

Travel Time Study

Using GPS

(US250, SR331, WV2 and WV250/88)

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Prepared by

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INTRODUCTION

This study is part of an ongoing travel time study initiated last year. The procedures to conduct this study and findings of the initial effort are documented in a report titled “A Travel Time Study Using GPS.” The roadways studied this year are US250 and SR331 in Belmont County and portions of US250 and WV2 in Ohio County and Marshall Counties. In addition, WV250/88 (Jefferson Ave.) in Moundsville is included. Jefferson Avenue data provides an opportunity to see how GPS data can be utilized to conduct intersection delay studies.

Originally, SR7, WV2, US40 and US250 were planned for this year. Due to the Wheeling Tunnel closure and other projects affecting these routes, it was necessary to select other routes. Therefore, SR331 and US250 in Belmont County and relevant portions of WV2 and US250 on the West Virginia side were selected. SR7 and US40 are deferred to next year. It was felt that Jefferson Avenue in Moundsville could also be done due to its proximity to US250 and WV2 runs. This study consists of two parts. A brief description of methodology used for this study is presented first. The data and graphics for each route along with key observations are presented next.

METHODOLOGY

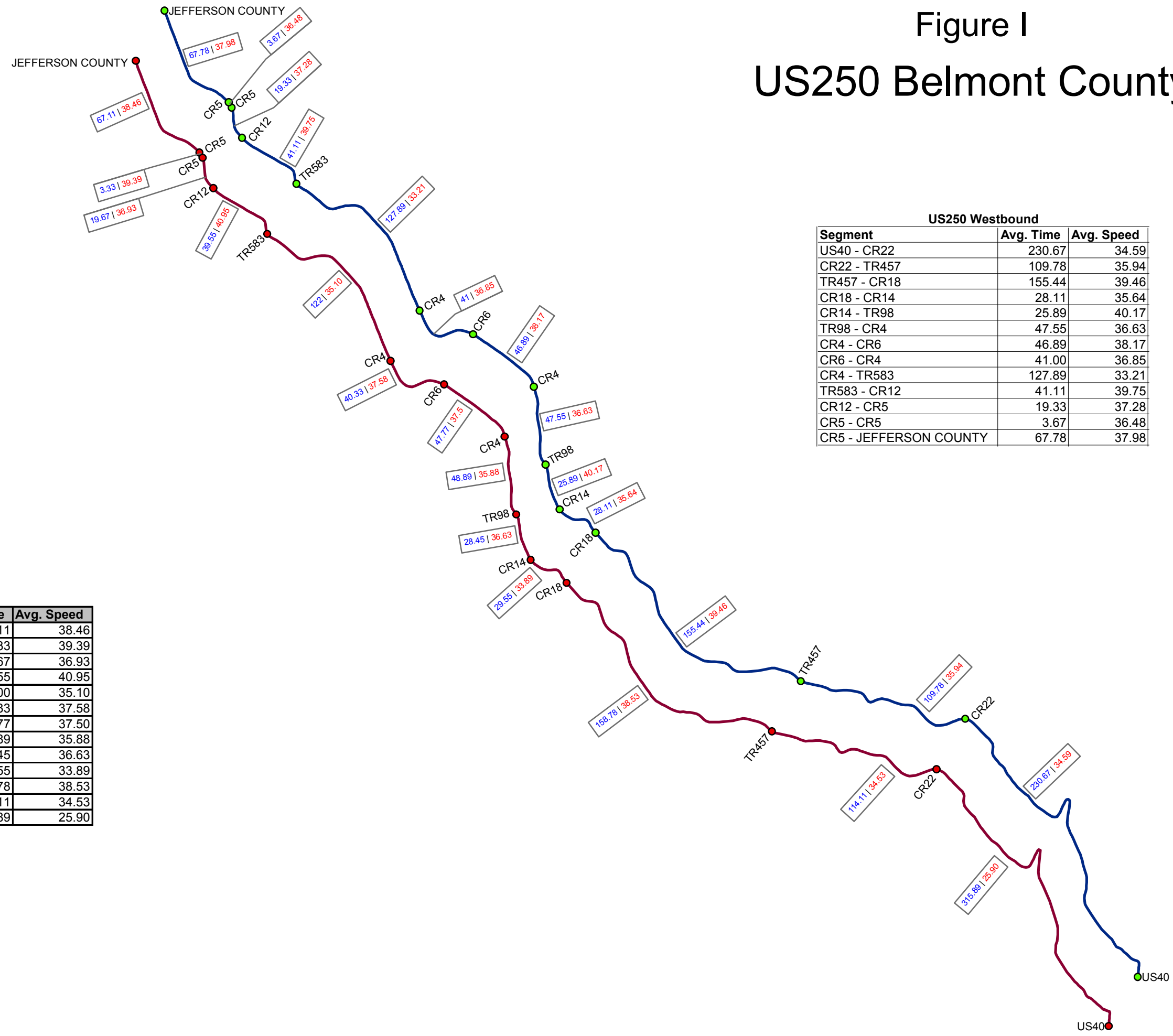
Three runs were planned for each route on different week days during the month of May and before June 5th. June 5th was the last day of school on the West Virginia side. The first run on each facility, was conducted with two persons in a vehicle with a GPS antenna and receiver. Only the GPS position data was collected in the field. The control points were added during post processing. The remaining two runs were conducted with only the driver in the vehicle. The GPS positions are recorded automatically. The position file was started before the run and closed after the run. The posted speed on these facilities varied from 15 MPH to 55 MPH. The points where posted speed changed were not recorded in the field. Thus, a comparison of posted versus observed speeds is not possible. However, this comparison can still be done in the future using data from the roadway inventory files.

US250 (Belmont County)

It is a two lane facility in a hilly terrain and runs from Jefferson County Line to US40 in Bridgeport near the West Virginia state line. The runs on this facility were conducted on May 7th, May 9th and May 10th. One file each for recording GPS positions was used for eastbound and westbound runs. The data for US250 eastbound and westbound is presented in Figure I.

There is little fluctuation in speeds in either direction. Eastbound speeds are consistent with westbound speeds. The only exception is in the eastbound direction, near US40, where an approximate drop of 10 MPH is observed. This section has a stop sign controlled intersection at Lincoln Avenue and the associated delay is reflected in the speed reduction. The highest speed in either direction is between 40 MPH and 41 MPH. With the exception of the eastbound section near US40, speeds at all sections, in either direction, are within 7 MPH of the highest observed speed.

Figure I US250 Belmont County



— Eastbound 250
— Westbound 250
| |
 Travel Time | Speed

US250 Westbound

Segment	Avg. Time	Avg. Speed
US40 - CR22	230.67	34.59
CR22 - TR457	109.78	35.94
TR457 - CR18	155.44	39.46
CR18 - CR14	28.11	35.64
CR14 - TR98	25.89	40.17
TR98 - CR4	47.55	36.63
CR4 - CR6	46.89	38.17
CR6 - CR4	41.00	36.85
CR4 - TR583	127.89	33.21
TR583 - CR12	41.11	39.75
CR12 - CR5	19.33	37.28
CR5 - CR5	3.67	36.48
CR5 - JEFFERSON COUNTY	67.78	37.98

US250 Eastbound

Segment	Avg. Time	Avg. Speed
JEFFERSON COUNTY - CR5	67.11	38.46
CR5 - CR5	3.33	39.39
CR5 - CR12	19.67	36.93
CR12 - TR583	39.55	40.95
TR583 - CR4	122.00	35.10
CR4 - CR6	40.33	37.58
CR6 - CR4	47.77	37.50
CR4 - TR98	48.89	35.88
TR98 - CR14	28.45	36.63
CR14 - CR18	29.55	33.89
CR18 - TR457	158.78	38.53
TR457 - CR22	114.11	34.53
CR22 - US40	315.89	25.90

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SR331

The SR331 is a two lane facility in a terrain that varies from level to rolling. It runs from the Harrison County line to US40 in Belmont County. Only two travels run on May 15th and May 16th were conducted on this facility. Before a third run could be completed, a resurfacing project with lane restrictions started on this roadway. Therefore, only two runs are utilized for this route. A third run may be added next year with average travel time recomputed accordingly.

The SR331 westbound run began at US40 and terminated at the Harrison County line. The positions were recorded in a file. The eastbound trip used the same termini with a new file to record the positions. The data for SR331 is presented in Figure II. As can be seen, the lower speeds are observed in the vicinity of US40, where major traffic generators such as Belmont Technical College and correctional facility are located. The highest speed is near the county line. The posted speeds vary from 25 to 50 MPH. The observed speeds vary from 23 MPH to 52 MPH with the exception of one segment near US40 that includes a traffic signal controlled intersection at US40.

US250 (Ohio and Marshall Counties)

US250 starts as a two lane facility at the Wetzel County line and proceeds north through Marshall County and the City of Moundsville before merging with WV2. It is a four lane facility north of WV2 and a limited access facility from north of the McMechen Corp. Line to I-70. It runs along the Ohio River on a level to rolling terrain and on a mountainous terrain south of Moundsville.

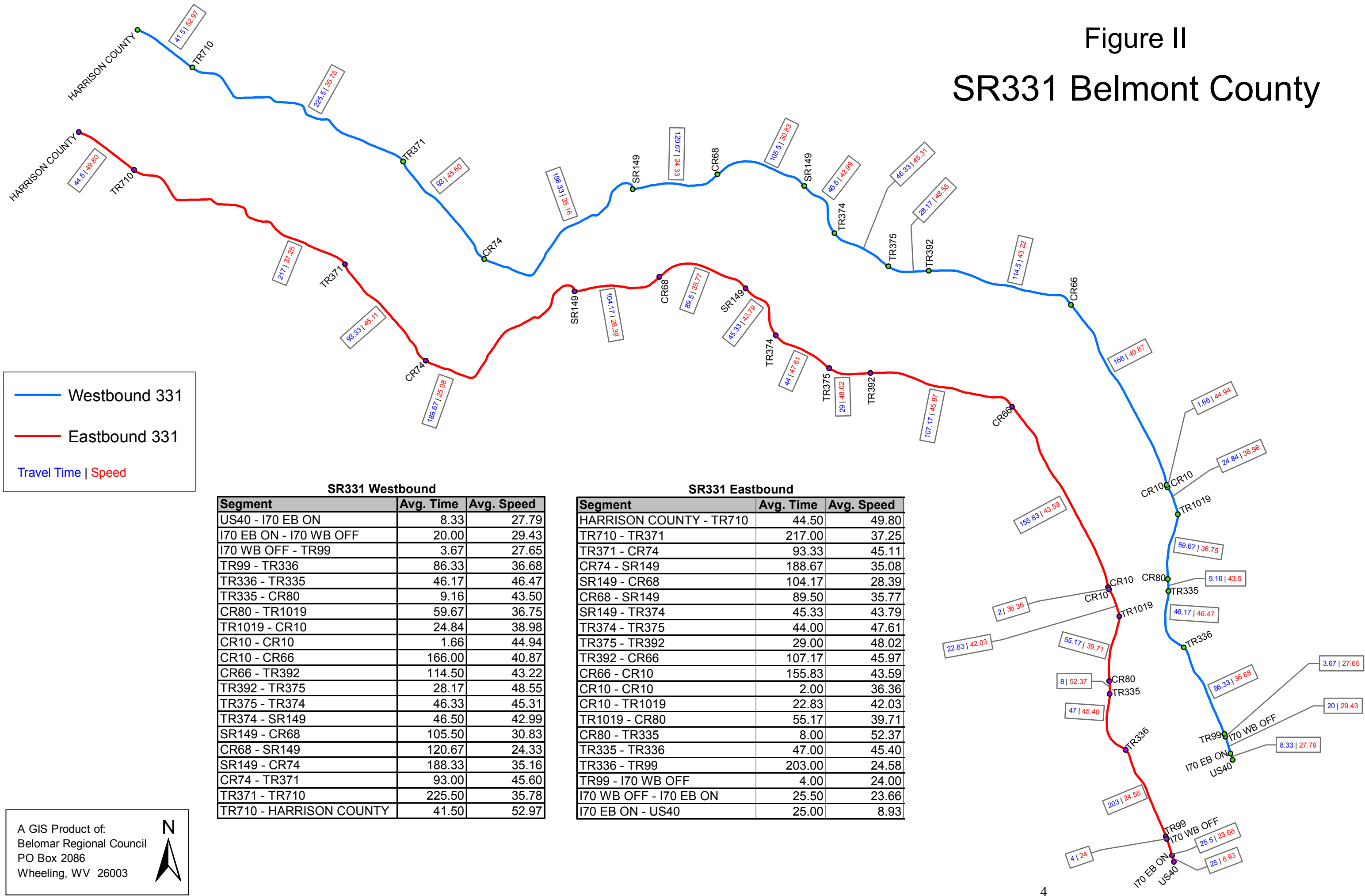
For the travel time purpose, only the portion of US250 from WV88 in Marshall County to I-70 in Ohio County is included. Three runs, one each on May 21st, May 22nd and May 23rd, were conducted. The termini of these runs were I-70 and WV88. The data for US250 is presented in Figure IIIa and IIIb.

The data suggests significant variation in speed. On the high end, speed exceeds 60 MPH and on the low end it falls below 15 MPH. The lowest speeds are in the vicinity of John Marshall High School and through the City of Moundsville. The observed speeds reflect posted speeds that vary from 15 MPH in the school zone to 55 MPH in Ohio County. Generally the observed speed on the limited access portion is 5 MPH over the posted speed limit.

WV2

WV2 generally runs along the Ohio River from the Wetzel County line to the Brooke County line. It has two lane and four lane sections in both Ohio and Marshall Counties. Only the section from the Wetzel County line to US250 north of Moundsville is studied this year. WV2 is a two lane facility south of CR27 to the Wetzel County line and a four lane facility from CR27 to US250. WV2 follows US250 through Glen Dale, McMechen, and Benwood in Marshall County and separates at 18th Street in the City of Wheeling. This section of WV2/US250 is studied separately and included in this report. The remaining portion of WV2 in Ohio County is affected by the Wheeling Tunnel closure and will be studied next year.

Figure II SR331 Belmont County



— Westbound 331
— Eastbound 331
| Travel Time | Speed

SR331 Westbound

Segment	Avg. Time	Avg. Speed
US40 - I70 EB ON	8.33	27.79
I70 EB ON - I70 WB OFF	20.00	29.43
I70 WB OFF - TR99	3.67	27.65
TR99 - TR336	86.33	36.68
TR336 - TR335	46.17	46.47
TR335 - CR80	9.16	43.50
CR80 - TR1019	59.67	36.75
TR1019 - CR10	24.84	38.98
CR10 - CR10	1.66	44.94
CR10 - CR66	166.00	40.87
CR66 - TR392	114.50	43.22
TR392 - TR375	28.17	48.55
TR375 - TR374	46.33	45.31
TR374 - SR149	46.50	42.99
SR149 - CR68	105.50	30.83
CR68 - SR149	120.67	24.33
SR149 - CR74	188.33	35.16
CR74 - TR371	93.00	45.60
TR371 - TR710	225.50	35.78
TR710 - HARRISON COUNTY	41.50	52.97

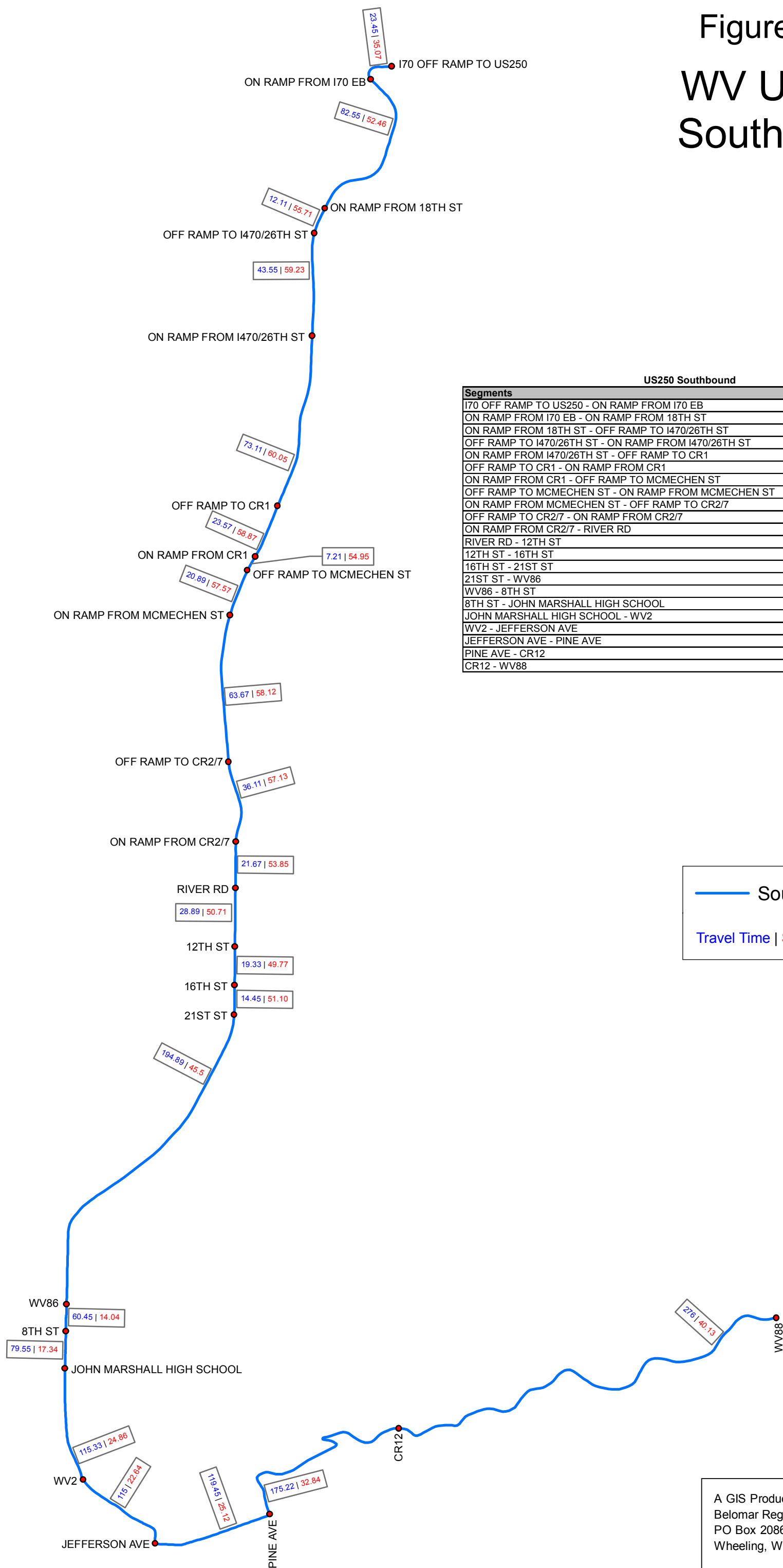
SR331 Eastbound

Segment	Avg. Time	Avg. Speed
HARRISON COUNTY - TR710	44.50	49.80
TR710 - TR371	217.00	37.25
TR371 - CR74	93.33	45.11
CR74 - SR149	188.67	35.08
SR149 - CR68	104.17	28.39
CR68 - SR149	89.50	35.77
SR149 - TR374	45.33	43.79
TR374 - TR375	44.00	47.61
TR375 - TR392	29.00	48.02
TR392 - CR66	107.17	45.97
CR66 - CR10	155.83	43.59
CR10 - CR10	2.00	36.36
CR10 - TR1019	22.83	42.03
TR1019 - CR80	55.17	39.71
CR80 - TR335	8.00	52.37
TR335 - TR336	47.00	45.40
TR336 - TR99	203.00	24.58
TR99 - I70 WB OFF	4.00	24.00
I70 WB OFF - I70 EB ON	25.50	23.66
I70 EB ON - US40	25.00	8.93

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Figure IIIa

WV US250 Southbound



US250 Southbound		
Segments	Avg. Time	Avg. Speed
I70 OFF RAMP TO US250 - ON RAMP FROM I70 EB	23.45	35.07
ON RAMP FROM I70 EB - ON RAMP FROM 18TH ST	82.55	52.46
ON RAMP FROM 18TH ST - OFF RAMP TO I470/26TH ST	12.11	55.71
OFF RAMP TO I470/26TH ST - ON RAMP FROM I470/26TH ST	43.55	59.23
ON RAMP FROM I470/26TH ST - OFF RAMP TO CR1	73.11	60.05
OFF RAMP TO CR1 - ON RAMP FROM CR1	23.57	58.87
ON RAMP FROM CR1 - OFF RAMP TO MCMECHEN ST	7.21	54.95
OFF RAMP TO MCMECHEN ST - ON RAMP FROM MCMECHEN ST	20.89	57.57
ON RAMP FROM MCMECHEN ST - OFF RAMP TO CR2/7	63.67	58.12
OFF RAMP TO CR2/7 - ON RAMP FROM CR2/7	36.11	57.13
ON RAMP FROM CR2/7 - RIVER RD	21.67	53.85
RIVER RD - 12TH ST	28.89	50.71
12TH ST - 16TH ST	19.33	49.77
16TH ST - 21ST ST	14.45	51.10
21ST ST - WV86	194.89	45.50
WV86 - 8TH ST	60.45	14.04
8TH ST - JOHN MARSHALL HIGH SCHOOL	79.55	17.34
JOHN MARSHALL HIGH SCHOOL - WV2	115.33	24.86
WV2 - JEFFERSON AVE	115.00	22.64
JEFFERSON AVE - PINE AVE	119.45	25.12
PINE AVE - CR12	175.22	32.84
CR12 - WV88	276.00	40.13

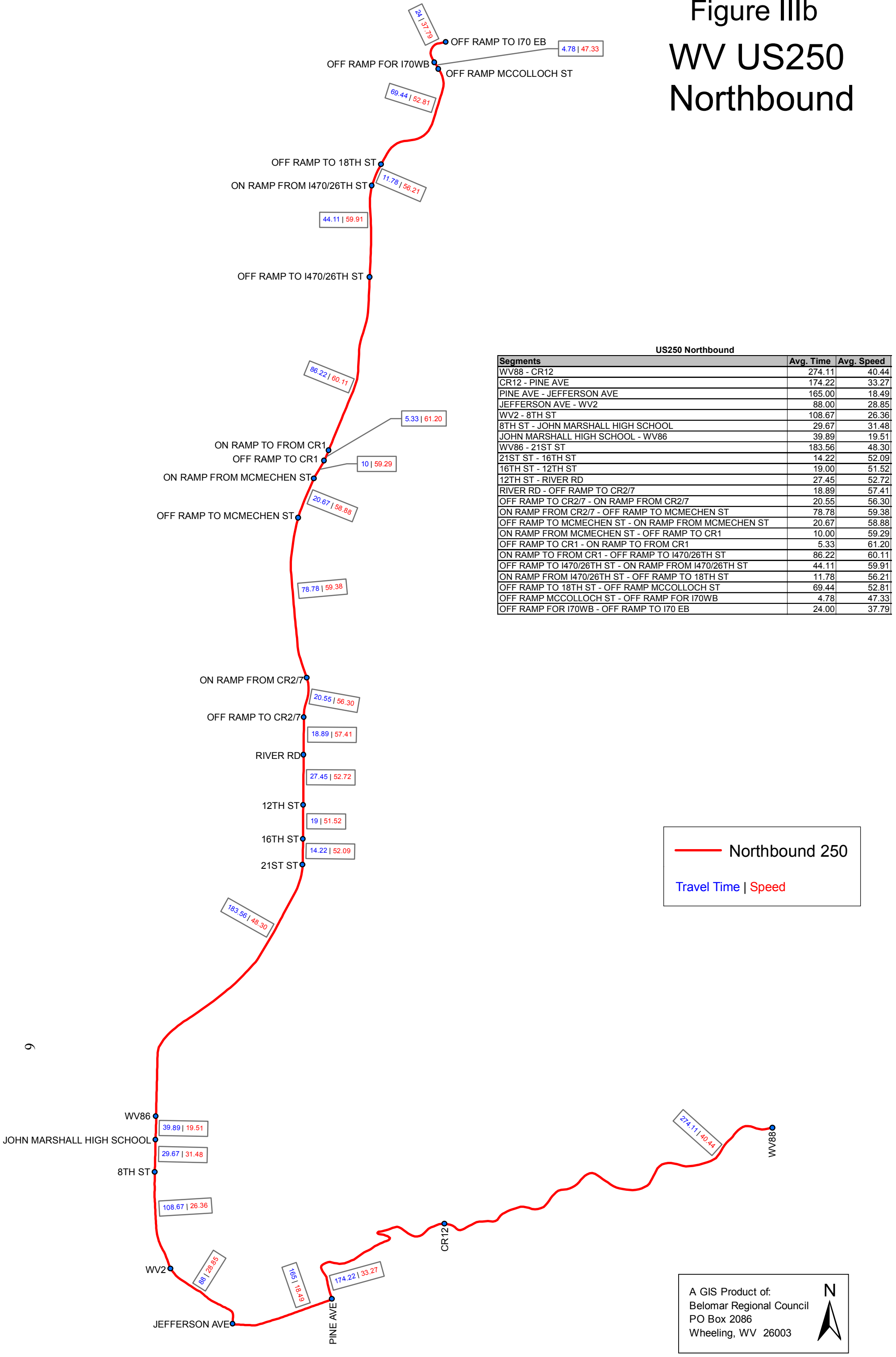
— Southbound 250

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Figure IIIb

WV US250 Northbound



US250 Northbound		
Segments	Avg. Time	Avg. Speed
WV88 - CR12	274.11	40.44
CR12 - PINE AVE	174.22	33.27
PINE AVE - JEFFERSON AVE	165.00	18.49
JEFFERSON AVE - WV2	88.00	28.85
WV2 - 8TH ST	108.67	26.36
8TH ST - JOHN MARSHALL HIGH SCHOOL	29.67	31.48
JOHN MARSHALL HIGH SCHOOL - WV86	39.89	19.51
WV86 - 21ST ST	183.56	48.30
21ST ST - 16TH ST	14.22	52.09
16TH ST - 12TH ST	19.00	51.52
12TH ST - RIVER RD	27.45	52.72
RIVER RD - OFF RAMP TO CR2/7	18.89	57.41
OFF RAMP TO CR2/7 - ON RAMP FROM CR2/7	20.55	56.30
ON RAMP FROM CR2/7 - OFF RAMP TO MCMECHEN ST	78.78	59.38
OFF RAMP TO MCMECHEN ST - ON RAMP FROM MCMECHEN ST	20.67	58.88
ON RAMP FROM MCMECHEN ST - OFF RAMP TO CR1	10.00	59.29
OFF RAMP TO CR1 - ON RAMP TO FROM CR1	5.33	61.20
ON RAMP TO FROM CR1 - OFF RAMP TO I470/26TH ST	86.22	60.11
OFF RAMP TO I470/26TH ST - ON RAMP FROM I470/26TH ST	44.11	59.91
ON RAMP FROM I470/26TH ST - OFF RAMP TO 18TH ST	11.78	56.21
OFF RAMP TO 18TH ST - OFF RAMP MCCOLLOCH ST	69.44	52.81
OFF RAMP MCCOLLOCH ST - OFF RAMP FOR I70WB	4.78	47.33
OFF RAMP FOR I70WB - OFF RAMP TO I70 EB	24.00	37.79

— Northbound 250
 Travel Time | Speed

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WV2 runs were conducted on May 21st, May 29th and May 30th. The southbound run started at US250 and ended at the Wetzel County line. The northbound run was the return trip. Data for WV2 is presented in Figure IV. Speeds from the county line to south of Moundsville are consistent and have a narrow range from 54 MPH to 61 MPH. Through Moundsville, speeds vary from 25 MPH to 36 MPH in the northbound direction and from 23 MPH to 43 MPH in the southbound direction. The four lane facility through Moundsville has many at grade intersections controlled by traffic signals. The observed speeds are consistent with posted speed limits on this facility. However, a direct comparison with posted speed limits is not possible, as this data is not available at this time.

WV250/88 (Jefferson Ave.)

This roadway runs from WV2 at 12th Street to US250 at 1st Street. It is a main route through the City of Moundsville. Some intersections on this facility have traffic signal control while others have stop signs.

The travel time runs were undertaken on May 29th, May 30th and June 4th. The southbound run started at 1st Street (US250) and ended at WV2. The northbound run was the return trip from WV2 to 1st Street. The data for WV250/88 is presented in Figure V. Generally, observed speeds are lower than or slightly above the posted speed limit of 25 MPH. The speed varies from a low of under 10 MPH to a high of 26 MPH. Lowest speeds are between 7th and 8th Street.

Figure IV

WV2 Southbound

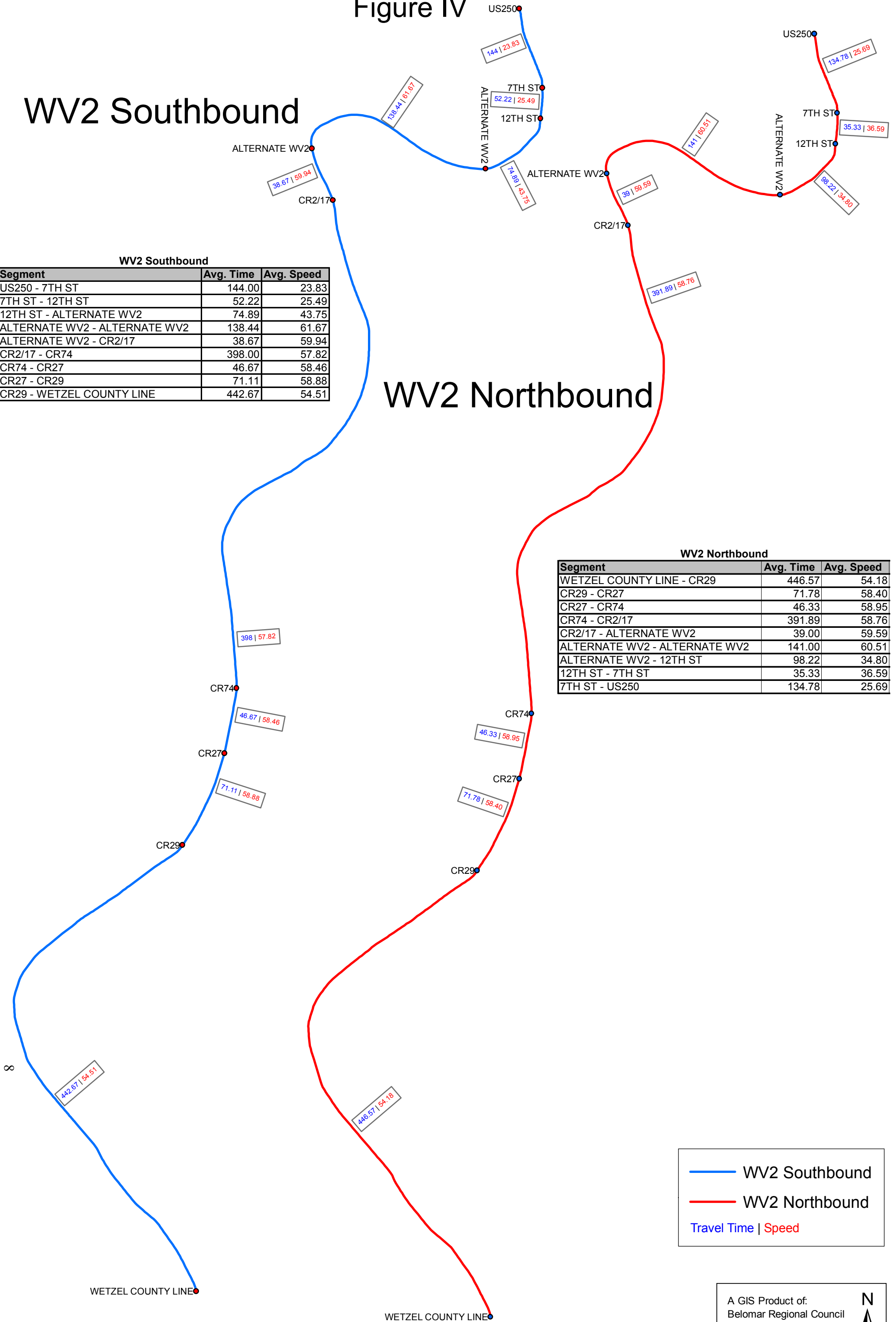
WV2 Northbound

WV2 Southbound

Segment	Avg. Time	Avg. Speed
US250 - 7TH ST	144.00	23.83
7TH ST - 12TH ST	52.22	25.49
12TH ST - ALTERNATE WV2	74.89	43.75
ALTERNATE WV2 - ALTERNATE WV2	138.44	61.67
ALTERNATE WV2 - CR2/17	38.67	59.94
CR2/17 - CR74	398.00	57.82
CR74 - CR27	46.67	58.46
CR27 - CR29	71.11	58.88
CR29 - WETZEL COUNTY LINE	442.67	54.51

WV2 Northbound

Segment	Avg. Time	Avg. Speed
WETZEL COUNTY LINE - CR29	446.57	54.18
CR29 - CR27	71.78	58.40
CR27 - CR74	46.33	58.95
CR74 - CR2/17	391.89	58.76
CR2/17 - ALTERNATE WV2	39.00	59.59
ALTERNATE WV2 - ALTERNATE WV2	141.00	60.51
ALTERNATE WV2 - 12TH ST	98.22	34.80
12TH ST - 7TH ST	35.33	36.59
7TH ST - US250	134.78	25.69



— WV2 Southbound
— WV2 Northbound
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Figure V

WV250/88 Southbound

WV250/88 Southbound

Segment	Avg. Time	Avg. Speed
US250 - 2ND ST	26.67	16.29
2ND ST - 3RD ST	43.11	9.66
3RD ST - 5TH ST	18.89	21.82
5TH ST - 6TH ST	8.45	26.71
6TH ST - 7TH ST	7.77	25.70
7TH ST - 8TH ST	23.45	10.27
8TH ST - 10TH ST	16.33	23.66
10TH ST - CR17	51.33	18.00
CR17 - WV2	42.89	18.57

WV250/88 Northbound

Segment	Avg. Time	Avg. Speed
WV2 - CR17	40.33	20.26
CR17 - 10TH ST	35.55	22.60
10TH ST - 8TH ST	26.45	15.09
8TH ST - 7TH ST	28.00	7.58
7TH ST - 6TH ST	9.00	22.13
6TH ST - 5TH ST	31.33	7.19
5TH ST - 3RD ST	23.00	17.98
3RD ST - 2ND ST	31.67	13.23
2ND ST - US250	49.67	11.58

— Southbound 250/88
— Northbound 250/88
| Travel Time | Speed

WV250/88 Northbound

