

# Travel Time Study

## Using GPS

(SR7, CR214 and WV2)

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Prepared by

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## *INTRODUCTION*

This study is part of an ongoing travel time study initiated in the year 2006. 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 SR7 and CR214 in Belmont County and WV2 north of I-70 in Ohio County

WV2/US250 south of I-70 was completed last year. This year WV2 north of I-70 was completed. In Belmont County, SR7 was split into SR7 north of I-70 and SR7 south of I-70. Both segments were traversed on different days. The data for both segments was then combined to generate the travel time for the entire length. County Route 214, along with access to CR214 from SR7, was also traversed this year.

## *METHODOLOGY*

Three runs were conducted for each route on three different weekdays. The routes were traversed only on Tuesdays, Wednesdays and Thursdays in April and May. 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 each run and closed after the run. From these position points, linear feature was generated during the post processing. 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.

### *WV2 (Ohio County)*

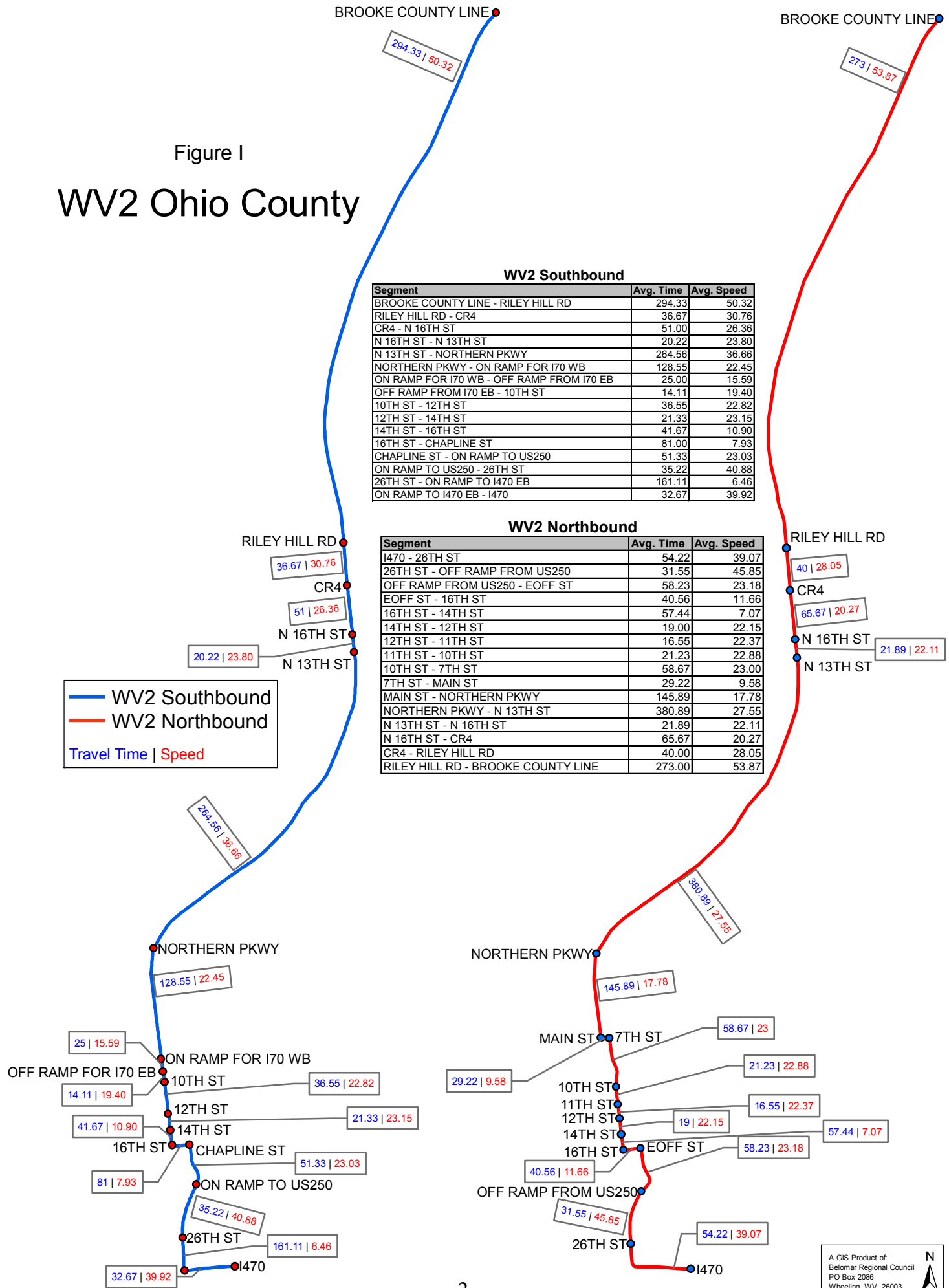
WV2 north of I-70 was affected by the Wheeling Tunnel closure last year. Thus, while sections south of the tunnels were completed last year, the sections through North Wheeling and Warwood were studied this year. Three runs were conducted on April 8<sup>th</sup>, 10<sup>th</sup> and 16<sup>th</sup>. Another run had to be abandoned due to the delay caused by an incident on this route.

The northbound run started from the I-470 westbound off ramp for 26<sup>th</sup> Street and ended at the Brooke County line. The southbound run started at the Brooke County line and ended at the I-470 eastbound on ramp from 26<sup>th</sup> Street. The WV2 northbound follows Market Street in downtown Wheeling, while WV2 southbound follows Main Street. Consistent with multiple signals in downtown, North Wheeling and Warwood, the speeds range from 6 MPH to approximately 37 MPH in these areas. The lower speeds are in downtown and higher speeds are on the section between Northern Parkway and south of Warwood. The four lane section of WV2 from north of Warwood to the Brooke County line has speeds consistent with a four lane expressway facility. The observed speed on this section is approximately 54 MPH.

No significant delays were observed on this facility. The GPS lock was lost at several locations in downtown Wheeling due to the presence of multi-story structures. Available recorded positions were used to compute travel time for the gaps.

The data and graphics generated for this route are presented in Figure I.

Figure I  
**WV2 Ohio County**



## *SR7 (Belmont County)*

SR7 is a four lane facility, with the exception of a two lane section in the southern portion of Belmont County. There are at grade intersections in Bridgeport and Martins Ferry. Due to the length of the route and limited window of time from 3 p.m. to 6 p.m., the route was split in two segments. The Route 7 north of I-70 was studied separately from the Route 7 south of I-70. Both segments were traversed on separate days and treated, for data collection, as separate routes. The data was combined in post processing phase to reflect the entire length of SR7 through Belmont County. The runs for the segment south of I-70 were conducted on April 17<sup>th</sup>, 22<sup>nd</sup> and 23<sup>rd</sup> and the segment north of I-70, was traversed on April 24<sup>th</sup>, May 6<sup>th</sup> and May 7<sup>th</sup>.

For the segment south of I-70, the southbound travel time runs started from the on ramp from Lincoln Avenue in Bridgeport and terminated at the Monroe County line. The northbound runs started from the Monroe County line and terminated at the Lincoln Avenue off ramp.

The travel time runs for the segment north of I-70 were between I-470 and the Jefferson County line. An overlap section between I-470 and Lincoln Avenue was utilized for joining the two segments during post processing.

The observed speeds, in both northbound and southbound directions, reflect the speeds consistent with the characteristics of the facility. Lower speeds are observed in sections through Powhatan Point, Bridgeport and Martins Ferry. On these sections, speeds vary from a low of approximately 27 MPH to 52 MPH. On four lane limited access sections, the speeds are generally higher than 55 MPH and the highest observed speed is close to 62 MPH near the Jefferson County line.

The data and graphics generated from this data are presented in Figure II.

## *CR214 (Belmont County)*

CR214, a two lane facility, starts at US40 and ends at Belmont Street (old SR7) in Bellaire. For travel time purposes, the data was collected between US40 and the 26<sup>th</sup> Street interchange in Bellaire. The outbound (northbound) run started from the SR7 southbound off ramp and terminated at US40. The inbound (southbound) run started at US40 and terminated at the SR7 northbound on ramp. The runs were conducted on May 21<sup>st</sup>, 27<sup>th</sup>, and 28<sup>th</sup>.

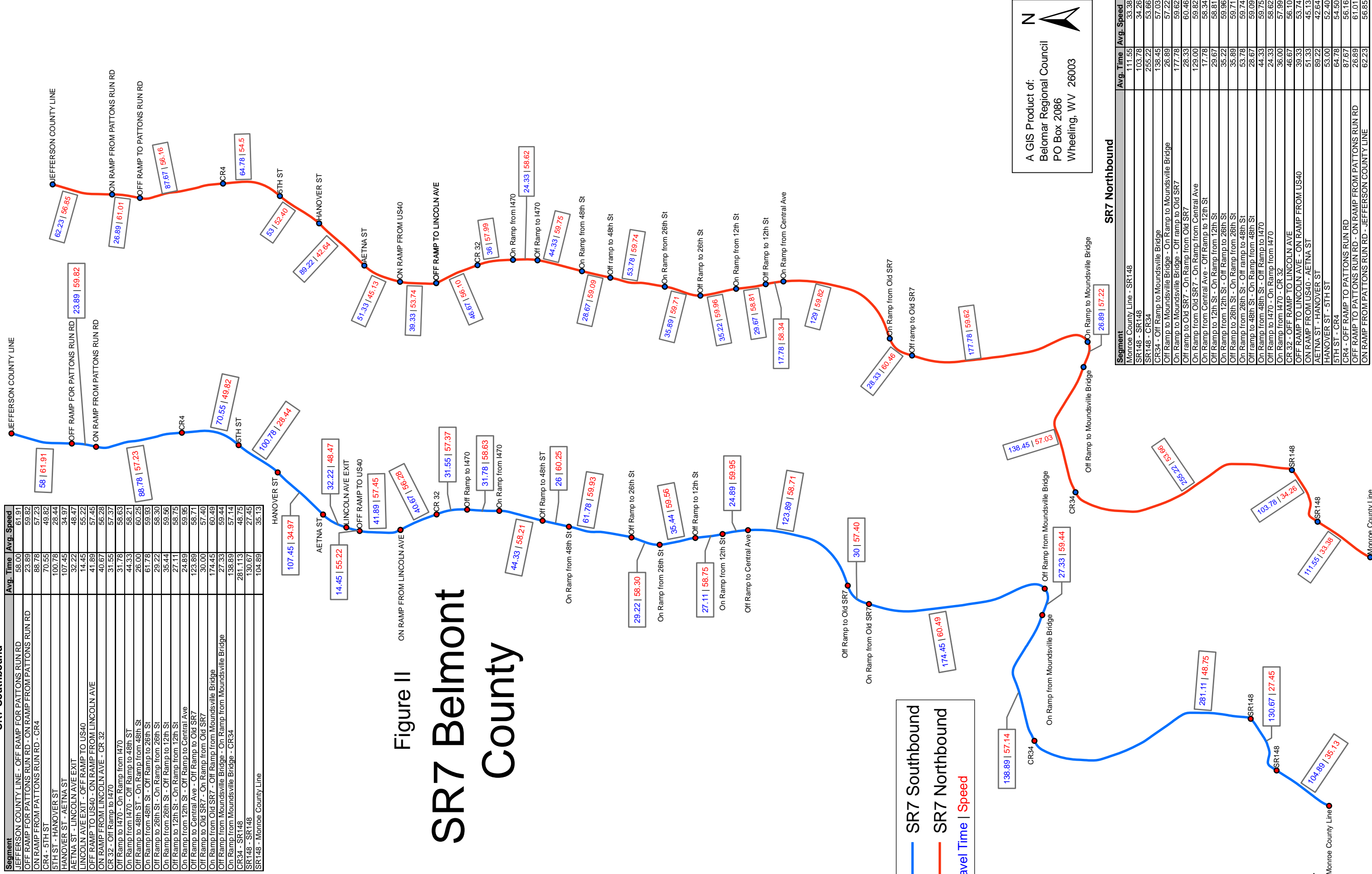
The observed speeds on the southbound run varied from a low of 15 MPH in Bellaire to a high of 46 MPH at the on ramp to SR7 northbound. On CR214, the highest speed of 45 MPH was observed just east of the CR214 interchange on I-470. In the northbound direction, the delay due to stop sign control at the US40 intersection is reflected in the second lowest speed of approximately 8 MPH on this facility. A similar delay is experienced at signalized intersection with Belmont Street. As is the case in the southbound direction, the highest speed in the northbound direction is just east of the CR214 interchange on I-470.

The data and graphics generated from this data are presented in Figure III.

SR7 Southbound

Segment	Avg. Time	Avg. Speed
JEFFERSON COUNTY LINE - OFF RAMP FOR PATTONS RUN RD	58.00	61.91
OFF RAMP FOR PATTONS RUN RD - ON RAMP FROM PATTONS RUN RD	23.89	59.82
ON RAMP FROM PATTONS RUN RD - CR4	88.78	57.23
CR4 - 5TH ST	70.55	49.82
5TH ST - HANOVER ST	100.78	28.44
HANOVER ST - AETNA ST	107.45	34.97
AETNA ST - LINCOLN AVE EXIT	32.22	48.47
LINCOLN AVE EXIT - OFF RAMP TO US40	14.45	55.22
OFF RAMP TO US40 - ON RAMP FROM LINCOLN AVE	41.89	57.45
ON RAMP FROM LINCOLN AVE - CR 32	40.67	56.28
CR 32 - Off Ramp to I470	31.55	57.37
Off Ramp to I470 - On Ramp from I470	31.78	58.63
On Ramp from I470 - Off Ramp to 48th St	44.33	58.21
Off Ramp to 48th St - On Ramp from 48th St	26.00	60.25
On Ramp from 48th St - Off Ramp to 26th St	61.78	59.93
Off Ramp to 26th St - On Ramp from 26th St	29.22	58.30
On Ramp from 26th St - Off Ramp to 12th St	35.44	59.56
Off Ramp to 12th St - On Ramp from 12th St	27.11	58.75
On Ramp from 12th St - Off Ramp to Central Ave	24.89	59.95
Off Ramp to Central Ave - Off Ramp to Old SR7	123.89	58.71
Off Ramp to Old SR7 - On Ramp from Old SR7	30.00	57.40
On Ramp from Old SR7 - Off Ramp from Moundsville Bridge	174.45	60.49
Off Ramp from Moundsville Bridge - On Ramp from Moundsville Bridge	27.33	59.44
On Ramp from Moundsville Bridge - CR34	138.89	57.14
CR34 - SR148	281.11	48.75
SR148 - SR148	130.67	27.45
SR148 - Monroe County Line	104.89	35.13

Figure II  
SR7 Belmont  
County



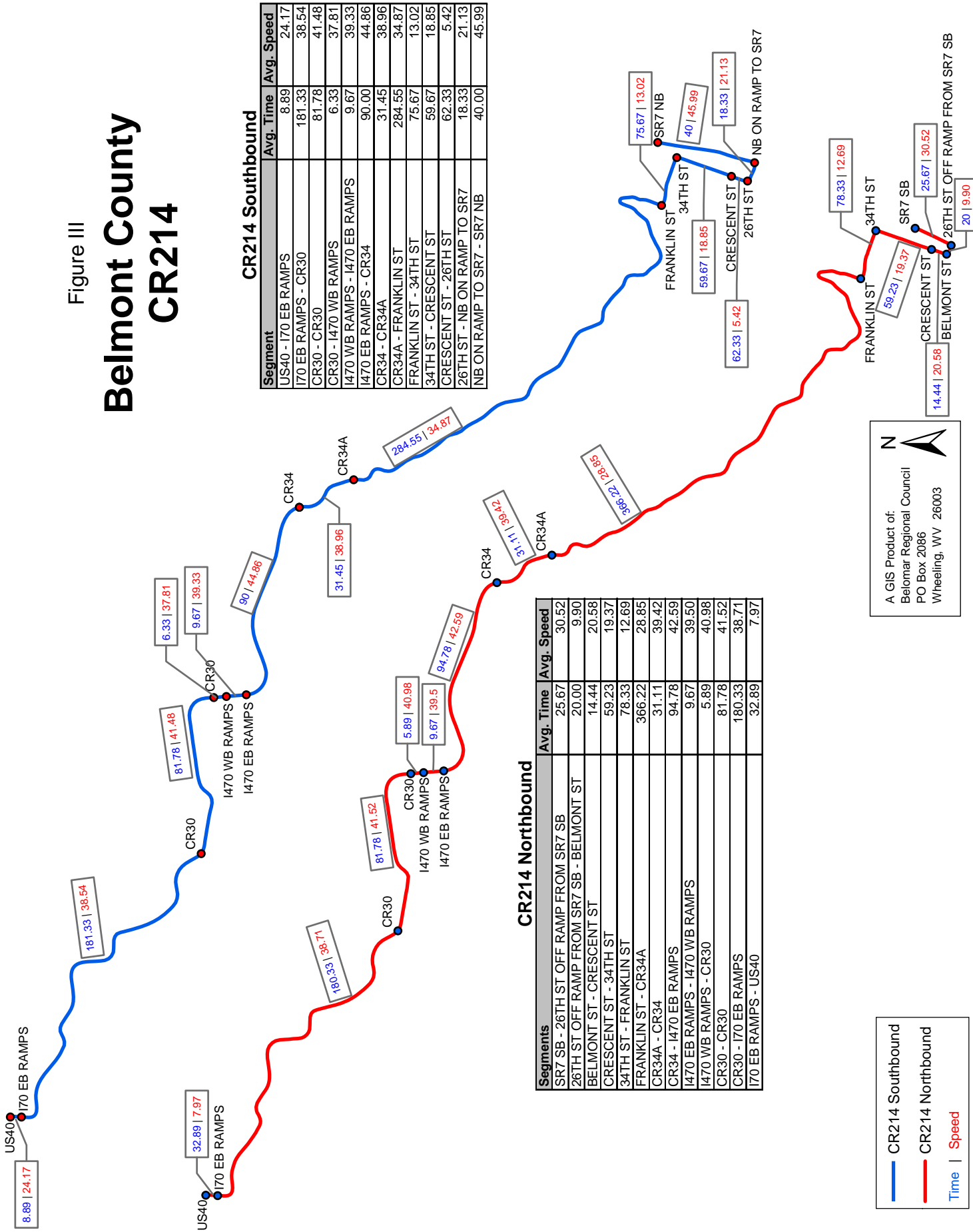
— SR7 Southbound  
— SR7 Northbound  
| Travel Time | | Speed

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SR7 Northbound

Segment	Avg. Time	Avg. Speed
Monroe County Line - SR148	111.55	33.38
SR148 - SR148	103.78	34.26
SR148 - CR34	255.22	53.66
CR34 - Off Ramp to Moundsville Bridge	138.45	57.03
Off Ramp to Moundsville Bridge - On Ramp to Moundsville Bridge	26.89	57.22
On Ramp to Moundsville Bridge - Off ramp to Old SR7	177.78	59.62
Off ramp to Old SR7 - On Ramp from Old SR7	28.33	60.46
On Ramp from Old SR7 - On Ramp from Central Ave	129.00	59.82
On Ramp from Central Ave - Off Ramp to 12th St	17.78	58.34
Off Ramp to 12th St - On Ramp from 12th St	29.67	58.81
On Ramp from 12th St - Off Ramp to 26th St	35.22	59.96
Off Ramp to 26th St - On Ramp from 26th St	35.89	59.71
On Ramp from 26th St - Off ramp to 48th St	53.78	59.74
Off ramp to 48th St - On Ramp from 48th St	28.67	59.09
On Ramp from 48th St - Off Ramp to I470	44.33	59.75
Off Ramp to I470 - On Ramp from I470	24.33	58.62
On Ramp from I470 - CR 32	36.00	57.99
CR 32 - OFF RAMP TO LINCOLN AVE	46.67	56.10
OFF RAMP TO LINCOLN AVE - ON RAMP FROM US40	39.33	53.74
ON RAMP FROM US40 - AETNA ST	51.33	45.13
AETNA ST - HANOVER ST	89.22	42.64
HANOVER ST - CR4	53.00	52.40
5TH ST - CR4	64.78	54.50
CR4 - OFF RAMP TO PATTONS RUN RD	87.67	56.16
OFF RAMP TO PATTONS RUN RD - ON RAMP FROM PATTONS RUN RD	26.89	61.01
ON RAMP FROM PATTONS RUN RD - JEFFERSON COUNTY LINE	62.23	56.85

# Figure III Belmont County CR214



Segment	Avg. Time	Avg. Speed
US40 - I70 EB RAMP	8.89	24.17
I70 EB RAMP - CR30	181.33	38.54
CR30 - CR30	81.78	41.48
CR30 - I470 WB RAMP	6.33	37.81
I470 WB RAMP - I470 EB RAMP	9.67	39.33
I470 EB RAMP - CR34	90.00	44.86
CR34 - CR34A	31.45	38.96
CR34A - FRANKLIN ST	284.55	34.87
FRANKLIN ST - 34TH ST	75.67	13.02
34TH ST - CRESCENT ST	59.67	18.85
CRESCENT ST - 26TH ST	62.33	5.42
26TH ST - NB ON RAMP TO SR7	18.33	21.13
NB ON RAMP TO SR7 - SR7 NB	40.00	45.99

Segments	Avg. Time	Avg. Speed
SR7 SB - 26TH ST OFF RAMP FROM SR7 SB	25.67	30.52
26TH ST OFF RAMP FROM SR7 SB - BELMONT ST	20.00	9.90
BELMONT ST - CRESCENT ST	14.44	20.58
CRESCENT ST - 34TH ST	59.23	19.37
34TH ST - FRANKLIN ST	78.33	12.69
FRANKLIN ST - CR34A	366.22	28.85
CR34A - CR34	31.11	39.42
CR34 - I470 EB RAMP	94.78	42.59
I470 EB RAMP - I470 WB RAMP	9.67	39.50
I470 WB RAMP - CR30	5.89	40.98
CR30 - CR30	81.78	41.52
CR30 - I70 EB RAMP	180.33	38.71
I70 EB RAMP - US40	32.89	7.97

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— CR214 Southbound  
— CR214 Northbound  
| Time | Speed