AM and PM Peak Hour Peak Season, Sheridan Lake Road Extension to Deadwood Avenue

The Rapid City Metropolitan Planning Organization provided TransCAD model files for year 2000 and year 2025. The travel demand model was originally calibrated to a base year of 2000. Average daily traffic volumes (ADTs) were developed for 6 scenarios:

- Year 2000 No-Build ADT
- Year 2000 Sheridan Lake Road Extension to W. Chicago Street ADT

- Year 2000 Sheridan Lake Road Extension to Deadwood Avenue ADT
- Year 2025 No-Build ADT
- Year 2025 Sheridan Lake Road Extension to W. Chicago Street ADT
- Year 2025 Sheridan Lake Road Extension to Deadwood Avenue ADT

Based on the growth trends between the 2000 and 2025 model assignments, 2007 and 2030 ADTs were developed. Peak hour volumes were developed utilizing k-factors (peak factor) and d-factors (directional factor) from the existing conditions scenarios. 2030 AM and PM peak hour volumes were developed for six scenarios:

- 2030 AM and PM Peak Hour Off-Peak Season, No-Build
- 2030 AM and PM Peak Hour Peak Season, No-Build
- 2030 AM and PM Peak Hour Off-Peak Season, Sheridan Lake Road Extension to W. Chicago Street
- 2030 AM and PM Peak Hour Peak Season, Sheridan Lake Road Extension to W. Chicago Street
- 2030 AM and PM Peak Hour Off-Peak Season, Sheridan Lake Road Extension to Deadwood Avenue
- 2030 AM and PM Peak Hour Peak Season, Sheridan Lake Road Extension to Deadwood Avenue

Operational Analysis

The off-peak season and peak season volumes were analyzed using the software package Synchro. Existing signal timings were obtained from the City of Rapid City and were input into Synchro for the 2007 conditions. Synchro replicates the analysis procedures defined in the *2000 Highway Capacity Manual*. This manual provides procedures for the analysis of both signalized and unsignalized intersections. Level of service (LOS) 'C' has generally been established as the standard for the planning of transportation facilities for peak hour traffic conditions. For this study, intersections with LOS 'D' or worse were considered deficient for the off-peak season conditions. However LOS 'D' was considered acceptable for the peak season conditions. Due to the number of reports, the Synchro output reports are available upon request.

Signal Warrant Analyses

Traffic signal warrant analyses were performed utilizing Warrant 3 (Peak Hour Vehicular Volume Warrant) from the *2003 Manual on Uniform Traffic Control Devices (MUTCD)*. The analyses were performed for three intersections:

- W. Chicago Street/St. Onge (Currently unsignalized)
- W. Chicago Street/Sheridan Lake Road (New intersection under build conditions)
- Sheridan Lake Road/Deadwood Avenue (New intersection under build conditions)

The signal warrant analyses show that signals would be warranted at all three intersections in the Year 2030. Under the Year 2007 build conditions Sheridan Lake Road/Deadwood Avenue would warrant a signal. The signal warrant analyses are shown in **Figures 1, 2 and 3** for W. Chicago Street/St. Onge, W. Chicago Street/Sheridan Lake Road, and Sheridan Lake Road/Deadwood Avenue, respectively.

Storage Lane Lengths

A Poisson distribution at a 95 percent confidence level was used to determine storage lane lengths for the study intersections based on the worst case peak hour and corresponding cycle length. The recommended storage bay lengths for the volume and geometric scenarios analyzed are shown in **Figures 4 - 21**.

Existing Conditions (2007) Analysis Results

2007 Off-Peak Season No-Build

The 2007 peak hour No-Build conditions were evaluated for the off-peak season. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 2 and 3**, respectively. The 2007 Off-Peak Season No-Build geometrics, intersection operations, and peak hour volumes are shown in **Figure 4**. All signalized intersections operate at LOS 'C' or better. Most of the stop controlled approaches of the existing unsignalized intersections operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'D' during the AM peak hour
  - SB Approach – LOS 'D' during the PM peak hour
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

2007 Off-Peak Season Sheridan Lake Road Extension to W. Chicago Street

The 2007 peak hour Sheridan Lake Road Extension to W. Chicago Street conditions were evaluated for the off-peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to W. Chicago Street. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 2 and 3**, respectively. The 2007 Off-Peak Season Sheridan Lake Road Extension to W. Chicago Street geometrics, intersection operations, and peak hour volumes are shown in **Figure 5**. All signalized intersections would operate at LOS 'C' or better. Most of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'D' during the AM peak hour
  - SB Approach – LOS 'D' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' during the PM peak hour

2007 Off-Peak Season Sheridan Lake Road Extension to Deadwood Avenue

The 2007 peak hour Sheridan Lake Road Extension to Deadwood Avenue conditions were evaluated for the off-peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to Deadwood Avenue. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 2 and 3**, respectively. The 2007 Off-Peak Season Sheridan Lake Road Extension to Deadwood Avenue geometrics, intersection operations, and peak hour volumes are shown in **Figure 6**. All signalized intersections would operate at LOS 'C' or better. Some of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - SB Approach – LOS 'D' during the PM peak hour
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' during the PM peak hour

2007 Peak Season No-Build

The 2007 peak hour No-Build conditions were evaluated for the peak season. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 4 and 5**, respectively. The 2007 Peak Season No-Build geometrics, intersection operations, and peak hour volumes are shown in **Figure 7**. All signalized intersections operate at LOS 'C' or better. Most of the stop controlled approaches of the existing unsignalized intersections operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' and 'D' during the AM and PM peak hours, respectively
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' and 'F' during the AM and PM peak hours, respectively

2007 Peak Season Sheridan Lake Road Extension to W. Chicago Street

The 2007 peak hour Sheridan Lake Road Extension to W. Chicago Street conditions were evaluated for the peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to W. Chicago Street. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 4 and 5**, respectively. The 2007 Peak Season Sheridan Lake Road Extension to W. Chicago Street geometrics,

intersection operations, and peak hour volumes are shown in **Figure 8**. All signalized intersections would operate at LOS 'C' or better with the exception of the intersection of W. Main Street/Jackson Boulevard which would operate at LOS 'D' during the PM peak hour. Most of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' and 'D' during the AM and PM peak hours, respectively
  - SB Approach – LOS 'E' and 'F' during the AM and PM peak hours, respectively
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

2007 Peak Season Sheridan Lake Road Extension to Deadwood Avenue

The 2007 peak hour Sheridan Lake Road Extension to Deadwood Avenue conditions were evaluated for the peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to Deadwood Avenue. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 4 and 5**, respectively. The 2007 Peak Season Sheridan Lake Road Extension to Deadwood Avenue geometrics, intersection operations, and peak hour volumes are shown in **Figure 9**. All signalized intersections would operate at LOS 'C' or better. Most of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'D' during the AM peak hour
  - SB Approach – LOS 'E' during the PM peak hour
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

Future Conditions (2030) Analysis Results

Future conditions were analyzed without and with geometric improvements for both the off-peak and peak season conditions. Signal timings were optimized as appropriate for the future condition scenarios possibly resulting in LOS improvements over 2007 conditions. For scenarios with geometric improvements, improvements were recommended to provide LOS 'C' or better for the off-peak season volume conditions as well as to improve movement LOS and overall safety of the intersections.

2030 Off-Peak Season No-Build without Improvements

The 2030 peak hour No-Build conditions without geometric improvements were evaluated for the off-peak season. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 6 and 7**, respectively. The 2030 Off-Peak Season No-Build without Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 10**. All signalized intersections operate at LOS 'C' or better. Most of the stop controlled approaches of the unsignalized intersections operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' during both peak hours
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

2030 Off-Peak Season Sheridan Lake Road Extension to W. Chicago Street without Improvements

The 2030 peak hour Extension to W. Chicago Street conditions without geometric improvements were evaluated for the off-peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to W. Chicago Street. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 6 and 7**, respectively. The 2030 Off-Peak Season Sheridan Lake Road Extension to W. Chicago Street without Improvements geometrics, intersection operations, and peak hour volumes are

shown in **Figure 11**. All signalized intersections would operate at LOS 'C' or better. Most of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' during both peak hours
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' during the PM peak hour

2030 Off-Peak Season Sheridan Lake Road Extension to Deadwood Avenue without Improvements
The 2030 peak hour Sheridan Lake Road Extension to Deadwood Avenue conditions without geometric improvements were evaluated for the off-peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to Deadwood Avenue. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 6 and 7**, respectively. The 2030 Off-Peak Season Sheridan Lake Road Extension to Deadwood Avenue without Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 12**. All signalized intersections would operate at LOS 'C' or better. Most of the stop controlled approaches of the unsignalized intersections would operate below LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' during both peak hours
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' during the PM peak hour

2030 Peak Season No-Build without Improvements
The 2030 peak hour No-Build conditions without geometric improvements were evaluated for the peak season. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 8 and 9**, respectively. The 2030 Peak Season No-Build without Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 13**. All signalized intersections operate at LOS 'C' or better with the exception of Mountain View Road/W. Omaha Street which would operate at LOS 'D' during the PM peak hour. All of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' during both peak hours
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' and 'F' during the AM and PM peak hours, respectively
- W. Chicago Street / Sheffer Road
  - NB Approach – LOS 'D' during the AM peak hour

2030 Peak Season Sheridan Lake Road Extension to W. Chicago Street without Improvements
The 2030 peak hour Sheridan Lake Road Extension to W. Chicago Street conditions without geometric improvements were evaluated for the peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to W. Chicago Street. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 8 and 9**, respectively. The 2030 Peak Season Sheridan Lake Road Extension to W. Chicago Street without Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 14**. Three signalized intersections would operate at LOS 'D' during the PM peak hour:

- Sheridan Lake Road/Canyon Lake Road
- Sheridan Lake Road/Jackson Boulevard
- Mountain View Road/W. Omaha Street

All of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' during both peak hours
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour
- W. Chicago Street / Sheffer Road
  - NB Approach – LOS 'D' during the AM peak hour

2030 Peak Season Sheridan Lake Road Extension to Deadwood Avenue without Improvements
The 2030 peak hour Sheridan Lake Road Extension to Deadwood Avenue conditions without geometric improvements were evaluated for the peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to Deadwood Avenue. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 8 and 9**, respectively. The 2030 Peak Season Sheridan Lake Road Extension to Deadwood Avenue without Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 15**. All signalized intersections would operate at LOS 'C' or better with the exception of Sheridan Lake Road/Jackson Boulevard which would operate at LOS 'D' during the PM peak hour. Most of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Chicago Street / St. Onge
  - NB Approach – LOS 'F' during both peak hours
  - SB Approach – LOS 'F' during both peak hours
- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

2030 Off-Peak Season No-Build with Improvements
The 2030 peak hour No-Build conditions with geometric improvements were evaluated for the off-peak season. Improvements recommended for the 2030 No-Build conditions include:

- W. Chicago Street / St. Onge
  - Signalization
- W. Chicago Street / Deadwood Avenue
  - Construction of dual SB left-turn lanes
  - Reconstruction of NB approach to consist of a left-turn lane and a shared through/right-turn lane
- W. Chicago Street / Mountain View Road
  - Addition of an EB right-turn lane
- Canyon Lake Road / Mountain View Road
  - Addition of a SB right-turn lane

Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 10 and 11**, respectively. The 2030 Off-Peak Season No-Build with Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 16**. All signalized intersections operate at LOS 'C' or better. One of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

2030 Off-Peak Season Sheridan Lake Road Extension to W. Chicago Street with Improvements
The 2030 peak hour Extension to W. Chicago Street conditions with geometric improvements were evaluated for the off-peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to W. Chicago Street. Additional intersection improvements for the 2030 Sheridan Lake Road

Extension to W. Chicago Street conditions include the same improvements noted in the 2030 No-Build conditions as well as:

- Sheridan Lake Road / Jackson Boulevard
  - Addition of a SB right-turn lane

Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 10 and 11**, respectively. The 2030 Off-Peak Season Sheridan Lake Road Extension to W. Chicago Street with Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 17**. All signalized intersections would operate at LOS 'C' or better. One of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' during the PM peak hour

2030 Off-Peak Season Sheridan Lake Road Extension to Deadwood Avenue with Improvements

The 2030 peak hour Sheridan Lake Road Extension to Deadwood Avenue conditions with geometric improvements were evaluated for the off-peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to Deadwood Avenue. Additional intersection improvements for the 2030 Sheridan Lake Road Extension to Deadwood Avenue include the same improvements noted in 2030 Sheridan Lake Road Extension to W. Chicago Street conditions. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 10 and 11**, respectively. The 2030 Off-Peak Season Sheridan Lake Road Extension to Deadwood Avenue with Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 18**. All signalized intersections would operate at LOS 'C' or better. One of the stop controlled approaches at unsignalized intersections would operate worse than LOS 'C':

- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' during the PM peak hour

2030 Peak Season No-Build with Improvements

The 2030 peak hour No-Build conditions with geometric improvements were evaluated for the peak season. The geometric improvements previously noted for the 2030 No-Build conditions were utilized for the analysis of peak season conditions. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 12 and 13**, respectively. The 2030 Peak Season No-Build with Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 19**. All signalized intersections operate at LOS 'C' or better. Both of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Main Street / Sheffer Road
  - SB Approach – LOS 'D' and 'F' during the AM and PM peak hours, respectively
- W. Chicago Street / Sheffer Road
  - NB Approach – LOS 'D' during the AM peak hour

2030 Peak Season Sheridan Lake Road Extension to W. Chicago Street with Improvements

The 2030 peak hour Extension to W. Chicago Street conditions with geometric improvements were evaluated for the peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to W. Chicago Street. The geometric improvements previously noted for the 2030 Sheridan Lake Road Extension to W. Chicago Street conditions were utilized for the analysis of the peak season conditions. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 12 and 13**, respectively. The 2030 Peak Season Sheridan Lake Road Extension to W. Chicago Street with Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 20**. All signalized intersections would operate at LOS 'C' or better with the exception of Sheridan Lake Road/Canyon Lake Road which would operate at LOS 'D' during the PM peak hour. Both of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour
- W. Chicago Street / Sheffer Road
  - NB Approach – LOS 'D' during the AM peak hour

2030 Peak Season Sheridan Lake Road Extension to Deadwood Avenue with Improvements

The 2030 peak hour Sheridan Lake Road Extension to Deadwood Avenue conditions with geometric improvements were evaluated for the peak season. Northbound and southbound left-turn lanes are recommended at the intersection of W. Main Street/Sheridan Lake Road with the construction of the Sheridan Lake Road extension to Deadwood Avenue. The geometric improvements previously noted for the 2030 Sheridan Lake Road Extension to Deadwood Avenue conditions were utilized for the analysis of the peak season conditions. Signalized intersection LOS and delays for the AM and PM peak hours are shown in **Tables 12 and 13**, respectively. The 2030 Peak Season Sheridan Lake Road Extension to Deadwood Avenue with Improvements geometrics, intersection operations, and peak hour volumes are shown in **Figure 21**. All signalized intersections would operate at LOS 'C' or better. One of the stop controlled approaches of the unsignalized intersections would operate worse than LOS 'C':

- W. Main Street / Sheffer Road
  - SB Approach – LOS 'E' during the PM peak hour

Figure 1. Signal Warrant Analysis – W. Chicago Street/St. Onge

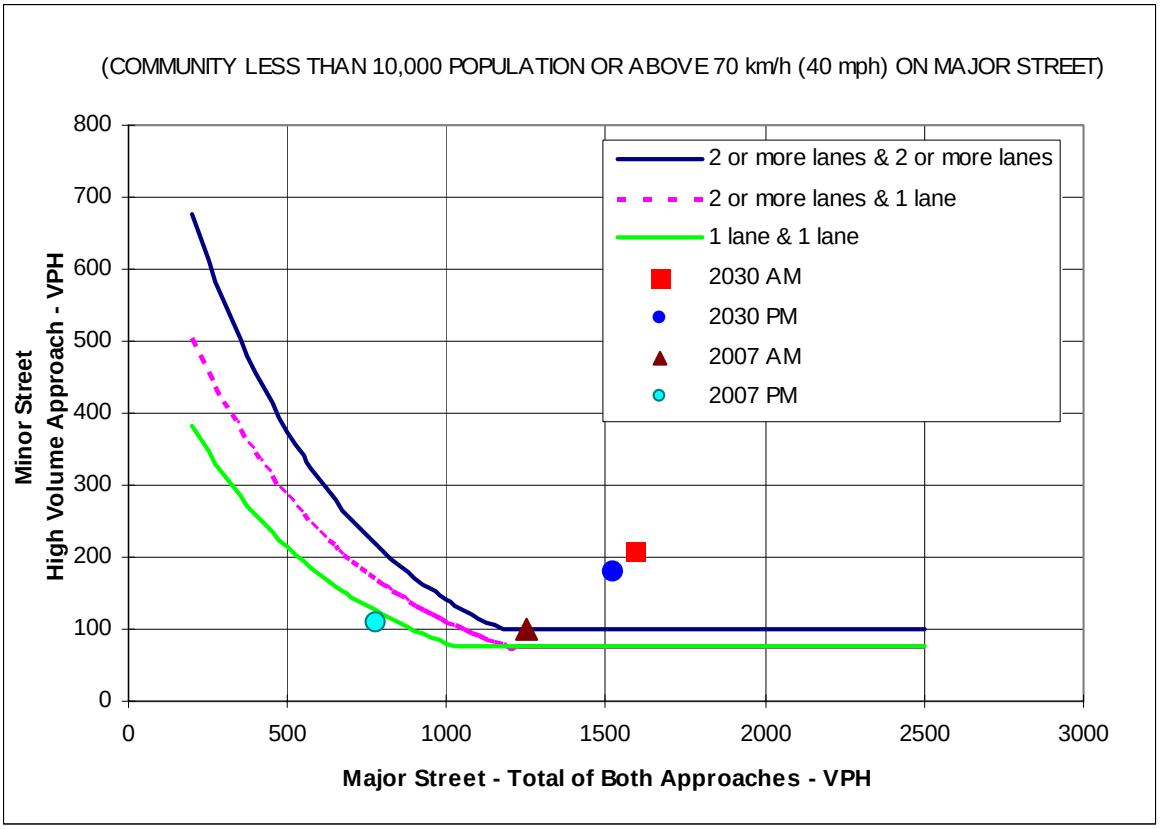


Figure 2. Signal Warrant Analysis – W. Chicago Street/Sheridan Lake Road

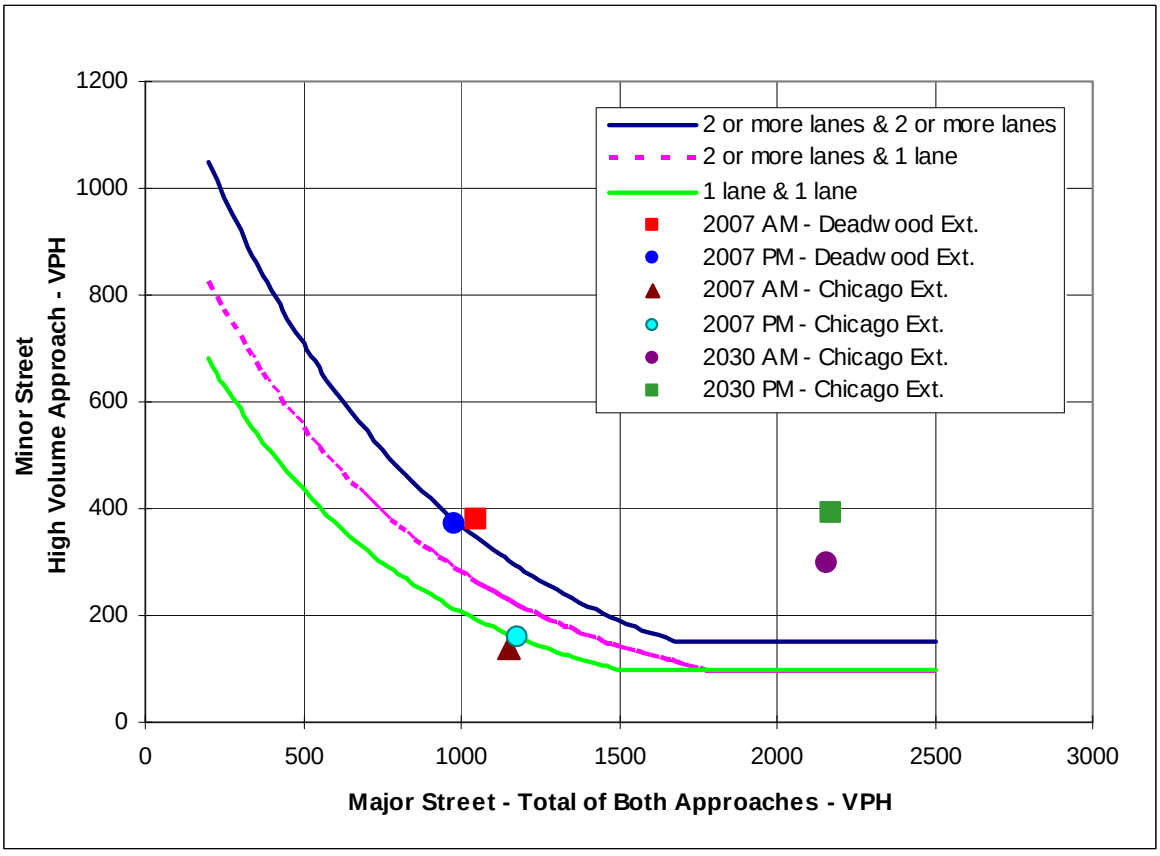


Figure 3. Signal Warrant Analysis – Sheridan Lake Road/Deadwood Avenue

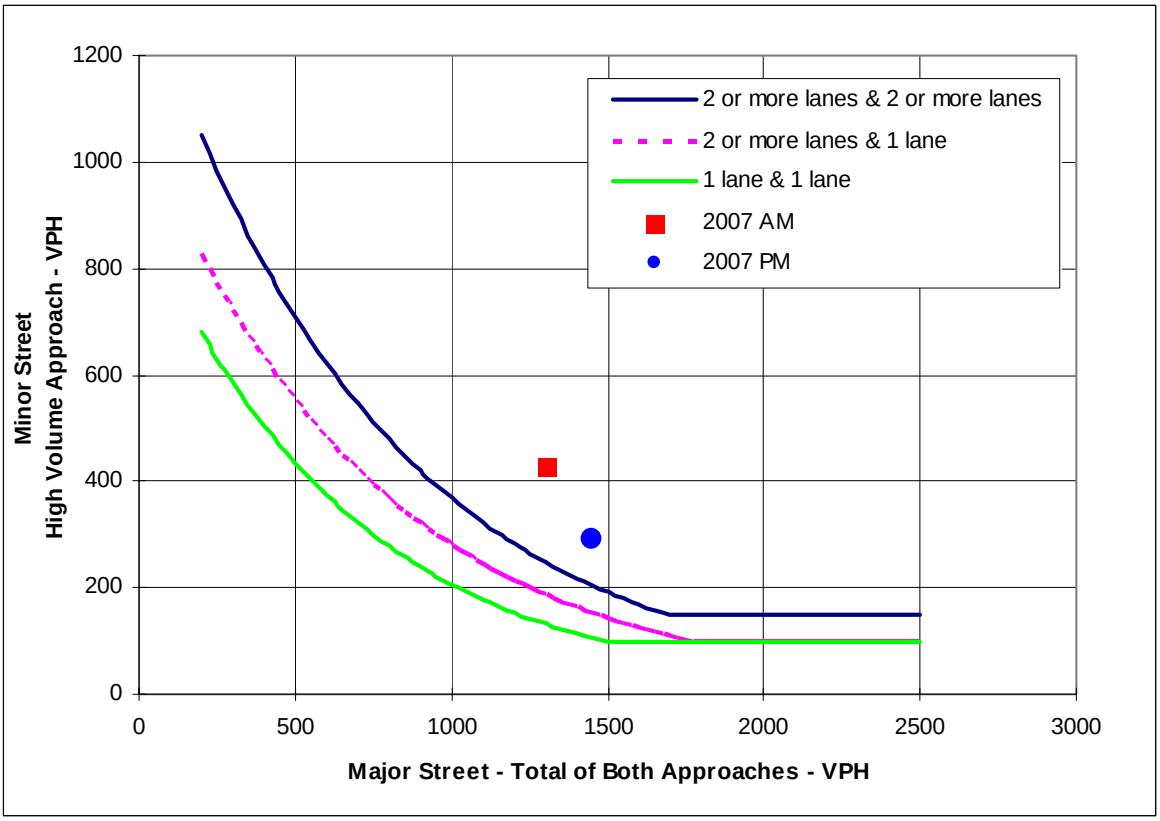


Table 2. 2007 AM Off-Peak Season Conditions – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	B	19.9	B	20.0	B	20.0
Sturgis Road/W. Main Street	B	11.0	B	11.2	B	11.3
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	11.5
Sheridan Lake Road/W. Chicago Street	N/A	N/A	N/A	N/A	B	14.9
Sheridan Lake Road/W. Main Street	B	15.5	B	13.2	B	15.6
Sheridan Lake Road/Canyon Lake Road	B	17.2	B	18.9	B	19.9
Sheridan Lake Road/Jackson Boulevard	C	23.6	B	19.8	C	20.0
Deadwood Avenue/W. Chicago Street	B	12.8	B	12.9	B	13.8
Mountain View Road/W. Omaha Street	B	18.4	B	18.0	B	17.7
Mountain View Road/W. Main Street	C	31.3	C	29.4	C	32.7
Mountain View Road/Canyon Lake Road	C	20.6	C	27.6	C	23.7
Mountain View Road/Jackson Boulevard	A	8.2	A	4.0	A	2.8
Jackson Boulevard/W. Main Street	C	24.5	B	19.5	B	17.8

Table 3. 2007 PM Off-Peak Season Conditions – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	21.4	C	21.7	C	21.8
Sturgis Road/W. Main Street	B	15.4	B	16.9	B	16.2
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	10.8
Sheridan Lake Road/W. Chicago Street	N/A	N/A	N/A	N/A	B	14.3
Sheridan Lake Road/W. Main Street	B	16.1	B	14.9	B	17.7
Sheridan Lake Road/Canyon Lake Road	B	17.5	C	20.5	B	19.5
Sheridan Lake Road/Jackson Boulevard	C	22.7	C	20.7	C	22.1
Deadwood Avenue/W. Chicago Street	B	17.3	B	19.6	B	16.6
Mountain View Road/W. Omaha Street	B	18.3	C	20.0	B	18.1
Mountain View Road/W. Main Street	C	28.2	C	24.8	C	24.8
Mountain View Road/Canyon Lake Road	B	17.3	C	20.3	C	20.3
Mountain View Road/Jackson Boulevard	C	20.6	A	5.5	A	4.3
Jackson Boulevard/W. Main Street	B	19.8	C	21.2	B	18.9

Table 4. 2007 AM Peak Season Conditions – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	21.3	C	21.3	C	21.3
Sturgis Road/W. Main Street	B	11.5	B	11.8	B	12.2
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	12.1
Sheridan Lake Road/W. Chicago Street	N/A	N/A	N/A	N/A	B	15.4
Sheridan Lake Road/W. Main Street	B	18.5	B	14.7	B	17.7
Sheridan Lake Road/Canyon Lake Road	B	19.3	C	32.3	C	23.2
Sheridan Lake Road/Jackson Boulevard	C	28.9	C	22.9	C	22.9
Deadwood Avenue/W. Chicago Street	B	14.0	B	14.5	B	14.5
Mountain View Road/W. Omaha Street	C	21.1	C	20.2	B	19.9
Mountain View Road/W. Main Street	C	33.6	C	31.6	C	34.9
Mountain View Road/Canyon Lake Road	C	20.3	C	31.1	C	25.1
Mountain View Road/Jackson Boulevard	A	8.3	A	4.8	A	3.4
Jackson Boulevard/W. Main Street	C	32.9	C	30.7	C	24.6

Table 5. 2007 PM Peak Season Conditions – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	23.4	C	23.9	C	24.1
Sturgis Road/W. Main Street	B	17.5	C	21.0	B	19.5
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	11.1
Sheridan Lake Road/W. Chicago Street	N/A	N/A	N/A	N/A	B	14.4
Sheridan Lake Road/W. Main Street	B	18.5	B	16.5	B	18.5
Sheridan Lake Road/Canyon Lake Road	C	21.9	C	31.8	C	24.3
Sheridan Lake Road/Jackson Boulevard	C	32.2	C	29.7	C	31.0
Deadwood Avenue/W. Chicago Street	B	19.8	C	23.0	B	19.3
Mountain View Road/W. Omaha Street	C	21.8	C	25.7	C	20.9
Mountain View Road/W. Main Street	C	30.3	C	28.4	C	29.8
Mountain View Road/Canyon Lake Road	B	17.7	C	22.2	C	24.9
Mountain View Road/Jackson Boulevard	C	21.8	A	6.5	A	4.9
Jackson Boulevard/W. Main Street	C	23.6	D	35.6	C	23.4

Table 6. 2030 AM Off-Peak Season Conditions without Improvements – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	21.2	C	22.7	C	23.1
Sturgis Road/W. Main Street	B	11.3	B	11.4	B	11.6
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	12.8
Sheridan Lake Road/W. Chicago Street	N/A	N/A	A	7.5	B	18.7
Sheridan Lake Road/W. Main Street	B	17.6	B	18.6	B	19.3
Sheridan Lake Road/Canyon Lake Road	B	17.7	C	21.6	C	22.7
Sheridan Lake Road/Jackson Boulevard	C	22.5	C	22.4	C	22.6
Deadwood Avenue/W. Chicago Street	B	14.2	B	19.7	B	14.4
Mountain View Road/W. Omaha Street	B	19.3	B	16.3	B	17.2
Mountain View Road/W. Main Street	B	19.4	C	21.1	C	20.8
Mountain View Road/Canyon Lake Road	B	14.1	B	13.4	B	11.8
Mountain View Road/Jackson Boulevard	A	8.7	A	4.8	A	4.5
Jackson Boulevard/W. Main Street	B	15.4	B	16.8	B	15.6

Table 7. 2030 PM Off-Peak Season Conditions without Improvements – Signalized Intersections

Intersection	No Build		Extension to Chicago		Extension to Deadwood	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	21.9	C	23.8	C	24.0
Sturgis Road/W. Main Street	B	16.0	B	17.7	B	16.8
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	11.3
Sheridan Lake Road/W. Chicago Street	N/A	N/A	A	8.0	B	15.9
Sheridan Lake Road/W. Main Street	B	18.7	B	18.8	C	21.8
Sheridan Lake Road/Canyon Lake Road	B	18.8	C	25.1	C	24.0
Sheridan Lake Road/Jackson Boulevard	C	22.5	C	26.0	C	26.9
Deadwood Avenue/W. Chicago Street	C	20.5	B	19.7	B	17.5
Mountain View Road/W. Omaha Street	C	26.3	C	26.0	B	19.8
Mountain View Road/W. Main Street	C	25.3	C	22.2	C	24.5
Mountain View Road/Canyon Lake Road	B	10.9	B	12.0	B	12.0
Mountain View Road/Jackson Boulevard	A	7.6	A	7.1	A	6.4
Jackson Boulevard/W. Main Street	B	15.4	B	16.6	B	15.2

Table 8. 2030 AM Peak Season Conditions without Improvements – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	22.3	C	24.6	C	25.3
Sturgis Road/W. Main Street	B	11.9	B	12.1	B	12.6
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	14.0
Sheridan Lake Road/W. Chicago Street	N/A	N/A	A	9.4	C	21.3
Sheridan Lake Road/W. Main Street	B	18.4	C	20.9	C	24.0
Sheridan Lake Road/Canyon Lake Road	C	20.9	C	27.3	C	30.0
Sheridan Lake Road/Jackson Boulevard	C	27.0	C	27.3	C	27.7
Deadwood Avenue/W. Chicago Street	B	16.7	C	26.2	B	16.4
Mountain View Road/W. Omaha Street	C	26.3	B	19.0	C	21.9
Mountain View Road/W. Main Street	C	21.4	C	20.8	C	22.8
Mountain View Road/Canyon Lake Road	B	14.2	C	21.5	B	13.0
Mountain View Road/Jackson Boulevard	A	6.8	A	4.7	B	15.2
Jackson Boulevard/W. Main Street	C	24.1	C	28.2	C	22.6

Table 9. 2030 PM Peak Season Conditions without Improvements – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	24.7	C	28.0	C	28.6
Sturgis Road/W. Main Street	B	18.5	C	22.1	C	20.3
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	12.1
Sheridan Lake Road/W. Chicago Street	N/A	N/A	C	20.5	B	17.7
Sheridan Lake Road/W. Main Street	C	20.4	C	21.0	C	25.4
Sheridan Lake Road/Canyon Lake Road	C	25.5	D	37.1	C	34.4
Sheridan Lake Road/Jackson Boulevard	C	30.1	D	37.0	D	40.4
Deadwood Avenue/W. Chicago Street	C	26.5	B	19.7	C	20.7
Mountain View Road/W. Omaha Street	D	48.8	D	48.0	C	34.4
Mountain View Road/W. Main Street	C	27.5	C	21.6	C	28.5
Mountain View Road/Canyon Lake Road	B	17.4	C	21.5	B	14.2
Mountain View Road/Jackson Boulevard	A	7.1	A	6.5	A	7.3
Jackson Boulevard/W. Main Street	B	18.5	C	21.0	B	17.9

Table 10. 2030 AM Off-Peak Season Conditions with Improvements – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	21.2	C	22.7	C	23.1
Sturgis Road/W. Main Street	B	11.3	B	11.4	B	11.6
St. Onge Street/W. Chicago Street	A	6.5	A	7.8	A	6.2
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	13.1
Sheridan Lake Road/W. Chicago Street	N/A	N/A	A	6.3	B	16.1
Sheridan Lake Road/W. Main Street	B	16.9	B	18.3	C	22.9
Sheridan Lake Road/Canyon Lake Road	B	17.7	C	21.6	C	22.7
Sheridan Lake Road/Jackson Boulevard	C	22.5	B	20.0	B	19.8
Deadwood Avenue/W. Chicago Street	B	14.2	B	18.7	B	14.0
Mountain View Road/W. Omaha Street	B	17.8	B	16.1	B	16.0
Mountain View Road/W. Main Street	C	21.4	C	20.3	B	20.0
Mountain View Road/Canyon Lake Road	B	15.2	B	13.7	B	14.5
Mountain View Road/Jackson Boulevard	B	17.3	A	4.8	A	4.5
Jackson Boulevard/W. Main Street	B	15.4	B	16.6	B	15.6

Table 11. 2030 PM Off-Peak Season Conditions with Improvements – Signalized Intersections

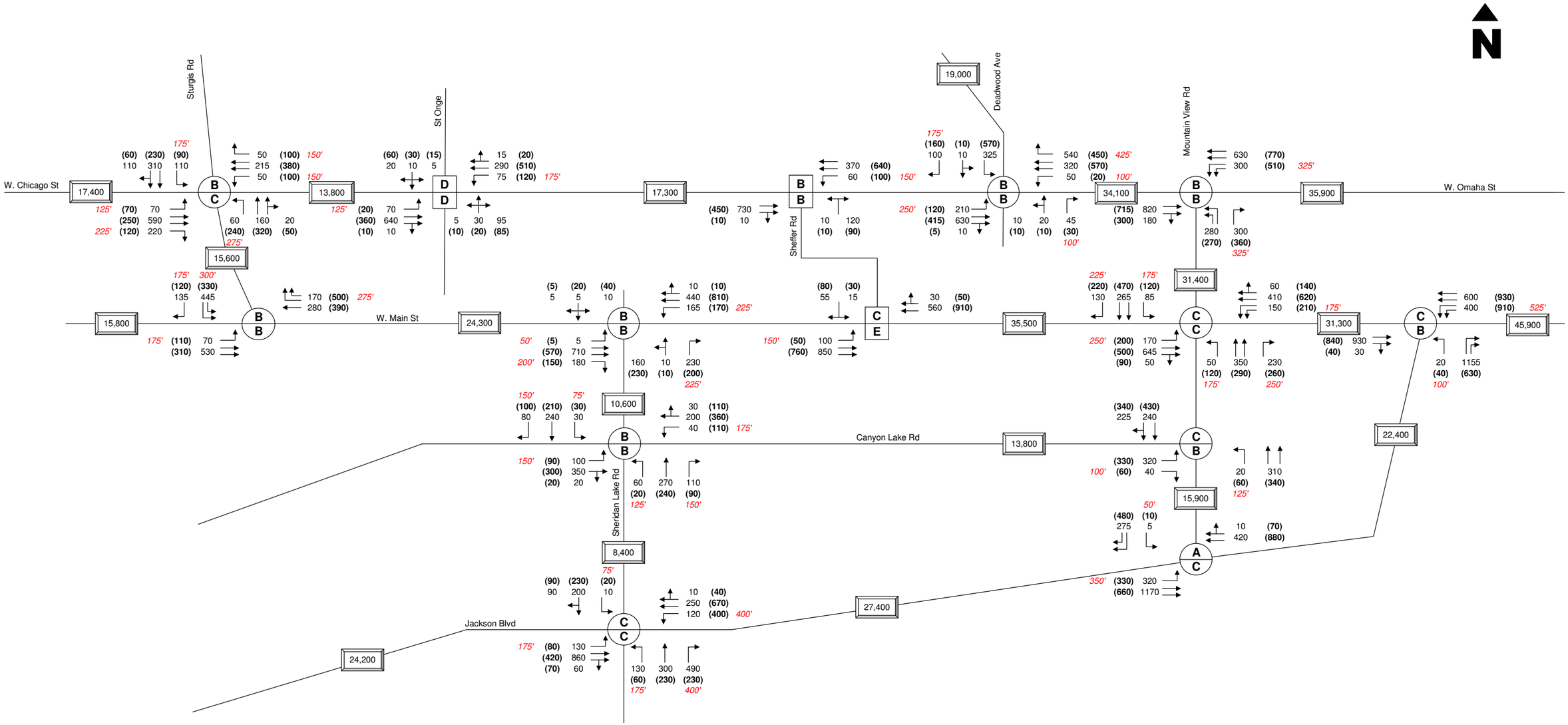
Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	21.9	C	23.8	C	24.0
Sturgis Road/W. Main Street	B	16.0	B	17.7	B	16.8
St. Onge Street/W. Chicago Street	A	6.6	A	8.9	A	6.0
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	11.3
Sheridan Lake Road/W. Chicago Street	N/A	N/A	A	7.5	B	16.0
Sheridan Lake Road/W. Main Street	B	18.1	B	18.7	C	22.3
Sheridan Lake Road/Canyon Lake Road	B	18.8	C	25.1	C	24.0
Sheridan Lake Road/Jackson Boulevard	C	22.5	C	20.8	C	21.2
Deadwood Avenue/W. Chicago Street	B	18.3	B	18.9	B	16.5
Mountain View Road/W. Omaha Street	B	18.6	B	19.3	B	17.2
Mountain View Road/W. Main Street	C	25.5	C	21.5	C	21.6
Mountain View Road/Canyon Lake Road	B	12.7	B	17.7	B	17.9
Mountain View Road/Jackson Boulevard	A	7.4	A	6.8	A	6.1
Jackson Boulevard/W. Main Street	B	15.5	B	16.6	B	15.0

Table 12. 2030 AM Peak Season Conditions with Improvements – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	22.3	C	24.6	C	25.3
Sturgis Road/W. Main Street	B	11.9	B	12.1	B	12.6
St. Onge Street/W. Chicago Street	A	7.4	A	8.8	A	6.5
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	13.7
Sheridan Lake Road/W. Chicago Street	N/A	N/A	A	7.8	B	19.7
Sheridan Lake Road/W. Main Street	B	18.5	C	20.8	C	25.3
Sheridan Lake Road/Canyon Lake Road	C	20.9	C	27.3	C	30.0
Sheridan Lake Road/Jackson Boulevard	C	27.0	C	23.4	C	22.6
Deadwood Avenue/W. Chicago Street	B	15.6	C	24.4	B	15.6
Mountain View Road/W. Omaha Street	B	19.5	B	16.5	B	16.6
Mountain View Road/W. Main Street	C	20.7	C	20.4	C	20.2
Mountain View Road/Canyon Lake Road	B	17.1	C	28.2	C	22.1
Mountain View Road/Jackson Boulevard	A	7.9	A	6.0	B	14.0
Jackson Boulevard/W. Main Street	C	24.2	C	28.2	C	23.2

Table 13. 2030 PM Peak Season Conditions with Improvements – Signalized Intersections

Intersection	No-Build		Extension to W. Chicago Street		Extension to Deadwood Avenue	
	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)	LOS	Ave. Delay (sec)
Sturgis Road/W. Chicago Street	C	24.7	C	28.0	C	28.6
Sturgis Road/W. Main Street	B	18.5	C	22.1	C	20.3
St. Onge Street/W. Chicago Street	A	7.0	A	9.3	A	6.7
Sheridan Lake Road/Deadwood Avenue	N/A	N/A	N/A	N/A	B	12.0
Sheridan Lake Road/W. Chicago Street	N/A	N/A	B	13.1	B	16.7
Sheridan Lake Road/W. Main Street	C	20.6	C	23.1	C	28.5
Sheridan Lake Road/Canyon Lake Road	C	25.5	D	37.1	C	34.4
Sheridan Lake Road/Jackson Boulevard	C	30.1	C	26.6	C	28.9
Deadwood Avenue/W. Chicago Street	C	23.5	B	18.1	B	18.9
Mountain View Road/W. Omaha Street	C	21.3	C	23.5	B	18.1
Mountain View Road/W. Main Street	C	28.8	C	23.2	C	26.6
Mountain View Road/Canyon Lake Road	C	20.7	C	33.7	C	25.1
Mountain View Road/Jackson Boulevard	A	6.0	A	5.5	A	7.6
Jackson Boulevard/W. Main Street	B	18.5	C	20.8	B	17.5



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2007 ADT
- XXX — 2007 AM Peak Hour Volume
- (XXX) — 2007 PM Peak Hour Volume
- ← — Existing Geometrics
- *XXX'* — Recommended Storage

Note:
Existing turn lane storage was not considered when developing recommended storage lengths. Storage lengths included on 2007 figures for comparison purposes only.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

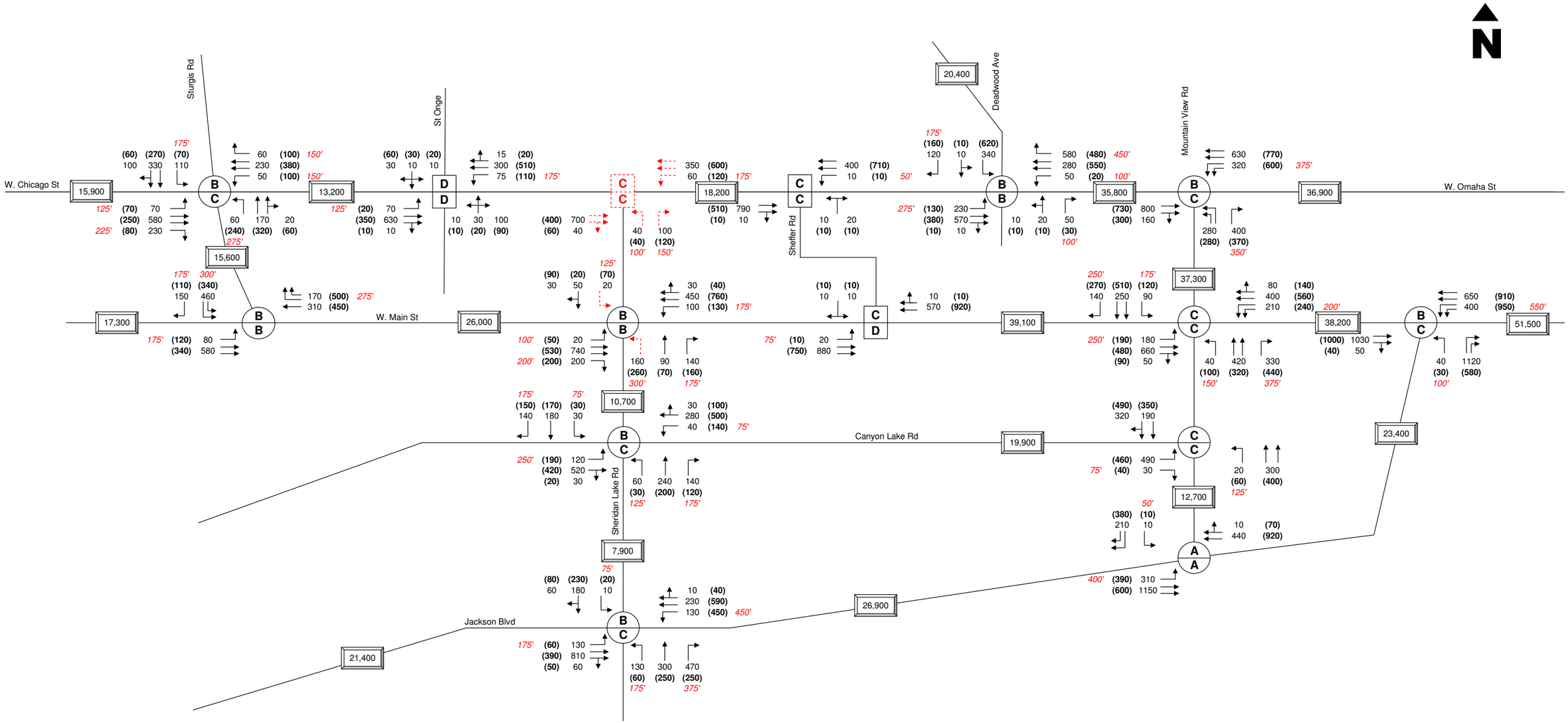
HDR

2007 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - No-Build

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
4



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2007 ADT
- XXX / (XXX) — 2007 AM Peak Hour Volume / 2007 PM Peak Hour Volume
- ← — Existing Geometrics
- XXX' — Recommended Storage
- ◄- - — Recommended Geometric Improvements
- X / X — Recommended Unsignalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to W. Chicago St.

Existing turn lane storage was not considered when developing recommended storage lengths. Storage lengths included on 2007 figures for comparison purposes only.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

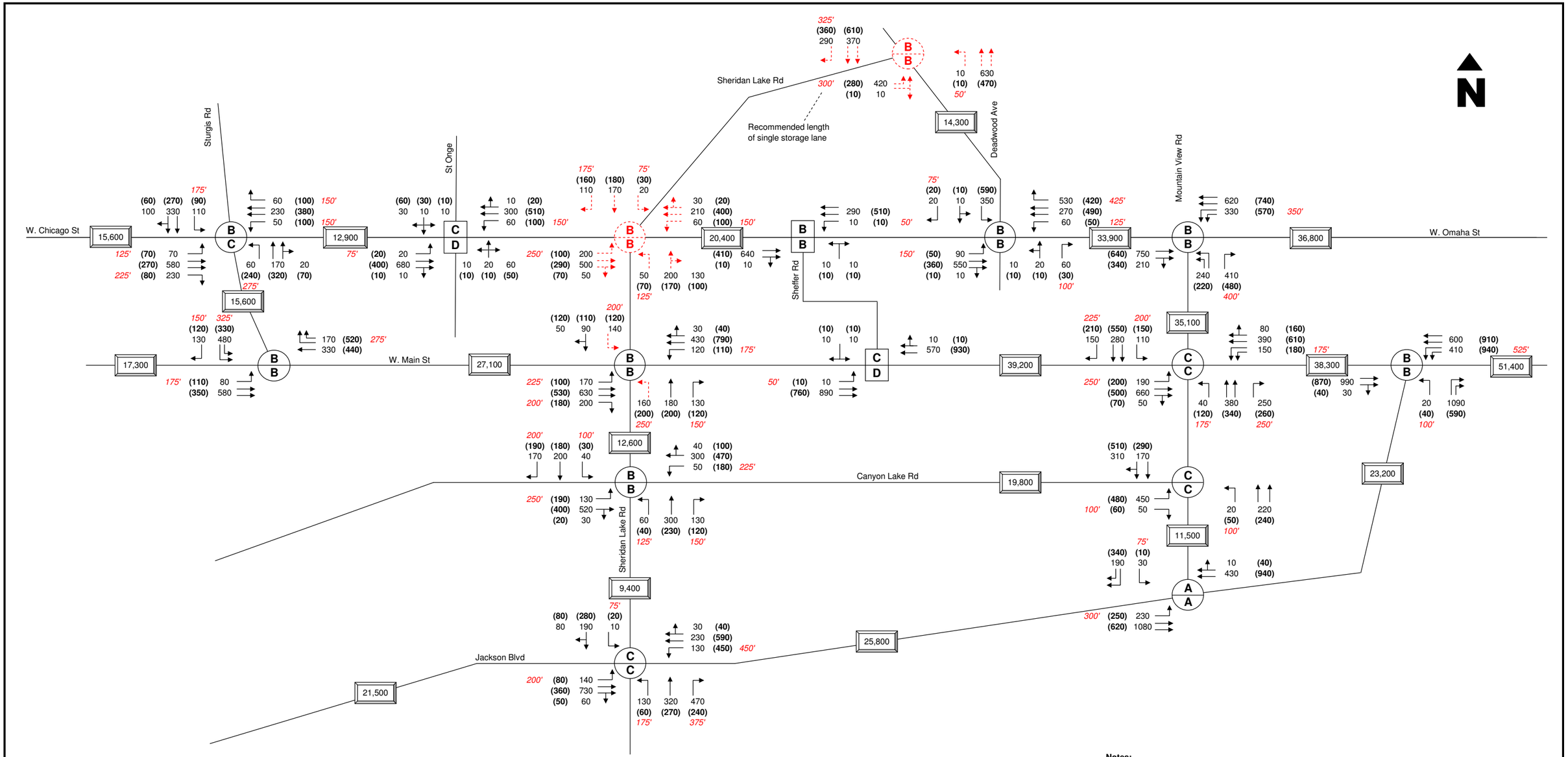
HDR

2007 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to W. Chicago Street

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
5



LEGEND

X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service	XXX — 2007 AM Peak Hour Volume; (XXX) — 2007 PM Peak Hour Volume
X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service	← — Existing Geometrics
XX,XXX — 2007 ADT	XXX' — Recommended Storage
	◄--- — Recommended Geometric Improvements
	X / X — Recommended Signalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to Deadwood Ave.

Existing turn lane storage was not considered when developing recommended storage lengths. Storage lengths included on 2007 figures for comparison purposes only.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

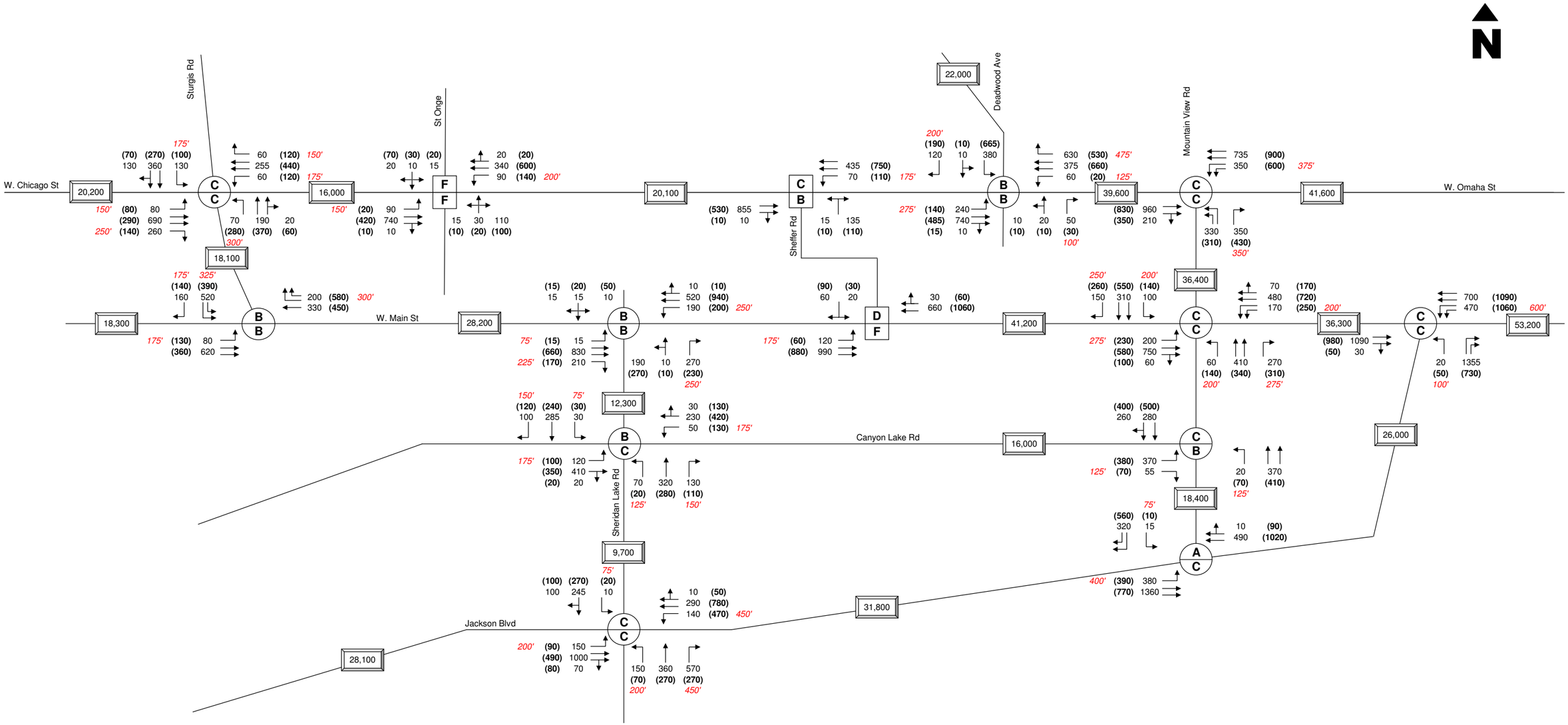
HDR

2007 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to Deadwood Avenue

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
6



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2007 ADT
- XXX — 2007 AM Peak Hour Volume
- (XXX) — 2007 PM Peak Hour Volume
- ← — Existing Geometrics
- *XXX'* — Recommended Storage

Note:
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2. 2006 Seasonal Factors, SDDOT, February 2007

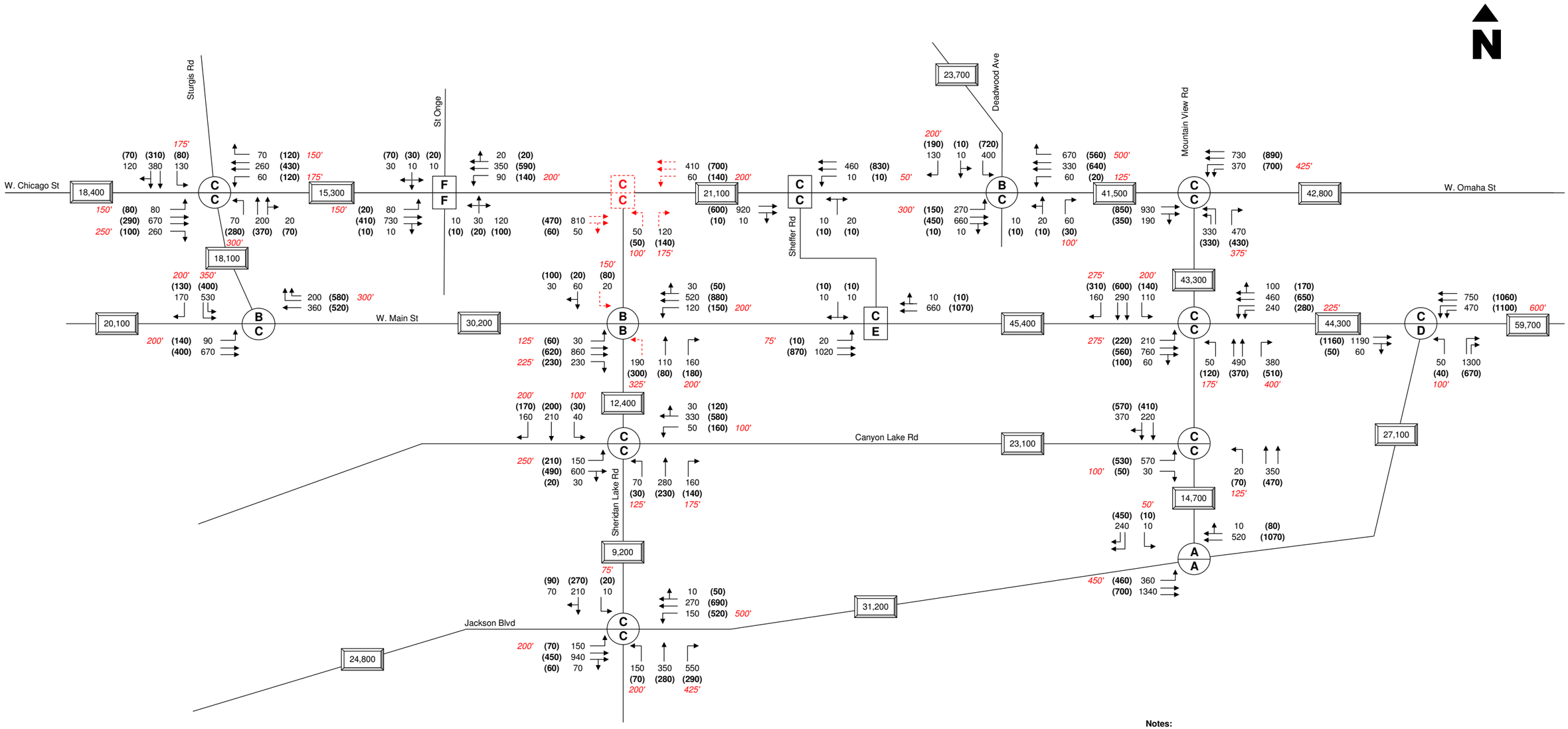
HDR

2007 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - No-Build

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
7



LEGEND

- AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- 2007 ADT
- XXX — 2007 AM Peak Hour Volume
- (XXX) — 2007 PM Peak Hour Volume
- Existing Geometrics
- XXX' — Recommended Storage
- Recommended Geometric Improvements
- Recommended Unsignalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to W. Chicago St.

Existing turn lane storage was not considered when developing recommended storage lengths. Storage lengths included on 2007 figures for comparison purposes only.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

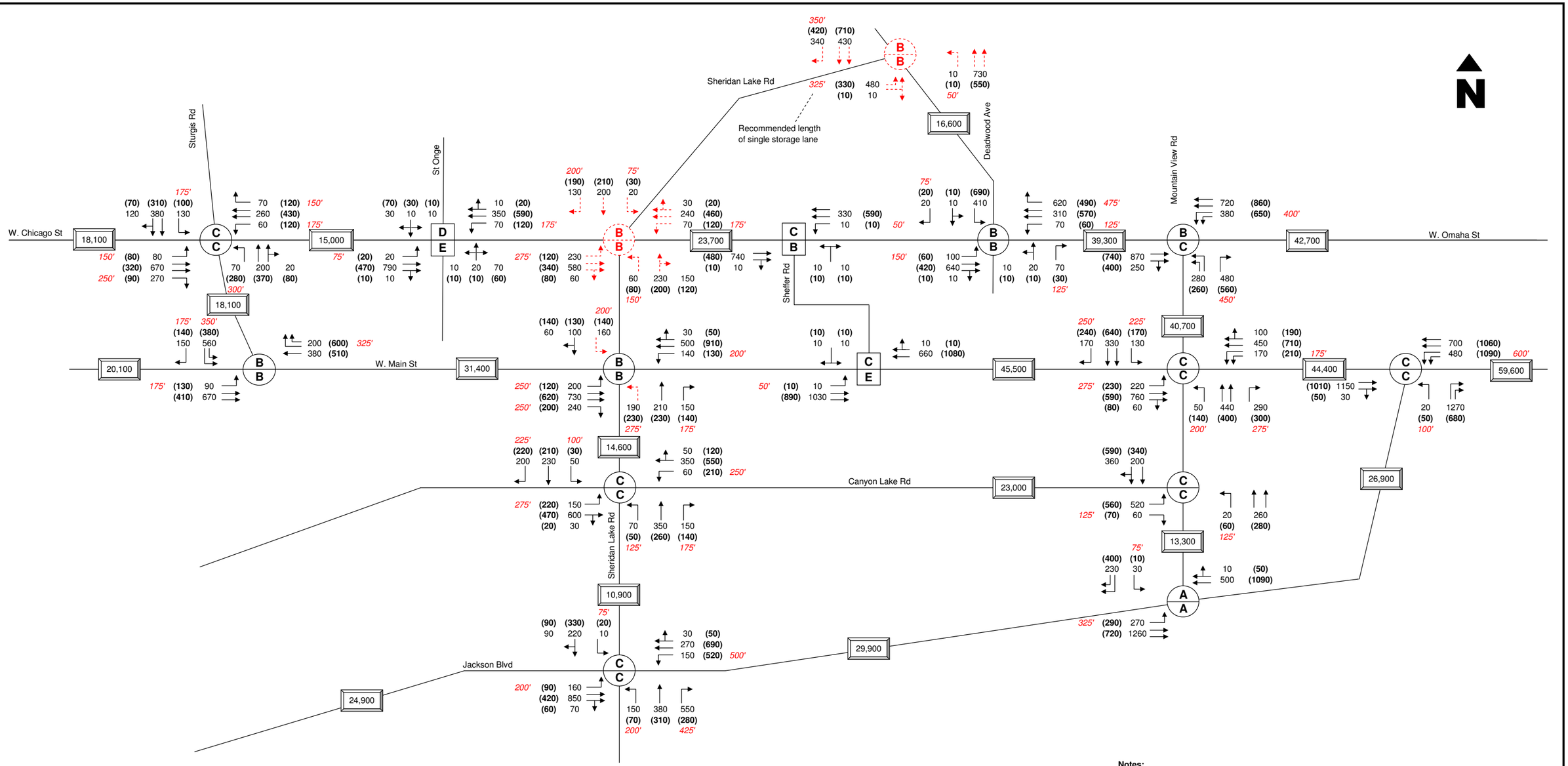
HDR

2007 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to W. Chicago Street

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
8



LEGEND

- AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2007 ADT
- XXX — 2007 AM Peak Hour Volume
- (XXX) — 2007 PM Peak Hour Volume
- Existing Geometrics
- XXX' — Recommended Storage
- Recommended Geometric Improvements
- Recommended Signalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to Deadwood Ave.

Existing turn lane storage was not considered when developing recommended storage lengths. Storage lengths included on 2007 figures for comparison purposes only.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

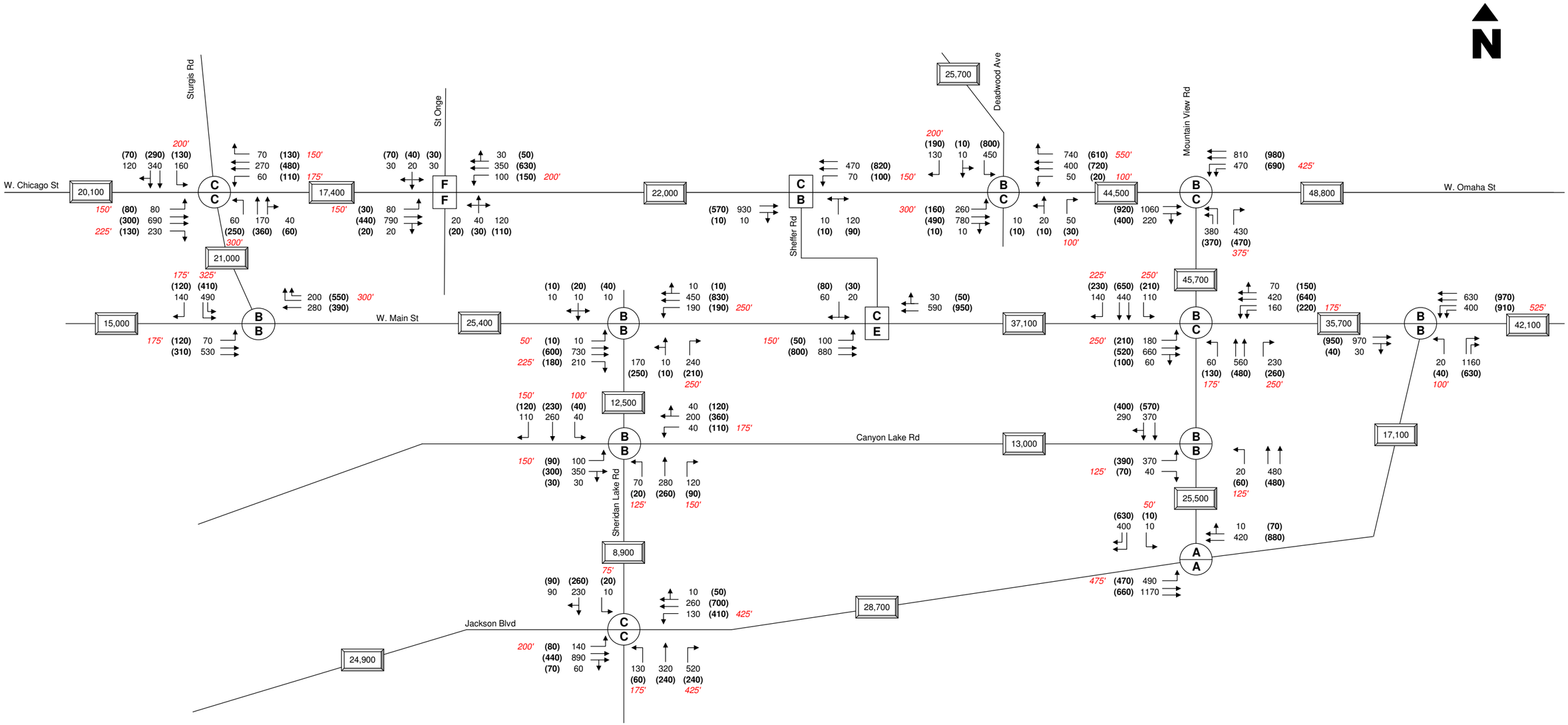
HDR

2007 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to Deadwood Avenue

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
9



LEGEND

- AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX — 2030 AM Peak Hour Volume
- (XXX) — 2030 PM Peak Hour Volume
- ← — Existing Geometrics
- XXX' — Recommended Storage

Note:
Existing turn lane storage was not considered when developing recommended storage lengths.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

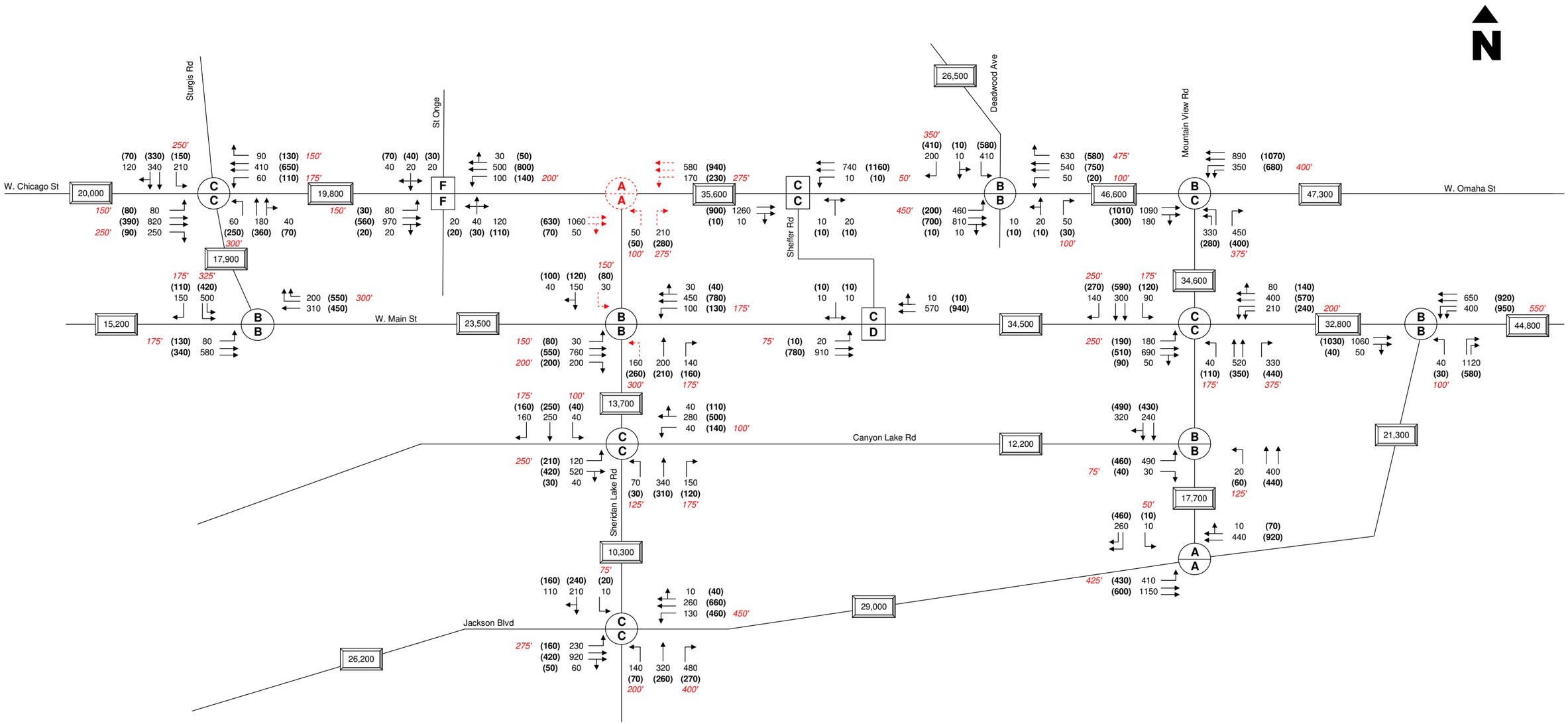
HDR

2030 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - No-Build (Without Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
10



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX — 2030 AM Peak Hour Volume
- (XXX) — 2030 PM Peak Hour Volume
- ← — Existing Geometrics
- XXX' — Recommended Storage
- ←- - — Recommended Geometric Improvements
- X / X — Recommended Signalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to W. Chicago St.

Existing turn lane storage was not considered when developing recommended storage lengths.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

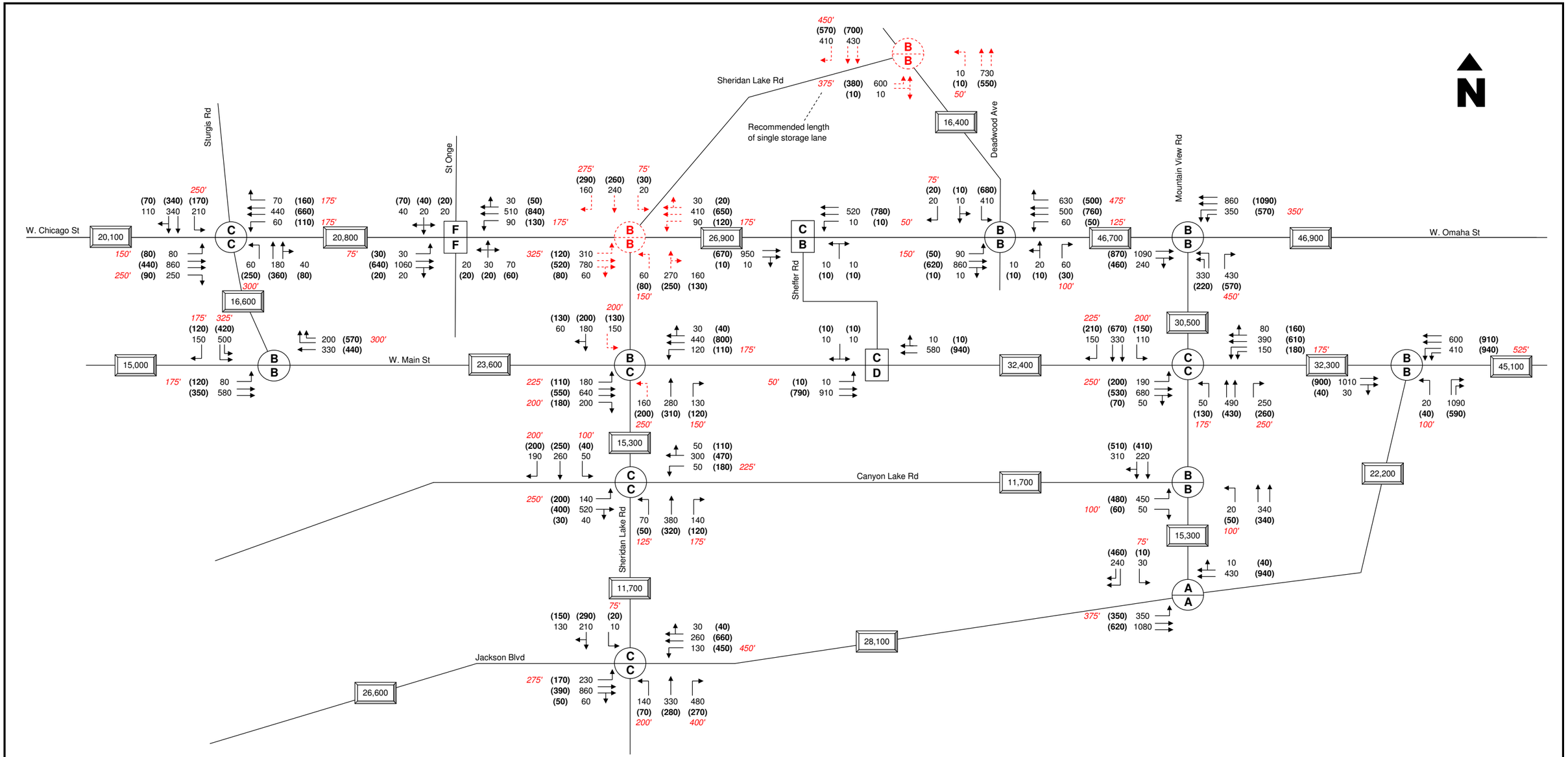
HDR

2030 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to W. Chicago Street (Without Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
11



LEGEND

- AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX — 2030 AM Peak Hour Volume
- (XXX) — 2030 PM Peak Hour Volume
- Existing Geometrics
- XXX' — Recommended Storage
- Recommended Geometric Improvements
- Recommended Signalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to Deadwood Ave.

Existing turn lane storage was not considered when developing recommended storage lengths.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

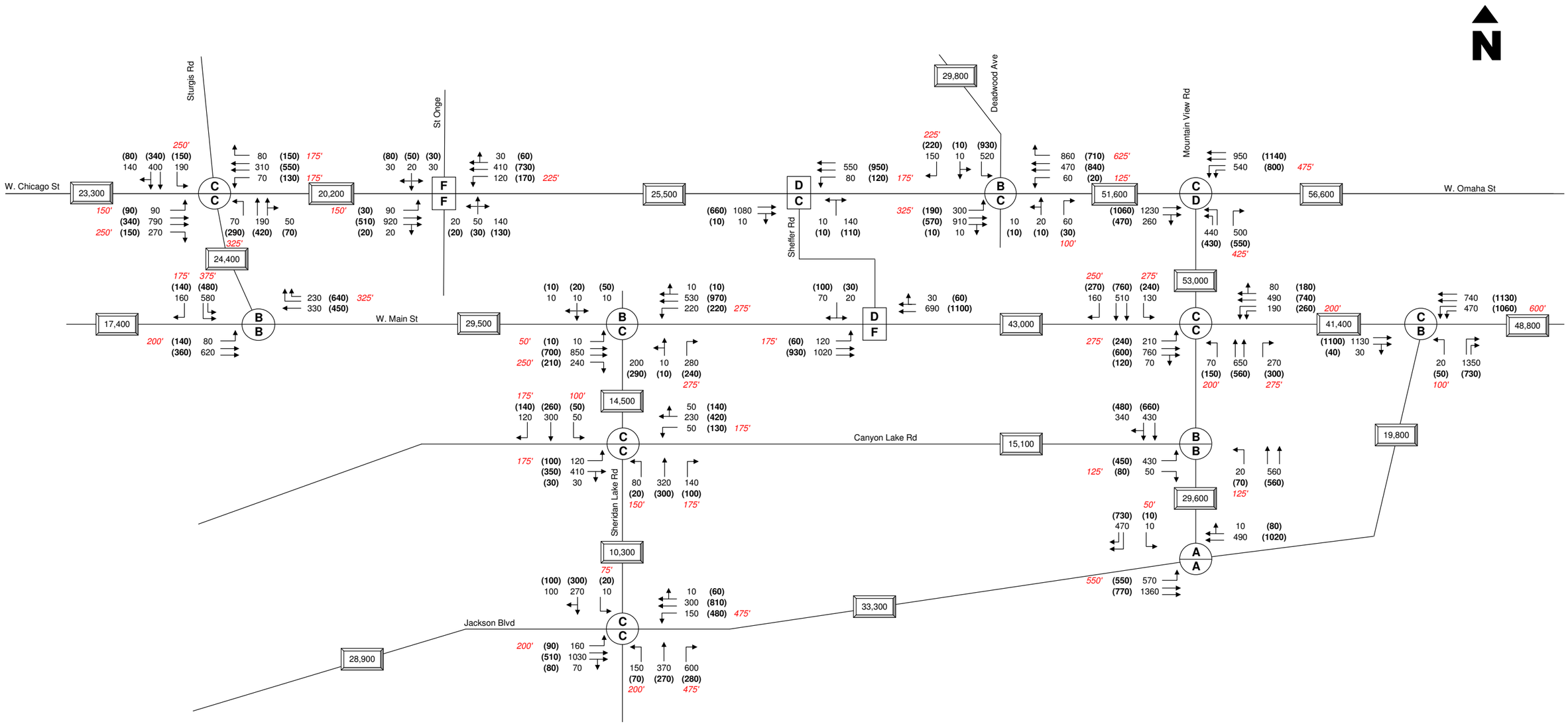
HDR

2030 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to Deadwood Avenue (Without Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
12



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX — 2030 AM Peak Hour Volume
- (XXX) — 2030 PM Peak Hour Volume
- ← — Existing Geometrics
- XXX' — Recommended Storage

Note:
Existing turn lane storage was not considered when developing recommended storage lengths.

Sources:
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2. 2006 Seasonal Factors, SDDOT, February 2007

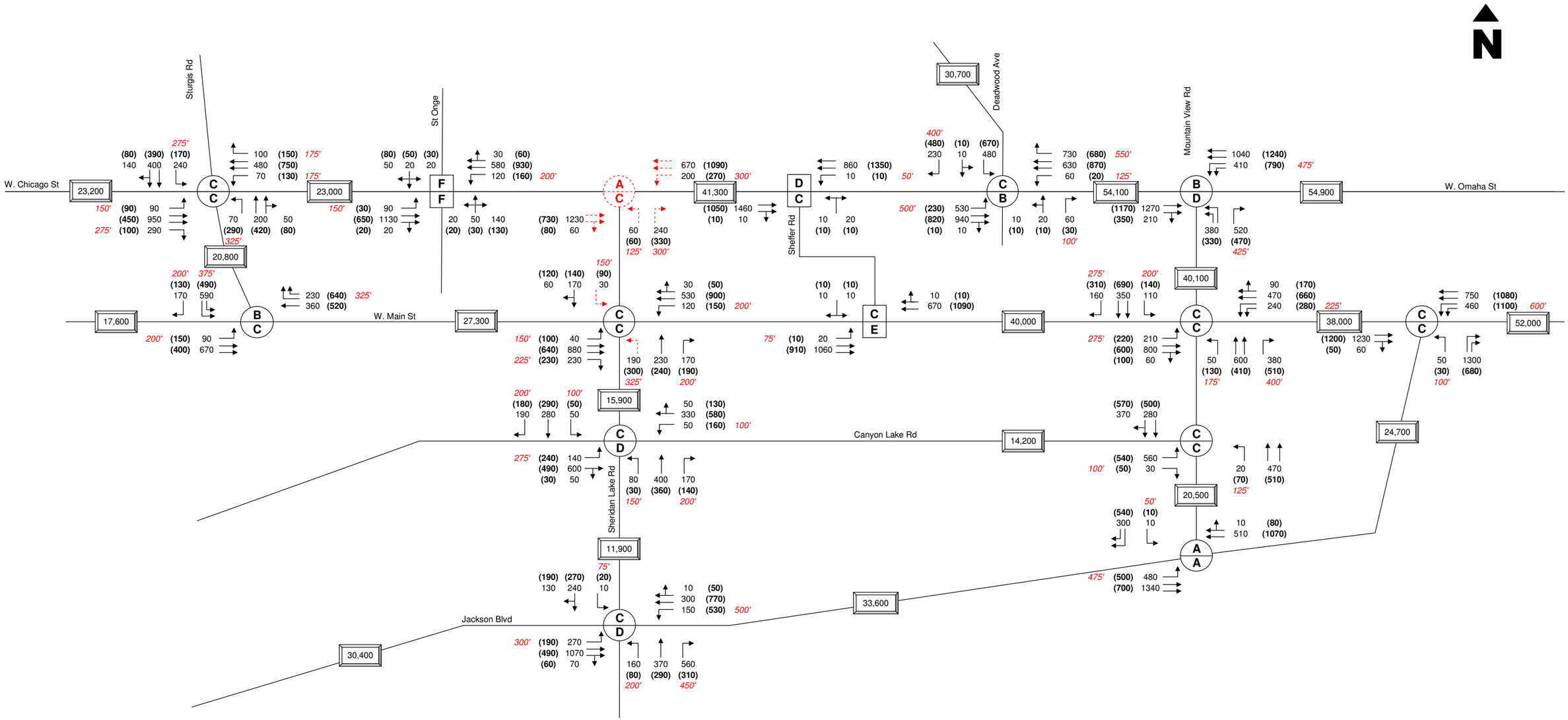
HDR

2030 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - No-Build (Without Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
13



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX / (XXX) — 2030 AM Peak Hour Volume / 2030 PM Peak Hour Volume
- Existing Geometrics
- XXX' — Recommended Storage
- Recommended Geometric Improvements
- X / X — Recommended Signalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to W. Chicago St.

Existing turn lane storage was not considered when developing recommended storage lengths.

Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

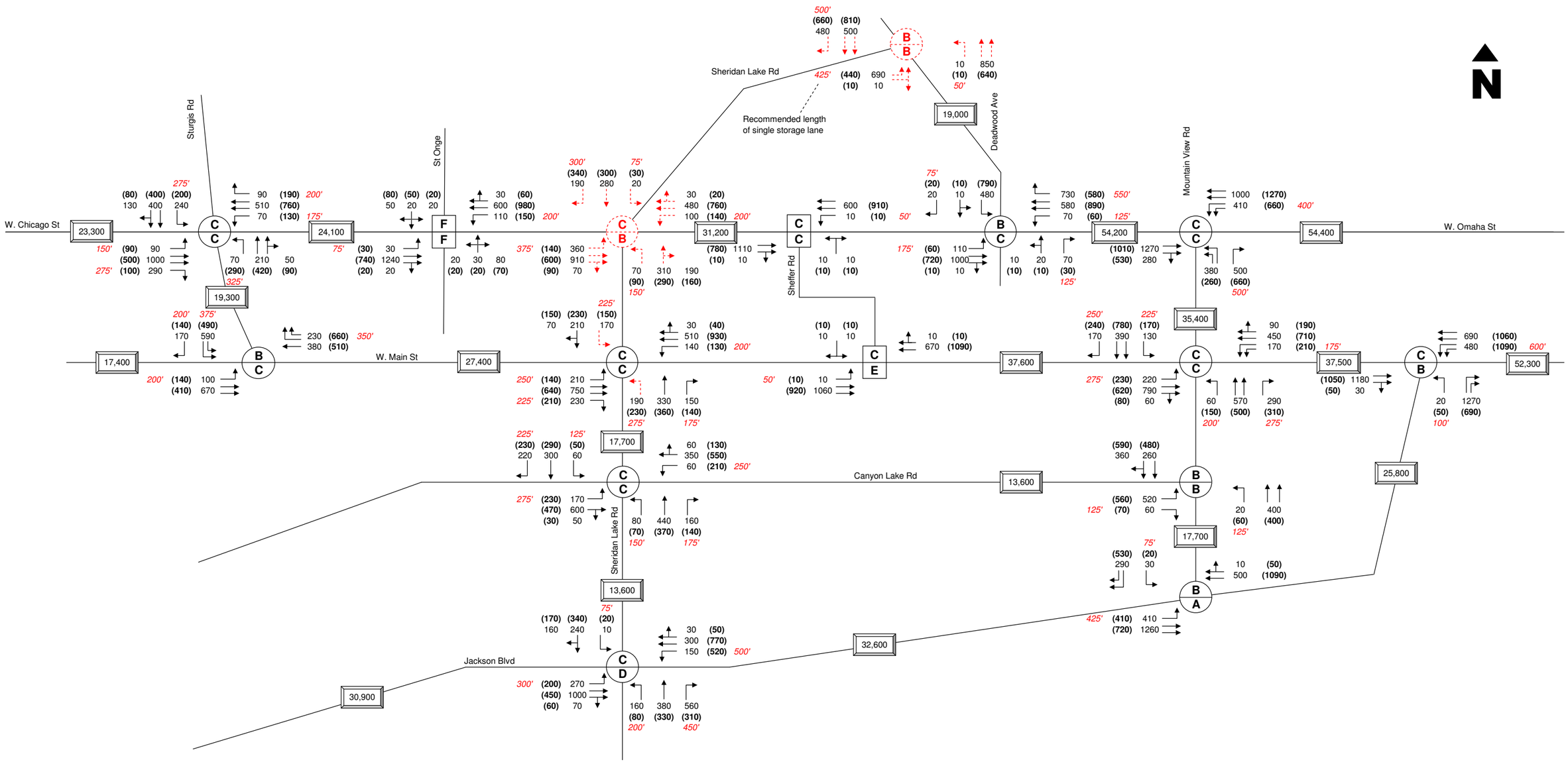
HDR

2030 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to W. Chicago Street (Without Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
14



LEGEND

- AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX — 2030 AM Peak Hour Volume
- (XXX) — 2030 PM Peak Hour Volume
- Existing Geometrics
- XXX' — Recommended Storage
- Recommended Geometric Improvements
- Recommended Signalized Intersection

Notes:
Geometric improvements are shown at the intersection of W. Main St/Sheridan Lake Rd based on the extension of Sheridan Lake Rd to Deadwood Ave.

Existing turn lane storage was not considered when developing recommended storage lengths.

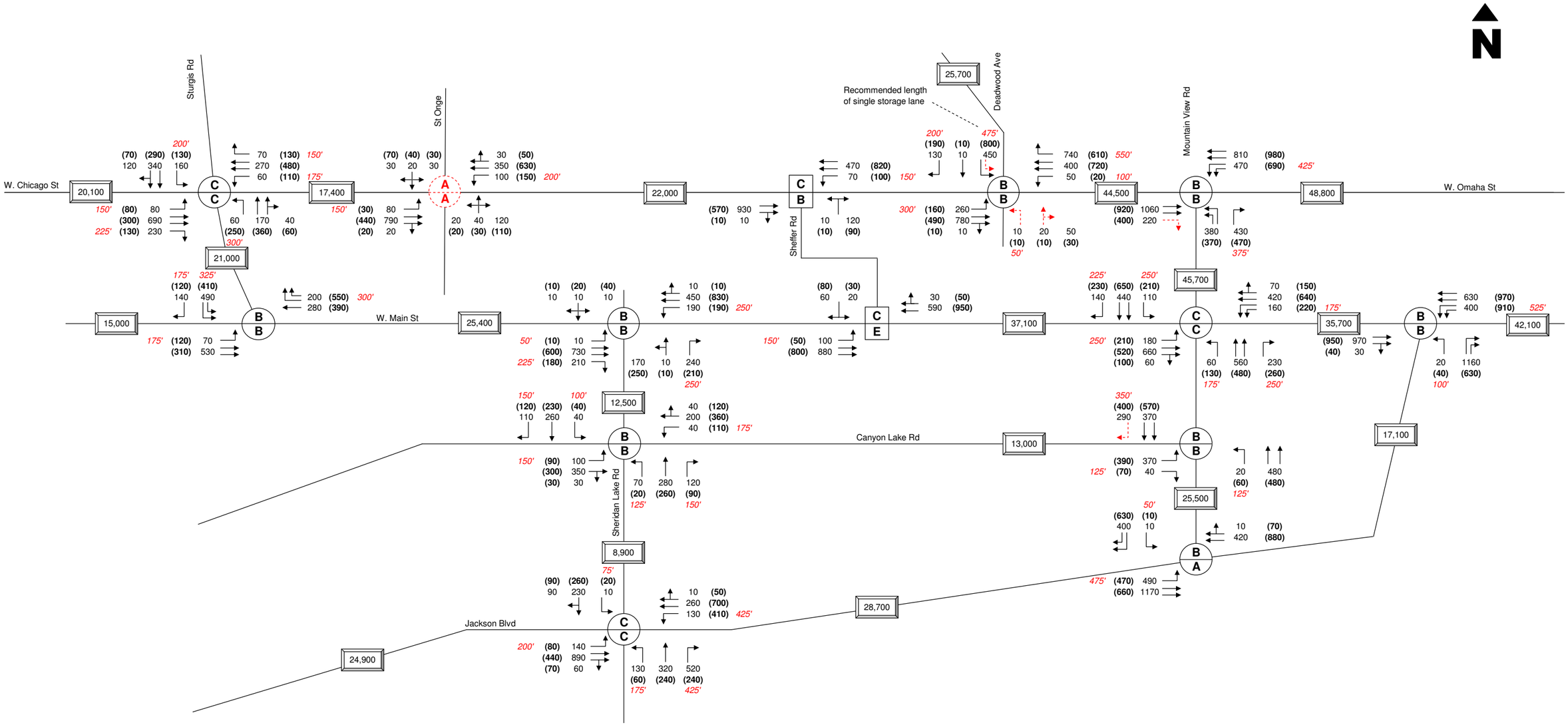
Sources:
1. 2007 Turning Movement Volumes by HDR, February 2007
2. 2006 Seasonal Factors, SDDOT, February 2007

2030 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to Deadwood Avenue (Without Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
15



LEGEND

- AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
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- Recommended Geometric Improvements
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Note:
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Sources:
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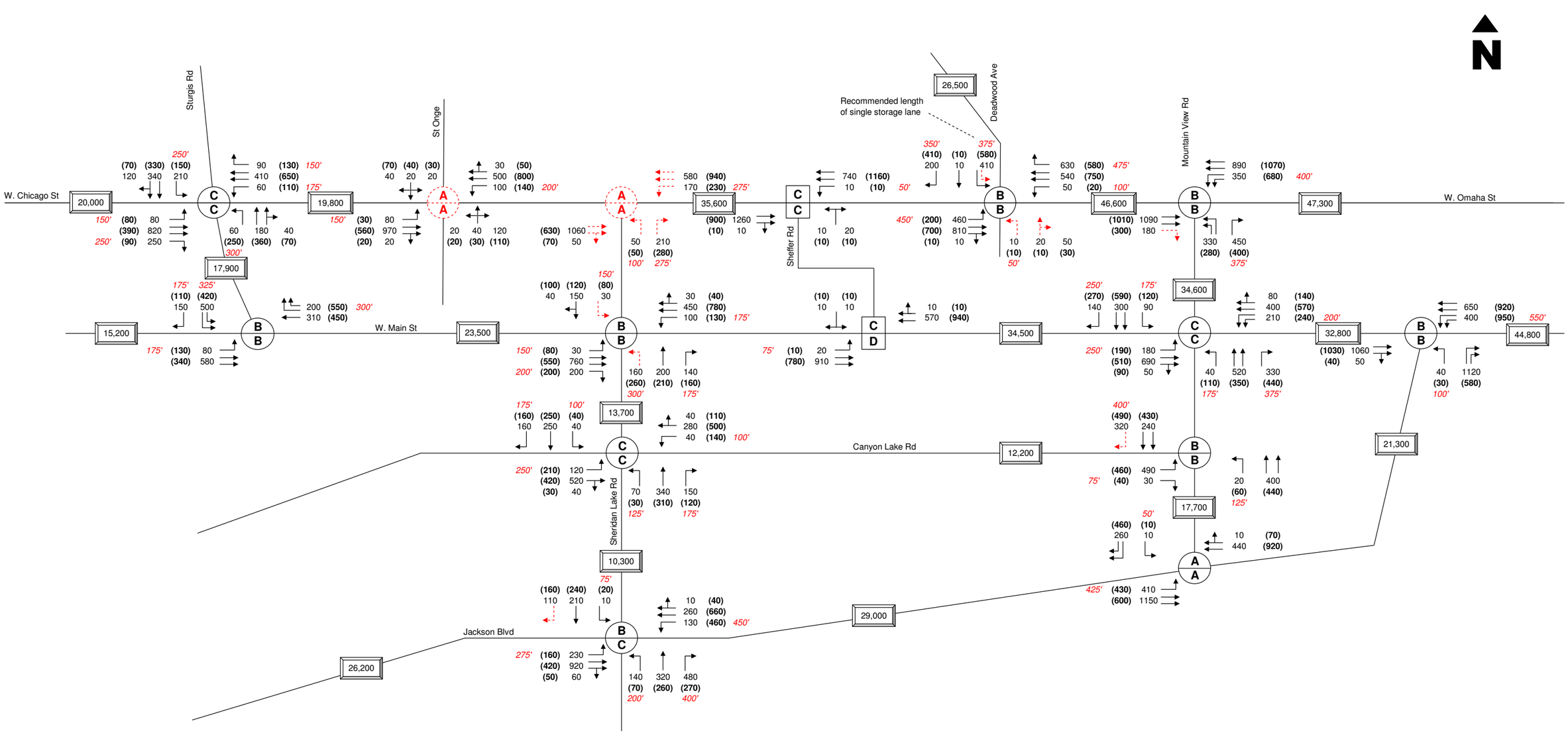
2030 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - No-Build (With Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
16



LEGEND

- X / X — AM Signalized Intersection Level of Service / PM Signalized Intersection Level of Service
- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
- XX,XXX — 2030 ADT
- XXX / (XXX) — 2030 AM Peak Hour Volume / 2030 PM Peak Hour Volume
- ← — Existing Geometrics
- XXX' — Recommended Storage
- ←- — Recommended Geometric Improvements
- X / X — Recommended Signalized Intersection

Notes:
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Sources:
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2. 2006 Seasonal Factors, SDDOT, February 2007

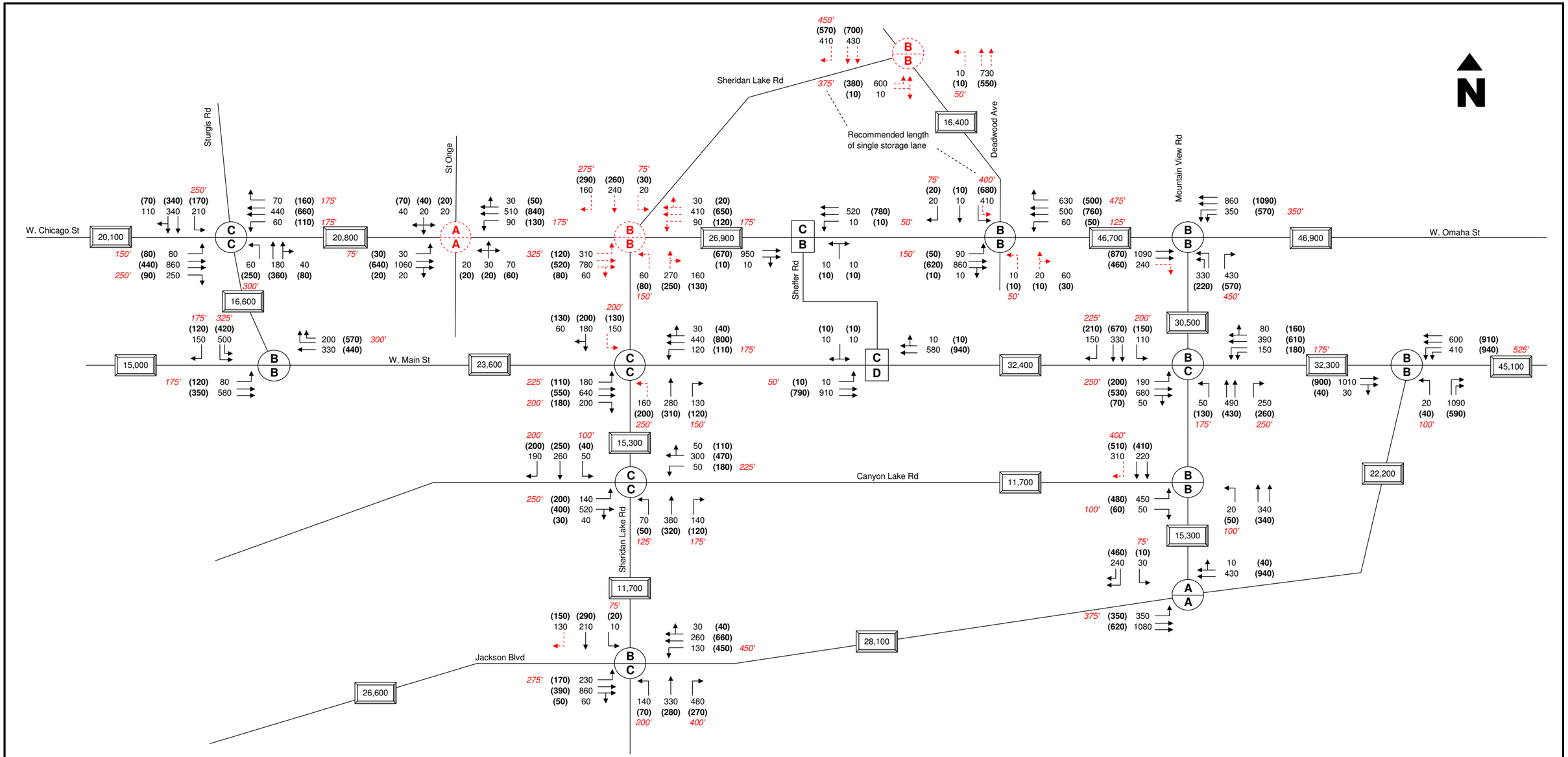
HDR

2030 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to W. Chicago Street (With Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
17



LEGEND

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- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
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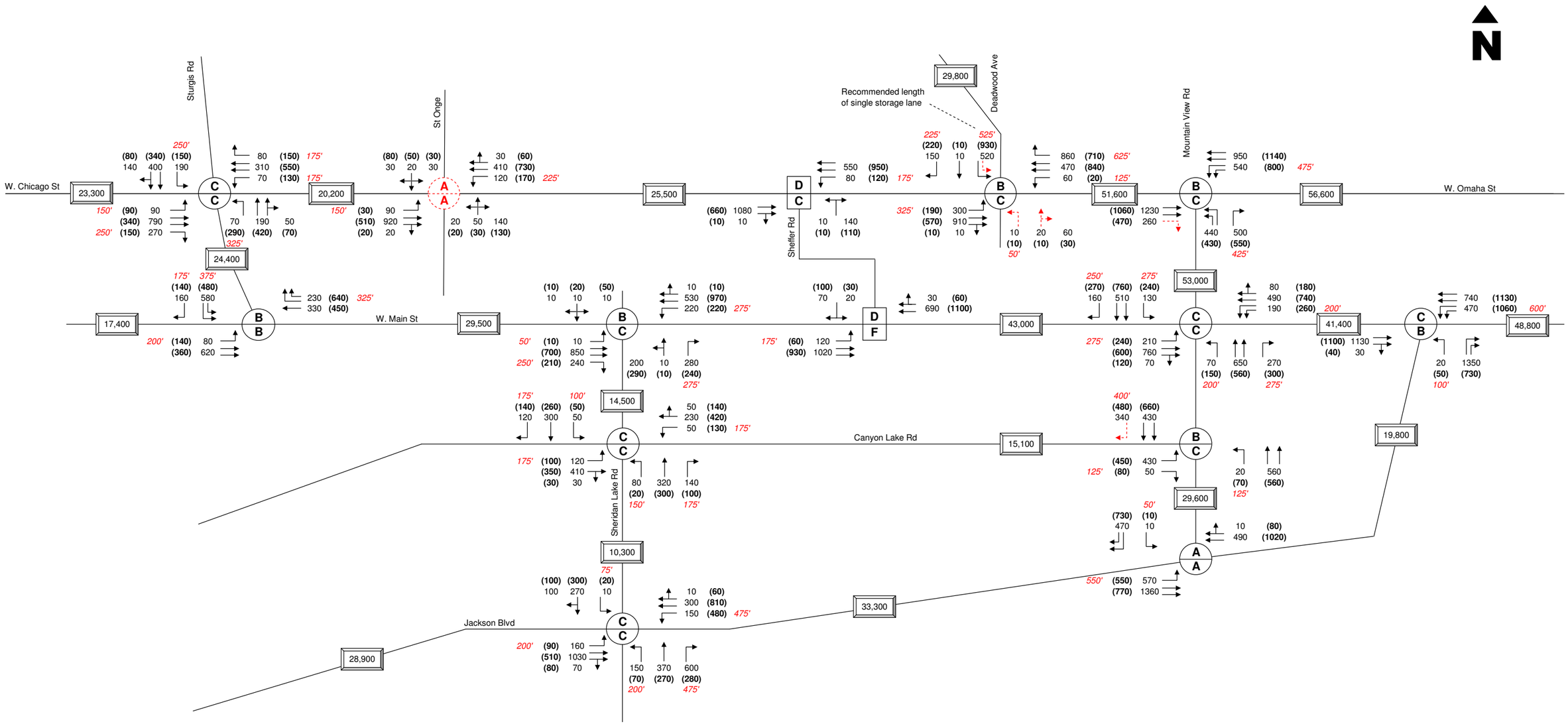
HDR

2030 Balanced Off-Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to Deadwood Avenue (With Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
18



LEGEND

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- AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
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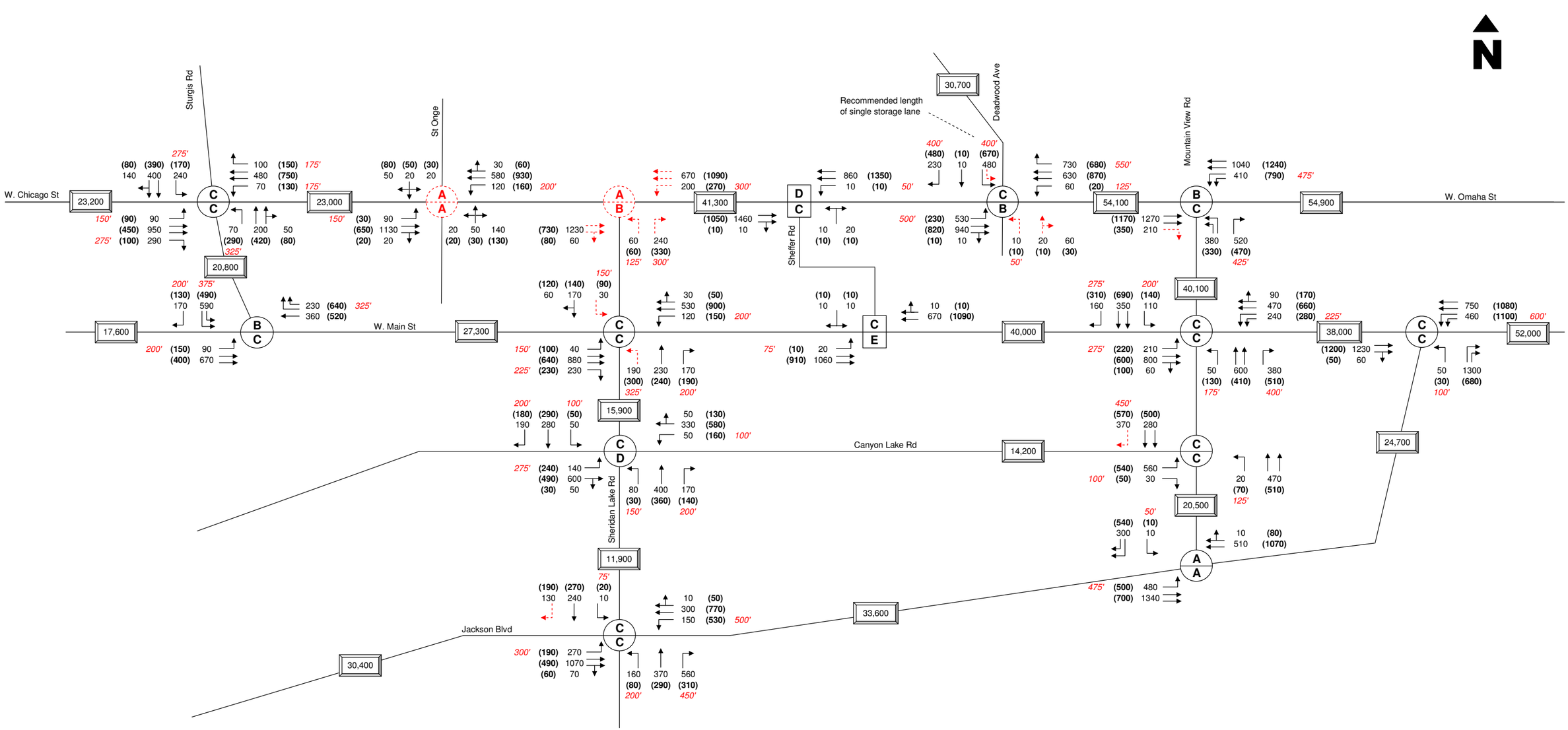
2030 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - No-Build (With Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
19



LEGEND

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- X / X — AM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service / PM Unsignalized Intersection Worst Case Stop Controlled Approach Level of Service
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Notes:
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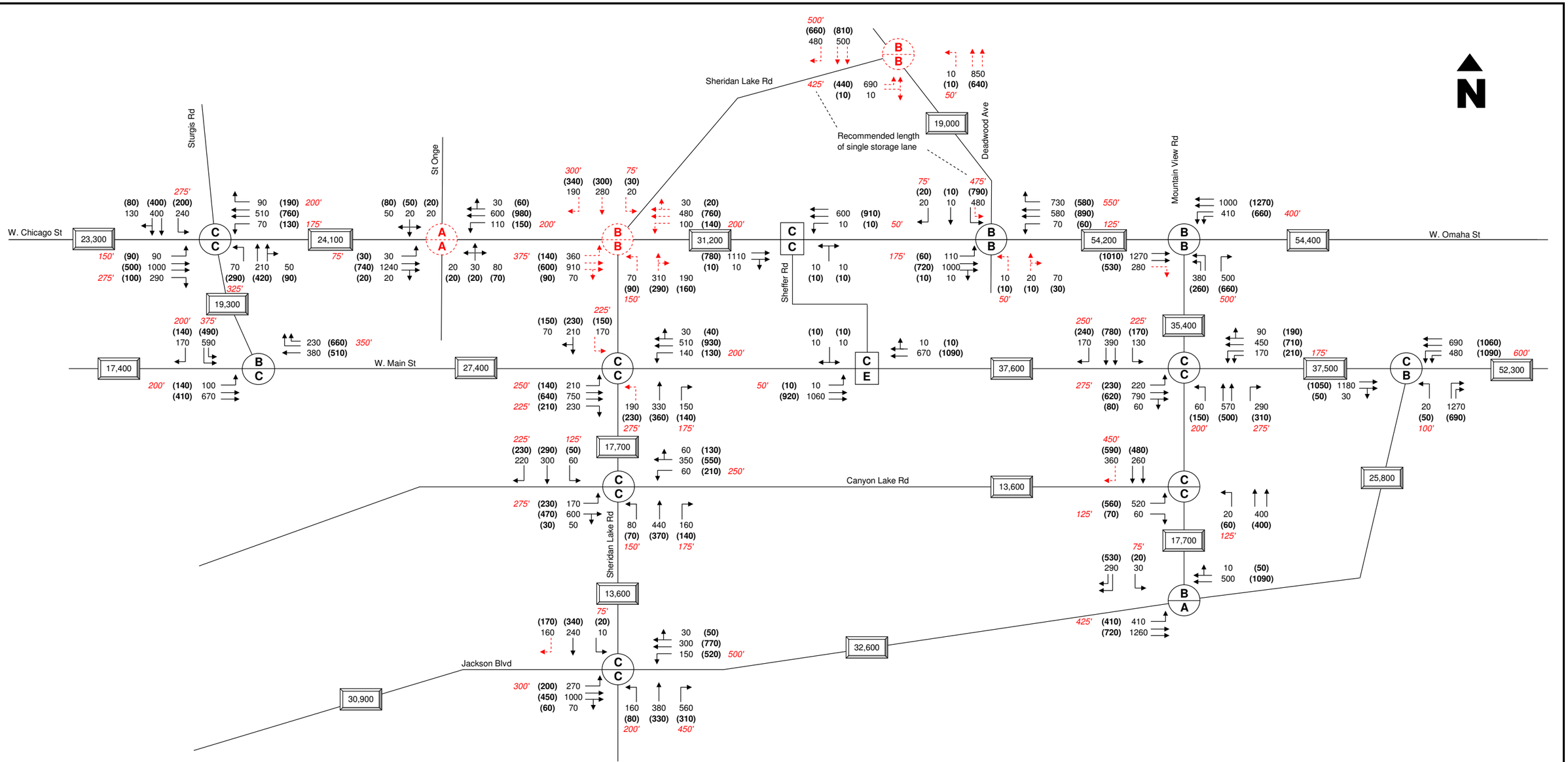
HDR

2030 Balanced Peak Season Peak Hour Volumes, Intersection Geometrics and Intersection Levels of Service - Extension to W. Chicago Street (With Improvements)

Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
20



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Sheridan Lake Road, Rapid City SD

Date
June 2007

Figure
21