Speed Management on Freeways in Transition Zones Between Rural and Urban Conditions

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16. Abstract

Drivers' noncompliance with the posted speed limit reductions on rural-to-urban freeway transition zones is a recurrent problem in Indiana and other states. Speed-reduction treatments, such as pavement markings and active signing, aim to solve this issue. Optical speed bars, longitudinal speed reduction markings, and speed feedback signs were identified as the most promising speed-reduction treatments for experimental implementation in Indiana. Probe-vehicle-based speed data for 1 year was acquired on selected freeway segments to measure the speed effect. A set of fixed-effects linear regression models were used to estimate the effect of speed-reduction treatments on three key speed behavior characteristics—average speed, 90th speed percentiles, and speed variability. Optical speed bars together with speed feedback signs are a promising combination of treatments. While this and other traditional speed-reduction treatments show promise, their influence area is limited to a portion of target road segments. Therefore, future speed management needs to consider other speed-reduction treatments, particularly automated and area-wide speed enforcement, to maintain reduced speeds inside urban areas.

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EXECUTIVE SUMMARY

Introduction

Drivers' non-compliance with reduced speed limits on freeway sections passing through urban roads is a persistent problem in Indiana and other states. Speed-reduction treatments, such as pavement markings and speed-activated signs, aim to address this issue. Engineering treatments are an inexpensive alternative for speed management compared to traditional speed enforcement. However, the effectiveness of engineering treatments may be limited. This study investigates the effectiveness of selected engineering treatments when applied in combination.

A comprehensive literature review of engineering treatments on freeways helped to select optical speed bars, longitudinal speed reduction markings, and speed feedback signs as the most promising methods for experimental implementation. In colla-boration with INDOT and members of the study advisory committee, the research team implemented and studied four treatment combinations in selected freeway transition zones. To measure the speed effect, travel speed data from the transportation analytics company INRIX was acquired for 1 year on select freeway segments near Indianapolis and Louisville. A set of fixed-effects linear regression models were proposed to estimate the effect of speed-reduction treatments on three key speed behavior characteristics—(1) average speed, (2) 90th-percentile speed, and (3) speed variability.

Findings

This study identified feasible and effective speed-reduction treatments for Indiana's rural-to-urban freeway transition zones. The most promising combination of speed-reduction treatments is optical speed bars and speed feedback signs. Implementing this combination of treatments is anticipated to result in a 1.1–3.5 mph reduction in average speed. The influence distance, i.e., the effective road segment length before the speed reduction becomes negligible, was estimated to be nearly 3 miles. In addition, the reduction in 90th-percentile speeds was lower the average speed but still quite considerable. The expected speed reduction of the 90th-percentile speed is about 72% of the expected decrease in average speed.

Implementation

While traditional speed-reduction treatments, such as pavement markings and active signs, show promise, their influence area may be limited to a portion of the target road segment. To maintain lower speeds inside urban areas, future speed management must consider other types of speed-reduction strategies. For instance, promising alternatives to extend the effect of local treatments inside the urban area are urban area skip designs and automated speed enforcement. In 2022, the Indiana Senate passed Senate Bill 179, which did not pass the Indiana House and would have authorized the creation of a speed photo enforcement pilot project for highway work zones. Results from this pilot project would have been useful for the future implementation of automated speed enforcement in other settings, such as transition zones.

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1. INTRODUCTION

1.1 Motivation

Drivers' noncompliance with speed limit reductions posted on freeways entering urban areas is a common and persistent problem in Indiana and other states. Speed enforcement by police, although effective when in progress, should be supplemented with less expensive and permanent engineering treatments. Therefore, the Indiana Department of Transportation (INDOT) has considered various speed-reduction treatments that use visual cues to supplement the information provided to drivers via posted speed limits. Normally, any implemented treatment must comply with the existing guidelines and manuals, including the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) issued by the Federal Highway Administration in 2009 (AASHTO, 2022).

It is hypothesized that a conspicuous and progressive change of pavement markings on rural-to-urban freeway transition zones will induce an intuitive response from drivers and ultimately lead to their speed reduction. Such an approach, based on a perceived distortion of geometric discontinuity in the visual field, was indicated to reduce operating speeds (Denton, 1980). It is hoped that this desired behavior remains along the road downstream of the special marking location.

Katz (2004) conducted an extensive study on speed management on arterial roads with a particular focus on pavement markings. His study concluded that modified pavement markings should be among the preferred potential speed-reduction treatments. In addition, his study showed that special pavement markings had a more substantial speed reduction effect on drivers unfamiliar with the road. Therefore, this countermeasure may be efficient on freeways with a considerable percentage of non-commuters.

Freeway rural-to-urban transition zones on the outskirts of large urban areas, such as Indianapolis, Chicago, and Louisville, may experience many recurrent origin and destination trips related to work, school, and other activities inside the urban area. Based on Katz (2004), these origin-destination travelers may respond to the markings differently than pass-through travelers. Thus, a study on changing speed-related behavior should look at the average speed reduction and the potential increase in the speed variance across a mix of drivers familiar and unfamiliar with the road. There is a long-standing opinion shared by many experts that traffic safety is affected by the combination of mean speed and speed variance (Garber & Gadiraju, 1989; Taylor et al., 2000).

According to Katz (2004), the initial effect of speed-reducing pavement markings may erode with the distance traveled; thus, its effectiveness may lessen along extended stretches of roads. This observation needs to be investigated with speed measurements downstream of rural-urban speed transition zones and inside urban areas to check if additional speed control means are necessary to reinforce the initial effect.

1.2 Scope and Objectives

The scope of this study includes identifying feasible and effective speed-reduction treatments in Indiana's rural-to-urban freeway transition zones. The following research questions are the subject of the reported study.

- Which pavement markings and their combination allowed by MUTCD on high-speed roads have the potential to reduce the operating speed of drivers entering urban areas?
- Which speed-reduction treatments reported in published sources and studied in this project are effective?
- Which effective long-term speed-reduction treatments should be considered for implementation in Indiana's rural-to-urban transition zones?
- Which speed-reduction treatments are preferred for prevailing traffic conditions and road geometry?
- What are the recommended placements of recommended treatments applied individually or in combination?

Following this study's scope and the proposed research questions, three research tasks have been formulated.

1. Review conventional and unconventional speed-reduction treatments on highways and select promising ones for performance evaluation.
2. Develop and implement alternative speed-reduction treatment scenarios in selected freeway transition zones for field study.
3. Collect and analyze speed data on selected sites before, during, and after installing speed-reduction treatments to identify the most effective solutions for Indiana conditions.

2. BACKGROUND

2.1 Speed-Reduction Treatments

Many published studies deal with the effectiveness of engineering treatments to reduce operating speeds. Typically, these studies test the effectiveness of speed-reduction treatments under different conditions that were present on target roads. Based on the recent literature, this section presents relevant engineering treatments divided into conventional and unconventional ones, i.e., not typically applied on U.S. roads. The discussion here is focused on the speed-reduction treatments applicable on freeways and rural-to-urban transition zones. The reader may refer to Boodlal et al. (2015) for a more comprehensive review of speed-reduction freeways.

2.1.1 Conventional Treatments

For this report, conventional speed-reduction treatments are included in FHWA's MUTCD. Examples of conventional treatments applicable to highways include

special speed limit signs, surface treatments, pavement markings, and dynamic signing. Although the intended focus of the presented study is on pavement markings, other speed-reduction treatments are also mentioned for cases where pavement markings require reinforcement with additional measures.

2.1.1.1 Speed limit sign conspicuity enhancements. In compliance with Section 2B.13 of the MUTCD, on the speed limit sign (R2-1), and Section 2A.15 of the MUTCD on enhanced conspicuity for standard signs, special speed limit signs mainly refer to speed limit signs with a red border (see Figure 2.1). Hawkins et al. (2007) found that red border speed limit signs can result in an average speed reduction of 3 mph. In addition, the reduction in operating speeds due to red border speed limit signs was confirmed 8 to 14 months after initial installation.

2.1.1.2 Surface treatments and pavement markings. A set of surface treatments and pavement markings were selected for consideration based on their applicability in freeway rural-to-urban transition zones. The selected treatments include transverse bars, converging chevrons, optical speed bars, "SLOW" legend on pavement, and speed limit pavement legend. According to past research by the Federal Highway Administration (FHWA, 2014), these engineering treatments can produce speed reductions of up to 13 mph.

Transverse bars (see Figure 2.2) are lines placed across the lane perpendicular to the direction of travel. Section 3B.15 of the MUTCD on transverse markings provides the guidelines for this speed-reduction treatment. Gates et al. (2008) investigated the effectiveness of transverse bars in reducing the operating speeds on freeway curves. They implemented transverse bar markings on multiple freeways in Milwaukee, WI. They found that the mean speeds in both directions of the treated sites were reduced by 1 to 5 mph shortly after the installation. In addition, based on a long-term analysis, the speed effects of transverse bars were still present 6 months after the initial installation.

Converging chevrons (see Figure 2.3) are another type of pavement marking that helps reduce highway speeds by providing passive cues that change drivers' speed perception. According to FHWA (2014), converging chevrons reduce highway speeds up to 17 mph,

Figure 2.2 Transverse bars.

which is quite a considerable reduction compared to other engineering treatments. Section 3B.24 of the MUTCD on chevron and diagonal crosshatch markings regulates the use of converging chevrons. Hunter et al. (2010) evaluated the effectiveness of converging chevrons on freeway ramps and observed speed reductions of 1 to 2 mph at multiple test sites. However, those effects faded out 9 months after installation. The difference between the 1 to 2 mph speed reduction concluded by Hunter et al. (2010) and the maximum 17 mph speed reduction reported in FHWA (2014) is considerable. This discrepancy could be caused by other contributing factors, including driving population, roadway characteristics, and weather conditions.

Optical speed bars (OSBs) are transverse stripes placed on travel lanes (see Figure 2.4). Similar to transverse bars, OSBs are perpendicular to the traffic direction. However, they are typically placed near lane markings and do not span across the entire lane width. This treatment is meant to narrow the lane width perceived by drivers while strengthening the perception of motion to promote a speed reduction. Section 3B.22 of the MUTCD on speed reduction markings contains the guidelines for implementing OSBs. One common variation of OSBs is the progressively growing frequency of transverse stripes to further strengthen the perceived motion and make the illusion of traveling faster. This variation of OSBs has been proven to reduce speeds effectively. For instance, Latoski (2009) implemented OSBs on rural two-lane highways and found an impressive speed reduction of 4 to 5 mph.

The "SLOW" pavement legend (see Figure 2.5) and speed limit pavement legend (see Figure 2.6) are two additional conventional speed-reduction treatments. Section 3B.20 of the MUTCD on pavement word, symbol, and arrow markings regulates, among others, the use of these two types of pavement legends. It was reported by FHWA (2014) that the "SLOW" pavement legend could reduce the operating speed by 1 to 3 mph, while the speed limit pavement legend could result in a speed reduction of up to 3 mph. Retting and Farmer (1998) reported a 2-mph speed reduction from

Figure 2.1 Red border speed limit sign.

Figure 2.3 Converging chevrons.

Figure 2.4 Optical speed bars.

Figure 2.5 "SLOW" pavement legend.

implementing the "SLOW" legend on the pavement near hazardous curves. In addition, Krammes and Sheldahl (2009) found that speed limit pavement legends reduced the operating speed by 1 to 2 mph on average.

Figure 2.6 Speed limit pavement legend.

2.1.1.3 Dynamic signing treatments. Dynamic signing treatments are a diverse group of engineering treatments. It includes variable speed limits, variable message signs, speed-activated signs, etc. The signs tend to display a changing message that depends on traffic characteristics, roadway capacity, or weather conditions. The most used dynamic signing treatments are speed-activated warning signs (see Figure 2.7) and speed feedback signs (see Figure 2.8).

Due to the strong visual impact of the mentioned dynamic signing, more considerable speed reductions can be achieved with them than with the discussed earlier surface treatments and pavement markings. Several authors evaluated the effectiveness of dynamic signings. Mattox et al. (2007) evaluated the effect of speed-activated warning signs in work zones and reported speed reductions of 3 to 11.2 mph on freeways. In addition, Hallmark et al. (2012) studied the impact of speed feedback signs on high-crash frequency curves and found a maximum of 9 mph speed reduction for high-end speeds.

MUTCD regulates the use of dynamic signing devices. In the current MUTCD, paragraphs 19 and 20 of Section 2B.13 explain the guidelines of speed-activated

Figure 2.7 Speed-activated warning sign.

Figure 2.8 Speed feedback sign.

Figure 2.9 Longitudinal speed reduction markings.

warning signs, and Section 2L.01 describing of change-able message signs elaborates on the practice of speed feedback signs. In the proposed next edition of the MUTCD this guidance is in Section 2B.13.

2.1.2 Non-Conventional Treatments

Besides the conventional treatments, there are several promising speed-reduction treatments implemented abroad. In this section, selected promising non-conventional treatments are presented. The longitudinal speed reduction markings (LSRMs) (see Figure 2.9) could be easily implemented in the U.S., and they are worth considering for speed management. Ding et al. (2013) investigated the effectiveness of various speed-reduction treatments using a driving simulator. However, conclusions about drivers' behavior observed in driving simulators should be considered cautiously since the risk perception is inadequate, a qualitative comparison of various scenarios may provide helpful insight. Results from studies that compare different treatments using driving simulators provide helpful insight on the

relative effects. However, the actual effects on drivers' speed may differ. In the Ding's study, the authors concluded that transverse speed reduction markings reduced the operating speeds to a higher degree than LSRMs. Still, the studied LSRMs caused a considerable reduction in speeds while being less intrusive to drivers than the studied transverse speed reduction markings.

Although some impactful transverse and longitudinal markings for reducing roadway speeds are not allowed on freeways due to their visual aggressiveness, they are widely used on low-hierarchy roads. Figures 2.10, 2.11, 2.12 and 2.13 present examples of these treatments. The main idea of these markings is to create an illusion of narrowed driving lanes and to make drivers feel uncomfortable travelling at their current speed—this discomfort results in speed reduction.

2.2 Point-to-Point Speed Enforcement

In addition to traditional pavement markings and signages, new speed reduction countermeasures, such as point-to-point (P2P) speed enforcement, have also been widely discussed and applied in and outside the U.S. Montella et al. (2015) evaluated the effects of the P2P speed enforcement system on an urban motorway in Italy. The resulting changes in operating speeds are very positive. The mean speed, the 85th percentile speed, and the standard deviation of speed were all considerably reduced with the implementation of a P2P speed enforcement system. Moreover, the proportion of vehicles violating the speed limits was considerably reduced by over 70%. However, the authors pointed out the diminishing effects of the P2P system over time, which may be balanced by regular monitoring and sanctions. All in all, the P2P speed enforcement system could be used as a supplemental active method for reducing speed on highways. This is particularly

Figure 2.10 "Dragon's teeth" in the UK, Australia, and Canada.

Figure 2.11 Zig zag markings in the UK.

Figure 2.12 Hatched shoulder.

Figure 2.13 Rumble strips.

attractive and easy to implement on access-controlled roads such as freeways.

2.3 Research Gap to Address in the Study

The reported previous research studied the effectiveness of speed-reduction treatments applied individually under specific roadway conditions. However, there is a need to investigate the combined effect of multiple treatments in various conditions changing with time, such as traffic composition, seasonality, and weather conditions. Additionally, while ramps, curves, and high-crash frequency sites were often selected for

analysis, freeway segments with considerable changes in posted speed limit remain to be further studied.

This study focuses on the selection, implementation, and in-service performance evaluation of speed-reduction treatments applicable to freeway transition zones between rural and urban conditions in Indiana. A committee consisting of INDOT and FHWA representatives and research team members chose the most promising and practical treatments for evaluation. This study's findings focus on the effectiveness of researched treatments and the other speed reduction factors.

3. RESEARCH APPROACH

3.1 Methodology Overview

To identify feasible and effective speed-reduction treatments for Indiana's rural-to-urban freeway transition zones, the research team applied a six-step approach presented in Figure 3.1.

The first step consists of identifying and selecting the most promising engineering treatments for implementation and in-service performance evaluation. The starting point for this selection is the literature review
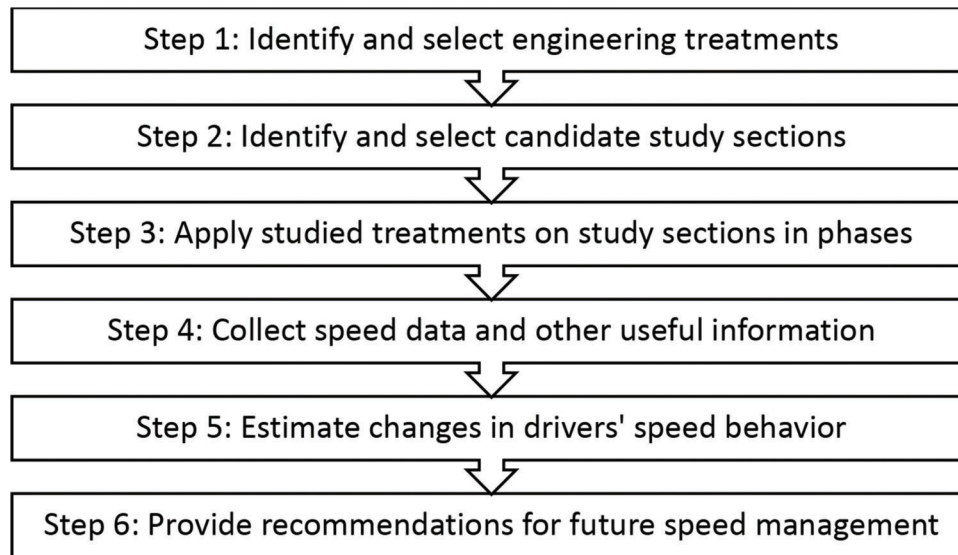
Figure 3.1 Implemented research procedure.

presented in Chapter 2. This review identified suitable conventional and non-conventional speed-reduction treatments based on past research. In addition, other selection criteria included the resources available to INDOT, previous experience with specific treatments in Indiana, and maintenance considerations. To account for these additional selection criteria, active participation from INDOT experts was critical.

The second step involves identifying and selecting study sections with treatment zones to implement the selected engineering treatments. Several factors were considered when selecting the study zones, including the continuity of the road inside the urban area, the presence of work zones during the analysis period, diversity of roadway characteristics, and safety considerations during the implementation of engineering treatments. For example, freeways that merge with the city's loop freeway do not offer the opportunity to analyze changes in speed behavior downstream of the treatment zone and therefore are not appropriate for this analysis. In addition, road closures and detours due to work zones may alter the road's capacity and composition of drivers, which makes it difficult to generalize the study's findings. Also, the number of lanes, median treatment, posted speed limits, and barriers guaranteed a broad scope of geometric characteristics. Finally, traffic characteristics were considered to decide which segments were suitable for implementation. The ideal study segments offer sufficient capacity during a specific period so that a temporal one-lane road closure used to implement speed-reduction treatments does not produce considerable congestion or major safety concerns.

The third step is the performance of the experimental field study. This step required coordination among INDOT Districts and the central office to implement the selected speed-reduction treatments accurately. For this purpose, the research team provided a detailed plan that includes design drawings, schematic installation, and a detailed implementation timeline. Additional considerations of the field study design are presented in detail in Chapter 4.

The fourth step entails collecting speed data and other helpful information to assess the effect of speed-reduction treatments on drivers' speed behavior. The initial data collection is partially done while the treatments are in place. However, additional data collection before and after the treatments was anticipated to accurately estimate changes to baseline conditions and the lasting effect of the speed-reduction treatments, respectively. Observations with adverse weather are filtered out to guarantee comparable conditions throughout the experiment. This filter includes rain, snow, below-freezing temperatures, low visibility, and moderate wind.

The fifth step consists of estimating the effect of speed-reduction treatments on various operating speed characteristics. This step is at the core of the study objectives and will provide insights to develop recommendations for future speed management on freeway transition zones in Indiana (Step 6). To do so, robust statistical analysis is proposed. This analysis focuses on assessing the effect of speed-reduction treatments on various speed characteristics in the vicinity of treated sites while accounting for several confounding factors to correctly isolate the engineering treatments' actual effect correctly.

3.2 Statistical Analysis

A set of fixed-effects linear models, a form of panel data analysis, are proposed to assess the changes in drivers' speed behavior due to the installation of the selected speed-reduction treatments. For each treatment site, three models are used to analyze critical operating speed characteristics: average speed, 90th percentile of speed, and speed variability. The three characteristics combined to provide a comprehensive

assessment of changes in speed behavior. In addition, these models permit accounting for several confounding factors, such as seasonal indicators and time-dependent characteristics, which ultimately help isolate engineering treatments' actual effect. In addition, the speed effect on the entire vicinity of the treated segments is studied. This is particularly important for downstream urban conditions. The general form of an individual fixed-effects linear regression model is presented in Equation 3.1.

$$Y_i = \beta_0 + \beta_1 X_{1,i} + \ldots + \beta_p X_{p,i} + \varepsilon_i \quad \text{(Equation 3.1)}$$

where, Y is the target operating speed characteristic, i.e., average speed, 90th percentile of speed, temporal speed variability) for the ith observation, $X_1, \ldots, X_p$ are a set of statistically significant predictors, $\beta_0, \beta_1, \ldots, \beta_p$ are a set of estimable parameters, and ε is a randomly distributed error term with zero mean and constant variance.

4. FIELD STUDY DESIGN

This chapter describes the design components of the experimental field study. It includes the selection of engineering treatments, the characterization of selected freeway study sections with treatment zones, the schematical description of a typical treatment site, and the timeline for performing the experimental field study.

4.1 Selected Speed Reduction Treatments

Based on the findings from the literature review on speed-reduction treatments, summarized in Chapter 2, a list of the most promising treatments for implementation was made available to INDOT personnel. These promising speed-reduction treatments were further examined using additional evaluation criteria such as the reported short-term speed reduction, the reported long-term speed reduction, their implementation cost, and their MUTCD compliance. Table 4.1 summarizes the result of this examination.

As shown in Table 4.1, longitudinal speed reduction markings (LSRMs) and optical speed bars (OSBs) have more considerable expected long-term speed reduction effects than converging Chevrons. Regarding dynamic signing, speed feedback signs (SFSs) and speed-activated warning signs are also proven to have substantial long-term speed reduction effects. Converging Chevrons are much more expensive in terms of installation cost than LSRMs and OSBs. SFSs have a similar installation cost compared to speed-activated warning signs.

The final selection of speed-reduction treatments for field implementation should include a combination of surface treatments and dynamic signing. While surface treatments and pavement markings tend to be more inexpensive and provide "passive" cues to drivers, dynamic signing treatments could considerably reduce speeding behavior. However, the spatial length of this effect needs to be confirmed, particularly in road sections downstream of the treatment segments. In addition, limitations due to the narrow median and outside shoulder could prevent the installation of dynamic singing treatments.

Taking both practical feasibility and speed reduction performances into account, INDOT staff members of the study advising committee and research team members determined to adopt three types of treatments in the experimental field study, i.e., LSRMs and OSBs for the category of surface treatments and markings while SFSs were chosen for the category of dynamic signing.

The size of the proposed OSBs is 18 inches long by 18 inches wide, while the proposed LSRMs are 3-feet long by 18-inches wide. A total of two SFSs were available in this field study. These SFSs need to be installed, removed, and transferred to all four treatment sites. Additional details on the pavement markings' dimensions and spacing can be found in Appendix A. Further information on the transport of SFSs is described in Section 4.4.

4.2 Freeway Study Sections

After the final set of speed-reduction treatments was selected, the next step was identifying extended road sections for studying the effect of the selected engineering treatments. These study sections were then divided

TABLE 4.1
Examination of promising speed-reduction treatments

Evaluation Criteria	Transverse Bars and Longitudinal Speed Reduction Markings	Converging Chevrons	Optical Speed Bars	Speed Feedback Signs	Speed-Activated Warning Sign
Short-term speed reduction	1.1 to 5.0 mph	1.5 mph	0.55 mph	N/A	2 to 6 mph
Long-term speed reduction	2.6 to 3.7 mph	0.5 mph	1.84 mph	0 to 6.5 mph	N/A
Installation cost	$0.10 to $2/ft	$100 to $200/marking	$8/ft^2	$5,000 to $12,000/sign	$1,500 to $12,000/sign
MUTCD compliance	Section 3B.15	Section 3B.24	Section 3B.22	Chapter 2L and Section 2B.13	Chapter 2C

into approximately 0.5-mile segments (corresponding to the INRIX segments) where speeds were to be measured. In the next step, treatment zones were decided in the upper part of the study sections at locations that allowed a limited number of speed segments upstream of the treatment and a higher number of such speed segments downstream. The speeds observed on the upstream speed segments could be considered close to the baseline value not affected by the treatment. In contrast, the speeds on the downstream segments helped estimate the speed reduction right at the upstream end of the treatment zone and the rate at which the effect was changing along the remaining segments as drivers moved away from the treatment zone.

Consistently with the research objective, the selected study sections were inside the rural-to-urban transition zones located on the outskirts of metropolitan areas in Indiana and neighboring states. Multiple urban areas included Indianapolis, Louisville, Fort Wayne, Cincinnati, Chicago, and Evansville. However, the cities of Indianapolis and Louisville were chosen for further investigation due to their data availability, experience, and technical resources, which facilitate the implementation of the field study.

In the Indianapolis area, eight one-way freeway sections were identified as potential candidates for the study. However, I-69 NB, I-69 SB, I-74 WB, and I-64 EB sections were discarded since these freeways did not continue past the I-465 loop, and thus there was no possibility to analyze the drivers' speed along the downstream road segments. In addition, the I-65 SB section could not be studied due to the major construction project planned for the speed data collection period.

Ultimately, two study sections were chosen for the implementation of speed-reduction treatments. These are I-70 WB and I-65 NB. Figure 4.1 shows the two selected freeway study sections in the Indianapolis metropolitan area. The colored lines represent the study sections consisting of INRIX segments (with INRIX speed data available); the yellow dotted triangles are the treatment zones where pavement markings and dynamic sings were implemented. For I-70 WB, the treated segment spans 1.09 miles east of Post Road to 0.75 miles east of Post Road. While for I-65 NB, the treated segment spans 2,080 feet south of Thompson Road to 280 feet south of Thompson Road. The two sections have a 65/60 mph differential speed limit. Both sites had a downstream posted speed limit of 55 mph. In addition, both sections had a narrow median (width < 60 ft) with a concrete barrier.

Five one-way freeways were considered for the study in the Louisville area. Two sites, I-71 SB and I-64 WB, were expected to be considerably affected by construction projects anticipated during the study's analysis period. In addition, the I-65 NB is in Kentucky, providing additional difficulty in acquiring speed factors such as crashes and police enforcement. Thus,

only two sites were included in this study, i.e., I-64 EB and I-65 SB.

Figure 4.2 presents the locations of the selected study sections near Louisville. The I-64 EB treatment zone stretched from 5,120 feet west of SR-64 to 3,320 feet, while the I-65 SB treatment zone starts at 0.74 miles south of Old SR-311 and ends at 1.08 miles south of Old SR-311. The upstream part of the I-64 EB section has a speed limit of 70/65 mph, and the downstream part has a speed limit of 55 mph. On the other hand, the I-65 SB site has a speed limit of 70/65 mph upstream, but the downstream part has a uniform speed limit of 65 mph. At the same time, the I-65 SB section has a narrow median (width < 60 ft) with a continuous concrete barrier, and the I-64 EB section has a wide median with a cable barrier.

4.3 Treatment Site Layout

Once the set of speed-reduction treatments for studying was selected and the treatment sites identified, the treatments were applied to the four treated study sections. The combination of OSBs plus SFSs was implemented on the I-70 WB and I-64 EB sections in the Seymour District, while the combination of LSRMs plus SFSs was implemented on the I-65 NB and I-65 SB freeway sections in the Greenfield District.

Figure 4.3 shows a schematic drawing of a treatment zone. It consists of three sections determined by the locations of a speed warning sign and a downstream speed limit sign. The longitudinal spacing between consecutive marking elements of OSBs and LSRMs gradually decreases from 25 feet to 10 feet to create the illusion of acceleration among drivers. In addition, the SFS elements are installed around 200 feet downstream of the downstream speed limit sign restricted by median and outside shoulder widths. Appendix A contains detailed drawings of the treatment zones.

A phased scheme of treatments is proposed. During the first phase, the surface treatments are implemented. In the second phase, the dynamic signing is installed to supplement the passive speed-reduction treatments. Finally, a third phase consists of removing the dynamic signing to study practical considerations such as how long this type of treatment needs to be installed to maximize the continuality of the initial change in speed behavior.

Regarding the costs of the treatments, the contractor bid price for the SFS was $3,160 per sign with installation. In terms of pavement markings, Greenfield District's budget for installing LSRMs in a single lane was $6,500, while Seymour District's budget for installing OSBs in a single lane was $1,700.

Figures 4.4, 4.5, 4.6, and 4.7 are pictures of the actual speed-reduction treatments implemented across the four study sections. Figure 4.4 shows the I-65 NB near Indianapolis after implementing the LSRMs. Figure 4.5 presents the I-65 SB near Louisville after the implementation of LSRMs. Figure 4.6 shows the median and outside shoulder SFSs on I-64 EB near Louisville.
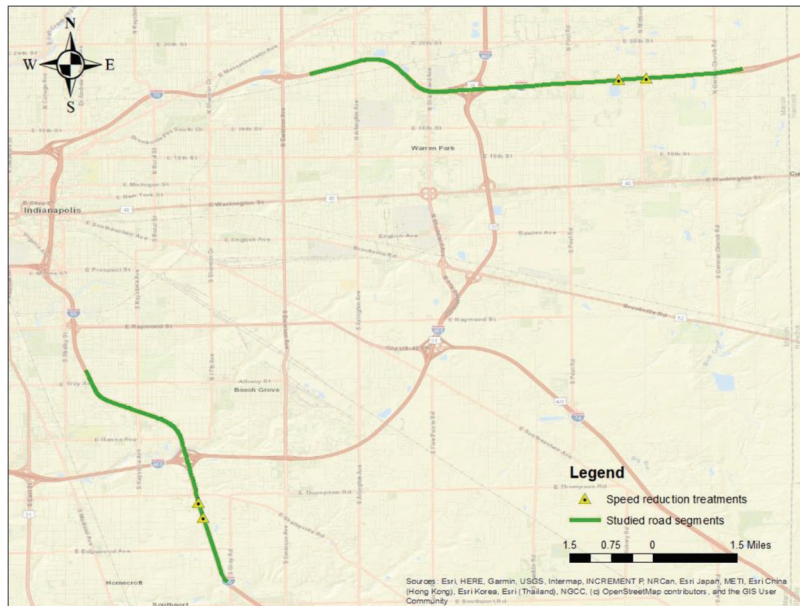
Figure 4.1 Study sections in Greenfield District.

Figure 4.2 Study sections in Seymour District.

Finally, Figure 4.7 shows the I-70 WB study section after implementing OSBs.

4.4 Implementation Timeline

The combinations of pavement markings and SFSs were implemented in three phases. During Phase 1, only surface treatments (OSBs or LSRMs) were introduced. In Phase 2, the SFSs were added to increase drivers' response by reinforcing the pavement markings effect. After Phase 2, the SFSs were removed and transferred to another site for implementation. The minimum duration of each phase was four weeks. Since only two SFSs were assigned for this study, the entire experiment spanned from April 2021 to March 2022.

Figure 4.8 summarizes the implemented timeline of the field study: the beginning, duration, and end of each of the three phases at the four treatment sites. Certain phases were delayed due to complications with the SFSs' installation. Furthermore, since the downstream speed limit sign within the treated zone in the I-65 SB site was 65 mph, it took the INDOT engineers more

Baseline: neither pavement marking nor active signage

Phase 1: Pavement marking only (OSBs or LSRMs)

Phase 2: Pavement marking (OSBs or LSRMs) and active signage (SFSs)

Phase 3: Pavement marking only (OSBs or LSRMs), SFSs removed
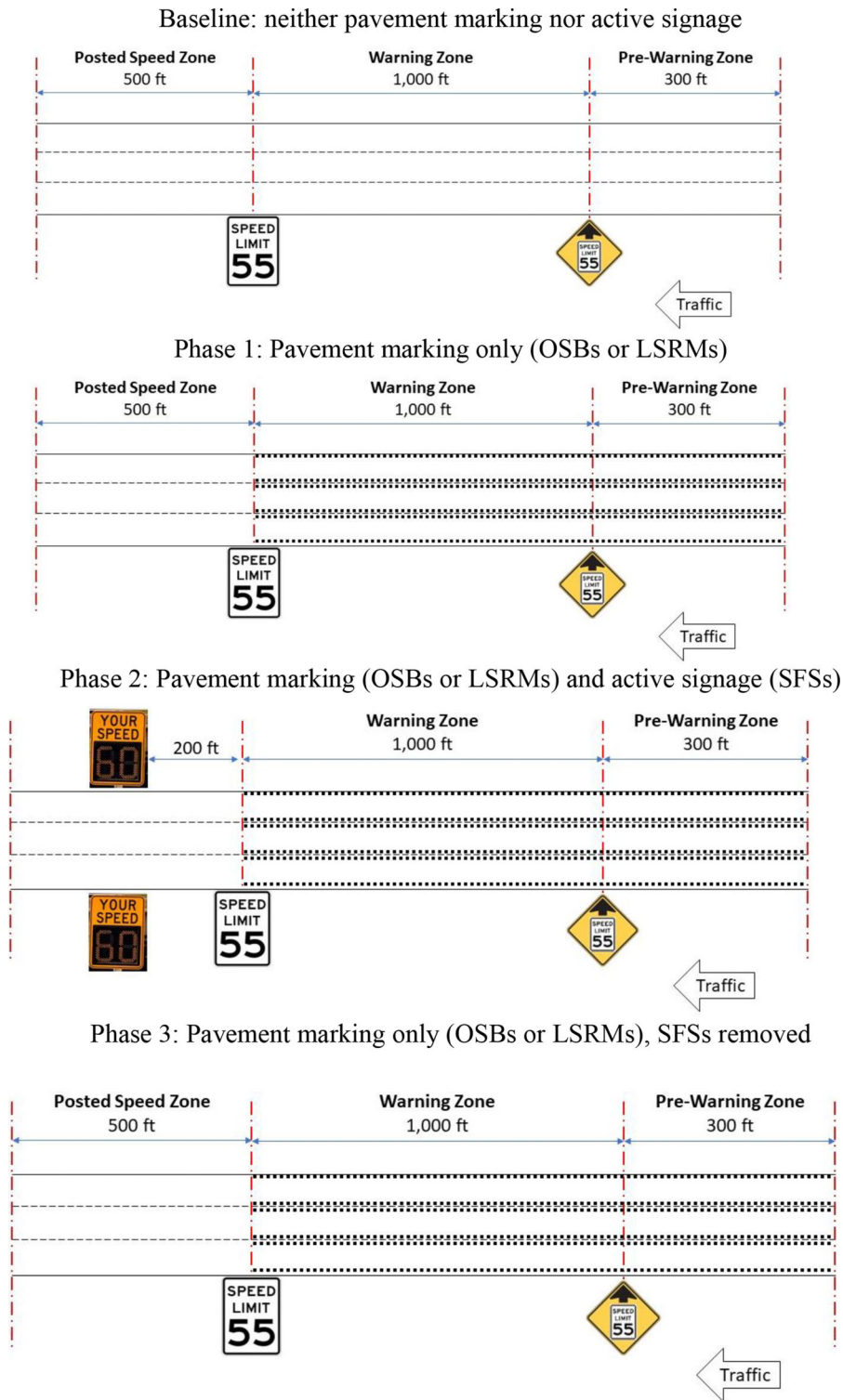
Figure 4.3 Treatment zone schematic.

time to reprogram the SFSs before moving it from the I-65 NB site in Greenfield to the I-65 SB site in Seymour.

Table 4.2 lists the installation/removal dates for individual speed-reduction treatments at specific treatment sites. Due to the limited median width and concrete barriers, the I-70 WB and I-65 SB sites had only one SFS installed during Phase 2. In all four sites, the pavement markings were installed overnight during a single night to minimize the traffic and safety impacts.

Figure 4.4 Longitudinal speed reduction markings on I-65 NB in Greenfield District.

Figure 4.5 Longitudinal speed reduction markings on I-65 SB in Seymour District.

(a) Median

(b) Outside shoulder

Figure 4.6 Optical speed bars and speed feedback signs on I-64 EB in Seymour District.

Figure 4.7 Optical speed bars on I-70 WB in Greenfield District.

Figure 4.8 Field study schedule.

TABLE 4.2
Treatment installation timetables

Treated Road	Pavement Markings Installation	Speed Feedback Signs Installation	Speed Feedback Signs Removal/Relocation
I-70 WB Marion County	6/16/21 (overnight)	Right Shoulder: 7/19/21 (morning) Median Shoulder: N/A	10/19/21 at 11:00 am
I-65 NB Marion County	6/23/21 to 6/24/21 (overnight)	Right Shoulder: 10/18/21 at 1:30 pm Median Shoulder: 10/19/21 at 11:00 am	11/23/21 (morning)
I-65 SB Clark County	8/8/21 to 8/9/21 (overnight)	Right Shoulder: 12/16/2021 at 11:00 am Median Shoulder: N/A	1/13/22 at 8:30 am
I-64 EB Floyd County	9/14/21	Right Shoulder: 1/13/22 at 10:45 am Median Shoulder: 1/13/22 at 10:45 am	2/24/22 at 1:48 pm

5. DATA

Several types of data from various sources are needed to accurately estimate the effect of speed-reduction treatments on drivers' speed behavior. While the primary data needed are operating speeds, additional data related to the drivers' speed selection factors are desired to extract the net effect of the speed-reduction treatments. These speed factors include weather conditions, crash occurrence, police enforcement, road geometry, signing, and surface visibility. This chapter describes the available data for estimating the effectiveness of the implemented engineering treatments—Section 5.1 details each data source's granularity, availability, coverage, and content. Section 5.2 presents the descriptive statistics of the final sample used in the statistical analysis.

5.1 Data Sources

5.1.1 Operating Travel Speeds

INRIX was the primary provider of speed data for this project. INRIX was selected as the primary source of speed data in the studied freeway transition zones due to its sufficient temporal and spatial granularity. The high temporal granularity, one observation every 60 seconds, permits considering confounding factors such as weather, crashes, and police enforcement. On the other hand, the spatial aggregation, every 0.5 miles approximately, provides a broader perspective of the effect of treatments and permits estimation of the range of the effect.

INRIX operating travel speed data are gathered from GPS probe vehicles. Such data are collected from millions of connected devices every 60 seconds. The average length of an INRIX segment is 0.5 miles. Data were acquired for 42 segments located in the four study sections in Greenfield and Seymour Districts. The segments included approximately one mile of freeway upstream of the treated zone and 5 to 10 miles of freeway road downstream of the treated zone and towards the city center. The INRIX data were delivered in monthly batches.

The INRIX speed data for each studied segment included the following elements: INRIX segment ID, date, time, segment length, observed travel speed, and data quality index. The data quality index is a three-level categorical variable indicating the number of probe vehicles used to estimate the speed. It can serve as a rough proxy for the volume, particularly when the volume is low.

5.1.2 Weather Conditions

Local Climatological Data (LCD) is a database maintained by the National Oceanic and Atmospheric Administration's (NOAA) National Center for Environmental Information (NCEI). It consists of detailed weather conditions gathered from a network of advanced weather stations located primarily in urban centers near airports. The average distance to the LCD stations from the sample transition zones was 7 miles.

Since this study focused on road segments near major cities, LCD database was ideal for addressing confounding weather factors that may alter drivers' speed behavior. The available weather variables included precipitation, temperature, wind speed, wind direction, and visibility. LCD stations updated these data every 15 minutes on average.

5.1.3 Crash Records

ARIES is the State of Indiana's crash repository. The crash data are generated through first responder crash reports and are collected within ARIES. Data are available from 2007 to the present. These data include crash details such as vehicle information, road

conditions, crash severity, weather conditions, location, date, and time. In this study, crash records from ARIES were used to account for any crash-related congestion which might alter drivers' speed.

5.1.4 Enforcement Data

Enforcement data (citations) were obtained between January 2021 and March 2022. This study included all the regulations violation codes to reflect the possible effects of traffic interruption due to the enforcement.

The source enforcement data contained: road name, direction, milepost, date, time, and other information. The coordinates of the citation events were extracted from the available data to assign the citations to the analyzed segments. CRS Milepost Conversion Application and Google Maps were used to complete this coordinates identification work.

After all the latitudes and longitudes were identified for the citation records within analysis zones, the citation records were assigned automatically, and in some cases manually, to each corresponding INRIX segment using ArcGIS tools.

5.1.5 Roadway Characteristics

Roadway characteristics, including geometric features, pavement markings, signing, and barriers, were collected manually during driving along the study sections. For this purpose, a passenger vehicle instrumented with an active camera and GPS was used. The two sensors were linked to an in-vehicle computer with custom data collection software developed by the Center for Road Safety. This setup allows the effective collection and automatic storage of specific roadway features. During post-processing, additional measurements were made using Google Maps imagery to supplement the collected data. While each study section extends for about 7 miles, roadway characteristics data were only collected for the vicinity of the treatment zone ($\sim$ 3 miles) and were attached to specific INRIX segments.

In addition to collecting data, the field visit permitted the research team to observe the engineering treatments firsthand. For example, using a simple traffic floating technique (driving at the speed of surrounding vehicles), a perceived reduction in operating speeds, particularly on the rightmost lanes, was observed. The field visit's recorded videos are available on the report's website.

5.1.6 Traffic Cameras

In addition to the variables extracted from existing databases, traffic camera pictures were inspected to extract time intervals when extreme weather, such as heavy snow or rain, for the studied road segments. This step aimed to identify significant road pavement conditions that could affect the speed selection by drivers. The traffic camera pictures came from the Indiana Trafficwise System. Each analyzed road

Figure 5.1 Example camera picture for I-65 SB.

segment was assigned the closest available traffic camera. The pavement conditions were coded as bad, slush, wet, dry, or unknown.

Figure 5.1 presents an example camera picture of the I-65 SB site with the code "slush," where snow on top of traffic lanes can be seen with the partly exposed pavement. Observations with pavement conditions like the one shown in Figure 5.1 were removed from the analysis to avoid potential bias in the final results.

5.2 Final Sample Characteristics

Table 5.1 presents the summary statistics of the 42 INRIX segments in the four study sections. There are 11 INRIX segments on I-70 WB, I-65 SB, I-64 EB, and nine on I-65 NB. The average length of one segment is 0.49 miles, which makes the average travel time approximately 26 seconds. The average AADT is about 80,000 veh/day with 13% of trucks. Three of the four study sections have a narrow median (<45 ft) with a concrete median barrier, while I-64 EB has a wide

median with a cable barrier. Regarding speed limits, 6% of segments have a 70-mph speed limit, 31% have 65 mph, and 63% have 55 mph. Most segments have three lanes by travel direction.

Table 5.2 presents the descriptive statistics for the modeling sample. This dataset has already been filtered for adverse weather conditions such as rain, heavy wind, low visibility, and freezing temperatures. The average speed in the study sections is 65 mph. The 90th speed percentile is 68 mph. The mean temporal speed variability is 2.36 mph. Regarding the treatment phase, 46% of observations were collected during the initial phase of pavement markings, 19% during the second phase with pavement markings and active signing, and 13% during the third phase after SFSs were removed. There were 124 speed-related citations and 71 crashes during the study period. While attempts were made to avoid the effect of road construction, 22% of the segment data still have some impact from road construction.

TABLE 5.1
Descriptive statistics of INRIX segments used in speed analysis

Variable	Mean	Std Dev	Minimum	Maximum
Segment length (mi)	0.49	0.16	0.11	0.93
AADT (veh/day)	80,439.64	24,977.81	33,418.00	121,671.00
AADT trucks (veh/day)	10,493.95	5,400.64	5,383.00	22,924.00
Median width (ft)	40.05	16.50	19.00	80.00
Outside shoulder width (ft)	12.05	1.94	9.00	19.00
Entering ramp auxiliary lane	0.52	0.51	0.00	1.00
Exiting ramp auxiliary lane	0.43	0.51	0.00	1.00
Curve	0.48	0.51	0.00	1.00
Guardrail median barrier	0.17	0.32	0.00	1.00
Concrete median barrier	0.43	0.49	0.00	1.00
Cable median barrier	0.31	0.44	0.00	1.00
Guardrail shoulder barrier	0.41	0.37	0.00	1.00
Concrete shoulder barrier	0.03	0.08	0.00	0.37
Speed limit = 70 mph	0.06	0.23	0.00	1.00
Speed limit = 65 mph	0.31	0.46	0.00	1.00
Speed limit = 55 mph	0.62	0.48	0.00	1.00
Overhead message sign	0.19	0.40	0.00	1.00
Speed warning sign	0.10	0.30	0.00	1.00
Number of lanes = 2	0.26	0.45	0.00	1.00
Number of lanes = 3	0.48	0.49	0.00	1.00
Number of lanes = 4	0.25	0.40	0.00	1.00
Number of lanes = 5	0.01	0.06	0.00	0.30
Inside city's loop	0.50	0.51	0.00	1.00
Distance from treatment (mi)	1.95	1.41	0.00	4.48
Within 1 mi of treatment	0.10	0.30	0.00	1.00
Within 2 mi of treatment	0.21	0.42	0.00	1.00
Within 3 mi of treatment	0.24	0.43	0.00	1.00
Within 4 mi of treatment	0.19	0.40	0.00	1.00
Within 5 mi of treatment	0.07	0.26	0.00	1.00
Proportion of treated traffic	0.73	0.22	0.45	1.00
Upstream road section	0.00	0.00	0.00	0.00
Treatment road section	0.19	0.40	0.00	1.00
Downstream road section	0.81	0.40	0.00	1.00
I-70 WB study zone	0.26	0.45	0.00	1.00
I-65 NB study zone	0.21	0.42	0.00	1.00
I-65 SB study zone	0.26	0.45	0.00	1.00
I-64 EB study zone	0.26	0.45	0.00	1.00

TABLE 5.2
Descriptive statistics of hourly observations used in speed analysis (N = 176,321)

Variable	Mean	Std Dev	Minimum	Maximum
Average speed (mph)	65.40	4.01	6.57	74.02
90th speed percentile (mph)	68.33	3.19	7.00	77.00
Speed variability (mph)	2.36	1.52	0.00	29.14
Markings 1	0.45	0.50	0.00	1.00
Markings + Signs	0.19	0.39	0.00	1.00
Markings 2	0.13	0.33	0.00	1.00
Road construction	0.22	0.42	0.00	1.00
Police	0.0007	0.03	0.00	1.00
Crash	0.0004	0.02	0.00	1.00
January	0.03	0.16	0.00	1.00
February	0.03	0.17	0.00	1.00
March	0.04	0.19	0.00	1.00
April	0.06	0.24	0.00	1.00
May	0.07	0.25	0.00	1.00
June	0.06	0.23	0.00	1.00
July	0.11	0.31	0.00	1.00
August	0.11	0.32	0.00	1.00
September	0.15	0.35	0.00	1.00
October	0.13	0.33	0.00	1.00
November	0.13	0.34	0.00	1.00
December	0.09	0.29	0.00	1.00
Monday	0.14	0.35	0.00	1.00
Tuesday	0.15	0.36	0.00	1.00
Wednesday	0.14	0.35	0.00	1.00
Thursday	0.14	0.35	0.00	1.00
Friday	0.14	0.35	0.00	1.00
Saturday	0.14	0.35	0.00	1.00
Sunday	0.14	0.35	0.00	1.00
00:00–00:59	0.04	0.20	0.00	1.00
01:00–01:59	0.04	0.20	0.00	1.00
02:00–02:59	0.04	0.20	0.00	1.00
03:00–03:59	0.04	0.20	0.00	1.00
04:00–04:59	0.04	0.19	0.00	1.00
05:00–05:59	0.04	0.19	0.00	1.00
06:00–06:59	0.04	0.19	0.00	1.00
07:00–07:59	0.04	0.19	0.00	1.00
08:00–08:59	0.04	0.19	0.00	1.00
09:00–09:59	0.04	0.20	0.00	1.00
10:00–10:59	0.04	0.20	0.00	1.00
11:00–11:59	0.04	0.20	0.00	1.00
12:00 –12:59	0.04	0.21	0.00	1.00
13:00–13:59	0.04	0.21	0.00	1.00
14:00–14:59	0.04	0.21	0.00	1.00
15:00–15:59	0.04	0.20	0.00	1.00
16:00–16:59	0.04	0.21	0.00	1.00
17:00–17:59	0.04	0.20	0.00	1.00
18:00–18:59	0.04	0.20	0.00	1.00
19:00–19:59	0.04	0.21	0.00	1.00
20:00–20:59	0.04	0.20	0.00	1.00
21:00–21:59	0.04	0.20	0.00	1.00
22:00–22:59	0.04	0.20	0.00	1.00
23:00–23:59	0.04	0.20	0.00	1.00

6. RESULTS AND DISCUSSION

This chapter presents the results from the speed evaluation of four study sections where combinations of speed-reduction treatments were applied in three phases. Additionally, the practical implications of these results for future speed management in transition zones are discussed. Results from the statistical analysis, described in Section 3.2, are presented for three speed behavior characteristics: average travel speed, high percentiles of speed distribution, and temporal speed variability. Finally, speed profiles of selected specific traffic conditions are presented and discussed.

The complete set of speed profiles can be found in Appendix D. For each study section, two sets of speed profiles were created. The first group includes speed profiles under typical traffic for the average speed, 90th percentile speed, and speed variability as well as the difference in speed behavior between individual phases and baseline conditions. The second group of speed profiles were created for specific traffic conditions, specifically, weekday morning, weekday midday, weekday night, weekend daytime, and weekend night.

Weather is a key factor affecting drivers' speed choice. Adverse weather conditions tend to reduce the operating speeds while increasing the variability between individual vehicle speeds. This response depends on the drivers' perceived risk of crash. An initial analysis found that the speed effect of weather is considerably higher than the effect of speed-reduction treatments. Whenever adverse weather conditions and engineering treatments were present simultaneously, the speed was governed by the former. Additionally, other speed factors such as geometry and signing, particularly posted speed limits, become irrelevant should the weather conditions deteriorate. For this reason, adverse weather conditions were removed from the sample before producing the final assessment of the speed-reduction treatments' effectiveness. The estimated amount of removed data is 25%, which includes rain, snow, visibility of less than 10 miles, and temperatures equal or below 32F°.

6.1 Effect on Average Speed

Average hourly operating speeds were obtained for each INRIX segment from 1-minute observations. The average speed is a vital indicator of the effect of specific engineering treatments on the overall traffic. While individual vehicles might be traveling at higher or lower rates, the average operating speed represents their aggregate effect which is helpful for economic analyses.

One can determine the economic impacts of a change in speed by multiplying the average effect on travel speed with the anticipated traffic volume and the unit cost. For example, previous research has connected changes in the average speed to changes in the frequency and severity of crashes (Elvik, 2009, 2013; Elvik et al., 2004).

Figure 6.1 and Figure 6.2 present the speed profiles on I-70 WB in Greenfield District for weekday morning and night conditions, respectively. During daytime, the initial operating speed decreases by 3 mph under baseline conditions, while at night the average reduction is 4 mph. This baseline speed reduction occurs in the signed speed reduction zone, likely as a result of the change in posted speed limit. The additional reduction due to the implementation of engineering treatment can also be appreciated. Pavement markings produced an additional 0.6-mph speed reduction while the combination of pavement markings and SFSs produced a 1.1-mph additional speed reduction. Despite this promising trend in speed behavior, the operating speed fails to stay low and entering vehicles push up the speed after the I-465 loop to conditions similar to suburban freeways. This trend is observed both on daylight and at night.

Figure 6.3 and Figure 6.4 present the speed profiles by treatment phase on I-64 EB for weekday and weekend daytime conditions, respectively. Weekend operating speeds tend to be 2-mph higher than weekday speeds. Overall, a modest and promising effect of the change in speed limit and speed-reduction treatments is observed. A 7-mph speed reduction was estimated under baseline conditions. This reduction is slightly more modest on weekends. In terms of the effect of speed-reduction treatments, an additional 1.2-mph speed reduction was linked to pavement markings while an extra 3.5-mph speed reduction was associated with the implementation of pavement markings with median and roadside SFSs. Despite the promising
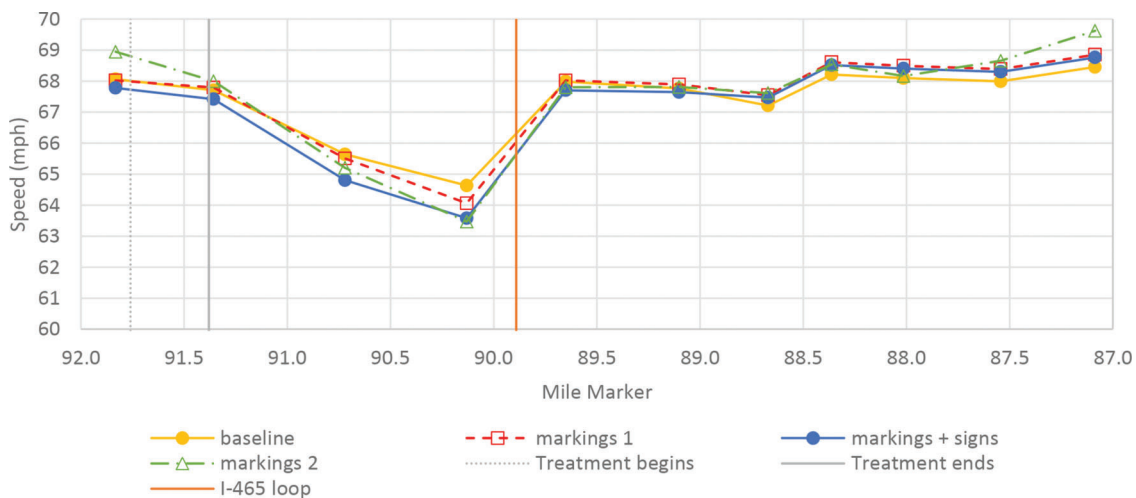
Figure 6.1 Speed profile by treatment phase on I-70 WB—Monday to Thursday morning.
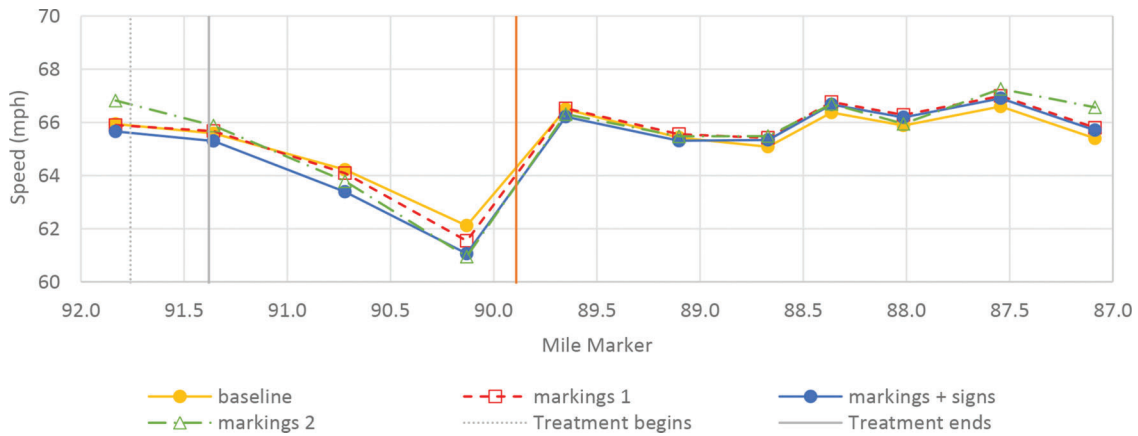
Figure 6.2 Speed profile by treatment phase on I-70 WB—Monday to Thursday night.
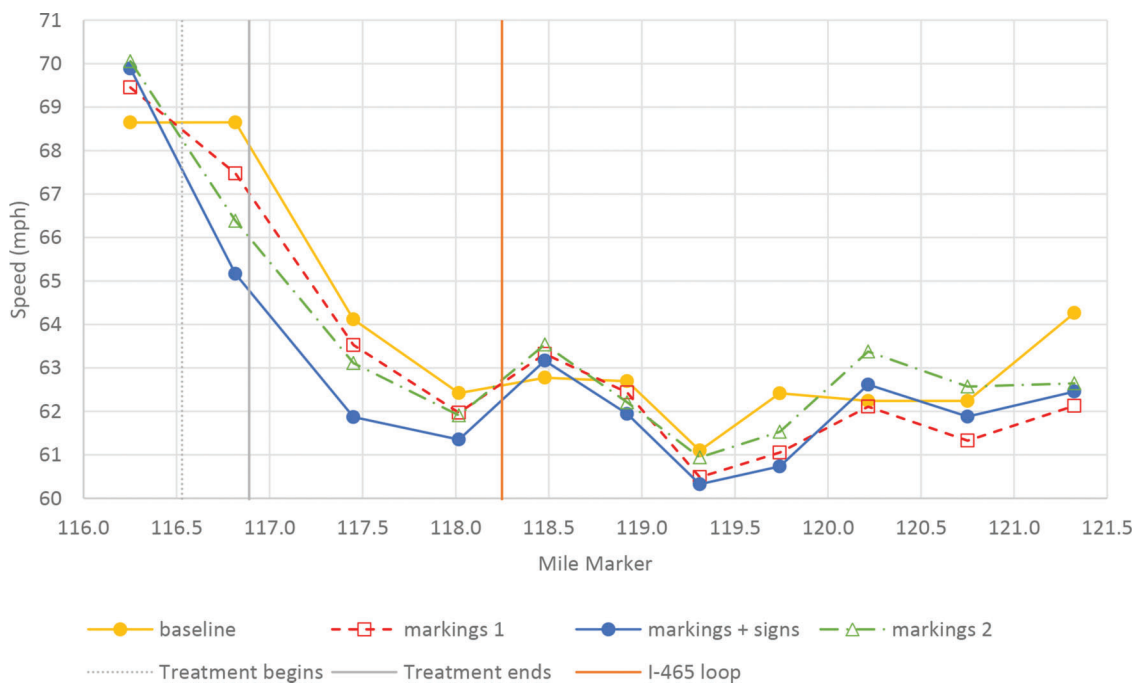
Figure 6.3 Speed profile by treatment phase on I-64 EB—Monday to Thursday midday.

results of speed-reduction treatments, the extent of its effect is local. After the traffic passes the I-265 loop, there is no significant difference between baseline and treated conditions. A supplemental treatment needs to take place to further extend this local effect inside the urban area.

Figure 6.5 shows the estimated difference in average speed between each treatment phase and baseline conditions (no treatment) on the I-70 WB study section in Greenfield District. A 0.6-mph reduction is speed was linked to the installation of pavement markings. A 1.1-mph speed reduction was also assigned to Phase 2 (markings + signs). Interestingly, a similar speed reduction was observed after the SFSs were removed. The

maximum effect of this reduction was found before the traffic passed the I-465 loop.

Figure 6.6 presents the calculated difference in average speed between baseline conditions and the three treatment phases on the I-65 NB study section in Greenfield District. After the initial implementation of LSRMs, a moderate 0.6-mph speed reduction was found. However, after the installation of two SFSs, a 2.8-mph reduction in average operating speed was estimated. This effect continued after the SFSs were removed. However, the average speed reduction diminished to 1.8 mph. Except for Phase 2 (markings + signs), the effect of the speed reduction treatments virtually disappeared after the I-465 loop.
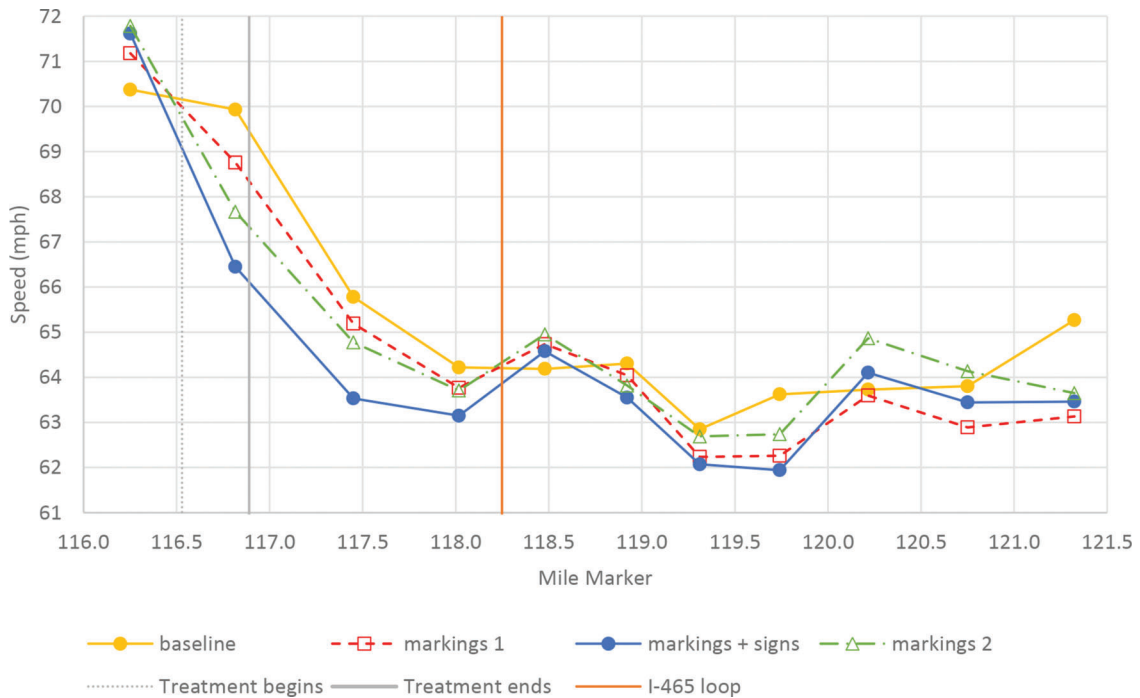
Figure 6.4 Speed profile by treatment phase on I-64 EB—Saturday and Sunday daytime.
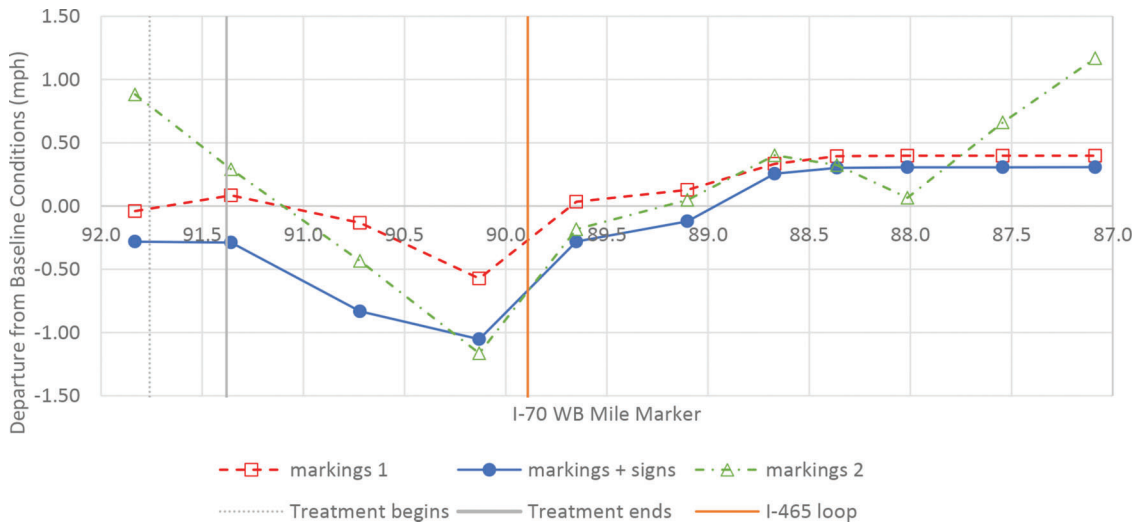
Figure 6.5 Estimated average speed difference from baseline conditions on I-70 WB.

Figure 6.7 presents the profiles of the estimated difference in average operating speed between each treatment phase and baseline conditions on the I-65 SB study section in Seymour District. No significant speed reduction was observed. This finding may be to the different downstream speed limit of 65 mph instead of 55 mph.

Lastly, Figure 6.8 shows the estimated difference in average speed between baseline conditions and the three treatment phases on the I-64 EB study section in

Seymour District. An intuitive and progressive reduction in average speed was observed. After the implementation of OSBs, a 1.2-mph speed reduction was estimated. A notable 3.5-mph speed reduction was observed after the implementation of SFSs. Interestingly, even after the SFSs were removed, they boosted the effect of OSBs. This is noted form a 2.3-mph speed reduction during Phase 3. These reductions in average speed disappeared after the traffic passed the I-265 loop.
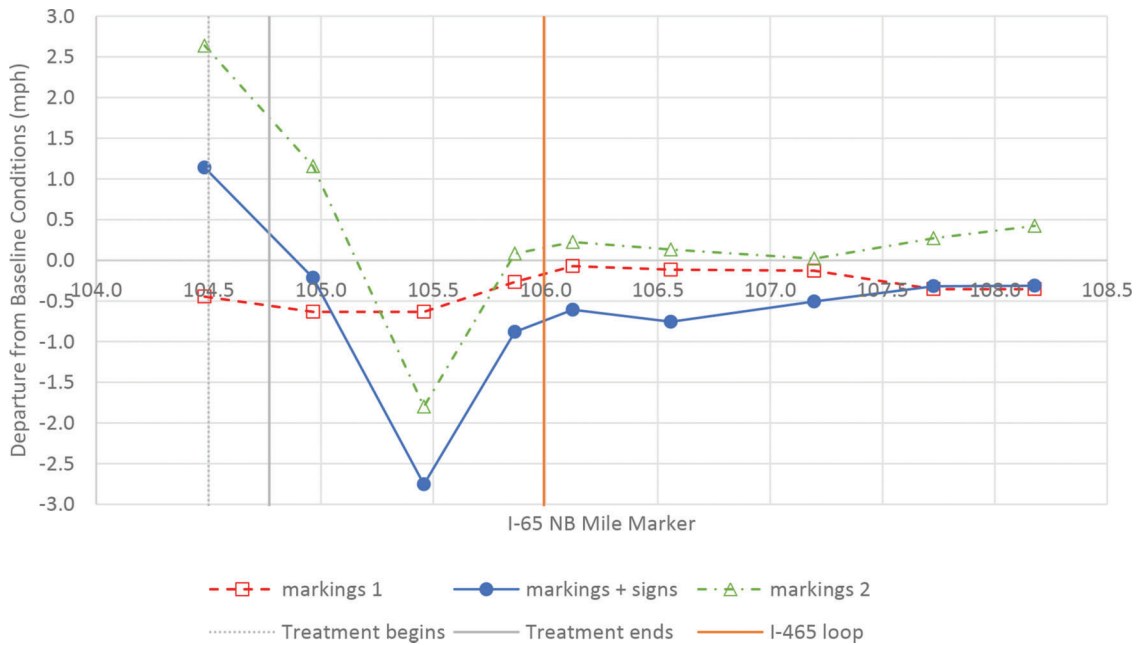
Figure 6.6 Estimated average speed difference from baseline conditions on I-65 NB.
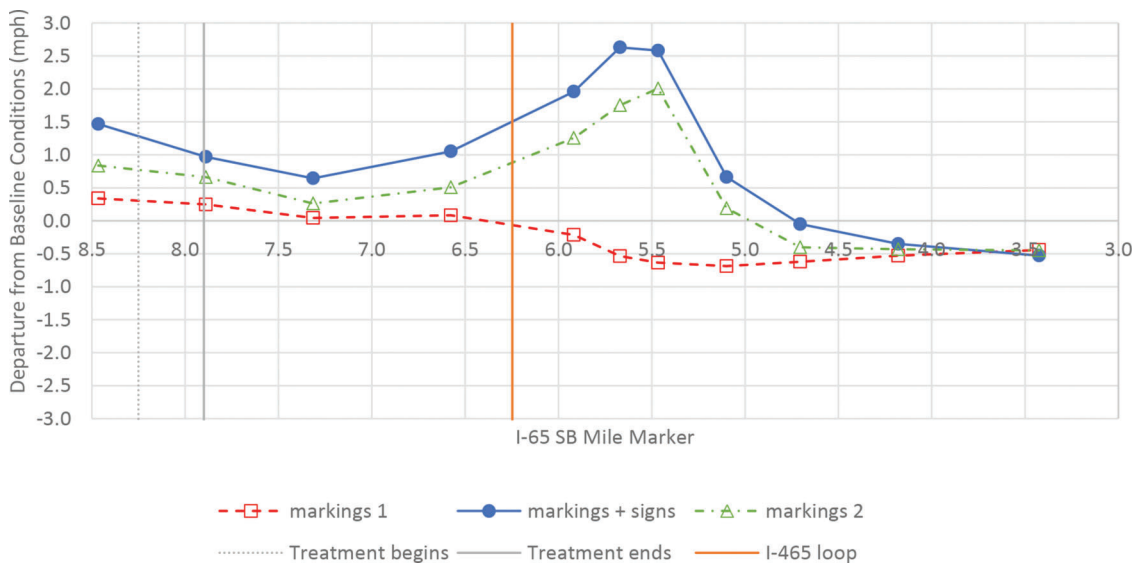
Figure 6.7 Estimated average speed difference from baseline conditions on I-65 SB.

6.2 Effect on 90th Speed Percentile

In addition to studying the effect of speed-reduction treatments on the average operating speed, assessing their impact on the highest speed percentiles, e.g., 90th speed percentile is critical. The 90th speed percentile reflects aggressive drivers' reactions to operating at higher speeds. By evaluating the effect of speed-reduction treatments on these percentiles, one may quantify the capacity of treatments to dissuade aggressive drivers from exceeding the posted speed limit.

Figures 6.9, 6.10, 6.11, and 6.12 show the estimated difference in the 90th speed percentile between baseline conditions and each treatment phase for the I-70 WB, I-65 NB, I-65 SB, and I-64 EB study sections, respectively. Again, the estimated effects follow a similar trend. However, the magnitude of these effects is considerably smaller than the ones reported on the average operating speed. This finding can be interpreted as aggressive drivers reacting to a smaller extent to the speed-reduction treatments.

6.3 Effect on Speed Variability

The speed variance typically refers to the difference in operating speeds among vehicles on a roadway.
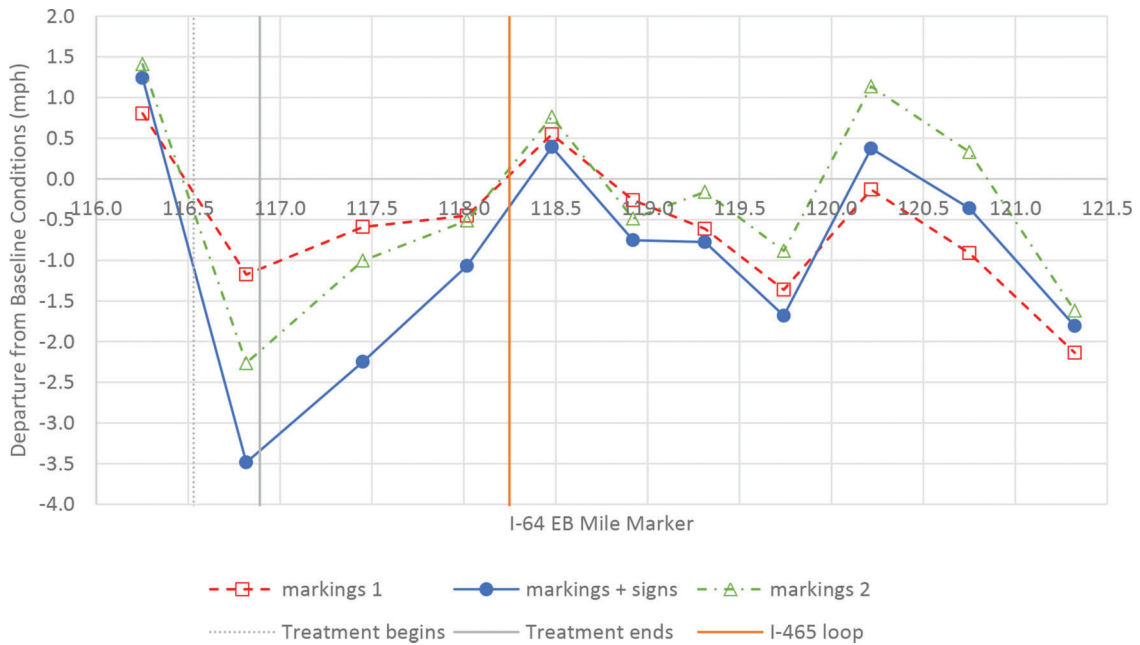
Figure 6.8 Estimated average speed difference from baseline conditions on I-64 EB.
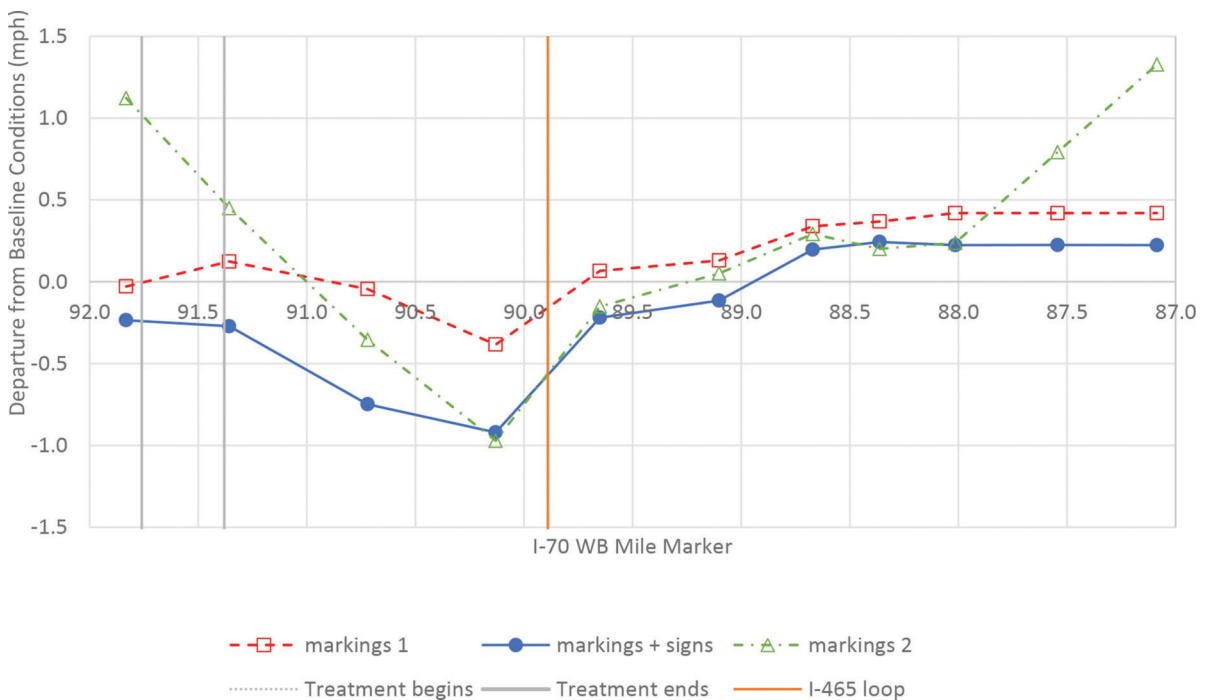
Figure 6.9 Estimated 90th percentile of speed difference from baseline conditions on I-70 WB.

To calculate the variability of speed, measurements of individual vehicles' speeds are needed. Unfortunately, such data is unsuitable for this study due to its prohibitive data collection cost and the availability of INRIX's travel speeds. Instead, the temporal variability of speed is accessible. The temporal variability of speed represents rapid changes in average travel speeds, not the speed variability between individual vehicles.

Figures 6.13, 6.14, 6.15, and 6.16 present the calculated difference in speed variability between baseline conditions and each treatment phase for the I-70 WB, I-65 NB, I-65 SB, and I-64 EB study sections, respectively. While a minor increase in speed variability was observed in the I-70 WB, I-65 NB, and I-64 EB study sections, this increase is not considerable, and it is concluded that there is no effect of the implemented speed-reduction treatments on speed variability.
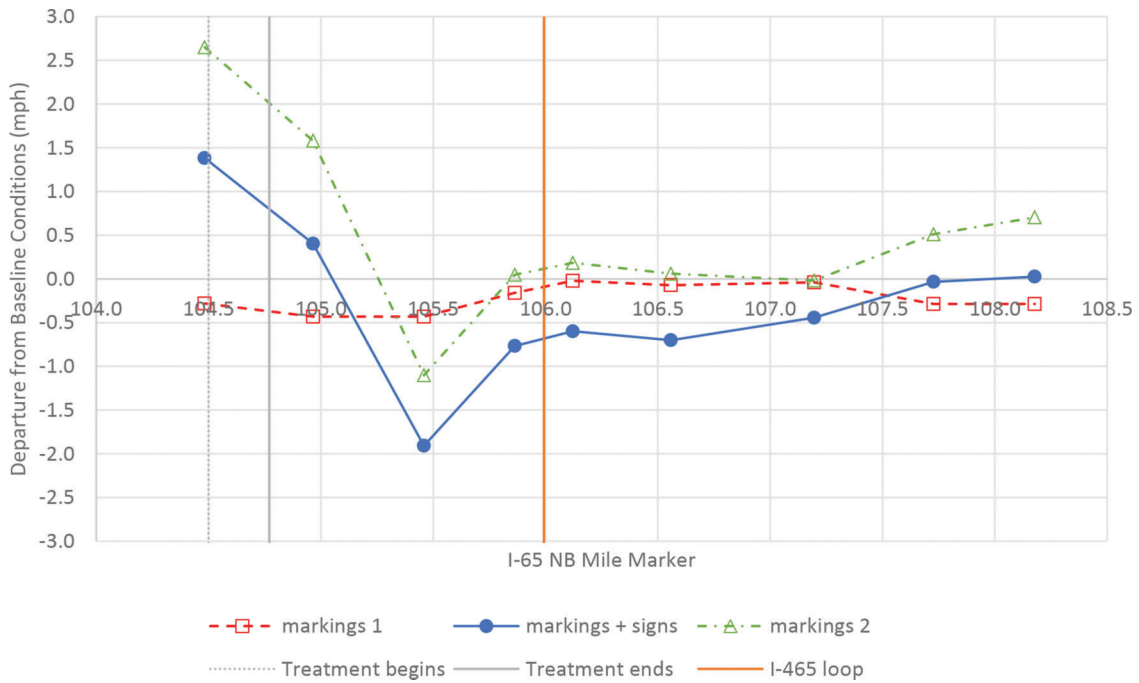
Figure 6.10 Estimated 90th percentile of speed difference from baseline conditions on I-65 NB.
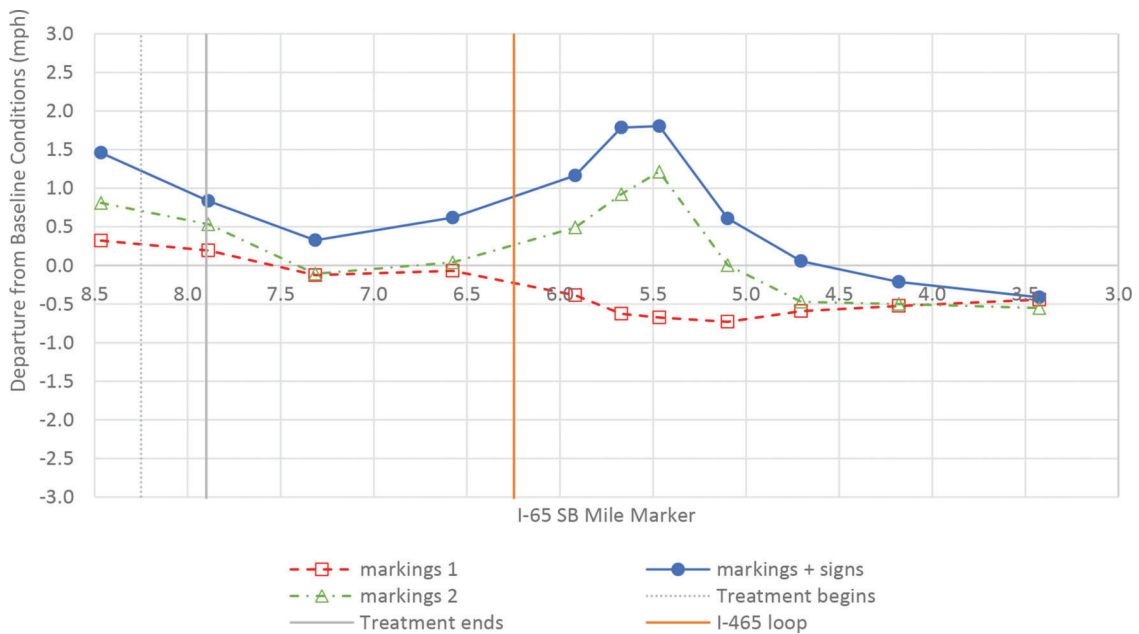
Figure 6.11 Estimated 90th percentile of speed difference from baseline conditions on I-65 SB.
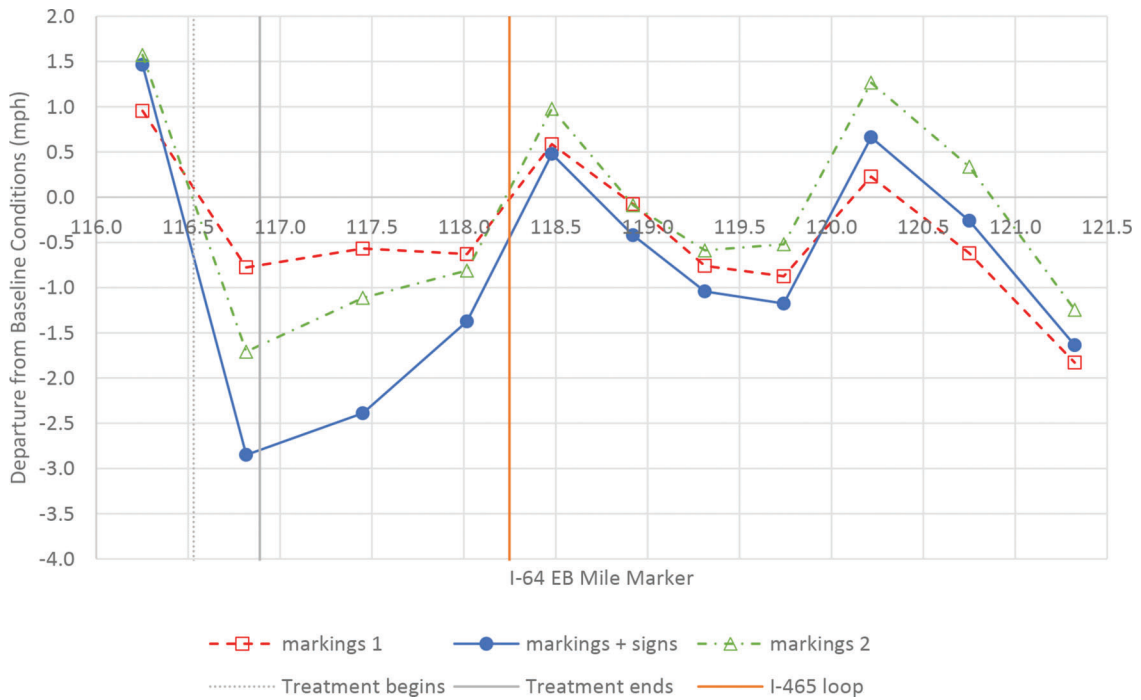
Figure 6.12 Estimated 90th percentile of speed difference from baseline conditions on I-64 EB.
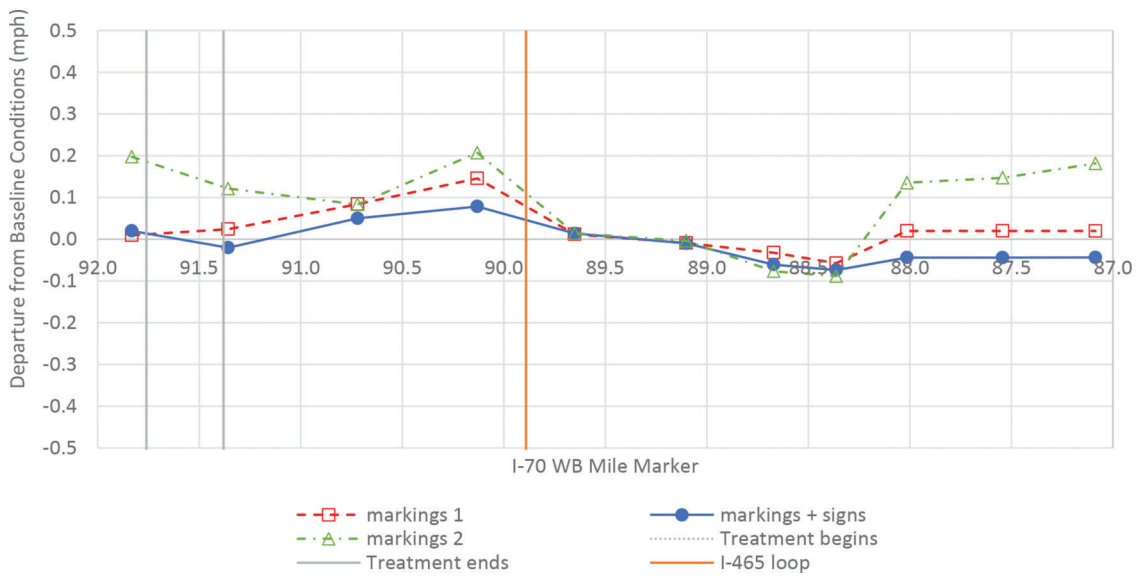
Figure 6.13 Estimated speed variability difference from baseline conditions on I-70 WB.
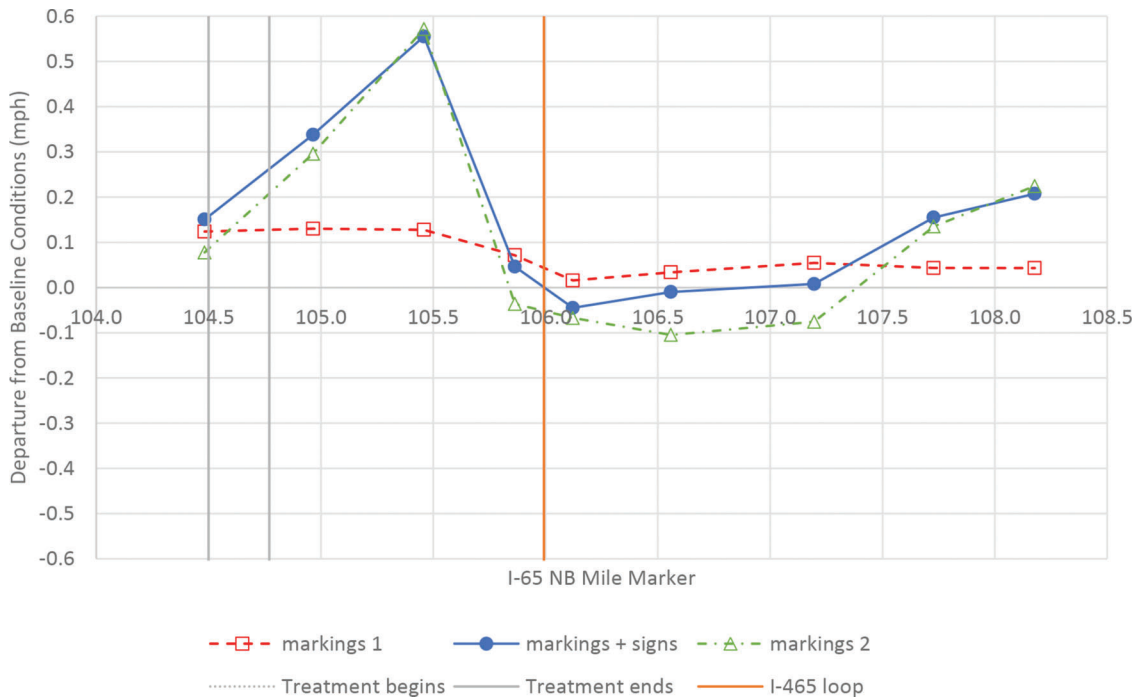
Figure 6.14 Estimated speed variability difference from baseline conditions on I-65 NB.
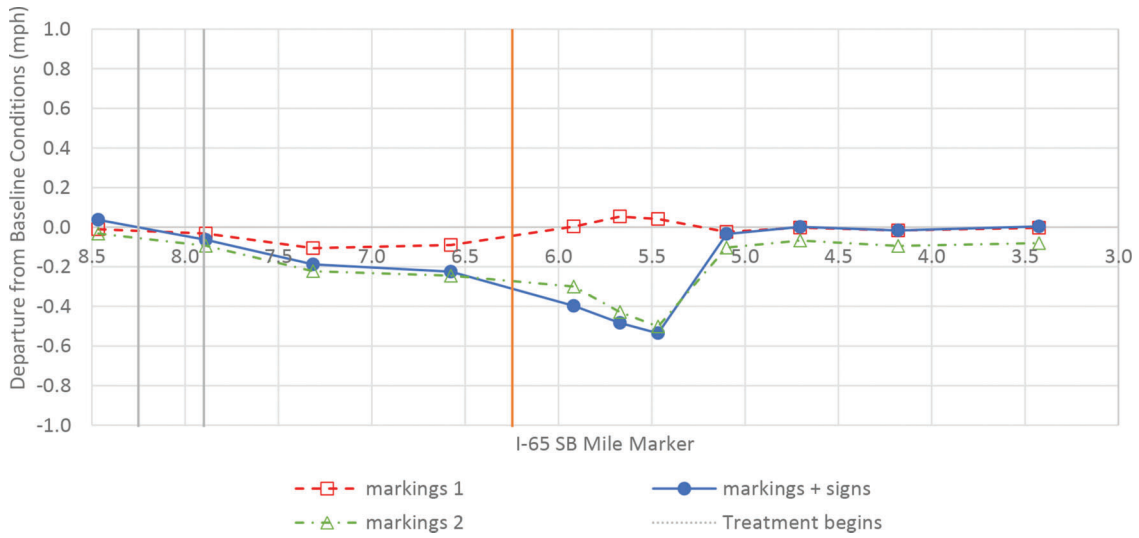
Figure 6.15 Estimated speed variability difference from baseline conditions on I-65 SB.
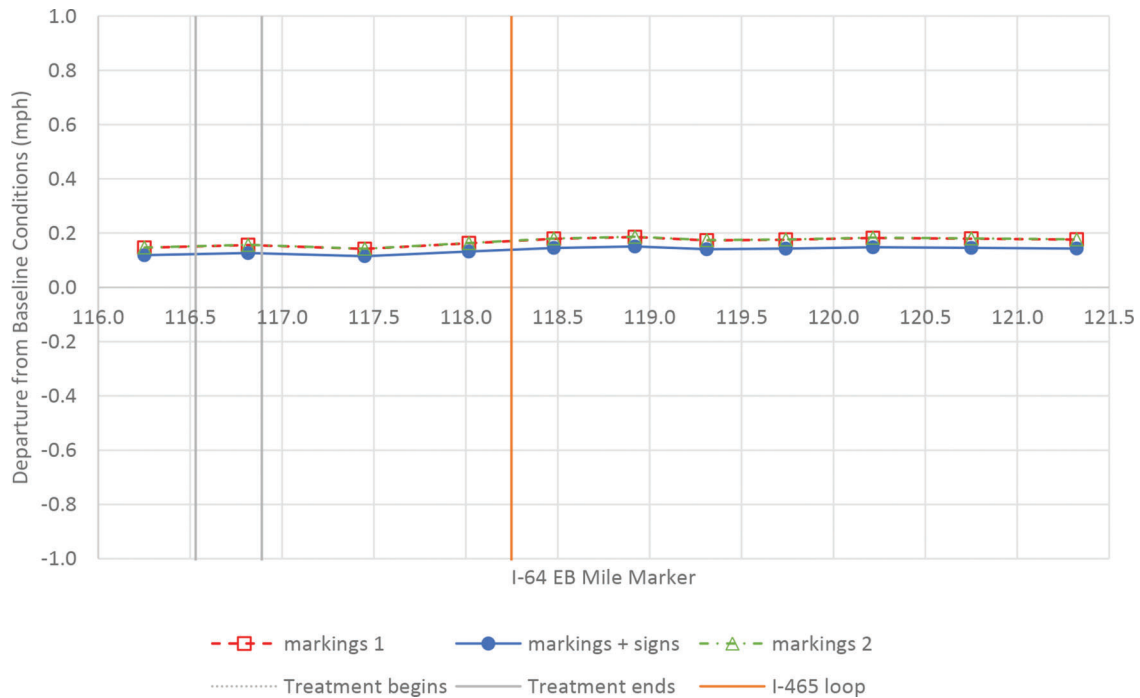
Figure 6.16 Estimated speed variability difference from baseline conditions on I-64 EB.

7. CONCLUSION

This study evaluated a set of speed-reduction treatments identified by the research team as promising for implementation in Indiana's rural-to-urban freeway transition zones. The treatments include pavement markings and active signing. Optical speed bars (OSBs) and longitudinal speed reduction markings (LSRMs) were combined with speed feedback signs (SFSs). These treatment combinations were implemented in four freeway transition zones, namely I-70 WB and I-65 NB in Greenfield District and I-64 EB and I-65 SB in Seymour District. The effect of speed-reduction treatments on three speed behavior characteristics, i.e., average travel speed, 90th percentile speed, and temporal speed variability, were estimated via advanced statistical analysis.

The results from this study are summarized in Table 7.1. It presents the estimated effects of speed-reduction treatments on the average and 90th percentile speed. Regarding average speed, the most promising speed-reduction treatment is the combination of OSBs and SFSs. This finding warrants further testing investigation by INDOT towards system-wide implementation. Implementing this combination of treatments is anticipated a 1.1–3.5 mph maximum reduction in average speed. Additionally, the expected influence distance of this speed-reduction treatment is up to 2.8 miles. The combination of LSRMs and SFSs produced a maximum speed reduction of 2.8 mph, lasting approximately 2.4 miles. In terms of the effect of speed-reduction treatments on the 90th percentile, a more minor yet considerable speed reduction was observed

after the implementation of treatments. The expected speed reduction in the 90th-speed percentile is about 72% of the expected decrease in average speed.

Several limitations must be considered when using this study's results in other freeway transition zones. First, the analysis period is from May 2021 to March 2022. While major speed factors, e.g., work construction and adverse weather conditions, are accounted for in the model, this long analysis period makes the findings susceptible to unobserved factors affecting the operating speed. Additionally, the inherent aggregation of the data to 0.5-mile road segments and 1-minute periods prevented the research team from analyzing the effect of speed-reduction treatments on the speed variance. This essential safety factor remains to be a matter of future research.

While traditional speed-reduction treatments such as pavement markings and active signs show promise, their influence area may be limited to a portion of the target road segment. For instance, I-65 SB in Louisville extends 18 miles inside the I-265 freeway loop. To maintain lower speeds inside urban areas, future speed management needs to consider other types of speed-reduction treatments. For instance, promising alternatives to extend the effect of local treatments inside the urban area include urban area skip designs and automated speed enforcement. These strategies warrant further testing and investigation by INDOT. Indiana has started moving in that direction. In fact, in early 2022, Indiana Senate passed House Bill 179 which, if it had been passed by the Indiana House and signed by the governor, would have authorized the creation of a photo enforcement pilot project for highway work zones. A pilot project such as that envisioned in Senate

TABLE 7.1
Estimated effects of engineering treatments on speed behavior

Combination of Treatments	Greenfield District		Seymour District	
	Maximum Speed Reduction (mph)	Influence Distance (mi)	Maximum Speed Reduction (mph)	Influence Distance (mi)
Average Travel Speed				
OSBs	0.6	1.3	2.3	1.8
OSBs + SFSs	1.1	2.8	3.5	2.0
LSRMs	1.8	1.6	N/A	N/A
LSRMs + SFSs	2.8	2.4	N/A	N/A
90th Percentile of Speed				
OSBs	0.4	1.0	1.7	1.8
OSBs + SFSs	0.9	2.5	2.8	2.0
LSRMs	1.1	1.6	N/A	N/A
LSRMs + SFSs	1.9	2.1	N/A	N/A

Notes:
OSBs: Optical Speed Bars.
LSRMs: Longitudinal Speed Reduction Markings.
SFSs: Speed Feedback Signs.

Bill 179 would be helpful for the future implementation of automated speed enforcement in other settings in Indiana, such as transition zones.

In addition to photo enforcement, a need for more consistency in Indiana on urban interstate speed limits was identified. The speed limit on the I-65 SB study section was 65 mph but the other study sections in the experiment had a posted speed limit of 55 mph. Outside the experiment scope, the speed limit on I-65 in Lafayette and I-69 in Fort Wayne is 65 mph, and it is 70 mph on I-90 in Gary. Speed limit consistency has potential as a system-wide speed management strategy. This affirmation is supported by a previous JTRP study that compared alternative speed limits on interstate freeways in Indiana and found uniform speed limits to provide both mobility and safety benefits (Tarko et al., 2019). While system-wide consistency is needed, engineering studies should continue to be carried out to revise and lower speed limits due to local conditions and crash history.

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APPENDICES

Appendix A. Experiment Design Details

Appendix B. Regression Analysis Results

Appendix C. Data Collection of Roadway Characteristics

Appendix D. Speed Profiles

APPENDIX A. EXPERIMENT DESIGN DETAILS

I-70 Westbound from 1.09 miles east of Post Road to 0.75 miles east of Post Road (West if to left in layout) – Greenfield District
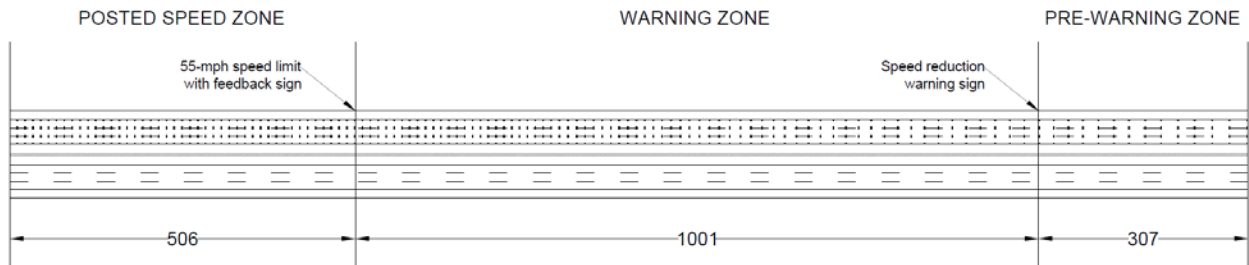
Figure A.1 Layout of the treatment zone for the I-70 WB study section in Greenfield District.

I-65 Northbound from 2,080 feet south of Thompson Road to 280 feet south of Thompson Road (north is to left in layout) – Greenfield District
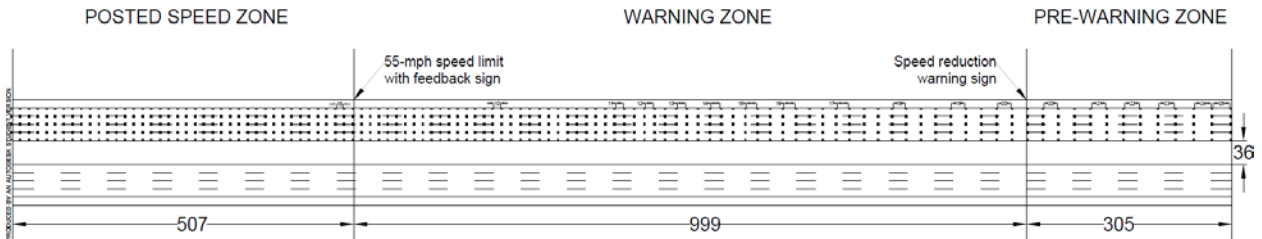
Figure A.2 Layout of the treatment zone for the I-65 NB study section in Greenfield District.

I-65 Southbound from 0.74 miles south of Old SR 311 to 1.08 miles south of Old SR 311 (south is to left in layout) – Seymour District

POSTED SPEED ZONE   WARNING ZONE   PRE-WARNING ZONE

55-mph speed limit
with feedback sign

Speed reduction
warning sign

————507————   ————————999————————   ————305————
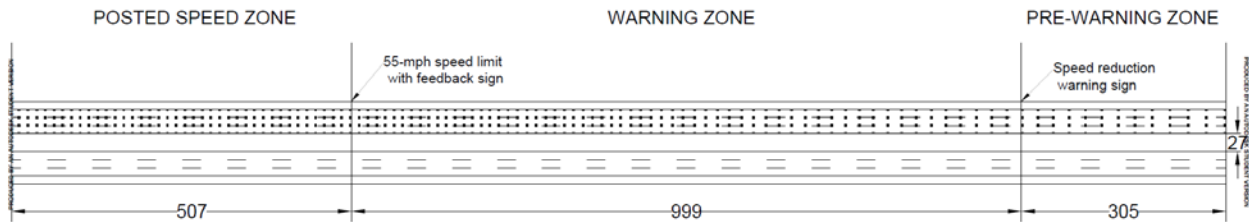
Second speed feedback sign to
be placed 0.5 mile downstream
of the 55-mph speed limit sign.

Figure A.3 Layout of the treatment zone for the I-65 SB study section in Seymour District.

I-64 Eastbound from 5,120 feet west of SR 64 to 3,320 feet west of SR 64 (east is to right in layout) – Seymour District
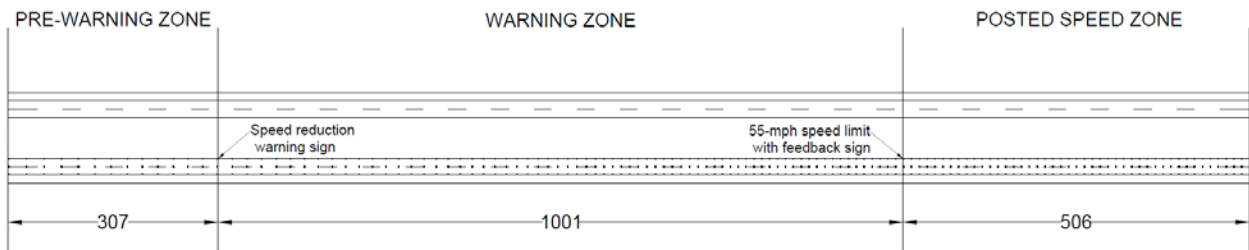
PRE-WARNING ZONE   WARNING ZONE   POSTED SPEED ZONE

Speed reduction
warning sign

55-mph speed limit
with feedback sign

————307————   ————————1001————————   ————506————

Second speed feedback sign to
be placed 0.5 mile downstream
of the 55-mph speed limit sign.

N

Figure A.4 Layout of the treatment zone for the I-64 EB study section in Seymour District.

A-2

APPENDIX B. REGRESSION ANALYSIS RESULTS

Table B.1 Multiple linear regression of average speed on I-70 WB in Greenfield District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	66.476	0.083	798.39	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	-0.340	0.053	-6.48	<.0001
Baseline | Segment 3	-1.944	0.053	-37.00	<.0001
Baseline | Segment 4	-3.516	0.053	-66.93	<.0001
Baseline | Segment 5	-0.163	0.053	-3.10	0.0019
Baseline | Segment 6	-0.571	0.052	-10.98	<.0001
Baseline | Segment 7	-1.024	0.052	-19.70	<.0001
Baseline | Segment 8	-0.074	0.052	-1.43	0.1527
Baseline | Segment 9	-0.010	0.052	-0.20	0.8414
Baseline | Segment 10	-0.010	0.052	-0.20	0.8414
Baseline | Segment 11	-0.010	0.052	-0.20	0.8414
Markings 1 | Segment 1	-0.040	0.069	-0.58	0.5629
Markings 1 | Segment 2	-0.256	0.069	-3.72	0.0002
Markings 1 | Segment 3	-2.077	0.069	-30.20	<.0001
Markings 1 | Segment 4	-4.089	0.069	-59.46	<.0001
Markings 1 | Segment 5	-0.129	0.069	-1.88	0.0605
Markings 1 | Segment 6	-0.443	0.068	-6.50	<.0001
Markings 1 | Segment 7	-0.691	0.068	-10.14	<.0001
Markings 1 | Segment 8	0.320	0.068	4.70	<.0001
Markings 1 | Segment 9	0.388	0.068	5.69	<.0001
Markings 1 | Segment 10	0.388	0.068	5.69	<.0001
Markings 1 | Segment 11	0.388	0.068	5.69	<.0001
Markings + Signs | Segment 1	-0.281	0.049	-5.69	<.0001
Markings + Signs | Segment 2	-0.629	0.049	-12.75	<.0001
Markings + Signs | Segment 3	-2.776	0.049	-56.33	<.0001
Markings + Signs | Segment 4	-4.568	0.049	-92.70	<.0001
Markings + Signs | Segment 5	-0.444	0.049	-9.01	<.0001
Markings + Signs | Segment 6	-0.691	0.049	-14.08	<.0001
Markings + Signs | Segment 7	-0.768	0.049	-15.65	<.0001
Markings + Signs | Segment 8	0.228	0.049	4.65	<.0001
Markings + Signs | Segment 9	0.297	0.049	6.04	<.0001
Markings + Signs | Segment 10	0.297	0.049	6.05	<.0001
Markings + Signs | Segment 11	0.297	0.049	6.06	<.0001
Markings 2 | Segment 1	0.883	0.064	13.84	<.0001
Markings 2 | Segment 2	-0.049	0.064	-0.77	0.4412

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 2 | Segment 3	-2.378	0.064	-37.21	<.0001
Markings 2 | Segment 4	-4.680	0.064	-73.27	<.0001
Markings 2 | Segment 5	-0.346	0.064	-5.42	<.0001
Markings 2 | Segment 6	-0.522	0.064	-8.12	<.0001
Markings 2 | Segment 7	-0.623	0.064	-9.69	<.0001
Markings 2 | Segment 8	0.250	0.064	3.88	0.0001
Markings 2 | Segment 9	0.055	0.064	0.86	0.3917
Markings 2 | Segment 10	0.651	0.064	10.13	<.0001
Markings 2 | Segment 11	1.159	0.064	18.02	<.0001
00:00–00:59 | Monday	-0.706	0.109	-6.50	<.0001
00:00–00:59 | Tuesday	-1.926	0.107	-18.03	<.0001
00:00–00:59 | Wednesday	-1.838	0.110	-16.69	<.0001
00:00–00:59 | Thursday	-1.558	0.108	-14.42	<.0001
00:00–00:59 | Friday	-1.510	0.108	-13.98	<.0001
00:00–00:59 | Saturday	-0.760	0.111	-6.83	<.0001
00:00–00:59 | Sunday	0.159	0.111	1.43	0.1531
01:00–01:59 | Monday	-2.067	0.108	-19.21	<.0001
01:00–01:59 | Tuesday	-2.631	0.107	-24.69	<.0001
01:00–01:59 | Wednesday	-2.184	0.110	-19.83	<.0001
01:00–01:59 | Thursday	-2.565	0.110	-23.39	<.0001
01:00–01:59 | Friday	-2.268	0.108	-20.96	<.0001
01:00–01:59 | Saturday	-1.339	0.110	-12.21	<.0001
01:00–01:59 | Sunday	-0.334	0.111	-3.02	0.0025
02:00–02:59 | Monday	-2.072	0.111	-18.69	<.0001
02:00–02:59 | Tuesday	-2.201	0.107	-20.51	<.0001
02:00–02:59 | Wednesday	-2.310	0.116	-19.92	<.0001
02:00–02:59 | Thursday	-2.253	0.111	-20.25	<.0001
02:00–02:59 | Friday	-1.672	0.108	-15.44	<.0001
02:00–02:59 | Saturday	-2.061	0.109	-18.88	<.0001
02:00–02:59 | Sunday	-1.612	0.108	-15.00	<.0001
03:00–02:59 | Monday	-1.896	0.112	-16.93	<.0001
03:00–02:59 | Tuesday	-1.615	0.105	-15.43	<.0001
03:00–02:59 | Wednesday	-1.557	0.118	-13.23	<.0001
03:00–02:59 | Thursday	-1.485	0.111	-13.42	<.0001
03:00–02:59 | Friday	-1.576	0.110	-14.34	<.0001
03:00–02:59 | Saturday	-2.163	0.112	-19.35	<.0001
03:00–02:59 | Sunday	-1.688	0.109	-15.55	<.0001
04:00–04:59 | Monday	0.338	0.114	2.97	0.0030
04:00–04:59 | Tuesday	0.129	0.105	1.23	0.2199

Variable	Estimate	Std. Error	t Value	Pr. > |t|
04:00–04:59 | Wednesday	0.304	0.113	2.70	0.0069
04:00–04:59 | Thursday	0.233	0.110	2.12	0.0341
04:00–04:59 | Friday	0.134	0.109	1.22	0.2210
04:00–04:59 | Saturday	-0.633	0.110	-5.77	<.0001
04:00–04:59 | Sunday	-1.088	0.110	-9.92	<.0001
05:00–05:59 | Monday	2.535	0.117	21.70	<.0001
05:00–05:59 | Tuesday	2.653	0.108	24.62	<.0001
05:00–05:59 | Wednesday	2.555	0.115	22.27	<.0001
05:00–05:59 | Thursday	2.657	0.111	23.87	<.0001
05:00–05:59 | Friday	2.586	0.112	23.10	<.0001
05:00–05:59 | Saturday	1.183	0.110	10.80	<.0001
05:00–05:59 | Sunday	0.787	0.112	7.05	<.0001
06:00–06:59 | Monday	2.324	0.117	19.94	<.0001
06:00–06:59 | Tuesday	2.332	0.111	21.06	<.0001
06:00–06:59 | Wednesday	2.289	0.117	19.57	<.0001
06:00–06:59 | Thursday	2.347	0.111	21.09	<.0001
06:00–06:59 | Friday	2.623	0.115	22.83	<.0001
06:00–06:59 | Saturday	1.913	0.112	17.07	<.0001
06:00–06:59 | Sunday	1.956	0.111	17.69	<.0001
07:00–07:59 | Monday	1.297	0.116	11.21	<.0001
07:00–07:59 | Tuesday	1.105	0.108	10.27	<.0001
07:00–07:59 | Wednesday	0.998	0.118	8.48	<.0001
07:00–07:59 | Thursday	1.281	0.111	11.50	<.0001
07:00–07:59 | Friday	1.420	0.114	12.47	<.0001
07:00–07:59 | Saturday	1.273	0.113	11.24	<.0001
07:00–07:59 | Sunday	1.043	0.111	9.41	<.0001
08:00–08:59 | Monday	1.234	0.113	10.90	<.0001
08:00–08:59 | Tuesday	0.758	0.109	6.95	<.0001
08:00–08:59 | Wednesday	0.820	0.119	6.92	<.0001
08:00–08:59 | Thursday	0.776	0.113	6.89	<.0001
08:00–08:59 | Friday	1.041	0.113	9.19	<.0001
08:00–08:59 | Saturday	1.475	0.107	13.78	<.0001
08:00–08:59 | Sunday	1.753	0.112	15.69	<.0001
09:00–09:59 | Monday	0.963	0.112	8.59	<.0001
09:00–09:59 | Tuesday	0.539	0.109	4.97	<.0001
09:00–09:59 | Wednesday	0.520	0.112	4.66	<.0001
09:00–09:59 | Thursday	0.419	0.110	3.82	0.0001
09:00–09:59 | Friday	0.935	0.110	8.52	<.0001
09:00–09:59 | Saturday	1.980	0.106	18.72	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
09:00–09:59 | Sunday	2.125	0.111	19.20	<.0001
10:00–10:59 | Monday	0.673	0.111	6.04	<.0001
10:00–10:59 | Tuesday	0.102	0.106	0.96	0.3364
10:00–10:59 | Wednesday	0.518	0.111	4.65	<.0001
10:00–10:59 | Thursday	-0.154	0.111	-1.38	0.1676
10:00–10:59 | Friday	0.574	0.109	5.29	<.0001
10:00–10:59 | Saturday	1.784	0.107	16.67	<.0001
10:00–10:59 | Sunday	2.379	0.109	21.90	<.0001
11:00–11:59 | Monday	0.537	0.108	4.95	<.0001
11:00–11:59 | Tuesday (Reference)	–	–	–	–
11:00–11:59 | Wednesday	0.145	0.114	1.27	0.2040
11:00–11:59 | Thursday	0.024	0.108	0.22	0.8234
11:00–11:59 | Friday	0.348	0.108	3.23	0.0012
11:00–11:59 | Saturday	1.434	0.110	13.09	<.0001
11:00–11:59 | Sunday	2.287	0.109	21.06	<.0001
12:00–12:59 | Monday	0.571	0.107	5.34	<.0001
12:00–12:59 | Tuesday	-0.076	0.108	-0.70	0.4814
12:00–12:59 | Wednesday	0.024	0.113	0.21	0.8322
12:00–12:59 | Thursday	0.085	0.108	0.78	0.4329
12:00–12:59 | Friday	0.328	0.108	3.03	0.0024
12:00–12:59 | Saturday	1.398	0.110	12.70	<.0001
12:00–12:59 | Sunday	2.390	0.108	22.10	<.0001
13:00–13:59 | Monday	0.508	0.107	4.74	<.0001
13:00–13:59 | Tuesday	-0.439	0.109	-4.05	<.0001
13:00–13:59 | Wednesday	-0.197	0.113	-1.75	0.0797
13:00–13:59 | Thursday	-0.289	0.108	-2.66	0.0078
13:00–13:59 | Friday	0.377	0.110	3.44	0.0006
13:00–13:59 | Saturday	1.435	0.108	13.28	<.0001
13:00–13:59 | Sunday	2.232	0.109	20.47	<.0001
14:00–14:59 | Monday	0.346	0.108	3.19	0.0014
14:00–14:59 | Tuesday	-0.314	0.107	-2.93	0.0033
14:00–14:59 | Wednesday	-0.143	0.114	-1.25	0.2103
14:00–14:59 | Thursday	-0.130	0.110	-1.18	0.2373
14:00–14:59 | Friday	0.394	0.107	3.68	0.0002
14:00–14:59 | Saturday	1.458	0.109	13.37	<.0001
14:00–14:59 | Sunday	2.146	0.107	20.12	<.0001
15:00–15:59 | Monday	0.272	0.110	2.48	0.0130
15:00–15:59 | Tuesday	-0.750	0.107	-7.03	<.0001
15:00–15:59 | Wednesday	-0.246	0.117	-2.10	0.0358

Variable	Estimate	Std. Error	t Value	Pr. > |t|
15:00–15:59 | Thursday	-0.288	0.110	-2.62	0.0088
15:00–15:59 | Friday	0.158	0.112	1.41	0.1584
15:00–15:59 | Saturday	1.526	0.109	14.05	<.0001
15:00–15:59 | Sunday	2.240	0.108	20.82	<.0001
16:00–16:59 | Monday	0.342	0.111	3.09	0.0020
16:00–16:59 | Tuesday	-0.725	0.108	-6.70	<.0001
16:00–16:59 | Wednesday	-0.314	0.114	-2.76	0.0059
16:00–16:59 | Thursday	-0.257	0.111	-2.32	0.0203
16:00–16:59 | Friday	-0.171	0.111	-1.54	0.1241
16:00–16:59 | Saturday	1.433	0.106	13.50	<.0001
16:00–16:59 | Sunday	2.089	0.108	19.34	<.0001
17:00–17:59 | Monday	0.554	0.112	4.95	<.0001
17:00–17:59 | Tuesday	0.010	0.109	0.09	0.9288
17:00–17:59 | Wednesday	-0.251	0.113	-2.21	0.0268
17:00–17:59 | Thursday	0.031	0.107	0.29	0.7726
17:00–17:59 | Friday	0.335	0.110	3.06	0.0022
17:00–17:59 | Saturday	1.766	0.109	16.27	<.0001
17:00–17:59 | Sunday	2.137	0.111	19.32	<.0001
18:00–18:59 | Monday	0.873	0.110	7.94	<.0001
18:00–18:59 | Tuesday	0.606	0.109	5.56	<.0001
18:00–18:59 | Wednesday	0.589	0.112	5.24	<.0001
18:00–18:59 | Thursday	0.643	0.109	5.89	<.0001
18:00–18:59 | Friday	0.865	0.109	7.93	<.0001
18:00–18:59 | Saturday	2.068	0.108	19.22	<.0001
18:00–18:59 | Sunday	2.200	0.109	20.19	<.0001
19:00–19:59 | Monday	1.188	0.108	11.04	<.0001
19:00–19:59 | Tuesday	0.862	0.109	7.87	<.0001
19:00–19:59 | Wednesday	0.955	0.111	8.58	<.0001
19:00–19:59 | Thursday	0.997	0.108	9.20	<.0001
19:00–19:59 | Friday	1.168	0.111	10.54	<.0001
19:00–19:59 | Saturday	2.098	0.108	19.34	<.0001
19:00–19:59 | Sunday	2.283	0.110	20.83	<.0001
20:00–20:59 | Monday	0.688	0.108	6.36	<.0001
20:00–20:59 | Tuesday	0.519	0.107	4.85	<.0001
20:00–20:59 | Wednesday	0.371	0.109	3.40	0.0007
20:00–20:59 | Thursday	0.811	0.109	7.44	<.0001
20:00–20:59 | Friday	0.769	0.110	7.02	<.0001
20:00–20:59 | Saturday	1.609	0.108	14.90	<.0001
20:00–20:59 | Sunday	1.749	0.107	16.40	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
21:00–21:59 | Monday	0.070	0.108	0.65	0.5164
21:00–21:59 | Tuesday	-0.085	0.110	-0.77	0.4385
21:00–21:59 | Wednesday	-0.162	0.108	-1.50	0.1340
21:00–21:59 | Thursday	0.216	0.112	1.93	0.0535
21:00–21:59 | Friday	0.215	0.110	1.96	0.0505
21:00–21:59 | Saturday	0.872	0.105	8.28	<.0001
21:00–21:59 | Sunday	1.072	0.109	9.88	<.0001
22:00–22:59 | Monday	-0.163	0.107	-1.52	0.1280
22:00–22:59 | Tuesday	-0.433	0.110	-3.95	<.0001
22:00–22:59 | Wednesday	-0.416	0.108	-3.85	0.0001
22:00–22:59 | Thursday	-0.343	0.110	-3.12	0.0018
22:00–22:59 | Friday	-0.017	0.109	-0.16	0.8751
22:00–22:59 | Saturday	0.725	0.107	6.77	<.0001
22:00–22:59 | Sunday	0.575	0.107	5.39	<.0001
23:00–23:59 | Monday	-1.215	0.109	-11.14	<.0001
23:00–23:59 | Tuesday	-1.532	0.109	-14.05	<.0001
23:00–23:59 | Wednesday	-0.999	0.108	-9.30	<.0001
23:00–23:59 | Thursday	-0.789	0.108	-7.33	<.0001
23:00–23:59 | Friday	-0.040	0.111	-0.36	0.7191
23:00–23:59 | Saturday	0.613	0.109	5.64	<.0001
23:00–23:59 | Sunday	-0.433	0.107	-4.06	<.0001
R-Square	0.648			
Coeff Var	2.089			
Root MSE	1.381			
Y Mean	66.128			

Table B.2 Multiple linear regression of 90th speed percentile on I-70 WB in Greenfield District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	68.973	0.080	857.70	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.038	0.051	0.75	0.4543
Baseline | Segment 3	-1.344	0.051	-26.50	<.0001
Baseline | Segment 4	-2.548	0.051	-50.23	<.0001
Baseline | Segment 5	0.138	0.051	2.72	0.0066
Baseline | Segment 6	-0.342	0.050	-6.81	<.0001
Baseline | Segment 7	-0.800	0.050	-15.93	<.0001
Baseline | Segment 8	0.242	0.050	4.81	<.0001
Baseline | Segment 9	0.152	0.050	3.03	0.0025

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Baseline | Segment 10	0.152	0.050	3.03	0.0025
Baseline | Segment 11	0.152	0.050	3.03	0.0025
Markings 1 | Segment 1	-0.028	0.066	-0.43	0.6693
Markings 1 | Segment 2	0.162	0.066	2.44	0.0147
Markings 1 | Segment 3	-1.389	0.066	-20.91	<.0001
Markings 1 | Segment 4	-2.932	0.066	-44.14	<.0001
Markings 1 | Segment 5	0.204	0.066	3.07	0.0021
Markings 1 | Segment 6	-0.212	0.066	-3.22	0.0013
Markings 1 | Segment 7	-0.461	0.066	-7.01	<.0001
Markings 1 | Segment 8	0.610	0.066	9.27	<.0001
Markings 1 | Segment 9	0.572	0.066	8.69	<.0001
Markings 1 | Segment 10	0.572	0.066	8.69	<.0001
Markings 1 | Segment 11	0.572	0.066	8.69	<.0001
Markings + Signs | Segment 1	-0.235	0.048	-4.93	<.0001
Markings + Signs | Segment 2	-0.234	0.048	-4.91	<.0001
Markings + Signs | Segment 3	-2.093	0.048	-43.97	<.0001
Markings + Signs | Segment 4	-3.469	0.048	-72.88	<.0001
Markings + Signs | Segment 5	-0.082	0.048	-1.71	0.0864
Markings + Signs | Segment 6	-0.457	0.047	-9.63	<.0001
Markings + Signs | Segment 7	-0.604	0.047	-12.73	<.0001
Markings + Signs | Segment 8	0.485	0.047	10.23	<.0001
Markings + Signs | Segment 9	0.376	0.047	7.93	<.0001
Markings + Signs | Segment 10	0.377	0.047	7.94	<.0001
Markings + Signs | Segment 11	0.376	0.047	7.93	<.0001
Markings 2 | Segment 1	1.122	0.062	18.22	<.0001
Markings 2 | Segment 2	0.488	0.062	7.92	<.0001
Markings 2 | Segment 3	-1.699	0.062	-27.53	<.0001
Markings 2 | Segment 4	-3.520	0.062	-57.06	<.0001
Markings 2 | Segment 5	-0.013	0.062	-0.22	0.8289
Markings 2 | Segment 6	-0.290	0.062	-4.67	<.0001
Markings 2 | Segment 7	-0.508	0.062	-8.18	<.0001
Markings 2 | Segment 8	0.443	0.062	7.12	<.0001
Markings 2 | Segment 9	0.390	0.062	6.28	<.0001
Markings 2 | Segment 10	0.944	0.062	15.20	<.0001
Markings 2 | Segment 11	1.479	0.062	23.81	<.0001
00:00–00:59 | Monday	-0.606	0.105	-5.78	<.0001
00:00–00:59 | Tuesday	-1.907	0.103	-18.49	<.0001
00:00–00:59 | Wednesday	-1.876	0.106	-17.64	<.0001
00:00–00:59 | Thursday	-1.467	0.104	-14.06	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
00:00–00:59 | Friday	-1.480	0.104	-14.19	<.0001
00:00–00:59 | Saturday	-0.935	0.107	-8.70	<.0001
00:00–00:59 | Sunday	0.004	0.107	0.04	0.9720
01:00–01:59 | Monday	-1.794	0.104	-17.26	<.0001
01:00–01:59 | Tuesday	-2.629	0.103	-25.54	<.0001
01:00–01:59 | Wednesday	-2.031	0.106	-19.09	<.0001
01:00–01:59 | Thursday	-2.236	0.106	-21.12	<.0001
01:00–01:59 | Friday	-2.355	0.105	-22.53	<.0001
01:00–01:59 | Saturday	-1.354	0.106	-12.79	<.0001
01:00–01:59 | Sunday	-0.257	0.107	-2.41	0.0161
02:00–02:59 | Monday	-1.596	0.107	-14.91	<.0001
02:00–02:59 | Tuesday	-1.883	0.104	-18.16	<.0001
02:00–02:59 | Wednesday	-2.075	0.112	-18.53	<.0001
02:00–02:59 | Thursday	-1.976	0.107	-18.39	<.0001
02:00–02:59 | Friday	-1.396	0.105	-13.34	<.0001
02:00–02:59 | Saturday	-2.131	0.105	-20.21	<.0001
02:00–02:59 | Sunday	-1.354	0.104	-13.04	<.0001
03:00–03:59 | Monday	-1.364	0.108	-12.61	<.0001
03:00–03:59 | Tuesday	-1.389	0.101	-13.74	<.0001
03:00–03:59 | Wednesday	-1.252	0.114	-11.02	<.0001
03:00–03:59 | Thursday	-1.010	0.107	-9.45	<.0001
03:00–03:59 | Friday	-1.363	0.106	-12.84	<.0001
03:00–03:59 | Saturday	-1.971	0.108	-18.27	<.0001
03:00–03:59 | Sunday	-1.575	0.105	-15.02	<.0001
04:00–04:59 | Monday	0.359	0.110	3.27	0.0011
04:00–04:59 | Tuesday	0.269	0.101	2.65	0.0080
04:00–04:59 | Wednesday	0.474	0.109	4.36	<.0001
04:00–04:59 | Thursday	0.205	0.106	1.93	0.0535
04:00–04:59 | Friday	0.418	0.106	3.96	<.0001
04:00–04:59 | Saturday	-0.171	0.106	-1.62	0.1061
04:00–04:59 | Sunday	-0.856	0.106	-8.08	<.0001
05:00–05:59 | Monday	2.426	0.113	21.51	<.0001
05:00–05:59 | Tuesday	2.465	0.104	23.68	<.0001
05:00–05:59 | Wednesday	2.438	0.111	22.00	<.0001
05:00–05:59 | Thursday	2.518	0.107	23.42	<.0001
05:00–05:59 | Friday	2.439	0.108	22.55	<.0001
05:00–05:59 | Saturday	1.293	0.106	12.22	<.0001
05:00–05:59 | Sunday	1.115	0.108	10.33	<.0001
06:00–06:59 | Monday	2.042	0.113	18.15	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
06:00–06:59 | Tuesday	2.166	0.107	20.25	<.0001
06:00–06:59 | Wednesday	2.080	0.113	18.42	<.0001
06:00–06:59 | Thursday	2.183	0.107	20.31	<.0001
06:00–06:59 | Friday	2.344	0.111	21.12	<.0001
06:00–06:59 | Saturday	1.865	0.108	17.23	<.0001
06:00–06:59 | Sunday	1.779	0.107	16.66	<.0001
07:00–07:59 | Monday	1.113	0.112	9.96	<.0001
07:00–07:59 | Tuesday	0.976	0.104	9.39	<.0001
07:00–07:59 | Wednesday	0.981	0.114	8.63	<.0001
07:00–07:59 | Thursday	1.218	0.108	11.32	<.0001
07:00–07:59 | Friday	1.403	0.110	12.76	<.0001
07:00–07:59 | Saturday	1.280	0.109	11.70	<.0001
07:00–07:59 | Sunday	0.902	0.107	8.43	<.0001
08:00–08:59 | Monday	0.954	0.109	8.72	<.0001
08:00–08:59 | Tuesday	0.690	0.105	6.55	<.0001
08:00–08:59 | Wednesday	0.783	0.115	6.83	<.0001
08:00–08:59 | Thursday	0.675	0.109	6.21	<.0001
08:00–08:59 | Friday	0.947	0.109	8.66	<.0001
08:00–08:59 | Saturday	1.255	0.103	12.14	<.0001
08:00–08:59 | Sunday	1.769	0.108	16.39	<.0001
09:00–09:59 | Monday	0.873	0.108	8.06	<.0001
09:00–09:59 | Tuesday	0.521	0.105	4.97	<.0001
09:00–09:59 | Wednesday	0.429	0.108	3.98	<.0001
09:00–09:59 | Thursday	0.383	0.106	3.62	0.0003
09:00–09:59 | Friday	0.862	0.106	8.13	<.0001
09:00–09:59 | Saturday	1.636	0.102	16.01	<.0001
09:00–09:59 | Sunday	1.856	0.107	17.37	<.0001
10:00–10:59 | Monday	0.474	0.107	4.41	<.0001
10:00–10:59 | Tuesday	-0.068	0.103	-0.67	0.5053
10:00–10:59 | Wednesday	0.382	0.107	3.56	0.0004
10:00–10:59 | Thursday	-0.241	0.107	-2.24	0.0249
10:00–10:59 | Friday	0.424	0.105	4.04	<.0001
10:00–10:59 | Saturday	1.536	0.103	14.85	<.0001
10:00–10:59 | Sunday	1.851	0.105	17.65	<.0001
11:00–11:59 | Monday	0.398	0.105	3.80	0.0001
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	0.016	0.110	0.15	0.8842
11:00–11:59 | Thursday	-0.107	0.104	-1.03	0.3035
11:00–11:59 | Friday	0.268	0.104	2.58	0.0098

Variable	Estimate	Std. Error	t Value	Pr. > |t|
11:00–11:59 | Saturday	1.243	0.106	11.75	<.0001
11:00–11:59 | Sunday	1.895	0.105	18.07	<.0001
12:00–12:59 | Monday	0.418	0.103	4.04	<.0001
12:00–12:59 | Tuesday	-0.167	0.104	-1.61	0.1077
12:00–12:59 | Wednesday	-0.061	0.109	-0.56	0.5741
12:00–12:59 | Thursday	-0.011	0.105	-0.11	0.9150
12:00–12:59 | Friday	0.187	0.104	1.79	0.0736
12:00–12:59 | Saturday	1.410	0.106	13.25	<.0001
12:00–12:59 | Sunday	2.032	0.104	19.46	<.0001
13:00–13:59 | Monday	0.373	0.103	3.61	0.0003
13:00–13:59 | Tuesday	-0.443	0.105	-4.22	<.0001
13:00–13:59 | Wednesday	-0.261	0.109	-2.40	0.0163
13:00–13:59 | Thursday	-0.288	0.105	-2.75	0.0060
13:00–13:59 | Friday	0.235	0.106	2.22	0.0265
13:00–13:59 | Saturday	1.101	0.104	10.56	<.0001
13:00–13:59 | Sunday	1.840	0.105	17.47	<.0001
14:00–14:59 | Monday	0.282	0.105	2.69	0.0072
14:00–14:59 | Tuesday	-0.266	0.103	-2.57	0.0101
14:00–14:59 | Wednesday	-0.158	0.110	-1.44	0.1505
14:00–14:59 | Thursday	-0.021	0.106	-0.20	0.8420
14:00–14:59 | Friday	0.282	0.103	2.73	0.0063
14:00–14:59 | Saturday	1.191	0.105	11.30	<.0001
14:00–14:59 | Sunday	1.795	0.103	17.42	<.0001
15:00–15:59 | Monday	0.177	0.106	1.67	0.0948
15:00–15:59 | Tuesday	-0.217	0.103	-2.10	0.0355
15:00–15:59 | Wednesday	-0.148	0.113	-1.31	0.1914
15:00–15:59 | Thursday	-0.290	0.106	-2.73	0.0063
15:00–15:59 | Friday	0.076	0.108	0.70	0.4862
15:00–15:59 | Saturday	1.396	0.105	13.32	<.0001
15:00–15:59 | Sunday	1.986	0.104	19.11	<.0001
16:00–16:59 | Monday	0.209	0.107	1.96	0.0502
16:00–16:59 | Tuesday	-0.474	0.104	-4.53	<.0001
16:00–16:59 | Wednesday	-0.329	0.110	-2.99	0.0028
16:00–16:59 | Thursday	-0.283	0.107	-2.65	0.0081
16:00–16:59 | Friday	-0.042	0.108	-0.39	0.6951
16:00–16:59 | Saturday	1.129	0.103	11.01	<.0001
16:00–16:59 | Sunday	1.716	0.104	16.45	<.0001
17:00–17:59 | Monday	0.414	0.108	3.83	0.0001
17:00–17:59 | Tuesday	0.188	0.105	1.79	0.0735

Variable	Estimate	Std. Error	t Value	Pr. > |t|
17:00–17:59 | Wednesday	-0.021	0.109	-0.19	0.8489
17:00–17:59 | Thursday	0.066	0.104	0.64	0.5239
17:00–17:59 | Friday	0.351	0.106	3.31	0.0009
17:00–17:59 | Saturday	1.453	0.105	13.86	<.0001
17:00–17:59 | Sunday	1.777	0.107	16.63	<.0001
18:00–18:59 | Monday	0.766	0.106	7.21	<.0001
18:00–18:59 | Tuesday	0.564	0.105	5.36	<.0001
18:00–18:59 | Wednesday	0.618	0.109	5.70	<.0001
18:00–18:59 | Thursday	0.525	0.105	4.98	<.0001
18:00–18:59 | Friday	0.753	0.105	7.15	<.0001
18:00–18:59 | Saturday	1.827	0.104	17.59	<.0001
18:00–18:59 | Sunday	1.774	0.105	16.86	<.0001
19:00–19:59 | Monday	1.029	0.104	9.90	<.0001
19:00–19:59 | Tuesday	0.747	0.106	7.06	<.0001
19:00–19:59 | Wednesday	0.946	0.107	8.81	<.0001
19:00–19:59 | Thursday	0.946	0.105	9.03	<.0001
19:00–19:59 | Friday	1.081	0.107	10.11	<.0001
19:00–19:59 | Saturday	1.927	0.105	18.39	<.0001
19:00–19:59 | Sunday	1.857	0.106	17.54	<.0001
20:00–20:59 | Monday	0.651	0.104	6.24	<.0001
20:00–20:59 | Tuesday	0.430	0.103	4.17	<.0001
20:00–20:59 | Wednesday	0.334	0.105	3.17	0.0015
20:00–20:59 | Thursday	0.686	0.105	6.52	<.0001
20:00–20:59 | Friday	0.983	0.106	9.29	<.0001
20:00–20:59 | Saturday	1.322	0.104	12.67	<.0001
20:00–20:59 | Sunday	1.490	0.103	14.47	<.0001
21:00–21:59 | Monday	0.010	0.104	0.09	0.9260
21:00–21:59 | Tuesday	-0.227	0.106	-2.14	0.0320
21:00–21:59 | Wednesday	0.011	0.104	0.10	0.9185
21:00–21:59 | Thursday	0.074	0.108	0.68	0.4947
21:00–21:59 | Friday	0.147	0.106	1.38	0.1666
21:00–21:59 | Saturday	0.691	0.102	6.80	<.0001
21:00–21:59 | Sunday	0.877	0.105	8.37	<.0001
22:00–22:59 | Monday	-0.116	0.104	-1.12	0.2622
22:00–22:59 | Tuesday	-0.367	0.106	-3.46	0.0005
22:00–22:59 | Wednesday	-0.403	0.104	-3.86	0.0001
22:00–22:59 | Thursday	-0.539	0.106	-5.06	<.0001
22:00–22:59 | Friday	-0.147	0.105	-1.40	0.1619
22:00–22:59 | Saturday	0.520	0.103	5.03	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
22:00–22:59	Sunday	0.383	0.103	3.72	0.0002
23:00–23:59	Monday	-1.189	0.105	-11.29	<.0001
23:00–23:59	Tuesday	-1.475	0.105	-14.00	<.0001
23:00–23:59	Wednesday	-1.115	0.104	-10.74	<.0001
23:00–23:59	Thursday	-0.875	0.104	-8.42	<.0001
23:00–23:59	Friday	-0.112	0.107	-1.04	0.2993
23:00–23:59	Saturday	0.418	0.105	3.99	<.0001
23:00–23:59	Sunday	-0.509	0.103	-4.93	<.0001
R-Square	0.591			
Coeff Var	1.936			
Root MSE	1.334			
Y Mean	68.907			

Table B.3 Multiple linear regression of the logarithm of speed variability on I-70 WB in Greenfield District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	0.595	0.009	69.71	<.0001
Baseline	Segment 1 (Reference)	.	.	.	.
Baseline	Segment 2	0.154	0.009	17.41	<.0001
Baseline	Segment 3	0.211	0.009	23.83	<.0001
Baseline	Segment 4	0.357	0.009	40.39	<.0001
Baseline	Segment 5	0.123	0.009	13.95	<.0001
Baseline	Segment 6	0.088	0.009	10.05	<.0001
Baseline	Segment 7	0.104	0.009	11.92	<.0001
Baseline	Segment 8	0.158	0.009	18.05	<.0001
Baseline	Segment 9	0.105	0.009	11.97	<.0001
Baseline	Segment 10	0.105	0.009	11.97	<.0001
Baseline	Segment 11	0.105	0.009	11.97	<.0001
Markings 1	Segment 1	0.005	0.012	0.43	0.6667
Markings 1	Segment 2	0.165	0.012	14.17	<.0001
Markings 1	Segment 3	0.246	0.012	21.17	<.0001
Markings 1	Segment 4	0.410	0.012	35.26	<.0001
Markings 1	Segment 5	0.129	0.012	11.07	<.0001
Markings 1	Segment 6	0.084	0.012	7.24	<.0001
Markings 1	Segment 7	0.089	0.012	7.68	<.0001
Markings 1	Segment 8	0.131	0.012	11.39	<.0001
Markings 1	Segment 9	0.114	0.012	9.91	<.0001
Markings 1	Segment 10	0.114	0.012	9.91	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 1 | Segment 11	0.114	0.012	9.91	<.0001
Markings + Signs | Segment 1	0.011	0.008	1.26	0.2088
Markings + Signs | Segment 2	0.145	0.008	17.23	<.0001
Markings + Signs | Segment 3	0.232	0.008	27.68	<.0001
Markings + Signs | Segment 4	0.386	0.008	46.05	<.0001
Markings + Signs | Segment 5	0.130	0.008	15.48	<.0001
Markings + Signs | Segment 6	0.083	0.008	9.95	<.0001
Markings + Signs | Segment 7	0.074	0.008	8.90	<.0001
Markings + Signs | Segment 8	0.124	0.008	14.79	<.0001
Markings + Signs | Segment 9	0.083	0.008	9.99	<.0001
Markings + Signs | Segment 10	0.083	0.008	9.98	<.0001
Markings + Signs | Segment 11	0.083	0.008	9.98	<.0001
Markings 2 | Segment 1	0.100	0.011	9.30	<.0001
Markings 2 | Segment 2	0.208	0.011	19.28	<.0001
Markings 2 | Segment 3	0.246	0.011	22.78	<.0001
Markings 2 | Segment 4	0.432	0.011	39.99	<.0001
Markings 2 | Segment 5	0.130	0.011	12.03	<.0001
Markings 2 | Segment 6	0.086	0.011	7.92	<.0001
Markings 2 | Segment 7	0.066	0.011	6.11	<.0001
Markings 2 | Segment 8	0.117	0.011	10.72	<.0001
Markings 2 | Segment 9	0.168	0.011	15.41	<.0001
Markings 2 | Segment 10	0.173	0.011	15.90	<.0001
Markings 2 | Segment 11	0.189	0.011	17.37	<.0001
00:00–00:59	0.019	0.007	2.65	0.0081
01:00–01:59	0.042	0.007	5.91	<.0001
02:00–02:59	0.079	0.007	10.96	<.0001
03:00–03:59	0.119	0.007	16.55	<.0001
04:00–04:59	0.094	0.007	13.16	<.0001
05:00–05:59	0.065	0.007	8.85	<.0001
06:00–06:59	0.023	0.007	3.06	0.0022
07:00–07:59	0.036	0.007	4.95	<.0001
08:00–08:59	0.022	0.007	2.97	0.0030
09:00–09:59	0.016	0.007	2.25	0.0242
10:00–10:59	-0.011	0.007	-1.54	0.1228
11:00–11:59 (Reference)	.	.	.	.
12:00–12:59	0.015	0.007	2.12	0.0340
13:00–13:59	0.012	0.007	1.70	0.0888
14:00–14:59	0.036	0.007	5.03	<.0001
15:00–15:59	0.063	0.007	8.72	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
16:00–16:59	0.025	0.007	3.49	0.0005
17:00–17:59	0.041	0.007	5.65	<.0001
18:00–18:59	0.025	0.007	3.51	0.0004
19:00–19:59	0.019	0.007	2.63	0.0084
20:00–20:59	0.041	0.007	5.79	<.0001
21:00–21:59	0.012	0.007	1.72	0.0846
22:00–22:59	0.004	0.007	0.63	0.5306
23:00–23:59	0.011	0.007	1.60	0.1100
Monday	-0.008	0.004	-2.12	0.0344
Tuesday (Reference)	.	.	.	.
Wednesday	-0.003	0.004	-0.77	0.4420
Thursday	0.000	0.004	0.07	0.9456
Friday	-0.011	0.004	-2.74	0.0062
Saturday	-0.039	0.004	-10.25	<.0001
Sunday	-0.055	0.004	-14.38	<.0001
Road construction	0.016	0.003	4.90	<.0001
R-Square	0.159			
Coeff Var	30.404			
Root MSE	0.233			
Y Mean	0.765			

Table B.4 Multiple linear regression of average speed on I-65 NB in Greenfield District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	65.640	0.200	328.49	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	-0.602	0.113	-5.32	<.0001
Baseline | Segment 3	-0.602	0.113	-5.32	<.0001
Baseline | Segment 4	0.589	0.113	5.20	<.0001
Baseline | Segment 5	-0.199	0.113	-1.76	0.0792
Baseline | Segment 6	-1.605	0.113	-14.18	<.0001
Baseline | Segment 7	-0.324	0.112	-2.89	0.0038
Baseline | Segment 8	0.198	0.112	1.76	0.0780
Baseline | Segment 9	0.198	0.112	1.76	0.0780
Markings 1 | Segment 1	-0.446	0.104	-4.31	<.0001
Markings 1 | Segment 2	-1.236	0.103	-11.94	<.0001
Markings 1 | Segment 3	-1.236	0.103	-11.94	<.0001
Markings 1 | Segment 4	0.321	0.103	3.10	0.0019
Markings 1 | Segment 5	-0.270	0.103	-2.61	0.0092

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 1 | Segment 6	-1.720	0.104	-16.62	<.0001
Markings 1 | Segment 7	-0.452	0.103	-4.39	<.0001
Markings 1 | Segment 8	-0.156	0.103	-1.52	0.1288
Markings 1 | Segment 9	-0.156	0.103	-1.52	0.1288
Markings + Signs | Segment 1	1.139	0.152	7.51	<.0001
Markings + Signs | Segment 2	-0.817	0.152	-5.39	<.0001
Markings + Signs | Segment 3	-3.356	0.152	-22.14	<.0001
Markings + Signs | Segment 4	-0.292	0.152	-1.92	0.0543
Markings + Signs | Segment 5	-0.807	0.152	-5.32	<.0001
Markings + Signs | Segment 6	-2.362	0.152	-15.59	<.0001
Markings + Signs | Segment 7	-0.831	0.152	-5.47	<.0001
Markings + Signs | Segment 8	-0.121	0.152	-0.79	0.4277
Markings + Signs | Segment 9	-0.115	0.152	-0.76	0.4499
Markings 2 | Segment 1	2.638	0.154	17.09	<.0001
Markings 2 | Segment 2	0.553	0.154	3.59	0.0003
Markings 2 | Segment 3	-2.401	0.154	-15.55	<.0001
Markings 2 | Segment 4	0.671	0.154	4.35	<.0001
Markings 2 | Segment 5	0.026	0.154	0.17	0.8677
Markings 2 | Segment 6	-1.473	0.154	-9.53	<.0001
Markings 2 | Segment 7	-0.304	0.155	-1.96	0.0500
Markings 2 | Segment 8	0.469	0.155	3.03	0.0025
Markings 2 | Segment 9	0.621	0.155	4.01	<.0001
00:00–00:59 | Monday	0.081	0.264	0.31	0.7599
00:00–00:59 | Tuesday	-1.790	0.261	-6.85	<.0001
00:00–00:59 | Wednesday	-1.704	0.264	-6.45	<.0001
00:00–00:59 | Thursday	-1.987	0.266	-7.48	<.0001
00:00–00:59 | Friday	-1.100	0.257	-4.29	<.0001
00:00–00:59 | Saturday	0.272	0.271	1.00	0.3154
00:00–00:59 | Sunday	0.725	0.271	2.68	0.0074
01:00–01:59 | Monday	-1.456	0.264	-5.51	<.0001
01:00–01:59 | Tuesday	-2.403	0.261	-9.22	<.0001
01:00–01:59 | Wednesday	-2.402	0.269	-8.93	<.0001
01:00–01:59 | Thursday	-2.325	0.269	-8.64	<.0001
01:00–01:59 | Friday	-1.839	0.259	-7.09	<.0001
01:00–01:59 | Saturday	-0.479	0.268	-1.79	0.0742
01:00–01:59 | Sunday	0.378	0.270	1.40	0.1610
02:00–02:59 | Monday	-1.019	0.272	-3.74	0.0002
02:00–02:59 | Tuesday	-2.096	0.261	-8.02	<.0001
02:00–02:59 | Wednesday	-1.955	0.285	-6.85	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
02:00–02:59 | Thursday	-1.616	0.274	-5.91	<.0001
02:00–02:59 | Friday	-1.758	0.257	-6.83	<.0001
02:00–02:59 | Saturday	-0.468	0.267	-1.75	0.0804
02:00–02:59 | Sunday	-0.513	0.263	-1.95	0.0510
03:00–02:59 | Monday	-0.776	0.277	-2.81	0.0050
03:00–02:59 | Tuesday	-0.940	0.255	-3.69	0.0002
03:00–02:59 | Wednesday	-0.777	0.288	-2.70	0.0070
03:00–02:59 | Thursday	-0.756	0.270	-2.80	0.0051
03:00–02:59 | Friday	-0.702	0.259	-2.71	0.0068
03:00–02:59 | Saturday	-1.199	0.273	-4.40	<.0001
03:00–02:59 | Sunday	-1.268	0.262	-4.84	<.0001
04:00–04:59 | Monday	0.898	0.282	3.19	0.0014
04:00–04:59 | Tuesday	0.848	0.255	3.33	0.0009
04:00–04:59 | Wednesday	0.767	0.275	2.79	0.0052
04:00–04:59 | Thursday	0.822	0.268	3.06	0.0022
04:00–04:59 | Friday	0.652	0.266	2.45	0.0141
04:00–04:59 | Saturday	-1.110	0.265	-4.19	<.0001
04:00–04:59 | Sunday	-0.613	0.264	-2.32	0.0204
05:00–05:59 | Monday	2.481	0.283	8.76	<.0001
05:00–05:59 | Tuesday	2.490	0.262	9.50	<.0001
05:00–05:59 | Wednesday	2.281	0.276	8.28	<.0001
05:00–05:59 | Thursday	2.456	0.271	9.07	<.0001
05:00–05:59 | Friday	2.398	0.272	8.82	<.0001
05:00–05:59 | Saturday	0.984	0.269	3.66	0.0002
05:00–05:59 | Sunday	0.900	0.267	3.38	0.0007
06:00–06:59 | Monday	2.617	0.278	9.43	<.0001
06:00–06:59 | Tuesday	2.288	0.269	8.50	<.0001
06:00–06:59 | Wednesday	2.161	0.282	7.66	<.0001
06:00–06:59 | Thursday	2.109	0.272	7.75	<.0001
06:00–06:59 | Friday	2.379	0.276	8.62	<.0001
06:00–06:59 | Saturday	1.875	0.270	6.95	<.0001
06:00–06:59 | Sunday	2.296	0.264	8.69	<.0001
07:00–07:59 | Monday	1.433	0.277	5.18	<.0001
07:00–07:59 | Tuesday	-1.397	0.262	-5.33	<.0001
07:00–07:59 | Wednesday	0.671	0.284	2.36	0.0183
07:00–07:59 | Thursday	0.315	0.269	1.17	0.2421
07:00–07:59 | Friday	1.386	0.275	5.05	<.0001
07:00–07:59 | Saturday	1.609	0.276	5.84	<.0001
07:00–07:59 | Sunday	1.378	0.267	5.17	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
08:00–08:59 | Monday	1.331	0.271	4.91	<.0001
08:00–08:59 | Tuesday	-2.421	0.267	-9.05	<.0001
08:00–08:59 | Wednesday	0.334	0.285	1.17	0.2425
08:00–08:59 | Thursday	-0.007	0.273	-0.03	0.9799
08:00–08:59 | Friday	0.800	0.271	2.95	0.0031
08:00–08:59 | Saturday	1.610	0.261	6.18	<.0001
08:00–08:59 | Sunday	1.836	0.274	6.71	<.0001
09:00–09:59 | Monday	0.895	0.269	3.33	0.0009
09:00–09:59 | Tuesday	-0.776	0.265	-2.93	0.0034
09:00–09:59 | Wednesday	0.169	0.269	0.63	0.5294
09:00–09:59 | Thursday	0.520	0.265	1.96	0.0499
09:00–09:59 | Friday	0.656	0.263	2.50	0.0125
09:00–09:59 | Saturday	1.946	0.258	7.54	<.0001
09:00–09:59 | Sunday	2.289	0.265	8.63	<.0001
10:00–10:59 | Monday	0.672	0.266	2.53	0.0114
10:00–10:59 | Tuesday	-0.630	0.261	-2.41	0.0160
10:00–10:59 | Wednesday	0.245	0.268	0.91	0.3619
10:00–10:59 | Thursday	-0.012	0.268	-0.04	0.9657
10:00–10:59 | Friday	0.438	0.262	1.67	0.0950
10:00–10:59 | Saturday	1.625	0.261	6.23	<.0001
10:00–10:59 | Sunday	2.538	0.262	9.69	<.0001
11:00–11:59 | Monday	0.206	0.261	0.79	0.4297
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	-0.250	0.274	-0.91	0.3612
11:00–11:59 | Thursday	-0.570	0.261	-2.18	0.0292
11:00–11:59 | Friday	0.044	0.260	0.17	0.8647
11:00–11:59 | Saturday	1.711	0.267	6.40	<.0001
11:00–11:59 | Sunday	2.478	0.260	9.53	<.0001
12:00–12:59 | Monday	0.044	0.257	0.17	0.8638
12:00–12:59 | Tuesday	0.170	0.264	0.65	0.5189
12:00–12:59 | Wednesday	0.268	0.269	1.00	0.3195
12:00–12:59 | Thursday	-0.091	0.263	-0.35	0.7283
12:00–12:59 | Friday	-0.182	0.257	-0.71	0.4788
12:00–12:59 | Saturday	1.723	0.267	6.44	<.0001
12:00–12:59 | Sunday	2.308	0.261	8.86	<.0001
13:00–13:59 | Monday	0.232	0.257	0.90	0.3669
13:00–13:59 | Tuesday	0.337	0.267	1.26	0.2067
13:00–13:59 | Wednesday	-0.014	0.270	-0.05	0.9573
13:00–13:59 | Thursday	-0.276	0.261	-1.06	0.2893

Variable	Estimate	Std. Error	t Value	Pr. > |t|
13:00–13:59	Friday	-0.456	0.262	-1.74	0.0820
13:00–13:59	Saturday	1.596	0.261	6.11	<.0001
13:00–13:59	Sunday	1.583	0.263	6.02	<.0001
14:00–14:59	Monday	-0.706	0.261	-2.71	0.0068
14:00–14:59	Tuesday	-0.233	0.263	-0.89	0.3745
14:00–14:59	Wednesday	-0.386	0.271	-1.42	0.1543
14:00–14:59	Thursday	-0.143	0.261	-0.55	0.5832
14:00–14:59	Friday	-1.148	0.261	-4.39	<.0001
14:00–14:59	Saturday	1.459	0.264	5.54	<.0001
14:00–14:59	Sunday	0.889	0.258	3.45	0.0006
15:00–15:59	Monday	-0.398	0.262	-1.52	0.1290
15:00–15:59	Tuesday	-1.348	0.262	-5.14	<.0001
15:00–15:59	Wednesday	-0.797	0.276	-2.89	0.0038
15:00–15:59	Thursday	-0.859	0.261	-3.29	0.0010
15:00–15:59	Friday	-1.803	0.271	-6.66	<.0001
15:00–15:59	Saturday	1.515	0.260	5.83	<.0001
15:00–15:59	Sunday	0.954	0.260	3.67	0.0002
16:00–16:59	Monday	-0.608	0.264	-2.30	0.0214
16:00–16:59	Tuesday	-2.744	0.265	-10.35	<.0001
16:00–16:59	Wednesday	-2.191	0.268	-8.17	<.0001
16:00–16:59	Thursday	-3.051	0.263	-11.61	<.0001
16:00–16:59	Friday	-3.046	0.267	-11.39	<.0001
16:00–16:59	Saturday	1.418	0.256	5.55	<.0001
16:00–16:59	Sunday	1.224	0.261	4.68	<.0001
17:00–17:59	Monday	-0.506	0.267	-1.89	0.0583
17:00–17:59	Tuesday	-1.785	0.268	-6.65	<.0001
17:00–17:59	Wednesday	-2.453	0.270	-9.09	<.0001
17:00–17:59	Thursday	-3.014	0.255	-11.82	<.0001
17:00–17:59	Friday	-2.378	0.264	-9.00	<.0001
17:00–17:59	Saturday	1.645	0.260	6.33	<.0001
17:00–17:59	Sunday	1.399	0.267	5.23	<.0001
18:00–18:59	Monday	0.625	0.267	2.35	0.0190
18:00–18:59	Tuesday	0.556	0.269	2.07	0.0387
18:00–18:59	Wednesday	-0.481	0.269	-1.79	0.0740
18:00–18:59	Thursday	0.181	0.259	0.70	0.4838
18:00–18:59	Friday	-0.425	0.261	-1.63	0.1041
18:00–18:59	Saturday	2.008	0.258	7.78	<.0001
18:00–18:59	Sunday	1.516	0.265	5.72	<.0001
19:00–19:59	Monday	1.715	0.260	6.60	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
19:00–19:59 | Tuesday	0.759	0.270	2.81	0.0050
19:00–19:59 | Wednesday	1.523	0.274	5.57	<.0001
19:00–19:59 | Thursday	1.483	0.259	5.73	<.0001
19:00–19:59 | Friday	1.955	0.267	7.33	<.0001
19:00–19:59 | Saturday	2.400	0.261	9.21	<.0001
19:00–19:59 | Sunday	2.575	0.264	9.75	<.0001
20:00–20:59 | Monday	1.281	0.261	4.90	<.0001
20:00–20:59 | Tuesday	0.704	0.262	2.69	0.0072
20:00–20:59 | Wednesday	0.965	0.267	3.61	0.0003
20:00–20:59 | Thursday	0.955	0.260	3.67	0.0002
20:00–20:59 | Friday	1.415	0.265	5.34	<.0001
20:00–20:59 | Saturday	2.113	0.259	8.15	<.0001
20:00–20:59 | Sunday	2.066	0.257	8.03	<.0001
21:00–21:59 | Monday	0.470	0.262	1.79	0.0729
21:00–21:59 | Tuesday	0.119	0.270	0.44	0.6604
21:00–21:59 | Wednesday	0.293	0.265	1.11	0.2685
21:00–21:59 | Thursday	0.506	0.265	1.91	0.0564
21:00–21:59 | Friday	0.909	0.266	3.42	0.0006
21:00–21:59 | Saturday	1.190	0.254	4.69	<.0001
21:00–21:59 | Sunday	1.574	0.264	5.96	<.0001
22:00–22:59 | Monday	0.437	0.260	1.68	0.0928
22:00–22:59 | Tuesday	0.103	0.269	0.38	0.7032
22:00–22:59 | Wednesday	0.283	0.266	1.07	0.2862
22:00–22:59 | Thursday	0.824	0.261	3.15	0.0016
22:00–22:59 | Friday	0.750	0.264	2.85	0.0044
22:00–22:59 | Saturday	1.270	0.257	4.93	<.0001
22:00–22:59 | Sunday	1.195	0.262	4.56	<.0001
23:00–23:59 | Monday	-0.371	0.266	-1.40	0.1628
23:00–23:59 | Tuesday	-0.553	0.266	-2.08	0.0376
23:00–23:59 | Wednesday	-0.402	0.265	-1.52	0.1294
23:00–23:59 | Thursday	0.003	0.256	0.01	0.9914
23:00–23:59 | Friday	0.511	0.271	1.89	0.0590
23:00–23:59 | Saturday	1.223	0.261	4.69	<.0001
23:00–23:59 | Sunday	0.790	0.261	3.02	0.0025
R-Square	0.215			
Coeff Var	4.764			
Root MSE	3.119			
Y Mean	65.482			

Table B.5 Multiple linear regression of 90th speed percentile on I-65 NB in Greenfield District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	68.564	0.147	465.78	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	-0.247	0.083	-2.96	0.0031
Baseline | Segment 3	-0.247	0.083	-2.96	0.0031
Baseline | Segment 4	0.580	0.083	6.95	<.0001
Baseline | Segment 5	0.074	0.083	0.89	0.3757
Baseline | Segment 6	-1.606	0.083	-19.25	<.0001
Baseline | Segment 7	-0.478	0.083	-5.78	<.0001
Baseline | Segment 8	-0.117	0.083	-1.42	0.1564
Baseline | Segment 9	-0.117	0.083	-1.42	0.1564
Markings 1 | Segment 1	-0.282	0.076	-3.69	0.0002
Markings 1 | Segment 2	-0.678	0.076	-8.89	<.0001
Markings 1 | Segment 3	-0.678	0.076	-8.89	<.0001
Markings 1 | Segment 4	0.420	0.076	5.51	<.0001
Markings 1 | Segment 5	0.052	0.076	0.69	0.4922
Markings 1 | Segment 6	-1.677	0.076	-22.00	<.0001
Markings 1 | Segment 7	-0.517	0.076	-6.81	<.0001
Markings 1 | Segment 8	-0.404	0.076	-5.32	<.0001
Markings 1 | Segment 9	-0.404	0.076	-5.32	<.0001
Markings + Signs | Segment 1	1.383	0.112	12.38	<.0001
Markings + Signs | Segment 2	0.156	0.112	1.40	0.1614
Markings + Signs | Segment 3	-2.155	0.112	-19.30	<.0001
Markings + Signs | Segment 4	-0.187	0.112	-1.68	0.0938
Markings + Signs | Segment 5	-0.525	0.112	-4.70	<.0001
Markings + Signs | Segment 6	-2.306	0.112	-20.66	<.0001
Markings + Signs | Segment 7	-0.921	0.112	-8.22	<.0001
Markings + Signs | Segment 8	-0.150	0.112	-1.34	0.1799
Markings + Signs | Segment 9	-0.091	0.112	-0.81	0.4163
Markings 2 | Segment 1	2.650	0.114	23.31	<.0001
Markings 2 | Segment 2	1.334	0.114	11.73	<.0001
Markings 2 | Segment 3	-1.348	0.114	-11.86	<.0001
Markings 2 | Segment 4	0.628	0.114	5.52	<.0001
Markings 2 | Segment 5	0.258	0.114	2.27	0.0233
Markings 2 | Segment 6	-1.545	0.114	-13.58	<.0001
Markings 2 | Segment 7	-0.495	0.114	-4.33	<.0001
Markings 2 | Segment 8	0.394	0.114	3.45	0.0006

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 2 | Segment 9	0.587	0.114	5.14	<.0001
00:00–00:59 | Monday	0.109	0.195	0.56	0.5752
00:00–00:59 | Tuesday	-1.771	0.193	-9.20	<.0001
00:00–00:59 | Wednesday	-1.931	0.195	-9.92	<.0001
00:00–00:59 | Thursday	-2.036	0.196	-10.40	<.0001
00:00–00:59 | Friday	-1.370	0.189	-7.24	<.0001
00:00–00:59 | Saturday	0.196	0.200	0.98	0.3263
00:00–00:59 | Sunday	0.417	0.200	2.09	0.0366
01:00–01:59 | Monday	-1.200	0.195	-6.16	<.0001
01:00–01:59 | Tuesday	-2.063	0.192	-10.74	<.0001
01:00–01:59 | Wednesday	-2.288	0.198	-11.54	<.0001
01:00–01:59 | Thursday	-2.398	0.198	-12.10	<.0001
01:00–01:59 | Friday	-2.160	0.191	-11.31	<.0001
01:00–01:59 | Saturday	-0.485	0.198	-2.46	0.0140
01:00–01:59 | Sunday	0.230	0.199	1.16	0.2469
02:00–02:59 | Monday	-0.857	0.200	-4.28	<.0001
02:00–02:59 | Tuesday	-1.581	0.193	-8.21	<.0001
02:00–02:59 | Wednesday	-1.555	0.210	-7.39	<.0001
02:00–02:59 | Thursday	-1.603	0.202	-7.95	<.0001
02:00–02:59 | Friday	-1.982	0.190	-10.46	<.0001
02:00–02:59 | Saturday	-0.565	0.197	-2.87	0.0041
02:00–02:59 | Sunday	-0.403	0.194	-2.08	0.0373
03:00–02:59 | Monday	-0.288	0.204	-1.41	0.1574
03:00–02:59 | Tuesday	-0.667	0.188	-3.55	0.0004
03:00–02:59 | Wednesday	-0.680	0.212	-3.20	0.0014
03:00–02:59 | Thursday	-0.506	0.199	-2.54	0.0110
03:00–02:59 | Friday	-0.672	0.191	-3.52	0.0004
03:00–02:59 | Saturday	-1.029	0.201	-5.12	<.0001
03:00–02:59 | Sunday	-0.894	0.193	-4.63	<.0001
04:00–04:59 | Monday	0.968	0.208	4.66	<.0001
04:00–04:59 | Tuesday	1.015	0.188	5.40	<.0001
04:00–04:59 | Wednesday	0.718	0.202	3.55	0.0004
04:00–04:59 | Thursday	0.719	0.198	3.64	0.0003
04:00–04:59 | Friday	0.568	0.196	2.90	0.0037
04:00–04:59 | Saturday	-0.637	0.195	-3.26	0.0011
04:00–04:59 | Sunday	-0.065	0.195	-0.33	0.7404
05:00–05:59 | Monday	2.101	0.209	10.08	<.0001
05:00–05:59 | Tuesday	2.320	0.193	12.02	<.0001
05:00–05:59 | Wednesday	1.893	0.203	9.33	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
05:00–05:59 | Thursday	2.105	0.200	10.55	<.0001
05:00–05:59 | Friday	2.214	0.200	11.06	<.0001
05:00–05:59 | Saturday	1.141	0.198	5.77	<.0001
05:00–05:59 | Sunday	0.583	0.196	2.97	0.0030
06:00–06:59 | Monday	2.089	0.204	10.21	<.0001
06:00–06:59 | Tuesday	1.790	0.198	9.03	<.0001
06:00–06:59 | Wednesday	1.721	0.208	8.29	<.0001
06:00–06:59 | Thursday	1.716	0.200	8.56	<.0001
06:00–06:59 | Friday	1.867	0.203	9.18	<.0001
06:00–06:59 | Saturday	1.619	0.199	8.14	<.0001
06:00–06:59 | Sunday	1.923	0.195	9.88	<.0001
07:00–07:59 | Monday	1.029	0.204	5.05	<.0001
07:00–07:59 | Tuesday	0.387	0.193	2.00	0.0451
07:00–07:59 | Wednesday	0.662	0.209	3.16	0.0016
07:00–07:59 | Thursday	0.618	0.198	3.12	0.0018
07:00–07:59 | Friday	1.016	0.202	5.03	<.0001
07:00–07:59 | Saturday	1.250	0.203	6.16	<.0001
07:00–07:59 | Sunday	1.247	0.196	6.35	<.0001
08:00–08:59 | Monday	0.998	0.200	5.00	<.0001
08:00–08:59 | Tuesday	-1.403	0.197	-7.12	<.0001
08:00–08:59 | Wednesday	0.147	0.210	0.70	0.4851
08:00–08:59 | Thursday	0.073	0.201	0.36	0.7177
08:00–08:59 | Friday	0.596	0.200	2.99	0.0028
08:00–08:59 | Saturday	1.177	0.192	6.13	<.0001
08:00–08:59 | Sunday	1.289	0.202	6.39	<.0001
09:00–09:59 | Monday	0.521	0.198	2.63	0.0086
09:00–09:59 | Tuesday	-0.618	0.195	-3.17	0.0015
09:00–09:59 | Wednesday	0.150	0.198	0.75	0.4512
09:00–09:59 | Thursday	0.263	0.195	1.35	0.1783
09:00–09:59 | Friday	0.385	0.194	1.99	0.0464
09:00–09:59 | Saturday	1.623	0.190	8.54	<.0001
09:00–09:59 | Sunday	1.810	0.195	9.27	<.0001
10:00–10:59 | Monday	0.290	0.196	1.48	0.1389
10:00–10:59 | Tuesday	-0.651	0.193	-3.38	0.0007
10:00–10:59 | Wednesday	0.193	0.198	0.98	0.3289
10:00–10:59 | Thursday	-0.130	0.198	-0.66	0.5115
10:00–10:59 | Friday	0.233	0.193	1.21	0.2281
10:00–10:59 | Saturday	1.382	0.192	7.20	<.0001
10:00–10:59 | Sunday	2.015	0.193	10.44	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
11:00–11:59 | Monday	0.226	0.192	1.18	0.2398
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	-0.264	0.202	-1.31	0.1909
11:00–11:59 | Thursday	-0.341	0.193	-1.77	0.0765
11:00–11:59 | Friday	0.120	0.191	0.63	0.5315
11:00–11:59 | Saturday	1.349	0.197	6.85	<.0001
11:00–11:59 | Sunday	2.097	0.192	10.95	<.0001
12:00–12:59 | Monday	0.410	0.190	2.16	0.0306
12:00–12:59 | Tuesday	0.147	0.195	0.76	0.4486
12:00–12:59 | Wednesday	0.081	0.198	0.41	0.6836
12:00–12:59 | Thursday	0.044	0.194	0.23	0.8188
12:00–12:59 | Friday	0.167	0.190	0.88	0.3785
12:00–12:59 | Saturday	1.529	0.197	7.76	<.0001
12:00–12:59 | Sunday	2.001	0.192	10.42	<.0001
13:00–13:59 | Monday	0.548	0.190	2.89	0.0038
13:00–13:59 | Tuesday	0.133	0.196	0.68	0.4980
13:00–13:59 | Wednesday	-0.158	0.199	-0.80	0.4256
13:00–13:59 | Thursday	0.020	0.192	0.10	0.9186
13:00–13:59 | Friday	-0.112	0.193	-0.58	0.5622
13:00–13:59 | Saturday	1.265	0.193	6.57	<.0001
13:00–13:59 | Sunday	1.577	0.194	8.14	<.0001
14:00–14:59 | Monday	-0.348	0.192	-1.81	0.0702
14:00–14:59 | Tuesday	-0.001	0.194	0.00	0.9966
14:00–14:59 | Wednesday	-0.063	0.200	-0.32	0.7520
14:00–14:59 | Thursday	0.122	0.192	0.64	0.5237
14:00–14:59 | Friday	-0.081	0.193	-0.42	0.6727
14:00–14:59 | Saturday	1.293	0.194	6.66	<.0001
14:00–14:59 | Sunday	1.063	0.190	5.59	<.0001
15:00–15:59 | Monday	0.208	0.193	1.08	0.2813
15:00–15:59 | Tuesday	-0.604	0.193	-3.13	0.0017
15:00–15:59 | Wednesday	-0.168	0.203	-0.83	0.4068
15:00–15:59 | Thursday	-0.193	0.193	-1.00	0.3156
15:00–15:59 | Friday	-0.756	0.200	-3.79	0.0002
15:00–15:59 | Saturday	1.489	0.192	7.77	<.0001
15:00–15:59 | Sunday	1.206	0.191	6.30	<.0001
16:00–16:59 | Monday	0.063	0.195	0.32	0.7471
16:00–16:59 | Tuesday	-1.450	0.195	-7.43	<.0001
16:00–16:59 | Wednesday	-1.063	0.198	-5.38	<.0001
16:00–16:59 | Thursday	-1.935	0.194	-10.00	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
16:00–16:59 | Friday	-1.370	0.197	-6.96	<.0001
16:00–16:59 | Saturday	1.266	0.188	6.73	<.0001
16:00–16:59 | Sunday	1.261	0.193	6.55	<.0001
17:00–17:59 | Monday	0.340	0.197	1.73	0.0842
17:00–17:59 | Tuesday	-0.613	0.198	-3.10	0.0019
17:00–17:59 | Wednesday	-0.888	0.199	-4.46	<.0001
17:00–17:59 | Thursday	-1.610	0.188	-8.57	<.0001
17:00–17:59 | Friday	-1.262	0.195	-6.48	<.0001
17:00–17:59 | Saturday	1.462	0.192	7.63	<.0001
17:00–17:59 | Sunday	1.580	0.197	8.02	<.0001
18:00–18:59 | Monday	0.664	0.196	3.38	0.0007
18:00–18:59 | Tuesday	0.690	0.198	3.48	0.0005
18:00–18:59 | Wednesday	0.002	0.198	0.01	0.9903
18:00–18:59 | Thursday	0.601	0.191	3.15	0.0016
18:00–18:59 | Friday	0.309	0.193	1.61	0.1083
18:00–18:59 | Saturday	1.603	0.190	8.43	<.0001
18:00–18:59 | Sunday	1.474	0.195	7.55	<.0001
19:00–19:59 | Monday	1.482	0.192	7.74	<.0001
19:00–19:59 | Tuesday	0.507	0.199	2.55	0.0108
19:00–19:59 | Wednesday	1.254	0.202	6.22	<.0001
19:00–19:59 | Thursday	1.178	0.191	6.18	<.0001
19:00–19:59 | Friday	1.670	0.196	8.51	<.0001
19:00–19:59 | Saturday	1.924	0.192	10.02	<.0001
19:00–19:59 | Sunday	2.135	0.195	10.97	<.0001
20:00–20:59 | Monday	1.035	0.193	5.37	<.0001
20:00–20:59 | Tuesday	0.573	0.193	2.97	0.0030
20:00–20:59 | Wednesday	0.722	0.197	3.66	0.0002
20:00–20:59 | Thursday	0.609	0.192	3.18	0.0015
20:00–20:59 | Friday	1.033	0.195	5.29	<.0001
20:00–20:59 | Saturday	1.669	0.191	8.74	<.0001
20:00–20:59 | Sunday	1.643	0.190	8.66	<.0001
21:00–21:59 | Monday	0.343	0.193	1.78	0.0753
21:00–21:59 | Tuesday	-0.144	0.199	-0.72	0.4699
21:00–21:59 | Wednesday	0.209	0.195	1.07	0.2842
21:00–21:59 | Thursday	0.351	0.195	1.80	0.0724
21:00–21:59 | Friday	0.559	0.196	2.85	0.0043
21:00–21:59 | Saturday	0.845	0.187	4.52	<.0001
21:00–21:59 | Sunday	1.241	0.195	6.38	<.0001
22:00–22:59 | Monday	0.352	0.191	1.84	0.0661

Variable	Estimate	Std. Error	t Value	Pr. > |t|
22:00–22:59 | Tuesday	0.072	0.198	0.36	0.7162
22:00–22:59 | Wednesday	0.270	0.196	1.38	0.1673
22:00–22:59 | Thursday	0.571	0.193	2.97	0.0030
22:00–22:59 | Friday	0.401	0.194	2.06	0.0391
22:00–22:59 | Saturday	0.923	0.190	4.87	<.0001
22:00–22:59 | Sunday	0.965	0.193	5.00	<.0001
23:00–23:59 | Monday	-0.522	0.196	-2.67	0.0077
23:00–23:59 | Tuesday	-0.621	0.196	-3.17	0.0015
23:00–23:59 | Wednesday	-0.511	0.195	-2.62	0.0088
23:00–23:59 | Thursday	-0.386	0.189	-2.04	0.0409
23:00–23:59 | Friday	0.203	0.200	1.02	0.3081
23:00–23:59 | Saturday	0.809	0.192	4.21	<.0001
23:00–23:59 | Sunday	0.575	0.193	2.99	0.0028
R-Square	0.252			
Coeff Var	3.352			
Root MSE	2.298			
Y Mean	68.563			

Table B.6 Multiple linear regression of the logarithm of speed variability on I-65 NB in Greenfield District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	0.789	0.020	39.16	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.139	0.011	12.14	<.0001
Baseline | Segment 3	0.139	0.011	12.14	<.0001
Baseline | Segment 4	0.047	0.011	4.14	<.0001
Baseline | Segment 5	0.154	0.011	13.48	<.0001
Baseline | Segment 6	0.063	0.011	5.50	<.0001
Baseline | Segment 7	0.004	0.011	0.34	0.7356
Baseline | Segment 8	-0.039	0.011	-3.42	0.0006
Baseline | Segment 9	-0.039	0.011	-3.42	0.0006
Markings 1 | Segment 1	0.056	0.010	5.38	<.0001
Markings 1 | Segment 2	0.190	0.010	18.18	<.0001
Markings 1 | Segment 3	0.190	0.010	18.18	<.0001
Markings 1 | Segment 4	0.078	0.010	7.47	<.0001
Markings 1 | Segment 5	0.160	0.010	15.33	<.0001
Markings 1 | Segment 6	0.077	0.010	7.41	<.0001
Markings 1 | Segment 7	0.029	0.010	2.79	0.0053

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 1 | Segment 8	-0.018	0.010	-1.73	0.0835
Markings 1 | Segment 9	-0.018	0.010	-1.73	0.0835
Markings + Signs | Segment 1	0.068	0.015	4.44	<.0001
Markings + Signs | Segment 2	0.266	0.015	17.41	<.0001
Markings + Signs | Segment 3	0.344	0.015	22.50	<.0001
Markings + Signs | Segment 4	0.067	0.015	4.40	<.0001
Markings + Signs | Segment 5	0.136	0.015	8.90	<.0001
Markings + Signs | Segment 6	0.058	0.015	3.83	0.0001
Markings + Signs | Segment 7	0.008	0.015	0.49	0.6231
Markings + Signs | Segment 8	0.034	0.015	2.19	0.0286
Markings + Signs | Segment 9	0.057	0.015	3.74	0.0002
Markings 2 | Segment 1	0.036	0.016	2.29	0.0223
Markings 2 | Segment 2	0.251	0.016	16.13	<.0001
Markings 2 | Segment 3	0.350	0.016	22.45	<.0001
Markings 2 | Segment 4	0.031	0.016	2.01	0.0439
Markings 2 | Segment 5	0.127	0.016	8.16	<.0001
Markings 2 | Segment 6	0.016	0.016	1.03	0.3045
Markings 2 | Segment 7	-0.032	0.016	-2.06	0.0398
Markings 2 | Segment 8	0.025	0.016	1.58	0.1148
Markings 2 | Segment 9	0.065	0.016	4.14	<.0001
00:00–00:59 | Monday	0.013	0.027	0.49	0.6216
00:00–00:59 | Tuesday	-0.020	0.026	-0.77	0.4441
00:00–00:59 | Wednesday	-0.098	0.027	-3.66	0.0002
00:00–00:59 | Thursday	-0.080	0.027	-2.99	0.0028
00:00–00:59 | Friday	-0.096	0.026	-3.72	0.0002
00:00–00:59 | Saturday	-0.070	0.027	-2.55	0.0108
00:00–00:59 | Sunday	-0.094	0.027	-3.46	0.0005
01:00–01:59 | Monday	0.039	0.027	1.46	0.1435
01:00–01:59 | Tuesday	0.043	0.026	1.63	0.1035
01:00–01:59 | Wednesday	0.000	0.027	-0.01	0.9901
01:00–01:59 | Thursday	-0.104	0.027	-3.82	0.0001
01:00–01:59 | Friday	-0.144	0.026	-5.52	<.0001
01:00–01:59 | Saturday	-0.038	0.027	-1.41	0.1583
01:00–01:59 | Sunday	-0.061	0.027	-2.26	0.0241
02:00–02:59 | Monday	-0.004	0.027	-0.15	0.8791
02:00–02:59 | Tuesday	0.056	0.026	2.13	0.0334
02:00–02:59 | Wednesday	0.044	0.029	1.51	0.1301
02:00–02:59 | Thursday	0.001	0.028	0.05	0.9628
02:00–02:59 | Friday	-0.105	0.026	-4.05	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
02:00–02:59	Saturday	-0.071	0.027	-2.65	0.0081
02:00–02:59	Sunday	0.007	0.027	0.26	0.7969
03:00–02:59	Monday	0.122	0.028	4.39	<.0001
03:00–02:59	Tuesday	0.037	0.026	1.44	0.1504
03:00–02:59	Wednesday	-0.014	0.029	-0.49	0.6221
03:00–02:59	Thursday	0.036	0.027	1.32	0.1885
03:00–02:59	Friday	-0.040	0.026	-1.52	0.1280
03:00–02:59	Saturday	-0.048	0.028	-1.74	0.0823
03:00–02:59	Sunday	0.062	0.026	2.35	0.0187
04:00–04:59	Monday	0.035	0.028	1.22	0.2231
04:00–04:59	Tuesday	0.012	0.026	0.46	0.6439
04:00–04:59	Wednesday	-0.048	0.028	-1.74	0.0825
04:00–04:59	Thursday	-0.048	0.027	-1.77	0.0766
04:00–04:59	Friday	-0.037	0.027	-1.39	0.1650
04:00–04:59	Saturday	0.081	0.027	3.03	0.0025
04:00–04:59	Sunday	0.106	0.027	3.98	<.0001
05:00–05:59	Monday	-0.119	0.029	-4.16	<.0001
05:00–05:59	Tuesday	-0.059	0.026	-2.25	0.0247
05:00–05:59	Wednesday	-0.106	0.028	-3.81	0.0001
05:00–05:59	Thursday	-0.087	0.027	-3.18	0.0015
05:00–05:59	Friday	-0.059	0.027	-2.15	0.0317
05:00–05:59	Saturday	0.016	0.027	0.61	0.5447
05:00–05:59	Sunday	-0.083	0.027	-3.10	0.0019
06:00–06:59	Monday	-0.138	0.028	-4.91	<.0001
06:00–06:59	Tuesday	-0.127	0.027	-4.69	<.0001
06:00–06:59	Wednesday	-0.113	0.028	-3.97	<.0001
06:00–06:59	Thursday	-0.105	0.027	-3.81	0.0001
06:00–06:59	Friday	-0.137	0.028	-4.94	<.0001
06:00–06:59	Saturday	-0.060	0.027	-2.19	0.0287
06:00–06:59	Sunday	-0.093	0.027	-3.50	0.0005
07:00–07:59	Monday	-0.116	0.028	-4.15	<.0001
07:00–07:59	Tuesday	0.265	0.026	10.02	<.0001
07:00–07:59	Wednesday	0.027	0.029	0.95	0.3442
07:00–07:59	Thursday	0.048	0.027	1.79	0.0740
07:00–07:59	Friday	-0.106	0.028	-3.84	0.0001
07:00–07:59	Saturday	-0.109	0.028	-3.93	<.0001
07:00–07:59	Sunday	-0.072	0.027	-2.67	0.0076
08:00–08:59	Monday	-0.124	0.027	-4.54	<.0001
08:00–08:59	Tuesday	0.120	0.027	4.45	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
08:00–08:59 | Wednesday	-0.065	0.029	-2.26	0.0241
08:00–08:59 | Thursday	-0.038	0.027	-1.37	0.1710
08:00–08:59 | Friday	-0.063	0.027	-2.31	0.0209
08:00–08:59 | Saturday	-0.161	0.026	-6.13	<.0001
08:00–08:59 | Sunday	-0.196	0.028	-7.10	<.0001
09:00–09:59 | Monday	-0.134	0.027	-4.94	<.0001
09:00–09:59 | Tuesday	0.009	0.027	0.35	0.7251
09:00–09:59 | Wednesday	-0.039	0.027	-1.45	0.1481
09:00–09:59 | Thursday	-0.076	0.027	-2.84	0.0045
09:00–09:59 | Friday	-0.074	0.027	-2.80	0.0050
09:00–09:59 | Saturday	-0.107	0.026	-4.09	<.0001
09:00–09:59 | Sunday	-0.174	0.027	-6.50	<.0001
10:00–10:59 | Monday	-0.110	0.027	-4.11	<.0001
10:00–10:59 | Tuesday	-0.037	0.026	-1.42	0.1569
10:00–10:59 | Wednesday	-0.019	0.027	-0.70	0.4849
10:00–10:59 | Thursday	-0.035	0.027	-1.29	0.1963
10:00–10:59 | Friday	-0.063	0.026	-2.38	0.0175
10:00–10:59 | Saturday	-0.102	0.026	-3.88	0.0001
10:00–10:59 | Sunday	-0.159	0.026	-6.01	<.0001
11:00–11:59 | Monday	-0.040	0.026	-1.51	0.1300
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	-0.018	0.028	-0.66	0.5095
11:00–11:59 | Thursday	0.007	0.026	0.26	0.7914
11:00–11:59 | Friday	0.020	0.026	0.78	0.4343
11:00–11:59 | Saturday	-0.120	0.027	-4.44	<.0001
11:00–11:59 | Sunday	-0.123	0.026	-4.68	<.0001
12:00–12:59 | Monday	0.047	0.026	1.81	0.0698
12:00–12:59 | Tuesday	-0.021	0.027	-0.79	0.4274
12:00–12:59 | Wednesday	-0.062	0.027	-2.28	0.0224
12:00–12:59 | Thursday	0.019	0.027	0.70	0.4820
12:00–12:59 | Friday	0.019	0.026	0.75	0.4562
12:00–12:59 | Saturday	-0.062	0.027	-2.30	0.0215
12:00–12:59 | Sunday	-0.100	0.026	-3.81	0.0001
13:00–13:59 | Monday	0.030	0.026	1.14	0.2542
13:00–13:59 | Tuesday	-0.082	0.027	-3.04	0.0024
13:00–13:59 | Wednesday	-0.024	0.027	-0.89	0.3754
13:00–13:59 | Thursday	0.048	0.026	1.82	0.0691
13:00–13:59 | Friday	0.067	0.026	2.52	0.0118
13:00–13:59 | Saturday	-0.092	0.026	-3.51	0.0005

Variable	Estimate	Std. Error	t Value	Pr. > |t|
13:00–13:59 | Sunday	-0.046	0.027	-1.72	0.0852
14:00–14:59 | Monday	0.025	0.026	0.95	0.3440
14:00–14:59 | Tuesday	0.007	0.027	0.25	0.8037
14:00–14:59 | Wednesday	0.060	0.027	2.18	0.0290
14:00–14:59 | Thursday	0.059	0.026	2.26	0.0241
14:00–14:59 | Friday	0.183	0.026	6.95	<.0001
14:00–14:59 | Saturday	-0.092	0.027	-3.45	0.0006
14:00–14:59 | Sunday	-0.008	0.026	-0.31	0.7601
15:00–15:59 | Monday	0.104	0.026	3.95	<.0001
15:00–15:59 | Tuesday	0.197	0.026	7.46	<.0001
15:00–15:59 | Wednesday	0.150	0.028	5.40	<.0001
15:00–15:59 | Thursday	0.142	0.026	5.39	<.0001
15:00–15:59 | Friday	0.181	0.027	6.63	<.0001
15:00–15:59 | Saturday	-0.038	0.026	-1.45	0.1461
15:00–15:59 | Sunday	-0.010	0.026	-0.39	0.6955
16:00–16:59 | Monday	0.135	0.027	5.07	<.0001
16:00–16:59 | Tuesday	0.208	0.027	7.77	<.0001
16:00–16:59 | Wednesday	0.183	0.027	6.78	<.0001
16:00–16:59 | Thursday	0.225	0.027	8.48	<.0001
16:00–16:59 | Friday	0.272	0.027	10.08	<.0001
16:00–16:59 | Saturday	-0.069	0.026	-2.69	0.0071
16:00–16:59 | Sunday	-0.005	0.026	-0.20	0.8381
17:00–17:59 | Monday	0.121	0.027	4.48	<.0001
17:00–17:59 | Tuesday	0.149	0.027	5.50	<.0001
17:00–17:59 | Wednesday	0.243	0.027	8.93	<.0001
17:00–17:59 | Thursday	0.238	0.026	9.26	<.0001
17:00–17:59 | Friday	0.177	0.027	6.65	<.0001
17:00–17:59 | Saturday	-0.087	0.026	-3.31	0.0009
17:00–17:59 | Sunday	0.009	0.027	0.32	0.7465
18:00–18:59 | Monday	0.014	0.027	0.53	0.5986
18:00–18:59 | Tuesday	-0.026	0.027	-0.95	0.3396
18:00–18:59 | Wednesday	0.073	0.027	2.70	0.0069
18:00–18:59 | Thursday	0.075	0.026	2.88	0.0040
18:00–18:59 | Friday	0.120	0.026	4.55	<.0001
18:00–18:59 | Saturday	-0.137	0.026	-5.27	<.0001
18:00–18:59 | Sunday	-0.050	0.027	-1.88	0.0596
19:00–19:59 | Monday	-0.087	0.026	-3.33	0.0009
19:00–19:59 | Tuesday	-0.091	0.027	-3.33	0.0009
19:00–19:59 | Wednesday	-0.071	0.028	-2.59	0.0097

Variable	Estimate	Std. Error	t Value	Pr. > |t|
19:00–19:59	Thursday	-0.088	0.026	-3.39	0.0007
19:00–19:59	Friday	-0.068	0.027	-2.52	0.0119
19:00–19:59	Saturday	-0.161	0.026	-6.14	<.0001
19:00–19:59	Sunday	-0.120	0.027	-4.50	<.0001
20:00–20:59	Monday	-0.072	0.026	-2.73	0.0063
20:00–20:59	Tuesday	-0.051	0.026	-1.91	0.0558
20:00–20:59	Wednesday	-0.093	0.027	-3.46	0.0005
20:00–20:59	Thursday	-0.112	0.026	-4.29	<.0001
20:00–20:59	Friday	-0.086	0.027	-3.22	0.0013
20:00–20:59	Saturday	-0.137	0.026	-5.25	<.0001
20:00–20:59	Sunday	-0.139	0.026	-5.37	<.0001
21:00–21:59	Monday	-0.067	0.026	-2.54	0.0111
21:00–21:59	Tuesday	-0.108	0.027	-3.97	<.0001
21:00–21:59	Wednesday	-0.068	0.027	-2.54	0.0111
21:00–21:59	Thursday	-0.071	0.027	-2.67	0.0077
21:00–21:59	Friday	-0.125	0.027	-4.66	<.0001
21:00–21:59	Saturday	-0.142	0.026	-5.54	<.0001
21:00–21:59	Sunday	-0.112	0.027	-4.19	<.0001
22:00–22:59	Monday	-0.065	0.026	-2.48	0.0131
22:00–22:59	Tuesday	-0.042	0.027	-1.55	0.1217
22:00–22:59	Wednesday	-0.050	0.027	-1.87	0.0615
22:00–22:59	Thursday	-0.089	0.026	-3.37	0.0008
22:00–22:59	Friday	-0.134	0.027	-5.05	<.0001
22:00–22:59	Saturday	-0.141	0.026	-5.44	<.0001
22:00–22:59	Sunday	-0.067	0.026	-2.53	0.0115
23:00–23:59	Monday	-0.095	0.027	-3.55	0.0004
23:00–23:59	Tuesday	-0.086	0.027	-3.20	0.0014
23:00–23:59	Wednesday	-0.079	0.027	-2.94	0.0033
23:00–23:59	Thursday	-0.156	0.026	-6.03	<.0001
23:00–23:59	Friday	-0.135	0.027	-4.93	<.0001
23:00–23:59	Saturday	-0.143	0.026	-5.44	<.0001
23:00–23:59	Sunday	-0.100	0.026	-3.78	0.0002
R-Square	0.150			
Coeff Var	37.469			
Root MSE	0.315			
Y Mean	0.840			

Table B.7 Multiple linear regression of average speed on I-65 SB in Seymour District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	67.947	0.174	390.87	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.000	0.127	0.00	1.0000
Baseline | Segment 3	0.016	0.127	0.13	0.9003
Baseline | Segment 4	-1.394	0.127	-10.96	<.0001
Baseline | Segment 5	-3.782	0.127	-29.72	<.0001
Baseline | Segment 6	-6.466	0.127	-50.82	<.0001
Baseline | Segment 7	-5.681	0.127	-44.65	<.0001
Baseline | Segment 8	-3.649	0.127	-28.67	<.0001
Baseline | Segment 9	-1.499	0.127	-11.77	<.0001
Baseline | Segment 10	-0.340	0.127	-2.67	0.0076
Baseline | Segment 11	-0.283	0.127	-2.22	0.0262
Markings 1 | Segment 1	0.340	0.103	3.30	0.0010
Markings 1 | Segment 2	0.248	0.103	2.41	0.0160
Markings 1 | Segment 3	0.060	0.103	0.58	0.5607
Markings 1 | Segment 4	-1.311	0.103	-12.74	<.0001
Markings 1 | Segment 5	-3.996	0.103	-38.84	<.0001
Markings 1 | Segment 6	-7.002	0.103	-68.06	<.0001
Markings 1 | Segment 7	-6.316	0.103	-61.40	<.0001
Markings 1 | Segment 8	-4.337	0.103	-42.16	<.0001
Markings 1 | Segment 9	-2.119	0.103	-20.60	<.0001
Markings 1 | Segment 10	-0.869	0.103	-8.45	<.0001
Markings 1 | Segment 11	-0.725	0.103	-7.05	<.0001
Markings + Signs | Segment 1	1.467	0.162	9.05	<.0001
Markings + Signs | Segment 2	0.969	0.162	5.98	<.0001
Markings + Signs | Segment 3	0.661	0.162	4.07	<.0001
Markings + Signs | Segment 4	-0.342	0.162	-2.11	0.0351
Markings + Signs | Segment 5	-1.823	0.162	-11.24	<.0001
Markings + Signs | Segment 6	-3.837	0.162	-23.66	<.0001
Markings + Signs | Segment 7	-3.101	0.162	-19.12	<.0001
Markings + Signs | Segment 8	-2.986	0.162	-18.42	<.0001
Markings + Signs | Segment 9	-1.549	0.162	-9.54	<.0001
Markings + Signs | Segment 10	-0.690	0.162	-4.26	<.0001
Markings + Signs | Segment 11	-0.811	0.162	-5.00	<.0001
Markings 2 | Segment 1	0.838	0.180	4.65	<.0001
Markings 2 | Segment 2	0.663	0.180	3.68	0.0002
Markings 2 | Segment 3	0.278	0.180	1.54	0.1226
Markings 2 | Segment 4	-0.885	0.180	-4.91	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 2 | Segment 5	-2.526	0.180	-14.01	<.0001
Markings 2 | Segment 6	-4.713	0.180	-26.15	<.0001
Markings 2 | Segment 7	-3.675	0.180	-20.39	<.0001
Markings 2 | Segment 8	-3.459	0.181	-19.13	<.0001
Markings 2 | Segment 9	-1.900	0.181	-10.51	<.0001
Markings 2 | Segment 10	-0.771	0.180	-4.28	<.0001
Markings 2 | Segment 11	-0.732	0.180	-4.06	<.0001
00:00–00:59 | Monday	0.904	0.220	4.11	<.0001
00:00–00:59 | Tuesday	0.212	0.220	0.96	0.3347
00:00–00:59 | Wednesday	0.132	0.211	0.63	0.5306
00:00–00:59 | Thursday	0.711	0.223	3.19	0.0014
00:00–00:59 | Friday	1.288	0.209	6.17	<.0001
00:00–00:59 | Saturday	2.237	0.217	10.29	<.0001
00:00–00:59 | Sunday	1.996	0.223	8.96	<.0001
01:00–01:59 | Monday	0.517	0.220	2.35	0.0187
01:00–01:59 | Tuesday	-0.164	0.223	-0.74	0.4616
01:00–01:59 | Wednesday	0.328	0.211	1.56	0.1191
01:00–01:59 | Thursday	0.418	0.223	1.87	0.0608
01:00–01:59 | Friday	0.894	0.205	4.36	<.0001
01:00–01:59 | Saturday	1.546	0.217	7.11	<.0001
01:00–01:59 | Sunday	1.478	0.223	6.63	<.0001
02:00–02:59 | Monday	0.636	0.237	2.68	0.0073
02:00–02:59 | Tuesday	0.398	0.229	1.73	0.0828
02:00–02:59 | Wednesday	0.574	0.207	2.78	0.0055
02:00–02:59 | Thursday	0.639	0.223	2.87	0.0042
02:00–02:59 | Friday	1.055	0.209	5.06	<.0001
02:00–02:59 | Saturday	1.952	0.217	8.98	<.0001
02:00–02:59 | Sunday	0.459	0.218	2.11	0.0349
03:00–02:59 | Monday	0.945	0.237	3.99	<.0001
03:00–02:59 | Tuesday	0.757	0.232	3.26	0.0011
03:00–02:59 | Wednesday	0.297	0.207	1.44	0.1507
03:00–02:59 | Thursday	0.545	0.226	2.41	0.0160
03:00–02:59 | Friday	0.916	0.209	4.39	<.0001
03:00–02:59 | Saturday	1.554	0.217	7.15	<.0001
03:00–02:59 | Sunday	0.320	0.223	1.44	0.1512
04:00–04:59 | Monday	1.926	0.229	8.40	<.0001
04:00–04:59 | Tuesday	1.238	0.229	5.40	<.0001
04:00–04:59 | Wednesday	1.281	0.213	6.02	<.0001
04:00–04:59 | Thursday	1.521	0.223	6.82	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
04:00–04:59	Friday	1.617	0.209	7.75	<.0001
04:00–04:59	Saturday	1.782	0.217	8.20	<.0001
04:00–04:59	Sunday	0.783	0.226	3.47	0.0005
05:00–05:59	Monday	2.319	0.237	9.78	<.0001
05:00–05:59	Tuesday	2.010	0.229	8.76	<.0001
05:00–05:59	Wednesday	1.732	0.215	8.05	<.0001
05:00–05:59	Thursday	1.843	0.227	8.10	<.0001
05:00–05:59	Friday	2.051	0.213	9.64	<.0001
05:00–05:59	Saturday	2.259	0.226	10.00	<.0001
05:00–05:59	Sunday	1.367	0.226	6.05	<.0001
06:00–06:59	Monday	2.190	0.241	9.07	<.0001
06:00–06:59	Tuesday	1.999	0.226	8.85	<.0001
06:00–06:59	Wednesday	1.884	0.217	8.66	<.0001
06:00–06:59	Thursday	1.485	0.233	6.38	<.0001
06:00–06:59	Friday	1.996	0.213	9.38	<.0001
06:00–06:59	Saturday	2.441	0.226	10.80	<.0001
06:00–06:59	Sunday	2.316	0.226	10.25	<.0001
07:00–07:59	Monday	1.356	0.233	5.82	<.0001
07:00–07:59	Tuesday	0.745	0.223	3.34	0.0008
07:00–07:59	Wednesday	0.177	0.223	0.79	0.4267
07:00–07:59	Thursday	-0.154	0.230	-0.67	0.5027
07:00–07:59	Friday	1.073	0.215	4.99	<.0001
07:00–07:59	Saturday	2.300	0.220	10.45	<.0001
07:00–07:59	Sunday	2.404	0.226	10.64	<.0001
08:00–08:59	Monday	1.267	0.233	5.44	<.0001
08:00–08:59	Tuesday	0.548	0.223	2.46	0.0139
08:00–08:59	Wednesday	0.032	0.220	0.14	0.8855
08:00–08:59	Thursday	-0.261	0.226	-1.15	0.2488
08:00–08:59	Friday	0.811	0.211	3.85	0.0001
08:00–08:59	Saturday	2.787	0.226	12.33	<.0001
08:00–08:59	Sunday	3.185	0.229	13.89	<.0001
09:00–09:59	Monday	1.251	0.220	5.69	<.0001
09:00–09:59	Tuesday	0.255	0.217	1.17	0.2415
09:00–09:59	Wednesday	0.179	0.215	0.83	0.4043
09:00–09:59	Thursday	0.756	0.223	3.39	0.0007
09:00–09:59	Friday	1.375	0.211	6.52	<.0001
09:00–09:59	Saturday	2.866	0.223	12.86	<.0001
09:00–09:59	Sunday	3.341	0.226	14.79	<.0001
10:00–10:59	Monday	1.038	0.211	4.93	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
10:00–10:59 | Tuesday	0.429	0.213	2.02	0.0436
10:00–10:59 | Wednesday	-0.580	0.215	-2.69	0.0070
10:00–10:59 | Thursday	0.638	0.229	2.78	0.0054
10:00–10:59 | Friday	1.175	0.213	5.52	<.0001
10:00–10:59 | Saturday	2.408	0.220	10.94	<.0001
10:00–10:59 | Sunday	3.150	0.223	14.13	<.0001
11:00–11:59 | Monday	0.862	0.211	4.09	<.0001
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	-1.035	0.209	-4.95	<.0001
11:00–11:59 | Thursday	-0.355	0.223	-1.59	0.1116
11:00–11:59 | Friday	0.196	0.211	0.93	0.3526
11:00–11:59 | Saturday	1.131	0.213	5.32	<.0001
11:00–11:59 | Sunday	2.674	0.215	12.43	<.0001
12:00–12:59 | Monday	0.913	0.209	4.37	<.0001
12:00–12:59 | Tuesday	-0.151	0.211	-0.72	0.4730
12:00–12:59 | Wednesday	-0.765	0.207	-3.70	0.0002
12:00–12:59 | Thursday	-0.812	0.223	-3.64	0.0003
12:00–12:59 | Friday	-0.362	0.213	-1.70	0.0893
12:00–12:59 | Saturday	1.012	0.211	4.80	<.0001
12:00–12:59 | Sunday	2.029	0.217	9.33	<.0001
13:00–13:59 | Monday	0.818	0.209	3.92	<.0001
13:00–13:59 | Tuesday	0.253	0.213	1.19	0.2353
13:00–13:59 | Wednesday	-0.413	0.211	-1.96	0.0503
13:00–13:59 | Thursday	0.002	0.223	0.01	0.9911
13:00–13:59 | Friday	0.124	0.213	0.58	0.5597
13:00–13:59 | Saturday	1.430	0.213	6.72	<.0001
13:00–13:59 | Sunday	2.255	0.209	10.80	<.0001
14:00–14:59 | Monday	0.820	0.209	3.93	<.0001
14:00–14:59 | Tuesday	0.305	0.204	1.50	0.1339
14:00–14:59 | Wednesday	-0.311	0.215	-1.45	0.1482
14:00–14:59 | Thursday	0.576	0.217	2.65	0.0081
14:00–14:59 | Friday	1.029	0.218	4.72	<.0001
14:00–14:59 | Saturday	1.476	0.213	6.94	<.0001
14:00–14:59 | Sunday	2.668	0.207	12.90	<.0001
15:00–15:59 | Monday	0.706	0.207	3.41	0.0006
15:00–15:59 | Tuesday	0.077	0.209	0.37	0.7138
15:00–15:59 | Wednesday	0.240	0.211	1.14	0.2550
15:00–15:59 | Thursday	0.217	0.220	0.99	0.3231
15:00–15:59 | Friday	0.737	0.221	3.34	0.0008

Variable	Estimate	Std. Error	t Value	Pr. > |t|
15:00–15:59 | Saturday	1.995	0.211	9.47	<.0001
15:00–15:59 | Sunday	2.725	0.211	12.93	<.0001
16:00–16:59 | Monday	0.597	0.205	2.91	0.0036
16:00–16:59 | Tuesday	-0.313	0.207	-1.51	0.1306
16:00–16:59 | Wednesday	-0.118	0.215	-0.55	0.5839
16:00–16:59 | Thursday	0.123	0.215	0.57	0.5684
16:00–16:59 | Friday	-1.602	0.213	-7.53	<.0001
16:00–16:59 | Saturday	2.019	0.211	9.58	<.0001
16:00–16:59 | Sunday	2.723	0.209	13.05	<.0001
17:00–17:59 | Monday	0.390	0.209	1.87	0.0614
17:00–17:59 | Tuesday	-0.558	0.209	-2.67	0.0075
17:00–17:59 | Wednesday	-0.624	0.217	-2.87	0.0041
17:00–17:59 | Thursday	-0.395	0.211	-1.88	0.0607
17:00–17:59 | Friday	-2.376	0.215	-11.05	<.0001
17:00–17:59 | Saturday	1.650	0.217	7.59	<.0001
17:00–17:59 | Sunday	2.604	0.209	12.47	<.0001
18:00–18:59 | Monday	0.519	0.211	2.46	0.0138
18:00–18:59 | Tuesday	0.144	0.207	0.70	0.4864
18:00–18:59 | Wednesday	-0.401	0.217	-1.84	0.0653
18:00–18:59 | Thursday	0.137	0.207	0.66	0.5080
18:00–18:59 | Friday	-2.234	0.217	-10.27	<.0001
18:00–18:59 | Saturday	1.881	0.217	8.65	<.0001
18:00–18:59 | Sunday	2.682	0.211	12.73	<.0001
19:00–19:59 | Monday	1.213	0.213	5.70	<.0001
19:00–19:59 | Tuesday	0.855	0.205	4.17	<.0001
19:00–19:59 | Wednesday	0.955	0.211	4.53	<.0001
19:00–19:59 | Thursday	1.844	0.211	8.75	<.0001
19:00–19:59 | Friday	2.016	0.213	9.47	<.0001
19:00–19:59 | Saturday	2.564	0.220	11.65	<.0001
19:00–19:59 | Sunday	2.924	0.209	14.01	<.0001
20:00–20:59 | Monday	0.934	0.211	4.43	<.0001
20:00–20:59 | Tuesday	0.706	0.211	3.35	0.0008
20:00–20:59 | Wednesday	1.210	0.213	5.69	<.0001
20:00–20:59 | Thursday	1.654	0.215	7.69	<.0001
20:00–20:59 | Friday	2.348	0.215	10.92	<.0001
20:00–20:59 | Saturday	2.003	0.220	9.10	<.0001
20:00–20:59 | Sunday	2.373	0.215	11.04	<.0001
21:00–21:59 | Monday	0.622	0.217	2.86	0.0042
21:00–21:59 | Tuesday	0.555	0.211	2.64	0.0084

Variable	Estimate	Std. Error	t Value	Pr. > |t|
21:00–21:59 | Wednesday	0.833	0.213	3.91	<.0001
21:00–21:59 | Thursday	2.071	0.215	9.63	<.0001
21:00–21:59 | Friday	1.514	0.223	6.79	<.0001
21:00–21:59 | Saturday	1.499	0.218	6.89	<.0001
21:00–21:59 | Sunday	2.230	0.223	10.00	<.0001
22:00–22:59 | Monday	0.940	0.217	4.32	<.0001
22:00–22:59 | Tuesday	0.979	0.211	4.65	<.0001
22:00–22:59 | Wednesday	1.259	0.215	5.86	<.0001
22:00–22:59 | Thursday	2.056	0.213	9.66	<.0001
22:00–22:59 | Friday	2.230	0.223	10.00	<.0001
22:00–22:59 | Saturday	1.408	0.215	6.54	<.0001
22:00–22:59 | Sunday	2.172	0.218	9.99	<.0001
23:00–23:59 | Monday	0.609	0.215	2.83	0.0046
23:00–23:59 | Tuesday	0.247	0.209	1.18	0.2368
23:00–23:59 | Wednesday	0.950	0.217	4.37	<.0001
23:00–23:59 | Thursday	1.770	0.211	8.40	<.0001
23:00–23:59 | Friday	1.913	0.223	8.58	<.0001
23:00–23:59 | Saturday	1.600	0.223	7.18	<.0001
23:00–23:59 | Sunday	1.954	0.221	8.86	<.0001
R-Square	0.519			
Coeff Var	3.769			
Root MSE	2.519			
Y Mean	66.841			

Table B.8 Multiple linear regression of 90th speed percentile on I-65 SB in Seymour District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	70.455	0.130	542.86	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.000	0.095	0.00	1.0000
Baseline | Segment 3	0.179	0.095	1.88	0.0601
Baseline | Segment 4	-1.016	0.095	-10.69	<.0001
Baseline | Segment 5	-2.438	0.095	-25.66	<.0001
Baseline | Segment 6	-4.219	0.095	-44.41	<.0001
Baseline | Segment 7	-4.151	0.095	-43.69	<.0001
Baseline | Segment 8	-2.942	0.095	-30.96	<.0001
Baseline | Segment 9	-1.245	0.095	-13.10	<.0001
Baseline | Segment 10	-0.370	0.095	-3.90	<.0001
Baseline | Segment 11	-0.365	0.095	-3.84	0.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 1 | Segment 1	0.322	0.077	4.19	<.0001
Markings 1 | Segment 2	0.194	0.077	2.52	0.0116
Markings 1 | Segment 3	0.052	0.077	0.68	0.4948
Markings 1 | Segment 4	-1.085	0.077	-14.13	<.0001
Markings 1 | Segment 5	-2.824	0.077	-36.76	<.0001
Markings 1 | Segment 6	-4.845	0.077	-63.08	<.0001
Markings 1 | Segment 7	-4.824	0.077	-62.81	<.0001
Markings 1 | Segment 8	-3.672	0.077	-47.81	<.0001
Markings 1 | Segment 9	-1.836	0.077	-23.91	<.0001
Markings 1 | Segment 10	-0.895	0.077	-11.65	<.0001
Markings 1 | Segment 11	-0.808	0.077	-10.52	<.0001
Markings + Signs | Segment 1	1.459	0.121	12.06	<.0001
Markings + Signs | Segment 2	0.835	0.121	6.90	<.0001
Markings + Signs | Segment 3	0.505	0.121	4.17	<.0001
Markings + Signs | Segment 4	-0.396	0.121	-3.27	0.0011
Markings + Signs | Segment 5	-1.274	0.121	-10.52	<.0001
Markings + Signs | Segment 6	-2.434	0.121	-20.10	<.0001
Markings + Signs | Segment 7	-2.346	0.121	-19.38	<.0001
Markings + Signs | Segment 8	-2.335	0.121	-19.29	<.0001
Markings + Signs | Segment 9	-1.190	0.121	-9.82	<.0001
Markings + Signs | Segment 10	-0.584	0.121	-4.82	<.0001
Markings + Signs | Segment 11	-0.778	0.121	-6.43	<.0001
Markings 2 | Segment 1	0.809	0.135	6.01	<.0001
Markings 2 | Segment 2	0.533	0.135	3.96	<.0001
Markings 2 | Segment 3	0.071	0.135	0.53	0.5967
Markings 2 | Segment 4	-0.977	0.135	-7.26	<.0001
Markings 2 | Segment 5	-1.946	0.135	-14.46	<.0001
Markings 2 | Segment 6	-3.297	0.135	-24.50	<.0001
Markings 2 | Segment 7	-2.938	0.135	-21.84	<.0001
Markings 2 | Segment 8	-2.939	0.135	-21.78	<.0001
Markings 2 | Segment 9	-1.715	0.135	-12.71	<.0001
Markings 2 | Segment 10	-0.869	0.135	-6.46	<.0001
Markings 2 | Segment 11	-0.917	0.135	-6.82	<.0001
00:00–00:59 | Monday	0.475	0.164	2.89	0.0039
00:00–00:59 | Tuesday	-0.591	0.164	-3.60	0.0003
00:00–00:59 | Wednesday	-0.410	0.157	-2.60	0.0092
00:00–00:59 | Thursday	0.059	0.166	0.35	0.7249
00:00–00:59 | Friday	0.715	0.156	4.59	<.0001
00:00–00:59 | Saturday	1.892	0.162	11.66	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
00:00–00:59 | Sunday	1.271	0.166	7.63	<.0001
01:00–01:59 | Monday	0.068	0.164	0.41	0.6795
01:00–01:59 | Tuesday	-0.911	0.166	-5.48	<.0001
01:00–01:59 | Wednesday	-0.233	0.157	-1.48	0.1382
01:00–01:59 | Thursday	-0.273	0.166	-1.64	0.1014
01:00–01:59 | Friday	0.515	0.153	3.36	0.0008
01:00–01:59 | Saturday	0.965	0.162	5.95	<.0001
01:00–01:59 | Sunday	1.035	0.166	6.22	<.0001
02:00–02:59 | Monday	-0.007	0.177	-0.04	0.9685
02:00–02:59 | Tuesday	-0.487	0.171	-2.84	0.0045
02:00–02:59 | Wednesday	-0.222	0.154	-1.44	0.1504
02:00–02:59 | Thursday	-0.279	0.166	-1.68	0.0935
02:00–02:59 | Friday	0.378	0.156	2.43	0.0152
02:00–02:59 | Saturday	1.365	0.162	8.41	<.0001
02:00–02:59 | Sunday	0.242	0.162	1.49	0.1357
03:00–02:59 | Monday	0.314	0.177	1.77	0.0761
03:00–02:59 | Tuesday	-0.103	0.173	-0.59	0.5538
03:00–02:59 | Wednesday	-0.384	0.154	-2.49	0.0128
03:00–02:59 | Thursday	-0.136	0.169	-0.81	0.4189
03:00–02:59 | Friday	0.306	0.156	1.96	0.0499
03:00–02:59 | Saturday	1.195	0.162	7.36	<.0001
03:00–02:59 | Sunday	0.102	0.166	0.61	0.5405
04:00–04:59 | Monday	1.472	0.171	8.60	<.0001
04:00–04:59 | Tuesday	0.487	0.171	2.84	0.0045
04:00–04:59 | Wednesday	0.631	0.159	3.97	<.0001
04:00–04:59 | Thursday	0.834	0.166	5.01	<.0001
04:00–04:59 | Friday	1.117	0.156	7.17	<.0001
04:00–04:59 | Saturday	1.174	0.162	7.23	<.0001
04:00–04:59 | Sunday	0.597	0.169	3.54	0.0004
05:00–05:59 | Monday	1.915	0.177	10.82	<.0001
05:00–05:59 | Tuesday	1.566	0.171	9.15	<.0001
05:00–05:59 | Wednesday	1.242	0.161	7.73	<.0001
05:00–05:59 | Thursday	1.364	0.170	8.03	<.0001
05:00–05:59 | Friday	1.600	0.159	10.07	<.0001
05:00–05:59 | Saturday	1.664	0.169	9.87	<.0001
05:00–05:59 | Sunday	0.979	0.169	5.80	<.0001
06:00–06:59 | Monday	1.576	0.180	8.74	<.0001
06:00–06:59 | Tuesday	1.536	0.169	9.11	<.0001
06:00–06:59 | Wednesday	1.457	0.162	8.97	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
06:00–06:59 | Thursday	1.495	0.174	8.60	<.0001
06:00–06:59 | Friday	1.578	0.159	9.93	<.0001
06:00–06:59 | Saturday	1.840	0.169	10.91	<.0001
06:00–06:59 | Sunday	1.831	0.169	10.85	<.0001
07:00–07:59 | Monday	1.048	0.174	6.03	<.0001
07:00–07:59 | Tuesday	0.529	0.166	3.18	0.0015
07:00–07:59 | Wednesday	0.364	0.166	2.19	0.0287
07:00–07:59 | Thursday	0.540	0.172	3.14	0.0017
07:00–07:59 | Friday	0.949	0.161	5.91	<.0001
07:00–07:59 | Saturday	1.865	0.164	11.35	<.0001
07:00–07:59 | Sunday	1.953	0.169	11.57	<.0001
08:00–08:59 | Monday	0.982	0.174	5.64	<.0001
08:00–08:59 | Tuesday	0.438	0.166	2.63	0.0085
08:00–08:59 | Wednesday	0.317	0.164	1.93	0.0533
08:00–08:59 | Thursday	-0.034	0.169	-0.20	0.8398
08:00–08:59 | Friday	0.808	0.157	5.14	<.0001
08:00–08:59 | Saturday	2.302	0.169	13.64	<.0001
08:00–08:59 | Sunday	2.543	0.171	14.85	<.0001
09:00–09:59 | Monday	1.041	0.164	6.33	<.0001
09:00–09:59 | Tuesday	0.431	0.162	2.65	0.0080
09:00–09:59 | Wednesday	0.263	0.161	1.64	0.1013
09:00–09:59 | Thursday	0.623	0.166	3.75	0.0002
09:00–09:59 | Friday	1.147	0.157	7.29	<.0001
09:00–09:59 | Saturday	2.422	0.166	14.55	<.0001
09:00–09:59 | Sunday	2.747	0.169	16.28	<.0001
10:00–10:59 | Monday	1.096	0.157	6.97	<.0001
10:00–10:59 | Tuesday	0.436	0.159	2.74	0.0061
10:00–10:59 | Wednesday	-0.266	0.161	-1.66	0.0976
10:00–10:59 | Thursday	0.654	0.171	3.82	0.0001
10:00–10:59 | Friday	1.245	0.159	7.84	<.0001
10:00–10:59 | Saturday	2.172	0.164	13.22	<.0001
10:00–10:59 | Sunday	2.712	0.166	16.30	<.0001
11:00–11:59 | Monday	0.867	0.157	5.51	<.0001
11:00–11:59 | Tuesday (Reference)	–	–	–	–
11:00–11:59 | Wednesday	-0.665	0.156	-4.26	<.0001
11:00–11:59 | Thursday	0.139	0.166	0.83	0.4048
11:00–11:59 | Friday	0.670	0.157	4.26	<.0001
11:00–11:59 | Saturday	1.507	0.159	9.48	<.0001
11:00–11:59 | Sunday	2.314	0.161	14.41	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
12:00–12:59	Monday	0.859	0.156	5.51	<.0001
12:00–12:59	Tuesday	-0.131	0.157	-0.83	0.4045
12:00–12:59	Wednesday	-0.325	0.154	-2.10	0.0355
12:00–12:59	Thursday	-0.292	0.166	-1.76	0.0792
12:00–12:59	Friday	0.119	0.159	0.75	0.4546
12:00–12:59	Saturday	1.514	0.157	9.62	<.0001
12:00–12:59	Sunday	2.056	0.162	12.67	<.0001
13:00–13:59	Monday	0.654	0.156	4.20	<.0001
13:00–13:59	Tuesday	0.237	0.159	1.49	0.1353
13:00–13:59	Wednesday	0.132	0.157	0.84	0.4021
13:00–13:59	Thursday	0.496	0.166	2.98	0.0029
13:00–13:59	Friday	0.620	0.159	3.90	<.0001
13:00–13:59	Saturday	1.492	0.159	9.39	<.0001
13:00–13:59	Sunday	2.093	0.156	13.43	<.0001
14:00–14:59	Monday	0.784	0.156	5.03	<.0001
14:00–14:59	Tuesday	0.136	0.152	0.89	0.3717
14:00–14:59	Wednesday	0.069	0.161	0.43	0.6664
14:00–14:59	Thursday	0.662	0.162	4.08	<.0001
14:00–14:59	Friday	1.243	0.163	7.64	<.0001
14:00–14:59	Saturday	1.522	0.159	9.58	<.0001
14:00–14:59	Sunday	2.287	0.154	14.80	<.0001
15:00–15:59	Monday	0.641	0.154	4.15	<.0001
15:00–15:59	Tuesday	0.128	0.156	0.82	0.4116
15:00–15:59	Wednesday	0.193	0.157	1.23	0.2201
15:00–15:59	Thursday	0.373	0.164	2.27	0.0233
15:00–15:59	Friday	1.059	0.165	6.43	<.0001
15:00–15:59	Saturday	1.709	0.157	10.87	<.0001
15:00–15:59	Sunday	2.444	0.157	15.53	<.0001
16:00–16:59	Monday	0.466	0.153	3.04	0.0024
16:00–16:59	Tuesday	-0.218	0.155	-1.41	0.1597
16:00–16:59	Wednesday	-0.043	0.161	-0.27	0.7883
16:00–16:59	Thursday	0.246	0.161	1.53	0.1254
16:00–16:59	Friday	-0.641	0.159	-4.04	<.0001
16:00–16:59	Saturday	1.702	0.157	10.82	<.0001
16:00–16:59	Sunday	2.261	0.156	14.51	<.0001
17:00–17:59	Monday	0.378	0.156	2.43	0.0152
17:00–17:59	Tuesday	-0.467	0.156	-3.00	0.0027
17:00–17:59	Wednesday	-0.411	0.162	-2.53	0.0114
17:00–17:59	Thursday	0.100	0.157	0.64	0.5231

Variable	Estimate	Std. Error	t Value	Pr. > |t|
17:00–17:59 | Friday	-0.540	0.161	-3.36	0.0008
17:00–17:59 | Saturday	1.520	0.162	9.36	<.0001
17:00–17:59 | Sunday	2.218	0.156	14.23	<.0001
18:00–18:59 | Monday	0.414	0.157	2.63	0.0084
18:00–18:59 | Tuesday	0.168	0.154	1.09	0.2767
18:00–18:59 | Wednesday	-0.357	0.162	-2.20	0.0280
18:00–18:59 | Thursday	0.367	0.154	2.38	0.0174
18:00–18:59 | Friday	-0.401	0.162	-2.47	0.0136
18:00–18:59 | Saturday	1.683	0.162	10.37	<.0001
18:00–18:59 | Sunday	2.383	0.157	15.15	<.0001
19:00–19:59 | Monday	1.008	0.159	6.35	<.0001
19:00–19:59 | Tuesday	0.641	0.153	4.19	<.0001
19:00–19:59 | Wednesday	0.649	0.157	4.13	<.0001
19:00–19:59 | Thursday	1.556	0.157	9.89	<.0001
19:00–19:59 | Friday	2.055	0.159	12.93	<.0001
19:00–19:59 | Saturday	2.182	0.164	13.28	<.0001
19:00–19:59 | Sunday	2.599	0.156	16.68	<.0001
20:00–20:59 | Monday	0.683	0.157	4.34	<.0001
20:00–20:59 | Tuesday	0.485	0.157	3.09	0.0020
20:00–20:59 | Wednesday	0.855	0.159	5.38	<.0001
20:00–20:59 | Thursday	1.476	0.161	9.19	<.0001
20:00–20:59 | Friday	2.059	0.161	12.82	<.0001
20:00–20:59 | Saturday	1.573	0.164	9.57	<.0001
20:00–20:59 | Sunday	1.993	0.161	12.41	<.0001
21:00–21:59 | Monday	0.302	0.162	1.86	0.0629
21:00–21:59 | Tuesday	0.105	0.157	0.67	0.5026
21:00–21:59 | Wednesday	0.541	0.159	3.40	0.0007
21:00–21:59 | Thursday	1.593	0.161	9.92	<.0001
21:00–21:59 | Friday	1.357	0.166	8.15	<.0001
21:00–21:59 | Saturday	0.993	0.162	6.12	<.0001
21:00–21:59 | Sunday	1.862	0.166	11.19	<.0001
22:00–22:59 | Monday	0.355	0.162	2.19	0.0286
22:00–22:59 | Tuesday	0.564	0.157	3.58	0.0003
22:00–22:59 | Wednesday	0.934	0.161	5.82	<.0001
22:00–22:59 | Thursday	1.775	0.159	11.17	<.0001
22:00–22:59 | Friday	1.972	0.166	11.85	<.0001
22:00–22:59 | Saturday	0.986	0.161	6.14	<.0001
22:00–22:59 | Sunday	1.782	0.162	10.98	<.0001
23:00–23:59 | Monday	0.067	0.161	0.42	0.6773

Variable	Estimate	Std. Error	t Value	Pr. > |t|
23:00–23:59 | Tuesday	-0.426	0.156	-2.74	0.0062
23:00–23:59 | Wednesday	0.340	0.162	2.10	0.0361
23:00–23:59 | Thursday	1.400	0.157	8.90	<.0001
23:00–23:59 | Friday	1.444	0.166	8.68	<.0001
23:00–23:59 | Saturday	1.125	0.166	6.76	<.0001
23:00–23:59 | Sunday	1.585	0.165	9.62	<.0001
R-Square	0.517			
Coeff Var	2.700			
Root MSE	1.881			
Y Mean	69.661			

Table B.9 Multiple linear regression of the logarithm of speed variability on I-65 SB in Seymour District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	0.674	0.019	34.58	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.000	0.014	0.00	1.0000
Baseline | Segment 3	0.031	0.014	2.17	0.0299
Baseline | Segment 4	0.100	0.014	6.99	<.0001
Baseline | Segment 5	0.393	0.014	27.54	<.0001
Baseline | Segment 6	0.632	0.014	44.34	<.0001
Baseline | Segment 7	0.474	0.014	33.26	<.0001
Baseline | Segment 8	0.257	0.014	18.04	<.0001
Baseline | Segment 9	0.117	0.014	8.17	<.0001
Baseline | Segment 10	-0.005	0.014	-0.34	0.7368
Baseline | Segment 11	-0.034	0.014	-2.39	0.0167
Markings 1 | Segment 1	-0.006	0.012	-0.52	0.6054
Markings 1 | Segment 2	-0.019	0.012	-1.62	0.1058
Markings 1 | Segment 3	-0.029	0.012	-2.52	0.0119
Markings 1 | Segment 4	0.053	0.012	4.55	<.0001
Markings 1 | Segment 5	0.394	0.012	34.18	<.0001
Markings 1 | Segment 6	0.648	0.012	56.23	<.0001
Markings 1 | Segment 7	0.489	0.012	42.37	<.0001
Markings 1 | Segment 8	0.247	0.012	21.41	<.0001
Markings 1 | Segment 9	0.115	0.012	10.01	<.0001
Markings 1 | Segment 10	-0.014	0.012	-1.23	0.2198
Markings 1 | Segment 11	-0.036	0.012	-3.12	0.0018
Markings + Signs | Segment 1	0.020	0.018	1.12	0.2609
Markings + Signs | Segment 2	-0.037	0.018	-2.04	0.0418

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings + Signs | Segment 3	-0.078	0.018	-4.28	<.0001
Markings + Signs | Segment 4	-0.022	0.018	-1.21	0.2248
Markings + Signs | Segment 5	0.227	0.018	12.49	<.0001
Markings + Signs | Segment 6	0.477	0.018	26.22	<.0001
Markings + Signs | Segment 7	0.270	0.018	14.87	<.0001
Markings + Signs | Segment 8	0.242	0.018	13.34	<.0001
Markings + Signs | Segment 9	0.117	0.018	6.45	<.0001
Markings + Signs | Segment 10	-0.014	0.018	-0.77	0.4391
Markings + Signs | Segment 11	-0.032	0.018	-1.76	0.0779
Markings 2 | Segment 1	-0.018	0.020	-0.90	0.3677
Markings 2 | Segment 2	-0.055	0.020	-2.72	0.0065
Markings 2 | Segment 3	-0.099	0.020	-4.90	<.0001
Markings 2 | Segment 4	-0.034	0.020	-1.67	0.0959
Markings 2 | Segment 5	0.270	0.020	13.38	<.0001
Markings 2 | Segment 6	0.496	0.020	24.53	<.0001
Markings 2 | Segment 7	0.284	0.020	14.08	<.0001
Markings 2 | Segment 8	0.212	0.020	10.45	<.0001
Markings 2 | Segment 9	0.083	0.020	4.08	<.0001
Markings 2 | Segment 10	-0.060	0.020	-2.96	0.0031
Markings 2 | Segment 11	-0.083	0.020	-4.12	<.0001
00:00–00:59 | Monday	-0.176	0.025	-7.13	<.0001
00:00–00:59 | Tuesday	-0.330	0.025	-13.39	<.0001
00:00–00:59 | Wednesday	-0.262	0.024	-11.10	<.0001
00:00–00:59 | Thursday	-0.272	0.025	-10.88	<.0001
00:00–00:59 | Friday	-0.223	0.023	-9.53	<.0001
00:00–00:59 | Saturday	-0.173	0.024	-7.08	<.0001
00:00–00:59 | Sunday	-0.278	0.025	-11.12	<.0001
01:00–01:59 | Monday	-0.154	0.025	-6.23	<.0001
01:00–01:59 | Tuesday	-0.315	0.025	-12.62	<.0001
01:00–01:59 | Wednesday	-0.258	0.024	-10.93	<.0001
01:00–01:59 | Thursday	-0.264	0.025	-10.57	<.0001
01:00–01:59 | Friday	-0.153	0.023	-6.65	<.0001
01:00–01:59 | Saturday	-0.189	0.024	-7.74	<.0001
01:00–01:59 | Sunday	-0.195	0.025	-7.79	<.0001
02:00–02:59 | Monday	-0.212	0.027	-7.98	<.0001
02:00–02:59 | Tuesday	-0.367	0.026	-14.29	<.0001
02:00–02:59 | Wednesday	-0.347	0.023	-14.98	<.0001
02:00–02:59 | Thursday	-0.371	0.025	-14.84	<.0001
02:00–02:59 | Friday	-0.275	0.023	-11.77	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
02:00–02:59 | Saturday	-0.198	0.024	-8.14	<.0001
02:00–02:59 | Sunday	-0.098	0.024	-4.01	<.0001
03:00–02:59 | Monday	-0.247	0.027	-9.29	<.0001
03:00–02:59 | Tuesday	-0.365	0.026	-14.03	<.0001
03:00–02:59 | Wednesday	-0.289	0.023	-12.46	<.0001
03:00–02:59 | Thursday	-0.311	0.025	-12.29	<.0001
03:00–02:59 | Friday	-0.262	0.023	-11.20	<.0001
03:00–02:59 | Saturday	-0.187	0.024	-7.67	<.0001
03:00–02:59 | Sunday	-0.131	0.025	-5.23	<.0001
04:00–04:59 | Monday	-0.226	0.026	-8.78	<.0001
04:00–04:59 | Tuesday	-0.319	0.026	-12.40	<.0001
04:00–04:59 | Wednesday	-0.271	0.024	-11.36	<.0001
04:00–04:59 | Thursday	-0.265	0.025	-10.60	<.0001
04:00–04:59 | Friday	-0.219	0.023	-9.35	<.0001
04:00–04:59 | Saturday	-0.265	0.024	-10.89	<.0001
04:00–04:59 | Sunday	-0.118	0.025	-4.64	<.0001
05:00–05:59 | Monday	-0.154	0.027	-5.78	<.0001
05:00–05:59 | Tuesday	-0.182	0.026	-7.07	<.0001
05:00–05:59 | Wednesday	-0.188	0.024	-7.82	<.0001
05:00–05:59 | Thursday	-0.182	0.025	-7.16	<.0001
05:00–05:59 | Friday	-0.162	0.024	-6.80	<.0001
05:00–05:59 | Saturday	-0.230	0.025	-9.09	<.0001
05:00–05:59 | Sunday	-0.181	0.025	-7.16	<.0001
06:00–06:59 | Monday	-0.187	0.027	-6.92	<.0001
06:00–06:59 | Tuesday	-0.135	0.025	-5.31	<.0001
06:00–06:59 | Wednesday	-0.142	0.024	-5.82	<.0001
06:00–06:59 | Thursday	-0.058	0.026	-2.21	0.0273
06:00–06:59 | Friday	-0.118	0.024	-4.94	<.0001
06:00–06:59 | Saturday	-0.220	0.025	-8.68	<.0001
06:00–06:59 | Sunday	-0.177	0.025	-7.00	<.0001
07:00–07:59 | Monday	-0.100	0.026	-3.84	0.0001
07:00–07:59 | Tuesday	-0.063	0.025	-2.51	0.0120
07:00–07:59 | Wednesday	0.022	0.025	0.89	0.3708
07:00–07:59 | Thursday	0.119	0.026	4.60	<.0001
07:00–07:59 | Friday	-0.031	0.024	-1.27	0.2044
07:00–07:59 | Saturday	-0.156	0.025	-6.31	<.0001
07:00–07:59 | Sunday	-0.140	0.025	-5.53	<.0001
08:00–08:59 | Monday	-0.090	0.026	-3.46	0.0005
08:00–08:59 | Tuesday	-0.035	0.025	-1.39	0.1659

Variable	Estimate	Std. Error	t Value	Pr. > |t|
08:00–08:59 | Wednesday	0.027	0.025	1.09	0.2767
08:00–08:59 | Thursday	0.012	0.025	0.49	0.6249
08:00–08:59 | Friday	-0.040	0.024	-1.70	0.0893
08:00–08:59 | Saturday	-0.177	0.025	-7.00	<.0001
08:00–08:59 | Sunday	-0.215	0.026	-8.37	<.0001
09:00–09:59 | Monday	-0.066	0.025	-2.68	0.0073
09:00–09:59 | Tuesday	-0.002	0.024	-0.10	0.9235
09:00–09:59 | Wednesday	0.009	0.024	0.37	0.7086
09:00–09:59 | Thursday	-0.053	0.025	-2.13	0.0331
09:00–09:59 | Friday	-0.060	0.024	-2.53	0.0115
09:00–09:59 | Saturday	-0.154	0.025	-6.16	<.0001
09:00–09:59 | Sunday	-0.203	0.025	-8.00	<.0001
10:00–10:59 | Monday	0.023	0.024	0.98	0.3281
10:00–10:59 | Tuesday	-0.012	0.024	-0.51	0.6070
10:00–10:59 | Wednesday	0.053	0.024	2.21	0.0274
10:00–10:59 | Thursday	0.014	0.026	0.54	0.5899
10:00–10:59 | Friday	0.015	0.024	0.61	0.5427
10:00–10:59 | Saturday	-0.060	0.025	-2.45	0.0144
10:00–10:59 | Sunday	-0.154	0.025	-6.16	<.0001
11:00–11:59 | Monday	0.014	0.024	0.58	0.5650
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	0.056	0.023	2.37	0.0177
11:00–11:59 | Thursday	0.088	0.025	3.51	0.0005
11:00–11:59 | Friday	0.084	0.024	3.54	0.0004
11:00–11:59 | Saturday	-0.001	0.024	-0.03	0.9766
11:00–11:59 | Sunday	-0.134	0.024	-5.55	<.0001
12:00–12:59 | Monday	-0.014	0.023	-0.58	0.5634
12:00–12:59 | Tuesday	0.010	0.024	0.40	0.6872
12:00–12:59 | Wednesday	0.046	0.023	1.99	0.0465
12:00–12:59 | Thursday	0.073	0.025	2.91	0.0037
12:00–12:59 | Friday	0.095	0.024	4.00	<.0001
12:00–12:59 | Saturday	0.069	0.024	2.93	0.0034
12:00–12:59 | Sunday	0.010	0.024	0.41	0.6796
13:00–13:59 | Monday	-0.036	0.023	-1.52	0.1277
13:00–13:59 | Tuesday	-0.006	0.024	-0.25	0.8016
13:00–13:59 | Wednesday	0.031	0.024	1.31	0.1889
13:00–13:59 | Thursday	0.081	0.025	3.22	0.0013
13:00–13:59 | Friday	0.060	0.024	2.53	0.0113
13:00–13:59 | Saturday	-0.043	0.024	-1.82	0.0687

Variable	Estimate	Std. Error	t Value	Pr. > |t|
13:00–13:59 | Sunday	-0.063	0.023	-2.70	0.0070
14:00–14:59 | Monday	-0.008	0.023	-0.36	0.7165
14:00–14:59 | Tuesday	-0.048	0.023	-2.12	0.0337
14:00–14:59 | Wednesday	0.027	0.024	1.12	0.2615
14:00–14:59 | Thursday	0.015	0.024	0.60	0.5487
14:00–14:59 | Friday	0.045	0.024	1.86	0.0632
14:00–14:59 | Saturday	-0.045	0.024	-1.88	0.0599
14:00–14:59 | Sunday	-0.114	0.023	-4.90	<.0001
15:00–15:59 | Monday	-0.003	0.023	-0.12	0.9010
15:00–15:59 | Tuesday	0.005	0.023	0.23	0.8164
15:00–15:59 | Wednesday	-0.026	0.024	-1.08	0.2792
15:00–15:59 | Thursday	0.055	0.025	2.24	0.0253
15:00–15:59 | Friday	0.063	0.025	2.56	0.0105
15:00–15:59 | Saturday	-0.093	0.024	-3.92	<.0001
15:00–15:59 | Sunday	-0.098	0.024	-4.14	<.0001
16:00–16:59 | Monday	-0.058	0.023	-2.53	0.0113
16:00–16:59 | Tuesday	-0.002	0.023	-0.10	0.9216
16:00–16:59 | Wednesday	0.000	0.024	0.00	0.9981
16:00–16:59 | Thursday	0.031	0.024	1.29	0.1957
16:00–16:59 | Friday	0.169	0.024	7.07	<.0001
16:00–16:59 | Saturday	-0.114	0.024	-4.83	<.0001
16:00–16:59 | Sunday	-0.148	0.023	-6.33	<.0001
17:00–17:59 | Monday	-0.010	0.023	-0.42	0.6748
17:00–17:59 | Tuesday	0.020	0.023	0.87	0.3835
17:00–17:59 | Wednesday	0.034	0.024	1.39	0.1660
17:00–17:59 | Thursday	0.074	0.024	3.12	0.0018
17:00–17:59 | Friday	0.208	0.024	8.64	<.0001
17:00–17:59 | Saturday	-0.056	0.024	-2.29	0.0222
17:00–17:59 | Sunday	-0.125	0.023	-5.34	<.0001
18:00–18:59 | Monday	-0.053	0.024	-2.23	0.0259
18:00–18:59 | Tuesday	-0.010	0.023	-0.43	0.6661
18:00–18:59 | Wednesday	-0.021	0.024	-0.85	0.3962
18:00–18:59 | Thursday	0.015	0.023	0.64	0.5198
18:00–18:59 | Friday	0.192	0.024	7.87	<.0001
18:00–18:59 | Saturday	-0.080	0.024	-3.27	0.0011
18:00–18:59 | Sunday	-0.107	0.024	-4.53	<.0001
19:00–19:59 | Monday	-0.088	0.024	-3.70	0.0002
19:00–19:59 | Tuesday	-0.085	0.023	-3.68	0.0002
19:00–19:59 | Wednesday	-0.109	0.024	-4.63	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
19:00–19:59 | Thursday	-0.085	0.024	-3.59	0.0003
19:00–19:59 | Friday	-0.037	0.024	-1.57	0.1173
19:00–19:59 | Saturday	-0.139	0.025	-5.65	<.0001
19:00–19:59 | Sunday	-0.110	0.023	-4.70	<.0001
20:00–20:59 | Monday	-0.092	0.024	-3.90	<.0001
20:00–20:59 | Tuesday	-0.084	0.024	-3.58	0.0003
20:00–20:59 | Wednesday	-0.131	0.024	-5.51	<.0001
20:00–20:59 | Thursday	-0.078	0.024	-3.22	0.0013
20:00–20:59 | Friday	-0.085	0.024	-3.53	0.0004
20:00–20:59 | Saturday	-0.153	0.025	-6.22	<.0001
20:00–20:59 | Sunday	-0.125	0.024	-5.19	<.0001
21:00–21:59 | Monday	-0.121	0.024	-4.96	<.0001
21:00–21:59 | Tuesday	-0.182	0.024	-7.72	<.0001
21:00–21:59 | Wednesday	-0.120	0.024	-5.04	<.0001
21:00–21:59 | Thursday	-0.157	0.024	-6.50	<.0001
21:00–21:59 | Friday	-0.061	0.025	-2.46	0.0140
21:00–21:59 | Saturday	-0.189	0.024	-7.76	<.0001
21:00–21:59 | Sunday	-0.139	0.025	-5.57	<.0001
22:00–22:59 | Monday	-0.217	0.024	-8.92	<.0001
22:00–22:59 | Tuesday	-0.152	0.024	-6.42	<.0001
22:00–22:59 | Wednesday	-0.138	0.024	-5.71	<.0001
22:00–22:59 | Thursday	-0.092	0.024	-3.85	0.0001
22:00–22:59 | Friday	-0.100	0.025	-3.98	<.0001
22:00–22:59 | Saturday	-0.179	0.024	-7.44	<.0001
22:00–22:59 | Sunday	-0.171	0.024	-7.02	<.0001
23:00–23:59 | Monday	-0.192	0.024	-7.98	<.0001
23:00–23:59 | Tuesday	-0.265	0.023	-11.32	<.0001
23:00–23:59 | Wednesday	-0.220	0.024	-9.02	<.0001
23:00–23:59 | Thursday	-0.146	0.024	-6.17	<.0001
23:00–23:59 | Friday	-0.174	0.025	-6.98	<.0001
23:00–23:59 | Saturday	-0.188	0.025	-7.53	<.0001
23:00–23:59 | Sunday	-0.145	0.025	-5.85	<.0001
R-Square	0.440			
Coeff Var	38.392			
Root MSE	0.282			
Y Mean	0.736			

Table B.10 Multiple linear regression of average speed on I-64 EB in Seymour District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	68.028	0.318	214.04	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.000	0.312	0.00	1.0000
Baseline | Segment 3	-4.382	0.312	-14.05	<.0001
Baseline | Segment 4	-5.983	0.312	-19.18	<.0001
Baseline | Segment 5	-5.983	0.312	-19.18	<.0001
Baseline | Segment 6	-5.983	0.312	-19.18	<.0001
Baseline | Segment 7	-7.431	0.312	-23.83	<.0001
Baseline | Segment 8	-6.305	0.312	-20.21	<.0001
Baseline | Segment 9	-6.305	0.312	-20.21	<.0001
Baseline | Segment 10	-6.305	0.312	-20.21	<.0001
Baseline | Segment 11	-4.448	0.312	-14.26	<.0001
Markings 1 | Segment 1	0.805	0.235	3.43	0.0006
Markings 1 | Segment 2	-1.174	0.235	-5.00	<.0001
Markings 1 | Segment 3	-4.972	0.235	-21.19	<.0001
Markings 1 | Segment 4	-6.435	0.235	-27.43	<.0001
Markings 1 | Segment 5	-5.435	0.235	-23.17	<.0001
Markings 1 | Segment 6	-6.244	0.235	-26.62	<.0001
Markings 1 | Segment 7	-8.045	0.235	-34.29	<.0001
Markings 1 | Segment 8	-7.667	0.235	-32.68	<.0001
Markings 1 | Segment 9	-6.436	0.235	-27.43	<.0001
Markings 1 | Segment 10	-7.217	0.235	-30.76	<.0001
Markings 1 | Segment 11	-6.584	0.235	-28.05	<.0001
Markings + Signs | Segment 1	1.242	0.291	4.27	<.0001
Markings + Signs | Segment 2	-3.484	0.291	-11.99	<.0001
Markings + Signs | Segment 3	-6.630	0.291	-22.82	<.0001
Markings + Signs | Segment 4	-7.052	0.291	-24.27	<.0001
Markings + Signs | Segment 5	-5.592	0.291	-19.24	<.0001
Markings + Signs | Segment 6	-6.736	0.291	-23.18	<.0001
Markings + Signs | Segment 7	-8.207	0.291	-28.22	<.0001
Markings + Signs | Segment 8	-7.986	0.291	-27.46	<.0001
Markings + Signs | Segment 9	-5.930	0.291	-20.41	<.0001
Markings + Signs | Segment 10	-6.665	0.291	-22.94	<.0001
Markings + Signs | Segment 11	-6.255	0.291	-21.53	<.0001
Markings 2 | Segment 1	1.411	0.265	5.32	<.0001
Markings 2 | Segment 2	-2.264	0.265	-8.54	<.0001
Markings 2 | Segment 3	-5.386	0.265	-20.31	<.0001
Markings 2 | Segment 4	-6.495	0.265	-24.49	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 2 | Segment 5	-5.219	0.265	-19.68	<.0001
Markings 2 | Segment 6	-6.470	0.265	-24.40	<.0001
Markings 2 | Segment 7	-7.590	0.265	-28.63	<.0001
Markings 2 | Segment 8	-7.189	0.265	-27.11	<.0001
Markings 2 | Segment 9	-5.167	0.265	-19.49	<.0001
Markings 2 | Segment 10	-5.973	0.265	-22.53	<.0001
Markings 2 | Segment 11	-6.068	0.265	-22.88	<.0001
00:00–00:59 | Monday	-1.388	0.335	-4.14	<.0001
00:00–00:59 | Tuesday	-2.710	0.344	-7.88	<.0001
00:00–00:59 | Wednesday	-2.705	0.324	-8.35	<.0001
00:00–00:59 | Thursday	-2.489	0.340	-7.33	<.0001
00:00–00:59 | Friday	-2.099	0.327	-6.42	<.0001
00:00–00:59 | Saturday	0.302	0.362	0.83	0.4042
00:00–00:59 | Sunday	-0.073	0.350	-0.21	0.8357
01:00–01:59 | Monday	-2.471	0.335	-7.37	<.0001
01:00–01:59 | Tuesday	-3.181	0.355	-8.95	<.0001
01:00–01:59 | Wednesday	-2.417	0.324	-7.47	<.0001
01:00–01:59 | Thursday	-3.170	0.344	-9.21	<.0001
01:00–01:59 | Friday	-2.482	0.324	-7.67	<.0001
01:00–01:59 | Saturday	-1.089	0.355	-3.06	0.0022
01:00–01:59 | Sunday	-0.860	0.355	-2.42	0.0155
02:00–02:59 | Monday	-1.883	0.355	-5.30	<.0001
02:00–02:59 | Tuesday	-2.835	0.362	-7.84	<.0001
02:00–02:59 | Wednesday	-2.734	0.320	-8.54	<.0001
02:00–02:59 | Thursday	-2.877	0.345	-8.35	<.0001
02:00–02:59 | Friday	-1.975	0.327	-6.04	<.0001
02:00–02:59 | Saturday	-2.270	0.344	-6.60	<.0001
02:00–02:59 | Sunday	-2.281	0.346	-6.60	<.0001
03:00–02:59 | Monday	-1.022	0.362	-2.82	0.0047
03:00–02:59 | Tuesday	-1.107	0.362	-3.06	0.0022
03:00–02:59 | Wednesday	-0.681	0.317	-2.15	0.0319
03:00–02:59 | Thursday	-1.067	0.335	-3.19	0.0014
03:00–02:59 | Friday	-0.413	0.327	-1.26	0.2062
03:00–02:59 | Saturday	-1.744	0.344	-5.07	<.0001
03:00–02:59 | Sunday	-2.757	0.363	-7.59	<.0001
04:00–04:59 | Monday	-0.474	0.377	-1.26	0.2083
04:00–04:59 | Tuesday	-0.369	0.369	-1.00	0.3167
04:00–04:59 | Wednesday	-0.331	0.328	-1.01	0.3120
04:00–04:59 | Thursday	-0.586	0.345	-1.70	0.0891

Variable	Estimate	Std. Error	t Value	Pr. > |t|
04:00–04:59 | Friday	0.034	0.327	0.10	0.9180
04:00–04:59 | Saturday	-0.541	0.345	-1.57	0.1166
04:00–04:59 | Sunday	-1.068	0.369	-2.89	0.0038
05:00–05:59 | Monday	1.737	0.396	4.38	<.0001
05:00–05:59 | Tuesday	1.831	0.386	4.74	<.0001
05:00–05:59 | Wednesday	1.647	0.335	4.92	<.0001
05:00–05:59 | Thursday	1.643	0.344	4.77	<.0001
05:00–05:59 | Friday	1.653	0.339	4.87	<.0001
05:00–05:59 | Saturday	0.215	0.355	0.60	0.5459
05:00–05:59 | Sunday	0.053	0.377	0.14	0.8886
06:00–06:59 | Monday	0.519	0.386	1.34	0.1787
06:00–06:59 | Tuesday	-2.345	0.369	-6.36	<.0001
06:00–06:59 | Wednesday	-1.664	0.327	-5.09	<.0001
06:00–06:59 | Thursday	-1.060	0.355	-2.98	0.0029
06:00–06:59 | Friday	0.170	0.339	0.50	0.6168
06:00–06:59 | Saturday	1.727	0.355	4.86	<.0001
06:00–06:59 | Sunday	1.175	0.377	3.12	0.0018
07:00–07:59 | Monday	-9.437	0.377	-25.03	<.0001
07:00–07:59 | Tuesday	-16.956	0.362	-46.87	<.0001
07:00–07:59 | Wednesday	-11.899	0.335	-35.53	<.0001
07:00–07:59 | Thursday	-14.423	0.357	-40.40	<.0001
07:00–07:59 | Friday	-7.161	0.344	-20.80	<.0001
07:00–07:59 | Saturday	1.092	0.350	3.12	0.0018
07:00–07:59 | Sunday	0.873	0.377	2.31	0.0206
08:00–08:59 | Monday	-4.628	0.355	-13.02	<.0001
08:00–08:59 | Tuesday	-5.016	0.362	-13.87	<.0001
08:00–08:59 | Wednesday	-5.351	0.335	-15.98	<.0001
08:00–08:59 | Thursday	-8.166	0.344	-23.72	<.0001
08:00–08:59 | Friday	-1.981	0.335	-5.91	<.0001
08:00–08:59 | Saturday	2.219	0.355	6.24	<.0001
08:00–08:59 | Sunday	2.042	0.377	5.42	<.0001
09:00–09:59 | Monday	0.695	0.339	2.05	0.0407
09:00–09:59 | Tuesday	0.239	0.344	0.69	0.4873
09:00–09:59 | Wednesday	-0.327	0.331	-0.99	0.3234
09:00–09:59 | Thursday	-0.047	0.339	-0.14	0.8905
09:00–09:59 | Friday	0.875	0.335	2.61	0.0090
09:00–09:59 | Saturday	2.304	0.362	6.37	<.0001
09:00–09:59 | Sunday	2.819	0.344	8.19	<.0001
10:00–10:59 | Monday	0.392	0.324	1.21	0.2255

Variable	Estimate	Std. Error	t Value	Pr. > |t|
10:00–10:59	Tuesday	-0.071	0.331	-0.22	0.8294
10:00–10:59	Wednesday	0.504	0.327	1.54	0.1236
10:00–10:59	Thursday	0.157	0.355	0.44	0.6596
10:00–10:59	Friday	0.965	0.339	2.84	0.0045
10:00–10:59	Saturday	1.319	0.349	3.77	0.0002
10:00–10:59	Sunday	2.651	0.344	7.70	<.0001
11:00–11:59	Monday	-0.080	0.320	-0.25	0.8034
11:00–11:59	Tuesday (Reference)	.	.	.	.
11:00–11:59	Wednesday	0.680	0.324	2.10	0.0355
11:00–11:59	Thursday	0.503	0.339	1.48	0.1380
11:00–11:59	Friday	1.128	0.335	3.37	0.0008
11:00–11:59	Saturday	0.770	0.335	2.30	0.0216
11:00–11:59	Sunday	2.555	0.331	7.73	<.0001
12:00–12:59	Monday	-0.028	0.314	-0.09	0.9289
12:00–12:59	Tuesday	0.779	0.327	2.38	0.0173
12:00–12:59	Wednesday	0.967	0.317	3.05	0.0023
12:00–12:59	Thursday	0.981	0.350	2.81	0.0050
12:00–12:59	Friday	1.124	0.331	3.40	0.0007
12:00–12:59	Saturday	2.457	0.331	7.43	<.0001
12:00–12:59	Sunday	1.945	0.335	5.81	<.0001
13:00–13:59	Monday	0.186	0.312	0.60	0.5511
13:00–13:59	Tuesday	0.986	0.327	3.02	0.0026
13:00–13:59	Wednesday	1.132	0.317	3.57	0.0004
13:00–13:59	Thursday	1.132	0.355	3.19	0.0014
13:00–13:59	Friday	1.108	0.327	3.39	0.0007
13:00–13:59	Saturday	2.778	0.335	8.29	<.0001
13:00–13:59	Sunday	2.446	0.323	7.56	<.0001
14:00–14:59	Monday	0.508	0.312	1.63	0.1031
14:00–14:59	Tuesday	1.023	0.317	3.23	0.0013
14:00–14:59	Wednesday	0.922	0.320	2.88	0.0040
14:00–14:59	Thursday	1.131	0.344	3.29	0.0010
14:00–14:59	Friday	1.125	0.336	3.35	0.0008
14:00–14:59	Saturday	2.567	0.331	7.76	<.0001
14:00–14:59	Sunday	2.649	0.320	8.27	<.0001
15:00–15:59	Monday	1.183	0.312	3.80	0.0001
15:00–15:59	Tuesday	0.324	0.309	1.05	0.2942
15:00–15:59	Wednesday	0.841	0.317	2.65	0.0080
15:00–15:59	Thursday	0.868	0.339	2.56	0.0105
15:00–15:59	Friday	1.345	0.341	3.95	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
15:00–15:59 | Saturday	2.721	0.331	8.23	<.0001
15:00–15:59 | Sunday	2.589	0.327	7.92	<.0001
16:00–16:59 | Monday	1.212	0.317	3.82	0.0001
16:00–16:59 | Tuesday	0.416	0.317	1.31	0.1901
16:00–16:59 | Wednesday	0.912	0.324	2.82	0.0048
16:00–16:59 | Thursday	0.545	0.335	1.63	0.1036
16:00–16:59 | Friday	1.244	0.335	3.71	0.0002
16:00–16:59 | Saturday	2.158	0.327	6.60	<.0001
16:00–16:59 | Sunday	2.505	0.324	7.74	<.0001
17:00–17:59 | Monday	1.556	0.320	4.86	<.0001
17:00–17:59 | Tuesday	0.486	0.317	1.53	0.1252
17:00–17:59 | Wednesday	0.930	0.327	2.84	0.0045
17:00–17:59 | Thursday	-0.901	0.327	-2.75	0.0059
17:00–17:59 | Friday	0.579	0.344	1.68	0.0925
17:00–17:59 | Saturday	1.460	0.339	4.30	<.0001
17:00–17:59 | Sunday	2.687	0.324	8.30	<.0001
18:00–18:59 | Monday	1.290	0.320	4.03	<.0001
18:00–18:59 | Tuesday	0.299	0.317	0.94	0.3453
18:00–18:59 | Wednesday	0.665	0.327	2.03	0.0421
18:00–18:59 | Thursday	0.231	0.324	0.71	0.4750
18:00–18:59 | Friday	1.462	0.344	4.25	<.0001
18:00–18:59 | Saturday	1.731	0.344	5.03	<.0001
18:00–18:59 | Sunday	2.625	0.324	8.11	<.0001
19:00–19:59 | Monday	1.744	0.324	5.39	<.0001
19:00–19:59 | Tuesday	1.480	0.314	4.71	<.0001
19:00–19:59 | Wednesday	1.354	0.324	4.19	<.0001
19:00–19:59 | Thursday	1.200	0.324	3.71	0.0002
19:00–19:59 | Friday	2.313	0.339	6.82	<.0001
19:00–19:59 | Saturday	2.468	0.349	7.06	<.0001
19:00–19:59 | Sunday	2.683	0.317	8.46	<.0001
20:00–20:59 | Monday	1.162	0.324	3.59	0.0003
20:00–20:59 | Tuesday	1.033	0.324	3.19	0.0014
20:00–20:59 | Wednesday	0.962	0.324	2.97	0.0030
20:00–20:59 | Thursday	1.203	0.327	3.68	0.0002
20:00–20:59 | Friday	1.904	0.349	5.45	<.0001
20:00–20:59 | Saturday	2.338	0.350	6.69	<.0001
20:00–20:59 | Sunday	2.222	0.327	6.79	<.0001
21:00–21:59 | Monday	0.200	0.331	0.61	0.5450
21:00–21:59 | Tuesday	0.989	0.331	2.99	0.0028

Variable	Estimate	Std. Error	t Value	Pr. > |t|
21:00–21:59 | Wednesday	0.369	0.324	1.14	0.2542
21:00–21:59 | Thursday	0.826	0.327	2.53	0.0116
21:00–21:59 | Friday	1.778	0.377	4.72	<.0001
21:00–21:59 | Saturday	2.073	0.344	6.02	<.0001
21:00–21:59 | Sunday	2.181	0.339	6.43	<.0001
22:00–22:59 | Monday	0.041	0.331	0.12	0.9021
22:00–22:59 | Tuesday	-0.099	0.331	-0.30	0.7640
22:00–22:59 | Wednesday	-0.203	0.331	-0.61	0.5399
22:00–22:59 | Thursday	0.596	0.327	1.82	0.0684
22:00–22:59 | Friday	1.631	0.377	4.33	<.0001
22:00–22:59 | Saturday	1.988	0.340	5.85	<.0001
22:00–22:59 | Sunday	1.694	0.335	5.06	<.0001
23:00–23:59 | Monday	-1.731	0.331	-5.23	<.0001
23:00–23:59 | Tuesday	-1.429	0.327	-4.37	<.0001
23:00–23:59 | Wednesday	-0.999	0.331	-3.02	0.0025
23:00–23:59 | Thursday	-0.941	0.327	-2.88	0.0040
23:00–23:59 | Friday	0.878	0.377	2.33	0.0199
23:00–23:59 | Saturday	1.248	0.362	3.44	0.0006
23:00–23:59 | Sunday	0.072	0.335	0.21	0.8299
R-Square	0.496			
Coeff Var	5.926			
Root MSE	3.717			
Y Mean	62.713			

Table B.11 Multiple linear regression of 90th speed percentile on I-64 EB in Seymour District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	70.340	0.245	287.03	<.0001
Baseline | Segment 1 (Reference)	.	.	.	.
Baseline | Segment 2	0.000	0.240	0.00	1.0000
Baseline | Segment 3	-4.058	0.240	-16.87	<.0001
Baseline | Segment 4	-4.930	0.240	-20.50	<.0001
Baseline | Segment 5	-4.930	0.240	-20.50	<.0001
Baseline | Segment 6	-4.930	0.240	-20.50	<.0001
Baseline | Segment 7	-5.919	0.240	-24.61	<.0001
Baseline | Segment 8	-5.701	0.240	-23.70	<.0001
Baseline | Segment 9	-5.701	0.240	-23.70	<.0001
Baseline | Segment 10	-5.701	0.240	-23.70	<.0001
Baseline | Segment 11	-3.942	0.240	-16.39	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Markings 1 | Segment 1	0.954	0.181	5.27	<.0001
Markings 1 | Segment 2	-0.777	0.181	-4.29	<.0001
Markings 1 | Segment 3	-4.626	0.181	-25.58	<.0001
Markings 1 | Segment 4	-5.558	0.181	-30.73	<.0001
Markings 1 | Segment 5	-4.344	0.181	-24.02	<.0001
Markings 1 | Segment 6	-5.007	0.181	-27.68	<.0001
Markings 1 | Segment 7	-6.678	0.181	-36.92	<.0001
Markings 1 | Segment 8	-6.576	0.181	-36.35	<.0001
Markings 1 | Segment 9	-5.473	0.181	-30.26	<.0001
Markings 1 | Segment 10	-6.321	0.181	-34.95	<.0001
Markings 1 | Segment 11	-5.770	0.181	-31.88	<.0001
Markings + Signs | Segment 1	1.464	0.224	6.53	<.0001
Markings + Signs | Segment 2	-2.849	0.224	-12.72	<.0001
Markings + Signs | Segment 3	-6.447	0.224	-28.78	<.0001
Markings + Signs | Segment 4	-6.303	0.224	-28.13	<.0001
Markings + Signs | Segment 5	-4.451	0.224	-19.87	<.0001
Markings + Signs | Segment 6	-5.350	0.224	-23.88	<.0001
Markings + Signs | Segment 7	-6.961	0.224	-31.04	<.0001
Markings + Signs | Segment 8	-6.877	0.224	-30.66	<.0001
Markings + Signs | Segment 9	-5.038	0.224	-22.49	<.0001
Markings + Signs | Segment 10	-5.961	0.224	-26.61	<.0001
Markings + Signs | Segment 11	-5.578	0.224	-24.90	<.0001
Markings 2 | Segment 1	1.573	0.204	7.69	<.0001
Markings 2 | Segment 2	-1.708	0.204	-8.36	<.0001
Markings 2 | Segment 3	-5.171	0.204	-25.29	<.0001
Markings 2 | Segment 4	-5.740	0.204	-28.08	<.0001
Markings 2 | Segment 5	-3.952	0.204	-19.33	<.0001
Markings 2 | Segment 6	-5.018	0.204	-24.54	<.0001
Markings 2 | Segment 7	-6.507	0.204	-31.83	<.0001
Markings 2 | Segment 8	-6.221	0.204	-30.43	<.0001
Markings 2 | Segment 9	-4.434	0.204	-21.69	<.0001
Markings 2 | Segment 10	-5.363	0.204	-26.23	<.0001
Markings 2 | Segment 11	-5.187	0.204	-25.37	<.0001
00:00–00:59 | Monday	-1.040	0.258	-4.03	<.0001
00:00–00:59 | Tuesday	-2.373	0.265	-8.94	<.0001
00:00–00:59 | Wednesday	-2.819	0.250	-11.29	<.0001
00:00–00:59 | Thursday	-2.153	0.262	-8.22	<.0001
00:00–00:59 | Friday	-1.708	0.252	-6.77	<.0001
00:00–00:59 | Saturday	0.161	0.279	0.58	0.5641

Variable	Estimate	Std. Error	t Value	Pr. > |t|
00:00–00:59 | Sunday	-0.044	0.270	-0.16	0.8714
01:00–01:59 | Monday	-1.903	0.259	-7.36	<.0001
01:00–01:59 | Tuesday	-3.077	0.274	-11.23	<.0001
01:00–01:59 | Wednesday	-1.935	0.249	-7.76	<.0001
01:00–01:59 | Thursday	-2.861	0.265	-10.78	<.0001
01:00–01:59 | Friday	-2.118	0.250	-8.48	<.0001
01:00–01:59 | Saturday	-0.795	0.274	-2.90	0.0037
01:00–01:59 | Sunday	-0.151	0.274	-0.55	0.5807
02:00–02:59 | Monday	-1.286	0.274	-4.69	<.0001
02:00–02:59 | Tuesday	-2.369	0.279	-8.49	<.0001
02:00–02:59 | Wednesday	-2.070	0.247	-8.38	<.0001
02:00–02:59 | Thursday	-2.353	0.266	-8.85	<.0001
02:00–02:59 | Friday	-1.331	0.252	-5.28	<.0001
02:00–02:59 | Saturday	-1.827	0.265	-6.88	<.0001
02:00–02:59 | Sunday	-1.576	0.267	-5.91	<.0001
03:00–02:59 | Monday	-1.246	0.279	-4.47	<.0001
03:00–02:59 | Tuesday	-0.929	0.279	-3.33	0.0009
03:00–02:59 | Wednesday	-0.583	0.245	-2.38	0.0172
03:00–02:59 | Thursday	-1.225	0.258	-4.74	<.0001
03:00–02:59 | Friday	-0.366	0.252	-1.45	0.1467
03:00–02:59 | Saturday	-1.339	0.265	-5.04	<.0001
03:00–02:59 | Sunday	-2.257	0.280	-8.06	<.0001
04:00–04:59 | Monday	-1.161	0.291	-4.00	<.0001
04:00–04:59 | Tuesday	-0.924	0.284	-3.25	0.0012
04:00–04:59 | Wednesday	-0.977	0.253	-3.87	0.0001
04:00–04:59 | Thursday	-0.947	0.266	-3.56	0.0004
04:00–04:59 | Friday	-0.490	0.252	-1.94	0.0521
04:00–04:59 | Saturday	-0.563	0.266	-2.12	0.0340
04:00–04:59 | Sunday	-0.493	0.285	-1.73	0.0834
05:00–05:59 | Monday	1.116	0.306	3.65	0.0003
05:00–05:59 | Tuesday	1.228	0.298	4.13	<.0001
05:00–05:59 | Wednesday	1.117	0.258	4.33	<.0001
05:00–05:59 | Thursday	1.246	0.265	4.70	<.0001
05:00–05:59 | Friday	1.240	0.262	4.74	<.0001
05:00–05:59 | Saturday	-0.181	0.274	-0.66	0.5091
05:00–05:59 | Sunday	-0.384	0.291	-1.32	0.1860
06:00–06:59 | Monday	0.498	0.298	1.67	0.0943
06:00–06:59 | Tuesday	0.243	0.284	0.85	0.3935
06:00–06:59 | Wednesday	0.048	0.252	0.19	0.8505

Variable	Estimate	Std. Error	t Value	Pr. > |t|
06:00–06:59 | Thursday	0.089	0.274	0.32	0.7466
06:00–06:59 | Friday	0.533	0.262	2.04	0.0415
06:00–06:59 | Saturday	1.027	0.274	3.75	0.0002
06:00–06:59 | Sunday	0.908	0.291	3.12	0.0018
07:00–07:59 | Monday	-3.928	0.291	-13.51	<.0001
07:00–07:59 | Tuesday	-8.838	0.279	-31.69	<.0001
07:00–07:59 | Wednesday	-4.926	0.258	-19.08	<.0001
07:00–07:59 | Thursday	-5.352	0.275	-19.44	<.0001
07:00–07:59 | Friday	-2.429	0.265	-9.15	<.0001
07:00–07:59 | Saturday	0.600	0.269	2.23	0.0259
07:00–07:59 | Sunday	0.197	0.291	0.68	0.4987
08:00–08:59 | Monday	-1.586	0.274	-5.79	<.0001
08:00–08:59 | Tuesday	-1.421	0.279	-5.09	<.0001
08:00–08:59 | Wednesday	-3.511	0.258	-13.60	<.0001
08:00–08:59 | Thursday	-3.311	0.265	-12.47	<.0001
08:00–08:59 | Friday	-0.542	0.258	-2.10	0.0359
08:00–08:59 | Saturday	1.526	0.274	5.57	<.0001
08:00–08:59 | Sunday	1.424	0.291	4.90	<.0001
09:00–09:59 | Monday	0.102	0.262	0.39	0.6971
09:00–09:59 | Tuesday	-0.498	0.265	-1.88	0.0607
09:00–09:59 | Wednesday	-0.205	0.255	-0.80	0.4218
09:00–09:59 | Thursday	-0.512	0.262	-1.96	0.0505
09:00–09:59 | Friday	0.174	0.258	0.68	0.4993
09:00–09:59 | Saturday	1.551	0.279	5.56	<.0001
09:00–09:59 | Sunday	2.022	0.265	7.62	<.0001
10:00–10:59 | Monday	0.298	0.249	1.19	0.2325
10:00–10:59 | Tuesday	-0.239	0.255	-0.94	0.3484
10:00–10:59 | Wednesday	-0.162	0.252	-0.64	0.5194
10:00–10:59 | Thursday	-0.444	0.274	-1.62	0.1055
10:00–10:59 | Friday	0.202	0.262	0.77	0.4409
10:00–10:59 | Saturday	1.145	0.269	4.25	<.0001
10:00–10:59 | Sunday	1.862	0.265	7.02	<.0001
11:00–11:59 | Monday	-0.621	0.247	-2.52	0.0119
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	0.119	0.249	0.48	0.6329
11:00–11:59 | Thursday	-0.129	0.262	-0.49	0.6217
11:00–11:59 | Friday	0.475	0.258	1.84	0.0657
11:00–11:59 | Saturday	0.262	0.258	1.01	0.3111
11:00–11:59 | Sunday	1.813	0.255	7.11	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
12:00–12:59 | Monday	-0.387	0.242	-1.59	0.1107
12:00–12:59 | Tuesday	0.131	0.252	0.52	0.6042
12:00–12:59 | Wednesday	0.287	0.245	1.17	0.2411
12:00–12:59 | Thursday	0.417	0.270	1.55	0.1219
12:00–12:59 | Friday	0.589	0.255	2.31	0.0209
12:00–12:59 | Saturday	1.923	0.255	7.54	<.0001
12:00–12:59 | Sunday	2.037	0.258	7.89	<.0001
13:00–13:59 | Monday	-0.235	0.240	-0.98	0.3281
13:00–13:59 | Tuesday	0.397	0.252	1.58	0.1151
13:00–13:59 | Wednesday	0.524	0.245	2.14	0.0322
13:00–13:59 | Thursday	0.353	0.274	1.29	0.1973
13:00–13:59 | Friday	0.795	0.252	3.15	0.0016
13:00–13:59 | Saturday	2.110	0.258	8.17	<.0001
13:00–13:59 | Sunday	1.688	0.249	6.77	<.0001
14:00–14:59 | Monday	0.414	0.240	1.72	0.0848
14:00–14:59 | Tuesday	0.448	0.245	1.83	0.0673
14:00–14:59 | Wednesday	0.380	0.247	1.54	0.1241
14:00–14:59 | Thursday	0.386	0.265	1.45	0.1461
14:00–14:59 | Friday	0.714	0.259	2.76	0.0058
14:00–14:59 | Saturday	1.903	0.255	7.46	<.0001
14:00–14:59 | Sunday	1.937	0.247	7.84	<.0001
15:00–15:59 | Monday	0.575	0.240	2.39	0.0168
15:00–15:59 | Tuesday	0.168	0.238	0.70	0.4812
15:00–15:59 | Wednesday	0.135	0.245	0.55	0.5820
15:00–15:59 | Thursday	0.498	0.262	1.90	0.0569
15:00–15:59 | Friday	0.550	0.263	2.09	0.0362
15:00–15:59 | Saturday	1.965	0.255	7.70	<.0001
15:00–15:59 | Sunday	2.003	0.252	7.94	<.0001
16:00–16:59 | Monday	0.616	0.245	2.52	0.0118
16:00–16:59 | Tuesday	0.150	0.245	0.61	0.5400
16:00–16:59 | Wednesday	0.303	0.249	1.21	0.2244
16:00–16:59 | Thursday	0.372	0.258	1.44	0.1493
16:00–16:59 | Friday	0.555	0.258	2.15	0.0317
16:00–16:59 | Saturday	1.431	0.252	5.67	<.0001
16:00–16:59 | Sunday	1.897	0.249	7.60	<.0001
17:00–17:59 | Monday	1.019	0.247	4.13	<.0001
17:00–17:59 | Tuesday	0.188	0.245	0.77	0.4412
17:00–17:59 | Wednesday	0.353	0.252	1.40	0.1611
17:00–17:59 | Thursday	-1.089	0.252	-4.32	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
17:00–17:59 | Friday	0.367	0.265	1.38	0.1668
17:00–17:59 | Saturday	1.398	0.262	5.34	<.0001
17:00–17:59 | Sunday	2.037	0.249	8.17	<.0001
18:00–18:59 | Monday	0.664	0.247	2.69	0.0072
18:00–18:59 | Tuesday	0.272	0.245	1.11	0.2653
18:00–18:59 | Wednesday	0.059	0.252	0.23	0.8153
18:00–18:59 | Thursday	-0.234	0.249	-0.94	0.3491
18:00–18:59 | Friday	0.778	0.265	2.93	0.0034
18:00–18:59 | Saturday	1.234	0.265	4.65	<.0001
18:00–18:59 | Sunday	2.000	0.249	8.02	<.0001
19:00–19:59 | Monday	1.313	0.249	5.26	<.0001
19:00–19:59 | Tuesday	0.933	0.242	3.85	0.0001
19:00–19:59 | Wednesday	0.965	0.249	3.87	0.0001
19:00–19:59 | Thursday	0.668	0.249	2.68	0.0074
19:00–19:59 | Friday	1.636	0.262	6.25	<.0001
19:00–19:59 | Saturday	1.649	0.269	6.12	<.0001
19:00–19:59 | Sunday	1.998	0.245	8.17	<.0001
20:00–20:59 | Monday	0.614	0.249	2.46	0.0139
20:00–20:59 | Tuesday	0.414	0.249	1.66	0.0973
20:00–20:59 | Wednesday	0.422	0.249	1.69	0.0911
20:00–20:59 | Thursday	0.744	0.252	2.95	0.0032
20:00–20:59 | Friday	1.203	0.269	4.47	<.0001
20:00–20:59 | Saturday	1.753	0.270	6.50	<.0001
20:00–20:59 | Sunday	1.739	0.252	6.90	<.0001
21:00–21:59 | Monday	-0.568	0.255	-2.23	0.0261
21:00–21:59 | Tuesday	0.556	0.255	2.18	0.0292
21:00–21:59 | Wednesday	-0.402	0.249	-1.61	0.1070
21:00–21:59 | Thursday	0.313	0.252	1.24	0.2147
21:00–21:59 | Friday	1.326	0.291	4.56	<.0001
21:00–21:59 | Saturday	1.505	0.265	5.67	<.0001
21:00–21:59 | Sunday	1.770	0.262	6.76	<.0001
22:00–22:59 | Monday	-0.165	0.255	-0.65	0.5184
22:00–22:59 | Tuesday	-0.593	0.255	-2.32	0.0203
22:00–22:59 | Wednesday	-0.610	0.255	-2.39	0.0168
22:00–22:59 | Thursday	0.236	0.252	0.94	0.3497
22:00–22:59 | Friday	1.374	0.291	4.73	<.0001
22:00–22:59 | Saturday	1.430	0.262	5.46	<.0001
22:00–22:59 | Sunday	1.356	0.258	5.25	<.0001
23:00–23:59 | Monday	-1.872	0.255	-7.34	<.0001

Variable	Estimate	Std. Error	t Value	Pr. > |t|
23:00–23:59 | Tuesday	-1.894	0.252	-7.50	<.0001
23:00–23:59 | Wednesday	-1.355	0.255	-5.31	<.0001
23:00–23:59 | Thursday	-1.393	0.252	-5.52	<.0001
23:00–23:59 | Friday	0.566	0.291	1.95	0.0517
23:00–23:59 | Saturday	0.822	0.279	2.94	0.0033
23:00–23:59 | Sunday	0.419	0.258	1.62	0.1045
R-Square	0.480			
Coeff Var	4.356			
Root MSE	2.866			
Y Mean	65.795			

Table B.12 Multiple linear regression of the logarithm of speed variability on I-64 EB in Seymour District

Variable	Estimate	Std. Error	t Value	Pr. > |t|
Intercept	0.503	0.025	20.15	<.0001
Baseline (Reference)	.	.	.	.
Markings 1	0.081	0.007	11.24	<.0001
Markings + Signs	0.066	0.009	7.37	<.0001
Markings 2	0.082	0.008	10.00	<.0001
Segment 1 (Reference)	.	.	.	.
Segment 2	0.084	0.009	9.23	<.0001
Segment 3	-0.014	0.009	-1.55	0.1202
Segment 4	0.137	0.009	15.09	<.0001
Segment 5	0.203	0.009	22.37	<.0001
Segment 6	0.240	0.009	26.48	<.0001
Segment 7	0.212	0.009	23.44	<.0001
Segment 8	0.220	0.009	24.31	<.0001
Segment 9	0.213	0.009	23.50	<.0001
Segment 10	0.196	0.009	21.66	<.0001
Segment 11	0.149	0.009	16.42	<.0001
00:00–00:59 | Monday	0.221	0.034	6.49	<.0001
00:00–00:59 | Tuesday	0.194	0.035	5.54	<.0001
00:00–00:59 | Wednesday	0.038	0.033	1.17	0.2422
00:00–00:59 | Thursday	0.187	0.035	5.41	<.0001
00:00–00:59 | Friday	0.170	0.033	5.11	<.0001
00:00–00:59 | Saturday	0.118	0.037	3.21	0.0013
00:00–00:59 | Sunday	0.085	0.036	2.37	0.0176
01:00–01:59 | Monday	0.231	0.034	6.76	<.0001
01:00–01:59 | Tuesday	0.082	0.036	2.26	0.0238

Variable	Estimate	Std. Error	t Value	Pr. > |t|
01:00–01:59 | Wednesday	0.200	0.033	6.06	<.0001
01:00–01:59 | Thursday	0.141	0.035	4.03	<.0001
01:00–01:59 | Friday	0.188	0.033	5.72	<.0001
01:00–01:59 | Saturday	0.166	0.036	4.59	<.0001
01:00–01:59 | Sunday	0.274	0.036	7.59	<.0001
02:00–02:59 | Monday	0.280	0.036	7.76	<.0001
02:00–02:59 | Tuesday	0.107	0.037	2.90	0.0037
02:00–02:59 | Wednesday	0.232	0.033	7.12	<.0001
02:00–02:59 | Thursday	0.209	0.035	5.96	<.0001
02:00–02:59 | Friday	0.263	0.033	7.91	<.0001
02:00–02:59 | Saturday	0.210	0.035	5.99	<.0001
02:00–02:59 | Sunday	0.303	0.035	8.61	<.0001
03:00–02:59 | Monday	0.011	0.037	0.31	0.7571
03:00–02:59 | Tuesday	0.161	0.037	4.38	<.0001
03:00–02:59 | Wednesday	0.171	0.032	5.31	<.0001
03:00–02:59 | Thursday	0.082	0.034	2.40	0.0163
03:00–02:59 | Friday	0.103	0.033	3.09	0.0020
03:00–02:59 | Saturday	0.186	0.035	5.31	<.0001
03:00–02:59 | Sunday	0.210	0.037	5.67	<.0001
04:00–04:59 | Monday	-0.095	0.038	-2.48	0.0130
04:00–04:59 | Tuesday	-0.047	0.038	-1.26	0.2082
04:00–04:59 | Wednesday	-0.144	0.033	-4.33	<.0001
04:00–04:59 | Thursday	-0.044	0.035	-1.26	0.2078
04:00–04:59 | Friday	-0.075	0.033	-2.26	0.0237
04:00–04:59 | Saturday	0.100	0.035	2.86	0.0042
04:00–04:59 | Sunday	0.247	0.038	6.57	<.0001
05:00–05:59 | Monday	-0.103	0.040	-2.54	0.0109
05:00–05:59 | Tuesday	-0.078	0.039	-2.00	0.0455
05:00–05:59 | Wednesday	-0.046	0.034	-1.35	0.1759
05:00–05:59 | Thursday	0.049	0.035	1.40	0.1619
05:00–05:59 | Friday	0.026	0.035	0.75	0.4530
05:00–05:59 | Saturday	-0.047	0.036	-1.30	0.1951
05:00–05:59 | Sunday	0.010	0.038	0.25	0.8009
06:00–06:59 | Monday	0.158	0.039	4.02	<.0001
06:00–06:59 | Tuesday	0.500	0.038	13.33	<.0001
06:00–06:59 | Wednesday	0.416	0.033	12.52	<.0001
06:00–06:59 | Thursday	0.367	0.036	10.15	<.0001
06:00–06:59 | Friday	0.190	0.035	5.50	<.0001
06:00–06:59 | Saturday	-0.101	0.036	-2.79	0.0053

Variable	Estimate	Std. Error	t Value	Pr. > |t|
06:00–06:59 | Sunday	0.110	0.038	2.86	0.0042
07:00–07:59 | Monday	0.677	0.038	17.66	<.0001
07:00–07:59 | Tuesday	1.089	0.037	29.62	<.0001
07:00–07:59 | Wednesday	0.931	0.034	27.35	<.0001
07:00–07:59 | Thursday	1.128	0.036	31.08	<.0001
07:00–07:59 | Friday	0.642	0.035	18.33	<.0001
07:00–07:59 | Saturday	-0.056	0.036	-1.58	0.1145
07:00–07:59 | Sunday	-0.120	0.038	-3.12	0.0018
08:00–08:59 | Monday	0.601	0.036	16.64	<.0001
08:00–08:59 | Tuesday	0.909	0.037	24.70	<.0001
08:00–08:59 | Wednesday	0.567	0.034	16.65	<.0001
08:00–08:59 | Thursday	0.914	0.035	26.13	<.0001
08:00–08:59 | Friday	0.446	0.034	13.09	<.0001
08:00–08:59 | Saturday	-0.112	0.036	-3.11	0.0019
08:00–08:59 | Sunday	-0.088	0.038	-2.28	0.0227
09:00–09:59 | Monday	-0.014	0.034	-0.41	0.6853
09:00–09:59 | Tuesday	-0.097	0.035	-2.76	0.0058
09:00–09:59 | Wednesday	0.099	0.034	2.93	0.0033
09:00–09:59 | Thursday	0.028	0.035	0.82	0.4131
09:00–09:59 | Friday	-0.088	0.034	-2.59	0.0095
09:00–09:59 | Saturday	-0.111	0.037	-3.02	0.0025
09:00–09:59 | Sunday	-0.140	0.035	-3.99	<.0001
10:00–10:59 | Monday	-0.054	0.033	-1.65	0.0997
10:00–10:59 | Tuesday	-0.028	0.034	-0.85	0.3981
10:00–10:59 | Wednesday	-0.076	0.033	-2.30	0.0215
10:00–10:59 | Thursday	-0.063	0.036	-1.75	0.0805
10:00–10:59 | Friday	-0.121	0.035	-3.51	0.0004
10:00–10:59 | Saturday	-0.056	0.036	-1.58	0.1150
10:00–10:59 | Sunday	-0.143	0.035	-4.10	<.0001
11:00–11:59 | Monday	-0.061	0.033	-1.87	0.0617
11:00–11:59 | Tuesday (Reference)	.	.	.	.
11:00–11:59 | Wednesday	-0.050	0.033	-1.52	0.1296
11:00–11:59 | Thursday	-0.089	0.034	-2.58	0.0098
11:00–11:59 | Friday	-0.038	0.034	-1.12	0.2624
11:00–11:59 | Saturday	-0.057	0.034	-1.68	0.0927
11:00–11:59 | Sunday	-0.124	0.034	-3.69	0.0002
12:00–12:59 | Monday	-0.044	0.032	-1.39	0.1640
12:00–12:59 | Tuesday	-0.109	0.033	-3.29	0.0010
12:00–12:59 | Wednesday	-0.109	0.032	-3.37	0.0008

Variable	Estimate	Std. Error	t Value	Pr. > |t|
12:00–12:59 | Thursday	-0.068	0.036	-1.90	0.0572
12:00–12:59 | Friday	0.001	0.034	0.02	0.9834
12:00–12:59 | Saturday	-0.044	0.034	-1.29	0.1957
12:00–12:59 | Sunday	0.026	0.034	0.76	0.4446
13:00–13:59 | Monday	-0.055	0.032	-1.74	0.0815
13:00–13:59 | Tuesday	-0.067	0.033	-2.02	0.0439
13:00–13:59 | Wednesday	-0.085	0.032	-2.63	0.0086
13:00–13:59 | Thursday	-0.133	0.036	-3.67	0.0002
13:00–13:59 | Friday	0.006	0.033	0.18	0.8590
13:00–13:59 | Saturday	-0.102	0.034	-3.00	0.0027
13:00–13:59 | Sunday	-0.142	0.033	-4.31	<.0001
14:00–14:59 | Monday	0.045	0.032	1.42	0.1546
14:00–14:59 | Tuesday	-0.057	0.032	-1.78	0.0755
14:00–14:59 | Wednesday	-0.054	0.033	-1.67	0.0950
14:00–14:59 | Thursday	-0.118	0.035	-3.38	0.0007
14:00–14:59 | Friday	-0.014	0.034	-0.41	0.6790
14:00–14:59 | Saturday	-0.101	0.034	-3.02	0.0025
14:00–14:59 | Sunday	-0.112	0.033	-3.43	0.0006
15:00–15:59 | Monday	-0.072	0.032	-2.27	0.0235
15:00–15:59 | Tuesday	-0.009	0.031	-0.28	0.7830
15:00–15:59 | Wednesday	-0.101	0.032	-3.13	0.0017
15:00–15:59 | Thursday	0.004	0.034	0.12	0.9061
15:00–15:59 | Friday	-0.099	0.035	-2.85	0.0043
15:00–15:59 | Saturday	-0.116	0.034	-3.44	0.0006
15:00–15:59 | Sunday	-0.071	0.033	-2.14	0.0323
16:00–16:59 | Monday	-0.052	0.032	-1.60	0.1085
16:00–16:59 | Tuesday	-0.021	0.032	-0.66	0.5119
16:00–16:59 | Wednesday	-0.049	0.033	-1.47	0.1403
16:00–16:59 | Thursday	-0.038	0.034	-1.11	0.2683
16:00–16:59 | Friday	-0.079	0.034	-2.33	0.0199
16:00–16:59 | Saturday	-0.108	0.033	-3.24	0.0012
16:00–16:59 | Sunday	-0.123	0.033	-3.75	0.0002
17:00–17:59 | Monday	-0.068	0.033	-2.09	0.0370
17:00–17:59 | Tuesday	-0.033	0.032	-1.02	0.3057
17:00–17:59 | Wednesday	-0.055	0.033	-1.64	0.1002
17:00–17:59 | Thursday	0.048	0.033	1.43	0.1513
17:00–17:59 | Friday	-0.004	0.035	-0.12	0.9082
17:00–17:59 | Saturday	-0.039	0.034	-1.12	0.2616
17:00–17:59 | Sunday	-0.097	0.033	-2.94	0.0033

Variable	Estimate	Std. Error	t Value	Pr. > |t|
18:00–18:59 | Monday	-0.085	0.033	-2.60	0.0093
18:00–18:59 | Tuesday	-0.015	0.032	-0.47	0.6400
18:00–18:59 | Wednesday	-0.065	0.033	-1.95	0.0512
18:00–18:59 | Thursday	-0.015	0.033	-0.46	0.6449
18:00–18:59 | Friday	-0.099	0.035	-2.82	0.0048
18:00–18:59 | Saturday	-0.071	0.035	-2.02	0.0434
18:00–18:59 | Sunday	-0.075	0.033	-2.29	0.0220
19:00–19:59 | Monday	-0.043	0.033	-1.29	0.1954
19:00–19:59 | Tuesday	-0.073	0.032	-2.29	0.0221
19:00–19:59 | Wednesday	-0.004	0.033	-0.13	0.8981
19:00–19:59 | Thursday	-0.042	0.033	-1.27	0.2045
19:00–19:59 | Friday	-0.087	0.034	-2.53	0.0115
19:00–19:59 | Saturday	-0.138	0.036	-3.89	0.0001
19:00–19:59 | Sunday	-0.101	0.032	-3.13	0.0017
20:00–20:59 | Monday	-0.084	0.033	-2.54	0.0110
20:00–20:59 | Tuesday	-0.101	0.033	-3.07	0.0021
20:00–20:59 | Wednesday	-0.055	0.033	-1.66	0.0962
20:00–20:59 | Thursday	-0.046	0.033	-1.37	0.1707
20:00–20:59 | Friday	-0.107	0.036	-3.01	0.0026
20:00–20:59 | Saturday	-0.097	0.036	-2.73	0.0064
20:00–20:59 | Sunday	-0.051	0.033	-1.54	0.1239
21:00–21:59 | Monday	-0.126	0.034	-3.73	0.0002
21:00–21:59 | Tuesday	-0.044	0.034	-1.30	0.1922
21:00–21:59 | Wednesday	-0.152	0.033	-4.62	<.0001
21:00–21:59 | Thursday	-0.065	0.033	-1.95	0.0514
21:00–21:59 | Friday	-0.009	0.038	-0.24	0.8142
21:00–21:59 | Saturday	-0.103	0.035	-2.93	0.0034
21:00–21:59 | Sunday	-0.051	0.035	-1.49	0.1368
22:00–22:59 | Monday	0.052	0.034	1.54	0.1228
22:00–22:59 | Tuesday	-0.063	0.034	-1.88	0.0604
22:00–22:59 | Wednesday	-0.022	0.034	-0.65	0.5146
22:00–22:59 | Thursday	0.010	0.033	0.30	0.7657
22:00–22:59 | Friday	-0.035	0.038	-0.91	0.3650
22:00–22:59 | Saturday	-0.087	0.035	-2.51	0.0120
22:00–22:59 | Sunday	0.011	0.034	0.33	0.7409
23:00–23:59 | Monday	0.059	0.034	1.76	0.0792
23:00–23:59 | Tuesday	-0.033	0.033	-1.00	0.3182
23:00–23:59 | Wednesday	-0.013	0.034	-0.38	0.7033
23:00–23:59 | Thursday	-0.045	0.033	-1.35	0.1772

Variable	Estimate	Std. Error	t Value	Pr. > |t|
23:00–23:59 | Friday	-0.001	0.038	-0.02	0.9829
23:00–23:59 | Saturday	-0.029	0.037	-0.78	0.4354
23:00–23:59 | Sunday	0.225	0.034	6.62	<.0001
R-Square	0.276			
Coeff Var	49.570			
Root MSE	0.378			
Y Mean	0.762			

APPENDIX C. DATA COLLECTION OF ROADWAY CHARACTERISTICS

During the field visit to the two sites near Indianapolis, specific important roadway characteristics, including speed limit signs, pavement markings, auxiliary lanes, etc., were collected using a GPS-based application. At the same time, the other features were extracted based on the videos taken as well as Google Maps. Here the configuration information for the GPS-based application is attached in Table 18. In addition, a screenshot of the post-collection data analysis application is presented in Figure 44.

Table C.1 Configuration table of GPS-based application

Key	Description
7D	Differential speed limit = 70/65 mph
7U	Uniform speed limit = 70 mph
6D	Differential speed limit = 65/60 mph
6U	Uniform speed limit = 65 mph
5U	Speed limit = 55 mph
W	Speed warning sign
PS	Pavement markings start
PE	Pavement markings end
AS	Auxiliary lane starts
AE	Auxiliary lane ends
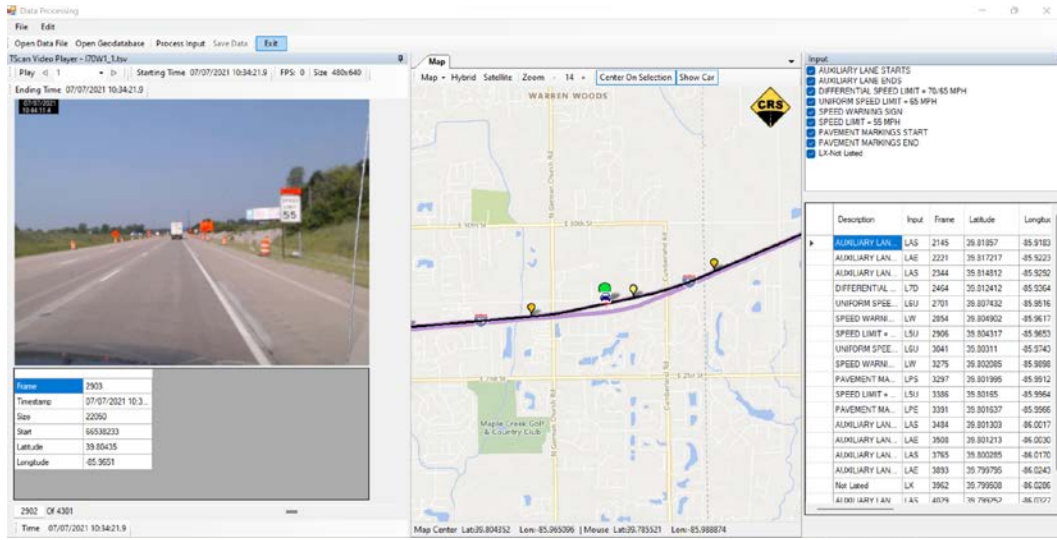
Figure C.1 Screenshot of GPS data analysis.

APPENDIX D. SPEED PROFILES

D.1 I-70 WB in Greenfield District

Average traffic conditions.
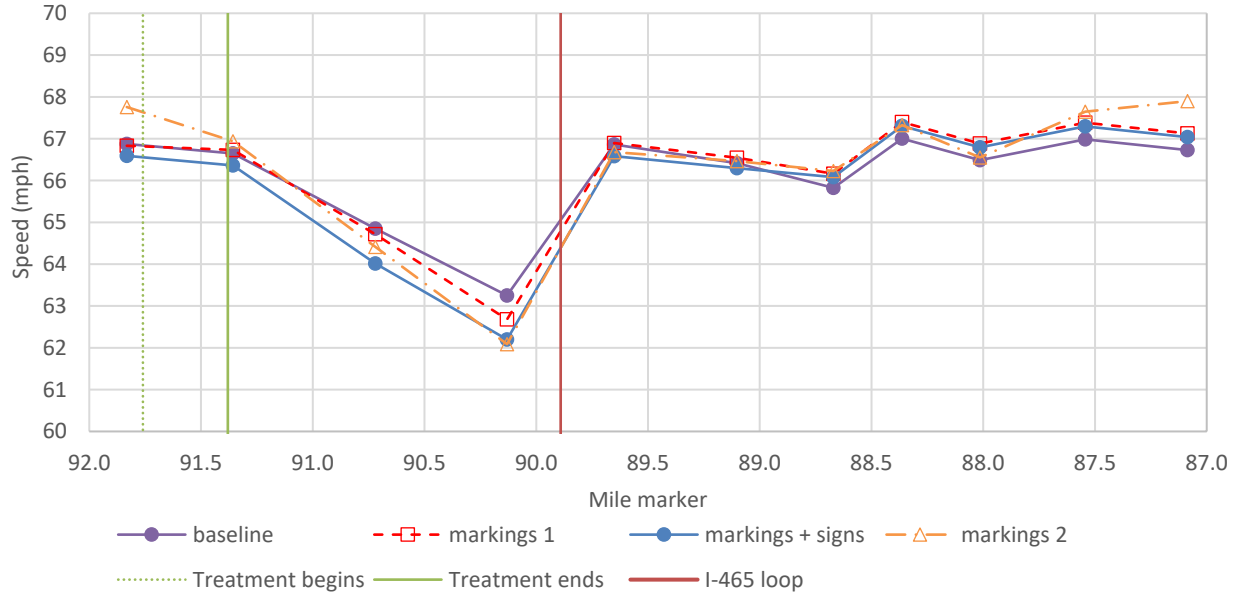
Figure D.1 Average speed profile by treatment phase on I-70 WB.
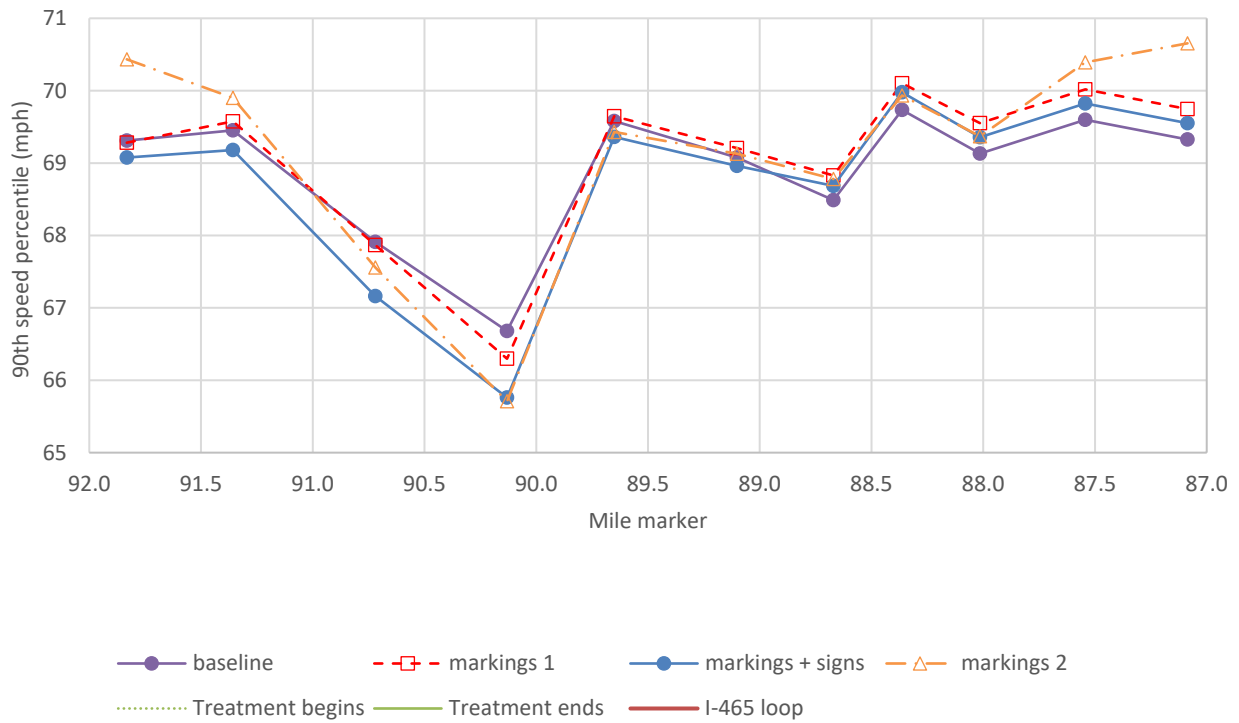
Figure D.2 90th percentile speed profile by treatment phase on I-70 WB.
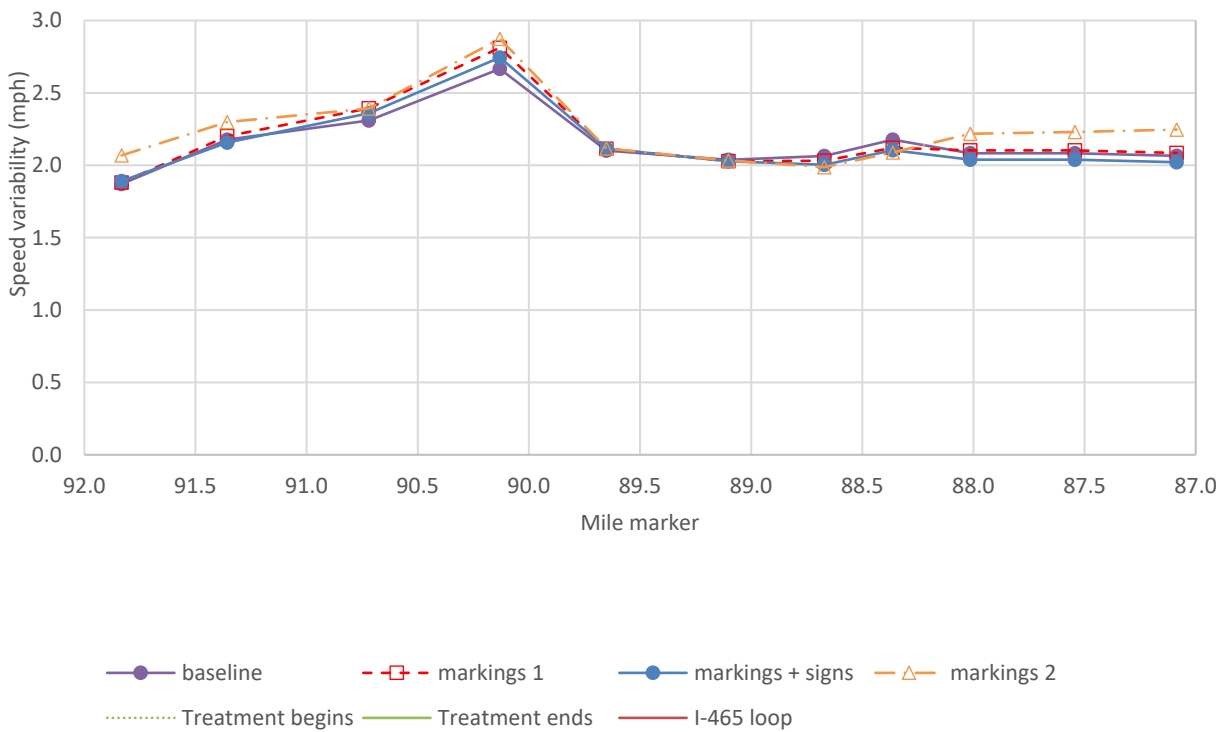
Figure D.3 Speed variability profile by treatment phase on I-70 WB.

Specific traffic conditions.
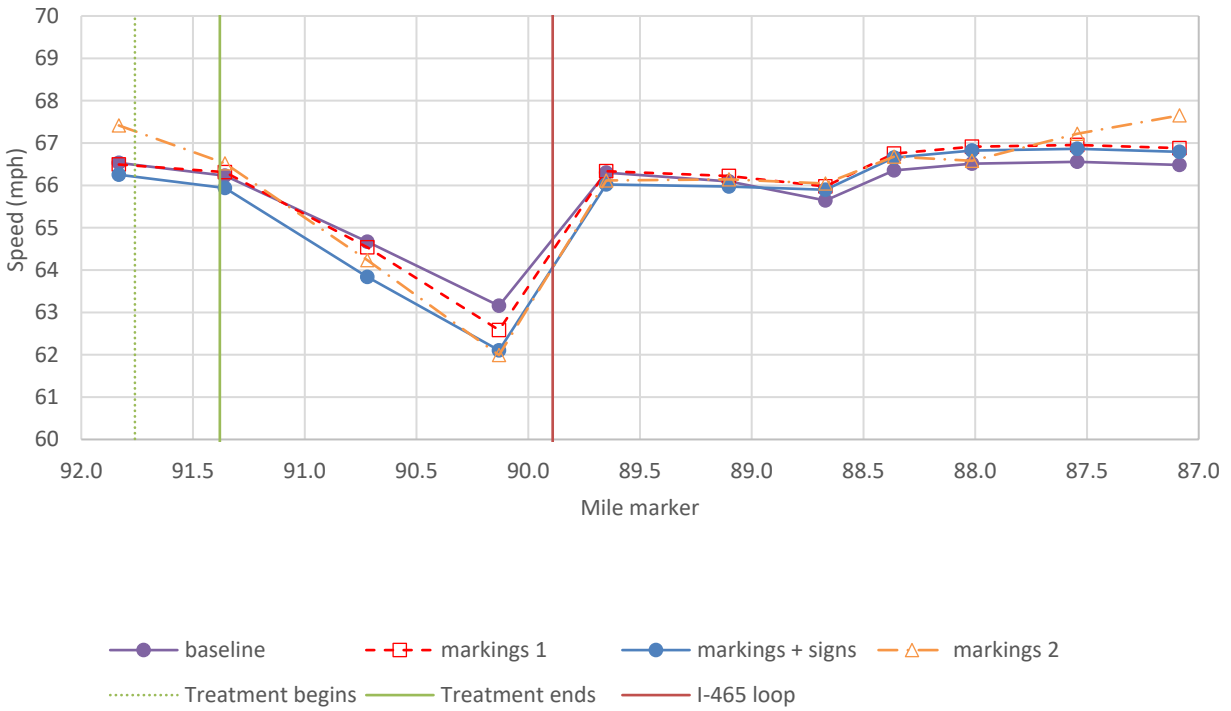
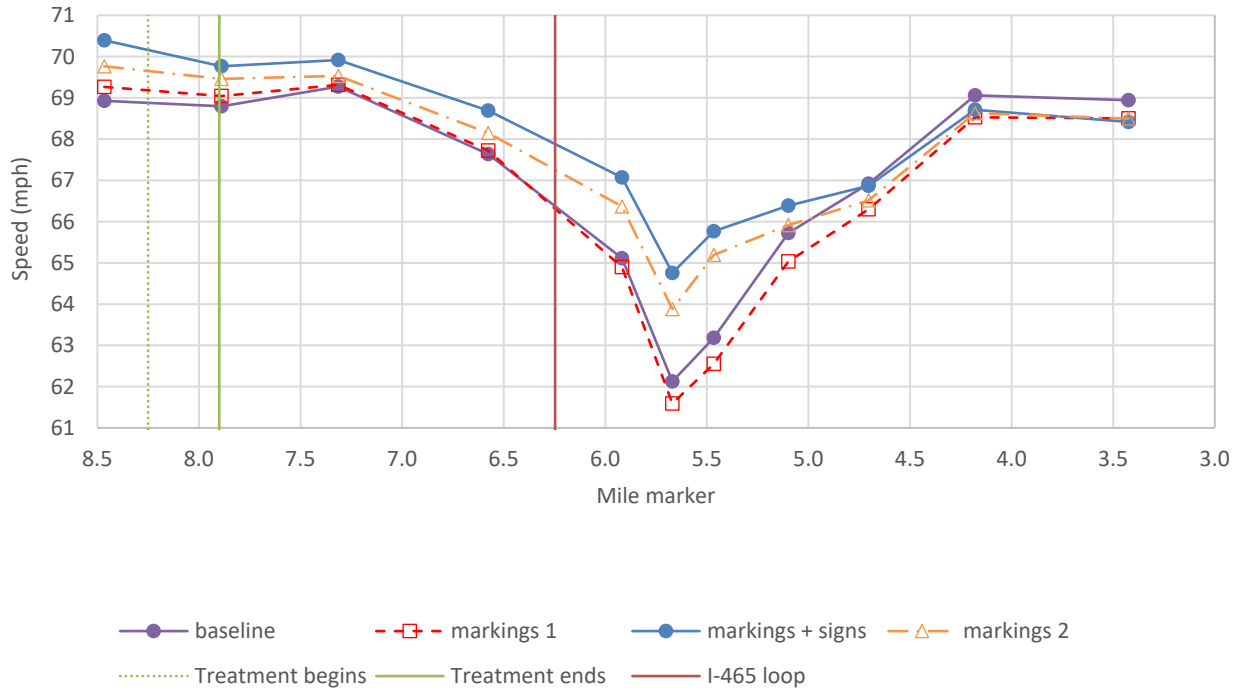*Figure D.4 Speed profile by treatment phase on I-70 WB—Monday to Thursday midday.*
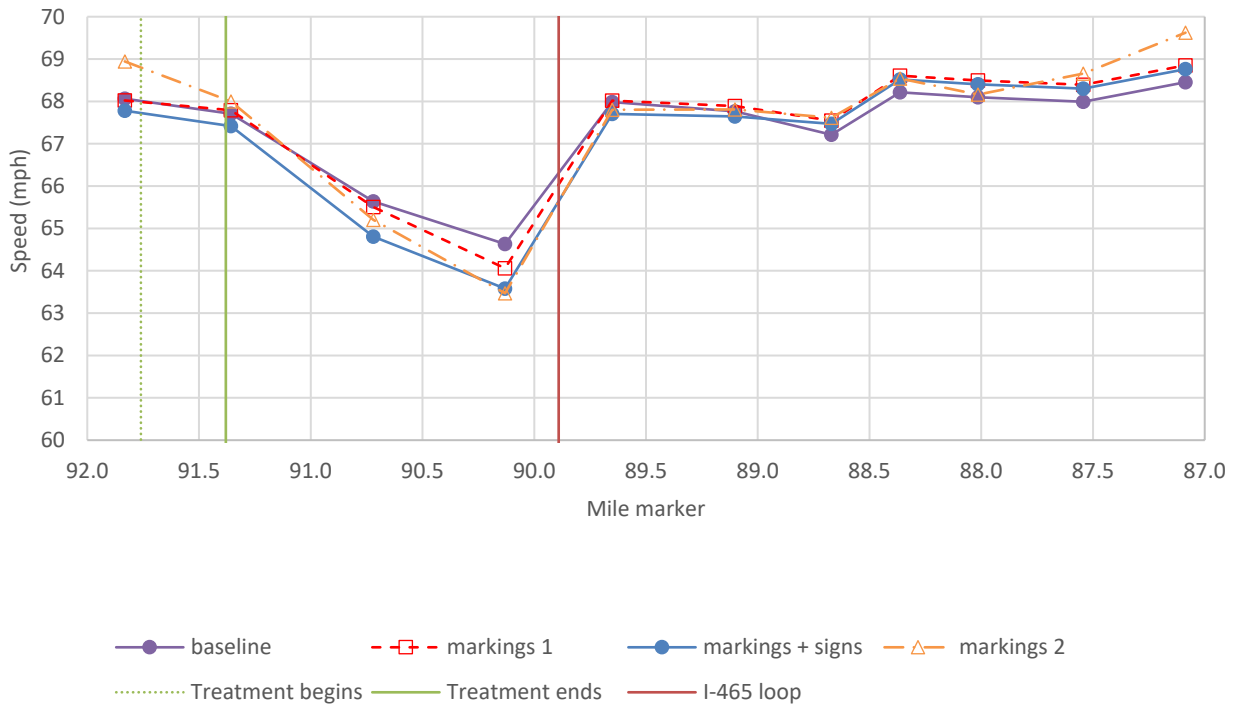
Figure D.5 Speed profile by treatment phase on I-70 WB—Monday to Thursday morning.
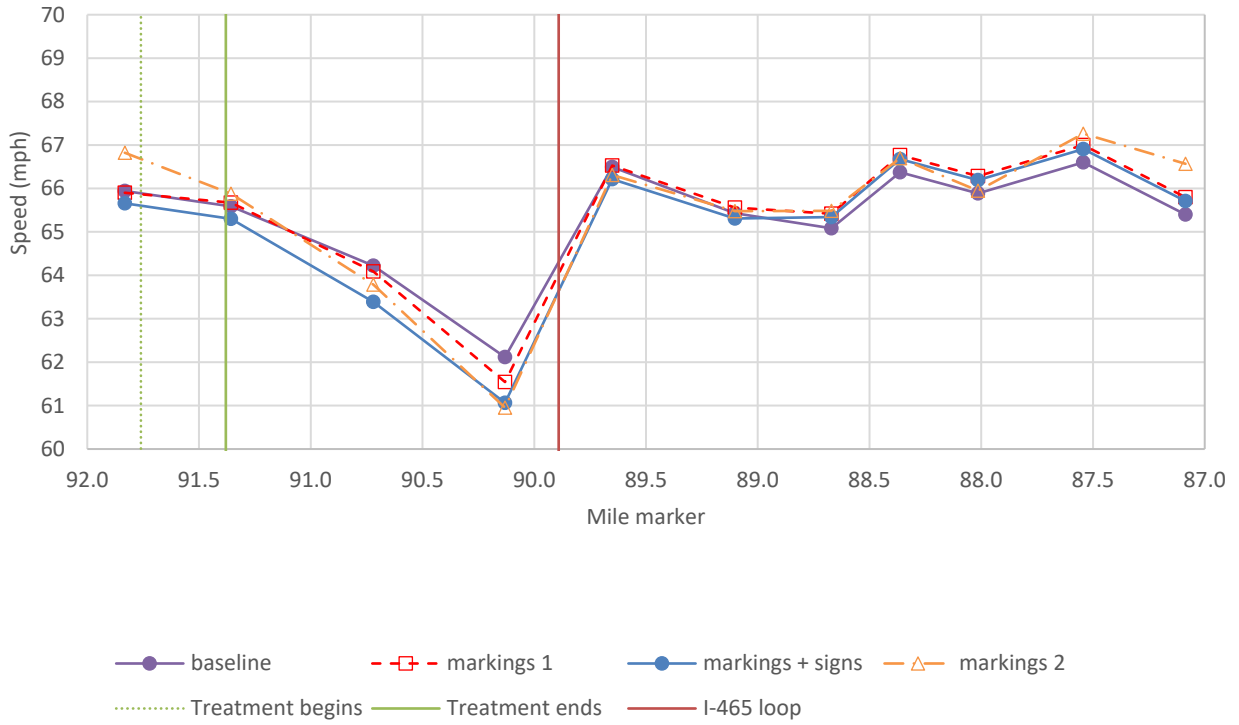
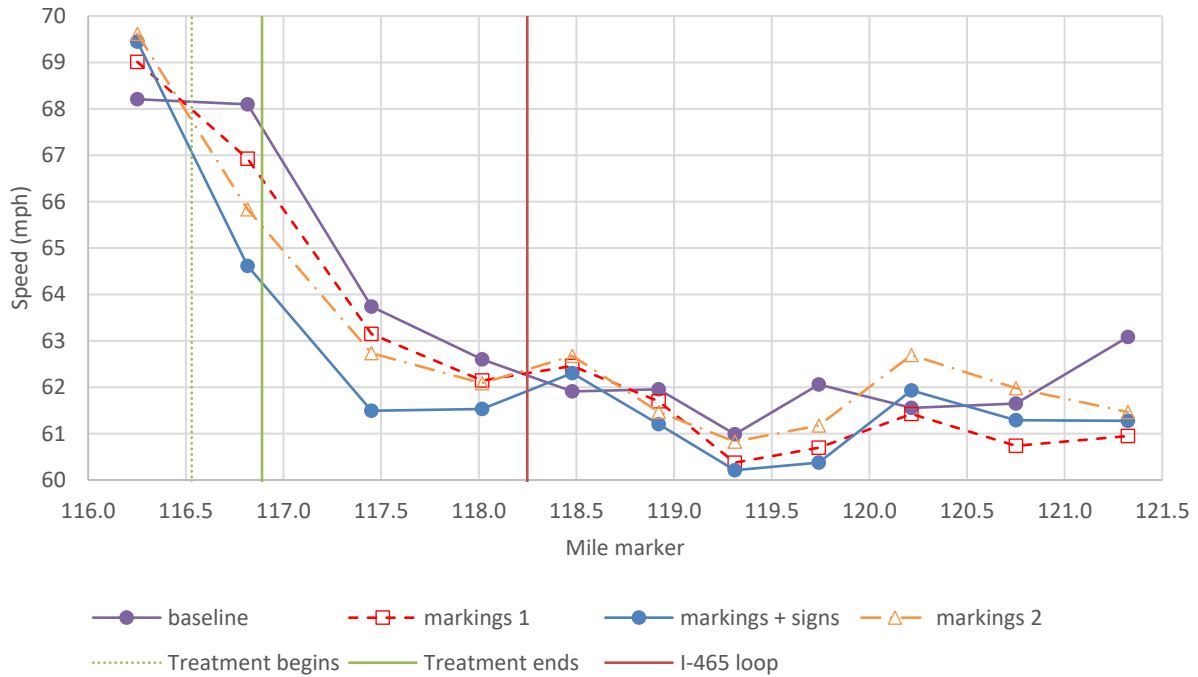*Figure D.6 Speed profile by treatment phase on I-70 WB—Monday to Thursday night.*
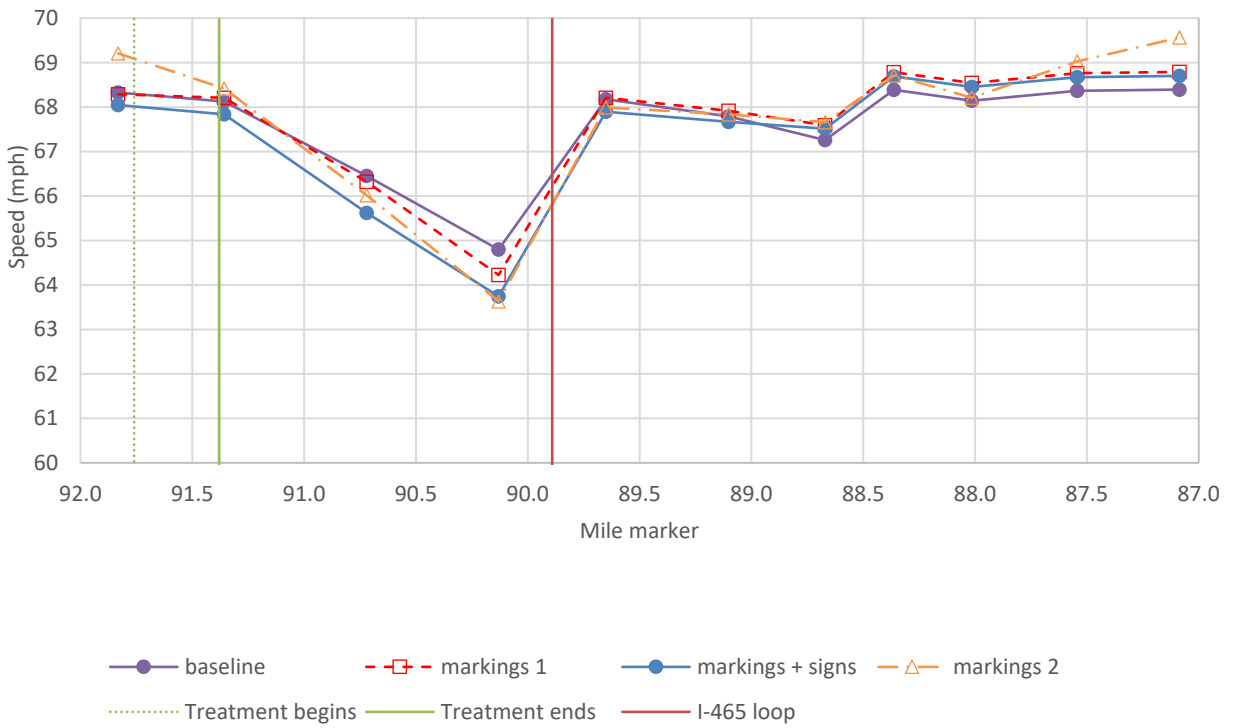
Figure D.7 Speed profile by treatment phase on I-70 WB—Saturday and Sunday daytime.
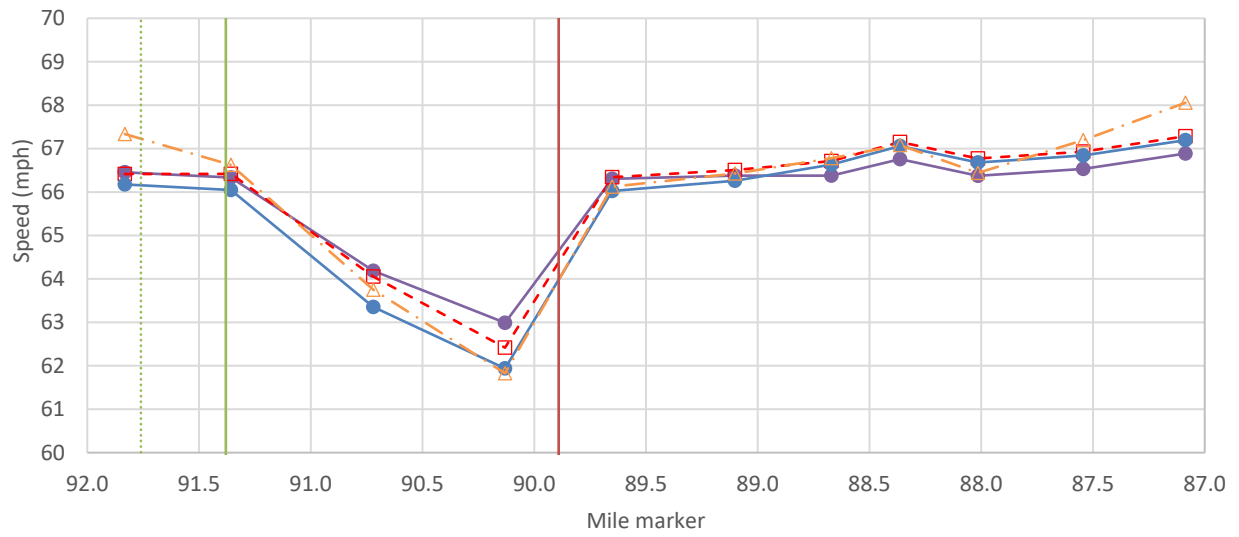
Figure D.8 Speed profile by treatment phase on I-70 WB—Saturday and Sunday night.

D.2 I-65 NB in Greenfield District

Average traffic conditions.
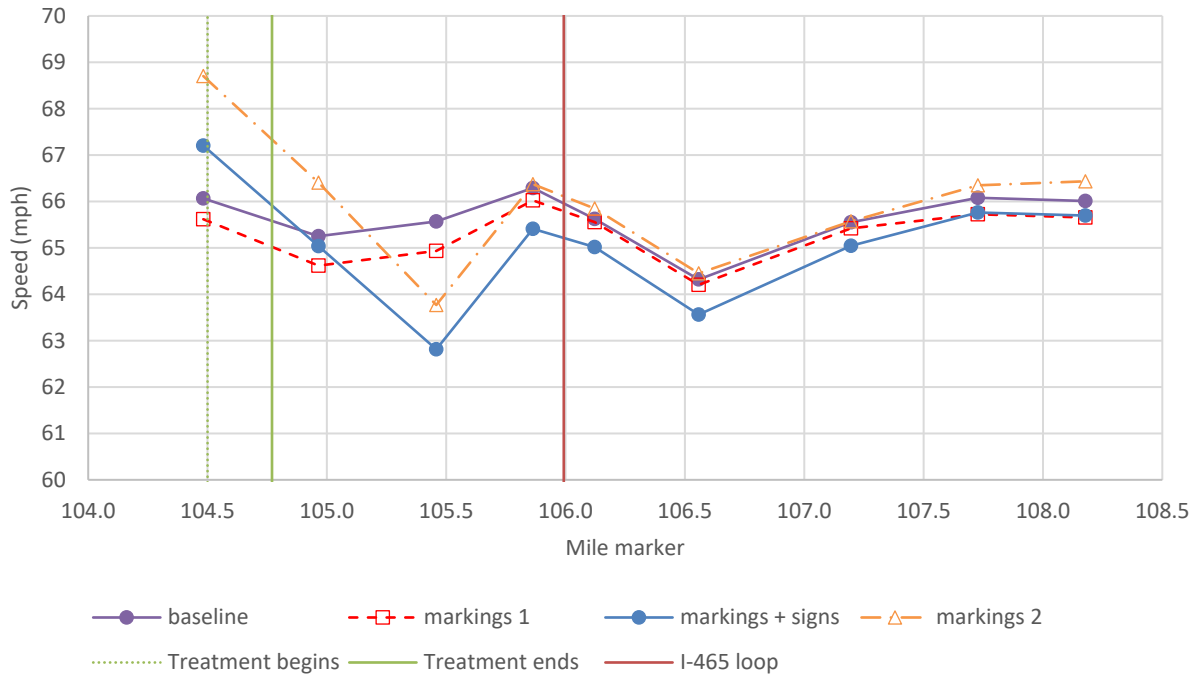
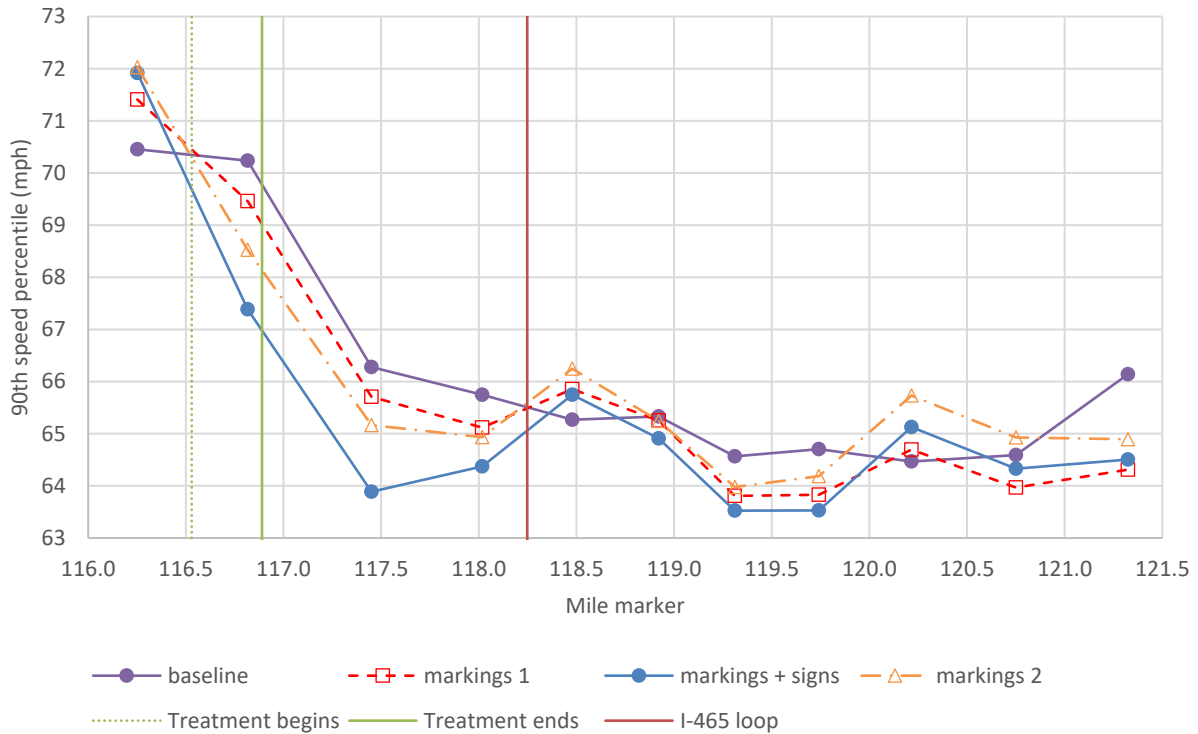*Figure D.9 Average speed profile by treatment phase on I-65 NB.*
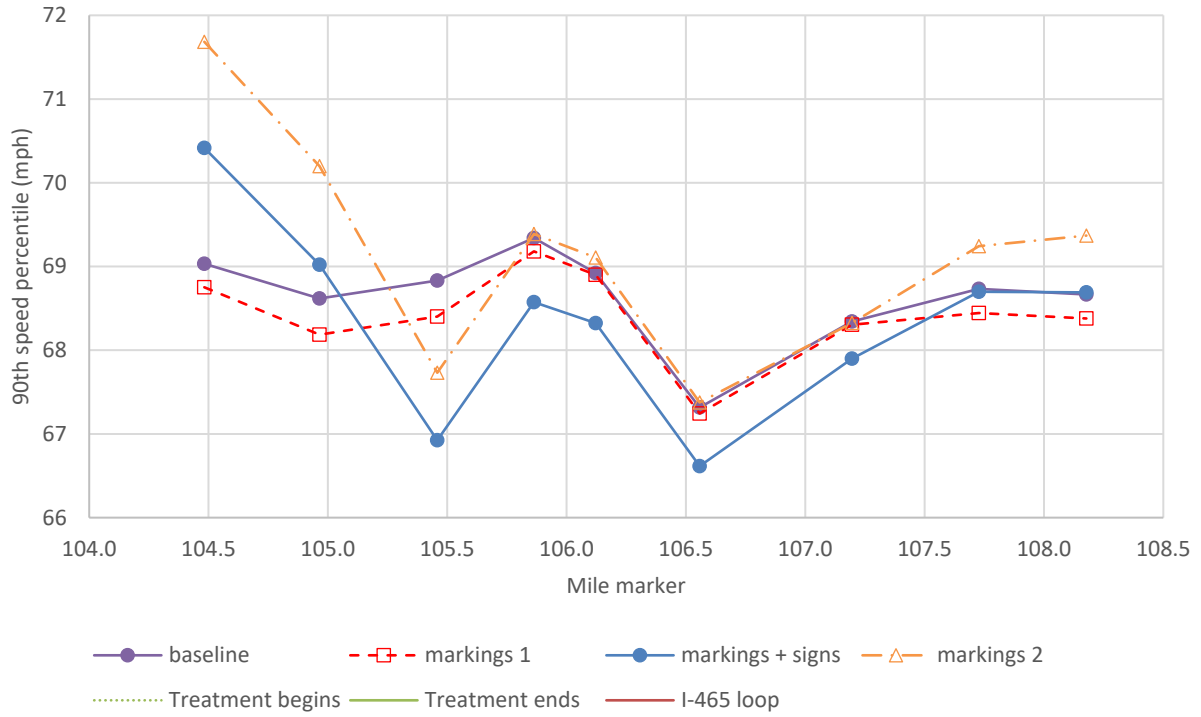
Figure D.10 90th percentile speed profile by treatment phase on I-65 NB.
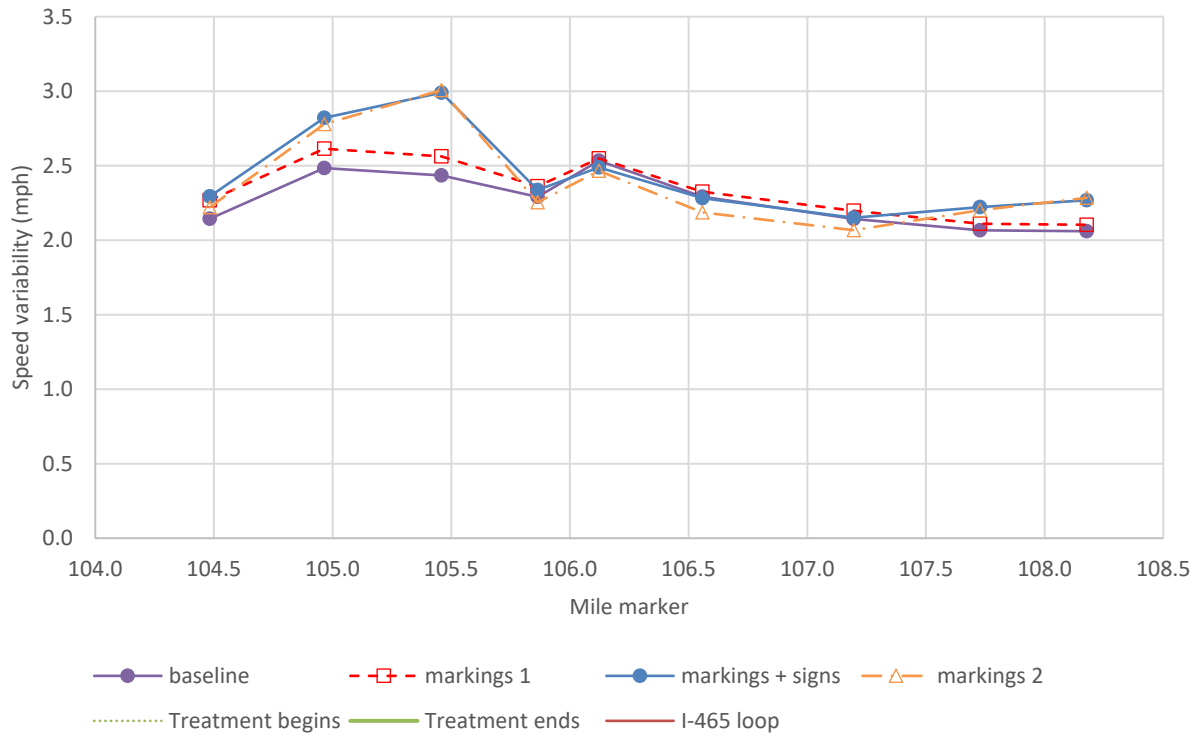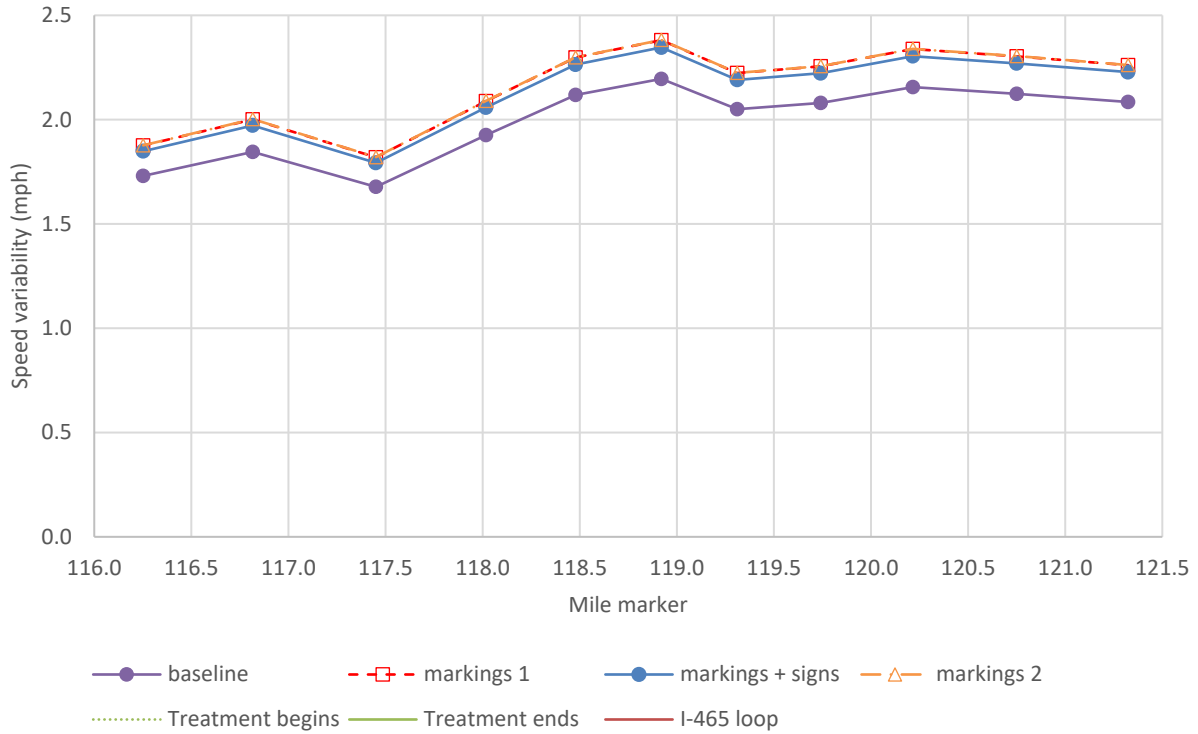

Figure D.11 Speed variability profile by treatment phase on I-65 NB.
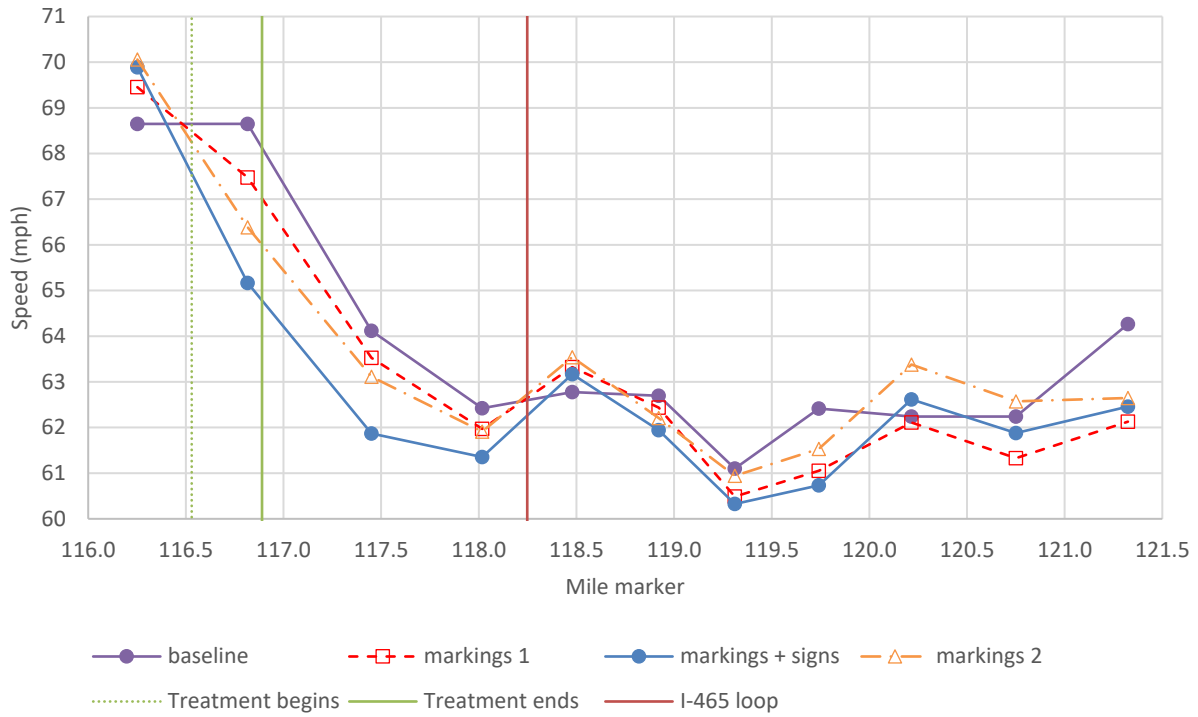
Specific traffic conditions.
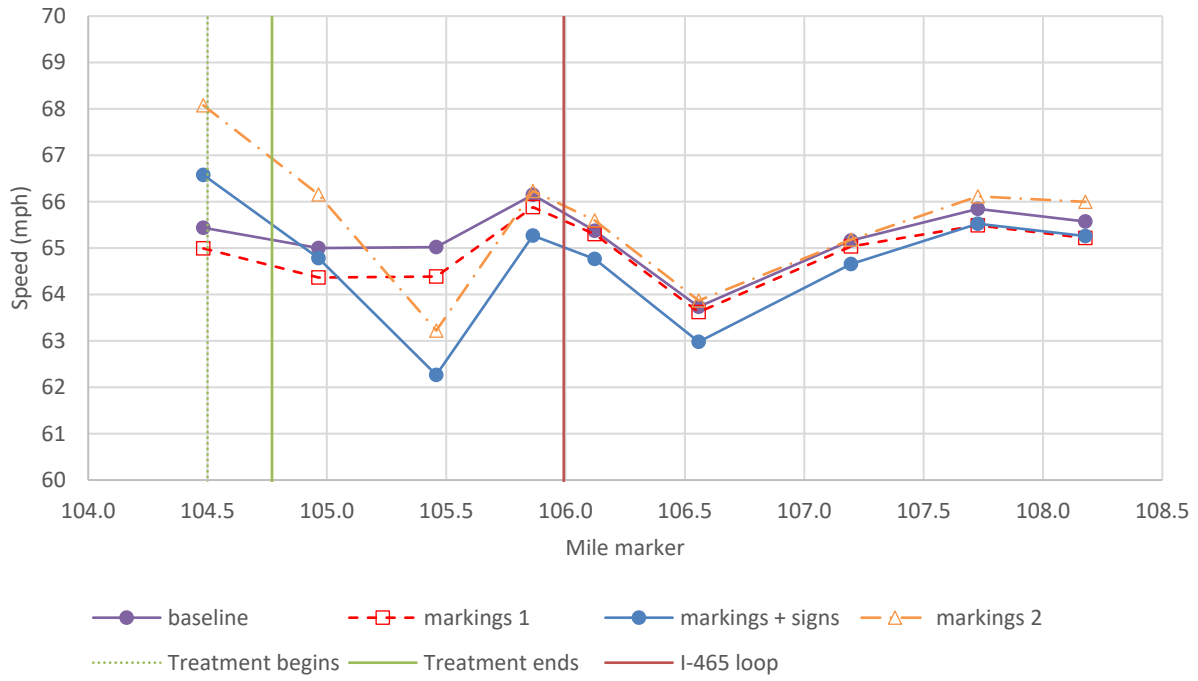
Figure D.12 Speed profile by treatment phase on I-65 NB—Monday to Thursday midday.
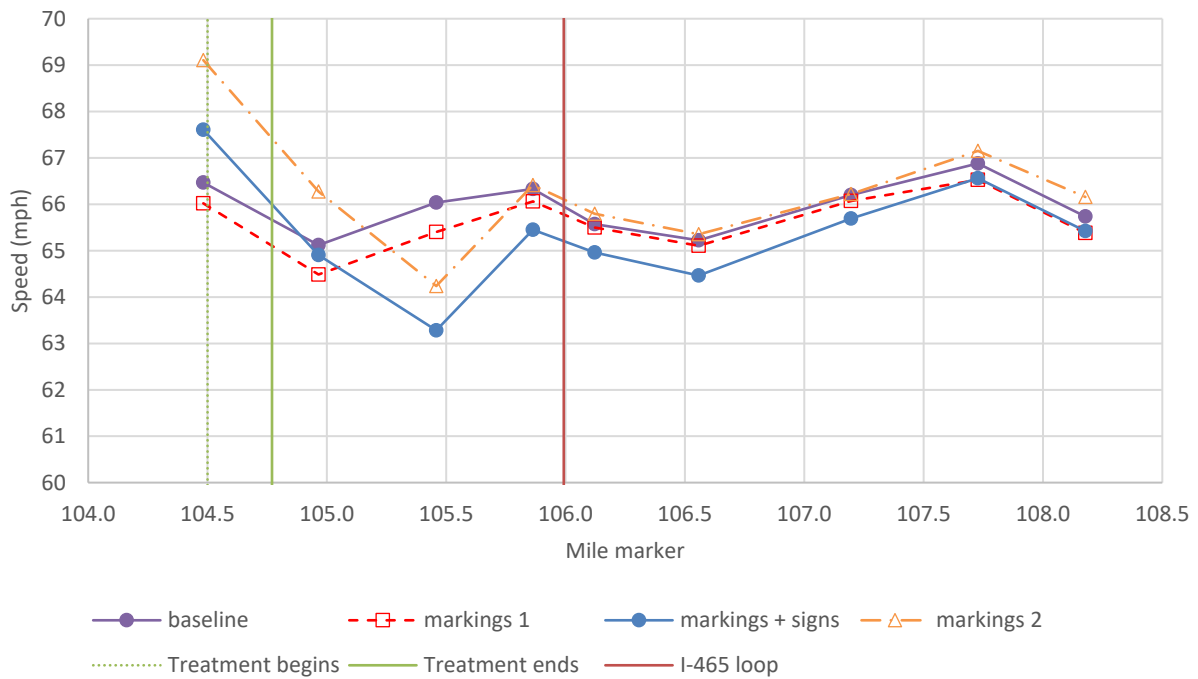
Figure D.13 Speed profile by treatment phase on I-65 NB—Monday to Thursday morning.
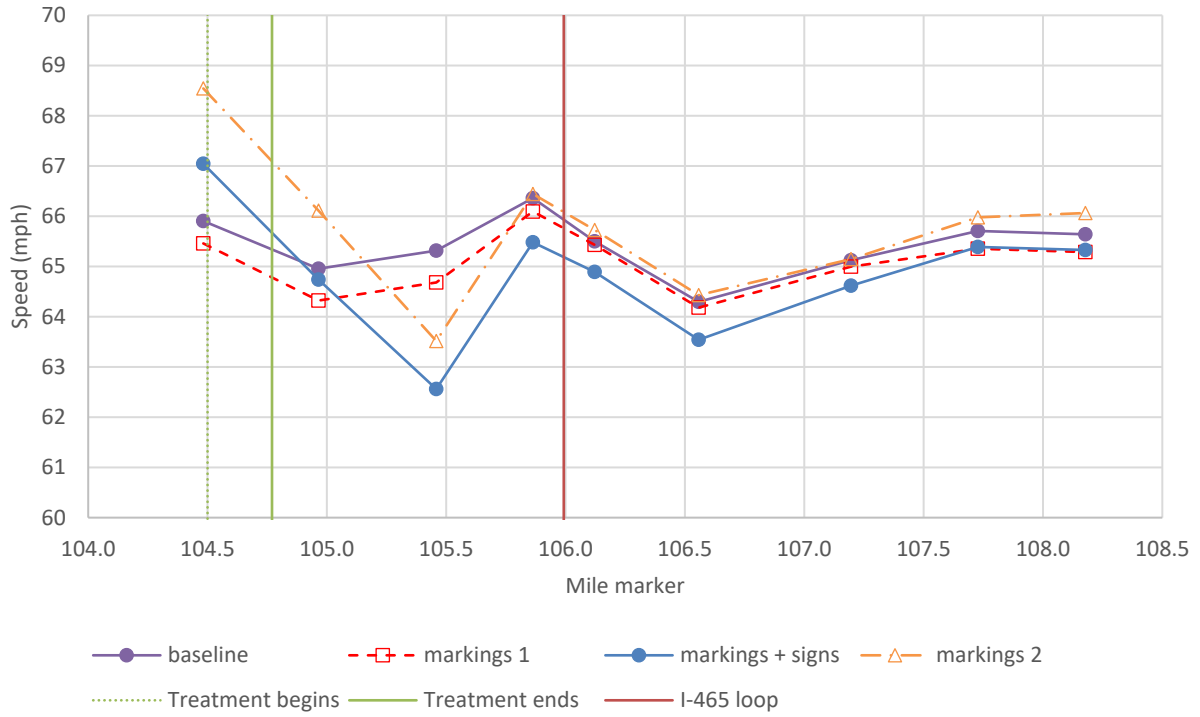
Figure D.14 Speed profile by treatment phase on I-65 NB—Monday to Thursday night.
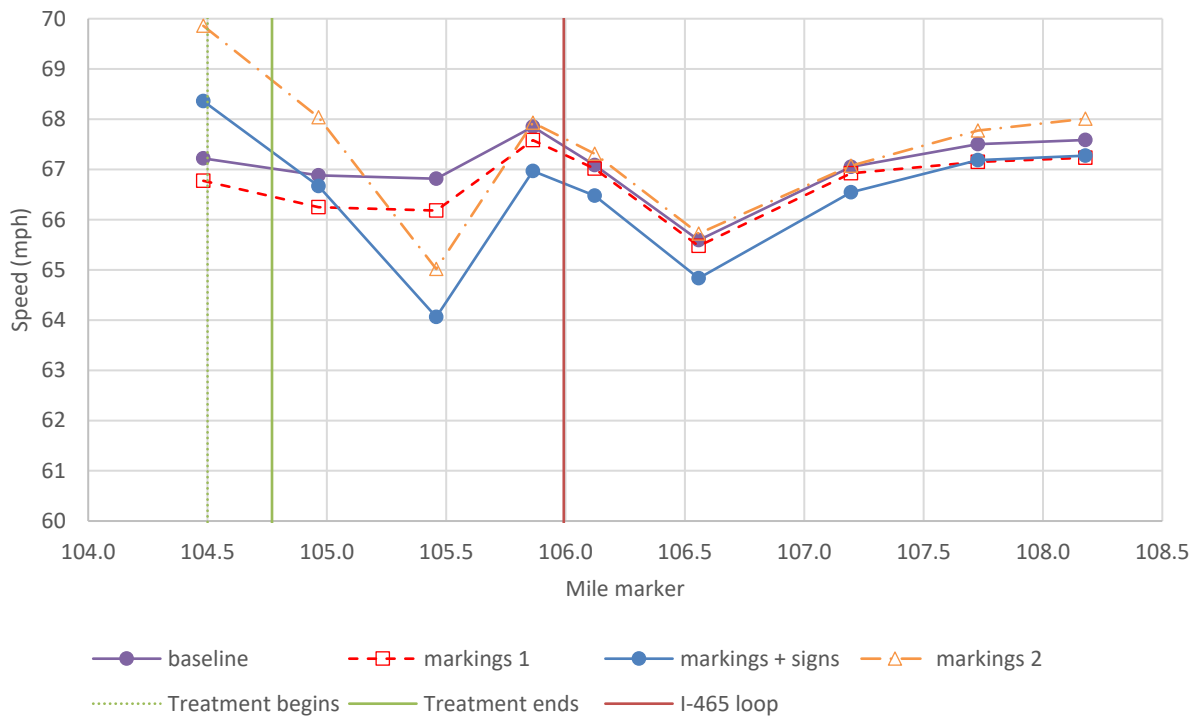
Figure D.15 Speed profile by treatment phase on I-65 NB—Saturday and Sunday daytime.
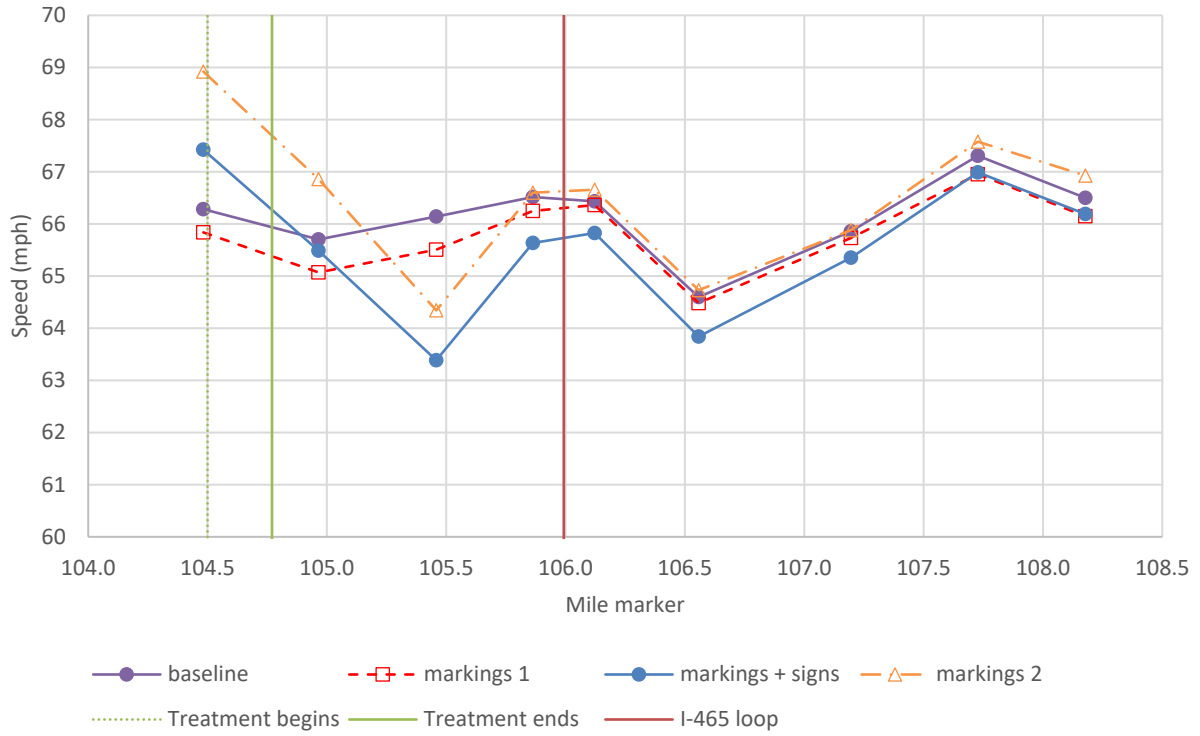
Figure D.16 Speed profile by treatment phase on I-65 NB—Saturday and Sunday night.

D.3 I-65 SB in Seymour District

Average traffic conditions.
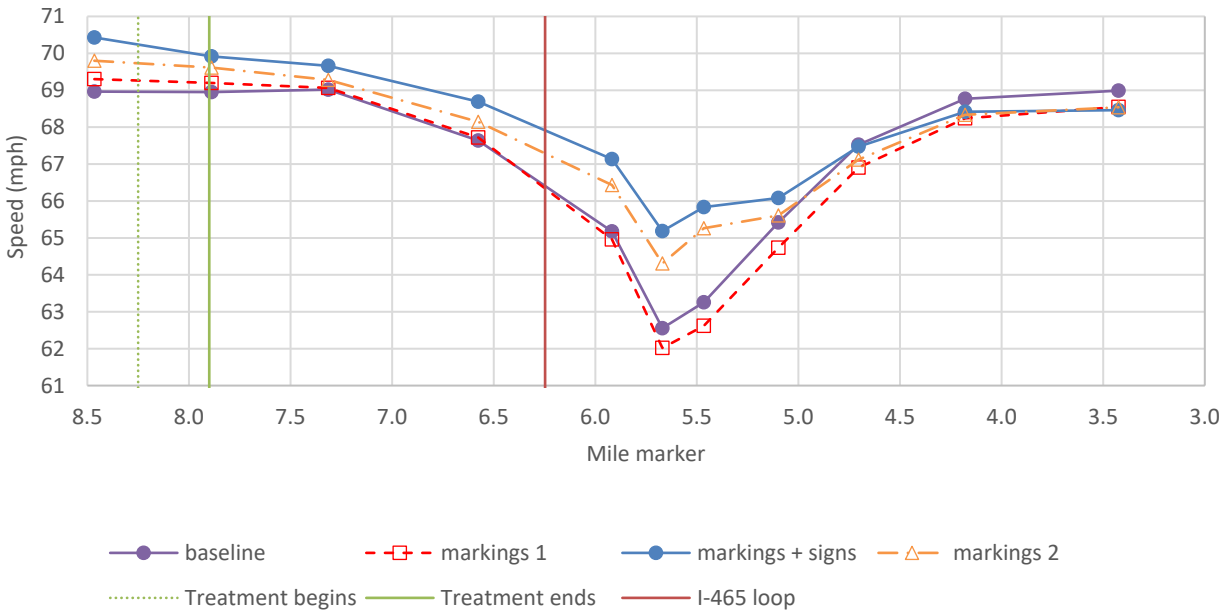
Figure D.17 Average speed profile by treatment phase on I-65 SB.
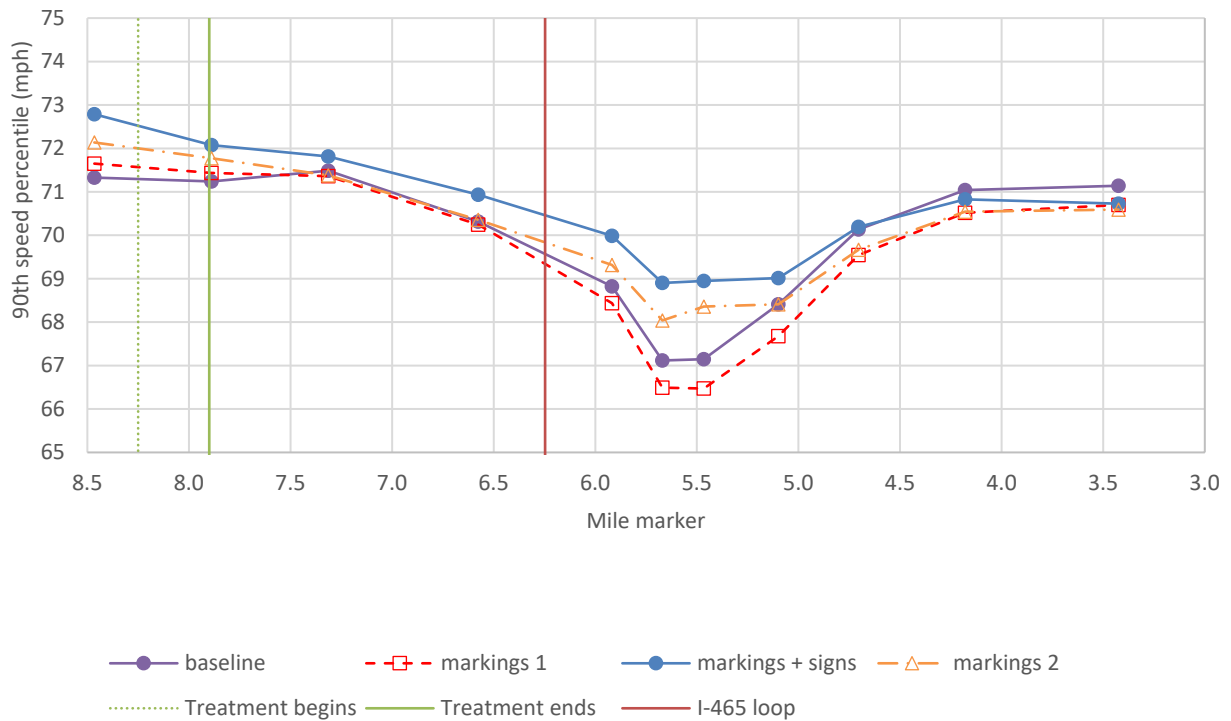
Figure D.18 90th percentile speed profile by treatment phase on I-65 SB.
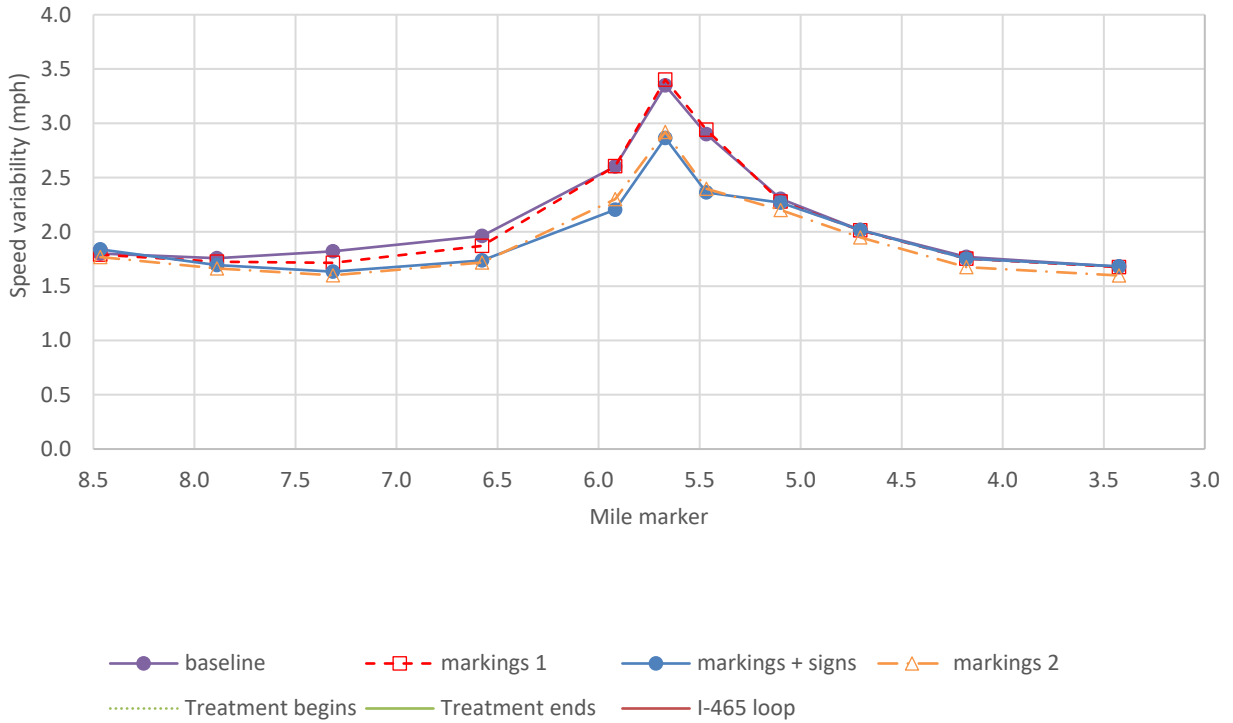
Figure D.19 Speed variability profile by treatment phase on I-65 SB.

Specific traffic conditions.
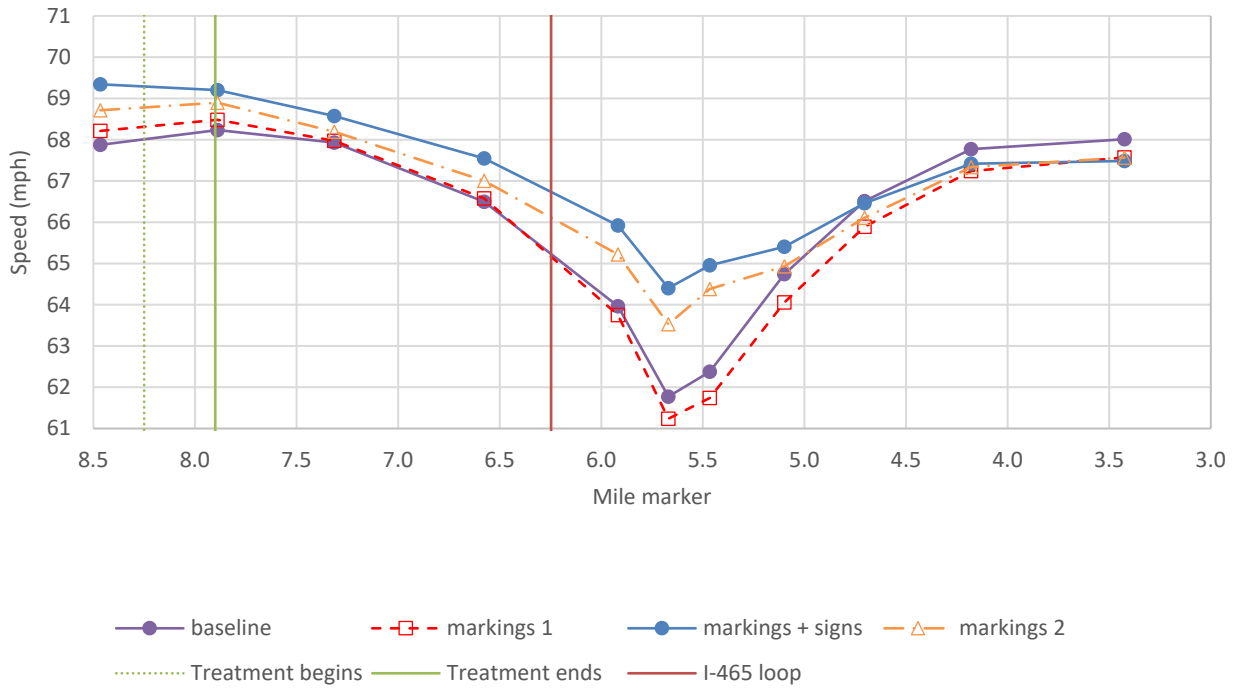
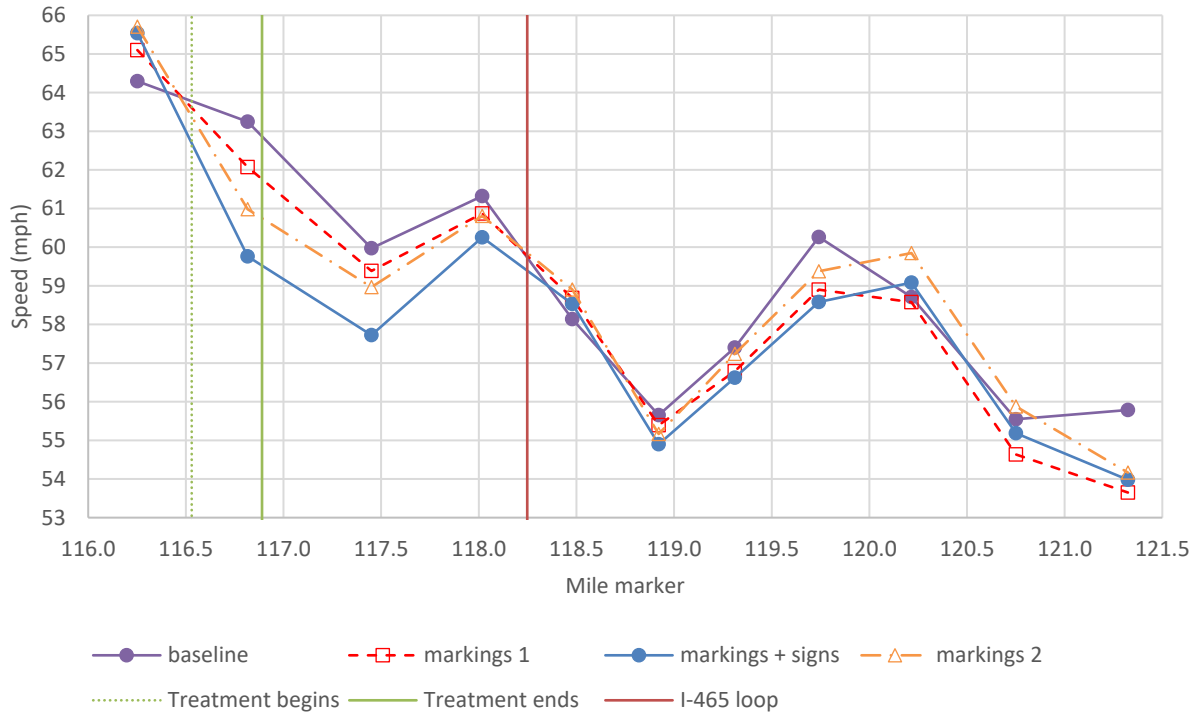*Figure D.20 Speed profile by treatment phase on I-65 SB—Monday to Thursday midday.*

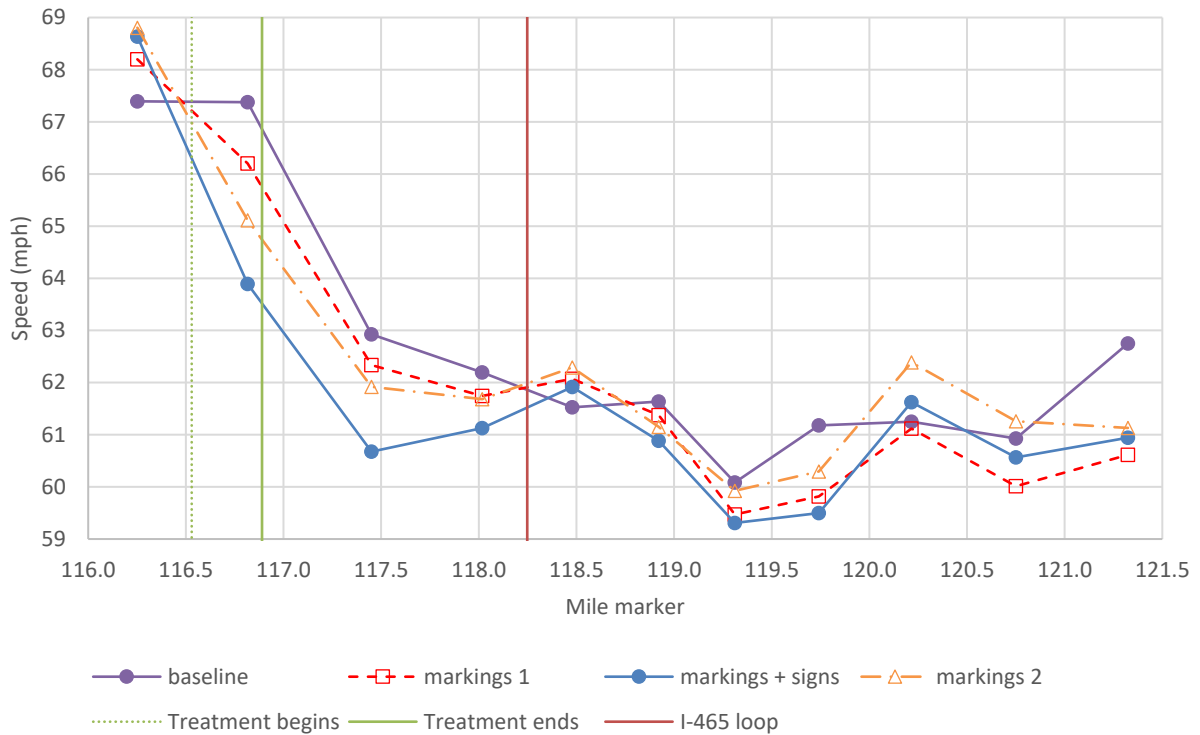*Figure D.21 Speed profile by treatment phase on I-65 SB—Monday to Thursday morning.*
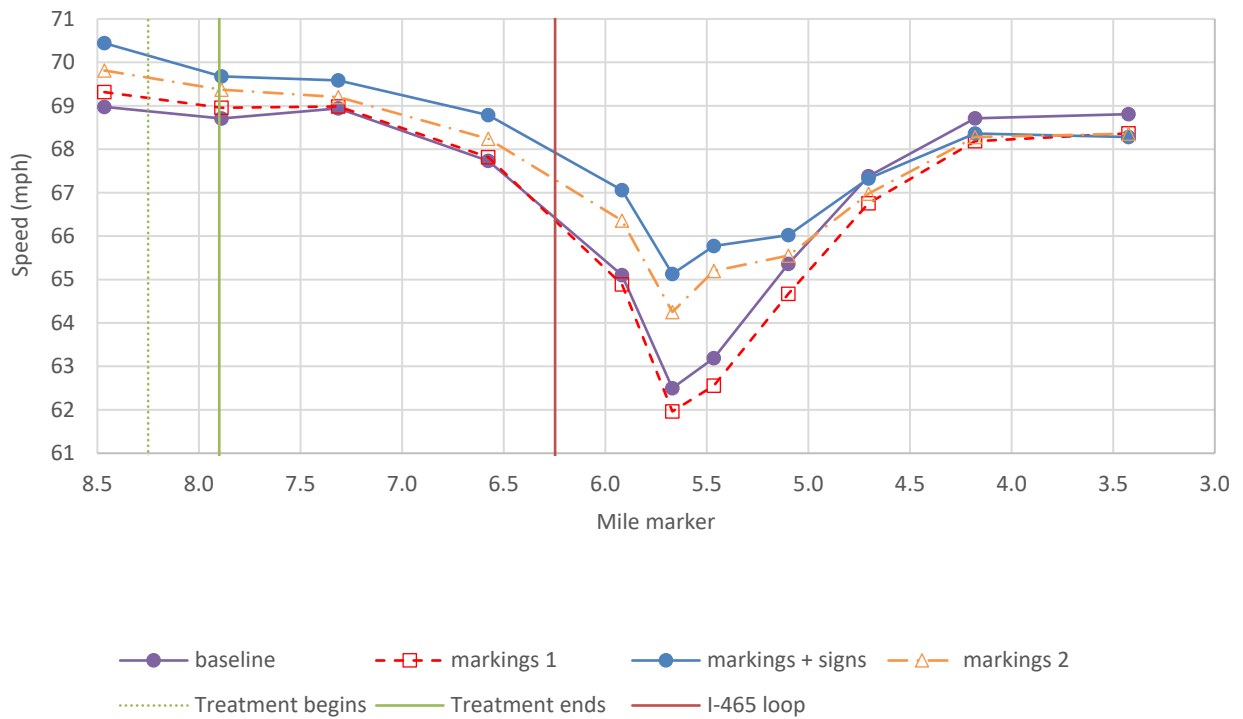
Figure D.22 Speed profile by treatment phase on I-65 SB—Monday to Thursday night.
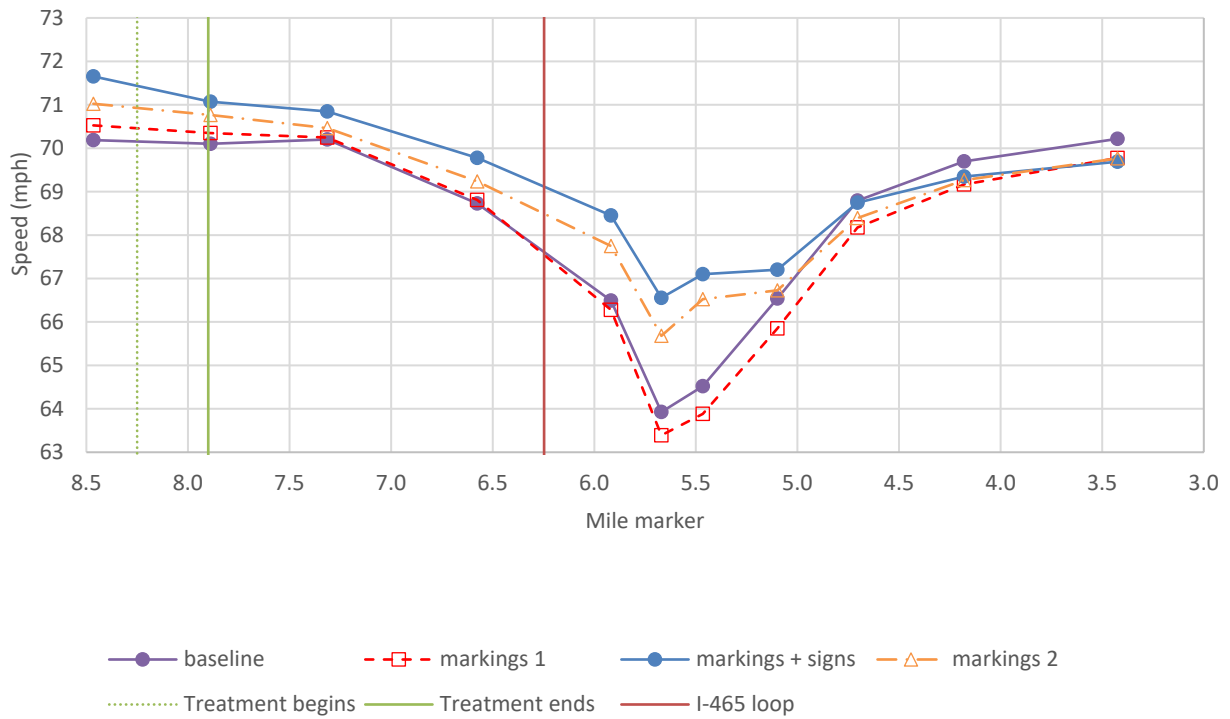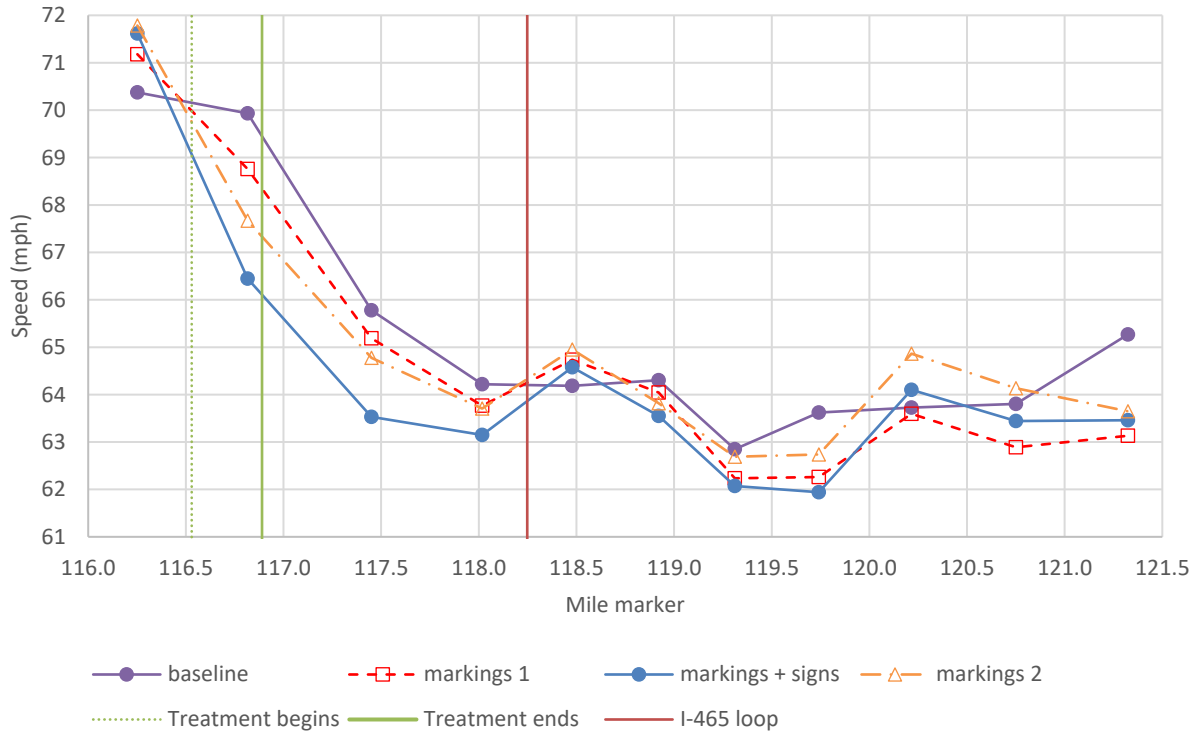
Figure D.23 Speed profile by treatment phase on I-65 SB—Saturday and Sunday daytime.
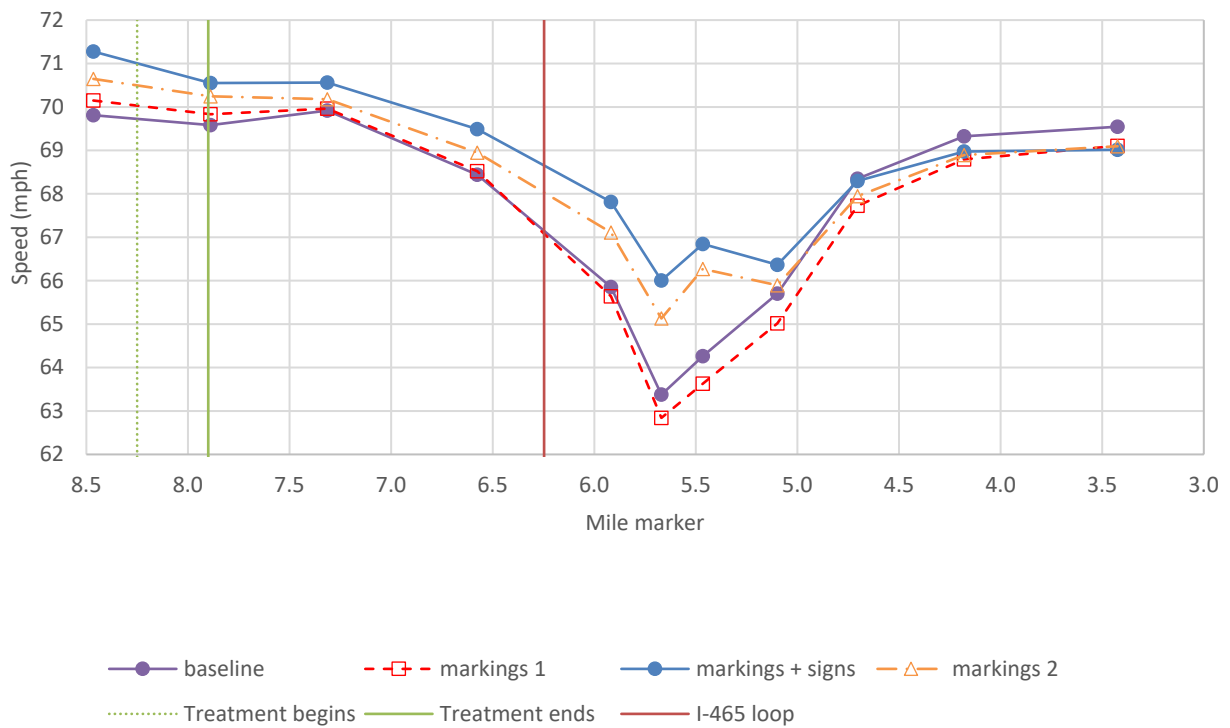
Figure D.24 Speed profile by treatment phase on I-65 SB—Saturday and Sunday night.

D.4 I-64 EB in Seymour District

Average traffic conditions.

Figure D.25 Average speed profile by treatment phase on I-64 EB.

Figure D.26 90th percentile speed profile by treatment phase on I-64 EB.

Figure D.27 Speed variability profile by treatment phase on I-64 EB.

Specific traffic conditions

Figure D.28 Speed profile by treatment phase on I-64 EB—Monday to Thursday midday.

Figure D.29 Speed profile by treatment phase on I-64 EB—Monday to Thursday morning.

Figure D.30 Speed profile by treatment phase on I-64 EB—Monday to Thursday night.

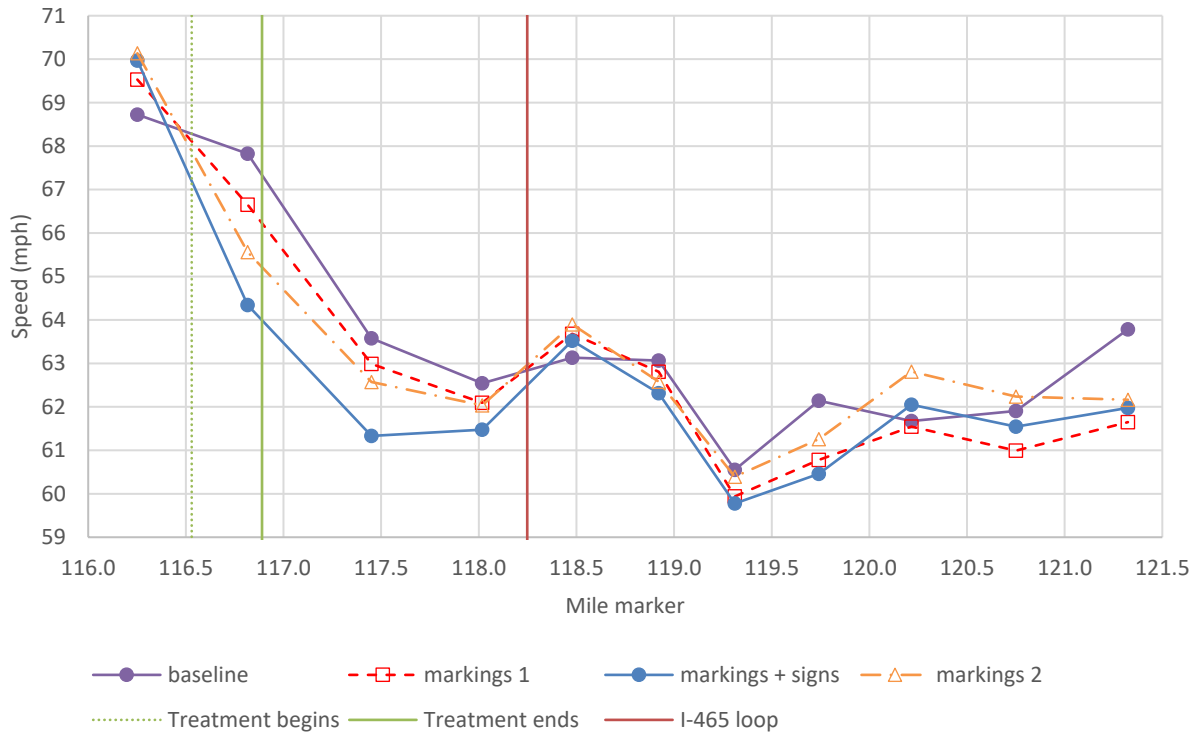*Figure D.31 Speed profile by treatment phase on I-64 EB—Saturday and Sunday daytime.*

Figure D.32 Speed profile by treatment phase on I-64 EB—Saturday and Sunday night.

About the Joint Transportation Research Program (JTRP)

On March 11, 1937, the Indiana Legislature passed an act which authorized the Indiana State Highway Commission to cooperate with and assist Purdue University in developing the best methods of improving and maintaining the highways of the state and the respective counties thereof. That collaborative effort was called the Joint Highway Research Project (JHRP). In 1997 the collaborative venture was renamed as the Joint Transportation Research Program (JTRP) to reflect the state and national efforts to integrate the management and operation of various transportation modes.

The first studies of JHRP were concerned with Test Road No. 1—evaluation of the weathering characteristics of stabilized materials. After World War II, the JHRP program grew substantially and was regularly producing technical reports. Over 1,600 technical reports are now available, published as part of the JHRP and subsequently JTRP collaborative venture between Purdue University and what is now the Indiana Department of Transportation.

Free online access to all reports is provided through a unique collaboration between JTRP and Purdue Libraries. These are available at http://docs.lib.purdue.edu/jtrp.

Further information about JTRP and its current research program is available at http://www.purdue.edu/jtrp.

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