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Improved Method of Using Traffic Estimates to Evaluate intersection Improvements

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IMPROVED METHOD OF USING TRAFFIC ESTIMATES TO EVALUATE INTERSECTION IMPROVEMENTS

Final Report

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16. Abstract

Traffic volume estimating is necessary for planning, designing and maintaining a reasonable quality of service along roadway networks. Reliable estimation of traffic volumes is needed to realistically assess problems and determine appropriate solutions that meet the expectations of the traveling public. Regression equations were developed to find the relationship between average peak hour volume and the design hourly volume/average annual daily traffic to ensure the appropriate design of geometric and traffic control improvements that best fit traffic characteristics in Nebraska.

Basic linear regression equations were used to extrapolate the number of hours in a year that have more volume than the average peak hour volume in a given year. It was found that the average peak hour was equivalent to about the 270th highest hourly volume of a typical year. This value is the average number of hours during which the average peak hour volume was exceeded for a specific year. Therefore, use of average PHV as an estimate for design may not be appropriate for Nebraska or at least must be understood by practitioners as a value that can be exceeded many, many times during the year.

The traditional definitions of average peak hour volume (PHV), design hourly volume (DHV) described as the 30th highest traffic hour volume of the year, and the average annual daily traffic (AADT) were verified by using continuous traffic count data from the Nebraska Department of Roads. The study resulted in the following conclusions.

- The average peak hourly volume can be reasonably estimated if the DHV (defined as the 30th highest hourly volume of the year) or the AADT volume is known. Conversely, if the average PHV is established from an actual traffic count, the DHV or AADT can be reasonably estimated.
- Nebraska traffic characteristics indicate that a significant change in the rate of traffic increase as a percent of the AADT occurs between the 14th and 24th highest hours of the year for a rural type roadway which represents a range from 47 to 67 percent of the 30th hour criteria. This differs from the commonly excepted value of the 30th highest hourly volume as the point where there is a significant change in volume which represents about 0.34 percent of the total annual hours. The location of significant change on urban type roadways closely approximates the 30th highest hour criteria representing a range of 77 to 100 percent of the 30th hour criteria.
- The average peak hourly volume may be exceeded between 200 to 400 hours annually, depending on the functional classification of the roadway. Assuming that these 200 to 400 hours would likely be during the weekday morning or evening peak hours (which would be a total of 5 days per week multiplied by 2 peaks per day multiplied by 52 weeks per year or 520 hours annually), using the average peak hourly volume for geometric and traffic control design purposes would mean the volume of traffic would exceed the design service volume 38 to 77 percent of the total number of peak hours in the year. If the goal was for the design of the facility to only be exceeded 30 hours in the design year (about 0.34 percent of the total annual hours in a future year), the design would fall severely short of its goal. The result would be the appearance that the improvement was ineffective, poorly designed and a source of frustration to the traveling public.
- Equations were developed to estimate the number of annual hours a measured peak hour would result in if the AADT for a facility is known.

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The project monitor was Laura Lenzen, Assistant Traffic Engineer in the Traffic Division at NDOR. She coordinated the involvement of NDOR in the research project after the initial project monitor Larry Briggs retired from the organization. She also provided oversight and guidance to the research team. Her excellent cooperation contributed to the successful completion of the research.

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CHAPTER 1

INTRODUCTION

Accurate traffic volume estimations are critical to allow the appropriate design of the geometric features and traffic control devices of roadway improvements to meet or exceed current and future traffic demands for a reasonable time period. In conducting traffic impact studies and reviews for planned roadway projects, a variety of traffic estimates are used by transportation engineers to evaluate the need for appropriate traffic control and geometric improvements.

What are the Appropriate Traffic Estimates To Use for Roadway Improvements and Traffic Control Solutions?

One of the primary dilemmas faced by governing traffic authorities in Nebraska is the design service traffic volume that should be used to determine the use of a traffic signal at suburban and fringe areas of towns and cities within the state. For example, the Design Hourly Volume (DHV) is sometimes used in the Peak Hour Warrant to justify the need for a traffic signal. However, the DHV is defined as the 30th highest hourly volume in the "design" year, whereas the peak hour volume (PHV) is defined as the highest hourly volume during an average day (1). Depending on the functional type of roadway, the PHV may be from 5 to 45 percent lower than the DHV. Consequently, implementation of the recommendations of traffic impact studies that use the DHV in the Peak Hour Warrant may result in the installation of unwarranted traffic signals. There is anecdotal evidence that some major chain developers believe a traffic signal will be beneficial to the success of their investment, whether or not it is warranted by the traffic volumes. This may result in the misuse of the intent of the traffic warrants for signalization defined in the Manual of Uniform Traffic Control Devices (MUTCD) (2).

Unwarranted traffic signals increase traffic delay, stops, and crashes. They also may be a tort liability risk and unnecessarily increase costs to developers. Variations in the use of traffic estimates to determine turning movement percentages in justifying auxiliary lanes may overstate the need for turning lanes and promote the unnecessary expenditure of highway and developer funds. On the other hand, variations in the use of traffic estimates may understate the need for traffic control and geometric improvements, resulting in unforeseen congestion, inconvenience, and additional expense.

The most commonly accepted traffic criteria for the design of the capacity of a roadway segment or intersection of roadways is the DHV, the 30th highest hourly volume in the design year (1). The definition infers that if a facility is to adequately serve throughout its life, its physical capacity will only be exceeded for about 30 hours out of the total 8,760 hours in the "design" year. The choice of the 30th highest hourly volume is a long-held concept which stems from research published in *A Policy on Geometric Design of Rural Highways* from the American Association of State Highway Officials (AASHO) in 1965 (pages 54-56). The concept is reproduced graphically in **FIGURE 1**. This figure is still used in the 2004 edition of the guidebook, which is commonly referred to as the Green Book (1).

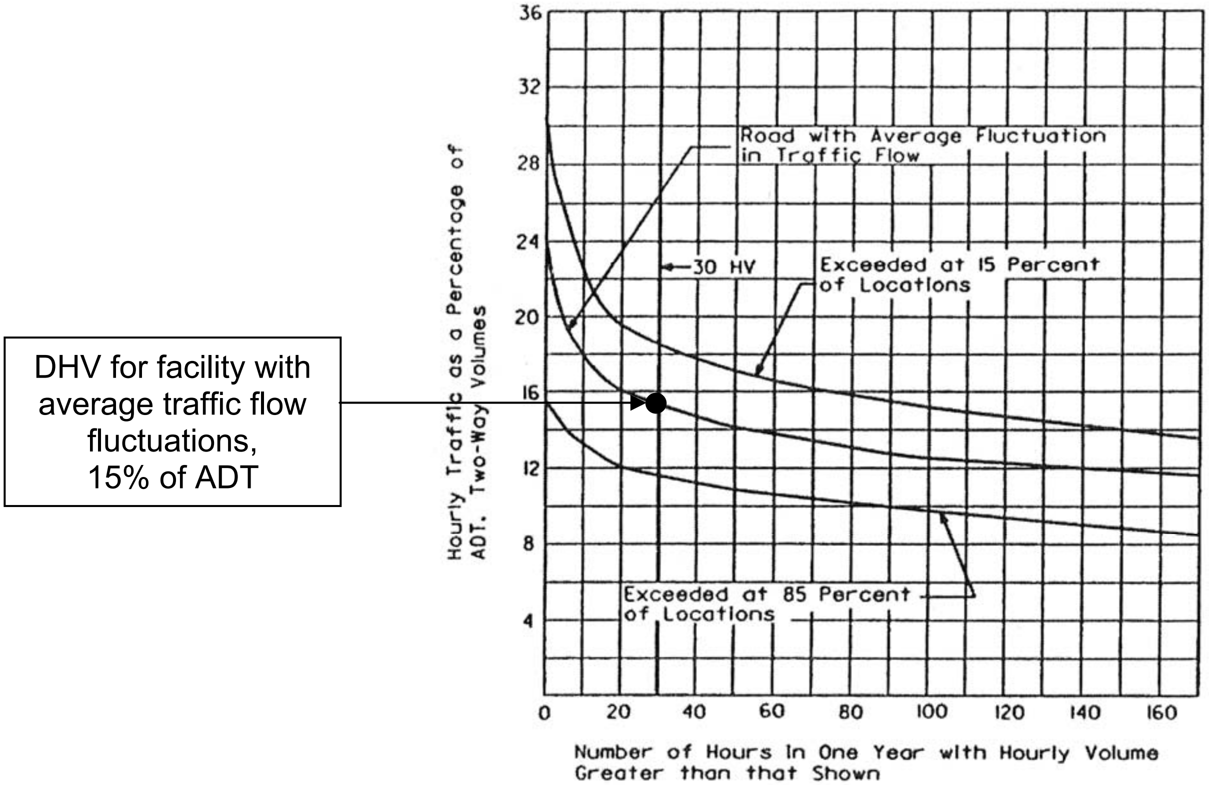


FIGURE 1 Relation Between Peak-Hour and Average Daily Traffic Volumes on Rural Arterials (p. 60, 1)

The data from which **FIGURE 1** was developed represent a multitude of rural arterials covering a wide range of volumes and geographic conditions. The horizontal axis of the figure indicates the 170 highest number of traffic hours in a typical year of 8,760 total hours. The vertical axis shows the value of the volume of traffic during these hours as a percentage of the average daily traffic (ADT) at the study locations. The vast amount of data points included in the study are bracketed by trend lines that capture the bulk of the results (70 percent as indicated by the curve labels), as shown by the upper and lower curves in the figure. The middle line represents sites that exhibited an average fluctuation in traffic flow. Visually comparing all of the trend lines together indicates that drastic traffic flow changes occurred near the 30th highest hour of the year, as the steepness of the curves indicates between the 1st highest hourly volume and the 30th. For the remainder of the hours between the 30th and the 170th, there is very little change in the slope of the curves, indicating that designing for that 30th hour would cover the expected traffic volume at almost any given hour in a given day of a given week in a given month of a given year.

If this concept is valid, one can estimate the average hourly volume that would be exceeded only 29 times per year on a facility with average traffic flow fluctuations by calculating 15 percent of the ADT, as shown by the caption in **FIGURE 1**. In an effort to reasonably balance desired level of service and practical economy, the 30th highest hour is traditionally seen as the pivot point of reasonable design.

Estimating a design hourly volume to plan the required number of lanes and appropriate traffic control devices in a suburban or urban situation is a challenge. In Nebraska, on a typical urban roadway, the 30th highest hourly volume is generally about 9-10% of the ADT. This value has remained consistent over many years. Conversion equations between ADT and DHV developed from the last three years of available continuous traffic count data from the Nebraska Department of Roads (NDOR) are shown in **TABLE 1** (3, 4, 5).

TABLE 1 Relationship Between the 30th Highest Hour of Yearly Traffic (DHV) and the ADT in Nebraska Derived from NDOR Continuous Traffic Count Data from the Years 2004-2006 (3, 4, 5)

Year of Continuous Traffic Count Data	**Rural Highways Other Than Low Volume Rural Roads and Rural Interstates**	**Urban Highways and Streets Other Than Urban Interstates**
2004	DHV = 6.89 + (0.1022)(ADT)	DHV = 96.44 + (0.0930)(ADT)
2005	DHV = 6.20 + (0.1025)(ADT)	DHV = 101.02 + (0.0927)(ADT)
2006	DHV = 4.21 + (0.1035)(ADT)	DHV = 105.46 + (0.0922)(ADT)

Example calculations using various representative ADT values which are realistic for daily traffic volumes on Nebraska roadways yield the following results shown for comparison purposes in **TABLE 2** for rural conditions and **TABLE 3** for urban conditions.

TABLE 2 Example Calculations to Estimate DHV on Rural Highways Other Than Low Volume Rural Roads and Rural Interstates Using NDOR Conversion Formulas Derived from Continuous Count Data for the Years 2004-2006 (3, 4, 5)

Year of Continuous Traffic Count	**DHV Estimate using 100 ADT**	**DHV Estimate using 1,000 ADT**	**DHV Estimate using 10,000 ADT**	**DHV Estimate using 20,000 ADT**
2004	18	110	1,029	2,051
2005	17	109	1,032	2,057
2006	15	108	1,040	2,075

TABLE 3 Example Calculations to Estimate DHV on Urban Highways and Streets Other Than Urban Interstates Using NDOR Conversion Formulas Derived from Continuous Count Data from the Years 2004-2006 (3, 4, 5)

Year of Continuous Traffic Count	**DHV Estimate using 100 ADT**	**DHV Estimate using 1,000 ADT**	**DHV Estimate using 10,000 ADT**	**DHV Estimate using 20,000 ADT**	**DHV Estimate using 50,000 ADT**
2004	106	190	1,027	1,957	4,747
2005	111	194	1,029	1,956	4,737
2006	115	198	1,028	1,950	4,716

Roadway improvements are normally based on volumes of traffic projected to a "design" year which is usually the time at which the facility will likely undergo a major reconstruction resulting in an opportunity to reassess the facility's function. The "design" year may be determined from the roadway network planning schedules (1-, 6-, and 20-year plans) of the appropriate governing agency, assuming funding mechanisms are similar to those upon which the plans are based. If the facility to be improved is designed to adequately accommodate the number of vehicles resulting from a reliable future traffic projection calculation and the design service volume is correctly estimated, the facility should be able to adequately function at a predetermined level of service 99.997% of the available hours in the "design" year. If the concept is valid, the assumptions appear to be very conservative, meaning there should be little complaint from the traveling public of frequent delays with over-capacity conditions as long as the level of service used to define "adequate" service is reasonable with respect to local user attitudes.

A suburban-urban surrogate estimate of design service volume is required to determine an equivalent DHV in less rural areas. Locations along the fringe of urban areas are the most contentious since the highest hourly volume of the typical 24-hour day occurs in the evening work-to-home peak. An understanding of the variability of the evening peak is necessary to properly assess a design service volume that will produce a geometric design configuration and traffic control device solution that will function appropriately for the "life" of the project. The design service volume is defined as the maximum hourly traffic volume that a roadway should be designed to serve without the quality of service falling below a predetermined level. The "life", in this less rural scenario, should exceed the generated traffic volume from a newly developed commercial attraction's ultimate build-out for several years. Practitioners agree that as a minimum, traffic volumes generated at the opening of a newly developed area should be accommodated with an acceptable level of service. A reasonable time period of similar acceptable level of service should be at least five years unless the land use in the area of the improvement drastically changes unpredictably. Choice of a suitable design service volume should be sensitive to the following points, highlighted by the Green Book:

Design should not be so economical that severe congestion results during peak periods. It may be desirable, therefore, to choose an hourly volume for design, which is about 50 percent of the volumes expected to occur during the few highest hours of the design year, whether or not that volume is equal to the 30th highest hour. Some congestion would be experienced by traffic during peak hours but the capacity would not be exceeded. A check should be made to ensure that the expected maximum hourly volume does not exceed the capacity **(p. 61, 1).**

The 30th Highest Hour Volume (HHV) criterion also applies in general to urban areas; however, where the fluctuation in traffic flow is markedly different from that on rural roadways, other hours of the year should be considered for the basis of design. A highest-hour-volume recommendation for these types of situations is given in the Green Book as follows:

In urban areas, an appropriate DHV may be determined from the study of traffic during normal daily peak periods. Because of the recurring morning and afternoon peak traffic flow, there is usually little difference between the 30th and the 200th highest hourly volume. For typical urban conditions, the highest hourly volume is found during the afternoon work-to-home travel peak. One approach for determining a suitable DHV is to select the highest afternoon peak traffic flow for each week and then average these values for the 52 weeks of the year. If the morning peak-hour volumes for each week of the year are all less than the afternoon peak volumes, the average of the 52 weekly afternoon peak-hour volumes would have about the same values as the 26th highest hourly volume of the year [assuming the average has half of the 52 peak hours higher than it and half lower]. If the morning peaks are equal to the afternoon peaks [a total of 52 x 2 = 104 hours], the average of the afternoon peaks would be about equal to the 52nd highest hourly volume [assuming the average has half of the 104 morning and afternoon peak hours higher than it and half lower].

The volumes represented by the 26th and 52nd highest hours of the year are not sufficiently different from the 30th highest hour value to affect design. Therefore, in urban design, the 30th highest hourly volume can also be assumed to be a reasonable representation of daily peak hours during the year **(p. 61*, 1*)*.***

The logic of the recommendation above should be compared to Nebraska traffic volume values to verify that it is similar to local traffic behaviors before accepting the assumptions.

There is a need for a better understanding of the local, commonly accepted use of traffic estimates to evaluate the need for intersection improvements in traffic impact studies and reviews of planned roadway projects. If the design hourly volume of every roadway improvement were estimated from a year's worth of manual or automated traffic counts at the improvement's location in question, error in the estimate of the 30th highest hourly volume would be small. However, the most commonly used method of determining peak-hour volumes involves an 8-hour count on a Tuesday, Wednesday or Thursday which are considered to be days of the week representing the most "average" traffic conditions. These types of counts are meaningful for many aspects of transportation engineering such as signal warrants but they are thought by practitioners to underestimate or overestimate the peak-hour volume, thereby resulting in physical improvements that will generate either over-capacity conditions more often than acceptable or unneeded auxiliary lanes.

RESEARCH PROJECT OBJECTIVES

The logic of the statements above is evident but does the logic fit reality closely enough to prevent the misinterpretation of commonly used traffic estimates? Key phrases alluding to assumptions of the logic fitting reality are shaded in the quotation above. One of the objectives of this research project is to compare these statements to reality based upon data collected at continuous counting sites operated and maintained by NDOR. If the assumptions aren't valid for user expectations and traffic conditions in Nebraska, the reality-based results should be used to appropriately represent more realistic estimates.

Traffic estimate accuracy is highly dependent on the applicability of the 30th highest hour assumption, as well as the appropriate choice of acceptable degree of congestion. Therefore, the following questions need to be answered before the design of any roadway improvement or traffic control solution can proceed:

1) **What is a politically acceptable and financially achievable degree of congestion in the design year, given the attitudes of the local traveling public?**

2) **What is a reasonably accurate estimate of the traffic volume standard selected to achieve relatively few opportunities of failure with respect to tolerable delay for local system users?**

Goals of the research project are to review traffic volume trends in Nebraska, determine if the trends follow the concept that has been thought to describe an appropriate estimate to determine the physical features of roadway systems for its "design" life, and develop a more realistic method of using traffic estimates to improve the quality and consistency of traffic impact studies and reviews of planned roadway projects. There exists a need to better plan for the future development along access points and standardize the methods used to determine the criteria for the selection of roadway improvements and traffic control solutions at those access points. Practitioners also find the notion of using a standard traffic volume unit for both design and operations desirable, if possible. For instance, NDOR uses DHV values to determine the appropriate number of lanes, pavement thickness, and turn-bay lengths yet warrants for signalization of intersections are based on peak hour, 4-hour vehicle volume and 8-hour counts. It would be desirable to be able to reliably estimate one traffic unit from another by understanding the relationships between them.

A better understanding of current traffic volume estimate relationships will promote consistency in their application. It will reduce the likelihood that unwarranted traffic signals and unnecessary roadway improvements will be installed at intersections on the state highway system. Likewise, it will reduce the likelihood that needed improvements are overlooked. Thus, the research results will promote greater safety and reduce unnecessary road user, highway, and developer costs.

CHAPTER 2

REVIEW OF REFERENCES TO ASSIST IN ANSWERING QUESTION 1: WHAT IS A POLITICALLY ACCEPTABLE AND FINANCIALLY ACHIEVABLE DEGREE OF CONGESTION IN THE DESIGN YEAR, GIVEN THE ATTITUDES OF THE LOCAL TRAVELING PUBLIC?

Traffic and design engineering practitioners have a plethora of guidebooks to choose from for advice on providing adequate service for road system users. As discussed earlier, the design service volume is the maximum hourly volume of traffic that a roadway should be designed to serve without the quality of service falling below a predetermined level. The roadway should be designed using a design hourly volume less than or equal to the design service volume.

Accepted Degrees of Congestion According to the 2004 Green Book

To meet the requirements described above, an understanding of “accepted” congestion needs to be defined. The following is an excerpt from the Green Book (p. 78, 1):

The degree of congestion that should not be exceeded during the design year on a proposed highway can be realistically assessed by:
1) determining the operating conditions that the majority of motorists will accept as satisfactory,
2) determining the most extensive highway improvement that the governmental jurisdiction considers practical, and
3) reconciling the demands of the motorist and the general public with the finances available to meet those demands.

This is an administrative process of high importance in meeting the expectations of the traveling public. The decision should first be made as to the degree of congestion that should not be exceeded during the design period. The appropriate design for a particular facility (such as number of lanes or optimal traffic control device) can then be estimated from the following foundational concepts (pp. 78-80, 1):

1. The highway should be so designed that, when it is carrying the design volume, the traffic demand will not exceed the capacity of the facility even during short intervals of time.
2. The design volume per lane should not exceed the rate at which traffic can dissipate from a standing queue (applicable primarily to freeways and high-type multilane highways).
3. Drivers should be afforded some choice of speed. The latitude in choice of speed should be related to the length of trip.
4. Operating conditions should be such that they provide a degree of freedom from driver tension that is related to or consistent with the length and duration of the trip.
5. There are practical limitations that preclude the design of an ideal freeway.

6. The attitude of motorists toward adverse operating conditions is influenced by their awareness of the construction and right-of-way costs that might be necessary to provide better service.

Level of Service (LOS) characterizes the operating conditions on a facility in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The transportation engineering profession has chosen to classify various service levels using a grading system from A through F. **TABLE 4** shows the alphabetic categories with short subjective phrases with respect to roadway segments characterizing general operation conditions for each of them.

TABLE 4 General Qualitative Definitions of Level of Service (p. 84, 1)

Level of Service	General Operating Conditions
A	Free flow
B	Reasonably free flow
C	Stable flow
D	Approaching unstable flow
E	Unstable flow
F	Forced or breakdown flow

The Green Book provides general guidance with respect to the appropriate level of service to which an improvement should perform. The guidance is reproduced in **FIGURE 2**. Recommendations are based on the variables of the functional class of the roadway, the location with respect to population concentration (rural, suburban, or urban), and the terrain type (level, rolling or mountainous). Service level recommendations are conscious of the expectations of drivers in the following ways:

1. Level of service decreases with decreased level of mobility in the functional hierarchy which has a direct impact on the design speed (and therefore upon the corresponding vertical and horizontal alignment) and the roadway cross section.
2. Level of service decreases with increasing cost of construction due to terrain.
3. Level of service decreases with increasing population density from rural to urban conditions.

	Appropriate level of service for specified combination of area and terrain type			
Functional Class	Rural level	Rural rolling	Rural mountainous	Urban and suburban
Freeway	B	B	C	C
Arterial	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

FIGURE 2 Guidelines for Selection of Design Levels of Service (p. 85, 1)

Quantitative Recommendations for Design Service Volumes Related to Level of Service Given by the 2000 Highway Capacity Manual

The latest formal version of the guiding document for traffic analysis, planning and design is the 2000 Edition of the Highway Capacity Manual (6). This guidebook assigns general quantitative values to design service volume levels that bracket the A-F level of service categories recommended by the Green Book. Values are separated by the functional classes of

- Two-Lane Rural Highway, **FIGURE 3,**
- Multi-Lane Highways, **FIGURE 4,** and
- Basic Freeway Segments, **FIGURE 5.**

(SEE FOOTNOTE FOR ASSUMED VALUES)

FFS (mi/h)	Terrain	Service Volumes (veh/h)				
		A	B	C	D	E
65	Level	260	480	870	1460	2770
	Rolling	130	290	710	1390	2590
	Mountainous	N/A	160	340	610	1300
60	Level	260	480	870	1460	2770
	Rolling	130	290	710	1390	2590
	Mountainous	N/A	160	340	610	1300
55	Level	N/A	330	870	1460	2770
	Rolling	N/A	170	710	1390	2590
	Mountainous	N/A	110	340	610	1300
50	Level	N/A	N/A	330	1000	2770
	Rolling	N/A	N/A	170	790	2590
	Mountainous	N/A	N/A	110	420	1300
45	Level	N/A	N/A	N/A	330	2770
	Rolling	N/A	N/A	N/A	170	2590
	Mountainous	N/A	N/A	N/A	110	1300

Note:
Assumptions: 60/40 directional split; 20-, 40-, and 60-percent no-passing zones for level, rolling, and mountainous terrain, respectively; 14 percent trucks; and 4 percent RVs.
N/A = not achievable for the given condition
Source: Harwood et al. (7).

This table contains approximate values and is meant for illustrative purposes only. The values depend on the assumptions and should not be used for operational analyses or final design. This table was derived using assumed values listed in the footnote.

FIGURE 3 Design Service Volumes for Two-Lane Rural Highways (p. 12-19, 6)

(SEE FOOTNOTE FOR ASSUMED VALUES)

FFS (mi/h)	Number of Lanes	Terrain	Service Volumes (veh/h) A	B	C	D	E
60	2	Level	1120	1840	2650	3400	3770
		Rolling	1070	1760	2520	3240	3590
		Mountainous	980	1610	2310	2960	3290
	3	Level	1690	2770	3970	5100	5660
		Rolling	1610	2640	3790	4860	5390
		Mountainous	1470	2410	3460	4450	4930
50	2	Level	940	1540	2220	2910	3430
		Rolling	890	1460	2120	2780	3260
		Mountainous	820	1340	1940	2540	2990
	3	Level	1410	2310	3340	4370	5140
		Rolling	1340	2200	3180	4170	4900
		Mountainous	1230	2010	2910	3810	4480

Notes:
Assumptions: highway with 60-mi/h FFS has 8 access points/mi; highway with 50-mi/h FFS has 25 access points/mi; lane width = 12 ft; shoulder width > 6 ft; divided highway; PHF = 0.88; 5 percent trucks; and regular commuters.

This table contains approximate values. It is meant for illustrative purposes only. The values are highly dependent on the assumptions and should not be used for operational analyses or final design. This table was derived from the assumed values listed in the footnote.

FIGURE 4 Design Service Volume for Multi-lane Highways, (p. 12-11, 6)

(SEE FOOTNOTE FOR ASSUMED VALUES)

	Number of Lanes	FFS (mi/h)	Service Volumes (veh/h) for LOS A	B	C	D	E
Urban	2	63	1230	2030	2930	3840	4560
	3	65	1900	3110	4500	5850	6930
	4	66	2590	4250	6130	7930	9360
	5	68	3320	5430	7820	10,070	11,850
Rural	2	75	1410	2310	3340	4500	5790
	3	75	2110	3460	5010	6750	8680
	4	75	2820	4620	6680	9000	11,580
	5	75	3520	5780	8350	11,250	14,470

Notes:
Assumptions: Urban: 70-mi/h base free-flow speed, 12-ft-wide lanes, 6-ft-wide shoulders, level terrain, 5 percent heavy vehicles, no driver population adjustment, 0.92 PHF, 1 interchange per mile.
Rural: 75-mi/h base free-flow speed, 12-ft-wide lanes, 6-ft-wide shoulders, level terrain, 5 percent heavy vehicles, no driver population adjustment, 0.88 PHF, 0.5 interchanges per mile.

This table contains approximate values. It is meant for illustrative purposes only. The values are highly dependent on the assumptions used. It should not be used for operational analyses or final design. This table was derived using assumed values given in the footnote.

FIGURE 5 Design Service Volumes for Basic Freeway Segments, (p. 13-13, 6)

The 2000 Highway Capacity Manual also gives quantitative criteria for levels of service A-F for intersections with various types of traffic control. Since traffic flow may be interrupted at intersections, service levels are quantified by units of user delay time in seconds. Separate criteria is given for the following traffic control types:

- Two-Way Stop Control, **FIGURE 6,**
- Signal Control, **FIGURE 7,** and
- All-Way Stop Control, **FIGURE 8.**

Level of Service	Average Control Delay (s/veh)
A	0–10
B	> 10–15
C	> 15–25
D	> 25–35
E	> 35–50
F	> 50

FIGURE 6 Delay Level of Service Criteria for Two-Way Stop-Controlled Intersections (p. 16-2, 6)

LOS	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10–20
C	> 20–35
D	> 35–55
E	> 55–80
F	> 80

FIGURE 7 Delay Level of Service Criteria for Signalized Intersections (p. 17-2, 6)

Level of Service	Control Delay (s/veh)
A	0–10
B	> 10–15
C	> 15–25
D	> 25–35
E	> 35–50
F	> 50

FIGURE 8 Delay Level of Service Criteria for All Way Stop-Controlled Intersections (p. 17-32, 6)

Practitioner Guides for Volume Studies from the 2000 Institute of Transportation Engineers (ITE) Manual of Transportation Engineering Studies (7)

The quality of operations and level of performance of roadway segments and intersections cannot be evaluated unless two things are known:

1) the capacity of the segment or intersection and
2) the volume of traffic using the facility at a given point in time.

For planning purposes, the traffic volume anticipated for the design hour must be estimated using traditional methods so a suitable geometric configuration and traffic control system may be used successfully.

Although it would be advantageous to have all state, county and city roadway networks monitored with continuous counting devices, technology limits and budget constraints have not made this possible at this point in time. Therefore, traffic counts must be made to sample actual volumes for various periods of time to estimate design service volumes. Sample periods and sample methods depend upon the ultimate use to which the volume data will be put (p. 20, 6).

***Count Periods for Volume Studies,* (p. 20, 7)**

The counting period selected for a given location depends on the planned use of the data and the methods available for collecting the data. The count period should be representative of the time of day, day of week, or month of year that is of interest in the study. Saturday counts are sometimes needed for shopping areas. Typical count periods for turning movements, sample counts, vehicle classifications, and pedestrians include:

- ***2 hours; peak period***
- ***4 hours; morning and afternoon peak periods***
- ***6 hours; morning, midday, and afternoon peak periods***
- ***12 hours; daytime (say 7:00 am to 7:00 pm)***

Count intervals are typically 5 or 15 minutes.

Capacity analysis purposes: 15-minute counts are adequate.
Peak-hour factor determination: 5-minute counts are preferable.
Automatic counts: 1-hour counts are commonly used.

***Traffic Access and Impact Studies* (p. 146, 6)**

Studies will frequently include the following:

- ***Peak-period turning movements for site and street***
- ***Adjustment factors to relate count data to design period***
- ***Machine counts to verify peaking characteristics***

Suggested Background Traffic Volume Data for Review **(p. 147, 6)**
The following recommendations are made for traffic volume data to be collected:

- ***Current and historic daily and hourly volume counts***
- ***Recent intersection turning movement counts***
- ***Seasonal variations***
- ***Projected volumes from previous studies or regional plans***
- ***Relationship of count day to both average and design days***

The time period(s) that provides the highest cumulative directional traffic demands should be used to assess the impact of site traffic on the adjacent street system and to define the roadway configurations and traffic control measure changes needed in the study area.

Typical Peak Traffic Flow Hours for Selected Land Use
FIGURE 9 is reproduced from the ITE guide.

Land Use	*Typical Peak Hours*[a]	*Peak Direction*
Residential	7:00–9:00 A.M. weekdays	Outbound
	4:00–6:00 P.M. weekdays	Inbound
Regional shopping center	5:00–6:00 P.M. weekdays	Total[b]
	12:30–1:30 P.M. Saturdays	Inbound
	2:30–3:30 P.M. Saturdays	Outbound
Office	7:00–9:00 A.M. weekdays	Inbound
	4:00–6:00 P.M. weekdays	Outbound
Industrial	Varies with employee shift schedule	
Recreational	Varies with activity type	

[a]Hours may vary based on local conditions.
[b]Period of maximum weekday traffic impact.
Source: ITE, 1987b.

FIGURE 9 Typical Peak Traffic Flow Hours for Selected Land Uses (p. 152, 7)

For uses that do not demonstrate substantial weekly or seasonal variations, select average days for the analysis. For developments that exhibit major seasonal variations, design days (approximating the 30th highest hour) should be selected.

Techniques for Projecting On-Site Traffic
FIGURE 10 is reproduced from the ITE guide.

Build-up	Appropriate in areas of moderate growth Usually used when project has horizon of 10 years or less Often the best method when there is good local information on development approvals
Transportation plan	Often used with large, regional projects that will develop over a long period Often appropriate for areas of high growth Locally credible transportation plan data that are adaptable to the study year must be available
Growth rates	Typically used for small projects that will be built within a year or two Local record keeping of traffic counts must be good At least 5 years of data showing stable growth should be available Simple, straightforward approach Not appropriate for long-range horizons May result in over- or undercounting nonsite traffic growth

FIGURE 10 Techniques for Projecting On-Site Traffic (p. 159, 7)

CHAPTER 3

USE OF AN ACCEPTABLE PROCEDURE FOR THE ANALYSIS OF ALTERNATIVES IN THE CHOICE OF OPTIMAL GEOMETRIC AND TRAFFIC CONTROL SOLUTIONS

The National Cooperative Highway Research Project 457 (*NCHRP 457): Evaluating Intersection Improvements: An Engineering Study Guide* (8) was developed specifically to define the steps involved in an engineering study of a problem intersection or intersection improvement, beginning with identifying the problem and viable alternatives to address the given situation. The document also illustrates how to use capacity analysis and traffic simulation models to determine the most effective operational traffic movement given the geometric configuration and choice of traffic control device. The report analyzed difficulties commonly faced when using traffic signal warrants to determine the appropriateness of traffic control signals and identified methods of determination for operational effectiveness that should be considered in the assessment of intersection improvements. The report then provides a step-by-step process for the execution of an engineering study for those improvements.

IT IS HIGHLY RECOMMENDED THAT THIS DOCUMENT GOVERN THE PROCESS REQUIRED BY NEBRASKA TO DETERMINE OPTIMAL INTERSECTION IMPROVEMENTS OF A FACILITY SINCE IT CONSIDERS BOTH GEOMETRIC AND TRAFFIC CONTROL DEVICE OPTIONS IN THE DETERMINATION OF AN OPTIMAL SOLUTION. An Internet version of the report includes internal hyperlinks between different parts of the report and external links to the most recent source material commonly used by practitioners. This Internet version also includes 17 interactive worksheets that can be helpful in using the guide.

A list of traffic control and geometric alternatives normally considered for problem locations or facility improvements from NCHRP 457 was reviewed and the required traffic estimates data for each alternate was compiled to get an idea of the typical uses of the data. **TABLE 5** lists required traffic data requirements for traffic control device options and **TABLE 6** lists traffic data requirements for geometric alternatives.

TABLE 5 Use of Traffic Estimates in Typical Traffic Control Alternatives for Optimal Operations Improvements at Intersections (8)

Traffic Control Alternative	Traffic Estimate Data Required
Add Flash Mode to Signal Control	1. Major-road and minor-road approach volumes for each hour of the average day 2. Major-road and minor-road approach through-lane count
Convert to Traffic Signal Control	Major-road and minor-road peak-hour, 4-hour and 8-hour counts.
Convert to Multi-way Stop Control	Minimum Volumes: 1. The vehicular volume entering the intersection from the major-street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day. 2. The combined vehicular, pedestrian and bicycle volume entering the intersection from the minor-street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour. 3. If the 85^{th}-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.
Convert to Two-Way Stop or Yield Control	Major- and minor-road approach volumes for the peak hour of the average day.
Prohibit On-Street Parking	1. Major- and minor-road approach volumes for 8 or more hours on the average day. 2. Major- and minor-road approach through-lane count.
Prohibit Left-Turn Movements	No traffic volumes required.

TABLE 6 Use of Traffic Estimates in Typical Geometric Alternatives for Optimal Operations at Intersections (8)

Geometric Alternative	Traffic Estimate Data Required
Convert to Roundabout	1. Major- and minor-road approach volumes for average day. 2. Major- and minor-road turn movement volumes for the average day (used to compute average left-turn percentage). 3. Major- and minor-road approach sight distance. 4. Major- and minor-road pedestrian, bicycle, and heavy vehicle volumes for the average day.
Add a Second Lane on the Minor Road	1. Major-road approach volume for the peak hour of the average day. 2. Minor-road turn movement volume for the peak hour of the average day (used to compute right-turn percentage).
Add a Left-Turn Bay on the Major Road	1. Major-road turn movement volume for the peak hour of the average day. 2. Major-road 85th-percentile speed (posted speed can be substituted if data are unavailable).
Add a Right-Turn Bay on the Major Road	1. Major-road turn movement volume for the peak hour of the average day. 2. Major-road 85th-percentile speed (posted speed can be substituted if data are unavailable).
Increase Length of Turn Bay	1. Major- and minor-road turn movement volumes for the peak hour of the average day. 2. Major-road 85th-percentile speed (posted speed can be substituted if data are unavailable). 3. Major- and minor-road bay lengths (taper length should be excluded).
Increase the Right-Turn Radius	1. Heavy vehicle volume during the peak hour of the average day. 2. Major- and minor-road functional classification. 3. Major- and minor-road right-turn radius, measured to the edge of the traveled way.

CHAPTER 4

DETERMINING PHV-DHV AND PHV-AADT RELATIONSHIPS USING NDOR CONTINUOUS COUNT DATA IN NEBRASKA

In conducting traffic impact studies and reviews for planned roadway projects, a variety of traffic estimates are used by transportation engineers to evaluate the need for traffic control and geometric improvements on the state highway system. This may lead to inconsistency (overstatement or understatement of needs) in the construction of roadway improvements and may result in unnecessary spending or increased delay. An analysis was completed to find best-fit equations to estimate the relationship between the three typical traffic estimates listed below for both urban and rural functional classifications in Nebraska:

- Peak Hour Volume (PHV) and Design Hourly Volume (DHV)
- Peak Hour Volume (PHV) and Average Annual Daily Volume (AADT)

There were 65 continuous traffic counter stations in Nebraska as of 2003, of which 63 were active in 2003. Traffic count data were not available at two count stations since they were discontinued by the year 2002. Counter stations were separated into five road categories:

- Rural Interstate (11 stations)
- Other Rural Highways (30 stations)
- Low Volume Rural Roads (8 stations)
- Urban Interstate (5 stations)
- Other Urban Highways and Streets (9 stations)

A Nebraska state map with locations of these counter stations is shown in **FIGURE 11**. **FIGURE 12** shows the typical annual data collected in 2003 by using Continuous Counter Station 16 traffic in both directions (16th and 17th and "B" Streets in Lincoln, NE as an example.

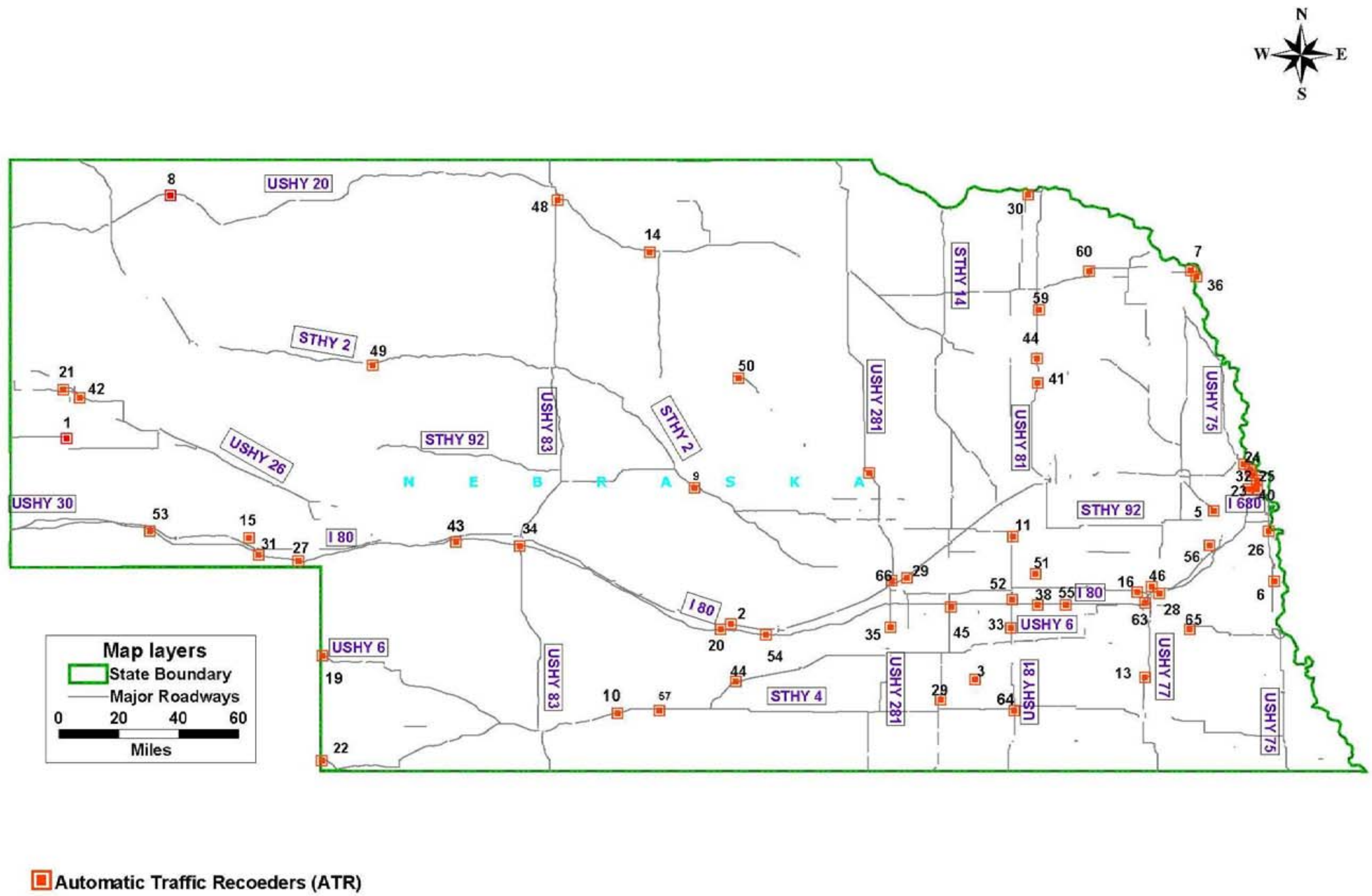
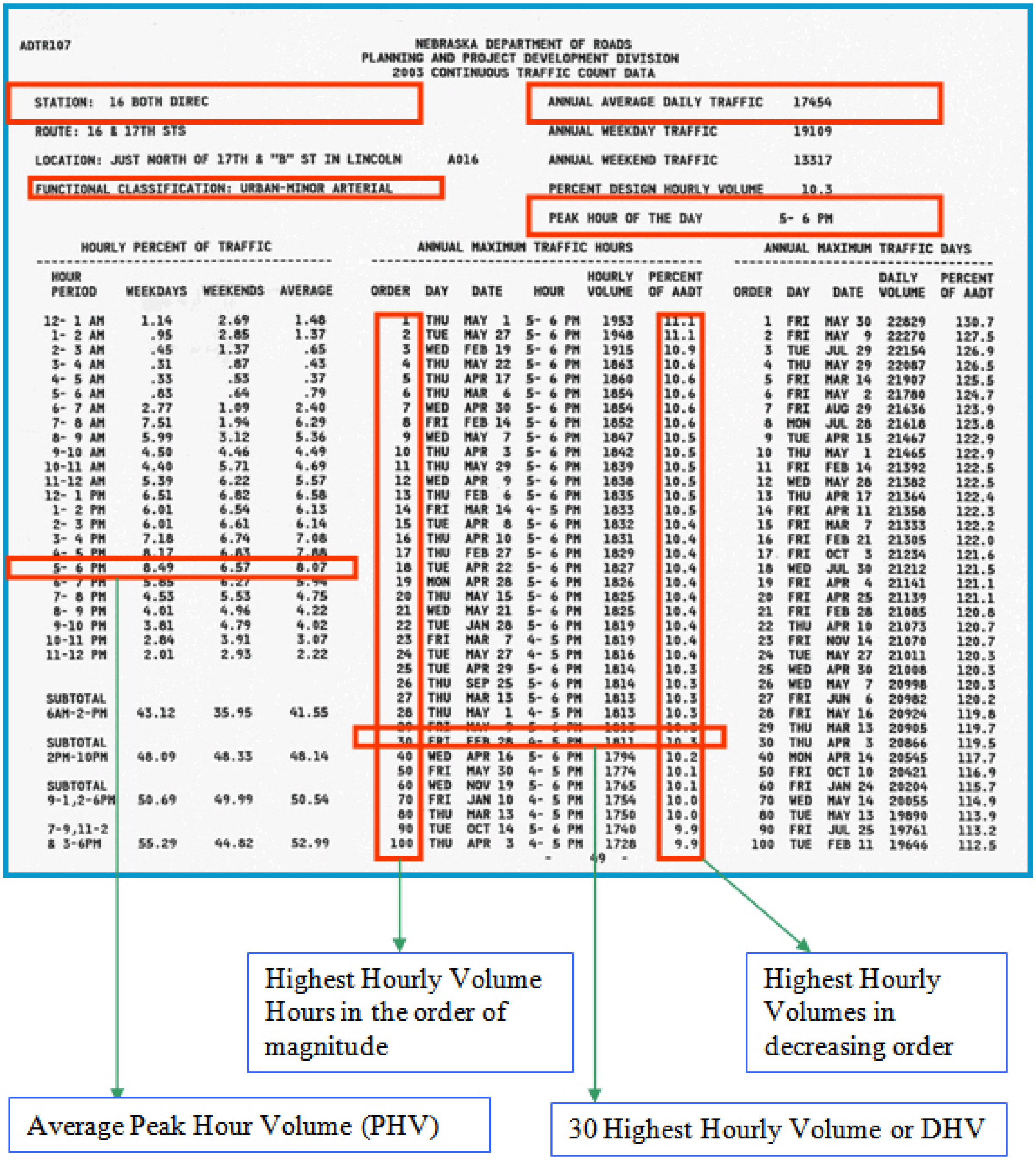


FIGURE 11 Locations of ATR Counter Stations in Nebraska



ADTR107

NEBRASKA DEPARTMENT OF ROADS
PLANNING AND PROJECT DEVELOPMENT DIVISION
2003 CONTINUOUS TRAFFIC COUNT DATA

STATION: 16 BOTH DIREC
ROUTE: 16 & 17TH STS
LOCATION: JUST NORTH OF 17TH & "B" ST IN LINCOLN A016
FUNCTIONAL CLASSIFICATION: URBAN-MINOR ARTERIAL

ANNUAL AVERAGE DAILY TRAFFIC 17454
ANNUAL WEEKDAY TRAFFIC 19109
ANNUAL WEEKEND TRAFFIC 13317
PERCENT DESIGN HOURLY VOLUME 10.3
PEAK HOUR OF THE DAY 5- 6 PM

HOURLY PERCENT OF TRAFFIC

HOUR PERIOD	WEEKDAYS	WEEKENDS	AVERAGE
12- 1 AM	1.14	2.69	1.48
1- 2 AM	.95	2.85	1.37
2- 3 AM	.45	1.37	.65
3- 4 AM	.31	.87	.43
4- 5 AM	.33	.53	.37
5- 6 AM	.83	.64	.79
6- 7 AM	2.77	1.09	2.40
7- 8 AM	7.51	1.94	6.29
8- 9 AM	5.99	3.12	5.36
9-10 AM	4.50	4.46	4.49
10-11 AM	4.40	5.71	4.69
11-12 AM	5.39	6.22	5.57
12- 1 PM	6.51	6.82	6.58
1- 2 PM	6.01	6.54	6.13
2- 3 PM	6.01	6.61	6.14
3- 4 PM	7.18	6.74	7.08
4- 5 PM	8.17	6.83	7.88
5- 6 PM	8.49	6.57	8.07
6- 7 PM	[illegible]	[illegible]	[illegible]
7- 8 PM	4.53	5.53	4.75
8- 9 PM	4.01	4.96	4.22
9-10 PM	3.81	4.79	4.02
10-11 PM	2.84	3.91	3.07
11-12 PM	2.01	2.93	2.22
SUBTOTAL 6AM-2-PM	43.12	35.95	41.55
SUBTOTAL 2PM-10PM	48.09	48.33	48.14
SUBTOTAL 9-1,2-6PM	50.69	49.99	50.54
7-9,11-2 & 3-6PM	55.29	44.82	52.99

ANNUAL MAXIMUM TRAFFIC HOURS

ORDER	DAY	DATE	HOUR	HOURLY VOLUME	PERCENT OF AADT
1	THU	MAY 1	5- 6 PM	1953	11.1
2	TUE	MAY 27	5- 6 PM	1948	11.1
3	WED	FEB 19	5- 6 PM	1915	10.9
4	THU	MAY 22	5- 6 PM	1863	10.6
5	THU	APR 17	5- 6 PM	1860	10.6
6	THU	MAR 6	5- 6 PM	1854	10.6
7	WED	APR 30	5- 6 PM	1854	10.6
8	FRI	FEB 14	5- 6 PM	1852	10.6
9	WED	MAY 7	5- 6 PM	1847	10.5
10	THU	APR 3	5- 6 PM	1842	10.5
11	THU	MAY 29	5- 6 PM	1839	10.5
12	WED	APR 9	5- 6 PM	1838	10.5
13	THU	FEB 6	5- 6 PM	1835	10.5
14	FRI	MAR 14	4- 5 PM	1833	10.5
15	TUE	APR 8	5- 6 PM	1832	10.4
16	THU	APR 10	5- 6 PM	1831	10.4
17	THU	FEB 27	5- 6 PM	1829	10.4
18	TUE	APR 22	5- 6 PM	1827	10.4
19	MON	APR 28	5- 6 PM	1826	10.4
20	THU	MAY 15	5- 6 PM	1825	10.4
21	WED	MAY 21	5- 6 PM	1825	10.4
22	TUE	JAN 28	5- 6 PM	1819	10.4
23	FRI	MAR 7	4- 5 PM	1819	10.4
24	TUE	MAY 27	4- 5 PM	1816	10.4
25	TUE	APR 29	5- 6 PM	1814	10.3
26	THU	SEP 25	5- 6 PM	1814	10.3
27	THU	MAR 13	5- 6 PM	1813	10.3
28	THU	MAY 1	4- 5 PM	1813	10.3
29	FRI	MAY 9	5- 6 PM	[illegible]	[illegible]
30	FRI	FEB 28	4- 5 PM	1811	10.3
40	WED	APR 16	5- 6 PM	1794	10.2
50	FRI	MAY 30	4- 5 PM	1774	10.1
60	WED	NOV 19	5- 6 PM	1765	10.1
70	FRI	JAN 10	4- 5 PM	1754	10.0
80	THU	MAR 13	4- 5 PM	1750	10.0
90	TUE	OCT 14	5- 6 PM	1740	9.9
100	THU	APR 3	4- 5 PM	1728	9.9

ANNUAL MAXIMUM TRAFFIC DAYS

ORDER	DAY	DATE	DAILY VOLUME	PERCENT OF AADT
1	FRI	MAY 30	22829	130.7
2	FRI	MAY 9	22270	127.5
3	TUE	JUL 29	22154	126.9
4	THU	MAY 29	22087	126.5
5	FRI	MAR 14	21907	125.5
6	FRI	MAY 2	21780	124.7
7	FRI	AUG 29	21636	123.9
8	MON	JUL 28	21618	123.8
9	TUE	APR 15	21467	122.9
10	THU	MAY 1	21465	122.9
11	FRI	FEB 14	21392	122.5
12	WED	MAY 28	21382	122.5
13	THU	APR 17	21364	122.4
14	FRI	APR 11	21358	122.3
15	FRI	MAR 7	21333	122.2
16	FRI	FEB 21	21305	122.0
17	FRI	OCT 3	21234	121.6
18	WED	JUL 30	21212	121.5
19	FRI	APR 4	21141	121.1
20	FRI	APR 25	21139	121.1
21	FRI	FEB 28	21085	120.8
22	THU	APR 10	21073	120.7
23	FRI	NOV 14	21070	120.7
24	TUE	MAY 27	21011	120.3
25	WED	APR 30	21008	120.3
26	WED	MAY 7	20998	120.3
27	FRI	JUN 6	20982	120.2
28	FRI	MAY 16	20924	119.8
29	THU	MAR 13	20905	119.7
30	THU	APR 3	20866	119.5
40	MON	APR 14	20545	117.7
50	FRI	OCT 10	20421	116.9
60	FRI	JAN 24	20204	115.7
70	WED	MAY 14	20055	114.9
80	TUE	MAY 13	19890	113.9
90	FRI	JUL 25	19761	113.2
100	TUE	FEB 11	19646	112.5

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FIGURE 12 Traffic Count Data at Counter Station 16 Located North of "B" Street on 16th and 17th Streets in Year 2003 (9)

Data used for the following analyses were collected from Nebraska Department of Roads (NDOR) continuous traffic count books for the years 2001, 2002, and 2003 (9, 10, 11). By using the data from the continuous count stations, the purest comparison can be made between average peak hour volumes and DHV and AADT since these are the most precise estimates available for this type of information.

After filtering out traffic count stations with incomplete or missing data, a total of 320 sets of data for 65 traffic counter stations were collected for all types of roadways included in the count data. This data is compiled in Appendix A.

A spreadsheet database was developed with the following information as column headings for each data set:

- Counter Station Number
- Functional Classification
- AADT Volume
- Peak Hour Percentage (weekday, weekend, and average)
- Peak Hour Volume (weekday, weekend, and average)
- DHV Percentage
- DHV Volume
- Day of DHV Occurrence
- Day of 1^{st}, 10^{th}, 20^{th}, and 30^{th} highest maximum traffic days and
- Percentage of AADT 1^{st}, 10^{th}, 20^{th}, and 30^{th} highest maximum traffic days

The data are further categorized by urban and rural functional types as shown in **TABLE 7**.

TABLE 7 Functional Roadway Categories Used in the NDOR Continuous Traffic Count Data Publications from 2001-2003 (9, 10, 11)

Category	Functional Type
Urban	Urban-Collector
	Urban-Minor Arterial
	Urban-Principal Arterial-Other
	Urban-Principal Arterial-Interstate
Rural	Rural-Major Arterial
	Rural-Minor Collector
	Rural-Major Collector
	Rural-Minor Arterial
	Rural-Principal Arterial-Other
	Rural-Principal Arterial-Interstate

Methodology

Relationships for PHV versus DVH and PHV versus AADT were plotted for each of the above functional classes except for 3 functional types which do not have sufficient data sets to form a relationship. The 3 functional types omitted from the analysis were: Urban-Collector, Rural-Major Arterial and Rural-Minor Collector. Each relationship was found to best fit a linear equation with a high value of R^2. Both best-fit lines with no constraints and lines intercepting zero were established. Figures showing these relationships are shown in Appendix B.

The data sets for each functional class were ranked from the lowest traffic volume to the highest for urban and rural area types with each correspondent relationship named accordingly, as shown in **TABLE 8** and **TABLE 9**.

TABLE 8 Rank of Urban Functional Classes and Name Convention for Relationship

Functional Class	Rank	Name Convention of Relationship
Urban-Minor Arterial	1	U1
Urban-Principal Arterial-Other	2	U2
Urban-Principal Arterial-Interstate	3	U3

TABLE 9 Rank of Rural Functional Classes and Name Convention for Relationship

Functional Class	Rank	Name Convention of Relationship
Rural-Major Collector	1	R1
Rural-Minor Arterial	2	R2
Rural-Principal Arterial-Other	3	R3
Rural-Principal Arterial-Interstate	4	R4

For the urban type, relationships between the first two ranks were compared at the 95 percent confidence level. Upper and lower 95 percent confidence bounds were plotted around the fitted regression lines for both relationships in one figure. The complete overlapping of two 95 percent confidence intervals indicated that the two relationships were not significantly different; therefore the data for these two functional classes could be combined to get a new linear relationship. The new relationship was then compared with the relationship of the third rank functional class at the 95 percent confidence level to see if they were significantly different. A flow chart describing the comparison process is presented in **FIGURE 13**.

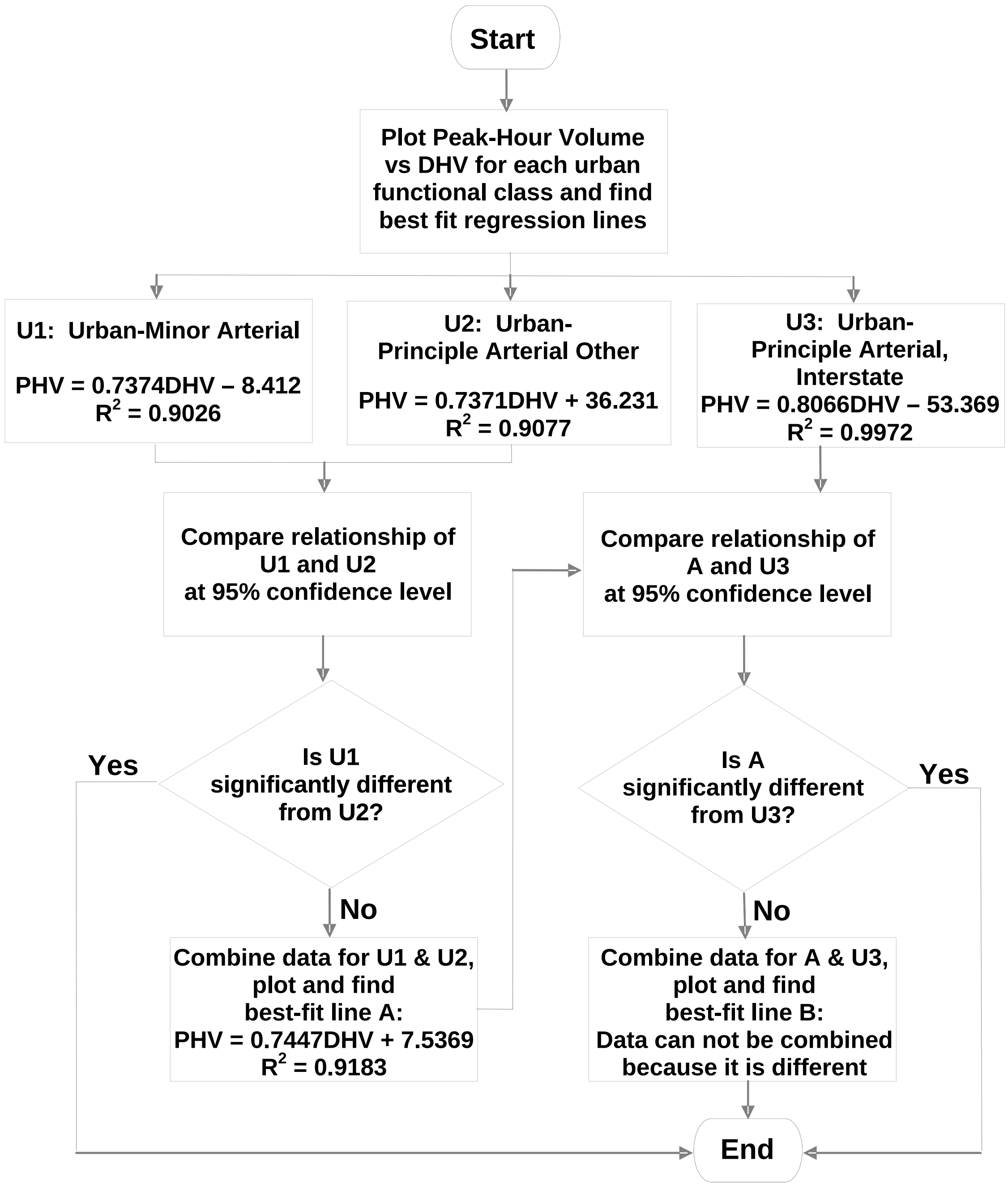

FIGURE 13 Flow Chart Showing Statistical Analysis Comparison of PHV-DHV Relationship Amongst Urban Functional Type Roadways

For rural roadway types, relationships for the last two ranks were compared first, then combined and compared with the 2nd rank data, then with the 1st rank data. **FIGURE 14** shows the comparison process for the rural ranked data relationship between PHV and AADT. For urban roadway types, a similar process was used.

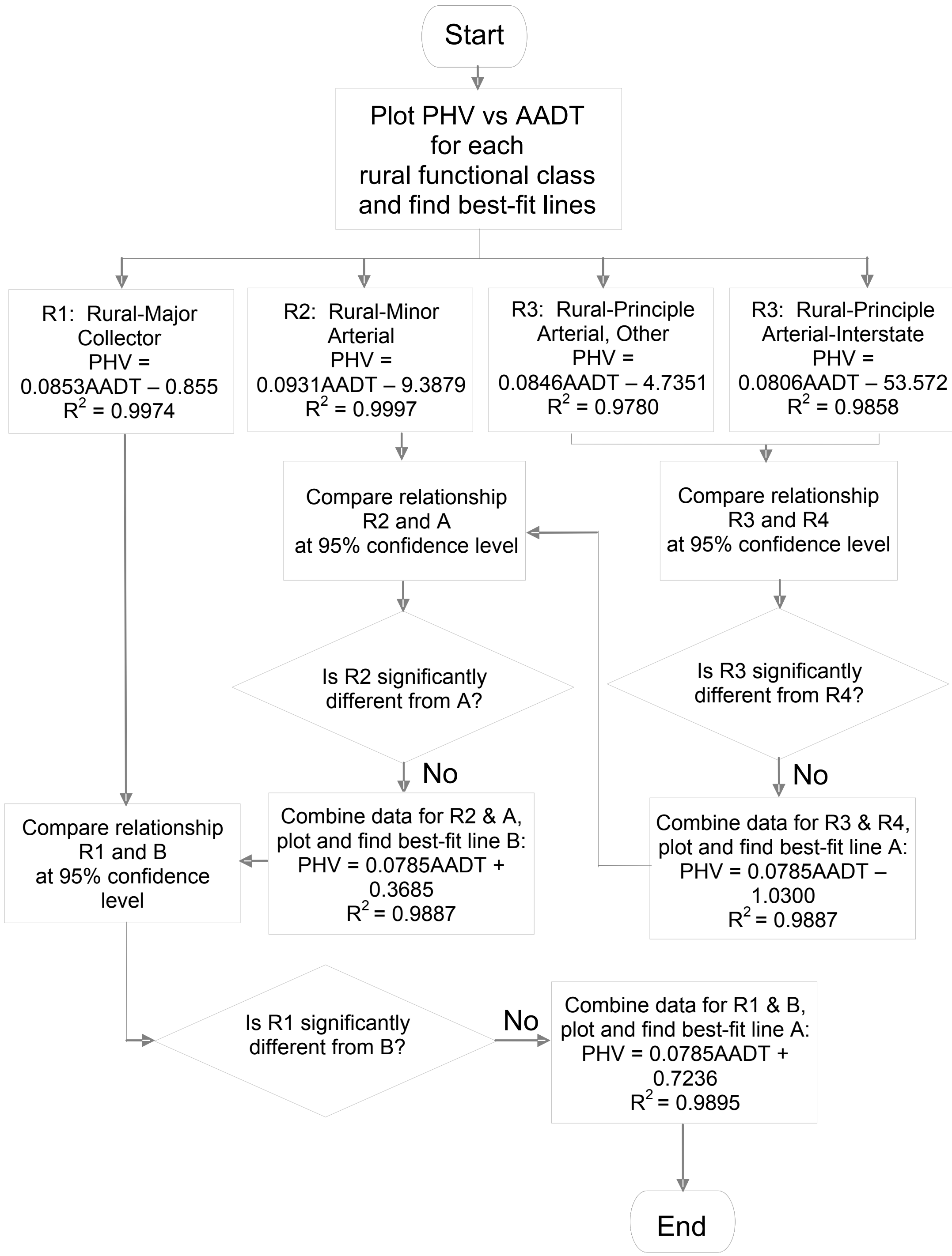

FIGURE 14 Flow Chart Showing Statistical Analysis Comparison of PHV-AADT Relationship Amongst Rural Functional Type Roadways

Finally, relationships between the combination of all rural classes and combination of all urban classes were compared at the 95 percent confidence level in order to find out if there was a common relationship that exists for all functional classes.

Findings

Strong linear relationships were found for both PHV versus DHV and PHV versus AADT for each functional class. **TABLE 10** and **TABLE 11** show the summaries of R^2 details.

TABLE 10 Summary of R^2 for Peak Hour Volume vs DHV Volume

Type	Relationship	R^2 (no constraint)	R^2 (intercept zero)
Urban	U1	0.9026	0.9025
	U2	0.9077	0.9072
	U3	0.9972	0.9971
	A (U1+U2)	0.9183	0.9183
Rural	R1	0.7784	0.7763
	R2	0.9974	0.9970
	R3	0.9874	0.9864
	R4	0.9340	0.9263
	A (R3+R4)	0.9563	0.9557
	B (R2+R3+R4)	0.9579	0.9574
	C (R1+R2+R3+R4)	0.9610	0.9604
Rural and Urban	(U1+U2+R1+R2+R3+R4)	0.9541	0.9536

TABLE 11 Summary of R^2 for Peak Hour Volume vs AADT Volume

Type	Relationship	R^2 (no constraint)	R^2 (intercept zero)
Urban	U1	0.9409	0.9402
	U2	0.9474	0.9467
	U3	0.9988	0.9986
	A (U1+U2)	0.9532	0.9529
Rural	R1	0.9974	0.9971
	R2	0.9997	0.9991
	R3	0.9780	0.9778
	R4	0.9858	0.9842
	A (R3+R4)	0.9887	0.9887
	B (R2+R3+R4)	0.9887	0.9887
	C (R1+R2+R3+R4)	0.9895	0.9895
Rural and Urban	(U1+U2+R1+R2+R3+R4)	0.9808	0.9807

The R^2 value measured the correlation between the PHV and DHV/AADT. A value of 1.0 would be a perfect fit of the regressed line to the data, meaning that the PHV and DHV or AADT relationships could be perfectly described linearly. Ideally, R^2 values which exceed 0.75 would indicate a strong relationship and higher confidence. Low R^2 values can indicate a weak relationship between the data points and the regression line used for traffic estimates.

Results showed that all the R^2 values exceeded 0.75, with most of them exceeding 0.90, which confirmed the strength in the relationship between PHV and DHV/AADT for all functional classes analyzed. The R^2 values for lines intercepting zero were found to be equal or slightly less than the values for those linear lines with no constraints.

Only one R^2 value of 0.7784 (0.7783 for intercepting zero) for the relationship between PHV and DHV for Rural-Major Collector appeared to be relatively lower than the others. It was observed that the DHV percentage for Station 15 and 50 in all collection years were consistently above 27 percent and as high as 34.7 percent, while the remaining DHV percentages were found to be around 12-18%, which is the typical percentage for rural roads. The high DHV percentages probably reflected a unique traffic pattern at the two stations. Since the data sets for these two stations took about half of the sample size in this functional class, they were believed to have affected the overall correlation coefficient between PHV and DHV. The relationship between PHV and AADT showed a very high R^2 value of 0.9974, which also supported the explanation. When combining all rural data into to one analysis, the linear relationships were found to be quite strong.

For urban functional classifications, the relationship for Urban-Principal Arterial-Interstate was found to be significantly different from the other two functions. This is likely due to the special nature of this type of urban roadway, i.e. high speed, high volume and total access control. Although it couldn't be further grouped with other functional classes, it had its own relationships between PHV and DHV/AADT, which also fit into nearly perfect regression lines.

TABLE 12 PHV Estimate Equations as a Function of DHV

Equation Functional Type	Regressed Equation	Equation Number	R^2
Urban (No Constraint)	PHV = 0.7447DHV + 7.5369	1	0.9183
Urban (Intercept Zero)	PHV = 0.7481DHV	2	0.9183
Rural (No Constraint)	PHV = 0.7321DHV – 20.872	3	0.9610
Rural (Intercept Zero)	PHV = 0.7197DHV	4	0.9604
Rural and Urban (No Constraint)	PHV = 0.7402DHV – 20.029	5	0.9541
Rural and Urban (Intercept Zero)	PHV = 0.7292DHV	6	0.9536

TABLE 13 PHV Estimate Equations as a Function of AADT

Equation Functional Type	Regressed Equation	Equation Number	R^2
Urban (No Constraint)	PHV = 0.0844AADT – 22.859	7	0.9532
Urban (Intercept Zero)	PHV = 0.0832AADT	8	0.9529
Rural (No Constraint)	PHV = 0.0785AADT + 0.7236	9	0.9895
Rural (Intercept Zero)	PHV = 0.0785AADT	10	0.9895
Rural and Urban (No Constraint)	PHV = 0.0801AADT – 4.5399	11	0.9808
Rural and Urban (Intercept Zero)	PHV = 0.0801AADT	12	0.9807

Examples of PHV Traffic Estimation Using Generated Relationships With DHV

The relationships established in this project between PHV and DHV can be used for PHV traffic volume estimation for different functional classes. Some examples are shown below. **TABLE 14** combines the results of the examples to view their similarity.

Example 1 Urban (Urban-Minor Arterial and Urban-Principal Arterial-Other Con.)

Given: **DHV of 2500 vph**
Estimate: **Peak Hour Volume**

Using linear (no constraint) equation:
PHV = 0.7447DHV + 7.5369 = 0.7747(2500) + 7.5369 = **1869 vph** **EQUATION 1**

Using linear (intercept zero) equation:
PHV = 0.7481DHV = 0.7481(2500) = **1870 vph** **EQUATION 2**

Example 2 Rural

Given: **DHV of 2500 vph**
Estimate: **Peak Hour Volume**

Using linear (no constraint) equation:
PHV = 0.7321DHV - 20.872 = 0.7321(2500) - 20.872 = **1809 vph** **EQUATION 3**

Using linear (intercept zero) equation:
PHV = 0.7197DHV = 0.7197(2500) = **1799 vph** **EQUATION 4**

Example 3 Rural and Urban

Given: **DHV of 2500 vph**
Estimate: **Peak Hour Volume**

Using linear (no constraint) equation:
PHV = 0.7402DHV - 20.029 = 0.7402(2500) - 20.029 = **1830 vph** **EQUATION 5**

Using linear (intercept zero) equation:
PHV = 0.7292DHV = 0.7292(2500) = **1823 vph** **EQUATION 6**

TABLE 14 Comparison of Results of Using Urban, Rural and Combined Rural-Urban Formulas Using DHV

Type	Estimated PHV
Urban (No Constraint)	1869
Urban (Intercept Zero)	1870
Rural (No Constraint)	1809
Rural (Intercept Zero)	1799
Rural and Urban (No Constraint)	1830
Rural and Urban (Intercept Zero)	1823
Low Estimate:1799 Average Estimate:1833 High Estimate:1870	

Examples of PHV Traffic Estimation Using Generated Relationships With AADT
The relationships established in this project between PHV and AADT can be used for PHV traffic volume estimation for different functional classes. Some examples are shown below. **TABLE 15** combines the example results to view their similarity.

Example 1 Urban (Urban-Minor Arterial and Urban-Principal Arterial-Other Con.)

Given: AADT of 25000 vpd
Estimate: Peak Hour Volume

Using linear (no constraint) equation:
PHV= 0.0844AADT - 22.859 = 0.0844(25000) - 22.859 = **2087 vph EQUATION 7**

Using linear (intercept zero) equation:
PHV = 0.0832AADT = 0.0832(25000) = **2080 vph** **EQUATION 8**

Example 2 Rural

Given: AADT of 25000 vpd
Estimate: Peak Hour Volume

Using linear (no constraint) equation:
PHV= 0.0785AADT + 0.7236= 0.0785(25000) + 0.7236= **1963 vph EQUATION 9**

Using linear (intercept zero) equation:
PHV = 0.0785AADT = 0.0785(25000) = **1963 vph** **EQUATION 10**

Example 3 Rural and Urban

Given: AADT of 25000 vpd
Estimate: Peak Hour Volume

Using linear (no constraint) equation:
PHV= 0.0803AADT - 4.5399= 0.0803(25000) - 4.5399= **2003 vph EQUATION 11**

Using linear (intercept zero) equation:
PHV = 0.0801AADT = 0.0801(25000) = **2003 vph** **EQUATION 12**

TABLE 15 Comparison of Results of Using Urban, Rural and Combined Rural-Urban Formulas Using AADT

Type	Estimated PHV
Urban (No Constraint)	2087
Urban (Intercept Zero)	2080
Rural (No Constraint)	1963
Rural (Intercept Zero)	1963
Rural and Urban (No Constraint)	2003
Rural and Urban (Intercept Zero)	2003
Low Estimate:1963 Average Estimate:2016 High Estimate:2087	

Conversely, if the average PHV is determined from a field study, DHV and AADT volumes can be estimated as well, which is important when converting a field-count peak hour value to an estimate of DHV or AADT.

Summary of Estimating PHV from DHV and AADT
Continuous traffic count data were collected for the 3 years from 2001-2003 and analyzed to establish methods for estimating traffic volume based on the relationships between PHV and DHV as well as PHV and AADT. Strong linear relationships were found in all functional classes. The relationships among urban and rural groups were compared statistically at the 95 percent confidence level and further grouped. Common relationships were finally established for the 3 categories: urban, rural and rural/urban combined. Methods for estimating PHV from DHV/AADT were also demonstrated in the examples.

Verifying Estimate Equations with Newer Field Data
Since the equations were derived from the years 2001-2003, it was necessary to apply them to newer data and determine if the relationships were still valid. Field data included in the 2004, 2005, 2006 Continuous Traffic Count Data was used to compare estimates made of PHV from 2004-2006 DHV and AADT data from all the counter stations. **TABLE 16** gives a summary of the validity of the equations using the newer data.

TABLE 16 Summary of Ability of Regressed Equations to Estimate Actual PHV

Predictability Range for Estimate of Actual PHV from Regressed Equations	**Continuous Count Data Years**		
	2004	**2005**	**2006**
± 5 percent	68 percent of counts	59 percent of counts	63 percent of counts
± 10 percent	95 percent of counts	82 percent of counts	84 percent of counts
± 15 percent	99 percent of counts	91 percent of counts	93 percent of counts
± 20 percent	100 percent of counts	100 percent of counts	98 percent of counts
± 30 percent	Not applicable	Not applicable	100 percent of counts
Average Predictability of Equations	Within ±3.9% of actual PHV value	Within ±5.1% of actual PHV value	Within ±5.2% of actual PHV value

For example, the regression equations were able to predict 59 percent of the 128 count entries available in the 2005 Continuous Count Data Book within ±5% of the actual average PHV, and 82 percent of the 128 count entries with ±10 percent of the actual average PHV. The average prediction rate for 2005 was within ±5.1% of the actual average PHV for that year. The range of predictability shown in **TABLE 16** indicates the estimate equations will be adequate over time.

CHAPTER 5

A CLOSER LOOK AT DHV AND THE 30TH HIGHEST HOUR CRITERIA: DOES THE LONG-HELD DEFINITION FOR AN APPROPRIATE DESIGN SERVICE VOLUME FIT TRAFFIC CHARACTERISTICS IN NEBRASKA?

As mentioned previously, the 2004 Green Book states that the hourly traffic volume that should generally be used for design is the 30th highest hourly volume (30HHV) of the year and that it may be used as the design service volume criteria for both rural and urban roadways (1). It further states that there is a significant break in the relationship between highest hour rank and percent of AADT near the 30th highest hour (1). The relationship is shown graphically in **FIGURE 1** (1). However, t-test comparisons of continuous count data in Nebraska show that the most significant break commonly occurs between the 14th and 24th highest hourly volumes in rural areas.

Appropriateness of 30th Highest Hourly Volume as the Design Service Volume in Nebraska

An analysis was conducted of 2001-2003 NDOR continuous count data to assess whether the 30th highest hour volume criteria is appropriate to use for a design service volume in Nebraska. Regression analysis was used to test the appropriateness of the use of 30 HV for the design of geometric features and traffic control solutions and to examine the design service volume criteria for each functional class of roadways in Nebraska.

Determination of the Significant Break Point for Each Functional Class of Roadway

To determine the significant break point for each functional class of roadway, the hourly volumes expressed as a percent of AADT were aggregated for all similar roadway types after checking that they were not significantly different from one year to the other using a t-test for two samples of unequal variances. The average hourly volumes over three years for each functional class were treated as separate data sets. These hourly volumes were plotted against the number of hours on the horizontal axis and a best-fit regression line was fit to the data points. Log regression was used for this analysis based on its high R^2 values when compared with linear or ordinary least squares (OLS) regression.

FIGURE 15 shows the best-fit regression curve for the functional class of Rural Major Collectors. The goal was to determine the location of the first significant break in the curve before or after the 30HHV, as 30HHV may not be appropriate for use as a representative design service volume in Nebraska.

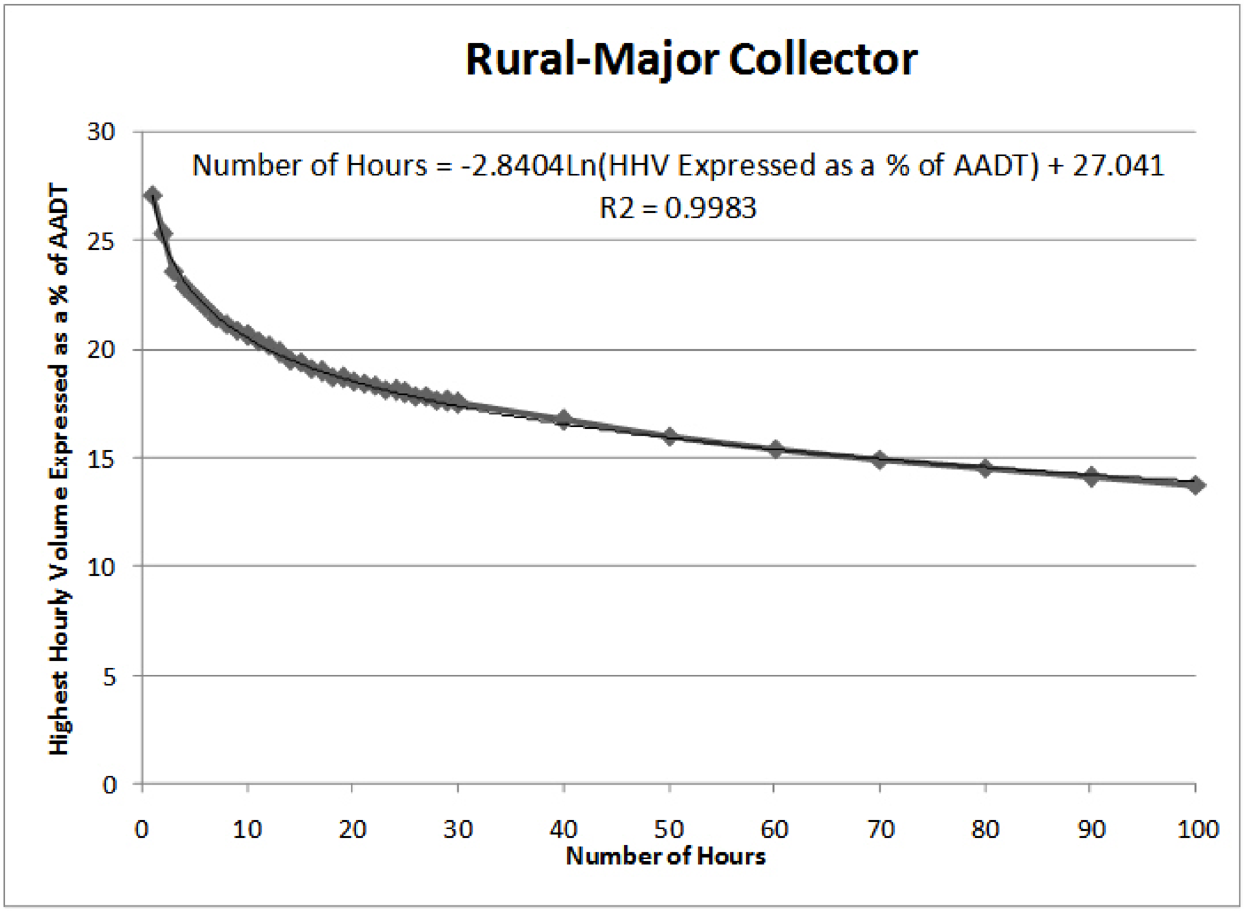

FIGURE 15 Best-Fit Curve for Highest Hourly Volumes for the Functional Category of Rural Major Collector in Nebraska Using 2001-2003 Continuous Count Data (9, 10, 11)

To find the point of significant change in the data, a scatter plot using logarithmic axes was created so the resulting best-fit curve would be linear as shown in **FIGURE 16**. The test was to locate the first significant change in linearity before 30HV. To find the significant change or break point, the data were divided into two separate data sets, the first one comprising values from the 30th highest hour to the 100th highest hour, and the second one from the 1st highest hour to the 29th highest hour. The R^2 of both the data sets and their difference was noted. This process was repeated, adding the last point in first set to the second set and eliminating that point from the first set. The break point was considered to be the point at which the difference in R^2 values between the two data sets was greatest taking into consideration the linearity of the complete data set.

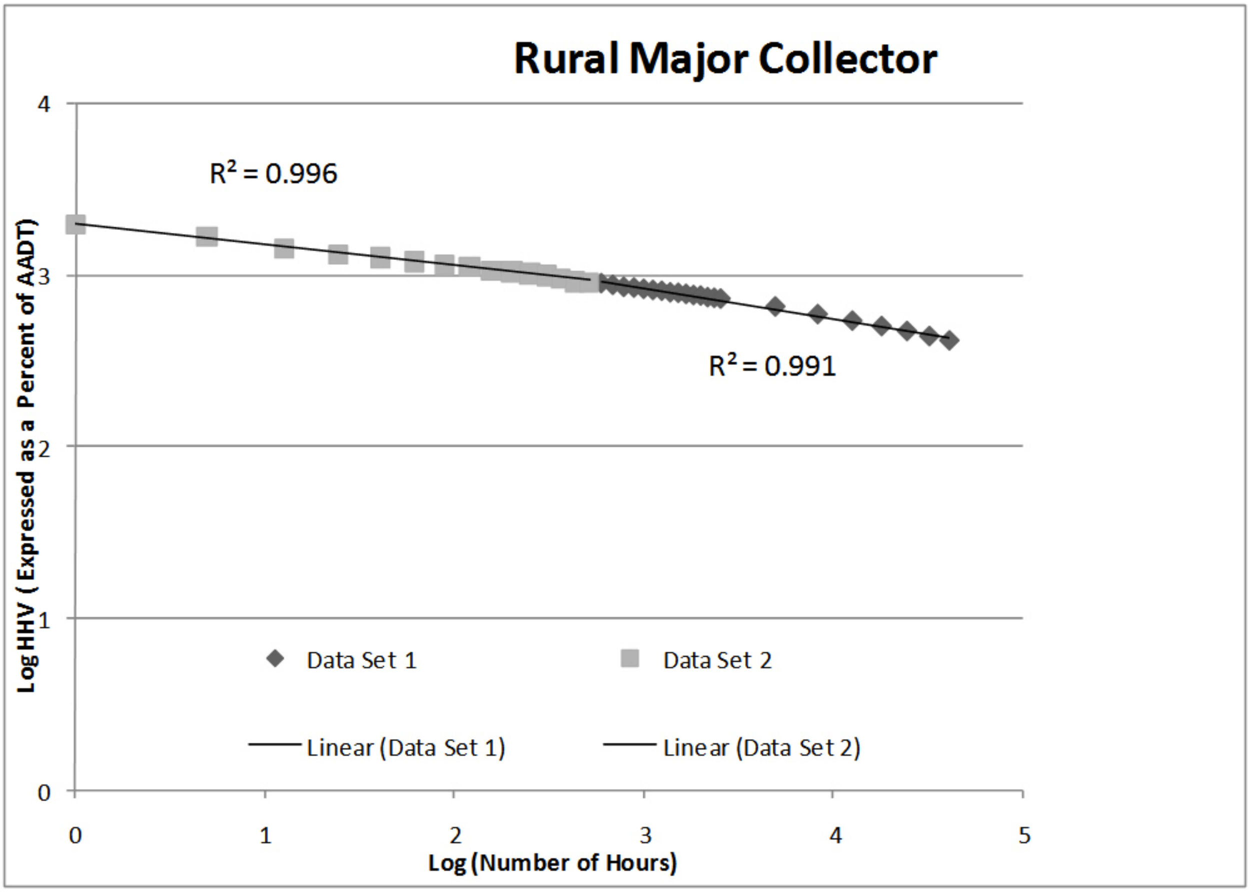

FIGURE 16 Comparison of Data Sets to Find Significant Change in DHV as a Percent of AADT Relationship of Rural Major Collectors (9, 10,11)

In **FIGURE 16**, the break point occurred at the 17th highest hour for Rural Major Collectors. Similarly, the break points were determined for all functional classes of roadways available. Related figures for other functional classes are shown in Appendix C and summarized in **TABLE 17**.

TABLE 17 Determination of the Point of Significant Change in the Highest Hourly Volume Curve Based on Roadway Functional Classification

Roadway Functional Class	**Highest Hourly Volume Indicating Significant Slope Change (Break Point)**
Rural Major Collector	17
Rural Minor Arterial	14
Rural Principle Arterial-Other	24
Rural Principle Arterial Interstate	20
Urban Minor Arterial	30
Urban Principle Arterial-Other	28
Urban Principle Arterial Interstate	23

It appears from the results that the rural roadways deviate more from the 30th highest hour criteria than do the urban roadways, which tend to closely match the 30th highest hour break point.

Determination of the Hourly Volume that the Average Peak Hour Volume Represents

Knowing the number of times the PHV will be exceeded annually is important to assist in evaluating the level of service at which a roadway segment or intersection will perform in high traffic situations. To determine the number of hours in a year with hourly volume greater than the PHV expressed as a percent of AADT, a basic linear regression equation was used of the form given below:

$$y = \beta_0 + \beta_1 x + \varepsilon \qquad \textbf{EQUATION 13}$$

where,

y = hourly traffic expressed as a percent of AADT,
x = number of hours with hourly volume greater than average PHV,
β_0 = estimated parameter for the constant,
β_1 = estimated parameter for the coefficient of regression, and
ε = random error term

In **EQUATION 13** the independent variable was the hourly traffic expressed as a percentage of AADT and the dependent variable was the number of hours. Linear regression equations were developed for the graphs as shown in **FIGURE 18** which were used to extrapolate the number of hours in a year that have more volume than the average peak hour volume in that given year.

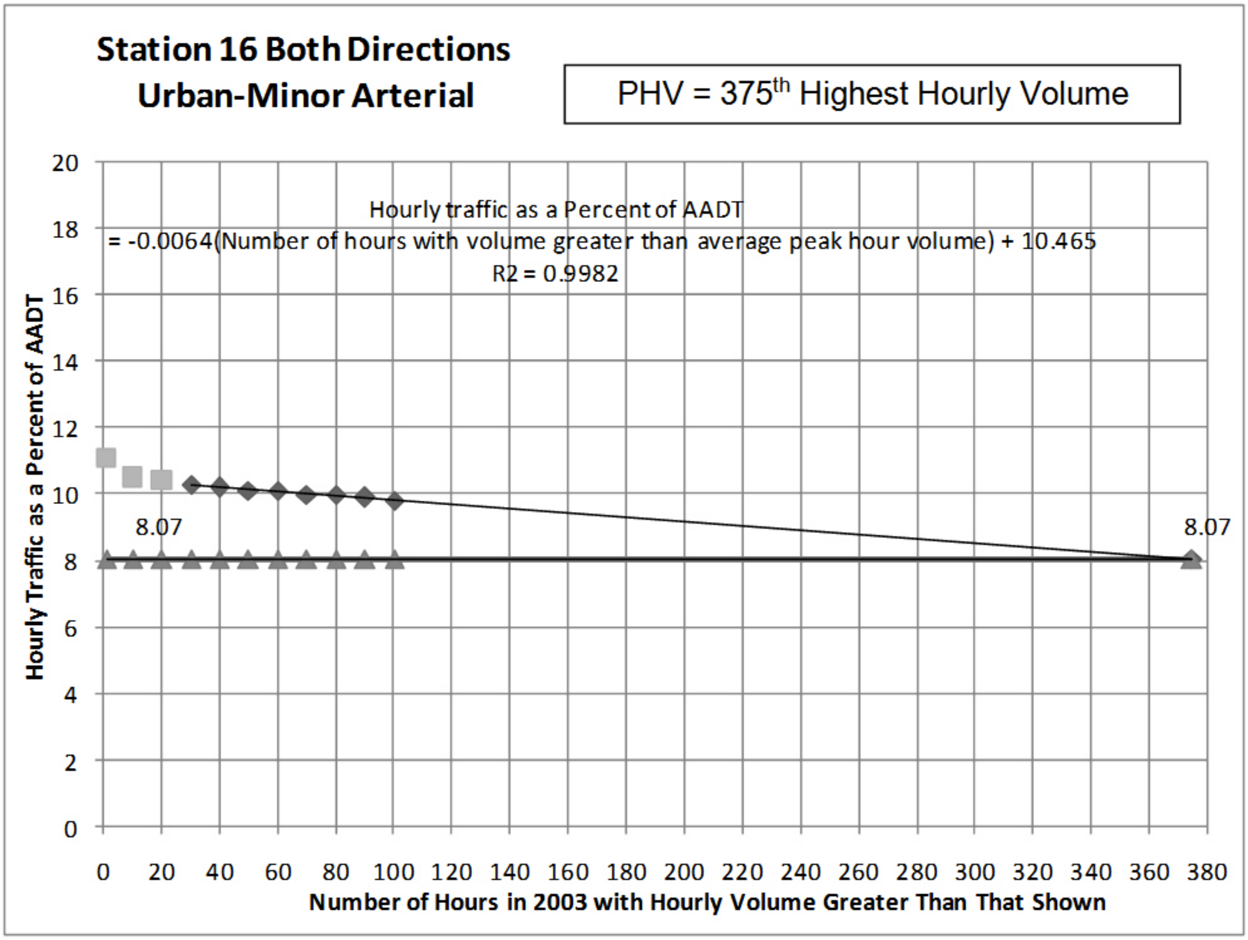

FIGURE 17 Estimating the Hourly Volume Which the Average Peak Hour Volume Represents by Extrapolation of NDOR Continuous Count Data, 2001-2003 (9, 10, 11)

To determine how many hours in a year have more volume than the peak hour traffic expressed as a percentage of AADT at a particular count station, the independent variable y in the regression equation developed was replaced with average hourly volume expressed as a percent of AADT (8.07 at this particular count station). The result (i.e., extrapolated hour) determines how many hours have more volume than the average peak hour volume in a year.

In **FIGURE 17**, it can be seen that for Count Station 16, there are 374 hours during the year 2003 with more traffic volume than the average peak hour volume expressed as a percent of AADT (8.07% of the AADT). Data from all available count stations for the period 2001-2003 were analyzed using the same technique. The extrapolated hours were then further divided by functional classification and by AADT for analyzing the results. The extrapolated hour changed, based on the functional type of roadway and the AADT traversing it.

From the data analysis, it was found that the average peak hour was equivalent to the 270^{th} HHV of the year for all counter stations from 2001-2003. The Average Peak Hour Volume-Highest Hour Equivalent (APHV-HHE) for all roadways studied was 259, 272 and 281 for the years 2001, 2002 and 2003 respectively. These values show the

average number of hours during which the average peak hour volume was exceeded for that specific year. Therefore, use of PHV as an estimate for design may not be appropriate for Nebraska or at least must be understood as a value that can be exceeded many times during the year.

Classification of APHV-HHE by Functional Type of Roadway

APHV-HHE values for each of the functionally classified roadways for the years 2001-2003 is shown in **FIGURE 18**. The value of APHV-HHE is greater on urban roadways than on rural roadways by about 100, due to the morning and afternoon peak hours in densely populated areas.

FIGURE 19 shows the maximum, minimum, mean and median statistics of the three-year APHV-HHEs. These statistics were compared to check for the variability and the standard deviation in results. Urban roadways showed more variability than rural roadways either because of the fluctuation of traffic conditions on urban roadways or due to the fact that fewer number of urban roadway counter stations were available for use in the analysis. Only 20 percent of all the roadways studied were located in urban settings and the large deviation in the maximum and minimum three-year APHV-HHEs may be attributed to this fact.

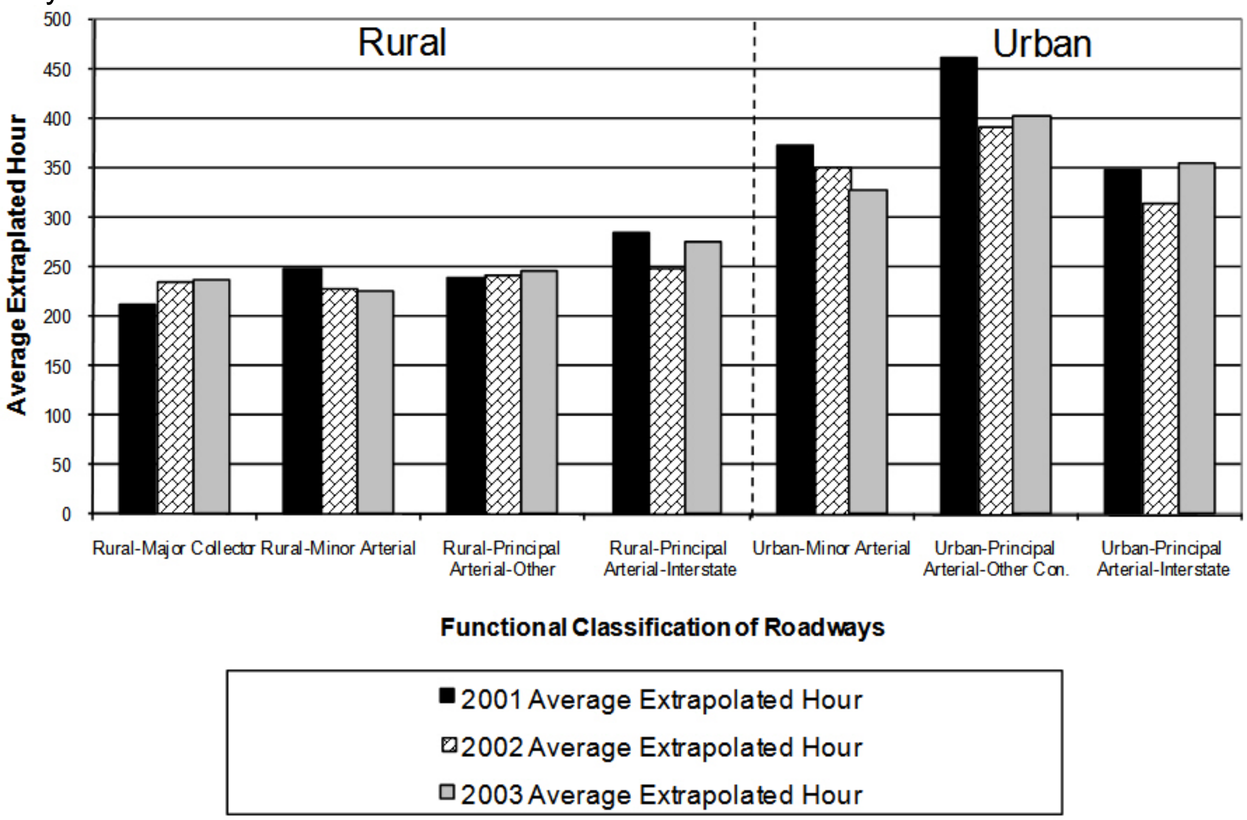

FIGURE 18 Average PHV Highest Hour Equivalent Classified by Roadway Functional Type, 2001-2003 (9, 10, 11)

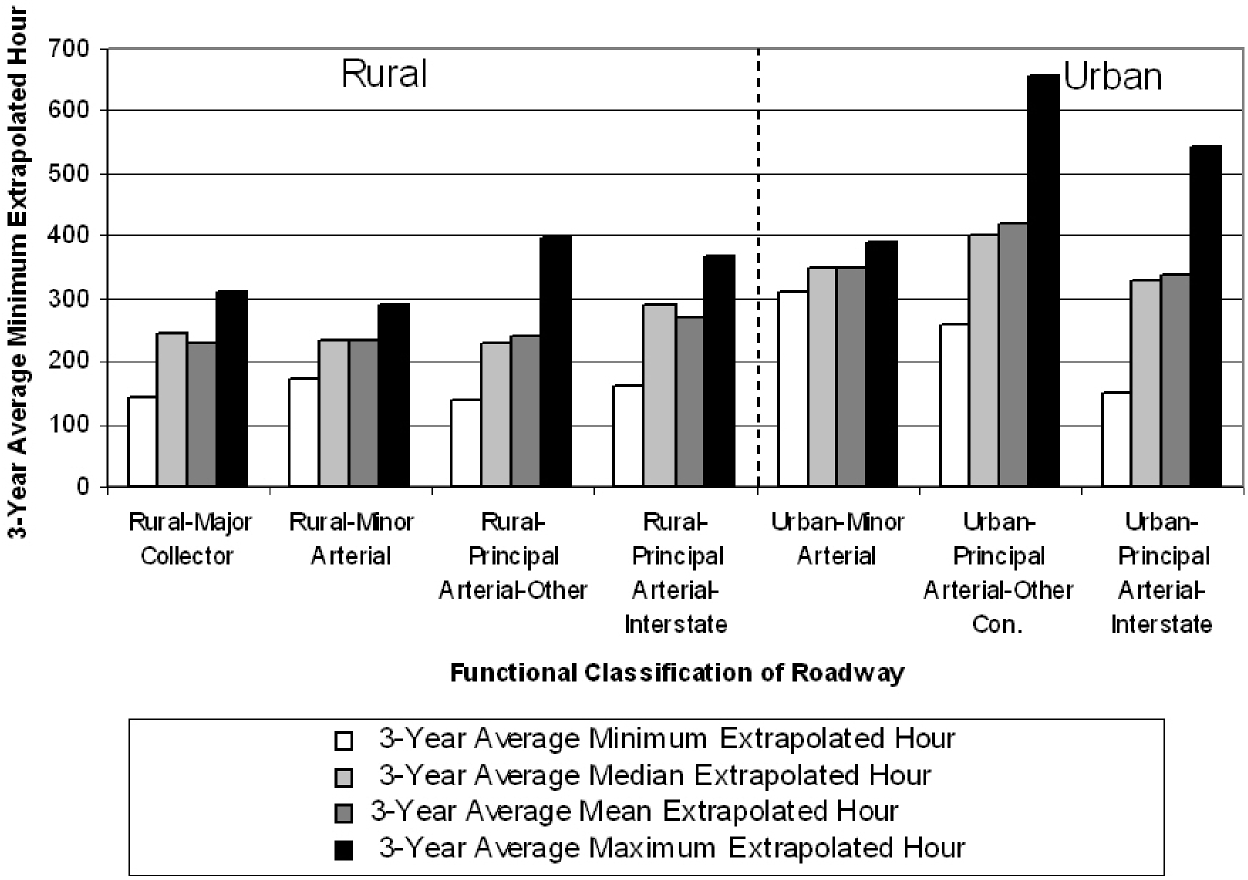

FIGURE 19 Descriptive Statistics for the Three-Year (2001-2003) Average PHV Highest Hour Equivalent Classified by Roadway Functional Type (9, 10, 11)

Classification of APHV-HHE by AADT of Roadway

The counter station data was categorized by AADT and the APHV-HHEs were determined for each data grouping. This type of classification was conducted mainly to understand the variation in the results with the AADT and with the functional classification. **FIGURE 20** shows that the APHV-HHEs increase with an increase in AADT except for the group of roadways with AADT between 8000-10000 vpd. This may be explained by the fact that only 2 counter stations represent this category.

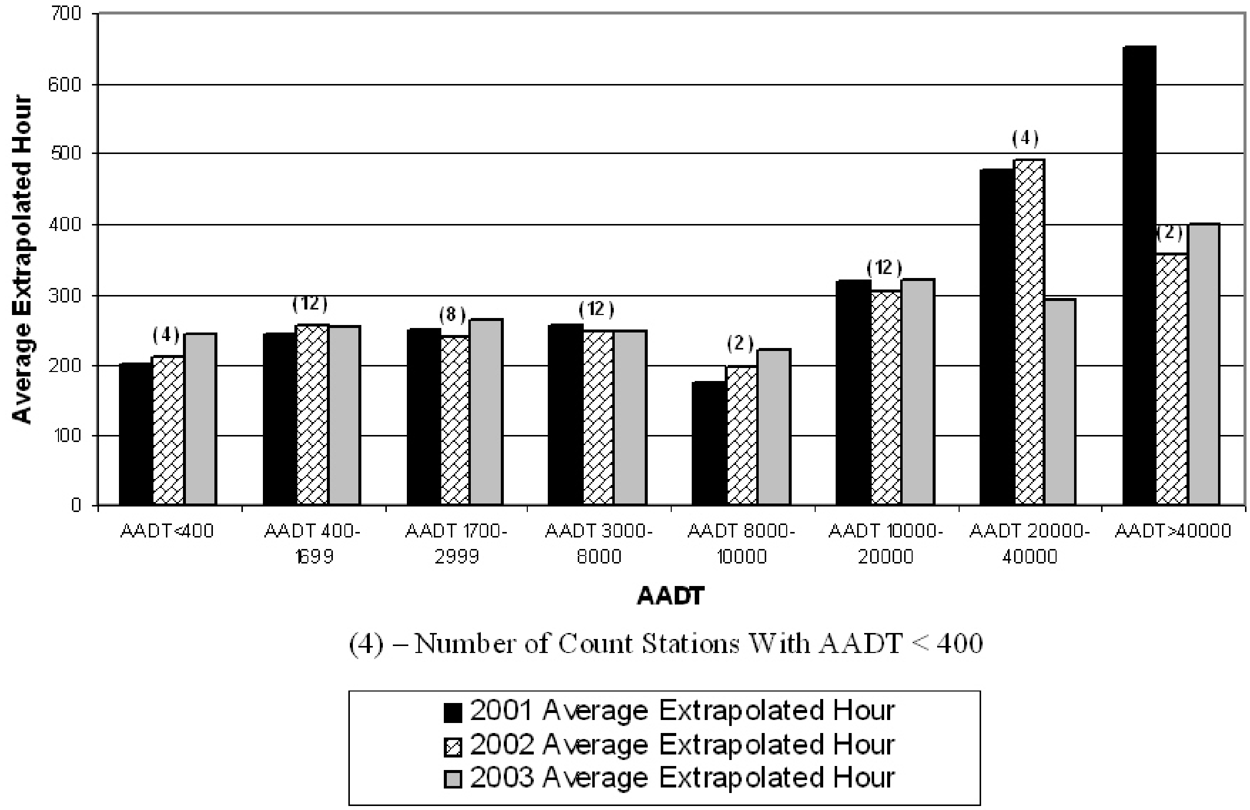

FIGURE 20 Three-Year (2001-2003) Average PHV Highest Hour Equivalent Based on AADT (9, 10, 11)

In **FIGURE 20**, it is evident that the 3-year APHV-HHEs with AADT less than 10,000 is between the 200th to 250th highest hour. To generalize the nature of the data, the roadways are classified into four groups of AADT ranges. **FIGURE 21** depicts the mean, maximum, minimum and median statistics of APHV-HHEs. These values estimate the variability and standard deviation of the APHV-HHEs based upon the AADT on those roadways.

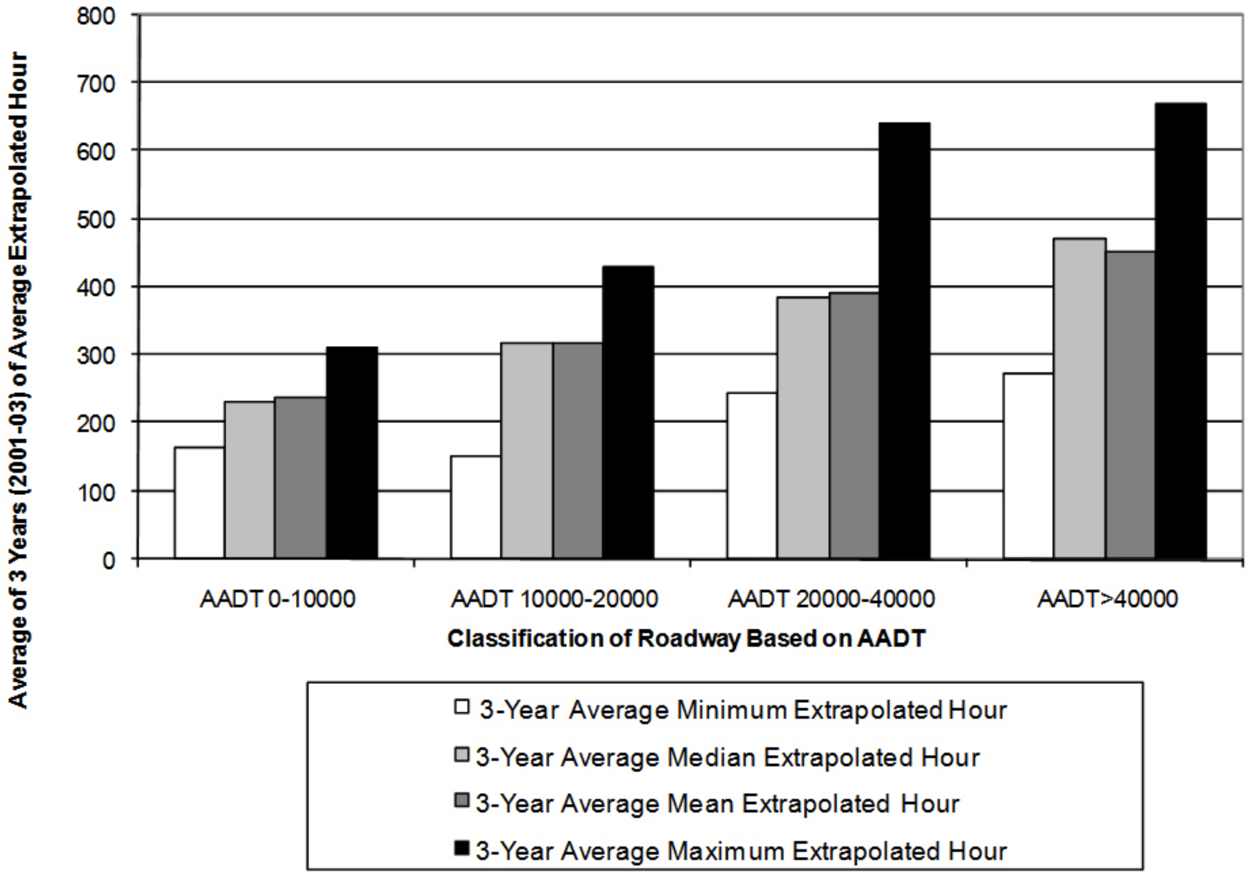

FIGURE 21 Descriptive Statistics for Three-Year (2001-2003) Average PHV Highest Hour Equivalents Classified by AADT (9, 10, 11)

TABLE 18 lists a best-fit equation developed from the AADT groupings shown in **FIGURE 21**. Given the AADT category of a facility and a desired highest hourly volume, one can estimate the volume which would approximate the design service volume required to match that desired highest hourly volume.

TABLE 18 Regressed Equations for Estimating Service Volumes Equivalent to Given Highest Hourly Volume.

AADT Category, Vehicles per Day	Service Volume Estimate for Given Highest Hourly Volume, Percent of AADT	Equation Number	R^2
1 to 10,000	y = - 0.021x + 12.99	14	0.95
10,000 to 20,000	y = - 0.013x + 11.28	15	0.94
20,000 to 40,000	y = - 0.011x + 11.27	16	0.94
Greater than 40,000	y = - 0.005x + 10.06	17	0.90

x = Desired Highest Hourly Volume, ranging from 1 to 8,760 hours in a year
y = Hourly Traffic Volume as a Percentage of AADT, vehicles per hour

Examples of Service Volume Estimation for Desired Highest Hourly Volume Using Generated Relationships Given AADT

The relationships established in this project between highest hourly volume and AADT can be used for service volume estimation for different AADT traffic volume categories.

Example 1 Design Service Volume Estimate Based on Demand Exceeding Capacity of an Acceptable Level of Service Once or Twice per Week in the Design Year

Given:

AADT of 16,000 vpd in the Design Year

Estimate:

Service volume estimate of the 52nd highest hour (assumes that the system capacity meets the design service volume all hours except 1 hour per week) and 104th highest hour (assumes that the system capacity meets the design service volume all hours except 2 hours per week) of the design year.

$y = -0.013x + 11.28$ **EQUATION 15**

Percentage of $AADT_{52nd\ HHV}$ = - 0.013 (52) + 11.28 = 10.604% of 16000 = **1697 vph**

Percentage of $AADT_{104th\ HHV}$ = - 0.013 (104) + 11.28 = 9.928% of 16000 = **1589 vph**

If the facility were designed for a peak volume of 1697 vph, it is likely the design capacity would be exceeded 1 hour each week during the year (say one afternoon peak per week). If the facility were designed for a peak volume of 1589 vph, it is likely the design capacity would be exceeded 2 hours each week during the year (say one morning and one afternoon peak or 2 afternoon peaks per week).

By using the equations in **TABLE 18**, one could estimate the number of hours during the year that a specific design volume would be exceeded to evaluate different performance levels for a given design and to evaluate cost differences for those performance levels based on the construction costs of the given geometry and traffic control devices used.

CHAPTER 6

CONCLUSIONS

Summary of Results

Traffic volume estimating is critical for planning, designing and maintaining a reasonable quality of service along surface transportation facilities. Reliable estimation of traffic volumes is needed to realistically assess problems and determine appropriate solutions that meet the expectations of the traveling public. Regression equations were developed in this project to find the relationship between average peak hour volume and the design hourly volume/average annual daily traffic to ensure the appropriate design of geometric and traffic control improvements that best fit traffic characteristics in Nebraska.

Comparisons using t-test analyses were conducted to check for the significant change in the relationships developed between average peak hour volumes and the highest hourly volumes. The results of the t-test comparisons indicated that the significant volume break occurs between 14th and 24th highest hourly volumes, depending on the functional type of the roadway and not at the 30th highest hourly volume for the analyzed data which is commonly accepted. Urban data fit the 30th HHV criteria fairly well as shown in **TABLE 17**.

Basic linear regression equations were used to extrapolate the number of hours in a year that have more volume than the average peak hour volume in that given year. From the data analysis, it was found that the average peak hour was equivalent to the 270th HHV of the year for all counter stations from 2001-2003. The Average Peak Hour Volume-Highest Hour Equivalent (APHV-HHE) for all roadways studied was 259, 272 and 281 for the years 2001, 2002 and 2003 respectively. These values show the average number of hours during which the average peak hour volume was exceeded for that specific year. Therefore, use of average PHV as an estimate for design may not be appropriate for Nebraska or at least must be understood as a value that can be exceeded many, many times during the year.

The traditional definitions of average peak hour volume (PHV), design hourly volume (DHV) described as the 30th highest traffic hour volume of the year, and the average annual daily traffic (AADT) were verified by using continuous traffic count data from NDOR. The study resulted in the following conclusions.

- The average peak hourly volume can be reasonably estimated if the DHV (defined as the 30th highest hourly volume of the year) or the AADT volume is known.
- Conversely, if the average PHV is established from an actual traffic count, the DHV or AADT can be reasonably estimated.
- Nebraska traffic characteristics indicate that a significant change in the rate of traffic increase as a percent of the AADT occurs between the 14th and 24th highest hours of the year or 0.16 or 0.27 percent of the total number of annual hours for rural type roadway which represents 47 to 67 percent of the 30 hour criteria. This differs from the commonly excepted value of the 30th highest hourly volume as the point where there is a significant change in volume which represents about 0.34 percent of the total annual hours.

- The location of significant change on urban type roadways closely approximates the 30th highest hour criteria representing 77 to 100 percent of the 30 hour criteria.
- The average peak hourly volume may be exceeded between 200 to 400 hours annually, depending on the functional classification of the roadway. Assuming that these 200 to 400 hours would likely be during the weekday morning or evening peak hours (which would be a total of 5 days per week multiplied by 2 peaks per day multiplied by 52 weeks or 520 hours annually), using the average peak hourly volume for geometric and traffic control design purposes would mean the volume of traffic would exceed the design service volume 38 to 77 percent of the total number of peak hours in the year. If the goal was for the design of the facility to only be exceeded 30 hours in the design year (about 0.34 percent of the total annual hours in a future year), the design would fall severely short of its goal. The result would be the appearance that the improvement was ineffective, poorly designed and a source of frustration to the traveling public.

The Need for Consistency

Although there are many aids for design and traffic engineers to analyze conditions to provide suitable solutions, the process of arriving at those solutions may take many forms, depending on the individual who is responsible for the analysis. It is highly recommended that the knowledge gained by this research project be used with the process defined in NCHRP 457 to define a more realistic range of traffic volume data that can be used in a consistent methodical process to determine the optimal geometric and traffic control solution for a given performance level in a given design year.

Defining a specific procedure to follow that is the result of a Transportation Research Board (TRB) project supported by the American Association of State Highway and Transportation Officials (AASHTO) will allow NDOR to review analysis results for all situations in a consistent format that may allow a more predictable performance product than previously experienced.

Limitations

The traffic data used for analysis was in the form of averages. The use of aggregate data reduces the total variability and nature of variability associated with the statistical relationship (12). Predictions from models based on aggregate data may appear to be more precise than they truly are. Data aggregation may also affect the prediction measures. Therefore, results from this research should be used knowing this limitation which is mainly due to the use of continuous traffic count data, which is presented as aggregate data.

One way to quantify the error in this research is to use disaggregate data for doing similar analysis and comparing those results with those from this research. However, disaggregate data were not available for this research. Further analysis is needed using disaggregate data in the future to quantify the error in this research and to validate the results obtained from this research.

CHAPTER 7
A PROCEDURE FOR THE OPTIMAL CHOICE OF GEOMETRIC AND TRAFFIC CONTROL SOLUTIONS FOR ROADWAY IMPROVEMENTS

***Choice of Reasonable Level of Service*:**
The procedure should begin with the recommendations for level of service provided by the 2004 Green Book shown in **FIGURE 2** to determine a "desirable" segment or intersection performance level depending on the functional type of roadway, terrain and population density area type.

***Choice of Design Year*:**
A reasonable design year should be chosen based on the authorized agency's planning documents. If the situation is that of a new development adjacent to an existing facility, practitioners agree that geometric and traffic control improvements should exceed the traffic demand at the opening of the development and should provide what is agreed upon by stakeholders to be a reasonable level of service about 5 years beyond the predicted ultimate build-out of the development. The proximity of the location with respect to fringe areas of growing communities should be carefully considered as these areas can grow quickly at rates which are difficult to predict.

Consistent Methodology Through the Use of NCHRP 457:
FIGURE 22 is reproduced from NCHRP 457. It shows the process of assessing viable alternatives, narrowing the field of solutions and selecting the best alternative for improvement. A selection of candidate alternatives should be compiled before traffic data is collected to make sure that the appropriate field data is available for later analysis.

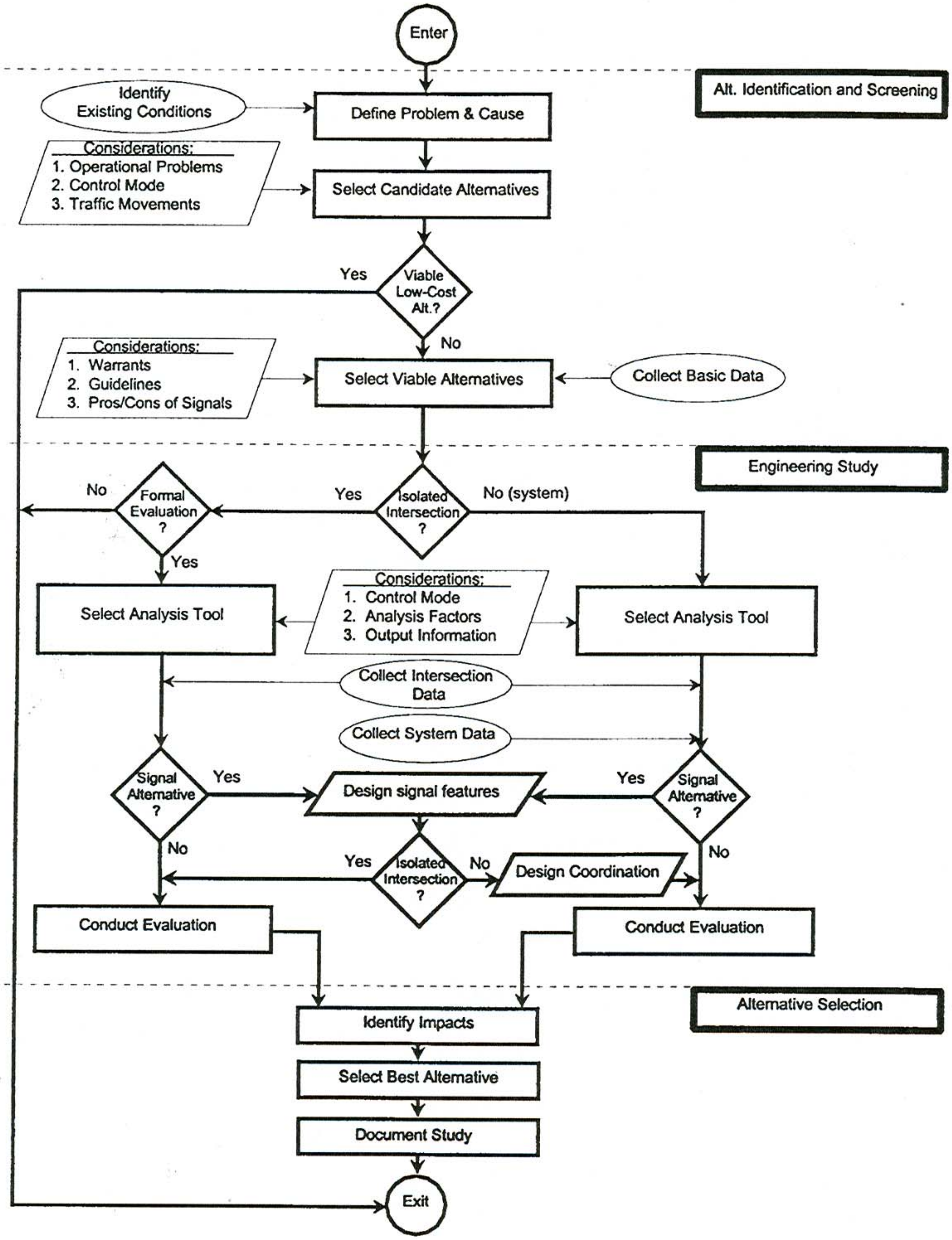

FIGURE 22 Flow Chart of the NCHRP 457 Assessment Process (Page 3, 8)

Traffic estimates required for different alternatives given in NCHRP 457 are listed in **TABLES 5 and 6**.

Including Project Recommendations in the NCHRP 457 Process:
Traffic data recommended in **TABLES 5 and 6** should be gathered using accepted traffic engineering procedures. Suggestions are given in Chapter 1. Once traffic counts are made and the peak hour volume determined, the DHV and AADT should be estimated from the developed regression equations in this project and compared to the best DHV and AADT information currently available. If reliable DHV and/or AADT for the segment is available, the PHV estimate should be calculated from the developed equations and compared to the traffic count PHV. A range of values should be used for analysis using **EQUATIONS 5, 6, 11 AND 12**: low, average and high if such distinctions appear in the field and estimated data. Simulations should be run using all possible volume ranges to see how the system would operate given the possibility that the field peak hour volume is inaccurate.

If an AADT is known for a facility, an estimate of the service volume for given hourly volumes can be estimated with **EQUATIONS 14-17** to give an idea of the performance level of a given design.

It should be noted that the NCHRP 457 process does not include a safety impact assessment. The expected safety of the optimal solution choice should be evaluated in some way, whether it is an informal subjective assessment or a formal quantitative evaluation. Suggestions are given in examples shown in NCHRP 457.

Evaluation of Cost of Desirable Level of Service:
Evaluate the cost of attaining the desirable level of service once an optimal solution is found and determine if it is economically feasible, given budgetary constraints of the funding agency.

Revise Expectations to Better Match Funding Capabilities:
If funding is not available to provide the desired level of service, reduce performance expectations to a more affordable range and iterate design and traffic control options until a reasonable level of service is balanced with available funding.

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Appendix A
Replica of Spreadsheet Database Input Values of Continuous Traffic Count Data

The following appendix contains data duplicated from an Excel spreadsheet file that was used in the determination of relationships between the average peak hour volume (PHV), the design hourly volume (DHV, or 30th highest hourly volume of the given year) and average annual daily traffic (AADT).

The three years of data represented are from 2001, 2002 and 2003.

Summary of Missing Data

Station	2001	2002	2003
17 North	No data	No data	
17 South	No data	No data	
17 Both Directions	No data	No data	
22 East			Missing
22 West			Missing
22 Both Directions			Missing
25 East	No data	No data	No data
25 Both Directions	No data	No data	No data
27 East			Missing
27 West			Missing
27 Both Directions			Missing
28 East			No data
28 Both Directions			No data
33 Both Directions		No data	No data
40 North	No data	No data	No data
40 South	No data	No data	No data
40 Both Directions	No data	No data	No data
43 Both Directions		No data	
46 Both Directions		No data	
64 North	No data	No data	No data
64 Both Directions	No data	No data	No data

Year 2001	Station, Direction	Functional Classification	Annual Weekday Traffic	Annual Weekend Traffic	AADT Volume	Peak Hour Percent, Weekdays	Peak Hour Percent, Weekends	Peak Hour Percent, Average	Peak Hour Volume, Weekdays	Peak Hour Volume, Weekends	Peak Hour Volume, Average	DHV, Percent of AADT	DHV Volume	Day of DHV Occurrence
1	1 Both	Rural-Major Collector	416	295	410	7.63	7.11	7.48	32	21	31	12.4	51	WED
2	2 Both	Rural-Major Arterial	2299	2226	2278	8.58	8.31	8.50	197	185	194	10.4	237	FRI
3	3 Both	Rural-Minor Arterial	648	515	610	7.79	7.26	7.66	50	37	47	12.2	75	FRI
4	4 North	Rural-Principal Arterial-Other	5007	5151	5048	10.40	8.02	9.70	521	413	490	12.7	646	FRI
5	4 South	Rural-Principal Arterial-Other	5015	5187	5064	6.89	7.38	7.04	346	383	357	10.5	536	TUE
6	4 Both	Rural-Principal Arterial-Other	10022	10337	10112	8.49	7.66	8.24	851	792	833	10.6	1079	FRI
7	5 Both	Rural-Minor Arterial	7830	7606	7766	10.00	7.74	9.37	783	589	728	12.8	996	SAT
8	6 Both	Rural-Principal Arterial-Other	4052	4045	4050	8.50	8.10	8.39	344	328	340	12.9	523	SUN
9	7 Both	Rural-Principal Arterial-Other	6031	4925	5715	8.68	7.18	8.31	523	354	475	10.3	593	FRI
10	8 Both	Rural-Principal Arterial-Other	2170	2016	2126	8.24	7.64	8.08	179	154	172	10.4	222	THU
11	9 Both	Rural-Principal Arterial-Other	2219	2016	2161	8.53	7.18	8.19	189	145	177	10.4	225	MON
12	10 Both	Rural-Principal Arterial-Other	2489	2153	2393	7.86	7.49	7.77	196	161	186	10.9	262	SUN
13	11 Both	Rural-Major Collector	334	292	322	8.88	7.62	8.55	30	22	28	15.5	50	SUN
14	12 Both	Rural-Minor Arterial	1182	1007	1132	8.28	7.14	7.99	98	72	90	11.3	129	FRI
15	13 Both	Rural-Major Collector	321	321	321	9.38	7.31	8.79	30	23	28	13	42	TUE
16	14 Both	Rural-Minor Arterial	492	482	489	8.38	7.47	8.13	41	36	40	12.4	61	FRI
17	15 Both	Rural-Major Collector	130	106	123	8.96	7.22	8.56	12	8	11	26	32	SAT
18	16 North	Urban-Minor Arterial	10198	7188	9338	4.42	5.52	4.65	451	397	434	13.6	1274	MON
19	16 South	Urban-Minor Arterial	9276	6669	8531	10.84	6.81	9.94	1006	454	848	13.6	1161	THU
20	16 Both	Urban-Minor Arterial	19474	13857	17869	8.56	6.65	8.14	1667	921	1455	10.3	1846	THU
21	17 North	Rural-Principal Arterial-Interstate												
22	17 South	Rural-Principal Arterial-Interstate												

23	17 Both	Rural-Principal Arterial-Interstate											
24	19 Both	Rural-Minor Arterial	535	430	505	7.62	7.44	7.58	41	32	38	12	61	WED
25	20 East	Rural-Principal Arterial-Interstate	7911	9108	8253	7.28	7.52	7.35	576	685	607	12.1	1004	SUN
26	20 West	Rural-Principal Arterial-Interstate	7727	9463	8223	6.86	6.94	6.89	530	657	567	11.2	924	SUN
27	20 Both	Rural-Principal Arterial-Interstate	15638	18571	16476	7.05	7.23	7.11	1102	1343	1171	11.3	1877	SUN
28	21 Both	Rural-Principal Arterial-Other	5589	4616	5311	8.54	7.19	8.20	477	332	436	10	532	MON
29	22 Both	Rural-Principal Arterial-Other	1022	942	999	7.39	6.77	7.22	76	64	72	10.6	106	FRI
30	23 North	Urban-Principal Arterial-Other Con.	8112	6208	7568	9.40	6.71	8.76	763	417	663	11.5	874	THU
31	23 South	Urban-Principal Arterial-Other Con.	8532	6194	7864	3.98	5.14	4.25	340	318	334	12.6	997	THU
32	23 Both	Urban-Principal Arterial-Other Con.	16644	12402	15432	8.35	6.93	8.02	1390	859	1238	10.2	1579	THU
33	24 East	Urban-Principal Arterial-Interstate	87050	62935	80160	7.86	6.95	7.66	6842	4374	6140	9.7	7782	MON
34	24 West	Urban-Principal Arterial-Interstate	89174	64380	82090	8.48	6.88	8.13	7562	4429	6674	9.9	8174	FRI
35	24 Both	Urban-Principal Arterial-Interstate	176224	127315	162250	8.18	6.91	7.89	14415	8797	12802	9.5	15571	THU
36	25 East	Urban-Principal Arterial-Other Con.												
37	25 West	Urban-Principal Arterial-Other Con.	27649	20376	25571	8.78	8.05	8.63	2428	1640	2207	10.3	2656	WED
38	25 Both	Urban-Principal Arterial-Other Con.												
39	26 North	Urban-Principal Arterial-Other Con.	23057	17356	21428	3.71	4.70	3.94	855	816	844	14	3007	THU
40	26 South	Urban-Principal Arterial-Other Con.	22222	16867	20692	10.75	7.16	9.91	2389	1208	2051	12.5	2605	TUE
41	26 Both	Urban-Principal Arterial-Other Con.	45279	34223	42120	8.86	6.90	8.40	4012	2361	3538	10.6	4489	THU
42	27 East	Rural-Principal Arterial-Interstate	3093	3188	3120	7.85	9.15	8.24	243	292	257	16.6	519	SAT
43	27 West	Rural-Principal Arterial-Interstate	2951	3627	3144	7.41	8.25	7.70	219	299	242	19.2	606	SUN
44	27 Both	Rural-Principal Arterial-Interstate	6044	6814	6264	7.34	8.03	7.56	444	547	474	15.7	987	SUN
45	28 East	Urban-Principal Arterial-Other Con.	20983	17567	20007	8.12	7.12	7.87	1704	1251	1575	9.4	1891	FRI
46	28 West	Urban-Principal Arterial-Other Con.	21612	17682	20489	7.47	7.46	7.47	1614	1319	1531	8.7	1784	THU
47	28 Both	Urban-Principal Arterial-Other Con.	42595	35249	40496	7.79	7.29	7.67	3318	2570	3106	8.9	3629	WED
48	29 East	Urban-Principal Arterial-Other Con.	8615	6795	8095	8.04	7.36	7.87	693	500	637	9.4	767	FRI
49	29 West	Urban-Principal Arterial-Other Con.	10713	8368	10043	8.03	8.13	8.05	860	680	808	9.5	963	FRI
50	29 Both	Urban-Principal Arterial-Other Con.	19328	18138	18138	7.94	7.92	7.94	1535	1437	1440	9.4	1715	WED
51	30 Both	Rural-Major Collector	1463	1747	1544	8.87	8.01	8.59	130	140	133	14.5	224	FRI
52	31 East	Rural-Principal Arterial-Interstate	3441	4047	3614	6.60	6.55	6.59	227	265	238	10.8	393	SUN
53	31 West	Rural-Principal Arterial-Interstate	3147	4379	3499	6.52	6.71	6.59	205	294	231	11.2	395	SUN
54	31 Both	Rural-Principal Arterial-Interstate	6588	8426	7113	6.56	6.64	6.59	432	559	469	10.5	753	SAT
55	32 East	Urban-Principal Arterial-Interstate	8451	7391	8148	12.53	7.61	11.24	1059	562	916	15.5	1263	FRI

56	32 West	Urban-Principal Arterial-Interstate	8238	7416	8003	11.89	2.44	9.35	979	181	748	14.4	1153	THU
57	32 Both	Urban-Principal Arterial-Interstate	16689	14806	16151	9.79	7.60	9.21	1634	1125	1488	12.2	1986	FRI
58	33 Both	Rural-Principal Arterial-Other	4131	3725	4015	7.35	7.35	7.35	304	274	295	9.8	395	FRI
59	34 Both	Rural-Principal Arterial-Other	1832	1510	1740	7.97	7.73	7.91	146	117	138	10.1	176	THU
60	35 Both	Rural-Principal Arterial-Other	3541	2866	3348	8.94	7.32	8.54	317	210	286	10.6	356	MON
61	36 East	Urban-Principal Arterial-Interstate	9820	7188	9068	8.34	7.84	8.23	819	564	746	10.6	970	THU
62	36 West	Urban-Principal Arterial-Interstate	10425	7580	9612	7.83	8.33	7.95	816	631	764	9.9	958	FRI
63	36 Both	Urban-Principal Arterial-Interstate	20245	14768	18680	8.00	8.13	8.03	1620	1201	1500	10	1882	FRI
64	37 Both	Rural-Minor Collector	66	59	64	8.04	7.94	8.01	5	5	5	18.7	12	THU
65	38 East	Rural-Principal Arterial-Interstate	11313	13784	12019	7.20	7.44	7.28	815	1026	875	12.5	1509	SUN
66	38 West	Rural-Principal Arterial-Interstate	11474	13865	12157	7.50	7.26	7.42	861	1007	902	11.7	1434	SUN
67	38 Both	Rural-Principal Arterial-Interstate	22787	27649	24176	7.35	7.35	7.35	1675	2032	1777	11.4	2757	SUN
68	39 Both	Rural-Principal Arterial-Other	5191	4803	5080	8.89	7.56	8.53	461	363	433	10.6	540	FRI
69	40 North	Urban-Principal Arterial-Interstate												
70	40 South	Urban-Principal Arterial-Interstate												
71	40 Both	Urban-Principal Arterial-Interstate												
72	41 Both	Rural-Principal Arterial-Other	6560	5783	6338	7.94	7.42	7.81	521	429	495	9.9	633	FRI
73	42 North	Urban-Minor Arterial	3386	2448	3118	7.80	8.36	7.92	264	205	247	10.1	318	MON
74	42 South	Urban-Minor Arterial	3511	2440	3205	9.15	7.48	8.79	321	183	282	11.2	362	WED
75	42 Both	Urban-Minor Arterial	6897	4888	6323	8.62	7.00	8.26	595	342	522	10.4	663	WED
76	43 East	Rural-Principal Arterial-Interstate	7277	7851	7441	7.05	7.41	7.16	513	582	533	11.7	871	SAT
77	43 West	Rural-Principal Arterial-Interstate	6960	8567	7419	6.88	7.20	6.99	479	617	519	11.6	867	MON
78	43 Both	Rural-Principal Arterial-Interstate	14237	16418	14860	6.92	7.22	7.02	985	1185	1043	11.4	1698	SUN
79	44 Both	Urban-Collector	2353	1548	2123	8.40	8.41	8.40	198	130	178	11.9	253	TUE
80	45 East	Rural-Principal Arterial-Interstate	9672	11828	10288	7.65	7.71	7.67	740	912	789	12.7	1311	SAT
81	45 West	Rural-Principal Arterial-Interstate	9687	11980	10342	7.06	7.09	7.07	684	849	731	11.6	1205	SAT
82	45 Both	Rural-Principal Arterial-Interstate	19359	23808	20630	7.36	7.40	7.37	1425	1762	1520	11.5	2377	FRI
83	46 North	Rural-Principal Arterial-Interstate	15601	10820	14235	10.05	6.41	9.25	1568	694	1317	12.3	1763	TUE
84	46 South	Rural-Principal Arterial-Interstate	16266	11027	14769	11.77	2.93	9.88	1915	323	1459	14.2	2106	TUE
85	46 Both	Rural-Principal Arterial-Interstate	31867	21847	29004	8.77	6.61	8.31	2795	1444	2410	10.7	3114	WED
86	47 East	Rural-Principal Arterial-Other	2126	2018	2095	8.73	2.63	7.06	186	53	148	10.6	223	WED
87	47 West	Rural-Principal Arterial-Other	2132	1915	2070	10.53	8.23	9.92	224	158	205	12.7	263	FRI
88	47 Both	Rural-Principal Arterial-Other	4258	3933	4165	8.46	7.57	8.22	360	298	342	10.0	420	FRI

89	48 East	Rural-Principal Arterial-Other	462	420	450	8.31	7.05	7.97	38	30	36	13.1	59	TUE
90	48 West	Rural-Principal Arterial-Other	458	406	443	7.13	8.02	7.36	33	33	33	12.1	54	SAT
91	48 Both	Rural-Principal Arterial-Other	920	826	893	7.85	7.13	7.66	72	59	68	11.7	105	WED
92	50 North	Rural-Major Collector	244	367	279	7.10	7.99	7.43	17	29	21	28.3	79	FRI
93	50 South	Rural-Major Collector	232	386	276	8.84	9.35	9.05	21	36	25	34.7	96	SAT
94	50 Both	Rural-Major Collector	476	753	555	8.10	8.37	8.20	39	63	46	27.9	155	SAT
95	51 Both	Rural-Major Collector	419	461	431	8.49	6.02	7.73	36	28	33	20.1	87	SUN
96	52 Both	Rural-Major Collector	500	371	463	9.02	7.46	8.66	45	28	40	13.3	62	MON
97	53 East	Rural-Principal Arterial-Interstate	3586	4164	3751	6.59	6.59	6.59	236	274	247	10.9	409	FRI
98	53 West	Rural-Principal Arterial-Interstate	3334	4556	3683	6.46	6.65	6.53	215	303	240	11.1	412	SUN
99	53 Both	Rural-Principal Arterial-Interstate	6920	8719	7434	6.54	6.60	6.56	453	575	488	10.4	779	SUN
100	54 East	Rural-Principal Arterial-Interstate	8637	10044	9039	7.46	7.74	7.55	644	777	682	12.0	1085	SUN
101	54 West	Rural-Principal Arterial-Interstate	8525	10345	9045	6.79	6.91	6.83	579	715	618	11.1	1004	SAT
102	54 Both	Rural-Principal Arterial-Interstate	17162	20389	18084	7.12	7.14	7.13	1222	1456	1289	11.0	1993	SUN
103	55 East	Rural-Principal Arterial-Interstate	13806	15654	14334	7.74	7.47	7.66	1069	1169	1098	11.9	1706	SUN
104	55 West	Rural-Principal Arterial-Interstate	13805	15678	14340	7.77	7.34	7.63	1073	1151	1094	11.5	1660	FRI
105	55 Both	Rural-Principal Arterial-Interstate	27611	31332	28674	7.75	7.41	7.64	2140	2322	2191	10.9	3128	SUN
106	56 East	Rural-Principal Arterial-Interstate	16727	18572	17254	8.11	7.89	8.04	1357	1465	1387	11.0	1904	FRI
107	56 West	Rural-Principal Arterial-Interstate	16851	18948	17540	8.10	7.16	7.81	1365	1357	1370	12.2	2136	FRI
108	56 Both	Rural-Principal Arterial-Interstate	33578	37519	34704	8.15	7.30	7.89	2737	2739	2738	11.2	3887	FRI
109	57 East	Rural-Principal Arterial-Other	1015	861	971	7.53	7.09	7.42	76	61	72	12.4	121	SAT
110	57 West	Rural-Principal Arterial-Other	985	838	943	8.13	8.05	8.11	80	67	76	12.4	117	SUN
111	57 Both	Rural-Principal Arterial-Other	2000	1699	1914	7.71	7.52	7.66	154	128	147	11.1	213	FRI
112	58 East	Rural-Principal Arterial-Other	1228	1071	1183	7.33	7.03	7.26	90	75	86	11.2	133	SAT
113	58 West	Rural-Principal Arterial-Other	1216	1062	1172	9.81	8.24	9.41	119	88	110	12.7	149	FRI
114	58 Both	Rural-Principal Arterial-Other	2444	2133	2355	8.15	7.56	8.00	199	161	188	10.8	256	FRI
115	59 North	Rural-Principal Arterial-Other	2443	2125	2352	8.99	7.77	8.67	220	165	204	13.0	307	WED
116	59 South	Rural-Principal Arterial-Other	2463	2215	2392	7.21	7.27	7.23	178	161	173	10.7	257	THU
117	59 Both	Rural-Principal Arterial-Other	4906	4339	4744	7.89	7.58	7.81	387	329	371	11.1	529	WED
118	60 East	Rural-Principal Arterial-Other	909	752	864	6.66	8.06	7.01	61	61	61	10.5	91	FRI
119	60 West	Rural-Principal Arterial-Other	884	716	836	7.99	7.53	7.88	71	54	66	11.3	95	THU
120	60 Both	Rural-Principal Arterial-Other	1793	1468	1700	7.44	7.12	7.36	133	105	125	10.0	170	FRI
121	61 East	Rural-Principal Arterial-Other	2833	2539	2749	8.65	7.07	8.22	245	180	226	10.4	288	TUE

122	61 West	Rural-Principal Arterial-Other	2806	2463	2708	8.68	7.15	8.28	244	176	224	10.7	292	TUE
123	61 Both	Rural-Principal Arterial-Other	5639	5002	5457	8.67	7.11	8.25	489	356	450	10.3	567	TUE
124	62 North	Urban-Principal Arterial-Other Con.	8372	6951	7966	9.74	7.21	9.11	815	501	726	11.1	888	MON
125	62 South	Urban-Principal Arterial-Other Con.	8314	6890	7907	7.51	7.79	7.58	624	537	599	9.3	742	TUE
126	62 Both	Urban-Principal Arterial-Other Con.	16686	13841	15873	8.49	7.34	8.20	1417	1016	1302	9.7	1549	MON
127	63 North	Rural-Principal Arterial-Other	5427	4556	5178	13.38	2.88	10.71	726	131	555	15.5	803	TUE
128	63 South	Rural-Principal Arterial-Other	5287	4458	5050	11.29	7.33	10.29	597	327	520	13.3	674	FRI
129	63 Both	Rural-Principal Arterial-Other	10714	9013	10228	8.77	7.45	8.44	940	671	863	10.7	1103	THU
130	64 North	Rural-Principal Arterial-Other	1502	1502	1502				0	0	0			
131	64 South	Rural-Principal Arterial-Other	1502	1502	1502	7.41	7.14	7.33	111	107	110	13.9	210	WED
132	64 Both	Rural-Principal Arterial-Other	3004	3004	3004				0	0	0			
133	65 East	Rural-Principal Arterial-Other	4426	4636	4486	9.65	6.97	8.85	427	323	397	11.9	534	FRI
134	65 West	Rural-Principal Arterial-Other	4389	4771	4498	7.05	7.40	7.16	309	353	322	10.8	489	THU
135	65 Both	Rural-Principal Arterial-Other	8815	9407	8984	8.36	7.19	8.00	737	676	719	10.5	950	FRI

Year 2001									
S/N	**Station, Direction**	**Day of 1st Highest Maximum Traffic Day**	**Percentage of AADT 1st Highest Max Traffic Day**	**Day of 10th Highest Maximum Traffic Day**	**Percentage of AADT 10th Highest Max Traffic Day**	**Day of 20th highest Maximum Traffic Day**	**Percentage of AADT 20th Highest Max Traffic Day**	**Day of 30th Highest Maximum Traffic Day**	**Percentage of AADT 30th Highest Max Traffic Day**
1	1 Both	FRI	141.4	SAT	134.8	SAT	130.9	THU	126.8
2	2 Both	FRI	128.5	SAT	120.9	THU	118.4	THU	115.7
3	3 Both	FRI	186.0	TUE	143.7	FRI	130.8	WED	127.2
4	4 North	WED	145.6	SAT	133.0	SAT	126.7	FRI	122.9
5	4 South	SUN	153.3	TUE	126.2	FRI	121.2	FRI	120.2
6	4 Both	SUN	136.5	SUN	127.4	FRI	123.9	FRI	119.9
7	5 Both	SAT	153.8	FRI	135.4	FRI	128.0	FRI	123.5
8	6 Both	SAT	186.8	FRI	132.3	FRI	127.9	FRI	123.9
9	7 Both	FRI	133.7	FRI	126.1	TUE	122.7	FRI	119.8
10	8 Both	SAT	146.2	FRI	124.2	WED	121.5	WED	118.7
11	9 Both	FRI	141.1	FRI	124.9	FRI	118.0	THU	113.9
12	10 Both	WED	144.9	FRI	129.8	FRI	124.9	THU	119.4
13	11 Both	SUN	258.0	FRI	140.0	FRI	131.9	MON	126.7
14	12 Both	FRI	150.8	FRI	126.0	FRI	126.0	FRI	123.2
15	13 Both	SAT	166.0	SAT	136.4	FRI	128.9	FRI	123.0
16	14 Both	SAT	175.4	MON	137.8	SUN	128.8	SAT	124.7
17	15 Both	WED	469.9	FRI	172.3	FRI	143.9	WED	134.9
18	16 North	FRI	124.4	FRI	120.8	THU	118.7	FRI	116.9
19	16 South	WED	137.7	FRI	127.2	MON	123.7	THU	121.8
20	16 Both	FRI	126.1	FRI	122.3	FRI	119.8	WED	118.3
21	17 North								
22	17 South								

23	17 Both								
24	19 Both	FRI	174.0	SAT	139.0	FRI	130.4	FRI	127.1
25	20 East	FRI	193.3	SUN	155.3	SUN	149.6	SUN	141.4
26	20 West	SUN	174.4	SUN	150.8	SAT	144.9	SUN	138.5
27	20 Both	SUN	169.8	SUN	153.5	FRI	146.6	SAT	139.2
28	21 Both	FRI	124.4	FRI	117.9	FRI	116.2	THU	114.7
29	22 Both	FRI	152.9	FRI	124.9	FRI	118.6	FRI	115.8
30	23 North	FRI	134.0	FRI	126.1	FRI	122.5	WED	121.0
31	23 South	FRI	132.9	FRI	125.0	TUE	121.6	TUE	120.0
32	23 Both	FRI	133.1	FRI	125.6	FRI	122.0	TUE	120.8
33	24 East	FRI	130.1	FRI	123.4	FRI	121.9	THU	119.5
34	24 West	FRI	127.7	FRI	121.8	FRI	120.3	THU	118.4
35	24 Both	FRI	128.9	FRI	122.4	FRI	121.0	THU	118.9
36	25 East								
37	25 West	FRI	133.3	FRI	118.3	FRI	115.3	MON	113.0
38	25 Both								
39	26 North	FRI	124.8	FRI	120.3	FRI	118.8	FRI	117.2
40	26 South	FRI	122.8	FRI	120.2	FRI	117.8	THU	116.1
41	26 Both	FRI	123.0	FRI	120.3	FRI	118.2	WED	116.1
42	27 East	FRI	318.6	FRI	179.4	SAT	163.9	SAT	150.4
43	27 West	SUN	278.3	WED	203.7	SUN	174.5	SAT	151.5
44	27 Both	SUN	242.1	FRI	181.7	SUN	165.7	THU	157.0
45	28 East	FRI	128.7	FRI	120.9	FRI	119.6	FRI	117.5
46	28 West	FRI	125.2	FRI	120.9	FRI	119.3	FRI	117.1
47	28 Both	FRI	126.7	FRI	121.1	FRI	119.0	FRI	118.1
48	29 East	FRI	127.5	FRI	119.0	FRI	116.5	FRI	114.6
49	29 West	FRI	125.1	FRI	117.1	FRI	114.6	THU	111.9
50	29 Both	FRI	126.1	FRI	117.7	FRI	115.9	FRI	113.0
51	30 Both	SAT	232.7	SAT	172.7	SUN	160.8	SAT	151.6
52	31 East	SAT	170.8	SAT	145.8	FRI	141.6	FRI	137.8
53	31 West	SAT	179.9	SUN	157.5	SUN	147.2	SUN	139.1
54	31 Both	SAT	168.6	SAT	151.4	SUN	140.1	FRI	135.3
55	32 East	FRI	159.8	FRI	138.2	FRI	129.6	THU	123.1

56	32 West	WED	134.3	FRI	127.5	FRI	123.9	FRI	119.9
57	32 Both	FRI	146.6	FRI	132.9	FRI	126.8	THU	120.0
58	33 Both	FRI	151.1	FRI	126.7	FRI	120.3	FRI	117.7
59	34 Both	FRI	129.7	FRI	120.6	FRI	117.6	FRI	116.5
60	35 Both	FRI	129.9	FRI	121.8	WED	118.7	FRI	116.9
61	36 East	FRI	141.8	FRI	123.8	FRI	121.8	FRI	120.2
62	36 West	FRI	143.7	FRI	124.9	FRI	123.2	FRI	120.4
63	36 Both	FRI	142.8	FRI	124.3	FRI	122.2	FRI	120.0
64	37 Both	SUN	206.2	FRI	157.8	TUE	143.7	SUN	139.0
65	38 East	SUN	181.9	SUN	145.3	MON	139.9	SAT	136.5
66	38 West	WED	181.6	SAT	143.4	FRI	136.4	FRI	132.6
67	38 Both	SUN	163.4	SUN	143.4	SAT	138.7	FRI	133.5
68	39 Both	FRI	138.9	FRI	125.2	FRI	120.3	FRI	116.8
69	40 North								
70	40 South								
71	40 Both								
72	41 Both	FRI	138.1	FRI	126.5	WED	124.2	TUE	121.0
73	42 North	FRI	131.2	THU	121.3	FRI	119.7	MON	117.7
74	42 South	FRI	129.6	FRI	122.3	FRI	120.4	MON	118.8
75	42 Both	FRI	130.3	MON	121.6	FRI	119.9	FRI	118.3
76	43 East	FRI	172.2	FRI	155.4	SAT	146.3	THU	139.2
77	43 West	SAT	181.5	SAT	154.0	MON	142.1	FRI	136.6
78	43 Both	SAT	171.4	FRI	149.7	FRI	143.2	SUN	135.5
79	44 Both	FRI	131.6	WED	127.3	THU	124.1	TUE	122.0
80	45 East	SUN	179.8	FRI	149.8	SUN	143.2	SAT	138.2
81	45 West	WED	181.1	FRI	149.9	SAT	141.5	SUN	135.8
82	45 Both	SUN	168.6	FRI	150.2	FRI	143.4	SAT	135.6
83	46 North	FRI	128.7	FRI	125.6	FRI	122.5	THU	121.1
84	46 South	FRI	128.9	FRI	123.2	WED	121.1	FRI	119.8
85	46 Both	FRI	128.8	WED	122.6	WED	120.9	WED	118.6
86	47 East	FRI	127.3	THU	120.0	FRI	116.8	THU	114.6
87	47 West	FRI	151.7	FRI	137.1	FRI	125.9	FRI	120.9
88	47 Both	FRI	133.6	FRI	126.5	FRI	120.0	THU	116.2

89	48 East	MON	175.7	FRI	133.1	FRI	125.5	FRI	122.6
90	48 West	FRI	186.2	TUE	136.1	THU	125.9	MON	121.6
91	48 Both	MON	160.6	SUN	133.2	THU	125.5	FRI	121.9
92	50 North	SAT	521.5	SAT	287.4	SAT	235.8	SUN	218.2
93	50 South	SAT	512.6	SUN	326.4	SAT	269.2	SUN	207.9
94	50 Both	SAT	517.1	SUN	289.3	SAT	263.2	FRI	207.0
95	51 Both	SUN	188.6	SUN	135.9	WED	127.6	WED	123.4
96	52 Both	THU	162.8	FRI	137.1	MON	129.5	FRI	127.2
97	53 East	SAT	169.1	SAT	149.8	FRI	139.9	FRI	137.6
98	53 West	SAT	177.6	SAT	157.8	SAT	146.7	SUN	140.7
99	53 Both	SAT	166.5	SAT	149.1	SUN	140.6	SUN	135.2
100	54 East	FRI	186.6	FRI	148.4	FRI	140.0	SUN	135.5
101	54 West	WED	170.4	SAT	146.7	SUN	138.7	SAT	132.7
102	54 Both	WED	167.7	SAT	148.1	FRI	138.5	SUN	132.3
103	55 East	SUN	165.4	SUN	139.7	SAT	133.6	MON	130.5
104	55 West	WED	174.0	SAT	138.2	FRI	132.2	FRI	127.1
105	55 Both	WED	156.3	FRI	135.9	SAT	131.4	SUN	127.7
106	56 East	SAT	154.2	FRI	133.9	SAT	129.3	SAT	126.7
107	56 West	SAT	158.4	SAT	136.6	FRI	129.9	SUN	125.1
108	56 Both	SAT	155.6	SAT	136.9	FRI	129.9	FRI	126.0
109	57 East	FRI	145.5	FRI	132.1	THU	127.4	FRI	123.7
110	57 West	WED	169.5	FRI	133.7	TUE	128.4	FRI	123.3
111	57 Both	WED	154.0	FRI	132.2	FRI	127.6	FRI	122.8
112	58 East	FRI	135.9	THU	128.4	FRI	123.4	FRI	119.8
113	58 West	WED	162.9	FRI	133.7	FRI	125.7	TUE	120.2
114	58 Both	WED	145.0	FRI	129.0	FRI	124.9	TUE	119.4
115	59 North	FRI	170.7	FRI	142.3	FRI	136.3	MON	131.2
116	59 South	FRI	150.5	WED	137.6	SAT	129.1	FRI	123.8
117	59 Both	FRI	158.3	MON	139.0	MON	132.1	FRI	127.8
118	60 East	FRI	135.8	FRI	125.6	TUE	121.0	THU	120.0
119	60 West	FRI	142.3	FRI	132.5	FRI	126.9	THU	121.7
120	60 Both	FRI	138.2	FRI	128.8	FRI	122.8	TUE	121.0
121	61 East	MON	136.8	FRI	124.4	FRI	120.9	SAT	117.9

122	61 West	FRI	138.3	FRI	125.2	FRI	122.0	THU	120.3
123	61 Both	FRI	134.9	WED	125.1	MON	121.6	FRI	118.9
124	62 North	FRI	130.7	FRI	123.0	FRI	119.8	FRI	118.0
125	62 South	FRI	125.9	FRI	118.6	FRI	116.1	FRI	114.9
126	62 Both	FRI	128.3	FRI	120.6	FRI	118.7	FRI	116.2
127	63 North	FRI	123.9	FRI	118.8	FRI	117.2	TUE	115.2
128	63 South	FRI	129.7	FRI	124.0	FRI	121.2	WED	116.6
129	63 Both	FRI	124.8	FRI	121.9	THU	119.2	FRI	115.5
130	64 North								
131	64 South	SUN	208.5	SUN	146.0	SUN	131.9	SAT	125.3
132	64 Both								
133	65 East	FRI	161.4	FRI	130.0	SAT	117.5	FRI	113.4
134	65 West	SUN	153.8	FRI	124.3	SAT	118.0	SAT	113.4
135	65 Both	FRI	141.5	FRI	125.6	SUN	117.7	SAT	113.1

Year 2002 S/N	Station, Direction	Functional Classification	Annual Weekday Traffic	Annual Weekend Traffic	AADT Volume	Peak Hour % Weekdays	Peak Hour % Weekends	Peak Hour % Average	Peak Hour Vol. Weekdays	Peak Hour Vol. Weekends	Peak Hour Vol. Average	DHV %	DHV Volume	Day of DHV Occurrence
1	1 Both	Rural-Major Collector	411	411	411	8.02	7.07	7.75	33	29	32	11.4	47	FRI
2	2 Both	Rural-Major Arterial	2441	2361	2418	8.63	8.46	8.58	211	200	207	10.5	256	MON
3	3 Both	Rural-Minor Arterial	584	486	556	8.00	7.41	7.85	47	36	44	11.5	64	FRI
4	4 North	Rural-Principal Arterial-Other	5227	5392	5274	10.56	7.94	9.78	552	428	516	12.7	671	FRI
5	4 South	Rural-Principal Arterial-Other	5051	5244	5106	6.99	7.45	7.13	353	391	364	10.2	524	SUN
6	4 Both	Rural-Principal Arterial-Other	10278	10635	10380	8.74	7.70	8.44	898	819	876	10.3	1078	FRI
7	5 Both	Rural-Minor Arterial	9204	9036	9156	9.75	7.68	9.17	897	694	840	11.3	1040	FRI
8	6 Both	Rural-Principal Arterial-Other	4130	4186	4146	8.45	8.14	8.36	349	341	347	12.3	511	FRI
9	7 Both	Rural-Principal Arterial-Other	6094	4960	5770	8.56	7.04	8.19	522	349	473	10.2	592	FRI
10	8 Both	Rural-Principal Arterial-Other	2260	2103	2215	8.44	7.07	8.07	191	149	179	10.5	234	FRI
11	9 Both	Rural-Principal Arterial-Other	2269	1986	2188	8.60	7.18	8.24	195	143	180	11.1	244	THU
12	10 Both	Rural-Principal Arterial-Other	2519	2215	2432	7.86	7.53	7.77	198	167	189	11.0	268	FRI
13	11 Both	Rural-Major Collector	350	308	338	8.82	7.75	8.54	31	24	29	15.3	52	FRI
14	12 Both	Rural-Minor Arterial	1210	1007	1152	8.21	7.11	7.93	99	72	91	11.1	128	SAT
15	13 Both	Rural-Major Collector	333	323	330	8.72	6.78	8.18	29	22	27	12.1	40	SAT
16	14 Both	Rural-Minor Arterial	485	461	478	8.24	7.84	8.13	40	36	39	12.3	59	THU
17	15 Both	Rural-Major Collector	123	106	118	8.90	8.19	8.74	11	9	10	27.1	32	WED
18	16 North	Urban-Minor Arterial	10609	7347	9677	10.81	2.28	8.95	1147	168	866	13.6	1321	THU
19	16 South	Urban-Minor Arterial	8913	6386	8191	10.84	6.81	9.93	966	435	813	13.1	1078	MON
20	16 Both	Urban-Minor Arterial	19522	13733	17868	8.49	6.69	8.09	1657	919	1446	10.1	1817	WED
21	17 North	Rural-Principal Arterial-Interstate	28210	23846	26963				0	0	0			
22	17 South	Rural-Principal Arterial-Interstate	28029	23682	26787				0	0	0			
23	17 Both	Rural-Principal Arterial-Interstate	56239	47528	53750				0	0	0			

24	19 Both	Rural-Minor Arterial	536	463	515	7.44	7.54	7.46	40	35	38	14.3	74	SUN
25	20 East	Rural-Principal Arterial-Interstate	8148	9503	8535	7.38	7.53	7.43	601	716	634	12.2	1049	WED
26	20 West	Rural-Principal Arterial-Interstate	7964	9812	8492	6.87	6.99	6.91	547	686	587	11.0	937	SAT
27	20 Both	Rural-Principal Arterial-Interstate	16112	19315	17027	7.13	7.25	7.17	1149	1400	1221	11.2	1923	MON
28	21 Both	Rural-Principal Arterial-Other	5796	4767	5502	8.56	7.15	8.21	496	341	452	10.0	555	THU
29	22 East	Rural-Principal Arterial-Other	608	507	579	7.88	6.35	7.49	48	32	43	12.2	71	FRI
30	22 West	Rural-Principal Arterial-Other	579	544	569	6.94	7.73	7.16	40	42	41	13.8	79	MON
31	22 Both	Rural-Principal Arterial-Other	1187	1051	1148	7.17	7.32	7.21	85	77	83	11.8	136	TUE
32	23 North	Urban-Principal Arterial-Other Con.	7888	5991	7346	9.23	6.87	8.68	728	412	638	11.0	815	THU
33	23 South	Urban-Principal Arterial-Other Con.	8236	5961	7586	10.06	2.99	8.47	829	178	643	12.2	928	TUE
34	23 Both	Urban-Principal Arterial-Other Con.	16124	11952	14932	8.23	7.02	7.95	1327	839	1187	9.9	1479	MON
35	24 East	Urban-Principal Arterial-Interstate	89392	64756	82353	7.93	6.99	7.72	7089	4526	6358	9.6	7934	WED
36	24 West	Urban-Principal Arterial-Interstate	91971	66218	84613	8.71	7.16	8.36	8011	4741	7074	11.5	9794	WED
37	24 Both	Urban-Principal Arterial-Interstate	181363	130974	166966	8.34	7.08	8.06	15126	9273	13457	10.3	17296	THU
38	25 East	Urban-Principal Arterial-Other Con.	32262	22935	29597				0	0	0			
39	25 West	Urban-Principal Arterial-Other Con.	32920	24111	30403				0	0	0			
40	25 Both	Urban-Principal Arterial-Other Con.	65182	47045	60000				0	0	0			
41	26 North	Urban-Principal Arterial-Other Con.	23902	17973	22208	11.52	3.38	9.64	2754	607	2141	13.6	3035	WED
42	26 South	Urban-Principal Arterial-Other Con.	23205	17581	21598	10.40	7.12	9.64	2413	1252	2082	12.0	2596	THU
43	26 Both	Urban-Principal Arterial-Other Con.	47107	35554	43806	8.75	6.97	8.34	4122	2478	3653	10.4	4588	MON
44	27 East	Rural-Principal Arterial-Interstate	3165	3323	3210	7.78	8.57	8.00	246	285	257	7.8	253	FRI
45	27 West	Rural-Principal Arterial-Interstate	3096	3800	3297	7.26	7.97	7.49	225	303	247	15.5	513	SUN
46	27 Both	Rural-Principal Arterial-Interstate	6261	7122	6507	7.30	7.99	7.52	457	569	489	8.4	547	SUN
47	28 East	Urban-Principal Arterial-Other Con.	19224	16228	18368	7.91	6.89	7.65	1521	1118	1405	9.6	1775	TUE
48	28 West	Urban-Principal Arterial-Other Con.	19902	16255	18860	7.71	7.61	7.69	1534	1237	1450	9.2	1739	WED
49	28 Both	Urban-Principal Arterial-Other Con.	39126	32483	37228	7.80	7.28	7.67	3052	2365	2855	9.2	3426	WED
50	29 East	Urban-Principal Arterial-Other Con.	8798	6961	8273	7.76	7.44	7.68	683	518	635	9.4	780	FRI
51	29 West	Urban-Principal Arterial-Other Con.	10709	8515	10082	7.89	7.69	7.84	845	655	790	9.5	963	FRI
52	29 Both	Urban-Principal Arterial-Other Con.	19507	15475	18355	7.83	7.57	7.77	1527	1171	1426	9.3	1723	WED
53	30 Both	Rural-Major Collector	1471	1755	1552	8.67	8.10	8.48	128	142	132	14.8	231	MON
54	31 East	Rural-Principal Arterial-Interstate	3546	4218	3738	6.52	6.73	6.59	231	284	246	10.6	397	SUN
55	31 West	Rural-Principal Arterial-Interstate	3239	4517	3604	6.51	6.62	6.55	211	299	236	11.2	406	SUN
56	31 Both	Rural-Principal Arterial-Interstate	6785	8735	7342	6.50	6.55	6.52	441	572	479	10.6	785	SAT

57	32 East	Urban-Principal Arterial-Interstate	8424	7332	8112	12.25	7.82	11.11	1032	573	901	12.7	1031	FRI
58	32 West	Urban-Principal Arterial-Interstate	8161	7363	7933	11.49	2.38	9.13	938	175	724	12.1	967	TUE
59	32 Both	Urban-Principal Arterial-Interstate	16585	14695	16045	9.36	7.77	8.95	1552	1142	1436	10.4	1673	FRI
60	33 Both	Rural-Principal Arterial-Other	4270	3850	4150				0	0	0			
61	34 Both	Rural-Principal Arterial-Other	1886	1564	1794	7.92	7.84	7.90	149	123	142	11.1	200	FRI
62	35 Both	Rural-Principal Arterial-Other	3478	2834	3294	8.90	7.39	8.53	310	209	281	10.5	347	WED
63	36 East	Urban-Principal Arterial-Interstate	10184	7594	9444	8.08	7.71	8.00	823	585	756	10.6	1010	FRI
64	36 West	Urban-Principal Arterial-Interstate	10627	7918	9853	7.56	8.18	7.71	803	648	760	9.9	980	FRI
65	36 Both	Urban-Principal Arterial-Interstate	20811	15512	19297	8.02	7.03	7.79	1669	1090	1503	10.0	1930	FRI
66	37 Both	Rural-Minor Collector	66	56	63	7.76	8.22	7.88	5	5	5	19.0	12	WED
67	38 East	Rural-Principal Arterial-Interstate	11758	13942	12382	7.30	7.70	7.44	858	1074	921	10.6	1318	SAT
68	38 West	Rural-Principal Arterial-Interstate	11824	13963	12435	7.75	7.85	7.78	916	1096	967	10.5	1316	SAT
69	38 Both	Rural-Principal Arterial-Interstate	23582	27905	24817	7.52	7.78	7.61	1773	2171	1889	10.1	2522	SAT
70	39 Both	Rural-Principal Arterial-Other	5188	4887	5102	8.85	7.67	8.53	459	375	435	10.5	537	WED
71	40 North	Urban-Principal Arterial-Interstate	35742	28193	33585									
72	40 South	Urban-Principal Arterial-Interstate	38869	30280	36415									
73	40 Both	Urban-Principal Arterial-Interstate	74611	58473	70000									
74	41 Both	Rural-Principal Arterial-Other	6247	5582	6057	7.85	7.36	7.73	490	411	468	9.6	586	FRI
75	42 North	Urban-Minor Arterial	3355	2414	3086	7.80	8.26	7.90	262	199	244	10.2	317	TUE
76	42 South	Urban-Minor Arterial	3489	2418	3183	8.80	7.32	8.48	307	177	270	10.9	349	TUE
77	42 Both	Urban-Minor Arterial	6844	4832	6269	8.42	6.99	8.10	576	338	508	10.3	646	MON
78	43 East	Rural-Principal Arterial-Interstate	7241	8053	7473	6.95	7.32	7.07	503	589	528	11.6	868	SAT
79	43 West	Rural-Principal Arterial-Interstate	7034	8868	7558	6.91	7.29	7.04	486	646	532	11.7	891	SAT
80	43 Both	Rural-Principal Arterial-Interstate	14275	16921	15031				0	0	0			
81	44 Both	Urban-Collector	2298	1511	2073	8.22	8.13	8.20	189	123	170	11.8	246	THU
82	45 East	Rural-Principal Arterial-Interstate	10068	12364	10724	7.58	7.61	7.59	763	941	814	12.6	1355	SUN
83	45 West	Rural-Principal Arterial-Interstate	10072	12519	10771	7.00	7.11	7.04	705	890	758	11.2	1217	FRI
84	45 Both	Rural-Principal Arterial-Interstate	20140	24883	21495	7.29	7.36	7.31	1468	1831	1571	11.2	2421	SUN
85	46 North	Rural-Principal Arterial-Interstate	15125	10603	13833	9.63	6.77	9.01	1457	718	1246	12.3	1706	MON
86	46 South	Rural-Principal Arterial-Interstate	15210	10611	13896	11.86	3.01	9.91	1804	319	1377	14.6	2036	WED
87	46 Both	Rural-Principal Arterial-Interstate	30335	21214	27729				0	0	0			
88	47 East	Rural-Principal Arterial-Other	2138	2037	2109	9.20	2.79	7.44	197	57	157	10.8	229	THU
89	47 West	Rural-Principal Arterial-Other	2154	1937	2092	10.56	8.14	9.93	227	158	208	12.7	267	FRI

90	47 Both	Rural-Principal Arterial-Other	4292	4201	3974	8.42	7.51	8.17	361	315	325	9.9	416	FRI
91	48 East	Rural-Principal Arterial-Other	492	450	480	8.51	6.95	8.10	42	31	39	13.1	63	MON
92	48 West	Rural-Principal Arterial-Other	497	441	481	6.96	7.75	7.16	35	34	34	12.8	62	FRI
93	48 Both	Rural-Principal Arterial-Other	989	891	961	7.73	7.34	7.63	76	65	73	11.8	114	FRI
94	50 North	Rural-Major Collector	247	363	280	7.80	7.37	7.64	19	27	21	28.2	79	SUN
95	50 South	Rural-Major Collector	232	393	278	8.76	9.35	9.00	20	37	25	32.7	91	SUN
96	50 Both	Rural-Major Collector	479	756	558	8.26	8.40	8.32	40	64	46	27.0	151	THU
97	51 Both	Rural-Major Collector	416	451	426	8.70	6.50	8.04	36	29	34	18.3	78	SUN
98	52 Both	Rural-Major Collector	505	369	466	8.92	7.32	8.56	45	27	40	12.8	60	TUE
99	53 East	Rural-Principal Arterial-Interstate	3487	4625	3812	6.55	6.44	6.52	228	298	249	7.9	303	FRI
100	53 West	Rural-Principal Arterial-Interstate	3431	4719	3799	6.46	6.58	6.50	222	311	247	11.1	425	SUN
101	53 Both	Rural-Principal Arterial-Interstate	6918	9344	7611	6.48	6.56	6.50	448	613	495	7.5	578	SUN
102	54 East	Rural-Principal Arterial-Interstate	8979	10407	9387	7.53	7.62	7.56	676	793	710	12.1	1141	SUN
103	54 West	Rural-Principal Arterial-Interstate	8845	10735	9385	6.80	6.93	6.84	601	744	642	10.9	1024	SUN
104	54 Both	Rural-Principal Arterial-Interstate	17824	21142	18772	7.10	7.25	7.15	1266	1533	1342	11.0	2079	MON
105	55 East	Rural-Principal Arterial-Interstate	14106	16199	14704	7.66	7.49	7.61	1081	1213	1119	11.7	1721	SUN
106	55 West	Rural-Principal Arterial-Interstate	14147	16195	14732	7.70	7.36	7.60	1089	1192	1120	11.5	1698	WED
107	55 Both	Rural-Principal Arterial-Interstate	28253	32394	29436	7.68	7.43	7.60	2170	2407	2237	10.5	3119	SAT
108	56 East	Rural-Principal Arterial-Interstate	17686	19499	18204	8.20	7.95	8.12	1450	1550	1478	10.7	1963	SUN
109	56 West	Rural-Principal Arterial-Interstate	17835	19781	18391	8.17	7.24	7.88	1457	1432	1449	11.4	2111	SAT
110	56 Both	Rural-Principal Arterial-Interstate	35521	39280	36595	8.21	7.34	7.95	2916	2883	2909	10.6	3894	FRI
111	57 East	Rural-Principal Arterial-Other	1001	875	965	7.44	7.08	7.35	74	62	71	12.0	116	SUN
112	57 West	Rural-Principal Arterial-Other	968	863	938	8.26	8.63	8.35	80	74	78	12.2	115	FRI
113	57 Both	Rural-Principal Arterial-Other	1969	1738	1903	7.65	7.81	7.69	151	136	146	10.9	208	FRI
114	58 East	Rural-Principal Arterial-Other	1203	1084	1169	7.54	7.40	7.50	91	80	88	11.5	135	FRI
115	58 West	Rural-Principal Arterial-Other	1194	1075	1160	10.25	8.50	9.78	122	91	113	12.8	149	FRI
116	58 Both	Rural-Principal Arterial-Other	2397	2159	2329	8.17	7.71	8.05	196	166	187	10.5	245	FRI
117	59 North	Rural-Principal Arterial-Other	2358	2106	2286	8.81	7.59	8.49	208	160	194	11.4	262	FRI
118	59 South	Rural-Principal Arterial-Other	2126	2018	2095	7.32	7.30	7.31	156	147	153	11.0	231	MON
119	59 Both	Rural-Principal Arterial-Other	4484	4124	4381	7.98	7.57	7.87	358	312	345	10.4	460	SAT
120	60 East	Rural-Principal Arterial-Other	950	782	902	6.66	8.16	7.04	63	64	64	10.3	93	FRI
121	60 West	Rural-Principal Arterial-Other	895	738	850	8.13	7.58	7.99	73	56	68	11.2	96	FRI
122	60 Both	Rural-Principal Arterial-Other	1845	1520	1752	7.50	7.15	7.41	138	109	130	9.7	171	SAT

123	61 East	Rural-Principal Arterial-Other	2761	2502	2687	8.76	7.19	8.34	242	180	224	10.3	277	THU
124	61 West	Rural-Principal Arterial-Other	2692	2409	2611	8.63	7.06	8.21	232	170	214	10.3	269	FRI
125	61 Both	Rural-Principal Arterial-Other	5453	4911	5298	8.70	7.13	8.27	474	350	438	9.9	529	MON
126	62 North	Urban-Principal Arterial-Other Con.	8506	7064	8094	9.71	7.15	9.07	826	505	734	11.1	902	FRI
127	62 South	Urban-Principal Arterial-Other Con.	8330	6899	7921	7.49	7.75	7.56	624	535	599	9.5	757	TUE
128	62 Both	Urban-Principal Arterial-Other Con.	16836	13963	16015	8.45	7.39	8.19	1423	1032	1312	9.6	1550	FRI
129	63 North	Rural-Principal Arterial-Other	5308	4430	5057	13.19	2.86	10.62	700	127	537	15.0	759	MON
130	63 South	Rural-Principal Arterial-Other	5083	4222	4837	11.07	7.76	10.25	563	328	496	13.0	631	THU
131	63 Both	Rural-Principal Arterial-Other	10391	8652	9894	8.79	7.58	8.48	913	656	839	10.6	1051	THU
132	64 North	Rural-Principal Arterial-Other	1606	1620	1610				0	0	0			
133	64 South	Rural-Principal Arterial-Other	1606	1620	1610	7.47	7.11	7.36	120	115	118	13.4	217	THU
134	64 Both	Rural-Principal Arterial-Other	3212	3240	3220				0	0	0			
135	65 East	Rural-Principal Arterial-Other	4635	4824	4689	9.92	7.09	9.09	460	342	426	12.3	577	FRI
136	65 West	Rural-Principal Arterial-Other	4641	4970	4735	6.72	7.68	7.01	312	382	332	10.8	512	SAT
137	65 Both	Rural-Principal Arterial-Other	9276	9794	9424	8.36	7.27	8.04	775	712	758	10.5	998	FRI

Year 2002									
S/N	**Station, Direction**	**Day of 1st highest maximum traffic day**	**Percentage of AADT 1st Highest max. traffic day**	**Day of 10th highest maximum traffic day**	**Percentage of AADT 10th Highest max. traffic day**	**Day of 20th highest maximum traffic day**	**Percentage of AADT 20th Highest max. traffic day**	**Day of 30th highest maximum traffic day**	**Percentage of AADT 30th Highest max. traffic day**
1	1 Both	FRI	169.0	FRI	131.8	FRI	123.8	SAT	120.4
2	2 Both	SAT	137.5	FRI	120.3	FRI	117.1	FRI	115.4
3	3 Both	MON	143.1	THU	126.2	TUE	122.3	SAT	120.1
4	4 North	FRI	136.8	FRI	128.8	FRI	124.2	FRI	120.5
5	4 South	FRI	130.0	SUN	122.1	FRI	118.7	FRI	117.0
6	4 Both	SAT	129.6	SAT	123.4	FRI	120.2	FRI	117.2
7	5 Both	SAT	137.0	FRI	128.9	FRI	123.0	FRI	118.3
8	6 Both	SAT	234.3	FRI	126.6	SAT	122.3	FRI	118.5
9	7 Both	FRI	135.0	FRI	124.0	FRI	120.8	FRI	118.9
10	8 Both	SAT	154.6	TUE	127.9	FRI	122.0	FRI	119.9
11	9 Both	FRI	149.3	FRI	134.7	SUN	127.3	FRI	125.4
12	10 Both	SUN	152.4	FRI	128.9	FRI	122.6	FRI	119.5
13	11 Both	MON	262.7	MON	144.9	TUE	134.3	MON	125.4
14	12 Both	FRI	150.2	FRI	128.5	WED	124.9	TUE	119.9
15	13 Both	SAT	143.6	SAT	129.6	FRI	123.6	SAT	120.3
16	14 Both	FRI	152.7	MON	135.7	SUN	127.4	FRI	124.4
17	15 Both	WED	453.3	THU	166.9	WED	133.8	MON	128.8
18	16 North	FRI	124.8	FRI	120.4	FRI	118.8	FRI	116.8
19	16 South	FRI	128.1	FRI	121.0	FRI	120.3	WED	118.7
20	16 Both	FRI	125.3	FRI	120.2	FRI	118.9	FRI	117.7
21	17 North								
22	17 South								
23	17 Both								
24	19 Both	SUN	228.7	FRI	159.0	WED	138.0	THU	133.0

25	20 East	WED	166.2	SAT	152.1	FRI	145.0	FRI	139.9
26	20 West	SAT	167.4	FRI	150.4	SAT	144.5	SUN	139.6
27	20 Both	SAT	159.7	FRI	150.6	FRI	143.8	SAT	137.5
28	21 Both	FRI	125.4	FRI	120.1	FRI	117.9	FRI	115.7
29	22 East	FRI	165.2	THU	139.2	FRI	133.8	FRI	128.3
30	22 West	SUN	279.9	SUN	132.3	FRI	125.4	FRI	121.6
31	22 Both	SUN	214.1	FRI	133.3	TUE	127.0	SAT	123.0
32	23 North	FRI	133.3	FRI	124.8	THU	121.2	FRI	119.3
33	23 South	FRI	130.5	FRI	124.0	FRI	121.1	THU	119.6
34	23 Both	FRI	131.9	THU	124.7	FRI	120.7	FRI	119.5
35	24 East	FRI	134.9	FRI	122.9	FRI	121.1	FRI	119.4
36	24 West	FRI	140.7	FRI	137.3	THU	131.1	THU	128.3
37	24 Both	FRI	137.9	FRI	127.7	WED	123.5	FRI	122.2
38	25 East								
39	25 West								
40	25 Both								
41	26 North	FRI	122.4	FRI	120.4	FRI	118.2	FRI	116.2
42	26 South	FRI	120.4	FRI	118.0	FRI	116.6	FRI	115.5
43	26 Both	FRI	121.3	FRI	118.8	FRI	117.3	FRI	115.6
44	27 East	SAT	108.8	THU	87.5	SAT	78.4	WED	69.4
45	27 West	MON	242.1	SAT	163.5	SUN	142.6	TUE	131.3
46	27 Both	MON	122.6	SUN	95.7	FRI	83.2	FRI	78.5
47	28 East	FRI	136.2	FRI	118.3	FRI	115.6	FRI	114.5
48	28 West	FRI	134.6	FRI	124.2	FRI	118.2	WED	116.5
49	28 Both	FRI	135.4	SAT	118.1	SAT	116.1	FRI	114.5
50	29 East	FRI	124.2	FRI	120.7	FRI	118.7	FRI	117.1
51	29 West	FRI	125.2	FRI	119.4	FRI	117.3	FRI	116.0
52	29 Both	FRI	123.6	FRI	120.0	FRI	117.8	WED	116.6
53	30 Both	SAT	226.0	SUN	176.7	SUN	158.5	SUN	152.4
54	31 East	SAT	165.5	FRI	149.6	SUN	143.3	FRI	138.8
55	31 West	SAT	184.9	SAT	161.7	SAT	150.4	SUN	142.5
56	31 Both	SAT	173.1	SAT	154.7	SUN	142.7	SAT	135.9
57	32 East	FRI	128.6	FRI	113.8	THU	105.1	TUE	102.4

58	32 West	FRI	122.2	THU	114.6	FRI	110.5	THU	106.2
59	32 Both	FRI	125.5	FRI	111.9	SUN	107.2	MON	102.3
60	33 Both								
61	34 Both	SAT	403.1	SAT	126.8	TUE	120.4	TUE	117.9
62	35 Both	FRI	127.8	THU	120.5	FRI	117.7	WED	115.5
63	36 East	FRI	135.4	FRI	124.2	FRI	121.2	FRI	119.2
64	36 West	FRI	130.2	THU	124.6	FRI	121.9	FRI	120.0
65	36 Both	FRI	132.0	FRI	123.2	FRI	121.0	FRI	119.8
66	37 Both	FRI	179.3	THU	150.7	FRI	142.8	FRI	133.3
67	38 East	SUN	167.3	FRI	120.8	SAT	112.0	SUN	107.3
68	38 West	WED	164.8	FRI	124.4	SUN	114.4	SAT	103.9
69	38 Both	SUN	158.0	THU	121.2	SAT	113.5	SAT	104.1
70	39 Both	FRI	140.7	FRI	123.9	FRI	120.9	FRI	116.9
71	40 North								
72	40 South								
73	40 Both								
74	41 Both	FRI	141.5	FRI	124.5	FRI	121.6	FRI	117.9
75	42 North	FRI	131.3	MON	121.5	FRI	119.3	WED	118.2
76	42 South	FRI	129.1	THU	124.4	FRI	121.5	FRI	119.5
77	42 Both	FRI	129.2	MON	122.7	THU	120.3	FRI	118.7
78	43 East	WED	170.5	FRI	151.8	SUN	144.1	MON	136.3
79	43 West	SUN	195.1	SAT	154.3	FRI	145.3	SAT	136.7
80	43 Both								
81	44 Both	TUE	158.6	THU	126.0	MON	123.7	THU	121.1
82	45 East	SUN	168.4	WED	149.1	SAT	141.8	SAT	135.5
83	45 West	WED	159.2	SAT	147.3	SAT	142.7	SUN	136.3
84	45 Both	SUN	159.9	SUN	145.4	MON	140.1	FRI	135.1
85	46 North	FRI	131.9	FRI	125.9	THU	122.0	WED	120.7
86	46 South	FRI	133.3	FRI	123.1	WED	118.3	WED	116.2
87	46 Both								
88	47 East	MON	124.5	SUN	117.6	FRI	113.9	MON	112.9
89	47 West	FRI	146.4	FRI	132.2	SAT	125.4	FRI	120.3
90	47 Both	FRI	128.8	FRI	122.7	FRI	119.4	SAT	116.2

91	48 East	THU	168.9	SUN	144.3	WED	138.1	THU	132.0
92	48 West	FRI	184.1	FRI	148.0	WED	138.8	THU	130.7
93	48 Both	FRI	162.5	MON	141.8	SUN	137.4	THU	131.4
94	50 North	SAT	444.6	SUN	287.8	SAT	242.5	FRI	221.0
95	50 South	SAT	433.8	SUN	327.6	FRI	274.8	SUN	221.2
96	50 Both	SAT	439.2	FRI	296.5	SUN	257.5	SAT	217.7
97	51 Both	SAT	166.4	SUN	131.9	SUN	123.0	WED	118.3
98	52 Both	THU	148.2	THU	133.4	FRI	126.6	MON	124.8
99	53 East	SAT	125.3	THU	109.8	SUN	100.6	WED	96.7
100	53 West	SAT	179.9	SAT	157.8	SUN	146.5	SUN	141.4
101	53 Both	SAT	124.7	SUN	105.0	SAT	101.4	WED	96.8
102	54 East	WED	163.0	SUN	149.6	WED	141.2	FRI	137.3
103	54 West	SUN	167.8	FRI	148.0	WED	142.2	SUN	136.0
104	54 Both	SUN	159.5	SAT	149.3	FRI	140.9	FRI	136.3
105	55 East	SUN	157.0	MON	138.6	SUN	132.8	SUN	127.1
106	55 West	WED	158.2	FRI	138.1	SUN	132.0	SAT	129.2
107	55 Both	WED	147.6	SUN	134.2	SAT	131.0	FRI	127.9
108	56 East	SAT	146.7	SAT	131.1	FRI	127.6	SAT	125.0
109	56 West	SAT	156.7	SAT	133.3	SAT	128.6	FRI	125.0
110	56 Both	SAT	150.0	SUN	131.9	SAT	127.7	FRI	125.3
111	57 East	MON	139.8	WED	129.6	THU	124.8	FRI	121.2
112	57 West	SUN	154.7	FRI	132.0	FRI	125.3	TUE	119.2
113	57 Both	SUN	147.0	TUE	129.3	FRI	122.7	FRI	120.3
114	58 East	FRI	133.9	SUN	123.8	FRI	119.5	FRI	116.6
115	58 West	FRI	145.0	FRI	128.6	MON	120.4	FRI	118.3
116	58 Both	FRI	133.2	FRI	125.5	FRI	119.7	FRI	116.9
117	59 North	FRI	147.6	FRI	131.8	FRI	128.1	THU	123.5
118	59 South	SUN	170.9	FRI	136.3	FRI	129.8	MON	124.7
119	59 Both	FRI	146.7	THU	132.5	THU	126.5	WED	122.3
120	60 East	FRI	133.2	FRI	122.8	FRI	120.0	FRI	118.4
121	60 West	FRI	140.4	FRI	131.5	FRI	125.1	FRI	122.8
122	60 Both	FRI	133.7	FRI	126.1	WED	122.6	THU	118.8
123	61 East	FRI	126.1	FRI	120.5	SAT	116.5	WED	114.4

124	61 West	FRI	128.8	FRI	122.4	THU	117.6	FRI	115.5
125	61 Both	FRI	126.7	FRI	121.3	FRI	116.9	SAT	114.9
126	62 North	FRI	125.3	FRI	122.0	FRI	119.9	FRI	117.6
127	62 South	FRI	124.3	FRI	117.3	FRI	115.7	THU	114.4
128	62 Both	FRI	124.7	FRI	119.6	FRI	118.1	WED	115.8
129	63 North	FRI	130.4	FRI	121.8	FRI	117.5	FRI	115.2
130	63 South	FRI	129.2	FRI	123.9	FRI	121.1	FRI	117.5
131	63 Both	FRI	128.9	FRI	122.6	FRI	119.0	FRI	115.4
132	64 North								
133	64 South	SUN	207.5	SAT	152.0	FRI	130.0	FRI	124.0
134	64 Both								
135	65 East	SAT	143.5	FRI	132.8	FRI	125.6	FRI	121.1
136	65 West	SAT	135.6	SUN	125.6	FRI	122.3	SUN	119.0
137	65 Both	SAT	137.0	SAT	128.4	FRI	123.7	SUN	119.9

Year 2003											
S/N	**Station, Direction**	**Functional Classification**	**Annual Weekday Traffic**	**Annual Weekend Traffic**	**AADT Volume**	**Peak Hour % Weekdays**	**Peak Hour % Weekends**	**Peak Hour % Average**	**DHV %**	**DHV Volume**	**Day of DHV Occurance**
1	1 Both	Rural-Major Collector	418	425	420	7.94	7.06	7.69	11.4	48	THU
2	2 Both	Rural-Major Arterial	2456	2351	2426	9.08	7.93	8.76	10.6	258	SAT
3	3 Both	Rural-Minor Arterial	569	464	539	8.02	7.10	7.80	11.1	60	TUE
4	4 North	Rural-Principal Arterial-Other	5316	5414	5344	10.42	7.73	9.64	12.8	685	FRI
5	4 South	Rural-Principal Arterial-Other	5152	5338	5205	7.07	7.43	7.17	10.5	551	SUN
6	4 Both	Rural-Principal Arterial-Other	10468	10752	10549	8.56	7.56	8.27	10.6	1123	SUN
7	5 Both	Rural-Minor Arterial	10352	9929	10231	9.76	7.58	9.16	12.2	1251	SAT
8	6 Both	Rural-Principal Arterial-Other	4106	4119	4074	8.47	8.11	8.37	12.7	524	SUN
9	7 Both	Rural-Principal Arterial-Other	6192	5002	5852	8.63	7.04	8.24	10.4	610	FRI
10	8 Both	Rural-Principal Arterial-Other	2298	2064	2231	8.28	7.48	8.07	10.2	229	SAT
11	9 Both	Rural-Principal Arterial-Other	2221	1906	2131	8.78	7.12	8.35	10.8	231	FRI
12	10 Both	Rural-Principal Arterial-Other	2509	2156	2408	7.88	7.72	7.84	10.5	254	FRI
13	11 Both	Rural-Major Collector	312	281	303	9.15	7.77	8.79	15.8	48	SAT
14	12 Both	Rural-Minor Arterial	1225	1026	1168	8.27	7.32	8.04	9.4	110	FRI
15	13 Both	Rural-Major Collector	343	329	339	8.67	7.13	8.24	12.0	41	SUN
16	14 Both	Rural-Minor Arterial	482	454	474	8.23	7.49	8.03	12.0	57	SUN
17	15 Both	Rural-Major Collector	130	106	123	8.45	8.05	8.35	29.2	36	MON
18	16 North	Urban-Minor Arterial	10422	7146	9486	10.66	2.34	8.88	13.4	1280	TUE
19	16 South	Urban-Minor Arterial	8687	6171	7968	10.94	6.78	10.01	13.4	1075	MON
20	16 Both	Urban-Minor Arterial	19109	13317	17454	8.49	6.57	8.07	10.3	1811	FRI
21	17 North	Rural-Principal Arterial-Interstate	28460	24211	27246	9.08	2.89	7.48	10.4	2846	THU
22	17 South	Rural-Principal Arterial-Interstate	29256	25361	28143	9.08	6.69	8.45	10.7	3018	FRI
23	17 Both	Rural-Principal Arterial-Interstate	57716	49572	55389	8.25	6.81	7.87	9.4	5229	THU

24	19 Both	Rural-Minor Arterial	527	443	503	7.59	7.20	7.49	12.7	64	MON
25	20 East	Rural-Principal Arterial-Interstate	8099	9356	8458	7.41	7.57	7.46	12.1	1031	SUN
26	20 West	Rural-Principal Arterial-Interstate	7981	9784	8496	6.84	7.03	6.91	11.6	987	SAT
27	20 Both	Rural-Principal Arterial-Interstate	16080	19139	16954	7.13	7.30	7.18	11.6	1979	MON
28	21 Both	Rural-Principal Arterial-Other	5814	4803	5525	8.72	7.30	8.37	9.2	512	FRI
29	22 East	Rural-Principal Arterial-Other									
30	22 West	Rural-Principal Arterial-Other									
31	22 Both	Rural-Principal Arterial-Other									
32	23 North	Urban-Principal Arterial-Other Con.	7848	5902	7292	9.23	6.78	8.66	11.0	806	FRI
33	23 South	Urban-Principal Arterial-Other Con.	8097	5829	7449	10.08	3.08	8.51	12.5	933	MON
34	23 Both	Urban-Principal Arterial-Other Con.	15945	11731	14741	8.26	6.95	7.96	9.8	1447	FRI
35	24 East	Urban-Principal Arterial-Interstate	88529	64320	81612	7.89	6.95	7.68	9.6	7856	MON
36	24 West	Urban-Principal Arterial-Interstate	92607	67295	85375	8.55	6.97	8.20	9.8	8449	WED
37	24 Both	Urban-Principal Arterial-Interstate	181136	131615	166987	8.23	6.97	7.96	9.5	15951	THU
38	25 East	Urban-Principal Arterial-Other Con.	33607	23888	30830						
39	25 West	Urban-Principal Arterial-Other Con.	34292	25115	31670						
40	25 Both	Urban-Principal Arterial-Other Con.	67899	49003	62500						
41	26 North	Urban-Principal Arterial-Other Con.	24245	17865	22422	11.29	3.47	9.49	13.4	3015	WED
42	26 South	Urban-Principal Arterial-Other Con.	23502	17531	21796	10.14	6.95	9.41	11.7	2562	WED
43	26 Both	Urban-Principal Arterial-Other Con.	47747	35396	44218	8.73	7.24	8.39	10.6	4718	MON
44	27 East	Rural-Principal Arterial-Interstate									
45	27 West	Rural-Principal Arterial-Interstate									
46	27 Both	Rural-Principal Arterial-Interstate									
47	28 East	Urban-Principal Arterial-Other Con.	20819	16801	19671						
48	28 West	Urban-Principal Arterial-Other Con.	20661	16878	19580	7.66	7.53	7.63	8.6	1695	FRI
49	28 Both	Urban-Principal Arterial-Other Con.	41480	33679	39251						
50	29 East	Urban-Principal Arterial-Other Con.	8853	7026	8331	7.80	7.41	7.70	9.4	786	FRI
51	29 West	Urban-Principal Arterial-Other Con.	10860	8603	10215	7.93	7.66	7.87	9.6	986	THU
52	29 Both	Urban-Principal Arterial-Other Con.	19713	15629	18546	7.87	7.55	7.79	9.4	1751	WED
53	30 Both	Rural-Major Collector	1391	1685	1475	8.66	7.96	8.43	14.9	221	SAT
54	31 East	Rural-Principal Arterial-Interstate	3515	4159	3699	6.57	6.64	6.60	11.0	409	FRI
55	31 West	Rural-Principal Arterial-Interstate	3241	4519	3606	6.55	6.70	6.60	11.5	415	SUN
56	31 Both	Rural-Principal Arterial-Interstate	6756	8678	7305	6.56	6.67	6.60	11.0	804	SAT

57	32 East	Urban-Principal Arterial-Interstate	8206	7384	7971	11.45	7.46	10.42	14.7	1172	FRI
58	32 West	Urban-Principal Arterial-Interstate	7986	7587	7872	10.59	2.36	8.35	12.2	968	SUN
59	32 Both	Urban-Principal Arterial-Interstate	16192	14971	15843	9.45	7.61	8.95	11.9	1894	FRI
60	33 Both	Rural-Principal Arterial-Other	4373	3943	4250						
61	34 Both	Rural-Principal Arterial-Other	1880	1530	1780	7.90	7.90	7.90	10.0	178	THU
62	35 Both	Rural-Principal Arterial-Other	3474	2774	3274	8.96	7.31	8.56	10.8	356	FRI
63	36 East	Urban-Principal Arterial-Interstate	10422	7797	9672	8.12	7.72	8.03	10.4	1015	THU
64	36 West	Urban-Principal Arterial-Interstate	11017	8186	10208	7.66	8.12	7.77	9.5	976	MON
65	36 Both	Urban-Principal Arterial-Interstate	21439	15983	19880	7.89	7.63	7.83	9.7	1936	WED
66	37 Both	Rural-Minor Collector	68	61	66	8.48	8.33	8.44	18.1	12	TUE
67	38 East	Rural-Principal Arterial-Interstate	11850	14384	12574	7.34	7.60	7.42	12.4	1566	MON
68	38 West	Rural-Principal Arterial-Interstate	11790	14212	12482	7.54	7.41	7.50	11.6	1459	FRI
69	38 Both	Rural-Principal Arterial-Interstate	23640	28596	25056	7.44	7.51	7.47	11.3	2843	MON
70	39 Both	Rural-Principal Arterial-Other	5253	4840	5135	8.90	7.55	8.54	10.3	533	FRI
71	40 North	Urban-Principal Arterial-Interstate	36253	28595	34065						
72	40 South	Urban-Principal Arterial-Interstate	39425	30710	36935						
73	40 Both	Urban-Principal Arterial-Interstate	75678	59305	71000						
74	41 Both	Rural-Principal Arterial-Other	5591	5087	5447	7.87	7.29	7.71	9.4	513	FRI
75	42 North	Urban-Minor Arterial	3275	2246	2981	7.82	8.18	7.90	10.9	326	THU
76	42 South	Urban-Minor Arterial	3387	2229	3056	8.44	7.06	8.16	11.0	339	WED
77	42 Both	Urban-Minor Arterial	6662	4475	6037	8.25	6.79	7.94	10.7	650	THU
78	43 East	Rural-Principal Arterial-Interstate	6760	7506	6973	7.09	7.47	7.21	11.8	826	SAT
79	43 West	Rural-Principal Arterial-Interstate	6704	8398	7188	6.91	7.25	7.02	12.2	878	SUN
80	43 Both	Rural-Principal Arterial-Interstate	13464	15904	14161	6.99	7.34	7.10	11.9	1692	SUN
81	44 Both	Urban-Collector	2302	1434	2054	8.34	7.93	8.26	11.5	237	TUE
82	45 East	Rural-Principal Arterial-Interstate	9920	12122	10549	7.64	7.72	7.67	12.8	1351	SUN
83	45 West	Rural-Principal Arterial-Interstate	10012	12361	10683	7.03	7.17	7.08	11.5	1229	FRI
84	45 Both	Rural-Principal Arterial-Interstate	19932	24482	21232	7.34	7.44	7.37	11.4	2425	SUN
85	46 North	Rural-Principal Arterial-Interstate	15816	10783	14378	9.94	6.91	9.29	12.4	1797	WED
86	46 South	Rural-Principal Arterial-Interstate	16456	10937	14879	11.66	3.16	9.88	14.7	2192	THU
87	46 Both	Rural-Principal Arterial-Interstate	32272	21720	29257	8.49	6.83	8.14	11.0	3239	WED
88	47 East	Rural-Principal Arterial-Other	2161	2032	2124	8.97	2.77	7.27	10.8	230	MON
89	47 West	Rural-Principal Arterial-Other	2180	1935	2110	10.38	8.01	9.76	12.7	268	TUE

90	47 Both	Rural-Principal Arterial-Other	4341	3967	4234	8.39	7.40	8.12	10.0	424	FRI
91	48 East	Rural-Principal Arterial-Other	480	435	467	8.25	7.43	8.03	13.7	64	SUN
92	48 West	Rural-Principal Arterial-Other	488	429	471	7.20	7.98	7.40	13.1	62	SAT
93	48 Both	Rural-Principal Arterial-Other	968	863	938	7.84	7.43	7.73	12.1	114	MON
94	50 North	Rural-Major Collector	249	368	283	7.36	8.12	7.64	28.6	81	SUN
95	50 South	Rural-Major Collector	234	399	281	9.14	8.99	9.08	33.8	95	SUN
96	50 Both	Rural-Major Collector	483	767	564	8.48	8.12	8.34	27.4	155	SUN
97	51 Both	Rural-Major Collector	381	402	387	8.96	6.63	8.27	15.2	59	SUN
98	52 Both	Rural-Major Collector	483	368	450	9.11	7.17	8.65	12.4	56	THU
99	53 East	Rural-Principal Arterial-Interstate	3631	4443	3863	6.54	6.71	6.59	10.4	405	FRI
100	53 West	Rural-Principal Arterial-Interstate	3421	4688	3783	6.36	6.55	6.43	10.6	404	SUN
101	53 Both	Rural-Principal Arterial-Interstate	7052	9131	7646	6.50	6.66	6.56	10.3	790	SUN
102	54 East	Rural-Principal Arterial-Interstate	8801	10124	9179	7.56	7.72	7.61	11.9	1098	SUN
103	54 West	Rural-Principal Arterial-Interstate	8691	10452	9194	6.83	6.98	6.88	11.3	1040	SAT
104	54 Both	Rural-Principal Arterial-Interstate	17492	20576	18373	7.11	7.31	7.17	11.2	2071	SUN
105	55 East	Rural-Principal Arterial-Interstate	14354	16668	15015	7.78	7.61	7.73	10.9	1637	SUN
106	55 West	Rural-Principal Arterial-Interstate	14175	16580	14862	7.84	7.59	7.76	11.0	1648	SAT
107	55 Both	Rural-Principal Arterial-Interstate	28529	33247	29877	7.81	7.60	7.74	10.3	3085	FRI
108	56 East	Rural-Principal Arterial-Interstate	18425	19958	18863	8.75	7.62	8.41	7.0	1332	SAT
109	56 West	Rural-Principal Arterial-Interstate	18583	20151	19031	8.61	7.34	8.22	6.9	1314	SUN
110	56 Both	Rural-Principal Arterial-Interstate	37008	40109	37894	8.68	7.48	8.31	6.8	2613	THU
111	57 East	Rural-Principal Arterial-Other	996	856	956	7.43	7.43	7.43	11.2	108	SUN
112	57 West	Rural-Principal Arterial-Other	973	844	936	8.46	8.85	8.56	12.1	114	WED
113	57 Both	Rural-Principal Arterial-Other	1969	1700	1892	7.84	7.85	7.84	10.7	204	FRI
114	58 East	Rural-Principal Arterial-Other	1213	1063	1170	7.49	7.70	7.54	11.1	130	MON
115	58 West	Rural-Principal Arterial-Other	1209	1069	1169	10.28	8.55	9.83	12.8	150	FRI
116	58 Both	Rural-Principal Arterial-Other	2422	2132	2339	8.11	7.67	8.00	10.4	245	SUN
117	59 North	Rural-Principal Arterial-Other	2027	1845	1975	9.12	7.47	8.68	11.5	229	FRI
118	59 South	Rural-Principal Arterial-Other	1976	1903	1955	6.98	7.42	7.10	11.0	217	MON
119	59 Both	Rural-Principal Arterial-Other	4003	3748	3930	7.91	7.42	7.78	10.1	398	FRI
120	60 East	Rural-Principal Arterial-Other	929	758	880	7.56	7.14	7.45	10.0	88	MON
121	60 West	Rural-Principal Arterial-Other	879	729	836	8.48	7.59	8.26	11.8	99	THU
122	60 Both	Rural-Principal Arterial-Other	1808	1486	1716	7.67	7.37	7.60	9.9	171	FRI

123	61 East	Rural-Principal Arterial-Other	2691	2443	2620	9.11	7.11	8.57	10.9	286	FRI
124	61 West	Rural-Principal Arterial-Other	2617	2320	2532	8.14	6.94	7.82	10.1	257	WED
125	61 Both	Rural-Principal Arterial-Other	5308	4762	5152	8.63	7.04	8.21	10.0	518	FRI
126	62 North	Urban-Principal Arterial-Other Con.	8648	7157	8222	9.76	7.23	9.13	11.1	915	FRI
127	62 South	Urban-Principal Arterial-Other Con.	8596	7168	8188	7.50	7.80	7.57	9.4	776	WED
128	62 Both	Urban-Principal Arterial-Other Con.	17244	14325	16410	8.46	7.36	8.19	9.6	1588	MON
129	63 North	Rural-Principal Arterial-Other	5436	4470	5160	12.82	2.85	10.29	15.6	809	FRI
130	63 South	Rural-Principal Arterial-Other	5343	4451	5088	10.91	7.76	10.12	13.5	690	TUE
131	63 Both	Rural-Principal Arterial-Other	10779	8921	10248	8.72	7.56	8.43	11.1	1143	WED
132	64 North	Rural-Principal Arterial-Other	1666	1666	1666						
133	64 South	Rural-Principal Arterial-Other	1666	1666	1666	7.74	7.33	7.62	13.3	223	WED
134	64 Both	Rural-Principal Arterial-Other	3332	3332	3332						
135	65 East	Rural-Principal Arterial-Other	4835	4996	4881	9.97	7.12	9.14	12.3	604	SAT
136	65 West	Rural-Principal Arterial-Other	4818	5182	4922	6.84	7.43	7.02	11.2	555	SUN
137	65 Both	Rural-Principal Arterial-Other	9653	10178	9803	8.41	7.27	8.07	10.6	1043	SUN

Year 2003									
S/N	**Station, Direction**	**Day of 1st highest maximum traffic day**	**Percentage of AADT 1st Highest max. traffic day**	**Day of 10th highest maximum traffic day**	**Percentage of AADT 10th Highest max. traffic day**	**Day of 20th highest maximum traffic day**	**Percentage of AADT 20th Highest max. traffic day**	**Day of 30th highest maximum traffic day**	**Percentage of AADT 30th Highest max. traffic day**
1	1 Both	FRI	147.6	FRI	129.5	WED	124.7	FRI	122.3
2	2 Both	FRI	126.9	TUE	122.7	SAT	118.3	FRI	116.8
3	3 Both	MON	131.7	FRI	124.3	TUE	120.7	FRI	119.1
4	4 North	SAT	145.3	FRI	130.0	FRI	126.7	FRI	123.2
5	4 South	SUN	145.5	FRI	123.5	FRI	120.2	FRI	118.2
6	4 Both	FRI	136.3	FRI	126.3	FRI	123.8	FRI	120.5
7	5 Both	SAT	145.6	SAT	131.7	FRI	124.9	FRI	122.3
8	6 Both	SAT	241.6	FRI	130.0	THU	125.5	WED	121.8
9	7 Both	FRI	136.6	FRI	129.4	FRI	123.2	WED	120.6
10	8 Both	SAT	155.5	FRI	122.9	THU	121.1	FRI	119.5
11	9 Both	FRI	145.0	FRI	129.8	SAT	125.2	FRI	122.4
12	10 Both	FRI	138.4	FRI	127.6	FRI	122.7	FRI	119.1
13	11 Both	SUN	247.5	THU	140.9	SUN	128.0	FRI	124.4
14	12 Both	FRI	124.0	FRI	109.3	FRI	102.3	TUE	98.3
15	13 Both	SAT	158.7	WED	132.7	WED	124.1	SAT	117.9
16	14 Both	SAT	150.2	WED	133.9	THU	127.6	TUE	124.4
17	15 Both	FRI	552.0	FRI	174.7	FRI	139.8	WED	131.7
18	16 North	TUE	136.7	FRI	123.4	FRI	120.5	WED	119.2
19	16 South	FRI	139.5	FRI	122.9	FRI	121.3	THU	119.2
20	16 Both	FRI	130.7	THU	122.9	FRI	121.1	THU	119.5
21	17 North	FRI	123.8	FRI	118.1	FRI	115.8	TUE	114.1
22	17 South	FRI	130.6	FRI	121.6	WED	117.4	WED	115.8
23	17 Both	FRI	126.4	FRI	119.2	FRI	116.2	WED	112.5
24	19 Both	FRI	193.2	TUE	152.2	SUN	134.9	MON	130.4

25	20 East	SUN	174.4	SUN	153.7	SUN	146.7	FRI	140.4
26	20 West	SAT	169.0	WED	154.4	SUN	144.7	FRI	139.5
27	20 Both	SUN	169.4	FRI	153.1	FRI	145.2	FRI	140.0
28	21 Both	THU	119.5	THU	108.9	TUE	106.9	WED	104.7
29	22 East								
30	22 West								
31	22 Both								
32	23 North	FRI	130.9	FRI	123.7	FRI	121.4	FRI	119.0
33	23 South	FRI	127.5	FRI	122.9	TUE	119.5	WED	118.3
34	23 Both	FRI	129.2	FRI	122.7	FRI	120.9	THU	118.4
35	24 East	FRI	148.9	FRI	123.0	FRI	121.7	FRI	118.9
36	24 West	FRI	127.7	FRI	121.3	FRI	120.0	TUE	118.5
37	24 Both	FRI	138.0	FRI	122.1	FRI	120.9	WED	118.2
38	25 East								
39	25 West								
40	25 Both								
41	26 North	FRI	125.1	FRI	121.2	FRI	119.4	FRI	117.7
42	26 South	FRI	122.7	FRI	120.1	FRI	118.4	WED	117.1
43	26 Both	FRI	123.9	FRI	120.4	FRI	118.9	THU	116.8
44	27 East								
45	27 West								
46	27 Both								
47	28 East								
48	28 West	FRI	130.0	FRI	118.7	FRI	114.7	FRI	112.3
49	28 Both								
50	29 East	FRI	124.5	FRI	121.2	FRI	119.7	FRI	117.6
51	29 West	FRI	123.9	TUE	120.4	FRI	117.6	TUE	116.2
52	29 Both	FRI	124.2	FRI	120.6	FRI	118.8	FRI	116.9
53	30 Both	SAT	232.6	SUN	170.5	SAT	162.3	FRI	152.2
54	31 East	SAT	169.8	FRI	152.5	SAT	145.6	SAT	138.5
55	31 West	SUN	174.9	SUN	160.4	SAT	153.6	SAT	140.1
56	31 Both	SAT	167.7	SAT	156.3	SUN	142.4	FRI	136.3
57	32 East	WED	148.9	THU	133.0	FRI	126.6	THU	121.1

58	32 West	SUN	140.9	FRI	127.9	FRI	124.0	THU	120.3
59	32 Both	FRI	139.0	FRI	130.0	FRI	124.9	FRI	118.6
60	33 Both								
61	34 Both	FRI	134.6	FRI	123.7	WED	119.4	WED	117.7
62	35 Both	FRI	130.0	FRI	123.8	TUE	120.3	THU	117.6
63	36 East	FRI	134.6	FRI	125.9	THU	121.6	THU	120.0
64	36 West	FRI	130.4	FRI	125.7	FRI	120.8	FRI	118.6
65	36 Both	FRI	132.5	FRI	124.2	FRI	120.4	FRI	118.0
66	37 Both	SAT	212.1	FRI	154.5	FRI	139.3	WED	133.3
67	38 East	SUN	170.2	SUN	143.8	FRI	136.3	SUN	132.6
68	38 West	FRI	153.7	SAT	143.4	FRI	138.1	FRI	135.5
69	38 Both	SUN	154.8	FRI	142.9	SUN	138.0	SAT	132.5
70	39 Both	FRI	135.0	FRI	123.9	SAT	120.7	FRI	117.0
71	40 North								
72	40 South								
73	40 Both								
74	41 Both	FRI	135.6	FRI	123.2	THU	118.6	THU	114.5
75	42 North	THU	158.2	THU	129.1	FRI	124.5	TUE	121.8
76	42 South	THU	175.0	MON	131.9	WED	127.5	FRI	123.8
77	42 Both	THU	166.7	WED	127.6	THU	125.2	MON	122.2
78	43 East	THU	171.9	SAT	153.7	SUN	145.8	THU	139.6
79	43 West	SUN	177.3	SUN	159.6	SAT	144.2	SUN	137.5
80	43 Both	SUN	165.5	SAT	156.8	FRI	145.8	SUN	137.0
81	44 Both	MON	132.2	THU	125.9	FRI	122.7	MON	121.1
82	45 East	SUN	177.2	FRI	149.6	SUN	140.3	WED	137.7
83	45 West	WED	166.3	SAT	147.1	SUN	142.0	SAT	137.5
84	45 Both	SUN	163.6	SAT	147.0	SUN	141.9	FRI	137.2
85	46 North	FRI	133.2	FRI	124.9	TUE	122.5	FRI	119.9
86	46 South	FRI	145.7	FRI	127.7	FRI	124.4	TUE	121.5
87	46 Both	FRI	139.5	FRI	125.4	THU	122.9	THU	120.8
88	47 East	FRI	127.8	FRI	117.7	SUN	115.2	FRI	114.1
89	47 West	FRI	144.5	FRI	131.2	FRI	124.7	FRI	121.0
90	47 Both	FRI	134.1	FRI	122.6	FRI	119.0	FRI	115.8

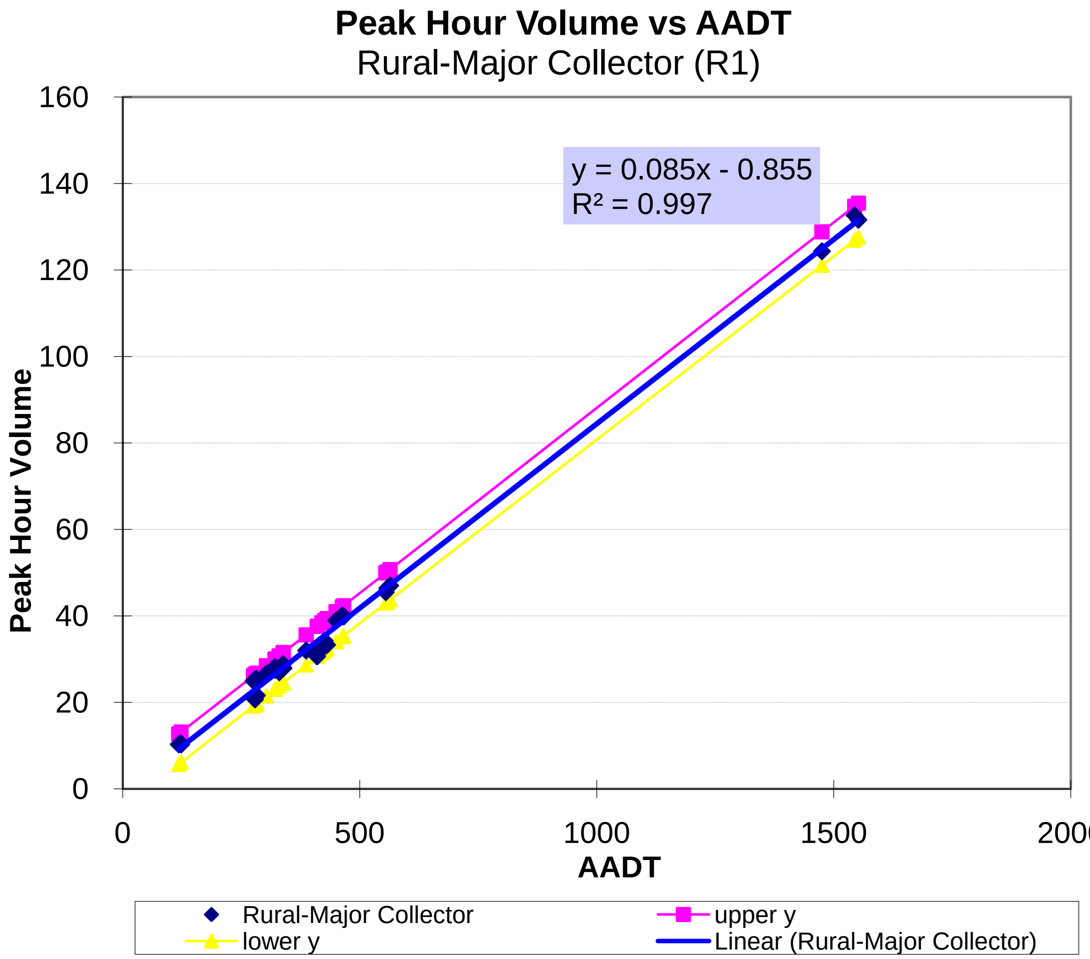
91	48 East	SUN	178.1	SUN	144.9	THU	138.9	FRI	132.3
92	48 West	SAT	177.9	FRI	149.4	WED	140.1	MON	131.2
93	48 Both	THU	170.2	FRI	143.8	WED	136.7	THU	131.9
94	50 North	SAT	427.5	SUN	275.2	FRI	248.4	SUN	214.8
95	50 South	SAT	416.3	SUN	336.6	SAT	252.3	SAT	224.1
96	50 Both	SAT	421.8	SUN	288.2	MON	251.9	SAT	219.3
97	51 Both	SAT	163.5	THU	125.3	FRI	122.7	FRI	118.8
98	52 Both	FRI	144.4	MON	130.6	TUE	126.6	FRI	124.0
99	53 East	SAT	163.9	SUN	146.6	SAT	140.9	SAT	135.8
100	53 West	SAT	165.9	SUN	152.0	SAT	140.4	SUN	137.8
101	53 Both	SAT	161.8	SUN	150.6	SAT	135.6	SUN	131.1
102	54 East	SUN	168.0	SUN	150.6	SAT	144.7	FRI	136.3
103	54 West	SAT	162.3	FRI	150.7	FRI	140.2	SAT	135.0
104	54 Both	SUN	163.4	SAT	148.7	FRI	141.8	SUN	136.2
105	55 East	SUN	156.7	FRI	129.7	FRI	125.4	THU	120.4
106	55 West	WED	164.9	SAT	130.9	FRI	126.5	FRI	121.3
107	55 Both	WED	146.4	SUN	131.1	FRI	123.8	SUN	120.8
108	56 East	SAT	98.0	FRI	89.4	SUN	78.0	MON	72.9
109	56 West	SAT	97.4	SAT	88.5	THU	81.8	TUE	74.7
110	56 Both	SAT	97.7	FRI	88.3	TUE	80.1	MON	74.0
111	57 East	FRI	140.1	SUN	130.3	WED	124.1	FRI	118.2
112	57 West	WED	152.9	FRI	129.3	FRI	123.3	FRI	119.9
113	57 Both	FRI	139.7	FRI	128.1	FRI	122.0	FRI	119.1
114	58 East	FRI	132.3	MON	125.1	FRI	121.8	THU	118.1
115	58 West	WED	150.9	WED	129.1	FRI	122.4	FRI	117.2
116	58 Both	FRI	135.9	FRI	127.8	FRI	120.9	FRI	117.7
117	59 North	THU	156.9	FRI	133.6	THU	122.9	FRI	120.4
118	59 South	SUN	148.1	FRI	125.3	WED	120.5	FRI	117.4
119	59 Both	THU	140.0	FRI	126.7	FRI	120.4	FRI	117.8
120	60 East	FRI	134.5	FRI	122.5	WED	118.4	THU	114.7
121	60 West	FRI	143.5	FRI	134.6	FRI	129.9	FRI	125.5
122	60 Both	FRI	138.9	THU	125.2	MON	120.3	FRI	118.7
123	61 East	FRI	132.6	FRI	122.0	SAT	116.9	SAT	115.0

124	61 West	FRI	136.4	FRI	124.4	FRI	119.7	SAT	115.6
125	61 Both	FRI	134.5	FRI	122.4	SAT	118.2	THU	115.3
126	62 North	FRI	128.1	FRI	123.2	TUE	120.9	FRI	118.3
127	62 South	FRI	123.9	FRI	118.8	FRI	116.9	TUE	114.5
128	62 Both	FRI	126.0	FRI	120.7	FRI	118.5	FRI	116.9
129	63 North	FRI	140.9	THU	130.0	WED	124.9	TUE	121.8
130	63 South	FRI	144.8	FRI	130.9	WED	124.0	WED	121.2
131	63 Both	FRI	141.8	FRI	128.8	THU	123.5	SAT	121.3
132	64 North								
133	64 South	SAT	194.0	FRI	138.5	TUE	128.2	SUN	123.5
134	64 Both								
135	65 East	FRI	143.5	FRI	133.6	FRI	127.2	FRI	122.8
136	65 West	SUN	137.9	SUN	125.3	FRI	122.3	SUN	120.7
137	65 Both	SAT	135.4	FRI	127.9	FRI	123.7	SUN	120.8

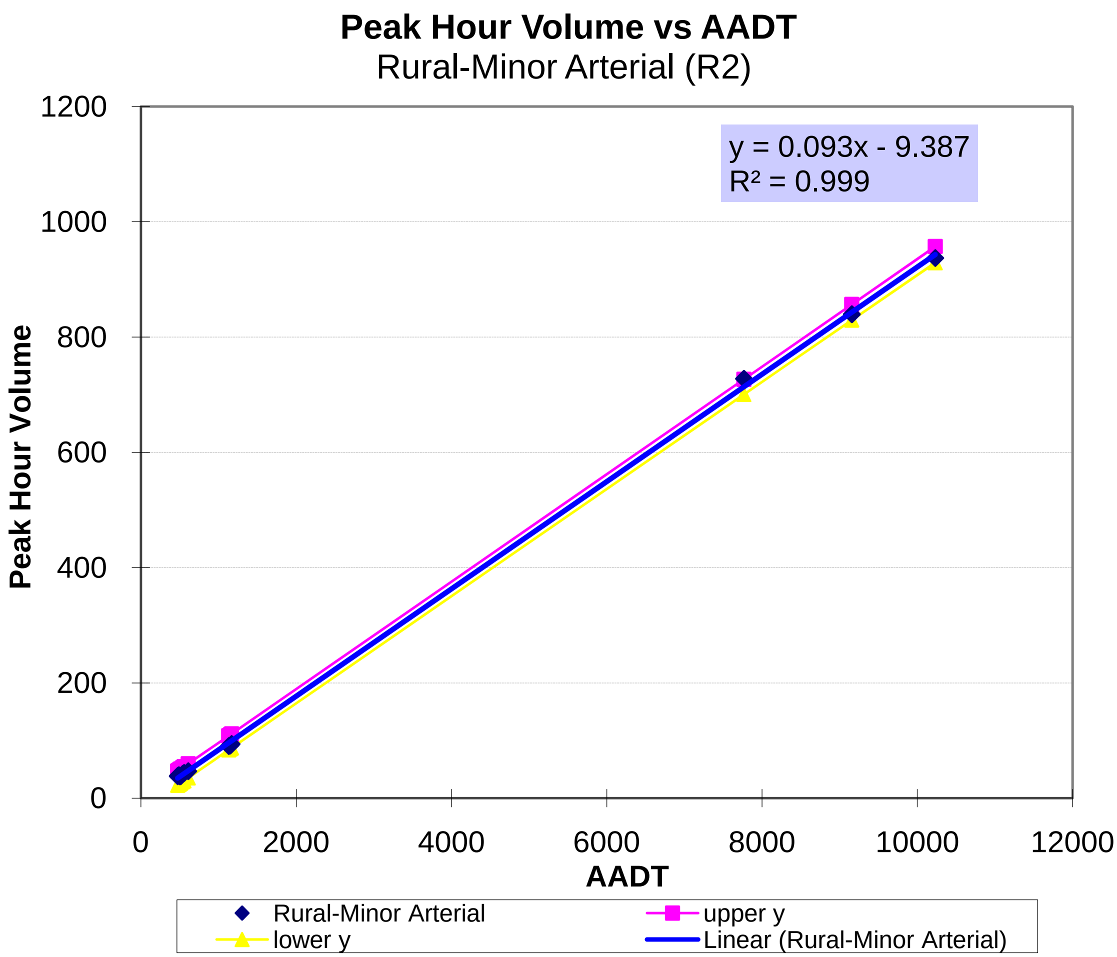
Appendix B

The following appendix includes the comparisons of different functional classes of rural and urban roadways to find the best-fit regression equations for the relationships between average peak hour volume (PHV), the design hourly volume (DHV, or 30^{th} highest hourly volume of the given year) and average annual daily traffic according to the methodology described in the flow charts of FIGURE 13 and FIGURE 14 using the largest possible data set.

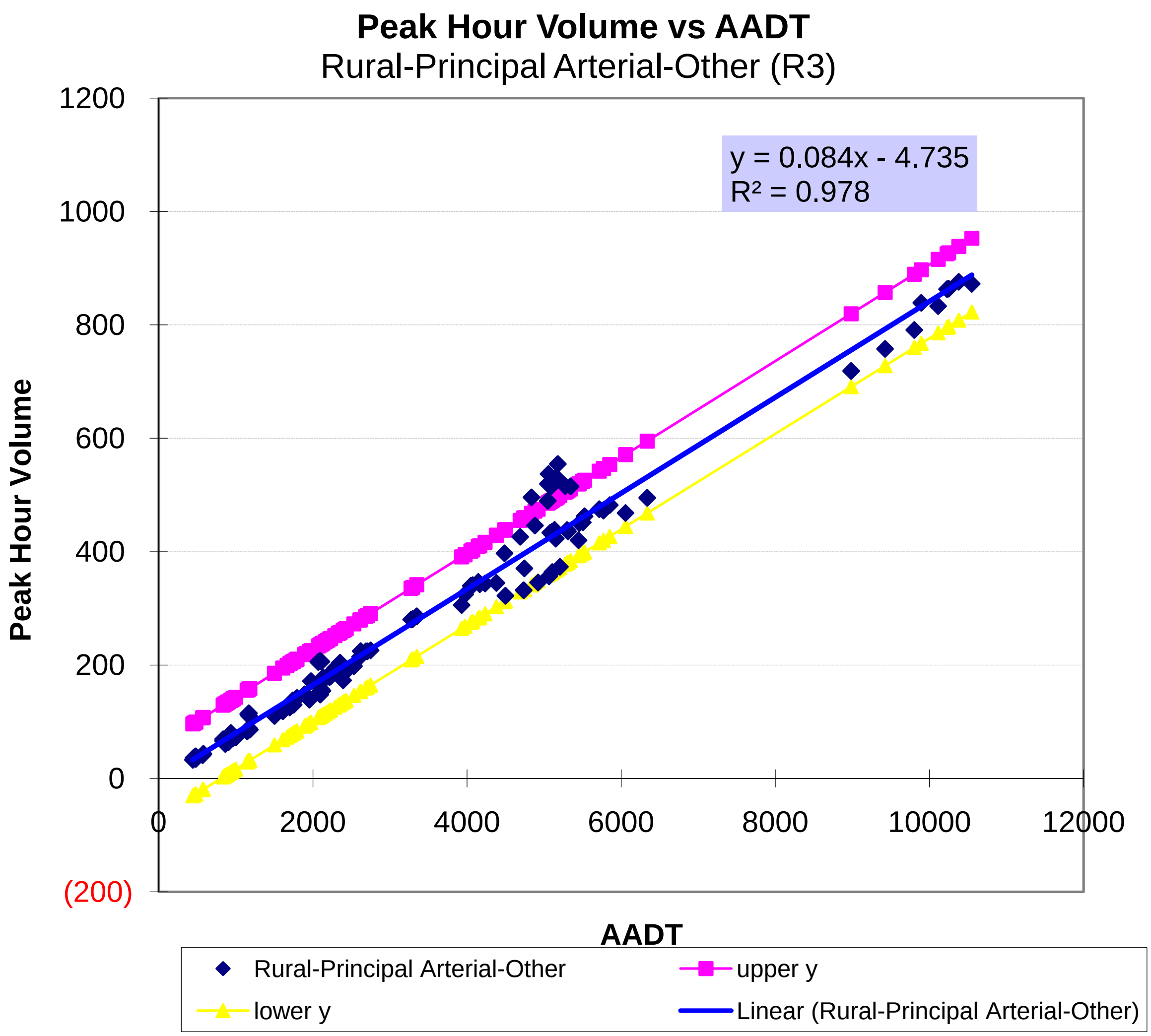
The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **PHV vs. AADT- Rural.**

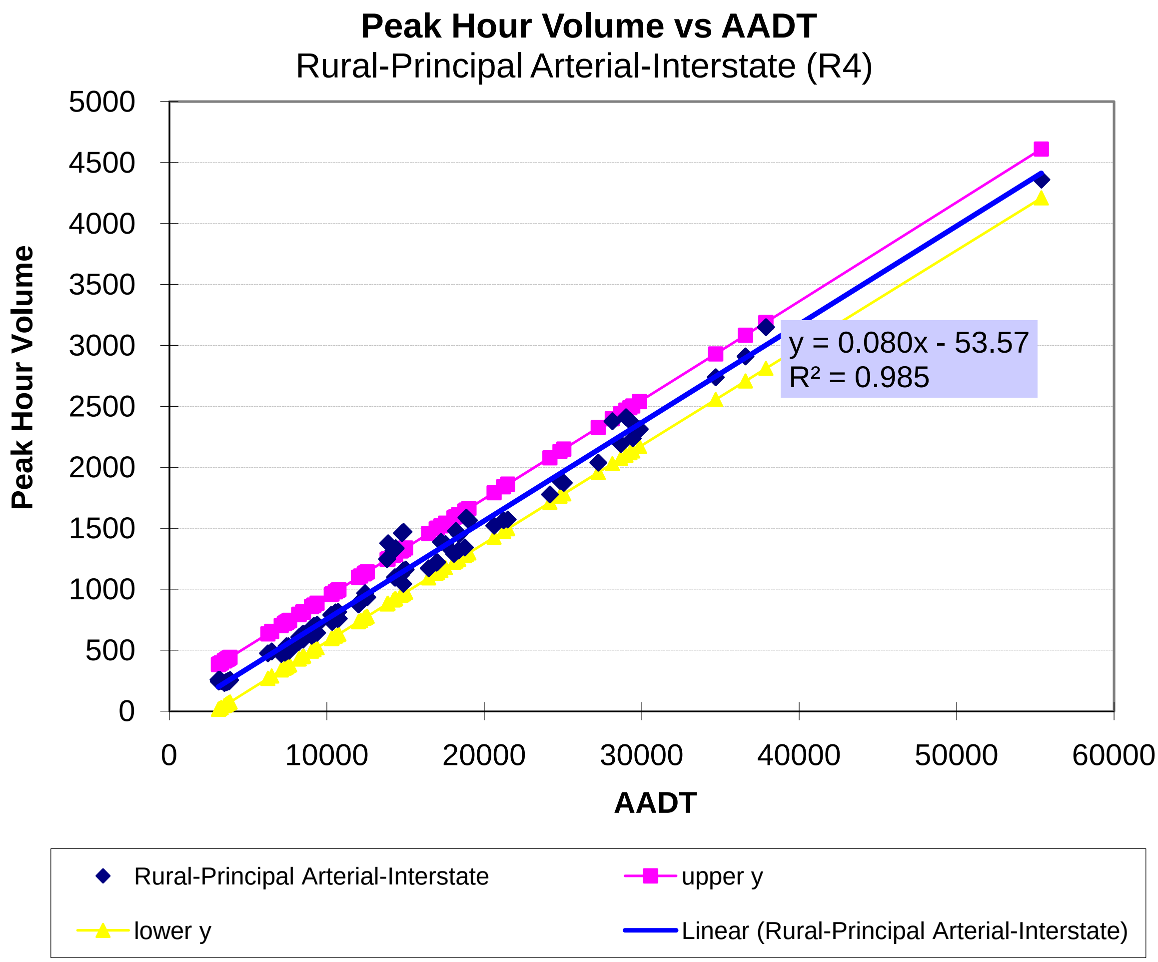


Peak Hour Volume vs AADT
Rural-Major Collector (R1)
y = 0.085x - 0.855
R² = 0.997
Peak Hour Volume
AADT
0
20
40
60
80
100
120
140
160
0
500
1000
1500
2000
Rural-Major Collector
upper y
lower y
Linear (Rural-Major Collector)

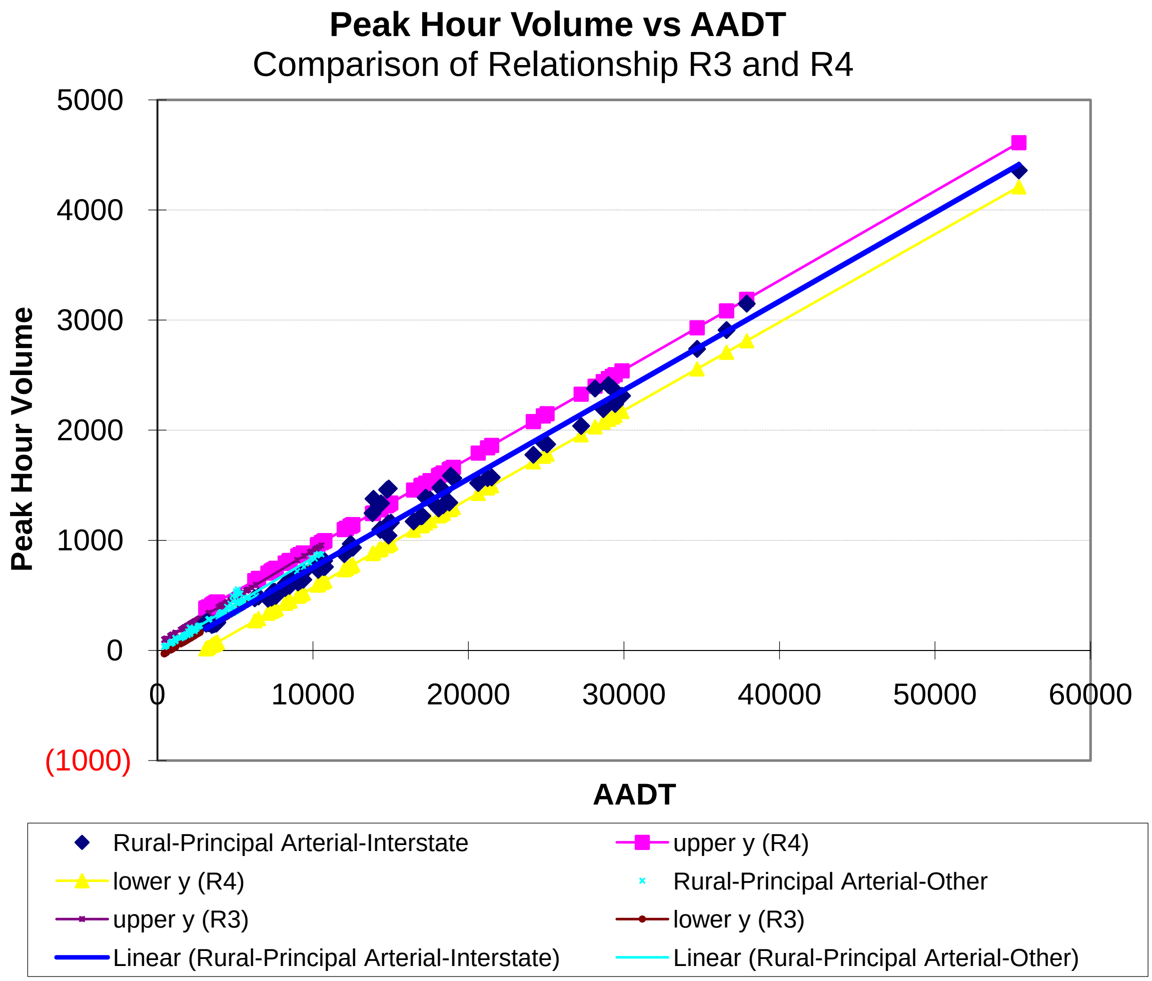


Peak Hour Volume vs AADT
Rural-Minor Arterial (R2)
y = 0.093x - 9.387
R² = 0.999
Peak Hour Volume
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
AADT
Rural-Minor Arterial
upper y
lower y
Linear (Rural-Minor Arterial)

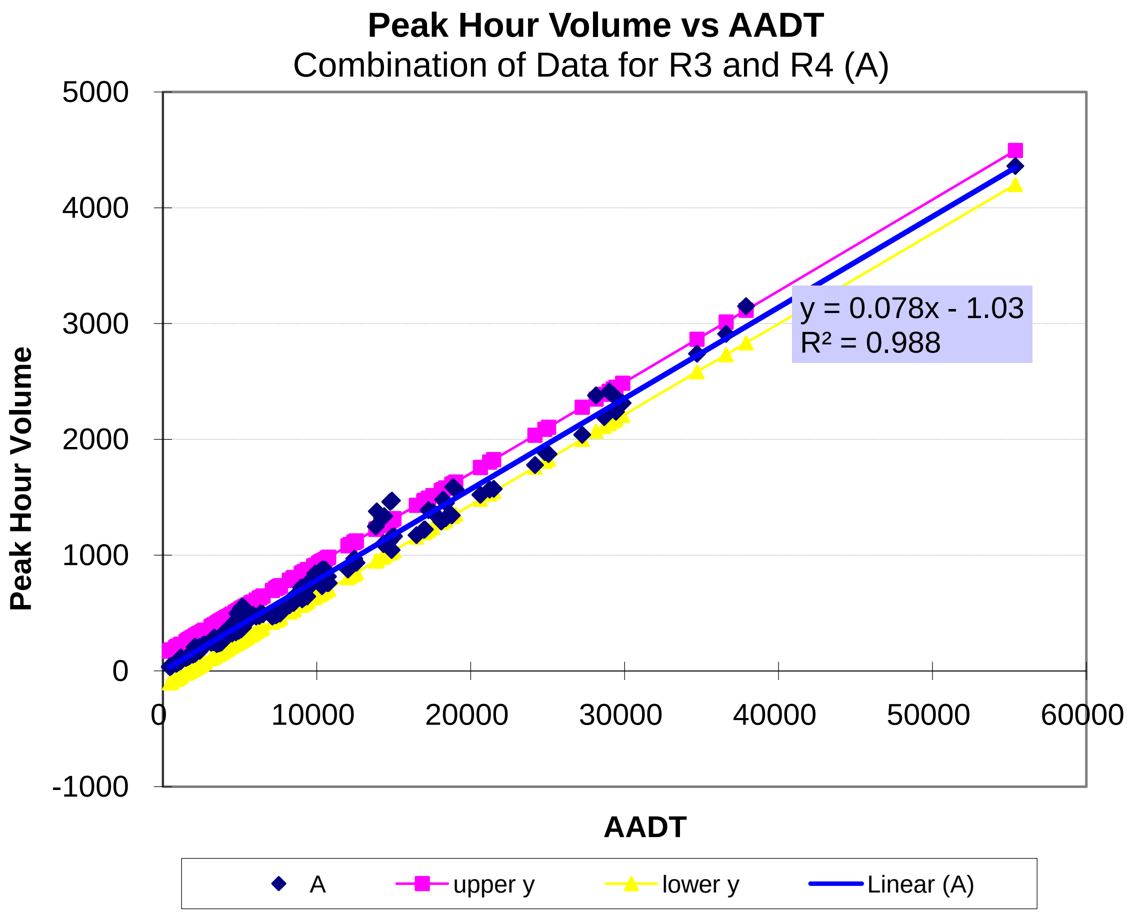

Peak Hour Volume vs AADT
Rural-Principal Arterial-Other (R3)
y = 0.084x - 4.735
R² = 0.978
1200
1000
800
600
400
200
0
(200)
Peak Hour Volume
0
2000
4000
6000
8000
10000
12000
AADT
Rural-Principal Arterial-Other
upper y
lower y
Linear (Rural-Principal Arterial-Other)

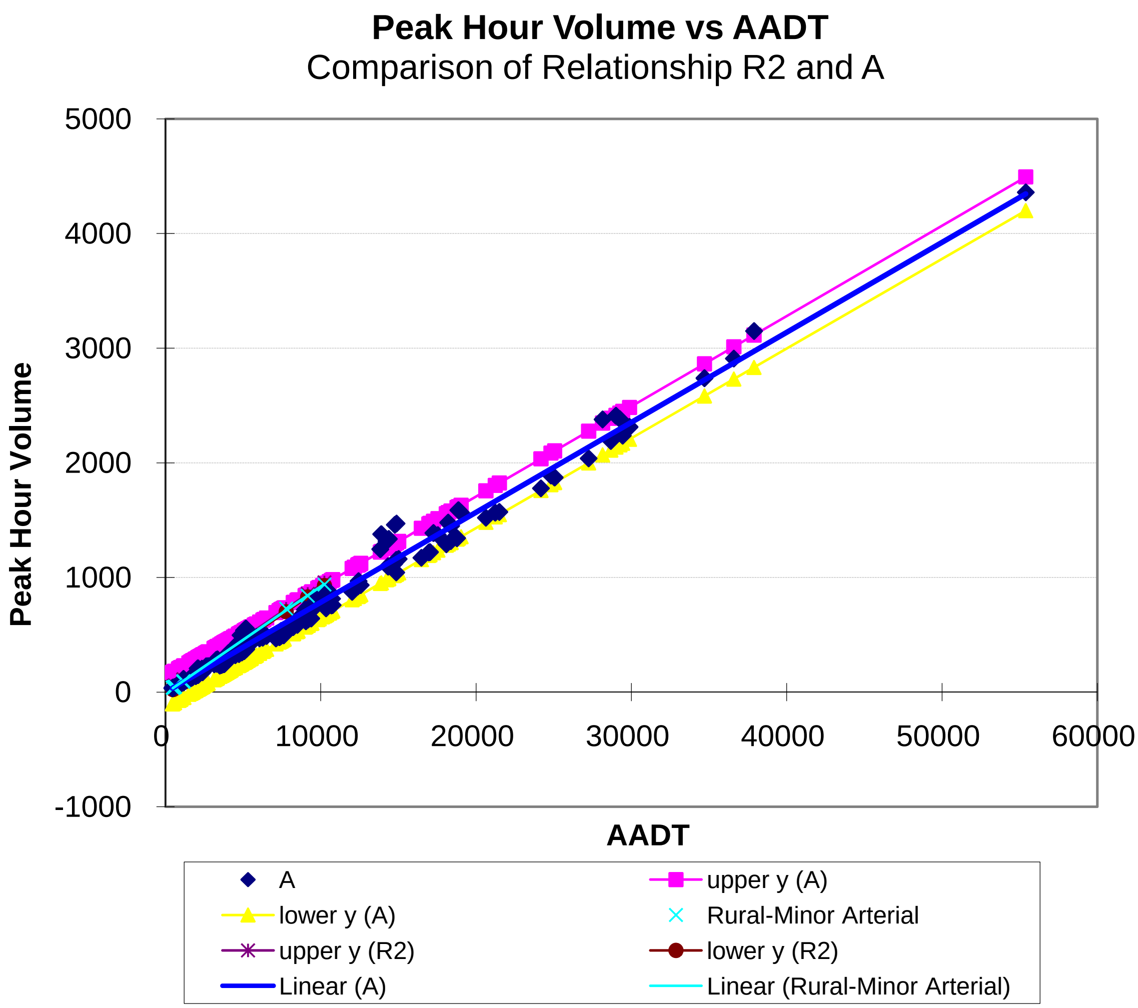


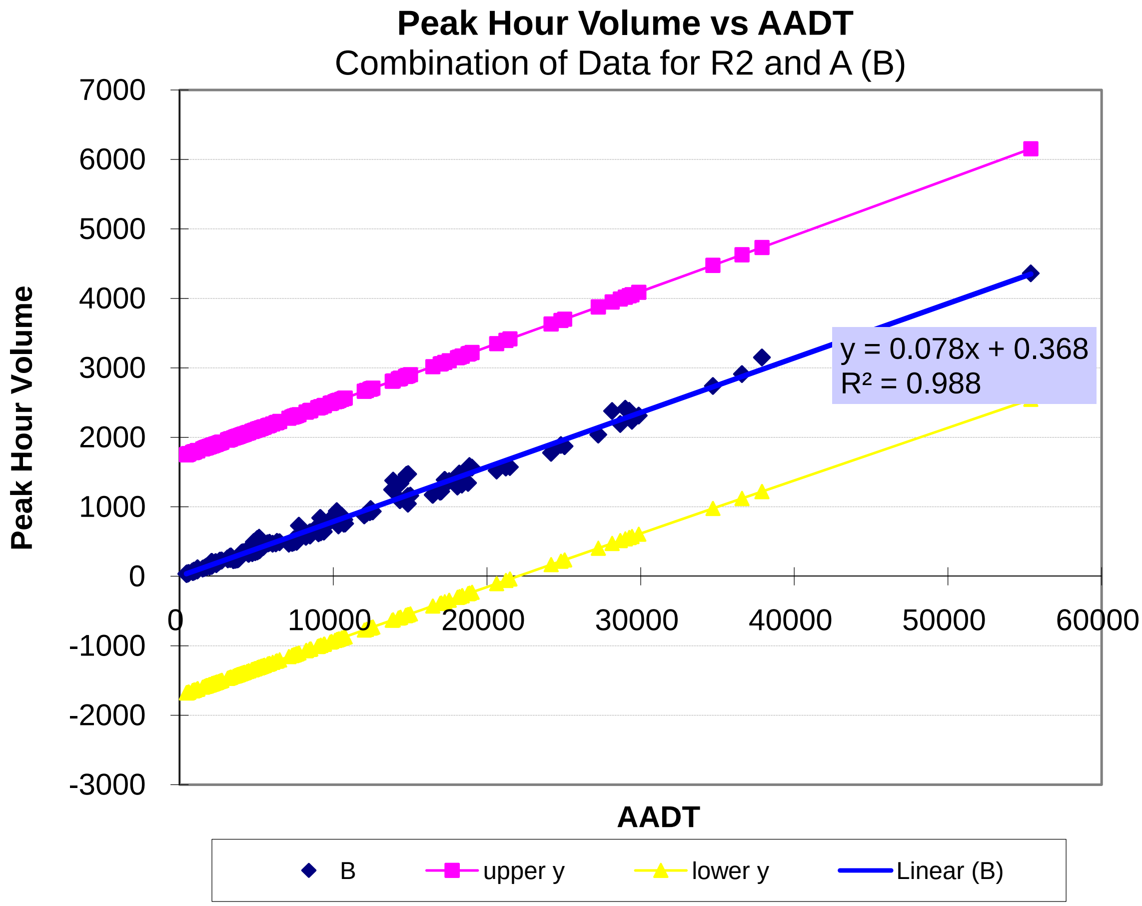
Peak Hour Volume vs AADT
Rural-Principal Arterial-Interstate (R4)
Peak Hour Volume
AADT
y = 0.080x - 53.57
R² = 0.985
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
0
10000
20000
30000
40000
50000
60000
Rural-Principal Arterial-Interstate
upper y
lower y
Linear (Rural-Principal Arterial-Interstate)



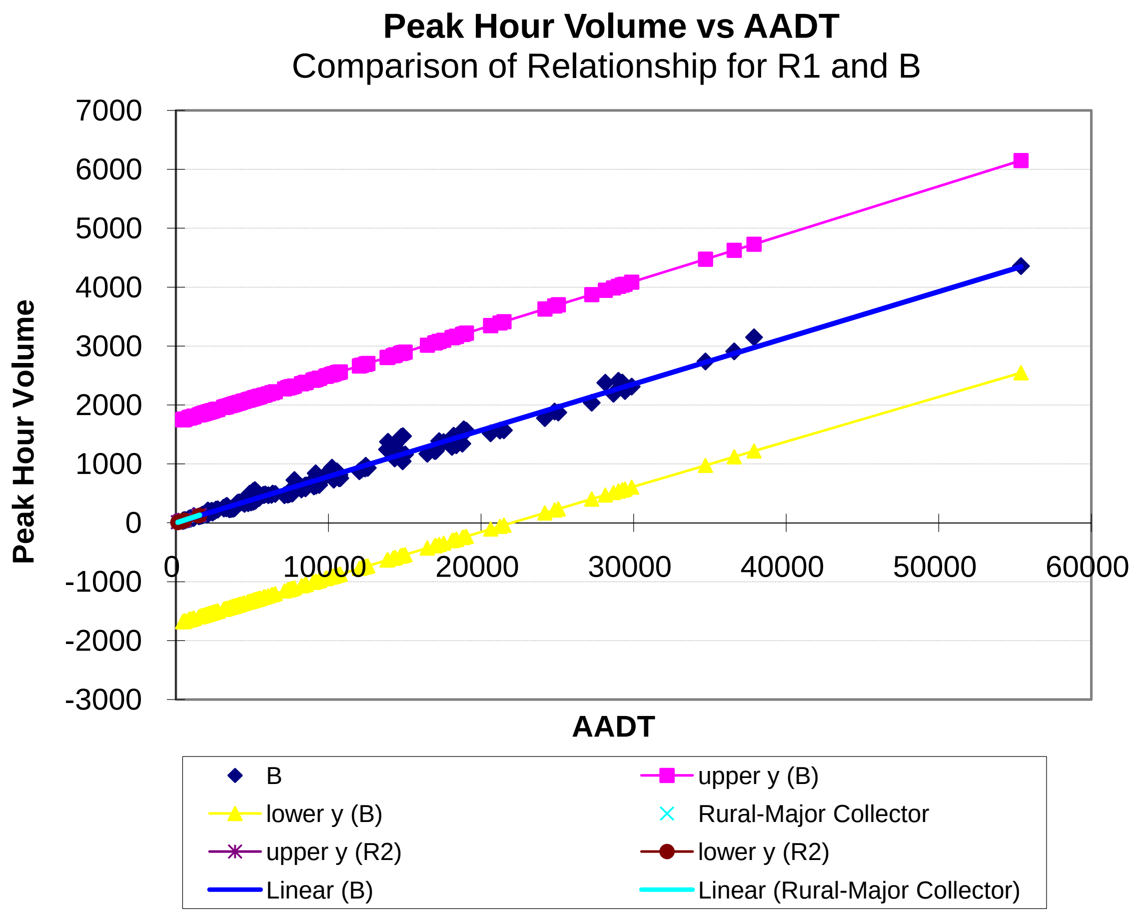
Peak Hour Volume vs AADT
Comparison of Relationship R3 and R4
5000
4000
3000
2000
1000
0
(1000)
Peak Hour Volume
0
10000
20000
30000
40000
50000
60000
AADT
Rural-Principal Arterial-Interstate
upper y (R4)
lower y (R4)
Rural-Principal Arterial-Other
upper y (R3)
lower y (R3)
Linear (Rural-Principal Arterial-Interstate)
Linear (Rural-Principal Arterial-Other)

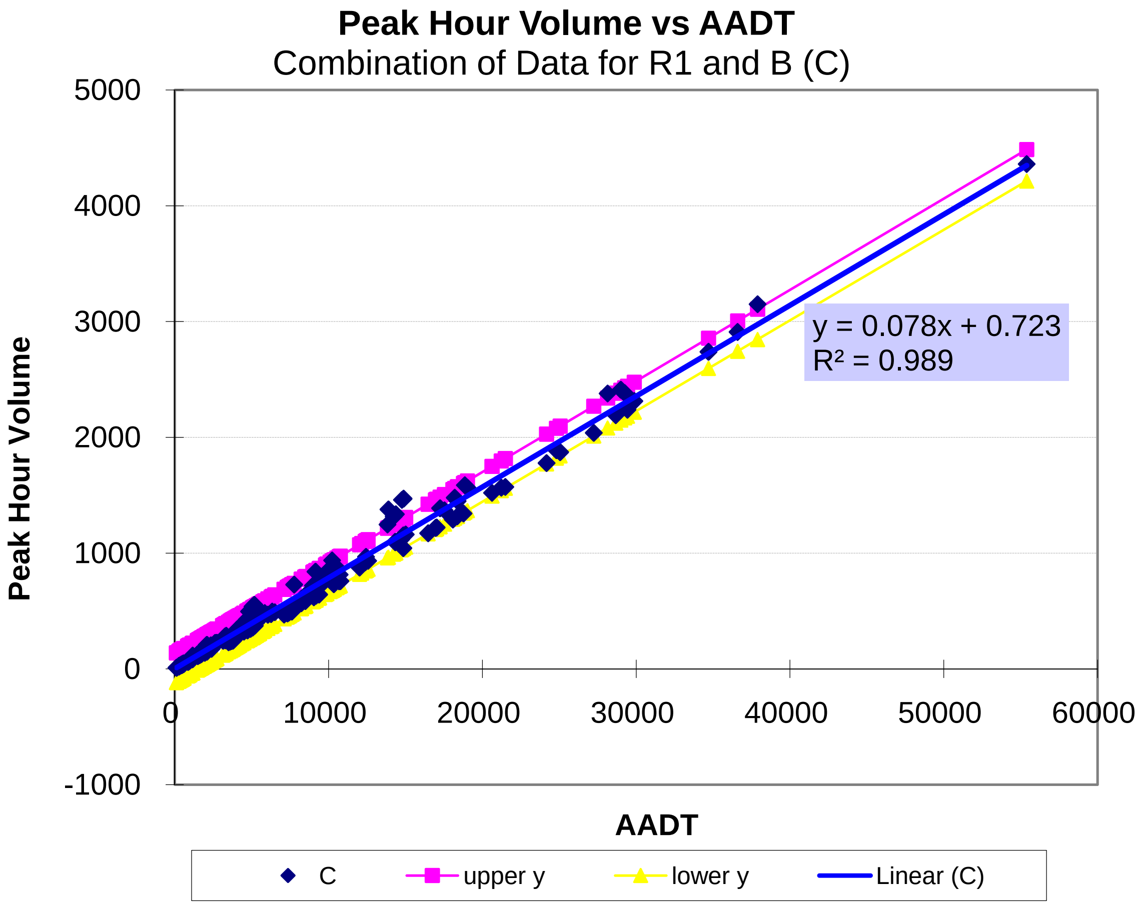

Peak Hour Volume vs AADT
Combination of Data for R3 and R4 (A)
5000
4000
3000
2000
1000
0
-1000
Peak Hour Volume
0
10000
20000
30000
40000
50000
60000
AADT
y = 0.078x - 1.03
R² = 0.988
A
upper y
lower y
Linear (A)


Peak Hour Volume vs AADT
Comparison of Relationship R2 and A
Peak Hour Volume
5000
4000
3000
2000
1000
0
-1000
0
10000
20000
30000
40000
50000
60000
AADT
A
upper y (A)
lower y (A)
Rural-Minor Arterial
upper y (R2)
lower y (R2)
Linear (A)
Linear (Rural-Minor Arterial)

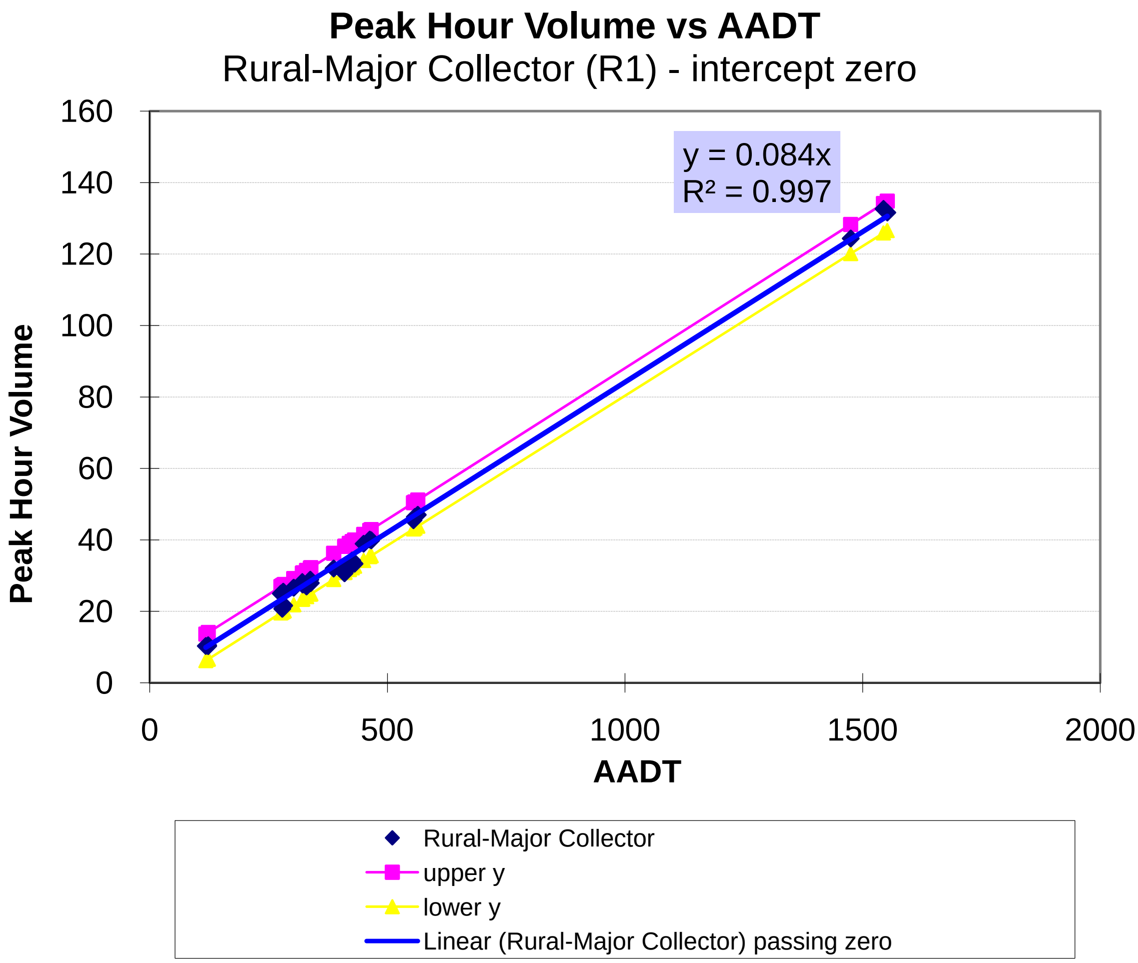


Peak Hour Volume vs AADT
Combination of Data for R2 and A (B)
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
Peak Hour Volume
0
10000
20000
30000
40000
50000
60000
AADT
y = 0.078x + 0.368
R² = 0.988
B
upper y
lower y
Linear (B)

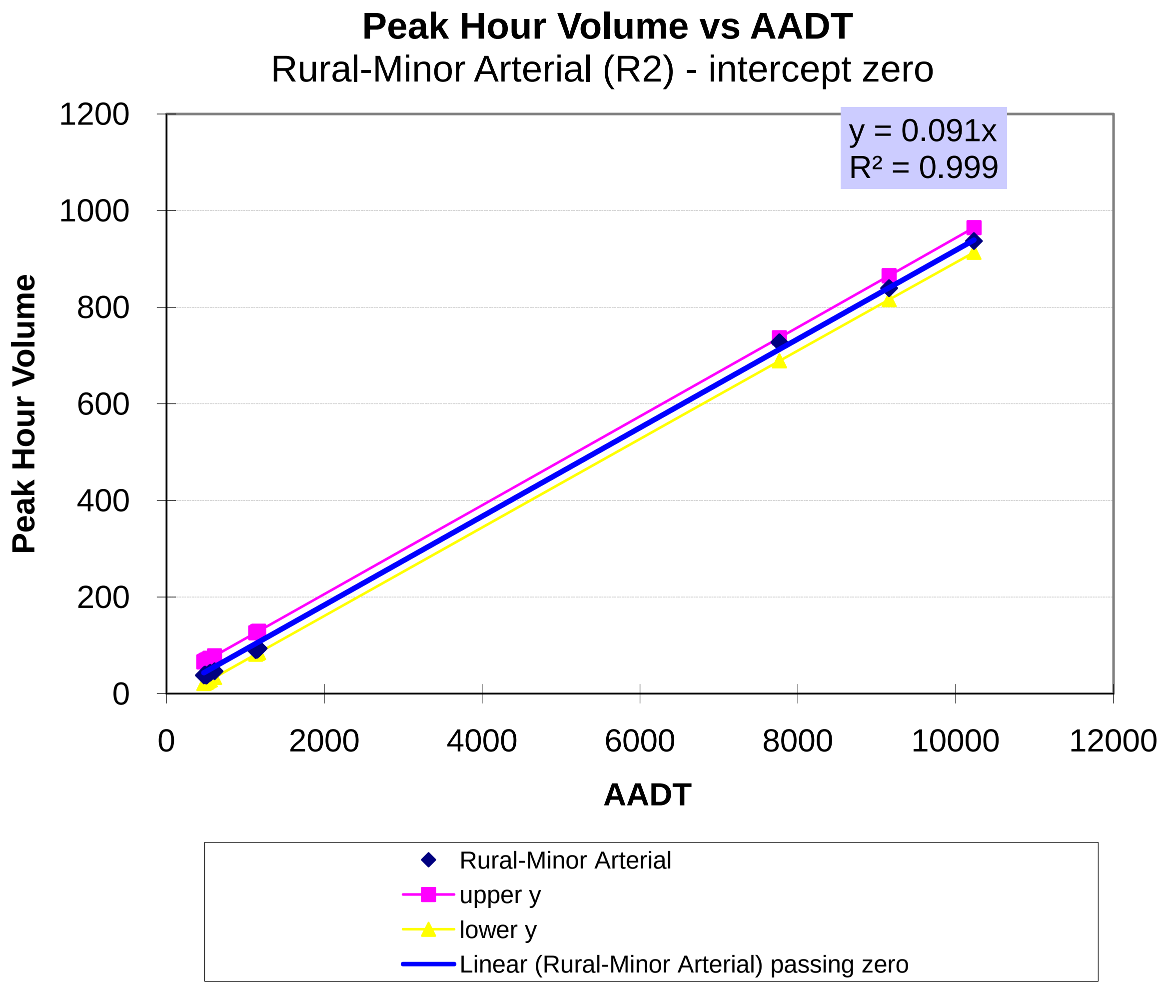

Peak Hour Volume vs AADT
Comparison of Relationship for R1 and B
Peak Hour Volume
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
0
10000
20000
30000
40000
50000
60000
AADT
B
upper y (B)
lower y (B)
Rural-Major Collector
upper y (R2)
lower y (R2)
Linear (B)
Linear (Rural-Major Collector)


Peak Hour Volume vs AADT
Combination of Data for R1 and B (C)
5000
4000
3000
2000
1000
0
-1000
Peak Hour Volume
0
10000
20000
30000
40000
50000
60000
AADT
y = 0.078x + 0.723
R² = 0.989
C
upper y
lower y
Linear (C)

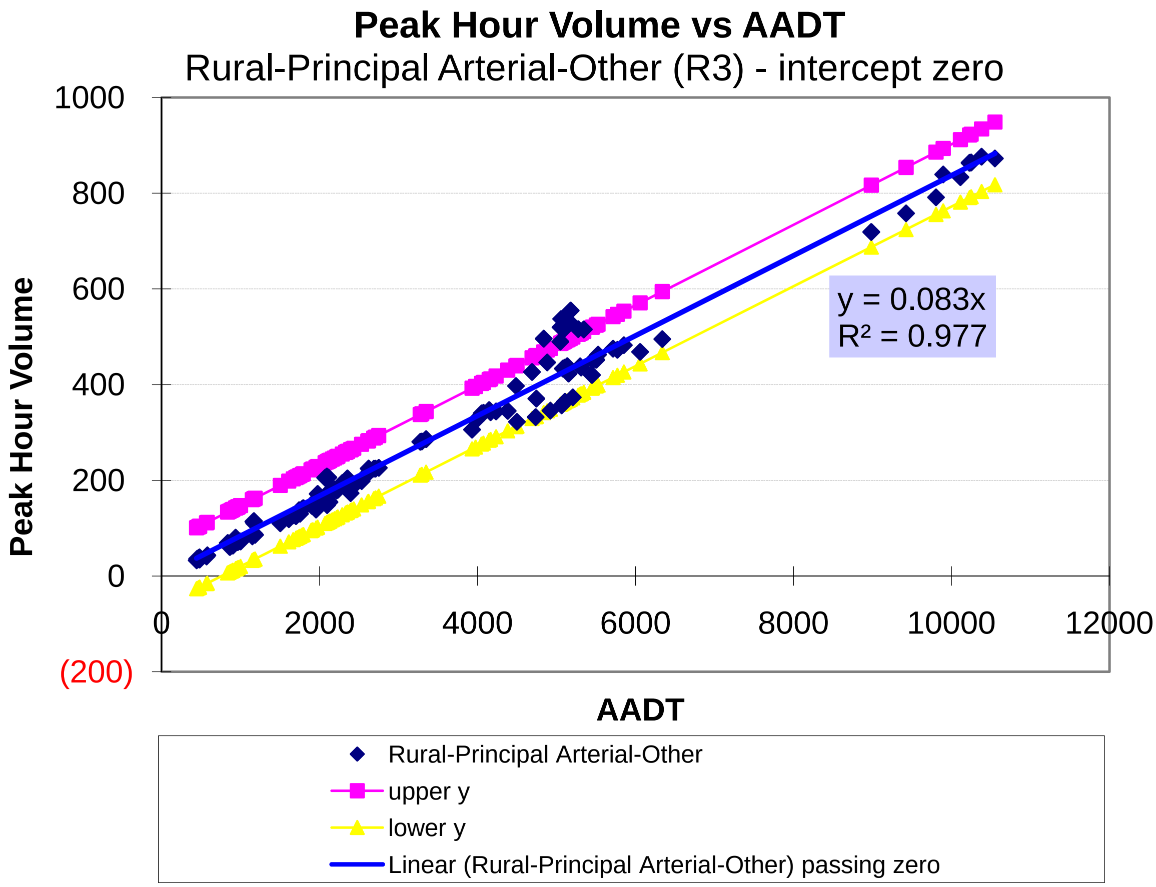
The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **PHV vs. AADT- Rural Constrained.**



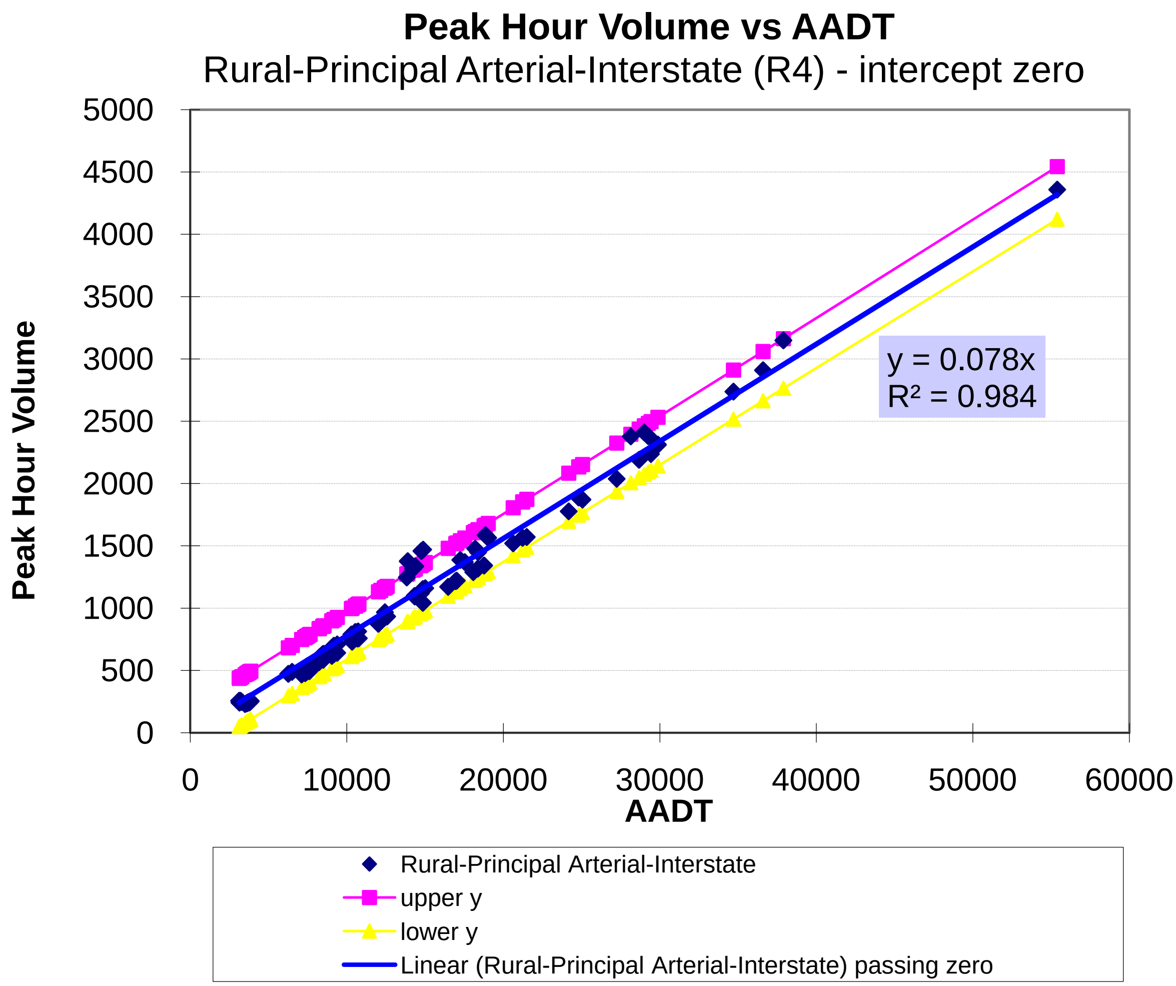
Peak Hour Volume vs AADT
Rural-Major Collector (R1) - intercept zero
y = 0.084x
R² = 0.997
Peak Hour Volume
0
20
40
60
80
100
120
140
160
0
500
1000
1500
2000
AADT
Rural-Major Collector
upper y
lower y
Linear (Rural-Major Collector) passing zero



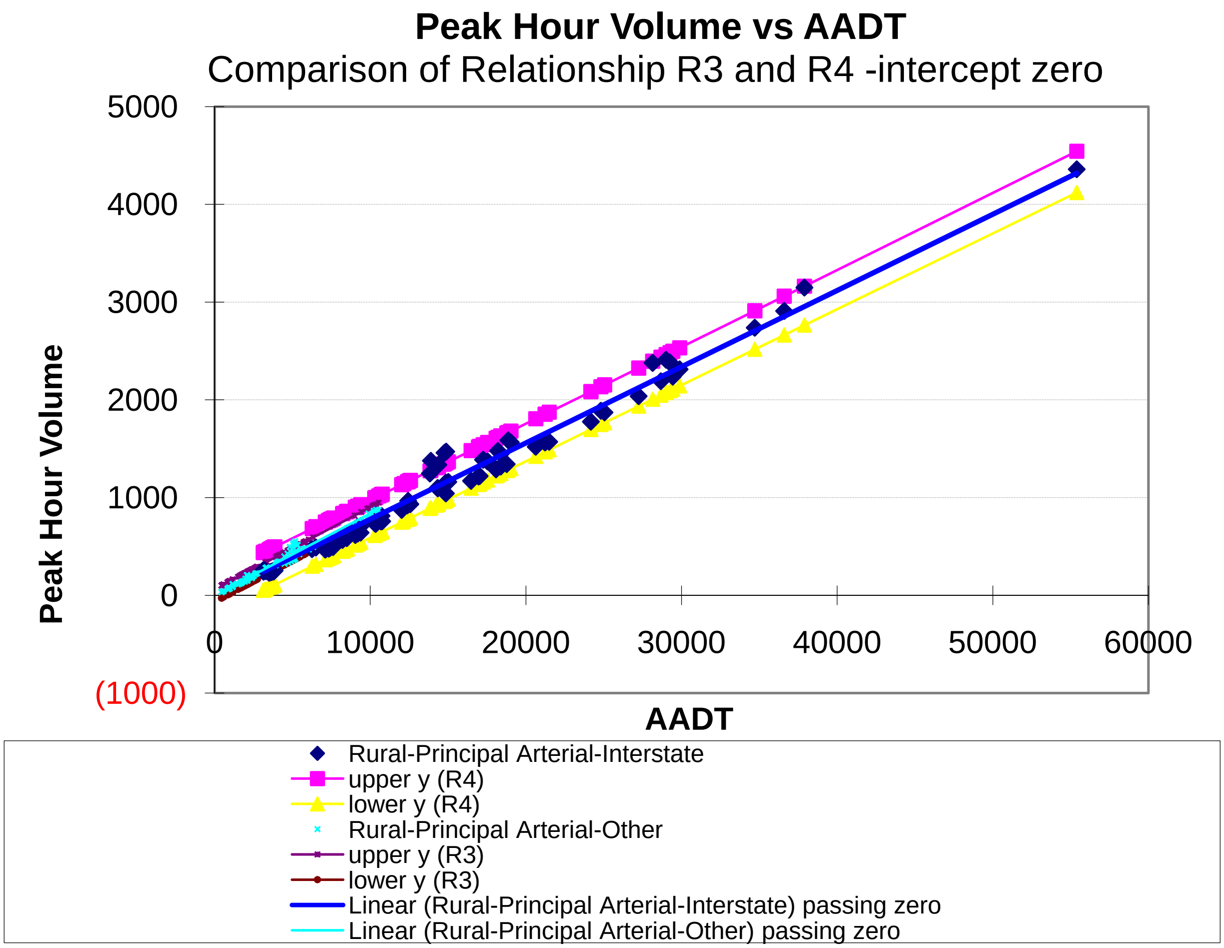
Peak Hour Volume vs AADT
Rural-Minor Arterial (R2) - intercept zero
y = 0.091x
R² = 0.999
Peak Hour Volume
1200
1000
800
600
400
200
0
0
2000
4000
6000
8000
10000
12000
AADT
Rural-Minor Arterial
upper y
lower y
Linear (Rural-Minor Arterial) passing zero

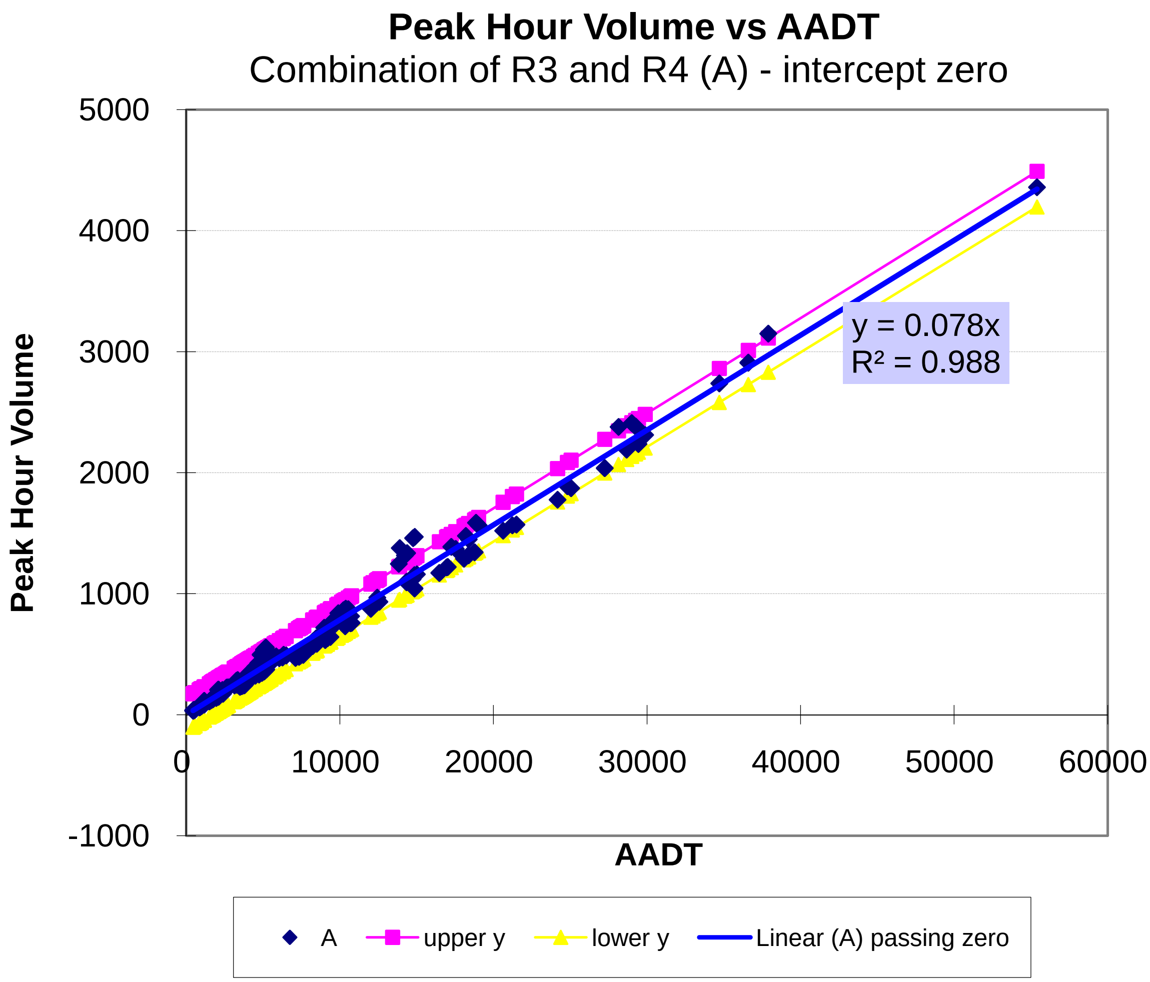


Peak Hour Volume vs AADT
Rural-Principal Arterial-Other (R3) - intercept zero
Peak Hour Volume
1000
800
600
400
200
0
(200)
0
2000
4000
6000
8000
10000
12000
AADT
y = 0.083x
R² = 0.977
Rural-Principal Arterial-Other
upper y
lower y
Linear (Rural-Principal Arterial-Other) passing zero

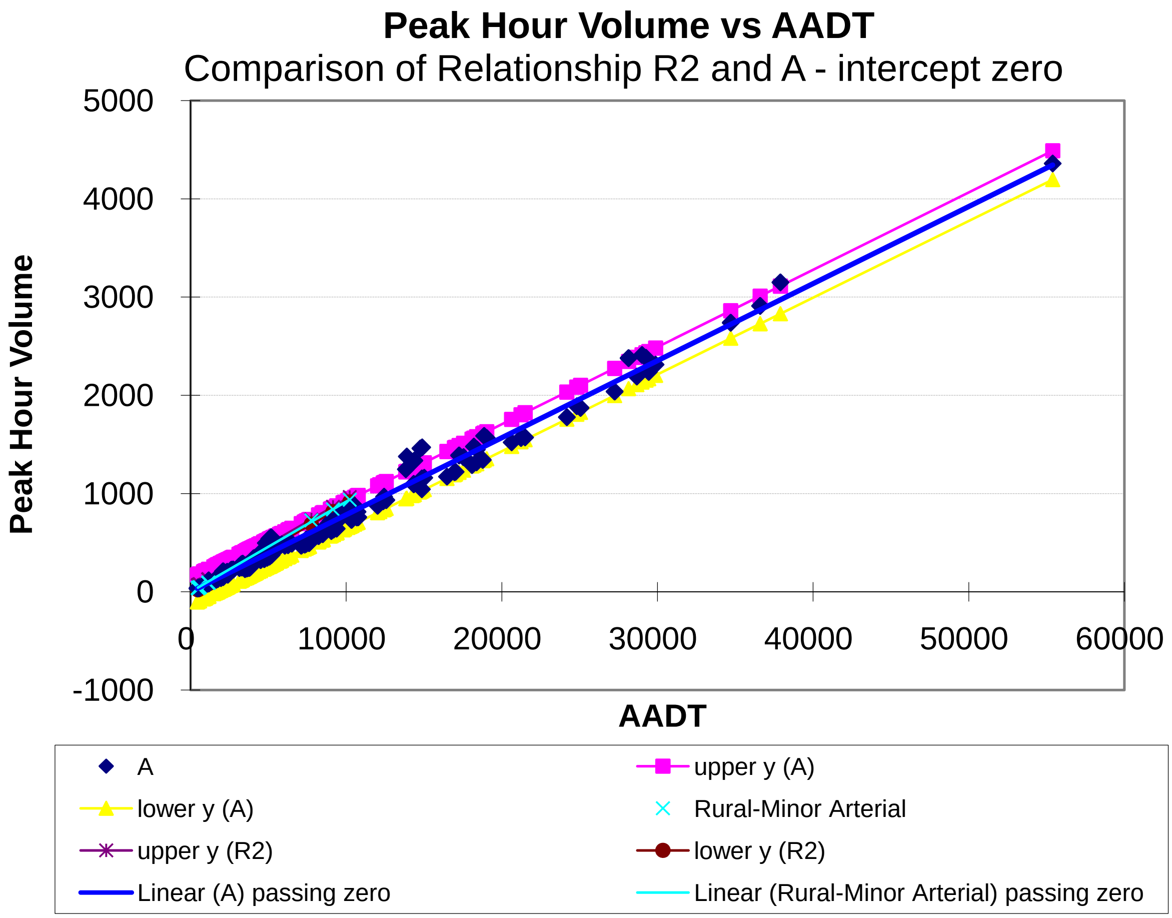


Peak Hour Volume vs AADT
Rural-Principal Arterial-Interstate (R4) - intercept zero
Peak Hour Volume
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10000
20000
30000
40000
50000
60000
AADT
y = 0.078x
R² = 0.984
Rural-Principal Arterial-Interstate
upper y
lower y
Linear (Rural-Principal Arterial-Interstate) passing zero

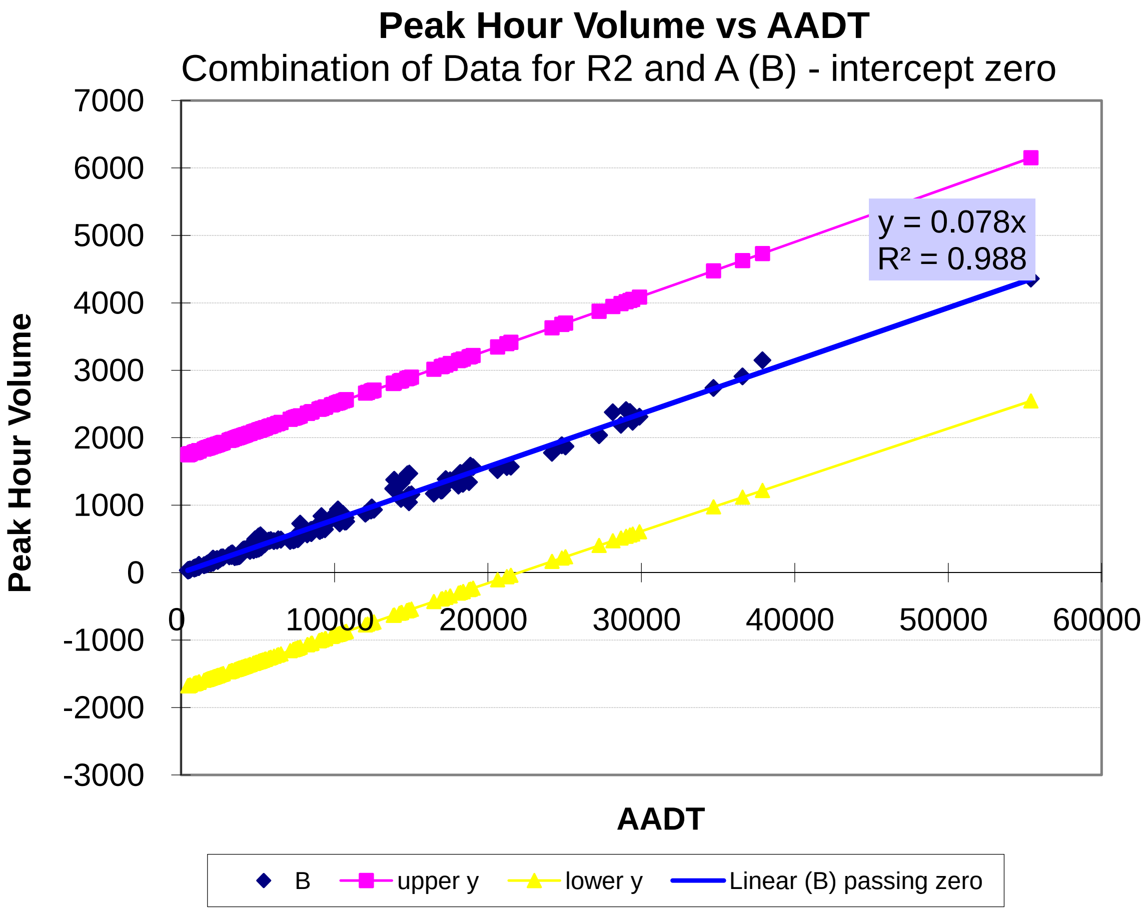

Peak Hour Volume vs AADT
Comparison of Relationship R3 and R4 -intercept zero
5000
4000
3000
2000
1000
0
(1000)
Peak Hour Volume
0
10000
20000
30000
40000
50000
60000
AADT
Rural-Principal Arterial-Interstate
upper y (R4)
lower y (R4)
Rural-Principal Arterial-Other
upper y (R3)
lower y (R3)
Linear (Rural-Principal Arterial-Interstate) passing zero
Linear (Rural-Principal Arterial-Other) passing zero



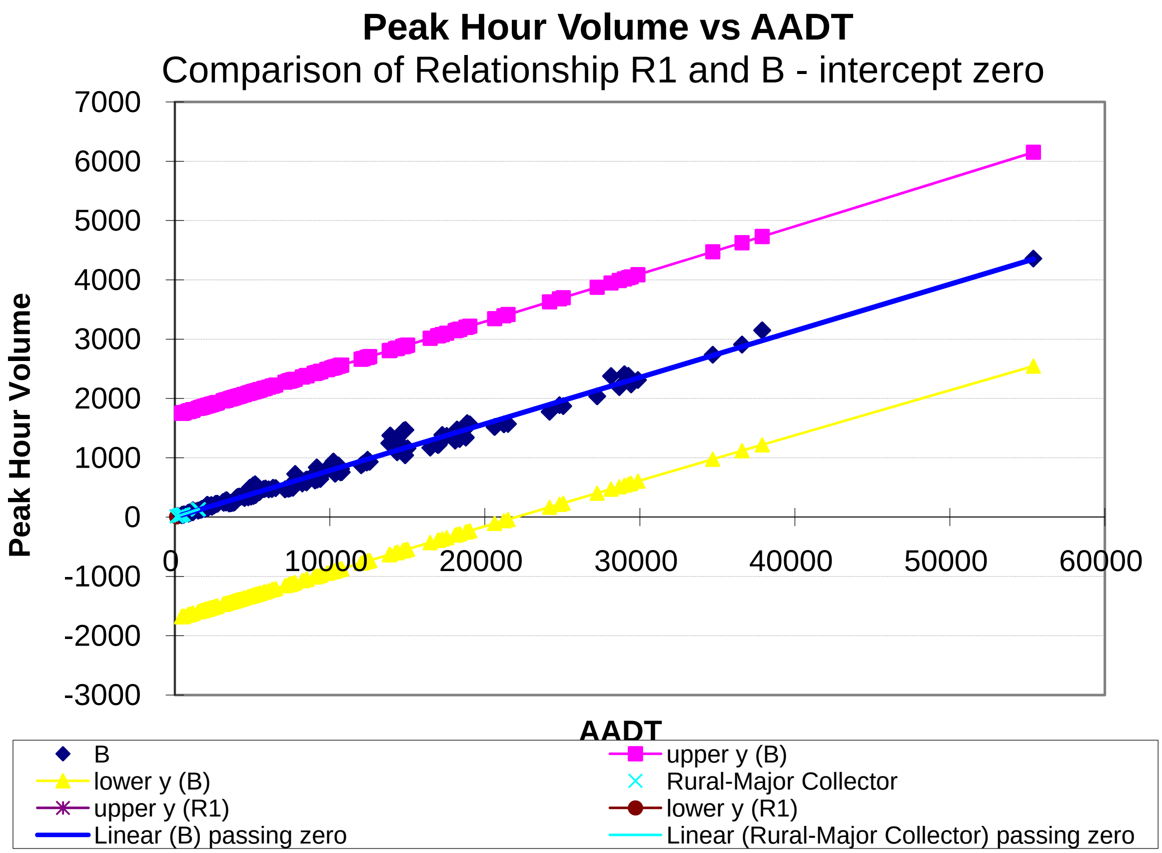
Peak Hour Volume vs AADT
Combination of R3 and R4 (A) - intercept zero
5000
4000
3000
2000
1000
0
-1000
0
10000
20000
30000
40000
50000
60000
Peak Hour Volume
AADT
y = 0.078x
R² = 0.988
A
upper y
lower y
Linear (A) passing zero



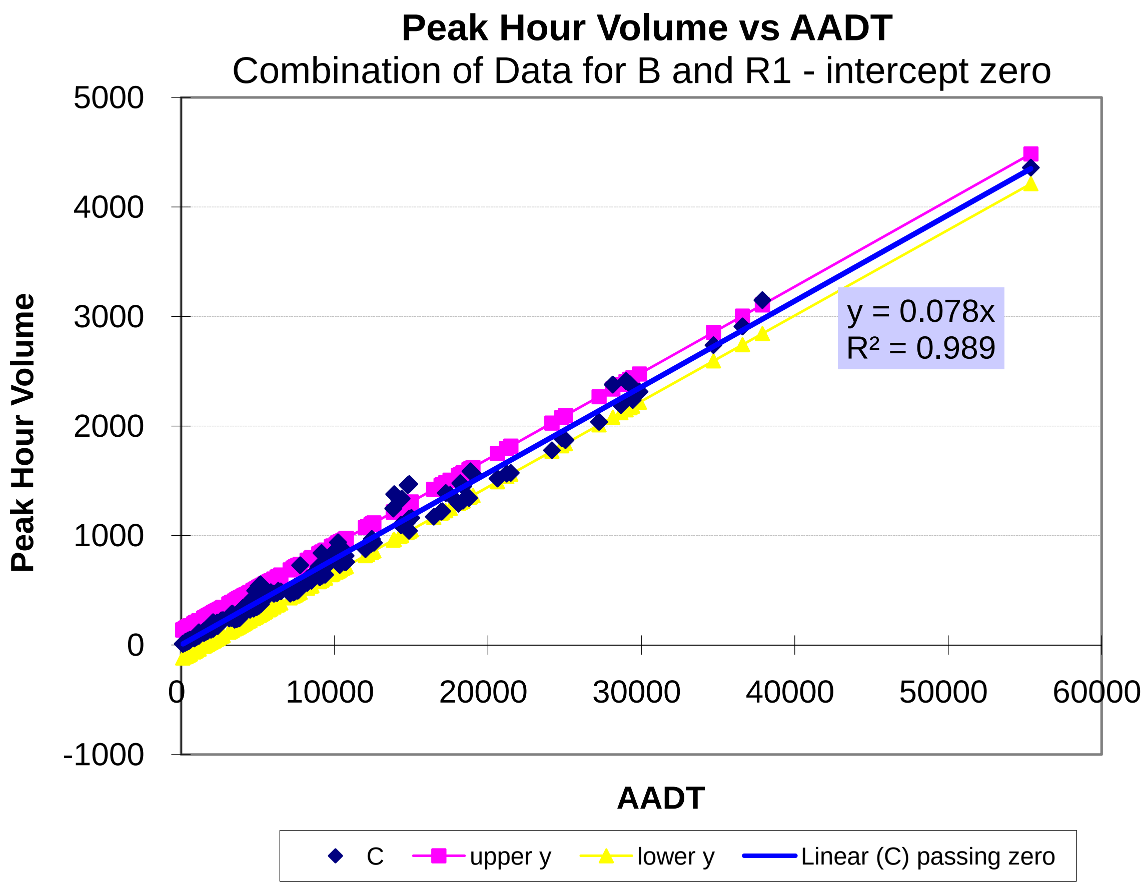
Peak Hour Volume vs AADT
Comparison of Relationship R2 and A - intercept zero
Peak Hour Volume
5000
4000
3000
2000
1000
0
-1000
0
10000
20000
30000
40000
50000
60000
AADT
A
upper y (A)
lower y (A)
Rural-Minor Arterial
upper y (R2)
lower y (R2)
Linear (A) passing zero
Linear (Rural-Minor Arterial) passing zero



Peak Hour Volume vs AADT
Combination of Data for R2 and A (B) - intercept zero
Peak Hour Volume
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
0
10000
20000
30000
40000
50000
60000
AADT
y = 0.078x
R² = 0.988
B
upper y
lower y
Linear (B) passing zero

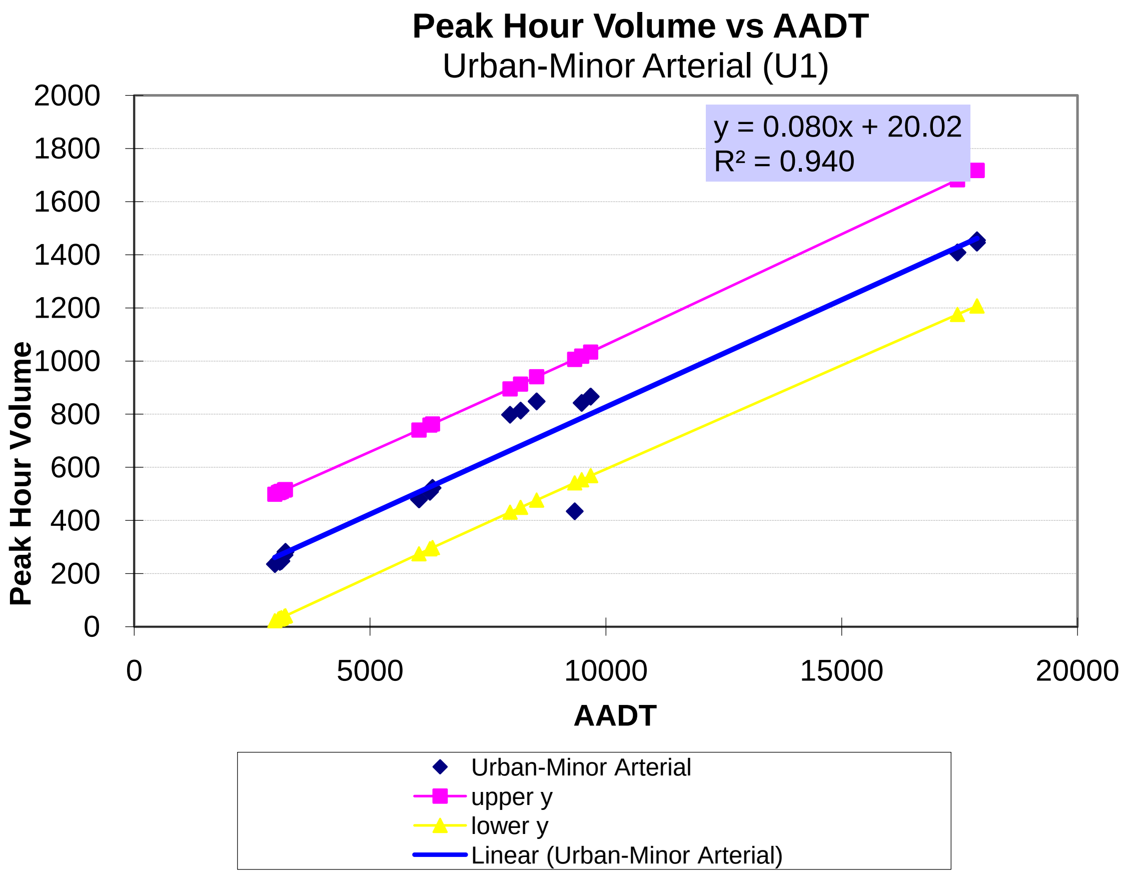


Peak Hour Volume vs AADT
Comparison of Relationship R1 and B - intercept zero
Peak Hour Volume
7000
6000
5000
4000
3000
2000
1000
0
-1000
-2000
-3000
0
10000
20000
30000
40000
50000
60000
AADT
B
upper y (B)
lower y (B)
Rural-Major Collector
upper y (R1)
lower y (R1)
Linear (B) passing zero
Linear (Rural-Major Collector) passing zero

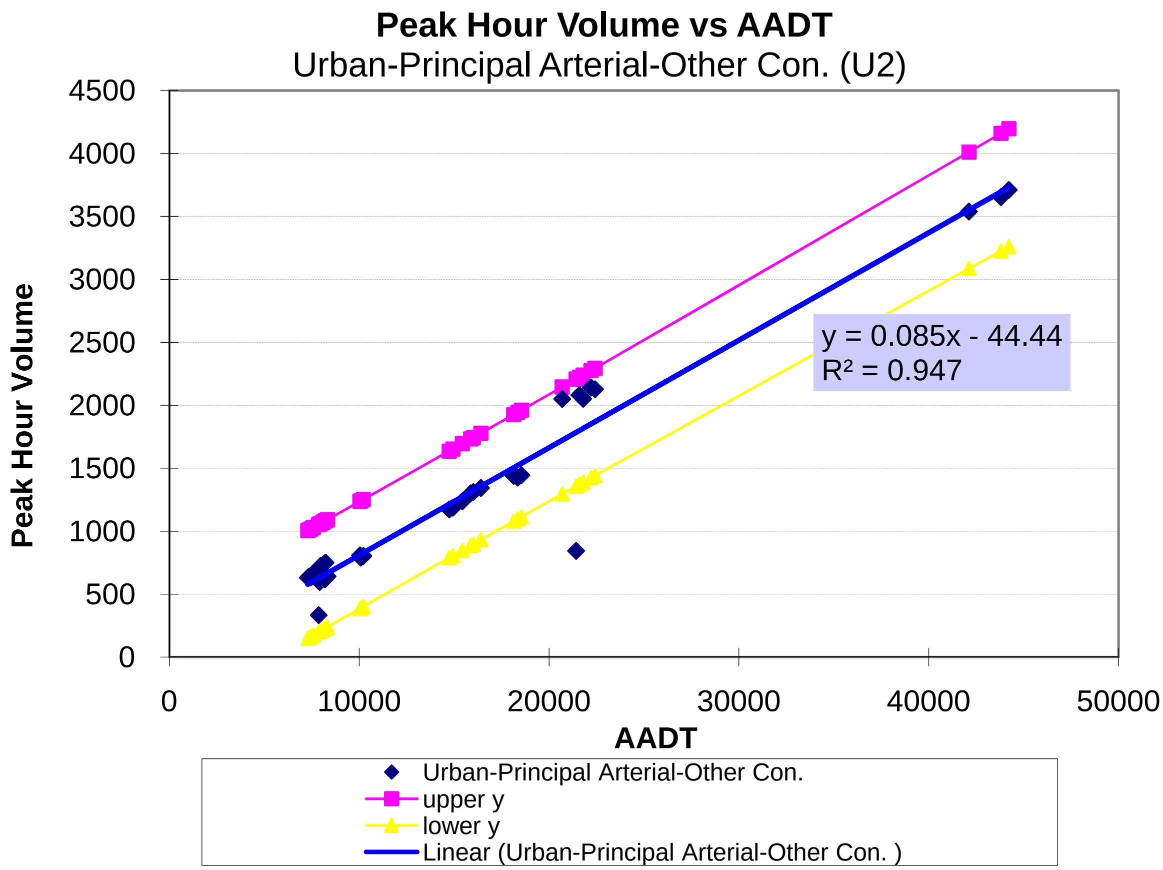


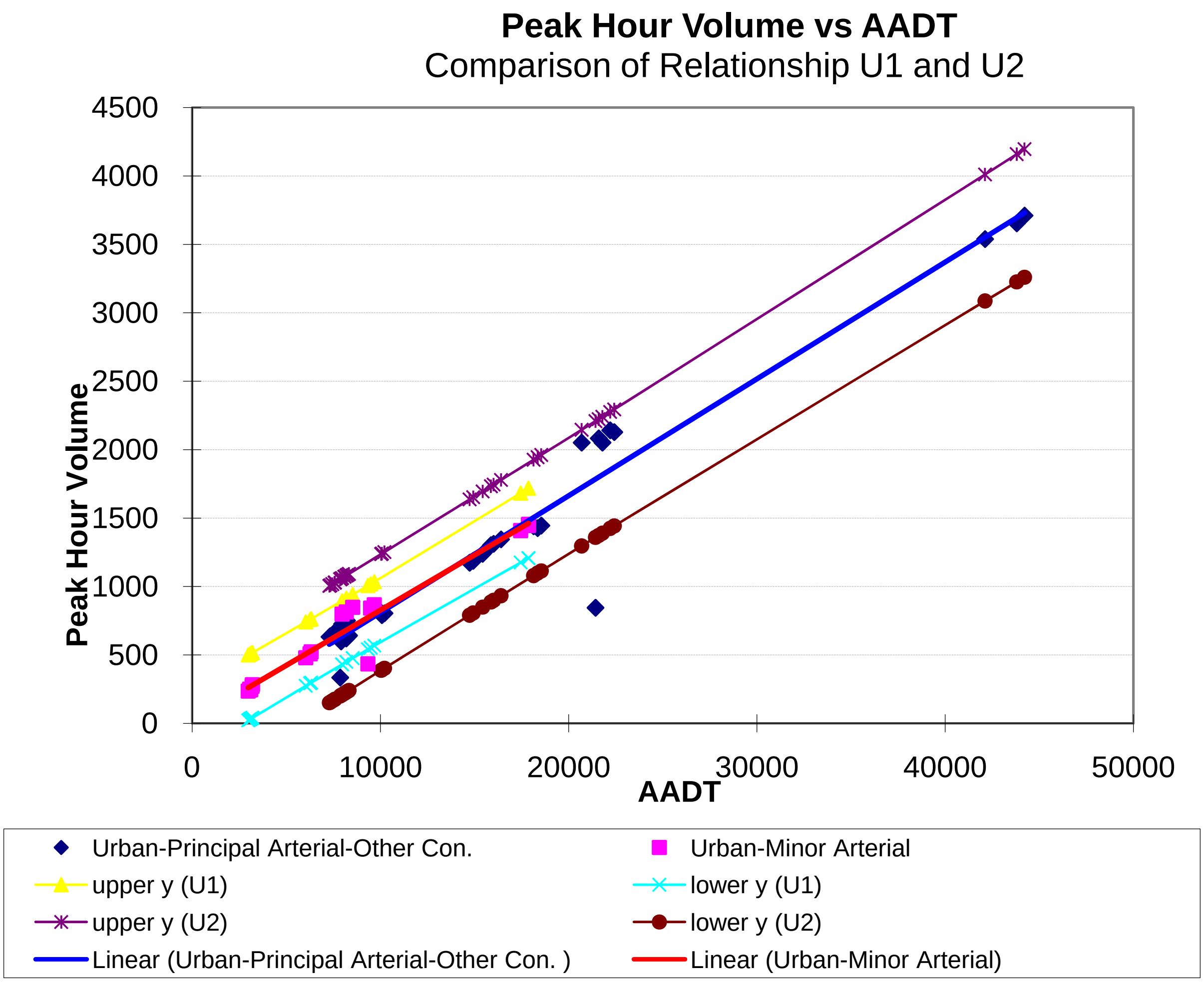
Peak Hour Volume vs AADT
Combination of Data for B and R1 - intercept zero
5000
4000
3000
2000
1000
0
-1000
Peak Hour Volume
0
10000
20000
30000
40000
50000
60000
AADT
y = 0.078x
R² = 0.989
C
upper y
lower y
Linear (C) passing zero

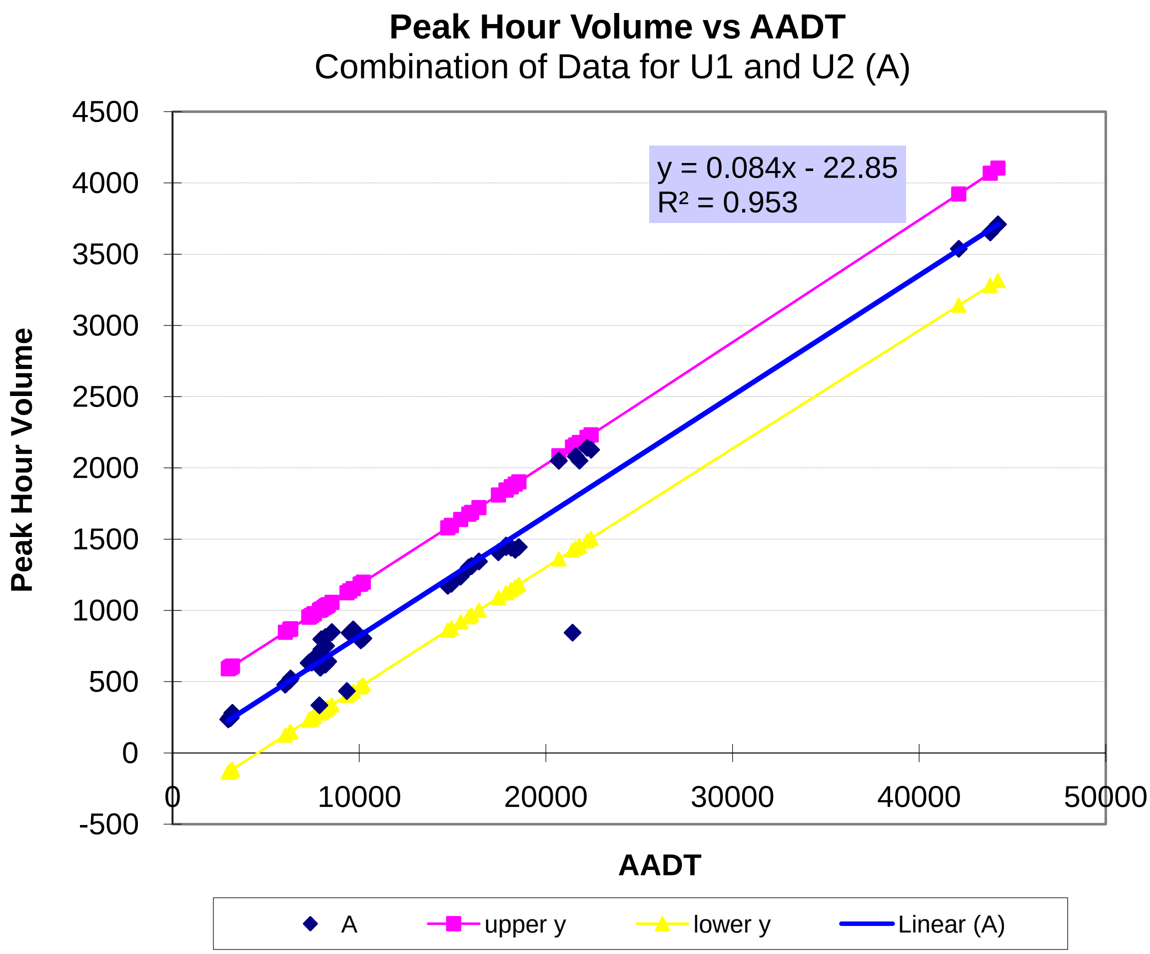
The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **PHV vs. AADT- Urban.**



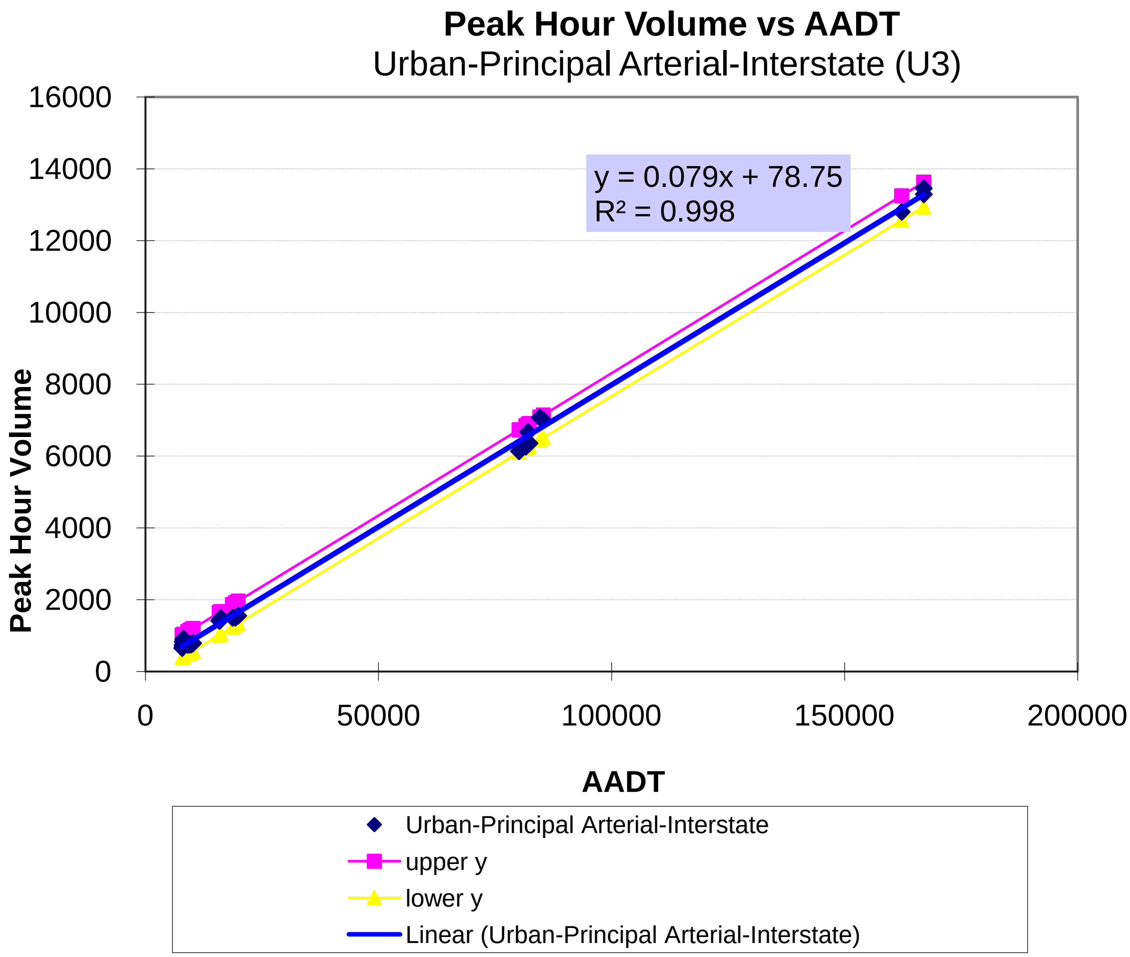
Peak Hour Volume vs AADT
Urban-Minor Arterial (U1)
y = 0.080x + 20.02
R² = 0.940
Peak Hour Volume
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
5000
10000
15000
20000
AADT
Urban-Minor Arterial
upper y
lower y
Linear (Urban-Minor Arterial)


Peak Hour Volume vs AADT
Urban-Principal Arterial-Other Con. (U2)
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10000
20000
30000
40000
50000
AADT
y = 0.085x - 44.44
R² = 0.947
Urban-Principal Arterial-Other Con.
upper y
lower y
Linear (Urban-Principal Arterial-Other Con.)

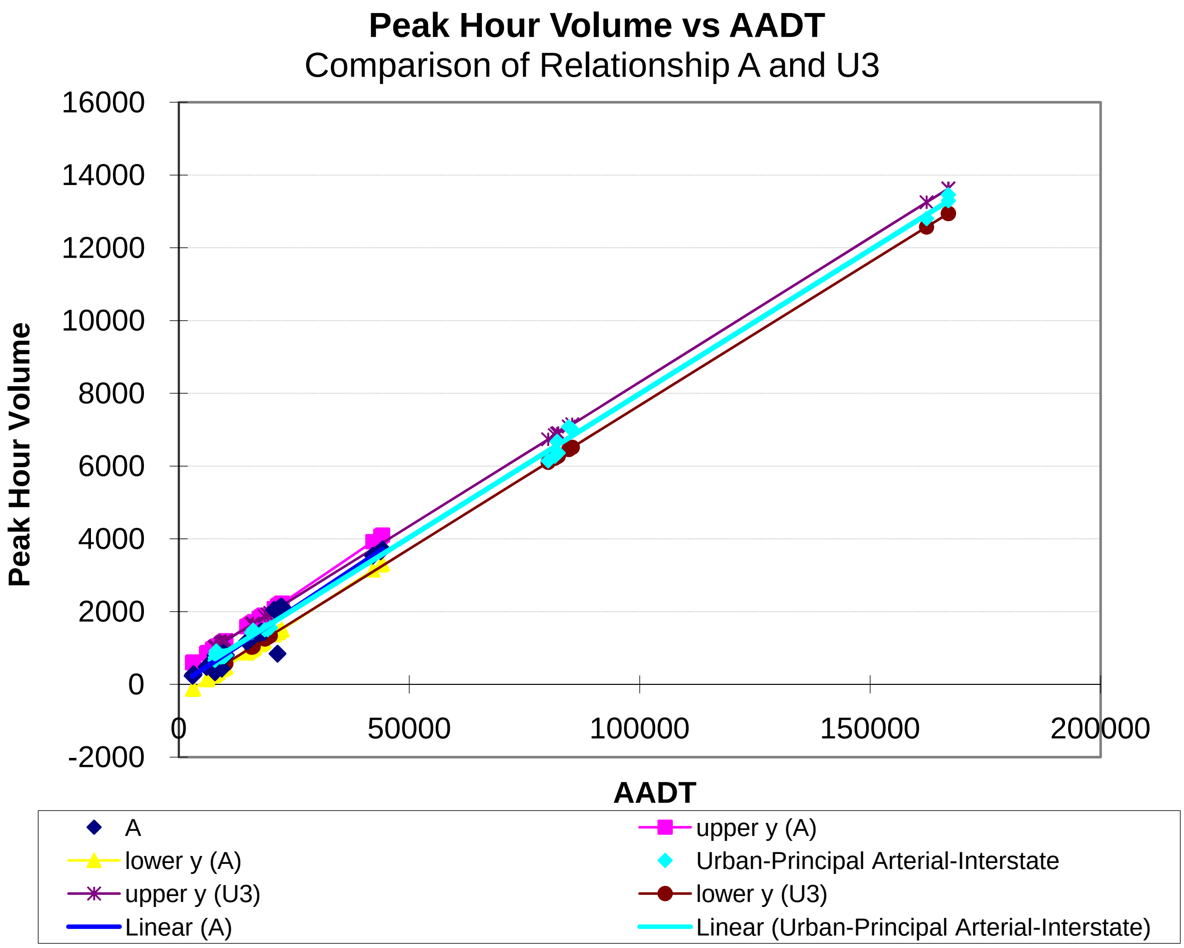

Peak Hour Volume vs AADT
Comparison of Relationship U1 and U2
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10000
20000
30000
40000
50000
AADT
Urban-Principal Arterial-Other Con.
Urban-Minor Arterial
upper y (U1)
lower y (U1)
upper y (U2)
lower y (U2)
Linear (Urban-Principal Arterial-Other Con.)
Linear (Urban-Minor Arterial)



Peak Hour Volume vs AADT
Combination of Data for U1 and U2 (A)
y = 0.084x - 22.85
R² = 0.953
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0
10000
20000
30000
40000
50000
AADT
A
upper y
lower y
Linear (A)

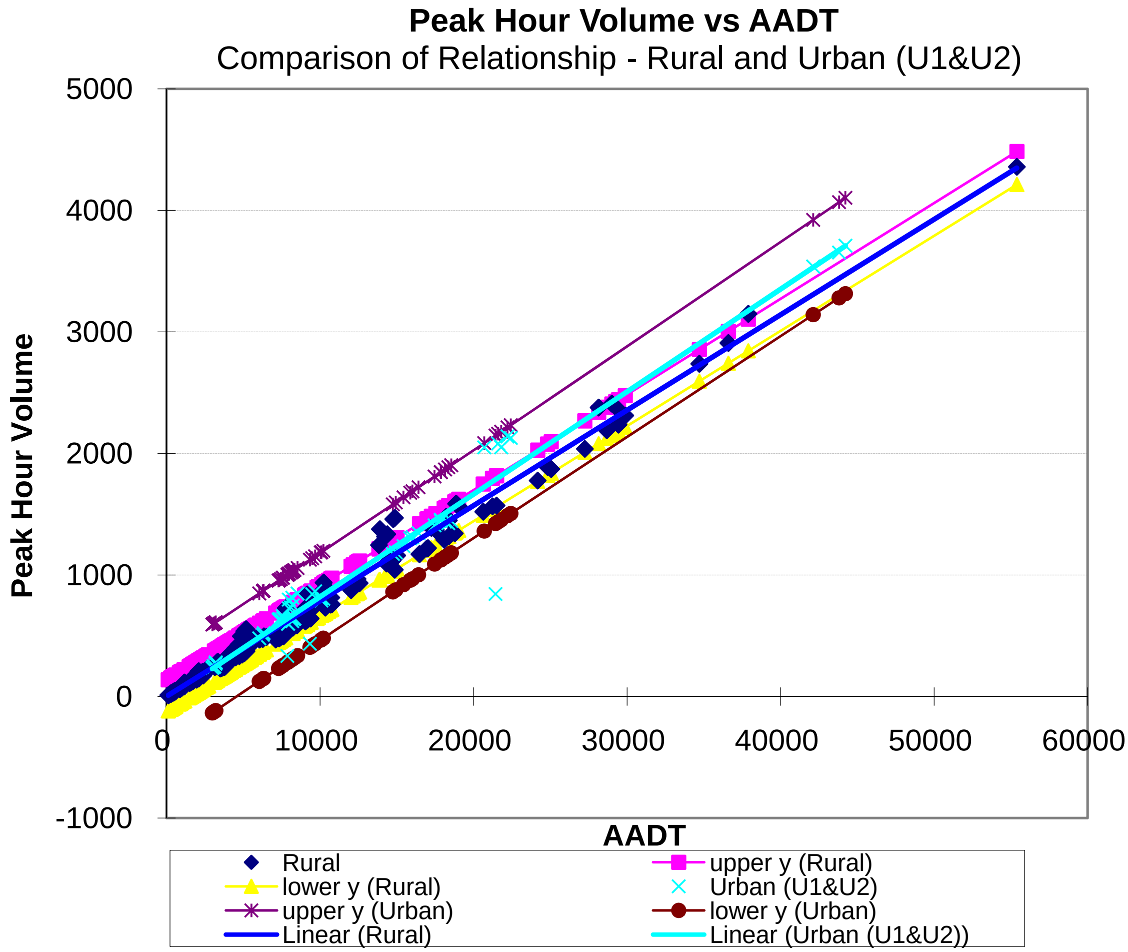


Peak Hour Volume vs AADT
Urban-Principal Arterial-Interstate (U3)
y = 0.079x + 78.75
R² = 0.998
16000
14000
12000
10000
8000
6000
4000
2000
0
Peak Hour Volume
0
50000
100000
150000
200000
AADT
Urban-Principal Arterial-Interstate
upper y
lower y
Linear (Urban-Principal Arterial-Interstate)

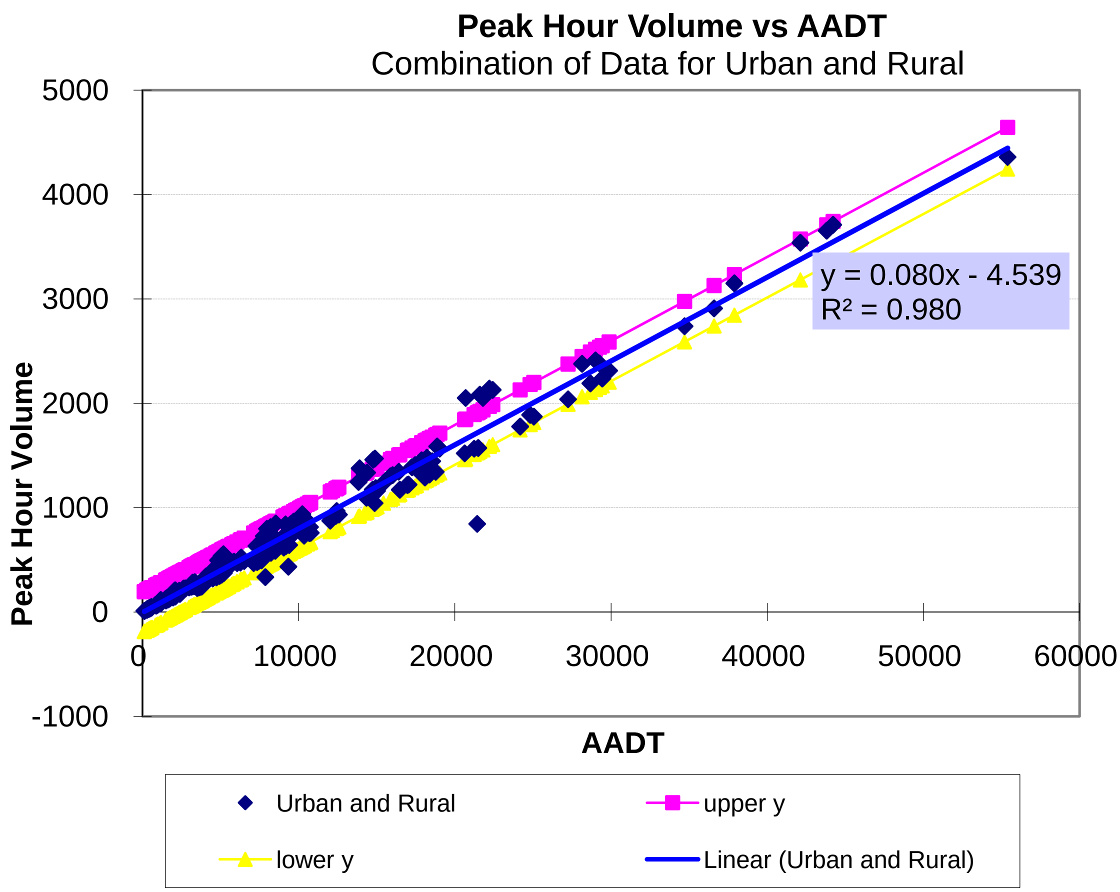


Peak Hour Volume vs AADT
Comparison of Relationship A and U3
16000
14000
12000
10000
8000
6000
4000
2000
0
-2000
Peak Hour Volume
0
50000
100000
150000
200000
AADT
A
upper y (A)
lower y (A)
Urban-Principal Arterial-Interstate
upper y (U3)
lower y (U3)
Linear (A)
Linear (Urban-Principal Arterial-Interstate)

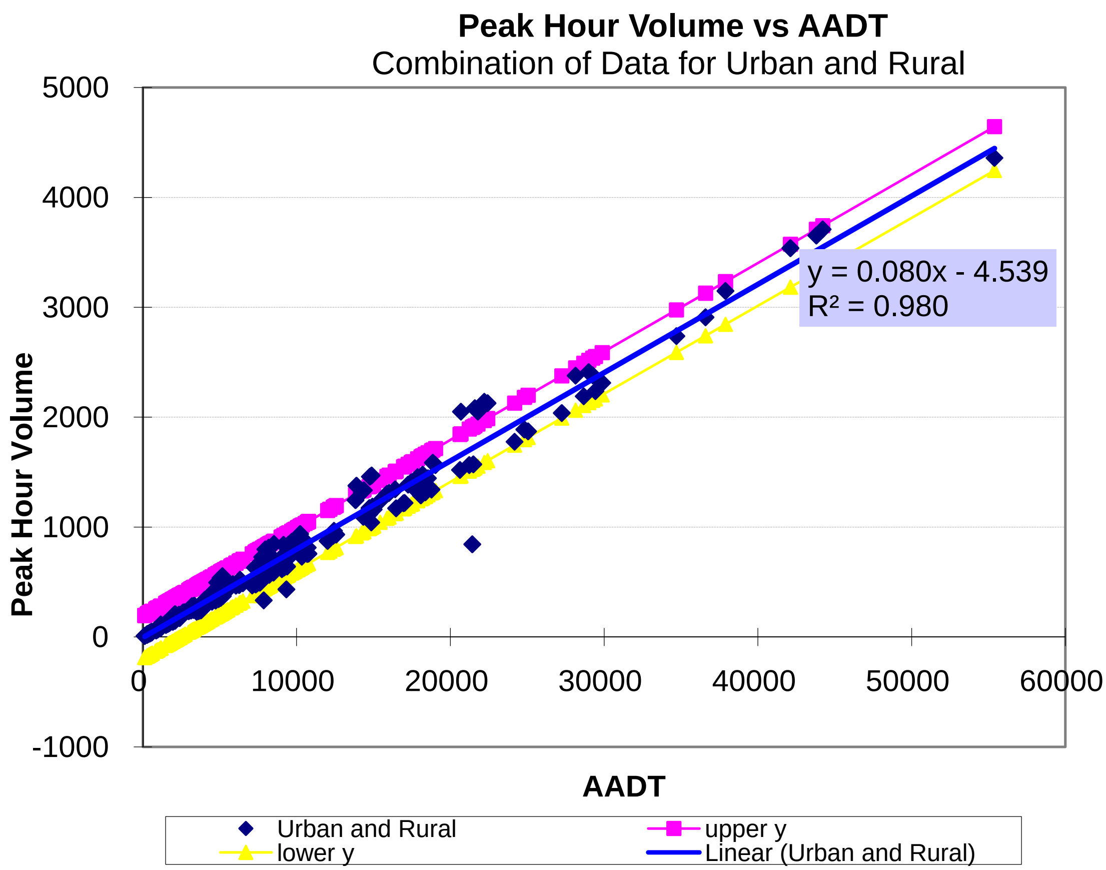
The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **PHV vs. AADT- Urban and Rural.**



Peak Hour Volume vs AADT
Comparison of Relationship - Rural and Urban (U1&U2)
Peak Hour Volume
5000
4000
3000
2000
1000
0
-1000
0
10000
20000
30000
40000
50000
60000
AADT
Rural
upper y (Rural)
lower y (Rural)
Urban (U1&U2)
upper y (Urban)
lower y (Urban)
Linear (Rural)
Linear (Urban (U1&U2))

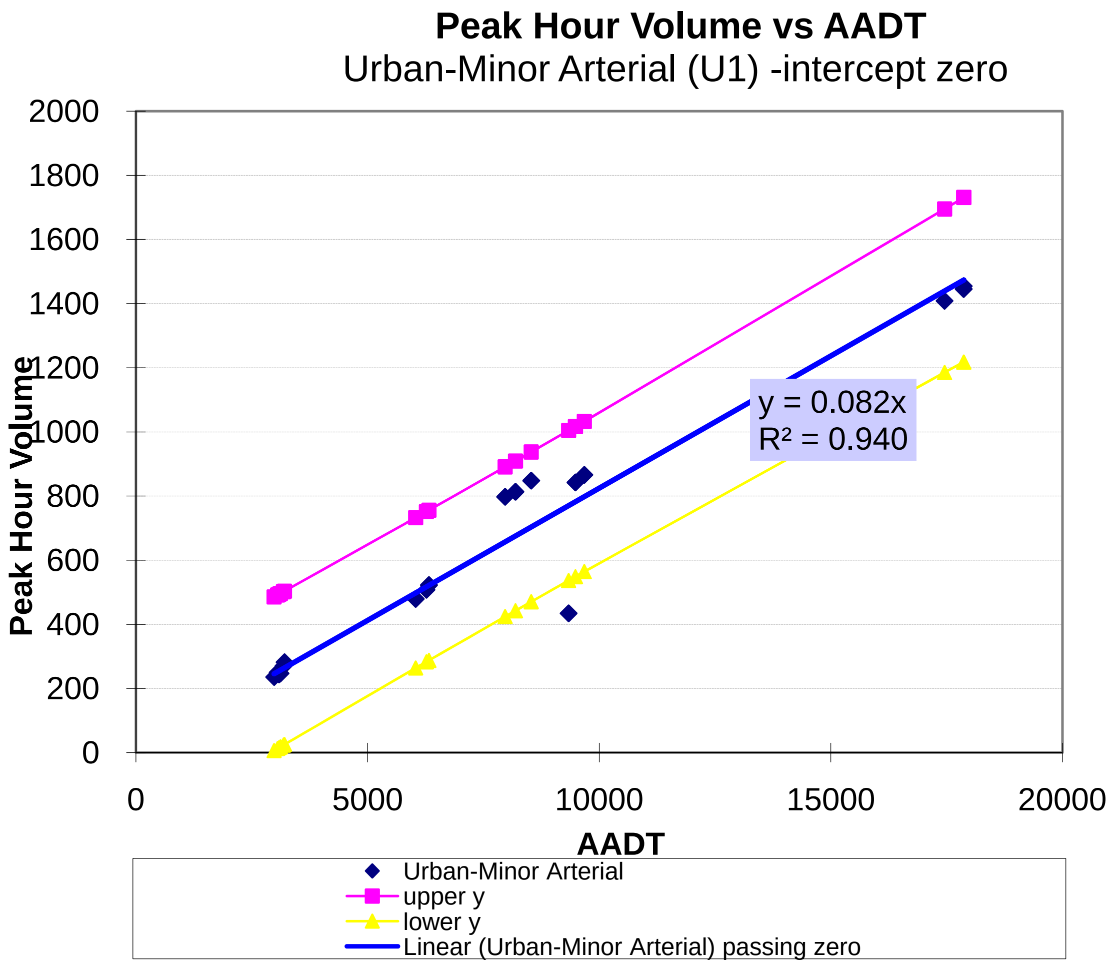


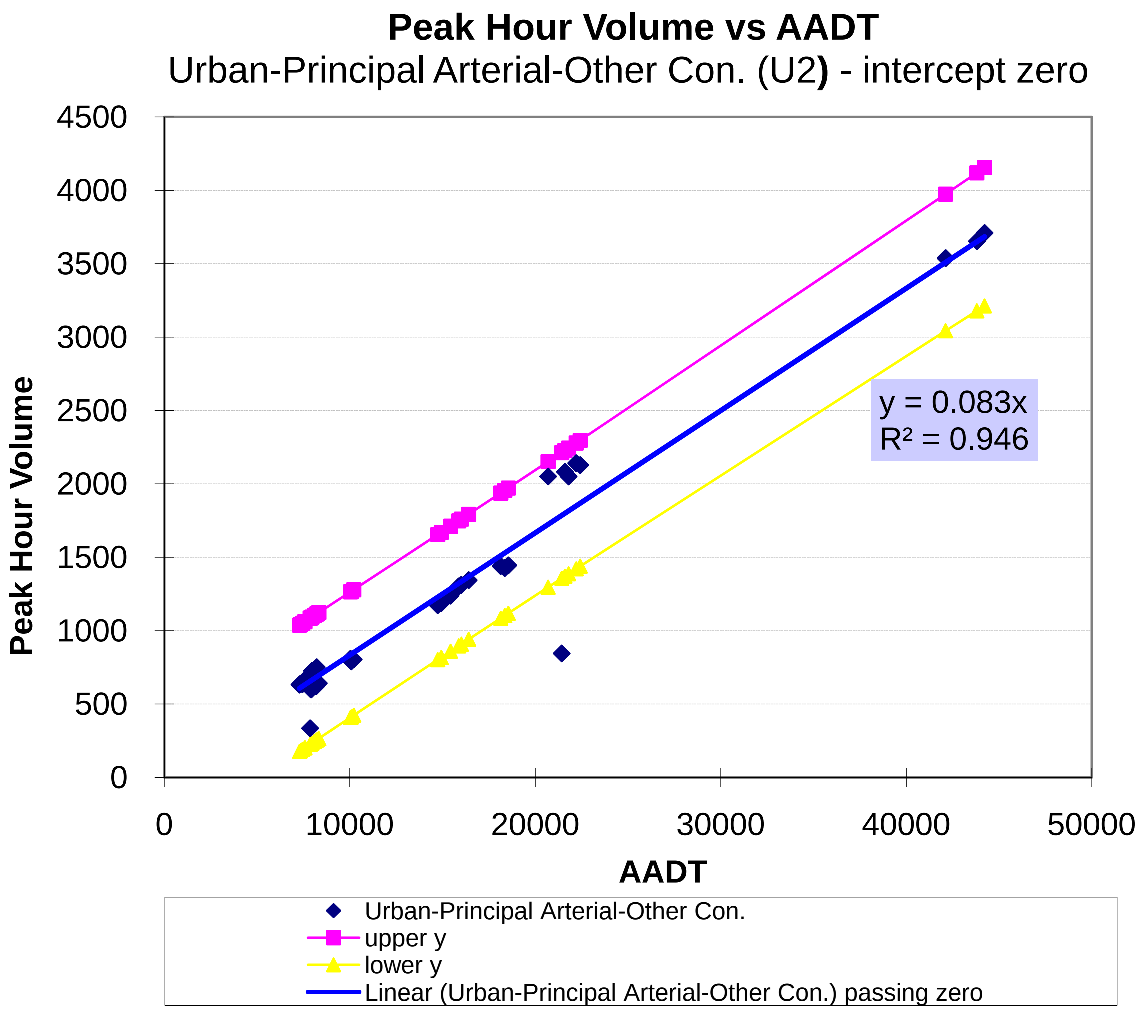
Peak Hour Volume vs AADT
Combination of Data for Urban and Rural
Peak Hour Volume
AADT
5000
4000
3000
2000
1000
0
-1000
0
10000
20000
30000
40000
50000
60000
y = 0.080x - 4.539
R² = 0.980
Urban and Rural
upper y
lower y
Linear (Urban and Rural)

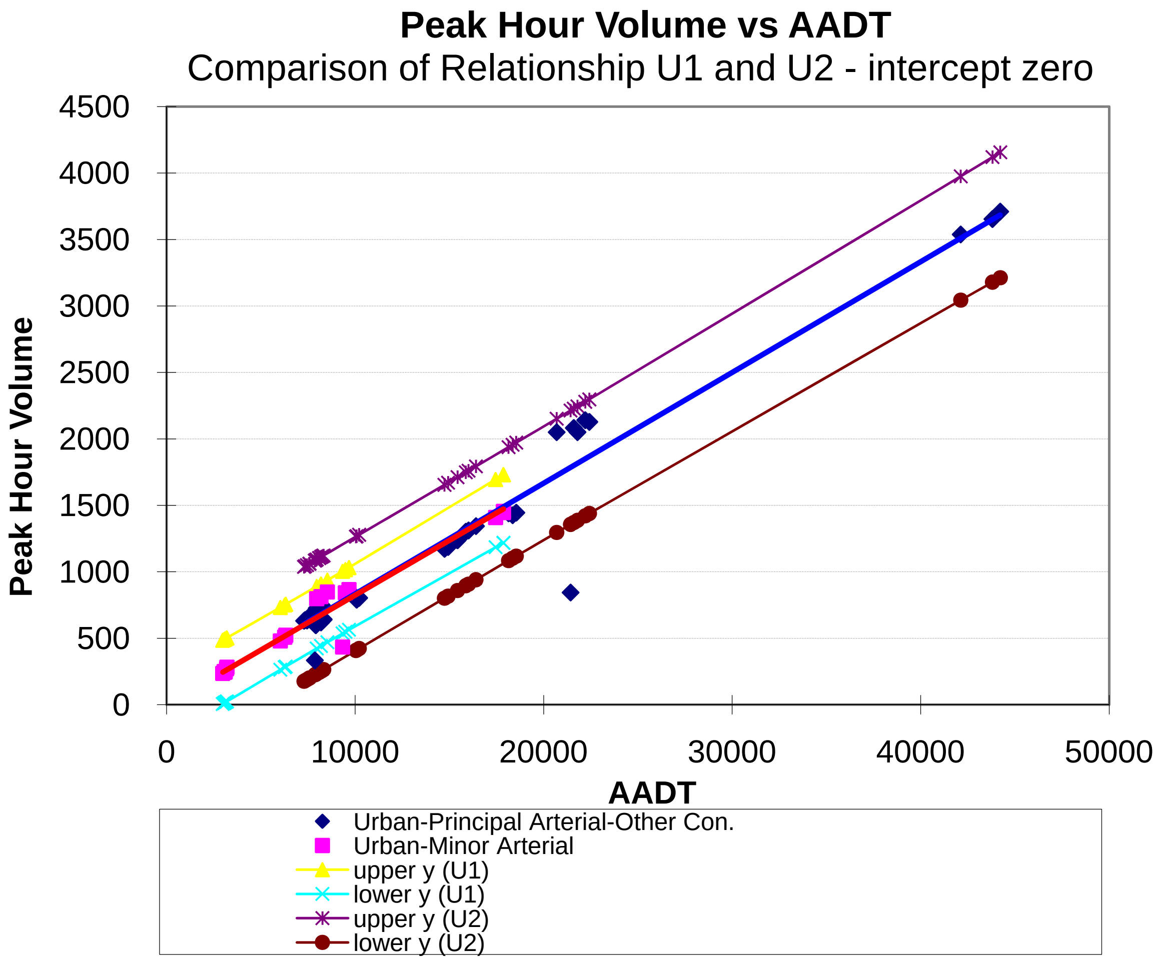


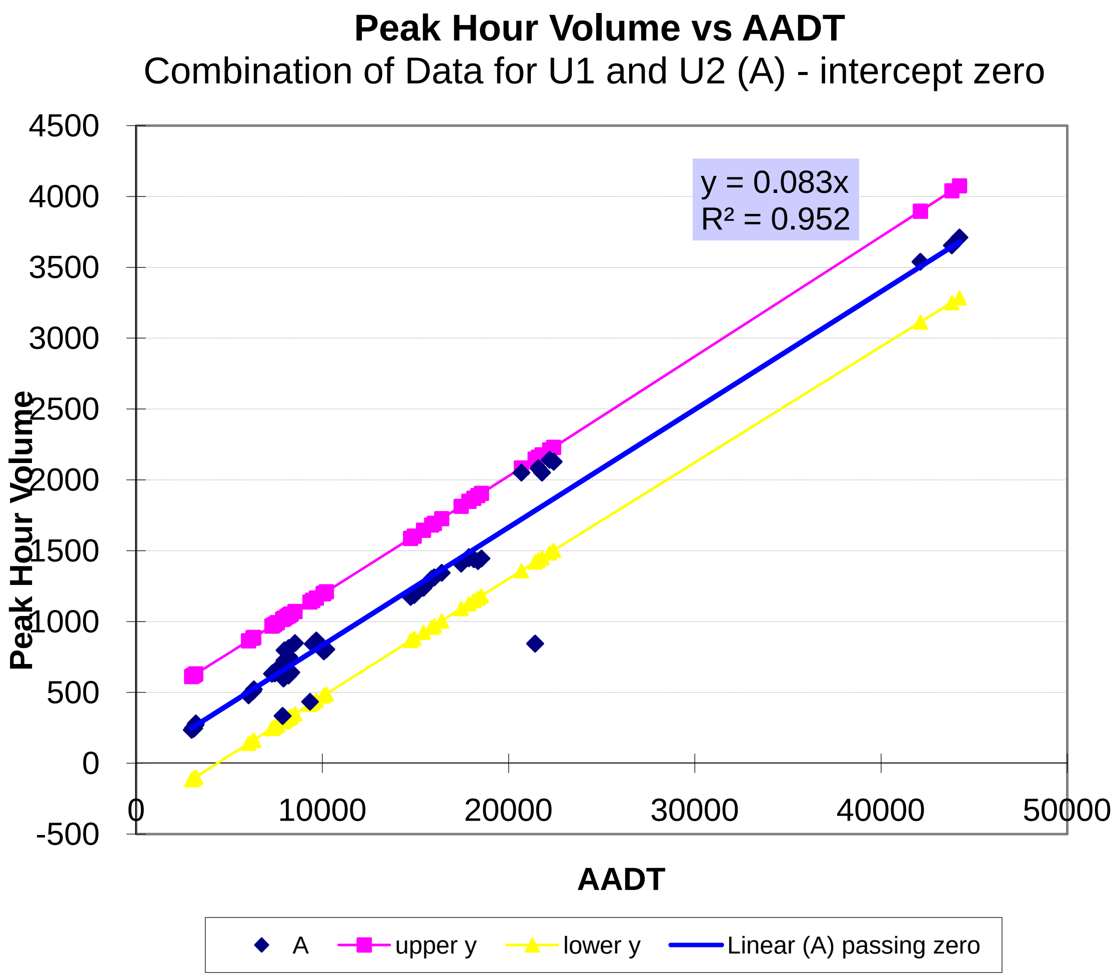
Peak Hour Volume vs AADT
Combination of Data for Urban and Rural
5000
4000
3000
2000
1000
0
-1000
0
10000
20000
30000
40000
50000
60000
Peak Hour Volume
AADT
y = 0.080x - 4.539
R² = 0.980
Urban and Rural
upper y
lower y
Linear (Urban and Rural)

The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **PHV vs. AADT- Urban Constrained.**

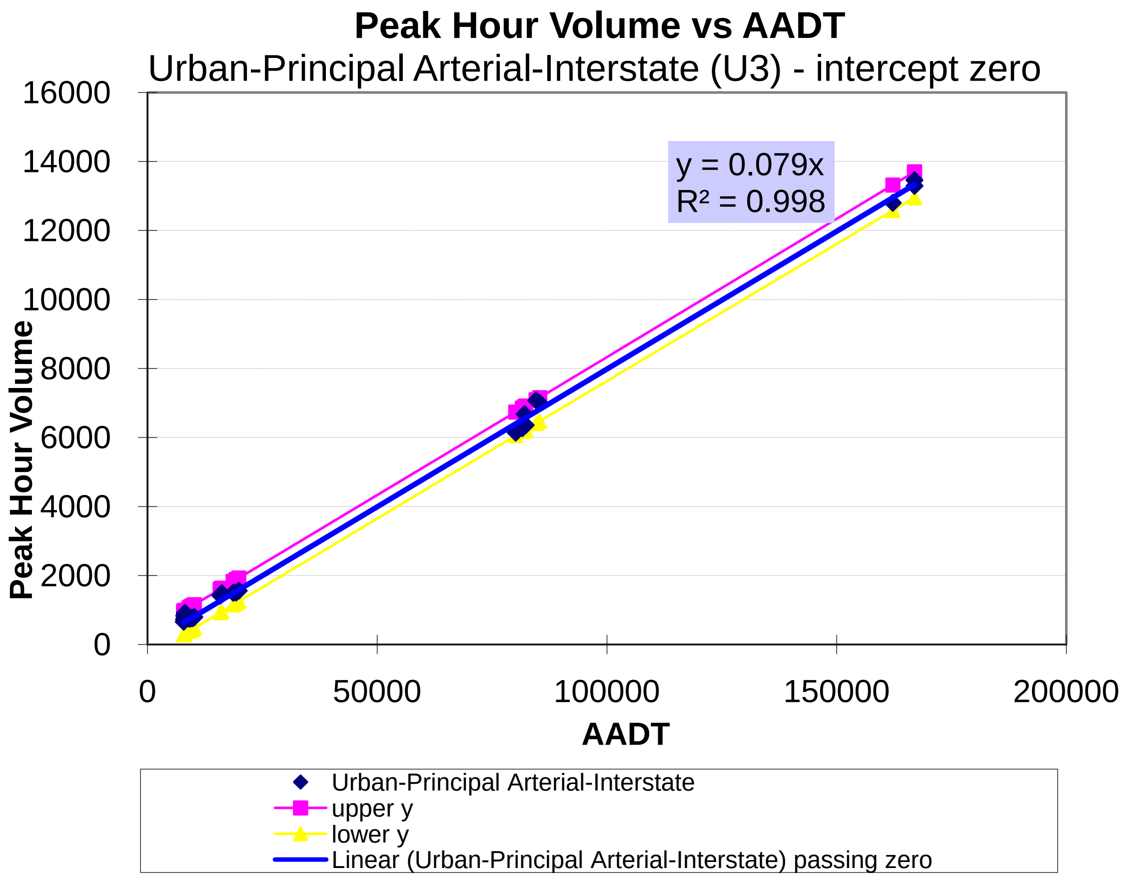

Peak Hour Volume vs AADT
Urban-Minor Arterial (U1) -intercept zero
Peak Hour Volume
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
5000
10000
15000
20000
AADT
y = 0.082x
R² = 0.940
Urban-Minor Arterial
upper y
lower y
Linear (Urban-Minor Arterial) passing zero


Peak Hour Volume vs AADT
Urban-Principal Arterial-Other Con. (U2) - intercept zero
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
10000
20000
30000
40000
50000
AADT
y = 0.083x
R² = 0.946
Urban-Principal Arterial-Other Con.
upper y
lower y
Linear (Urban-Principal Arterial-Other Con.) passing zero

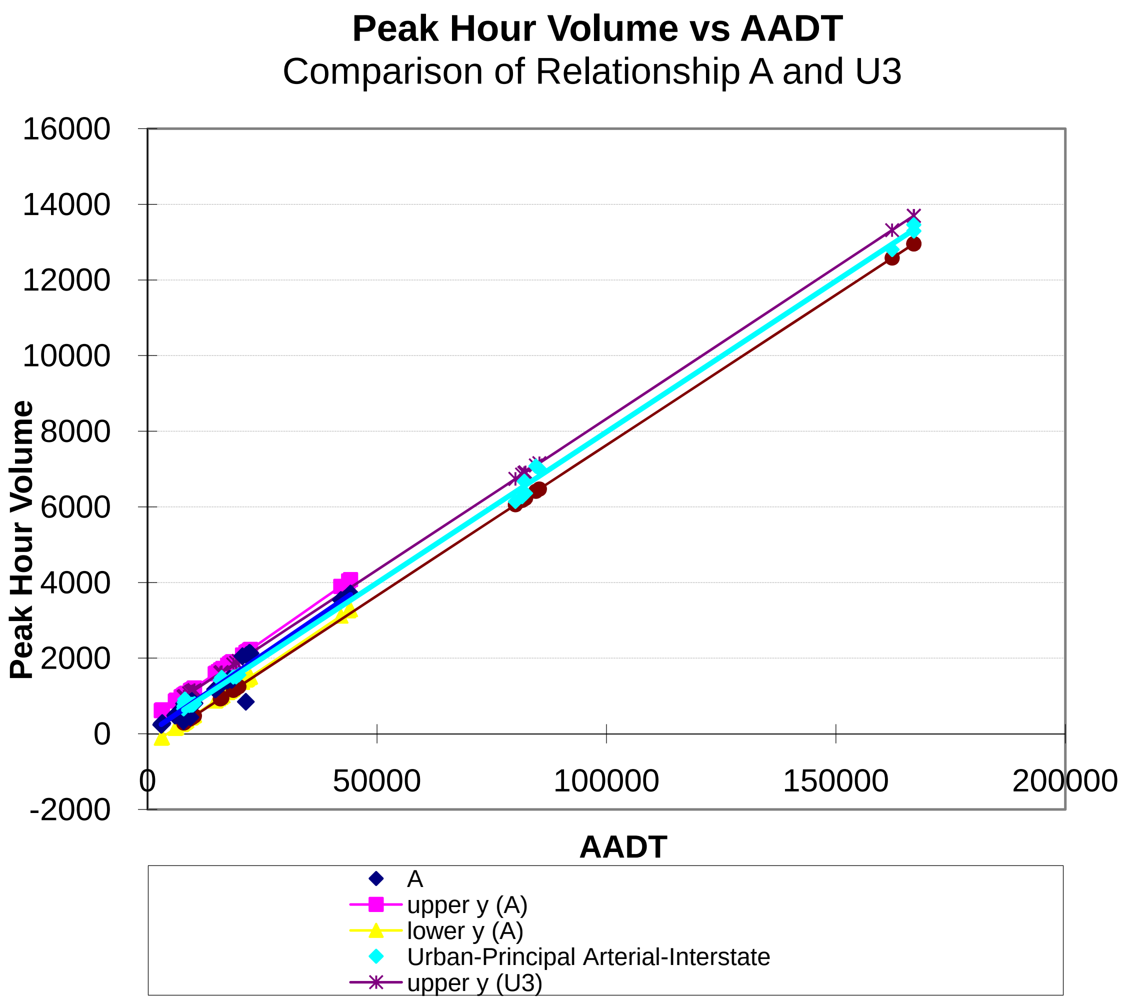

Peak Hour Volume vs AADT
Comparison of Relationship U1 and U2 - intercept zero
Peak Hour Volume
AADT
0
500
1000
1500
2000
2500
3000
3500
4000
4500
0
10000
20000
30000
40000
50000
Urban-Principal Arterial-Other Con.
Urban-Minor Arterial
upper y (U1)
lower y (U1)
upper y (U2)
lower y (U2)



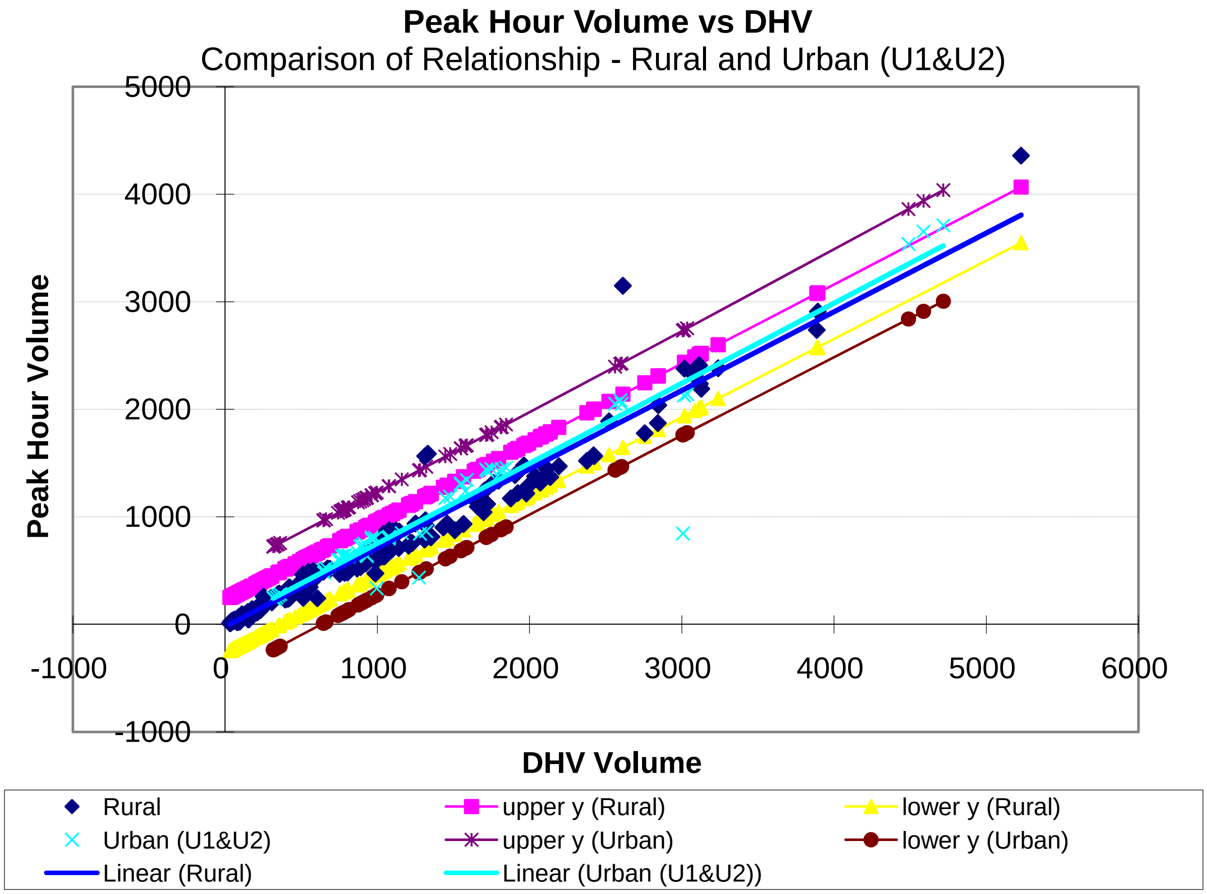
Peak Hour Volume vs AADT
Combination of Data for U1 and U2 (A) - intercept zero
y = 0.083x
R² = 0.952
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0
10000
20000
30000
40000
50000
AADT
A
upper y
lower y
Linear (A) passing zero

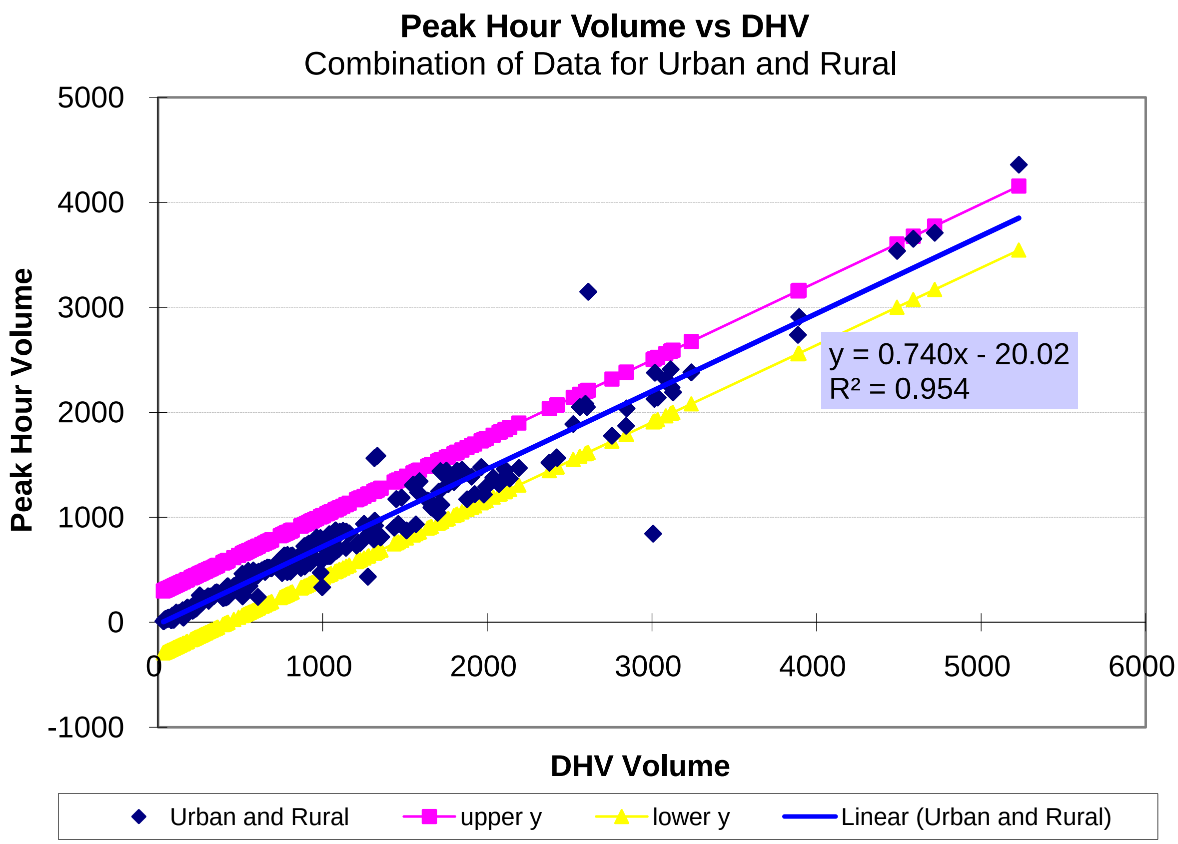


Peak Hour Volume vs AADT
Urban-Principal Arterial-Interstate (U3) - intercept zero
y = 0.079x
R² = 0.998
Peak Hour Volume
16000
14000
12000
10000
8000
6000
4000
2000
0
0
50000
100000
150000
200000
AADT
Urban-Principal Arterial-Interstate
upper y
lower y
Linear (Urban-Principal Arterial-Interstate) passing zero

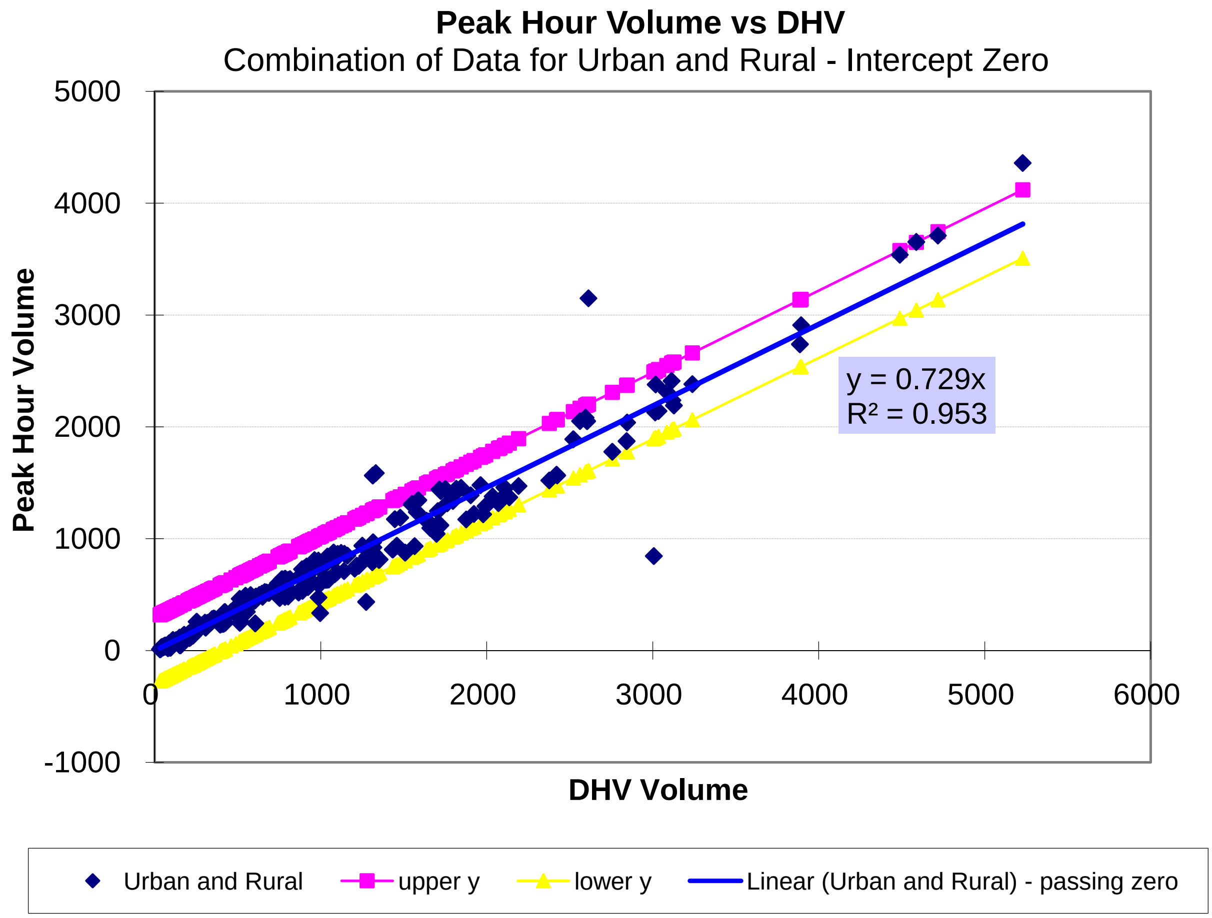

Peak Hour Volume vs AADT
Comparison of Relationship A and U3
Peak Hour Volume
AADT
16000
14000
12000
10000
8000
6000
4000
2000
0
-2000
0
50000
100000
150000
200000
A
upper y (A)
lower y (A)
Urban-Principal Arterial-Interstate
upper y (U3)

The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **Peak Hour Volume vs DHV-Urban and Rural.**

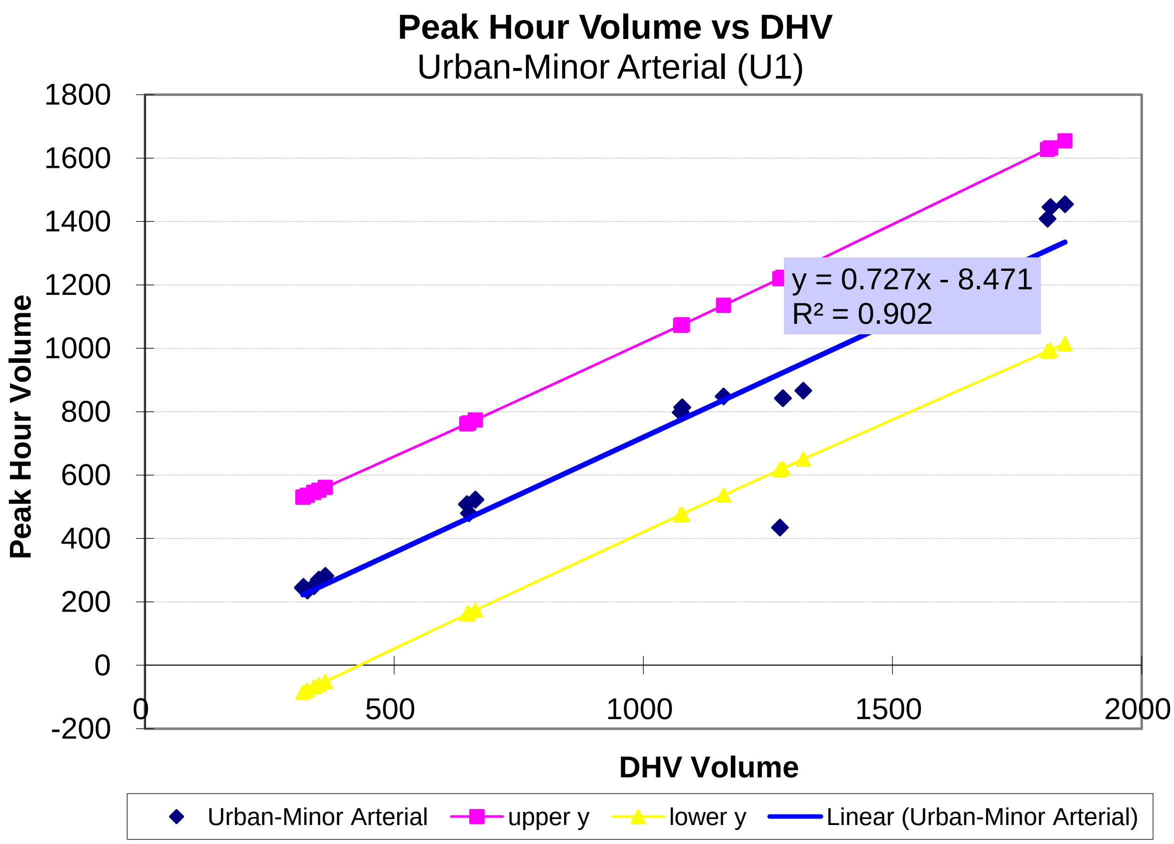

Peak Hour Volume vs DHV
Comparison of Relationship - Rural and Urban (U1&U2)
Peak Hour Volume
DHV Volume
5000
4000
3000
2000
1000
0
-1000
-1000
0
1000
2000
3000
4000
5000
6000
Rural
Urban (U1&U2)
Linear (Rural)
upper y (Rural)
upper y (Urban)
Linear (Urban (U1&U2))
lower y (Rural)
lower y (Urban)

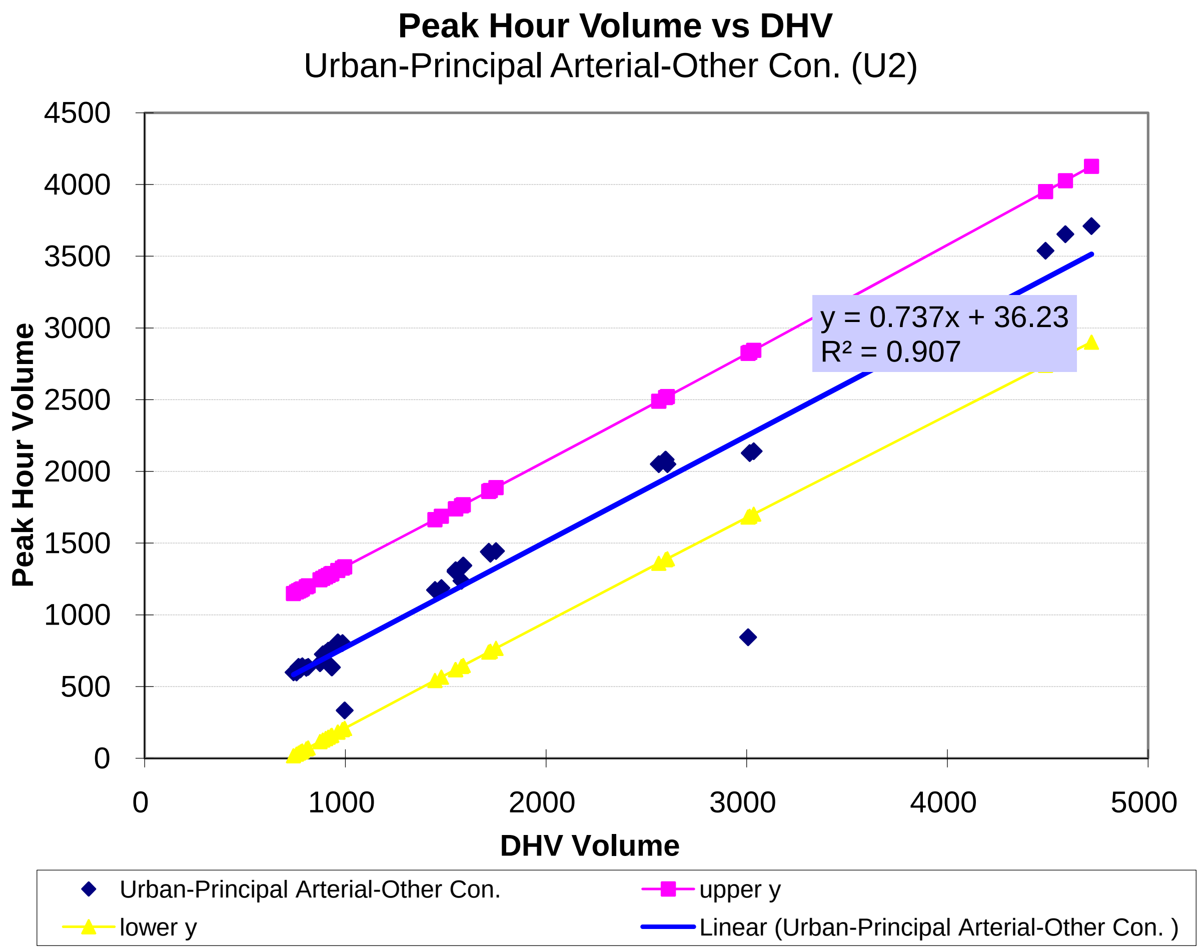


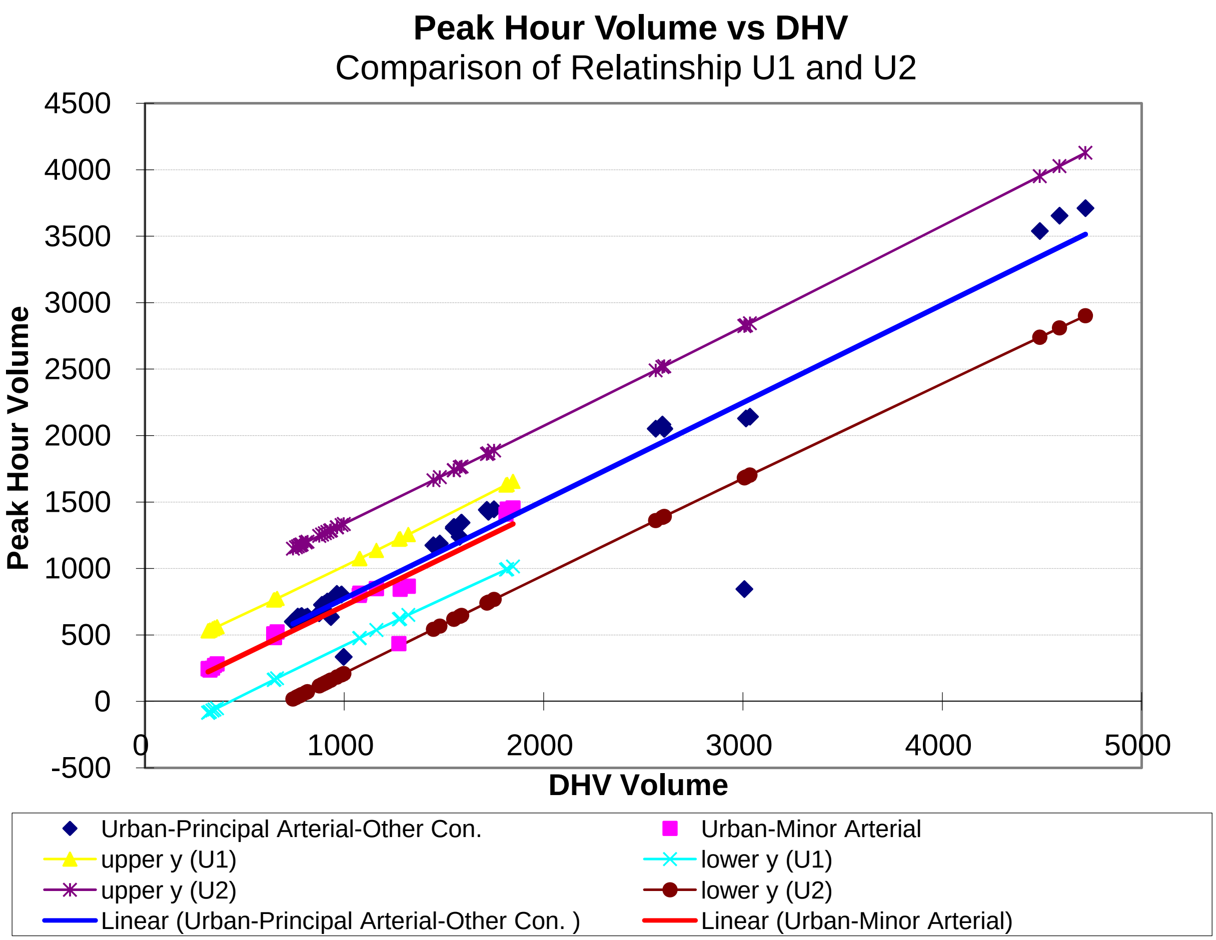
Peak Hour Volume vs DHV
Combination of Data for Urban and Rural
Peak Hour Volume
5000
4000
3000
2000
1000
0
-1000
0
1000
2000
3000
4000
5000
6000
DHV Volume
y = 0.740x - 20.02
R² = 0.954
Urban and Rural
upper y
lower y
Linear (Urban and Rural)


Peak Hour Volume vs DHV
Combination of Data for Urban and Rural - Intercept Zero
Peak Hour Volume
DHV Volume
5000
4000
3000
2000
1000
0
-1000
0
1000
2000
3000
4000
5000
6000
y = 0.729x
R² = 0.953
Urban and Rural
upper y
lower y
Linear (Urban and Rural) - passing zero

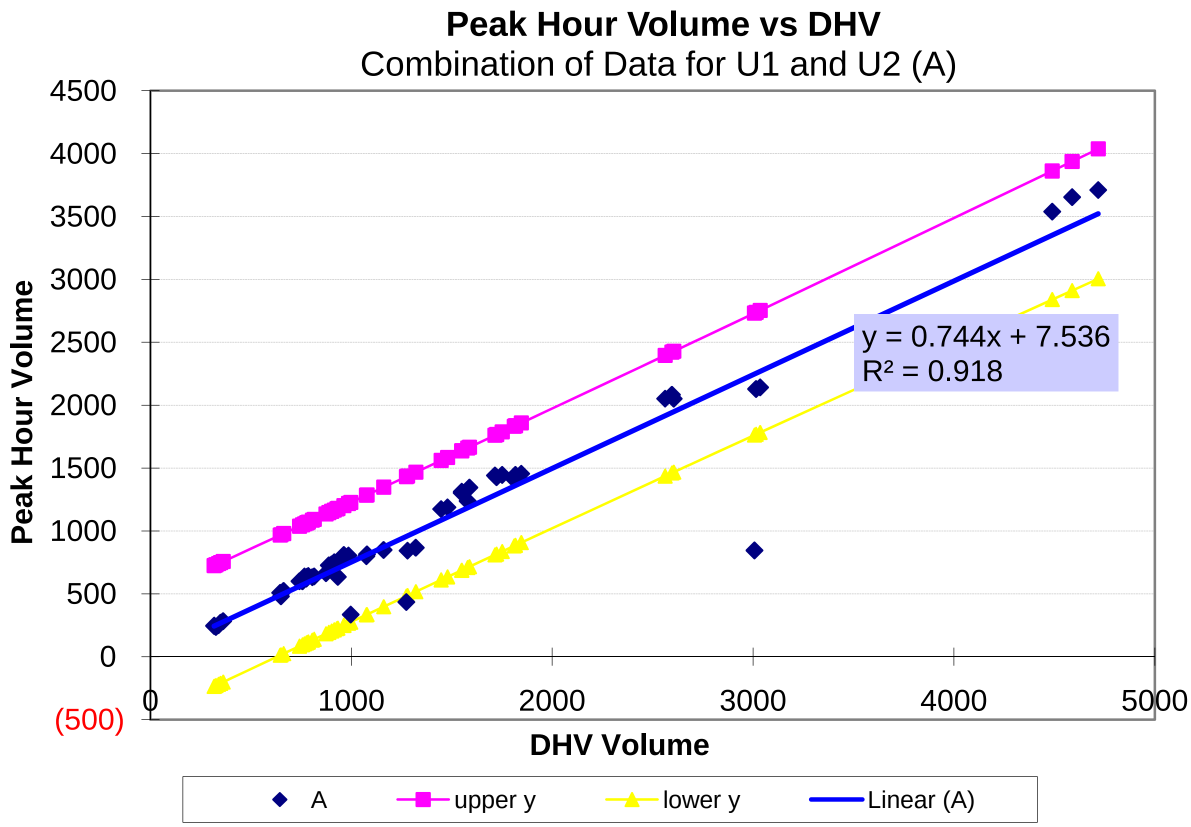
The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **Peak Hour Volume vs DHV-Urban.**

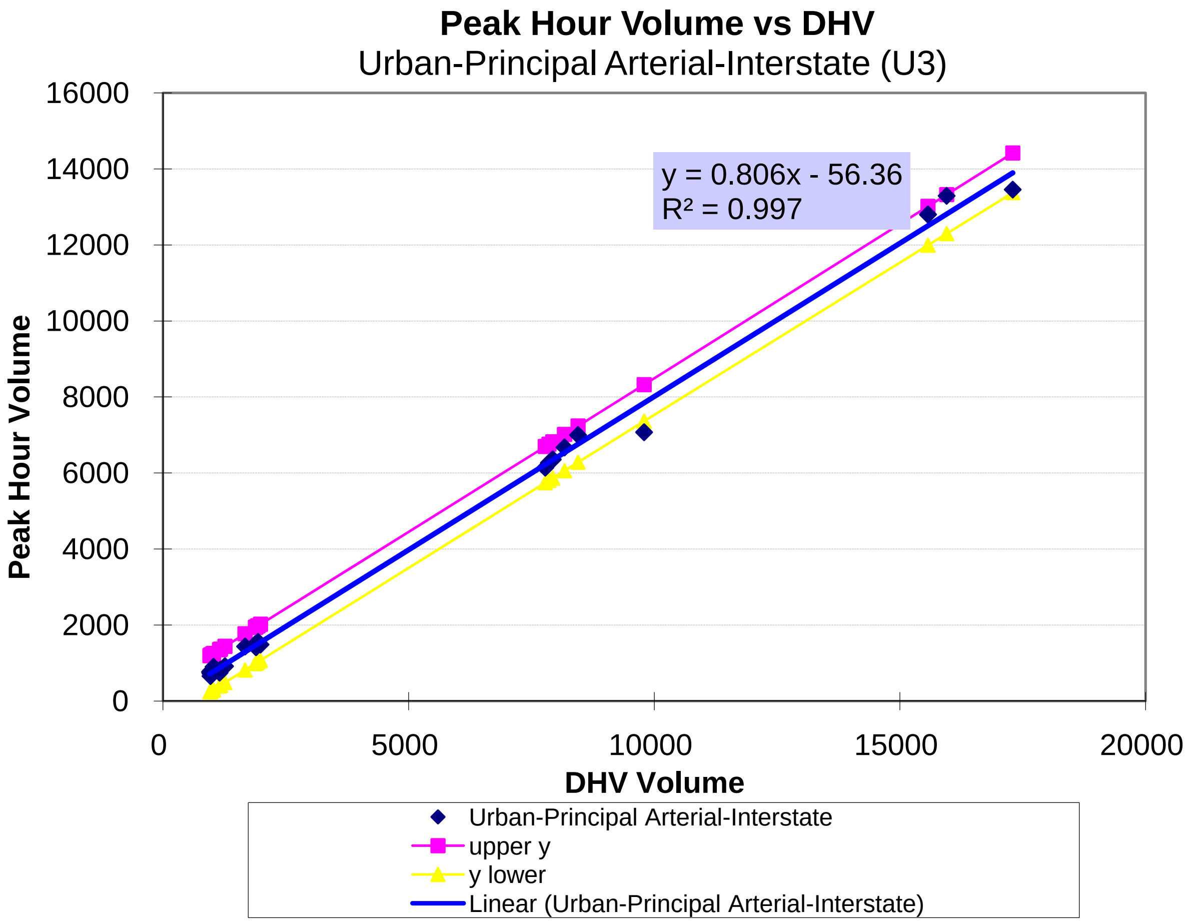

Peak Hour Volume vs DHV
Urban-Minor Arterial (U1)
1800
1600
1400
1200
1000
800
600
400
200
0
-200
Peak Hour Volume
y = 0.727x - 8.471
R² = 0.902
0
500
1000
1500
2000
DHV Volume
Urban-Minor Arterial
upper y
lower y
Linear (Urban-Minor Arterial)


Peak Hour Volume vs DHV
Urban-Principal Arterial-Other Con. (U2)
y = 0.737x + 36.23
R² = 0.907
Peak Hour Volume
DHV Volume
0
500
1000
1500
2000
2500
3000
3500
4000
4500
0
1000
2000
3000
4000
5000
Urban-Principal Arterial-Other Con.
upper y
lower y
Linear (Urban-Principal Arterial-Other Con.)

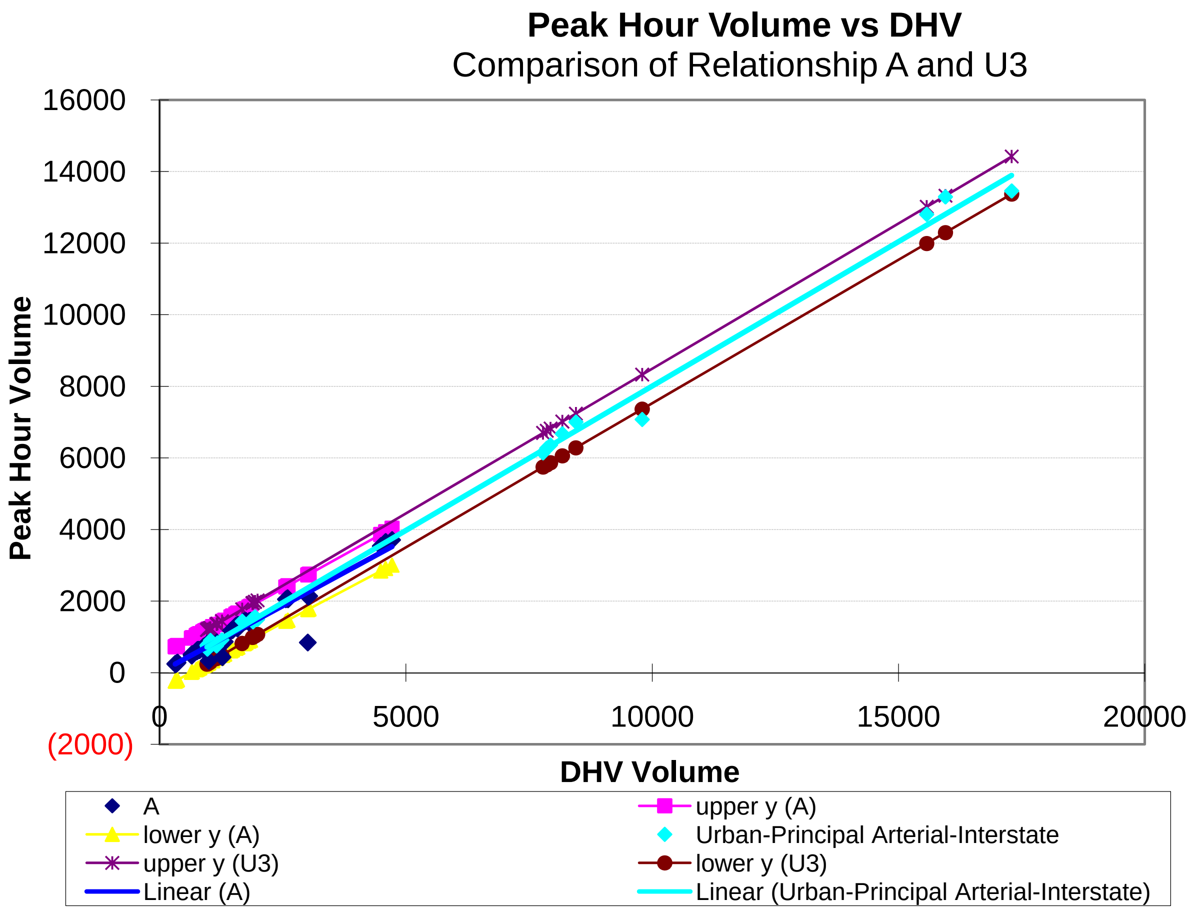


Peak Hour Volume vs DHV
Comparison of Relatinship U1 and U2
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
Peak Hour Volume
0
1000
2000
3000
4000
5000
DHV Volume
Urban-Principal Arterial-Other Con.
Urban-Minor Arterial
upper y (U1)
lower y (U1)
upper y (U2)
lower y (U2)
Linear (Urban-Principal Arterial-Other Con.)
Linear (Urban-Minor Arterial)

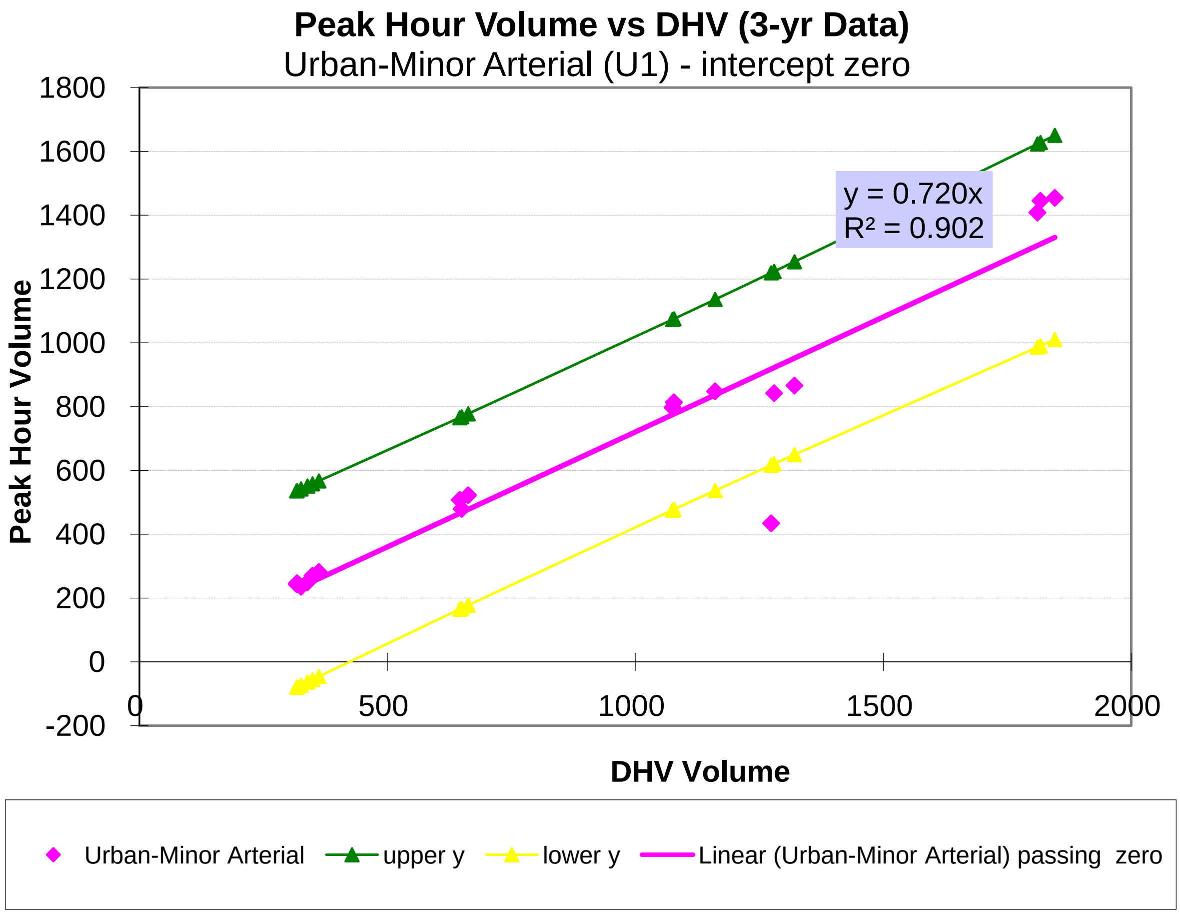

Peak Hour Volume vs DHV
Combination of Data for U1 and U2 (A)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
(500)
Peak Hour Volume
0
1000
2000
3000
4000
5000
DHV Volume
y = 0.744x + 7.536
R² = 0.918
A
upper y
lower y
Linear (A)



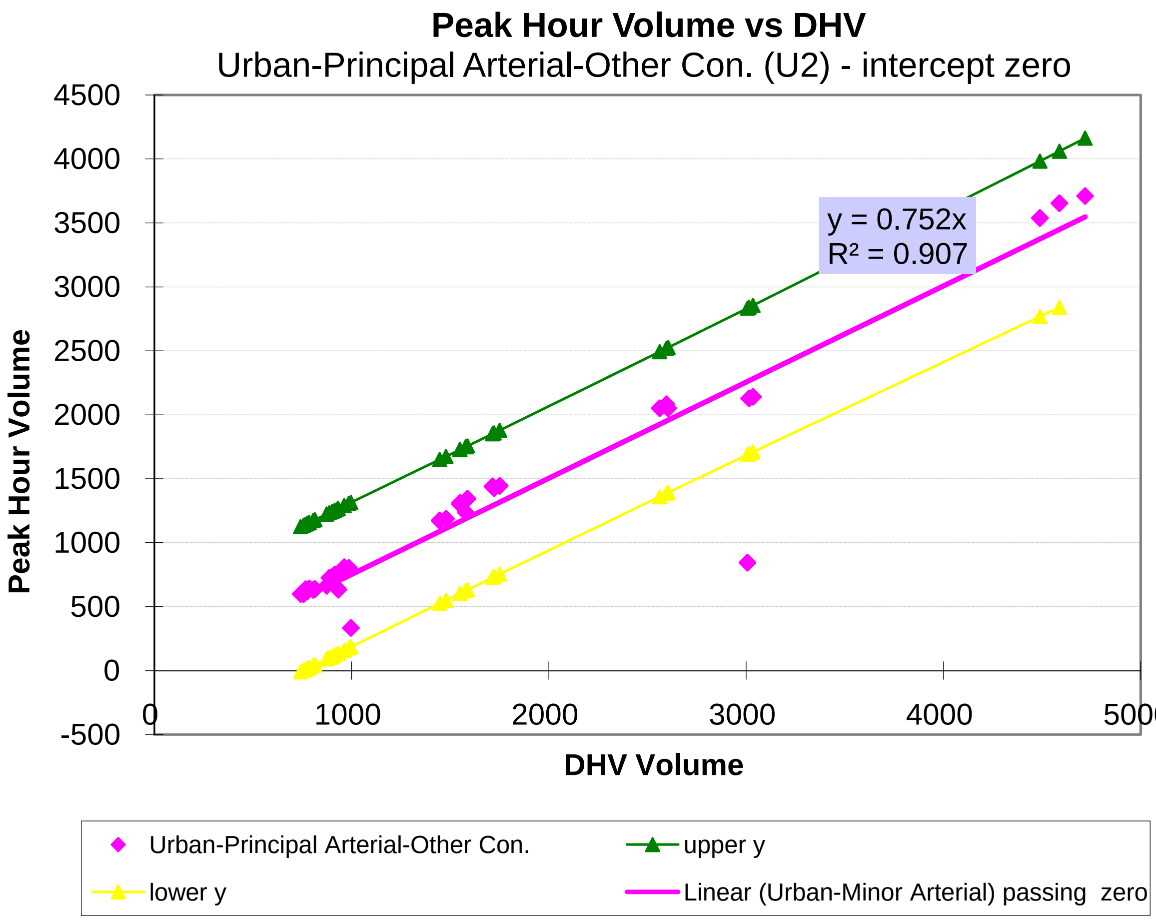
Peak Hour Volume vs DHV
Urban-Principal Arterial-Interstate (U3)
y = 0.806x - 56.36
R² = 0.997
16000
14000
12000
10000
8000
6000
4000
2000
0
0
5000
10000
15000
20000
Peak Hour Volume
DHV Volume
Urban-Principal Arterial-Interstate
upper y
y lower
Linear (Urban-Principal Arterial-Interstate)


Peak Hour Volume vs DHV
Comparison of Relationship A and U3
Peak Hour Volume
16000
14000
12000
10000
8000
6000
4000
2000
0
(2000)
0
5000
10000
15000
20000
DHV Volume
A
upper y (A)
lower y (A)
Urban-Principal Arterial-Interstate
upper y (U3)
lower y (U3)
Linear (A)
Linear (Urban-Principal Arterial-Interstate)

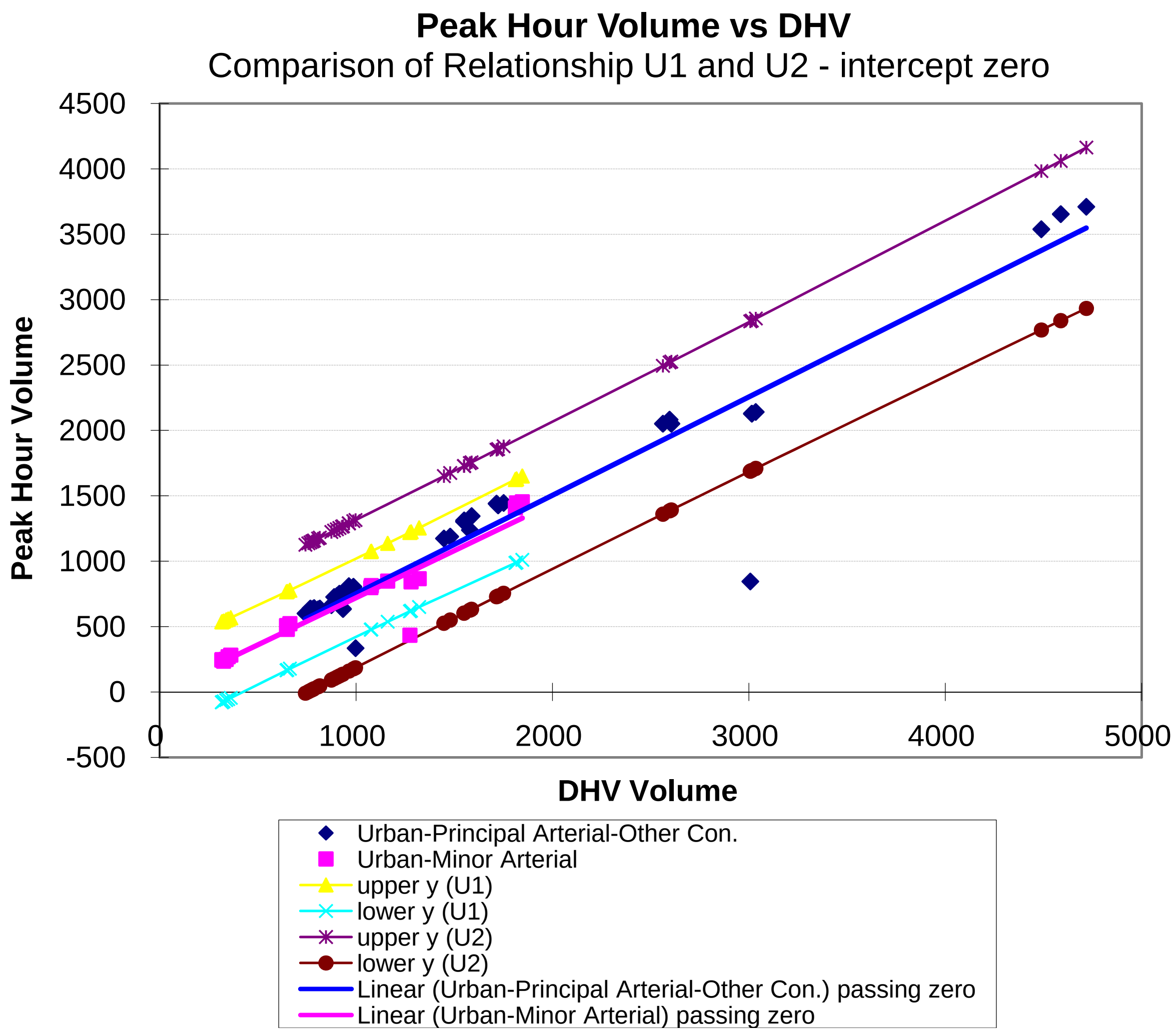
The following sequence of comparisons ultimately determines a best-fit regression equation for the relationship of **Peak Hour Volume vs. DHV-Urban Passing Zero.**

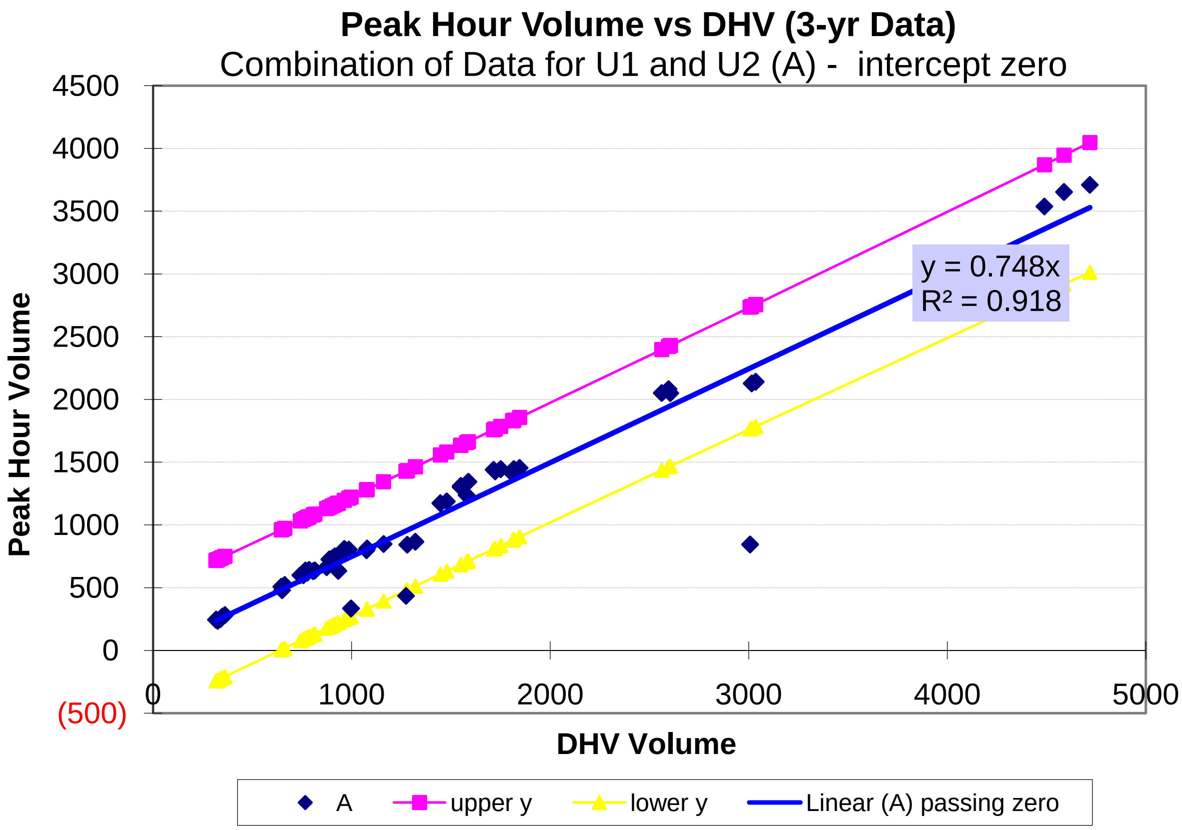


Peak Hour Volume vs DHV (3-yr Data)
Urban-Minor Arterial (U1) - intercept zero
Peak Hour Volume
1800
1600
1400
1200
1000
800
600
400
200
0
-200
0
500
1000
1500
2000
DHV Volume
y = 0.720x
R² = 0.902
Urban-Minor Arterial
upper y
lower y
Linear (Urban-Minor Arterial) passing zero

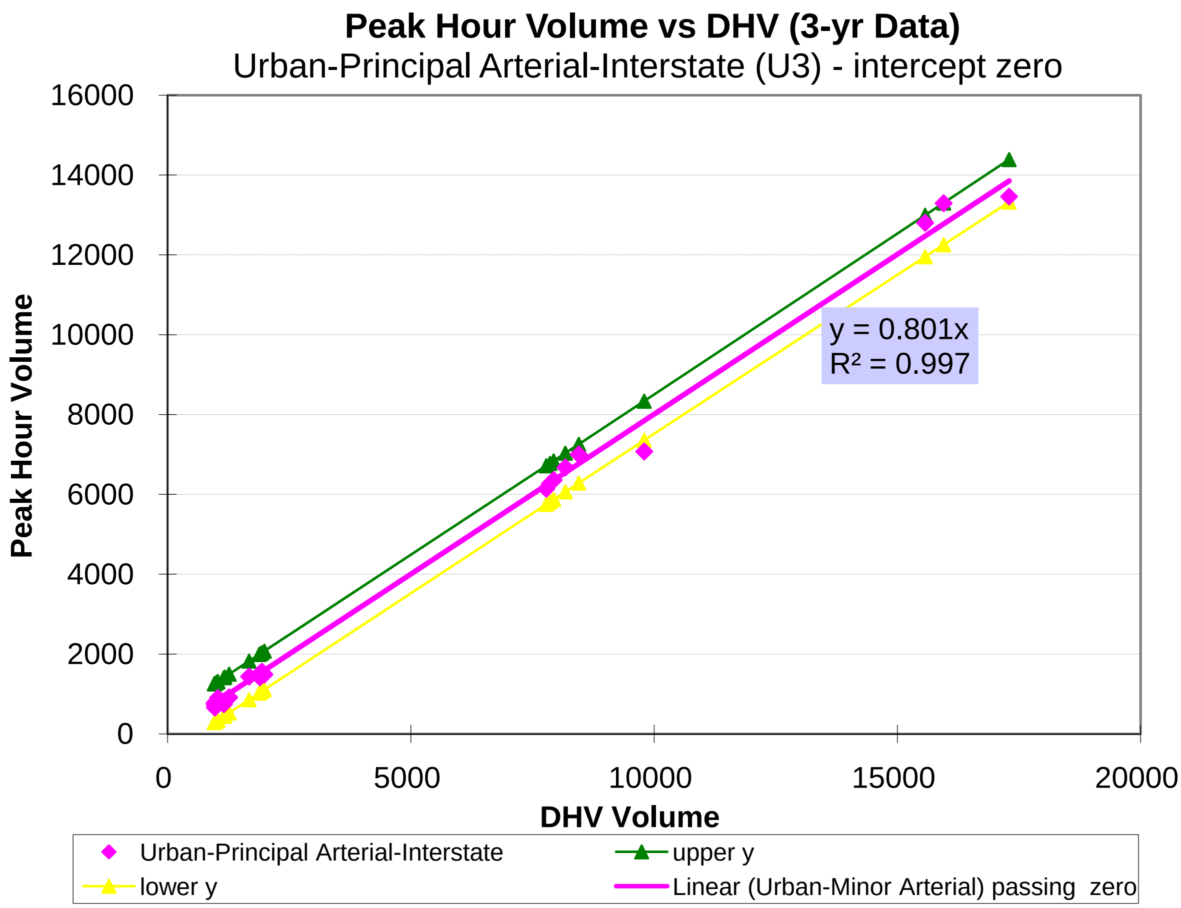


Peak Hour Volume vs DHV
Urban-Principal Arterial-Other Con. (U2) - intercept zero
y = 0.752x
R² = 0.907
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0
1000
2000
3000
4000
5000
DHV Volume
Urban-Principal Arterial-Other Con.
upper y
lower y
Linear (Urban-Minor Arterial) passing zero

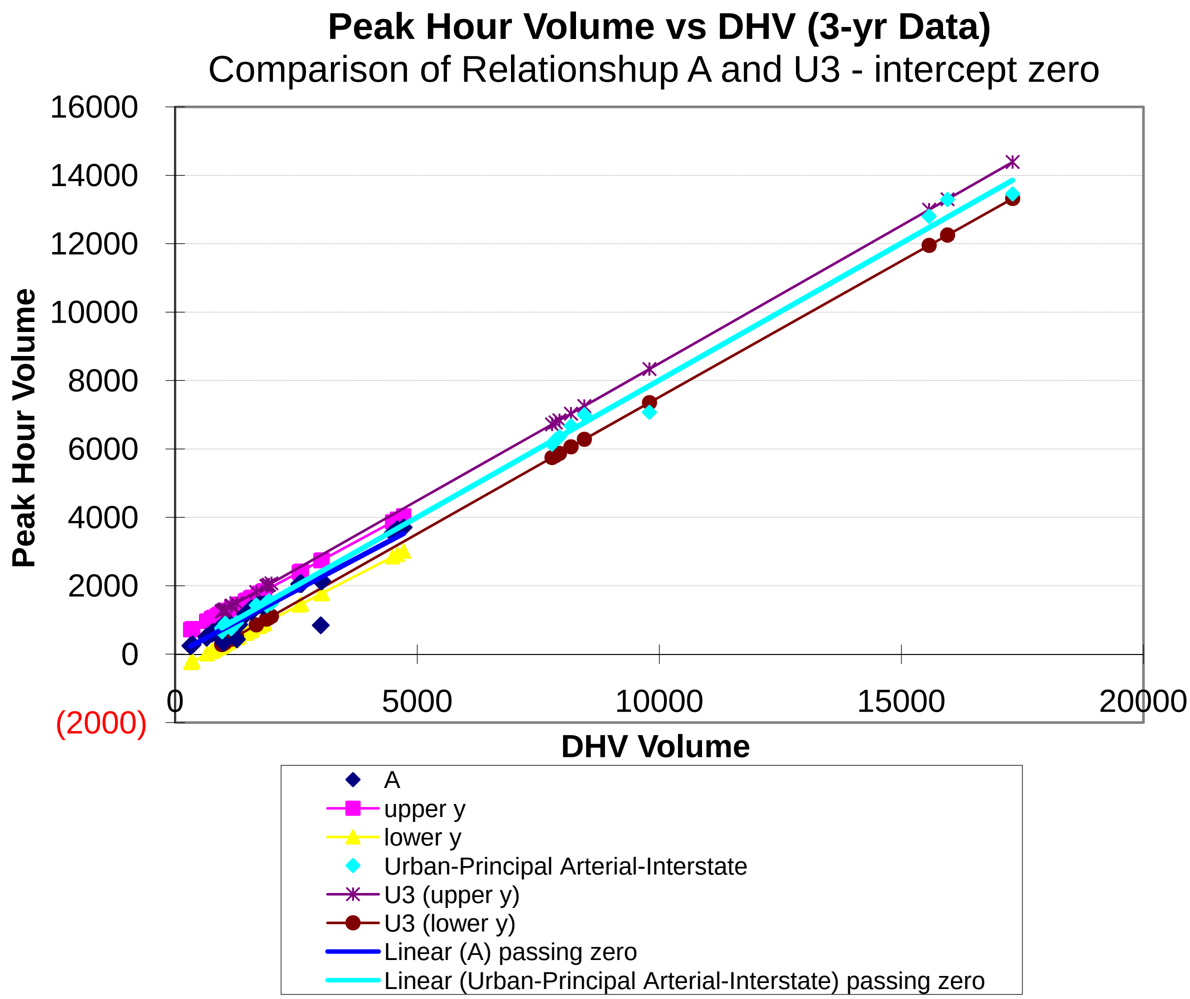

Peak Hour Volume vs DHV
Comparison of Relationship U1 and U2 - intercept zero
Peak Hour Volume
DHV Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
0
1000
2000
3000
4000
5000
Urban-Principal Arterial-Other Con.
Urban-Minor Arterial
upper y (U1)
lower y (U1)
upper y (U2)
lower y (U2)
Linear (Urban-Principal Arterial-Other Con.) passing zero
Linear (Urban-Minor Arterial) passing zero



Peak Hour Volume vs DHV (3-yr Data)
Combination of Data for U1 and U2 (A) - intercept zero
Peak Hour Volume
4500
4000
3500
3000
2500
2000
1500
1000
500
0
(500)
0
1000
2000
3000
4000
5000
DHV Volume
y = 0.748x
R² = 0.918
A
upper y
lower y
Linear (A) passing zero



Peak Hour Volume vs DHV (3-yr Data)
Urban-Principal Arterial-Interstate (U3) - intercept zero
y = 0.801x
R² = 0.997
Peak Hour Volume
0
2000
4000
6000
8000
10000
12000
14000
16000
0
5000
10000
15000
20000
DHV Volume
Urban-Principal Arterial-Interstate
upper y
lower y
Linear (Urban-Minor Arterial) passing zero


Peak Hour Volume vs DHV (3-yr Data)
Comparison of Relationshup A and U3 - intercept zero
Peak Hour Volume
16000
14000
12000
10000
8000
6000
4000
2000
0
(2000)
0
5000
10000
15000
20000
DHV Volume
A
upper y
lower y
Urban-Principal Arterial-Interstate
U3 (upper y)
U3 (lower y)
Linear (A) passing zero
Linear (Urban-Principal Arterial-Interstate) passing zero

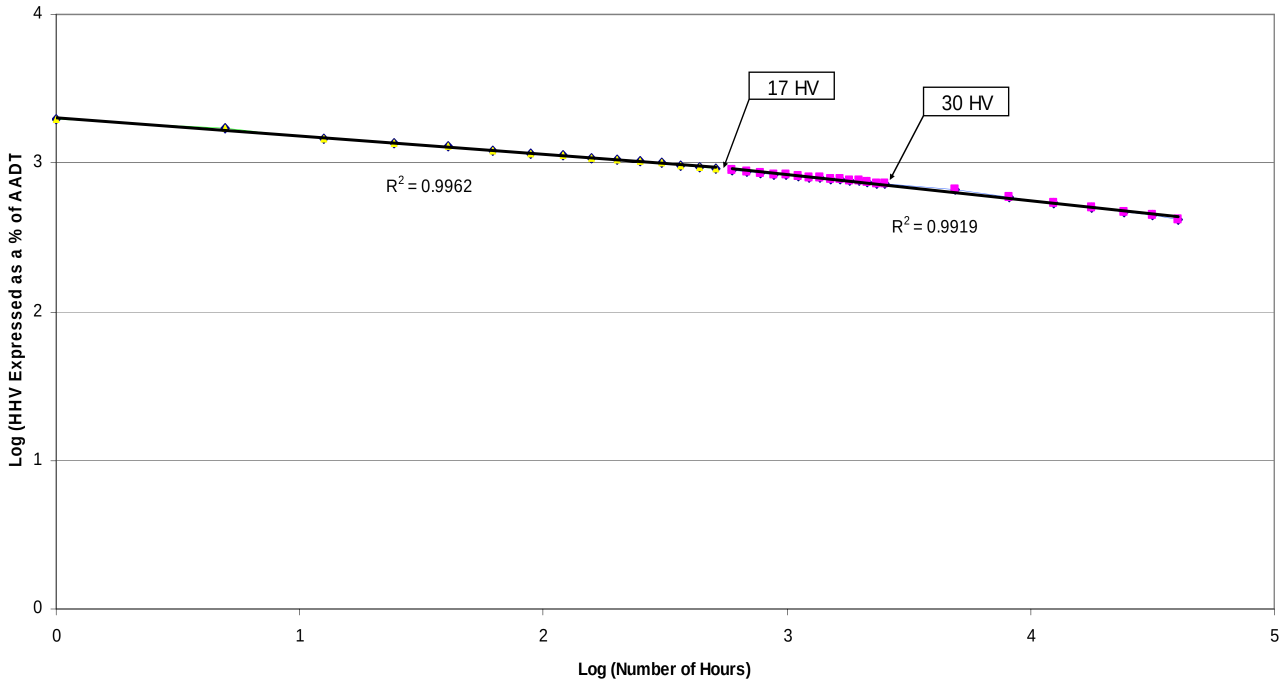
Appendix C

Determination of Break Point Design Hourly Volume

for Each Functional Class of Roadway

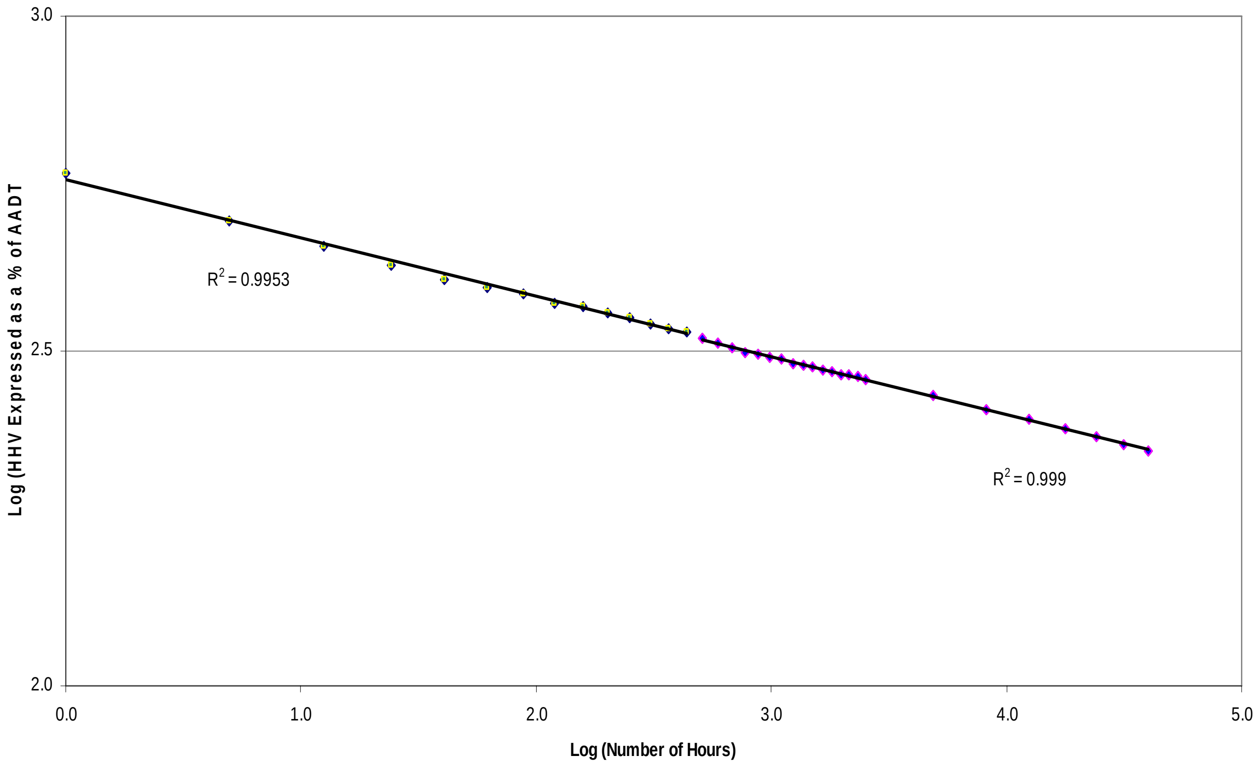
The following appendix contains figures depicting the first significant break point before 30HV for each functional class of roadway given in NDOR Continuous Count Data and Traffic Characteristic Reports from 2001-2003. The complete data set for each functional type is divided into two separate data sets, the first one comprising values from the 30^{th} hour to the 100^{th} hour, and the second one from 1^{st} hour to the 29^{th}. The R^2 of both the data sets and their difference is noted. This process is repeated adding the last point in first set to the second set and eliminating that point from the first set. The break point is considered to be the point where the difference in R^2 between the two data sets is greatest taking into consideration the linearity of the complete data set.

Figure C. 1: Rural-Major Collector



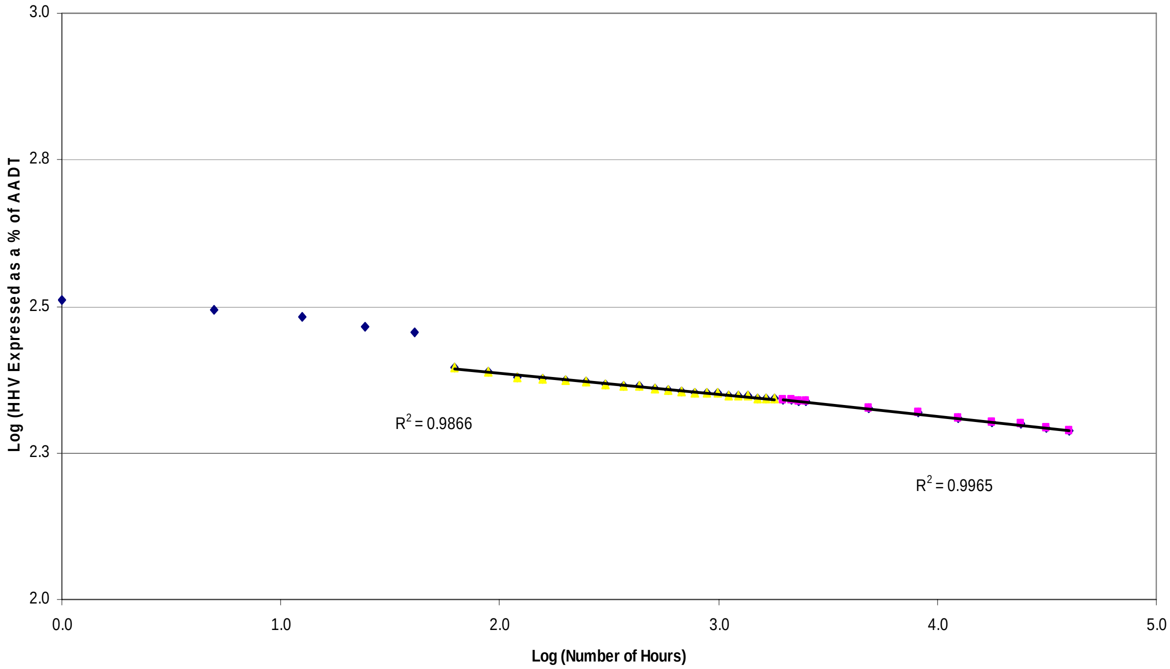
	1 set R^2	2 set R^2	Diff
30 -100	0.996	0.995	0.001
29 -100	0.996	0.995	0.001
28 -100	0.996	0.995	0.001
27 -100	0.996	0.995	0.001
26 -100	0.996	0.995	0.001
25 -100	0.996	0.995	0.001
24 -100	0.996	0.994	0.002
23 -100	0.995	0.994	0.001
22 -100	0.995	0.994	0.001
21-100	0.995	0.994	0.001
20 -100	0.994	0.994	0.000
19 -100	0.994	0.994	0.000
18 -100	0.993	0.995	-0.002
17-100	***0.992***	***0.996***	***-0.004***
16 -100	0.992	0.996	-0.004

Figure C. 2: Rural-Minor Arterial



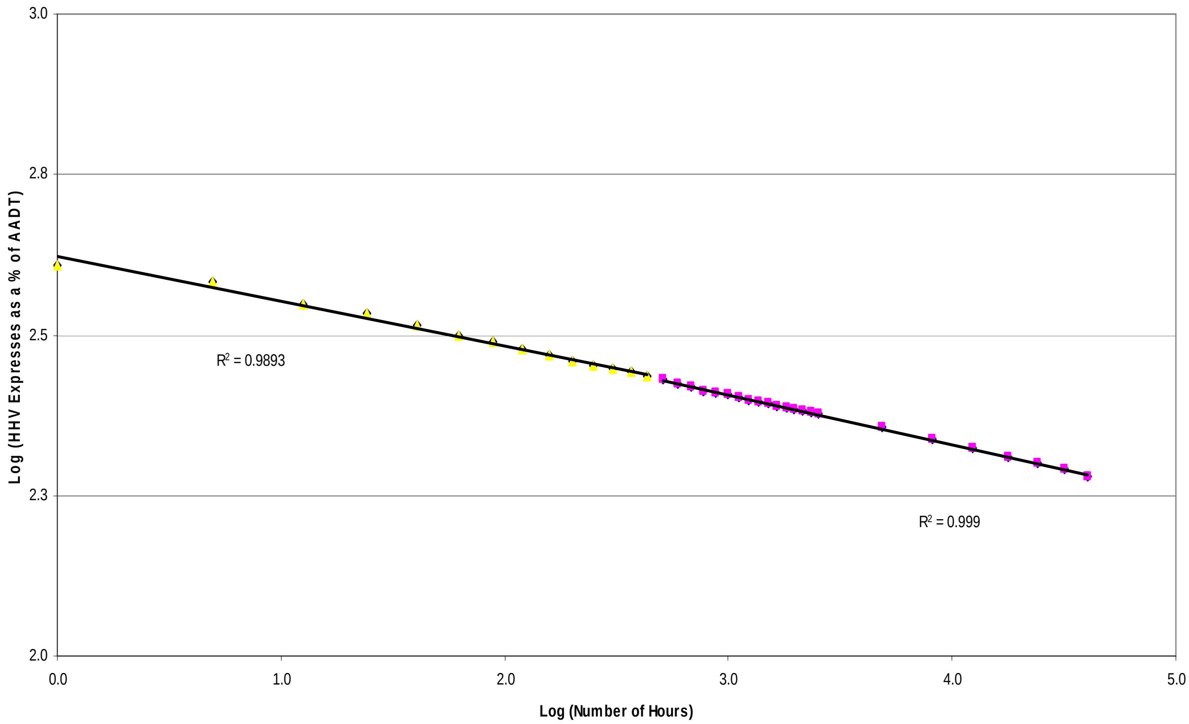
	1 set R^2	2 set R^2	Diff
30-100	0.999	0.998	0.001
29-100	0.999	0.998	0.001
28-100	0.999	0.998	0.001
27-100	0.999	0.998	0.001
26-100	0.999	0.997	0.002
25-100	0.999	0.997	0.002
24-100	0.999	0.997	0.002
23-100	0.999	0.997	0.002
22-100	0.999	0.997	0.002
21-100	0.999	0.997	0.002
20-100	0.999	0.996	0.003
19-100	0.999	0.996	0.003
18-100	0.999	0.996	0.003
17-100	0.999	0.996	0.003
16-100	0.999	0.996	0.003
15-100	0.999	0.996	0.003
14-100	***0.999***	***0.995***	***0.004***
13-100	0.999	0.995	0.004

Figure C. 3: Urban-Minor Arterial



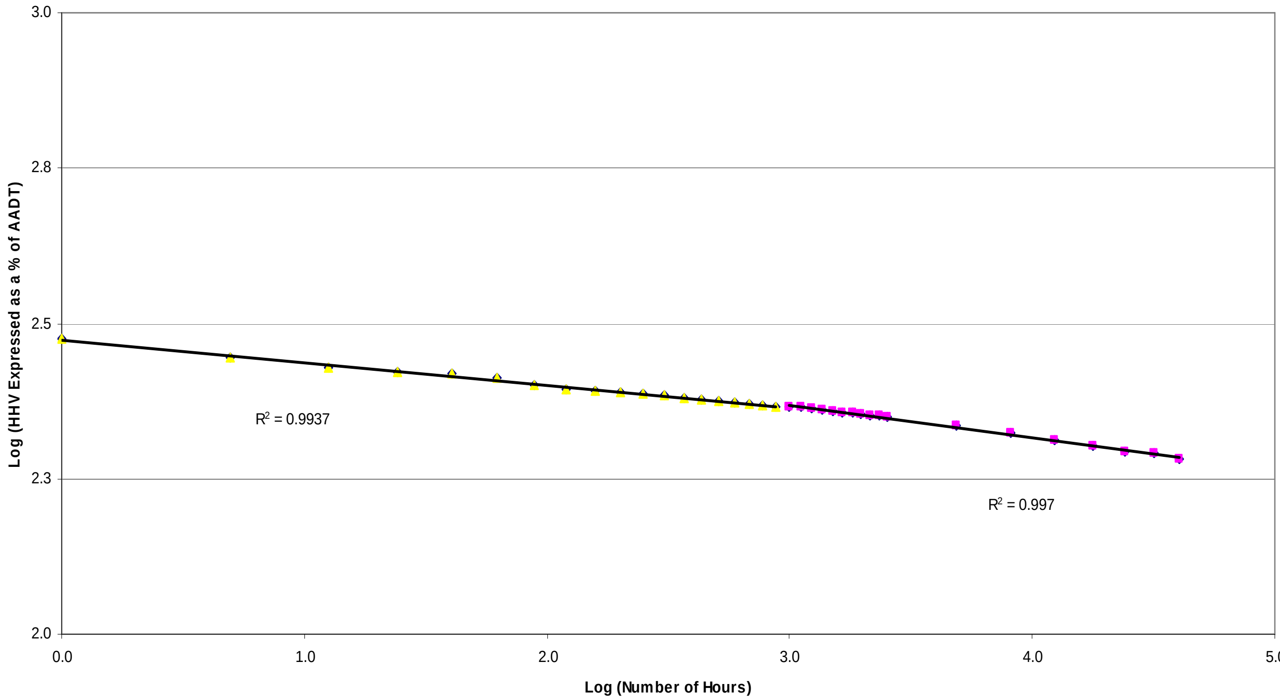
	1 set R^2	2 set R^2	Diff
30-100	***0.995***	***0.988***	***0.007***
29-100	0.996	0.988	0.008
28-100	0.997	0.987	0.010
27-100	0.997	0.987	0.010

Figure C. 4: Rural-Principal Arterial Interstate



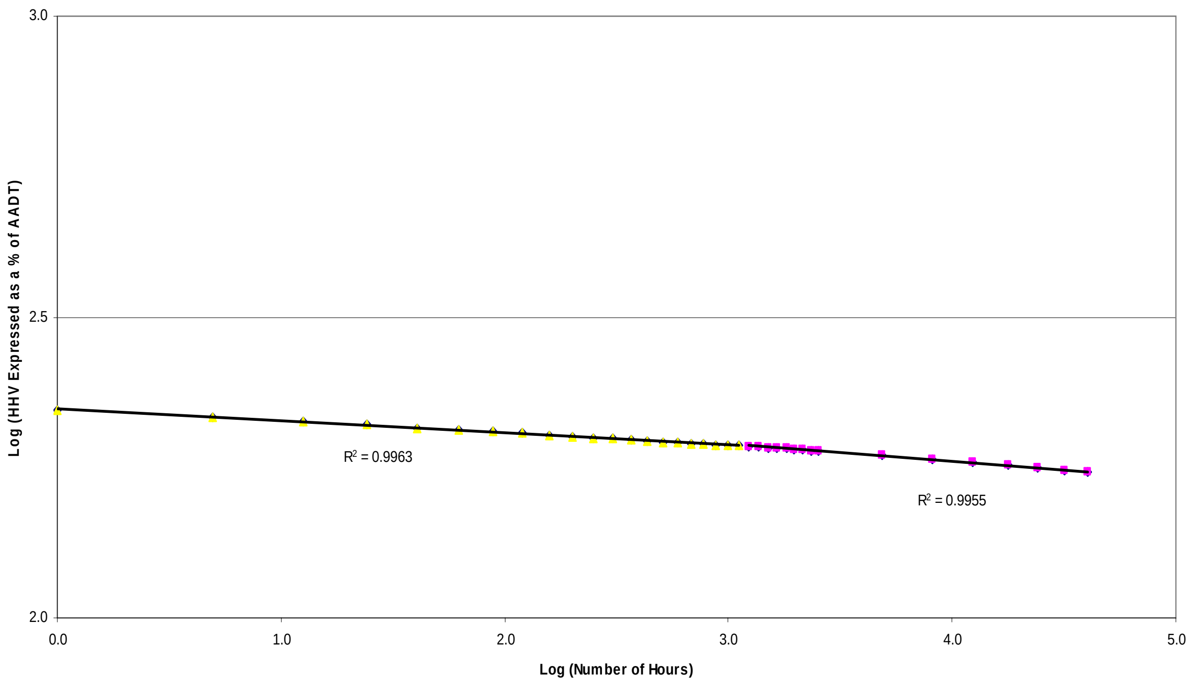
	1 set R^2	2 set R^2	Diff
30-100	0.999	0.994	0.005
29-100	0.999	0.994	0.005
28-100	0.999	0.994	0.005
27-100	0.999	0.994	0.005
26-100	0.999	0.993	0.006
25-100	0.999	0.993	0.006
24-100	0.999	0.993	0.006
23-100	0.999	0.993	0.006
22-100	0.999	0.992	0.007
21-100	0.999	0.992	0.007
20-100	***0.999***	***0.991***	***0.008***
19-100	0.999	0.991	0.008
18-100	0.999	0.991	0.008
17-100	0.999	0.991	0.008
16-100	0.999	0.991	0.008
15-100	0.999	0.990	0.009
14-100	0.999	0.989	0.010

Figure C. 5: Urban-Principal Arterial Interstate



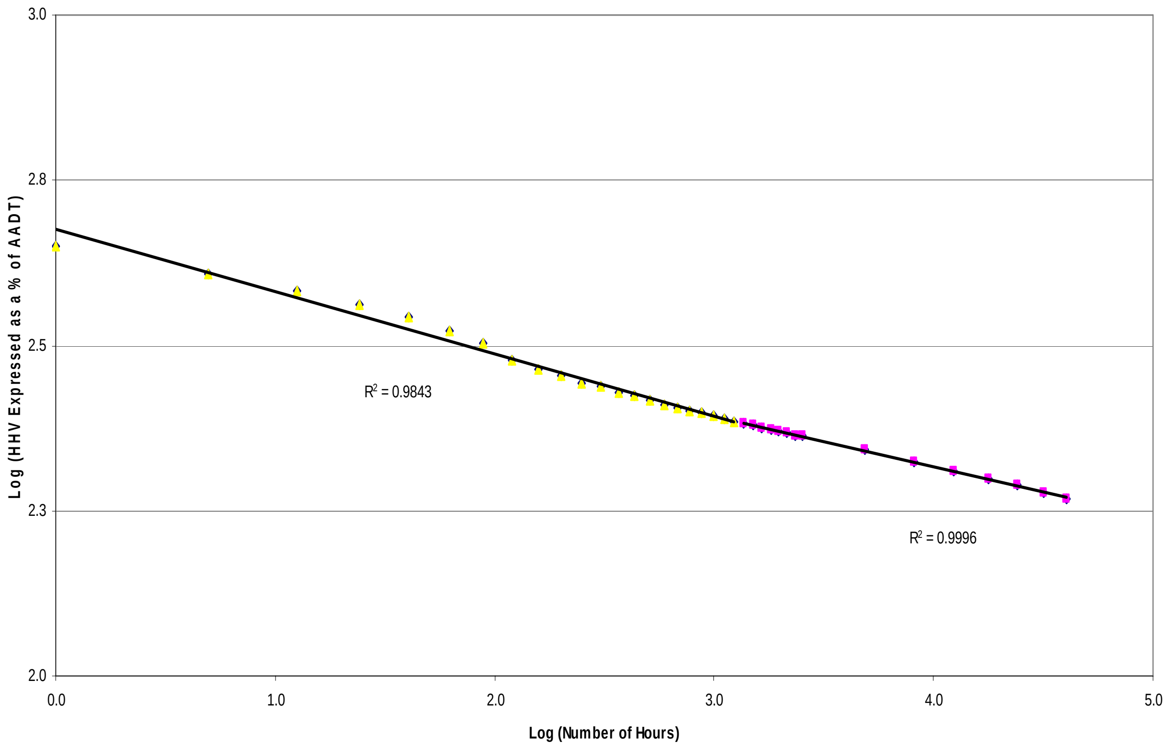
	1 set R^2	2 set R^2	Diff
30-100	0.997	0.996	0.001
29-100	0.998	0.996	0.002
28-100	0.998	0.996	0.002
27-100	0.998	0.996	0.002
26-100	0.998	0.995	0.003
25-100	0.998	0.995	0.003
24-100	0.998	0.995	0.003
23-100	***0.998***	***0.994***	***0.004***
22-100	0.998	0.994	0.004
21-100	0.998	0.994	0.004
20-100	0.997	0.994	0.003
19-100	0.996	0.993	0.003

Figure C. 6: Urban Principal Arterial Other Con.



	1 set R^2	2 set R^2	Diff
30-100	0.996	0.997	-0.001
29-100	0.996	0.997	-0.001
28-100	***0.995***	***0.997***	***-0.002***
27-100	0.995	0.997	-0.002
26-100	0.996	0.997	-0.001
25-100	0.996	0.997	-0.001
24-100	0.996	0.997	-0.001
23-100	0.996	0.996	0.000
22-100	0.996	0.996	0.000

Figure C. 7: Rural-Principal Arterial Other



	1 set R^2	2 set R^2	Diff
30-100	0.999	0.988	0.011
29-100	0.999	0.988	0.012
28-100	0.999	0.988	0.012
27-100	1.000	0.987	0.013
26-100	1.000	0.987	0.013
25-100	1.000	0.986	0.014
24-100	***1.000***	***0.985***	***0.015***
23-100	1.000	0.984	0.015

Appendix D

Summary of Results of Regression Analysis

The following appendix consists of the results of the regression analysis conducted on the data at all NDOR continuous counter stations for the three-year period 2001-2003. Regression equations developed are shown in **TABLE D1**. The independent variable (y) represents hourly traffic expressed as a percentage of AADT and x is the dependent variable (number of hours) in these equations. The extrapolated hour value is shown in the last column indicating number of hours in a year in which the average peak hour volume is exceeded at that particular counter station.

TABLE D1 Results of Regression Analysis for All Counter Stations from 2001- 03

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	1	Rural-Major Collector	410	7.48	y=-0.020x+12.79	0.9375	263
2002			411	7.75	y=-0.014x+11.88	0.9592	291
2003			420	7.69	y=-0.015x+11.71	0.9277	278
2001	2	Rural-Minor Arterial	2278	8.5	y=-0.009x+10.53	0.8851	221
2002			2418	8.58	y=-0.009x+10.53	0.8851	212
2003			2426	8.76	y=-0.01x+10.85	0.9545	209
2001	3	Rural-Minor Arterial	610	7.66	y=-0.017x+12.69	0.9681	294
2002			556	7.85	y=-0.016x+11.87	0.9412	254
2003			539	7.8	y=-0.011x+11.31	0.8997	319
2001	4N	Rural-Principal Arterial-Other	5048	9.7	y=-0.02x+13.25	0.9742	172
2002			5274	9.78	y=-0.02x+13.18	0.9669	161
2003			5344	9.64	y=-0.02x+13.37	0.9687	175
2001	4S	Rural-Principal Arterial-Other	5064	7.04	y=-0.016x+10.82	0.932	232
2002			5106	7.13	y=-0.015x+10.52	0.9201	231
2003			5205	7.17	y=-0.015x+10.77	0.9277	248
2001	4	Rural-Principal Arterial-Other	10112	8.24	y=-0.014x+10.99	0.9926	196
2002			10380	8.44	y=-0.013x+10.69	0.9753	177
2003			10549	8.27	y=-0.012x+10.93	0.9886	217
2001	5	Rural-Minor Arterial	7766	9.37	y=-0.02x+13.35	0.9683	183
2002			9156	9.17	y=-0.011x+11.62	0.9884	215
2003			10231	9.16	y=-0.02x+12.55	0.9537	194
2001	6	Rural-Principal Arterial-Other	4050	8.39	y=-0.03x+13.17	0.8525	169
2002			4146	8.36	y=-0.03x+12.78	0.896	142
2003			4106	8.37	y=-0.034x+13.26	0.9149	143
2001	7	Rural-Principal Arterial-Other	5715	8.31	y=-0.008x+10.60	0.9722	275
2002			5770	8.19	y=-0.008x+10.38	0.9586	274
2003			5852	8.24	y=-0.009x+10.56	0.9186	258
2001	8	Rural-Principal Arterial-Other	2126	8.08	y=-0.009x+10.65	0.9837	280
2002			2215	8.07	y=-0.01x+10.78	0.9655	271
2003			2231	8.07	y=-0.007x+10.38	0.9534	312
2001	9	Rural-Principal Arterial-Other	2161	8.19	y=-0.014x+10.76	0.9816	181
2002			2188	8.24	y=-0.015x+11.48	0.9643	216
2003			2131	8.35	y=-0.011x+11.04	0.9458	236
2001	10	Rural-Principal Arterial-Other	2393	7.77	y=-0.014x+11.15	0.8996	235
2002			2432	7.77	y=-0.015x+11.29	0.9412	223
2003			2408	7.84	y=-0.01x+10.66	0.9201	288
2001	11	Rural-Major Collector	322	8.55	y=-0.041x+16.27	0.9252	189
2002			338	8.54	y=-0.042x+16.08	0.9175	177
2003			303	8.79	y=-0.048x+16.80	0.9301	168

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	12	Rural-Minor Arterial	1132	7.99	y=-0.017x+11.76	0.9787	218
2002			1152	7.93	y=-0.014x+11.38	0.9524	241
2003			1168	8.04	y=-0.014x+9.75	0.9796	120
2001	13	Rural-Major Collector	321	8.79	y=-0.021x+13.64	0.974	227
2002			330	8.18	y=-0.017x+12.48	0.9477	256
2003			339	8.24	y=-0.016x+12.45	0.9472	268
2001	14	Rural-Minor Arterial	489	8.13	y=-0.016x+12.69	0.9179	278
2002			478	8.13	y=-0.021x+12.90	0.9821	226
2003			474	8.03	y=-0.019x+12.51	0.9716	237
2001	15	Rural-Minor Collector	123	8.56	y=-0.14x+28.34	0.9087	142
2002			118	8.74	y=-0.16x+31.78	0.9873	141
2003			123	8.35	y=-0.18x+34.04	0.9799	144
2001	16N	Urban-Minor Arterial	9338	9.05	y=-0.012x+13.94	0.9886	397
2002			9677	8.95	y=-0.012x+13.94	0.9676	412
2003			9486	8.88	y=-0.01x+13.70	1	482
2001	16S	Urban-Minor Arterial	8531	9.94	y=-0.012x+13.86	0.9304	319
2002			8191	9.93	y=-0.006x+13.25	0.9264	489
2003			7968	10.01	y=-0.011x+13.70	0.9831	330
2001	16	Urban-Minor Arterial	17869	8.14	y=-0.006x+10.41	0.8997	319
2002			17868	8.09	y=-0.06x+10.29	0.9608	380
2003			17454	8.07	y=-0.006x+10.47	0.9643	375
2001	17N	Rural-Principal Arterial Interstate	Data Not Available				
2002			Data Not Available				
2003			27246	7.48	y=-0.14x+10.85	0.9855	246
2001	17S	Rural-Principal Arterial Interstate	Data Not Available				
2002			Data Not Available				
2003			28143	8.45	y=-0.009x+10.88	0.955	271
2001	17	Rural-Principal Arterial Interstate	Data Not Available				
2002			Data Not Available				
2003			55389	7.87	y=-0.008x+9.63	0.9796	205
2001	18	Currently Not Assigned					
2002							
2003							
2001	19	Rural-Minor Arterial	505	7.58	y=-0.016x+12.44	0.9814	297
2002			515	7.46	y=-0.034x+14.88	0.9138	221
2003			503	7.49	y=-0.021x+13.25	0.9647	272
2001	20E	Rural-Principal Arterial Interstate	8253	7.35	y=-0.018x+12.57	0.9891	297
2002			8535	7.43	y=-0.022x+12.69	0.9623	238
2003			8458	7.46	y=-0.021x+12.65	0.9742	252
2001	20W	Rural-Principal Arterial Interstate	8223	6.89	y=-0.012x+11.49	0.9734	374
2002			8492	6.91	y=-0.009x+11.19	0.955	475
2003			8496	6.91	y=-0.016x+11.94	0.9496	318

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001		Rural-Principal	16476	7.11	y=-0.013x+11.69	0.989	345
2002	20	Arterial	17027	7.17	y=-0.015x+11.64	0.991	306
2003		Interstate	16954	7.18	y=-0.014x+11.87	0.9486	326
2001		Rural-Principal	5311	8.2	y=-0.006x+10.12	0.8679	300
2002	21	Arterial - Other	5502	8.21	y=-0.006x+10.16	0.9601	325
2003			5525	8.37	y=-0.009x+9.43	0.9796	124
2001		Rural-Principal	Data Not Available				
2002	22E	Arterial - Other	579	7.49	y=-0.019x+12.59	0.9296	270
2003			Data Not Available				
2001		Rural-Principal	Data Not Available				
2002	22W	Arterial - Other	569	7.21	y=-0.025x+12.26	0.9032	205
2003			Data Not Available				
2001		Rural-Principal	Data Not Available				
2002	22	Arterial - Other	1148	7.21	y=-0.025x+12.26	0.9032	203
2003			999	7.22	y=-0.017x+11.11	0.9798	223
2001		Urban-Principal	7568	8.76	y=-0.01x+11.75	0.9545	299
2002	23N	Arterial - Other	7346	8.68	y=-0.007x+11.18	0.973	368
2003		Con.	7292	8.66	y=-0.006x+11.13	0.9477	440
2001		Urban-Principal	7864	8.6	y=-0.013x+12.99	0.989	330
2002	23S	Arterial - Other	7586	8.47	y=-0.011x+12.57	0.988	360
2003		Con.	7449	8.51	y=-0.011x+12.76	0.956	383
2001		Urban-Principal	15432	8.02	y=-0.006x+10.33	0.9477	412
2002	23	Arterial - Other	14932	7.95	y=-0.006x+10.01	0.8997	374
2003		Con.	14741	7.96	y=-0.004x+9.90	0.9259	464
2001		Urban-Principal	80160	7.66	y=-0.004x+9.79	0.9175	532
2002	24E	Arterial	82353	7.72	y=-0.004x+9.73	0.9259	479
2003		Interstate	81612	7.68	y=-0.004x+9.66	0.8521	566
2001		Urban-Principal	82090	8.13	y=-0.004x+9.98	0.8929	515
2002	24W	Arterial	84613	8.36	y=-0.006x+11.68	0.973	488
2003		Interstate	85375	8.2	y=-0.003x+9.89	0.8231	652
2001		Urban-Principal	162250	7.89	y=-0.002x+9.57	0.7619	886
2002	24	Arterial	166966	8.06	y=-0.004x+10.39	0.9182	532
2003		Interstate	166987	7.96	y=-0.003x+9.54	0.8126	585
2001		Urban-Principal	25571	8.63	y=-0.008x+10.52	0.9814	231
2002	25W	Arterial - Other	Data Not Available				
2003			Data Not Available				
2001		Urban-Principal	21428	9.93	y=-0.006x+14.14	0.9301	231
2002	26N	Arterial - Other	22208	9.64	y=-0.007x+13.78	0.973	609
2003		Con.	22422	9.49	y=-0.01x+13.7	1	421
2001		Urban-Principal	20692	9.91	y=-0.004x+12.59	0.9182	231
2002	26S	Arterial - Other		9.64	y=-0.005x+12.11	0.9201	503
2003		Con.	21796	9.41	y=-0.004x+11.83	0.9259	577

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	26	Urban-Principal Arterial - Other Con.	42120	8.4	y=-0.003x+10.64	0.8126	231
2002			43806	8.34	y=-0.003x+10.50	0.8901	674
2003			44218	8.39	y=-0.006x+10.73	0.9477	417
2001	27E	Rural-Principal Arterial - Interstate	3120	8.24	y=-0.043x+17.23	0.8857	209
2002			3210	8	y=-0.021x+8.18	0.9245	8.4
2003			Data Not Available				
2001	27W	Rural-Principal Arterial - Interstate	3144	7.7	y=-0.06x+20.51	0.9511	206
2002			3297	7.49	y=-0.06x+16.75	0.9334	158
2003			Data Not Available				
2001	27	Rural-Principal Arterial - Interstate	6264	7.56	y=-0.035x+16.87	0.9672	258
2002			6507	7.52	y=-0.024x+9.62	0.97	62
2003			Data Not Available				
2001	28E	Urban-Principal Arterial - Other	20007	7.87	y=-0.003x+9.44	0.8231	606
2002			18368	7.65	y=-0.0011x+9.90	0.8917	212
2003			Data Not Available				
2001	28W	Urban-Principal Arterial - Other	20489	7.47	y=-0.006x+8.86	0.9601	232
2002			18860	7.69	y=-0.007x+9..38	0.9534	228
2003			19580	7.63	y=-0.005x+8.74	0.9603	214
2001	28	Urban-Principal Arterial - Other	40496	7.67	y=-0.003x+8.99	0.8901	415
2002			37228	7.67	y=-0.009x+9.39	0.9556	184
2003			Data Not Available				
2001	29E	Urban-Principal Arterial - Other Con.	8095	7.87	y=-0.004x+9.50	0.9182	370
2002			8273	7.68	y=-0.005x+9.54	0.9603	358
2003			8331	7.7	y=-0.005x+9.5	0.913	360
2001	29W	Urban-Principal Arterial - Other Con.	10043	8.05	y=-0.004x+9.59	0.9175	385
2002			10082	7.84	y=-0.005x+9.64	0.9168	391
2003			10215	7.87	y=-0.005x+9.7	0.913	366
2001	29	Urban-Principal Arterial - Other Con.	18138	7.94	y=-0.006x+9.59	0.9608	285
2002			18355	7.77	y=-0.004x+9.43	0.9259	396
2003			18546	7.79	y=-0.004x+9.46	0.8601	418
2001	30	Rural-Major Colectors	1544	8.59	y=-0.02x+15.02	0.9392	270
2002			1552	8.48	y=-0.02x+15.40	0.9924	318
2003			1475	8.43	y=-0.02x+15.41	0.981	340
2001	31E	Rural-Principal Arterial Interstate	3614	6.59	y=-0.013x+11.09	0.9418	341
2002			3738	6.59	y=-0.011x+10.83	0.9382	342
2003			3699	6.6	y=-0.013x+11.21	0.8854	354
2001	31W	Rural-Principal Arterial Interstate	3499	6.59	y=-0.014x+11.54	0.9715	356
2002			3604	6.55	y=-0.011x+11.46	0.9883	455
2003			3606	6.6	y=-0.015x+11.87	0.971	349
2001	31	Rural-Principal Arterial Interstate	7113	6.59	y=-0.012x+10.82	0.9601	356
2002			7342	6.52	y=-0.011x+10.94	0.9883	409
2003			7305	6.6	y=-0.015x+11.45	0.9809	321

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	32E	Urban-Principal Arterial Interstate	8148	11.24	y=-0.021x+16.02	0.9667	223
2002			8112	11.11	y=-0.018x+13.22	0.9885	113
2003			7971	10.42	y=-0.023x+15.09	0.9167	206
2001	32W	Urban-Principal Arterial Interstate	8003	9.35	y=-0.012x+14.81	0.9498	274
2002			7933	9.13	y=-0.013x+12.58	0.9392	276
2003			7872	8.35	y=-0.01x+12.50	1	415
2001	32	Urban-Principal Arterial Interstate	16151	9.21	y=-0.019x+12.74	0.9889	180
2002			16045	8.95	y=-0.018x+10.82	0.9685	103
2003			15843	8.95	y=-0.02x+12.39	0.9466	168
2001	33	Rural-Principal Arterial - Other	4015	7.35	y=-0.011x+10.07	0.9883	252
2002			Data Not Available				
2003			Data Not Available				
2001	34	Rural-Principal Arterial - Other	1740	7.91	y=-0.009x+10.29	0.9556	254
2002			1794	7.9	y=-0.021x+11.64	0.9431	178
2003			1780	7.9	y=-0.009x+10.12	0.9556	245
2001	35	Rural-Principal Arterial - Other	3348	8.54	y=-0.007x+10.76	0.9573	331
2002			3294	8.53	y=-0.008x+10.72	0.9814	267
2003			3274	8.56	y=-0.009x+10.99	0.9556	259
2001	36E	Urban-Principal Arterial Interstate	9068	8.23	y=-0.008x+10.74	0.9179	307
2002			9444	8	y=-0.009x+10.82	0.9587	321
2003			9672	8.03	y=-0.007x+10.58	0.9534	345
2001	36W	Urban-Principal Arterial Interstate	9612	7.95	y=-0.007x+10.08	0.973	313
2002			9853	7.71	y=-0.008x+10.05	0.9179	285
2003			10208	7.77	y=-0.006x+9.66	0.9601	315
2001	36	Urban-Principal Arterial Interstate	18680	8.03	y=-0.007x+10.16	0.9573	318
2002			19297	7.79	y=-0.008x+10.12	0.8866	307
2003			19880	7.83	y=-0.007x+9.86	0.9573	303
2001	37	Rural-Minor Collector	64	8.01	y=-0.05x+20.58	0.8917	251
2002			63	7.88	y=-0.05x+20.37	0.8571	273
2003			66	8.44	y=-0.03x+18.90	0.7143	390
2001	38E	Rural-Principal Arterial Interstate	12019	7.28	y=-0.026x+13.23	0.9831	232
2002			12382	7.44	y=-0.023x+10.88	0.8768	149
2003			12574	7.42	y=-0.027x+13.13	0.984	208
2001	38W	Rural-Principal Arterial Interstate	12157	7.42	y=-0.021x+12.22	0.9807	231
2002			12435	7.78	y=-0.025x+11.22	0.9856	137
2003			12482	7.5	y=-0.017x+12.02	0.9448	255
2001	38	Rural-Principal Arterial Interstate	24176	7.35	y=-0.018x+11.79	0.93	244
2002			24817	7.61	y=-0.019x+10.51	0.9564	147
2003			25056	7.47	y=-0.015x+11.55	0.913	272
2001	39	Rural-Principal Arterial Other	5080	8.53	y=-0.01x+10.88	0.9734	192
2002			5102	8.53	y=-0.01x+10.73	0.9392	196
2003			5135	8.54	y=-0.01x+10.60	1	206

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	40	Data Not Available					
2002							
2003							
2001	41	Rural-Principal Arterial Other	6338	7.81	y=-0.01x+10.2	1	239
2002			6057	7.73	y=-0.01x+9.86	0.9794	222
2003			5447	7.71	y=-0.01x+9.60	0.9486	230
2001	42N	Urban-Minor Arterial	3118	7.92	y=-0.004x+10.19	0.9182	518
2002			3086	7.9	y=-0.006x+10.36	0.9354	389
2003			2986	7.9	y=-0.011x+11.08	0.8864	303
2001	42S	Urban-Minor Arterial	3205	8.79	y=-0.007x+11.39	0.9358	338
2002			3183	8.48	y=-0.008x+11.10	0.9364	301
2003			3056	8.16	y=-0.009x+11.23	0.9796	357
2001	42	Urban-Minor Arterial	6323	8.26	y=-0.007x+10.61	0.974	332
2002			6269	8.1	y=-0.007x+10.48	0.9534	322
2003			6037	7.94	y=-0.011x+10.94	0.9502	278
2001	43E	Rural-Principal Arterial Interstate	7441	7.16	y=-0.016x+12.18	0.984	305
2002			7473	7.07	y=-0.016x+11.91	0.9254	303
2003			6973	7.21	y=-0.014x+12.16	0.973	364
2001	43W	Rural-Principal Arterial Interstate	7419	6.99	y=-0.017x+12.08	0.9913	293
2002			7558	7.04	y=-0.015x+12.14	0.9809	338
2003			7188	7.02	y=-0.021x+12.80	0.9952	273
2001	43	Rural-Principal Arterial Interstate	14860	7.02	y=-0.017x+11.16	0.9495	277
2002			Data Not Available				
2003			14161	7.1	y=-0.018x+12.32	0.9828	299
2001	44	Urban Collector	2123	8.4	y=-0.011x+12.16	0.9689	342
2002			2073	8.2	y=-0.012x+12.09	0.9657	325
2003			2054	8.26	y=-0.01x+11.73	0.9655	347
2001	45E	Rural-Principal Arterial Interstate	10288	7.69	y=-0.025x+13.39	0.9747	228
2002			10724	7.59	y=-0.025x+13.26	0.9897	223
2003			10549	7.67	y=-0.025x+13.26	0.9272	219
2001	45W	Rural-Principal Arterial Interstate	10342	7.07	y=-0.018x+12.10	0.9738	271
2002			10771	7.04	y=-0.012x+11.38	0.9003	371
2003			10683	7.08	y=-0.016x+11.86	0.949	308
2001	45	Rural-Principal Arterial Interstate	20630	7.37	y=-0.016x+11.85	0.9559	275
2002			21495	7.31	y=-0.014x+11.49	0.9058	298
2003			Data Not Available				
2001	46N	Urban-Principal Arterial Interstate	14235	9.25	y=-0.007x+12.51	0.974	460
2002			13833	9.01	y=-0.005x+12.41	0.9201	693
2003			14378	9.29	y=-0.009x+12.63	0.9796	389
2001	46S	Urban-Principal Arterial Interstate	14769	9.88	y=-0.018x+14.79	0.9941	268
2002			13896	9.91	y=-0.033x+15.79	0.9927	180
2003			14879	9.88	y=-0.017x+15.11	0.9711	302

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	46	Urban-Principal Arterial Interstate	29004	8.31	y=-0.007x+10.88	0.973	378
2002			Data Not Available				
2003			29257	8.14	y=-0.009x+11.23	0.9796	360
2001	47E	Rural-Principal Arterial-Other	2095	7.06	y=-0.01x+10.89	0.9611	368
2002			2109	7.44	y=-0.01x+11.10	1	366
2003			2124	7.27	y=-0.01x+11.01	0.9411	360
2001	47W	Rural-Principal Arterial-Other	2070	9.92	y=-0.014x+13.09	0.9917	221
2002			2092	9.93	y=-0.015x+13.08	0.9803	211
2003			2110	9.76	y=-0.016x+13.04	0.9496	208
2001	47	Rural-Principal Arterial-Other	4165	8.22	y=-0.009x+10.31	0.9644	213
2002			4201	8.17	y=-0.008x+10.07	0.9259	229
2003			4234	8.12	y=-0.009x+10.19	0.9556	221
2001	48E	Rural-Principal Arterial-Other	450	7.97	y=-0.029x+13.51	0.8847	185
2002			480	8.1	y=-0.023x+13.73	0.9497	250
2003			467	8.03	y=-0.028x+14.36	0.96	226
2001	48W	Rural-Principal Arterial-Other	443	7.36	y=-0.024x+12.50	0.9086	216
2002			481	7.16	y=-0.025x+13.59	0.9908	255
2003			471	7.4	y=-0.024x+13.71	0.992	269
2001	48	Rural-Principal Arterial-Other	893	7.66	y=-0.025x+12.26	0.9465	180
2002			961	7.63	y=-0.015x+11.99	0.8686	301
2003			938	7.73	y=-0.02x+12.54	0.954	245
2001	49	Data Not Available					
2002							
2003							
2001	50N	Rural-Major Collector	279	7.43	y=-0.088x+30.34	0.9737	259
2002			280	7.64	y=-0.091x+30.74	0.9789	254
2003			283	7.64	y=-0.087x+30.66	0.9596	265
2001	50S	Rural-Major Collector	276	9.05	y=-0.15x+39.14	0.9921	200
2002			278	9	y=-0.11x+35.49	0.9812	242
2003			281	9.08	y=-0.12x+36.45	0.9682	232
2001	50	Rural-Major Collector	555	8.2	y=-0.081x+30.17	0.9728	271
2002			558	8.32	y=-0.064x+28.45	0.9578	316
2003			564	8.34	y=-0.068x+29.45	0.9953	312
2001	51	Rural-Major Collector	431	7.73	y=-0.089x+22.34	0.9883	165
2002			426	8.04	y=-0.076x+19.95	0.9389	156
2003			387	8.27	y=-0.049x+16.47	0.9654	166
2001	52	Rural-Major Collector	463	8.66	y=-0.025x+14.01	0.9929	218
2002			466	8.56	y=-0.016x+13.09	0.9246	287
2003			450	8.65	y=-0.016x+12.82	0.9641	256
2001	53E	Rural-Principal Arterial Interstate	3751	6.59	y=-0.015x+11.23	0.9701	311
2002			3812	6.52	y=-0.012x+8.23	0.9538	138
2003			3863	6.59	y=-0.009x+10.46	0.8044	420

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	53W	Rural-Principal Arterial Interstate	3683	6.53	y=-0.014x+11.52	0.9832	359
2002			3799	6.5	y=-0.014x+11.47	0.9488	358
2003			3783	6.43	y=-0.013x+11.94	0.9643	349
2001	53	Rural-Principal Arterial Interstate	7634	6.56	y=-0.011x+10.72	0.9884	365
2002			7611	6.5	y=-0.009x+7.71	0.9685	135
2003			7646	6.56	y=-0.014x+10.66	0.9816	289
2001	54E	Rural-Principal Arterial Interstate	9039	7.55	y=-0.019x+12.42	0.9651	251
2002			9387	7.56	y=-0.022x+12.46	0.895	228
2003			9179	7.61	y=-0.017x+12.29	0.9681	274
2001	54W	Rural-Principal Arterial Interstate	9045	6.83	y=-0.017x+11.46	0.9495	271
2002			9385	6.84	y=-0.013x+11.24	0.9895	347
2003			9194	6.88	y=-0.017x+11.63	0.9259	285
2001	54	Rural-Principal Arterial Interstate	18084	7.13	y=-0.014x+11.31	0.976	310
2002			18772	7.15	y=-0.013x+11.27	0.9289	327
2003			18373	7.17	y=-0.014x+11.48	0.9209	317
2001	55E	Rural-Principal Arterial Interstate	14334	7.66	y=-0.022x+12.28	0.932	212
2002			14704	7.61	y=-0.022x+12.16	0.9645	206
2003			15015	7.73	y=-0.017x+11.11	0.872	194
2001	55W	Rural-Principal Arterial Interstate	14340	7.63	y=-0.02x+11.97	0.9774	215
2002			14732	7.6	y=-0.021x+11.99	0.9794	212
2003			14862	7.76	y=-0.022x+11.48	0.9589	171
2001	55	Rural-Principal Arterial Interstate	28674	7.64	y=-0.016x+11.19	0.9412	225
2002			29436	7.6	y=-0.01x+10.70	0.913	310
2003			29877	7.74	y=-0.016x+10.77	0.9945	192
2001	56E	Rural-Principal Arterial Interstate	17254	8.04	y=-0.017x+11.39	0.9679	199
2002			18204	8.12	y=-0.014x+11.04	0.9684	208
2003			Data Not Available				
2001	56W	Rural-Principal Arterial Interstate	17450	7.81	y=-0.031x+12.53	0.848	155
2002			18391	7.88	y=-0.021x+11.77	0.9245	184
2003			Data Not Available				
2001	56	Rural-Principal Arterial Interstate	34704	7.89	y=-0.02x+11.54	0.9215	184
2002			36595	7.95	y=-0.011x+11.77	0.9068	252
2003			Data Not Available				
2001	57E	Rural-Principal Arterial-Other	971	7.42	y=-0.028x+12.83	0.896	193
2002			965	7.35	y=-0.023x+12.28	0.8848	216
2003			956	7.43	y=-0.014x+11.44	0.9066	289
2001	57W	Rural-Principal Arterial-Other	943	8.11	y=-0.026x+13.08	0.8895	193
2002			938	8.35	y=-0.023x+12.74	0.97	193
2003			936	8.56	y=-0.019x+12.51	0.9675	208
2001	57	Rural-Principal Arterial-Other	1914	7.66	y=-0.017x+11.49	0.9445	226
2002			1903	7.69	y=-0.016x+11.32	0.9852	230
2003			1892	7.84	y=-0.014x+11.11	0.9867	234

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	58E	Rural-Principal Arterial-Other	1183	7.26	y=-0.017x+11.56	0.9447	257
2002			1169	7.5	y=-0.021x+11.91	0.9238	209
2003			1170	7.54	y=-0.015x+11.51	0.9819	258
2001	58W	Rural-Principal Arterial-Other	1172	9.41	y=-0.018x+13.02	0.9175	198
2002			1160	9.78	y=-0.019x+13.23	0.9562	186
2003			1169	9.83	y=-0.017x+13.16	0.9495	195
2001	58	Rural-Principal Arterial-Other	2355	8	y=-0.017x+11.18	0.9722	191
2002			2329	8.05	y=-0.014x+10.90	0.9917	198
2003			2339	8	y=-0.012x+10.68	0.9538	216
2001	59N	Rural-Principal Arterial-Other	2352	8.67	y=-0.027x+13.58	0.9573	184
2002			2286	8.49	y=-0.015x+11.73	0.9536	211
2003			1975	8.68	y=-0.016x+11.96	0.9443	204
2001	59S	Rural-Principal Arterial-Other	2392	7.23	y=-0.012x+11.05	0.9909	324
2002			2095	7.31	y=-0.016x+11.37	0.9784	259
2003			1955	7.1	y=-0.022x+11.53	0.9883	204
2001	59	Rural-Principal Arterial-Other	4744	7.81	y=-0.018x+11.65	0.9821	211
2002			4381	7.87	y=-0.011x+10.65	0.9643	259
2003			3930	7.78	y=-0.011x+10.33	0.9382	230
2001	60E	Rural-Principal Arterial-Other	864	7.01	y=-0.014x+10.81	0.9062	282
2002			902	7.04	y=-0.012x+10.51	0.9169	282
2003			880	7.45	y=-0.009x+10.11	0.8704	296
2001	60W	Rural-Principal Arterial-Other	836	7.88	y=-0.014x+11.58	0.9317	259
2002			850	7.99	y=-0.015x+11.56	0.9492	245
2003			836	8.26	y=-0.019x+12.33	0.9835	212
2001	60	Rural-Principal Arterial-Other	836	7.36	y=-0.011x+10.27	0.9614	258
2002			1752	7.41	y=-0.007x+9.83	0.9277	332
2003			1716	7.6	y=-0.008x+10.05	0.9179	298
2001	61E	Rural-Principal Arterial-Other	2749	8.22	y=-0.01x+10.7	1	248
2002			2687	8.34	y=-0.01x+10.53	0.9655	219
2003			2620	8.57	y=-0.014x+11.22	0.9592	192
2001	61W	Rural-Principal Arterial-Other	2708	8.28	y=-0.012x+11.00	0.9429	231
2002			2611	8.21	y=-0.01x+10.53	0.9655	232
2003			2532	7.82	y=-0.01x+10.28	0.9231	246
2001	61	Rural-Principal Arterial-Other	5457	8.25	y=-0.01x+10.54	0.9644	242
2002			5298	8.27	y=-0.008x+10.16	0.9719	246
2003			5152	8.21	y=-0.009x+10.23	0.9796	351
2001	62N	Urban-Principal Arterial-Other	7966	9.11	y=-0.007x+11.28	0.973	319
2002			8094	9.07	y=-0.006x+11.27	0.9643	343
2003			8222	9.13	y=-0.007x+11.28	0.973	316
2001	62S	Urban-Principal Arterial-Other	7907	7.58	y=-0.005x+9.46	0.9524	392
2002			7921	7.56	y=-0.005x+9.65	0.913	418
2003			8188	7.57	y=-0.006x+9.52	0.9003	275

Year	Station No.	Functional Classification	AADT	Percentage of AADT Volume Representing Average Peak Hour	Regression Equation	R^2 Value	Extrapolated Hour
2001	62	Urban-Principal Arterial-Other	15873	8.2	y=-0.004x+9.79	0.9182	363
2002			16015	8.19	y=-0.005x+9.74	0.9168	337
2003			16410	8.19	y=-0.005x+9.75	0.913	312
2001	63N	Rural-Principal Arterial-Other	5178	10.71	y=-0.012x+15.81	0.9856	436
2002			5057	10.62	y=-0.007x+15.21	0.9737	620
2003			5160	10.29	y=-0.016x+16.05	0.983	356
2001	63S	Rural-Principal Arterial-Other	5050	10.29	y=-0.009x+13.50	0.9556	341
2002			4837	10.25	y=-0.007x+13.19	0.9472	421
2003			5088	10.12	y=-0.012x+13.80	9.9755	297
2001	63	Rural-Principal Arterial-Other	10228	8.44	y=-0.006x+10.89	0.9608	423
2002			9894	8.48	y=-0.006x+10.77	0.9608	394
2003			10248	8.43	y=-0.008x+11.23	0.913	373
2001	64S	Rural-Principal Arterial-Other	1502	7.33	y=-0.048x+15.11	0.9486	162
2002			1610	7.36	y=-0.037x+14.32	0.9803	189
2003			1666	7.62	y=-0.036x+13.98	0.9332	176
2001	65E	Rural-Principal Arterial-Other	4486	8.85	y=-0.029x+12.51	0.9663	129
2002			4689	9.09	y=-0.019x+12.80	0.9763	192
2003			4881	9.14	y=-0.017x+12.76	0.9787	209
2001	65W	Rural-Principal Arterial-Other	4498	7.16	y=-0.022x+11.31	0.9651	185
2002			4735	7.01	y=-0.018x+11.06	0.8878	225
2003			4922	7.02	y=-0.023x+11.58	0.8613	202
2001	65	Rural-Principal Arterial-Other	8984	8	y=-0.019x+10.98	0.9651	155
2002			9424	8.04	y=-0.013x+10.88	0.9839	219
2003			9803	8.07	y=-0.013x+10.99	0.9918	226