Quantifying the Relationship between Skid Resistance and Wet Weather Accidents for Virginia Data

Jeffrey S. Kuttesch

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Dr. Gerardo Flintsch, Chair
Dr. Imad Al-Qadi
Dr. Antonio Trani
Mr. Kevin K. McGhee

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Abstract

One of the factors contributing to motor vehicle crashes is lack of sufficient friction at the tire-pavement interface. Although the relationship between surface friction and roadway safety has long been recognized, attempts to quantify the effect of pavement skid resistance on wet accident rates have produced inconsistent results. This thesis analyzes the relationships between skid resistance, accident, and traffic data for the state of Virginia. The correlation between wet skid resistance measured with a locked-wheel trailer using a smooth tire and wet accident rates is examined. Additionally, the influence of traffic volumes on accident rates is considered.

The research used accident and skid data from the Virginia wet accident reduction program as well as from sections without pre-identified accident or skid problems. The wet accident data was aggregated in 1.6 km (1 mi) sections and divided by the annual traffic to obtain wet accident rates. The minimum skid number measured on each of these sections was then obtained and added to the database.

Regression analyses indicated that there is statistically significant effect of skid resistance on wet accident rate; the wet accident rate increases with decreasing skid numbers. However, as expected, skid resistance alone does a poor job of modeling the variability in the wet accident rates. In addition, the wet accident rate also decreases with increasing traffic volume. Based on the data studied, a target skid number (SN(64)S) of 25 to 30 appears to be justified.

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Chapter 1
Introduction

1.1. Background

The volume and severity of motor vehicle crashes in the United States has recently led the FHWA to declare safety as their top priority (FHWA 1998). In 2002, nearly 43 thousand fatalities occurred on America's roadways. Another 3 million people were injured. In addition to the loss of life, the economic impact in the U.S. due to these crashes has reached a level of $230.6 billion annually (NTSB 2002). This equates to an annual cost of $820 per person and a full 2 percent of the gross domestic product (GDP). Recent European crash statistics are comparable to those in the United States. The World Health Organization (WHO) reports that motor vehicle crashes worldwide kill 1.2 million and injure 50 million people annually. The worldwide economic costs are estimated at $518 billion each year (WHO 2004).

Motor vehicle crashes result from numerous contributing factors including driver error, poor geometric alignment of the roadway, and a lack of sufficient friction at the tire-pavement interface during wet weather. The relationship between surface friction and roadway safety has long been recognized by transportation agencies and concern with the number of accidents occurring in wet pavement conditions has grown. NTSB and FHWA reports indicate that 13.5% of fatal crashes and 18.8% of all crashes occur when pavements are wet (Dahir and Gramling 1990).

Numerous studies were conducted in the 1970's to explore the relationship between friction and crash occurrence. These early attempts to correlate the relationship between friction numbers measured using a ribbed tire and wet crash rates were generally unsuccessful (Henry 2000). After the introduction of the smooth tire for friction testing, better correlations were found (Henry and Wambold 1992). However, in the last 20 years, the effect of friction deficiencies on crash rates has not been thoroughly researched in the United States.

Highway safety in the United States can be enhanced if the relationships between the factors which cause crashes can be quantified. This would allow decision makers to better allocate resources to address the most serious safety risks.

1.2. Problem Statement

Recent research in Europe has indicated that the relationship between surface friction properties and wet crash rates can be quantified. Threshold levels for certain pavement surface properties, macrotexture and friction number, have been established below which wet crash rates begin to increase significantly. However, the process of quantifying this relationship and validating the European findings has not occurred sufficiently in the United States (Larson 1999).

1.3. Objectives

To address the issues presented in the problem statement, the relationship between surface properties and wet crash rates needs to be quantified in the United States. Therefore, the objective of this research was to analyze network-level pavement friction and crash data for the state of Virginia. The correlation between friction and wet crash rates was examined. Additionally, the influence of traffic volume on crash rates was considered.

1.4. Research Scope

To accomplish the objective of this research, network-level accident and friction data were acquired from the Virginia Department of Transportation (VDOT). The data was processed and grouped into 1-mile sections prior to analysis. Different statistical tests were then used to quantify the relationship between surface friction and crash rates for the state of Virginia.

In this thesis, Chapter 2 presents a review of the literature regarding important issues in measuring pavement friction and previous attempts to quantify the relationship between

friction and motor vehicle crashes. Chapter 3 describes the tasks undertaken to collect and pre-process the data. Chapter 4 discusses the analysis performed on the data and presents the results of this research. Chapter 5 presents the findings and conclusions of this research. Chapter 6 provides recommendations for future research.

Chapter 2
Literature Review

2.1. Introduction

Pavement skid resistance is defined as the retarding force generated by the interaction between a tire and a pavement under a locked, or non-rotating, wheel (ASTM E 867). It is a measure of the ability of a pavement to resist the skidding of a tire on a motor vehicle. Skidding occurs when the frictional demand exceeds the available friction force at the interface between a tire and pavement (Kennedy et al. 1990).

2.2. Tire-Pavement Friction Mechanism

The frictional force which develops between a pavement and a tire is composed of two components: adhesion and hysteresis (Choubane et al. 2003). The adhesion component of the frictional force is due to the actual contact between the rubber tire and the pavement; the adhesion component indicates the shear force which develops at the tire-pavement interface as the tire conforms to the shape of the contact area (Choubane et al. 2003). Panagouli and Kokkalis (1998) attribute the adhesion component to the electrostatic attraction between the rubber tire and asperities on the surface of the aggregate.

The hysteresis component of the frictional force is related to the energy storage and dissipation as the rubber tire is deformed as it passes over an irregularity in the pavement. The hysteresis component typically becomes dominant after the tire begins to skid. At that point, the adhesion component, which is dominant prior to a skidding condition, begins to decrease and the hysteresis component undergoes a corresponding increase (Choubane et al. 2003).

Numerous factors can influence the magnitude of the frictional force generated between the tire and pavement surface. These factors include the tread pattern and depth, tire pressure, vehicle speed, and load distribution.

2.3. Surface Texture Properties and Pavement Friction

At the 18th World Congress, the World Road Association (PIARC) defined four levels of pavement texture. These levels and their corresponding texture wavelengths are presented in Table 2.1.

Table 2.1. PIARC Texture Definitions

Texture Level	Wavelengths
Microtexture	$\lambda < 0.5$ mm
Macrotexture	0.5 mm $< \lambda <$ 50 mm
Megatexture	50 mm $< \lambda <$ 0.5 m
Roughness	0.5 m $< \lambda <$ 50 m

Microtexture and macrotexture are the two levels of pavement texture which affect the friction between the pavement and tire (Henry 2000). Microtexture is believed to be responsible for pavement friction at low speeds; while macrotexture is predominantly responsible for pavement friction at high speeds. Some researchers have indicated that microtexture is the single most important factor at both low and high speeds in providing adequate friction at the tire pavement interface (Papagouli and Kokkalis 1998). The difference between microtexture and macrotexture is presented in Figure 2.1.

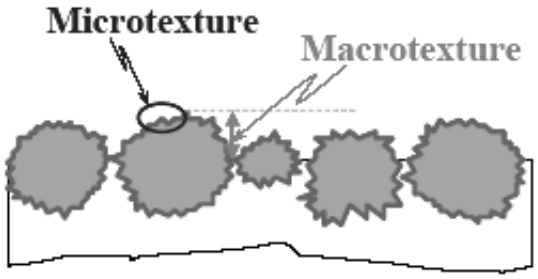

Figure 2.1. Microtexture vs. Macrotexture (Flintsch et al. 2003)

Microtexture is essentially a measure of the surface irregularities of the individual aggregates and is thus mainly responsible for the adhesion component of the frictional force. Macrotexture is a measure of the deviations and channels in the pavement surface between aggregate particles. The macrotexture contributes to the pavement friction by helping drain water away from the surface. The pavement microtexture then breaks up the remaining thin water film and establishes contact with the tire (Dames 1990). Thus, microtexture is necessary at all speeds to maintain contact between the tire and road surface. Macrotexture is important in limiting the reduction in friction as the vehicle speed or water film thickness increases (Kamel and Gartshore 1982).

A nationwide survey was conducted in 1995 in order to determine how states attempt to control the friction on HMA pavements (Jayawickrama et al. 1996). Nearly half of the state highway agencies do not have any design guidelines which specifically address friction. Among the states that do attempt to address friction in their pavements, the majority focused on controlling the quality of the aggregate used in the mix. The survey indicated that most state agencies cannot account for macrotexture differences in the design stage; thus, the friction control used by state agencies is limited to ensuring good microtexture in the pavement (Jayawickrama et al. 1996).

There are currently no methods for directly measuring pavement microtexture, so surrogate measures are used. Low-speed friction measurement devices, such as the British Pendulum Tester (BPT), are commonly used to indicate the pavement microtexture (Wambold et al. 1995).

There are three common methods for measuring pavement macrotexture: profilometers, volumetric, and outflow. Profilometers typically use lasers to generate a two-dimensional measure of the pavement macrotexture. The volumetric measurement technique involves spreading a known volume of a single-sized material in a circle on the pavement surface. The area of the circle is divided by the volume of the material to determine a three-dimensional texture measurement, the mean texture depth (MTD). The volumetric approach is commonly called the sand patch method and is specified in *ASTM Standard Measuring Pavement Macrotexture Depth Using a Volumetric Technique* (E 965). The outflow method measures the time for a known volume of water to flow out from a cylinder placed on the pavement surface (Wambold et al. 1995).

2.4. Laboratory Measurement of Pavement Friction

Two major devices are used for the measurement of pavement friction characteristics in the laboratory. These devices are the aforementioned BPT and the Dynamic Friction (DF) tester. Both these devices can also be used to measure frictional properties in the field. They both offer the advantage of being highly portable and easy to handle.

2.4.1. British Pendulum Tester

The procedure for measuring frictional properties using the BPT is specified in ASTM E 303. The BPT operates by releasing a pendulum from a fixed height above the pavement surface. The pendulum has a rubber slider attached to the end; as the slider moves across the pavement surface, the frictional force reduces the kinetic energy of the pendulum. The loss in kinetic energy and thus the magnitude of the frictional force in the pavement can be measured from the difference in the height of the pendulum before and after the slider crosses the pavement (Henry 2000).

The slip speed for the BPT is assumed to be 6 miles per hour; this slip speed is very low and as a result, the British Pendulum Number (BPN) is typically used as a surrogate for the pavement microtexture. The disadvantages of the BPT are that it only provides a measurement of the friction at very low speeds and that the BPN values do not correlate well with the frictional properties measured using other devices (Saito et al. 1996).

2.4.2. Dynamic Friction Tester

The DF tester was developed as an alternative to the BPT. The primary goal in its development was to produce a small-scale testing device which could measure the pavement friction and its speed dependency (Saito et al. 1996). The DF tester is specified in ASTM E 1911.

The DF tester consists of a rotating disc with three attached rubber sliders. Water is applied to the pavement surface as the disc begins to rotate without contact between the sliders and the pavement surface. Once the target speed, typically 90 km/hr (55 mph), is reached, the water supply is stopped and the disc is lowered to the pavement surface

and a vertical load is applied. As the disc rotates, a frictional force develops between the pads and pavement surface. The coefficient of friction is then computed based on the frictional force and the vertical load applied to the disc. The coefficient of friction is measured continuously as the speed of the disc's rotation decreases due to the application of the frictional force. This provides a profile of the speed dependency of the pavement friction (Saito et al. 1996).

2.5. Full-Scale Measurement of Skid Resistance

There are four basic types of full-scale friction measurement devices currently used around the world. The four types are: locked wheel, side-force, fixed-slip, and variable slip. All four systems utilize one or two full-scale test tires to measure the pavement friction properties under different conditions. These devices have an advantage over the small-scale devices discussed in the previous section in that the friction measurements can be taken at or close to highway speeds.

2.5.1. Side-Force Testers

The side-force method is used to measure the ability of vehicles to maintain control in curves (Henry 2000). This method involves maintaining a constant angle, the yaw angle, between the tire and the direction of motion. Water is applied to the pavement at a prescribed rate in front of the test wheel, a vertical load is applied to the test tire, and the force perpendicular to the plane of rotation (the side-force) is measured (Gargett 1990). Equation (1) shows how the side-force coefficient (SFC) is calculated.

$$SFC(V,\alpha) = (F_s / N)100 \quad (1)$$

where,

V = velocity of the test tire

α = yaw angle

N = normal force on the test tire

F_s = force perpendicular to plane of rotation

The slip speed, which is the relative velocity between the tire and the pavement surface, for these side-force devices can be estimated as V sin α (Henry 2000). Since the yaw angle is typically small, between 7.5 and 20 degrees, the slip speed is also quite low; this means that side-force testers are particularly sensitive to the pavement microtexture but are generally insensitive to changes in the pavement macrotexture.

The two most common side-force measuring devices are the Mu-Meter and the Side-Force Coefficient Road Inventory Machine (SCRIM). The standard test method for the Mu-Meter is presented in ASTM E 670. This device was originally designed for measuring friction on airport runways but was adopted in some areas for use on highway pavements (Henry 1986). The SCRIM device was developed in Great Britain, specifically for highway measurement. The SCRIM utilizes a yaw angle of 20 degrees (Gargett 1990).

The primary advantage offered by side-force measuring devices is the ability for continuous friction measurement throughout a test section (Henry 2000). This ensures that areas of low friction are not skipped due to a sampling procedure.

2.5.2. Fixed-Slip Devices

Fixed-slip devices are meant to measure the friction observed for vehicles with anti-lock brakes. Fixed-slip devices maintain a constant slip, typically between 10 and 20 percent, as a vertical load is applied to the test tire; the frictional force in the direction of motion between the tire and pavement is measured (Henry 2000). Equation (2) is used for calculating the percent slip.

$$\% \, Slip = \left[\left(V - r\omega \right) / V \right] 100 \tag{2}$$

where,

% Slip = the ratio of slip speed to test speed (in percent)

V = test speed

r = effective tire rolling radius

ω = angular velocity of test tire

The measurements from fixed-slip devices are reported as brake slip numbers (BSN), which are calculated using Equation (3).

$$BSN\,(V, \%\,slip) = \left(F / N\right)100 \tag{3}$$

where,

BSN (V, % slip) = brake slip number for a given test speed and percent slip

F = measured friction force

N = vertical force on test tire

V = test speed

Fixed-slip devices share an advantage with the side-force measuring devices in that they can be operated continuously without producing undue wear on the test tire (Henry 2000). These devices are also more sensitive to microtexture as the slip speed is low.

2.5.3. Variable Slip Devices

Variable slip devices measure the frictional force as the tire is taken through a pre-determined set of slip ratios (Henry 2000). ASTM Standard E 1859 outlines the full procedure for measuring pavement friction using a variable slip technique. The slip friction number (SFN) is a measurement of the longitudinal frictional force divided by the vertical force on the test tire (ASTM E 1859). The SFN is recorded over a range of slip speeds from zero up to the test speed and the results are presented in a graphical format.

2.5.4. Locked-Wheel Devices

The most common method for measuring pavement friction in the United States is the locked-wheel method (Henry 2000). The locked-wheel method is specified in ASTM E 274. This method is meant to test the frictional properties of the surface under emergency braking conditions for a vehicle without anti-lock brakes. As opposed to the side force and fixed slip methods, the locked-wheel approach tests at a slip speed equal to the vehicle speed, this means that the wheel is locked and unable to rotate (Henry

1986). The results of a locked-wheel test conducted under ASTM specifications are reported as a skid number (SN) or friction number (FN). Equation (4) is used for computing SN or FN.

$$FN = (F / N)100 \tag{4}$$

where,

F = friction force

N = vertical load on the test tire

Locked-wheel friction testers usually operate at speeds between 40 and 60 mph. Once the target test speed has been attained, a film of water is sprayed onto the pavement 10 to 18 inches in front of the test tire. This water film has a nominal thickness of 0.5 mm. At this point, a vertical load of 1085 $\pm$ 15 pounds is applied to the test wheel and the wheel is locked. The wheel is locked for a period of 1 second and the frictional force is measured and averaged over that period of time (ASTM E 274). One locked wheel friction testing device is shown in Figure 2.2.

Figure 2.2. Locked-wheel skid tester

The locked-wheel trailer offers the advantage that the test variables are easy to understand and control. The primary disadvantage of this test method is that, unlike the side-force and fixed-slip methods, the friction measurement is not continuous over a test section (Henry 2000). In order to avoid undue wear on the test tire, the tire can only be

locked for one-second increments. This means that locations with low friction could be missed in the testing procedure.

The precision of locked-wheel skid testers was studied most recently by the Florida Department of Transportation (FDOT). Four automated locked-wheel testers were used to measure the skid resistance on numerous test sections to evaluate the reproducibility and repeatability of the skid measurements (Choubane et al. 2003). The research found that two tests from the same device on the same pavement section varied by no more 3.9 FN. Two tests conducted by two different locked-wheel devices on the same pavement section varied by no more than 4.2 FN (Choubane et al. 2003). These variations in the friction numbers correspond to pooled standard deviations of 1.38 FN and 1.47 FN, respectively. ASTM E 274 allows for a maximum standard deviation of 2 FN in skid resistance measurement using the locked-wheel trailer. The FDOT study showed that the four friction devices produce results with a higher precision than required by ASTM standards (Choubane et al. 2003).

Locked wheel skid testers are used in some fashion in all 50 states for measuring pavement surface friction (Wambold et al. 1995). The original ASTM specification for these devices, developed in the early 1960's, called for the use of a standard ribbed test tire. ASTM Standard Specification for Standard Rib Tire for Pavement Skid Resistance Tests (E 501) details the requirements for the ribbed test tire. The ribbed tire should be a bias-belted type with 7 circumferential ribs which are 0.66 in wide. The depth of the grooves on the tire should be 0.385 inches (ASTM E 501).

Henry and Wambold (1992) discussed the reasoning behind specifying the use of the ribbed tire in the original ASTM standard for locked-wheel friction measurement. The main concern was that a smooth test tire was too sensitive to the water film thickness on the pavement. Since early water delivery systems were not refined, the repeatability of the skid measurements conducted with a smooth tire was poor. However, the ribbed tire had several disadvantages. Because the ribbed tire is insensitive to the water film thickness, this means it is also insensitive to the pavement macrotexture which will ultimately determine the water film thickness (Henry and Wambold 1992). A clear example of the weakness of using the ribbed tire for pavement friction measurement is

its inability to distinguish between longitudinally grooved and ungrooved concrete pavements (Henry and Wambold 1992).

The realization that the ribbed tire was not ideally suited to measure pavement frictional properties led to the development of an ASTM standard smooth test tire for measuring pavement skid resistance (ASTM E 524) in 1975. The smooth tire has the same general dimensions as the ribbed tire but lacks the 7 ribs. This test tire simulates the worst case scenario of a vehicle with a tire worn to a point of no tread. In 1990, ASTM E 274 was amended so that the ribbed and smooth tires were given equal status (Henry and Wambold 1992).

The current ASTM E274 standard requires that skid numbers be reported with both the test speed and tire type. For tests conducted at 40 mph using the ribbed tire, the skid number should be reported as SN40R. Tests conducted at that same speed using the smooth tire should be reported as SN40S. That standard test speed in metric units is 64 km/h. If metric standards are used, the test speed is reported in parentheses. Thus, for tests conducted at 64 km/h using the ribbed tire, the skid number will be reported as SN(64)R.

2.6. Factors Affecting Pavement Friction

It has already been discussed how the microtexture and macrotexture are responsible for the frictional properties of a pavement surface. These textural properties and the frictional resistance of the pavement are sensitive to several additional factors.

2.6.1. Aggregate Polishing and Spacing

The pavement microtexture is dependent on the type and quality of the aggregate used in the hot-mix asphalt. Many aggregates begin with good microtexture properties due to the crushing and fracturing which occurs at quarries, however, some aggregates are more likely to undergo polishing than others (Gandhi et al. 1991). Polishing is the wearing down and smoothing of the small surface irregularities of the aggregate under traffic loading. Polishing directly affects the microtexture of the pavement and thus

lowers the pavement friction at all speeds (Gandhi et al. 1991). The rate of polishing has been shown to be dependent on the mineral composition of the aggregate, the aggregate grain size, the presence of impurities, the porosity, and heterogeneity of the aggregate (Gandhi et al. 1991).

A study conducted in Maryland in 2002 determined that the rate of aggregate polishing was affected by aggregate size, highway geometry, and the volume of commercial vehicles (Chelliah et al. 2003). Large aggregates develop higher stresses and thus polish faster. Geometric features, such as curves and intersections, also develop higher stresses in the pavement and lead to faster polishing. Commercial vehicles impart higher stresses to the pavement, which will lead to faster polishing.

Another study conducted in Singapore attempted to quantify the effect of aggregate spacing at the pavement surface on the friction number. This aggregate spacing has been shown to vary from 2 mm for dense gradations to 11 mm for a porous asphalt surface (Fwa et al. 2003). The research was conducted using both BPN values obtained in the laboratory and brake slip numbers collected in the field using a GripTester®. Both series of measurements indicated that the porous asphalt surfaces exhibited lower friction than the dense graded surfaces at low slip speeds.

2.6.2. Seasonal Variation in Pavement Friction

Bird and Scott first recognized that skidding resistance is higher in the winter and spring than in the summer and fall in 1931. The magnitude of these variations has been reported as high as 30 SN, however, variations of 5 to 15 SN are more common (Jayawickrama and Thomas 1998). In Great Britain, side force coefficient values have been shown to vary by more than 25 percent across the seasons (Gargett 1990).

The theory behind this variation has been outlined by several researchers. During the hot, dry summer months, fine particles accumulate on the aggregate surface and the aggregates are polished off (Gargett 1990). During the winter, it is believed that deicing salts wear the aggregate surface, and expose new rough particles (Jayawickrama and Thomas 1998). Researchers also believe that the heavy rains typical of the early spring

flush any accumulated particles from the drainage channels in the pavement surface, thus increasing the pavement macrotexture. This flushing effect of rainfall is also believed to cause short-term increases in the friction after large rainfall events (Hill and Henry 1982). It is also theorized that polishing is less of a problem in the winter months because the pavement is wet a greater percentage of the time. The moisture acts a lubricant on the aggregate surface and helps reduce the amount of polishing (Jayawickrama and Thomas 1998).

While some studies have concluded that temperature changes do not have a direct effect on the pavement friction, other investigations have found a statistically significant effect of pavement temperature on the skid resistance at the tire-pavement interface (Flintsch et al., 2004). In particular, the temperature affects the rubber tires used to collect the friction measurements. With higher temperatures, the rubber will become more flexible and less energy will be lost during the skid. This will lead to lower measured skid values (Jayawickrama and Thomas 1998).

These variations cause problems for year-round friction measurement programs because these seasonal effects need to be accounted for if sites with truly low friction are to be identified. Several attempts have been made to quantify these effects. Hill and Henry (1982) developed a mechanistic model, shown in Equation (5), to account for both the short-term and long-term seasonal effects. For asphalt surfaces, the long-term seasonal variation was shown to follow an exponential relationship.

$$SN_o = SN_{0R} + SN_{0L} + SN_{0F} \quad (5)$$

where,

SN_0 = skid number at time t

SN_{0R} = short-term weather-related variation

SN_{0L} = long-term seasonal variation

SN_{0F} = skid resistance independent of short and long-term effects

Research conducted in Texas attempted to develop a simple regression model using what were believed to be most critical climatic variables. The final regression model included the average temperature and cumulative rainfall just prior to the measurement,

as well as the Julian calendar day. This model showed very good correlation with the measured skid data and could account for both short-term and long-term seasonal variations (Jayawickrama and Thomas 1998).

2.6.3. Variation due to Speed

As early as 1934, the decrease in wet pavement friction with increasing vehicle speed was recognized (Henry 2000). The friction decreases as the slip speed of the tire increases. This means that the measured friction will be a function of the speed of the test; tests conducted at different speeds will not produce comparable results. Several models have been developed to describe the relationship between friction and slip speed. One such model is the Penn State Model, presented in Equation (6) and (7) (Henry 2000).

$$F(S) = F0 * e^{-\frac{PNG}{100}S} \tag{6}$$

where,

S = slip speed

F(S) = friction number at the slip speed

F0 = friction number at zero slip speed

PNG = percent normalized gradient

$$PNG = -\frac{100}{\mu}\frac{d\mu}{ds} \tag{7}$$

where,

μ = friction coefficient

$\frac{d\mu}{ds}$ = gradient of friction with speed

2.7. International Friction Index

In 1995, the results of the International PIARC Experiment to Compare and Harmonize Texture and Skid Resistance Measurements were published (Wambold et al. 1995). This experiment was conducted to create a common scale for the reporting of pavement friction measurements. The result of the experiment was the development of the International Friction Index (IFI) which reports the frictional properties of a pavement with two terms: the speed constant, S_p, which is a function of the pavement macrotexture, and the friction number, F60, which depends on a measured friction value, the slip speed, and the speed constant (Wambold et al. 1995). The speed constant is used to adjust the friction values measured at any slip speed to a friction value at 60 km/h. ASTM Standard Practice for Calculating International Friction Index of a Pavement Surface (E 1960) details the necessary equations for calculating and reporting the IFI:

$$S_p = a + b\,TX \tag{8}$$

where,
a, b = coefficients dependent on the device used for measuring macrotexture
TX = macrotexture measurement

$$FR60 = FRS\, e^{\frac{S-60}{S_p}} \tag{9}$$

where,
FR60 = adjusted value of friction for a slip speed of 60 km/h
FRS = measured friction value at speed S
S = slip speed (km/h)

$$F60 = A + B\ x\ FR60 + C\ x\ TX \tag{10}$$

where,
A, B = coefficients dependent on friction measuring device
C = regression constant required for measurements using ribbed tire
TX = macrotexture measurement required for ribbed tire readings

The IFI allows agencies to conduct friction and macrotexture measurements using a wide number of devices. The measurements made using those devices can be converted to a common reference scale and compared. Additionally, the value of F60 will be the same regardless of the slip speed of the friction test. This allows agencies to conduct tests at different speeds and cause less disruption to the normal traffic flow (Wambold et al. 1995).

2.8. Pavement Friction Data in Research

Henry (2000) provides a thorough account on the various uses of friction data. These uses include network surveys for pavement management, specifications for construction or surface restoration, accident investigations, measurements for winter maintenance, and measurements of runway conditions for both maintenance and pilot advisories. The use of friction data for accident investigations is of interest in this thesis.

2.8.1. Relating Surface Properties to Crashes – Early Research

Research was performed in Great Britain as early as the 1950s in order to quantify the accident risks associated with certain levels of side-force coefficients (Salt 1977). The first international conference on skid resistant pavement was held in Virginia in the 1958. The Second International Skid Prevention Conference, held in 1977, included numerous studies which attempted to establish pavement friction guidelines based on accident data. Proposed pavement friction recommendations for Japan, Great Britain, and France were presented (Ichihara 1978, Carroll 1978, Sauterey 1978). This work focused on attempting to determine thresholds for friction measurements below which accident rates increased significantly.

The National Cooperative Highway Research Program sponsored a program to develop minimum friction levels for rural highways in 1967. The resulting report, NCHRP Report 37, “Tentative Skid Resistance Requirements for Main Rural Highways,” presented tentative minimum friction levels based on the ribbed test tire for these roadways; these requirements were a function of the mean traffic speed (Kummer and Meyer 1967). These tentative requirements are shown in Table 2.2. These requirements were

provided to the states by the U.S. Department of Transportation as a general guide for maintaining skid resistant pavements (Smith 1977).

Table 2.2. Tentative Minimum Skid Numbers (NCHRP Report 37)

Mean Traffic Speed, V (mph)	Skid Number	
	SN_V	SN_{40}
0	60	-
10	50	-
20	40	-
30	36	31
40	33	33
50	32	37
60	31	41
70	31	46
80	31	51

One of the most comprehensive early studies attempting to correlate accident data with friction data was performed in Kentucky. Friction, accident, and traffic (AADT) data was collected for 770 miles of rural, four-lane, limited access highways (Rizenbergs et al. 1976). The data was aggregated into 110 test sections. The researchers recognized that other factors, such as roadway geometry, could influence the accident rates. The use of only a certain class of roadways was an attempt to limit the effects from these additional factors. A model was suggested relating the percent of wet accidents to SN70R (Burchett and Rizenbergs, 1982). This model is shown in Figure 2.3.

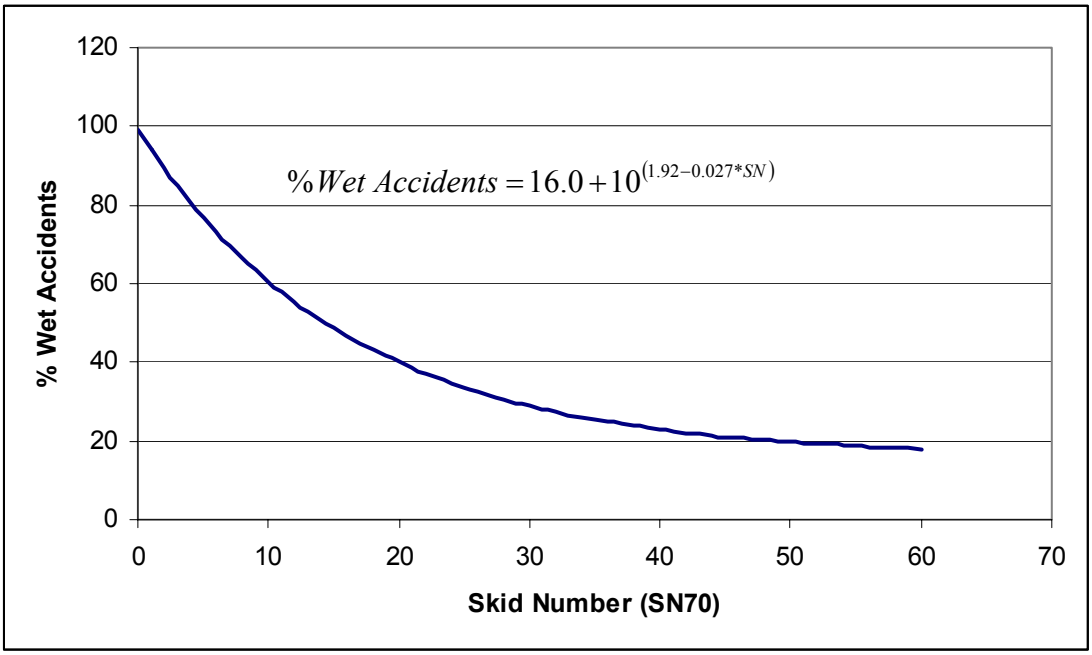

Figure 2.3. Kentucky Model Relating Percent Wet Accidents to SN70R

The Kentucky data showed a great deal of scatter, but there did appear to be a general trend that increasing the skid number leads to lower wet accident rates. The researchers concluded that of a number of potential dependent variables the wet accident rate per 100 million vehicles mile traveled (VMT) correlated best with the ribbed tire skid data. Additional analysis using moving averages of 5 sections produced results which indicated a significant increase in accident rate for SN70R below 27 (Rizenbergs et al. 1976).

Runkle and Mahone (1977b) conducted a limited study on 312 miles of interstate highway in Virginia in order to develop recommended minimum skid number values. This research recommended a minimum value of SN(64) of 30 on interstate highways. The results from similar studies conducted in Texas by McCullough and Hankins, in Tennessee by Moore and Humphreys, and Arizona by Burns and Peters are presented with the Kentucky and Virginia results in Table 2.3 (Runkle and Mahone 1977b). The results have all been adjusted to SN(64)R values for comparison.

Table 2.3. Proposed Minimum Skid Values

State	Minimum Friction Value
Tennessee	SN_{64} = 40
Texas	SN_{64} = 38
Arizona	SN_{64} = 29
Virginia	SN_{64} = 30
Kentucky	SN_{64} = 40

Work continued in Great Britain during the 1970s. The Transport and Road Research Laboratory (TRRL) presented proposals in 1972 for new minimum side-force coefficients based on site classifications and a risk rating (Salt 1977). The TRRL also attempted to address the texture problems which could lead to poor frictional characteristics in the pavement. Minimum polished stone values (PSV) were proposed based on the required SFC and the expected traffic; these minimums were meant to ensure adequate microtexture (Salt 1977). Specifications were also developed to ensure sufficient macrotexture so that the decrease in friction with speed would be limited (Salt 1977). These suggested macrotexture specifications are shown in Table 2.4.

Table 2.4. TRRL Texture Recommendations for Limiting Reduction in Friction

Percent Decrease in Skid Resistance for change in speed from 50 km/h to 130 km/h	Texture Depth (mm)	
	Flexible	Concrete
0	2.0	0.8
10	1.5	0.7
20	1.0	0.5
30	0.5	0.4

2.8.2. Problems with Early Research

A major problem with the early research attempting to quantify the relationships between friction and wet accidents was the use of the ribbed test tire on the locked wheel skid trailer (Henry and Wambold 1992). Research was conducted in the 1980s to determine if results from the smooth test tire had a better correlation with wet accident rates. The Florida Department of Transportation in 1984 conducted skid tests using both the ribbed

and smooth tires for two types of sites: sites with less than 25 percent wet accidents and sites with greater than 50 percent wet accidents. This study showed that an SN(64)S value of 25 could be used to separate the high wet accident sites from the low wet accident sites (Henry and Wambold 1992). No such value could be established for the ribbed tire data. The research also showed that data for the smooth tire shows a much greater difference between sites with low and high wet accident rates.

Much of the early research relating pavement friction to crash rates was aimed at establishing minimum thresholds for friction. However, this concept of minimum values which could be used as standards for design and maintenance faced strong opposition due to the legal responsibilities it would place on the state highway agencies. Carlson (1974) provides a thorough summary of the early case law involving the liability for skidding accidents. The case law indicates that states can be found liable for low friction conditions due to either their actions or lack of action; states can also be held liable for weather related hazards which the state has a duty to remove or at the minimum warn the public about. Carlson suggested that every state needed programs to identify and improve areas of low friction; however, the use of mandatory standards for pavement friction would place an undue responsibility on the agency.

2.8.3. Wet-Accident Reduction Programs

The type of programs described by Carlson had been in development since the Highway Safety Act of 1966 emphasized federal action to improve friction (Loutzenheiser 1974). The Federal Highway Administration (FHWA) issued an instructional memorandum (IM 21-3-68) to states in 1968 which offered federal aid for resurfacing projects for pavements with a skid number less than 35. In 1973, IM 21-2-73 was issued. This instructional memorandum called for the establishment of state programs for reducing wet-accidents by identifying and improving sites with high accidents rates and correspondingly low skid numbers (Loutzenheiser 1974).

NCHRP Synthesis 158: Wet Pavement Safety Programs attempted to update the status of wet accident reduction programs in state highway agencies (Dahir and Gramling 1990). As of 1990, two-thirds of responding agencies had developed policies for taking action in response to results from their friction testing program. There was no uniformity in the threshold skid values at which action was required, nor was there uniformity in the

timeliness required in the response. This report indicated that accident data was collected in all 50 states, though the level of detail in the information varies widely. Every state but one had a formal program for testing the pavement friction characteristics. Some of these programs involved routine network-level surveys of the pavement friction, while others involved testing at locations with known or potential skidding problems. Over twenty agencies reported using before and after accident studies to evaluate the effectiveness of maintenance programs. Ten of those agencies had attempted to quantify the economic benefits of improving the skid resistance (Dahir and Gramling 1990).

The Virginia Wet Pavement Accident Reduction Program was developed in 1976 (Runkle and Mahone 1977a). Virginia had banned the use of polish susceptible aggregates in the 1950s, but did not have a comprehensive program for identifying and treating sites with high rates of wet accidents. The original program emphasized the use of accident data in identifying hazardous locations (Runkle and Mahone 1977a). Sites with more than 3 wet accidents, where those wet accidents account for greater than thirty percent of the total number of accidents, were flagged for further analysis. Sites with SN40 values less than 30 were also identified for further analysis. An economic analysis was performed for each site to determine the time until the cost of an improvement would be paid back by the expected savings in wet accidents (Runkle and Mahone 1977). This analysis assumed that wet accidents should account for twenty percent of the total accidents after corrective action.

2.8.4. Relating Surface Properties to Crashes – Recent Research

Since the 1970s, much of the research into relating accident rates to friction has occurred outside the United States. Studies have been conducted in Puerto Rico, Israel, Switzerland, Great Britain, France, and the Netherlands. Larson (1999) presents an excellent summary of recent research activities focused on the accident improvements due to specific maintenance actions. Fuzzy logic techniques were investigated in Pennsylvania and accident prediction models were developed in Maryland.

In the early 1990s, a study conducted in Puerto Rico found a statistically significant relationship between the minimum Mu-Meter skid number and the ratio of wet to dry

accidents in a section (Gandhi et al., 1991). Using linear regression, an r-squared value of 0.55 was obtained for those two variables. Other dependent variables considered included the ratio of wet accidents to the total number of accidents. The average friction coefficient in a section was found to be less related to accident rates than the minimum friction coefficient.

A study was conducted by the Israeli Public Works Department to examine the relationship between pavement frictional condition measured by a Mu-Meter and highway accidents (Craus et al. 1991). This study found that average Mu-Meter readings for the network greater than 37 could reduce the total number of accidents by 7.5 percent.

French research reported in 1996 found a fivefold increase in the wet accident rates on the Bordeaux Ring Road when the side-force coefficient decreased from greater than 0.60 to less than 0.50 (Larson 1999). This study also found that the risk of wet accidents increases greatly for surfaces with an estimated texture depth less than 0.40 mm. Two studies, one conducted in Great Britain, found that the accident risk increased for roads with an average texture depth less than 0.7 mm.

Researchers at the Pennsylvania Transportation Institute developed two fuzzy logic models to predict wet-pavement accidents (Xiao et al. 2000). The skid number, posted speed, average daily traffic, pavement wet time, and driving difficulty were the variables selected as having the greatest effect on the risk of skidding accidents at a site. These models were used to calculate the improvement in safety expected from improvements in each of the input variables. It was shown that the safety condition, measured by the percent reduction in wet pavement accidents, could be improved nearly 60 percent if the skid number increased from 33.4 to 48 (Xiao et al. 2000).

Another recent study to examine the correlation between friction and accident rates was conducted in Switzerland (Lindenmann 2004). This work used data from the entire Swiss national highway network; nearly 6000 km of roadway were surveyed using the SCRIM (Sideway Force Coefficient Routine Investigation Machine). Attempts to correlate the friction data with accident data from five years were unsuccessful. No

analytical models relating these parameters could be found with what the author termed "an adequate correlation coefficient" (Lindenmann 2004).

The use of the smooth test tire for friction measurement in a network-level inventory program was summarized for the state of Indiana (Li et al. 2004). Indiana attempted to develop a uniform minimum friction requirement using the smooth tire by adjusting the NCHRP recommended minimum ribbed tire skid number by the average difference between ribbed and smooth tire values. This resulted in a minimum friction requirement of 20 when using the smooth tire (Li et al. 2004). An effort to correlate the mean network friction level to the percentage of wet accidents across the network failed to find a statistically significant relationship (Li et al. 2004).

A study was conducted in Maryland to develop policies to improve pavement surface characteristics (Chelliah et al. 2003). A major part of this effort was the development of empirical models to predict wet pavement accidents from the friction number. These models would be used in benefit-cost analyses by quantifying the expected reduction in wet accidents due to improving the pavement friction. Models were developed for various AADT ranges of and all wet accident data from 2001. The accident data was grouped into six classes based on the SN(64)R; the SN classes ranged from 35 to 60. The dependent variable for this model is the total number of wet accidents per year for roads in the AADT range.

2.9. Summary

The frictional properties of a pavement surface are dependent on its surface texture characteristics. Adequate microtexture and macrotexture are required for a pavement to exhibit high skid resistance at all speeds. The skidding resistance of pavements has been shown to vary due to seasonal efforts.

There are numerous devices available for measuring the skid resistance of highway pavements. These devices utilize four main approaches: side-force, fixed slip, variable slip, and locked wheel. The locked wheel approach using a ribbed test tire is the most

common approach in the United States, though the use of the smooth test tire has increased due to the inherent limitations of the ribbed tire.

The fact that motor vehicle crashes are more likely to occur on wet pavements has long been recognized and research into this field has been ongoing since the 1950s. Studies have shown that skid resistance data measured using the smooth test tire is better correlated to wet accident data. Much of this research has concluded that below certain friction levels on the pavement surface, the risk of wet accidents increases significantly. However, recent studies have been inconclusive. While some investigations have not found a statistically significant relationship between friction and wet accident rates; other studies have found a clear relationship between these variables.

Chapter 3
Data Collection and Pre-Processing

The process of quantifying the relationship between pavement friction and crashes for the state of Virginia required the collection of statewide data for both variables. However, much of this data was already maintained within different divisions in the Virginia Department of Transportation (VDOT), which provided the data for use in this research. After acquisition, the data needed to be processed into a form useful for analysis. This procedure is described in detail in this chapter.

3.1. Data Acquisition

The data needed for this research effort had already been collected and stored by VDOT. Crash data, based on police reports, from across the state is collected and stored annually. This crash data is summarized and used in the Virginia wet accident reduction program. Friction data is collected through the wet accident reduction program at sites with potential wet accident problems and at sites paved with SuperPave™ mixes. Network-level traffic data, in the form of average annual daily traffic (AADT), is also maintained by VDOT.

3.1.1. Crash Data

The accident data provided by VDOT contains data for 23,175 accident sites across the state for the year 2002. The data does not indicate the cause of the accidents. Some sites only had dry weather accidents, some only had wet weather accidents, and the other sites had accidents in both types of weather. Each site corresponds to a one-tenth of a mile section of a given route in a given direction. For each location, data is reported on the total number of wet accidents, total number of dry accidents, the type of wet or dry accident (fatal, injury, property damage), and the amount of property damage. A sample record for an accident site on Interstate 77 is shown in Table 3.1.

Table 3.1. Sample Record for I-77 Accident Site

Identification Data		Accident Data	
ID	1	Wet-Fatal-Accidents	0
Road System	1	Wet-NBR-Fatal	0
Wet-Sub-District	0	Wet-Injur-Accidents	0
Wet-District	1	Wet-NBR-Injur	0
Maint-Juris	10	Wet-Damage-Accidents	0
Residency	6	Wet-Damage-Amt	0
County	10	Wet-Total	0
City		Dry-Fatal-Accidents	0
Route-ID-Exit	IS-00077-N	Dry-NBR-Fatal	0
Direction	1	Dry-Injur-Accidents	1
MP	7	Dry-NBR-Injur	1
		Dry-Damage-Accidents	1
		Dry-Damage-AMT	3500
		Dry Total	1
		Total Accidents	1

NBR = Number of Fatalities/Injuries

AMT = Amount ($)

3.1.2. Traffic Data

In order to compute accident rates and examine the influence of traffic volumes on wet accident occurrence, traffic data for the state of Virginia was also required. This data was obtained from the Mobility Management division within VDOT. This data included both the AADT and the percentage of trucks between two mileposts along a given route. The traffic data was divided by route type into three tables: interstate, primary, and secondary. A sample record is shown in Table 3.2 for a portion of the Powhite Parkway in Richmond.

Table 3.2. Sample Record for Powhite Parkway Section

Identification Data		Traffic Data	
LinkID	40500	AADT	38000
Jurisdiction	127	AADT Quality	A
Route Prefix	IS	AAWDT	44000
Route Number	195	AAWDT QUALITY	A
Route Suffix	N	% 4-TIRE	97
Start Label		% BUS	0
Start Node	378492	% TRUCK 2-AXLE	1
Start Offset	0	% TRUCK 3-AXLE	0
End Label		% TRUCK 1-TRAIL	1
End Node	378628	% TRUCK 2-TRAIL	0
End Offset	0	Classification Quality	C
Start Milepost	0.48	K-Factor	0.156
End Milepost	1.27	K-Factor Quality	A
Functional Class	A		
Pavement	P		
HPMS Designation	-1		
NHS Designation	-1		
Data Type	2		
Route Alias			
Active Date	35431		
Inactive Date			

AADT = Average Annual Daily Traffic

AAWDT = Average Annual Weekday Traffic

K-Factor = Ratio of Design Hour Traffic to AADT

K-Factor quality = Designation of Statistical Quality of Data

3.1.3. Friction Data

VDOT also provided a database of skid resistance measurements. This database contains pavement friction data collected between 1987 and July 2003. These skid resistance measurements were made with a locked-wheel trailer using the smooth test tire at a slip speed of 64 km/h; in accordance with ASTM E 274. The database contains 245,816 records. Each record includes the skid number at a certain date for a certain milepost location along a route. In the database, there are measurements reported from multiple dates for some locations. The friction data provided includes information for sites which are part of the wet accident reduction program as well as friction measurements for SuperPave™ sites across the state, which have not been identified as having wet accident problems. A skid project code is used to indicate whether the measurement was made as part of the wet accident reduction program (1= Inventory

Site, 2 = Accident Reduction Program Site). A sample record for a site on I-66 in Fauquier County is shown in Table 3.3.

Table 3.3. Sample Data from Skid Resistance Database

Jurisdiction	30
Route ID	IS00066W
County MP	10050
Route MP	24880
Date Rated	871027
Lane Number	1
Lane Direction	W
Lane Type	
Skid Data Type	0
Skid Number	55
Skid Project Code	1

3.2. Data Pre-Processing

The friction, crash, and traffic data all originated from different sources within VDOT and were not stored using consistent referencing methods. The crash data was referenced by county mileposts, while the traffic data was referenced by route mileposts; the friction data had both county and route milepost references. Thus, the data needed significant pre-processing prior to performing the analysis. This pre-processing involved filtering the friction data to include only valid measurements and aggregating each type of data into consistent sections one-mile in length. At that point, the three types of data could be linked and the analysis performed.

3.2.1. Filtering and Aggregating Data

The first step in processing the friction data was filtering out all measurements collected prior to the year 2000. This was intended to exclude older skid measurements, which may no longer be valid due to resurfacing or other rehabilitation, from the analysis.

For the skid data, there were typically numerous measurements for each one-mile segment. To aggregate this data and select the value used for analysis, two steps were required. First, for each location where multiple measurements had been taken since

the year 2000, the most recent skid value was selected. Then, over the entire one-mile section, the minimum skid number from among those most recent values was selected for use in the analysis. The use of the minimum skid number is valid since this is the critical location within a section where the friction is lowest and the potential for a skidding accident should be highest. The minimum skid number was also found to have a better correlation with accident statistics in the Puerto Rico study reported earlier (Gandhi et al. 1991). Table 3.4 shows an example of how the friction data was filtered and aggregated into one-mile sections.

Table 3.4. Friction Data Pre-Processing

Original Data	Site ID	Milepost	Date Rated	SN(64)S
	1	110	6/8/2000	26
	1	110	4/6/2002	33
	1	110	7/10/2001	34
	2	110	5/8/2002	41
	3	110	6/14/2002	25
Data Filtering	Site ID	Milepost	Date Rated	SN(64)S
	1	110	4/6/2002	33
	2	110	5/8/2002	41
	3	110	6/14/2002	25
	Select most recent measurement at each location.			
Data Aggregation	Site ID	Milepost	Date Rated	SN(64)S
	3	110	6/14/2002	25
	Select minimum friction value for Milepost 110.			

The accident data provided by VDOT defined each accident site by a 0.1 mile segment; in order to aggregate the data for analysis, these 160 m segments had to be combined into larger one-mile sections and the total number of wet and dry accidents for each section had to be computed. Aggregating the accident data involved defining the corresponding one-mile section for each tenth of a mile segment recorded in the data and summing the accident data across those sections. Table 3. 5 shows the aggregated crash data for one-mile of U.S. Route 60 in Henrico County; for this site, 10 total accidents were recorded in 2002.

Table 3. 5. Aggregated Crash Data for U.S. Route 60 (Henrico County)

County	43
Route ID Ext	US-00060
Dir	4
Sum Of Wet-Damag-AMT	13525
Sum Of Wet-Total	2
Sum Of Dry-Damag-Amt	37100
Sum Of Dry-Total	8
Sum Of Total-Accid	10
County Milepost	4

The sections within the traffic data were clearly demarcated by starting and ending mileposts. These sections were typically longer than one-mile, so the traffic data did not have to be aggregated into new sections. The appropriate traffic data could be extracted for each site by comparing the site location to the starting and ending points for the traffic sections.

3.2.2. Linking Data

Once all the data had been aggregated into one-mile sections, an identification scheme needed to be devised in order to link the three data types. This was made somewhat difficult due to the manner in which the data was recorded. The accident data was referenced by county milepost, the traffic data by route milepost, and the skid data was referenced by both county and route mileposts. This fact meant that the friction data had to be linked separately to the traffic and crash data before analysis could be performed.

The final procedure selected to generate unique identifiers for each crash site involved combining unique route identification numbers generated for this study (see Appendix B), VDOT county identification numbers, travel direction, and mileposts. The traffic data was first linked to the friction data using route mileposts. A similar procedure, using county mileposts instead of route mileposts, was used to create a second set of unique site IDs linking the accident and friction data. Table 3.6 shows the procedure used to develop the site IDs which were used to link the crash and friction data.

Table 3.6. Development of Unique Site IDs for Crash and Friction Data

Category	Base Data	Factor	Base x Factor
County	43	10000	43000
Route ID Ext	US-00060	NA	-
County Milepost	4	1	4
Route ID (New)	149000000	1	149000000
Prelim Site ID			149043004
Dir	4 (west)	125000	500000
Final Site ID			**149543004**

After the two sets of site identifiers were generated in Microsoft Excel, the aggregated data was transferred to a Microsoft Access database and relationships were created between the tables for friction, crash, and traffic data. The database structure used is shown in Figure 3.1.

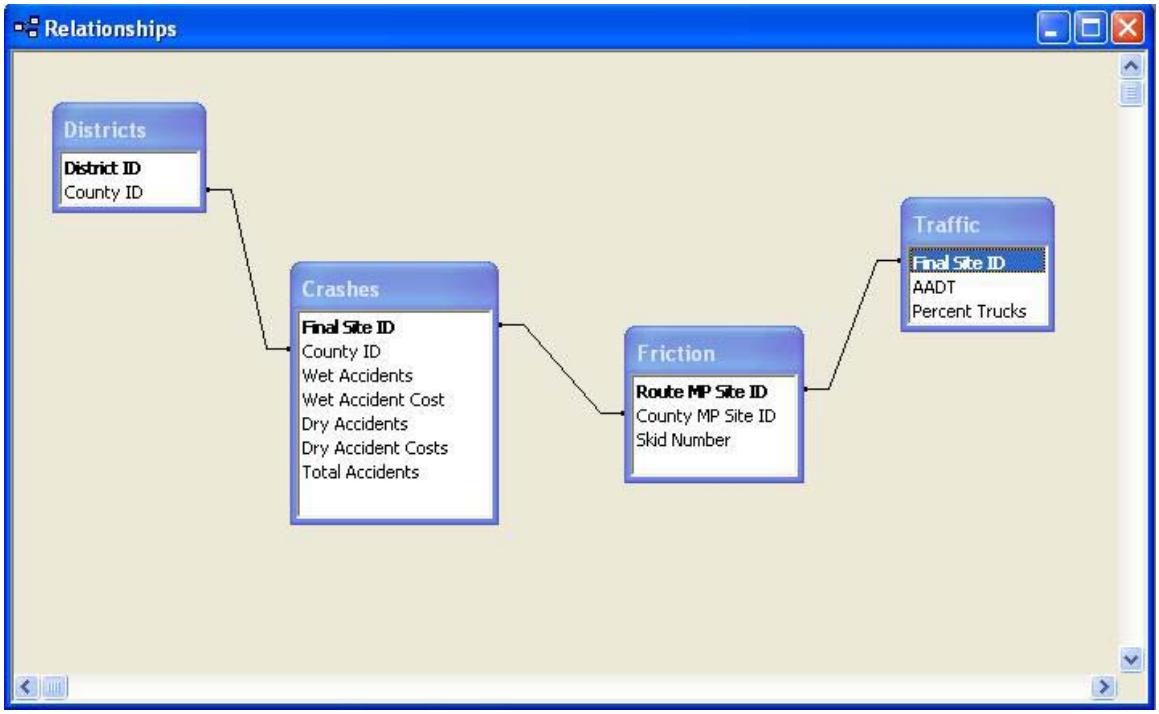

Figure 3.1. Accident, Friction, and Traffic Database Structure

A simple database query was then used to match the crash data to the skid number and AADT for each one-mile section. The query results were exported to Microsoft Excel so

further analysis could be performed. The result of this pre-processing was a new dataset containing 3243 records, each with crash, friction, and traffic data.

The final step in the data processing stage was generating accident rates based on the accident totals and AADT. Both the total accident rate per 10 million vehicle-miles traveled (VMT) and the wet accident rate per 10 million VMT were computed for each site. This was accomplished by determining the annual VMT for each site based on the AADT and normalizing the accident rates. Since the sites are one-mile long, the daily VMT for each site is equivalent to the AADT. The equation used to calculate the wet accident rate is shown below:

$$Wet\ Accident\ Rate\,(per\,10^7\ VMT) = \frac{\#\ of\ Wet\ Accidents}{AADT * 365}\left(10^7\right)$$

Chapter 4
Data Analysis and Results

This chapter details the analysis of the Virginia friction, crash, and traffic data which was acquired and pre-processed as described in Chapter 3. The major variables which will be discussed are the friction or skid number measured at 64 km/h (40 mph) with the smooth tire, reported as SN(64)S; the wet accident rate per 10 million VMT, reported as WAR(10^7); and the AADT.

4.1 Base Data

Prior to exploring the relationships between the friction, crash, and traffic data, it is necessary to examine the data independently to ensure that the data covers a wide range of scenarios and is not biased to certain types of sites.

4.1.1. Friction Data

The friction data should include sites with poor friction as well as sites with good friction and would preferably exhibit a normal distribution. Descriptive statistics were computed and a histogram was generated to examine this data. The mean of the skid numbers for these 1-mile sections is 37.9. The standard deviation is 8.42. The friction numbers range from 4 to 68. Figure 4.1 shows a histogram of the skid resistance data after aggregating the data into 3243 one-mile sections. For each section, the lowest skid resistance value was selected. There is a clear bell shape distribution to the friction data, though, with approximately 20 percent of the sections having a minimum skid number below 30. There appears to be a wide range of skid numbers to be considered in the analysis. Within the friction data there appears to be a scarcity of sites with good skid resistance performance. This could be attributed to the procedure used to collect skid data, in which only sites identified as potential accident trouble spots or those paved using SuperPave™ mixes are tested for their resistance to skidding.

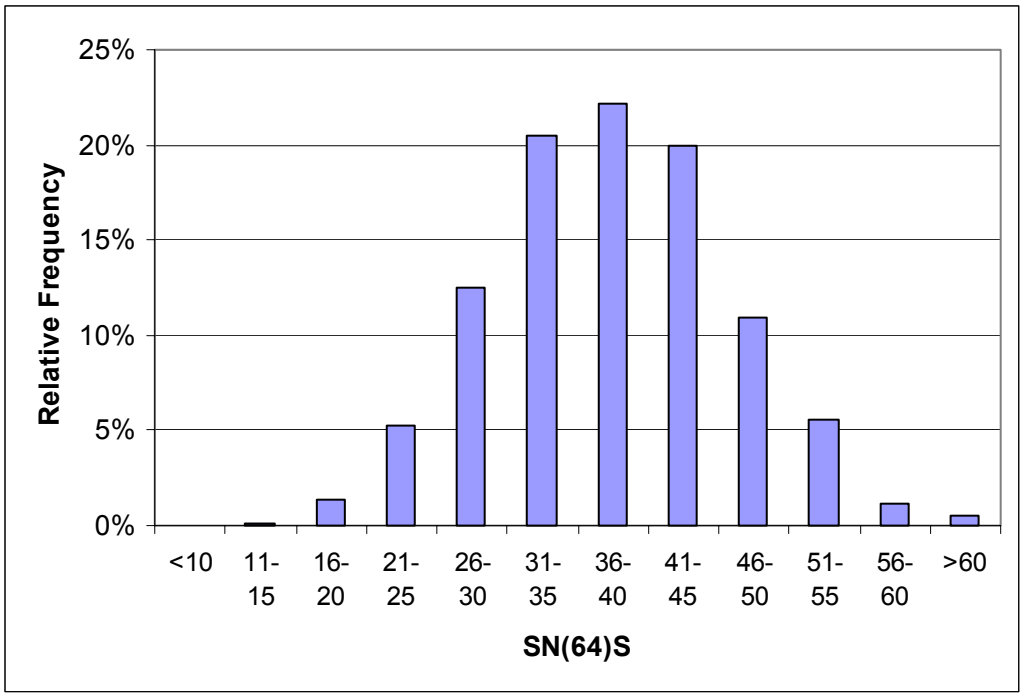

Figure 4.1. Histogram of Friction Data

4.1.2. Crash Data

A primary issue in examining the crash data prior to any analysis is to ensure that the data represents a wide range of accident rates; specifically, it is important that sites with low wet accident rates, or sites with no wet accidents at all, are considered in the analysis. If only sites with a wet accident problem and high wet accident rates are considered, then any relationships found cannot be assumed to be valid for all types of sites. In this data set, 1728, or 53 percent, of the 3243 sites actually had no wet weather accidents in 2002. Clearly, this is sufficient to ensure that the data set is not biased toward sites with wet accident problems.

Further analysis was performed on the crash data to determine the total number of accidents across the study sites, the overall percentage of wet accidents, and the overall property damage due to these accidents. A total of 22,232 accidents occurred at the study sites. Table 4.1 shows a breakdown of accidents at the study sites by severity and weather condition. As has been reported elsewhere (Henry 2000), the percentage of

fatal accidents which occur in wet weather is less than the overall percentage of accidents which occur in wet weather.

Table 4.1. Accidents by Severity and Weather Conditions

Accident Category	Total Wet	Total Dry	% Wet
Fatal	18	128	12.3
Injury	1434	6951	17.1
Total	3842	18390	17.3

The total property damage for the accidents at the study sites is approximately $113 million. Table 4.2 contains information about the total economic impact, in terms of property damage only, of the accidents. The average costs of each accident type are also presented.

Table 4.2. Economic Impact of Accidents at Study Sites

	Wet Accidents	Dry Accidents
Total Cost ($1,000,000s)	18.6	94.3
Average Cost ($1000s)	4.84	5.13

The overall wet accident rate for the 3243 sites was calculated to be 1.83 wet accidents per 10 million VMT. This was determined by computing the total VMT across all the sites and dividing the total of wet accidents by that number. Over 31 percent of the study sites have wet accident rates higher than the overall wet accident rate. For comparison, the overall accident rate for the study sites is 10.6 accidents per 10 million VMT. Nearly 45 percent of the study sites have an accident rate higher than the overall total accident rate.

4.1.3. Traffic Data

Prior to any analysis, it was necessary to verify that the distribution of the AADT for the study sites is similar to the overall traffic distribution across the state. This will ensure that the overall relationships are not biased towards certain traffic conditions and make for a stronger analysis of statewide conditions. The distribution of the traffic data was

checked by generating a histogram of the AADT values for the study sites; a histogram was also generated for the entire traffic dataset provided by VDOT as the basis for comparison. These two distributions are presented in Figure 4.2.

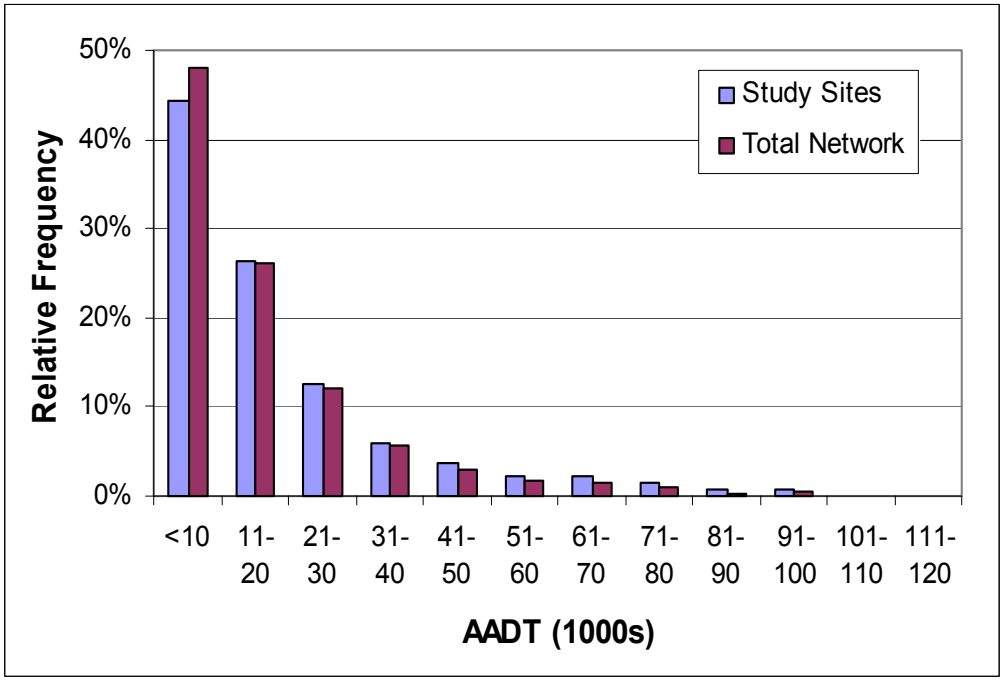

Figure 4.2. Distribution of AADT for Study Site and Virginia Network

Figure 4.2 shows that the traffic distribution for the sites in this study matches very closely the distribution for statewide traffic data. This indicates that the study sites represent a sample of the network with regards to traffic conditions.

4.2 Statistical Analysis Considering All Sites

The primary analysis of the data involved a series of statistical tests in order to quantify the relationship between friction, traffic, and wet accident rates. Linear regression and comparison tests were the core of the statistical analysis.

4.2.1. Linear Regression

Prior to attempting the regression analysis, the variables were plotted against each other to observe general trends and to assist in formulating the best models for the regression. Figure 4.3 shows a plot of the wet accident rate versus skid number for all 3243 sites. The figure shows a great deal of scatter, but also a slight trend of decreasing wet accident rates with increasing skid number.

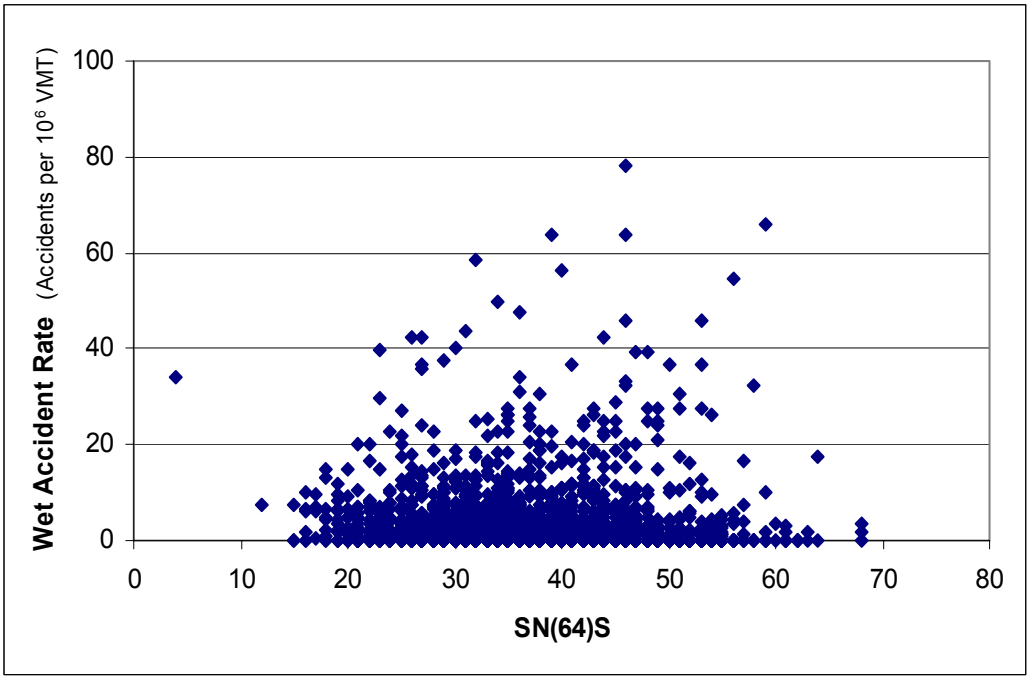

Figure 4.3. Wet Accident Rate versus Skid Number (All Sites)

The wet accident rate for each site versus the AADT is shown in Figure 4.4. This plot indicates a fairly good relationship between these variables, with the wet accident rate decreasing with increasing traffic. It must be noted that the wet accident rates were computed using the AADT values; this partially explains the quality of the trend, particularly for sections with very low traffic.

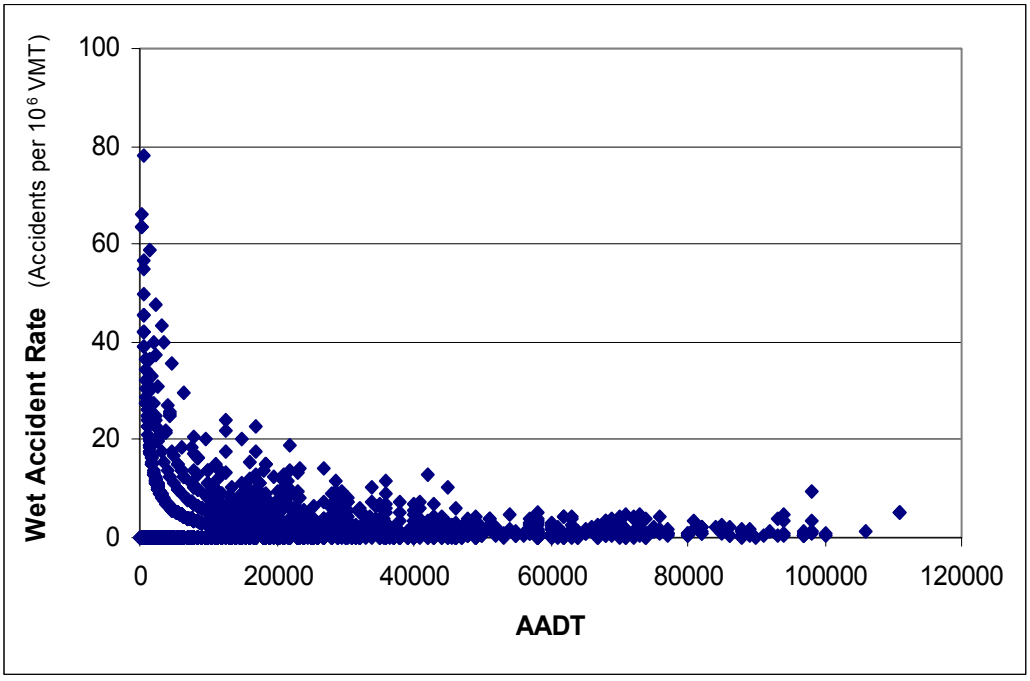

Figure 4.4. Wet Accident Rate versus AADT (All Sites)

The measured skid numbers are plotted against the AADT for the study sites in Figure 4.5. The data shows that almost all of the sites with very good friction (skid numbers greater than 50) have lower levels of traffic. Additionally, the sites with traffic levels above 50000 vehicles per day tend to have friction numbers below 40. This could indicate that the higher levels of traffic lead to more aggregate polishing and reduce the skidding resistance potential of those roads. This could also be another result of the procedure used to the collect the friction data; roads with high traffic and good friction performance simply may not be tested and thus are underrepresented in the study.

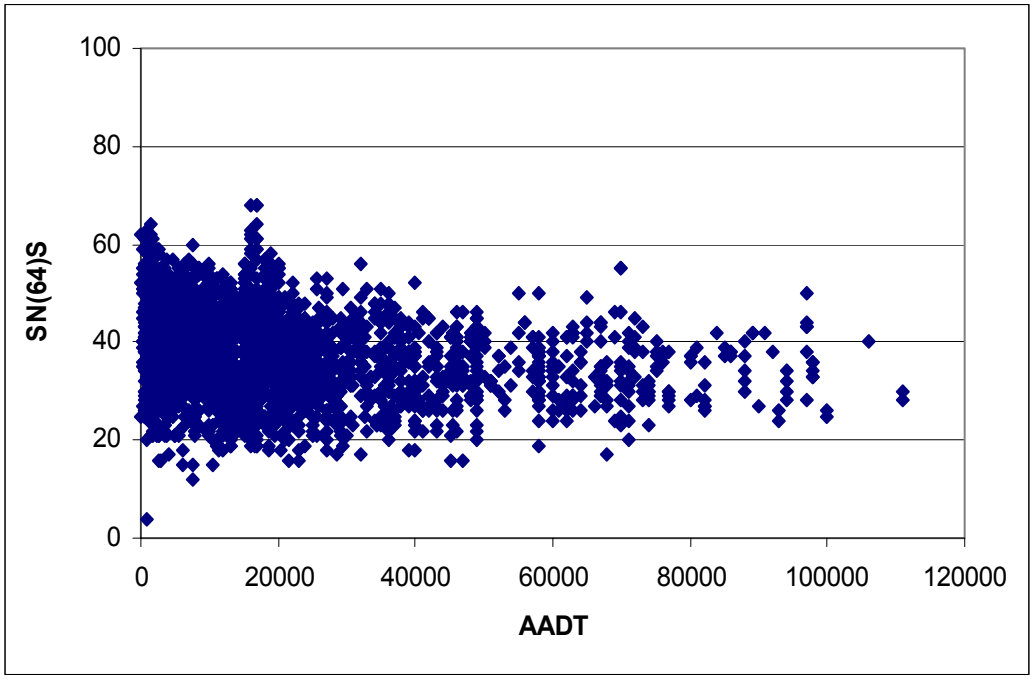

Figure 4.5. Friction Levels versus AADT

Regression analyses, using the SAS System, were conducted to determine if the trends observed in Figures 4.3 and 4.4 were statistically significant. The first regression was intended to model the relationship between the skid number and the wet accident rate. A linear model with friction as the independent variable was found to be the best fit. The results are presented in the first column of Table 4.3.

Table 4.3. Regression Results: Independent Variable = SN(64)S

Dependent Variable	Wet Accident Rate	Wet/Total
F Value	11.92	9.02
Pr > F	0.0006	0.0027
R^2	0.0037	0.0039
SN(64)S Coefficient	-0.07737 (skid)	-0.00154
t-value	-3.45	-3.00
Pr > |t|	0.0006	0.0027
Full Model	WAR = 5.8 – 0.077*SN(64)S	Wet / Total = 0.227 – 0.0015*SN(64)S

As indicated in the table, the r-squared value for this model is quite low, meaning that only a small percentage of the variation in the wet accident rate can be explained by the

skid number alone. This is expected because the skid number is only one of the numerous factors which contribute to wet accidents. The important result is that the coefficient for the skid number is in fact negative and is significant at a 0.05 level of significance. This verifies that the wet accident rate does in fact statistically decrease with increasing skid numbers.

In addition to the wet accident rate per 10 million VMT, another dependent variable, the ratio of wet accidents to total accidents, was also considered. Again, a linear model with SN40S as the independent variable was found to be the best fit. The results of this regression are presented in the second column of Table 4.3. The results are quite similar to the model using the wet accident rate as the dependent variable; again, the friction data explains only a small portion of the variation in the wet accident data. However, the regression does show that the ratio of wet accidents to total accidents decreases with increasing pavement friction.

The next regression analysis was intended to quantify the relationship between the AADT and the wet accident rate. In this case, the natural log of the wet accident rate was used as the dependent variable and AADT was the independent variable. This combination of variables actually had a lower r-squared value than a model using the natural log of the AADT as the independent variable. However, the residuals for that model did not exhibit a good distribution. This led to the selection of first model. The results presented in Table 4.4 indicate that the traffic alone explains around 30 percent of the variation in the wet accident rate. Additionally, the trend, which shows decreasing wet accident rate for higher levels of traffic, is shown to be statistically significant.

Table 4.4. Regression Results: Independent Variable = AADT

Dependent Variable	Wet Accident Rate
F Value	645.53
Pr > F	<0.0001
R^2	0.2991
AADT Coefficient	-0.00002470 (AADT)
t-value	-25.41
Pr > |t|	<0.0001
Full Model	Ln(WAR) = 1.96 – 0.0000247*AADT

The final regression analysis performed for this portion of the study involved creating a multiple regression model based on both surface friction and traffic. The model selected used the natural log of the wet accident rate as the dependent variable and SN(64)S and AADT as independent variables. The results in Table 4.5 show that both SN(64)S and AADT are statistically significant terms in the model. Both independent variables have negative coefficients, further reinforcing the findings from the individual models. This combined model has an r-squared value of 0.3122. Again, this low r-squared value is to be expected when a number of possible contributing factors to wet accidents are not present in the model and because of the scatter in the large number of data points.

Table 4.5. Regression Results: Independent Variables = SN(64)S & AADT

Dependent Variable	Wet Accident Rate
F Value	343.09
Pr > F	<0.0001
R^2	0.3122
SN(64)S Coefficient	-0.01492
t-value	-5.37
Pr > t	<0.0001
AADT Coefficient	-0.00002605 (AADT)
t-value	-26.16
Pr > t	<0.0001
Full Model	WAR = 2.54 – 0.01492*SN(64)S – 0.000026*AADT

The results of the regression analyses indicate that there is a significant effect of skid resistance on wet accident rate; the wet accident rate decreases with increasing skid resistance. However, skid resistance alone does a poor job of modeling the variability in the wet accident rates.

These regression analyses also showed that a statistically significant relationship exists between the wet accident rate and AADT. This relationship is interesting in that the accident rate only tends to decrease with increasing traffic. Previous studies of the variability of accident rates with traffic have often found a U-shaped relationship, with accident rates decreasing initially with increasing traffic levels, reaching a minimum value, and then increasing at higher traffic levels (Persaud 2001).

One significant issue with the dataset used in this analysis is an overall lack of skid resistance data for roads with good friction performance. The state of Virginia's current procedure for measuring skid resistance is to identify sites with more than 3 wet accidents during a year, and test the skid resistance of these sites as part of the wet accident reduction program. In addition, VDOT also collects data for a limited number of sections for purposes other than the wet accident reduction program. For example, the state also conducts skid resistance tests on sections of highway paved with SuperPave™ mixes. This means that many of the roadway sections which do not have a potential wet accident problem are not routinely tested for skidding resistance. The procedure used in this study was to take VDOT's existing skid resistance database included sections not in the and a summary database of 2002 accidents and match the skid numbers to those 2002 accident sites. This means that this study includes many sites without wet accident problems. However, the number of sections in the "good" side of the skid number spectrum is somewhat limited. This tends to leave a gap in the data where high skid, low accident sites would fall. This gap can be observed in Figure 4.3 for sites with skid numbers greater than 50.

This issue at least partially explains the poorness of the fit for the models attempting to relate skid resistance to the wet accident rate. In the dataset used in the regression analysis, sites with good skid but high wet accident rates are overrepresented and this certainly could have affected the quality of the model developed in this research.

4.2.2. Comparison Tests

The next step in the statistical analysis was to perform a series of comparison tests on the means from different groups of data. These comparison tests were used to consider if the wet accident rate increased below certain friction levels. Four potential breakpoints, at skid numbers of 25, 30, 35, and 40 were chosen. For each breakpoint, two means were computed; one mean wet accident rate was found for all sites with skid numbers greater than the breakpoint and another mean accident rate was calculated for all sites with skid numbers less than the breakpoint. These means are compared in Figure 4.6.

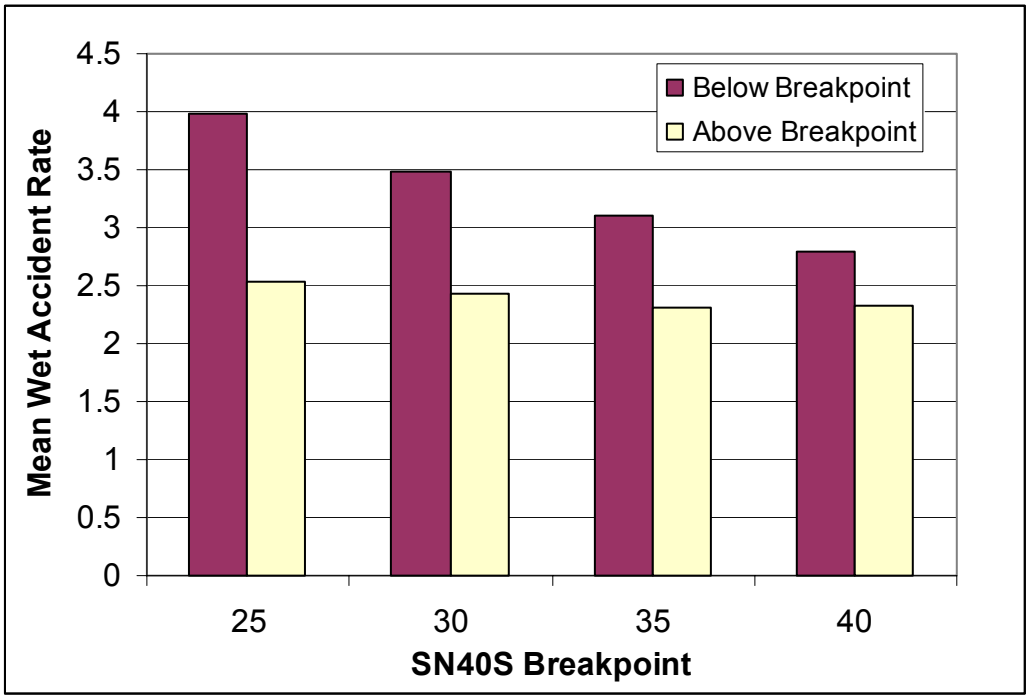

Figure 4.6. Mean Wet Accident Rates at Friction Breakpoints

Those two means were then compared using t-tests to determine if the difference in the means were statistically significant. The results of these comparison tests are shown in Table 4.6.

Table 4.6. T-Test Results: Mean Wet Accident Rate

Statistic	SN(64)S		SN(64)S		SN(64)S		SN(64)S	
	<25	>25	< 30	>30	<35	>35	< 40	>40
Mean WAR	3.976	2.532	3.488	2.424	3.105	2.316	2.792	2.328
Variance	36.54	36.44	35.49	36.61	32.27	39.13	31.71	44.34
t-stat	3.399		3.989		3.715		1.965	
Pr > t	0.0007		<0.0001		0.0002		0.0495	

The results of the comparison tests include several interesting facts:

- On average, sites with skid numbers of 25 and below had a wet accident rate 57 percent higher than sites with skid numbers greater than 25. Essentially, those sites with very low skid have on average 1.4 more accidents per 10 million VMT than sites with skid numbers greater than 25.
- Sites with skid numbers of 30 and below had a wet accident rate 44 percent higher than sites with skid numbers greater than 30.
- Sites with skid numbers 35 and below had an average wet accident rate 34 percent higher than sites with a skid number above 35.
- Those sites with a skid number less than or equal to 40 have a wet accident rate 10% higher on average than sites with skid numbers greater than 40. However, the t-test using 40 as the skid number breakpoint barely passes the significance test at a 0.05 level of significance and should probably be further investigated to validate that the means are in fact different.

Additionally, t-tests were performed on the mean ratio of wet accidents to total accidents at skid number breakpoints of 25, 30, 35, and 40. These tests showed that wet accidents, on average, account for 19.9% of all accidents at sites with skid numbers less than 25 but only 16.6% of all accidents at sites with skid numbers greater than 25. The results also show that wet accidents represent 18.7% of all accidents at sites with skid numbers less than or equal to 30. Wet accidents account for 16.3% of accidents at sites with skid numbers greater than 30. The difference between these means is significant at an alpha level of 0.05. The tests for skid numbers of 35 and 40 showed that there was not a significant difference between the percentage of wet accidents above and below those breakpoints. The results of these comparison tests are shown in Table 4.7.

Table 4.7. T-Test Results: Mean Ratio of Wet to Total Accidents

Statistic	SN(64)S		SN(64)S		SN(64)S		SN(64)S	
	<25	>25	< 30	>30	<35	>35	< 40	>40
Mean Wet/Total	0.199	0.166	0.187	0.163	0.178	0.161	0.171	0.163
Variance	0.056	0.069	0.051	0.072	0.053	0.078	0.057	0.086
t-stat	1.979		2.055		1.816		0.782	
Pr > t	0.025		0.020		0.069		0.217	

4.3 Statistical Analysis Considering Only Interstate Sites

After examining the relationships between friction, accidents, and traffic for all 3243 sites in the dataset, the results showed that despite a statistically significant relationship between them, friction alone could explain little of the variability in the wet accident rates. The next step in the analysis involved filtering the dataset to select sites which should have similar geometric design standards and a more narrow range of traffic volumes. This filtering was intended to limit some of the variability in the test sites to see if this could improve the relationship between friction and the wet accident rate. Due to the nature of the data, and the lack of general information about each site, the best way to proceed with this was to select all the sites from the study which were located on interstate highways.

Of the 3243 one-mile sections used in the study, 1240, or 38 percent, are sections from interstates. The average skid number for these sites was 37.4; this is slightly lower than the average skid number for the full set of data. The standard deviation is 8.16 and the skid numbers range from 16 to 68. A histogram of the skid values for this set of interstate sites is shown in Figure 4.7. Also shown is the histogram from the entire set of data. This figure shows that there are relatively fewer sites with skid numbers greater than 50 in the interstate data. Overall, though, the histograms are fairly similar, and the data for the interstates shows an approximate normal distribution.

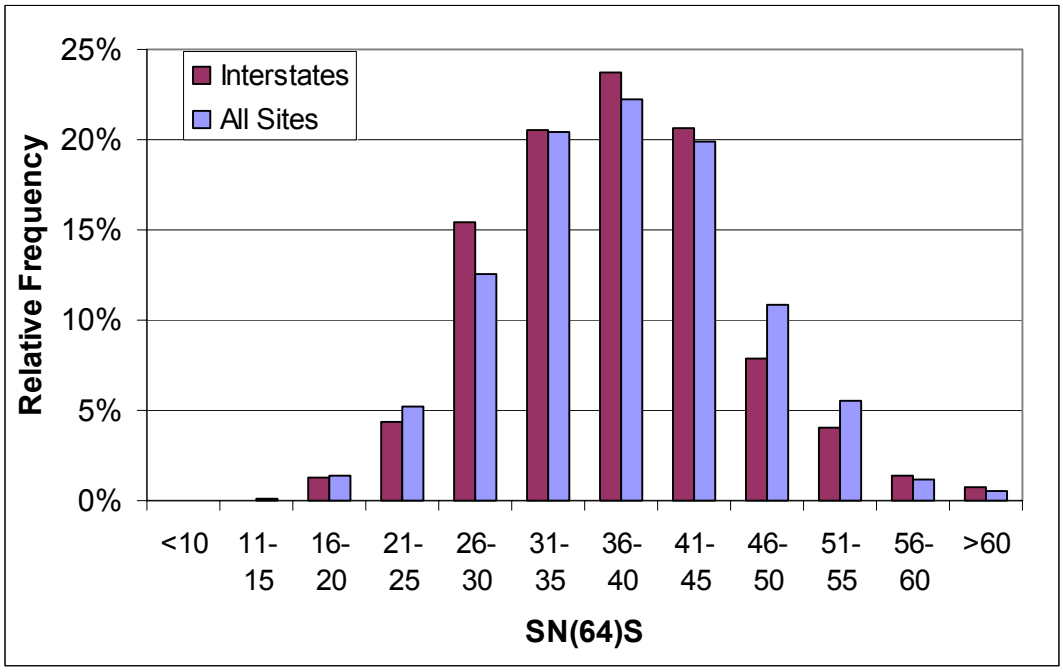

Figure 4.7. Histogram of Friction Data for Interstates and All Sites

The distribution of traffic for the interstate sites is shown in Figure 4.8. Over 55 percent of the sites have average daily traffic between 20000 and 40000 vehicles. As expected, very few sites see less than 10000 vehicles per day. This is in stark contrast to the full set of sites, where 45 percent of the sites an AADT less 10000.

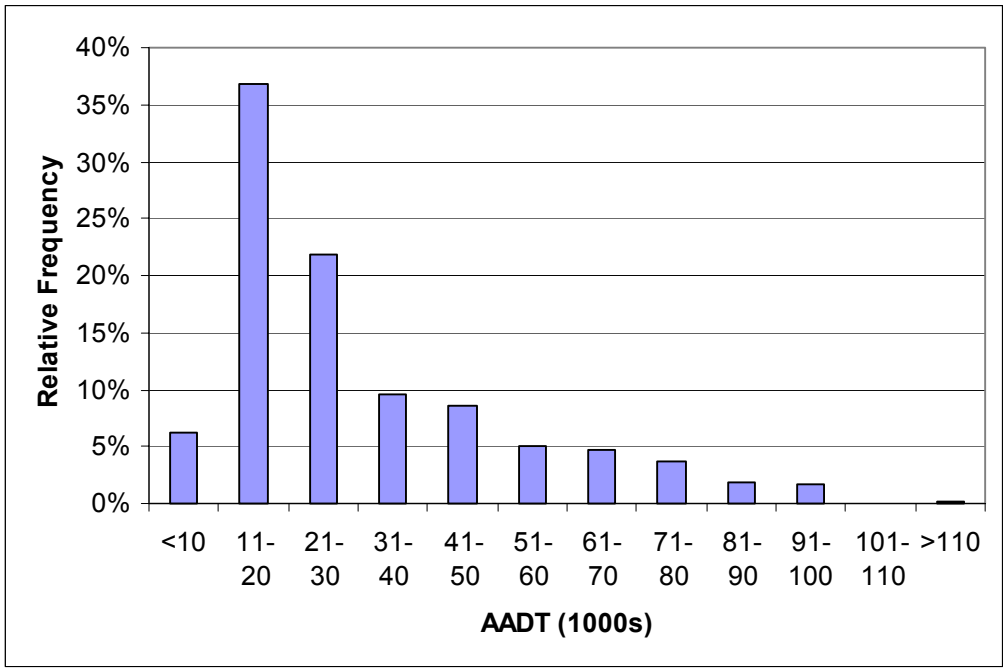

Figure 4.8. AADT Distribution for Interstate Sites

Across the 1240 interstate sites, 11750 total accidents occurred. Of that total, 15.5 percent, or 1821 accidents, occurred in wet conditions. The overall wet accident rate for these interstate sites was 1.30 wet accidents per 10 million VMT. This is 29 percent lower than the overall wet accident rate for the full dataset. This section has provided some insight into the difference between the interstate sites and all the study sites. The following section will discuss the analysis performed on this subset of the data.

4.3.1. Linear Regression

As was the case for the full data set, the first type of analysis performed on the interstate data was regression analysis. Prior to the analysis, the variables were all plotted against each other as a guide for developing the models to be tested. Figure 4.9 shows a plot of the wet accident rate versus skid number for the interstate sites. Much like for the full dataset, a slight trend of decreasing wet accident rate with increasing skid number can be observed from the data.

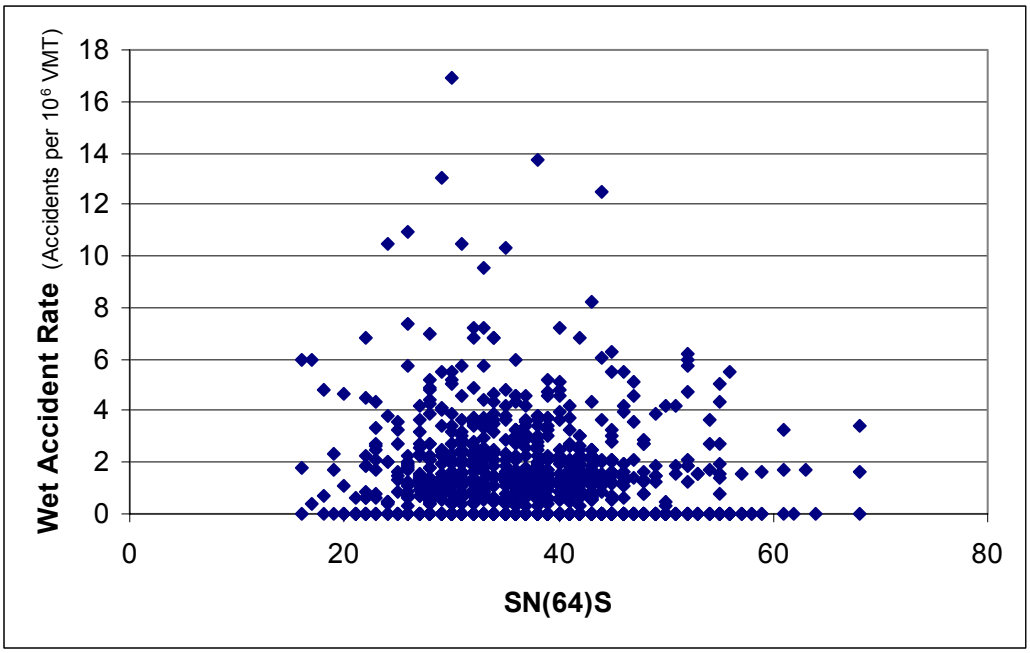

Figure 4.9. Wet Accident Rate versus Friction for Interstate Sites

The plots of the wet accident rate and AADT for the interstate sites and the skid number and AADT were both very similar to the plots generated for the full set of sites. The wet accident rate again appears to decrease with increasing AADT; also, the only trend apparent in the plot of skid number versus AADT was the majority of sites with high skid numbers having relatively low traffic levels.

Independent relationships were first developed between the friction and traffic data and the wet accident rate. The results of these three regression analyses can be found in Table 4.8. The natural log of the wet accident rate was used as the dependent variable for the model involving only the AADT.

Table 4.8. Regression Results for Interstate Sites

Dependent Variable	**WAR**	**Ln(WAR)**
Independent Variable	**SN(64)S**	**AADT**
F Value	17.38	83.33
Pr > F	<0.0001	<0.0001
R-Square	0.0138	0.1126
Parameter Coefficient	-0.02498	-0.00000988
t-value	-4.17	-9.13
Pr > t	< 0.0001	< 0.0001
Full Model	WAR = 2.1 – 0.025*SN(64)S	Ln (WAR) = 0.91– 0.0000098*AADT

The primary result of the regression is that there is a statistically significant relationship between friction and the wet accident rate. The negative coefficient for the skid number shows that, generally, as the skid number increases, the wet accident rate decreases. This model, like the model for the full dataset, has a low r-squared value, indicating that friction alone cannot fully explain the variation in the wet accident rate. However, the r-squared is over three times greater for this model than the same model for all the accident sites; thus, by selecting sites with similar geometric characteristics, more of the variation in wet accident rates can be explained by changes in the skid number.

For the interstate sites, the model generated using the AADT as the independent variable explains much less of the variation in the wet accident rate than the same model did for all the accident sites.

4.3.2. Comparison Tests

As with the full dataset, a series of comparison tests were carried out using the interstate sites. The same set of breakpoints, 25, 30, 35, and 40, within the skid numbers were chosen for the analysis. The mean wet accident rates above and below each breakpoint are presented in Figure 4.10.

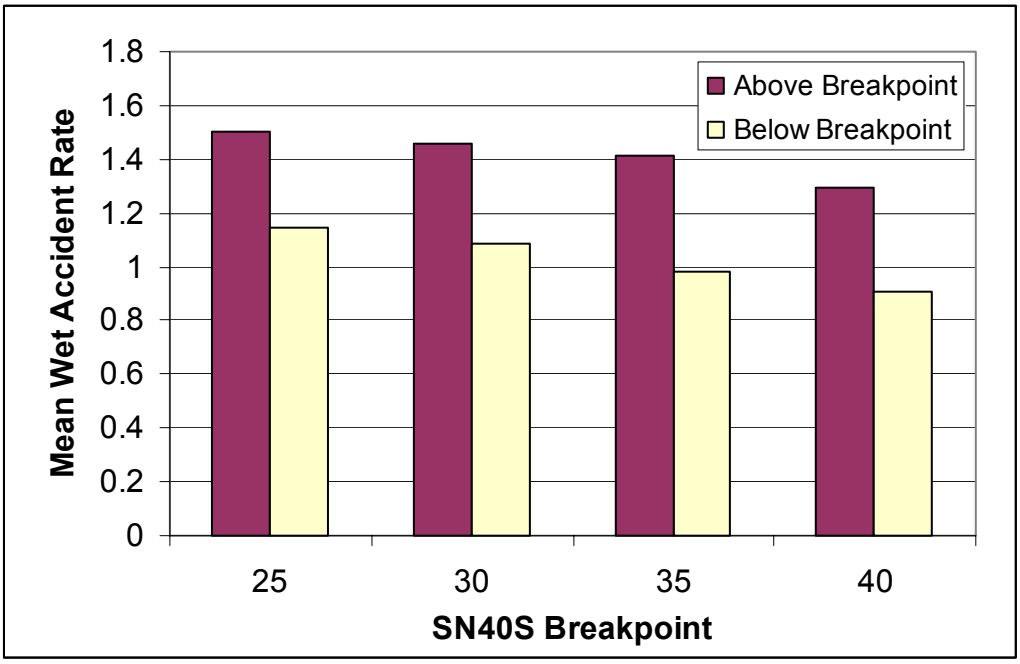

Figure 4.10. Mean Wet Accident Rates for Comparison Tests

The figure shows a fairly consistent difference between the means for each breakpoint. T-tests were then used to test the statistical significance of those means. The results of those t-tests are presented in Table 4.9.

Table 4.9. T-Test Results: Interstate Sites

Statistic	SN(64)S		SN(64)S		SN(64)S		SN(64)S	
	<25	>25	< 30	>30	<35	>35	< 40	>40
Mean WAR	1.503	1.142	1.459	1.083	1.414	0.983	1.296	0.910
Variance	4.11	2.93	4.53	2.57	3.90	2.29	3.37	2.21
t-stat	1.695		3.127		4.352		3.755	
Pr > t	0.045		0.0009		<0.0001		<0.0001	

The results in Table 4.9 show that the difference between the means was statistically significant for each breakpoint in the friction data. For a friction number breakpoint of 25, the significance test is barely passed. This is a function of relatively few degrees of freedom in that test. The number of sites with skid numbers less than 25 was very low which increased the uncertainty in that mean. Overall, these results further illustrate that

the wet accident rate decreases with increasing skid numbers. This relationship seems to be stronger for the interstate sites than for the full dataset since even at a skid number breakpoint of 40, the mean wet accident rates are clearly statistically different. In fact, at this point, the mean wet accident rate for sites with skid numbers less than 40 is 43 percent higher than the wet accident rate for sites with skid numbers greater than 40.

The results of the analysis conducted after filtering the data and analyzing a subset of the accident sites, were consistent with those obtained analyzing the full data set. It was shown again that as the skid number increases, the wet accident rate tends to decrease. This relationship is not very strong when considering one-mile accident sites, but is quite clear when comparing wet accident rates across ranges of skid numbers. Sites with higher skid resistance lead to significantly lower wet accident rates. For the interstate sites, it appears that, at the least, significant reductions in the wet accident rate can be expected for skid numbers up to 40.

4.4 Analysis of Trends by VDOT District

After exploring the relationship between pavement surface friction and wet accident rates for a set of accident sites and verifying that there is in fact a statistically significant relationship between those variables, the data was further analyzed by grouping the friction and accident data by geographic regions. This analysis would explore whether the overall ratio of wet to total accidents varies across the districts, and if that variation can be explained by differences in the average skid resistance in those districts. The district average skid resistance was computed based on the minimum skid number for each one-mile site. VDOT has established nine geographic districts for its operation; those districts were used as the basis of this portion of the analysis.

First, the ratio of wet accidents to total accidents was computed for each of the 9 VDOT districts. The percentage of wet accidents in each VDOT district is shown in Figure 4.11.

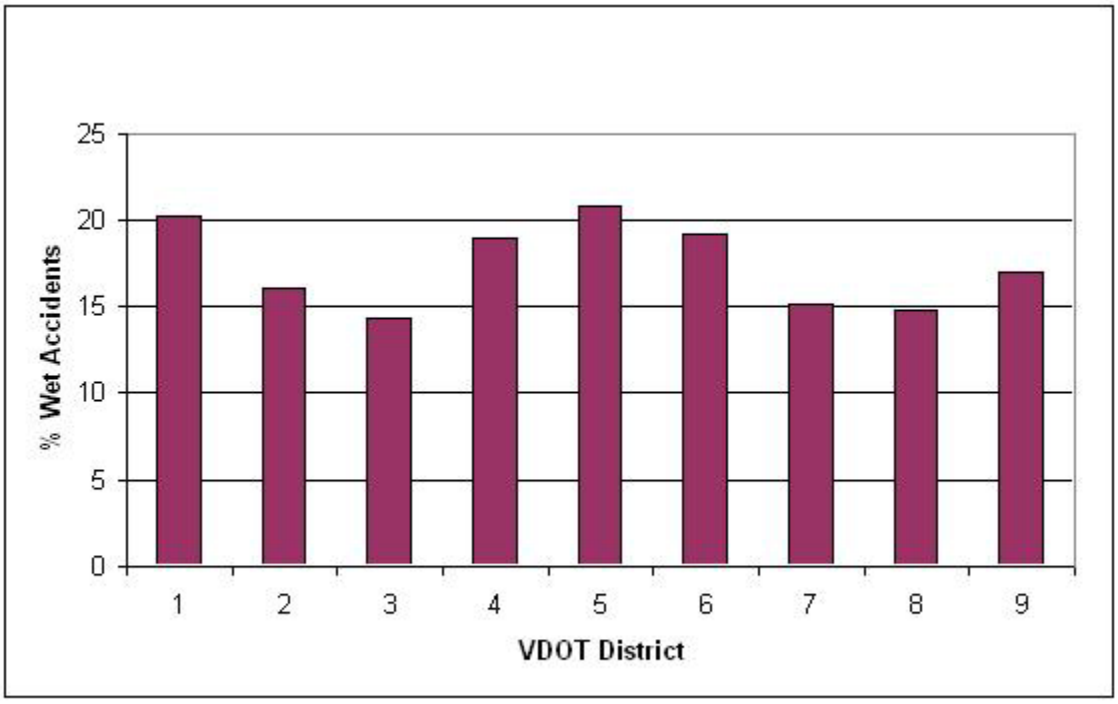

Figure 4.11. Ratio of Wet to Total Accidents for VDOT Districts

The figure shows that districts 1, 4, 5, and 6 appear to have a higher percentage of wet accidents than the other districts. The 1st district is in the far southwest corner of the state, while the 4th, 5th, and 6th districts are found in eastern half of the state. Next, the average skid number was computed for the sites from each of the nine VDOT districts; the results are shown in Figure 4.12.

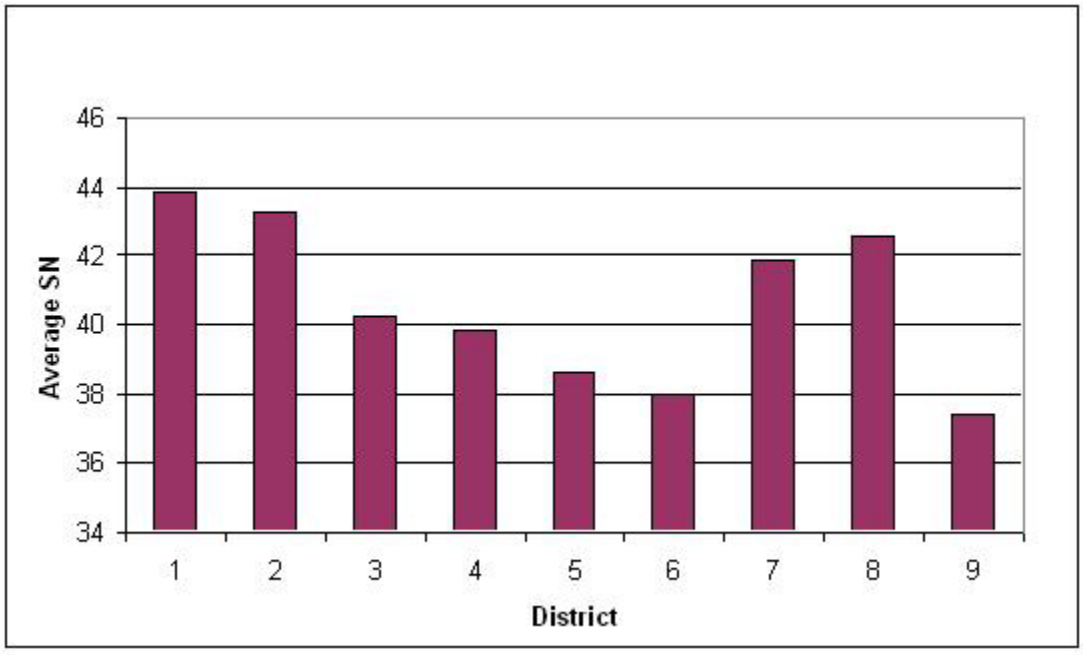

Figure 4.12. Average SN40S Measurements by VDOT District

Comparing Figures 4.11 and 4.12, we can see a general correlation between lower average skid resistance values and higher percentages of wet accidents. Districts 4, 5, and 6 all have relatively low average friction values. These districts also have relatively high ratios of wet accidents to total accidents. The data, aggregated at the district level, seems to verify the findings of the earlier analysis that lower skid resistance leads to more wet accidents. This relationship was checked using statistical analysis.

A linear regression was carried out between the ratio of the number of wet accidents to the number of total accidents and the average skid number of each district. The results of this regression are presented in Figure 4.13. The regression coefficient, r-squared, for this data was rather low at 0.45. However, this value is much higher than the r-squared coefficient for the models attempting to link friction measurements to the wet accident rates across all the accident sites. It is important to note also that the regression coefficient for the skid number is significant at an alpha level of 0.05. This means that a statistically significant relationship does exist between the skid number and the ratio of wet to total accidents.

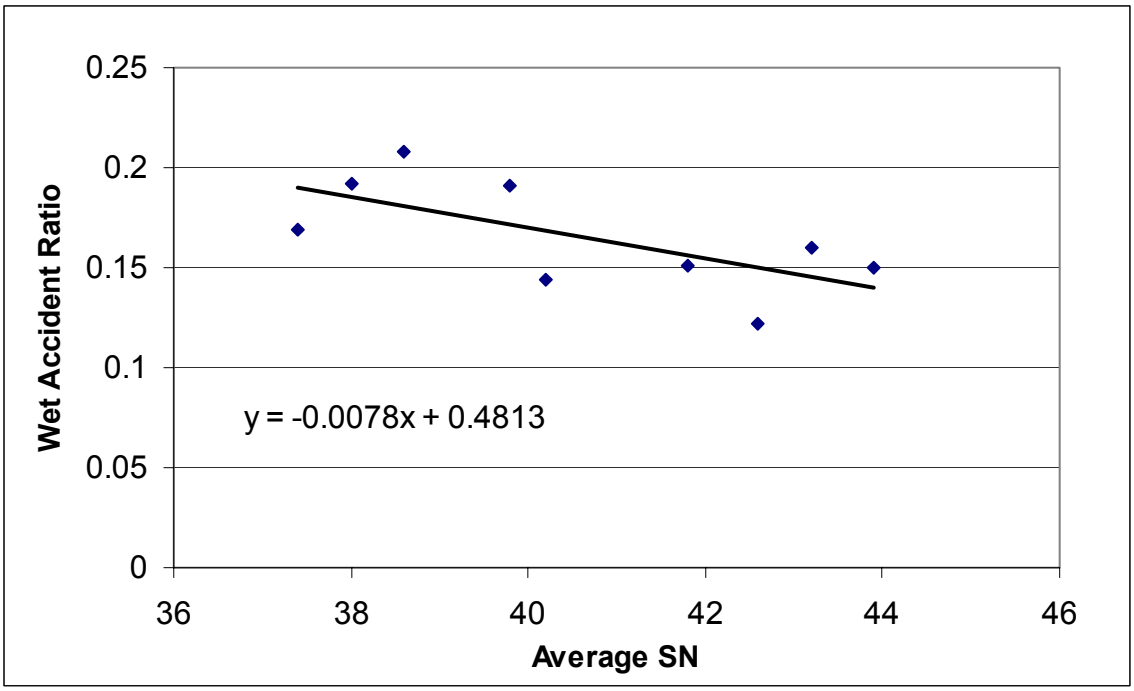

Figure 4.13. Model Relating Wet Accident Ratio to Average SN40S by District

Chapter 5
Findings and Conclusions

To study the relationship between pavement skid resistance and wet weather accidents, a statistical analysis was performed on Virginia data. Summary accident data for 2002 was combined with extensive traffic and skid resistance databases. The skid resistance data was not network-wide inventory data, but instead mostly contained data for sites identified by the Virginia wet accident reduction program and sites paved with SuperPave™ mixes. The data was pre-processed using Excel and Access to prepare the data for analysis. Then SAS statistical software was used to perform regression analyses and t-tests on means to quantify the influence of friction and traffic on wet weather accident rates.

5.1. Findings

This research produced numerous findings which regard the relationship between friction, traffic, and wet-weather accidents for Virginia data:

- The study found that skid resistance is a statistically significant factor in explaining the variation in wet accident rates as well as on the ratio of wet accidents to total accidents; the wet accident rate increases with decreasing skid numbers.
- However, friction data tend to explain only a small portion of the variation in wet accident rates when considering individual accident sites. Considering the friction and accident data across road categories and geographic districts may allow developing models which better explain the variability in wet accident occurrence.
- For all sites evaluated, the wet accident rate is on average 44% higher for sites with skid numbers less than or equal to 30 than for sites with skid numbers greater than 30 and 57% higher for sites with skid numbers less than 25 than for sites with skid numbers greater than 25. The interstate sites had an overall wet accident rate significantly lower than the overall wet accident rate for all types of

sites. The model developed for the interstate sites explains roughly three times the variation explained by the model developed for all sites.

- Traffic volume was also found to be a significant factor in explaining the variation in wet accident rates and the ratio of wet accidents to total accidents. The wet accident rate tends to only decrease with increasing AADT, rather than showing a U-shaped relationship as traffic increases.
- A target skid resistance for all types of sites between 25 and 30 appears to be justified by the reduction in the wet accident rate observed for sites with friction measurements above these values.
- For interstate sites, consistent reductions in the mean wet accident rate are observed for increasing the target skid number beyond 40; attempting to maintain skid numbers above this value should have positive safety benefits.
- As expected, grouping the accident sites by similar characteristics improves the ability to model the variation in wet accident rates using friction data.

5.2. Conclusions

The study found that there is statistically significant effect of skid resistance on wet accident rate; the wet accident rate increases with decreasing skid numbers. However, as expected, skid resistance alone does a poor job of modeling the variability in the wet accident rates. In addition, the wet accident rate also decreases with increasing traffic volume. Based on the data studied, a target skid number (SN(64)S) of 25 to 30 appears to be justified. For interstate highways a higher target number, i.e. 40, appears to have a positive effect on reducing the wet accident rates.

Chapter 6
Recommendations

The following recommendations could be used to enhance the results of this research and allow for an improved understanding of the relationship between friction and wet weather accidents.

Due to the relative shortage of skid resistance data for roadways with good accident performance records, further skid resistance testing of such roadways is needed for strengthening the analysis performed here. Testing the skid resistance of a random sample of roadway pavement sections is recommended to obtain a better coverage of the entire range of pavement surface in service throughout the State. Such a skid testing program should improve the quality of any models developed to link wet accidents to pavement friction.

Also recommended in conjunction with more widespread skid resistance testing is performing a similar analysis using accident and traffic data from multiple years. This multi-year study would allow for the calculation of more stable wet accident rates for a site as any single year spikes in the accident rate would not have as great an impact on the results.

The economic costs and benefits of maintaining certain average levels of skid resistance should be examined. This study indicated that significant reductions in the wet accident rate can be achieved by increasing the skid number above certain thresholds; however, the economic tradeoffs of maintaining high levels of skid resistance should be examined to determine at what point increasing the skid resistance stops making economic sense.

Additionally, the effects of other factors, such as geometric characteristics and actual expected travel speeds should be considered. A study of a sample of the accident sites, but including more detailed geometric and operational information about each site could lead to the development of models which can explain a greater portion of the variability in wet accident rates than friction alone.

An additional recommendation is to perform a similar study considering macrotexture measurements. Macrotexture can be a better pavement characteristic to measure at the network level due to the ease of data collection using laser profilers. Also, several European studies have shown that a reduction in accident rates is observed when macrotexture is increased above certain levels. Friction and macrotexture measurements could also be combined through the use of the IFI, and the relationship between that friction index and wet accidents could be examined.

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Appendix A
Route Index Numbers

Route ID	Route Index Number
IS00064E	1,000,000
IS00064W	2,000,000
IS00066E	3,000,000
IS00066W	4,000,000
IS00077N	5,000,000
IS00077S	6,000,000
IS00081N	7,000,000
IS00081S	8,000,000
IS00085N	9,000,000
IS00085S	10,000,000
IS00095N	11,000,000
IS00095S	12,000,000
IS00195N	13,000,000
IS00195S	14,000,000
IS00264E	15,000,000
IS00264W	16,000,000
IS00295E	17,000,000
IS00295W	18,000,000
IS00381N	19,000,000
IS00381S	20,000,000
IS00395N	21,000,000
IS00395S	22,000,000
IS00464N	23,000,000
IS00464S	24,000,000
IS00495N	25,000,000
IS00495S	26,000,000
IS00564N	27,000,000
IS00564S	28,000,000
IS00581N	29,000,000
IS00581S	30,000,000
IS00664E	31,000,000
IS00664W	32,000,000
SR00003	33,000,000
SR00005	34,000,000
SR00006	35,000,000
SR00007	36,000,000
SR00008	37,000,000
SR00010	38,000,000
SR00013	39,000,000
SR00020	40,000,000
SR00022	41,000,000
SR00024	42,000,000
SR00027E	43,000,000
SR00027W	44,000,000
SR00028	45,000,000
SR00030	46,000,000
SR00033	47,000,000

Route ID	Route Index Number
SR00035	48,000,000
SR00036	49,000,000
SR00040	50,000,000
SR00041	51,000,000
SR00042	52,000,000
SR00043	53,000,000
SR00046	54,000,000
SR00047	55,000,000
SR00049	56,000,000
SR00053	57,000,000
SR00054	58,000,000
SR00055	59,000,000
SR00057	60,000,000
SR00062	61,000,000
SR00063	62,000,000
SR00068	63,000,000
SR00070	64,000,000
SR00072	65,000,000
SR00076	66,000,000
SR00078	67,000,000
SR00080	68,000,000
SR00083	69,000,000
SR00091	70,000,000
SR00092	71,000,000
SR00100	72,000,000
SR00106	73,000,000
SR00110	74,000,000
SR00114	75,000,000
SR00116	76,000,000
SR00119	77,000,000
SR00120	78,000,000
SR00121	79,000,000
SR00122	80,000,000
SR00123	81,000,000
SR00134	82,000,000
SR00137	83,000,000
SR00138	84,000,000
SR00143	85,000,000
SR00144	86,000,000
SR00145	87,000,000
SR00147	88,000,000
SR00150	89,000,000
SR00151	90,000,000
SR00153	91,000,000
SR00155	92,000,000
SR00156	93,000,000
SR00157	94,000,000

Route ID	Route Index Number
SR00160	95,000,000
SR00171	96,000,000
SR00173	97,000,000
SR00174	98,000,000
SR00193	99,000,000
SR00197	100,000,000
SR00199	101,000,000
SR00206	102,000,000
SR00208	103,000,000
SR00212	104,000,000
SR00215	105,000,000
SR00216	106,000,000
SR00228	107,000,000
SR00229	108,000,000
SR00230	109,000,000
SR00231	110,000,000
SR00234	111,000,000
SR00235	112,000,000
SR00236	113,000,000
SR00237	114,000,000
SR00238	115,000,000
SR00241	116,000,000
SR00243	117,000,000
SR00244	118,000,000
SR00245	119,000,000
SR00249	120,000,000
SR00256	121,000,000
SR00267E	122,000,000
SR00267W	123,000,000
SR00271	124,000,000
SR00287	125,000,000
SR00288	126,000,000
SR00307	127,000,000
SR00309	128,000,000
SR00311	129,000,000
SR00337	130,000,000
SR00344	131,000,000
SR00352	132,000,000
SR00360	133,000,000
SR00419	134,000,000
SR00895E	135,000,000
SR00895W	136,000,000
US00001	137,000,000
US00011	138,000,000
US00013	139,000,000
US00015	140,000,000
US00017	141,000,000

Route ID	Route Index Number
US00019	142,000,000
US00023	143,000,000
US00029	144,000,000
US00033	145,000,000
US00050	146,000,000
US00052	147,000,000
US00058	148,000,000
US00060	149,000,000
US00211	150,000,000
US00220	151,000,000
US00221	152,000,000
US00250	153,000,000
US00258	154,000,000
US00301	155,000,000
US00340	156,000,000
US00360	157,000,000
US00421	158,000,000
US00460	159,000,000
US00501	160,000,000
US00522	161,000,000
OSR00063	162,000,000
A1US00058	163,000,000
C1SR00234	164,000,000
C1US00001	165,000,000
C1US00017	166,000,000
C1US00029	167,000,000
C2US00033	168,000,000
C4US00058	169,000,000
C4US00220	170,000,000
C4US00460	171,000,000
C5US00058	172,000,000

Appendix B
Processed Site Data

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
1002004	1.000	43	12000	2.283
1002007	0.200	28	12000	2.283
1002008	0.000	47	16000	0.000
1002017	0.000	50	17000	0.000
1002018	0.300	40	17000	4.835
1003002	1.000	52	5800	4.724
1003003	0.000	48	5800	0.000
1003004	0.000	48	5800	0.000
1003005	0.000	50	5800	0.000
1003006	0.000	52	5800	0.000
1003009	0.000	44	5800	0.000
1003010	0.000	40	5000	0.000
1003014	0.500	46	5000	5.479
1003015	0.000	48	7600	0.000
1003016	0.143	40	7600	7.210
1003017	0.500	48	10000	2.740
1003019	0.333	54	10000	2.740
1003020	0.500	55	10000	2.740
1003021	0.400	56	10000	5.479
1003022	0.000	52	9800	0.000
1003023	1.000	38	9800	2.796
1003024	0.333	39	7300	3.753
1003025	1.000	41	7300	3.753
1003026	0.500	39	7300	3.753
1003027	0.000	41	7300	0.000
1003028	0.000	41	5500	0.000
1003030	0.000	49	4200	0.000
1003032	0.000	42	4200	0.000
1003035	0.000	50	4200	0.000
1003037	0.000	49	4900	0.000
1003038	0.000	45	4900	0.000
1003039	0.000	45	4900	0.000
1007016	0.000	40	6200	0.000
1007017	0.000	55	19000	0.000
1007019	0.000	56	19000	0.000
1007020	0.000	53	15000	0.000
1007021	0.000	56	15000	0.000
1007022	1.000	52	15000	1.826
1007023	0.000	54	15000	0.000
1007024	0.000	51	16000	0.000
1007025	0.000	41	13000	0.000
1007026	0.000	37	13000	0.000
1007027	0.333	31	13000	2.107
1007028	0.143	42	13000	2.107
1037000	0.000	21	12000	0.000
1037004	0.000	33	12000	0.000
1037005	0.000	31	13000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
1037006	1.000	28	13000	2.107
1037007	1.000	39	13000	2.107
1037008	0.000	46	13000	0.000
1037009	0.000	45	13000	0.000
1037010	0.000	42	13000	0.000
1037012	0.000	41	15000	0.000
1037013	0.000	34	15000	0.000
1037014	0.000	34	15000	0.000
1037015	0.333	49	15000	1.826
1037017	0.000	48	15000	0.000
1037018	0.000	47	15000	0.000
1037019	0.462	26	15000	10.959
1037020	0.667	23	22000	2.491
1037021	0.000	50	22000	0.000
1037022	0.333	48	22000	1.245
1037025	0.000	46	22000	0.000
1037026	0.200	46	22000	1.245
1043000	0.000	21	25000	0.000
1043001	0.000	22	25000	0.000
1043002	0.000	25	25000	0.000
1043003	0.263	31	24000	5.708
1043004	0.091	33	30000	0.913
1043005	0.000	31	46000	0.000
1043006	0.231	28	46000	1.787
1043007	0.000	39	46000	0.000
1043008	0.118	46	49000	1.118
1043009	0.147	45	49000	2.796
1043010	0.089	42	65000	1.686
1043011	0.133	44	65000	0.843
1043015	0.214	49	65000	1.264
1043016	0.263	32	49000	2.796
1043017	0.000	48	36000	0.000
1043018	0.429	47	23000	3.574
1043019	0.500	28	23000	1.191
1043020	0.429	25	23000	3.574
1043021	0.000	47	22000	0.000
1043022	0.000	48	14000	0.000
1043024	0.333	46	14000	1.957
1043025	0.000	46	14000	0.000
1043026	0.250	46	14000	1.957
1043027	0.143	39	29000	0.945
1043028	0.000	34	29000	0.000
1047000	0.500	25	21000	1.305
1047001	0.500	35	21000	1.305
1047002	0.000	30	21000	0.000
1047003	0.000	31	22000	0.000
1047004	0.000	31	22000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
1047005	0.250	29	22000	1.245
1047006	0.143	36	22000	1.245
1047007	0.000	42	25000	0.000
1047008	0.000	39	25000	0.000
1054000	0.000	50	15000	0.000
1054002	0.000	48	15000	0.000
1054005	0.000	46	15000	0.000
1054006	1.000	45	13000	2.107
1054007	0.000	46	13000	0.000
1054009	1.000	50	13000	4.215
1054010	0.000	51	13000	0.000
1054011	0.000	51	13000	0.000
1054013	0.000	49	12000	0.000
1054014	0.000	50	12000	0.000
1054016	0.000	50	12000	0.000
1063000	0.000	21	29000	0.000
1063001	1.000	22	29000	1.889
1063002	0.000	25	20000	0.000
1063003	0.000	31	20000	0.000
1063004	0.000	33	20000	0.000
1063005	0.000	31	20000	0.000
1063006	0.000	28	20000	0.000
1063007	0.000	39	20000	0.000
1063008	0.000	46	20000	0.000
1063009	0.000	45	20000	0.000
1063010	0.250	42	20000	1.370
1063011	0.000	44	20000	0.000
1063012	0.000	41	20000	0.000
1063013	0.333	34	20000	1.370
1063015	0.000	49	20000	0.000
1063016	0.000	49	21000	0.000
1063017	0.200	48	21000	1.305
1063019	0.000	28	21000	0.000
1064000	0.667	28	48000	1.142
1064001	0.154	35	43000	1.274
1064002	0.000	35	42000	0.000
1064003	0.111	38	47000	0.583
1064004	0.286	33	47000	2.332
1064005	0.250	34	57000	2.403
1064006	0.318	34	60000	3.196
1064007	0.121	34	60000	1.826
1064008	0.238	26	61000	2.246
1064009	0.161	33	66000	2.076
1064010	0.135	31	67000	2.045
1064011	0.130	35	70000	2.348
1064012	0.084	34	70000	3.523
1064013	0.167	28	68000	0.403

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
1064014	0.125	32	68000	0.806
1064015	0.071	32	58000	0.472
1064016	0.000	32	58000	0.000
1064017	0.278	19	58000	2.362
1064018	0.136	34	58000	1.417
1064019	0.175	32	51000	3.760
1064020	0.175	32	51000	3.760
1064021	0.167	23	40000	2.740
1064022	0.250	24	40000	2.055
1064023	0.000	24	40000	0.000
1064024	0.278	38	40000	3.425
1064025	0.000	44	36000	0.000
1064026	0.500	45	34000	1.612
1064027	0.143	29	34000	0.806
1081007	0.000	40	4400	0.000
1081009	1.000	44	4400	12.453
1081010	0.000	40	4800	0.000
1081011	0.000	43	4800	0.000
1081013	0.000	41	4800	0.000
1081014	0.000	46	4800	0.000
1099000	0.500	25	25000	3.288
1099001	0.000	35	23000	0.000
1099002	0.000	30	23000	0.000
1099003	0.000	31	23000	0.000
1099004	0.000	31	23000	0.000
1099005	0.286	29	23000	2.382
1099006	0.143	36	28000	0.978
1099007	0.000	42	28000	0.000
1099008	0.000	39	28000	0.000
1099009	0.100	34	37000	1.481
1099010	0.000	34	37000	0.000
1099011	0.000	30	36000	0.000
1099012	0.000	31	36000	0.000
1099013	0.077	30	36000	0.761
1099014	0.154	25	37000	1.481
1099015	0.200	39	38000	1.442
1099016	0.133	45	38000	1.442
1099017	0.103	41	45000	1.826
1099018	0.000	41	45000	0.000
1099019	0.400	32	45000	2.435
1099020	0.167	21	45000	0.609
1099021	0.000	16	45000	0.000
1099022	0.091	34	45000	0.609
1099023	0.600	23	49000	3.355
1099024	0.167	24	60000	0.457
1099025	0.111	29	60000	0.913
1099026	0.111	28	74000	0.370

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
1099027	0.083	30	74000	0.370
1099028	0.071	30	74000	0.740
1099029	0.130	27	66000	1.245
1099030	0.196	29	74000	4.073
1099031	0.294	31	70000	1.957
1099032	0.321	28	63000	3.914
1099033	0.120	39	54000	1.522
1099034	0.220	31	54000	4.566
1099035	0.102	31	48000	2.854
1099036	0.194	40	48000	3.995
1099037	0.200	42	48000	1.142
2502007	0.000	42	14000	0.000
2502008	0.400	42	16000	6.849
2502028	0.000	43	19000	0.000
2502029	0.000	48	19000	0.000
2503002	0.000	50	5100	0.000
2503007	0.500	52	4600	5.956
2503009	0.000	52	4600	0.000
2503010	0.000	57	4600	0.000
2503013	0.000	55	6300	0.000
2503014	0.333	55	6300	4.349
2503015	0.000	42	7300	0.000
2503016	0.000	50	7300	0.000
2503020	0.000	45	9000	0.000
2503021	0.000	44	9000	0.000
2503023	0.000	42	10000	0.000
2503024	0.000	40	10000	0.000
2503027	0.000	56	7400	0.000
2503028	1.000	55	5400	5.074
2503029	0.000	43	5400	0.000
2503030	0.000	36	4800	0.000
2503032	1.000	52	4800	5.708
2503035	0.000	35	4800	0.000
2503036	1.000	33	4800	5.708
2503037	0.000	34	3900	0.000
2507016	0.333	45	17000	1.612
2507017	0.000	46	17000	0.000
2507018	0.000	45	17000	0.000
2507019	0.000	45	17000	0.000
2507020	0.000	46	17000	0.000
2507022	0.000	50	15000	0.000
2507023	0.100	51	15000	1.826
2507025	0.250	41	16000	1.712
2507026	0.667	34	14000	3.914
2507027	0.333	38	14000	1.957
2507028	0.000	43	14000	0.000
2537001	0.000	30	13000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
2537003	0.333	23	13000	2.107
2537005	0.000	23	13000	0.000
2537008	0.000	35	12000	0.000
2537009	0.000	33	12000	0.000
2537010	0.000	42	12000	0.000
2537011	0.000	40	12000	0.000
2537013	0.000	36	16000	0.000
2537014	0.333	39	16000	1.712
2537015	0.000	41	16000	0.000
2537017	0.500	42	16000	1.712
2537019	0.111	38	16000	1.712
2537020	0.000	38	18000	0.000
2537021	0.500	39	18000	1.522
2537022	0.000	39	18000	0.000
2537024	0.000	41	18000	0.000
2537025	0.000	37	18000	0.000
2543000	0.000	31	24000	0.000
2543001	0.000	30	24000	0.000
2543002	0.250	31	24000	1.142
2543003	0.333	23	25000	4.384
2543004	0.667	32	29000	1.889
2543005	0.375	35	29000	2.834
2543006	0.429	16	47000	1.749
2543007	0.000	27	46000	0.000
2543008	0.231	26	46000	1.787
2543009	0.125	33	47000	1.749
2543010	0.065	31	47000	1.166
2543011	0.500	24	69000	1.985
2543015	0.222	46	69000	3.971
2543016	0.438	28	43000	4.460
2543017	0.400	27	43000	2.549
2543018	0.250	22	33000	0.830
2543019	0.000	36	28000	0.000
2543020	0.375	38	28000	2.935
2543021	0.000	39	24000	0.000
2543022	0.167	39	24000	1.142
2543023	0.000	35	16000	0.000
2543024	0.500	41	16000	1.712
2543025	0.286	37	16000	3.425
2543026	1.000	23	16000	1.712
2543027	0.000	40	30000	0.000
2543028	1.000	41	30000	0.913
2547000	0.250	30	22000	1.245
2547001	0.500	27	22000	1.245
2547002	0.000	29	22000	0.000
2547004	0.000	34	21000	0.000
2547005	0.333	32	21000	1.305

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
2547006	0.200	33	21000	1.305
2547007	0.000	37	21000	0.000
2547008	0.000	38	27000	0.000
2554001	0.000	51	15000	0.000
2554002	0.000	56	15000	0.000
2554004	0.250	52	15000	1.826
2554005	0.000	50	15000	0.000
2554006	0.000	41	15000	0.000
2554007	0.000	42	13000	0.000
2554008	0.000	47	13000	0.000
2554010	1.000	43	13000	2.107
2554011	0.000	49	13000	0.000
2554012	0.667	46	13000	4.215
2554013	0.000	44	13000	0.000
2554015	1.000	45	13000	2.107
2554016	0.000	47	13000	0.000
2563000	0.000	35	30000	0.000
2563001	0.091	32	30000	0.913
2563002	0.143	42	21000	1.305
2563003	0.250	43	21000	1.305
2563004	0.000	28	21000	0.000
2563005	0.000	31	21000	0.000
2563006	0.250	41	21000	2.609
2563007	0.250	44	21000	1.305
2563008	0.125	41	21000	1.305
2563009	0.000	42	21000	0.000
2563010	0.222	41	21000	2.609
2563011	0.000	42	21000	0.000
2563012	0.500	41	21000	2.609
2563014	0.000	44	21000	0.000
2563015	0.000	38	21000	0.000
2563016	0.250	37	21000	1.305
2563017	1.000	43	22000	1.245
2563018	0.000	38	22000	0.000
2564002	0.040	29	39000	0.702
2564003	0.045	23	43000	0.637
2564004	0.000	34	38000	0.000
2564005	0.294	32	38000	7.210
2564006	0.080	33	62000	0.884
2564007	0.231	31	51000	1.612
2564008	0.000	35	61000	0.000
2564009	0.286	37	75000	1.461
2564010	0.351	28	73000	4.879
2564011	0.238	39	81000	1.691
2564012	0.139	29	81000	3.382
2564013	0.200	33	67000	0.818
2564014	0.111	43	67000	0.818

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
2564015	0.429	30	67000	1.227
2564016	0.000	29	62000	0.000
2564017	0.000	26	62000	0.000
2564018	0.364	26	63000	1.740
2564019	0.250	33	58000	0.945
2564020	0.375	37	58000	1.417
2564021	0.579	26	41000	7.350
2564022	0.118	31	41000	1.336
2564023	0.100	45	41000	0.668
2564024	0.000	46	41000	0.000
2564025	0.100	48	34000	0.806
2564026	0.125	48	34000	0.806
2564027	0.000	46	34000	0.000
2581002	0.000	50	3900	0.000
2581003	0.000	44	4400	0.000
2581005	0.000	42	4400	0.000
2581007	0.000	52	4400	0.000
2581008	0.000	49	4400	0.000
2581009	1.000	52	4400	6.227
2581013	0.000	55	5400	0.000
2581014	0.000	55	5400	0.000
2599005	0.000	33	27000	0.000
2599006	0.200	33	27000	1.015
2599009	0.238	32	28000	4.892
2599010	0.000	29	35000	0.000
2599011	0.125	38	35000	0.783
2599013	0.273	33	44000	3.736
2599014	0.111	26	41000	0.668
2599016	0.000	30	44000	0.000
2599017	0.200	29	44000	2.491
2599021	0.091	43	46000	0.596
2599022	0.000	41	46000	0.000
2599023	0.333	28	58000	1.417
2599024	0.600	29	58000	1.417
2599025	0.105	28	61000	0.898
2599026	0.091	30	73000	0.375
2599029	0.222	28	58000	0.945
2599030	0.212	25	70000	2.740
2599031	0.154	33	58000	1.889
2599032	0.143	37	58000	0.945
2599033	0.714	37	45000	3.044
2599034	0.586	35	45000	10.350
2599035	0.200	40	46000	1.191
2599036	0.174	29	48000	2.283
2599037	0.067	37	48000	1.712
3000000	0.190	31	73000	3.002
3000001	0.167	28	53000	1.034

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
3000002	0.000	29	64000	0.000
3000003	0.107	40	42000	1.957
3000004	0.125	35	53000	0.517
3000005	0.111	35	47000	0.583
3000006	0.471	30	40000	5.479
3029000	0.500	24	58000	0.472
3029001	0.000	35	58000	0.000
3029002	0.133	27	58000	0.945
3029003	0.000	40	60000	0.000
3029004	0.250	26	60000	1.826
3029005	0.000	30	71000	0.000
3029006	0.063	31	71000	0.386
3029007	0.000	29	67000	0.000
3029008	0.222	34	67000	2.453
3029009	0.077	38	97000	0.565
3029010	0.077	28	97000	0.565
3029011	0.200	25	100000	0.822
3029012	0.063	26	100000	0.274
3029013	0.169	24	93000	3.830
3029014	0.091	26	93000	0.589
3029017	0.154	45	36000	3.044
3029018	0.086	39	36000	2.283
3030000	0.000	57	17000	0.000
3030003	0.000	53	17000	0.000
3030004	0.000	57	18000	0.000
3030005	0.500	53	18000	1.522
3030007	0.000	44	18000	0.000
3030008	0.200	55	18000	1.522
3030009	0.143	57	18000	1.522
3030011	1.000	55	20000	1.370
3030012	0.000	54	20000	0.000
3030013	0.000	56	20000	0.000
3030016	0.667	39	17000	3.223
3030017	0.000	34	16000	0.000
3030018	0.000	54	16000	0.000
3030019	0.000	55	16000	0.000
3030020	0.333	54	16000	1.712
3030021	0.500	63	16000	1.712
3076002	0.000	44	16000	0.000
3076003	0.000	49	16000	0.000
3076004	0.000	44	22000	0.000
3076005	0.000	44	22000	0.000
3076006	0.067	37	22000	1.245
3076007	0.250	36	42000	3.262
3076008	0.154	27	42000	1.305
3076009	0.000	37	43000	0.000
3076010	0.143	39	43000	0.637

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
3076011	0.143	30	58000	0.472
3076012	0.000	50	58000	0.000
3093000	0.500	40	13000	2.107
3093002	1.000	51	13000	4.215
3093004	0.000	39	13000	0.000
3093005	0.000	42	13000	0.000
3093006	0.500	44	13000	2.107
3093008	0.400	35	13000	4.215
3093009	0.333	36	13000	2.107
3093010	0.000	36	13000	0.000
3093011	0.333	32	13000	2.107
3093012	0.000	32	13000	0.000
3093013	0.333	30	17000	1.612
3093014	0.500	33	17000	1.612
4500000	0.214	37	52000	1.581
4500001	0.444	30	52000	2.107
4500002	0.120	37	52000	1.581
4500003	0.324	28	43000	7.009
4500004	0.250	29	48000	0.571
4500005	0.333	27	40000	0.685
4500006	0.500	32	33000	1.660
4529000	0.200	39	58000	0.945
4529001	0.000	30	58000	0.000
4529002	0.273	37	58000	2.834
4529003	0.083	28	58000	0.472
4529004	0.083	30	58000	0.472
4529005	0.000	34	71000	0.000
4529006	0.133	32	71000	0.772
4529007	0.000	42	63000	0.000
4529008	0.182	29	63000	0.870
4529009	0.143	32	63000	0.870
4529010	0.096	28	77000	1.779
4529011	0.071	29	77000	1.067
4529012	0.000	27	90000	0.000
4529013	0.095	31	82000	2.339
4529014	0.148	28	82000	1.336
4529015	0.056	27	82000	0.668
4529016	0.300	36	82000	1.002
4529017	0.571	39	36000	3.044
4529018	0.000	41	38000	0.000
4530000	0.000	58	16000	0.000
4530002	0.000	59	16000	0.000
4530003	0.333	61	16000	1.712
4530004	0.000	62	16000	0.000
4530005	1.000	61	17000	3.223
4530006	0.000	51	17000	0.000
4530007	0.000	59	17000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
4530008	0.000	61	17000	0.000
4530009	0.200	59	17000	1.612
4530010	0.000	52	19000	0.000
4530011	0.000	58	19000	0.000
4530012	0.000	56	19000	0.000
4530013	0.000	54	19000	0.000
4530014	0.333	68	17000	1.612
4530015	0.000	68	17000	0.000
4530016	0.000	64	17000	0.000
4530017	0.500	68	16000	3.425
4530018	0.000	46	16000	0.000
4530019	0.000	31	16000	0.000
4530020	0.000	38	16000	0.000
4576001	0.000	25	16000	0.000
4576002	0.000	27	16000	0.000
4576003	0.000	22	16000	0.000
4576004	0.500	19	16000	1.712
4576005	0.000	20	21000	0.000
4576006	0.000	21	21000	0.000
4576007	0.133	27	38000	1.442
4576008	0.000	36	39000	0.000
4576009	0.000	29	39000	0.000
4576010	0.091	38	39000	0.702
4576011	0.048	34	58000	0.472
4576012	0.000	36	58000	0.000
4593000	0.500	50	55000	0.498
4593002	0.000	47	12000	0.000
4593003	1.000	47	12000	4.566
4593004	0.000	46	12000	0.000
4593007	0.500	40	12000	2.283
4593008	0.000	41	13000	0.000
4593009	0.000	44	13000	0.000
4593010	0.500	37	13000	4.215
4593011	0.333	41	13000	2.107
4593012	0.000	28	13000	0.000
4593013	0.000	30	13000	0.000
4593014	0.000	32	16000	0.000
5510000	0.000	44	14000	0.000
5510001	0.000	33	13000	0.000
5510002	0.000	41	13000	0.000
5510005	0.000	40	13000	0.000
5510006	0.000	36	13000	0.000
5510009	0.000	41	15000	0.000
5510010	0.000	43	15000	0.000
5510011	0.000	45	15000	0.000
5510012	0.500	41	15000	1.826
5510016	0.333	47	13000	2.107

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
5510017	1.000	54	15000	3.653
5510018	0.000	22	15000	0.000
5510019	0.000	48	14000	0.000
5510020	0.400	49	14000	3.914
5517000	0.000	46	47000	0.000
5517001	0.500	43	15000	1.826
5517002	0.000	43	15000	0.000
5517004	0.000	40	15000	0.000
5517005	1.000	29	15000	5.479
5517006	1.000	45	15000	5.479
5517007	1.000	32	15000	3.653
5517008	1.000	38	15000	1.826
5517009	0.000	29	17000	0.000
5517010	0.500	25	17000	1.612
5517011	0.000	24	17000	0.000
5517012	0.000	28	17000	0.000
5517013	0.500	30	17000	1.612
5517014	0.167	48	17000	1.612
5517015	0.000	23	18000	0.000
5517016	0.000	35	18000	0.000
5517017	0.200	29	18000	1.522
5517018	0.000	25	18000	0.000
5517019	0.500	42	18000	3.044
5517021	0.000	26	17000	0.000
5517022	0.333	45	17000	3.223
5517023	0.600	28	17000	4.835
5598000	0.000	42	23000	0.000
5598002	0.600	32	23000	3.574
5598003	0.000	39	23000	0.000
5598004	1.000	43	23000	1.191
5598005	0.000	34	23000	0.000
5598006	0.000	42	23000	0.000
5598007	0.250	39	23000	1.191
5598017	0.167	39	23000	1.191
5598018	0.000	22	14000	0.000
5598019	0.000	44	14000	0.000
5598021	0.000	34	14000	0.000
5598022	0.333	31	14000	1.957
7507000	0.000	39	21000	0.000
7507001	0.000	40	21000	0.000
7507002	0.500	41	21000	1.305
7507003	0.000	35	21000	0.000
7507004	0.000	35	21000	0.000
7507006	0.000	42	21000	0.000
7507007	0.000	44	21000	0.000
7507008	0.143	43	21000	1.305
7507009	0.000	40	21000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
7507012	0.286	38	21000	2.609
7507014	0.000	43	24000	0.000
7507016	0.000	45	26000	0.000
7507017	0.250	34	26000	2.107
7507018	0.000	38	26000	0.000
7507019	0.200	36	26000	1.054
7507020	0.000	30	24000	0.000
7507021	0.333	32	24000	1.142
7507022	0.000	35	22000	0.000
7507025	0.000	40	22000	0.000
7507026	0.000	37	22000	0.000
7507027	0.333	38	22000	1.245
7507028	0.000	42	22000	0.000
7507029	0.000	38	22000	0.000
7507030	0.111	38	22000	1.245
7507031	0.000	37	22000	0.000
7511014	0.250	35	17000	4.835
7511015	0.000	39	17000	0.000
7534000	0.571	39	24000	4.566
7534001	0.200	40	24000	1.142
7534002	0.000	41	22000	0.000
7534003	0.000	35	22000	0.000
7534004	0.333	35	22000	1.245
7534006	0.000	42	22000	0.000
7534008	0.000	43	22000	0.000
7534009	0.000	40	26000	0.000
7534010	0.000	42	26000	0.000
7534011	0.143	39	26000	1.054
7534012	0.000	38	23000	0.000
7534013	0.000	40	23000	0.000
7534014	0.000	35	23000	0.000
7534015	0.286	39	23000	4.765
7534016	0.000	45	28000	0.000
7534017	0.000	34	28000	0.000
7534018	0.500	38	27000	2.029
7534019	0.000	36	27000	0.000
7534020	0.000	30	24000	0.000
7534022	0.000	35	24000	0.000
7534023	0.000	38	24000	0.000
7534024	0.000	39	24000	0.000
7534025	0.000	40	19000	0.000
7560000	0.500	41	17000	1.612
7560002	0.250	43	17000	1.612
7560003	0.333	36	17000	1.612
7560004	0.000	45	17000	0.000
7560006	0.333	32	21000	1.305
7560007	0.000	36	21000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
7560008	0.000	36	21000	0.000
7560009	0.000	34	21000	0.000
7560010	0.000	35	22000	0.000
7560011	0.000	30	22000	0.000
7560013	0.167	28	22000	1.245
7560014	0.000	30	25000	0.000
7560015	0.000	30	25000	0.000
7560016	0.143	28	25000	1.096
7560017	0.500	31	25000	1.096
7560018	1.000	30	25000	1.096
7560020	0.333	33	25000	1.096
7560021	0.000	28	25000	0.000
7560022	0.000	34	25000	0.000
7560023	0.200	34	25000	1.096
7560024	0.200	39	25000	1.096
7560025	0.000	36	25000	0.000
7577000	0.000	41	19000	0.000
7577001	0.333	44	19000	1.442
7577002	0.000	43	19000	0.000
7577003	0.000	36	22000	0.000
7577004	0.333	45	22000	1.245
7577005	0.750	37	18000	4.566
7577006	0.167	45	18000	1.522
7577007	0.400	48	20000	2.740
7577008	0.250	36	20000	1.370
7577009	0.000	34	20000	0.000
7577010	0.000	35	20000	0.000
7577011	0.500	30	20000	2.740
7577012	0.000	30	23000	0.000
7577013	1.000	28	23000	1.191
7577014	0.333	30	20000	1.370
7577015	0.000	30	20000	0.000
7577016	0.500	28	20000	2.740
7577017	0.000	31	20000	0.000
7580000	0.000	41	25000	0.000
7580002	0.333	43	25000	2.192
7580003	0.100	36	27000	1.015
7580004	0.333	45	27000	2.029
7580006	0.286	32	27000	2.029
7580007	0.000	36	32000	0.000
7580008	0.000	36	32000	0.000
7580009	0.000	34	32000	0.000
7580010	0.667	35	29000	3.779
7580011	0.000	30	29000	0.000
7580012	0.000	30	38000	0.000
7580013	0.000	28	38000	0.000
7580014	0.000	30	28000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
7580015	0.667	30	28000	1.957
7580016	0.333	28	28000	0.978
7581000	0.000	45	17000	0.000
7581001	0.000	43	17000	0.000
7581002	1.000	47	16000	5.137
7581003	0.000	42	16000	0.000
7581004	0.000	38	16000	0.000
7581006	0.071	36	16000	1.712
7581007	0.000	29	18000	0.000
7581008	0.000	37	18000	0.000
7581009	0.000	36	18000	0.000
7581010	0.333	51	18000	1.522
7581013	0.000	44	18000	0.000
7581014	0.200	38	18000	1.522
7581015	0.125	36	20000	1.370
7581016	1.000	47	20000	1.370
7581017	0.000	39	20000	0.000
7581019	0.000	41	19000	0.000
7581020	0.000	35	19000	0.000
7581021	0.250	48	19000	2.884
7581022	0.333	49	19000	1.442
7581023	0.000	41	19000	0.000
7581024	0.333	46	19000	1.442
7581025	0.000	45	19000	0.000
7581026	0.000	47	19000	0.000
7581027	0.000	46	20000	0.000
7581028	0.000	47	20000	0.000
7581030	0.000	46	20000	0.000
7581031	0.333	46	20000	1.370
7582000	0.000	39	22000	0.000
7582002	0.000	41	22000	0.000
7582003	0.167	35	22000	1.245
7582006	0.000	42	22000	0.000
7582008	0.200	43	24000	1.142
7582010	0.400	42	24000	2.283
7582011	0.000	39	21000	0.000
7582012	0.000	38	21000	0.000
7582013	0.000	40	21000	0.000
7582014	0.000	43	21000	0.000
7582015	0.250	44	23000	1.191
7582016	1.000	45	23000	1.191
7582017	0.000	34	23000	0.000
7582018	0.000	38	23000	0.000
7582019	0.000	36	23000	0.000
7582020	1.000	30	23000	1.191
7582021	0.000	32	18000	0.000
7582023	0.000	38	18000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
7582024	0.000	39	18000	0.000
7582025	0.000	40	18000	0.000
7582026	0.000	37	18000	0.000
7585000	0.000	39	18000	0.000
7585001	0.000	40	20000	0.000
7585002	0.000	41	20000	0.000
7585003	0.000	35	20000	0.000
7585004	0.000	35	20000	0.000
7585005	0.000	45	18000	0.000
7585006	1.000	42	18000	1.522
7585007	1.000	44	18000	6.088
7585008	0.200	43	18000	1.522
7585009	0.375	40	18000	4.566
7585010	0.333	42	22000	1.245
7585011	0.333	39	22000	1.245
7585012	1.000	38	22000	1.245
7585013	0.000	40	22000	0.000
7585014	1.000	43	20000	1.370
7585015	0.200	44	20000	1.370
7585016	0.000	45	20000	0.000
7585018	0.000	38	20000	0.000
7585019	0.000	36	20000	0.000
7585020	0.000	30	21000	0.000
7585021	0.000	32	21000	0.000
7585022	0.000	35	21000	0.000
7585023	0.000	38	21000	0.000
7585025	0.333	40	21000	1.305
7585026	0.500	37	21000	1.305
7585027	0.615	31	21000	10.437
7585028	0.429	29	20000	4.110
7585029	0.000	38	20000	0.000
7585031	0.333	29	20000	1.370
7585032	0.286	27	20000	2.740
7585033	0.000	24	21000	0.000
7585034	0.000	29	21000	0.000
7586000	0.000	41	14000	0.000
7586002	0.000	40	15000	0.000
7586004	0.000	40	15000	0.000
7586005	1.000	22	15000	1.826
7586006	0.000	30	15000	0.000
7586007	0.667	38	15000	3.653
7586008	0.000	42	15000	0.000
7586009	0.500	43	15000	1.826
7586010	0.000	42	14000	0.000
7586011	0.000	34	14000	0.000
7586012	0.000	38	14000	0.000
7586014	0.000	27	13000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
7586015	0.250	33	13000	2.107
7586016	0.000	32	13000	0.000
7586018	0.500	28	13000	2.107
7586019	1.000	41	13000	2.107
7586021	0.000	37	13000	0.000
7595000	0.000	41	14000	0.000
7595002	0.000	40	15000	0.000
7595003	0.000	43	15000	0.000
7595004	0.000	40	25000	0.000
7595005	0.000	22	21000	0.000
7595007	0.688	38	22000	13.699
7595008	0.667	42	22000	2.491
7595009	0.000	43	22000	0.000
7595010	0.000	39	22000	0.000
7595011	0.000	30	22000	0.000
7595012	0.500	38	20000	1.370
7595013	0.000	38	20000	0.000
7595014	0.000	27	20000	0.000
7595015	0.000	33	21000	0.000
7595016	0.333	32	21000	2.609
7595017	0.000	38	21000	0.000
7595018	0.000	28	24000	0.000
7595022	0.500	41	17000	3.223
7595023	0.250	46	17000	1.612
7595024	0.000	36	17000	0.000
7595026	0.500	31	17000	1.612
7595027	0.000	42	16000	0.000
7595028	0.000	41	16000	0.000
7595030	0.000	26	17000	0.000
7595031	0.000	19	17000	0.000
7595032	0.333	30	17000	1.612
7595033	0.000	29	14000	0.000
7598000	1.000	35	13000	2.107
7598001	1.000	36	13000	2.107
7598002	0.000	27	13000	0.000
7598003	0.000	33	13000	0.000
7598004	0.000	38	15000	0.000
7598005	0.000	31	15000	0.000
7598006	0.000	36	15000	0.000
7598007	0.000	31	15000	0.000
7598008	1.000	44	15000	3.653
7598009	0.000	39	15000	0.000
7598010	0.000	28	15000	0.000
7598011	0.000	20	13000	0.000
7598012	0.000	41	13000	0.000
7598013	0.000	28	13000	0.000
7598015	0.250	29	14000	1.957

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
7598016	0.333	30	24000	3.425
7598017	0.000	41	26000	0.000
7598018	0.000	27	26000	0.000
7598019	0.000	40	26000	0.000
7598020	0.000	40	25000	0.000
7598021	0.000	44	25000	0.000
7598022	0.000	30	25000	0.000
7598023	0.333	44	26000	1.054
7598024	0.600	31	26000	3.161
7598025	0.000	35	19000	0.000
7598026	0.000	32	19000	0.000
7598029	0.000	36	19000	0.000
9512000	0.500	31	7500	3.653
9512001	1.000	34	7500	3.653
9512003	0.000	40	7500	0.000
9512004	0.500	37	7500	3.653
9512005	0.000	33	13000	0.000
9512006	0.000	42	13000	0.000
9512007	0.000	42	13000	0.000
9512008	0.000	36	12000	0.000
9512009	0.333	31	11000	2.491
9512011	0.000	35	11000	0.000
9512012	0.000	37	11000	0.000
9512013	1.000	43	11000	2.491
9512017	0.500	39	13000	2.107
9512019	0.000	28	13000	0.000
9512020	0.200	27	12000	2.283
9526000	0.000	31	12000	0.000
9526001	0.750	34	12000	6.849
9526003	1.000	40	11000	2.491
9526005	1.000	33	11000	2.491
9526006	0.000	42	11000	0.000
9526007	0.000	42	11000	0.000
9526010	0.000	38	11000	0.000
9526011	0.000	35	11000	0.000
9526013	0.167	43	11000	2.491
9526014	0.000	38	13000	0.000
9526015	0.000	37	13000	0.000
9526016	0.500	40	13000	2.107
9526017	1.000	39	13000	2.107
9526018	0.000	41	13000	0.000
9526020	0.000	27	13000	0.000
9526021	0.000	25	13000	0.000
9526022	0.000	32	20000	0.000
9526023	0.167	37	20000	1.370
9526024	0.000	37	25000	0.000
9526025	0.200	36	25000	2.192

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
9526026	0.200	33	32000	0.856
9526027	0.000	36	32000	0.000
9526028	0.000	39	32000	0.000
9558000	0.000	31	12000	0.000
9558001	0.000	34	12000	0.000
9558002	0.250	32	12000	2.283
9558003	0.000	40	12000	0.000
9558004	0.000	37	12000	0.000
9558005	0.500	33	12000	2.283
9558006	0.500	42	12000	2.283
9558007	0.333	42	12000	2.283
9558009	0.000	31	12000	0.000
9558010	0.500	38	12000	2.283
9558011	0.000	35	12000	0.000
9558012	0.250	37	12000	2.283
9558013	0.333	43	11000	2.491
9558014	0.500	38	11000	2.491
9558015	0.000	37	7500	0.000
9558016	0.500	40	7500	3.653
9558017	0.000	39	7500	0.000
9558018	0.000	41	7500	0.000
11516000	0.333	32	39000	0.702
11516001	0.250	41	39000	1.405
11516002	0.250	41	39000	1.405
11516003	0.333	44	39000	1.405
11516004	0.000	37	40000	0.000
11516005	0.000	37	40000	0.000
11516006	0.200	32	40000	0.685
11516007	0.000	31	40000	0.000
11516008	0.222	29	40000	1.370
11516009	0.400	31	40000	1.370
11516010	0.000	30	38000	0.000
11516013	0.000	35	38000	0.000
11516014	0.000	40	38000	0.000
11520000	0.333	33	50000	0.548
11520001	0.241	18	40000	4.795
11520002	0.250	22	43000	0.637
11520003	0.000	35	43000	0.000
11520004	0.000	42	43000	0.000
11520005	0.222	38	43000	1.274
11520006	0.667	32	40000	1.370
11520007	0.667	35	40000	1.370
11520008	0.455	22	40000	6.849
11520009	0.167	34	52000	0.527
11520010	0.167	22	46000	0.596
11520011	0.167	46	46000	0.596
11520012	0.091	28	49000	0.559

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
11520013	0.111	40	49000	0.559
11520014	0.154	41	49000	1.118
11520015	0.125	39	50000	0.548
11520016	0.222	40	50000	2.192
11520017	0.143	40	49000	0.559
11520018	0.500	39	49000	1.118
11520019	0.083	43	49000	0.559
11520020	0.115	43	49000	1.677
11526000	0.278	32	20000	6.849
11526001	0.222	42	50000	1.096
11529000	0.238	44	97000	1.412
11529001	0.105	37	80000	0.685
11529002	0.071	28	80000	0.685
11529003	0.200	30	88000	1.557
11529004	0.200	34	88000	0.623
11529005	0.152	37	76000	1.802
11529006	0.250	30	94000	0.874
11529007	0.050	28	94000	0.583
11529008	0.136	30	111000	5.183
11529009	0.193	28	111000	5.183
11529010	0.174	27	71000	1.544
11529011	0.114	40	71000	1.544
11529012	0.267	32	67000	1.636
11529013	0.091	23	70000	0.783
11529014	0.130	36	70000	2.740
11540000	0.500	38	28000	0.978
11540001	0.000	41	20000	0.000
11540002	1.000	39	20000	1.370
11540003	0.000	34	20000	0.000
11540004	0.500	34	20000	1.370
11540006	0.000	38	19000	0.000
11540007	0.000	42	19000	0.000
11540008	0.000	38	19000	0.000
11540009	0.000	42	20000	0.000
11540010	0.500	41	20000	1.370
11540011	0.556	34	20000	6.849
11540012	0.000	40	19000	0.000
11540015	1.000	43	16000	1.712
11542000	0.128	32	70000	1.957
11542001	0.500	42	55000	1.494
11542002	0.500	34	55000	0.498
11542003	0.250	32	43000	1.274
11542004	0.500	26	43000	1.274
11542005	0.211	33	43000	2.549
11542006	0.500	35	49000	1.118
11542007	0.000	37	49000	0.000
11542008	0.000	28	49000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
11542009	0.400	30	49000	1.118
11542010	0.000	30	49000	0.000
11542011	0.167	20	49000	1.118
11542012	0.333	18	39000	0.702
11542013	0.000	30	39000	0.000
11542014	0.667	27	39000	1.405
11543000	0.286	36	68000	3.223
11543001	0.231	27	68000	3.626
11543002	0.211	20	71000	4.631
11543003	0.077	35	71000	0.386
11543004	0.088	42	71000	1.929
11543005	0.080	38	64000	0.856
11543006	0.158	32	40000	2.055
11543007	0.250	35	40000	1.370
11543008	0.571	22	49000	4.473
11543009	0.143	34	49000	0.559
11543010	0.176	22	36000	2.283
11543011	0.000	46	70000	0.000
11543012	0.314	28	70000	4.305
11574002	0.000	34	14000	0.000
11574003	1.000	32	15000	1.826
11574004	0.000	26	15000	0.000
11574005	0.333	33	15000	1.826
11574006	0.000	35	15000	0.000
11574007	0.000	37	20000	0.000
11574008	0.000	28	20000	0.000
11574009	0.250	30	20000	1.370
11574010	0.400	30	20000	2.740
11574011	0.000	20	16000	0.000
11574012	0.000	18	12000	0.000
11574013	0.000	30	13000	0.000
11574014	0.500	27	20000	1.370
11574015	0.500	42	20000	1.370
11574016	0.250	41	20000	1.370
11576000	0.357	44	67000	2.045
11576001	0.100	39	71000	0.386
11576002	0.053	24	71000	0.386
11576003	0.222	26	82000	2.005
11576004	0.200	27	82000	2.339
11576005	0.107	39	72000	1.142
11576006	0.158	33	72000	1.142
11576007	0.306	41	72000	4.186
11576008	0.370	38	72000	3.805
11576009	0.194	36	76000	4.326
11576010	0.133	38	76000	0.721
11576011	0.154	39	85000	0.645
11576012	0.320	37	85000	2.579

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
11576013	0.143	43	97000	0.565
11588000	0.000	32	38000	0.000
11588001	0.125	41	38000	0.721
11588002	0.125	43	46000	0.596
11588003	0.000	38	46000	0.000
11588004	0.000	37	46000	0.000
11588005	0.000	37	46000	0.000
11588006	0.000	32	46000	0.000
11588007	0.500	33	46000	2.978
11588008	0.444	32	46000	2.382
11588009	0.000	34	46000	0.000
11588011	0.000	29	49000	0.000
11588012	0.182	33	49000	1.118
11588013	0.500	29	49000	2.237
11588014	0.000	23	74000	0.000
11589000	0.100	32	74000	0.370
11589001	0.000	31	74000	0.000
11589002	0.125	41	58000	0.472
11589003	0.000	38	58000	0.000
11589004	0.000	37	58000	0.000
11589005	0.400	37	58000	0.945
11589006	0.400	32	58000	0.945
11589007	0.412	33	58000	3.307
11589008	0.200	32	58000	1.889
11589009	0.000	31	64000	0.000
11589010	0.133	26	64000	0.856
11589011	0.182	29	67000	0.818
11589012	0.267	35	67000	1.636
11589013	0.200	35	67000	0.409
11589014	0.500	40	67000	0.818
11589015	0.000	44	67000	0.000
11591000	0.333	37	17000	1.612
11591001	0.000	41	17000	0.000
11591003	0.000	34	18000	0.000
11591006	0.000	38	18000	0.000
11591007	0.000	42	18000	0.000
11591008	0.000	38	16000	0.000
11591010	0.000	44	16000	0.000
11591011	0.000	37	16000	0.000
11591013	0.000	41	16000	0.000
11591015	0.000	43	16000	0.000
13543000	0.000	45	72000	0.000
13543001	0.389	30	38000	5.047
13543002	0.625	29	42000	13.046
13543003	0.750	26	42000	1.957
15064000	0.000	45	24000	0.000
15064001	0.500	26	24000	5.708

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
15064002	0.714	16	23000	5.956
15064003	0.000	21	30000	0.000
15064004	0.250	23	31000	2.651
15064005	0.250	28	40000	2.740
15064006	0.220	24	34000	10.475
15064007	0.173	33	34000	7.252
15064008	0.333	39	58000	5.196
15064009	0.200	38	60000	1.826
15064010	0.091	29	63000	0.870
15064011	0.357	34	63000	4.349
15064012	0.207	42	63000	2.609
15075001	0.162	32	94000	3.498
15075002	0.314	34	94000	4.663
15075003	0.102	34	98000	1.398
15075004	0.600	27	77000	1.067
15075005	0.231	38	77000	1.067
15075006	0.111	24	62000	0.442
15075007	0.222	33	62000	4.419
15075008	0.091	36	55000	0.498
15075009	0.333	32	33000	0.830
15075010	0.278	27	33000	4.151
16564000	0.000	35	15000	0.000
16564001	0.000	40	25000	0.000
16564002	0.500	36	24000	4.566
16564003	0.250	33	24000	1.142
16564004	0.185	36	30000	4.566
16564005	0.444	37	35000	3.131
16564006	0.333	17	32000	5.993
16564007	0.140	40	32000	5.137
16564008	0.160	38	58000	3.779
16564009	0.138	35	47000	2.332
16564010	0.320	30	57000	3.845
16564011	0.000	35	60000	0.000
16564012	0.357	36	60000	2.283
16564013	0.333	42	60000	0.913
16575000	0.152	36	98000	1.398
16575001	0.260	33	98000	9.505
16575002	0.091	36	98000	0.839
16575003	0.277	33	98000	3.634
16575004	0.077	36	80000	0.342
16575005	0.040	37	80000	0.342
16575006	0.200	17	68000	0.403
16575007	0.300	31	68000	2.417
16575008	0.316	32	48000	3.425
16575009	0.500	35	40000	1.370
16575010	0.400	30	40000	1.370
16575011	0.400	35	30000	3.653

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
17020000	0.000	38	17000	0.000
17020001	0.000	36	17000	0.000
17020002	0.000	45	17000	0.000
17042000	0.000	26	53000	0.000
17042001	0.286	36	49000	1.118
17042002	1.000	45	49000	0.559
17042003	0.200	26	49000	1.118
17042004	0.000	31	47000	0.000
17042005	0.250	34	47000	2.332
17042007	0.250	37	37000	0.740
17042008	0.400	41	37000	1.481
17042009	0.333	41	37000	0.740
17043001	0.000	36	21000	0.000
17043002	0.000	45	24000	0.000
17043003	0.000	48	24000	0.000
17043004	0.000	33	25000	0.000
17043006	1.000	39	25000	1.096
17043007	0.100	38	25000	1.096
17043008	0.000	38	27000	0.000
17043010	0.000	29	16000	0.000
17043021	0.500	42	37000	0.740
17043022	0.125	43	33000	0.830
17043023	0.375	45	13000	6.322
17043024	0.500	52	13000	2.107
17043025	0.000	50	13000	0.000
17043027	0.000	48	19000	0.000
17043028	0.000	49	19000	0.000
17043029	0.200	44	19000	1.442
17043030	0.000	51	19000	0.000
17043031	0.500	49	19000	1.442
17043032	0.000	50	19000	0.000
17043033	0.000	45	19000	0.000
17074000	0.000	38	17000	0.000
17074001	0.400	36	17000	3.223
17074002	0.000	45	17000	0.000
17074003	0.000	48	17000	0.000
17074004	0.000	33	11000	0.000
17074007	0.000	38	11000	0.000
17074008	0.000	38	11000	0.000
17074009	0.000	41	11000	0.000
17074011	0.500	30	8700	3.149
18520000	0.000	49	18000	0.000
18520001	0.000	53	18000	0.000
18542000	0.000	26	44000	0.000
18542001	0.250	31	44000	0.623
18542002	0.000	52	40000	0.000
18542003	0.143	31	40000	0.685

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
18542004	0.000	38	40000	0.000
18542005	0.000	41	46000	0.000
18542007	0.000	43	38000	0.000
18542008	0.333	43	38000	0.721
18542009	0.000	42	35000	0.000
18542010	0.000	44	35000	0.000
18543001	0.000	53	19000	0.000
18543002	0.143	52	22000	1.245
18543003	0.000	31	22000	0.000
18543004	0.500	38	22000	1.245
18543005	0.000	41	25000	0.000
18543006	0.500	42	25000	2.192
18543007	0.167	43	25000	1.096
18543008	0.000	43	29000	0.000
18543009	0.000	42	15000	0.000
18543010	0.000	44	15000	0.000
18543021	0.333	44	35000	1.566
18543022	0.400	45	35000	1.566
18543023	0.000	45	31000	0.000
18543025	0.200	34	13000	2.107
18543026	0.000	42	18000	0.000
18543027	0.000	54	18000	0.000
18543028	0.000	50	18000	0.000
18543029	0.000	45	18000	0.000
18543030	0.000	43	18000	0.000
18543031	0.000	55	20000	0.000
18543032	1.000	41	20000	2.740
18574000	0.000	49	18000	0.000
18574001	1.000	53	18000	1.522
18574003	0.333	31	18000	1.522
18574004	0.143	38	9000	3.044
18574005	0.000	41	9000	0.000
18574007	0.000	43	9000	0.000
18574009	1.000	42	9000	3.044
19595001	0.000	36	8400	0.000
21500000	0.125	30	77000	1.067
21500001	0.077	55	70000	0.783
21500002	0.286	40	75000	2.192
21500003	0.250	43	44000	4.359
21500004	0.179	35	75000	1.826
21529000	0.417	30	8100	16.912
21529001	0.185	55	70000	1.957
21529002	0.061	40	65000	0.843
21529003	0.162	43	73000	2.252
21529004	0.115	38	73000	1.126
21529005	0.059	30	77000	0.356
23564000	0.143	31	25000	1.096

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
23564001	0.125	40	23000	1.191
23564002	0.000	44	23000	0.000
23564003	0.667	34	23000	2.382
23564004	0.333	37	23000	1.191
25529000	0.182	40	88000	0.623
25529001	0.235	32	88000	1.245
25529002	0.000	37	88000	0.000
25529003	0.053	38	86000	0.319
25529004	0.133	37	86000	0.637
25529005	0.132	38	92000	1.489
25529006	0.111	34	75000	1.461
25529007	0.192	38	75000	1.826
25529008	0.102	42	89000	1.539
25529009	0.071	42	89000	0.308
25529010	0.163	42	84000	2.283
25529011	0.304	38	86000	2.230
25529012	0.071	50	97000	0.282
25529013	0.150	43	97000	0.847
25529014	0.200	40	106000	1.292
27564000	0.125	42	91000	0.602
27564001	0.200	42	29000	1.889
27564002	0.105	36	18000	3.044
29580000	0.222	37	34000	1.612
29580001	0.080	38	39000	1.405
29580002	0.000	43	39000	0.000
29580003	0.000	43	31000	0.000
29580004	0.111	40	26000	1.054
29580005	0.000	40	26000	0.000
31061003	0.333	33	24000	1.142
31061004	0.000	35	25000	0.000
31061005	0.000	56	32000	0.000
31064000	0.000	44	32000	0.000
31064002	0.222	35	36000	1.522
31064003	0.250	33	36000	0.761
31064004	0.417	37	38000	3.605
31064005	0.588	36	46000	5.956
31064006	1.000	31	51000	2.686
31099000	0.250	34	25000	1.096
31099001	0.143	43	38000	0.721
31099002	0.333	35	37000	0.740
31099003	0.500	30	35000	2.348
31099004	0.143	37	28000	0.978
31099005	0.000	36	28000	0.000
31099006	0.000	32	24000	0.000
31099007	0.083	26	24000	1.142
32561001	0.000	33	26000	0.000
32561002	0.000	36	26000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
32561003	0.000	47	26000	0.000
32561004	0.000	38	26000	0.000
32561005	0.143	30	33000	0.830
32564000	0.000	31	33000	0.000
32564001	0.000	33	36000	0.000
32564002	0.111	36	36000	0.761
32564003	0.000	47	37000	0.000
32564004	0.250	43	40000	0.685
32564005	0.333	39	40000	3.425
32564006	1.000	32	51000	1.612
32599000	0.182	38	31000	1.768
32599001	0.125	31	31000	0.884
32599002	0.125	28	38000	0.721
32599003	0.200	28	35000	0.783
32599004	0.750	43	30000	8.219
32599005	0.167	39	24000	1.142
32599006	0.000	39	26000	0.000
32599007	0.120	27	26000	3.161
33023000	0.500	35	25500	1.074
33023001	0.333	44	3650	7.506
33023002	0.000	49	3650	0.000
33023007	0.000	29	4900	0.000
33023008	0.500	33	4900	16.774
33023010	1.000	39	4250	6.446
33023012	0.000	42	4250	0.000
33023013	0.000	53	4250	0.000
33048008	0.250	29	9000	3.044
33068000	0.000	30	4250	0.000
33068001	0.500	49	6500	4.215
33068002	0.000	49	6500	0.000
33068003	0.000	49	6500	0.000
33068004	0.000	45	6500	0.000
33088009	0.357	24	13500	10.147
33088010	0.111	33	33500	2.453
33089000	0.333	28	15500	3.535
33523005	0.000	29	3650	0.000
33523009	0.333	48	4250	6.446
33523010	0.000	49	4250	0.000
33523012	1.000	34	4250	6.446
33568000	0.000	43	4250	0.000
33568001	1.000	36	6500	4.215
33568002	1.000	34	6500	12.645
33568003	0.000	33	6500	0.000
33568004	0.000	39	6500	0.000
33588007	0.000	45	13500	0.000
33588008	0.300	41	13500	6.088
33588009	0.077	43	13500	2.029

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
33588010	0.227	33	33500	4.089
33588011	0.073	28	33500	2.453
33596002	0.750	29	2200	37.360
34018001	1.000	46	700	78.278
34018002	0.000	47	700	0.000
34018004	0.000	40	700	0.000
34018009	0.000	49	1150	0.000
34018011	0.000	38	1150	0.000
34018012	0.000	47	1150	0.000
34018014	0.000	42	1000	0.000
34018015	1.000	51	1000	27.397
34018017	0.000	50	1000	0.000
34018019	0.000	49	1100	0.000
34018021	0.000	59	1100	0.000
34018022	0.000	54	1100	0.000
34018023	0.000	55	1100	0.000
34043002	0.250	38	3650	7.506
34043004	0.000	39	3650	0.000
34043005	0.000	25	3750	0.000
34043006	0.000	40	3750	0.000
34043007	0.500	44	3750	21.918
34043008	0.000	45	1300	0.000
34043011	0.000	46	1300	0.000
34043012	0.500	49	1300	21.075
34043013	0.000	49	1200	0.000
35002000	0.000	42	600	0.000
35002002	0.000	40	600	0.000
35002003	0.000	40	600	0.000
35002005	0.000	41	600	0.000
35002007	0.000	40	600	0.000
35002009	0.000	43	750	0.000
35002010	1.000	41	750	36.530
35002012	0.000	34	750	0.000
35002013	0.333	39	3450	7.941
35037003	0.000	55	850	0.000
35037006	0.000	44	1800	0.000
35037009	0.000	46	1800	0.000
35037012	0.000	48	1800	0.000
35037013	0.000	48	2650	0.000
35037014	0.000	52	2650	0.000
35037018	0.000	52	2350	0.000
35037020	0.000	55	2350	0.000
35037021	0.000	48	2350	0.000
35037022	1.000	52	2350	11.658
35037023	0.000	49	2900	0.000
35037026	0.000	55	2900	0.000
35037029	0.000	47	4000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
35037030	0.000	48	4000	0.000
35037032	0.000	46	4000	0.000
35043000	1.000	46	9500	2.884
35043001	0.000	51	12000	0.000
35043002	0.083	30	10500	2.609
35043003	0.286	42	11000	4.981
35043004	0.000	52	10000	0.000
35043005	0.000	54	9000	0.000
35532008	1.000	35	1050	26.093
35532012	1.000	38	1200	22.831
35532020	0.000	37	1050	0.000
35543000	0.250	46	9500	2.884
35543001	0.167	35	12000	4.566
35543002	0.571	43	10500	10.437
35543003	0.105	43	11000	4.981
35543004	0.000	44	10000	0.000
36029000	0.200	39	35000	2.348
36029001	0.000	36	29500	0.000
36029002	0.091	39	27000	1.015
36029003	0.250	26	27000	1.015
36029004	0.105	38	27000	2.029
36029005	0.286	33	27000	4.059
36029006	0.200	26	27000	1.015
36029007	0.100	22	27000	1.015
36029008	0.000	31	27000	0.000
36029009	0.061	18	27000	2.029
36029010	0.179	25	36000	11.416
36029011	0.158	35	32500	5.058
36029012	0.156	34	22000	8.717
36029015	0.100	19	11500	11.912
36029016	0.281	26	21000	11.742
36029017	0.217	35	21000	13.046
36029018	0.074	40	23000	2.382
36034000	0.500	37	12500	2.192
36034001	0.333	46	12500	6.575
36034002	0.333	51	12500	2.192
36034003	0.500	47	12500	2.192
36053000	0.250	53	10500	2.609
36053001	0.000	53	10500	0.000
36053002	0.000	49	10500	0.000
36053003	0.000	48	10500	0.000
36053004	0.000	47	9500	0.000
36053005	0.000	50	9500	0.000
36053007	0.000	51	9500	0.000
36053008	0.500	46	9500	2.884
36053009	0.000	45	9500	0.000
36053011	0.000	37	15000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
36053012	0.000	41	15000	0.000
36053013	0.111	47	15000	1.826
36053014	0.000	51	25500	0.000
36053015	0.200	41	25500	1.074
36053016	0.000	52	20000	0.000
36053017	0.000	49	20000	0.000
36053019	0.308	37	20000	5.479
36053020	0.000	24	27000	0.000
36053021	0.368	25	27000	7.103
36053022	0.125	39	29000	1.889
36053023	0.071	25	29000	0.945
36053024	0.071	36	30500	0.898
36053025	0.455	33	30500	4.491
36053026	0.063	33	30500	0.898
36053027	0.385	35	35000	3.914
36053028	0.067	25	35000	0.783
36053029	0.188	23	35000	7.045
36053030	0.154	34	35000	1.566
36529000	0.120	48	35000	2.348
36529001	0.077	32	29500	0.929
36529002	0.429	38	27000	3.044
36529003	0.200	40	27000	1.015
36529004	0.087	41	27000	2.029
36529005	0.143	46	27000	1.015
36529006	0.000	35	27000	0.000
36529007	0.364	39	27000	4.059
36529008	0.093	41	27000	4.059
36529009	0.164	34	36000	6.849
36529010	0.116	32	36000	6.088
36529011	0.143	23	22000	3.736
36529012	0.313	28	22000	18.680
36529015	0.186	29	22000	9.963
36529016	0.091	38	21000	2.609
36529017	0.146	33	21000	7.828
36529018	0.211	34	23000	4.765
36553000	0.167	48	9000	3.044
36553001	0.333	47	10500	2.609
36553003	0.000	40	10500	0.000
36553005	0.000	46	9500	0.000
36553007	0.000	49	9500	0.000
36553010	0.000	32	14500	0.000
36553011	0.000	31	14500	0.000
36553012	0.000	34	15000	0.000
36553013	0.000	49	15000	0.000
36553014	0.167	53	25500	1.074
36553015	0.125	29	25500	1.074
36553016	0.000	38	20000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
36553017	0.000	40	20000	0.000
36553019	0.063	39	27000	1.015
36553020	0.333	33	27000	1.015
36553021	0.154	20	27000	2.029
36553022	0.133	45	29000	1.889
36553023	0.083	39	29000	1.889
36553024	0.071	34	30500	0.898
36553025	0.000	47	30500	0.000
36553026	0.273	33	30500	5.390
36553027	0.176	51	35000	2.348
36553028	0.000	38	35000	0.000
36553029	0.160	30	35000	6.262
37570008	0.400	36	2300	47.647
38020000	0.000	32	5500	0.000
38020001	0.207	42	15500	10.605
38020002	0.111	43	13000	2.107
38020003	0.111	40	13000	2.107
38020004	0.364	44	13000	8.430
38020005	0.100	34	17000	1.612
38020006	0.083	26	17000	1.612
38020007	0.000	33	12000	0.000
38020008	0.143	38	12000	2.283
38020009	0.000	31	12000	0.000
38020010	0.200	38	12000	2.283
38020011	0.077	28	10000	2.740
38020012	0.000	35	14000	0.000
38020013	0.200	22	14000	7.828
38020014	0.000	43	19000	0.000
38020015	0.125	43	19000	1.442
38020016	0.091	25	18000	3.044
38020017	0.100	24	18000	1.522
38020018	0.000	41	13000	0.000
38020019	0.000	28	9500	0.000
38020020	0.333	39	9500	2.884
38061000	0.000	32	4950	0.000
38061001	0.000	29	4950	0.000
38061002	0.000	42	5000	0.000
38074003	1.000	40	4800	5.708
38074004	0.000	44	4800	0.000
38074006	0.500	40	2550	10.744
38074007	1.000	40	2550	10.744
38074009	0.000	31	1800	0.000
38074010	0.000	43	1450	0.000
38074011	1.000	45	1450	18.895
38074013	1.000	38	1450	18.895
38074014	0.333	43	1450	18.895
38074015	0.000	43	1450	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
38074016	0.000	34	1200	0.000
38520000	0.333	47	5500	4.981
38520001	0.188	41	15500	5.303
38520002	0.200	39	13000	2.107
38520003	0.333	26	13000	4.215
38520004	0.143	39	13000	2.107
38520005	0.200	33	13000	2.107
38520006	0.250	37	17000	1.612
38520007	0.154	30	12000	4.566
38520008	0.143	31	12000	2.283
38520009	0.000	31	12000	0.000
38520010	0.375	33	12000	6.849
38520011	0.118	29	10000	5.479
38520012	0.100	32	14000	1.957
38520013	0.000	24	14000	0.000
38520014	0.263	35	19000	7.210
38520015	0.250	33	19000	2.884
38520016	0.154	27	19000	2.884
38520017	0.000	38	18000	0.000
38520018	0.000	37	13000	0.000
38520019	0.000	29	9500	0.000
38561000	0.000	27	4950	0.000
38561001	0.000	30	4950	0.000
38561002	0.000	31	5000	0.000
39572003	0.000	45	700	0.000
39572006	0.000	46	1050	0.000
39572007	0.000	49	1050	0.000
39572009	1.000	43	1050	26.093
39572012	0.400	38	2700	20.294
39572013	0.000	44	2250	0.000
39572015	0.000	44	1450	0.000
39572016	0.000	42	1450	0.000
40502001	0.000	33	3050	0.000
40502002	1.000	36	3050	8.983
40502003	0.000	38	3050	0.000
40502006	0.000	38	3050	0.000
40502007	0.000	36	3850	0.000
40502009	0.000	33	3850	0.000
40502010	0.500	25	3850	7.116
40502011	1.000	34	4350	6.298
40502012	0.333	38	4350	6.298
40502013	0.250	35	4350	6.298
40502014	0.500	38	4350	6.298
40502015	0.000	35	4350	0.000
40502016	0.000	34	3450	0.000
40502017	0.250	23	3450	39.706
40502018	0.000	33	8500	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
40502021	0.000	42	8000	0.000
40502022	0.000	32	5500	0.000
40502023	0.500	33	3550	7.718
40502025	0.000	48	3550	0.000
40502026	0.000	44	3550	0.000
40502027	0.000	46	1700	0.000
40502028	0.000	42	1700	0.000
40502029	0.000	41	1000	0.000
40502031	0.000	63	1000	0.000
40502032	0.000	61	1000	0.000
40502033	0.000	58	1000	0.000
40502034	0.000	62	1000	0.000
40568001	0.000	33	1150	0.000
40568002	0.000	36	1350	0.000
40568004	0.000	39	1350	0.000
40568006	0.500	38	1350	20.294
40568007	0.000	36	1350	0.000
40568008	0.000	36	2100	0.000
40568009	0.000	36	2100	0.000
40568011	0.000	38	2100	0.000
40568012	0.000	38	2100	0.000
40568015	0.333	45	5500	4.981
40568016	0.000	41	5500	0.000
40568017	0.333	45	4000	6.849
40568018	1.000	25	4000	6.849
40568019	0.250	32	4000	6.849
40568020	0.500	33	4000	6.849
40568021	1.000	39	4000	6.849
40568022	0.000	40	4000	0.000
40568025	0.000	40	3250	0.000
40568027	1.000	46	3250	8.430
40568028	0.000	43	3250	0.000
40568031	0.000	34	3250	0.000
40568032	0.000	41	4350	0.000
40568033	0.000	40	4350	0.000
40568034	0.000	40	4350	0.000
40568035	0.000	42	4350	0.000
41002001	1.000	45	3750	7.306
41002002	0.000	40	3750	0.000
41002003	0.000	43	3650	0.000
41002004	0.000	39	3650	0.000
41002005	0.000	41	3650	0.000
41002006	0.000	50	950	0.000
41054000	0.000	42	950	0.000
41054006	0.000	50	850	0.000
41054007	0.000	55	850	0.000
41054008	0.000	50	850	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
41054009	1.000	58	850	32.232
41054015	1.000	46	850	32.232
41054016	0.000	52	4550	0.000
41054017	0.250	43	4550	6.021
41054018	1.000	48	4550	6.021
41054019	0.000	43	4550	0.000
41054020	1.000	42	4550	6.021
41554017	0.000	36	4550	0.000
41554018	0.000	45	4550	0.000
42009000	0.000	19	11500	0.000
42009001	0.000	26	8000	0.000
42009002	1.000	32	8000	3.425
42009003	0.000	25	8000	0.000
42009004	0.000	40	8000	0.000
42009006	0.000	46	4400	0.000
42009008	0.000	36	3800	0.000
42009009	0.000	37	3800	0.000
42009010	0.250	39	1800	15.221
42009011	0.000	42	1800	0.000
42009012	0.333	44	1800	15.221
42009013	0.667	38	1800	30.441
42009014	0.000	41	1000	0.000
42009015	0.000	46	1000	0.000
42009016	0.000	38	1000	0.000
42009017	0.000	27	1000	0.000
42009019	0.000	34	950	0.000
42009023	1.000	44	1100	24.907
42009028	0.500	37	1150	23.824
42009029	0.000	44	1150	0.000
42009030	0.000	29	1150	0.000
42080000	0.053	34	12000	2.283
42080001	0.000	35	11500	0.000
42509000	0.000	37	8000	0.000
42509002	0.000	53	8000	0.000
42509003	0.000	48	8000	0.000
42580000	0.286	37	12000	9.132
43000000	0.375	32	1400	58.708
43000001	0.304	35	43000	4.460
43000002	0.500	51	33000	1.660
44500000	0.125	38	34000	0.806
44500001	0.273	42	43000	1.911
45529000	0.278	20	21500	6.371
45529001	0.194	25	25500	6.446
45529002	0.087	32	25500	2.149
45529003	0.286	20	36000	9.132
45529004	0.000	25	36500	0.000
45529005	0.250	23	36500	2.252

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
45529006	0.154	27	36500	1.501
45529007	0.222	47	36500	1.501
45529008	0.100	42	45500	0.602
45529009	0.105	31	45500	1.204
45529010	0.333	23	45500	2.409
45529011	0.000	34	45500	0.000
45530001	0.333	43	3200	8.562
45530002	0.167	43	3200	8.562
45530003	0.000	43	5000	0.000
45530004	0.000	33	5000	0.000
45530005	1.000	49	5500	14.944
45530007	0.000	37	5500	0.000
45530008	0.000	31	5500	0.000
45530009	0.000	40	4650	0.000
45530010	0.000	43	4650	0.000
45530011	0.250	35	4650	5.892
45530012	0.000	39	5500	0.000
45530013	0.000	41	5500	0.000
45553000	0.100	26	45500	0.602
45553001	0.257	22	41000	6.014
45553002	0.083	33	41000	2.005
45553003	0.182	27	41000	4.009
45553004	0.111	41	17000	1.612
45553005	0.000	49	17000	0.000
45553006	0.000	47	17000	0.000
45576000	0.000	44	6500	0.000
45576001	0.000	33	6500	0.000
45576002	0.000	37	6500	0.000
45576003	1.000	43	6500	4.215
45576004	0.250	25	6500	4.215
45576005	0.350	23	6500	29.505
45576006	0.111	38	15000	1.826
45576011	0.000	42	23000	0.000
45576012	0.200	16	21500	6.371
45576013	0.000	25	21500	0.000
46042000	0.333	16	2750	9.963
46042001	0.000	15	6000	0.000
46050036	0.000	21	1650	0.000
46550035	1.000	22	1650	16.604
46550036	0.000	25	1650	0.000
47043001	0.056	31	12500	2.192
47043002	0.227	35	10000	13.699
47043003	0.211	30	10000	10.959
47043004	0.158	30	6000	13.699
47043005	0.000	30	4300	0.000
47543000	0.300	27	4600	35.736
47543001	0.261	27	12500	13.151

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
47543002	0.364	35	10000	10.959
47543003	0.000	28	10000	0.000
47543004	0.231	33	6000	13.699
48587002	0.000	20	850	0.000
48587003	0.000	23	2250	0.000
48587007	0.000	35	850	0.000
48587015	0.000	23	2450	0.000
48587016	0.500	27	2450	11.183
48587018	0.000	25	1050	0.000
48591009	0.000	34	850	0.000
48591013	0.000	39	850	0.000
48591014	0.000	40	950	0.000
49020000	0.000	25	475	0.000
49020001	0.000	27	2300	0.000
49020002	0.000	21	2300	0.000
49020003	0.000	23	3500	0.000
49020004	0.000	21	3500	0.000
49020005	0.000	23	3600	0.000
50026001	0.000	41	600	0.000
50026003	0.000	61	600	0.000
50026007	0.000	54	550	0.000
50026015	0.000	52	900	0.000
50026022	0.000	42	650	0.000
50026024	0.500	47	700	39.139
50026026	0.000	51	700	0.000
50033002	0.000	52	145	0.000
50033003	0.000	50	180	0.000
50033005	0.000	40	380	0.000
50033010	0.000	45	900	0.000
50033012	0.000	33	900	0.000
50033016	0.333	41	2300	11.912
50033020	0.000	40	2300	0.000
50033024	0.000	40	9500	0.000
50033025	0.000	26	4600	0.000
50033026	0.000	38	4600	0.000
50033027	0.500	46	4600	5.956
50033029	1.000	46	2750	9.963
50033030	0.667	47	2750	19.925
50033031	0.000	46	2750	0.000
50033032	0.000	46	2400	0.000
50033034	0.000	35	2400	0.000
50033036	0.000	34	1700	0.000
50033039	0.000	31	1700	0.000
50055000	0.000	54	1700	0.000
50055001	0.000	41	440	0.000
50055006	0.000	55	440	0.000
50055008	0.000	51	440	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
50055010	0.000	50	440	0.000
50055011	0.000	51	440	0.000
50055015	0.000	52	1500	0.000
50055016	0.000	48	3050	0.000
50055017	0.000	46	2650	0.000
50055018	1.000	47	2650	10.339
50055019	0.000	41	2650	0.000
50055020	0.000	48	2650	0.000
50055022	0.000	42	3100	0.000
50055024	1.000	47	1800	15.221
50055025	0.000	48	1800	0.000
50055026	0.000	51	1800	0.000
50067003	0.000	61	1800	0.000
50067010	1.000	50	750	36.530
50071013	0.000	21	1350	0.000
50091000	0.000	25	700	0.000
50091004	0.000	34	1250	0.000
50091005	0.000	44	1150	0.000
50091013	0.000	43	800	0.000
50091014	0.000	44	800	0.000
50091015	0.000	41	800	0.000
50091019	0.000	44	1050	0.000
50091020	0.000	47	1050	0.000
50091024	0.500	35	1050	26.093
50091026	0.000	45	2350	0.000
51571000	0.250	44	7000	3.914
51571001	0.200	39	6000	9.132
51571002	0.000	45	2450	0.000
51571003	0.000	45	2450	0.000
51571004	0.000	44	2450	0.000
51571005	0.500	43	2450	11.183
51571006	0.000	49	1900	0.000
51571009	0.000	48	1350	0.000
51571010	0.000	29	1350	0.000
51571011	0.000	40	1350	0.000
51571013	0.000	41	1100	0.000
51571014	0.000	39	700	0.000
51571017	0.000	51	700	0.000
51571018	0.000	43	700	0.000
53511000	1.000	59	415	66.017
53511011	0.000	55	290	0.000
53511012	0.000	51	290	0.000
53511020	0.000	36	225	0.000
53511021	1.000	35	225	121.766
56558005	0.000	43	700	0.000
56558014	0.000	51	1350	0.000
56558015	0.000	52	1350	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
56558021	0.000	47	1250	0.000
56558023	0.000	49	1200	0.000
56558027	1.000	39	3200	8.562
57502000	0.091	35	5000	5.479
57502001	0.333	32	5000	5.479
57502002	1.000	32	4350	12.596
57502003	0.500	33	4350	25.193
57502004	0.000	37	2550	0.000
57502005	0.000	37	2550	0.000
57502006	1.000	38	4250	6.446
57502008	0.800	37	4250	25.786
57502009	0.500	40	4250	6.446
57532000	0.000	35	2650	0.000
57532002	0.000	34	2650	0.000
57532003	1.000	37	2650	10.339
57532004	0.667	37	2650	20.677
57532005	0.000	37	2650	0.000
57532006	0.333	38	1450	18.895
58542000	0.000	35	1700	0.000
58542001	1.000	52	1700	16.116
58542002	0.000	57	1700	0.000
58542003	0.000	54	1700	0.000
58542007	0.000	42	2350	0.000
58542008	0.500	41	2350	11.658
58542009	0.200	39	4100	6.682
59030000	0.000	53	1850	0.000
59030002	0.000	56	455	0.000
59030004	0.000	55	455	0.000
59030008	0.000	47	455	0.000
59030014	0.000	37	3550	0.000
59030015	0.000	37	2550	0.000
59030016	0.167	40	2550	10.744
59030019	1.000	53	750	36.530
59030022	0.000	52	750	0.000
60041001	0.000	40	370	0.000
60041004	0.000	46	500	0.000
60041005	0.000	40	500	0.000
60041006	1.000	36	800	34.247
60044003	0.286	35	3950	13.872
60044004	0.000	36	5000	0.000
60044005	0.500	36	5000	5.479
60044006	0.000	38	5000	0.000
60071000	1.000	37	1000	27.397
60071004	0.000	42	750	0.000
60071005	0.000	38	750	0.000
60071007	0.000	41	950	0.000
60071008	0.000	44	950	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
60071010	1.000	4	800	34.247
60071015	0.000	39	1250	0.000
60071016	0.000	37	1250	0.000
60544003	0.000	41	3950	0.000
60544004	0.000	43	5000	0.000
60544024	0.000	28	1850	0.000
60544025	0.000	32	1850	0.000
61571002	0.000	40	1800	0.000
61571003	0.000	34	1800	0.000
63597004	0.500	45	950	28.839
63597005	0.000	42	950	0.000
65525000	0.000	25	850	0.000
65525004	0.000	30	550	0.000
65525005	0.000	30	550	0.000
65525006	0.500	34	550	49.813
65525007	0.000	34	550	0.000
65597002	0.500	24	1200	22.831
65597003	0.000	31	1200	0.000
65597006	0.000	34	2650	0.000
65597009	0.500	21	2650	10.339
65597010	0.000	26	650	0.000
65597012	1.000	26	650	42.150
65597013	0.000	29	650	0.000
65597016	1.000	27	650	42.150
66020009	0.143	21	25500	1.074
66020010	0.100	26	37000	0.740
66043000	0.000	45	37000	0.000
66043001	0.500	38	33000	0.830
66520009	0.000	29	37000	0.000
66520010	0.231	24	37000	2.221
66520011	0.000	23	37000	0.000
67597001	0.000	41	1600	0.000
67597003	1.000	35	1100	24.907
68513003	0.000	55	1000	0.000
68513004	0.000	51	1000	0.000
68513007	0.000	50	1000	0.000
68513008	0.333	48	1000	27.397
68513009	0.000	47	1000	0.000
68525014	0.000	32	550	0.000
69013014	0.000	52	4500	0.000
69013017	0.000	48	3100	0.000
69013018	0.250	43	3100	8.838
69013019	0.250	40	3100	17.676
69013020	1.000	57	1650	16.604
69013023	0.000	60	1650	0.000
69013024	0.000	59	900	0.000
69013025	1.000	51	900	30.441

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
69013026	1.000	56	500	54.795
69013029	0.000	61	500	0.000
69513001	1.000	40	1700	16.116
69513003	0.000	50	1450	0.000
69513004	0.000	54	1450	0.000
69513006	0.000	52	1450	0.000
69513008	0.000	56	1450	0.000
69513009	0.000	51	3800	0.000
69513010	0.000	51	3800	0.000
69525000	0.000	38	2900	0.000
69525001	0.000	38	2900	0.000
69525002	0.000	30	2900	0.000
69525003	0.000	32	2900	0.000
69525004	0.000	48	2900	0.000
69525005	0.000	44	4300	0.000
69525006	0.000	50	4300	0.000
69525007	1.000	46	2650	10.339
69525008	0.000	48	2650	0.000
69525011	0.000	51	2650	0.000
69525020	0.000	46	1600	0.000
69525022	0.000	44	1600	0.000
69525023	0.333	37	1600	17.123
69525025	0.000	46	1150	0.000
69525026	0.000	46	1150	0.000
69525027	0.000	45	1150	0.000
69597000	0.000	38	3400	0.000
69597001	0.000	38	3400	0.000
70595017	1.000	27	1500	36.530
71519002	0.000	36	1150	0.000
71558002	1.000	44	650	42.150
71558014	0.000	50	1900	0.000
72577013	0.167	33	7000	3.914
72577014	0.091	41	8500	3.223
72577015	0.000	47	2900	0.000
72577016	1.000	44	2900	9.447
72577017	0.000	40	2900	0.000
72577018	0.000	42	2900	0.000
72577021	1.000	43	2450	11.183
72577022	0.000	34	2450	0.000
74000000	0.222	38	32000	1.712
74000001	0.000	49	32000	0.000
74500000	0.167	29	32000	0.856
74500001	0.333	42	32000	1.712
75560002	0.125	36	8000	3.425
75560003	0.000	46	8000	0.000
76533001	0.000	33	1750	0.000
76533005	0.500	33	1750	15.656

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
76533007	0.000	34	1950	0.000
76533008	0.000	35	1950	0.000
76580000	0.000	32	1950	0.000
76580001	0.000	33	2700	0.000
76580002	0.000	34	2700	0.000
78000003	0.214	31	11500	7.147
78000004	0.176	27	11500	14.294
78000005	0.171	19	17000	9.670
78000006	0.180	26	16000	15.411
78000007	0.048	27	15000	1.826
78000008	0.167	35	14500	3.779
78500003	0.067	35	11500	2.382
78500004	0.174	28	11500	9.529
78500005	0.100	28	17000	4.835
78500006	0.161	31	15000	9.132
78500007	0.080	27	15000	3.653
80509000	0.000	44	3050	0.000
80509001	0.000	48	3050	0.000
80509002	0.000	35	3050	0.000
80509004	0.000	35	2800	0.000
80509005	0.000	33	2800	0.000
80509006	0.000	34	2800	0.000
80509008	0.000	28	2150	0.000
80509009	0.000	30	2550	0.000
80509011	0.000	29	2550	0.000
80509012	1.000	26	2550	10.744
80509013	0.000	22	3500	0.000
80509014	0.000	27	3500	0.000
80509015	0.000	27	3500	0.000
80509022	0.000	33	1500	0.000
80509025	0.500	32	1500	18.265
80509028	0.000	33	1500	0.000
80509030	0.000	28	850	0.000
80509031	0.000	35	850	0.000
80509032	0.000	28	850	0.000
80509035	0.000	29	850	0.000
80533001	0.000	48	2400	0.000
80533002	0.000	35	2400	0.000
80533003	1.000	34	2400	22.831
80533004	0.000	35	2400	0.000
80533006	0.000	36	2400	0.000
80533007	0.250	42	2400	11.416
80533008	0.500	38	2950	9.287
80533009	1.000	36	2950	9.287
80533010	0.000	35	2950	0.000
80533015	0.000	38	3200	0.000
80533016	0.000	41	3200	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
80533017	0.000	42	3200	0.000
81529008	0.800	34	12000	9.132
81529009	0.222	23	12000	4.566
81529010	0.000	38	13000	0.000
81529011	0.231	20	17000	4.835
81529012	0.000	32	17000	0.000
81529015	0.095	21	13000	4.215
81529016	0.250	32	13000	4.215
81529019	0.000	25	15000	0.000
81529020	0.208	27	15000	9.132
81529021	0.213	37	18500	14.809
81529022	0.071	32	18000	1.522
81529023	0.267	30	18000	6.088
81529024	0.333	44	16000	6.849
81576000	0.000	38	9500	0.000
81576001	0.105	25	16500	3.321
82099000	0.250	33	12500	2.192
82099001	0.000	31	12500	0.000
83055005	0.000	38	500	0.000
83055008	0.000	51	500	0.000
84555006	1.000	48	1100	24.907
84555008	0.000	37	1100	0.000
84555009	0.000	53	1100	0.000
86520004	0.250	35	4750	5.768
86520005	0.000	33	4750	0.000
87520001	0.143	34	4050	6.765
87520002	0.364	25	4050	27.059
88020000	0.263	31	3150	43.488
88020001	0.176	32	20500	4.009
88020002	0.125	30	23500	2.332
88020003	0.167	34	23500	1.166
88020004	0.300	27	23500	3.498
88520000	0.071	40	20500	1.336
88520001	0.100	30	20500	2.673
88520002	0.444	36	23500	4.663
88520003	0.250	41	23500	1.166
89020000	0.333	36	21000	1.305
89020001	0.400	35	24500	2.237
89020002	0.143	37	32000	0.856
89020003	0.000	40	36000	0.000
89020004	0.000	45	31500	0.000
89020005	0.000	43	31500	0.000
89020006	0.143	43	31500	0.870
89020007	0.143	50	27000	1.015
89020008	0.400	49	27000	2.029
89020009	0.250	36	27000	2.029
89520000	0.000	37	24500	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
89520001	0.000	46	32000	0.000
89520002	0.200	50	36000	1.522
89520003	0.583	46	36000	5.327
89520004	0.333	44	31500	0.870
89520005	0.000	45	31500	0.000
89520006	0.000	36	27000	0.000
89520007	0.000	44	27000	0.000
89520008	0.200	42	27000	1.015
89520009	0.000	53	27000	0.000
90562012	0.500	46	600	45.662
90562013	1.000	53	600	45.662
92518001	0.000	48	950	0.000
92518005	0.500	41	1650	16.604
92518006	1.000	46	1650	33.209
92563001	0.000	48	1200	0.000
92563003	1.000	44	1200	22.831
92563004	0.000	53	1200	0.000
92563005	0.000	41	1000	0.000
92563007	1.000	53	1000	27.397
93543003	0.000	62	90	0.000
93543011	0.000	49	2100	0.000
93543016	0.250	38	2100	13.046
93543017	0.125	39	16000	1.712
93543018	0.000	32	10500	0.000
93543019	0.000	35	8000	0.000
93543020	1.000	53	3000	9.132
93574000	0.000	44	950	0.000
93574002	0.000	45	850	0.000
93574005	1.000	49	1150	23.824
93574007	0.000	45	1150	0.000
93574009	0.000	49	2300	0.000
93574010	0.000	47	2300	0.000
93574011	0.333	42	2300	11.912
93574013	0.000	43	2300	0.000
93574014	0.000	44	3550	0.000
93574015	0.400	45	3550	15.435
94543000	0.000	33	10500	0.000
94543001	0.200	37	8500	3.223
94543002	0.000	35	5500	0.000
94543003	0.143	34	5500	9.963
94543004	0.000	33	7000	0.000
96099000	0.231	27	24500	3.355
96099001	0.333	29	9500	2.884
96099002	0.500	34	9500	5.768
96599000	0.222	27	23000	2.382
96599001	0.200	32	9500	2.884
97099000	1.000	30	15500	1.768

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
98044003	0.500	32	7500	3.653
99029002	0.100	43	9500	2.884
99029003	0.143	40	9500	5.768
99029004	0.000	36	9500	0.000
99029005	0.467	22	9500	20.187
99029006	1.000	36	9500	5.768
99029007	0.000	36	7500	0.000
99029008	0.417	34	8500	16.116
99029009	0.214	38	8500	9.670
99029010	0.000	45	4850	0.000
99529000	0.133	34	4950	11.070
99529002	0.222	30	9500	5.768
99529003	0.250	34	9500	5.768
99529004	0.200	34	9500	5.768
99529005	0.100	30	9500	2.884
99529006	0.200	34	9500	2.884
99529007	0.357	34	7500	18.265
99529008	0.294	33	8500	16.116
99529009	0.364	42	8500	12.893
99529010	0.100	35	4850	5.649
99529011	0.000	39	4850	0.000
101047005	0.000	33	7000	0.000
101047006	0.000	15	10500	0.000
101047007	0.000	26	11000	0.000
101047008	0.000	31	11000	0.000
101047009	0.000	26	11000	0.000
101547008	0.571	35	11000	9.963
101547009	0.000	26	11000	0.000
101547010	0.000	45	10000	0.000
102048008	0.000	32	5500	0.000
102048009	0.250	31	5500	4.981
102048010	0.800	35	6000	18.265
103588023	0.000	31	15500	0.000
103588024	0.167	39	15500	1.768
104089000	0.000	36	8000	0.000
104089001	0.000	30	8000	0.000
105576000	0.000	35	2950	0.000
105576001	0.000	34	1950	0.000
105576005	0.000	51	2450	0.000
106036000	0.333	31	2450	11.183
108523000	0.000	33	4650	0.000
108523001	0.000	36	4650	0.000
108523002	0.000	38	3150	0.000
108523004	0.000	43	3150	0.000
108523006	0.000	47	3150	0.000
108523007	0.000	42	2950	0.000
108523008	0.000	31	2950	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
108523011	0.500	41	2950	9.287
108523013	0.000	38	3100	0.000
109039000	1.000	35	3100	8.838
109039001	0.000	41	2150	0.000
109039002	0.000	41	2150	0.000
109556004	1.000	46	1550	17.676
109556006	0.000	40	1550	0.000
109556007	0.000	34	1550	0.000
109556008	0.000	37	1550	0.000
109556009	1.000	42	1850	14.809
109556010	0.000	38	1850	0.000
109556011	0.000	39	1850	0.000
109556012	0.000	33	1700	0.000
109556013	0.000	35	1700	0.000
109556014	0.000	36	1700	0.000
109556016	0.000	41	1750	0.000
109556017	0.000	34	1750	0.000
110502000	0.000	33	1750	0.000
110502001	0.000	34	2300	0.000
110502004	1.000	42	2300	23.824
110502005	0.000	39	2300	0.000
110502006	0.000	45	2300	0.000
110502008	0.000	53	2300	0.000
110556016	0.000	41	1650	0.000
110556022	0.000	41	850	0.000
110556023	0.000	41	850	0.000
110556024	0.000	39	850	0.000
110578000	0.000	47	850	0.000
111576000	0.147	28	700	195.695
111576001	0.000	40	18000	0.000
111576002	0.000	42	18000	0.000
111576003	0.200	38	13500	4.059
111576004	0.125	44	13500	2.029
111576005	0.333	50	11000	2.491
111576006	0.250	51	11000	2.491
111576007	0.000	33	11000	0.000
111576008	0.214	28	11000	7.472
111576009	0.400	36	10500	5.219
111576010	0.000	41	10500	0.000
111576011	0.188	40	10500	7.828
111576012	0.571	19	13000	8.430
111576013	0.300	19	13000	6.322
111576014	0.286	34	13500	8.118
111576019	0.000	35	10000	0.000
111576020	0.500	34	10000	2.740
111576021	0.000	28	12500	0.000
111576022	0.000	34	12500	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
111576023	0.000	34	16000	0.000
111576025	0.000	33	16000	0.000
111576026	0.600	41	8000	20.548
111576027	0.167	47	8000	6.849
111576028	0.500	43	5500	4.981
111576029	0.000	48	5500	0.000
111576030	0.000	44	4450	0.000
112529004	0.000	36	1400	0.000
113029000	0.250	29	20000	2.740
113029001	0.171	34	20000	9.589
113029002	0.214	31	22500	3.653
113029003	0.205	31	23000	9.529
113029004	0.071	23	23000	3.574
113029005	0.167	31	19500	2.810
113029006	0.182	30	20500	8.019
113029007	0.357	18	20500	6.682
113529000	0.154	36	20000	2.740
113529001	0.081	35	20000	4.110
113529002	0.250	32	22500	6.088
113529003	0.239	18	23000	13.103
113529004	0.233	22	23000	8.338
113529005	0.167	33	19500	1.405
113529006	0.250	30	19500	12.645
113529007	0.167	27	20500	5.346
114000003	0.095	29	11000	4.981
114000004	0.000	37	5500	0.000
114500002	0.182	31	6500	8.430
114500003	0.200	26	11000	7.472
114500004	0.000	28	5500	0.000
115599000	0.000	33	4350	0.000
115599001	0.000	35	4350	0.000
116529000	0.083	30	11500	2.382
116529000	0.000	30	11500	0.000
116529001	0.130	28	11500	7.147
118000000	0.212	26	17000	17.728
118000001	0.250	25	12500	21.918
118000002	0.234	25	15000	20.091
118000003	0.000	39	6500	0.000
118029000	0.200	26	17000	4.835
118029001	0.250	21	17000	1.612
118029002	0.222	24	17000	6.446
118029003	0.158	26	17000	4.835
118029004	0.111	42	17000	4.835
118500000	0.350	39	17000	22.562
118500001	0.220	27	12500	24.110
118500002	0.115	23	15000	5.479
118529000	0.211	39	18500	5.924

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
118529001	0.200	27	17000	3.223
118529002	0.200	23	17000	3.223
118529003	0.296	36	17000	12.893
118529004	0.182	28	17000	6.446
119530001	0.000	46	1250	0.000
119530003	0.000	38	1750	0.000
120063000	0.250	39	2750	9.963
120063001	0.250	42	2750	9.963
120063002	0.000	38	2750	0.000
120063003	0.333	46	2750	9.963
120063004	0.000	43	2750	0.000
120063005	0.500	42	1350	20.294
120063006	0.500	46	1350	20.294
120063007	0.000	48	1200	0.000
120063008	0.000	45	1200	0.000
120063012	0.500	45	1200	22.831
120063016	0.000	48	750	0.000
121007000	0.000	40	4400	0.000
121007000	0.000	40	4400	0.000
121007001	0.500	32	4400	24.907
121007001	0.000	32	4400	0.000
122029002	0.111	40	48000	0.571
122029003	0.200	41	48000	0.571
122029004	0.200	40	48000	1.712
122029005	0.182	41	57000	0.961
122029006	0.308	41	57000	1.923
122029007	0.125	39	57000	0.961
122029008	0.000	37	62000	0.000
122029009	0.111	41	62000	0.442
122029010	0.500	41	62000	0.442
122029011	0.204	27	62000	4.419
122029012	0.080	31	60000	0.913
122029013	0.125	33	60000	2.740
123529003	0.000	45	42000	0.000
123529004	0.125	45	42000	1.305
123529006	0.200	44	56000	0.978
123529007	0.250	44	56000	0.489
123529009	0.200	43	63000	0.435
123529010	0.333	41	63000	1.305
123529011	0.167	42	63000	0.435
123529012	0.200	33	57000	2.884
123529013	0.071	41	69000	0.397
123529014	0.000	38	31000	0.000
125553000	0.333	35	2400	22.831
125553001	0.000	42	2400	0.000
125553002	0.500	41	2400	11.416
125553003	0.500	43	2400	11.416

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
125553004	0.000	44	3450	0.000
125553005	0.000	48	3450	0.000
125553006	0.000	49	2800	0.000
125553007	0.000	50	2800	0.000
125553010	0.000	34	2800	0.000
125553011	0.000	36	2100	0.000
126520000	0.000	42	14000	0.000
126520001	0.000	35	14000	0.000
126520003	0.000	41	16500	0.000
126520004	0.000	43	16500	0.000
126520006	0.000	34	16500	0.000
126520007	0.000	47	19000	0.000
126520009	0.000	33	19000	0.000
126520010	0.000	37	15500	0.000
126520012	0.500	43	15500	1.768
126520013	0.200	46	15500	1.768
126520014	0.000	49	15000	0.000
127004000	0.000	38	2400	0.000
127067001	0.000	44	2550	0.000
127067002	0.000	51	2550	0.000
127067003	0.500	50	2550	10.744
127067004	0.000	51	2550	0.000
128000000	0.222	24	7000	7.828
128000001	0.286	31	7000	7.828
128029000	0.111	26	7000	3.914
128529000	0.133	28	2400	22.831
129522000	0.000	46	2500	0.000
129522001	0.000	42	2200	0.000
129522003	0.000	34	2200	0.000
129522004	0.000	36	2200	0.000
129522005	0.000	48	2200	0.000
129522006	1.000	45	2200	24.907
129522007	0.500	53	2200	12.453
129522009	0.000	43	2200	0.000
129522011	1.000	49	1000	27.397
129522016	0.000	54	210	0.000
129580001	0.000	42	4600	0.000
129580002	0.000	34	4600	0.000
129580003	0.333	34	4600	5.956
129580004	0.000	36	4600	0.000
129580006	0.000	45	4600	0.000
129580007	0.000	53	4600	0.000
129580008	0.000	50	4600	0.000
129580009	0.000	43	2500	0.000
129580010	0.200	43	2500	10.959
130561000	0.300	25	4700	17.488
130561001	0.000	30	4700	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
130561010	0.200	27	5500	4.981
131041003	0.000	38	460	0.000
132552000	0.333	25	60	456.621
133041000	0.000	38	550	0.000
133041001	0.000	46	550	0.000
133041003	0.000	41	550	0.000
133041007	1.000	43	1000	27.397
133041009	0.000	44	1000	0.000
133041010	0.000	38	1000	0.000
133041011	0.000	36	2900	0.000
133041012	0.000	46	2900	0.000
133041017	0.000	39	2050	0.000
133041019	1.000	26	2050	13.365
133041021	0.000	24	2050	0.000
134580000	0.150	30	2050	40.094
134580001	0.125	32	14500	3.779
134580003	0.333	36	17000	3.223
134580004	0.111	41	17000	1.612
137500004	0.000	23	10500	0.000
137500005	0.000	34	24000	0.000
137512008	0.000	40	1550	0.000
137512009	0.000	39	1550	0.000
137512010	0.500	48	700	39.139
137512012	0.000	50	650	0.000
137512020	1.000	40	485	56.489
137520000	0.125	35	13000	2.107
137520003	0.250	39	7500	3.653
137520004	0.250	35	7500	10.959
137520005	0.167	27	10000	5.479
137520006	0.000	27	11000	0.000
137520007	0.286	28	11000	4.981
137520008	0.353	20	11000	14.944
137520009	0.278	37	10000	13.699
137520010	0.300	26	10000	8.219
137520011	0.250	29	10000	8.219
137526004	0.000	51	1100	0.000
137526007	0.000	40	1350	0.000
137526011	0.000	51	1350	0.000
137526014	0.000	43	2050	0.000
137526015	0.000	48	2050	0.000
137526016	0.000	54	2750	0.000
137526017	0.333	59	2750	9.963
137526018	0.000	58	2750	0.000
137526019	0.333	57	3650	7.506
137526022	0.000	46	5500	0.000
137526023	0.333	51	5500	4.981
137526024	0.333	37	7500	3.653

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
137529000	0.222	43	18500	2.962
137529001	0.167	45	19500	1.405
137529002	0.083	34	19500	1.405
137529003	0.235	45	16500	6.642
137529004	0.176	23	16500	4.981
137529005	0.250	31	16500	4.981
137529006	0.227	41	16500	8.302
137529007	0.082	44	17000	6.446
137529008	0.106	29	18500	7.405
137529009	0.182	25	18500	8.886
137529010	0.103	25	18500	5.924
137529011	0.093	33	30500	3.593
137529012	0.176	31	30500	8.084
137529013	0.178	41	30500	7.186
137529014	0.269	33	27000	14.206
137542000	0.000	41	7500	0.000
137542001	0.000	43	7500	0.000
137542002	0.400	36	7500	7.306
137542008	0.000	48	4400	0.000
137542011	0.200	36	3550	7.718
137542012	0.000	40	2400	0.000
137542013	0.000	40	2400	0.000
137542014	0.000	41	2400	0.000
137543000	0.000	34	9000	0.000
137543001	0.129	32	11500	9.529
137543002	0.111	32	12000	4.566
137543003	0.111	40	12000	2.283
137543004	0.079	31	16500	4.981
137543005	0.250	31	12000	2.283
137558001	0.000	43	600	0.000
137558004	0.000	51	950	0.000
137558005	0.000	52	950	0.000
137558008	0.000	40	950	0.000
137576000	0.222	43	9000	6.088
137576001	0.500	33	9000	3.044
137576002	0.059	35	9000	3.044
137576003	0.000	48	7000	0.000
137576004	0.167	39	7000	7.828
137576005	0.077	37	15500	1.768
137576006	0.200	41	15500	5.303
137576007	0.172	36	15500	8.838
137576008	0.111	33	17500	1.566
137576009	0.140	31	17500	10.959
137576010	0.265	32	18000	13.699
137576011	0.122	31	18000	7.610
137576012	0.000	40	18000	0.000
137588008	0.000	32	8500	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
137588009	0.200	29	8500	16.116
137588010	0.182	18	18500	14.809
137588011	0.211	27	11500	9.529
137588012	0.333	30	14000	1.957
137589000	0.000	31	15500	0.000
137589008	0.000	32	8000	0.000
137589010	0.000	18	11500	0.000
137589011	0.462	35	11500	14.294
137589012	0.188	30	11000	7.472
138511000	0.333	37	9000	3.044
138511001	0.375	32	6500	12.645
138511002	0.100	30	6500	4.215
138511003	0.273	33	3800	21.629
138511004	0.000	45	3800	0.000
138511005	0.000	35	3800	0.000
138511006	0.500	36	3800	7.210
138511007	0.000	40	2500	0.000
138511008	0.000	48	2500	0.000
138511012	0.000	56	1600	0.000
138511013	0.000	54	1600	0.000
138511014	0.000	28	1600	0.000
138511019	0.000	39	2300	0.000
138511020	0.000	59	1550	0.000
138534017	0.000	31	6000	0.000
138534018	0.000	30	6000	0.000
138560005	0.000	37	5000	0.000
138560008	0.000	48	4750	0.000
138560020	0.000	36	4000	0.000
138560021	0.000	54	4050	0.000
138560023	0.000	43	4050	0.000
138577003	0.000	46	1550	0.000
138577004	0.000	39	1550	0.000
138577014	0.000	39	7500	0.000
138577015	0.000	42	7500	0.000
138577016	0.000	40	7500	0.000
138577017	0.000	44	6500	0.000
138577018	0.000	53	6500	0.000
138577019	1.000	38	6500	4.215
138577020	0.000	36	8000	0.000
138577021	0.250	40	8000	10.274
138577022	0.200	42	12500	2.192
138580000	0.000	39	5000	0.000
138580001	0.333	44	5000	5.479
138580002	0.000	38	5000	0.000
138580005	0.000	26	7500	0.000
138580021	0.000	41	7000	0.000
138580022	0.143	36	7000	7.828

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
138580023	0.200	40	7000	3.914
138580024	0.000	43	7000	0.000
139501010	1.000	37	9000	6.088
139501011	0.143	33	9500	2.884
140523014	0.000	48	13000	0.000
140523015	0.000	45	13000	0.000
140523016	0.000	42	13000	0.000
140523017	0.200	40	13000	2.107
140523018	0.000	38	13000	0.000
140523019	0.200	35	13000	2.107
140530000	0.000	52	13000	0.000
140530001	0.000	53	11000	0.000
140530003	0.000	53	12000	0.000
140530004	0.500	53	12000	2.283
140530005	0.000	50	12000	0.000
140530006	0.000	24	12000	0.000
140530007	0.000	26	20500	0.000
140530009	0.333	43	24000	1.142
140530010	0.235	29	24000	4.566
140530011	0.000	35	24000	0.000
140530012	0.000	41	19000	0.000
140530013	0.000	38	19000	0.000
140553000	0.000	38	8000	0.000
140553001	0.500	30	7500	10.959
140553002	0.167	36	7500	3.653
140553003	0.000	45	5500	0.000
140553006	0.000	39	5500	0.000
140553007	0.000	40	5500	0.000
140553008	0.000	39	5500	0.000
140553009	0.000	38	5500	0.000
140553010	0.000	37	5500	0.000
140553011	0.000	33	7000	0.000
140553013	0.000	32	24000	0.000
140553014	0.000	19	24000	0.000
140553017	0.000	38	10000	0.000
140553018	0.167	40	9500	2.884
140553019	0.000	47	9500	0.000
140553021	0.000	45	9500	0.000
140553022	0.231	35	9500	8.652
140553023	0.333	36	8000	6.849
140553024	0.000	47	8000	0.000
140553025	0.333	36	8000	3.425
140553026	0.333	42	8000	3.425
140553027	0.000	34	8000	0.000
140558006	0.000	29	3400	0.000
140558008	0.000	32	3250	0.000
140568001	0.000	47	4450	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
140568004	0.000	42	6500	0.000
140568007	0.000	38	5000	0.000
140576001	0.000	32	6000	0.000
140576002	0.000	36	6000	0.000
140576003	0.000	45	6000	0.000
140576004	0.111	49	10000	2.740
140576005	0.000	45	10000	0.000
140576007	0.000	40	10000	0.000
140576008	0.250	39	8000	3.425
140576009	0.000	38	8000	0.000
140576010	0.000	37	8000	0.000
140576011	0.000	33	8000	0.000
141528013	0.143	17	3950	6.936
141528014	0.800	53	11000	9.963
141528015	0.000	19	11000	0.000
141530000	0.000	41	11000	0.000
141530001	0.000	40	11000	0.000
141530002	0.000	41	11000	0.000
141530003	0.000	38	11000	0.000
141530004	0.000	37	11000	0.000
141530005	0.000	36	11000	0.000
141530006	0.000	39	12000	0.000
141530007	0.000	41	12000	0.000
141530008	0.000	41	12000	0.000
141530009	0.000	42	12000	0.000
141530010	0.000	43	12000	0.000
141530012	0.000	30	12000	0.000
141530013	0.250	22	10000	8.219
141530015	0.000	44	10000	0.000
141530016	0.000	43	10000	0.000
141530024	0.000	45	6000	0.000
141530028	0.000	52	10500	0.000
141530031	0.000	51	9000	0.000
141530033	0.000	48	8000	0.000
141530035	0.167	60	7500	3.653
141530041	0.000	52	3900	0.000
141530042	0.000	35	3900	0.000
141530043	1.000	48	3900	7.025
141530046	0.000	46	3900	0.000
141530048	0.000	44	3950	0.000
141536002	0.182	36	16500	3.321
141536003	0.000	31	16500	0.000
141536004	0.400	29	17500	3.131
141536005	0.182	33	17500	3.131
141536009	1.000	45	14000	1.957
141536010	0.000	32	14000	0.000
141536011	0.125	25	14000	1.957

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
141536012	0.250	26	14000	1.957
141536013	0.000	23	8500	0.000
141546000	0.000	41	6000	0.000
141546001	0.000	37	6000	0.000
141546002	0.250	35	6000	4.566
141546003	0.000	33	13000	0.000
141546004	0.000	35	13000	0.000
141561000	0.143	41	12000	2.283
141561001	0.000	37	12000	0.000
141561002	0.000	35	12000	0.000
141561003	0.000	33	12000	0.000
141561004	0.167	35	12000	2.283
141561006	0.167	39	8000	3.425
141589001	0.000	23	19500	0.000
141589002	0.250	21	19500	7.025
141589003	0.333	30	19500	2.810
141589004	0.000	30	19500	0.000
141599003	0.071	33	26000	1.054
141599004	0.000	28	26000	0.000
141599005	0.100	33	17500	1.566
141599006	0.429	28	17500	4.697
143552000	0.000	33	5000	0.000
143552003	1.000	35	4850	5.649
143552004	0.000	29	4850	0.000
143597002	0.000	39	4900	0.000
143597004	0.500	54	6000	4.566
143597005	1.000	56	7500	3.653
143597008	1.000	44	7500	7.306
143597009	1.000	46	7500	3.653
143597010	0.500	45	7500	3.653
143597011	0.000	50	7500	0.000
143597012	0.500	54	8000	3.425
143597013	0.500	51	8000	10.274
143597014	0.000	42	11000	0.000
143597015	0.750	26	11000	7.472
143597017	1.000	45	11000	2.491
143597020	1.000	56	6500	4.215
143597021	0.200	55	6500	4.215
143597022	0.000	56	6500	0.000
143597023	0.250	53	7000	3.914
143597024	0.000	49	7000	0.000
143597025	0.500	47	7000	3.914
143597026	1.000	57	7000	3.914
143597029	0.000	48	3400	0.000
144500001	0.077	37	12500	2.192
144500002	0.056	28	12500	2.192
144500003	0.133	41	11500	4.765

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
144500004	0.286	33	12500	4.384
144500005	0.296	32	12500	17.534
144502001	0.000	36	6500	0.000
144502002	0.500	41	6500	4.215
144502005	1.000	46	6500	4.215
144502006	0.000	45	6500	0.000
144502007	0.000	46	6500	0.000
144502008	0.333	39	7000	7.828
144502009	0.250	40	7000	3.914
144502010	0.000	37	7000	0.000
144502011	0.000	40	7500	0.000
144502012	0.500	41	7500	3.653
144502013	0.000	41	7500	0.000
144502014	0.000	43	7500	0.000
144502016	0.167	40	7500	3.653
144502017	0.000	43	20500	0.000
144502018	0.250	38	17500	1.566
144502021	0.167	29	17500	4.697
144502022	0.300	29	28000	8.806
144502023	0.188	27	28000	5.871
144502024	0.208	37	22000	6.227
144502025	0.150	39	22000	3.736
144502026	0.000	37	22000	0.000
144502027	0.115	47	18000	4.566
144502028	0.000	48	18000	0.000
144502029	0.000	45	16000	0.000
144502030	0.000	48	16000	0.000
144502031	0.000	48	16000	0.000
144505001	0.000	35	17000	0.000
144505002	0.087	30	17000	3.223
144505003	0.176	32	18500	4.443
144505004	0.000	22	18500	0.000
144505005	0.286	33	12500	4.384
144523000	0.000	51	7500	0.000
144523001	0.000	38	10500	0.000
144523002	0.200	47	10500	2.609
144523003	0.000	43	12000	0.000
144523004	0.000	43	12000	0.000
144523005	0.125	42	12000	2.283
144523007	0.500	51	10500	2.609
144523009	0.000	48	10000	0.000
144523010	0.000	51	10000	0.000
144523011	0.000	40	10000	0.000
144529000	0.000	26	8500	0.000
144529001	1.000	26	8500	3.223
144529002	0.000	26	8500	0.000
144529003	0.125	35	8500	6.446

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
144529004	0.138	33	16500	6.642
144529005	0.211	32	15500	7.070
144529006	0.143	46	15500	1.768
144529007	0.100	41	15500	3.535
144529008	0.250	41	17500	1.566
144529009	0.214	32	17500	4.697
144529013	0.217	29	19500	7.025
144529014	0.235	30	19500	5.620
144529015	0.097	25	19500	4.215
144529016	0.105	37	19500	2.810
144529017	0.214	38	19500	4.215
144530014	0.000	37	10000	0.000
144530015	0.250	33	23000	4.765
144530016	0.000	37	23000	0.000
144530017	0.167	48	23000	1.191
144530018	0.118	40	22000	2.491
144530019	0.000	40	22000	0.000
144530020	0.000	45	22000	0.000
144539000	0.000	36	16000	0.000
144539001	0.167	23	13500	2.029
144539002	0.000	38	13500	0.000
144539003	0.500	37	13500	4.059
144539004	0.000	39	7500	0.000
144539005	1.000	40	7500	3.653
144556000	0.000	51	7000	0.000
144556001	0.000	38	7000	0.000
144556003	0.000	43	7000	0.000
144556005	0.500	42	7000	3.914
144556006	0.200	40	10000	2.740
144556007	0.000	51	9000	0.000
144556008	0.000	45	8500	0.000
144556009	0.333	48	8500	3.223
144556010	0.000	51	8000	0.000
144556012	0.000	36	8000	0.000
144556013	1.000	37	7500	3.653
144556014	0.000	48	7500	0.000
144556015	1.000	31	7500	3.653
144556016	0.000	31	7500	0.000
144576000	0.167	44	24000	2.283
144576001	0.000	43	18500	0.000
144576002	0.000	42	18500	0.000
144576003	0.077	19	18500	4.443
144576004	0.208	23	18500	14.809
144576005	0.000	43	4400	0.000
144576006	0.000	43	4400	0.000
145039010	0.333	30	7000	3.914
145039011	0.000	30	7000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
145039012	0.000	32	7000	0.000
145039013	0.000	38	9000	0.000
145039014	0.000	31	9000	0.000
145042000	0.000	46	2150	0.000
145042001	0.000	38	2250	0.000
145042002	0.000	40	2250	0.000
145042004	0.500	30	2250	12.177
145042006	0.000	37	3300	0.000
145042008	0.000	41	3300	0.000
145042011	0.000	41	4100	0.000
145042012	0.000	39	4950	0.000
145042013	0.000	34	4950	0.000
145042016	0.000	29	4950	0.000
145043002	0.000	34	5500	0.000
145043003	0.200	29	5500	9.963
145043004	0.222	40	16500	3.321
145043005	0.250	29	16500	8.302
145043006	0.304	35	16000	11.986
145043007	0.063	35	13000	2.107
145054004	0.000	46	1650	0.000
145054008	0.000	40	1650	0.000
145054009	0.000	42	2600	0.000
145054010	1.000	46	2600	10.537
145054012	0.000	37	2600	0.000
145054013	0.000	37	3150	0.000
145054016	0.000	46	1450	0.000
145054019	0.333	43	1450	18.895
145054023	0.000	40	1500	0.000
145054024	0.000	39	1500	0.000
145054025	0.000	53	1500	0.000
145054026	0.000	46	1500	0.000
145054029	0.000	48	1500	0.000
145054030	1.000	43	1500	18.265
145054031	0.000	43	2150	0.000
145054032	0.000	50	2150	0.000
145539000	0.750	36	2650	31.016
145539002	0.000	43	2300	0.000
145539003	0.000	50	2300	0.000
145539004	0.000	46	2300	0.000
145539006	0.000	38	2500	0.000
145539007	0.000	34	2500	0.000
145539009	0.000	24	1500	0.000
145539010	0.000	52	7000	0.000
145539011	0.000	36	7000	0.000
145539012	0.500	34	7000	3.914
145539013	0.000	41	9000	0.000
145539014	0.000	34	9000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
145539015	0.000	53	3000	0.000
145542016	0.000	21	4950	0.000
145543003	0.000	43	8000	0.000
145543004	0.227	42	8000	17.123
145543005	0.133	19	16500	3.321
145543006	0.200	28	16000	6.849
145568000	0.000	44	3350	0.000
145568002	0.000	43	3350	0.000
145568003	0.000	50	3350	0.000
145568004	0.333	46	3350	8.178
145568005	0.000	42	2600	0.000
145568006	1.000	38	2600	10.537
145568008	0.000	49	2600	0.000
145568010	0.000	52	2600	0.000
146000000	0.200	41	26500	3.102
146000001	0.231	31	30500	2.695
146000003	0.421	32	29000	7.558
146000004	0.100	27	29000	0.945
146029000	0.000	32	14500	0.000
146029001	0.067	31	16500	1.660
146029002	0.091	34	16500	1.660
146029003	0.000	27	35500	0.000
146029004	0.167	27	35500	3.087
146029005	0.071	24	35500	0.772
146029006	0.286	42	40500	2.706
146029007	0.188	36	64000	1.284
146029008	0.056	41	32500	0.843
146029012	0.241	29	17500	10.959
146029013	0.235	29	21500	10.194
146029014	0.154	45	21500	2.549
146029015	0.053	25	28500	0.961
146029016	0.100	29	28500	1.923
146029017	0.190	29	28500	11.536
146029018	0.212	31	28500	6.729
146029019	0.286	29	26500	2.068
146053000	0.000	45	7000	0.000
146053001	0.000	47	7000	0.000
146053002	0.000	55	3500	0.000
146053004	0.000	49	3500	0.000
146053007	0.000	48	4000	0.000
146053009	0.000	36	3850	0.000
146053010	0.000	53	5000	0.000
146053011	0.000	53	5000	0.000
146053012	0.200	42	6000	4.566
146053013	0.500	30	5500	4.981
146053014	0.000	37	5000	0.000
146053015	0.000	43	5000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
146053016	0.000	40	5000	0.000
146053017	0.000	40	5000	0.000
146053018	0.200	35	5000	5.479
146053019	0.000	35	5000	0.000
146053020	0.000	36	8500	0.000
146053021	1.000	39	8500	3.223
146053022	0.000	37	8500	0.000
146053023	0.000	41	8500	0.000
146053024	0.250	33	8500	6.446
146053025	0.000	30	8500	0.000
146053026	0.000	29	14500	0.000
146053027	0.100	33	14500	1.889
146053028	0.250	33	14500	1.889
146500000	0.250	38	30500	1.797
146500001	0.296	25	30500	7.186
146500002	0.056	43	30500	0.898
146500003	0.156	27	29000	4.724
146500004	0.091	31	29000	0.945
146529000	0.286	28	14500	3.779
146529001	0.167	35	16500	8.302
146529002	0.030	29	16500	1.660
146529003	0.045	36	35500	0.772
146529004	0.192	31	35500	3.859
146529005	0.129	23	35500	3.087
146529006	0.105	28	40500	1.353
146529007	0.375	36	64000	1.284
146529008	0.250	25	32500	2.529
146529012	0.222	28	17500	9.393
146529013	0.243	27	21500	11.469
146529014	0.133	27	21500	2.549
146529015	0.167	31	28500	5.768
146529016	0.145	24	28500	7.690
146529017	0.222	17	28500	9.613
146529018	0.095	35	28500	1.923
146529019	0.200	32	26500	1.034
146553007	0.000	48	4000	0.000
146553008	0.000	48	3850	0.000
146553009	0.000	21	3850	0.000
146553010	0.500	21	5000	5.479
146553011	0.000	50	5000	0.000
146553019	0.000	40	8500	0.000
146553020	0.000	39	8500	0.000
146553021	0.000	44	8500	0.000
146553022	0.000	39	8500	0.000
146553023	0.000	35	8500	0.000
146553024	0.125	34	8500	3.223
146553025	0.111	29	8500	3.223

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
146553026	0.000	28	14500	0.000
148012000	0.000	34	5500	0.000
148012001	0.000	40	4600	0.000
148012005	0.000	32	4600	0.000
148012006	0.000	35	4600	0.000
148012009	0.000	33	4600	0.000
148012010	0.000	46	4600	0.000
148012012	0.000	48	4750	0.000
148012015	0.000	39	5500	0.000
148012016	0.000	41	5500	0.000
148012017	0.000	42	4600	0.000
148012018	0.500	45	4600	5.956
148012021	0.000	41	4600	0.000
148017000	0.500	34	7500	3.653
148017001	0.000	48	7500	0.000
148017002	0.250	41	7500	3.653
148017004	0.000	47	7000	0.000
148017005	0.200	50	7000	3.914
148017006	0.000	45	7000	0.000
148017007	0.500	32	7500	3.653
148017008	1.000	45	7500	3.653
148017010	0.000	49	2250	0.000
148017011	0.000	52	2250	0.000
148017013	0.000	47	2250	0.000
148017014	0.000	54	2250	0.000
148017016	0.000	48	2250	0.000
148017017	0.000	45	2250	0.000
148017018	0.000	49	2250	0.000
148017020	0.000	53	1450	0.000
148017023	0.000	42	1450	0.000
148040002	1.000	44	5500	4.981
148040003	0.000	44	5500	0.000
148040004	0.000	41	5500	0.000
148040005	0.333	36	5500	4.981
148040006	0.333	21	5500	4.981
148040007	0.444	31	8000	13.699
148040011	0.000	35	8000	0.000
148041027	1.000	21	2750	19.925
148044002	0.000	43	3400	0.000
148044004	0.000	39	4000	0.000
148044005	0.000	35	4000	0.000
148044007	0.000	40	6000	0.000
148044008	0.429	27	6000	13.699
148044017	0.000	45	4100	0.000
148044018	0.000	49	4100	0.000
148044019	0.000	49	7500	0.000
148044020	0.000	53	7500	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
148044022	0.000	49	7000	0.000
148052001	0.000	31	3400	0.000
148052005	0.000	31	2650	0.000
148052010	0.000	48	2150	0.000
148052011	0.000	53	2150	0.000
148052020	0.000	53	1550	0.000
148052021	0.000	53	1550	0.000
148052027	0.000	55	1550	0.000
148052028	1.000	64	1550	17.676
148058001	0.000	45	2450	0.000
148058002	1.000	32	2450	11.183
148058003	0.000	16	2900	0.000
148058004	0.000	40	2900	0.000
148058005	0.000	41	2900	0.000
148058010	0.000	33	2100	0.000
148058011	0.500	42	2100	13.046
148058014	0.000	26	2100	0.000
148058016	0.000	37	2100	0.000
148058018	1.000	37	2100	13.046
148058020	0.000	39	2650	0.000
148058021	0.000	40	2900	0.000
148058022	0.000	34	2900	0.000
148058024	0.000	39	2900	0.000
148058028	0.000	34	2650	0.000
148058037	0.000	44	7000	0.000
148058038	0.500	50	7000	3.914
148058039	0.000	49	5500	0.000
148058040	0.000	47	5500	0.000
148058041	0.000	41	5500	0.000
148061005	0.333	34	9500	2.884
148061006	0.333	34	9500	2.884
148061015	0.000	25	14500	0.000
148061016	0.273	23	14500	5.668
148061018	0.000	42	15500	0.000
148061019	0.600	36	15500	5.303
148061020	0.000	42	20000	0.000
148061024	0.000	33	19000	0.000
148061025	0.100	32	27000	1.015
148061026	0.000	35	27000	0.000
148064011	0.000	35	25500	0.000
148070001	0.000	51	1050	0.000
148070002	0.000	43	1050	0.000
148070003	0.000	40	1400	0.000
148070004	1.000	39	1400	19.569
148070008	0.000	44	1050	0.000
148070014	0.500	54	1050	26.093
148070015	0.333	47	2500	10.959

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
148070016	0.000	48	2500	0.000
148070017	0.000	45	2500	0.000
148070018	0.000	49	3400	0.000
148070021	0.000	50	3400	0.000
148070022	0.000	49	3400	0.000
148070024	0.000	48	2600	0.000
148071003	0.000	42	4750	0.000
148071004	0.000	45	5500	0.000
148071009	0.167	43	5500	4.981
148071010	0.000	35	5500	0.000
148087000	0.000	32	8000	0.000
148087005	0.000	35	8000	0.000
148087006	0.000	30	7500	0.000
148087012	0.500	32	8000	3.425
148087013	0.333	31	8000	3.425
148087014	0.000	24	8000	0.000
148087015	0.000	28	8000	0.000
148087016	0.000	31	7500	0.000
148087018	0.000	35	7500	0.000
148087019	0.000	31	7500	0.000
148087021	0.000	37	7500	0.000
148087022	0.500	33	9000	3.044
148087023	0.000	36	9000	0.000
148087024	0.000	35	9000	0.000
148087025	0.000	34	9000	0.000
148087026	0.000	39	10000	0.000
148087027	0.000	32	10000	0.000
148087028	0.000	42	10500	0.000
148087029	0.000	47	10500	0.000
148087030	0.000	40	10500	0.000
148087032	0.000	44	9000	0.000
148512000	0.000	36	5500	0.000
148512001	0.000	39	4600	0.000
148512006	0.250	36	4600	5.956
148512007	0.000	41	4600	0.000
148512008	0.000	39	4600	0.000
148512009	0.500	40	4600	5.956
148512010	0.000	42	4600	0.000
148512015	0.000	38	5500	0.000
148512016	0.500	39	5500	9.963
148512017	0.000	37	4600	0.000
148512018	0.000	38	4600	0.000
148512021	0.000	49	4600	0.000
148517000	0.143	40	7500	3.653
148517001	0.333	36	7500	3.653
148517002	0.500	39	7500	3.653
148517004	0.000	44	7000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
148517005	0.000	47	7000	0.000
148517006	0.000	42	7000	0.000
148517007	0.000	37	7000	0.000
148540002	0.333	46	5500	4.981
148540005	0.000	22	5500	0.000
148540006	0.300	28	5500	14.944
148540007	0.500	31	11000	4.981
148540008	0.000	41	7000	0.000
148544003	0.000	38	4000	0.000
148544005	0.000	47	4000	0.000
148544006	0.000	28	4000	0.000
148544007	0.250	30	6000	4.566
148544008	0.000	42	6000	0.000
148544014	1.000	41	6000	4.566
148544018	0.000	31	4100	0.000
148544019	0.000	34	7500	0.000
148544020	0.250	34	7500	3.653
148544022	0.000	32	7000	0.000
148544023	0.000	36	5500	0.000
148544024	1.000	43	5500	4.981
148552001	0.000	47	3400	0.000
148552002	1.000	35	2650	10.339
148552003	0.000	36	2650	0.000
148552005	0.000	33	2650	0.000
148552006	0.000	32	2650	0.000
148552008	0.000	51	2250	0.000
148552011	0.000	47	2150	0.000
148552020	0.000	50	1550	0.000
148552021	0.000	53	1550	0.000
148552024	1.000	51	1550	17.676
148552026	0.000	56	1550	0.000
148552027	0.000	62	1550	0.000
148552029	0.000	35	2550	0.000
148552033	0.000	32	2550	0.000
148552034	0.333	27	2600	10.537
148552035	0.000	40	2600	0.000
148552036	0.000	29	1450	0.000
148552038	0.250	30	1450	18.895
148552039	0.000	29	1450	0.000
148552041	0.000	32	1450	0.000
148552043	0.000	46	2150	0.000
148552047	0.000	27	2150	0.000
148558003	0.000	38	2450	0.000
148558005	0.000	41	2900	0.000
148558008	0.000	41	4750	0.000
148558019	0.000	42	2100	0.000
148558022	0.000	32	2900	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
148558025	0.000	46	2900	0.000
148558026	0.000	41	2650	0.000
148558028	0.000	47	2650	0.000
148558037	0.000	40	7000	0.000
148558040	0.500	48	5500	4.981
148561008	0.167	28	11500	2.382
148561009	0.000	26	11500	0.000
148561015	0.286	29	14500	3.779
148561016	0.188	33	14500	5.668
148561018	0.500	35	15500	5.303
148561019	0.000	27	15500	0.000
148561020	0.000	30	20000	0.000
148561024	0.000	40	19000	0.000
148561025	0.286	41	27000	2.029
148561026	0.250	36	27000	1.015
148570018	0.000	31	3400	0.000
148570019	0.000	34	3400	0.000
148570022	0.000	32	2600	0.000
148570024	0.000	43	2600	0.000
148570025	0.000	39	2600	0.000
148570026	0.000	40	2400	0.000
148570027	0.000	45	2400	0.000
148570030	0.000	44	2400	0.000
148570031	0.500	45	2400	11.416
148584002	0.667	35	2000	27.397
148584003	0.000	36	2000	0.000
148584004	0.333	33	2000	13.699
148587001	0.000	30	8000	0.000
148587002	0.000	34	8000	0.000
148587006	0.000	41	7500	0.000
148587007	1.000	41	7500	7.306
148587008	0.000	41	7500	0.000
148587010	0.000	38	7500	0.000
148587011	0.000	39	8000	0.000
148587012	0.667	39	8000	6.849
148587013	0.000	38	8000	0.000
148587014	0.000	41	8000	0.000
148587015	0.000	34	8000	0.000
148587017	0.000	37	7500	0.000
148587019	0.000	37	7500	0.000
148587020	0.000	35	7500	0.000
148587021	0.333	35	7500	3.653
148587022	0.000	41	9000	0.000
148587023	0.000	36	9000	0.000
148587025	0.500	35	10000	2.740
148587026	0.000	35	10000	0.000
148587027	0.000	39	10000	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
148587030	0.000	35	10500	0.000
148587031	1.000	42	10500	2.609
148587033	1.000	38	9000	6.088
149005000	1.000	44	1550	17.676
149005005	0.000	38	500	0.000
149005010	0.000	42	750	0.000
149005012	0.000	49	750	0.000
149005013	0.000	49	750	0.000
149005015	0.000	29	750	0.000
149005019	0.000	35	1250	0.000
149005020	0.000	38	1250	0.000
149005022	0.000	39	1250	0.000
149005027	0.000	37	1200	0.000
149005030	0.000	44	1200	0.000
149006000	0.000	44	1000	0.000
149006002	0.000	45	550	0.000
149006003	0.000	46	550	0.000
149014003	1.000	46	430	63.715
149014004	0.000	45	430	0.000
149014007	0.000	27	430	0.000
149014008	1.000	39	430	63.715
149014011	0.000	44	1350	0.000
149014013	0.000	49	1900	0.000
149014014	0.000	36	2400	0.000
149014015	0.000	29	2400	0.000
149014021	0.000	33	1100	0.000
149020000	0.000	45	12000	0.000
149020001	0.500	48	12000	2.283
149020002	0.000	38	12000	0.000
149020003	0.083	38	12000	2.283
149020004	0.100	34	15000	3.653
149020005	0.273	37	23500	3.498
149020006	0.050	38	23500	1.166
149020007	0.085	35	23500	4.663
149020008	0.108	23	28500	3.845
149020009	0.076	23	34500	3.971
149020010	0.074	23	34500	1.588
149020011	0.156	19	29500	6.501
149020012	0.133	51	29500	1.857
149024006	0.000	34	3300	0.000
149024009	0.000	36	2100	0.000
149024014	0.000	36	2100	0.000
149043000	0.077	18	6000	4.566
149043001	0.375	48	8500	9.670
149043002	0.313	38	8500	16.116
149043003	0.200	38	10500	5.219
149043004	0.143	12	7500	7.306

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
149043005	0.000	27	6000	0.000
149043007	0.500	25	6500	12.645
149043008	0.000	29	6500	0.000
149062002	0.000	45	1000	0.000
149062004	0.000	45	1000	0.000
149063001	0.333	37	5500	4.981
149063002	0.000	41	5500	0.000
149063004	0.500	35	5500	4.981
149063008	0.250	42	2900	9.447
149063009	0.000	41	2900	0.000
149063011	0.000	34	2050	0.000
149063013	0.000	52	2050	0.000
149063014	0.000	50	2050	0.000
149063017	0.000	43	2050	0.000
149063018	0.000	36	2050	0.000
149072001	0.200	48	2600	10.537
149072003	0.000	38	2600	0.000
149072005	0.000	37	3600	0.000
149072007	0.000	35	3600	0.000
149072008	0.000	29	3600	0.000
149072009	0.250	28	3600	7.610
149072010	0.500	38	7500	3.653
149072013	0.000	41	10500	0.000
149072015	0.000	40	10500	0.000
149072016	0.000	37	10500	0.000
149072017	0.500	28	11000	4.981
149072018	0.000	43	11000	0.000
149072019	0.000	29	11000	0.000
149072020	0.000	34	14000	0.000
149072021	0.500	42	14000	1.957
149099000	0.250	34	14500	3.779
149099001	0.200	27	14500	1.889
149099004	0.167	23	10000	2.740
149099005	0.143	30	6500	4.215
149520000	0.000	54	12000	0.000
149520001	0.333	47	12000	2.283
149520002	0.000	43	12000	0.000
149520003	0.000	30	12000	0.000
149520004	0.222	21	15000	3.653
149520005	0.368	34	23500	8.161
149520006	0.143	41	23500	2.332
149520007	0.176	36	23500	13.990
149520008	0.119	35	28500	4.807
149520009	0.147	37	34500	3.971
149520010	0.258	29	34500	6.353
149520011	0.222	31	29500	9.287
149520012	0.417	24	29500	4.644

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
149543000	0.250	54	8500	9.670
149543001	0.143	47	8500	6.446
149543002	0.300	43	8500	9.670
149543003	0.200	36	10500	2.609
149543004	0.200	15	7500	7.306
149543005	0.333	29	6000	4.566
149543007	0.000	42	6500	0.000
149543008	0.000	31	6500	0.000
149543009	0.000	37	4600	0.000
149547009	0.000	36	9500	0.000
149547010	0.000	28	9500	0.000
149547012	0.000	33	10000	0.000
149547013	0.250	30	10000	2.740
149563000	1.000	32	4600	5.956
149563001	0.333	39	5500	4.981
149563002	0.667	38	5500	9.963
149563003	0.000	36	5500	0.000
149563004	0.000	35	5500	0.000
149563005	0.500	39	2900	9.447
149563006	0.000	37	2900	0.000
149563009	0.000	43	2900	0.000
149563010	0.000	45	2900	0.000
149563017	0.000	40	2050	0.000
149563018	0.000	41	2050	0.000
149572008	0.000	41	3600	0.000
149572009	0.250	45	3600	7.610
149572010	0.000	45	7500	0.000
149572011	0.667	36	7500	7.306
149572012	0.250	42	10500	2.609
149572013	0.000	39	10500	0.000
149572014	0.500	44	10500	2.609
149572015	0.500	20	10500	2.609
149572016	0.167	40	10500	2.609
149572018	0.000	43	11000	0.000
149572019	0.000	41	11000	0.000
149572020	0.000	38	14000	0.000
149599004	0.500	32	10000	2.740
149599005	0.000	32	6500	0.000
150030000	0.000	43	8500	0.000
150030001	0.000	55	8500	0.000
150030002	0.500	49	8500	3.223
150030003	0.000	54	8500	0.000
150030004	1.000	55	8500	3.223
150030005	0.000	47	8500	0.000
150078001	0.000	55	1100	0.000
150078002	1.000	49	1100	24.907
150078004	0.000	55	1100	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
150078006	0.333	42	1100	24.907
150078011	0.000	39	2550	0.000
150078012	0.333	50	2750	9.963
150078013	1.000	47	3050	8.983
150078016	0.000	46	3050	0.000
150078017	0.000	46	3050	0.000
150078021	0.000	50	3050	0.000
150078022	0.000	44	3050	0.000
150078023	0.000	40	3050	0.000
150078024	0.000	39	3050	0.000
150530000	0.000	44	7000	0.000
150530001	0.000	55	8500	0.000
150530002	0.000	48	8500	0.000
150530004	0.000	43	8500	0.000
150530005	0.000	31	8500	0.000
150578008	0.000	49	2550	0.000
150578010	0.000	51	2550	0.000
150578011	0.000	51	2550	0.000
150578012	0.000	49	2750	0.000
150578013	0.000	42	3050	0.000
150578014	0.000	49	3050	0.000
150578015	0.000	47	3050	0.000
150578017	0.000	48	3050	0.000
150578020	0.000	49	3050	0.000
150578021	0.000	49	3050	0.000
150578023	0.000	47	3050	0.000
150578024	0.000	44	3050	0.000
151511003	0.333	26	11000	2.491
151511004	0.250	36	11000	2.491
151511005	0.000	31	6000	0.000
151511010	0.000	30	5500	0.000
151511011	0.000	35	5500	0.000
151511015	0.000	44	4300	0.000
151511018	0.000	29	3350	0.000
151511025	0.000	37	2850	0.000
151511026	0.000	37	2950	0.000
151511028	0.000	35	2950	0.000
151511033	1.000	32	2950	9.287
151511034	0.000	27	2950	0.000
151533000	0.000	37	6500	0.000
151533001	0.000	34	6500	0.000
151533002	0.000	32	7500	0.000
151533003	0.000	38	7500	0.000
151533005	0.000	33	7500	0.000
151533006	0.000	41	7500	0.000
151533007	0.000	34	7500	0.000
151533008	0.000	39	7500	0.000

Final Site ID	Wet / Dry Ratio	SN(64)S	AADT	Wet Accident Rate
151533009	0.000	33	7500	0.000
151533010	0.000	34	7500	0.000
151533011	0.500	32	7500	3.653
151533012	0.000	32	7500	0.000
151533013	0.000	32	8500	0.000
151533016	0.500	21	10000	2.740
151533017	0.000	22	10000	0.000
151533018	0.000	32	12000	0.000
151533019	0.000	31	12000	0.000
151533020	0.000	22	12000	0.000
151533021	1.000	24	11500	2.382
151533024	0.333	26	11500	4.765
151533025	0.000	35	14000	0.000
151533026	0.500	24	14000	1.957
151533027	0.333	27	13000	2.107
151544001	0.000	46	6000	0.000
151544003	0.000	40	6000	0.000
151544004	0.000	45	6500	0.000
151544005	0.333	46	12000	4.566
151544006	0.143	24	12000	2.283
151544007	0.000	34	8500	0.000
151544008	0.000	39	8500	0.000
151544009	0.000	33	8500	0.000
151544010	0.200	34	8500	3.223
151544011	0.000	32	8000	0.000
151544012	0.000	32	8000	0.000
151544013	0.000	32	8000	0.000
151544014	0.000	25	8000	0.000
151544016	0.400	21	8000	6.849
151544017	1.000	22	8000	3.425
151544018	0.000	32	8500	0.000
151544019	0.500	31	9500	2.884
151544020	0.000	22	9500	0.000
151544022	0.000	23	8000	0.000
151580000	0.000	37	13500	0.000
151580002	0.000	32	13500	0.000
151580003	0.000	38	13500	0.000
151580004	0.000	44	13500	0.000
151580005	0.375	23	13500	6.088
151580006	0.000	21	13500	0.000
151580007	0.056	24	19500	1.405
151580008	0.000	39	23500	0.000
151580009	0.000	33	23500	0.000
151580010	0.091	40	31500	0.870
151580011	0.333	42	31500	2.609
172561004	0.000	32	9500	0.000
172561005	0.000	28	9500	0.000

VITA

Jeffrey Scott Kuttesch was born in Charlottesville, Virginia on October 30, 1980 to Frederick S. Kuttesch and Doris A. Kuttesch. He lived in Earlysville, Virginia and attended Albemarle High School, where he graduated in 1999. After graduation, he attended Virginia Polytechnic Institute and State University. In 2003, he graduated with a Bachelor of Science degree in Civil Engineering.

Upon graduation, Jeff pursued a Masters of Science degree in Civil Engineering at Virginia Polytechnic Institute and State University. He was a Via Scholar and served as a graduate teaching assistant during his tenure. He expects his Masters degree in December 2004.