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Characterization of Bridge Deck Runoff

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16. Abstract

In this study, time-weighted composite samples of bridge runoff and hourly traffic data were collected at four sampling locations in Nebraska. Total suspended solids (TSS) and hexane extractable material (HEM) had the highest concentrations during the first rainfall event of the year, while other constituent concentrations peaked during the third rainfall event of the year. In general, constituent concentrations were highest in the spring, and then decreased throughout the summer and fall. Average concentrations of TDS, TSS, chloride, iron, and lead measured in this study were higher than those found in the previous NDOR study at the same sampling locations. For lead and iron, it was difficult to observe a direct relationship between concentration and ADP, or concentration and daily traffic. However, there was a stronger correlation (R^2 = 0.3716) between traffic during ADP and the concentration of zinc. This difference may be explained in the sources of these metals in runoff. The only source of zinc in bridge deck runoff is vehicle wear, but the sources of iron include the materials and structure of the bridge in addition to vehicle materials. Therefore, to improve the correlation for iron and lead, it is necessary to consider other variables such as bridge design and bridge materials, or other non-bridge related sources.

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List of Abbreviations

ADP	Antecedent Dry Period
ADT	Average Daily Traffic
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
DOT	Department of Transportation
DO	Dissolved Oxygen
EMC	Event Mean Concentration
HEM	Hexane Extractable Materials
HDPE	High Density Polyethylene
MTBE	Methyl Tert-Butyl Ether
NCHRP	National Cooperative Highway Research Program
NDOR	Nebraska Department of Roads
PAH	Polycyclic Aromatic Hydrocarbon
PVC	Polyvinyl Chloride
SFOBB	San Francisco-Oakland Bay Bridge
SVOC	Semi-volatile Organic Compound
SCMs	Stormwater Control Measures
TAC	Technical Advisory Committee
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UNL	University of Nebraska – Lincoln
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound

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Disclaimer

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Abstract

Bridge deck runoff is often discharged to water bodies. Numerous studies have investigated roadway water quality, however, there are fewer studies focused solely on bridge deck runoff quality. Only one prior study assessed the impacts of bridge deck runoff on receiving waters in Nebraska; however, their conclusions were based on samples collected during a persistent drought. The objective of this research was to evaluate the quality of bridge deck runoff and to determine if contaminant occurrence can be related to traffic occurring during the antecedent dry period (ADP).

In this study, time-weighted composite samples of bridge runoff and hourly traffic data were collected at four sampling locations in Nebraska. Total suspended solids (TSS) and hexane extractable material (HEM) had the highest concentrations during the first rainfall event of the year, while other constituent concentrations peaked during the third rainfall event of the year. In general, constituent concentrations were highest in the spring, and then decreased throughout the summer and fall. Average concentrations of TDS, TSS, chloride, iron, and lead measured in this study were higher than those found in the previous NDOR study at the same sampling locations. For lead and iron, it was difficult to observe a direct relationship between concentration and ADP, or concentration and daily traffic. However, there was a stronger correlation ($R^2 = 0.3716$) between traffic during ADP and the concentration of zinc at the I-80 bridge over the Platte River. This difference may be explained in the sources of these metals in runoff. The only source of zinc in bridge deck runoff is vehicle wear, but the sources of iron include the materials and structure of the bridge in addition to vehicle materials. Therefore, to improve the correlation for iron and lead, it is necessary to consider other variables such as bridge design and bridge materials, or other non-bridge related sources.

Chapter 1 Literature Review

Bridges are located close to receiving water, and their runoff is often discharged to water bodies. Prior studies have focused on water quality impacts of roadway runoff (Crabtree et al. 2006; Findlay and Kelly 2001; Han et al. 2006; Kayhanian et al. 2003; Kayhanian et al. 2008; Lau et al. 2009; Li et al. 2008; Patel and Drieu 2005); however, there are fewer studies focused solely on bridge deck runoff quality.

1.1 Highway and Bridge Deck Runoff Constituents

Sediment, salts, organic compounds, microorganisms, and metals are some constituents found in highway and bridge deck runoff. If suspended solids concentrations are high, sediments can inhibit the diversity of organisms that are important to the stream's ecosystem (McNeill and Olley 1998; Buckler and Granato 1999).

Sediment can also become a medium to transport other pollutants. When rainfall intensity increases, Total Suspended Solids (TSS) can be flushed, which causes bursts of other contaminants throughout the storm (Han et al. 2006). Some studies have found that the concentration of total zinc (Kayhanian et al. 2003; URS Corporation – North Carolina 2010), lead (Yousef et al. 1982; Patel and Drieu 2005), copper (Pontier et al. 2001; McNeill and Olley 1998), TSS (Kayhanian et al. 2003; Li et al. 2008), and total phosphorus (TP) (Kayhanian et al. 2003) increased in sediment from highway runoff.

Another constituent present in bridge deck runoff is salt. Salts applied during the winter are transported slowly, and will affect organisms' activity in the summer. Specifically, salt alters the osmotic balance between the organism and its surrounding environment (Findlay and Kelly 2001).

Metals usually come from vehicle wear and vehicle fuel, and can be found in both roadway and bridge runoff. Metals are either attached to sediment particles, suspended in the water column, or dissolved. Some metals commonly found in bridge deck runoff are cadmium, chromium, cooper, iron, lead, nickel, and zinc. Metals measured at the highest concentrations in bridge deck runoff include copper and zinc (Dupuis 2002; Nwaneshiudu 2014).

Organic compounds found in runoff include volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC). Methyl tert-butyl ether (MTBE) is a VOC added to fuel, which is soluble, but biodegrades very slowly. Therefore, it is commonly detected in receiving waters and groundwater. Polycyclic Aromatic Hydrocarbons (PAHs) are SVOCs that are formed from incomplete combustion of fuel in vehicles (Lau et al. 2009). PAHs have a tendency to attach to particulates in the air and in water, which has implications for their transport in the environment.

Other organic compounds are oil and grease. Oil and grease can originate from spills, motor lubricants, antifreeze and hydraulics fluids, and are normally measured as Hexane Extractable Materials (HEM). Approximately two thousand spills occur per year on roadways (Buckler and Granato 1999). Ellis et al (1997) recommended installing efficient oil and sedimentation BMPs for high risk locations.

1.2 Existing Studies on Bridge Deck Runoff Characterization

Taylor et al. (2014) conducted a study to identify the appropriate BMPs for stormwater runoff from bridge decks. In the study, the authors developed a guide that allows users to select the best treatment for a new or reconstructed bridge project crossing a water body in the United States. The guide included a BMP evaluation tool, which is a set of spreadsheets in which the user inputs design configurations and calculates stormwater volume, pollutant load removal, and

costs of the BMP. Although this study is not directly quantifying the water quality of bridge deck runoff, it can be used to determine the best BMP to minimize or eliminate environmental impacts.

Swadener et al. (2012) conducted an evaluation of the environmental impacts of bridge deck runoff on surface water bodies in Nebraska. Water samples were collected from the I-80 bridge over the Platte River (40,830 Average Daily Traffic), the Highway 64 bridge over the Platte River near Leshara, Nebraska (1,515 ADT), the I-80 bridge over the Little Salt Creek (40,616 ADT), and the Highway 77 bridge over Rock Creek South of Ceresco, Nebraska (8,076 ADT). In-stream dry weather and sediment samples were also collected. The results showed that bridges did not impact the quality of the water body in dry weather. Similar results were found from sediment samples as there was no definite increase in streambed sediment concentrations from downstream of the bridge to upstream. Two runoff events were also used in a 48-hour 5 dilution series toxicity test with fat head minnows, and no toxic effects were found.

A characterization of stormwater runoff from a bridge deck and approach highway was conducted by Malina et al. (2005) in three different geographical areas of Texas: 1) the Loop 360 Bridge crossing Barton Creek in Austin, Texas with 58,000 vehicles per day (VDP); 2) the Loop 289 bridge over the North Fork of the Double Mountain Fork of the Brazos River in Lubbock, Texas with 10,000 VPD; and 3) the bridge on FM 528 crossing Clear Creek near Friendswood, in the Houston area with 15,000 VPD. Flow-weighted composite and grab samples of runoff were collected from the approach highway and the bridge deck. The average annual loads (lb/yr) of all constituents in the bridge deck runoff were much lower than the annual loads of the respective constituent in the receiving stream. The difference was several orders of magnitude in

most cases. Therefore, the storm water runoff from each of the bridges has very little impact on the water quality of respective receiving stream.

Nwaneshiudu (2004) conducted a study assessing the quantity and quality of the stormwater runoff of a bridge deck that discharged into a receiving water body. The bridge deck and the creek were located in the coastal margin region in the southeast area of Texas on the border of Harris and Galveston counties. The results illustrated that the runoff from the bridge deck exhibited low total suspended solids concentrations (which were highest in the creek). The phosphate concentrations in the creek were the highest and exceeded EPA standards. Therefore, the author concluded that bridge decks can be considered a non-point source that produce noticeable amounts of constituent loading to receiving waters, which are sometimes greater than that from roads.

A characterization of bridge discharge to receiving streams and a correlation of water quality parameters with factors influencing them were conducted by Nishtala (2004). The bridge was located by the East Loop 289 and 50th Street in Lubbock, TX and spans Yellow House River. Flow weighted samples from the approach road and the stream were collected in a portable autosampler, while the runoff samples from the bridge deck were collected in a 500 gallon tank connected to a bridge drain. Significant correlations between precipitation and total copper and zinc, total phosphorous, TSS and VSS concentrations in the upstream samples, COD and TKN concentrations in the bridge deck runoff, and TKN in the approach road runoff were determined. The intensity of rainfall correlated with total lead concentration in the approach road runoff. The antecedent dry period was found to affect the dissolved copper, nitrate nitrogen, TKN, oil and grease and fecal coliform concentrations in the bridge deck runoff, and TKN in the approach road runoff.

McKenzie and Irwin (1983) conducted a water-quality assessment of stormwater runoff from a heavily used urban highway bridge in Miami, Florida. Water samples were taken during five storms between November 1979 and May 1981. The most significant factor influencing stormwater loading was constituent concentration among storms of the same relative magnitude of runoff. For example, the storms of November 3, 1979, and May 1, 1981, had the same runoff volume; but the November 3, 1979 event had significantly higher total loads because its runoff contained much higher constituent concentrations. They also concluded that the rainfall intensity and runoff volume (velocity) influenced rates of loading. In the case of suspended solids, the higher intensity storms transported about 60 percent of their respective loads within the initial 4 minutes of runoff, whereas a low-intensity storm transported only about 15 percent of its total load within the first 4 minutes of runoff. Loading rates for the majority of the other constituents indicated a similar pattern. Table 1.1 compares the average concentrations of contaminants measured in previous bridge runoff studies.

Table 1.1 Average concentrations of bridge runoff studies analyzed in the literature review

	Swadener 2012	**URS 2010**	**Kim et al. 2007**	**Malina et al. 2005**	**Nwaneshiudu 2004**	**Nishtala 2004**	**Dupuis[a] 2002 NCHRP 474**
Number of Sites (n)	n = 4	n = 15	n = 1	n = 3	n = 1	n = 1	n = 1/1
pH	7.65	6.8					
TDS (mg/L)	170.22	34					
TSS (mg/L)	138.12	39	155.4	89.60	22.09	65.3	
Chemical Oxygen Demand (mg/L)			137.1	48.60	41.27	110.7	
Chloride (mg/L)	24.33	0.81					
Specific Conductance (µmhos/cm)	270.25	51					
Total Nitrogen (mg/L)		0.97	3.23				
Total Kjeldahl Nitrogen (TKN) (mg/L)	3.16	0.71	2.59	1.82	0.96	4.0	
TP (mg/L)	0.42	0.169	0.65	0.42	0.06	0.9	
Orthophosphate (mg/L)		0.019	0.01				
Nitrate + Nitrite (mg/L)	2.63	0.21					
Total Recoverable Cadmium (µg/L)		0.10					1.9/1.2
Dissolved Cadmium (µg/L)		0.03					
Total Recoverable Chromium (µg/L)	10	3.9					19/12
Dissolved Chromium (µg/L)		0.62					
Total Recoverable Copper (µg/L)	30	9.6		17.76	15.98	17.7	195/57
Dissolved Copper (µg/L)		2.7		7.93	11.72	11.0	
Total Recoverable Iron (µg/L)	3290	1420					
Dissolved Iron (µg/L)		17					
Total Recoverable Nickel (µg/L)	10	2.3					26/17
Dissolved Nickel (µg/L)		0.69					
Total Recoverable Lead (µg/L)		5.29		9.86	4.99	11.1	103/17
Dissolved Lead (µg/L)		0.09		1.09	1.33		
Total Recoverable Zinc (µg/L)	120	65.9		145.01	119.95	168.3	555/278
Dissolved Zinc (µg/L)		16.8		59.51	80.58	107.0	
Oil and Grease (mg/L)		4.8	29.42	4.60		6.7	
Total Petroleum Hydrocarbons (mg/L)	0.05	3.1					

[a] First value is SFOBB. Second value is I-85 and Mallard Creek

1.3 Climatic Factors Affecting Runoff

Rainfall intensity, antecedent dry period (ADP), and first flush are some factors that affect runoff. An increase in rainfall intensity makes the runoff more diluted (Kayhanian et al. 2003) but mobilizes more pollutants and sediments downstream and expands the area of impact (Crabtree et al. 2006; Ellis et al. 1997). Some studies have found that ADP, the number of days since the last rain event, causes a spike in concentration (Kayhanian et al. 2003; Li et al. 2008), while other studies could not find a connection due to the low number of sites and samples (Crabtree et al. 2006). If there is a long ADP, the first flush may affect the water quality of the receiving stream (McNeill and Olley 1998). The characteristics of the storm and the size of the watershed are factors that affect the concentration and types of contaminants carried by the first flush (Lau et al. 2009). Several studies found that during the first 5-10 mm of rainfall, contaminants were of particular concern (Kim et al. 2007), and that more specifically, the first 20 percent of runoff contains 30-35 percent of the mass of pollutants (Han et al. 2006).

1.4 Bridges Characteristics Affecting Runoff

Slope, composition, size, and drainage are some bridge design characteristics that have an impact in the bridge deck runoff quality (Dupuis 2002). Average daily traffic (ADT), vehicle types, their cargo, and materials can also impact runoff quality. Bridges with ADT less than 30,000 vehicles per day did not produce a noticeable effect on the receiving water body, and bridges with ADT greater than 180,000 vehicles per day produced only minor effects on the water bodies (Dupuis 2002). One study determined that ADT, total rainfall for the storm, total rainfall for the season, and length of the antecedent dry period could account for over 70 percent of the contaminants measured (Kayhanian et al. 2003).

The objective of this research is to evaluate the quality of bridge deck runoff and to determine if contaminant occurrence can be related to traffic during the ADP. This will generate information for regulatory agencies to decide if structural controls for bridge deck runoff may be necessary to protect water quality and aquatic life.

Chapter 2 Methods

2.1 Site Selection

Four bridges were selected based on average daily traffic (ADT), stream flow, safety considerations, and accessibility for the retrieval of bridge deck runoff samples. These four sites are listed in table 2.1 and pictured in the map in figure 2.1 and include a high traffic bridge with high stream flow, a low traffic bridge with high stream flow, a high traffic bridge with low stream flow, and a low traffic bridge with low stream flow.

Table 2.1 Bridge sites selected and their attributes

Bridge Site	**Receiving Stream**	**Average Yearly Stream Flow (m^3/s)**	**AADT* 2012 (2010)**	**Bridge Area Sampled (m^2)**	**Road Area Sampled (m^2)**	**Closest Weather Station**
I-80	Platte River	228	39,965 (38,710)	426.72 (2 lanes and shoulder)	432.81	Ashland2 (4.4 mi)
Hwy 64 Leshara, NE	Platte River	167	1,565 (1,515)	250.54 (1 lane and shoulder)	280.41	Valley 1MNW (4.0 mi)
27^{th} Street and I-80 Lincoln, NE	Little Salt Creek	0.22	43,190 (42,300)	587.53 (3 lanes and 1 shoulder)	426.72	Lincoln Airport (3.9 mi)
Hwy 77 Ceresco, NE	Rock Creek	0.65	7,280 (7,070)	213.36 (2 lanes and shoulder)	146.30	Raymon2 NE (16 mi)

*AADT = Average Annual Daily Traffic

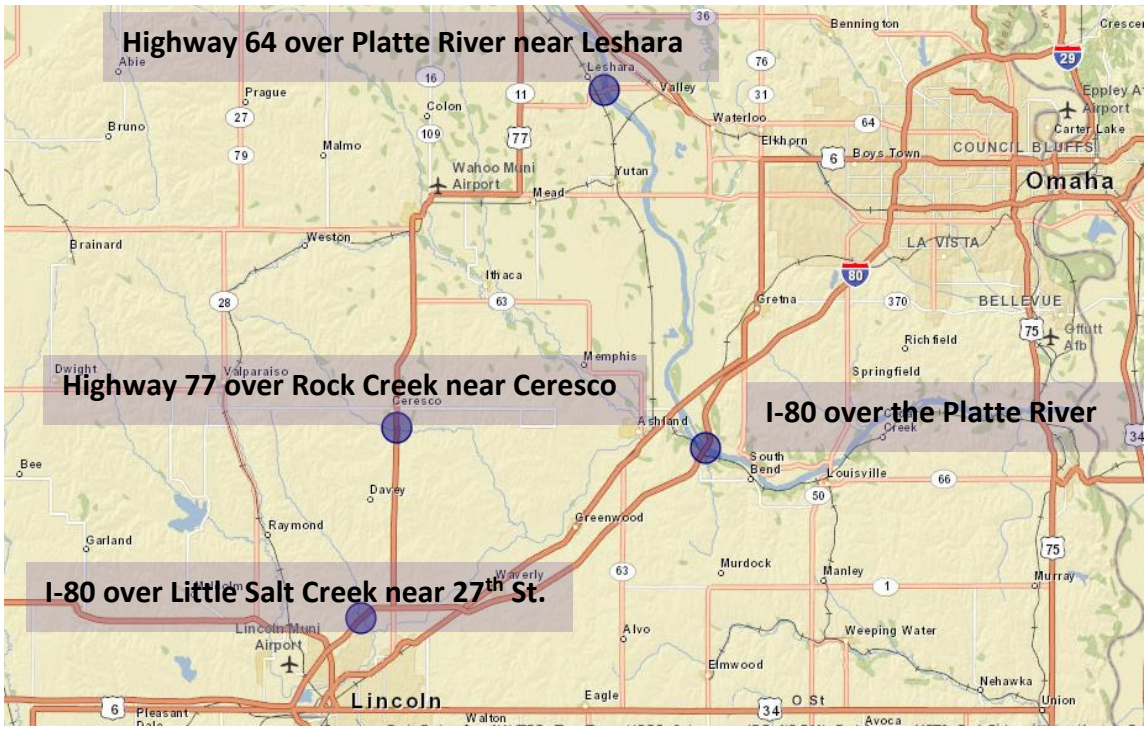

Figure 2.1 Bridge site locations

2.2 Runoff Stormwater Sample Collection

A gutter system specific to each bridge was designed to hang under the concrete drip edge and to collect runoff. Three bridges were instrumented with a twelve meter (40 foot) length of polyvinyl chloride (PVC) gutter, and the bridge over Rock Creek near Ceresco was instrumented with an eight meter (26 foot) length of PVC gutter, because the distance between its two pillars was 8.5 meters (28 feet). Each gutter had a cap attached to the end. A hole was drilled into the cap where a metal coupling was screwed in. One end of a length of ½ in. polyethylene plastic tubing was attached to the coupling, with the other end drained into a 2 gallon high density polyethylene (HDPE) bucket. An ISCO® 3700 series automatic sampler was used to collect time-weighted composite samples of bridge runoff from the HDPE bucket via the auto sampler's ⅜ inch vinyl suction line. The autosampler was triggered by a liquid level

actuator. There was a 2.5 gallon composite sample container inside the autosampler. The autosampler was programed to collect a 200 mL sample volume every 30 minutes. Therefore, the autosampler collected 47 samples maximum per rainfall event. The autosampler was stored in a 33-inch x 21-inch fiberglass security box. The bucket was placed near the security box. A 12-volt battery served as a power source for the equipment. Figures 2.2 through 2.4 show pictures of the bridge gutter system installed at some of the bridge sites.

Figure 2.2 Bridge gutter system installed at Highway 77 over Rock Creek near Ceresco

Figure 2.3 Autosampler installed at Highway 77 over Rock Creek site

Figure 2.4 Bucket stacked near the security box at Highway 77 over Rock Creek

2.3 Bridge Runoff Sample Analyses

Bridge runoff sampling dates are shown in table 2.2.

Table 2.2 Bridge runoff sampling dates

Date Sampled	Bridge Location			
	I-80 Bridge over the Platte River	**Highway 64 Bridge over the Platte River**	**I-80 Bridge over Little Salt Creek**	**Highway 77 Bridge over Rock Creek**
March 28, 2014	X			X
April 4, 2014	X			X
April 14, 2014	X			
April 25, 2014	X			X
April 28, 2014	X			
April 30, 2014	X			
May 8, 2014	X			
May 12, 2014	X			
May 23, 2014	X			
June 2, 2014	X			
June 4, 2014	X	X		
June 9, 2014	X	X		
June 16, 2014			X	
June 18, 2014		X		
June 23, 2014	X	X	X	
June 27, 2014	X	X	X	X
July 3, 2014	X	X		
July 8, 2014	X	X		
July 23, 2014		X	X	
August 7, 2014	X			
August 22, 2014	X	X	X	
August 25, 2014	X	X	X	
August 26, 2014	X	X	X	
August 29, 2014	X	X		
September 3, 2014	X	X	X	
September 8, 2014		X		
September 10, 2014	X		X	
September 15, 2014	X	X		
September 25, 2014	X	X		
Total Samples	**25**	**16**	**9**	**4**

All bridge runoff samples were tested for chloride, conductivity, iron, lead, total solids, TSS, TDS, fixed and volatile solids, zinc, and pH. These tests were conducted in the Environmental Engineering Lab at the Peter Kiewit Institute and testing methods used are listed in table 2.3. For all tests, three replicates were evaluated for each sample.

Table 2.3 Analyses conducted at Peter Kiewit Institute

Analyses	Method
Chloride	Ion Selective Electrode
Conductivity	SM 2510
Iron (total)	SM 3111-B
Lead (total)	SM 3113
Solids	SM 2540
Zinc (total)	SM 3111-B
pH	SM 4500-H^+

An ion selective electrode (ISE) specific for Cl^- and a voltage meter were used to measure chlorine concentration. By dilution of a 1000 ppm standard, four standards of 20, 50, 100, and 250 ppm were prepared. One hundred mL of each standard was stirred at a constant rate, then 2 mL of ionic strength adjuster (ISA) were added, and after 1 minute, the voltage was measured. A calibration curve was created by plotting log [Cl^-] vs voltage. The same procedure was followed with the samples, and the voltage was compared with the calibration curve to determine the Cl^- concentration in the sample.

For conductivity, the constant cell was measured using a conductivity solution of 1,413 μS. Each sample was stirred at a constant rate while the conductivity value was measured.

For metals, a flame and longitudinal Zeeman atomic absorption spectrometer was used for all measurements. Single-element hollow cathode lamps (HCLs) were used for iron, lead, and zinc. Each sample was preserved with nitric acid at 4°C. Before analysis, samples were digested with nitric acid on a hot plate to a volume of approximately 20 mL. That volume was transferred to a volumetric flask and concentrations were diluted to 100 mL. Portions of this solution were taken to determine metals. Stock standard solutions of 1000 ppm of iron, lead, and zinc were prepared to create calibration curves. A mix of acetylene-air was used to feed the burner. Instrument settings for each metal are listed in table 2.4.

Table 2.4 Instrument settings used for metals on the atomic absorption spectrometer

Element	Wavelength (nm)	Instrument detection level (mg/L)	Standard solutions (ppm)
Iron	248.3	0.02	0.3, 1, 6, 10
Lead	283.3	0.05	0.5, 1, 5, 10
Zinc	213.9	0.005	0.05, 0.5, 1, 2

For solids, each sample was preserved at 4°C until the time of analysis. Each evaporating dish and filter used was prepared by ignition at 550°C. For total solids, 30 mL of a well-mixed sample was pipetted into a pre-weighed dish and dried for 2 h in an oven at 104°C. The dish was cooled in desiccator and weighed. The dish was dried for 1 h more at 104°C, cooled, and weighed again. For total suspended solids, 30 mL of a well-mixed sample was pipetted to a pre-weighed filter with applied vacuum. After that, the filter was washed with three successive 10 mL volumes of reagent-grade water and transferred to an aluminum weighing dish to be dried for 2 h at 104°C in an oven. The filter was cooled in a desiccator and weighed. The filter was dried

for 1 h more at 104°C, cooled, and weighed again. For total dissolved solids, the total filtrate (with washings) was transferred to a weighed evaporating dish and dried for 2 h in an oven at 180°C. The dish was cooled in a desiccator and weighed. The dish was dried for 1 h more at 180°C, cooled, and weighed again. For fixed and volatile solids, Method 2540 was used, as described in the 21st edition of *Standard Methods for the Examination of Water and Wastewater*.

A pH meter was calibrated with buffers of pH 4.00, 7.00, and 10.00. Each sample was stirred at a constant rate while the electrode was taking the pH value.

From March 28 to July 3, 2014, samples tested for Hexane Extractable Materials (HEM), E.Coli, TKN, nitrate, nitrite, and total phosphorous were analyzed at Midwest Laboratories in Omaha, NE. Testing methods are listed in table 2.5.

Table 2.5 Analyses conducted through Midwest Laboratories

Analyses	Method	Detention Level
E. Coli	SM 9223-B	1.0 MPN/100 mL
Hexane Extractable Materials (HEM)	EPA 1664A-SPE	5.0 mg/L
Nitrate/Nitrite Nitrogen	EPA 353.2	0.20 mg/L
Nitrite Nitrogen	SM 4500-NO2-B-2000	0.02 mg/L
Phosphorus (total)	SM 4500-P F	0.05 mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	0.50g/L

2.4 Traffic Data Collection

Hourly traffic volumes were collected at locations near each of the study bridges, as it is not possible to collect traffic data at exactly the same location as the runoff sample. The exact

locations for traffic data collection were selected to capture traffic crossing the study bridges as accurately as possible. Figures 2.5 through 2.8 show the location of the traffic data collection sites relative to each bridge site.

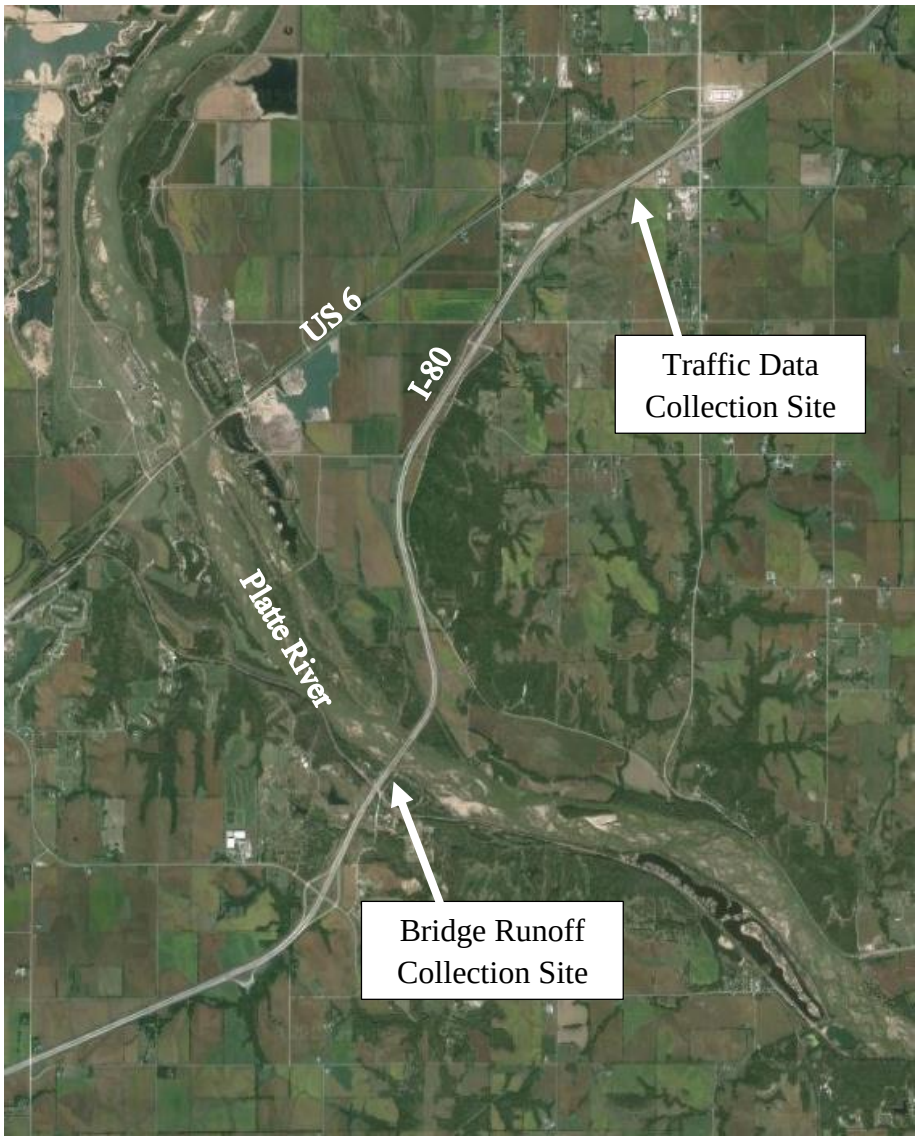

Figure 2.5 I-80 Platte River traffic data collection site

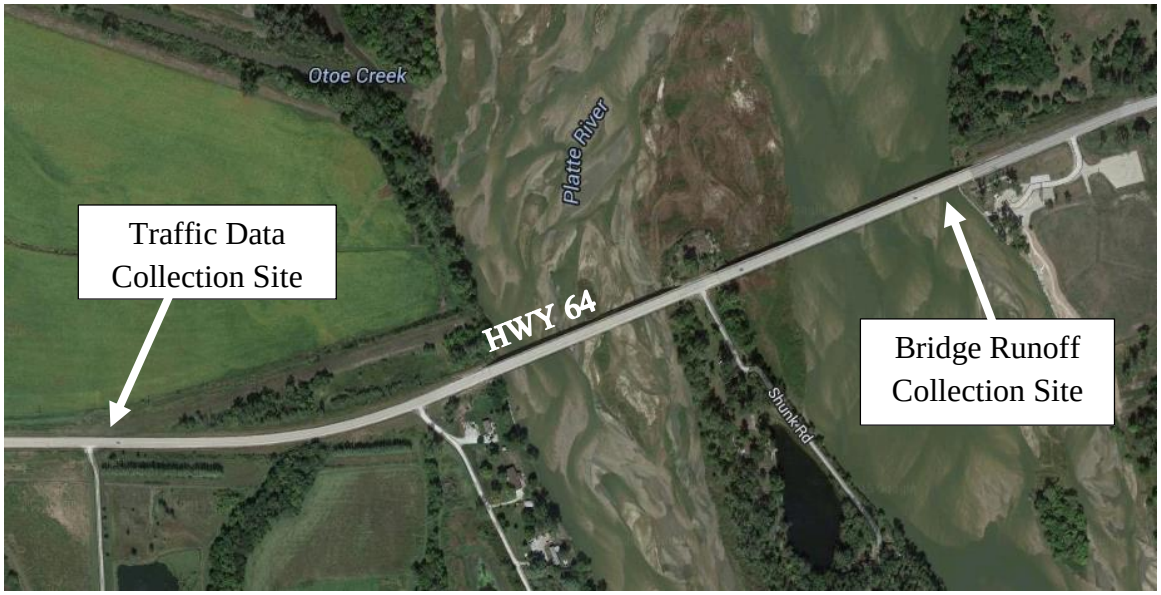

Figure 2.6 Highway 64 Platte River traffic data collection site

Figure 2.7 I-80 Little Salt Creek traffic data collection site

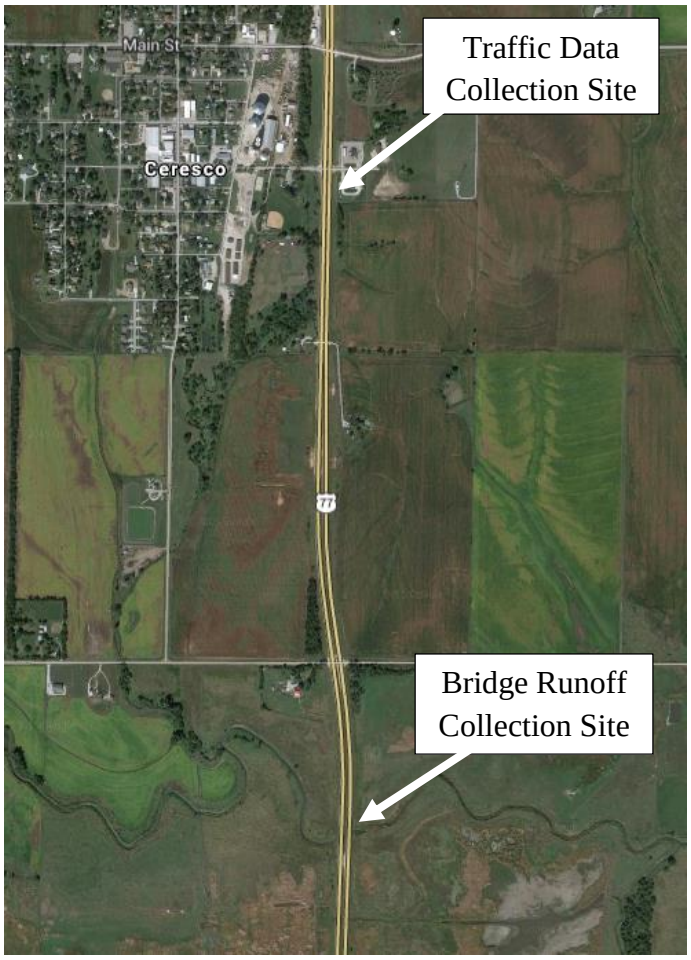

Figure 2.8 Highway 77 Rock Creek traffic data collection site

Hourly traffic data were collected from April 7th to September 30th from the Nebraska Department of Roads Automatic Traffic Recorder Site 56E on eastbound I-80 west of Gretna for the I-80 Platte River site. At the other locations, a Wavetronix HD sensor powered by a small solar panel was used to collect daily traffic data. The Wavetronix HD sensor and power system were installed by NDOR personnel and configured by staff from the Nebraska Transportation Center. Figure 2.9 shows the two types of equipment used in this project.

(a) (b)

Figure 2.9 Traffic data collection equipment. a) NDOR automated traffic recorder station 56E on I-80 west Gretna b) Wavetronic HD sensor installation on Highway 64 near Leshara

2.5 Total Metals Mass and Total Mass per Area Calculation

The mass of total metals was calculated using the following equation:

$$Total\ Mass = Metal\ concentration * Runoff \quad (2.1)$$

where

Runoff = Precipitation * Bridge Area Sampled * Infiltration coefficient (0.90).

Total mass/area was calculated as follows:

$$\frac{Total\ Mass}{Area} = \frac{Total\ Mass}{Road\ area\ sampled} \quad (2.2)$$

2.6 Statistical Analysis

Statistical analysis software, Statistix 10, was used to determine a linear regression between metal concentration and ADP, or metal concentration and traffic during the antecedent

dry period. The significance of the slope and intercept were evaluated at a 95 percent confidence level.

Chapter 3 Results

3.1 Precipitation

Weather stations used to obtain the precipitation data are listed in table 3.1.

Table 3.1 Weather stations selected

Bridge location	Weather station	Station ID	Distance (mi) from bridge location
I-80 bridge over the Platte River	Ashland2	250375	4.4
Highway 64 bridge over the Platte River	Valley 1WNW	258795	4.0
I-80 bridge over Little Salt Creek	Lincoln Airport	254795	3.9
Highway 77 bridge over Rock Creek	Raymond 2NE	257055	16

Weather stations selected were as close to bridge locations as possible; however rain events must still be considered approximate in regards to the exact locations of the bridges. Precipitation data were found at the website: http://climodtest.nrcc.cornell.edu/ for each weather station using the link daily data for a month. The following figures show the rainfall throughout the spring, summer, and fall 2014. The gray square dots on the graphs signify the storm events that were sampled.

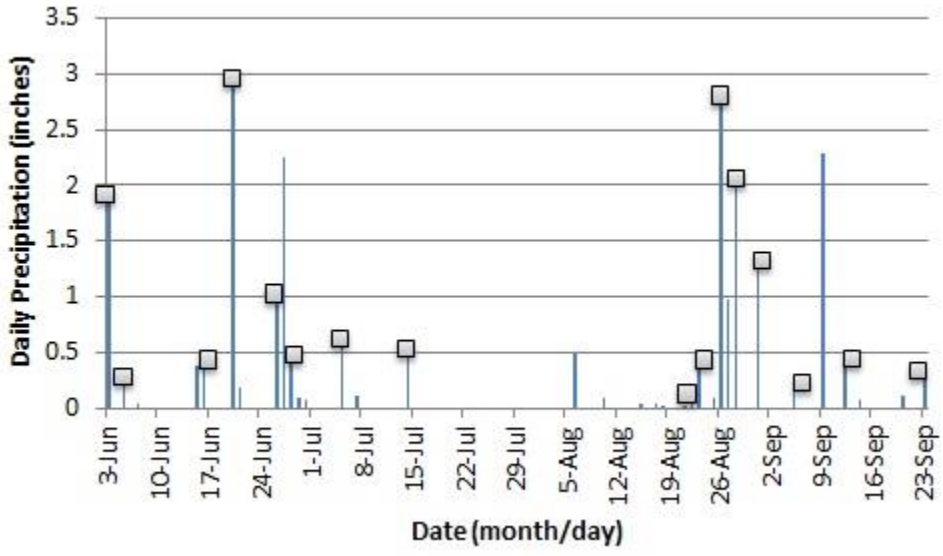

Figure 3.1 Rainfall events sampled at the Highway 64 bridge over the Platte River

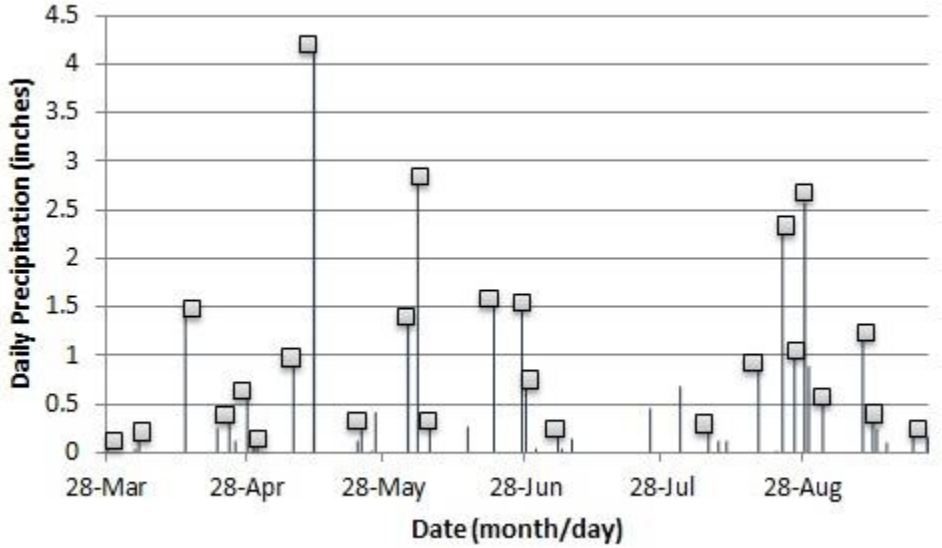

Figure 3.2 Rainfall events sampled at the I-80 bridge over the Platte River

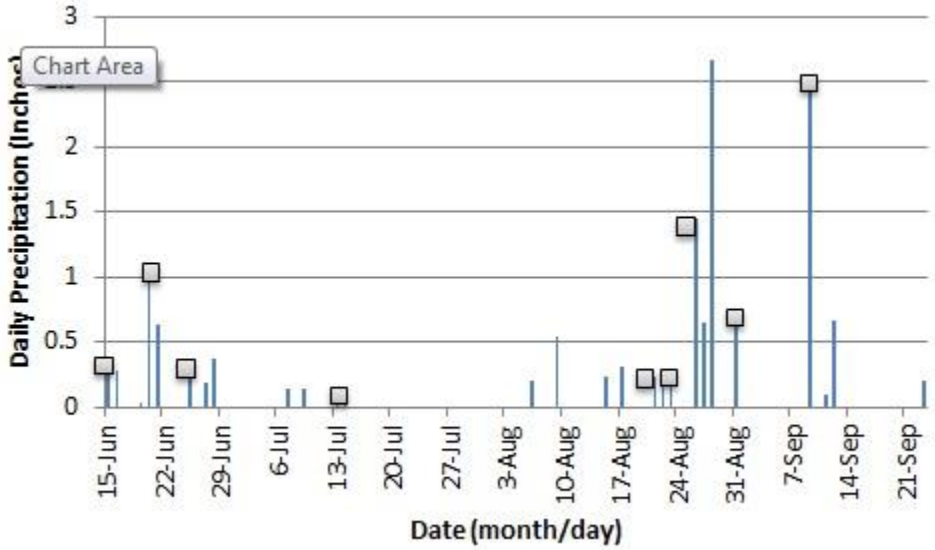

Figure 3.3 Rainfall events sampled at the I-80 bridge over the Little Salt Creek

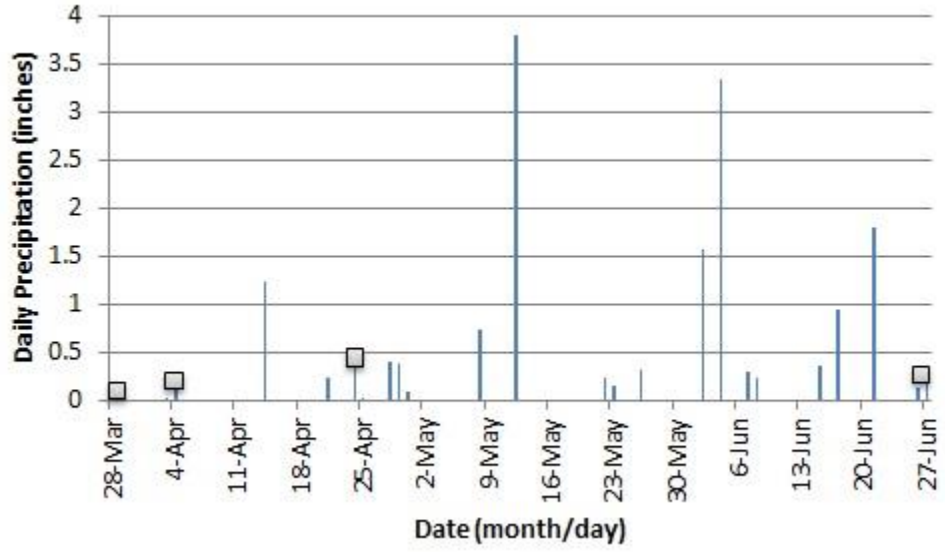

Figure 3.4 Rainfall events sampled at the Highway 77 bridge over the Rock Creek

3.2 Bridge Runoff Contaminant Results

The following figures show the concentration of contaminants in runoff from the four sampling sites monitored in this study and a comparison to the average concentration from the same sites from the prior NDOR study conducted by Swadener et al (2012).

3.2.1 Chloride

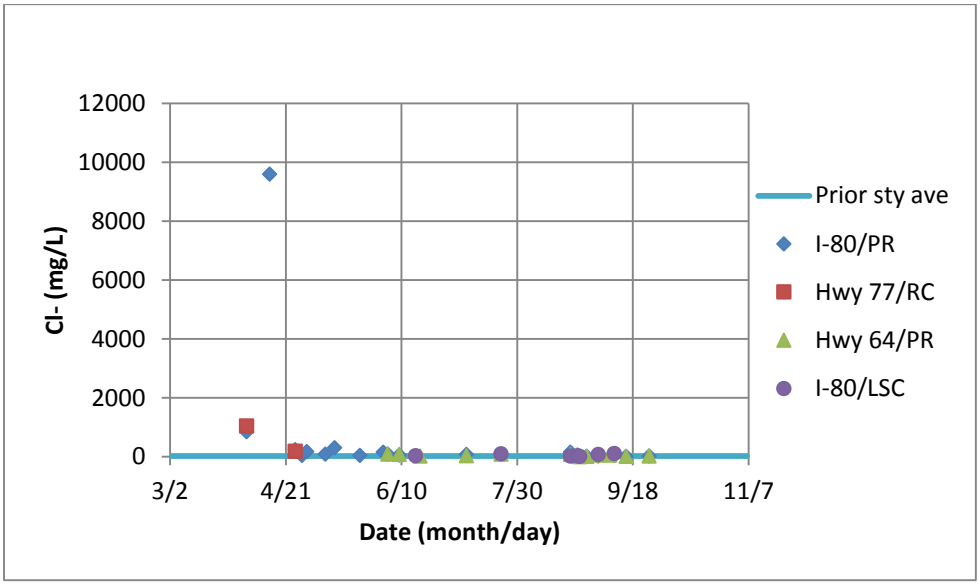

Figure 3.5 Chloride concentration in runoff

3.2.2 Conductivity

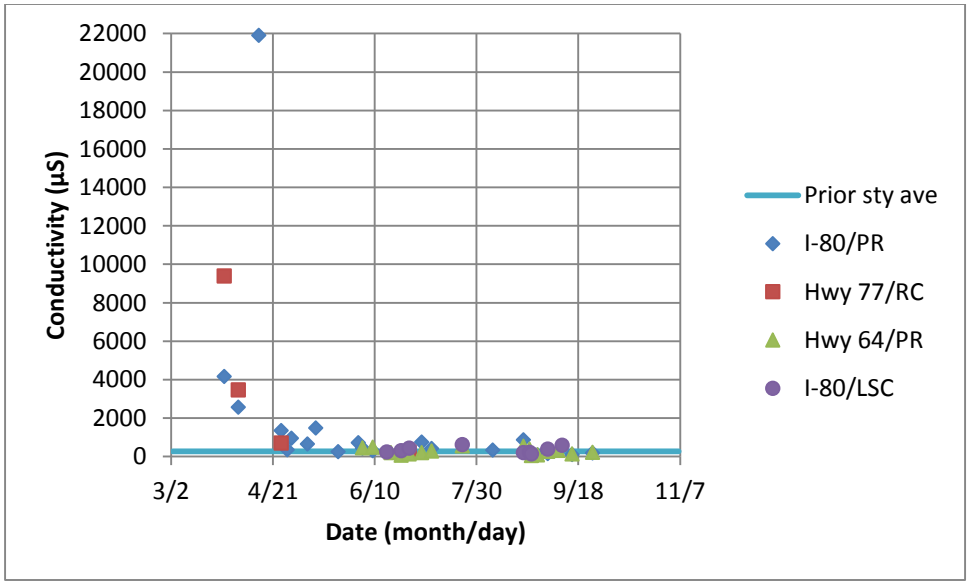

Figure 3.6 Conductivity of runoff

3.2.3 E coli

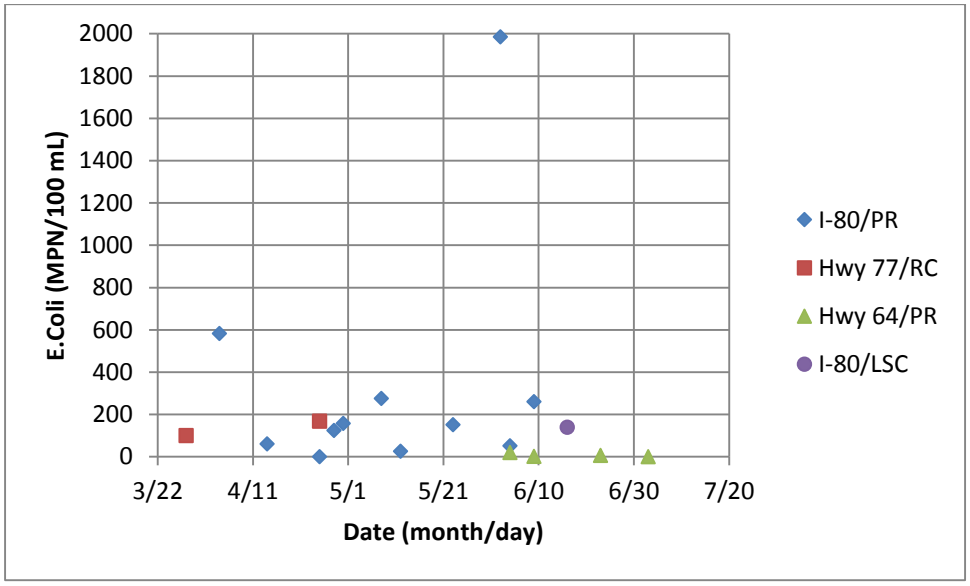

Figure 3.7 *E coli* concentration in runoff

3.2.4 HEM

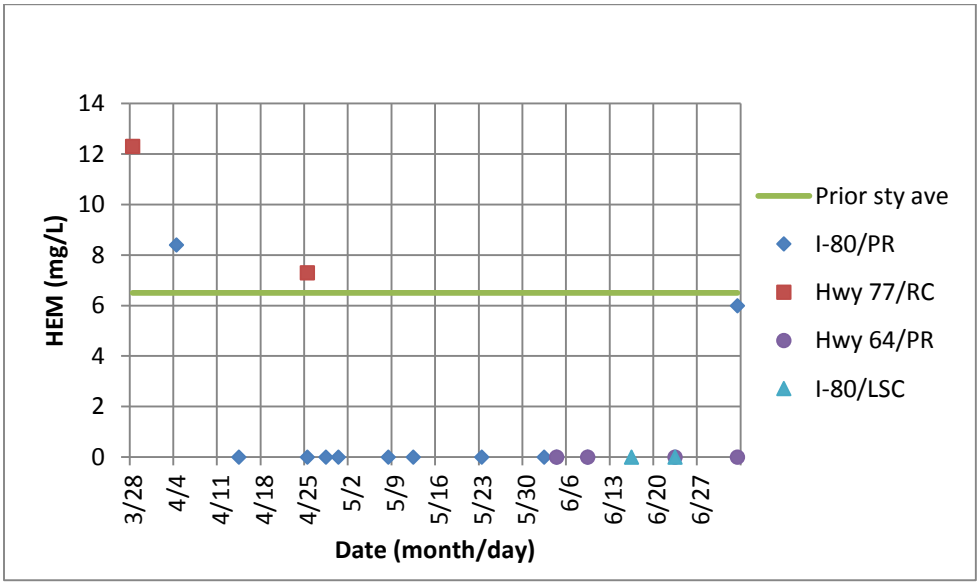

Figure 3.8 Hexane Extractable Materials concentration in runoff

3.2.5 Iron

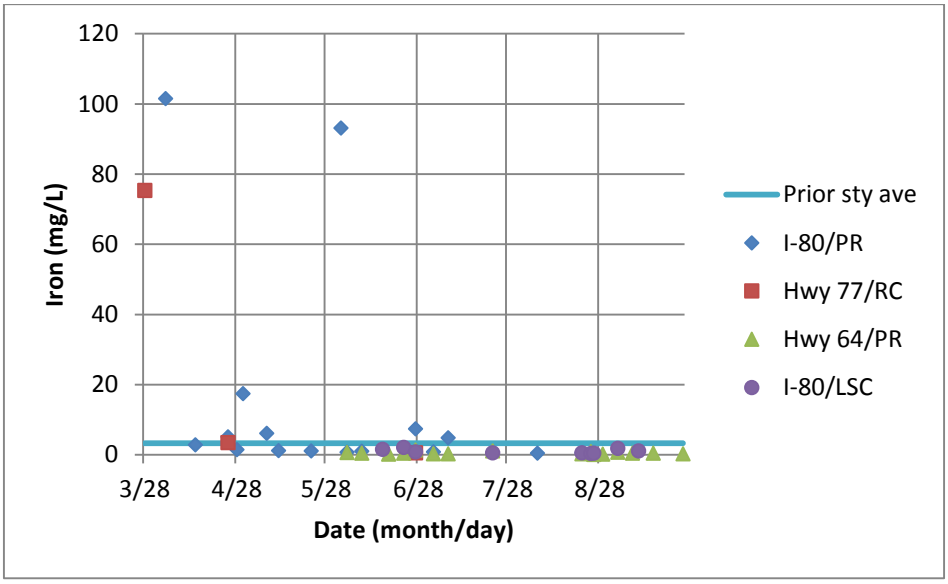

Figure 3.9 Iron concentration in runoff

3.2.6 Lead

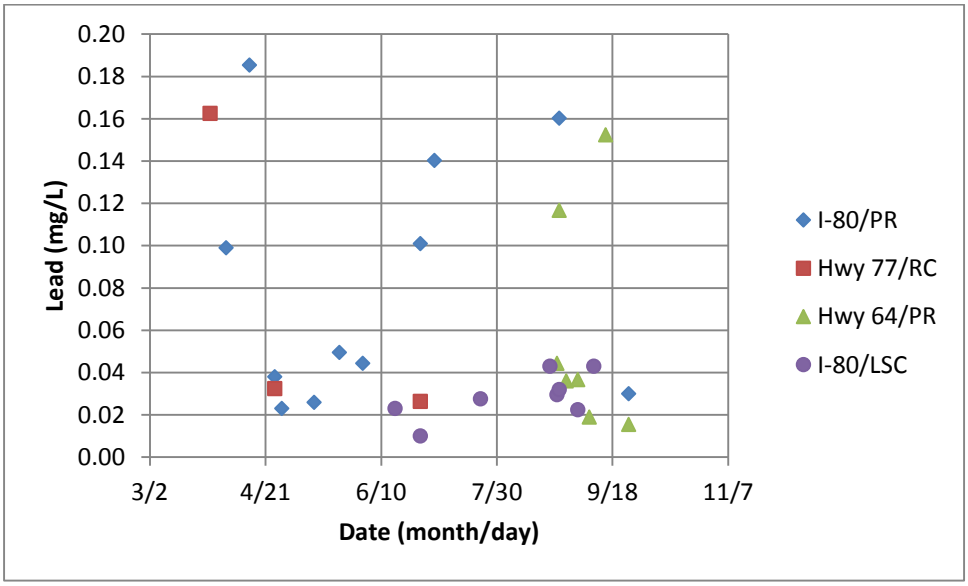

Figure 3.10 Lead concentration in runoff

3.2.7 Nitrate

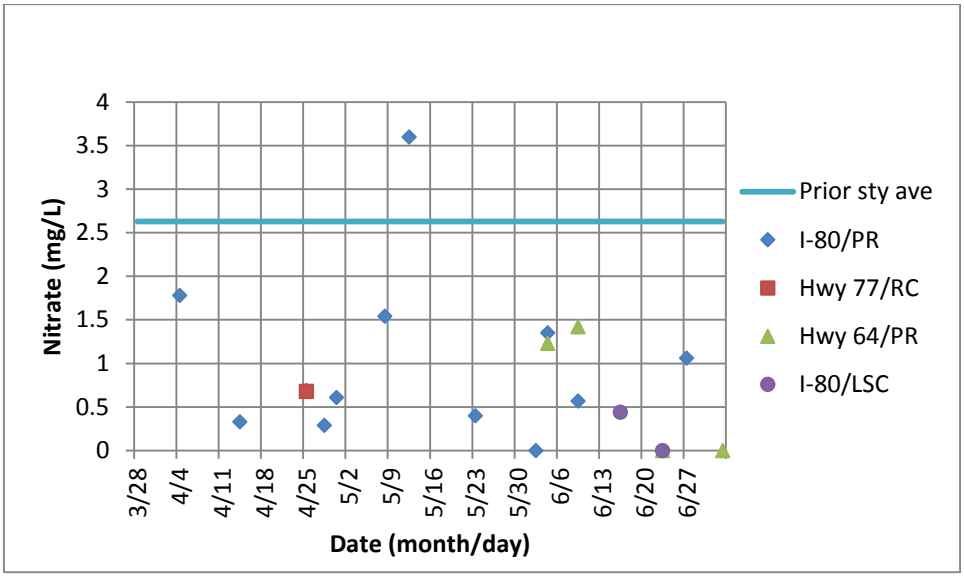

Figure 3.11 Nitrate concentration in runoff

3.2.8 Nitrite

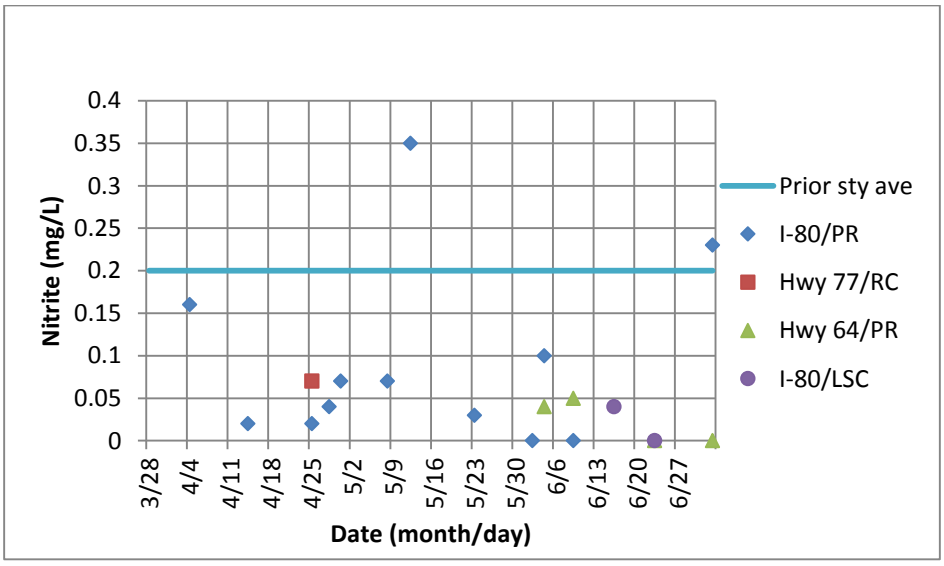

Figure 3.12 Nitrite concentration in runoff

3.2.9 TKN

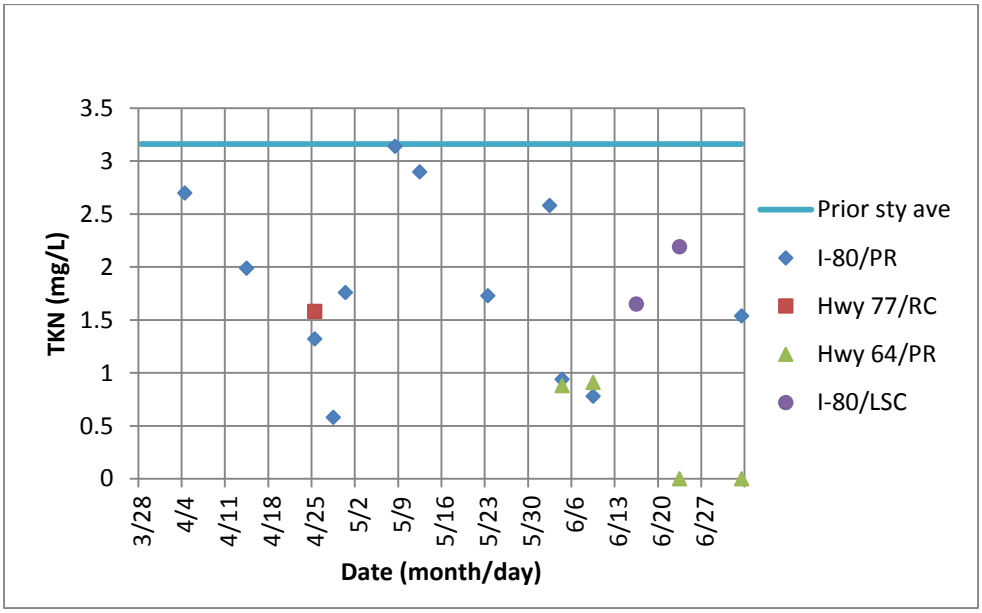

Figure 3.13 TKN concentration in runoff

3.2.10 TP

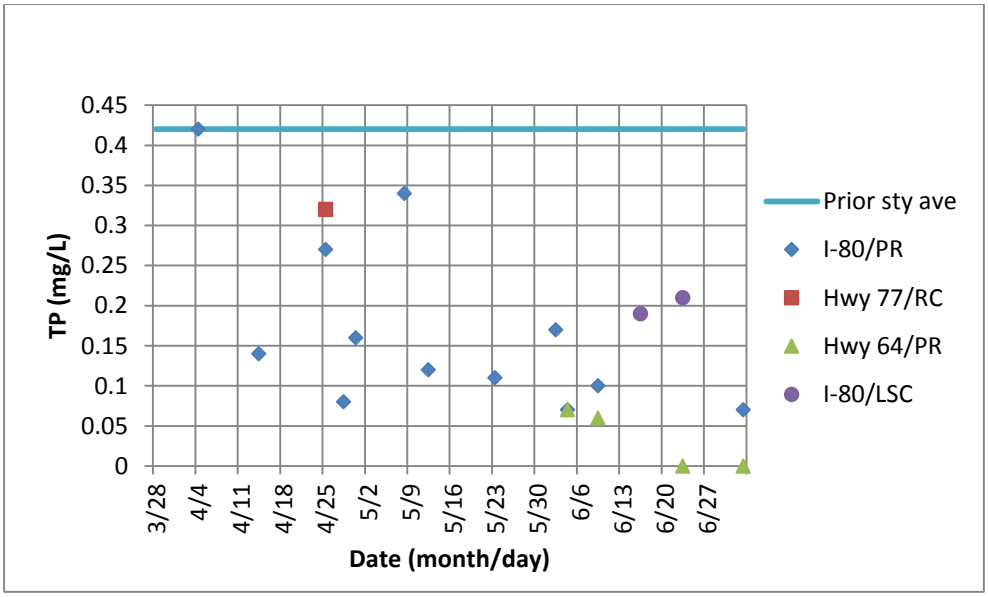

Figure 3.14 Total phosphorus concentration in runoff

3.2.11 Total Solids

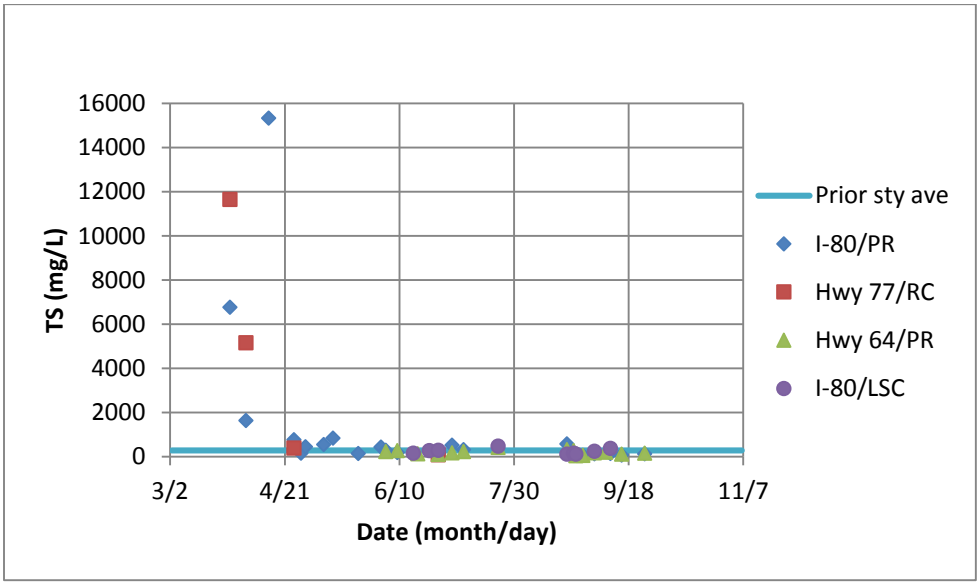

Figure 3.15 Total solids concentration in runoff

3.2.12 TSS

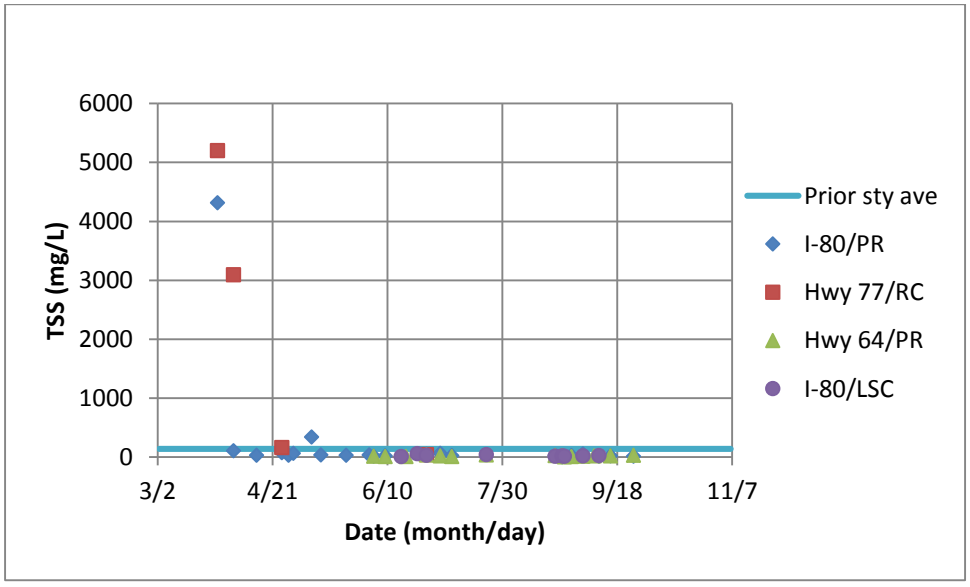

Figure 3.16 Total suspended solids concentration in runoff

3.2.13 TDS

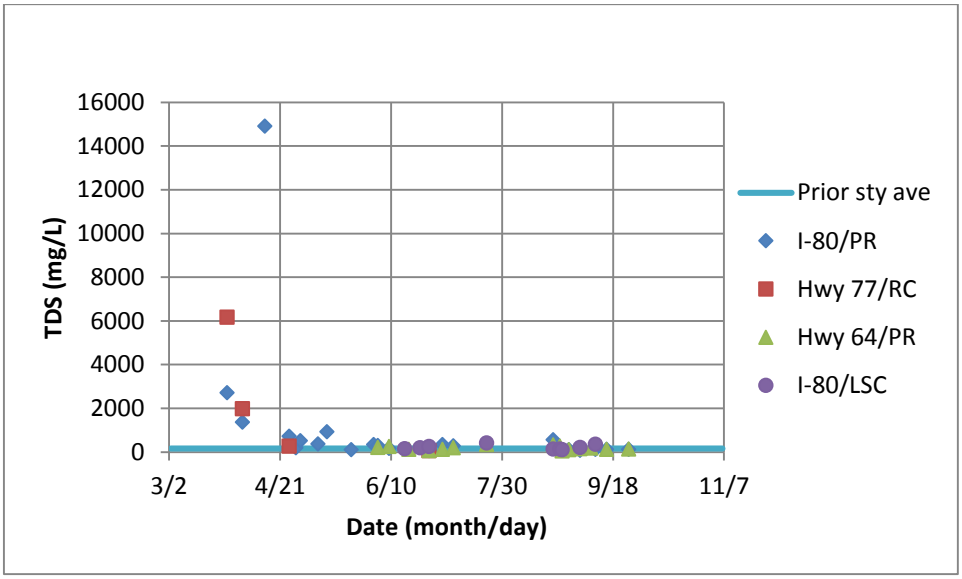

Figure 3.17 Total dissolved solids concentration in runoff

3.2.14 Zinc

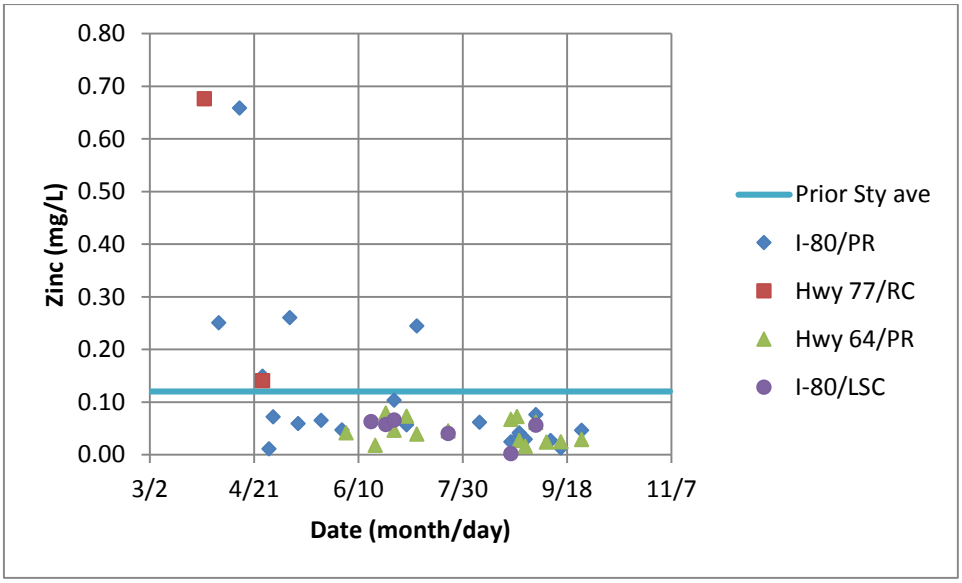

Figure 3.18 Zinc concentration in runoff

3.2.15 pH

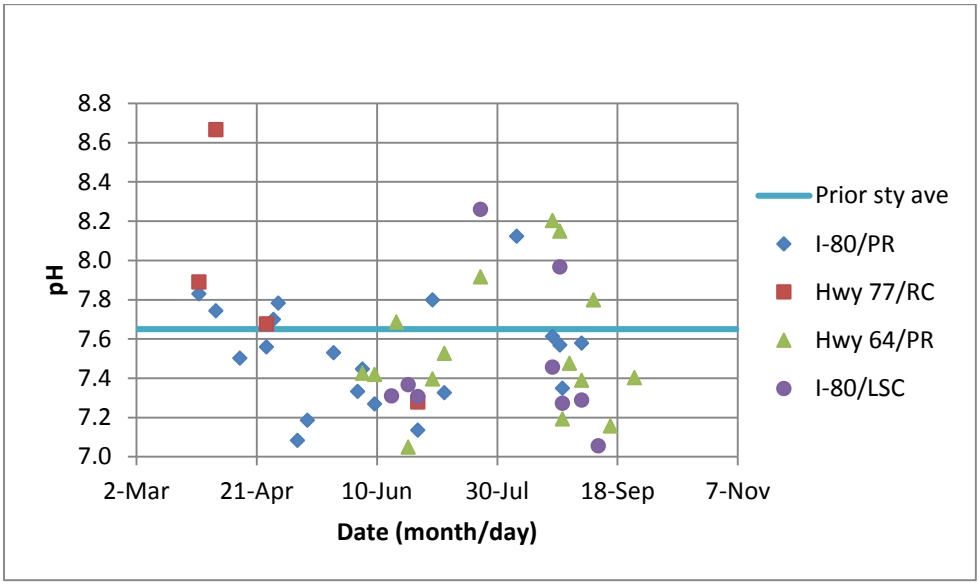

Figure 3.19 pH of runoff

3.3 Traffic Data Collection Results

Traffic data were collected continuously from early April 2014 through September 2014 and reported as hourly volumes at all locations. A full record of traffic data were collected at the NDOR I-80 ATR Station 56E. All other locations where the Wavetronix sensors were installed were also set to collect traffic data continuously and record the data as hourly volumes. Due to the large number of rain events and the generally cloudy conditions, the solar panel installed did not provide enough power to continuously record traffic data. The Wavetronix HD sensors did record enough data to be able to reasonable estimate hourly traffic volumes for the gaps in the data streams.

The process to estimate the missing traffic data started with recognizing that on a day of the week basis, traffic patterns at the same location are generally consistent. These patterns were

used to generate, from all of the traffic data collected, an average hourly traffic volume for each hour of the day by day of the week for each site. An example of this is shown in table 3.2 and figure 3.20 for the I-80 at 27th Street traffic data collection site near Little Salt Creek for Mondays.

Figure 3.20 shows the consistency of the hourly traffic volumes on Mondays throughout the data collection period. An exception to this was Labor Day, September 1, 2014. Days with unusual patterns, such as Labor Day, were not included in the averages used to estimate missing traffic data during the antecedent dry periods. All traffic data collected at the four locations is found in Appendix F. Also in Appendix F are day of the week plots for the three stations using the Wavetronix HD sensor that were used to estimate the missing data. Lastly in Appendix F are the traffic data, both measured and estimated, for the antecedent dry periods that are used in the data analysis presented in chapter 4.

Table 3.2 Eastbound traffic on I-80 at 27th Street near Little Salt Creek – Monday hourly traffic volumes as collected by the Wavetronix sensor – blank cells indicate no data collected for that hour, yellow cells indicate an antecedent dry period, yellow with crosshatch cells are estimated traffic volumes using the average data for all Mondays during data collection period, excluding Labor Day

		Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday	Monday
		4/14/2014	4/21/2014	4/28/2014	5/5/2014	5/12/2014	5/19/2014	5/26/2014	6/2/2014	6/9/2014	6/16/2014	6/23/2014	6/30/2014	7/7/2014	7/14/2014	7/21/2014	7/28/2014	8/4/2014	8/11/2014	8/18/2014	8/25/2014	9/1/2014	9/8/2014	9/15/2014	9/22/2014	9/29/2014	Average
Hour of Day	1	165		150	151	102	213			205	208	204.0		239	251	252		259			217	251	204.0		216	228	204.0
	2	73		101	137	91	129			154	177	148.4		196	182	189		177			149	185	148.4		152	171	148.4
	3	95		87	112	74	113			122.5	141	122.5		148	156	155		149			124	158	122.5		128	110	122.5
	4	101		123	145	138	147			145.8	168	145.8		168	157	180		154			149	125	145.8		146	119	145.8
	5	157		173	208	191	261			223.8	236	223.8			246	251		240			236	134	223.8		226	261	223.8
	6	356		404	448	370	449			438.0	498	438.0			453	469		454			457	180	438.0		467	431	438.0
	7	778		840	889	879	881			876.3	906	876.3			892	901		888			904	248	876.3		884	874	876.3
	8	1012		1040	1100	1032	1117			1081.3	1131	1081.3			1152	1096		1115			1066	392	1081.3		1060	1055	1081.3
	9	850		877	912	952	929			930.3	925	930.3			923	980		950			918	544	930.3		945	1003	930.3
	10	856		790	784	839	897			872.9	911	872.9			899	948		945		962	858	809	857		864	811	872.9
	11	835		801	813	834	911			886.5	943	886.5			901	947		959		938	860	1071	870		901	898	886.5
	12	828		798	894	873	943			913.2	1014	913.2			953	959	955	1007		1046	837	1132	874	871	875	884	913.2
	13	856		853	885	830	904			937.3	967	937.3			1049	1032	1024	1005		1003	930	1152	879	865	932	982	937.3
	14	861		915	907	895	995			986.8	1003	986.8			1132	993	1129	1049		1062	947	1180	955	937	982	1026	986.8
	15	948		986	944	956	1109			1074.4	1096	1074.4			1141	1155	1154	1173		1200	1073	1215	1059	1022	1099	1076	1074.4
	16	1168		1221	1225	1164	1345			1292.8	1389	1292.8			1361	1372	1389	1319		1405	1285	1221	1218	1249	1297	1278	1292.8
	17	1331		1413	1413	1312	1492			1485.1	1610	1485.1			1568	1492	1560	1566		1533	1483	1271	1470	1512	1495	1511	1485.1
	18	1274		1337	1421	1328	1459			1429.9	1356	1429.9			1463	1452	1514	1528		1493	1390	1177	1504	1419	1402	1539	1429.9
	19	892		994	870	769	960			935.4	879	935.4			1001	962	1034	1064		996	898	1099	877	913	930	928	935.4
	20	616		726	682	567	639			697.8	657	697.8			754	755	761	783		746	637	986	687	740	669	745	697.8
	21	543		677	575	505	651			587.5	549	587.5			655	594	626	597		552	570	858	554	599	593	560	587.5
	22	494		462	411	403	442			459.0	432	459.0			519	467	503	487		440	460	657	468	439	438	479	459.0
	23	350		367	319	365	447			364.4	344	364.4			434	421	365	418		352	364.4	451	317	330	310	327	364.4
	24	256		244	231	248	315			255.5	235	255.5				286	290	260		257	255.5	276	223	246	260	226	255.5

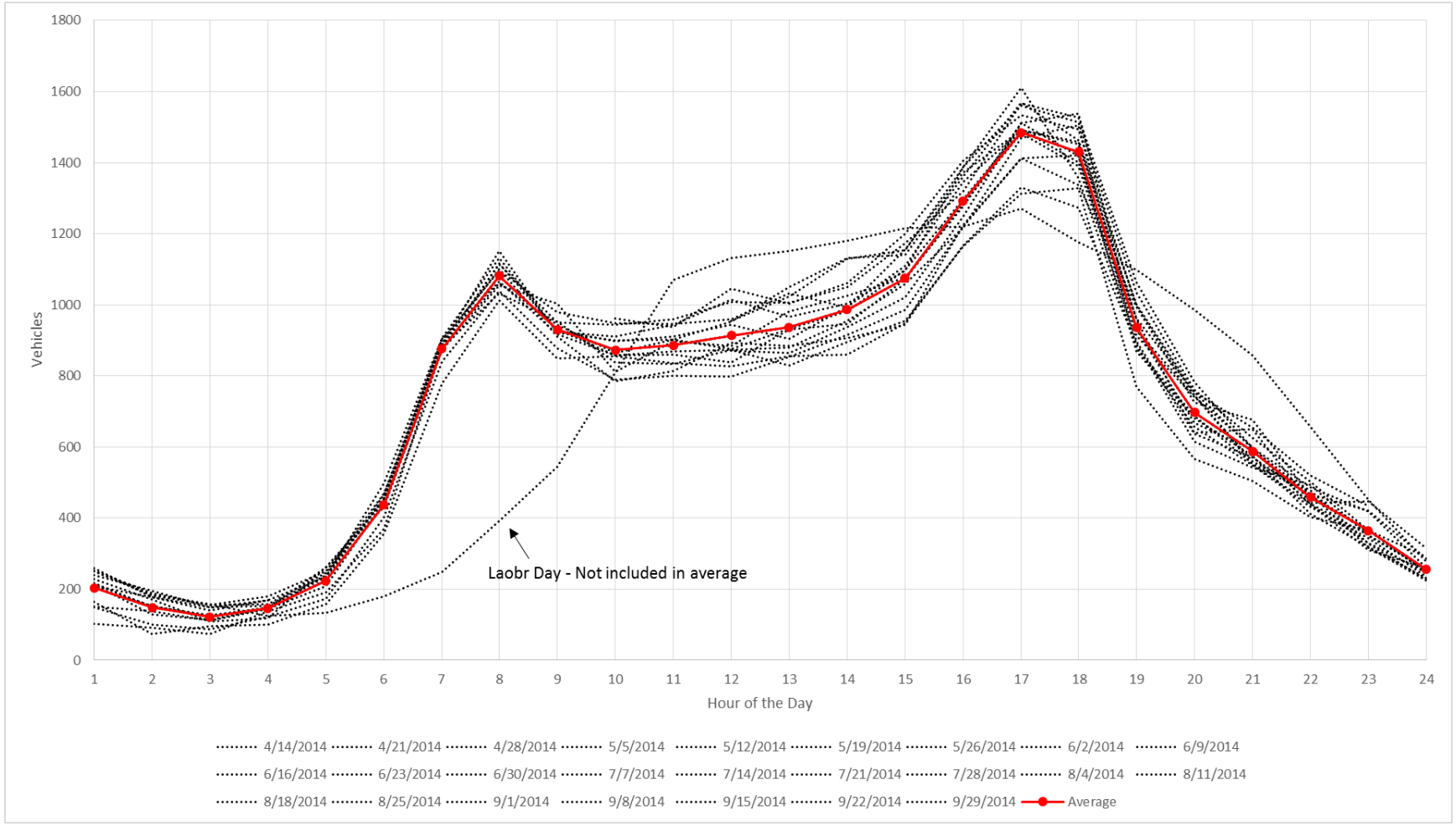

Figure 3.20 Eastbound traffic on I-80 at 27th Street near Little Salt Creek – Monday hour traffic patterns with average

Chapter 4 Data Analysis and Discussion of Results

4.1 First Rainfall Event

The first rainfall event occurred on March 28th, 2014, and samples were collected at I-80 over the Platte River (I-80/PR) and Highway 77 over Rock Creek (Hwy 77/RC). For the first rainfall event, solids, pH, and conductivity were measured for the I-80/PR sample, and in addition to these constituents, HEM, *E.Coli*, and metals were also measured for the Hwy 77/RC sample. It was expected that the highest concentrations of contaminants would occur during the first rainfall event. However, only TSS and HEM concentrations had the highest values during the first rainfall event. According to figures in section 3.2, the highest concentrations for TDS, chloride, zinc, and lead were found during the third rainfall event of the year on April 14th, 2014.

4.2 Literature Comparison

Table 4.1 shows a comparison of the contaminant concentrations found in this study as compared to other studies of bridge deck runoff. The NDOR study was conducted by Swadener et al (2012), who measured concentrations in bridge runoff at the same sites investigated in this study, and the final conclusion was that bridges did not impact the quality of the water body in dry weather. Further information regarding this and other studies shown in table 4.1 is explained in the literature review in section 1.2.

According to table 4.1, average concentrations of TDS, TSS, conductivity, chloride, and iron measured in this study were typically higher than those found in other studies. Average concentrations of these constituents were higher than the average concentration measured in the 2012 NDOR study performed at the same locations. An average TDS concentration of 902 mg/L was measured in this study, compared with 170 mg/L determined in the prior NDOR study at the same locations. Average TSS in this study was 602 mg/L, compared with 138 mg/L measured in

2012; conductivity was 1440 µmhos/cm compared with 270 µmhos/cm in the prior study; average chloride was 333 mg/L compared with 24 mg/L in the prior study; average iron was 9.7 mg/L compared with 3.2 mg/L from the prior study. One reason for these differences may be due to differences in the sampling methods used in this study compared to the prior study. In this study, a time-weighted average composite sample was collected and should include sub-samples from the beginning of the storm event when the concentrations are typically higher; while in the prior study, a 5 gallon collection bucket was used to collect runoff. Because the storm volume was much larger than 5 gallons, the sample collected in the 2012 study likely represented runoff generated near the end of the storm event when concentrations in runoff are often lower. However, some constituents measured in the current study had average concentrations that were similar or lower than concentrations measured in 2012. For example, the average concentration of total phosphorus measured in this study was 0.18 mg/L compared with 0.42 mg/L measured in the 2012 study at the same locations and the average concentration of nitrate + nitrite was 0.70 mg/L compared with an average concentration of 2.63 mg/L measured in 2012.

Table 4.1 Comparison of contaminants values with literature review

	NDOR 2014[1]			NDOR 2012*	URS 2010*	Kim et al. 2007*	Malina et al. 2005*	Nishtala 2004*
	Average values	Max. values	Min. values					
Number of Sites (n)	4	4	4	4	15	1	3	1
pH	7.58	8.67	6.85	7.65	6.8			
TDS (mg/L)	902	14,900	51.7	170	34			
TSS (mg/L)	602	5203	3.33	138	39	155.4	89.60	65.3
Chloride (mg/L)	334	9602	5.53	24.3	0.81			
Specific Conductance (µmhos/cm)	1440	21,900	50	270.3	51			
Total Kjeldahl Nitrogen (TKN) (mg/L)	1.44	3.14	0	3.16	0.71	2.59	1.82	4.0
TP (mg/L)	0.18	0.42	0	0.42	0.169	0.65	0.42	0.9
Nitrate + Nitrite (mg/L)	0.70	3.95	0	2.63	0.21			
Total Iron (µg/L)	9740	101,500	69	3290	1420			
Total Lead (µg/L)	60	185	10		5.29		9.86	11.1
Total Zinc (µg/L)	120	676	2	120	65.9		145.01	168.3
Oil and Grease (mg/L)	2.75	12.3	0		4.8	29.42	4.60	6.7

[1]This study
*Average concentrations

4.3 Trends of Contaminants in Runoff

Conductivity, TS, TSS, TDS, and chloride concentrations demonstrated similar behavior at the sampling locations. Their concentration was high during the first rainfall events, but then decreased with subsequent rainfall events. This was to be expected due to the accumulation of solids and salts during the winter months that are washed away throughout the wet season. Many samples for HEM, TKN, nitrate, nitrite, and TP were detected at concentrations below the

average concentration found in the previous NDOR study conducted by Swadener et al (2012). Iron and zinc concentrations decreased during the summer but showed some spikes.

Generally, the highest concentrations of zinc, lead, iron, HEM, chloride, TDS, TSS, and TS were measured at the I-80 bridge over the Platte River and the Highway 77 bridge over the Rock Creek.

4.4 Correlation between Antecedent Dry Period (ADP) and Metals Concentration

The following figures compare the concentration of metals in bridge runoff with the ADP. Trend lines are also included in the graphs in order to better represent general increases or decreases in the data. Some correlation between ADP and zinc concentration was determined for the I-80 bridge over the Platte River. However, there was no correlation between lead or iron concentration and ADP in any bridge. Since only three points were used to determine the relationship between metals concentration and ADP at the Highway 77 bridge over Rock Creek, the graphs are shown in this section, but not considered in this analysis. The same behavior is observed for the relationship between metal mass, or metal mass per area and ADP. The sets of figures for those variables can be found in Appendices A and B.

4.4.1 Zinc Concentration versus ADP

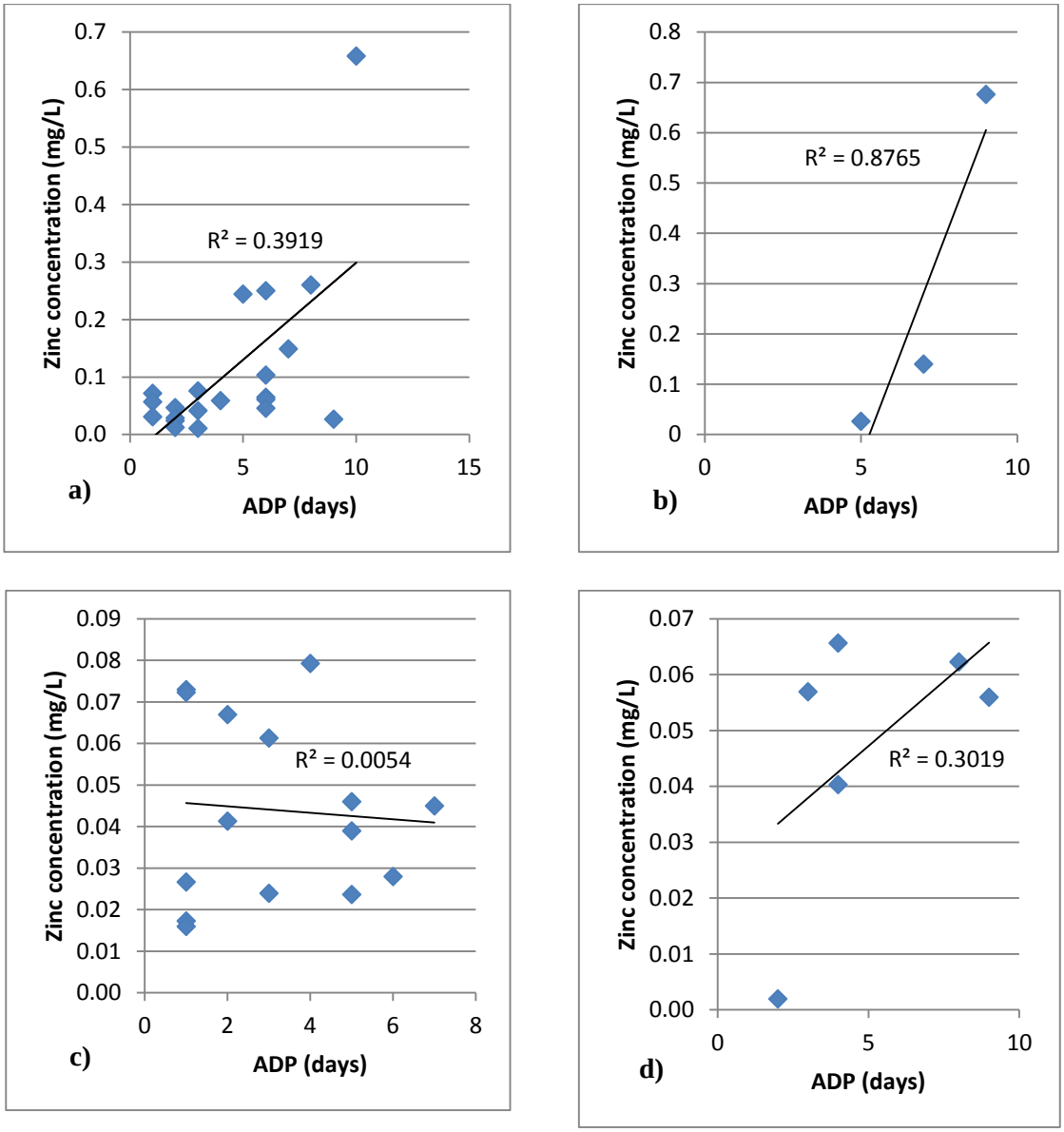

Figure 4.1 Zinc concentration in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

4.4.2 Lead Concentration versus ADP

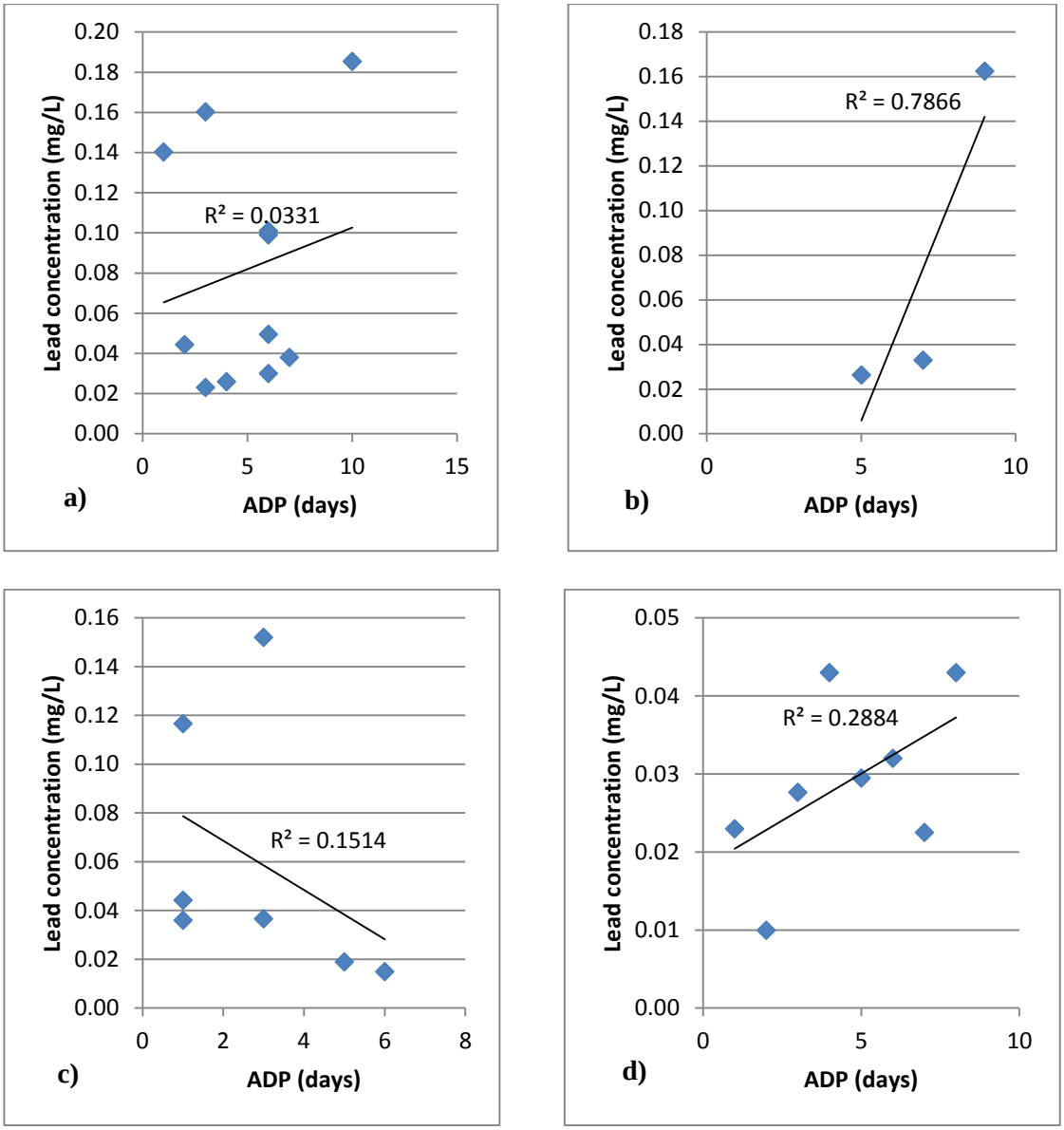

Figure 4.2 Lead concentration in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

4.4.3 Iron Concentration versus ADP

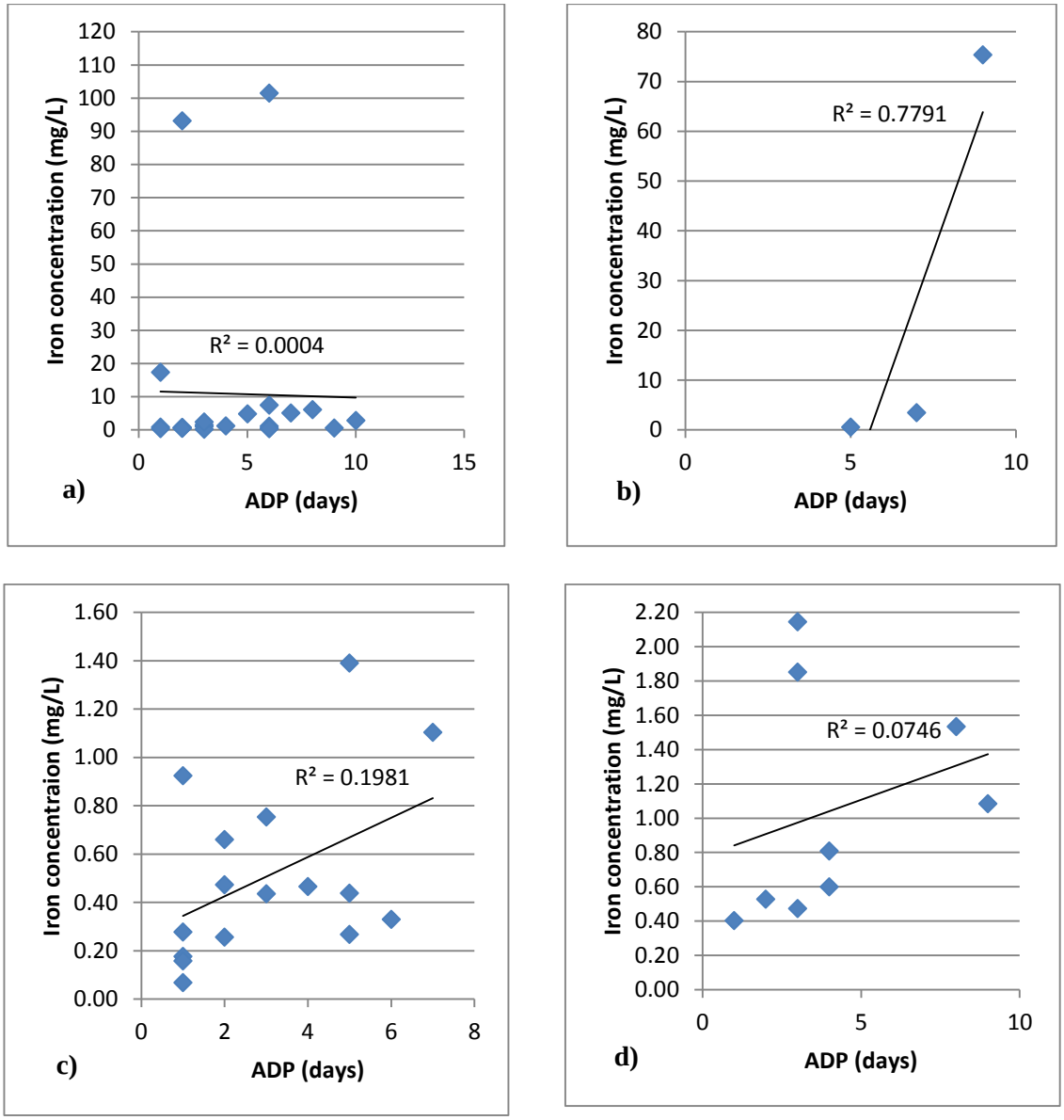

Figure 4.3 Iron concentration in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

4.5 Correlation between Traffic during the Antecedent Dry Period and Metals Concentration in Runoff

The following sets of figures compare the concentration of metals in bridge runoff with daily traffic during the antecedent dry period (ADP). At the I-80 bridge over the Platte River, the daily traffic data was collected from the permanent count station operated by NDOR. The daily traffic values used from that bridge represents the number of vehicles counted on the roadway, taking into account the lane distribution of vehicles in the two lanes within the roadway area sampled (see table 2.1) during each ADP. The two lanes sampled represented 76.4 percent of the total traffic along the interstate. At the other locations, the daily traffic data was collected using a mounted and solar powered wavetronics HD sensor pole, taking into account the number of vehicles in the lanes explained in table 2.1. Since during the traffic data collection period only two bridge runoff samples were taken at Highway 77 over Rock Creek, we did not perform a regression analysis at that location. There was no correlation between the amount of traffic and the concentration of lead and iron at any bridge. However, there was a correlation ($R^2 = 0.3716$) between the amount of traffic and the concentration of zinc at the I-80 bridge over the Platte River. This difference is explained in the sources of these metals in runoff. The only source of zinc in bridge deck runoff is vehicle wear, but the sources of lead and iron may also include the materials and structure of the bridge. It can be seen in figure 4.6a that the intercept in the y-axis (iron concentration) is larger than the y-axis intercept for zinc (fig. 4.4a). This reinforces the idea that there are other non-traffic variables that influence iron concentration. To obtain a better correlation for iron and lead, it may be necessary to consider other variables such as bridge design. In figure 4.4a, not only is the regression coefficient shown but also the equation for the

correlation between zinc concentration and traffic. The relationship determined at this location is:

$$\mathrm{zinc(mg/L)} = 0.000002(\mathrm{traffic}) - 0.0234 \quad (4.1)$$

When data from all four sites was considered together, the resulting linear regression equation had an R^2 value of 0.259. The relationship between zinc concentrations in runoff and daily traffic during the ADP for the four sites was:

$$\mathrm{zinc(mg/L)} = 0.000001(\mathrm{traffic}) + 0.0266 \quad (4.2)$$

To our knowledge, this represents the first relationship developed between traffic and contaminant concentration in runoff. Prior studies have determined a bimodal relationship with daily traffic. For example, Dupuis (2002) identified that bridges with ADT over 180,000 vehicles per day resulted in water quality impacts; however, bridges with ADT less than 30,000 produced no noticeable impact. In this study, the total traffic during the ADP ranged from 20,000 to 160,000. No correlation was observed for metal mass, and metal mass per area versus traffic during the ADP. Those regression relationships are shown in Appendices C and D.

4.5.1 Zinc concentration versus traffic during the ADP

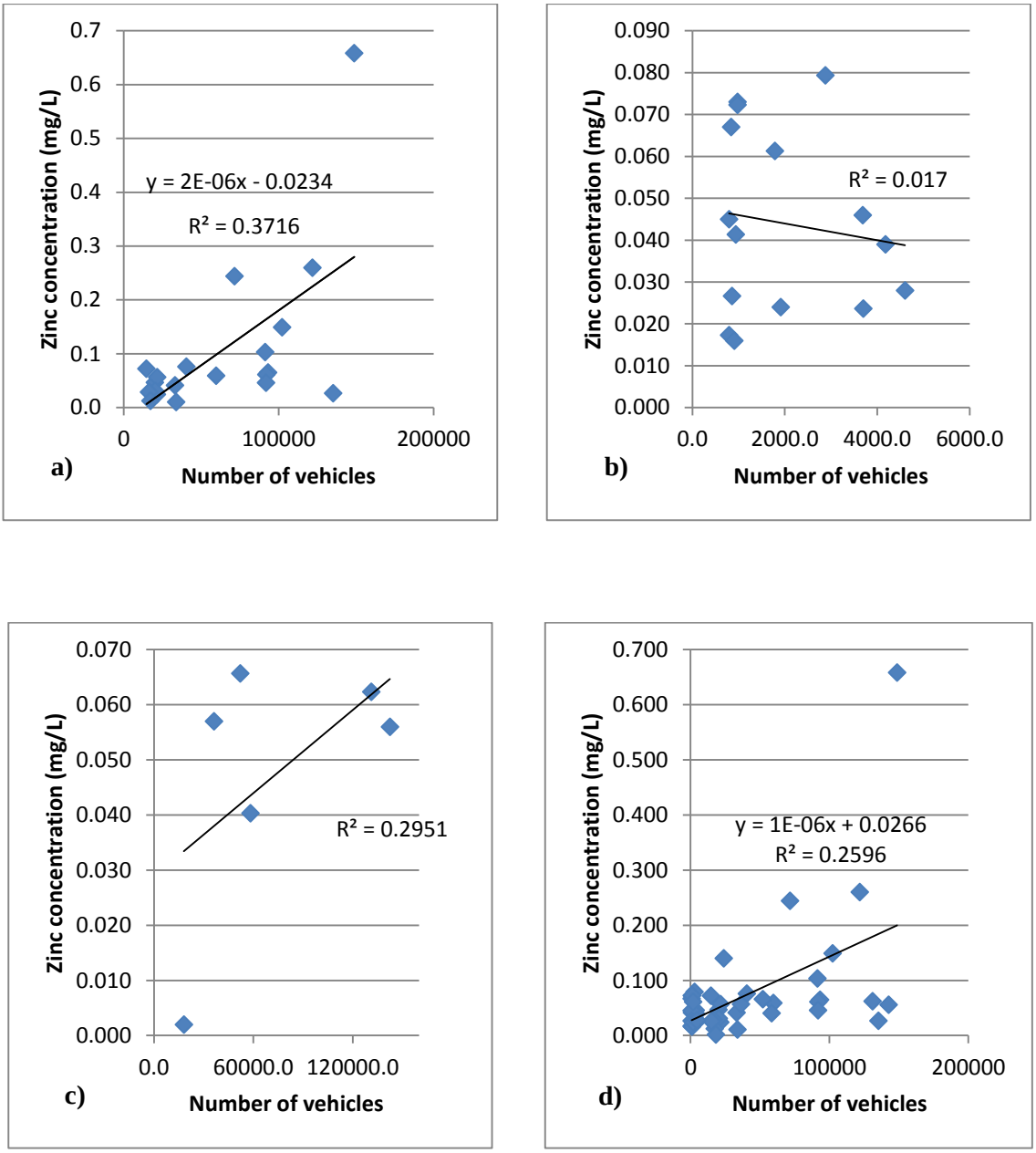

Figure 4.4 Zinc concentration in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek d) All four locations together

4.5.2 Lead concentration versus traffic during the ADP

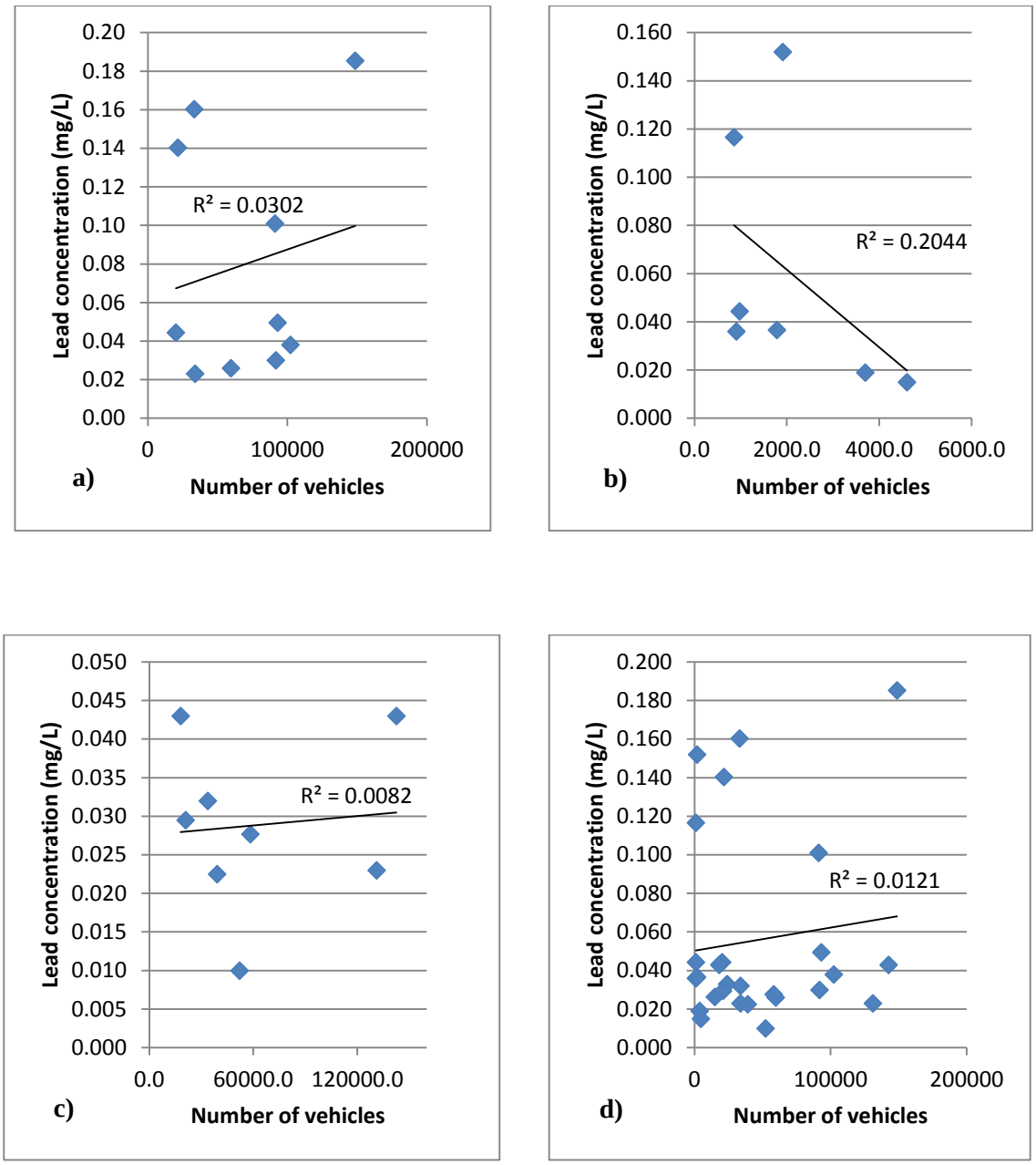

Figure 4.5 Lead concentration in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek d) All four locations together

4.5.3 Iron concentration versus traffic during the ADP

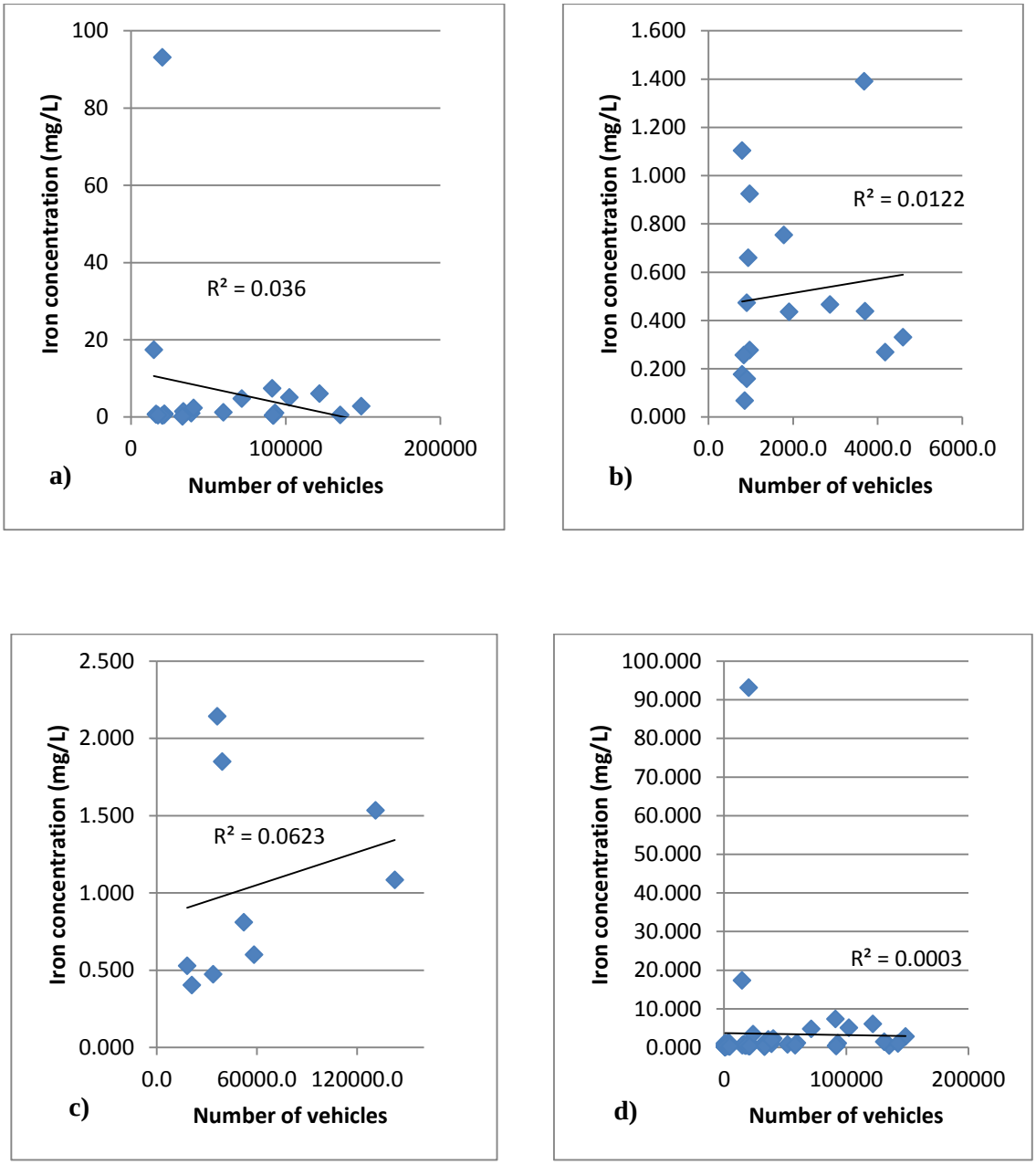

Figure 4.6 Iron concentration in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek d) All four locations together

4.6 ADP and Traffic Statistical Analysis

Using the statistical analysis software Statistixs 10, the p-values for the slope and intercept for the correlation between zinc concentration and ADP, or zinc concentration and traffic from the I-80 bridge over the Platte River, were calculated. Those values are shown in table 4.2.

Table 4.2 ADP and Traffic Statistical Analysis p-value results from I-80 bridge over the Platte River for zinc concentration (mg/L)

Statistics	Traffic	p-value	ADP	p-value
b (intercept)	-0.02342	0.6268	-0.03899	0.4443
m (slope)	2.04E-06	0.0043	0.03379	0.0024
R^2	0.3716		0.3919	
R^2 adjusted	0.3367		0.3599	

Since p-values for the slope for traffic and ADP were less than 0.05, it means that the slope is different from zero, and therefore, there is a correlation between zinc concentration and ADP, or zinc concentration and traffic. Additional statistics analysis relating metal mass, and metal mass per area versus traffic or ADP, is shown in Appendix F.

The p-values for the slope and intercept for the correlation between zinc concentration and traffic from all four locations together were calculated. Those values are shown in table 4.3.

Table 4.3 ADP and Traffic Statistical Analysis p-value results from all four locations together for zinc concentration (mg/L)

Statistics	Traffic	p-value
b (intercept)	0.02656	0.1646
m (slope)	1.164E-06	0.0005
R^2	0.2596	
R^2 adjusted	0.2416	

When data from all four site locations together is used, p-values for the slope for traffic was less than 0.05, which means that the slope is different from zero, and therefore, there is a correlation between zinc concentration and traffic.

4.7 State Water Quality Standards Comparison

Using the Title 117 Nebraska Water Quality Standards, a comparison was made between runoff water quality results found in this study and state water quality standards (table 4.4). Only chloride, *E.Coli*, HEM, iron, and pH could be compared to state water quality standards. Zinc and lead could not be compared with Title 117, because the water quality standards for those metals are based on total hardness, which was not measured in this study

Table 4.4 Comparison of contaminants values with state water quality standards

Constituent	Water Quality Standard From Title 117	Bridge Site	Receiving Stream	% of Exceedances
Chloride	860 mg/L	I-80	Platte River	5
		Hwy 77 Ceresco, NE	Rock Creek	50
HEM*	10 mg/L	Hwy 77 Ceresco, NE	Rock Creek	50
Iron	1,000 µg/L	I-80	Platte River	56.5
		Hwy 77 Ceresco, NE	Rock Creek	66.6
		Hwy 64 Leshara, NE	Platte River	18.7
		27th Street and I-80 Lincoln, NE	Little Salt Creek	44.4

*As petroleum oil

There were no exceedances of Title 117 standards for *E.coli* and pH, and therefore, they were not included in table 4.4. It is important to note that only four samples were collected at the Highway 77 bridge over Rock Creek location, and two were tested for chloride and HEM and three for iron, which is why the percent of exceedance is higher for those constituents at that

location. Iron was the only constituent that exceeded state water quality standards at all sampling locations. For the I-80 bridge over the Platte River, and the I-80 bridge over Little Salt Creek, the percentage of runoff samples exceeding the state standard was almost 50 percent of samples tested.

Chapter 5 Conclusions

Since bridges are located close to receiving water, bridge deck runoff is often discharged directly to water bodies. Several prior studies have focused on roadway runoff quality, however, there are fewer studies focused solely on bridge deck runoff. There is only one prior study available regarding the impacts of bridge deck runoff on receiving waters in Nebraska. However, their conclusions were based on a sampling conducted during a drought period. Regulatory agencies need appropriate information to decide if structural control for bridge deck runoff will be necessary to protect water quality and aquatic life. The objective of this research was to evaluate the quality of bridge deck runoff by evaluating water chemistry.

Four bridges were selected based on ADT, stream flow, safety considerations, and accessibility for the retrieval of bridge deck runoff samples. A gutter system specific to each bridge was designed and constructed to catch and collect runoff. Automatic samplers were used to collect time weighted composite samples of bridge runoff. Several samples were collected and sampled from three sites, but only four samples were collected from the Highway 77 bridge over Rock Creek. Hourly traffic data was also collected from all sites.

The concentrations of all contaminants in the runoff samples were analyzed based on the first flush, literature values, and temporal trends, but only metals concentrations were evaluated as a function of ADP and traffic. It was expected that the highest concentrations of contaminants occurred during the first flush. However, only TSS and HEM concentration had the highest values during the first flush. The highest concentrations for TDS, chloride, zinc, and lead were found during the third rainfall event of the year. Average concentrations of TDS, TSS, chloride, iron, and lead measured in this study were higher than those found in other studies. For lead and iron, it was difficult to observe a direct relationship between concentration and ADP, or

concentration and traffic. However, there was a stronger correlation between the amount of traffic and the concentration of zinc. This difference is explained in the sources of these metals in runoff. The only source of zinc in bridge deck runoff is vehicle wear, but the sources of lead and iron may include the bridge materials. Therefore, to get a better correlation for iron and lead, it is necessary to consider other variables such as bridge design.

In this study, few runoff samples exceeded in stream state water quality standards. It should be noted, however, that water quality standards could not be determined for all constituents measured because several are based on hardness, which was not evaluated in this study. In addition, peak concentrations may be of concern, especially for total solids, total suspended solids, and total dissolved solids, which were higher during the spring. These high concentrations are likely due to accumulation of sediment as well as road salt application over the winter months. The buildup of these contaminants during the winter months can result in a spring 'flush' causing the higher concentrations measured in the early spring. Samples from this time period (March – May) were only obtained from two bridges, and more sampling during the early spring may be necessary to better quantify peak concentrations of total solids, total dissolved solids, and total suspended solids originating in roadway runoff. Additional recommendations for future research are listed below:

- To obtain precipitation data closer to the sampling site, it may be beneficial to install rain gauges to measure rainfall instead of using data from nearby weather stations, which ranged from 4 to 16 miles from the sampling locations.
- It would be favorable to sweep the street or bridge after all runoff sampling is completed, and test the collected sediment for metals in order to determine what is left on the bridges.

- Conduct metal testing for additional metals including chromium, copper, and nickel to determine if there are any additional correlations between metal concentration and traffic.
- Conduct additional metal testing for lead and iron from the bridges analyzed in this study to determine how other sources, such as bridge design, are affecting metal concentrations in runoff.

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Appendices

Appendix A ADP versus Metal Mass and Metal Mass per Area

A.1 Zinc Mass versus ADP

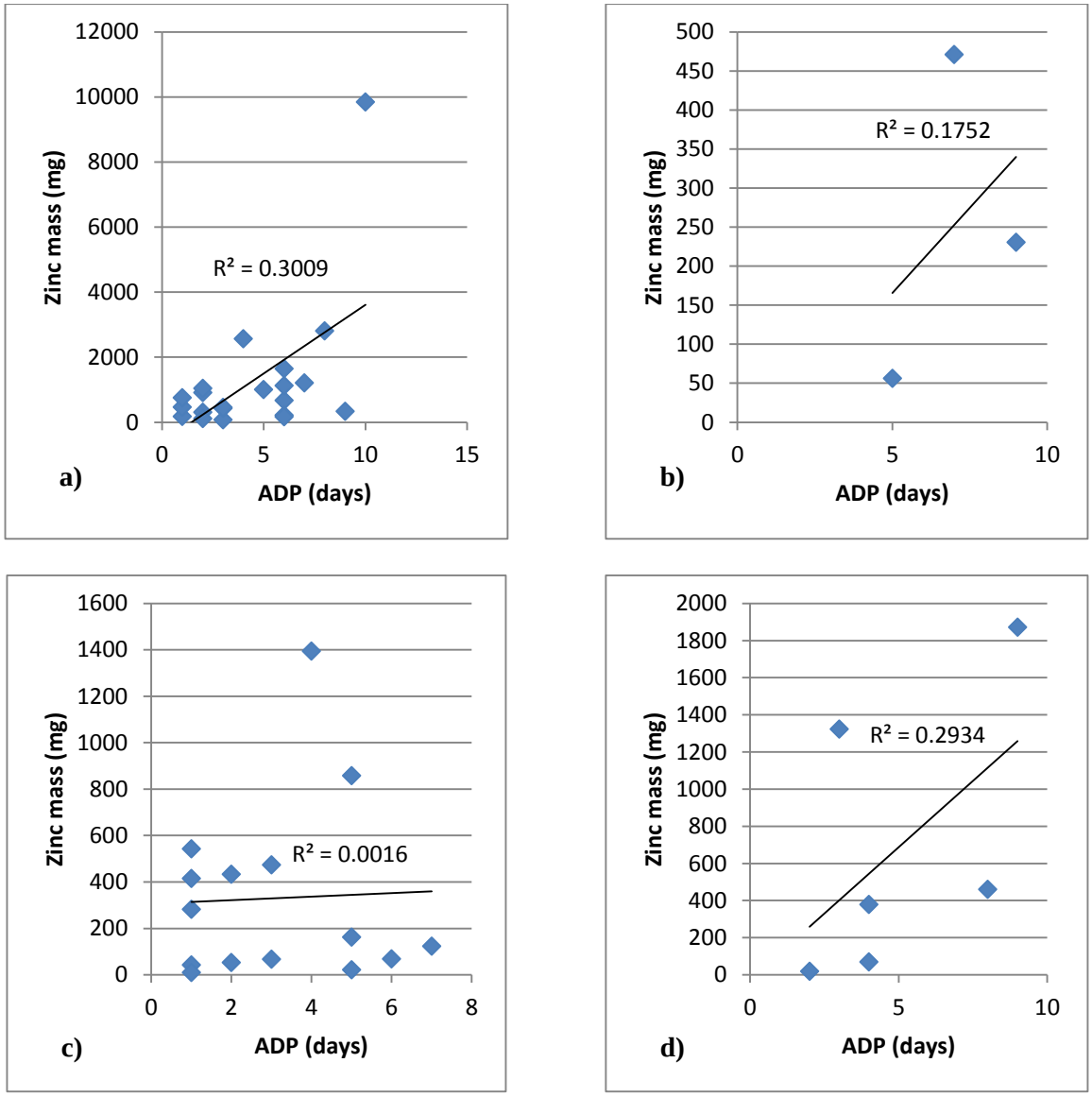


Figure A.1 Zinc mass in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

A.2 Lead Mass versus ADP

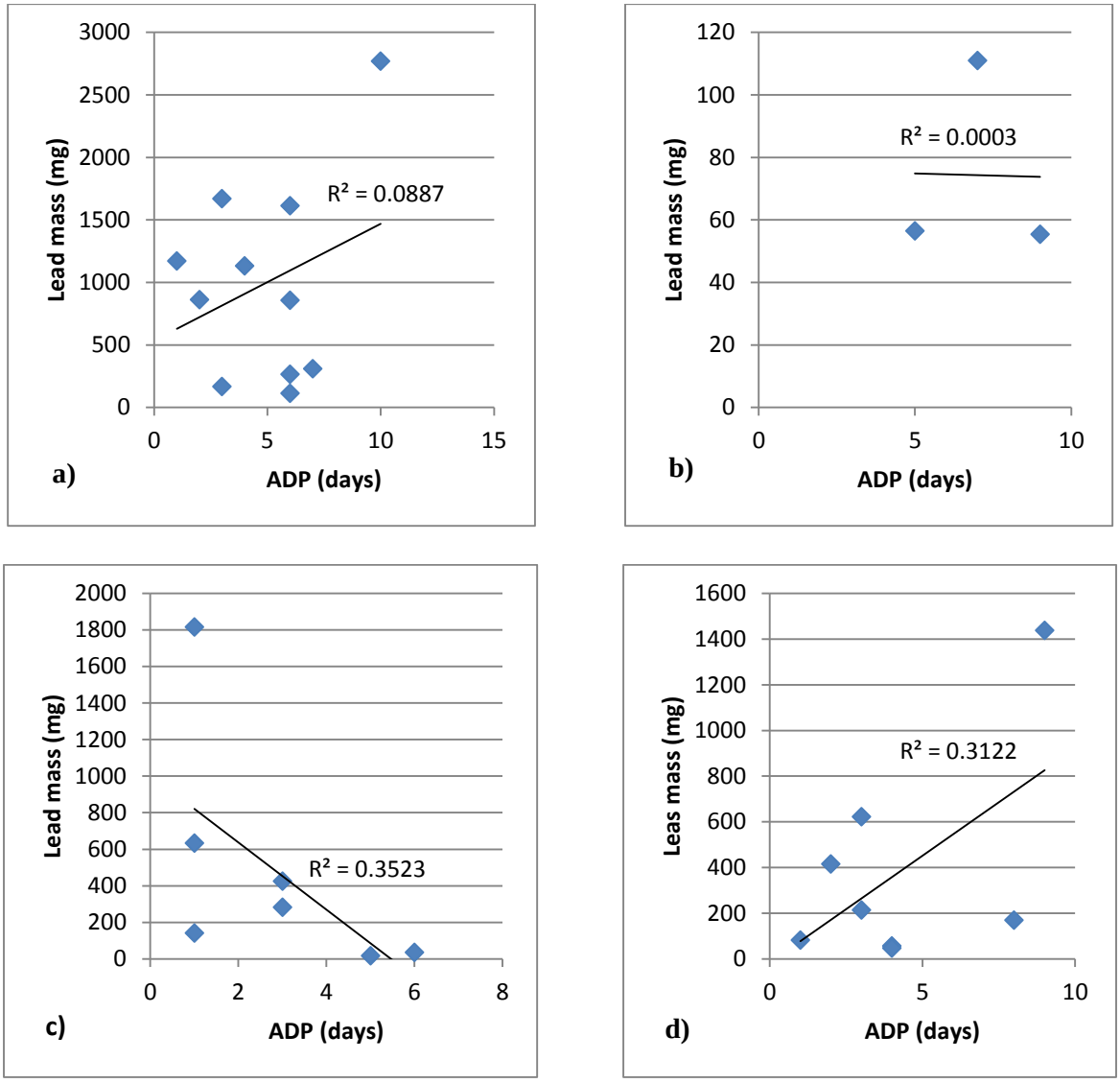


Figure A.2 Lead mass in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

A.3 Iron Mass versus ADP

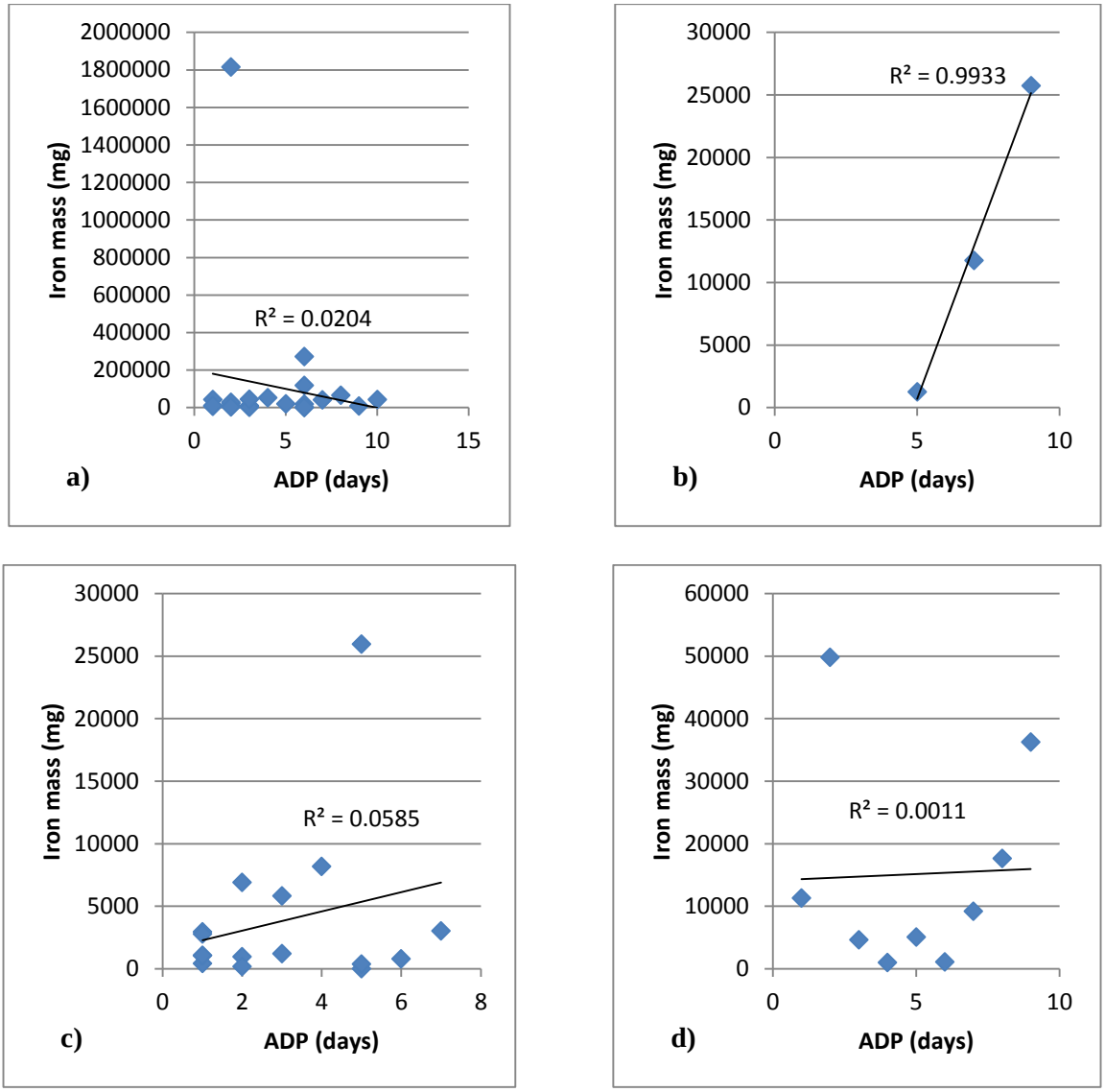


Figure A.3 Iron mass in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

A.4 Zinc Mass per Area versus ADP

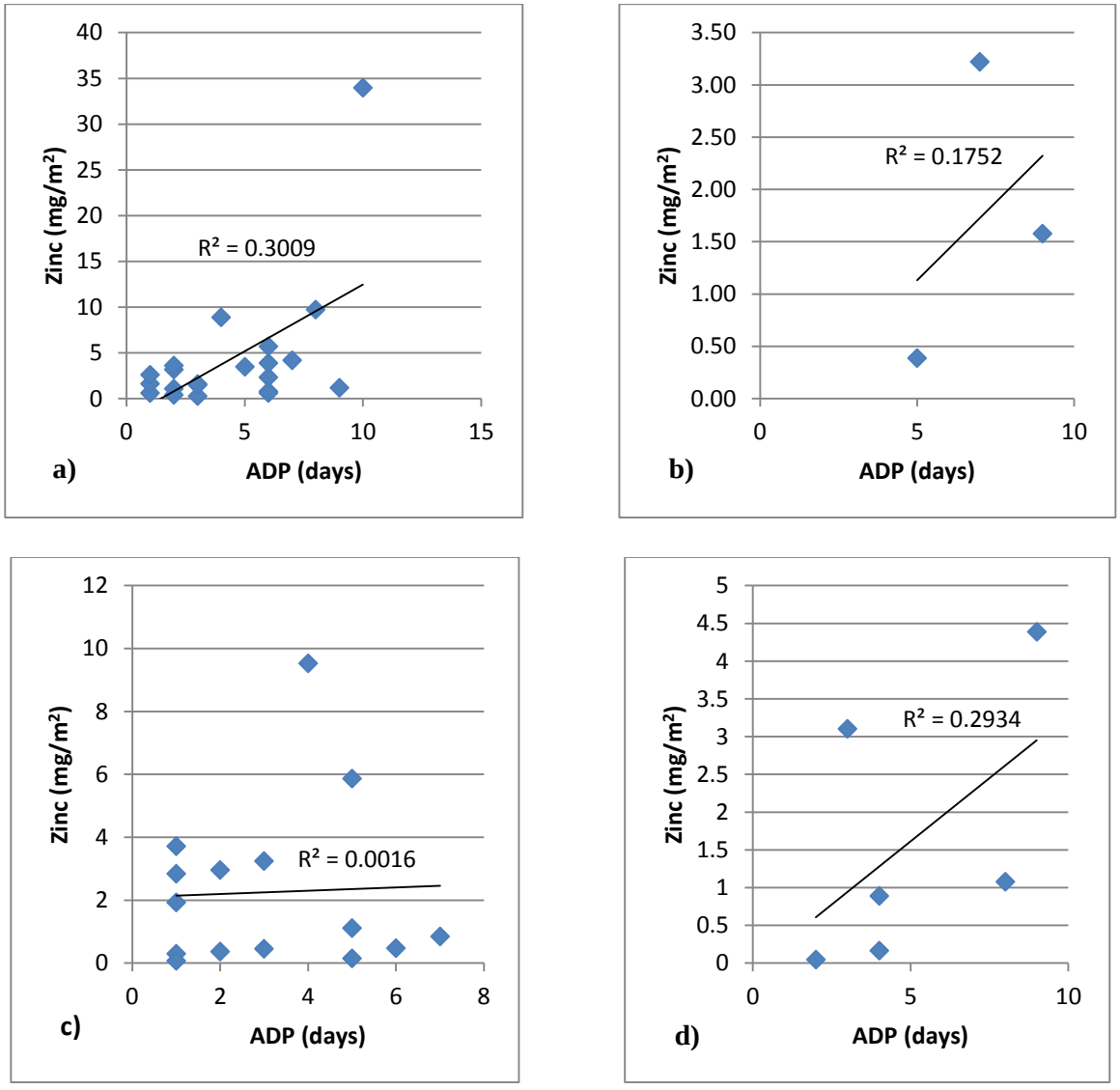


Figure A.4 Zinc mass per area in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

A.5 Lead Mass per Area versus ADP

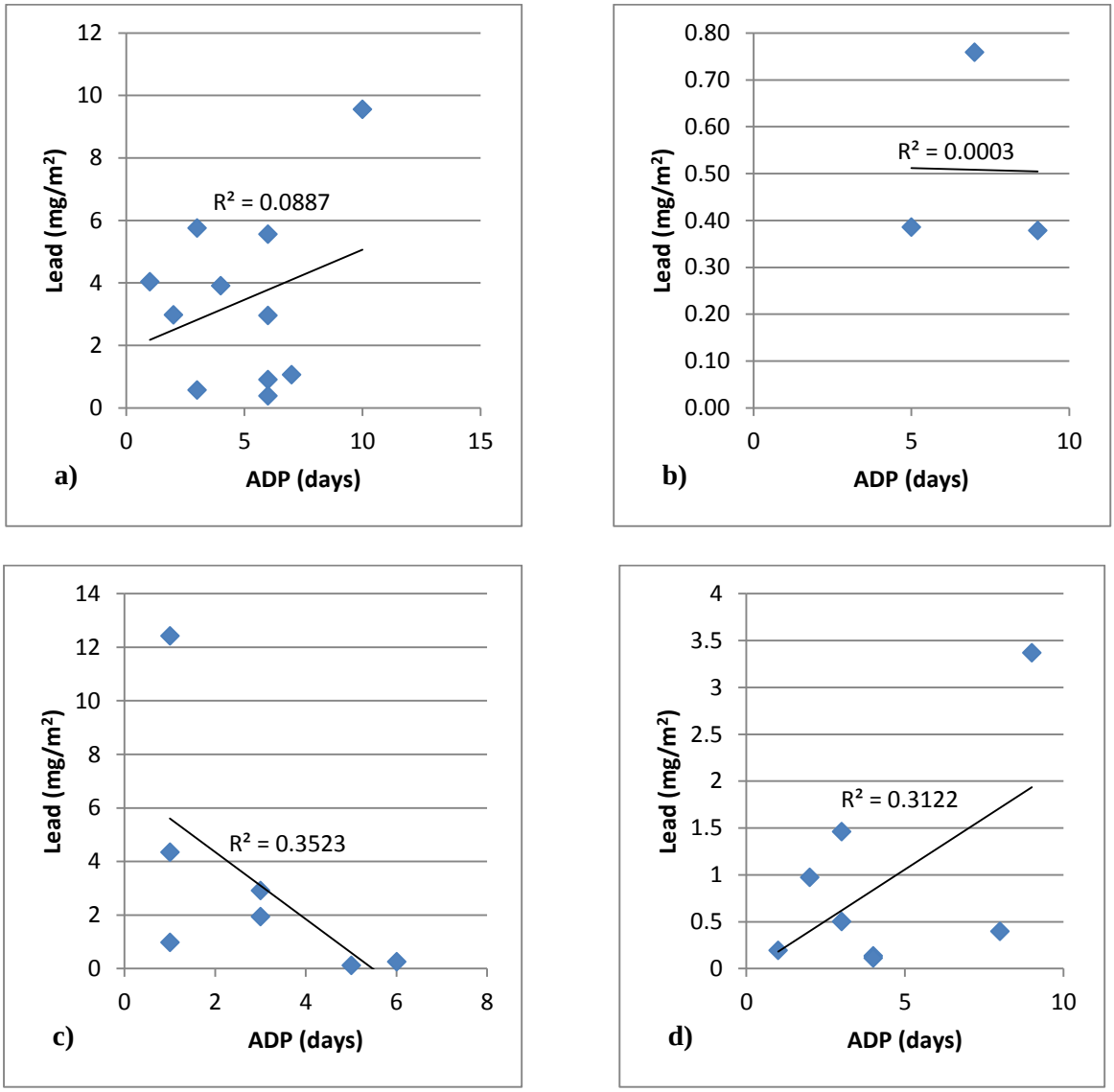


Figure A.5 Lead mass per area in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

A.6 Iron Mass per Area versus ADP

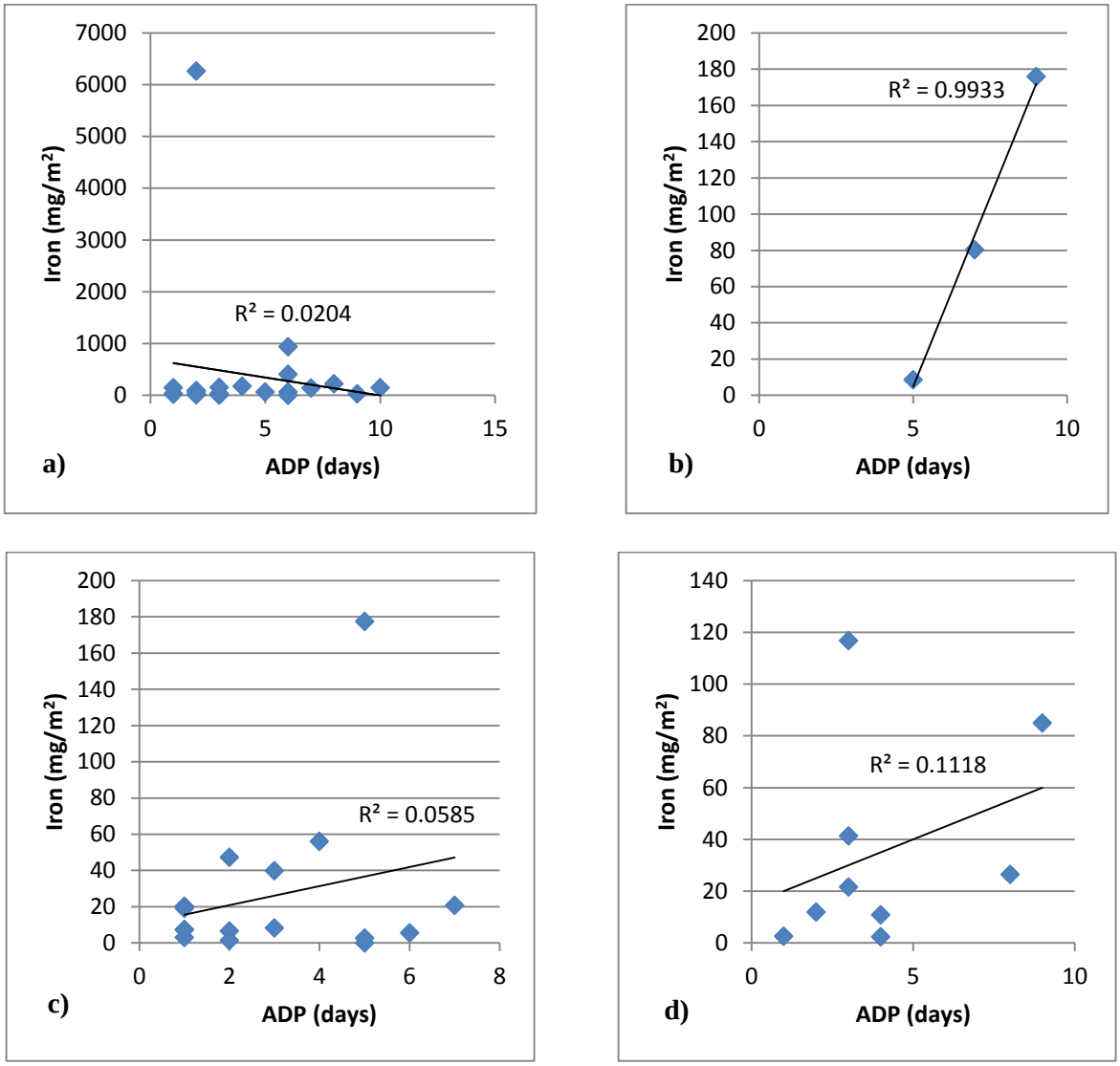


Figure A.6 Iron mass per area in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

Appendix B ADP versus Total Metal Concentration, Total Metal Mass, and Total Metal Mass per Area

B.1 Total Metal Concentration versus ADP

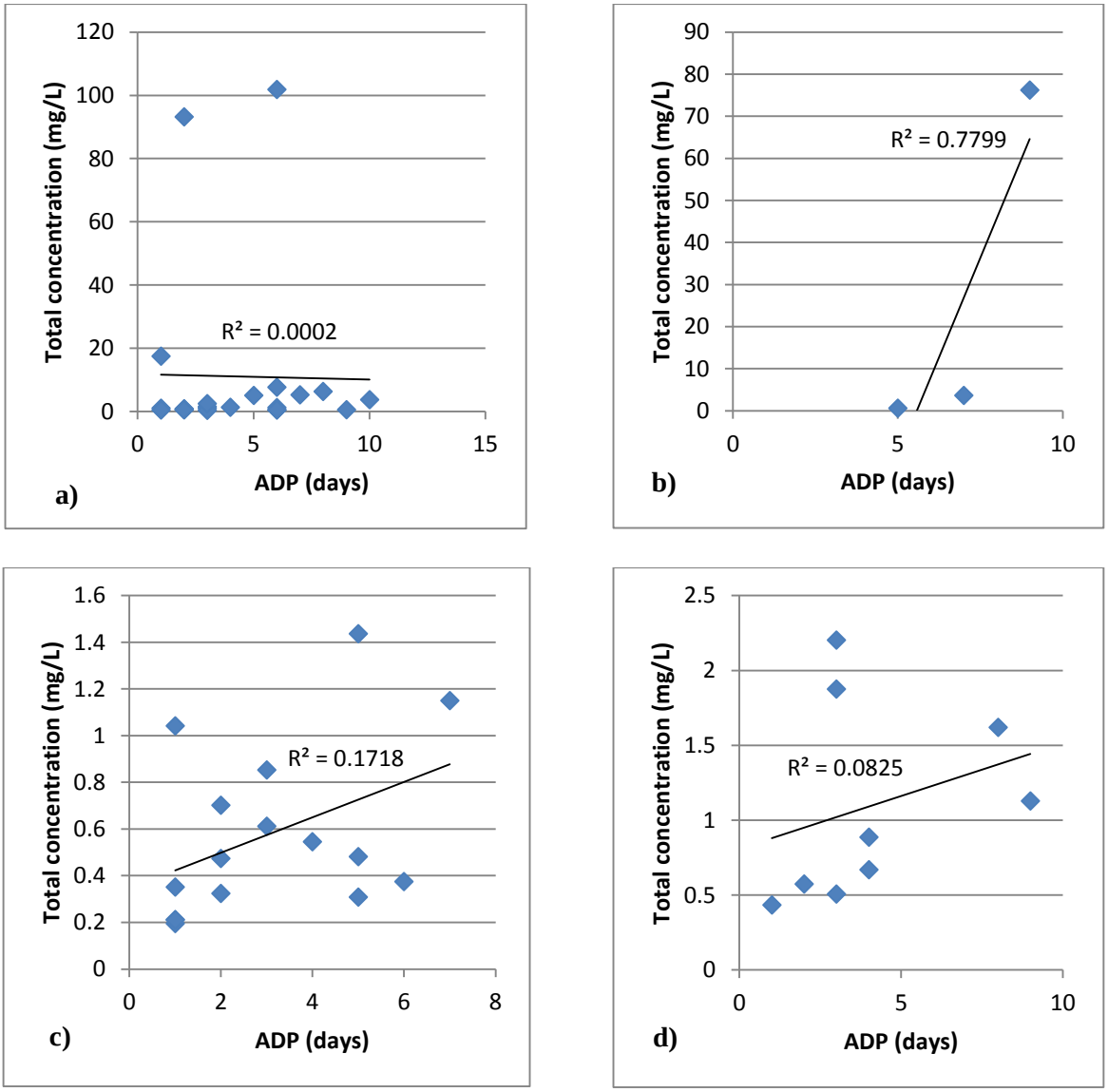


Figure B.1 Total metal concentration in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

B.2 Total Metal Mass versus ADP

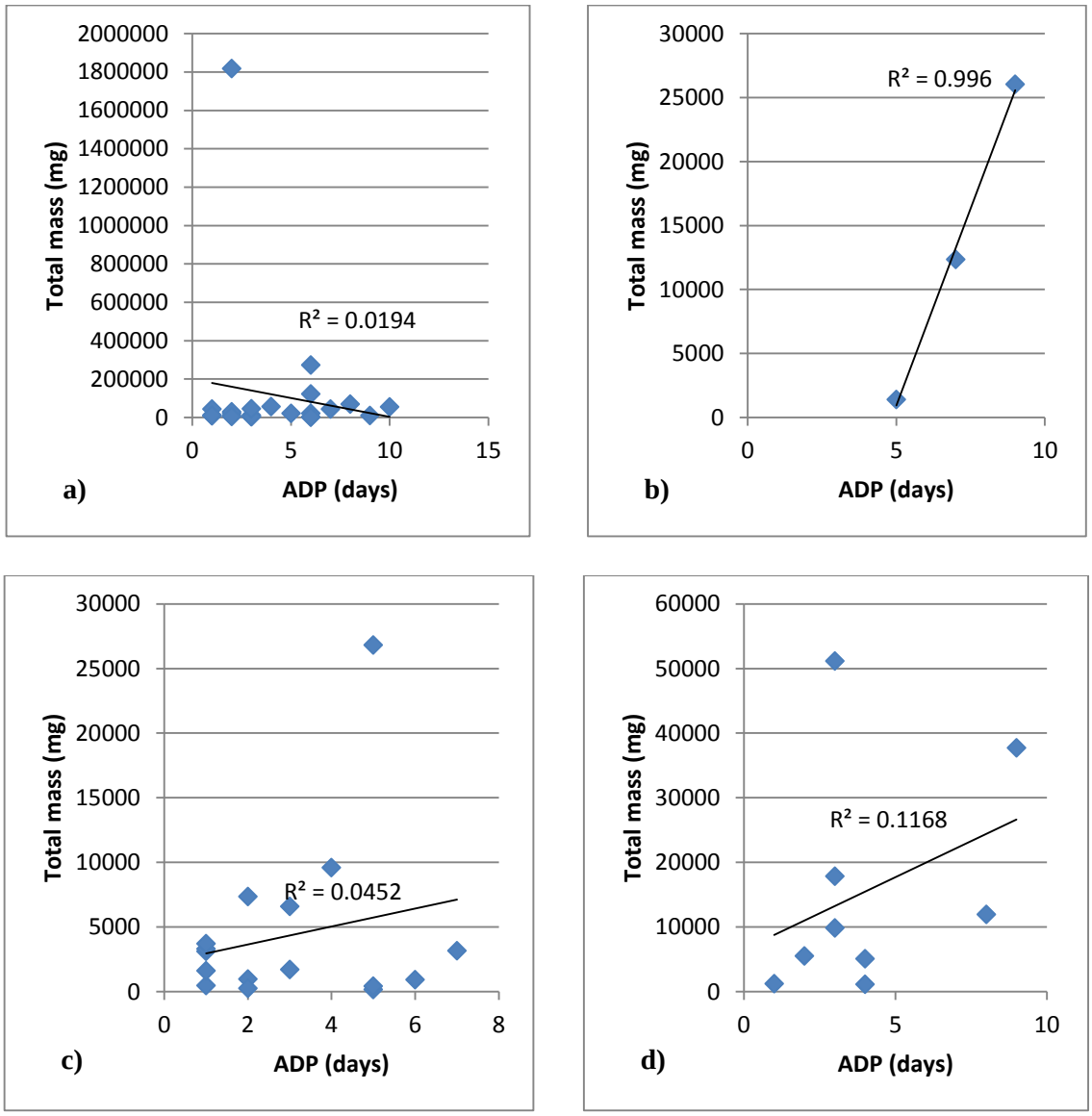


Figure B.2 Total metal mass in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

B.3 Total Metal Mass per Area versus ADP

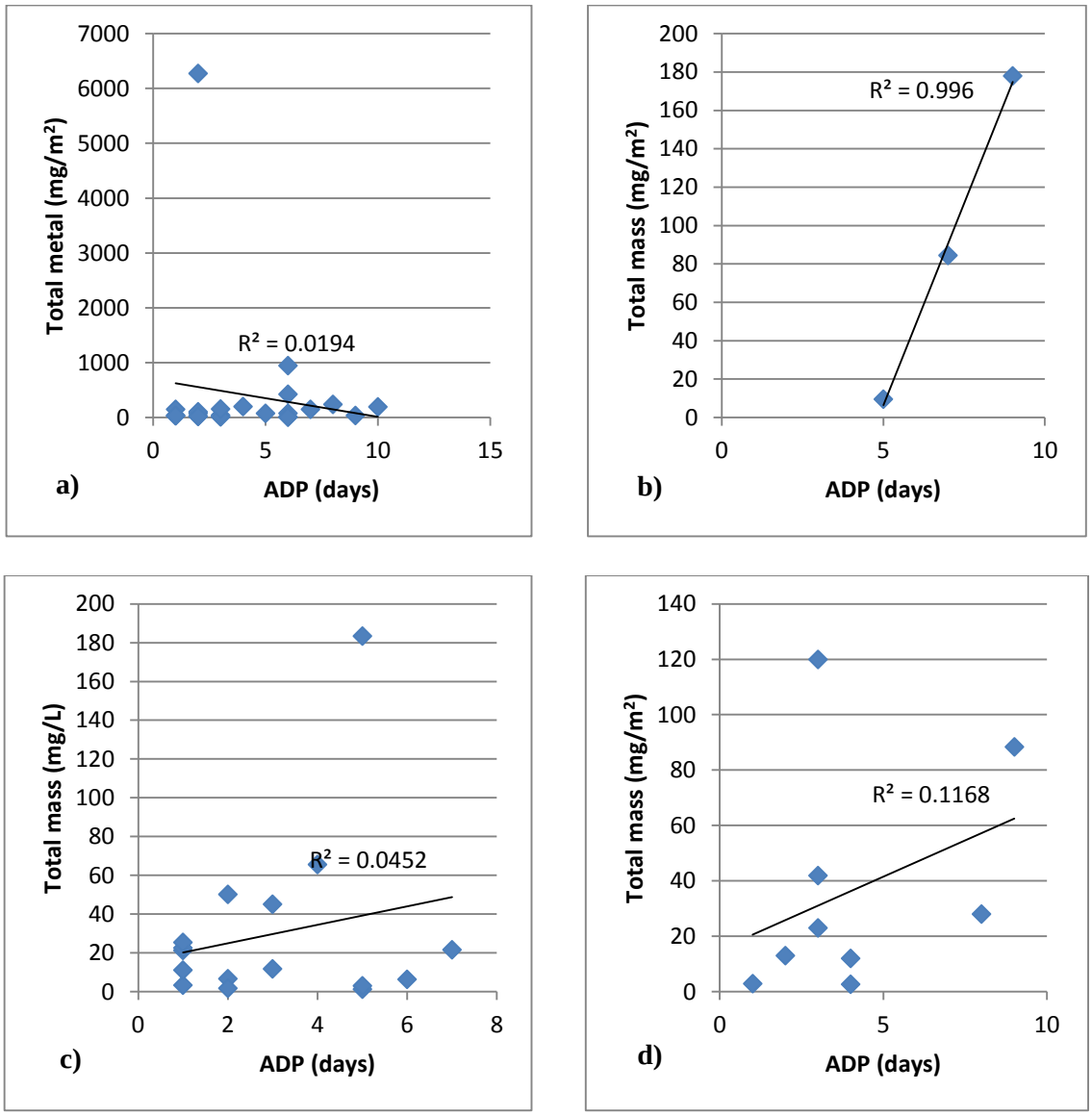


Figure B.3 Total metal mass per area in runoff versus ADP from: a) I-80 bridge over Platte River b) Highway 77 bridge over Rock Creek c) Highway 64 bridge over Platte River d) I-80 bridge over Little Salt Creek

Appendix C Traffic versus Metal Mass and Metal Mass per Area

C.1 Zinc Mass versus Traffic during the ADP

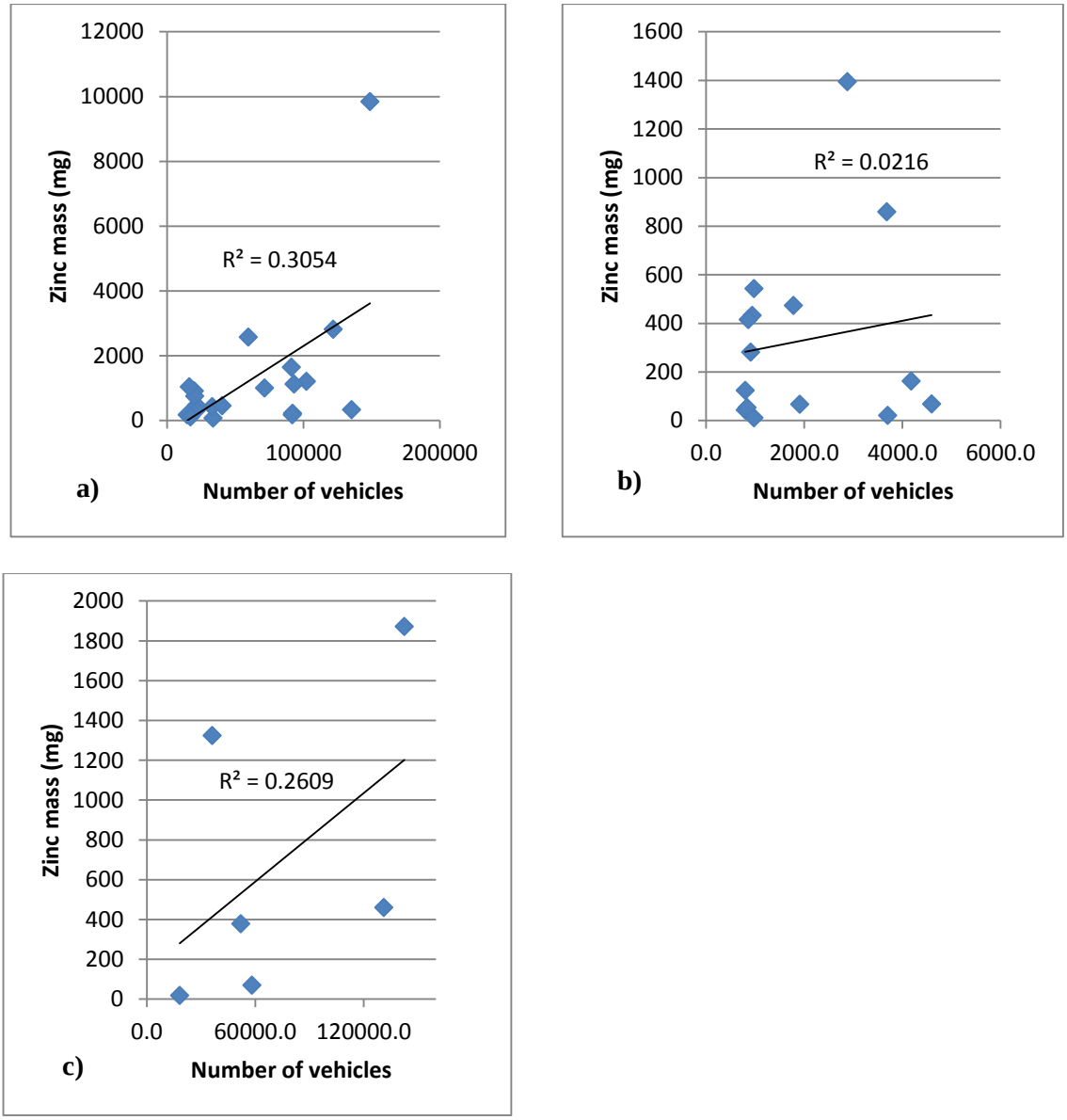


Figure C.1 Zinc mass in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

C.2 Lead Mass versus Traffic during the ADP

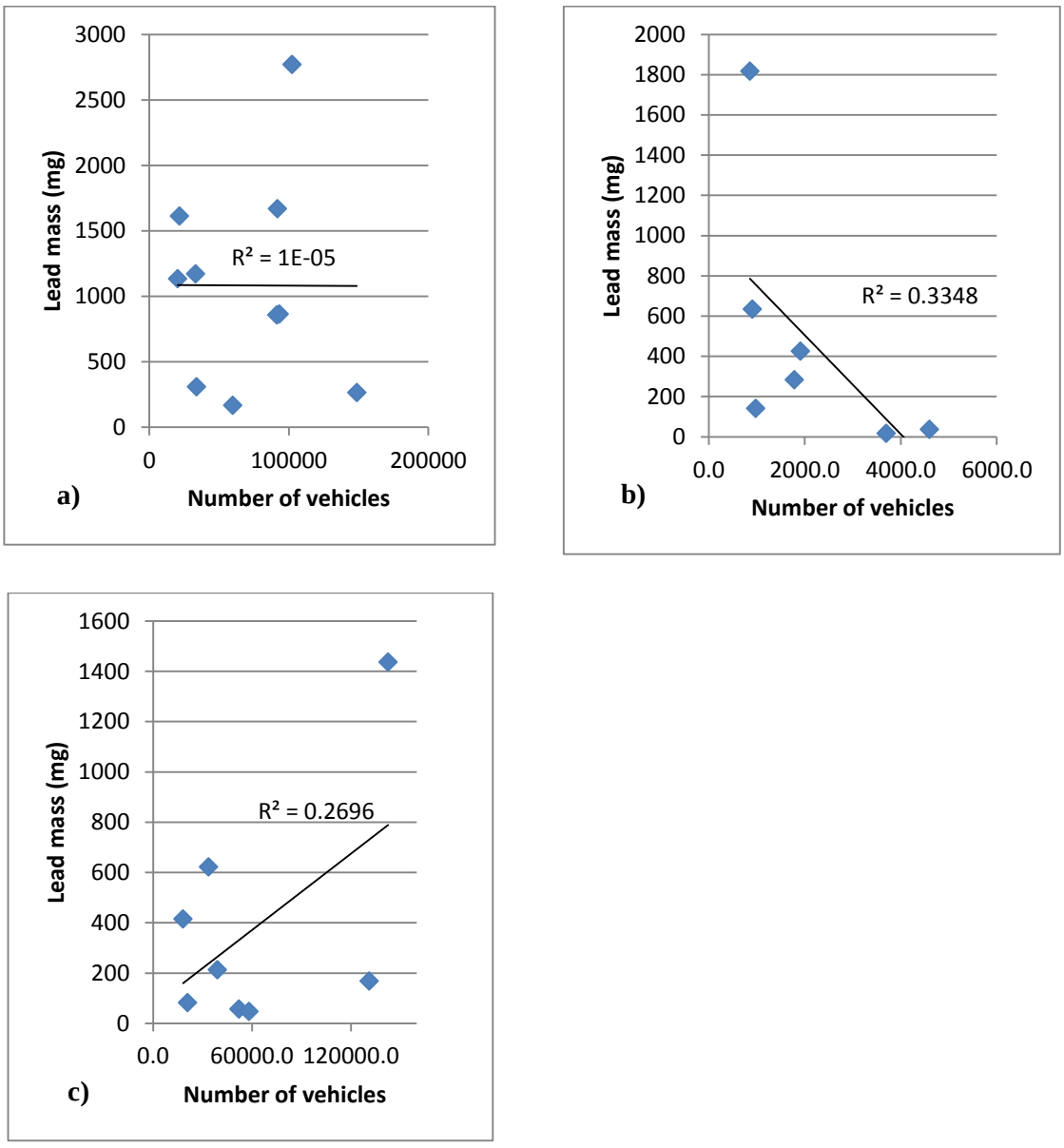


Figure C.2 Lead mass in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

C.3 Iron Mass versus Traffic during the ADP

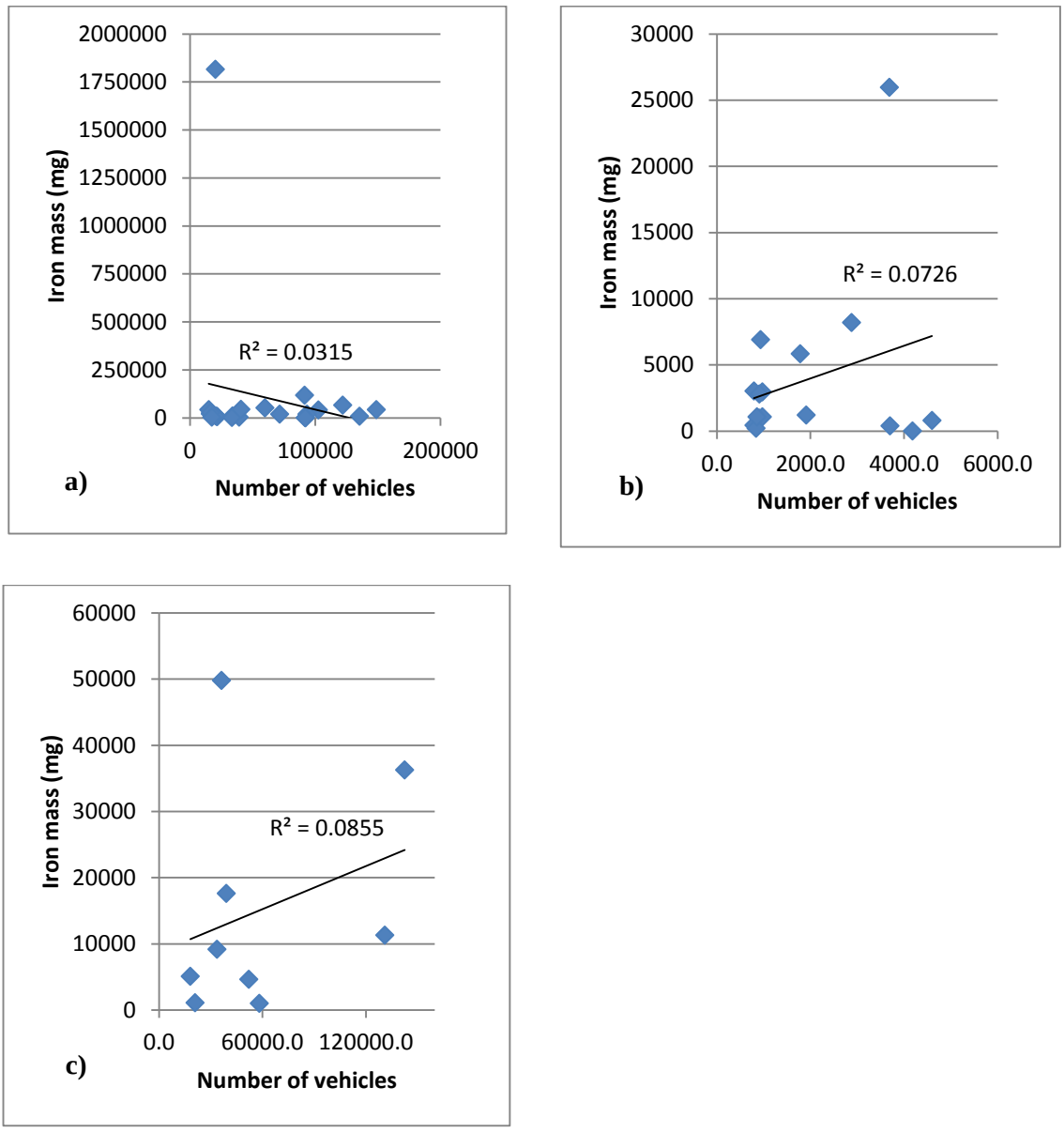


Figure C.3 Iron mass in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

C.4 Zinc Mass per Area versus Traffic during the ADP

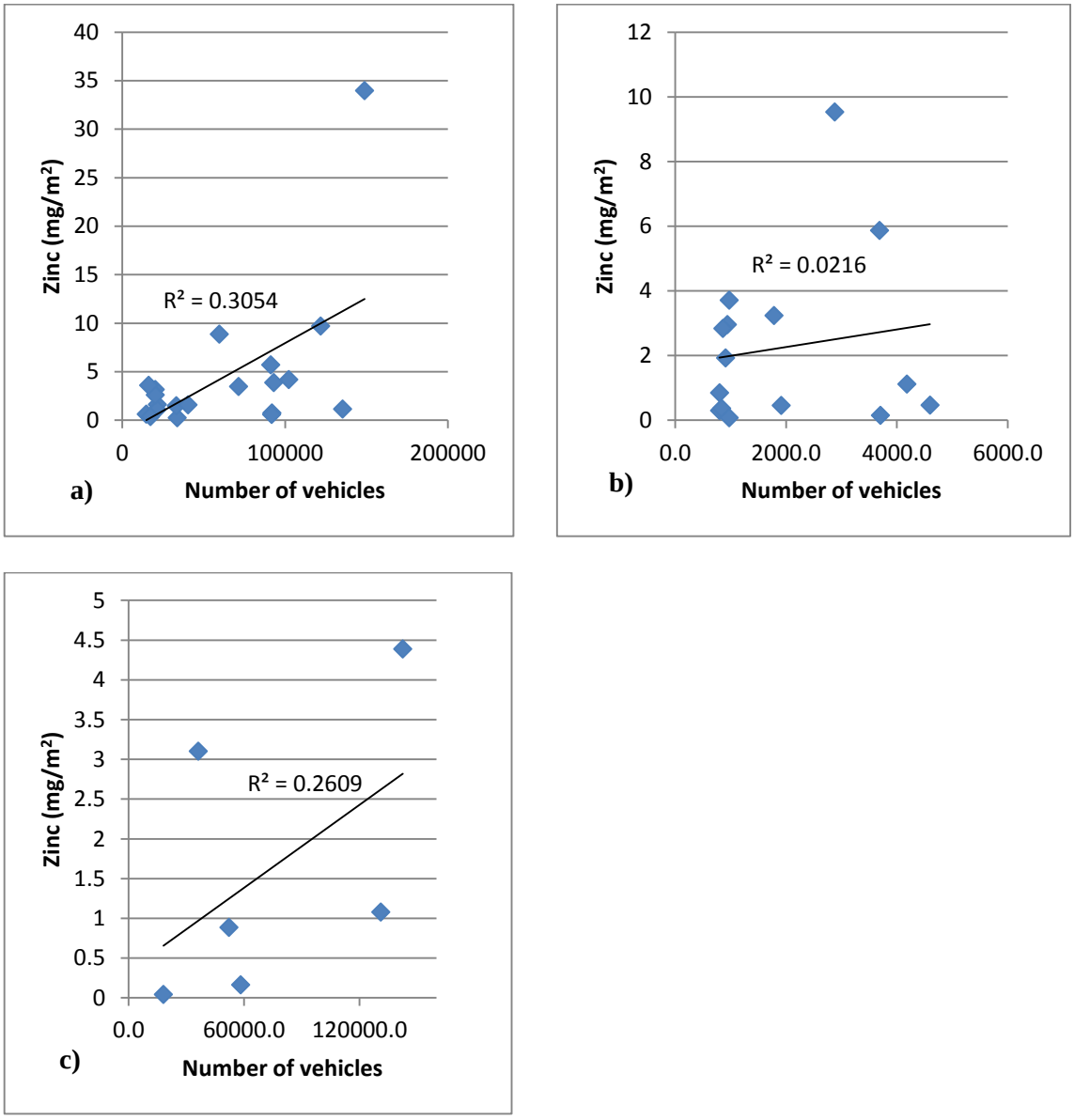


Figure C.4 Zinc mass per area in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

C.5 Lead Mass per Area versus Traffic during the ADP

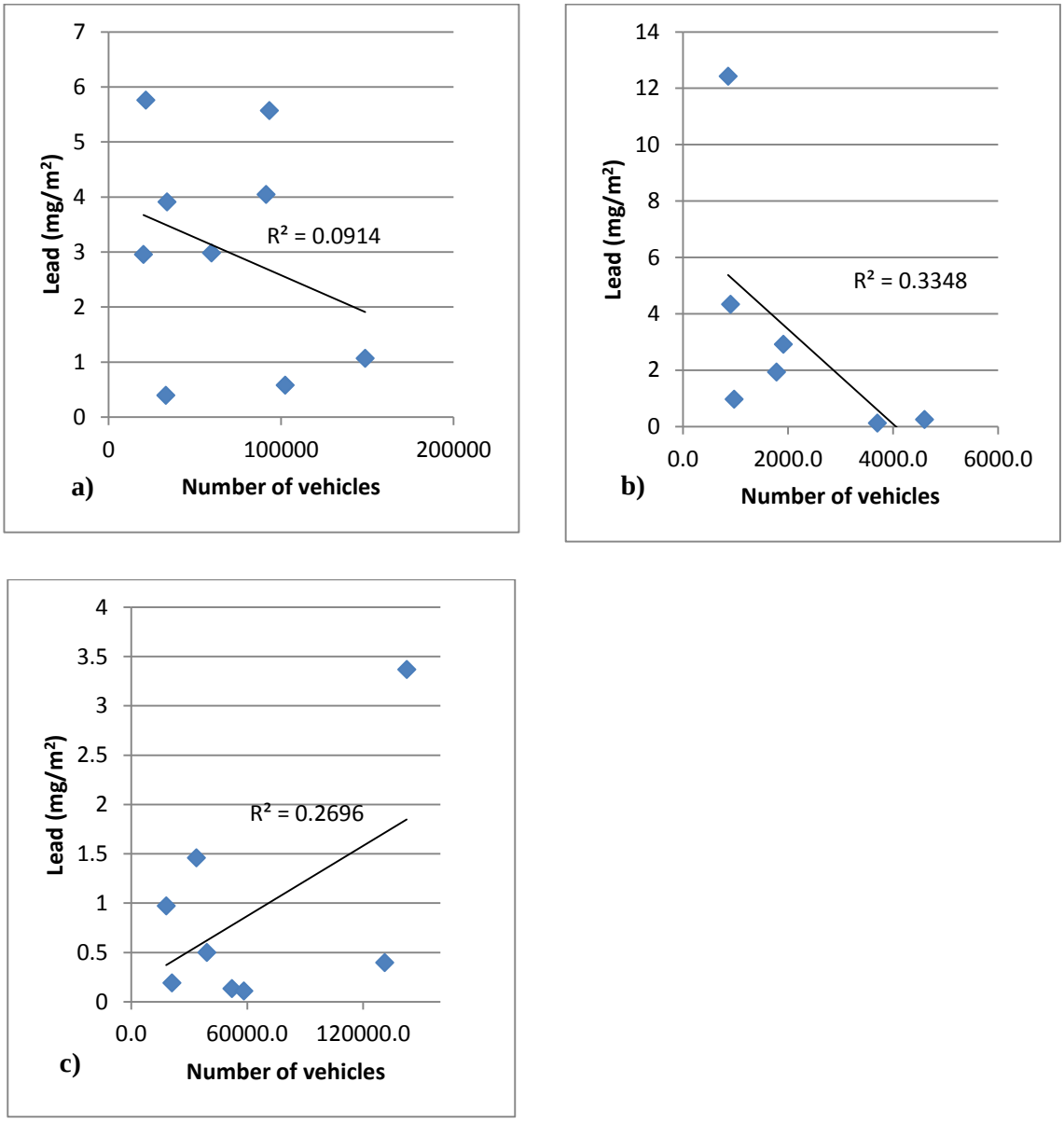


Figure C.5 Lead mass per area in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

C.6 Iron Mass per Area versus Traffic during the ADP

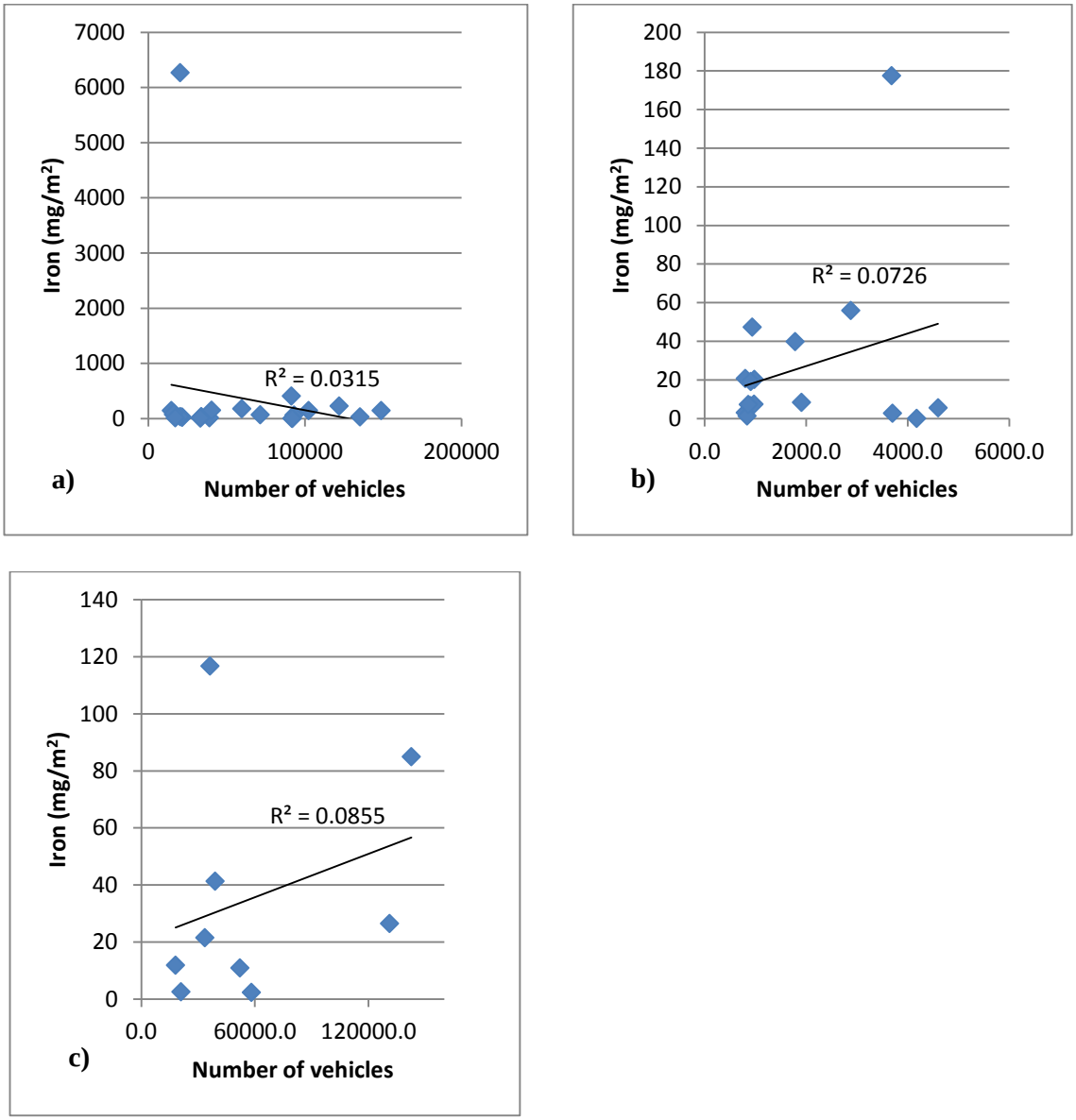


Figure C.6 Iron mass per area in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

Appendix D Traffic versus Total Metal Concentration, Total Metal Mass, and Total Metal Mass per Area

D.1 Total Metal Concentration versus Traffic during the ADP

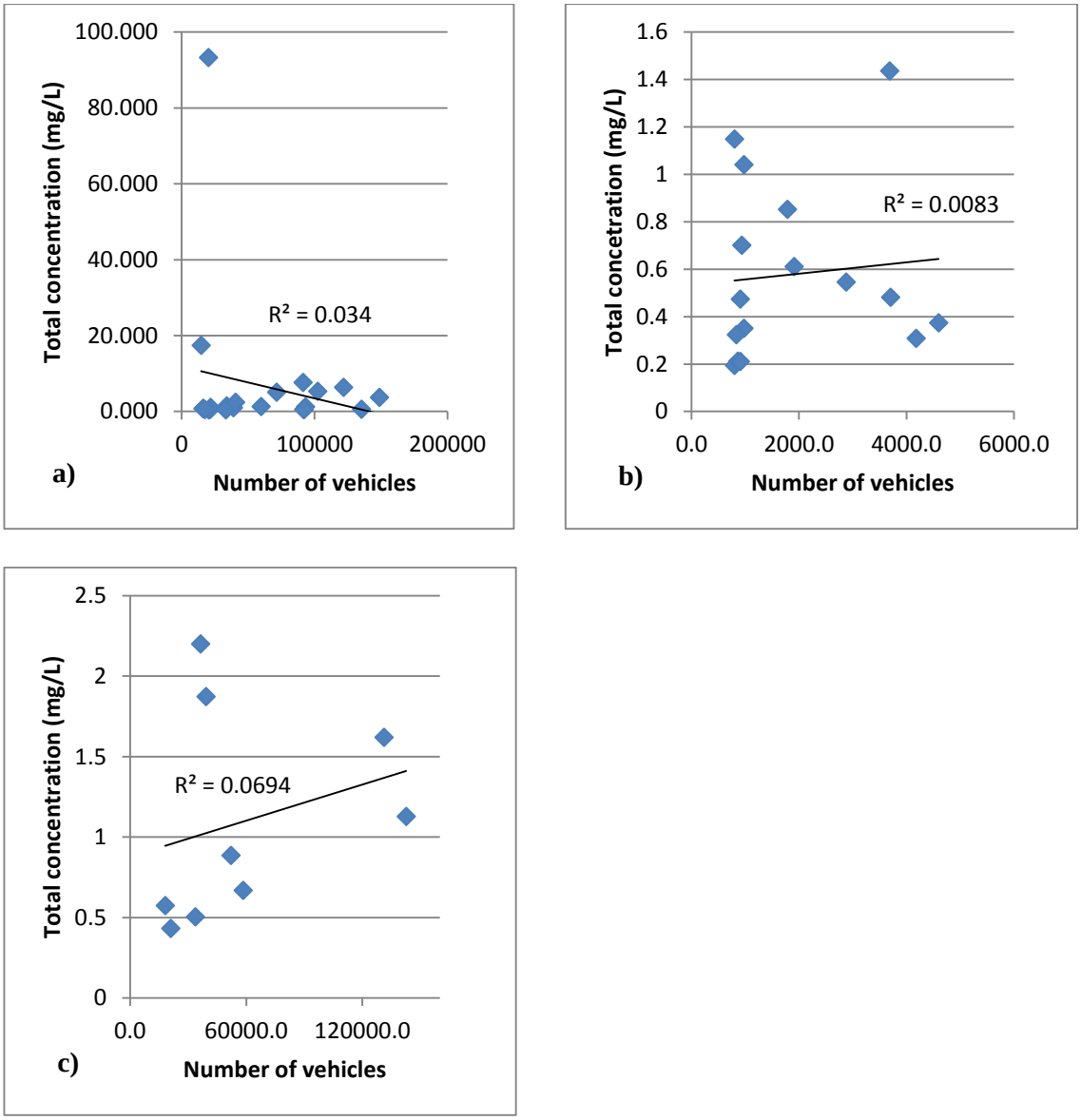


Figure D.1 Total metal concentration in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

D.2 Total Metal Mass versus Traffic during the ADP

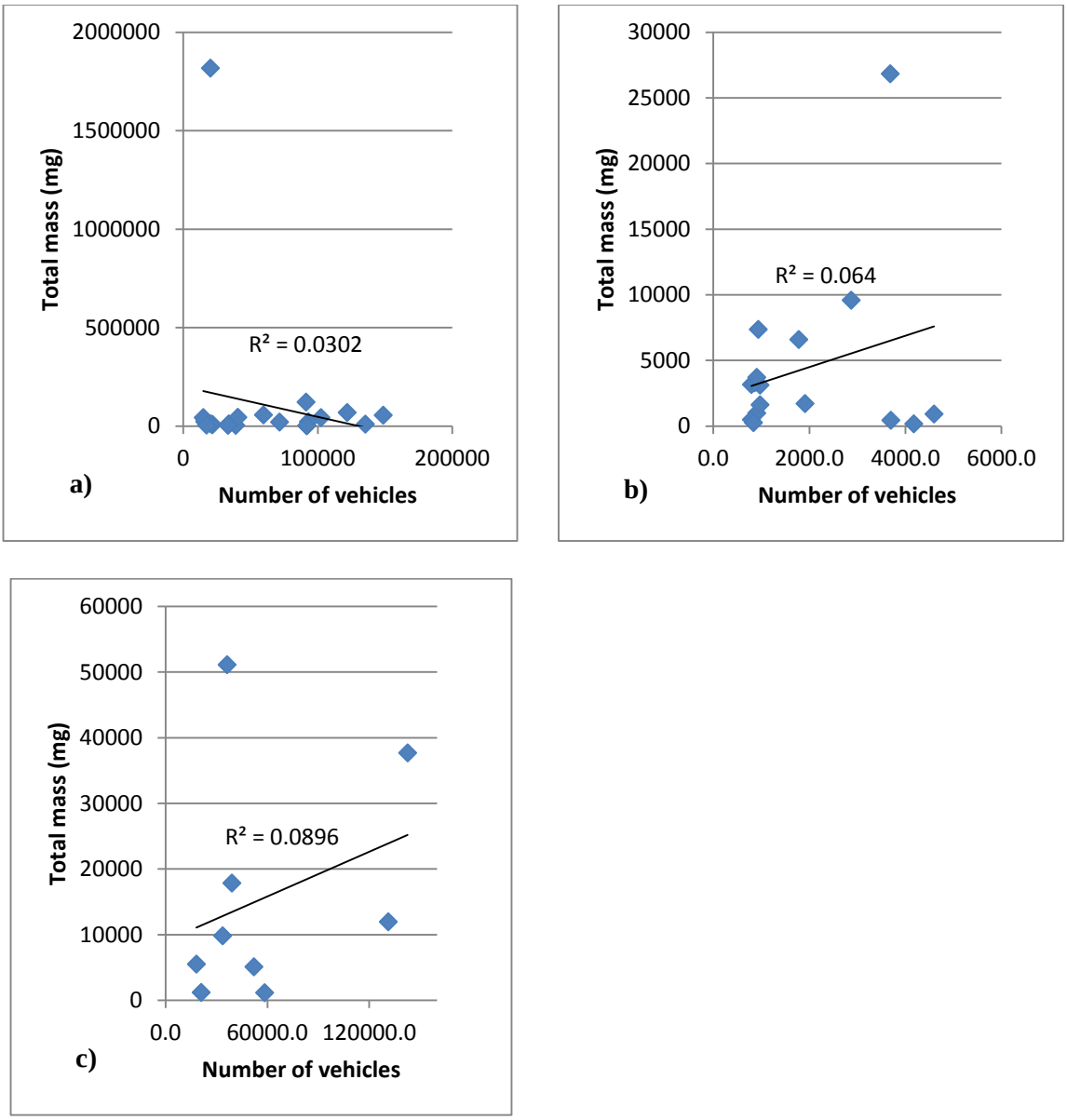


Figure D.2 Total metal mass in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

D.3 Total Metal Mass per Area versus Traffic during the ADP

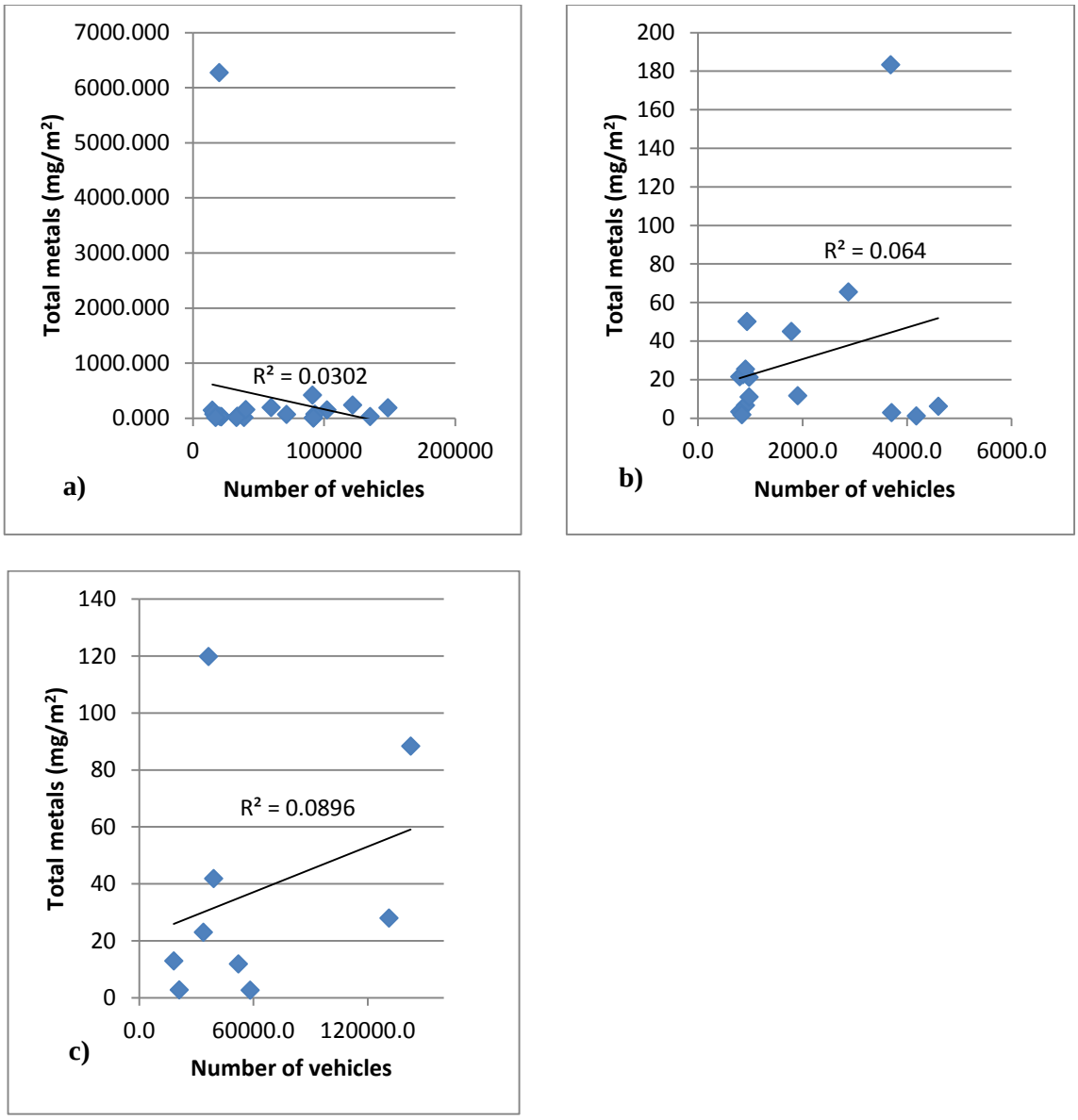


Figure D.3 Total metal mass per area in runoff versus traffic during the ADP from: a) I-80 bridge over Platte River b) Highway 64 bridge over Platte River c) I-80 bridge over Little Salt Creek

Appendix E Raw Data – Bridge Runoff Water Quality Sampling

Conducted by Midwest Laboratories	HEM (mg/L) (limit=5)	E.Coli (MPN/100 mL) (limit=1)	TKN (mg/L) (limit=0.50)	Nitrate (mg/L) (limit=0.20)	Nitrite (mg/L) (limit=0.02)	TP (mg/L) (limit=0.10)
I-80 Platte River						
28-Mar-14	NM	NM	NM	NM	NM	NM
4-Apr-14	8.4	583	2.7	1.78	0.16	0.42
14-Apr-14	0	61.3	1.99	0.33	0.02	0.14
25-Apr-14	0	0	1.32	0.69	0.02	0.27
28-Apr-14	0	124.6	0.58	0.29	0.04	0.08
30-Apr-14	0	157.6	1.76	0.61	0.07	0.16
8-May-14	0	275.5	3.14	1.54	0.07	0.34
12-May-14	0	26.8	2.9	3.6	0.35	0.12
23-May-14	0	151.5	1.73	0.4	0.03	0.11
2-Jun-14	0	1986	2.58	0	0	0.17
4-Jun-14	0	52.9	0.94	1.35	0.1	0.07
9-Jun-14	0	260.3	0.78	0.57	0	0.1
27-Jun-14	NM	NM	NM	NM	NM	NM
3-Jul-14	6	ND	1.54	1.06	0.23	0.07
8-Jul-14	NM	NM	NM	NM	NM	NM
7-Aug-14	NM	NM	NM	NM	NM	NM
22-Aug-14	NM	NM	NM	NM	NM	NM
25-Aug-14	NM	NM	NM	NM	NM	NM
26-Aug-14	NM	NM	NM	NM	NM	NM
29-Aug-14	NM	NM	NM	NM	NM	NM
3-Sep-14	NM	NM	NM	NM	NM	NM
10-Sep-14	NM	NM	NM	NM	NM	NM
15-Sep-14	NM	NM	NM	NM	NM	NM
25-Sep-14	NM	NM	NM	NM	NM	NM
Average	1.20	334.50	1.83	1.02	0.09	0.17
Std Dev	-	-	-	-	-	-
Hwy 77 Rock Creek						
28-Mar-14	12.3	100	NM	NM	NM	NM
4-Apr-14	NM	NM	NM	NM	NM	NM
25-Apr-14	7.3	169.4	1.58	0.68	0.07	0.32
27-Jun-14	NM	NM	NM	NM	NM	NM
Average	9.80	134.70	1.58	0.68	0.07	0.32
Std Dev	-	-	-	-	-	-
Hwy 64 Platte River						
4-Jun-14	0	20.1	0.88	1.23	0.04	0.07
9-Jun-14	0	2	0.91	1.42	0.05	0.06
18-Jun-14	NM	NM	NM	NM	NM	NM
23-Jun-14	0	6.3	0	0	0	0
27-Jun-14	NM	NM	NM	NM	NM	NM
3-Jul-14	0	0	0	0	0	0
8-Jul-14	NM	NM	NM	NM	NM	NM
23-Jul-14	NM	NM	NM	NM	NM	NM
22-Aug-14	NM	NM	NM	NM	NM	NM
25-Aug-14	NM	NM	NM	NM	NM	NM

26-Aug-14	NM	NM	NM	NM	NM	NM
29-Aug-14	NM	NM	NM	NM	NM	NM
3-Sep-14	NM	NM	NM	NM	NM	NM
8-Sep-14	NM	NM	NM	NM	NM	NM
15-Sep-14	NM	NM	NM	NM	NM	NM
25-Sep-14	NM	NM	NM	NM	NM	NM
Average	0.00	7.10	0.45	0.66	0.02	0.03
Std Dev	-	-	-	-	-	-
I-80 Salt Creek						
16-Jun-14	0	140.10	1.65	0.44	0.04	0.19
23-Jun-14	0	ND	2.19	0	0	0.21
27-Jun-14	NM	NM	NM	NM	NM	NM
23-Jul-14	NM	NM	NM	NM	NM	NM
22-Aug-14	NM	NM	NM	NM	NM	NM
25-Aug-14	NM	NM	NM	NM	NM	NM
26-Aug-14	NM	NM	NM	NM	NM	NM
3-Sep-14	NM	NM	NM	NM	NM	NM
10-Sep-14	NM	NM	NM	NM	NM	NM
Average	0.00	140.10	1.92	0.22	0.02	0.20
Std Dev	-	-	-	-	-	-
Total Average	2.75	154.10	1.44	0.65	0.05	0.18
Total Std Dev	-	-	-	-	-	-
Total Max Value	12.3	1986	3.14	3.6	0.35	0.42
Total Min Value	0	0	0	0	0	0

NM=No Measured, ND=No Detected, "-"=No Calculated

Conducted by Renys Barrios	pH	Conductivity (µS)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Chloride (mg/L)
I-80 Platte River						
28-Mar-14	7.83	4173	6766.67	4320.00	2716.67	NM
4-Apr-14	7.74	2563	1638.89	107.78	1372.22	854.24
14-Apr-14	7.50	21900	15338.89	34.44	14913.33	9601.90
25-Apr-14	7.56	1355	767.78	75.56	721.11	249.30
28-Apr-14	7.70	351	160.00	34.44	200.00	48.27
30-Apr-14	7.78	948	452.22	65.56	528.89	181.58
8-May-14	7.08	655	553.33	343.33	370.00	94.86
12-May-14	7.19	1485	843.33	40.00	934.44	307.17
23-May-14	7.53	250	150	33.33	115.56	47.49
2-Jun-14	7.33	722	445.56	37.78	344.44	156.05
4-Jun-14	7.45	443	296.67	15.00	304.44	87.73
9-Jun-14	7.27	300	202.22	20.00	178.89	61.26
27-Jun-14	7.14	237	180.00	50.00	68.33	NM
3-Jul-14	7.80	752	533.33	63.33	346.67	NM
8-Jul-14	7.33	418	323.33	26.67	288.89	80.77
7-Aug-14	8.12	343	NM	NM	NM	NM
22-Aug-14	7.61	866	593.33	26.67	565.00	155.79
25-Aug-14	7.57	145	68.33	6.67	102.22	20.69
26-Aug-14	7.35	116	88.89	10.00	118.89	19.19
29-Aug-14	6.95	94	71.11	26.67	111.67	16.70
3-Sep-14	7.58	163	138.33	52.22	90.00	29.21
10-Sep-14	NM	NM	146.67	15.56	131.67	46.22
15-Sep-14	6.99	109	86.67	20.00	123.33	14.01
25-Sep-14	6.85	188	143.33	16.67	126.67	22.22
Average	7.45	1677.22	1303.86	236.59	1077.10	604.73
Std Dev	-	-	-	-	-	-
Hwy 77 Rock Creek						
28-Mar-14	7.89	9387	11653.33	5203.33	6177.78	NM
4-Apr-14	8.67	3473	5166.67	3093.33	1990.00	1043.71
25-Apr-14	7.68	700	398.89	164.44	267.78	192.94
27-Jun-14	7.28	229	93.33	44.44	63.33	NM
Average	7.88	3447.08	4328.06	2126.39	2124.72	618.33
Std Dev	-	-	-	-	-	-
Hwy 64 Platte River						
4-Jun-14	7.43	454	240.00	13.33	215.00	97.40
9-Jun-14	7.42	487	281.11	12.22	257.78	86.28
18-Jun-14	7.69	211	143.33	10.00	134.44	26.54
23-Jun-14	7.05	72	NM	NM	NM	NM
27-Jun-14	6.95	140	106.67	36.67	70.00	NM
3-Jul-14	7.40	208	180.00	20.00	126.67	NM
8-Jul-14	7.53	294	234.44	10.00	203.33	41.14
23-Jul-14	7.92	555	424.44	38.89	351.11	88.24
22-Aug-14	8.20	534	325.56	24.44	328.89	84.60
25-Aug-14	8.15	397	280.00	25.56	268.89	70.60
26-Aug-14	7.19	50	56.67	3.33	51.67	5.53
29-Aug-14	7.48	93	66.67	7.78	106.67	14.02

3-Sep-14	7.39	278	182.22	13.33	151.67	55.80
8-Sep-14	7.80	318	213.33	20.00	193.33	55.94
15-Sep-14	7.16	145	121.67	20.00	125.00	18.57
25-Sep-14	7.40	226	170.00	30.00	143.33	26.59
Average	7.51	278.92	201.74	19.04	181.85	51.63
Std Dev	-	-	-	-	-	-
I-80 Salt Creek						
16-Jun-14	7.31	243	171.11	10.00	162.22	42.76
23-Jun-14	7.37	301	280.00	61.11	201.67	NM
27-Jun-14	7.31	442	298.33	33.33	257.78	NM
23-Jul-14	8.26	627	491.11	41.67	425.00	100.12
22-Aug-14	7.46	208	128.89	16.67	150.00	32.36
25-Aug-14	7.97	226	160.00	22.22	135.56	36.19
26-Aug-14	7.27	143	120.00	16.67	118.33	17.45
3-Sep-14	7.29	395	257.78	21.67	216.67	77.94
10-Sep-14	7.06	596	388.33	24.44	361.11	115.96
Average	7.48	353.52	255.06	27.53	225.37	60.40
Std Dev	-	-	-	-	-	-
Total Average	7.58	1439.19	1522.18	602.39	902.26	333.77
Total Std Dev	-	-	-	-	-	-
Total Max Value	8.67	21900	15338.89	5203.33	14913.33	9601.90
Total Min Value	6.85	50	56.67	3.33	51.67	5.53

NM=No Measured, ND=No Detected, “-“=No Calculated

Conducted by Renys Barrios	Total Zinc (mg/L) (Limit=0.005)	Total Lead (mg/L) (Limit=0.05)	Total Iron (mg/L) (Limit=0.02)	Precipitation (in)	ADP (days)	# Vehicles
I-80 Platte River						
28-Mar-14	NM	NM	NM	0.09	-	NM
4-Apr-14	0.250	0.099	101.500	0.07	6	NM
14-Apr-14	0.659	0.185	2.854	1.45	10	148736
25-Apr-14	0.149	0.038	5.129	0.27	7	102310
28-Apr-14	0.011	0.023	1.454	0.71	3	33796
30-Apr-14	0.072	ND	17.407	0.11	1	14708
8-May-14	0.260	ND	6.110	1.05	8	121817
12-May-14	0.059	0.026	1.210	4.23	4	59631
23-May-14	0.065	0.050	1.119	0.14	10	160540
2-Jun-14	0.047	0.044	93.173	0.05	2	20178
4-Jun-14	ND	ND	0.722	2.9	2	15958
9-Jun-14	ND	ND	1.012	0.35	3	38914
27-Jun-14	0.103	0.101	7.442	1.68	6	93115
3-Jul-14	0.057	0.140	0.853	1.55	6	91254
8-Jul-14	0.244	ND	4.827	0.75	1	21589
7-Aug-14	0.061	ND	0.441	0.18	5	71466
22-Aug-14	0.024	ND	0.555	0.35	6	91973
25-Aug-14	0.031	ND	0.410	0.15	2	21382
26-Aug-14	0.041	0.160	0.207	2.36	1	20247
29-Aug-14	0.029	ND	0.791	1.01	3	33165
3-Sep-14	0.076	ND	2.368	2.58	2	16235
10-Sep-14	0.027	ND	0.544	0.59	3	40448
15-Sep-14	0.013	ND	0.510	1.23	9	135247
25-Sep-14	0.046	0.030	0.473	0.46	2	17274
Average	0.11	0.08	10.92	-	-	-
Std Dev	-	-	-	-	-	-
Hwy 77 Rock Creek						
28-Mar-14	NM	NM	NM	0.07	9	-
4-Apr-14	0.140	0.033	3.497	0.03	6	-
25-Apr-14	0.026	0.026	0.594	0.23	7	23797
27-Jun-14	0.28	0.07	26.49	0.13	5	14966.0
Average	0.676	0.163	75.390	-	-	-
Std Dev	-	-	-	-	-	-
Hwy 64 Platte River						
4-Jun-14	0.041	ND	0.660	1.83	2	935.8
9-Jun-14	ND	ND	0.474	0.32	2	903.0
18-Jun-14	0.017	ND	0.177	0.44	1	794.9
23-Jun-14	0.079	ND	0.466	2.88	4	2874.3
27-Jun-14	0.046	ND	1.391	1.02	5	3682.3
3-Jul-14	0.073	ND	0.278	0.5	1	972.0
8-Jul-14	0.039	ND	0.269	0.62	5	4176.6
23-Jul-14	0.045	ND	1.104	0.48	7	794.9
22-Aug-14	0.067	ND	0.257	0.04	2	833.7
25-Aug-14	0.072	0.044	0.925	0.46	1	973.0
26-Aug-14	0.027	0.117	0.069	2.72	1	858.0
29-Aug-14	0.016	0.036	0.159	0.97	1	906.0

3-Sep-14	0.061	0.037	0.755	1.35	3	1780.8
8-Sep-14	0.024	0.019	0.439	0.16	5	3698.9
15-Sep-14	0.024	0.152	0.436	0.42	3	1906.6
25-Sep-14	0.028	0.016	0.331	0.11	6	4596.3
Average	0.04	0.06	0.51	-	-	-
Std Dev	-	-	-	-	-	-
I-80 Salt Creek						
16-Jun-14	0.062	0.023	1.535	0.27	8	131108.2
23-Jun-14	0.057	ND	2.145	0.04	3	36225.8
27-Jun-14	0.066	0.010	0.810	0.24	4	52067.1
23-Jul-14	0.040	0.028	0.601	0.06	4	58235.6
22-Aug-14	0.002	0.043	0.529	0.31	2	18116.7
25-Aug-14	ND	0.030	0.404	0.21	1	20911.0
26-Aug-14	ND	0.032	0.474	1.45	3	33630.9
3-Sep-14	ND	0.023	1.852	0.71	3	39057.9
10-Sep-14	0.056	0.043	1.085	2.49	9	142541.1
Average	0.05	0.03	1.05	-	-	-
Std Dev	-	-	-	-	-	-
Total Average	0.12	0.06	9.74	-	-	-
Total Std Dev	-	-	-	-	-	-
Total Max Value	0.676	0.185	101.500	-	-	-
Total Min Value	0.002	0.010	0.069	-	-	-

NM=No Measured, ND=No Detected, “-“=No Calculated

Conducted by Renys Barrios	Zinc Mass (mg)	Lead Mass (mg)	Iron Mass (mg)	Zinc Mass per area (mg/m^2)	Lead Mass per area (mg/m^2)	Iron Mass per area (mg/m^2)
I-80 Platte River						
28-Mar-14	NM	NM	NM	NM	NM	NM
4-Apr-14	671.18	265.43	272137.53	2.316	0.916	939.053
14-Apr-14	9848.79	2771.22	42674.75	33.985	9.563	147.256
25-Apr-14	1213.84	309.57	41781.17	4.189	1.068	144.172
28-Apr-14	78.10	168.40	10643.20	0.269	0.581	36.726
30-Apr-14	178.19	ND	43080.02	0.615	ND	148.654
8-May-14	2815.22	ND	66161.18	9.714	ND	228.299
12-May-14	2573.60	1134.13	52780.66	8.881	3.913	182.128
23-May-14	NM	NM	NM	NM	NM	NM
2-Jun-14	916.03	864.05	1815944.16	3.161	2.982	6266.198
4-Jun-14	ND	ND	21601.54	ND	ND	74.539
9-Jun-14	ND	ND	3653.77	ND	ND	12.608
27-Jun-14	1126.09	857.56	19391.78	3.886	2.959	66.914
3-Jul-14	1651.66	1614.37	118956.96	5.699	5.571	410.480
8-Jul-14	473.33	1172.18	7124.97	1.633	4.045	24.586
7-Aug-14	1007.84	ND	19912.07	3.478	ND	68.710
22-Aug-14	221.37	ND	1590.48	0.764	ND	5.488
25-Aug-14	313.66	ND	7154.05	1.082	ND	24.686
26-Aug-14	754.44	ND	9969.92	2.603	ND	34.403
29-Aug-14	430.50	1669.91	2159.43	1.485	5.762	7.451
3-Sep-14	1043.69	ND	28479.60	3.601	ND	98.273
10-Sep-14	462.40	ND	44436.62	1.596	ND	153.335
15-Sep-14	338.24	ND	9486.38	1.167	ND	32.734
25-Sep-14	113.64	ND	4572.51	0.392	ND	15.778
Average	-	-	-	-	-	-
Std Dev	-	-	-	-	-	-
Hwy 77 Rock Creek						
28-Mar-14	230.80	55.48	25739.55	1.58	0.38	175.94
4-Apr-14	NM	NM	NM	NM	NM	NM
25-Apr-14	471.16	111.06	11768.85	3.22	0.76	80.44
27-Jun-14	56.51	56.51	1275.48	0.39	0.39	8.72
Average	-	-	-	-	-	-
Std Dev	-	-	-	-	-	-
Hwy 64 Platte River						
4-Jun-14	433.2163	ND	6920.98	2.961151	ND	47.30677
9-Jun-14	ND	ND	977.314	ND	ND	6.680205
18-Jun-14	43.68055	ND	446.8856	0.298568	ND	3.054584
23-Jun-14	1394.914	ND	8199.514	9.534613	ND	56.04589
27-Jun-14	858.8726	ND	25965.34	5.870626	ND	177.4801
3-Jul-14	543.525	ND	1082.697	3.71514	ND	7.400528
8-Jul-14	163.0575	ND	17.95607	1.114542	ND	0.122735
23-Jul-14	123.7106	ND	3035.951	0.845596	ND	20.75154
22-Aug-14	53.72249	ND	205.8026	0.367208	ND	1.406716
25-Aug-14	11.11179	142.1909	2965.695	0.075952	0.971913	20.27133
26-Aug-14	415.4234	1817.477	1069.715	2.839531	12.42295	7.311792
29-Aug-14	282.2435	635.0479	2804.795	1.929211	4.340724	19.17153

3-Sep-14	474.2241	283.5035	5835.018	3.24145	1.937823	39.88393
8-Sep-14	21.68754	17.41113	401.9832	0.14824	0.11901	2.747664
15-Sep-14	67.35357	426.5726	1223.59	0.46038	2.915739	8.363567
25-Sep-14	68.95723	36.94137	815.1729	0.471341	0.252504	5.571927
Average	-	-	-	-	-	-
Std Dev	-	-	-	-	-	-
I-80 Salt Creek						
16-Jun-14	460.4572	169.9013	11336.61	1.079062	0.398156	26.56685
23-Jun-14	1324.425	ND	49840.19	3.103732	ND	116.7983
27-Jun-14	379.2449	57.75302	4679.92	0.888744	0.135342	10.96719
23-Jul-14	70.42287	48.3066	1048.777	0.165033	0.113204	2.457764
22-Aug-14	19.34055	415.8218	5115.575	0.045324	0.97446	11.98813
25-Aug-14	ND	83.20465	1139.481	ND	0.194987	2.670324
26-Aug-14	ND	623.1954	9224.591	ND	1.460432	21.61743
3-Sep-14	ND	214.5592	17660.61	ND	0.50281	41.38687
10-Sep-14	1872.81	1438.05	36285.69	4.388849	3.370009	85.03395
Average	-	-	-	-	-	-
Std Dev	-	-	-	-	-	-
Total Average	-	-	-	-	-	-
Total Std Dev	-	-	-	-	-	-
Total Max Value	-	-	-	-	-	-
Total Min Value	-	-	-	-	-	-

NM=No Measured, ND=No Detected, “-“=No Calculated

Appendix F Traffic Data

Part 1: Data from Sensors

F.1 ATR56E I-80 Traffic Counts - April 2014

April 2014		Hour of Day																									
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	T 01	143	108	97	105	170	302	712	1226	1040	949	931	924	899	981	1094	1275	1577	1749	1105	748	541	467	350	195	17688
	W 02	138	131	93	122	187	353	757	1282	1050	1245	1182	971	1117	823	1134	1257	1719	1856	1350	803	634	571	435	265	19475
	T 03	171	118	97	106	197	334	820	1439	1255	1175	1110	1148	1155	1162	1356	1429	1793	1859	1291	774	625	586	412	216	20628
	F 04	150	155	133	143	210	328	781	1338	1181	1171	1185	1174	1279	1379	1467	1650	2075	2199	1714	1169	928	877	671	457	23814
	S 05	342	188	151	116	184	220	360	599	1001	1282	1547	1624	1602	1729	1719	1790	1851	1903	1535	1156	969	876	887	688	24319
	S 06	321	233	151	155	155	150	236	435	676	863	1210	1452	1507	1515	1446	1645	1736	1659	1287	1081	894	553	419	279	20058
	M 07	184	142	114	111	203	374	865	1467	1153	1006	906	960	1053	958	1125	1183	1553	1692	1060	798	571	429	345	311	18563
	T 08	200	114	100	107	214	340	834	1329	1178	1020	943	1001	1052	1089	1139	1353	1653	1902	1248	785	575	508	354	233	19271
	W 09	132	138	124	116	195	338	813	1425	1135	1036	1068	1082	1137	1131	1287	1387	1793	1826	1204	774	660	605	406	407	20219
	T 10	237	173	146	131	233	369	823	1405	1241	1096	1040	1128	1148	1204	1329	1507	1932	1965	1391	918	765	636	495	312	21624
	F 11	194	158	152	136	234	343	801	1416	1153	1154	1200	1302	1352	1445	1589	1789	2278	2340	1845	1182	994	875	753	515	25200
Red/White Game	S 12	328	209	171	153	149	230	433	688	1048	1272	1405	1565	1511	1591	1460	1929	2955	3517	2043	1382	1140	1027	902	602	27710
Snow	S 13	314	242	183	200	196	159	348	464	655	598	1472	1452	1541	1290	1363	1200	1315	1230	1017	734	559	521	347	317	17717
Palm Sunday/Snow	M 14	190	90	82	80	173	314	789	1368	1100	1004	1006	1036	981	966	981	1135	1481	1637	1104	714	569	539	406	270	18015
	T 15	199	130	100	101	186	329	818	1401	1187	1036	991	973	1092	1079	1239	1330	1705	1883	1133	759	642	569	423	239	19544
	W 16	150	122	114	109	190	368	871	1394	1205	1059	1046	1099	1117	1131	1232	1448	1697	1980	1258	811	733	591	473	274	20472
	T 17	178	146	115	130	197	358	864	1400	1222	1187	1057	1149	1187	1225	1444	1646	2057	2214	1485	967	834	697	458	283	22500
Good Friday	F 18	203	193	169	117	219	326	754	1248	1138	1255	1359	1478	1595	1714	1922	2023	2248	2168	1613	1158	953	796	660	573	25882
	S 19	355	196	167	149	140	175	270	707	781	1084	1379	1602	1566	1553	1489	1644	1640	1518	1307	1134	919	867	733	482	21857
Easter Sunday	S 20	267	218	180	138	114	141	180	319	572	948	1250	1611	1707	1437	1366	1774	2138	2105	2076	1784	1370	1021	590	353	23659
	M 21	245	141	125	134	243	419	888	1359	1191	1151	1134	1115	1253	1179	1312	1522	1885	1928	1373	790	629	505	404	275	21200
	T 22	170	144	123	129	195	357	850	1413	1211	1057	928	1054	1076	1128	1198	1356	1759	1962	1301	779	686	546	421	252	20095
	W 23	157	132	129	119	209	365	866	1355	1148	1072	1016	1014	1095	1117	1185	1291	1782	1828	1224	806	645	503	413	290	19761
	T 24	149	149	108	116	212	398	837	1555	1312	1244	1132	1094	1239	1311	1406	1569	1869	2041	1366	998	759	870	468	279	22481
	F 25	204	142	123	121	226	365	814	1432	1327	1275	1307	1362	1428	1487	1641	1849	2104	2128	1693	1197	947	894	813	881	25760
Arbor Day	S 26	341	280	180	139	158	197	446	835	1280	1485	1570	1778	1804	1845	1766	1800	1800	1823	1457	1198	907	786	766	547	25188
	S 27	361	231	209	145	151	178	380	437	664	929	1171	1384	1405	1466	1418	1458	1548	1372	1147	965	821	584	380	244	19048
	M 28	185	102	107	95	182	337	840	1367	1142	1024	976	945	995	984	1148	1295	1614	1810	1241	867	746	547	461	242	19252
	T 29	171	111	97	89	167	313	783	1286	1148	1053	1011	1002	1060	1070	1182	1277	1549	1667	1088	695	581	464	368	248	18480
	W 30	167	111	111	124	192	343	774	1311	1137	1126	1029	1010	1117	1063	1181	1339	1630	1858	1248	770	628	523	424	313	19529
	Total	6546	4747	3951	3736	5681	9123	20607	34700	32531	32856	34561	36489	38070	38052	40618	45150	54736	57619	41204	28696	23224	19833	15437	10842	
Source: Nebraska Department of Roads, ATR 56E																										

F.2 ATR56E I-80 Traffic Counts - May 2014

May 2014		Hour of Day																							
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
	T 01	214	282	193	171	235	382	865	1362	1196	1118	1168	1152	1165	1315	1431	1487	1941	2029	1421	864	764	660	457	312	22184
	F 02	248	208	197	206	222	370	825	1341	1264	1347	1251	1320	1315	1448	1618	1875	2274	2328	1765	1252	1046	953	949	631	26253
	S 03	327	223	148	166	182	273	643	1069	1407	1603	1722	1675	1719	1588	1620	1785	2065	1807	1405	1147	957	918	798	579	25826
	S 04	397	230	156	119	130	151	420	492	684	1001	1634	2165	2130	2144	1974	1927	1919	1672	1387	1216	953	697	462	311	24371
	M 05	185	126	113	104	223	390	910	1426	1151	1038	956	995	1073	1028	1053	1195	1658	1756	1234	793	691	520	412	246	19276
	T 06	158	115	106	109	199	348	828	1391	1166	1111	1002	1022	1052	1162	1166	1469	1742	1872	1267	829	655	565	427	239	20000
	W 07	185	122	125	117	193	374	844	1360	1205	1167	1103	1116	1195	1210	1310	1524	1840	2079	1361	867	686	712	526	316	21537
	T 08	179	141	134	131	229	398	915	1473	1270	1186	1174	1285	1324	1428	1566	1713	2004	2110	1463	977	868	846	559	357	23730
	F 09	219	156	129	119	209	440	861	1705	1518	1474	1553	1531	1562	1642	1717	1923	2296	2512	1986	1450	1284	1109	1071	650	29116
	S 10	318	192	148	125	182	283	375	655	1032	1361	1665	2008	1967	2094	2258	2271	2168	2044	1684	1346	1105	1056	857	580	27774
Mother's Day, Interstate closed in WY-Blizzard conditions	S 11	386	236	197	125	159	165	237	392	551	1126	1503	1776	1810	1652	1535	1793	1924	1708	1000	601	927	692	413	254	21162
Interstate closed in WY-Blizzard conditions	M 12	130	86	62	115	218	386	851	1406	1197	1135	1024	1052	1006	976	1146	1262	1580	1641	1099	657	547	474	373	262	18685
	T 13	199	167	159	168	257	419	891	1410	1236	1144	1030	1110	1168	1159	1241	1485	1915	2151	1334	860	779	665	404	314	21665
	W 14	210	143	115	140	236	393	922	1448	1313	1223	1110	1190	1338	1278	1425	1591	1923	2053	1423	1007	827	653	454	298	22713
	T 15	219	136	113	151	218	391	889	1428	1283	1184	1145	1222	1258	1377	1526	1765	2284	2348	1689	940	821	762	537	341	24027
	F 16	226	165	140	168	219	382	870	1335	1257	1225	1318	1312	1406	1466	1590	1739	2152	2445	1796	1276	1048	1047	899	556	26037
	S 17	301	182	163	164	179	219	463	740	1176	1479	1759	1834	1943	1877	1845	1864	2016	1834	1656	1264	1150	1110	883	632	26733
	S 18	360	188	147	132	151	197	305	488	755	1045	1378	1731	1722	1653	1645	1646	1866	1667	1518	1259	1089	853	642	399	22836
	M 19	231	147	110	129	234	393	950	1446	1201	1124	1100	1085	1051	1097	1326	1483	1787	1870	1346	783	752	594	446	273	20958
	T 20	189	133	106	129	235	370	916	1423	1188	1094	1074	1142	1146	1276	1383	1559	1882	2157	1429	840	684	621	469	286	21731
	W 21	187	110	116	170	202	401	903	1435	1345	1253	1237	1498	1384	1257	1446	1586	1916	2135	1546	982	841	633	530	318	23431
	T 22	230	160	145	159	235	348	881	1412	1289	1299	1273	1330	1326	1494	1642	2068	2558	2484	1658	1089	978	788	617	401	25864
	F 23	252	209	167	180	248	328	874	1497	1594	1421	1417	1502	1668	1923	2170	2079	2272	2336	1899	1389	1079	904	976	667	29051
Holiday weekend	S 24	361	277	167	164	177	242	427	1152	1701	1591	1698	1818	1842	1757	1787	1771	1774	1613	1323	1112	1052	955	1047	604	26412
Holiday weekend	S 25	466	281	138	124	112	151	282	460	711	1102	1826	2659	1970	1649	1592	1619	1600	1487	1304	1253	1153	1062	666	436	24103
Memorial Day	M 26	304	186	133	123	149	162	225	386	615	961	1237	1486	1428	1486	1633	1720	1656	1736	1403	1106	1058	791	538	311	20833
	T 27	218	129	105	143	234	414	888	1434	1154	1090	1058	1145	1180	1110	1260	1383	1821	1957	1312	787	636	571	419	288	20736
	W 28	167	112	102	122	218	370	879	1427	1202	1086	1116	1142	1198	1221	1373	1506	1816	1927	1297	871	765	634	492	306	21349
	T 29	226	151	138	147	218	394	913	1453	1178	1166	1227	1199	1233	1273	1401	1632	2024	2125	1478	1077	864	708	552	356	23133
	F 30	233	185	172	164	236	393	873	1378	1238	1254	1466	1493	1498	1555	1689	1849	2159	2227	1780	1227	991	984	959	626	26629
	W 31	326	319	189	164	204	286	367	681	1143	1521	1730	1764	1899	1780	1703	1738	1805	1676	1524	1226	1122	964	859	623	25613
	Total	7851	5497	4333	4448	6343	10213	22292	36505	36220	37929	40954	44759	44976	45375	48071	52307	60637	61786	45787	32347	28172	24501	19693	12772	733768
Source: Nebraska Department of Roads, ATR 56E																										

F.3 ATR56E I-80 Traffic Counts - June 2014

June 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	S 01	374	219	207	148	138	189	250	478	872	1015	1396	1751	1716	1645	1652	1874	1846	1665	1373	1058	781	616	510	326	22099
	M 02	222	169	110	128	246	421	955	1477	1197	1143	1131	1130	1178	1138	1220	1403	1739	2011	1297	890	718	593	463	289	21268
	T 03	150	142	101	138	194	401	898	1441	1198	1063	988	1095	1032	1145	1305	1557	1871	2135	1389	880	695	592	294	184	20888
	W 04	114	129	128	131	207	415	943	1499	1310	1253	1230	1176	1260	1221	1376	1553	1952	2106	1383	952	802	646	472	352	22610
	T 05	204	162	134	152	231	426	883	1432	1296	1209	1179	1180	1274	1324	1508	1701	2112	2125	1460	1012	875	699	561	376	23515
	F 06	251	187	162	135	239	422	899	1497	1322	1273	1311	1411	1389	1642	1592	1832	2576	2398	1821	1219	1012	927	1084	819	27420
	S 07	358	207	158	152	163	286	516	749	1071	1348	1670	1703	1631	1637	1666	1681	1590	1548	1285	1179	1031	964	890	587	24070
	S 08	405	256	209	156	191	200	270	439	735	1089	1440	1776	1732	1691	1702	1841	2069	1694	1486	1244	1052	851	584	375	23487
	M 09	204	150	135	123	230	449	882	1474	1238	1105	1087	1122	1140	1188	1283	1449	1965	2142	1556	799	673	574	421	252	21641
	T 10	162	134	89	123	200	403	928	1395	1298	1121	1101	1176	1197	1166	1251	1589	1893	2102	1329	892	674	556	441	310	21530
	W 11	185	143	130	114	206	418	905	1500	1242	1197	1131	1246	1255	1297	1398	1634	2169	2226	1488	919	859	710	536	365	23273
	T 12	207	176	118	165	220	448	908	1471	1382	1293	1302	1341	1407	1355	1512	1771	2156	2121	1468	1074	888	766	543	409	24501
	F 13	275	195	169	194	262	423	909	1489	1410	1416	1335	1391	1437	1452	1652	1892	2245	2290	1872	1443	1103	1126	911	699	27590
	S 14	345	247	195	174	185	251	437	751	1172	1490	1781	2055	1994	1893	1805	1714	1771	1688	1296	1111	1030	902	711	475	25473
Father's Day	S 15	351	197	109	121	185	178	275	417	728	1197	1753	2067	1924	1829	1877	2014	2123	1987	1679	1370	1244	944	674	400	25643
	M 16	209	167	153	154	229	439	991	1528	1184	1217	1191	1213	1279	1185	1234	1500	2001	1964	1192	797	629	512	428	249	21645
	T 17	157	148	111	134	225	425	877	1474	1325	1197	1264	1316	1280	1236	1291	1552	2177	2114	1385	849	698	563	464	296	22558
	W 18	178	143	126	139	229	424	910	1446	1257	1317	1204	1265	1249	1466	1458	1811	2282	2369	1467	973	783	708	459	394	24057
	T 19	199	172	153	136	242	429	917	1482	1333	1339	1329	1395	1390	1497	1618	1912	2214	2280	1463	949	824	708	530	402	24913
	F 20	227	184	153	165	272	409	899	1412	1433	1497	1514	1567	1660	1691	1639	2074	2325	2435	1956	1318	1109	1144	861	762	28706
	S 21	279	256	153	160	197	266	364	606	1111	1335	1670	1779	1913	1828	1703	1853	1893	1835	1508	1259	1137	1132	929	584	25750
	S 22	406	316	200	185	172	244	272	394	675	1123	1423	1750	1659	1742	1823	1948	2064	1780	1526	1209	1054	930	748	406	24049
	M 23	264	174	109	159	262	436	932	1425	1282	1229	1138	1274	1253	1315	1406	1702	2152	2471	1701	1004	705	588	476	320	23777
	T 24	192	147	140	145	253	427	877	1453	1240	1190	1138	1195	1151	1279	1358	1622	2116	2189	1453	900	712	658	641	263	22739
	W 25	277	161	138	148	272	467	895	1452	1263	1203	1304	1293	1326	1291	1535	1699	2169	2325	1526	974	825	735	672	370	24320
	T 26	235	232	157	148	247	471	893	1515	1309	1314	1222	1318	1369	1405	1553	1850	2125	2166	1552	963	872	694	531	417	24558
	F 27	258	195	222	182	272	448	880	1389	1414	1326	1348	1632	1535	1726	1868	2071	2306	2395	1932	1412	1119	1023	788	517	28258
	S 28	305	234	221	196	226	308	486	787	1038	1431	1664	1733	1819	1880	1909	1867	1980	1854	1483	1270	1093	1091	908	699	26482
	S 29	489	292	213	164	180	231	284	528	751	1089	1505	1567	1602	1641	1763	1814	1901	1664	1394	1195	1152	871	804	494	23588
	M 30	286	195	135	161	235	452	921	1439	1237	1249	1239	1190	1156	1255	1330	1478	1898	1881	1346	939	752	640	512	341	22267
	Total	7768	5729	4538	4530	6610	11206	22256	35839	35323	37268	39988	43107	43207	44060	46287	52258	61680	61960	45066	32053	26901	23463	18846	12732	722675
Source: Nebraska Department of Roads, ATR 56E																										

F.4 ATR56E I-80 Traffic Counts - July 2014

July 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	T 01	214	124	135	128	213	403	895	1380	1237	1241	1222	1233	1217	1335	1428	1578	1945	1968	1472	940	763	719	512	352	22654
	W 02	227	203	169	146	255	419	887	1377	1261	1268	1331	1380	1349	1441	1451	1738	2083	2202	1490	1033	997	798	636	445	24586
Holiday weekend	T 03	275	236	181	219	269	432	853	1245	1194	1340	1398	1435	1426	1599	1723	1984	2279	2232	1754	1220	1047	785	713	672	26511
4th of July	F 04	452	294	204	211	189	209	282	445	639	889	1179	1303	1311	1353	1360	1521	1498	1284	1055	938	874	674	673	955	19792
Holiday weekend	S 05	506	234	119	129	144	183	252	427	671	1056	1383	1716	1776	1704	1747	1792	1828	1708	1423	1150	1066	1029	986	862	23891
Holiday weekend	S 06	447	251	160	138	199	195	303	487	806	1106	1378	1746	1707	1887	1915	2072	2181	2023	1634	1390	1362	927	631	405	25350
	M 07	268	188	144	144	243	407	962	1468	1253	1201	1184	1214	1206	1171	1344	1641	1875	1981	1336	889	701	612	429	265	22126
	T 08	175	125	110	122	238	413	869	1444	1188	1212	1171	1159	1202	1222	1269	1561	2047	2113	1311	919	750	641	453	327	22041
	W 09	198	144	125	155	242	432	884	1474	1305	1195	1266	1230	1249	1287	1431	1679	1941	2165	1458	937	812	695	460	367	23131
	T 10	224	173	150	161	221	425	884	1542	1413	1354	1281	1297	1392	1390	1527	1846	2157	2277	1551	1125	940	773	544	403	25050
	F 11	246	210	139	191	225	418	931	1429	1302	1258	1332	1397	1425	1549	1723	2048	2320	2416	1940	1387	1179	1018	902	813	27798
	S 12	459	230	188	162	197	274	532	697	1019	1308	1589	1609	1654	1683	1583	1743	2001	1853	1504	1212	1162	1108	988	649	25404
	S 13	402	272	202	168	191	220	325	440	694	1021	1372	1756	1715	1730	1730	1798	2145	1805	1508	1247	1098	861	636	426	23762
	M 14	305	161	154	149	221	447	900	1553	1206	1212	1114	1179	1169	1238	1368	1550	1856	1873	1443	897	767	625	495	299	22181
	T 15	206	134	133	130	197	448	828	1469	1312	1247	1255	1254	1290	1226	1375	1624	1844	2087	1386	841	725	659	496	326	22492
	W 16	239	210	151	122	218	427	887	1399	1264	1262	1295	1232	1347	1391	1478	1664	2139	2022	1496	1032	849	700	528	301	23653
	T 17	222	181	135	154	196	479	843	1464	1364	1347	1311	1362	1376	1472	1629	1752	2110	2151	1389	1067	999	836	558	516	24913
	F 18	347	230	198	183	247	450	861	1438	1322	1414	1396	1448	1540	1632	1894	2147	2480	2548	1995	1438	1141	962	831	805	28947
	S 19	486	251	213	170	212	297	492	769	1075	1535	1864	2010	1944	1850	1894	1814	1944	1885	1609	1240	1116	1069	953	780	27472
	S 20	410	260	186	173	213	242	320	457	714	1122	1615	1811	1936	1880	1864	2078	2195	1974	1602	1310	1109	909	687	416	25483
	M 21	283	205	141	170	264	453	913	1411	1255	1215	1194	1150	1139	1216	1361	1550	1837	1920	1327	888	761	597	444	320	22014
	T 22	219	125	105	138	215	401	870	1345	1233	1122	1172	1201	1167	1240	1387	1588	2008	2027	1348	837	735	669	481	322	21955
	W 23	175	158	126	131	227	413	907	1431	1271	1214	1273	1274	1391	1319	1437	1693	2112	2238	1444	975	881	772	599	396	23857
	T 24	259	159	134	140	246	451	843	1450	1298	1210	1255	1308	1405	1467	1587	1838	2098	2254	1559	1046	891	744	561	368	24571
	F 25	263	205	155	142	218	459	783	1354	1290	1303	1345	1489	1509	1600	1826	1983	2298	2495	1879	1329	1114	961	910	781	27691
	S 26	331	231	191	177	233	262	452	755	1026	1385	1626	1794	1768	1786	1833	2039	2000	1880	1480	1185	1217	938	881	620	26090
	S 27	382	258	220	175	171	216	292	444	691	1130	1400	1732	1779	1644	1730	1852	2066	1949	1653	1390	1224	1020	614	390	24422
	M 28	270	177	125	131	247	416	852	1407	1205	1299	1267	1172	1186	1239	1386	1538	1824	2053	1442	932	759	619	420	311	22277
	T 29	224	151	121	121	205	410	846	1406	1208	1120	1209	1335	1296	1311	1380	1686	1985	2036	1411	946	798	680	522	342	22749
	W 30	243	136	141	129	235	433	843	1441	1334	1257	1268	1398	1350	1426	1541	1817	2352	2562	1788	1067	905	743	607	399	25415
	T 31	276	185	160	162	233	449	890	1430	1321	1368	1387	1318	1395	1502	1581	1891	2178	2377	1654	1131	936	763	570	426	25583
	Total	9233	6101	4815	4771	6824	11583	22481	36278	35371	38211	41332	43942	44616	45790	48782	55105	63626	64358	47341	33938	29678	24906	19720	15059	753861
Source: Nebraska Department of Roads, ATR 56E																										

F.5 ATR56E I-80 Traffic Counts - August 2014

August 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	F 01	267	231	176	168	302	424	852	1344	1294	1360	1450	1528	1562	1681	1689	2055	2582	2390	1852	1360	1029	931	1023	680	28230
	S 02	439	267	198	191	217	253	394	597	994	1392	1764	1845	1855	1923	1846	1970	2072	1830	1522	1233	1190	1052	959	751	26754
	S 03	419	234	214	179	188	218	281	412	679	1067	1410	1679	1789	1845	1793	2110	2122	1968	1628	1333	1184	978	663	461	24854
	M 04	283	205	138	166	229	435	872	1471	1215	1239	1207	1266	1226	1288	1375	1569	1836	2103	1488	991	780	632	464	312	22790
	T 05	184	125	110	107	190	376	845	1450	1250	1215	1357	1253	1304	1336	1333	1568	2049	2099	1413	976	758	669	455	284	22706
	W 06	248	153	116	161	240	419	850	1404	1218	1235	1314	1337	1305	1346	1464	1634	1939	2132	1449	952	826	693	522	323	23280
	T 07	309	160	164	151	239	446	910	1434	1325	1383	1400	1427	1455	1442	1584	1816	2102	2210	1546	1111	883	735	553	401	25186
	F 08	268	182	148	184	241	395	878	1391	1294	1336	1433	1488	1452	1595	1762	2025	2389	2416	1919	1440	1180	1012	820	740	27988
	S 09	408	198	202	160	242	278	442	790	1116	1426	1813	1800	1935	2037	1951	2057	2084	1837	1546	1206	1119	1092	954	614	27307
	S 10	340	270	221	183	188	215	330	513	750	1081	1390	1721	1729	1801	1856	1865	1960	1735	1515	1231	1068	885	613	427	23887
	M 11	271	180	119	169	255	419	954	1465	1286	1300	1208	1218	1238	1272	1302	1576	1889	1923	1363	905	700	608	442	292	22354
	T 12	205	148	124	123	191	392	841	1404	1253	1148	1198	1186	1209	1232	1365	1601	1979	2010	1332	859	693	600	464	377	21934
	W 13	264	173	141	168	228	410	880	1406	1345	1270	1247	1178	1363	1251	1356	1591	1964	2048	1484	961	773	721	499	343	23064
	T 14	224	184	151	179	241	395	893	1436	1258	1270	1306	1308	1302	1416	1562	1670	2080	2195	1495	1036	891	725	536	352	24105
	F 15	228	187	172	157	233	399	865	1404	1246	1296	1309	1427	1489	1540	1620	1864	2230	2354	1867	1411	1102	1069	1196	704	27369
	S 16	306	225	151	155	203	249	372	684	1042	1441	1627	1782	1907	1976	1921	1877	1922	1880	1546	1217	1110	1068	876	701	26238
	S 17	397	262	210	175	160	212	272	463	735	1120	1378	1606	1725	1749	1762	1812	1971	1759	1433	1336	1089	819	470	415	23330
	M 18	254	174	121	137	246	449	955	1432	1220	1155	1208	1248	1206	1314	1429	1533	1895	1965	1392	939	716	536	399	265	22188
	T 19	194	126	105	131	202	394	893	1435	1260	1131	1130	1178	1167	1184	1294	1455	1746	1962	1381	851	729	560	470	331	21309
	W 20	188	149	143	154	199	444	927	1426	1217	1222	1133	1162	1250	1281	1478	1562	1916	1955	1447	957	801	640	508	325	22484
	T 21	240	222	170	165	261	435	898	1409	1336	1298	1284	1373	1354	1492	1642	1813	2110	2100	1521	1079	936	824	558	382	24902
	F 22	270	155	171	174	230	419	929	1362	1217	1326	1287	1370	1423	1448	1632	1789	2273	2316	1795	1337	1060	949	950	620	26502
	S 23	373	204	184	173	176	230	410	648	1072	1319	1595	1671	1722	1677	1697	1724	1841	1750	1447	1198	1231	1193	1017	674	25226
	S 24	471	315	214	176	150	193	234	411	657	995	1360	1617	1746	1695	1639	1860	1878	1738	1426	1240	1134	880	556	356	22941
	M 25	256	138	136	143	228	470	934	1484	1182	1079	1075	1037	1007	1103	1206	1450	1683	1793	1213	810	700	531	483	328	20469
	T 26	184	129	113	133	178	354	901	1422	1203	1061	974	1087	1101	1158	1179	1432	1838	1852	1213	810	780	576	443	286	20407
	W 27	241	187	126	130	206	404	850	1409	1125	1090	1121	1105	1106	1254	1287	1434	1774	1953	1292	918	804	658	474	303	21251
	T 28	188	169	130	146	226	374	916	1376	1220	1226	1094	1225	1266	1254	1452	1622	2050	2046	1421	1066	874	651	564	395	22951
	F 29	243	188	197	180	268	383	810	1267	1237	1257	1306	1412	1346	1641	1734	1875	2254	2374	2012	1247	1050	962	1109	656	27008
Home game, Holiday weekend	S 30	407	324	254	186	167	213	388	521	895	1174	1345	1478	1412	1521	1386	1244	1547	2409	3768	3536	2222	1439	912	634	29382
Holiday weekend	S 31	424	271	239	188	142	164	257	403	684	1152	1541	2005	1903	1716	2022	1813	1833	1675	1479	1004	926	786	562	372	23561
	Total	8993	6135	5058	4992	6666	10861	22033	35073	34825	38064	41264	44017	44854	46468	48618	53266	61808	62777	49205	36550	30338	25474	20514	14104	751957
Source: Nebraska Department of Roads, ATR 56E																										

F.6 ATR56E I-80 Traffic Counts - September 2014

September 2014		Hour of Day																									
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Labor Day, Holiday weekend	M 01	265	176	158	127	156	171	275	400	640	972	1451	1756	1690	1662	1819	1887	2057	1831	1623	1499	1233	943	579	343	23713
	T 02	201	160	108	133	244	453	922	1403	1141	1036	1015	1059	1084	1106	1130	1333	1621	1830	1200	814	681	539	396	313	19922
	W 03	170	106	115	113	186	419	899	1375	1144	1049	961	1059	1042	1094	1230	1379	1744	1741	1325	867	726	579	401	270	19994
	T 04	187	132	134	132	206	435	928	1425	1326	1158	1060	1059	1140	1121	1332	1570	1926	2059	1365	919	901	653	536	356	22060
	F 05	237	183	149	148	187	437	861	1316	1161	1184	1165	1363	1367	1443	1637	1848	2337	2449	2024	1276	988	895	792	491	25938
Home game	S 06	282	236	151	137	162	254	381	643	1019	1174	1433	1336	1358	1561	2255	4296	3653	2377	1638	1218	1117	856	650	511	28698
	S 07	322	239	200	172	150	218	233	433	673	985	1413	1700	1607	1627	1666	1589	1774	1505	1265	1088	1018	706	632	324	21539
	M 08	213	144	120	150	215	457	956	1411	1163	1052	988	1057	1040	987	1160	1361	1670	1829	1244	756	649	531	385	226	19764
	T 09	158	120	88	115	192	428	921	1381	1156	1004	972	1050	1061	1096	1161	1461	1730	1690	1035	719	531	376	436	229	19110
	W 10	145	158	99	127	189	409	888	1431	1228	1093	1085	1150	1121	1120	1286	1435	1739	1896	1293	843	728	643	377	279	20762
Patriot Day	T 11	207	149	133	157	227	394	890	1414	1255	1192	1077	1123	1195	1230	1380	1620	2003	2059	1530	1023	845	701	439	367	22610
	F 12	201	160	102	143	231	418	820	1377	1178	1260	1248	1259	1416	1417	1707	1939	2229	2177	2118	1286	1025	1247	835	497	26290
	S 13	389	243	170	140	159	271	407	747	1109	1310	1618	1613	1689	1584	1538	1733	1876	1673	1259	1035	1158	988	606	418	23733
	S 14	352	238	207	130	125	157	240	503	658	984	1220	1771	1759	1492	1712	1622	1883	1609	1341	1258	1022	690	463	294	21730
	M 15	188	135	115	118	233	429	951	1439	1150	1084	999	1055	1003	1041	1130	1287	1706	1805	1146	813	666	513	374	263	19643
	T 16	151	105	91	103	189	399	856	1436	1224	1087	988	1003	1114	1124	1225	1436	1757	1829	1267	837	641	527	391	312	20092
	W 17	193	129	119	145	207	392	895	1463	1231	1123	1063	1027	1084	1144	1263	1489	1753	1918	1324	901	687	795	413	315	21073
	T 18	196	170	151	152	213	401	910	1474	1241	1203	1088	1188	1255	1252	1512	1919	2002	2619	1686	1100	859	752	584	436	24363
	F 19	240	209	176	160	268	425	915	1457	1251	1279	1258	1318	1372	1529	1747	1949	2367	2497	2115	1297	1089	986	793	538	27235
Home game	S 20	624	305	213	175	185	231	381	599	971	1208	1421	1423	1481	1431	1532	1488	1517	1641	1378	1089	1001	1161	1853	4079	27387
	S 21	4121	1612	550	343	289	391	332	554	917	1423	2137	2398	2145	1943	2035	2057	1894	1717	1400	1350	1105	706	552	341	32312
	M 22	234	166	115	135	264	443	996	1393	1226	1162	1125	1062	1094	1065	1155	1414	1744	1857	1259	772	715	521	365	242	20524
	T 23	158	104	105	89	196	409	864	1365	1240	1054	1018	1015	1091	1038	1193	1397	1768	1892	1229	834	698	569	362	250	19938
	W 24	173	128	117	133	217	372	932	1393	1242	1145	1102	1144	1131	1189	1290	1508	1775	2024	1401	996	790	672	463	328	21665
	T 25	204	170	167	162	223	413	903	1408	1266	1199	1135	1238	1224	1279	1470	1649	2079	2051	1466	1054	834	715	517	379	23205
	F 26	253	174	142	138	233	377	893	1388	1224	1262	1248	1365	1409	1553	1706	2054	2377	2336	1987	1329	1008	994	862	625	26937
Home game	S 27	348	253	195	151	176	230	445	580	945	1318	1422	1614	1571	1631	1550	1573	1725	1514	1351	1167	1018	766	1173	2254	24970
	S 28	3915	1975	448	244	194	253	377	434	811	1291	1734	2041	1928	1874	1839	2030	1909	1846	1505	1241	1101	717	481	307	30495
	M 29	243	163	112	125	218	434	941	1402	1187	1139	1012	1116	1064	1153	1154	1221	1725	1858	1213	811	739	575	405	261	20271
	T 30	135	120	98	107	201	373	845	1370	1138	1075	987	1070	1131	1109	1241	1365	1588	1809	1103	803	679	500	354	236	19437
	Total	14705	8362	4848	4404	6135	10893	22057	34414	33115	34505	36443	39432	39666	39895	44055	50909	57928	57938	43090	30995	26252	21816	17469	16084	695410
Source: Nebraska Department of Roads, ATR 56E																										

F.7 Total Northbound US 77 Traffic Counts – April 2014

April 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Sensor deployed	M 07														194	205	283	362	387	221	153	129	91	48	55	2128
	T 08	18	11	11	12	19	52	130	239	195	171	145	170	195	200	225	268	373	406	244	157	128	119	64	43	3595
	W 09	16	12	10	8	22	66	114	215	199	190	183	165	213	202	222	261	368	408	276	160	159	126	80	66	3741
	T 10	29	11	12	9	24	70	143	226	213	185	179	167	195	204	254	344	368	399	257	207	162	149	79	50	3936
	F 11	24	8	18	8	23	92	144	242	239	171	194	183	230	253	268	421	453	451	310	196	182	163	157	98	4528
Red/White Game	S 12	42	23	27	13	18	55	98	140	210	197	213	258	236	245	244	278	405	460	317	193	181	125	117	82	4177
Snow	S 13	43	25	13	7	10	49	124	171	130	368	260	369	232	226	194	257	285	215	206	124	110	70	39	29	3556
Palm Sunday/Snow	M 14	12	8	10	9	21	74	118	199	175	192	177	171	167	191	208	273	397	379	224	146	126	107	54	37	3475
	T 15	24	12	10	13	17	58	110	214	208	176	170	155	210	178	226	307	361	449	265	165	139	101	67	47	3682
	W 16	25	14	11	12	23	79	142	234	211	177	183	175	198	238	209	310	369	406	204	167	142	120	80	43	3772
	T 17	26	14	11	5	20	62	141	209	233	169	157	160	217	225	246	321	375	429	319	193	176	157	81	59	4005
Good Friday	F 18	29	25	15	6	14	59	108	163	185	210	241	239	242	319	341	354	446	434	296	202	183	154	132	79	4476
	S 19	52	19	18	11	16	41	56	101	187	261	290	309	290	304	290	300	293	284	200	161	162	111	105	58	3919
Easter Sunday	S 20	36	25	20	6	9	13	25	51	108	261	322	475	332	258	207	281	401	324	244	214	147	88	61	35	3943
	M 21	22	12	7	6	27	77	131	182	184	190	194	198	232	221	255	276	361	434	270	165	156	111	62	47	3820
	T 22	21	16	9	11	20	77	146	255	254	168	162	181	202	225	219	282	384	410	249	124	130	108	54	55	3762
	W 23	19	8	12	9	23	56	138																		265
	T 24																									0
	F 25																									0
Arbor Day	S 26																									0
	S 27															225	231	240	251	221	178	109	89	43	41	1628
	M 28	26	9	10	9	19	72	143	221	217	191	181	165	164	183	201	269	369	404	209	135	130	84	66	39	3516
	T 29	23	12	17	14	18	46	105	228	207	161	121	146	179	192	204	243	363	422	228	162	111	90	59	38	3389
	W 30	17	15	7	18	23																				80
	Total	504	279	248	186	366	1098	2116	3290	3355	3438	3372	3686	3734	4058	4443	5559	6973	7352	4760	3202	2762	2163	1448	1001	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.8 Total Northbound US 77 Traffic Counts – May 2014

May 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
	T 01																									0
	F 02																									0
	S 03																									0
	S 04												291	388	343	300	291	328	277	227	180	147	85	65	27	2949
	M 05	25	11	6	8	30	65	125	222	222	178	182	153	191	180	172	302	374	409	282	156	138	116	50	41	3638
	T 06	14	13	12	12	17	73	119	241	247	201	155	145	167	198	232	279	358	401	265	173	151	133	67	41	3714
	W 07	16	5	9	14	19	62	134	228	216	184	172	173	200	207	228	304	335	408	246	156	244	215	89	48	3912
	T 08	24	9	6	50	22	80	138	225	208	191	173	171	182	203	264	253	415	418	243	180	144	158	88	53	3898
	F 09	26	14	6	16																					62
	S 10																									0
Mother's Day	S 11																	232	268	723	413	170	96	48	43	1993
	M 12	8	13	10	50	27	71	138	205	236	195	201	184	183	188	209	288	324	389	254	125	122	75	60	43	3598
	T 13																									0
	W 14															215	289	346	450	232	176	154	130	82	49	2123
	T 15	24	11	6	10	19	73	122	211	219	206	178	183	212	202	252	301	394	444	300	159	173	149	70	54	3972
	F 16	20	13	18	12																					63
	S 17																									0
	S 18												274	260	255	232	297	282	251	220	227	165	118	70	45	2696
	M 19	26	20	8	11	24	74	132	243	248	198	200	168	176	194	198	288	380	404	233	153	126	143	63	45	3755
	T 20	15	17	7	14	29	73	134	229	242	209	172	163	181	224	274	327	372	436	252	138	133	153			3794
	W 21																									0
	T 22														248	256	295	412	471	315	169	162	151	102	58	2639
	F 23	46	14	10	15	32	70	128	195	240	252	221	212	277	296	328	393	400	430	366	220	158	161	119	83	4666
Holiday weekend	S 24																									0
Holiday weekend	S 25																									0
Memorial Day	M 26																									0
	T 27													194	191	207	267	338	376	237	147	139	154	90	45	2385
	W 28	19	12	12	11	25	87	136	206	222	186	179	195	208	218	242	291	407	416	252	199	119	142	71	61	3916
	T 29	22	20	8	8	20	75	129	220	222	201	188	195	193	226	235	318	447	513	316	199	146	143	100	51	4195
	F 30	27	15	10	11	30	69	135	258	248	242	232	234	249	247	279	358	410	475	311	185	157	122	127		4431
	W 31																									0
	Total	312	187	128	242	294	872	1570	2683	2770	2443	2253	2741	3261	3620	4123	5141	6554	7236	5274	3355	2748	2444	1361	787	62399
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.9 Total Northbound US 77 Traffic Counts – June 2014

June 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	S 01																									0
	M 02																									0
	T 03												179	209	186	219	273	354	382	166	330	248	285	207	109	3147
	W 04	15	12	9	14	32	67	148	219	224	217	190	186	211	188	272	279	356	467	283	169	127	149	71	65	3970
	T 05	29	11	8	13	23	82	132	220	203	182	233	171	195	211	224	329	364	452	286	182	144	120	87		3901
	F 06																									0
	S 07																									0
	S 08													248	284	287	258	260	240	230	165	146	110	57	42	2327
	M 09	30	13	8	6	28	80	118	199	224	190	183	176	171	205	257	245	366	433	264	146	142	137	87		3708
	T 10																									0
	W 11																									0
	T 12												200	214	224	248	283	375	486	265	185	160	149	106	59	2954
	F 13	24	11	9	14	21	75	125	222	228	201	229	205	248	266	289	351	430	498	361	218	164	140	141	98	4568
	S 14	47	33	20	6	12	41	67	115	168	249	255	273	275	297	262	238	241	195	166	153	129	128	84	54	3508
Father's Day	S 15	35	111																							146
	M 16																									0
	T 17																									0
	W 18												196	199	208	243	305	397	441	255	146	145	135	101	70	2841
	T 19	35	15	13	10	26	93	155	204	233	218	223	220	203	227	219	345	408	438	276	197	144	121	70	58	4151
	F 20	27	14	8	6	36	80	135	219	219	265	250	234	247	322	301	404	445	445	341	196	210	157	146	135	4842
	S 21	207	33	15	12	23	101																			391
	S 22																									0
	M 23																									0
	T 24															215	289	418	403	262	168	158	143	135	66	2257
	W 25	31	8	4	11	29	68	143	208	227	217	215	190	197	243	219	300	372	440	248	188	138	150	119	83	4048
	T 26	76	51	6	9	18	79	144	217	238	205	191	194	223	258	438	388	395	441	273	177	151	132	83	46	4433
	F 27																									0
	S 28																									0
	S 29																									0
	M 30													227	213	209	300	342	406	272	159	132	124	83	52	2519
	Total	556	312	100	101	248	766	1167	1823	1964	1944	1969	2424	3067	3332	3902	4587	5523	6167	3948	2779	2338	2180	1577	937	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.10 Total Northbound US 77 Traffic Counts – July 2014

July 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	T 01	28	16	4	10	21	75	136	223	188	190	186	210	196	243	200	279	392	456	260	201	157	167	117	65	4020
	W 02	22	19	6	8	33	79																			167
Holiday weekend	T 03																									0
4th of July	F 04												261	260	291	245	262	251	216	152	122	112	108	79	132	2491
Holiday weekend	S 05	57	34	45	15	7	22	36	58	113	167	220	282	295	313	308	291	237	247	219	156	127	121	83	69	3522
Holiday weekend	S 06	37	12	17	9	13	21	28	53	87	144	139	238	267	230	235	267	230	214	194	191	140	118	61	27	2972
	M 07	31																								31
	T 08																									0
	W 09												202	222	244	227	288	385	424	260	192	150	139	66	59	2858
	T 10	16	20	11	14	18	84	160	212	235	191	181	179	193	226	247	289	394	415	280	171	174	134	92	67	4003
	F 11	20	15	11	5	33	95	138	193	213	221	222		227	283	286	322	454	437	359						3534
	S 12																									0
	S 13																									0
	M 14												168	226	204	216	251	352	403	250	140	127	115	89	117	2658
	T 15	91	23	12	17	20	71	164	235	213	206	203	183	184	208	194	272	346	422	220	177	132	116	92	79	3880
	W 16	29	19	10	16	41	81	137	229																	562
	T 17															233	307	367	422	284	159	173	130	93	68	2236
	F 18	32	9	8	11	26	76	169	200	196	185	194	220	285	261	313	323	457	485	352	228	160	142	105	80	4517
	S 19																									0
	S 20																									0
	M 21												156	191	183	230	273	350	401	207	157	128	89	90	48	2503
	T 22	24	10	10	13	28	65	147	230	197	186	170	186	203	192	232	263	363	409	234	152	125	129	68	48	3684
	W 23	28	11	5	13	25	66	145	206	217	207	188	195	207	195	233	300	393	469	261	188	170	114	86	55	3977
	T 24	31	12	5																						48
	F 25															300	388	388	439	326	207	142	137	99	62	2488
	S 26	54	30	16	9	22	44	65	127	177	198	244	224	256	280	269	257	230	210	205	165	122	104	102	82	3492
	S 27	29	26	12																						67
	M 28												163	168	183	205	262	383	399	252	198	116	90	61	51	2531
	T 29	25	12	11	14	23	76	157	210	199	201	163	182	185	209	230	298	346	412	270	164	120	107	75	48	3737
	W 30	24	15	9																						48
	T 31													227	233	298	381	469	551	241	158	189	103	86	66	3002
	Total	578	283	192	154	310	855	1482	2176	2035	2096	2110	3049	3792	3978	4701	5573	6787	7431	4826	3126	2564	2163	1544	1223	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.11 Total Northbound US 77 Traffic Counts – August 2014

August 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	F 01	27	10	10	7	25	69	136	203	206	224	184	204	253	247	295	360	497	536	390	183	171	152	134	82	4605
	S 02	51	23	21																						95
	S 03															246	255	226	229	194	133	150	97	78	40	1648
	M 04	34	7	9	5	27	82	140	203	187	188	194	184	170	182	241	271	389	393	247	174	113	101	67	53	3661
	T 05																									0
	W 06																									0
	T 07															228	338	394	392	301	187	166	125	95	55	2281
	F 08	17	19	6	18	26	67	118	196	185	189	183	204	244	243	309	336	439	444	309	211					3763
	S 09																									0
	S 10																									0
	M 11													164	191	212	307	340	446	260	160	124	95	48	44	2391
	T 12	21	14	9	10	20	59	133	239	193	195	152	162	197	202	220	309	363	406	241	143	131	113	62	58	3652
	W 13	22	21	12	6	26	61	123																		271
	T 14												167	189	229	244	296	376	445	250	196	129	118	67	47	2753
	F 15	22	11	12	11	21	66	123	206	204	220	176	229	221	240	280	369	420	483	307						3621
	S 16																									0
	S 17														258	273	283	298	233	193	182	156	109	53	67	2105
	M 18	27	13	13	14	28	69	143	224	219	191	184	167	192	193	176	280	375	422	238	161	119	86	43	44	3621
	T 19	22	7	11	5	25	60																			130
	W 20														205	227	273	356	402	249	167	121	80	65	88	2233
	T 21	82	21	12	7	20	75	149	228	235	159	174	228	207	228	233	333	389	432	294	159	169	115	85	60	4094
	F 22	22	17	14	8	23																				84
	S 23															322	288	270	228	267	196	162	217	141	71	2162
	S 24	51	23	21	19	8	19	31	67	105	167	156	240	238	258	239	273	255	243	219	198	126	107	56	31	3150
	M 25	27	13	6	12	17	73																			148
	T 26												180	175	196	224	308	381	396	227	158	149	90	52	58	2594
	W 27	12	16	6	9	20	57	121	240	234	178	156	174	190	195	233	284	355								2480
	T 28																									0
	F 29																									0
Home game, Holiday weekend	S 30														219	205	160	201	322	791	704	341	198	98	50	3289
Holiday weekend	S 31	26	29	27	17	14	20	20	58	108	185	227	302	271	313	310	275	274	241	199	157					3073
	Total	463	244	189	148	300	777	1237	1864	1876	1896	1786	2441	2711	3599	4717	5598	6598	6693	5176	3469	2327	1803	1144	848	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.12 Total Northbound US 77 Traffic Counts – September 2014

September 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Labor Day, Holiday weekend	M 01																									0
	T 02												176	176	187	246	260	375	379	233	140	139	130	79	42	2562
	W 03	23	7	12	7	23	71	127	235	204	199	154	169	169	191	231	295	389	365	252	154	125	103	61	45	3611
	T 04	20	10																							30
	F 05																									0
Home game	S 06											226	190	209	229	361	861	599	409	292	177	142	134	73	58	3960
	S 07	51	19	21	9	8	18	31	66	102	143	171	262	241	234	225	247	240	237	213	180	137	90	60	28	3033
	M 08	20	8	7	7	16	62	154	221	207	182	152	151	161	178	193	302	340	407	245	160	155	103	41	44	3516
	T 09	19	11	7	7	19	61	146																		270
	W 10																									0
Patriot Day	T 11																									0
	F 12												188	237	231	247	346	468	531	348	207	197				3000
	S 13												223	249	253	225	279	322	241	186	144	203	148	95	63	2631
	S 14	32	27	17												215	279	287	263	202	179	157	81	40	30	1809
	M 15	59	7	8	12	13	69										281	378	415	228	163	151	85	58	37	1964
	T 16	18	10	8											170	218	272	368	432	225	161	165	145	54	52	2298
	W 17	21	8	13	14	24	62																			142
	T 18												203	181	218	228	337	390	400	274	189	177	146	75	46	2864
	F 19	23	12	15	9	26	63	147	232	179	216	197	198	220	250	315	338	455	509	401	220	170	152	121	84	4552
Home game	S 20	62	25	20	18	17	31	62	148	211	221	237	226	289	263	227	218	199	248	200	155	126	100	252	854	4409
	S 21	504	117	46	16	12	23																			718
	M 22										192	173	188	167	184	234	331	392	436	241	170	128	93	54	45	3028
	T 23	19	10	8	11	13	59	150	206	227	186	182	153	189	187	240	275	402	425	243	192	156	100	77		3710
	W 24																									0
	T 25															226	308	390	408	255	164	147	130	86	47	2161
	F 26	29	14	11	11	28	55	149	216	231	184	206	233	250	266	310	368	444	482	313	186	181	155	124	75	4521
Home game	S 27	52	18	10	11	15	35																			141
	S 28												390	333	319	339	324	318	304	288	209	142	84	56	35	3141
	M 29	30	11	8	14	17	69	166	214	217	217	220	189	161	183	239	269	368	412	248	155	120	94	48	33	3702
	T 30	19	16	10	10	17	56	132	212	204																676
	Total	1001	330	221	156	248	734	1264	1750	1782	1740	1918	3139	3232	3543	4519	6190	7124	7303	4887	3305	2918	2073	1454	1618	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.13 Eastbound HWY 64 Traffic Counts – April 2014

April 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Sensor deployed	M 07													31	42	41	65	44	37	38	28	9	13	24	7	379
	T 08	3	0	0	7	11	50	96	128	67	32	43	37	38	41	53	57	58	45	42	24	18	5	18	8	881
	W 09	3	0	1	5	11	47	102	122	60	38	27	41	43	44	45	44	46	43	52	31	27	16	26	13	887
	T 10	1	1	0	6	12	49	97	142	53	42	42	38	38	40	45	34	44	46	42	20	39	7	22	7	867
	F 11	3	1	1	4	14	45	98	130	68	42	41	41	45	41	51	53	52	49	48	47	25	13	22	11	945
Red/White Game	S 12	4	7	2	2	4	15	28	34	42	52	45	53	61	37	46	41	67	55	51	39	27	15	16	15	758
Snow	S 13	7	3	1	2	4	7	6	36	19	39	45	38	43	40	41	39	25	28	30	14	10	11	21	5	514
Palm Sunday/Snow	M 14	0	1	1	3	9	50	82	127	53	30	39	47	25	34	45	33	40	36	32	28	12	10	23	9	769
	T 15	13	0	2	6	12	40	92	125	60	47	21	42	37	32	56	39	34	45	47	20	15	10	27	6	828
	W 16	1	2	0	5	14	42	106	124	58	39	41	32	46	40	64	39	45	45	39	27	19	5	23	8	864
	T 17	2	2	0	5	13	42	94	130	24	44	53	36	58	44	47	49	40	64	52	31	26	14	2	10	882
Good Friday	F 18	1	2	0	2	4	22	62	87	41	48	44	43	50	34	42	49	44	58	43	47	31	20	15	9	798
	S 19	13	3	1	2	3	12	26	26	29	59	41	52	41	51	47	48	52	50	51	42	48	16	7	11	731
Easter Sunday	S 20	8	1	3	8	1	4	5	32	27	29	55	57	47	51	56	62	81	89	69	51	31	18	10	9	804
	M 21	1	1	1	8	12	50	91	118	61	46	31	42	46	34	62	61	49	49	37	25	23	15	27	10	900
	T 22	3	0	1	5	9	54	92	125	62	38	40	54	40	48	51	60	48	44	41	36	20	11	9	7	898
	W 23	3	0	0	9	16	50	100	133	63	38	32	37	38	39	55	39	47	39	46	22	13	7	29	8	863
	T 24	2	0	0	5																					7
	F 25																									0
Arbor Day	S 26																									0
	S 27															30	41	40	46	33	30	29	4	23	6	282
	M 28	2	0	0	4	9	44	105	113	62	37	31	30	46	38	68	39	32	43	42	24	16	9	24	9	827
	T 29	1	1	0	3	14	39	90	117	63	28	35	35	34	38	54	38	31	44	30	12	15	6	18	7	753
	W 30	0																								0
	Total	71	25	14	91	172	662	1372	1849	912	728	706	755	807	768	999	930	919	955	865	598	453	225	386	175	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.14 Eastbound HWY 64 Traffic Counts – May 2014

June 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	S 01																									0
	M 02	3	2	3	5	11	42	107	107	77	54	44	50	42	39	62	57	69	61	67	47	46	34	56	12	1097
	T 03	5	2	4	6	12	44	106	113	68	36	32	64	64	47	63	43	92	73	67	120	40	46	22	15	1184
	W 04																									0
	T 05											45	48	34	46	44	51	60	52	42	21	39	26	22	13	543
	F 06	2	2	1	4	13																				22
	S 07														46	49	49	53	38	36	26	26	10	20	9	362
	S 08																									0
	M 09	4																								4
	T 10													55	49	55	54	55	42	46	36	30	19	19	22	482
	W 11	7	4	1	5	6	24	34	51	58	70	67	62	61	42	38	65	44	46	33	43	28				789
	T 12	16	5	3	7	10	18	43	49	47	53	66	43	59	66	52	52	56	60	77	38	45				865
	F 13												49	44	52	60	55	45	44	46	42	39	57	37	20	590
	S 14																									0
Father's Day	S 15	7	6	0	0	4	6	14	21	31	38	51	47	48	54	56	69	80	68	51	53	62	34	28	7	835
	M 16																									0
	T 17																									0
	W 18	17	5	2	7	4	8	15	22	24	38	37	32	44	45	52	61	90	73	62	53	33	25	43	11	803
	T 19																									0
	F 20	6	0	0	4	10	51	106	110	72	47	37	48	50	45	43	33	54	44	31	29	34	20	27	16	917
	S 21																45	53	65	46	35	30	25	26	10	335
	S 22	1	1	1	9	13	47																			72
	M 23	2	0	0	2	19	52	106	92	62	49	42	51	25	43	66	59	37	45	32		12	19	23	5	843
	T 24																									0
	W 25	4	1	1	7	13	48	107	122	72	38	34	60	36	48	42	48	46	61	43	30	27	24	30	9	951
	T 26														51	55	54	77	61	49	26	29	37	19	14	472
	F 27	1	0	0	1	16	48	92	90	60	44	36	43	43	48	69	45	40	53	62	29	32				852
	S 28											53	58	35	42	54	45	75	51	58	40	38	35	33	10	627
	S 29	2	1	1	7	19																				30
	M 30	2	0	2	5	15	51	119	107	65	41	52	52	38	53	47	46	56	61	53	31	42	24	30	10	1002
	Total	79	29	19	69	165	439	849	884	636	508	596	707	678	816	907	931	1082	998	901	699	632	435	435	183	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.15 Eastbound HWY 64 Traffic Counts – June 2014

May 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
	T 01																									0
	F 02																									0
	S 03													58	60	52	52	59	61	52	51	46	20	17	13	541
	S 04	1	9	2	6	6	4	13	20	32	44	65	47	73	55	48	44	51	54	56	44	33	25	22	10	764
	M 05	0	1	0	3	15	32	111	131	52	38	40	34	49	48	55	33	50	44	37	32	30	20	22	8	885
	T 06	1	1	3	4	13	51	104	119	55	60	38	47	55	41	60	58	46	57	35	29	22	13	26	8	946
	W 07	2	1	1	5	12	45	95	119	70	40	47	48	33	51	50	51	41	43	45	39	30	14	29	8	919
	T 08	3	0	0	3	11																				17
	F 09																									0
	S 10												52	55	66	54	44	59	58	69	36	24	26	25	24	592
Mother's Day	S 11	11	7	6	1	5	6	10	11	18	34	43	54	47	41	37	46	64	55	42	21	18	9	14	4	604
	M 12	0	1	0	6	14	38	95	122																	276
	T 13																									0
	W 14											30	65	36	40	57	42	53	52	58	25	25	9	17	8	517
	T 15	3	2	0	5	8	41	110	118	70	53	54	45	48	52	56	39	63	49	47	24	24	19	15	7	952
	F 16	3	3	0	5	6	40	103	112	79	54	37	45	38	51	59	54	45	66	52	28	29	22			931
	S 17																									0
	S 18												60	44	73	39	57	65	49	44	44	39	23	22	9	568
	M 19	2	1	1	3	9	51	106	129	64	31	39	36	38	50	52	47	52	49	39	18	27	19	21	8	892
	T 20	3	0	1	5	12	46																			67
	W 21																									0
	T 22													59	58	47	49	58	65	46	27	27	24	34	6	500
	F 23	4	2	1	5	13	44	89	111	64	38	67	39	42	57	84	50	58	63	39	34	30	33	18	20	1005
Holiday weekend	S 24	8	3	1	2	3	8	24	31	54	60	40	72	53	45	49	74	69	61	55	31	41	30	29	23	866
Holiday weekend	S 25	6	6	5	7	3																				27
Memorial Day	M 26																									0
	T 27													52	53	49	44	49	57	39	26	36	13	26	12	456
	W 28	2	1	1	4	13	48	102	118	66	45	46	45	49	45	57	37	54	59	43	37	22	25	24	10	953
	T 29	2	2	1	2	13	45	98	124	73	60	45	44	43	43	40	49	54	72	49	38	31	25	23	6	982
	F 30	3	1	1	4	13	42	96	114	60	43	56	40	39	40	66	51	49	53	56	28	22	15	23	9	924
	W 31																									0
	Total	54	41	24	70	169	541	1156	1379	757	600	647	773	911	969	1011	921	1039	1067	903	612	556	384	407	193	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.16 Eastbound HWY 64 Traffic Counts – July 2014

July 2014		Hour of Day																									
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	T 01																										0
	W 02										48	48	41	58	52	55	62	54	52	53	31	39	29	29	8	659
Holiday weekend	T 03	3	2	1	4	9	45	110	109	64	60	44	71	51	54	92	67	72	100	77	69	49	48	36	34	1271
4th of July	F 04	9	2	3	2																					16
Holiday weekend	S 05												53	52	56	53	49	82	57	60	62	72	75	122	212	1005
Holiday weekend	S 06	61	29	10	3	4	10	16	28	41	67	74	95	82	64	86	75	96	88	103	86	55	42	32	17	1264
	M 07	2	1	0	4	9	37																			53
	T 08													58	41	57	57	49	65	44	23	25	28	22	18	487
	W 09	1	2	0	10	12	50	102	121	67	54	46	53	52	48	61	63	79	53	62	31	36	23	25	7	1058
	T 10	1	2	1	3																					7
	F 11														36		58	66	71	47	33	40	46	42	8	447
	S 12	9	10	15	6	5	24	37	28	65	48	52	58	56	37	53	49	60	63	51	33	36				795
	S 13																									0
	M 14												39	41	44	48	50	46	51	36	30	19	23	30	15	472
	T 15	5	3	1	6	16	48	117	101	71	40	48	36	54	56	53	47	56	59	41	32	24	16	29	11	970
	W 16	0	2	0	3																					5
	T 17										39	46	42	45	49	59	50	50	50	57	35	27	35	24	15	623
	F 18	4	2	0	3	10	56	98	110	63	47	43	50	54	38	60	53	56	54	74	46	40	40	39	8	1048
	S 19	6	2																							8
	S 20													54	57	54	61	98	75	77	51	54	42	28	9	660
	M 21	4	2	2	5	12	54	126	117	68	51	49	42	50	41	57	43	57	60	37	26	43	28	22	10	1006
	T 22	2	2	1	6	12	48	116	104	57	51	34	53	50	48	55	47	43	54	38	27	21	18	32		919
	W 23																									0
	T 24												48	72	31	61	40	45	65	33	21	28	31	30	14	519
	F 25	1	3	1	5	11	37	101	108	63	57	41	56	48	43	53	46	72	36	44	30	38	35	42	9	980
	S 26	11	7	1	7	5	14	43	39	44	49	53	64	49	46	50	51	56	50	49	36					724
	S 27																									0
	M 28											52	34	36	39	63	55	51	59	43	28	21	22	27	13	543
	T 29	3	1	2	4	13	48	105	112	52	50	45	55	43	51	49	43	51	51	41	30	31	29	21	14	944
	W 30	2	2																							4
	T 31											50	58	39	41	66	43	59	47	46	29	37	34	20	12	581
	Total	124	74	38	71	118	471	971	977	655	661	725	948	1044	972	1185	1109	1298	1260	1113	789	735	644	652	434	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.17 Eastbound HWY 64 Traffic Counts – August 2014

August 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	F 01	3	3	0	7	11	35	102	104	69	43	43	50	45	42	65	43	55	46	52	38	28	25	29	15	953
	S 02	6	4	4	2	11	15	40	32	48	45	54	48	53	40	43	41	71	44	50	35	49	35	48	15	833
	S 03	7	7																							14
	M 04																49	45	53	41	30	24	15	24	14	295
	T 05	1	1	1	5	20	54	105	116	66	49	53	56	36	53	55	44	49	45	41	27	25	31	26	11	970
	W 06	6	1	1	5																					13
	T 07																									0
	F 08														50	61	49	54	55	38	26	20	24	35	20	432
	S 09	6	2	4	4	7	12	46																		81
	S 10														52	60	61	56	48	49	37	45	15	32	11	466
	M 11	2	0														41	56	40	39	27	15	20	26	10	276
	T 12	2	0	1	5	12	57									46	40	42	56	41	34	24	21	26	6	413
	W 13	3	1	0	4	11	47	113																		179
	T 14										42	34	46	35	44	52	61	51	58	31	36	35	27	23	11	586
	F 15	6	2	0	5	12	41	105	118	67	45	48	47	27	49	59	49	45	54	44						823
	S 16																									0
	S 17												47	58	53	70	53	67	69	56	71	34	30	19	13	640
	M 18	1	0	2	4	11	53	114	131	60	46	42	46	34	34	59	43	57	40	29	31	17	21	20	3	898
	T 19	3	0	0	8	9	48	114	124	57	46	44	45	28	26	49	46	44	47	48	33	21	18	28	7	893
	W 20	2	2	1	6																					11
	T 21																41	30	49	39	20	25	25	20	7	256
	F 22	2	1	2	6	13	53	104	126	71	46	37	38	49	43	52	51	55	62	49	27	21	24	24	17	973
	S 23	5	4																							9
	S 24												58	53	52	65	51	78	62	78	58	49	18	18	7	647
	M 25	0	2	0	2	12	50	109	119	58	48	35	30	46	42	42	44	38	43	38	30	26	15	23	6	858
	T 26	8	84	8	11	11																				122
	W 27																	50	49	43	24	19	11	22	7	225
	T 28	1	2	0	7	11	59																			80
	F 29																									0
Home game, Holiday weekend	S 30												42	39	40	32	31	33	42	62	73	49	40	31	28	542
Holiday weekend	S 31	11	7	2	6	4	8	10	16	26	38	44	63	45	41	52	42	61	73	85						634
	Total	75	123	26	87	155	532	962	886	522	448	434	616	548	661	862	880	1037	1035	953	657	526	415	474	208	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.18 Eastbound HWY 64 Traffic Counts – September 2014

September 2014		Hour of Day																									
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Labor Day, Holiday weekend	M 01																									0
	T 02											46	36	53	41	55	49	48	47	47	20	31	16	19	10	518
	W 03	0	0	1	4	13	47	116	133	70	51	35	45	38	41	61	56	56	55	24	21	26	11	16	8	928
	T 04	5	0																							5
	F 05																41	41	59	52	38	25	14	29	7	306
Home game	S 06	5	0	2	5	6	17								26	53	66	72	53	55	33	38	43	25	22	521
	S 07	6	7	3	3	4	11	14	24	30	53	54	63	67	62	52	49	54	48	61	34	32	20	14	6	771
	M 08	1	0	3	5											59	65	44	43	41	24	26	21	21	6	359
	T 09	1	2	1	7	17	50											32	35							145
	W 10																									0
Patriot Day	T 11																									0
	F 12												39	32	50	57	39	61	56	48	33					415
	S 13											47	45	45	63	64	83	62	54	65	30	29	20	26	12	645
	S 14	8	4	6	3										58	47	62	51	78	61	55	36	13	26	7	515
	M 15	1	1	0	5	13											45	42	58	45	25	25	10	25	8	303
	T 16	1	1											33	53	64	47	40	46	42	33	30	10	19	7	426
	W 17	2	0	0	6	16	42									60	54	38	46	47	30	22	17	20	9	409
	T 18	1	0	1	6	16	42	112	102																	280
	F 19												32	60	39	57	47	57	49	57	37	22	16	18	7	498
Home game	S 20	7	3	2	8	11	13	34	37	37	49	51	42	39	45	51	45	35	46	40	35	37	20	20	28	735
	S 21	19	10	1	3	6	6	20	21	36	51	54	51	48	38	53	57	71	60	59	52	30	12	18	10	786
	M 22	0	0	0	6									37	39	58	54	42	45	41	25	20	16	20	9	412
	T 23	2	0	3	6	14	43	115																		183
	W 24																									0
	T 25											46	54	31	45	60	48	48	45	45	39	24	16	24	9	534
	F 26	1	1	0	7	10	39	104	124	60	52	43	35	50	48	56	53	57	76	45	34	19	16	20	11	961
Home game	S 27	1	2	3	7	6	16	33	33	44	53	71	47	41	41	60	48	60	62	41	35	17	19	18	18	776
	S 28	26	26																							52
	M 29											36	35	31	30	49	42	47	48	35	27	31	13	20	5	449
	T 30	2	1	1	7	6	49	124	118	58	42	38	34	36	30	43	38									627
	Total	89	58	27	88	138	375	672	592	335	351	521	558	641	749	1059	1088	1058	1109	951	660	520	323	398	199	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.19 Eastbound I-80-27 Street Traffic Counts – April 2014

April 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Sensor deployed	M 07											744	831	869	878	973	1184	1403	1293	846	621	535	372	309	289	11147
	T 08	178	106	108	128	184	373	815	1076	880	890	787	900	893	931	998	1309	1474	1394	904	586	597	407	302	221	16441
	w 09	143	165	118	164	198	390	829	1110	959	829	889	865	947	970	1082	1250	1524	1389	870	650	657	449	419	318	17184
	T 10	212	158	140	157	202	403	817	1072	951	832	883	908	928	952	1010	1339	1471	1334	962	729	639	540	396	267	17302
	F 11	174	143	134	146	189	387	798	995	886	875	949	1031	1093	1114	1239	1411	1580	1495	1095	735	681	573	590	347	18660
Red/White Game	s 12	266	188	163	166	151	222	496	608	866	913	1098	1067	1074	1006	1104	1424	2269	1855	1197	878	786	649	576	359	19381
Snow	s 13	261	190	216	169	140	182	338	456	681	752	818	1005	1076	919	869	849	977	915	744	493	485	398	349	304	13586
Palm Sunday, Snow	M 14	165	73	95	101	157	356	778	1012	850	856	835	828	856	861	948	1168	1331	1274	892	616	543	494	350	256	15530
	T 15	183	118	113	129	171	376	835	1078	930	877	832	886	893	1005	1067	1275	1466	1377	890	641	586	450	360	231	16769
	w 16	169	131	136	116	218	427	883	1076	934	860	905	900	958	954	1096	1323	1481	1470	946	711	667	523	394	218	17496
	T 17	197	127	116	147	205	398	863	1124	982	898	850	963	1038	1017	1203	1413	1596	1655	1100	780	759	620	423	286	18760
Good Friday	F 18	201	189	152	138	187	366	726	973	952	992	1054	1176	1281	1333	1385	1524	1640	1500	1123	801	747	587	579	430	20036
	S 19	253	174	138	145	134	196	293	456	667	938	1071	1104	1111	1079	1033	1169	1037	1041	914	794	694	569	432	308	15750
Easter Sunday	S 20	208	218	182	105	113	139	191	305	509	723	965	1118	1121	889	938	1143	1213	1006	1218	1083	897	651			14935
	M 21																									0
	T 22																									0
	w 23																									0
	T 24																									0
	F 25										903	1021	1143	1143	1183	1285	1464	1559	1499	1131	837	764	621	613	536	15702
Arbor Day	S 26	330	221	169	130	136	235	435	721	918	1082	1195	1206	1190	1157	1189	1184	1129	1094	897	772	661	590	501	378	17520
	s 27	286	225	159	119	129	202	275	394	518	725	870	979	1012	997	995	1031	1077	1035	874	772	598	420	287	225	14204
	M 28	150	101	87	123	173	404	840	1040	877	790	801	798	853	915	986	1221	1413	1337	994	726	677	462	367	244	16379
	T 29	124																								124
	w 30																									0
	Totals	3500	2527	2226	2183	2687	5056	10212	13496	13360	14735	16567	17708	18336	18160	19400	22681	25640	23963	17597	13225	11973	9375	7247	5217	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.20 Eastbound I-80-27 Street Traffic – May 2014

May 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
	T 01																									0
	F 02																									0
	S 03											1144	1206	1163	1045	1203	1335	1425	1273	1049	806	670	713	517	417	13966
	S 04	271	182	159	111	127	172	324	404	524	887	1315	1531	1498	1337	1343	1280	1284	1165	993	860	662	487	374	244	17534
	M 05	151	137	112	145	208	448	889	1100	912	784	813	894	885	907	944	1225	1413	1421	870	682	575	411	319	231	16476
	T 06	163	126	100	145	198	424	869	1115	934	867	889	827	897	953	1008	1294	1449	1453	926	680	556	476	304	227	16880
	W 07	167	113	131	151	229	428	849	1074	917	1005	871	907	1007	1020	1103	1378	1503	1501	973	695	764	595	442	275	18098
	T 08	174	149	158																						481
	F 09																									0
	S 10																									0
Mother's Day	S 11															1131	1177	1196	892	761	805	612	417	293	193	7477
	M 12	102	91	74	138	191	370	879	1032	952	839	834	873	830	895	956	1164	1312	1328	769	567	505	403	365	248	15717
	T 13	196	185																							381
	W 14										952	899	1007	1124	1069	1126	1384	1598	1496	1002	769	634	539	405	273	14277
	T 15	190	126	150	154	230	436	911	1141	988	916	963	972	1065	1140	1196	1552	1677	1657	1067	767	778	575	452	281	19384
	F 16	195	159	165	175	226	426	867	1024	972	945	956	1050	1136	1210	1249	1469	1666	1608	1136	892					17526
	S 17																									0
	S 18											1067	1138	1233	1105	1123	1163	1238	1145	956	958	795	607	505	303	13336
	M 19	213	129	113	147	261	449	881	1117	929	897	911	943	904	995	1109	1345	1492	1459	960	639	651	442	447	315	17748
	T 20	148	132	126	161	216	409																			1192
	W 21																									0
	T 22												1015	1076	1177	1396	1646	1779	1703	1092	870	771	650	486	343	14004
	F 23	253	191	160	193	239	446	866	1203	1076	1114	1125	1143	1341	1462	1428	1617	1610	1595	1262	913	791	677	562	438	21705
Holiday weekend	S 24	332	268	164	152	158	243	447	892	982	1136	1171	1264	1249	1213	1239	1239	1094	1024	855						15122
Holiday weekend	S 25																									0
Memorial Day	M 26																									0
	T 27																									0
	W 28									878	848	943	952	1001	1007	1068	1338	1493	1456	936	698	634	517	413	299	14481
	T 29	219	163	145	164	212	455	919	1069	963	937	942	917	1057	1094	1118	1414	1589	1574	1033	884	683	568	492	342	18953
	F 30	222	190	168	193	262	430	884	1093	935	994	1082	1088	1215	1199	1288	1520	1610	1597	1265	905	753	630	500	760	20783
	W 31	594	234	182	168	193	265	396	665	969	1151	1295	1207	1296	1263	1154	1224	1154	1053	960	737	716	638	530	439	18483
	Total	3590	2575	2107	2197	2950	5401	9981	12929	12931	14272	17220	18934	19977	20091	22182	25764	27582	26400	18865	14127	11550	9345	7406	5628	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.21 Eastbound I-80-27 Street Traffic – June 2014

June 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	S 01	286	189	186	128	108	192	255	457	639	787	1092	1079	1208	1083	1276	1207	1097	1096	891	747	595	470			15068
	M 02																									0
	T 03												942	890	1031	1137	1370	1451	1111	637	551	500	452	296	258	10626
	W 04	181	129	147	140	246	460	894	1139	984	971	921	996	1025	1063	1139	1396	1601	1600	975	745					16752
	T 05																									0
	F 06																									0
	S 07												1156	1170	1185	1124	1190	1058	999	933	810	706	721	698	933	12683
	S 08	384	279	192	166	166	194	329	437	614	819	1050	1137	1179	1146	1176	1263	1282	1140	1063	879	785	639	447	294	17060
	M 09	205	154																							359
	T 10																									0
	W 11										969	929	968	1077	1135	1179	1521	1675	1647	1008	810	699	600	455	297	14969
	T 12	220	165	152	159	241	517	936	1137	1058	1028	1015	1036	1136	1115	1213	1520	1726	1638	1143	866	729	653	473	365	20241
	F 13	247	210	171	211	270	479	906	1144	1024	996	1061	1077	1205	1248	1398	1572	1707	1628	1306	1013	896	737	584	422	21512
	S 14	327	199	200	158																					884
Father's Day	S 15												1372	1188	1268	1267	1339	1358	1230	1135	903	791	719	506	322	13398
	M 16	208	177	141	168	236	498	906	1131	925	911	943	1014	967	1003	1096	1389	1610	1356	879	657	549	432	344	235	17775
	T 17																									0
	W 18																									0
	T 19											1043	1072	1123	1181	1278	1532	1739	1605	1053	769	728	543	469	343	14478
	F 20	219	193	184	174	282	508	883	1123	1070	1100	1144	1208	1262	1245	1330	1605	1760	1637	1301	922	823	664	634	535	21806
	S 21	239	213	147	172	177	293	373	682	938	1114	1191	1240	1349	1245	1255	1273	1270	1244	1065	871	779	797	591	979	19497
	S 22	393	267																							660
	M 23																									0
	T 24															1179	1422	1637	1550	993	708	644	526	733	488	9880
	W 25	232	145	139	175	311	466	962	1113	981	1002	1018	1017	1049	1116	1205	1443	1724	1653	1086	797	701	569	692	401	19997
	T 26	286	205	160																						651
	F 27																									0
	S 28											1173	1213	1258	1238	1282	1236	1372	1266	976	876	749	802	572	494	14507
	S 29	343	228	184	174	163	198	305	446	694	889	1015	1065	1173	1159	1319	1292	1263	1152	1002	908					14972
	M 30																									0
	Total	3770	2753	2003	1825	2200	3805	6749	8809	8927	10586	13595	17592	18259	18461	20853	23570	25330	23552	17446	13832	10674	9324	7494	6366	277775
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.22 Eastbound I-80-27 Street Traffic – July 2014

July 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	T 01																									0
	W 02										1042	1012	1048	1090	1187	1255	1520	1642	1546	1004	995	770	628	521	377	15637
Holiday weekend	T 03	258	226	206	248	291	479	852	1025	974	1047	1090	1125	1186	1352	1390	1656	1608	1624	1232	961	846	655	712	568	21611
4th of July	F 04	350	252	230																						832
Holiday weekend	S 05													1147	1192	1191	1194	1198	1175	940	861	751	686	528	453	11316
Holiday weekend	S 06	319	190	161	146	155	179	278	436	620	784	1020	1173	1184	1230	1364	1394	1366	1304	1176	1009	932	681	463	327	17891
	M 07	239	196	148	168																					751
	T 08										912	950	954	1002	1027	1085	1433	1581	1495	981	697	628	493	430	265	13933
	W 09	188	165	147	148	268	470	880	1165	970	937	958	1001	1076	1107	1160	1450	1536	1590	1048	783	614	545	415	305	18926
	T 10	222	178	176	187	247																				1010
	F 11										987		1045	1122	1236	1341	1525	1758	1678	1316	989	804	707	584	415	15507
	S 12	275	216	186	153	185	269	422	622	847	993	1058	1104	1183	1142	1158	1203	1203	1203	943	903	766	685	573	458	17750
	S 13	328	240	178	161	166	210	291	409	604	773	1067	1184	1118	1139	1254	1255	1205	1208	1039	851	777	638	476	384	16955
	M 14	251	182	156	157	246	453	892	1152	923	899	901	953	1049	1132	1141	1361	1568	1463	1001	754	655	519	434	1134	19376
	T 15	508	171	139	134	213	456	896	1172	981	1004	951	1005	1005	1003	1128	1353	1603	1523	933	688	625	556	395	334	18776
	W 16	234	156	156	149	274	453	868	1109	989	978	935	981	1086	1146	1225	1477	1626	1554	1052	816	688	525	453	313	19243
	T 17	208	181	134	169	235	478	871	1155	1089	957	1040	998	1124	1186	1282	1458	1716	1494	1054	828	831	811	535	375	20209
	F 18	235	211	198	165	257	462	866	1108	1021	1016	1071	1156	1272	1294	1420	1617	1826	1735	1375	1062	807	775	606	424	21979
	S 19	291	232	190	153	235	297	524	804	989	1218	1362	1307	1302	1289	1293	1253	1276	1284	1068	818	831	689	573	430	19708
	S 20	324	225	167	192	172	208	283	504	703	945	1148	1254	1331	1289	1280	1396	1344	1274	1020	980	789	658	496	362	18344
	M 21	252	189	155	180	251	469	901	1096	980	948	947	959	1032	993	1155	1372	1492	1452	962	755	594	467	421	286	18308
	T 22	188	132	114	146	225	470	874	1092	940	919	1002	933	999	1049	1184	1394	1657	1462	937	724	644	588	417	273	18363
	W 23	185	164	137	150	246	477	913	1140	927	992	1045	1016	1109	1085	1204	1488	1694	1604	1032	813	747	587	510	347	19612
	T 24	230	161	143	147	242	468	901	1112	975	964	1012	1076	1171	1156	1305	1491	1652	1575	1113	815	730	542	468	335	19784
	F 25	248	207	155	163	248	461	858	1104	1006	1089	1063	1132	1263	1323	1426	1526	1696	1662	1301	965	756	691	598	414	21355
	S 26	297																								297
	S 27																									0
	M 28												955	1024	1129	1154	1389	1560	1514	1034	761	626	503	365	290	12304
	T 29	222	129	126	123	207	431	749	1112	924	953	985	993	1076	1103	1193	1419	1599	1545	999	803	624	528	424	324	18591
	W 30	218	150	133	155	257	459	909	1163	961	1010	1047	1052	1026	1116	1243	1486	1766	1746	1087	805	724	596	517	344	19970
	T 31	222	214	133	165	239																				973
	Total	6292	4367	3668	3559	4859	7649	14028	18480	17423	21367	21664	24404	26977	27905	29831	34110	37172	35710	25647	20436	17559	14753	11914	9537	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

F.23 Eastbound I-80-27 Street Traffic – August 2014

August 2014		Hour of Day																								
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
	F 01																									0
	S 02										1106	1213	1272	1238	1198	1180	1314	1253	1192	1073	887	788	704	716	479	15613
	S 03	300	221	185	172	166	189	290	408	625	851	1009	1168	1253	1200	1330	1338	1294	1251	1106	887	830	671	538	337	17619
	M 04	259	177	149	154	240	454	888	1115	950	945	959	1007	1005	1049	1173	1319	1566	1528	1064	783	597	487	418	260	18546
	T 05	183	132																							315
	W 06																									0
	T 07																									0
	F 08														1257	1386	1571	1778	1650	1288	1027	879	712	675	575	12798
	S 09	300	177	199	186	203	271	429	655	908	1095	1162	1284	1284	1235	1313	1332	1330	1232	989	897	768	729	632		18610
	S 10																									0
	M 11																									0
	T 12										964	897	952	962	1012	1187	1374	1616	1531	974	737	561	476	395	382	14020
	W 13	260	133	155	187	238	412	896	1140	984	1018	953	960	1024	993	1133	1400	1609	1486	1043	730	602	569	414	302	18641
	T 14	231	174	148	189	261	448	856	1089	948	980	988	982	1017	1195	1254	1475	1704	1605	1107	826	713	587	431	297	19505
	F 15	232	180																							412
	S 16																									0
	S 17																									0
	M 18										962	938	1046	1003	1062	1200	1405	1533	1493	996	746	552	440	352	257	13985
	T 19	172	126	121	128	219	433	905	1105	973	904	893	911	939	1016	1113	1337	1512	1485	992	707	610	522	395	265	17783
	W 20	175	151	137	159	233	449	897	1104	963	894	927	945	1009	1084	1173	1406	1560	1499	999	706	623	510	503	745	18851
	T 21	722	213	169	176	272																				1552
	F 22																									0
	S 23											1165	1202	1171	1133	1188	1262	1208	1186	968	863	851	898	634	494	14223
	S 24	402	260	199	155	138	180	266	372	609	759	971	1133	1160	1147	1192	1297	1173	1140	995	893	748	622	437	315	16563
	M 25	217	149	124	149	236	457	904	1066	918	858	860	837	930	947	1073	1285	1483	1390	898	637	570	460			16448
	T 26																									0
	W 27																									0
	T 28													1002	1100	1197	1393	1589	1574	1008	832	719	570	441	330	11755
	F 29	237	196	191																						624
Home game, Holiday weekend	S 30																									0
Holiday weekend	S 31															1292	1191	1142	1054	776	726	636	577	404	356	8154
	Total	3690	2289	1777	1655	2206	3293	6331	8054	7878	11336	12935	13699	14997	16628	19384	21699	23350	22296	16276	12884	11047	9534	7385	5394	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																										
Blank cells are missing data																										

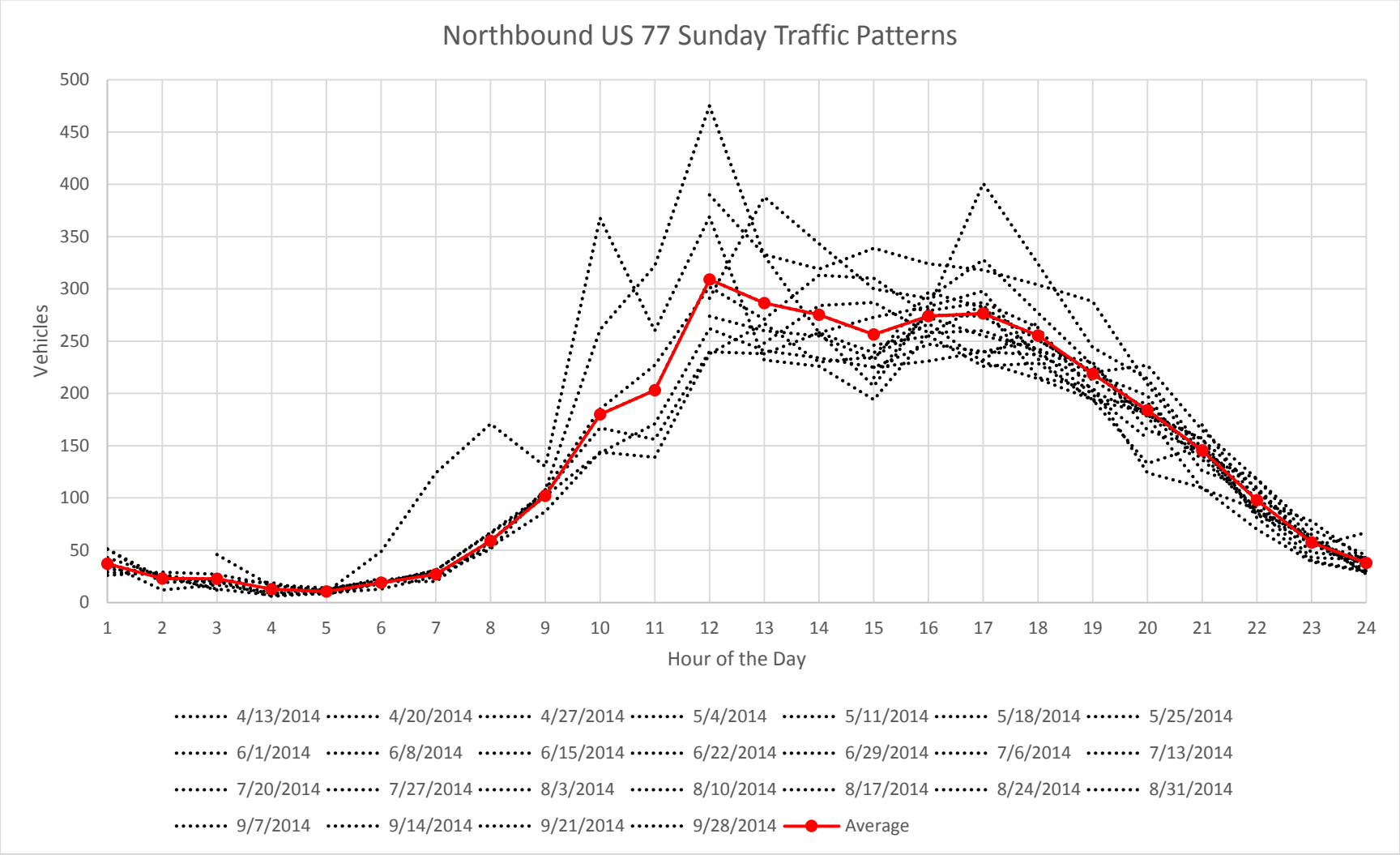
F.24 Eastbound I-80-27 Street Traffic – September 2014

September 2014		Hour of Day																									
Notes	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
Labor Day, Holiday weekend	M 01	251	185	158	125	134	180	248	392	544	809	1071	1132	1152	1180	1215	1221	1271	1177	1099	986	858	657	451	276	16772
	T 02	201	135	125																						461
	W 03														947	1094	1259	1450	1440	912	659	574	419	345	230	9329
	T 04	157	126	129	158	218	390	893	1104	972	862	890	972	942	1041	1150	1388	1678	1575	982	783	678	530	466	340	18424
	F 05	209	192	151	144																					696
Home game	S 06													987	1187	1906	2775	2033	1419	1053	785	698	567	515	393	14318
	S 07	280	232	203	138	142																				995
	M 08										857	870	874	879	955	1059	1218	1470	1504	877	687	554	468	317	223	12812
	T 09	155	124	106	123	207	413	806	1073	885	822	826	849	912	953	1008	1310	1512	1363	829	632	478				15386
	W 10																									0
Patriot Day	T 11																									0
	F 12																									0
	S 13										1037	1109	1189	1133	1085	1061	1239	1191	992	828	760	915	592	464	372	13967
	S 14	273	229	179	107	142	279																			1209
	M 15												871	865	937	1022	1249	1512	1419	913	740	599	439	330	246	11142
	T 16	157	123	95	125	174	429	847	1079	918	883	781	874	975	985	1020	1362	1462	1468	926	692	619	482	360	317	17153
	W 17	178	130	136	154	235																				833
	T 18											940	986	1019	1101	1228	1593	1762	1798	1138	821	700	581	460	365	14492
	F 19	233	205	164	180	258	458	829	1083	974	1035	983	1054	1121	1302	1365	1563	1789	1808	1362	969	824	772	630	456	21417
Home game	S 20	261																								261
	S 21											1415	1485	1355	1294	1314	1277	1224	1124	1001	940	725	517	405	287	14363
	M 22	216	152	128	146	226	467	884	1060	945	864	901	875	932	982	1099	1297	1495	1402	930	669	593	438	310	260	17271
	T 23	119	121	97	117	211																				665
	W 24																									0
	T 25												1019	1034	1131	1208	1432	1605	1634	987	757	728	561	431	325	12852
	F 26	235	161	146	160	268	433	876	1011	999	973	1047	1093	1172	1196	1391	1614	1691	1644	1307	983	749	800	616	472	21037
Home game	S 27	314	208	152																						674
	S 28												1369	1269	1277	1300	1307	1283	1168	997	907	693	536	382	292	12780
	M 29	228	171	110	119	261	431	874	1055	1003	811	898	884	982	1026	1076	1278	1511	1539	928	745	560	479	327	226	17522
	T 30	139	129	98																						366
	Total	3606	2623	2177	1796	2476	3480	6257	7857	7240	8953	11731	15526	16729	18579	20516	24382	25939	24474	17069	13515	11545	8838	6809	5080	
Source: Nebraska Transportation Center solar powered Wavetronix HD sensor																											
Blank cells are missing data																											

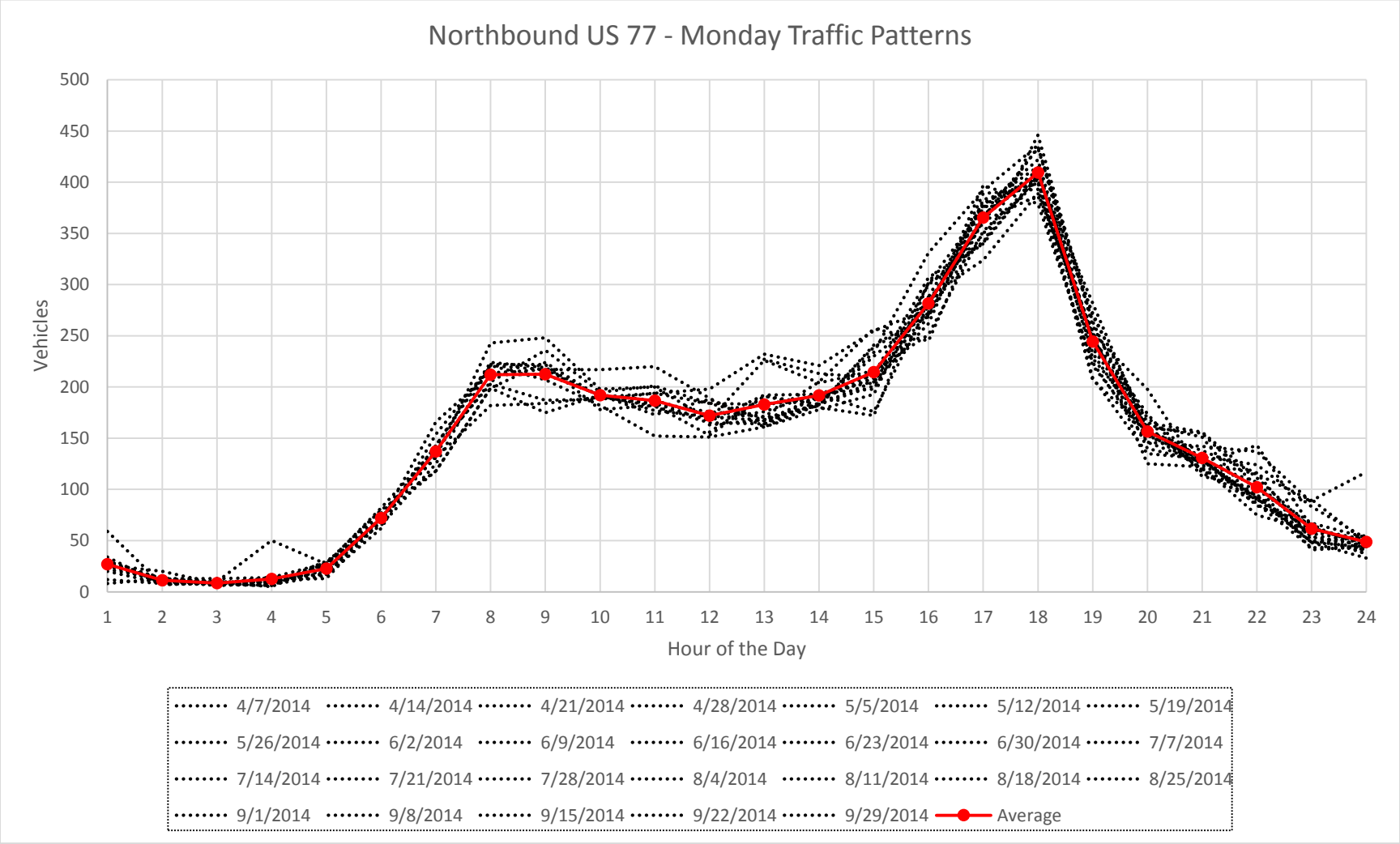
Appendix F Traffic Data

Part 2: Daily Traffic Patterns for the Wavetronix HD Sensor Data

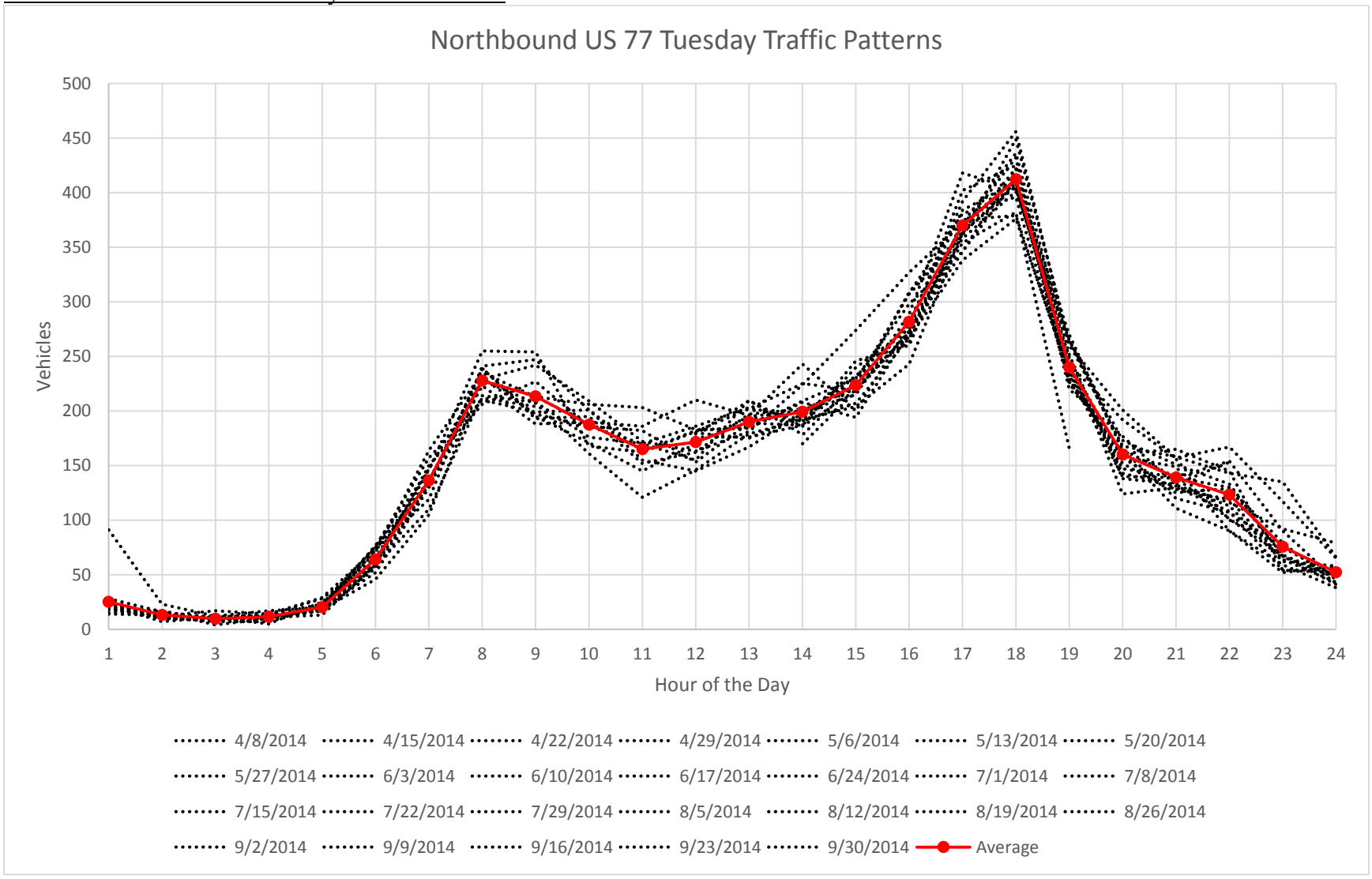
F.25 Northbound US 77 Sunday Traffic Patterns



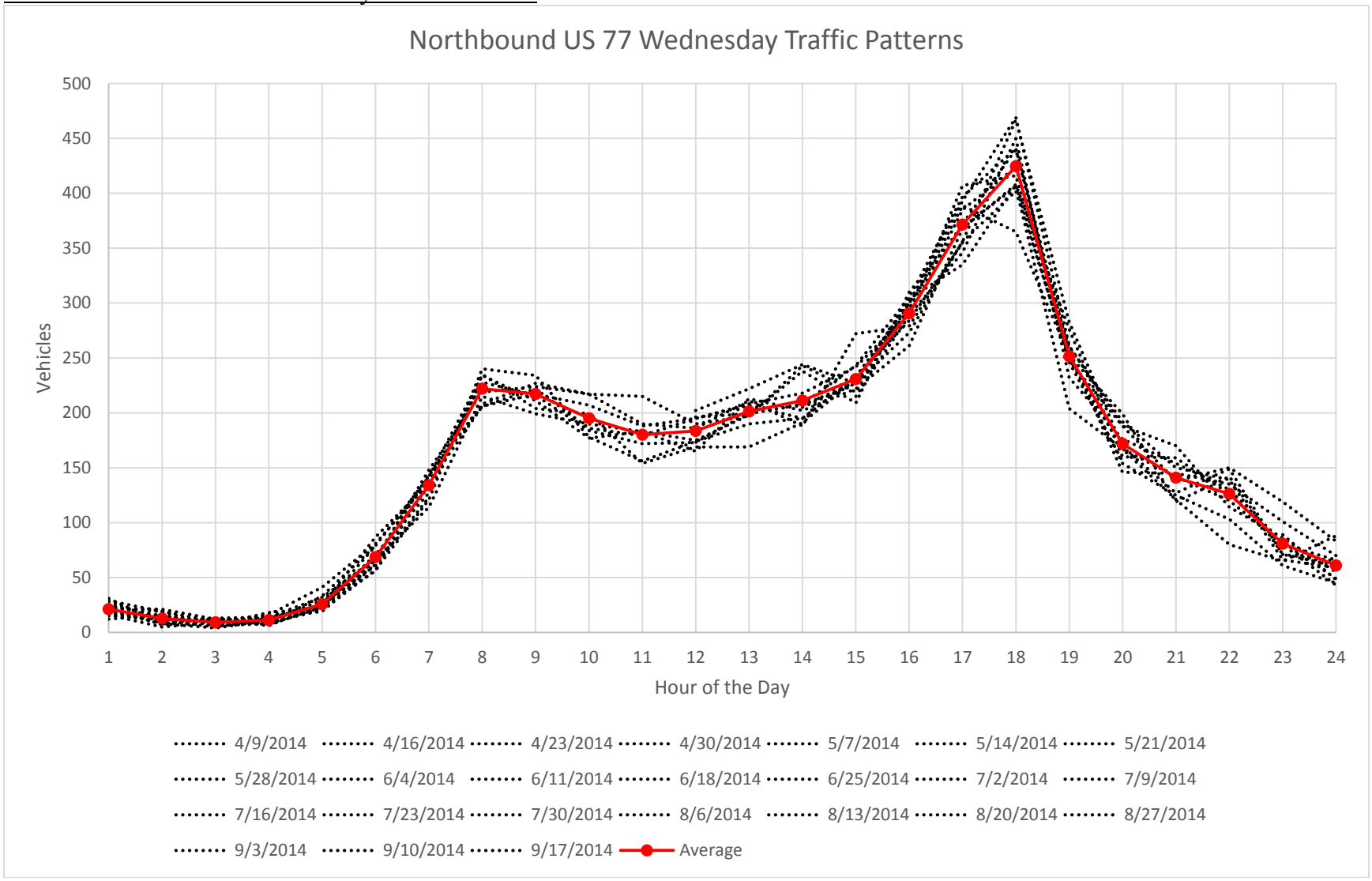
F.26 Northbound US 77 Monday Traffic Patterns



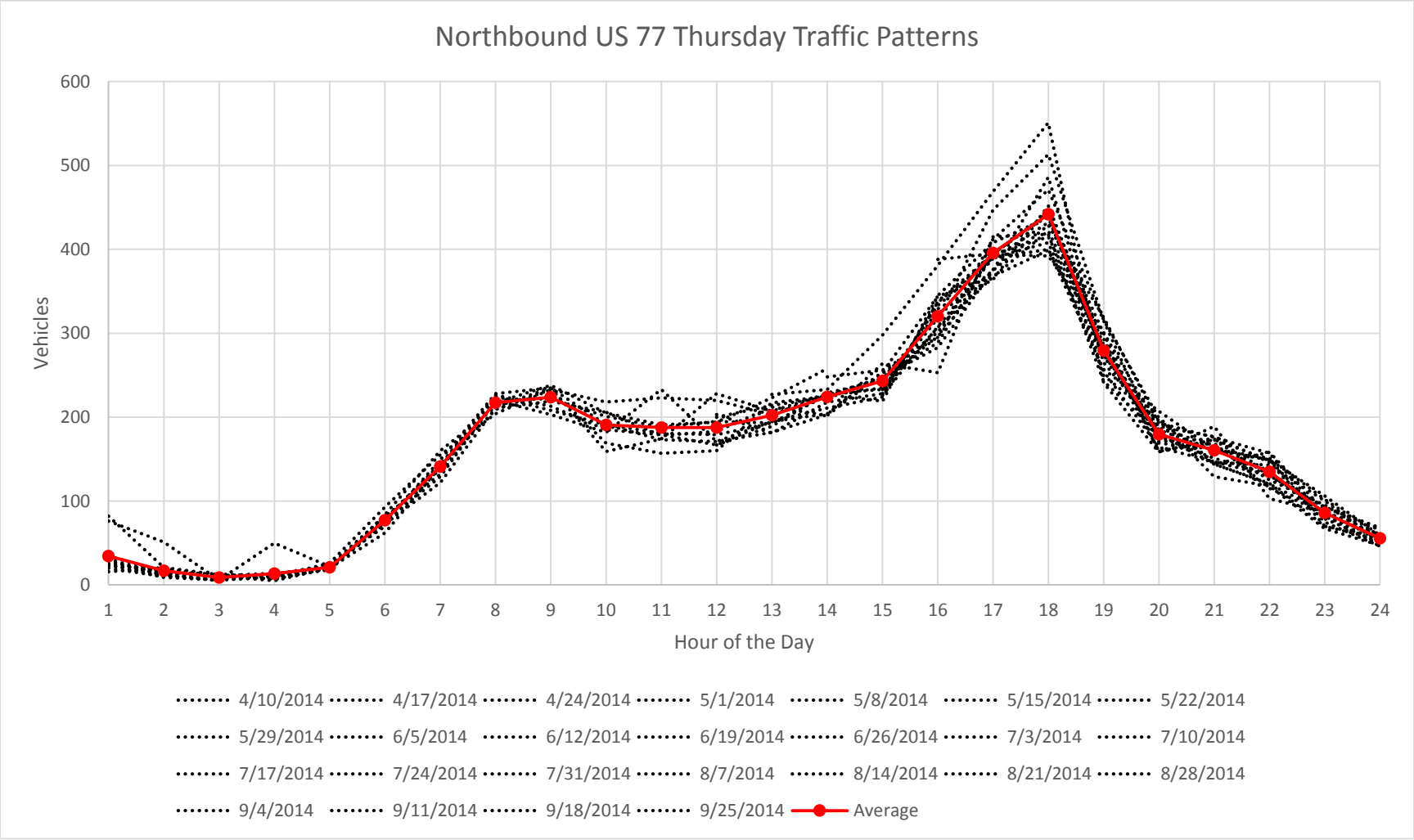
F.27 Northbound US 77 Tuesday Traffic Patterns



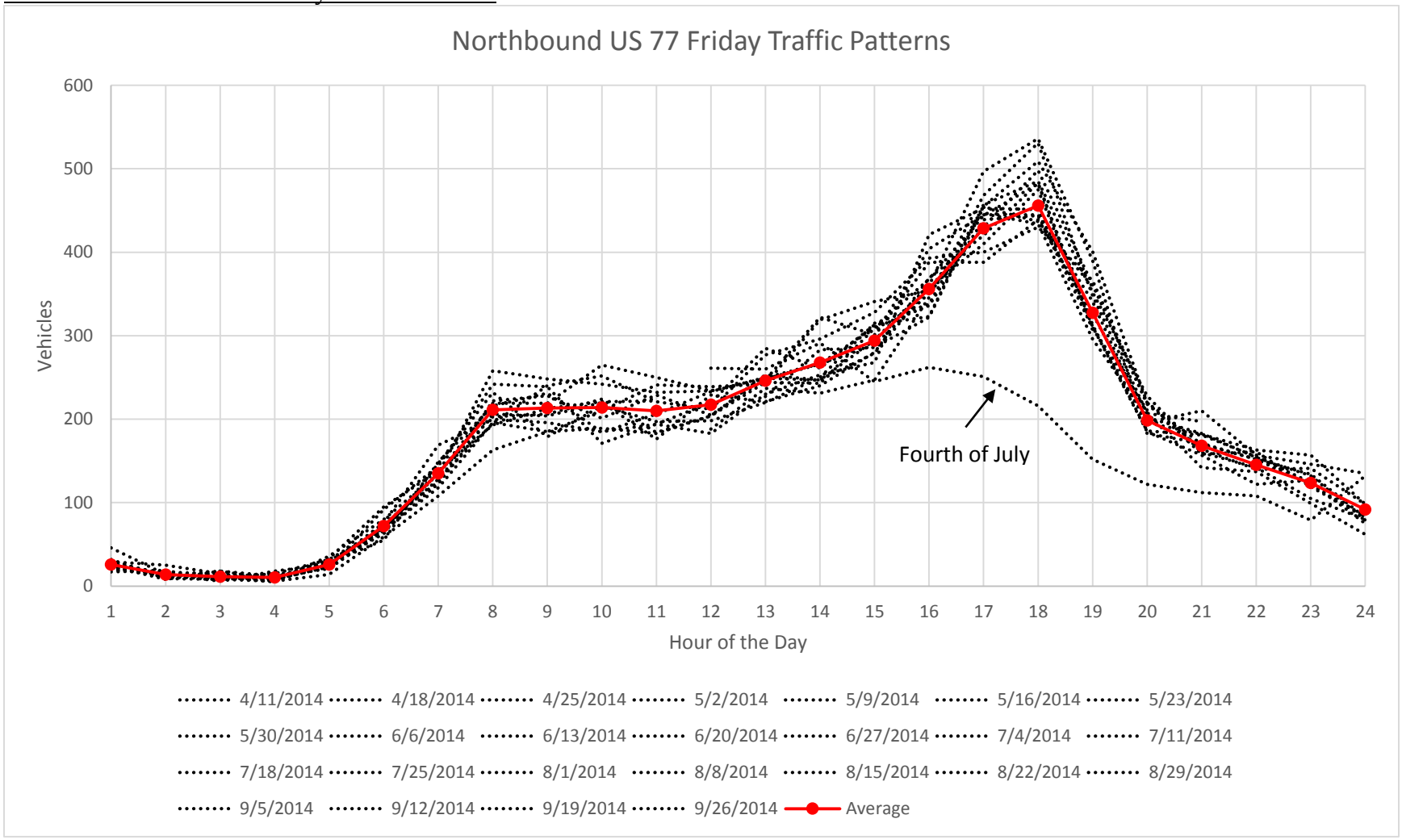
F.28 Northbound US 77 Wednesday Traffic Patterns



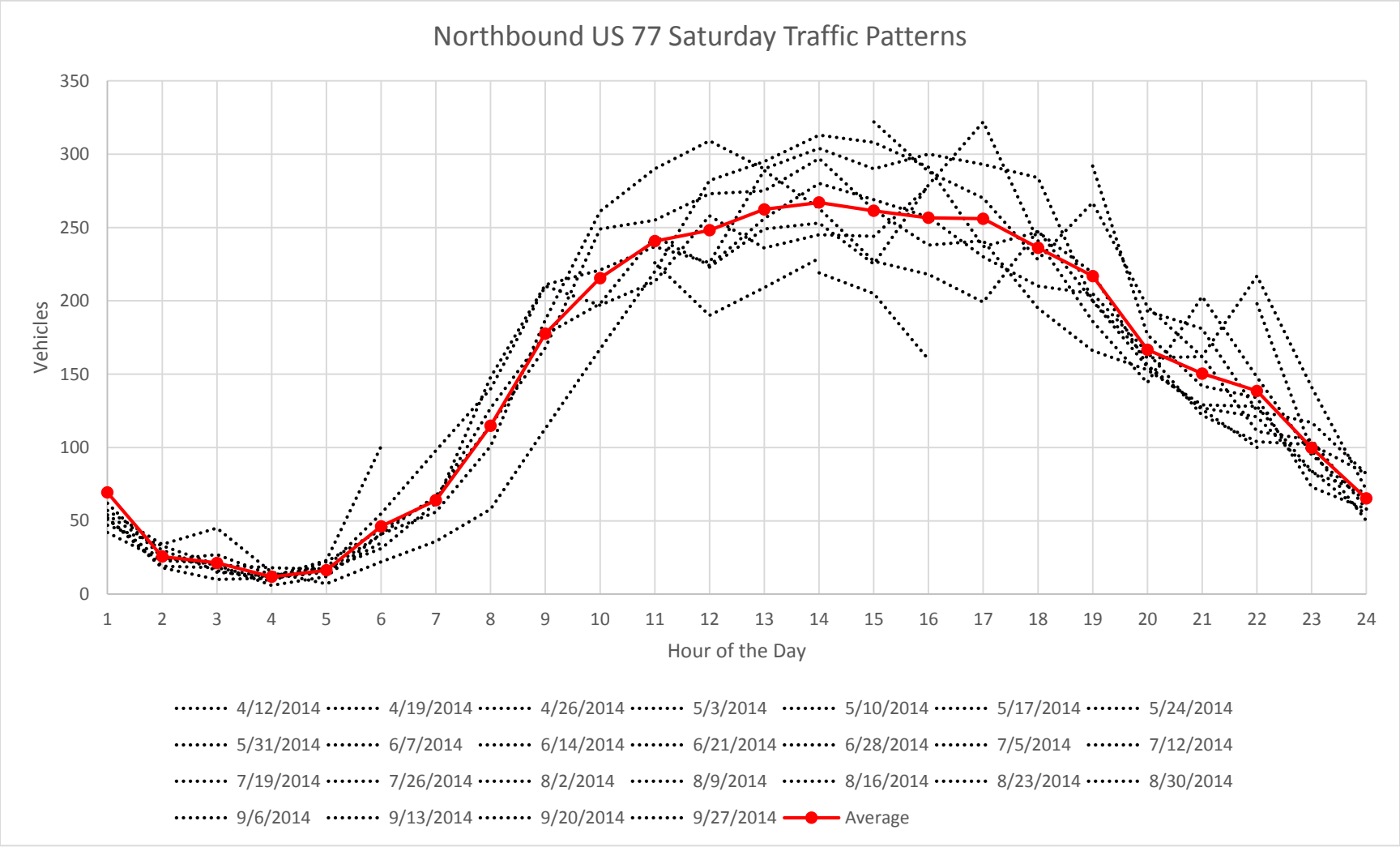
F.29 Northbound US 77 Thursday Traffic Patterns



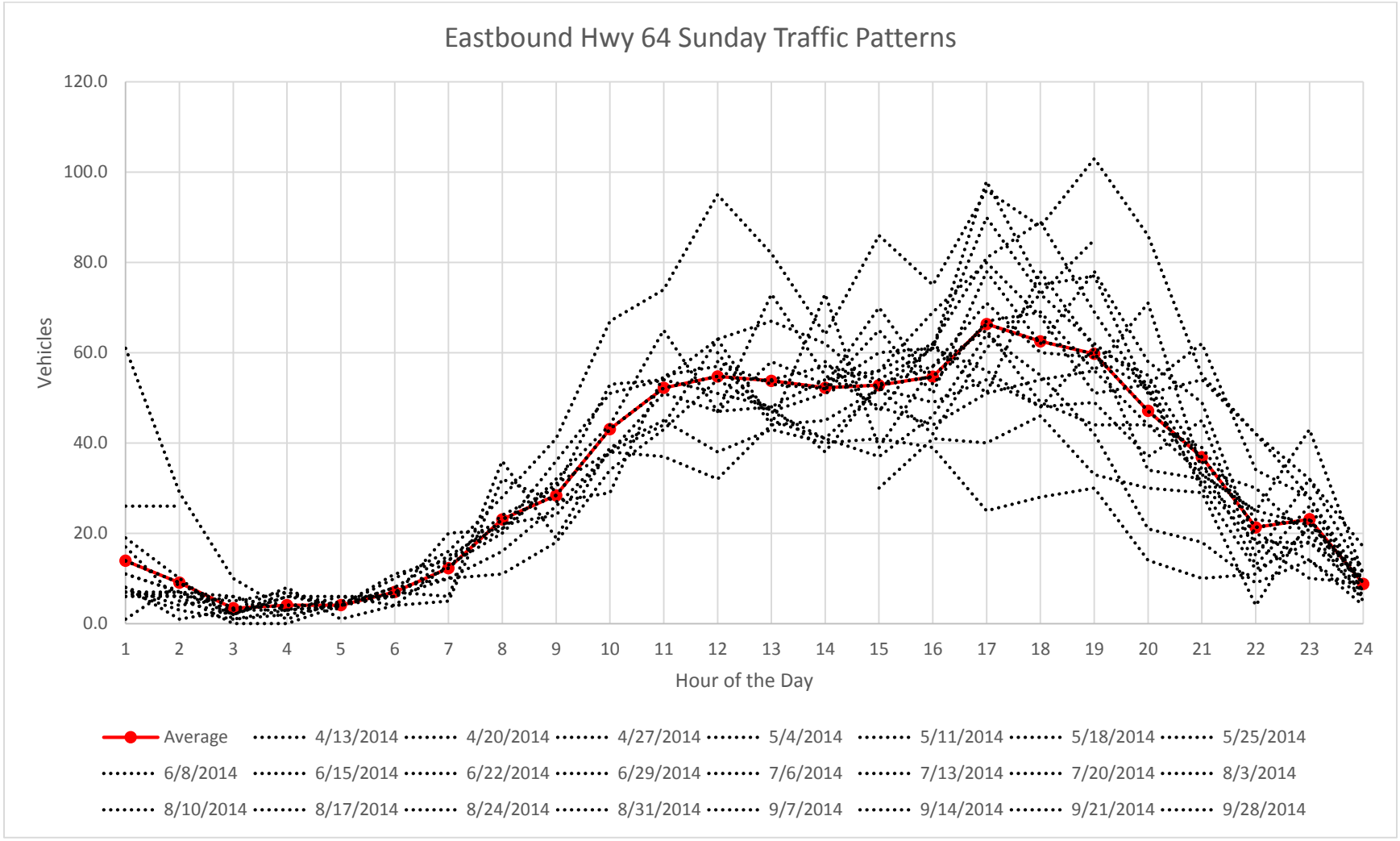
F.30 Northbound US 77 Friday Traffic Patterns



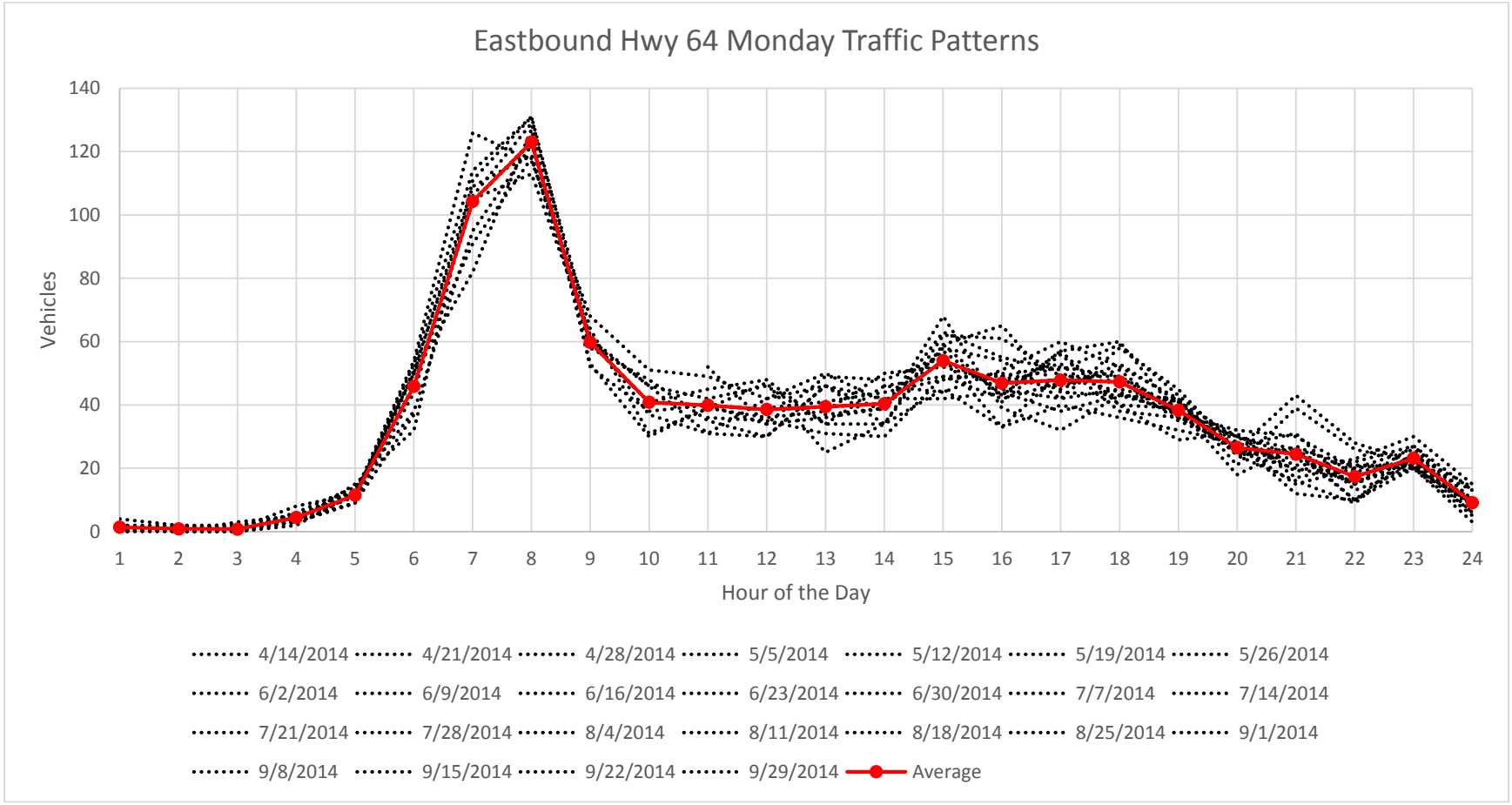
F.31 Northbound US 77 Saturday Traffic Patterns



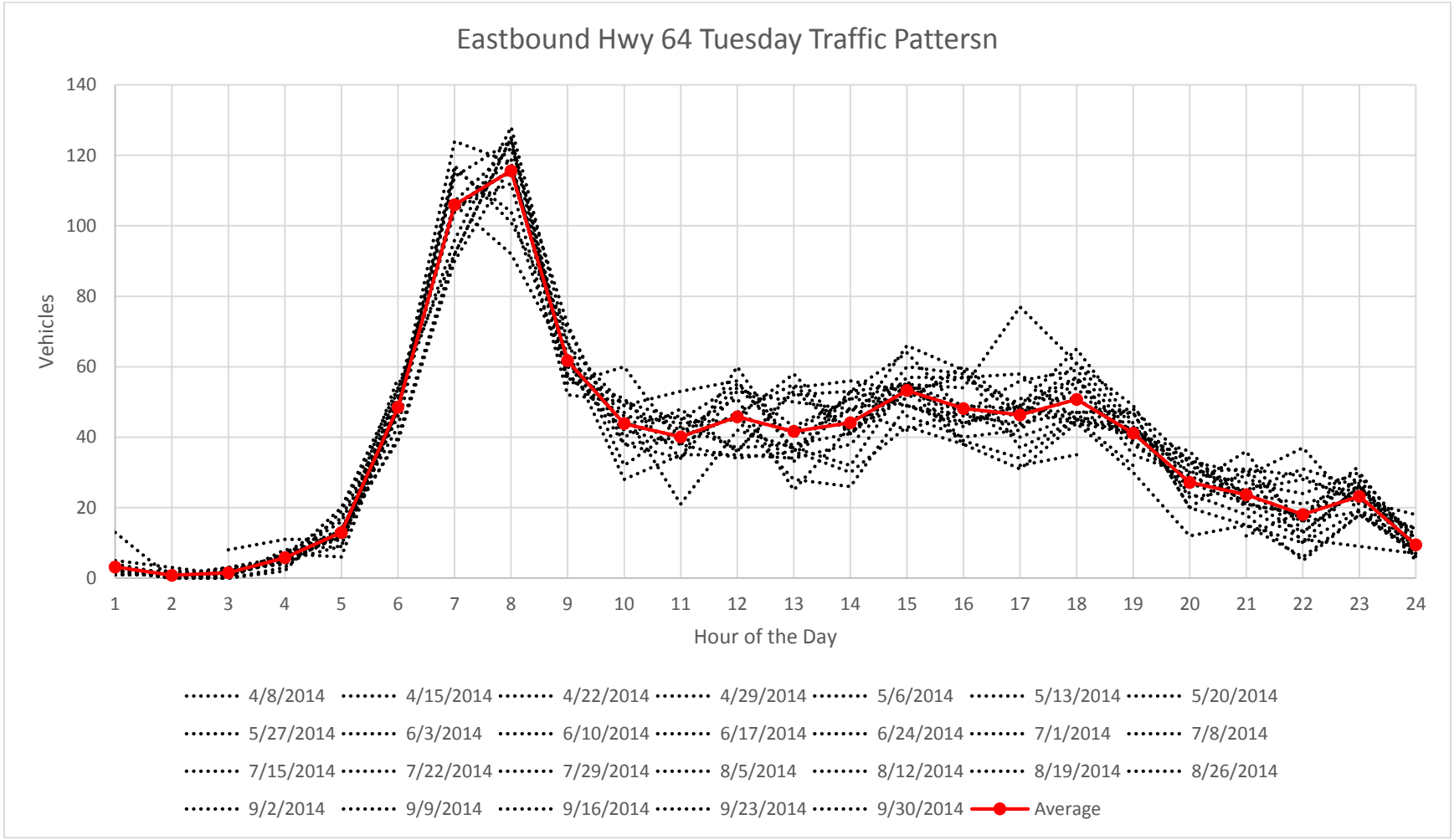
F.32 Eastbound Highway 64 Sunday Traffic Patterns



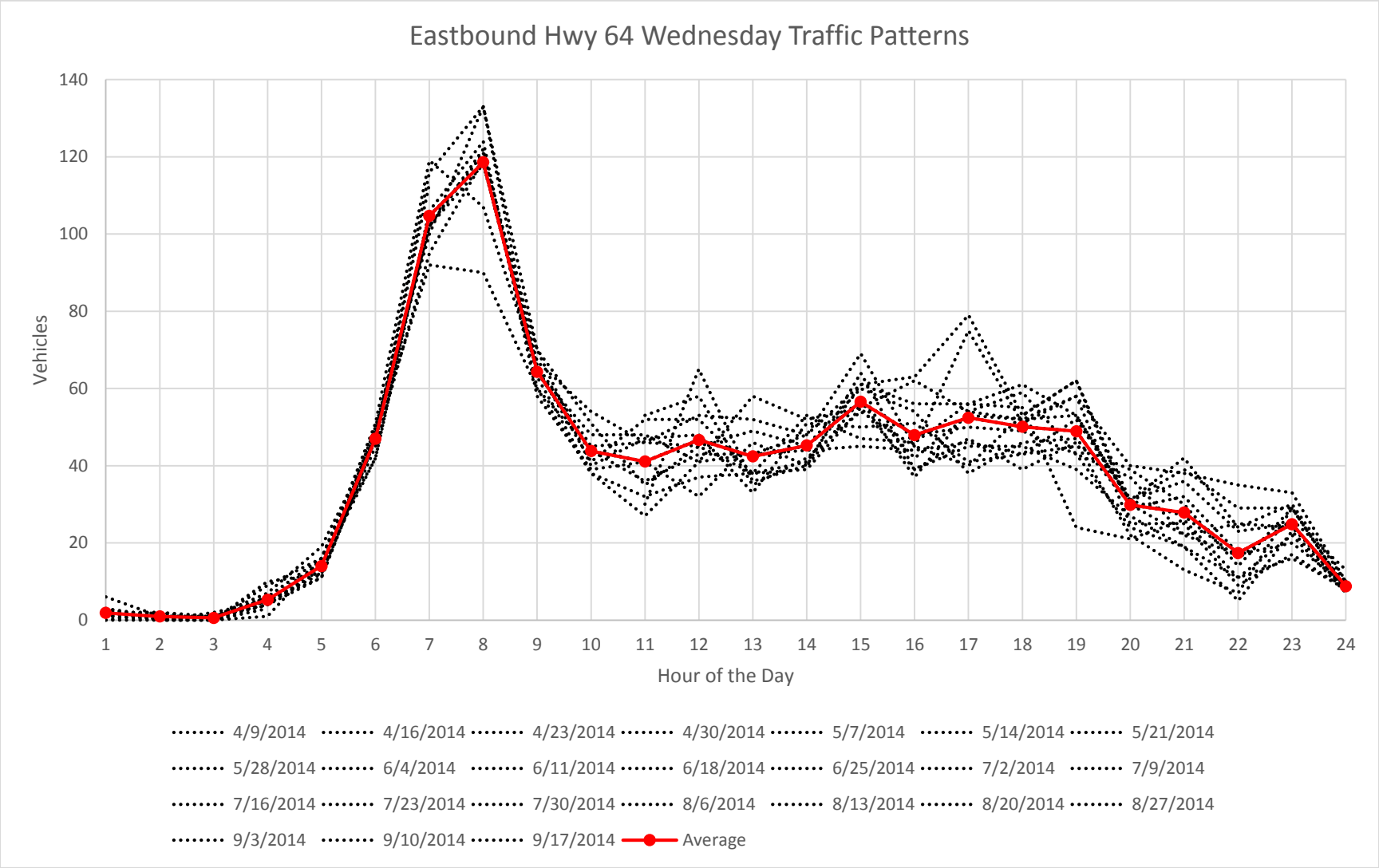
F.33 Eastbound Highway 64 Monday Traffic Patterns



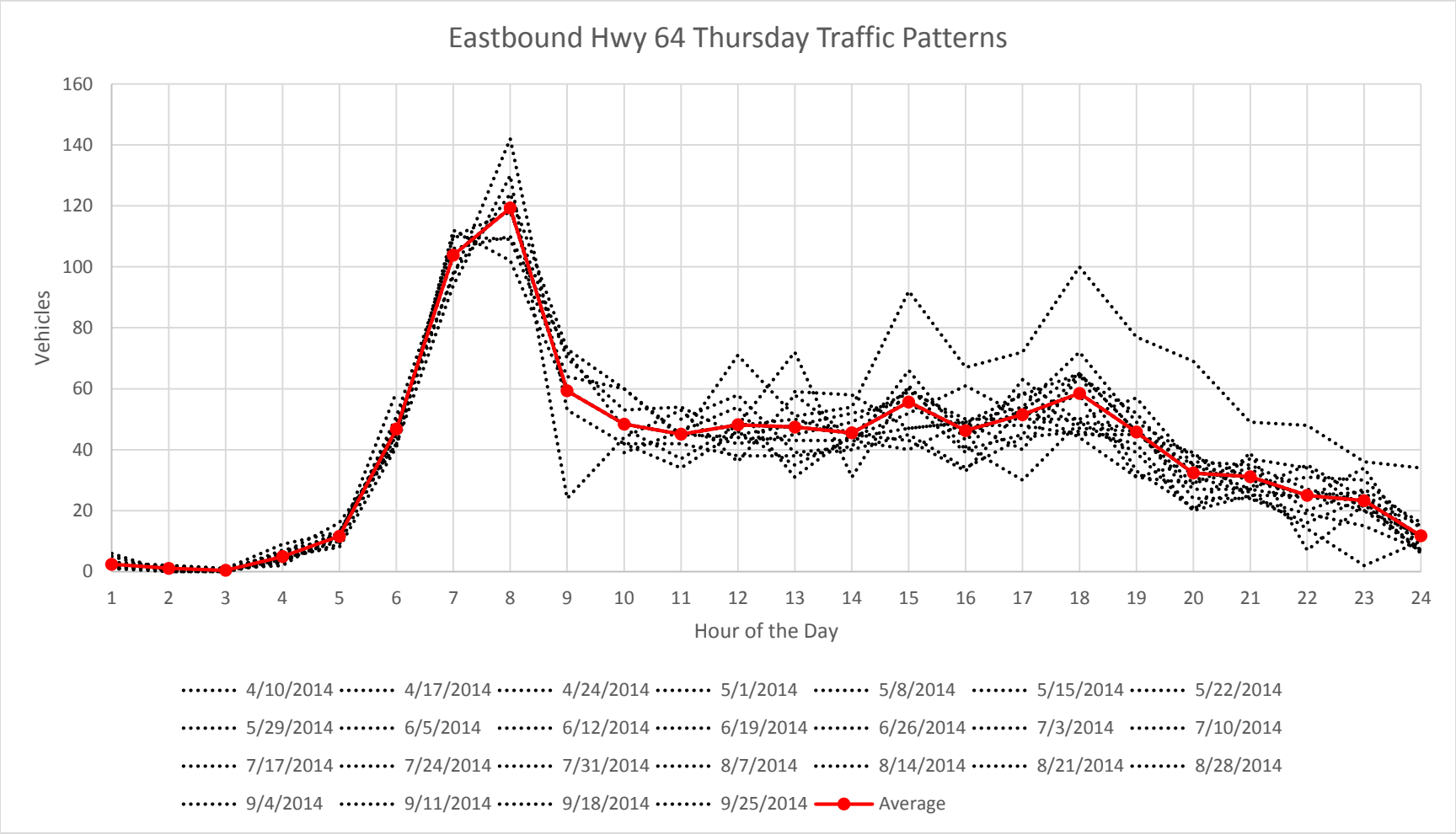
F.34 Eastbound Highway 64 Tuesday Traffic Patterns



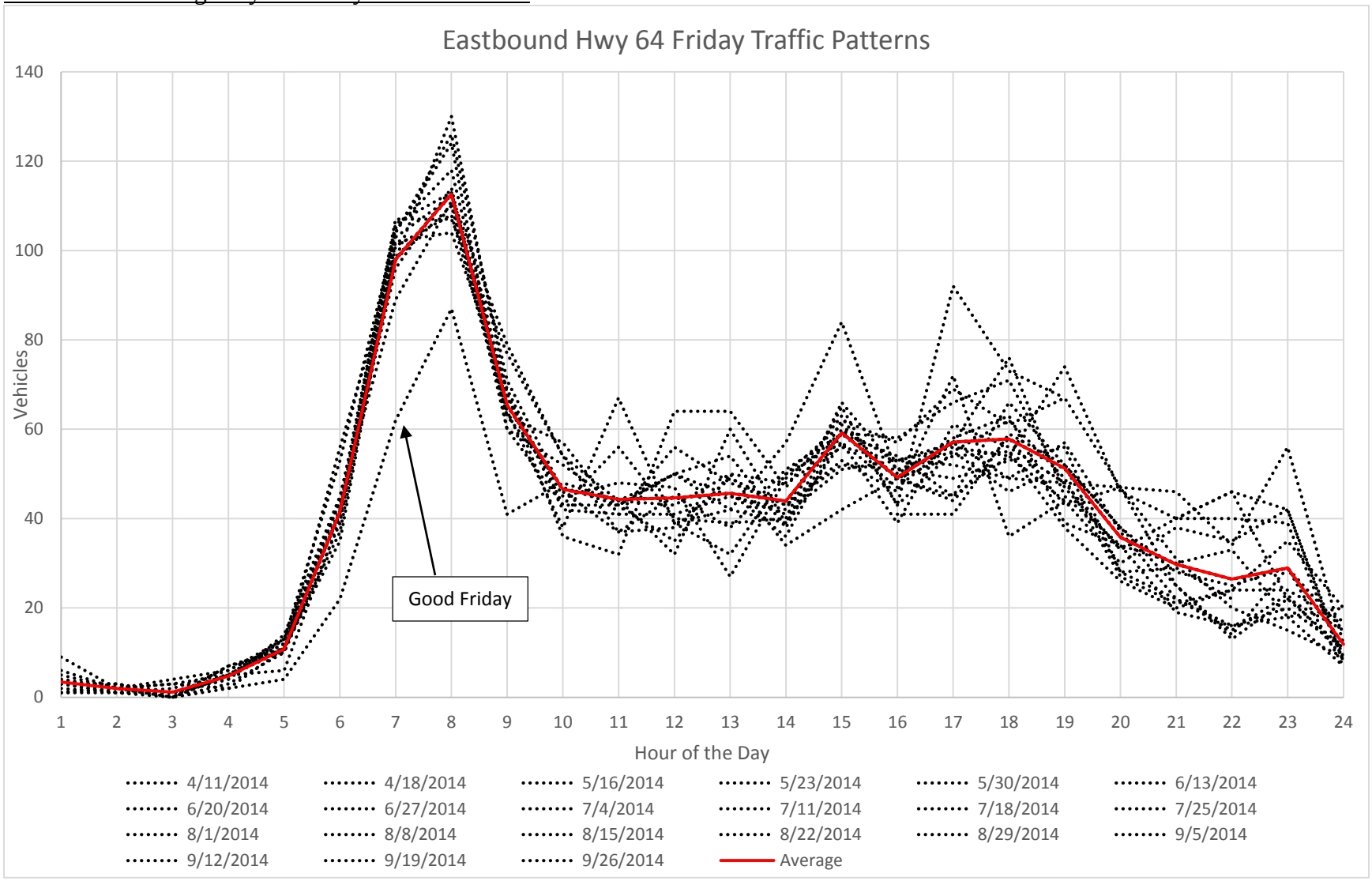
F.35 Eastbound Highway 64 Wednesday Traffic Patterns



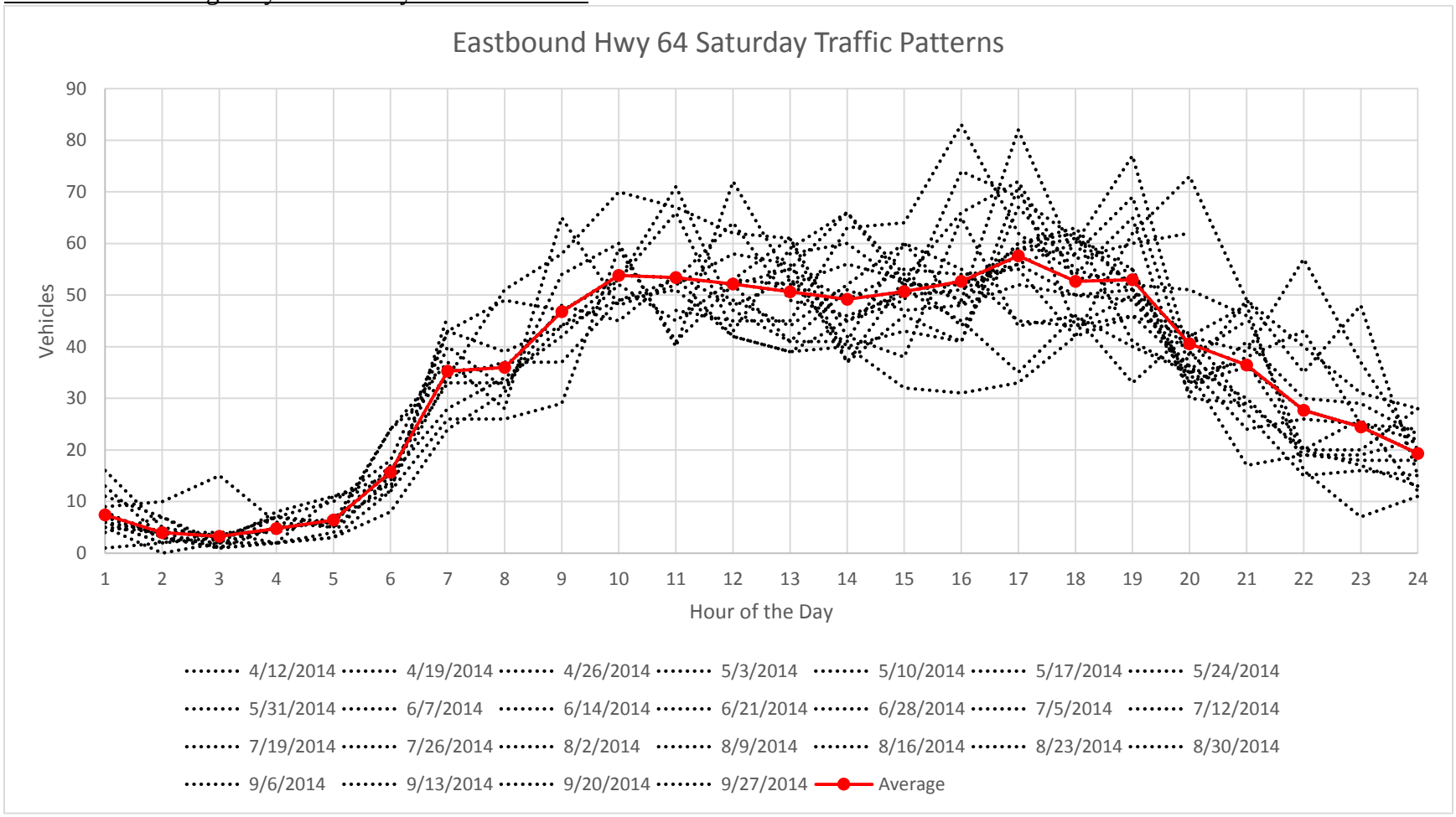
F.36 Eastbound Highway 64 Thursday Traffic Patterns



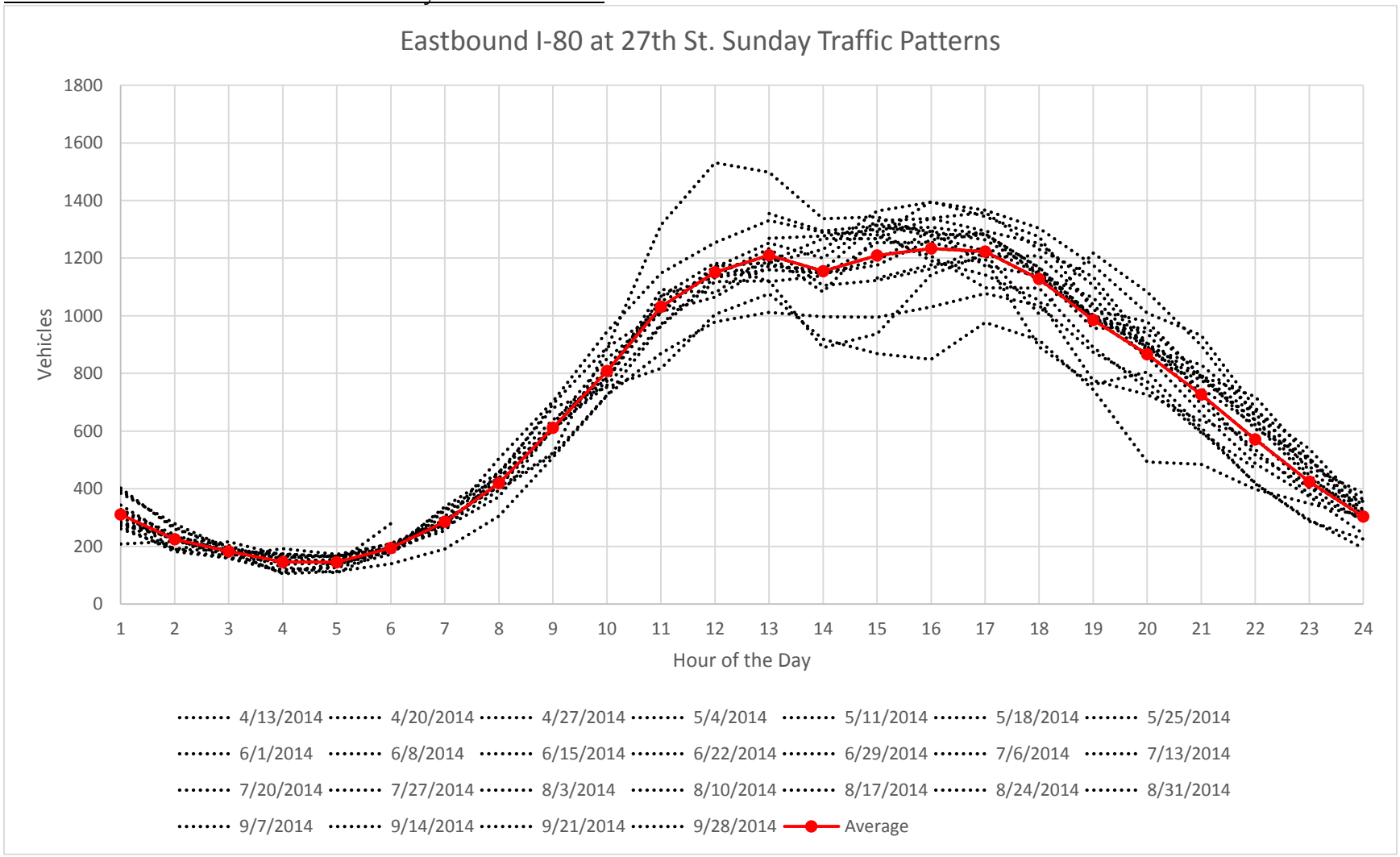
F.37 Eastbound Highway 64 Friday Traffic Patterns



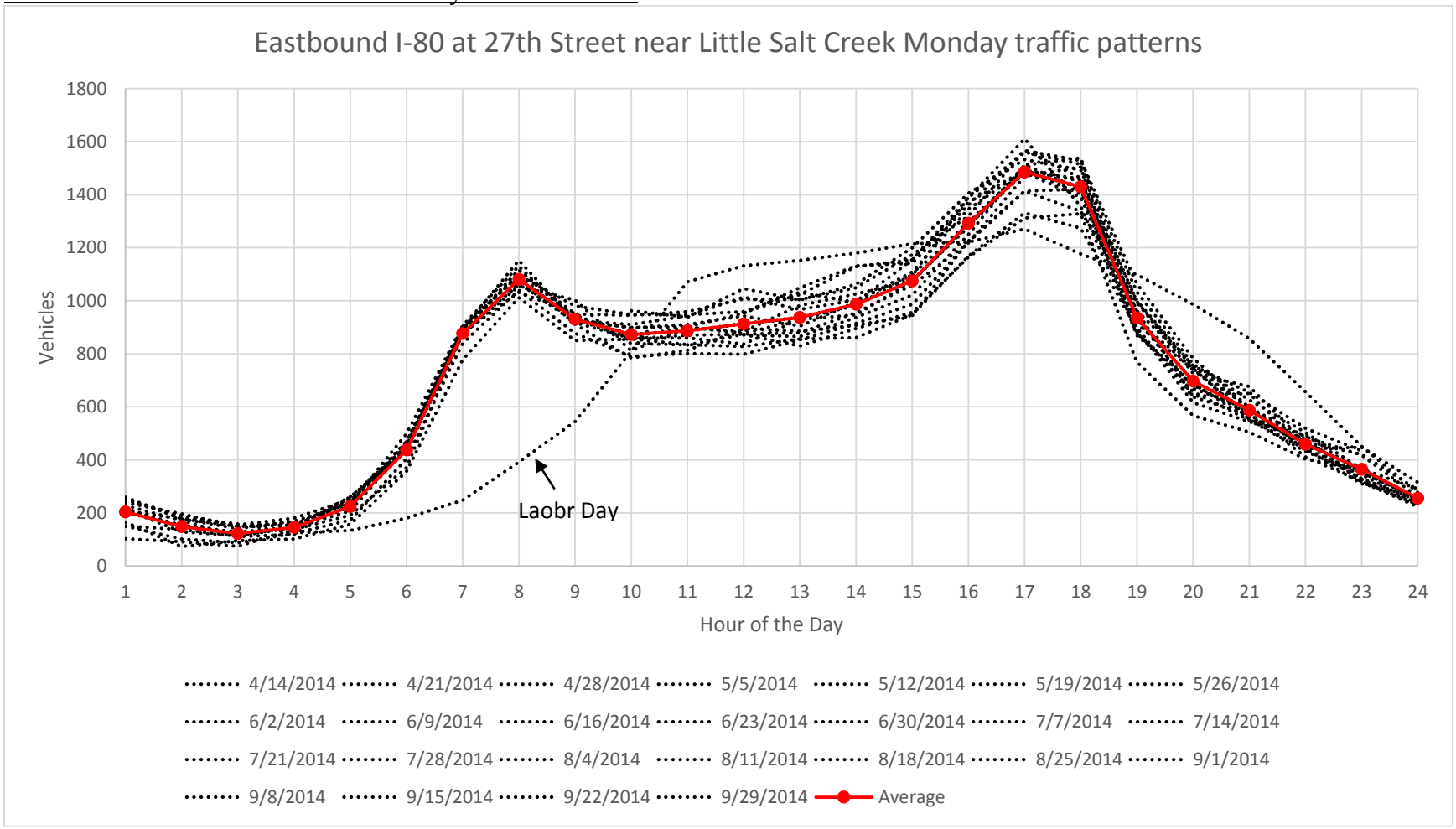
F.38 Eastbound Highway 64 Saturday Traffic Patterns



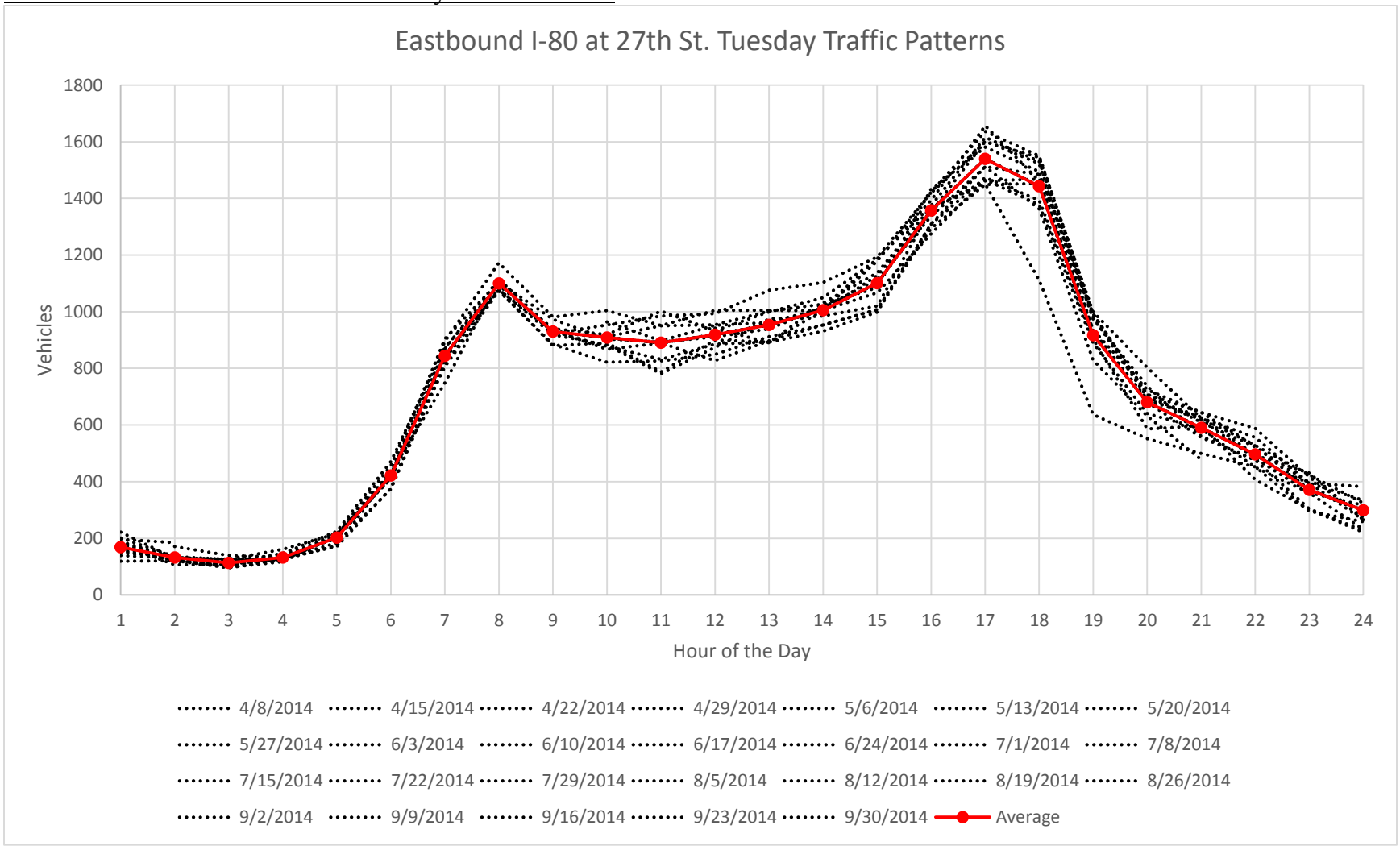
F.39 Eastbound I-80 at 27th Street Sunday Traffic Patterns



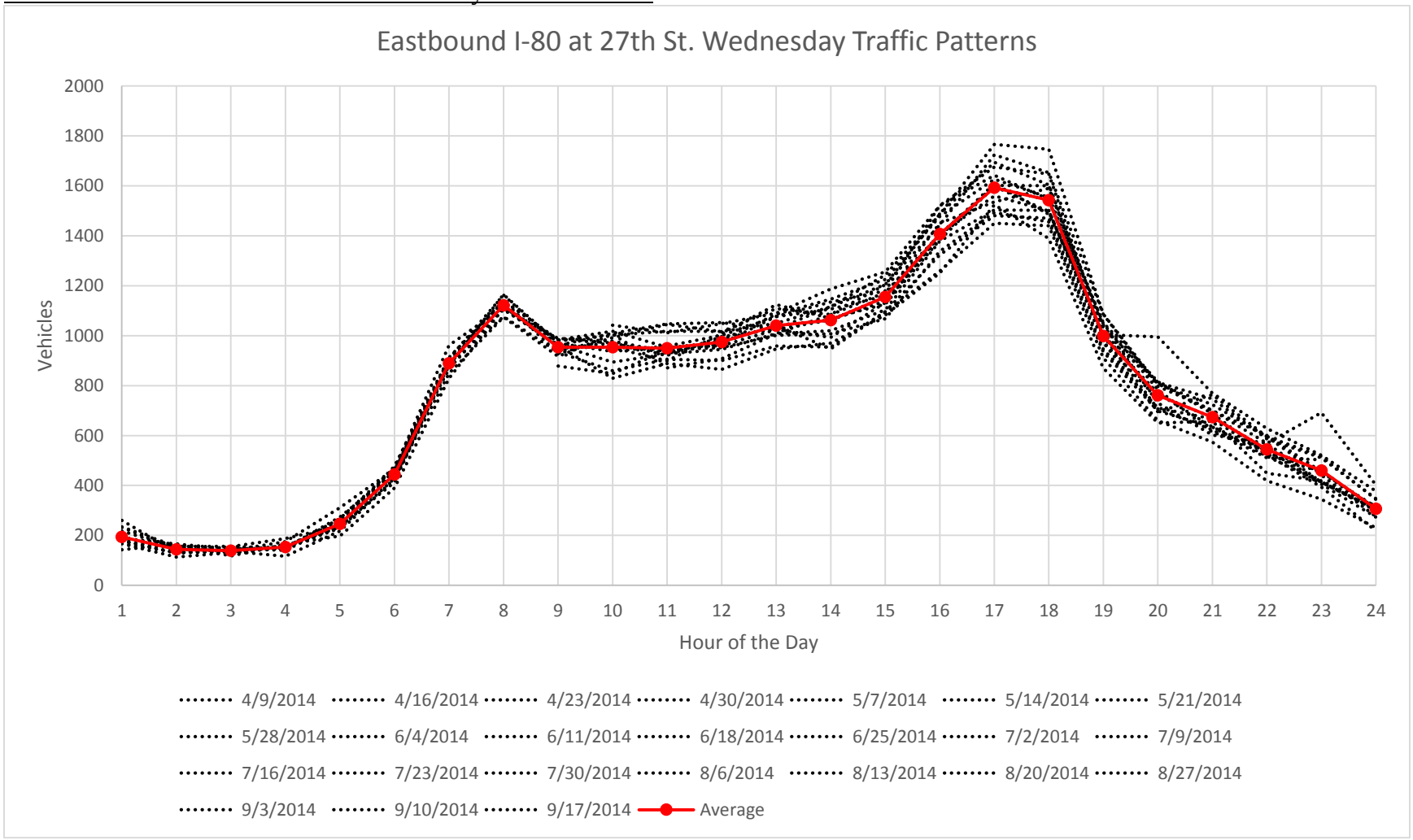
F.40 Eastbound I-80 at 27th Street Monday Traffic Patterns



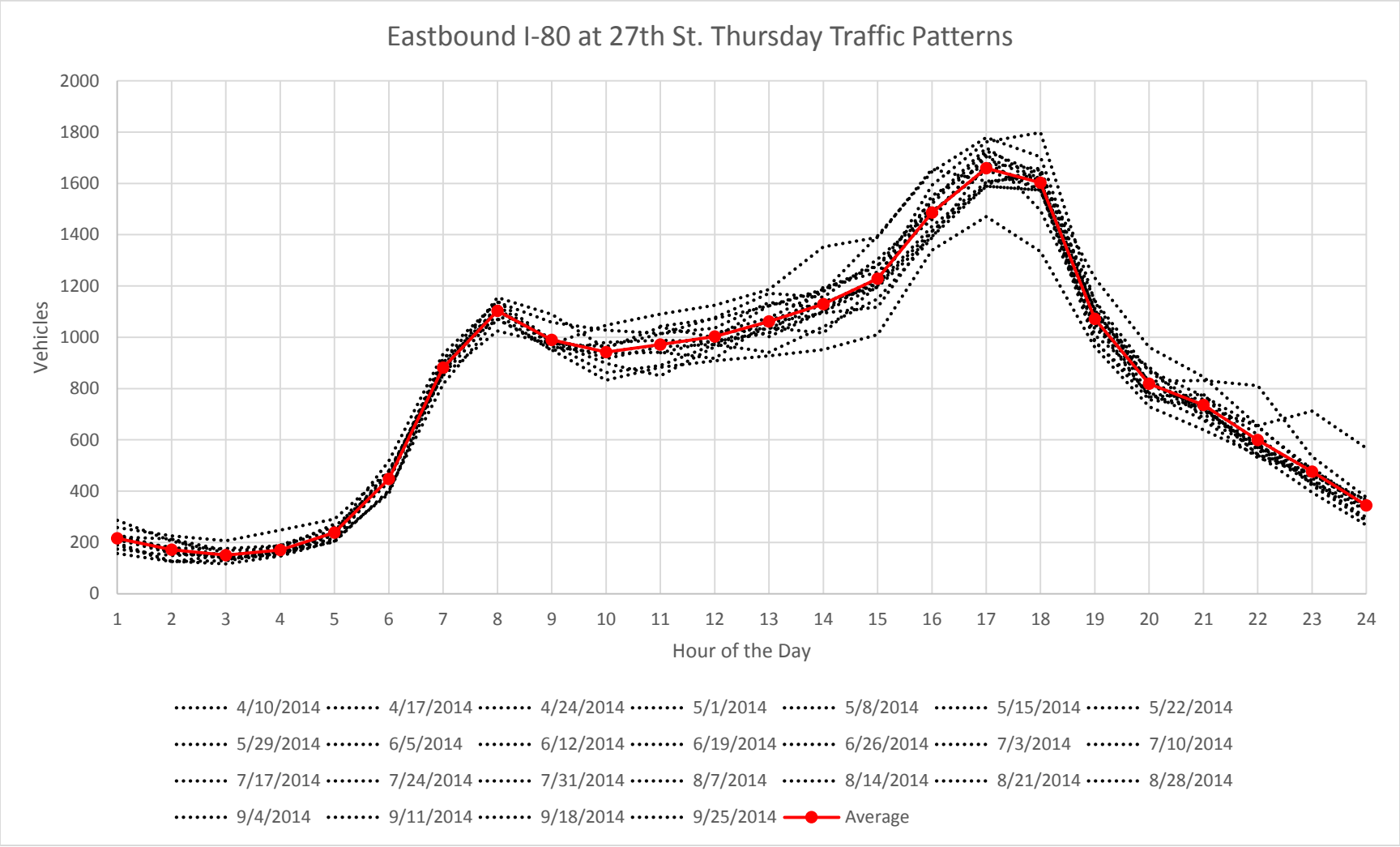
F.41 Eastbound I-80 at 27th Street Tuesday Traffic Patterns



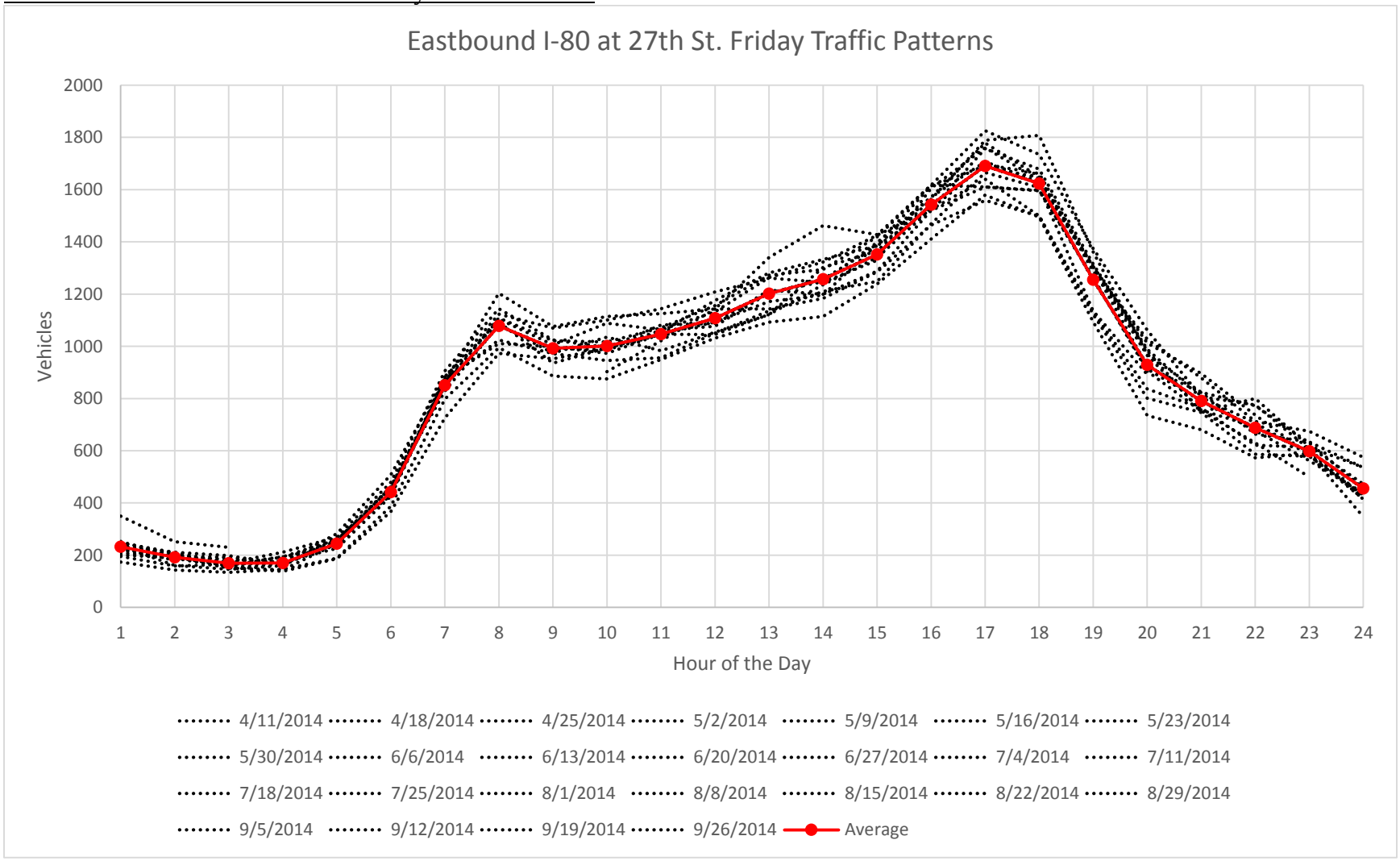
F.42 Eastbound I-80 at 27th Street Wednesday Traffic Patterns



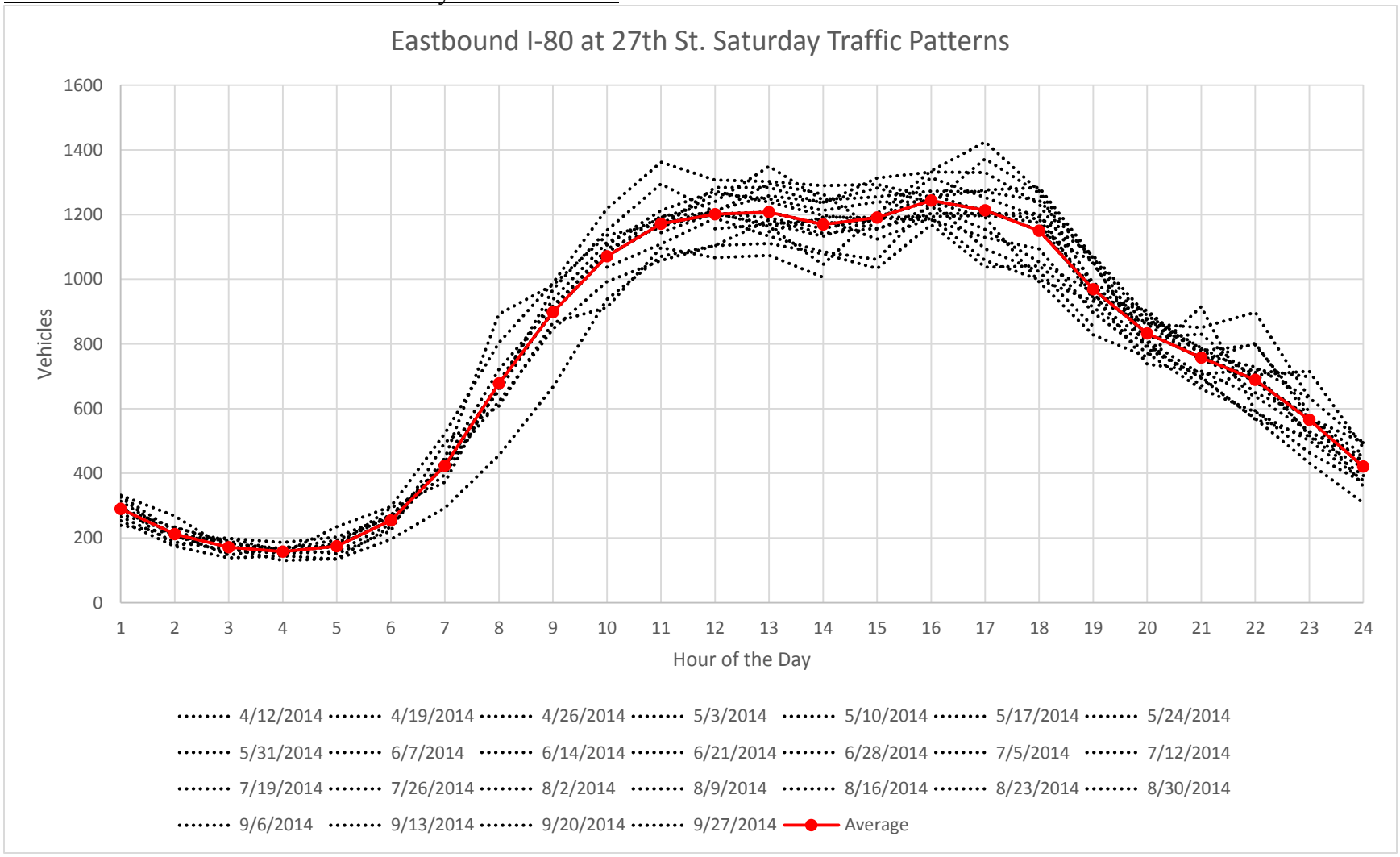
F.43 Eastbound I-80 at 27th Street Thursday Traffic Patterns



F.44 Eastbound I-80 at 27th Street Friday Traffic Patterns



F.45 Eastbound I-80 at 27th Street Saturday Traffic Patterns



Appendix F Traffic Data

Part 3: Antecedent Dry Period Data (Collected and Estimated) for Wavetronix HD Sensors

F.46 Northbound US 77 Antecedent Dry Period Traffic Data

		Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Sunday	Monday	Tuesday	Wednesday
		4/15/2014	4/16/2014	4/17/2014	4/18/2014	4/19/2014	4/20/2014	6/22/2014	6/23/2014	6/24/2014	6/25/2014
Hour of Day	1	24	25	26	29	52	36	**37.1**	**26.9**	**25.1**	31
	2	12	14	14	25	19	25	**23.0**	**11.2**	**13.1**	8
	3	10	11	11	15	18	20	**22.6**	**8.5**	**9.8**	4
	4	13	12	5	6	11	6	**12.7**	**12.5**	**11.5**	11
	5	17	23	20	14	16	9	**10.7**	**22.6**	**20.4**	29
	6	58	79	62	59	41	13	**19.0**	**72.1**	**64.1**	68
	7	110	142	141	108	56	25	**27.0**	**137.1**	**136.4**	143
	8	214	234	209	163	101	51	**59.0**	**212.1**	**227.8**	208
	9	208	211	233	185	187	108	**102.0**	**212.4**	**213.4**	227
	10	176	177	169	210	261	261	**180.0**	**192.0**	**187.5**	217
	11	170	183	157	241	290	322	**203.0**	**186.8**	**165.1**	215
	12	155	175	160	239	309	475	**309.0**	**172.1**	**171.4**	190
	13	210	198	217	242	290	332	**286.4**	**183.0**	**190.1**	197
	14	178	238	225	319	304	258	**275.2**	**191.7**	**199.3**	243
	15	226	209	246	341	290	207	**256.4**	**214.4**	215	219
	16	307	310	321	354	300	281	**273.9**	**281.6**	289	300
	17	361	369	375	446	293	401	**276.5**	**365.4**	418	372
	18	449	406	429	434	284	324	**255.4**	**409.4**	403	440
	19	265	204	319	296	200	244	**218.8**	**244.5**	262	248
	20	165	167	193	202	161	214	**184.1**	**156.6**	168	188
	21	139	142	176	183	162	147	**145.5**	**130.6**	158	138
	22	101	120	157	154	111	88	**97.8**	**102.1**	143	150
	23	67	80	81	132	105	61	**57.5**	**61.7**	135	119
	24	47	43	59	79	58	35	**37.8**	**48.6**	66	83
Bold are estimated data											

F.47 Eastbound Highway 64 Antecedent Dry Period Traffic Data

		Monday	Wednesday	Sunday	Tuesday	Wednesday	Thursday	Sunday	Monday	Tuesday	Wednesday	Friday
		6/2/2014	6/4/2014	6/15/2014	6/17/2014	6/18/2014	6/19/2014	6/22/2014	6/23/2014	6/24/2014	6/25/2014	6/27/2014
Hour of Day	1	**1.4**	1	**13.9**	4	2	**2.4**	**13.9**	**1.4**	**3.2**	2	**3.4**
	2	**0.9**	0	**9.1**	1	1	**1.1**	**9.1**	**0.9**	**0.8**	0	**1.9**
	3	**0.8**	0	**3.4**	1	1	**0.4**	**3.4**	**0.8**	**1.5**	2	**1.1**
	4	**4.4**	1	**4.1**	7	7	**4.9**	**4.1**	**4.4**	**5.8**	5	**4.7**
	5	**11.5**	16	**4.1**	13	19	**11.6**	**4.1**	**11.5**	**12.9**	15	**10.8**
	6	**45.9**	48	**7.0**	48	**47.0**	**46.8**	**7.0**	**45.9**	**48.5**	51	**41.5**
	7	**104.3**	92	**12.3**	107	**104.7**	**103.9**	**12.3**	**104.3**	**105.9**	119	**98.1**
	8	**123.0**	90	**23.1**	122	**118.6**	**119.3**	**23.1**	**123.0**	**115.6**	107	**112.6**
	9	**59.8**	60	**28.4**	72	**64.3**	**59.3**	**28.4**	**59.8**	**61.7**	65	**65.4**
	10	**40.9**	44	**43.1**	38	**43.8**	**48.4**	**43.1**	**40.9**	**43.8**	41	**46.5**
	11	45	36	**52.2**	34	**41.1**	**45.1**	**52.2**	**39.9**	**40.1**	52	**44.3**
	12	48	43	**54.8**	60	**46.7**	**48.2**	**54.8**	**38.6**	**45.8**	52	**44.6**
	13	34	43	**53.8**	36	**42.4**	**47.4**	**53.8**	**39.5**	**41.6**	38	**45.7**
	14	46	48	**52.3**	48	**45.3**	**45.5**	**52.3**	**40.4**	51	53	**43.9**
	15	44	69	**52.8**	42	**56.5**	**55.7**	**52.8**	**54.0**	55	47	**59.2**
	16	51	45	**54.7**	48	**47.9**	45	**54.7**	**46.9**	54	46	**49.2**
	17	60	40	**66.4**	46	**52.4**	53	**66.4**	**47.8**	77	56	**57.1**
	18	52	53	**62.5**	61	**50.1**	65	**62.5**	**47.3**	61	61	**57.8**
	19	42	62	**59.8**	43	**48.9**	46	**59.8**	**38.3**	49	53	**51.2**
	20	21	29	**47.1**	30	**29.9**	35	**47.1**	**26.5**	26	31	**35.8**
	21	39	32	**36.9**	27	**27.9**	30	**36.9**	**24.4**	29	42	**29.8**
	22	26	**17.4**	**21.3**	24	**17.4**	25	**21.3**	**17.4**	37	24	**26.4**
	23	22	**24.8**	**23.1**	30	**24.8**	26	**23.1**	**23.2**	19	30	**28.9**
	24	13	**8.8**	**8.8**	9	**8.8**	10	**8.8**	**9.2**	14	10	**11.9**
Bold are estimated data												

F.47 Eastbound Highway 64 Antecedent Dry Period Traffic Data (Continued)

		Tuesday	Wednesday	Thursday	Friday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Saturday
		7/1/2014	7/2/2014	7/3/2014	7/4/2014	7/8/2014	7/9/2014	7/10/2014	7/11/2014	7/12/2014	7/13/2014	8/16/2014
Hour of Day	1	**3.2**	**1.9**	3	9	**3.2**	1	1	**3.4**	9	**13.9**	**7.4**
	2	**0.8**	**0.9**	2	2	**0.8**	2	2	**1.9**	10	**9.1**	**4.0**
	3	**1.5**	**0.6**	1	3	**1.5**	0	1	**1.1**	15	**3.4**	**3.3**
	4	**5.8**	**5.3**	4	2	**5.8**	10	3	**4.7**	6	**4.1**	**4.8**
	5	**12.9**	**14.0**	9	**10.8**	**12.9**	12	**11.6**	**10.8**	5	**4.1**	**6.4**
	6	**48.5**	**47.0**	45	**41.5**	**48.5**	50	**46.8**	**41.5**	24	**7.0**	**15.7**
	7	**105.9**	**104.7**	110	**98.1**	**105.9**	102	**103.9**	**98.1**	37	**12.3**	**35.3**
	8	**115.6**	**118.6**	109	**112.6**	**115.6**	121	**119.3**	**112.6**	28	**23.1**	**36.0**
	9	**61.7**	**64.3**	64	**65.4**	**61.7**	67	**59.3**	**65.4**	65	**28.4**	**46.8**
	10	**43.8**	48	60	**46.5**	**43.8**	54	**48.4**	**46.5**	48	**43.1**	**53.8**
	11	**40.1**	48	44	**44.3**	**40.1**	46	**45.1**	**44.3**	52	**52.2**	**53.4**
	12	**45.8**	41	71	**44.6**	**45.8**	53	**48.2**	**44.6**	58	**54.8**	**52.1**
	13	**41.6**	58	51	**45.7**	58	52	**47.4**	**45.7**	56	**53.8**	**50.6**
	14	**44.1**	52	54	**43.9**	41	48	**45.5**	36	37	**52.3**	**49.2**
	15	**53.3**	55	92	**59.2**	57	61	**55.7**	**59.2**	53	**52.8**	**50.7**
	16	**48.2**	62	67	**49.2**	57	63	**46.3**	58	49	**54.7**	**52.7**
	17	**46.3**	54	72	**57.1**	49	79	**51.5**	66	60	**66.4**	**57.6**
	18	**50.7**	52	100	**57.8**	65	53	**58.5**	71	63	**62.5**	**52.7**
	19	**41.2**	53	77	**51.2**	44	62	**45.8**	47	51	**59.8**	**52.9**
	20	**27.2**	31	69	**35.8**	23	31	**32.4**	33	33	**47.1**	**40.6**
	21	**23.7**	39	49	**29.8**	25	36	**31.1**	40	36	**36.9**	**36.4**
	22	**18.1**	29	48	**26.4**	28	23	**25.0**	46	**27.7**	**21.3**	**27.7**
	23	**23.2**	29	36	**28.9**	22	25	**23.3**	42	**24.5**	**23.1**	**24.5**
	24	**9.4**	8	34	**11.9**	18	7	**11.7**	8	**19.3**	**8.8**	**19.3**
Bold are estimated data												

F.47 Eastbound Highway 64 Antecedent Dry Period Traffic Data (Continued)

		Friday	Monday	Wednesday	Friday	Saturday	Monday	Tuesday	Wednesday	Thursday	Wednesday	Thursday	Monday	Tuesday	Wednesday	Thursday	Friday
		8/22/2014	8/25/2014	8/27/2014	8/29/2014	8/30/2014	9/1/2014	9/2/2014	9/3/2014	9/4/2014	9/10/2014	9/11/2014	9/15/2014	9/16/2014	9/17/2014	9/18/2014	9/19/2014
Hour of Day	1	2	0	**1.9**	**3.4**	**7.4**	**1.4**	**3.2**	0	5	**1.9**	**2.4**	1	1	2	1	**3.4**
	2	1	2	**0.9**	**1.9**	**4.0**	**0.9**	**0.8**	0	0	**0.9**	**1.1**	1	1	0	0	**1.9**
	3	2	0	**0.6**	**1.1**	**3.3**	**0.8**	**1.5**	1	**0.4**	**0.6**	**0.4**	0	**1.5**	0	1	**1.1**
	4	6	2	**5.3**	**4.7**	**4.8**	**4.4**	**5.8**	4	**4.9**	**5.3**	**4.9**	5	**5.8**	6	6	**4.7**
	5	13	12	**14.0**	**10.8**	**6.4**	**11.5**	**12.9**	13	**11.6**	**14.0**	**11.6**	13	**12.9**	16	16	**10.8**
	6	53	50	**47.0**	**41.5**	**15.7**	**45.9**	**48.5**	47	**46.8**	**47.0**	**46.8**	**45.9**	**48.5**	42	42	**41.5**
	7	104	109	**104.7**	**98.1**	**35.3**	**104.3**	**105.9**	116	**103.9**	**104.7**	**103.9**	**104.3**	**105.9**	**104.7**	112	**98.1**
	8	126	119	**118.6**	**112.6**	**36.0**	**123.0**	**115.6**	133	**119.3**	**118.6**	**119.3**	**123.0**	**115.6**	**118.6**	102	**112.6**
	9	71	58	**64.3**	**65.4**	**46.8**	**59.8**	**61.7**	70	**59.3**	**64.3**	**59.3**	**59.8**	**61.7**	**64.3**	**59.3**	**65.4**
	10	46	48	**43.8**	**46.5**	**53.8**	**40.9**	**43.8**	51	**48.4**	**43.8**	**48.4**	**40.9**	**43.8**	**43.8**	**48.4**	**46.5**
	11	37	35	**41.1**	**44.3**	**53.4**	**39.9**	46	35	**45.1**	**41.1**	**45.1**	**39.9**	**40.1**	**41.1**	**45.1**	**44.3**
	12	38	30	**46.7**	**44.6**	42	**38.6**	36	45	**48.2**	**46.7**	**48.2**	**38.6**	**45.8**	**46.7**	**48.2**	32
	13	49	46	**42.4**	**45.7**	39	**39.5**	53	38	**47.4**	**42.4**	**47.4**	**39.5**	33	**42.4**	**47.4**	60
	14	43	42	**45.3**	**43.9**	40	**40.4**	41	41	**45.5**	**45.3**	**45.5**	**40.4**	53	**45.3**	**45.5**	39
	15	52	42	**56.5**	**59.2**	32	**54.0**	55	61	**55.7**	**56.5**	**55.7**	**54.0**	64	60	**55.7**	57
	16	51	44	**47.9**	**49.2**	31	**46.9**	49	56	**46.3**	**47.9**	**46.3**	45	47	54	**46.3**	47
	17	55	38	50	**57.1**	33	**47.8**	48	56	**51.5**	**52.4**	**51.5**	42	40	38	**51.5**	57
	18	62	43	49	**57.8**	42	**47.3**	47	55	**58.5**	**50.1**	**58.5**	58	46	46	**58.5**	49
	19	49	38	43	**51.2**	62	**38.3**	47	24	**45.8**	**48.9**	**45.8**	45	42	47	**45.8**	57
	20	27	30	24	**35.8**	73	**26.5**	20	21	**32.4**	**29.9**	**32.4**	25	33	30	**32.4**	37
	21	21	26	19	**29.8**	49	**24.4**	31	26	**31.1**	**27.9**	**31.1**	25	30	22	**31.1**	22
	22	24	15	11	**26.4**	40	**17.4**	16	11	**25.0**	**17.4**	**25.0**	10	10	17	**25.0**	16
	23	24	23	22	**28.9**	31	**23.2**	19	16	**23.3**	**24.8**	**23.3**	25	19	20	**23.3**	18
	24	17	6	7	**11.9**	28	**9.2**	10	8	**11.7**	**8.8**	**11.7**	8	7	9	**11.7**	7
Bold are estimated data																	

F.48 Eastbound I-80 at 27th Street Antecedent Dry Period Traffic Data

		Sunday	Sunday	Sunday	Sunday	Monday	Monday	Monday	Monday	Monday	Tuesday	Tuesday
		6/8/2014	6/22/2014	8/24/2014	9/7/2014	6/9/2014	6/23/2014	8/25/2014	9/1/2014	9/8/2014	6/10/2014	6/17/2014
Hour of Day	1	384	393	402	280	205	**204.0**	217	251	**204.0**	**168.5**	**168.5**
	2	279	267	260	232	154	**148.4**	149	185	**148.4**	**132.6**	**132.6**
	3	192	**182.1**	199	203	**122.5**	**122.5**	124	158	**122.5**	**112.9**	**112.9**
	4	166	**145.9**	155	138	**145.8**	**145.8**	149	125	**145.8**	**132.6**	**132.6**
	5	166	**144.8**	138	142	**223.8**	**223.8**	236	134	**223.8**	**202.3**	**202.3**
	6	194	**194.2**	180	**194.2**	**438.0**	**438.0**	457	180	**438.0**	**421.4**	**421.4**
	7	329	**285.4**	266	**285.4**	**876.3**	**876.3**	904	248	**876.3**	**844.0**	**844.0**
	8	437	**419.0**	372	**419.0**	**1081.3**	**1081.3**	1066	392	**1081.3**	**1100.2**	**1100.2**
	9	614	**611.7**	609	**611.7**	**930.3**	**930.3**	918	544	**930.3**	**929.4**	**929.4**
	10	819	**807.8**	759	**807.8**	**872.9**	**872.9**	858	809	857	**908.6**	**908.6**
	11	1050	**1031.3**	971	**1031.3**	**886.5**	**886.5**	860	1071	870	**890.3**	**890.3**
	12	1137	**1151.1**	1133	**1151.1**	**913.2**	**913.2**	837	1132	874	**918.8**	**918.8**
	13	1179	**1209.9**	1160	**1209.9**	**937.3**	**937.3**	930	1152	879	**953.6**	**953.6**
	14	1146	**1154.9**	1147	**1154.9**	**986.8**	**986.8**	947	1180	955	**1005.7**	**1005.7**
	15	1176	**1209.1**	1192	**1209.1**	**1074.4**	**1074.4**	1073	1215	1059	**1100.5**	**1100.5**
	16	1263	**1233.3**	1297	**1233.3**	**1292.8**	**1292.8**	1285	1221	1218	**1357.8**	**1357.8**
	17	1282	**1223.1**	1173	**1223.1**	**1485.1**	**1485.1**	1483	1271	1470	**1539.9**	**1539.9**
	18	1140	**1127.7**	1140	**1127.7**	**1429.9**	**1429.9**	1390	1177	1504	**1442.8**	**1442.8**
	19	1063	**985.9**	995	**985.9**	**935.4**	**935.4**	898	1099	877	**917.0**	**917.0**
	20	879	**866.7**	893	**866.7**	**697.8**	**697.8**	637	986	687	**680.5**	**680.5**
	21	785	**726.5**	748	**726.5**	**587.5**	**587.5**	570	858	554	**590.2**	**590.2**
	22	639	**571.1**	622	**571.1**	**459.0**	**459.0**	460	657	468	**496.3**	**496.3**
	23	447	**424.1**	437	**424.1**	**364.4**	**364.4**	**364.4**	451	317	**370.7**	**370.7**
	24	294	**303.0**	315	**303.0**	**255.5**	**255.5**	**255.5**	276	223	**298.8**	**298.8**
Bold are estimated data												

F.48 Eastbound I-80 at 27th Street Antecedent Dry Period Traffic Data (Continued)

		Tuesday	Tuesday	Wednesday	Wednesday	Wednesday	Thursday	Thursday	Thursday	Friday	Friday	Friday
		6/24/2014	9/2/2014	6/11/2014	6/18/2014	9/3/2014	6/12/2014	7/10/2014	9/4/2014	6/13/2014	7/11/2014	8/22/2014
Hour of Day	1	**168.5**	201	**194.2**	**194.2**	**194.2**	220	222	157	247	**232.7**	**232.7**
	2	**132.6**	135	**144.3**	**144.3**	**144.3**	165	178	126	210	**191.9**	**191.9**
	3	**112.9**	125	**139.3**	**139.3**	**139.3**	152	176	129	171	**169.2**	**169.2**
	4	**132.6**	**132.6**	**154.0**	**154.0**	**154.0**	159	187	158	211	**170.2**	**170.2**
	5	**202.3**	**202.3**	**246.1**	**246.1**	**246.1**	241	247	218	270	**244.2**	**244.2**
	6	**421.4**	**421.4**	**444.6**	**444.6**	**444.6**	517	**447.2**	390	479	**441.5**	**441.5**
	7	**844.0**	**844.0**	**889.1**	**889.1**	**889.1**	936	**881.9**	893	906	**850.8**	**850.8**
	8	**1100.2**	**1100.2**	**1121.2**	**1121.2**	**1121.2**	1137	**1102.8**	1104	1144	**1078.3**	**1078.3**
	9	**929.4**	**929.4**	**953.9**	**953.9**	**953.9**	1058	**990.0**	972	1024	**992.3**	**992.3**
	10	**908.6**	**908.6**	969	**953.8**	**953.8**	1028	**942.1**	862	996	987	**1001.5**
	11	**890.3**	**890.3**	929	**950.1**	**950.1**	1015	**971.3**	890	1061	**1046.3**	**1046.3**
	12	**918.8**	**918.8**	968	**974.3**	**974.3**	1036	**1002.9**	972	1077	1045	**1107.4**
	13	**953.6**	**953.6**	1077	**1040.5**	**1040.5**	1136	**1061.2**	942	1205	1122	**1202.0**
	14	**1005.7**	**1005.7**	1135	**1062.4**	947	1115	**1129.2**	1041	1248	1236	**1257.3**
	15	1179	**1100.5**	1179	**1155.3**	1094	1213	**1228.5**	1150	1398	1341	**1352.2**
	16	1422	**1357.8**	1521	**1407.4**	1259	1520	**1486.8**	1388	1572	1525	**1542.7**
	17	1637	**1539.9**	1675	**1592.6**	1450	1726	**1659.4**	1678	1707	1758	**1690.7**
	18	1550	**1442.8**	1647	**1542.3**	1440	1638	**1603.0**	1575	1628	1678	**1624.0**
	19	993	**917.0**	1008	**998.3**	912	1143	**1071.4**	982	1306	1316	**1254.9**
	20	708	**680.5**	810	**761.4**	659	866	**819.2**	783	1013	989	**929.5**
	21	644	**590.2**	699	**673.2**	574	729	**735.5**	678	896	804	**790.3**
	22	526	**496.3**	600	**544.7**	419	653	**599.1**	530	737	707	**688.2**
	23	**370.7**	**370.7**	455	**459.9**	345	473	**475.7**	466	584	584	**597.8**
	24	**298.8**	**298.8**	297	**307.1**	230	365	**344.1**	340	422	415	**455.3**
Bold are estimated data												

F.48 Eastbound I-80 at 27th Street Antecedent Dry Period Traffic Data (Continued)

		Friday	Friday	Saturday	Saturday	Saturday	Saturday	Saturday
		8/29/2014	9/5/2014	6/14/2014	7/12/2014	8/16/2014	8/30/2014	9/6/2014
Hour of Day	1	237	209	327	275	**290.4**	**290.4**	**290.4**
	2	196	192	199	216	**211.8**	**211.8**	**211.8**
	3	191	151	200	186	**171.8**	**171.8**	**171.8**
	4	**170.2**	144	158	153	**158.3**	**158.3**	**158.3**
	5	**244.2**	**244.2**	**174.7**	185	**174.7**	**174.7**	**174.7**
	6	**441.5**	**441.5**	**254.6**	269	**254.6**	**254.6**	**254.6**
	7	**850.8**	**850.8**	**423.9**	422	**423.9**	**423.9**	**423.9**
	8	**1078.3**	**1078.3**	**678.3**	622	**678.3**	**678.3**	**678.3**
	9	**992.3**	**992.3**	**898.2**	847	**898.2**	**898.2**	**898.2**
	10	**1001.5**	**1001.5**	**1071.2**	993	**1071.2**	**1071.2**	**1071.2**
	11	**1046.3**	**1046.3**	**1171.9**	1058	**1171.9**	**1171.9**	**1171.9**
	12	**1107.4**	**1107.4**	**1201.4**	1104	**1201.4**	**1201.4**	**1201.4**
	13	**1202.0**	**1202.0**	**1207.4**	1183	**1207.4**	**1207.4**	**1207.4**
	14	**1257.3**	**1257.3**	**1169.1**	1142	**1169.1**	**1169.1**	**1169.1**
	15	**1352.2**	**1352.2**	**1190.9**	1158	**1190.9**	**1190.9**	**1190.9**
	16	**1542.7**	**1542.7**	**1243.1**	1203	**1243.1**	**1243.1**	**1243.1**
	17	**1690.7**	**1690.7**	**1213.2**	1203	**1213.2**	**1213.2**	**1213.2**
	18	**1624.0**	**1624.0**	**1150.5**	1203	**1150.5**	**1150.5**	**1150.5**
	19	**1254.9**	**1254.9**	**969.4**	943	**969.4**	**969.4**	1053
	20	**929.5**	**929.5**	**832.4**	903	**832.4**	**832.4**	785
	21	**790.3**	**790.3**	**758.1**	766	**758.1**	**758.1**	698
	22	**688.2**	**688.2**	**689.3**	685	**689.3**	**689.3**	567
	23	**597.8**	**597.8**	**565.8**	573	**565.8**	**565.8**	515
	24	**455.3**	**455.3**	**421.1**	458	**421.1**	**421.1**	393
Bold are estimated data								

Appendix G ADP and Traffic Statistical Analysis

	Statistics	Traffic	p-value	ADP	p-value
I-80 Platte River					
Zinc (mg/L)	b (intercept)	-0.02342	0.6268	-0.03899	0.4443
	m (slope)	2.04E-06	0.0043	0.03379	0.0024
	R^2	0.3716	-	0.3919	-
	R^2 adjusted	0.3367	-	0.3599	-
Lead (mg/L)	b (intercept)	0.06205	0.1639	0.06102	0.1693
	m (slope)	2.54E-07	0.6277	4.16E-03	0.5892
	R^2	0.0308	-	0.0337	-
	R^2 adjusted	-0.0903	-	-0.0737	-
Iron (mg/L)	b (intercept)	11.8936	0.1165	11.7789	0.3076
	m (slope)	-8.61E-05	0.3978	2.25492	0.9294
	R^2	0.036	-	0.0004	-
	R^2 adjusted	-0.0122	-	-0.0472	-
Zinc (mg)	b (intercept)	-396.61	0.5921	-616.33	0.4303
	m (slope)	2.70E-02	0.0115	423.121	0.01
	R^2	0.3054	-	0.3009	-
	R^2 adjusted	0.2668	-	0.2641	-
Lead (mg)	b (intercept)	596.594	0.2742	537.562	0.3511
	m (slope)	6.77E-03	0.3152	9.31E+01	0.3738
	R^2	0.1255	-	0.0887	-
	R^2 adjusted	0.0162	-	-0.0126	-
Iron (mg)	b (intercept)	200536	0.1711	200708	0.2005
	m (slope)	-1.57E+00	0.4293	-20110	0.5154
	R^2	0.0315	-	0.0204	-
	R^2 adjusted	-0.0169	-	-0.0262	-
Zinc (mg/m^2)	b (intercept)	-1.36875	0.592	-2.12693	0.4302
	m (slope)	9.32E-05	0.0115	1.46E+00	0.01
	R^2	0.3054	-	0.3009	-
	R^2 adjusted	0.2669	-	0.2641	-
Lead (mg/m^2)	b (intercept)	2.05858	0.2743	1.85488	0.3511
	m (slope)	2.34E-05	0.3152	3.21E-01	0.3738
	R^2	0.1255	-	0.0887	-
	R^2 adjusted	0.0162	-	-0.0126	-
Iron (mg/m^2)	b (intercept)	691.98	0.1711	692.573	0.2005
	m (slope)	-5.41E-03	0.4293	-69.3827	0.5154
	R^2	0.0315	-	0.0204	-
	R^2 adjusted	-0.0169	-	-0.0262	-
Hwy 64 Platte River					
Zinc (mg/L)	b (intercept)	0.04784	0.0004	0.04629	0.0009
	m (slope)	-1.97E-06	0.648	-7.51E-04	0.7997
	R^2	0.0165	-	0.0051	-
	R^2 adjusted	-0.0591	-	-0.0714	-
Lead (mg/L)	b (intercept)	0.09393	0.0467	0.08885	0.0598
	m (slope)	-1.61E-05	0.3086	-1.01E-02	0.3889
	R^2	0.2043		0.151	-

	R^2 adjusted	0.0452		-0.0187	-
Iron (mg/L)	b (intercept)	0.45591	0.0151	0.2629	0.12
	m (slope)	2.92E-05	0.684	0.0813	0.0841
	R^2	0.0122		0.198	-
	R^2 adjusted	-0.0584		0.1407	-
Zinc (mg)	b (intercept)	251.191	0.1849	307.08	0.1325
	m (slope)	3.99E-02	0.6012	7.44E+00	0.8874
	R^2	0.0216		0.0016	-
	R^2 adjusted	-0.0537		-0.0752	-
Lead (mg)	b (intercept)	997.074	0.0505	1004.46	0.0462
	m (slope)	-2.46E-01	0.1735	-1.84E+02	0.1601
	R^2	0.3348		0.3523	-
	R^2 adjusted	0.2018		0.2227	-
Iron (mg)	b (intercept)	1498.31	0.5976	1518.88	0.6196
	m (slope)	1.24E+00	0.313	768.701	0.3666
	R^2	0.0726		0.0585	-
	R^2 adjusted	0.0063		-0.0087	-
Zinc (mg/m^2)	b (intercept)	1.71696	0.1849	2.09897	0.1325
	m (slope)	2.73E-04	0.6012	5.08E-02	0.8874
	R^2	0.0216		0.0016	-
	R^2 adjusted	-0.0537		-0.0752	-
Lead (mg/m^2)	b (intercept)	6.81527	0.0505	6.86579	0.0462
	m (slope)	-1.68E-03	0.1735	-1.25E+00	0.1601
	R^2	0.3348		0.3523	-
	R^2 adjusted	0.2018		0.2227	-
Iron (mg/m^2)	b (intercept)	10.2414	0.5976	10.382	0.6196
	m (slope)	8.46E-03	0.313	5.25428	0.3666
	R^2	0.0726		0.0585	-
	R^2 adjusted	0.0063		-0.0087	-
I-80 Salt Creek					
Zinc (mg/L)	b (intercept)	0.02892	0.1631	0.02417	0.2907
	m (slope)	2.50E-07	0.2697	4.60E-03	0.2626
	R^2	0.2906		0.2979	-
	R^2 adjusted	0.1132		0.1224	-
Lead (mg/L)	b (intercept)	0.02785	0.0076	0.02762	0.0128
	m (slope)	1.85E-08	0.8471	3.24E-04	0.844
	R^2	0.0067		0.007	-
	R^2 adjusted	-0.1588		-0.1585	-
Iron (mg/L)	b (intercept)	0.84041	0.0616	0.77548	0.1113
	m (slope)	3.52E-06	0.5171	0.06637	0.477
	R^2	0.0623		0.0746	-
	R^2 adjusted	-0.0716		-0.0576	-
Zinc (mg)	b (intercept)	146.554	0.8001	-26.7257	0.9679
	m (slope)	7.41E-03	0.3005	1.43E+02	0.267
	R^2	0.2609		0.2934	-
	R^2 adjusted	0.0761		0.1167	-
Lead (mg)	b (intercept)	67.524	0.8045	-15.9415	0.9569
	m (slope)	5.07E-03	0.1873	9.35E+01	0.15
	R^2	0.2696		0.3122	-
	R^2 adjusted	0.1478		0.1976	-
Iron (mg)	b (intercept)	8758.31	0.4009	6385.59	0.5778
	m (slope)	1.08E-01	0.4451	2131.38	0.3791

	R^2	0.0855		0.1118	-
	R^2 adjusted	-0.0451		-0.0151	-
Zinc (mg/m^2)	b (intercept)	0.34344	0.8001	-0.06263	0.9679
	m (slope)	1.74E-05	0.3005	3.35E-01	0.267
	R^2	0.2609		0.2934	-
	R^2 adjusted	0.0761		0.1167	-
Lead (mg/m^2)	b (intercept)	0.15824	0.8045	-0.03736	0.9569
	m (slope)	1.19E-05	0.1873	2.19E-01	0.15
	R^2	0.2696		0.3122	-
	R^2 adjusted	0.1478		0.1976	-
Iron (mg/m^2)	b (intercept)	20.5247	0.4009	14.9644	0.5778
	m (slope)	2.53E-04	0.4451	4.9948	0.3791
	R^2	0.0855		0.1118	-
	R^2 adjusted	-0.0451		-0.0151	-

NM=No Measured, ND=No Detected, "-"=No Calculated

Appendix H Autosampler Configuration and Program

Procedure:

1. Press the ENTER/PROGRAM key and select “CONFIGURE”. Use the left and right arrows to move through the options.
2. To verify the Bottles and Sizes settings, press the ENTER/PROGRAM key. Select “PORTABLE”. Use the arrows keys until “1” blinks, then press the ENTER/PROGRAM key.
3. Enter the bottle size here. Enter “10000” and press the ENTER/PROGRAM key.
4. Press the ENTER/PROGRAM key to access the Suction Line input. Select “3/8 INCH”, “VINYL”, and enter the length of the suction line.
5. Press the ENTER/PROGRAM key to access the Liquid Detector input. Select “ENABLE”, enter “0” to set the rinse cycles at zero, and select “NO” to answer the question ENTER HEAD MANUALLY? Then, enter “0” to set the set of number of retries at zero.
6. To verify the programming mode setting, press the ENTER/PROGRAM key. Select “BASIC” and press the ENTER/PROGRAM key to accept the selection.
7. To verify the start time delay, press the ENTER/PROGRAM key. Enter “0” for the minute delay.
8. To verify the enable pin option, press the ENTER/PROGRAM key. Select “NO” for the master/slave, select “NO” for the sample upon disable, select “YES” for the sample upon unable, select “NO” for the reset sampling, and select “YES” for the inhibit countdown. For more information, read the example: Checking the

Configure Option Settings in 3700 Portable Samplers Installation and Operation Guide page 3-23

Autosampler Program

Procedure:

1. Press the ENTER/PROGRAM key and select “PROGRAM”. Use the left and right arrows to move through the options.
2. To enter the interval between samples in time increments, select “TIME”. This option requires two entries: one for the hours and one for the minutes. Enter “0” to set the hours at zero. Press the ENTER/PROGRAM to accept the number “0” and move to the minutes entry. Enter “30” to set the minutes at thirty.
3. Enter the sample volume, “200”. Press the ENTER/PROGRAM to accept the entry.
4. Because this sampling routine does not require a specific start time, use the arrow keys to select “NO”. Press the ENTER/PROGRAM key to accept the entry.
5. After you properly install the sampler, press the START SAMPLING key to run the program. For more information, read the example: Time-Paced Sequential Sampling in 3700 Portable Samplers Installation and Operation Guide page 3-26