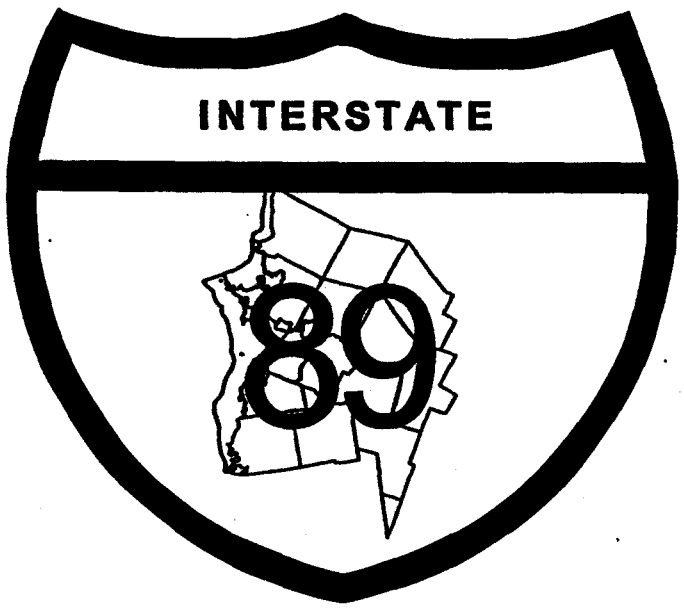
Chittenden County I-89 Corridor Study

Final Report
December 31, 1997



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EXECUTIVE SUMMARY

This document summarizes a study of the performance and safety of Interstates 89 and 189 in Chittenden County under existing conditions and in twenty years. This study was initiated through the FY 1996 Unified Planning Work Program (UPWP) of the Chittenden County Metropolitan Planning Organization (CCMPO). It responds to a 1994 Vermont State Legislature directive to the Vermont Agency of Transportation to study congestion and the effect of proposed interchanges on I-89 in Chittenden County.

Performance is quantified for the base year of 1995 and two 2015 scenarios: base network and network build-out. The base network scenario for 2015 includes programmed transportation projects soon to be constructed. The network build-out scenario, which is based on the CCMPO's 1997 Long Range Transportation Plan and other projects from MPO jurisdictions' municipal plans, includes projects 1-5 listed below, each of which has been investigated on its own merits at some point in the past:

1. the Chittenden County Circumferential Highway;
2. a new interchange between I-89 and VT 116;
3. an additional on-ramp at Exit 13 connecting the intersection of Dorset Street and Kennedy Drive to northbound I-89;
4. the expansion of Exit 15 in Winooski to a full interchange; and
5. a new interchange between Mayo Road and I-89 in Milton.

Traffic projections are based on 2015 land use which includes background growth and build-out estimates for South Burlington City Center, Taft Corners, Chimney Corners Growth Center at Exit 17 and the Husky Manufacturing Campus in Milton.

The study discussed in this summary considers the combined effects of the projects and land use plans noted above on the transportation system at three levels of detail. At the first level, performance is measured at individual freeway segments and interchanges on I-89 from Richmond to Milton including Exits 12 through 17 and on I-189 freeway segments. This level also includes a safety analysis. At the second level, performance is measured at signalized intersections in the sub area defined by Williston Road, Dorset Street and Kennedy Drive in South Burlington. The final level includes a county-wide transportation system analysis. The results of each level of analysis are summarized below.

Interstate Assessment

A. Interstate Performance

For all three scenarios, AM and PM peak hour level of service analyses have been performed on all freeway segments, interchange weaving areas, ramp to mainline junctions and the intersection of ramps with arterial.

- In 1995, operational deficiencies exist at certain elements of the Exit 14 and Exit 17 interchanges. Performance at all other interstate segments and interchanges is acceptable.
- By 2015, with the base network, operational deficiencies are projected at:
  - Exits 12, 13, 14, 16 and 17 interchanges.
  - North and southbound I-89 between Exit 14 and the Winooski River bridge.
- In 2015, with the network build-out, some improvement results in performance at Exits 12 and 17 relative to the base network. Performance at all other interchanges is not significantly affected by the network build-out.
- With the network build-out, operational deficiencies are projected in 2015 on:
  - Northbound I-89 between Exits 13 and 14, Exit 14 and the Winooski River bridge and Exits 15 and 16.
  - Southbound I-89, from the Winooski River bridge to Exit 14.
  - Eastbound I-189 from US 7 to I-89.

B. Interstate Safety

- There are two High Accident Locations in the study area located at Exit 17 in Colchester and Exit 15 in Winooski. Accident rates for all other interstate elements are not critical.
- The vast majority of crashes that have occurred on the interstate are due to driver behavior. There is no evidence that suggests road design is causing a safety problem other than at Exits 15 and 17.

South Burlington Center Sub Area Performance

- The network build-out is projected to have a positive impact on the South Burlington Center Sub Area by removing through traffic and improving performance to acceptable levels at the following key intersections:
  - Williston Road with Dorset Street
  - Williston Road with Kennedy Drive
  - Kennedy Drive with Hinesburg Road
- With or without the network build-out, deficiencies are projected at the following intersections:
  - Williston Road with White Street
  - Williston Road with Hinesburg and Patchen Roads
  - Kennedy Drive with I-189 and Dorset Street

Regional Transportation System Performance

- The network build-out is projected to reduce the amount of congested VMT on local streets and arterials by 24 and 22% during the AM and PM peak hours respectively. At the same time, congested VMT is projected to increase on the interstate system. In effect, congestion is being consolidated on the interstate where it could be addressed more efficiently.
- The network build-out improves the efficiency of the transportation system. Total VMT remains unchanged while total delay, average delay per vehicle trip and average travel time per trip decrease.
- The network build-out is projected to reduce through traffic in Burlington (-10%), Taft Corners (-19%), Essex Junction (-44%), Winooski (-22%), Colchester Village (-60%) and in the South Burlington Center Sub Area of South Burlington (-18%).

Next Steps

In the long term, the network build-out scenario is projected to improve the overall efficiency of the transportation system, remove congestion from local and arterial streets, remove through traffic from activity areas, and improve the performance of key intersections in the South Burlington Center Sub Area. This study has also identified safety problems and both current and projected future performance deficiencies in the Chittenden County I-89 corridor.

Interchanges studied and issues identified in this report have been placed into two categories: (1) interchanges to be included in the CCMPO list of candidates for scoping and (2) problems and issues requiring additional study before projects can be considered for scoping.

Interchanges Recommended for Scoping (north to south):

- Exit 17 Interchange: Purpose is to address existing operational and safety deficiencies.
- Exit 14 Interchange: Purpose is to address existing operational and safety deficiencies. The limits of work will include US 2 from the Staples and Sheraton intersection to Dorset Street.
- Exit 13 Interchange: Complete the Exit 13 Northbound On Ramp scoping study started in 1994.
- VT 116 Interchange with I-89: The purpose is to improve linkage between NHS facilities, provide enhanced access to the Burlington International Airport and relieve congestion.

Issues Recommended for Additional Study:

- I-89 from Exit 13 to Exit 16 and I-189: Perform a planning study to develop, analyze and select alternatives that address long term congestion projected on freeway segments in 2015.

- New Milton Interchange: Determine the best location and update the benefit to cost analysis in light of recent developments in Milton.

- Exit 15 Safety Improvements: Re-evaluate the safety data following paving, re-striping and signal timing work completed in 1996.

- Full Interchange at Exit 15: Update the benefit to cost ratio, including the effect of an improved link to Burlington International Airport.

INTRODUCTION

Previous interstate studies and projects have focussed on correcting operational and safety problems at specific interchanges, modifying existing interchanges or the construction of new interchanges. In general, the studies were limited to the area assumed to be directly affected and did not consider the impacts to the whole interstate system. In 1994, the Vermont Legislature directed the Vermont Agency of Transportation to study congestion and the effect of proposed interchanges on I-89 in Chittenden County. In response, this report was initiated in the FY 1996 Unified Work Program (UPWP) of the Chittenden County Metropolitan Planning Organization (CCMPO).

The purpose of this study is to quantify the performance of the interstate system now and in the future in light of several changes that have been proposed over the years. These changes include:

1. the Chittenden County Circumferential Highway (CCCH);
2. a new interchange between I-89 and VT 116;
3. an additional on ramp at Exit 13 connecting the intersection of Dorset Street and Kennedy Drive to northbound I-89;
4. the construction of a full interchange at Exit 15 in Winooski; and
5. a new interchange between Mayo Road and I-89 in Milton.

Study Area and Level of Detail

The study area includes, at three levels of detail, all of Chittenden County. The first and most detailed level includes I-89 between the proposed interchange with the CCCH in Williston to and including Exit 17 in Colchester. The segments of I-189 are also included in this level. Level 1 detail includes level of service and safety analyses for freeway segments, ramp\freeway junctions, weaving areas and ramp\arterial intersections.

The level 2 study area is located in South Burlington northeast of the interstate. This area includes Williston Road, Dorset Street, Kennedy Drive and Burlington International Airport (BIA). Because changes to the interstate corridor, especially the VT 116\ I-89 interchange and the northbound on ramp at Exit 13, will have a significant impact on travel patterns in this area, level of service analyses will be included for the signalized intersections and the impact on through traffic assessed. This level of analysis will allow the impact of proposed interstate changes to be quantified. Specific improvements in this area will not be addressed. The level 3 study area includes all remaining areas of the county. System wide performance measures such

as vehicle miles of travel (VMT) by road class, congested VMT, through traffic percentages for activity areas, average travel time, average delay per trip and total delay are compared by scenario.

Scenario Descriptions

Performance is analyzed under three scenarios at interstate segments and interchanges and South Burlington Center Sub Area signalized intersections. Scenario #1 is the base year 1995. Scenarios 2 and 3 are designed for 2015. Scenario #2, referred to as the base network scenario, assumes only the Southern Connector, Shelburne Road widening and Burlington Main Street projects are complete. Scenario #3, referred to as the network build-out, includes these three projects plus new interchanges, interchange improvements, the CCCH and new local roads in South Burlington as listed in **Table 1** below.

Scenario	Year	Network
1	1995	Existing 1995 Highway Network
2 BASE NETWORK	2015	Southern Connector Shelburne Road Reconstruction Burlington Main Street Widening
3 NETWORK BUILD-OUT	2015	All of Scenario #2 VT 116 & I-89 Interchange Northbound On Ramp at Exit 13 Full Interchange at Exit 15 Mayo Road & I-89 Interchange CCCH complete from Williston to VT 127 Corporate Way Kimball Avenue Connector

Table 1. Scenarios

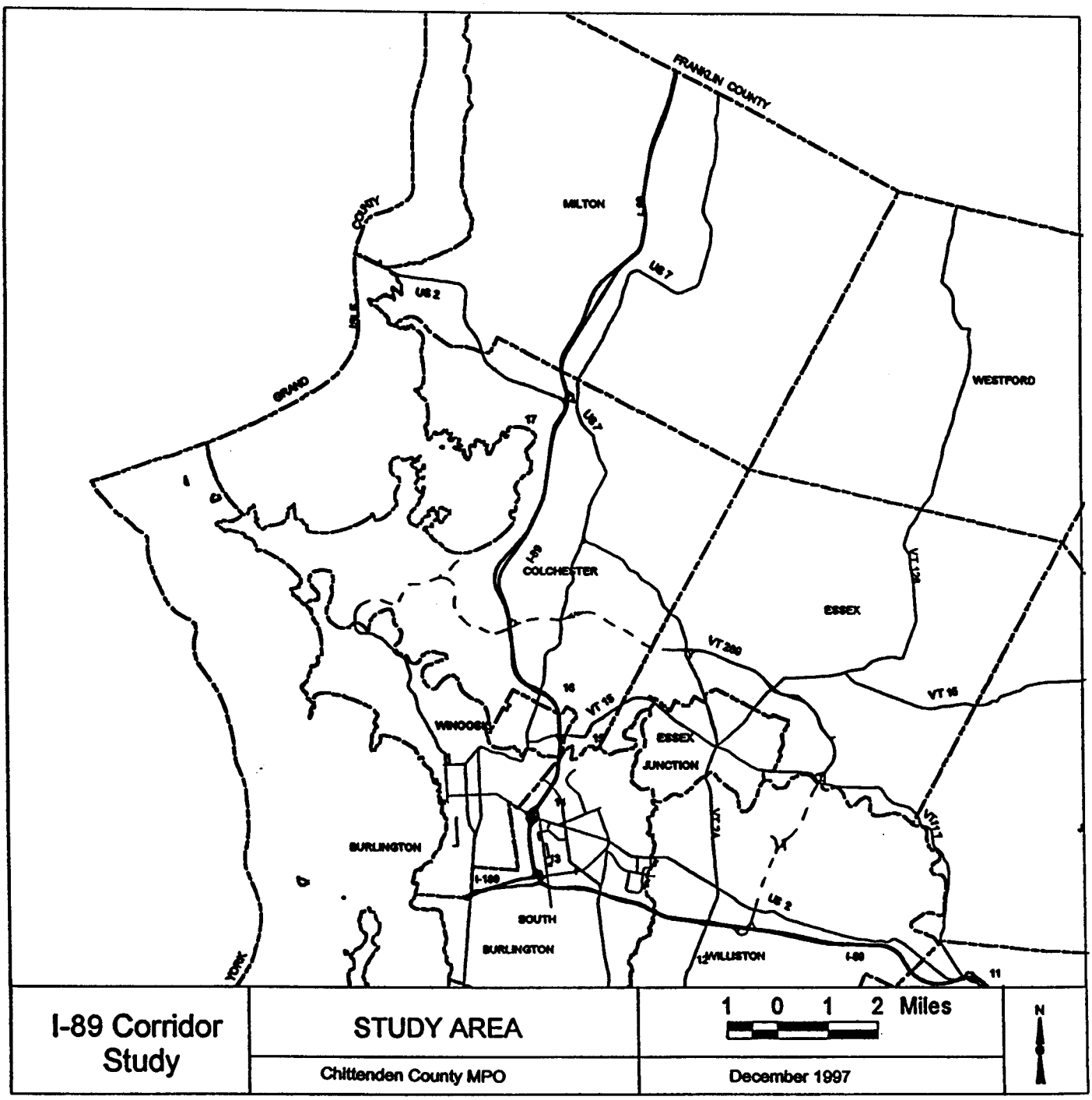
FRANKLIN COUNTY
GRAND
MILTON
US 2
US 7
WESTFORD
17
COLCHESTER
I-89
ESSEX
VT 128
VT 289
VT 15
16
WINOOSKI
ESSEX
JUNCTION
BURLINGTON
I-189
SOUTH
BURLINGTON
WILLISTON
I-89
11
YORK
I-89 Corridor Study
STUDY AREA
Chittenden County MPO
1 0 1 2 Miles
December 1997
N

Figure 1.

METHODOLOGY

Future Traffic Volumes

Performance has been measured on the interstate and South Burlington Center Sub Area intersections for AM and PM design hour volumes (DHV) in 1995 and 2015. 1995 DHVs are based on 1995 automatic traffic recorder (ATR) counts taken on each segment of the interstate in Chittenden County by VAOT. Directional split is based on the raw ATR count data and turning movement counts taken at interchanges. Projections to 2015 were performed with the Chittenden County Transportation Model. The model was used in lieu of traditional straight line projection methods which are typically based on historical growth and can not account for changes in the system such as new interchanges. The straight line method assumes an even distribution of growth. However, in order to account for the build-out of the Taft Corners area, South Burlington City Center, Chimney Corners Growth Center and Husky, the model provides a more reasonable approach. Moreover, the model includes highway capacity constraints which result in trips being diverted to other routes when a facility becomes congested. The traditional straight line approach assumes traffic grows continually, no matter what the capacity of the facility is. Land Use estimates are shown in Appendix A and AM and PM peak hour traffic volumes are presented in Appendix B.

Acceptable Performance

Most readers are familiar with the level of service concept, particularly at signalized and un-signalized intersections where LOS is related to delay. Level of service is also used to describe performance for freeway elements but parameters other than delay are used. The elements of a freeway are basic freeway segments, ramp and freeway junctions, weaving areas and the ramp and arterial intersection. These parameters are briefly discussed below for each freeway element. For additional information, readers should refer to the 1994 Highway Capacity Manual (1994 HCM).

Regardless of the parameters used and the type of roadway feature in question, the performance expected for any particular level of service is the same. In general, levels of service of A through C are considered acceptable. At these levels of service, delay is minimal, speeds are close to free flow and maneuvering is relatively easy. At a level of service of D, delay has increased to a point where it may be frustrating, certain elements of a facility my be over capacity, and minor interruptions cause significant delays. LOS D is generally acceptable in urban areas, but not in rural areas. At LOS E, operation is at capacity. At LOS F, vehicular flow has broken down.

The Vermont Agency of Transportation has adopted a Highway Design Level of Service Policy that requires state highway facilities to be designed to Level of Service C for the design period. Reduced levels of service may be approved by the Secretary of Transportation based in part on the negative impacts that could result to the surrounding area because of

improvements required to achieve LOS C. In extreme cases when geometric improvements are not feasible, LOS F may be acceptable (VAOT 7-25-96, See Appendix C). On existing facilities, level of service E is often the point at which corrective measures are taken.

Level of Service Criteria for Freeways

Basic Freeways Level of Service

A basic freeway segment is located between interchanges. On and off ramp junctions and weaving areas are not close enough to affect its performance. The parameter used to define level of service for basic freeway segments is density. Density is equal to the number of passenger cars per mile per lane (pc/mi/ln). The 1994 HCM uses speed to define level of service for other roads. However, speed is not an adequate measure of performance for freeways because research shows it remains constant over a wide range of flow rates. The 1994 HCM points out that although "...speed is a major indication of service quality to drivers, freedom to maneuver within the traffic stream, and proximity to other vehicles are equally noticeable concerns."(1994 HCM 3-7) Because density impacts these factors, it is used as the performance measurement. **Table 2** presents the relationship between level of service and density for basic freeway segments.

LOS	Maximum Density (pc/mi/ln)
A	10
B	16
C	24
D	32
E and F	Varies from 36.7 to 47.9 .depending on free flow speed and number of lanes

Table 2. Basic Freeway Segments LOS Parameters
(1994 HCM 3-8)

Ramp Junctions Level of Service

Ramp junctions occur when off and on ramps exit and enter freeway segments. Although speed is provided as a secondary measure, density is used to define level of service for ramp junctions. The density is computed for an area of influence located 1500 feet upstream of diverges and downstream of mergers.

Level of Service	Maximum Influence Area Density (pc/mi/ln)	Minimum Speed (mph)
A	10	58
B	20	56
C	28	52
D	35	46
E	Greater Than 35	42
F	Flow Rates Exceed Limit	

Table 3. Ramp Junction LOS Parameters
(1994 HCM Table 5-2)

Weaving Areas Level of Service

The 1994 HCM defines weaving as "...the crossing of two or more traffic streams travelling in the same direction along a significant length of highway, without the aid of traffic control devices" (1994 HCM, 4-2). Exit 14 is the only location in this corridor study that has weaving areas (See **Figure 7**, page 20). Weaving area level of service is defined by average speed for two movements. LOS is estimated for vehicles weaving and vehicles passing through the weave area.

Level of Service	Min. Average Weaving Speeds (mph)	Min. Average Non-Weaving Speed(mph)
A	55	60
B	50	54
C	45	48
D	40	42
E	35	35
F	Less Than 35	Less Than 35

Table 4. Level of Service Criteria for Weaving Sections
(1994 HCM Table 4-6)

Signalized and UN-signalized Intersections Level of Service

Ramp intersections with arterials are controlled by traffic signals, stop signs or yield signs. Level of Service for both signalized and UN-signalized intersections is measured in terms of average per vehicle. **Table 5** below presents the relationship between LOS and average delay. As

indicated below, the 1994 HCM has lower delay thresholds for UN-signalized intersections. The HCM rationalizes this difference by pointing out that drivers at signalized intersections are able to relax during red cycles while at UN-signalized intersections, drivers must stay alert and be ready to move when gaps in opposing traffic are large enough. Furthermore, UN-signalized intersections are smaller volume facilities and drivers therefor expect less delay. And finally, there is greater variability in delay encountered at UN-signalized intersections compared to pre-timed signals.

Stop Sign	LOS	Traffic Signal
<5.0	A	≤ 5.0
> 5.0 and ≤ 10.0	B	> 5.0 and ≤ 15.0
> 10.0 and ≤ 20.0	C	> 15.0 and ≤ 25.0
> 20.0 and ≤ 30.0	D	> 25.0 and ≤ 40.0
> 30.0 and ≤ 45.0	E	> 40.0 and ≤ 60.0
> 45.0	F	> 60.0

Table 5. LOS Criteria for Intersections (seconds)
(HCM Tables 9-1 and 10-3)

RELATED STUDIES

Interchange Feasibility Studies at Four Locations in the Chittenden County MPO Area.

This study is the most significant analysis performed on the interstate in the last ten to fifteen years and was completed in 1987 by Storch Engineers of Providence, Rhode Island. Commonly referred to as the Storch Report, this is a feasibility analysis for changes to existing interchanges and the addition of two new interchanges. The design year is 2010. Employing an AASHTO 1977 benefit\cost analysis methodology, the Storch Report determined the economic feasibility of

1. a new interchange at VT 116 and I-89;
2. a full interchange at the I-89/I-189 junction at Exit 13;
3. construction of a full interchange at Exit 15; and
4. construction of a new interchange between I-89 and Mayo Road in Milton

Relative to a VT 116/I-89 interchange and the construction of a full interchange at Exit 13, The Storch Report concluded that either interchange would have a significant benefit for the Williston Road and Dorset Street intersection. However, the Dorset Street\Kennedy Drive intersection was projected to have a poor level of service under any scenario even with the additional capacity planned in the Dorset Street reconstruction project. The full interchange at Exit 13, estimated to cost $8.6 million in 1987 dollars ($11.5 in 1996), had a benefit to cost ratio

of 3.2. The VT 116 and I-89 interchange, estimated to cost $2.2 million in 1987 dollars ($2.9 in 19961), had an extremely high benefit to cost ratio of 16.6.

Adding a northbound on ramp and a southbound off ramp to create a full diamond interchange at Exit 15 in Winooski was estimated to cost $2.5 million in 1987 dollars ($3.4 in 1996). Because of the urban environment in which this interchange is located, right of way acquisition consists of approximately $1 million dollars of the estimated $2.5 million. The benefit to cost ratio was estimated at 0.27, leading to the conclusion that adding new ramps is not economically justified.

The construction of a new interchange between I-89 and Mayo Road in Milton was estimated to cost $3.4 million in 1987 dollars ($4.6 in 1996). The benefit cost analysis was performed for a scenario that assumed full build-out of the Catamount Industrial Park and another scenario that assumed no development occurred in the industrial park. With no development, the benefit to cost ratio was 0.01. With full build-out, the benefit to cost ratio was 0.96. The report concluded that the interchange was not economically justified at that time.

Although the Storch Report considered interchanges from South Burlington to Milton, it is not intended to be a corridor analysis. It treats each interchange independently of the others and states specifically that "impacts to travel patterns have been assumed to be limited only to the 'area of influence' defined in each study area" (Storch, II-10). The Storch Report does not consider the interstate corridor as a whole. For example, it does not examine the impacts of the reconstructed and new interchanges on Exit 14 and the freeway segments.

Per AASHTO's methodology, the benefit to cost ratio is equal to the net change in road user costs divided by the cost of the improvement. Road user costs consists of vehicle operating costs, travel time costs and vehicle accident costs. However, an economic feasibility analysis that considers only the benefits to road users is incomplete. These interchanges may have other benefits and costs that are not accounted for in the analysis, such as removing through traffic from local streets and congested activity centers, reducing congestion on arterials and improving accessibility to industrial and commercial zones.

Vermont's Long Range Transportation Plan

In the Vermont Agency of Transportation's Long Range Plan, a new transportation classification system has been proposed. The Multimodal System Classification System (MSC) is based on a set of principles that can help further define the role of the interstate. Although the MSC has not yet been designated and adopted in Chittenden County or any of the other regions, it is safe to say the interstate corridor would be designated as Class 1. In general, "The goal for this class is to move people and goods in the most efficient and responsive way achieving high mobility" (MSC, p 15) **Table 6** on the following page summarizes the MSC principles and describes the characteristics of a class 1 corridor.

1 1996 costs estimates are based on the consumer price index.

Principle	Class 1 Characteristics		
Mobility and Accessibility	High level of mobility for people and goods		
Trip Origin and Destination	International, interstate, interregional. Large number of through trips	Link to airports, ferry landings	Direct service. Longer Distance travel
Intermodal Connectivity	Diverse Connections	High Volume Transfers Intermodal Centers,	terminals, park and rides
Trip Volume and Density	High Volume Movement of People and Goods	High Capacity of Routes and Hubs	High Diversity of Modal Trips
Typical Modes	Automobile Rail freight Truck Freight	Commuter Rail Intercity Bus Intercity Passenger	Bicycle and Pedestrian Airplane Ferry
Routes	All Multimodal NHS Urban principal arterial Highways Core Rail System	Intercity Transit Service Off road bicycle connectors	Recreation Paths Bicycle facilities on rail/transit systems
Access Management	Full Access Control		

Table 6. Class I Corridor Characteristics

An important component of this new classification scheme is the level of improvement concept. The three levels of improvement are reconstruction, rehabilitation and preservation of highways. Reconstruction generally involves the addition of capacity such as new construction, or bypasses of town centers. Rehabilitation involves improvements in existing right of ways to roadway surfaces, roadway sub-surfaces and structures with the intent of extending service life. Preservation includes minor work such as thin overlays and crack sealing. All these levels of improvements are available options for Class 1 corridors.

A Twenty Year Vision for Transportation in Chittenden County

This document is the Chittenden County Metropolitan Planning Organization's (CCMPO) long range transportation plan (LRTP), prepared as required by ISTEA. Adopted by CCMPO in January of 1997, the plan contains six general recommendations.

1. Maintenance first- the existing system of highways, bridges and public transit needs to be maintained and deferred maintenance corrected.
2. Growth center based land use and intermodal nodes - a development pattern based on pedestrian and transit friendly growth centers is critical to limiting future congestion
3. Public/alternative transportation - increasing public transportation's share of the market would have substantial benefits for the whole system

4. Roadway efficiency improvements - signal progression improvement, access management and innovative intersections improvements will help facilitate mobility
5. Key highway improvements - some highway improvements are crucial when growth center development is facilitated, intermodal freight operations are enhanced and general traffic movement is improved.
6. Goods movement and freight - Greater use of multimodal facilities, especially railroads will facilitate economic vitality and reduces congestion and wear and tear on the roadway system

GENERAL INTERSTATE CHARACTERISTICS

Interstate I-89 in Vermont, from New Hampshire to Canada, was constructed during 1959 to 1970 at a cost of $163 million. In 1962, I-189 and I-89 between Exits 12 and 13 were the first segments to open in Chittenden County. By 1964, all Chittenden County segments of I-89 were open including the segments to Montpelier. This section describes the function, physical characteristics, travel demand and traffic characteristics of the Interstate in Chittenden County.

Physical Characteristics

Interstate I-89 is 31.7 miles long in Chittenden County. Heading northbound, I-89 enters Chittenden County in the town of Bolton; passes through the communities of Richmond, Williston, South Burlington, Winooski and Colchester; and exits the County from the Town of Milton. I-89 has seven Chittenden County interchanges located in the communities of Richmond (Exit 11), Williston (Exit 12), South Burlington (Exits 13 and 14), Winooski (Exit 15) and Colchester (Exit 16 and Exit 17) I-189, located completely in South Burlington, connects I-89 to U.S. 7 and is 1.4 miles long.

Access to I-89 and I-189 is fully controlled and is provided at grade separated interchanges. The typical cross section consists of a 10 foot paved shoulder/breakdown lane, two twelve foot travel lanes and a four foot shoulder. For approximately 0.6 miles, I-89 has three travel lanes in the north and southbound directions located between the south end of the Winooski River Bridge and the Exit 15 ramp junctions. The north and southbound directions are separated by a median that typically varies from 50 to 200 feet.

The Function of the Interstate and the National Highway System

The interstate plays a significant role in the county's transportation system. The interstate

1. connects Chittenden County communities;
2. connects Chittenden County to the rest of Vermont and beyond,
3. serves statewide, interstate and international through traffic, and thus
4. removes through traffic from local arterials
5. serves goods movement
6. supports economic development

Consistent with these functions, the Interstate is part of the National Highway System (NHS), an interconnected system of principal arterials serving "...major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities...." The NHS is designed to meet national defense requirements and serves interstate and interregional travel demand as well as major travel destinations.

In addition to I-89 and I-189, the NHS includes segments of U.S. 7, U.S. 2 and VT 2A. NHS connector roads include Kennedy Drive, proposed and existing segments of the Circumferential Highway and VT 15, from the CCCH to Five Corners. The NHS was designated by Congress in 1996.

Intermodal Facilities

Major intermodal facilities include the Burlington International Airport (BIA); Burlington's Waterfront with the Lake Champlain Ferry landing, Vermont Railway's yard, and a planned commuter rail station; the Vermont Transit Bus Station on Burlington's Main Street; and the Amtrak Station in Essex Junction.

There are two Park and Ride lots open in Chittenden County at Exit 11 in Richmond and Exit 17 in Colchester. The Richmond Park and Ride lot, was recently reconstructed is paved, landscaped, and has lighting, a shelter, bicycle rack, telephone and capacity for 110 vehicles. The Park and Ride lot at Exit 17 in Colchester is located just north of the U.S. 2 intersection with U.S. 7. There are approximately 30 spaces available. This lot will also be improved in 1997. Prior to 1996, there was a Park and Ride lot at Exit 12, which had approximately 47 spaces. This lot was removed to accommodate an auxiliary turning lane from VT 2A to the northbound I-89 on ramp. Although it is generally understood that this lot will be replaced, there are no specific plans to date. Excluding the Exit 12 Park and Ride lot, there will be a total of 140 spaces available in Chittenden County by the end of 1997.

Average Annual Daily Traffic

Table 7 below presents the average annual daily traffic (AADT) in 1995 for segments of I-89 and I-189 in Chittenden County while **Figure 2** provides a visual comparison of AADT on the interstate and other arterials in the study area. The highest volume segment is located between Exits 14 and 15 in South Burlington and Winooski. As indicated by the graph on the following page, this segment of I-89 between Exits 14 and 15 is also the highest volume segment on I-89 in Vermont. **Figure 3**, on the following page demonstrates that I-89 between Exits 12 and 16 in Chittenden County have higher AADT's than anywhere else in the state.

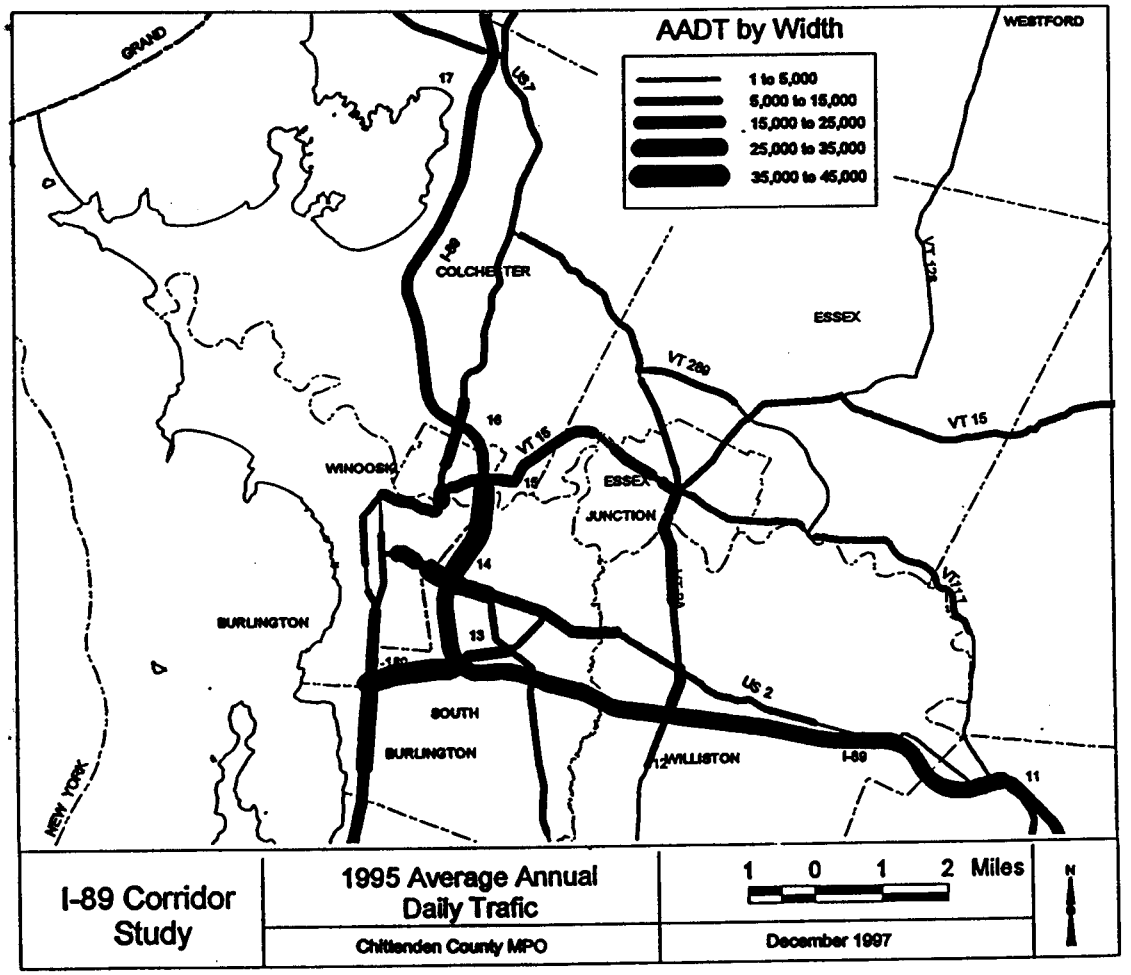

Figure 2

Exit 11 to Exit 12	24,220	Exit 14 to Exit 15	44,715
Exit 12 to Exit 13	29,310	Exit 15 to Exit 16	30,770
Exit 13 to Exit 14	34,880	Exit 16 to Exit 17	23,664
I-189	38,104	Exit 17 to 18	16,230

Table 7. 1995 Interstate AADT in Chittenden County

Hourly Variations

Figure 4 below shows hourly volume variations for I-189 and I-89 between Exits 14 and 15 and between Exits 16 and 17. The data are all unadjusted counts taken on May 17, 1995. The peak periods occur between 7:00 and 9:00 AM and 4:00 and 6:00 PM respectively. This hourly variation is typical and indicates that peak hour periods are not yet expanding to other periods of the day.

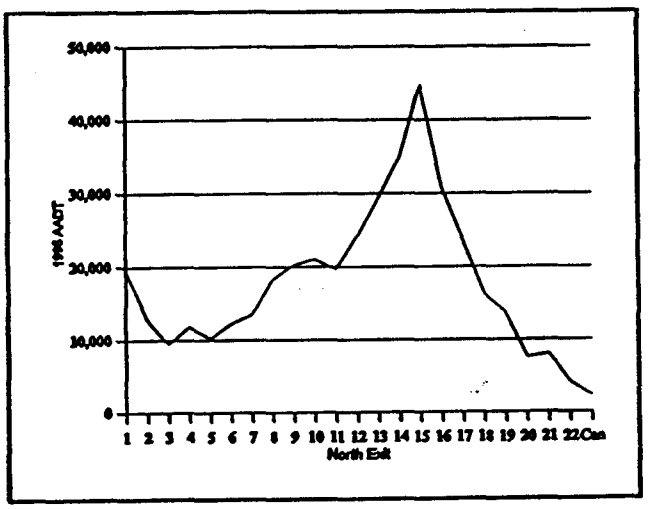

Figure 3. I-89 Average Annual Daily Traffic North to South

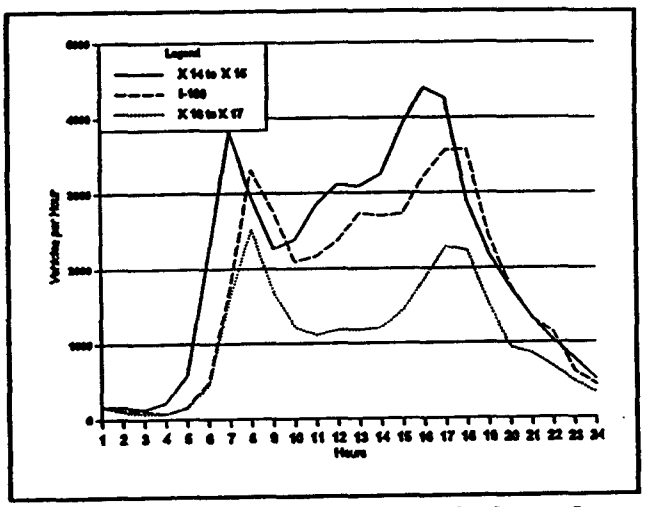

Figure 4. Hourly Volume Variations for Select Interstate Segments

Vehicle Classification & Truck Traffic

Tables 8 and 9 on the following page present the results of vehicle classification counts performed on I-189 and some segments of I-89 in Chittenden County in 1995. The amount of trucks in the traffic stream impacts the maintenance and operation of a road segment. Truck use is also a measure of the role the interstate plays in goods movement. The truck traffic rises steadily from Exits 11 to 14, increases significantly between Exits 14 and 15, and declines north of Exit 17. It is reasonable to infer that the increase in truck traffic between Exits 13 and 15 is due to the movement of goods with origins and/or destinations in Chittenden County. Minimizing delays along this segment of the interstate could help improve goods movement in the urbanized area of the County.

	I-89 Segments					I-189
	11 to 12	12 to 13	13 to 14	14 to 15	17 to 18	
Motorcycles, Cars, Pickups	91.9	92.8	92.4	90.3	90.5	94.0
Medium Weight Trucks	3.0	3.0	2.9	4.7	3.2	3.0
Heavy Weight Trucks	5.1	4.2	4.7	5.0	6.3	3.0

Table 8. 1995 Daily Vehicle Classification Percentages

	I-89 Segments					I-189
	11 to 12	12 to 13	13 to 14	14 to 15	17 to 18	
Motorcycles, Cars, Pickups	22,260	27,200	32,230	40,380	14,690	35,820
Medium Weight Trucks	730	880	1,010	2,100	520	1,140
Heavy Weight Trucks	1,235	1,230	1,640	2,235	1,020	1,140

Table 9. 1995 Average Daily Traffic Volume by Class

Origins and Destinations

Using the Chittenden County Transportation Model, origins and destinations for traffic on the interstate has been estimated and is presented **Tables 10 and 11.** The purpose of this analysis is to develop an understanding of where traffic using the interstate originates and ends. The table lists the three following categories:

CC to CC: Vehicle trips that start and end somewhere in Chittenden County.

CC & EXT: This category includes two origin and destination pairs. Vehicle trips that start in Chittenden County and end somewhere outside the county and visa versa.

EXT to EXT: Vehicle trips starting and ending outside o the County. These vehicle trips are also described as regional through trips.

Segment	North and Westbound			South and Eastbound		
	CC to CC	CC & EXT	EXT to EXT	CC to CC	CC & EXT	EXT to EXT
Exits 11 to 12	56%	39%	4%	45%	27%	27%
Exits 12 to 13	74%	23%	3%	70%	15%	15%
Exits 13 to 14	74%	20%	7%	69%	14%	17%
Exits 14 to 15	75%	17%	8%	75%	17%	8%
Exits 15 to 16	67%	20%	13%	55%	31%	14%
Exits 16 to 17	31%	45%	24%	38%	47%	15%
I-189	84%	11%	5%	89%	7%	3%

Table 10. AM Peak Hour Origins and Destinations

Segment	North and Westbound			South and Eastbound		
	CC to CC	CC & EXT	EXT to EXT	CC to CC	CC & EXT	EXT to EXT
Exits 11 to 12	30%	50%	19%	36%	59%	5%
Exits 12 to 13	60%	29%	11%	59%	38%	3%
Exits 13 to 14	62%	36%	12%	64%	31%	5%
Exits 14 to 15	64%	29%	7%	73%	23%	5%
Exits 15 to 16	45%	44%	12%	54%	37%	9%
Exits 16 to 17	19%	68%	13%	25%	64%	11%
I-189	83%	14%	3%	76%	19%	4%

Table 11. PM Peak Hour Origins and Destinations

The following observations can be made about **Tables 10 and 11**:

- Trips that start and end somewhere in Chittenden County comprise the largest percentage of trips on I-89 between Exits 12 and 16 and on I-189. About 85% of the traffic on the interstate is moving within, to or from the county. This proportion underscores the importance of the interstate system in serving travel demand within the region.

- The segment between Exits 14 and 15, which has the highest AADT in the County, has a through traffic percentage less than 10% for both directions and peak hour periods.

LEVEL 1 ANALYSIS: INTERSTATE SEGMENTS AND INTERCHANGES

Basic Freeway Segments Existing and Projected Level of Service

Tables 12 and 13 below present level of service results for basic freeway segments during the AM and PM peak hours for all three scenarios. The shaded cells emphasize where a segment is deficient. Level of service summarized by mileage is presented in **Tables 14 and 15** on the following page.

Segment	Northbound\Westboun			Southbound\Eastbound		
	1	2	3	1	2	3
Exit 11 to CCCH Interchange	B	B	B	A	A	A
CCCH Interchange to Exit 12	B	B	C	A	A	B
Exit 12 to VT 116	B	B	C	B	B	C
VT 116 to Exit 13	B	B	C	B	B	C
Exit 13 to Exit 14	B	C	D	B	C	D
Exit 14 to Winooski River Bridge	B	D	D	D		
Winooski River Bridge to Exit 15	A	C	C	C	D	D
Exit 15 to Exit 16	B	C	C	C	B	D
Exit 16 to CCCH Interchange	A	B	B	B	B	D
CCCH Interchange to Exit 17	A	B	B	B	B	C
Exit 17 to Mayo Rd	A	A	B	A	A	B
Mayo Rd to Exit 18	A	A	A	A	A	A
I-189	B	C	D	A	C	C

Table 12. AM Design Hour Volume Freeway Segment Level of Service

Segment	Northbound\Westboun			Southbound\Eastbound		
	1	2	3	1	2	3
Exit 11 to CCCH Interchange	A	B	B	B	C	C
CCCH Interchange to Exit 12	A	B	B	B	C	B
Exit 12 to VT 116	B	B	C	B	C	D
VT 116 to Exit 13	B	B	C	B	C	D
Exit 13 to Exit 14	B	D		B	D	C
Exit 14 to Winooski River Bridge	C			C	D	D
Winooski River Bridge to Exit 15	B	D	D	A	C	C
Exit 15 to Exit 16	B	D		A	C	C
Exit 16 to CCCH Interchange	B	C	D	A	B	B
CCCH Interchange to Exit 17	B	C	D	A	B	C
Exit 17 to Mayo Rd	A	B	C	A	A	B
Mayo Rd to Exit 18	A	B	B	A	A	A
I-189	B	C	C	C	D	

Table 13. PM Design Hour Volume Freeway Segment Level of Service

Level of Service	Scenario #1 (1995)		Scenario #2 (2015)		Scenario #3 (2015)	
	NB\WB	SB\EB	NB\WB	SB\EB	NB\WB	SB\EB
A,B,C	29.6	29.6	28.9	27.8	26.3	24.2
	100%	100%	98%	94%	89%	82%
D	0	0	0.7	1.1	3.3	4.7
	0%	0%	2%	4%	11%	16%
E,F	0	0	0	0.7	0	0.7
	0%	0%	0%	2%	0%	2%

Table 14. AM Peak Hour Level of Service by Mileage

Level of Service	Scenario #1 (1995)		Scenario #2 (2015)		Scenario #3 (2015)	
	NB\WB	SB\EB	NB\WB	SB\EB	NB\WB	SB\EB
A,B,C	29.6	29.6	25.7	26.3	19.3	23.9
	100%	100%	87%	89%	65%	81%
D	0	0	3.2	3.3	7.5	4.3
	0%	0%	11%	11%	25%	14%
E,F	0	0	0.7	0	2.9	1.4
	0%	0%	2%	0%	10%	5%

Table 15. PM Peak Hour Level of Service by Mileage

Basic Freeway Performance Findings:

- In 1995, congestion (LOS D or worse) was limited to I-89 southbound between the Winooski River Bridge and Exit 14 during the AM peak hour. All other interstate segments are operating at LOS C or better.

- By 2015, assuming only the base network, congestion is projected (LOS D or worse) on I-89 northbound segments between Exit 13 in South Burlington and Exit 16 in Colchester and on I-89 southbound between Exits 14 and 15.

- By 2015, assuming only the base network, failing segments (LOS E or F) are projected on I-89 northbound and southbound between Exit 14 and the Winooski River Bridge.

- With the network build-out, LOS E or F is projected between Exits 13 and 16 in the northbound direction during the PM peak hour. LOS E is also projected for I-189 eastbound with the network build-out.

Exit 12 Interchange

Exit 12 is a diamond interchange located in the Town of Williston connecting VT 2A and I-89. This interchange serves the sub-regional growth center located at Taft Corners. This growth center is currently experiencing a high level of development. The future projections include land use estimates based on a full build-out of the Taft Corners growth center (See Appendix A). The intersection of VT 2A with the on and off ramps was recently reconstructed to include auxiliary turn lanes and a traffic signal at the southbound ramps B & C. This analysis assumes a traffic signal is installed at the northbound ramps A & D intersection with VT 2A.

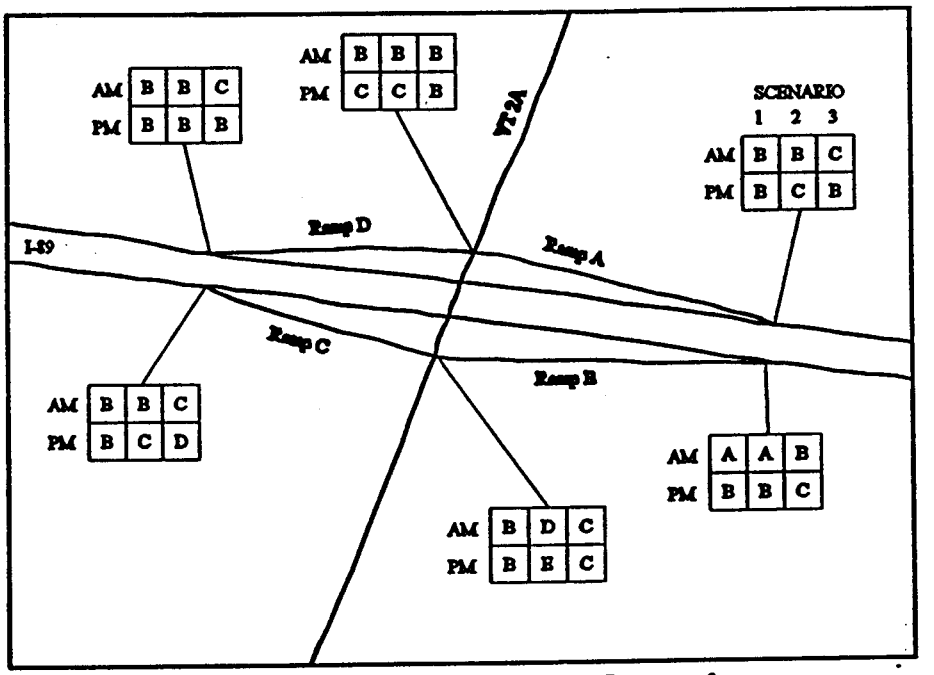

Figure 5. Exit 12 Interchange LOS by Scenario

Exit 12 Performance Summary

- Level of service for all ramp junctions and the intersections between the ramps and VT 2A were all acceptable in 1995.
- By 2015, the intersection of the southbound ramps C and B with VT 2A is projected to drop to LOS E in PM peak hour. The network build-out is projected to eliminate this deficiency.

Exit 13 Interchange

Exit 13 is a partial interchange that connects I-189 and I-89 but does not provide access to and from South Burlington local streets. **Figure 6** on the following page shows the approximate location of the proposed northbound on ramp.

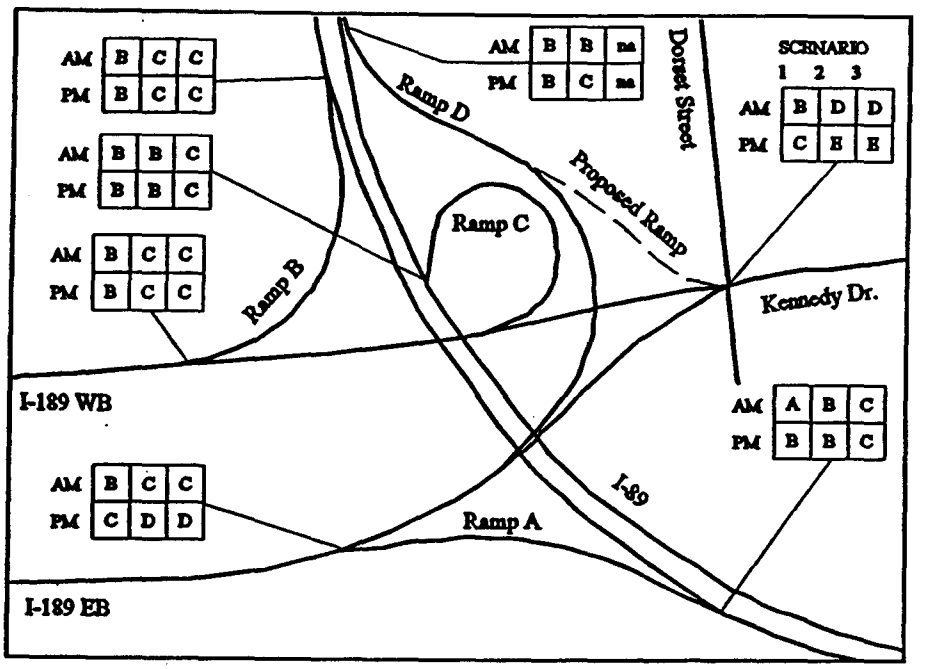

Figure 6. Exit 13 Interchange LOS by Scenario

Exit 13 Performance Summary

- In 1995, all ramp junctions and the intersection of Dorset Street and Kennedy Drive were operating at acceptable levels of service.
- Performance at all ramp junctions is projected to remain at acceptable levels of service in 2015 under both the base and build-out network scenarios.
- In 2015, performance of the Dorset Street\Kennedy Drive intersection is projected to drop to level of service E during the PM Peak hour.

Note: Scenario #3 for the Ramp D\I-89 junction indicates "na" because this ramp junction would be reconstructed to accommodate the proposed northbound on ramp.

Exit 14 Interchange

Exit 14 is a clover leaf interchange located in the City of South Burlington connecting Williston Road (US 2) to I-89. Exit 14 serves the Burlington\South Burlington Regional Growth Center. This interchange has weaving areas on both I-89 and U.S. 2. Level of service for the I-89 weaving areas is determined by the procedures in Chapter 4 of the 1994 HCM and is presented in the tables below. However, since Chapter 4 deals only with freeway weaving areas, this LOS methodology does not apply to the U.S. 2 weaving areas. Weaving maneuvers require 2.5 to 4.5

seconds. Based on the 4.5 second maneuver time and the 35 mph speed limit on U.S. 2, 231 feet are required for weaving. The weaving areas on U.S. 2 are 500 and 590 feet long in the eastbound and westbound directions respectively. Although this methodology does not indicate how well the merge area is functioning, at least this minimum requirement is met.

The intersection of Ramp F with U.S. 2 eastbound is controlled by a traffic signal. The Ramp G intersection with U.S. 2 is controlled by a yield sign. All other U.S. 2 ramp junctions are uncontrolled allowing free flow merges.

The intersection of Ramp C with U.S. 2 westbound was the subject of a scoping report prepared in 1993 by Pinkham Engineering for CCRPC. During the AM peak hour, queues backup at the ramp's intersection with U.S. 2 occasionally extending into the travel lanes of I-89. The recommendations included removing the yield sign, installing a merge warning sign, minor striping and the addition of one turning lane to East Ave. With the exception of the East Avenue turning lanes, all recommendations have been implemented. These improvements have not completely eliminated the problem. Some motorists still yield at the ramp/U.S. 2 junction. Motorists may not feel comfortable with the amount of distance available to merge between the ramp and the Staples\Sheraton intersection.

The intersection of Williston Road (US 2) with Sheraton and Staples has been studied by Resource Systems Group (RSG) of White River Junction, VT for the University of Vermont and is currently being studied as part of the Fletcher Allen Health Care Master Plan due out some time in 1998. In addition to Staples and the Sheraton, the intersection provides access to UVM housing and a commuter parking lot. Vehicles to and from the Exit 14 interchange must pass through this intersection. By observation, the eastbound approach is confusing. Although it appears to continue to the southbound on ramp "A", the right turn lane into the Staples plaza disappears after the intersection,. Analyses performed by RSG indicate a level of service of D at this intersection in 1995 and E in 2007. By adding an additional through lane on the eastbound approach, intersection level of service is shown to improve.

	1995 Existing		2015 Base		2015 Build-Out	
	Weaving	Through	Weaving	Through	Weaving	Through
AM	D	D	E	D	F	D
PM	E	D	E	E	E	E

Table 16. LOS at Northbound I-89 Weaving Area at Exit 14

	1995 Existing		2015 Base		2015 Build-Out	
	Weaving	Through	Weaving	Through	Weaving	Through
AM	E	E	F	F	F	F
PM	E	D	F	F	F	E

Table 17 LOS at Southbound I-89 Weaving Area at Exit 14

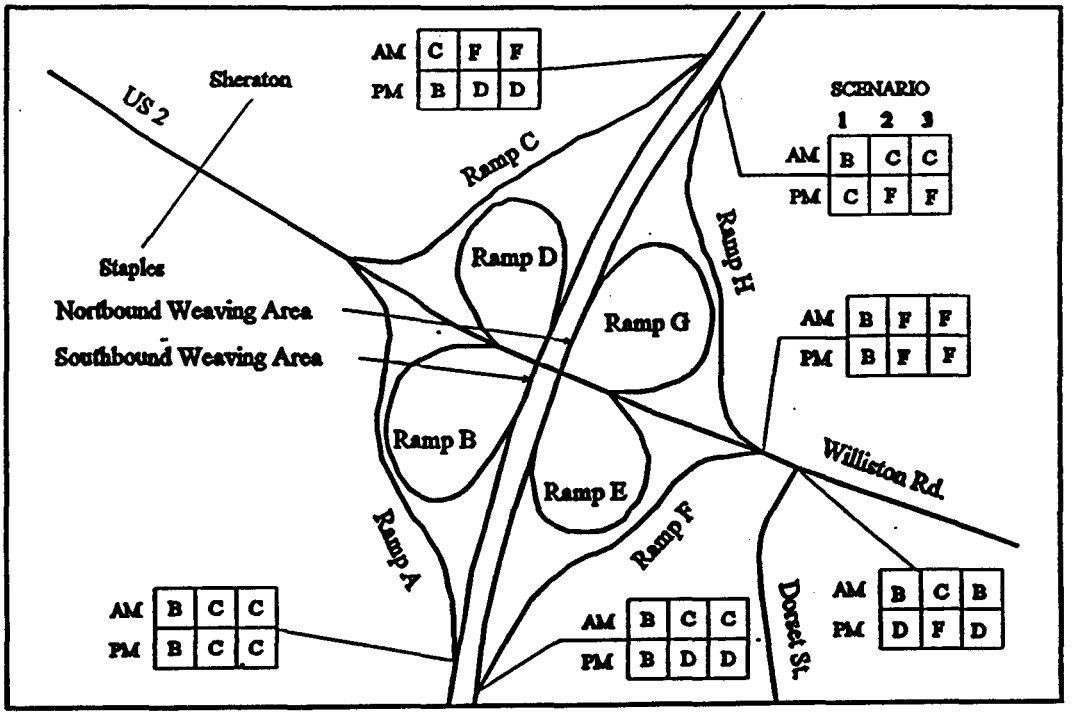

Figure 7. Exit 14 Interchange LOS by Scenario

Exit 14 Performance Summary

- Exit 14 had operational problems in 1995. The Ramp "C" intersection with US 2 was discussed above. In addition, the I-89 weaving areas are operating at level of service of E during the AM and the PM peak hours depending on direction. Performance in the weaving areas will deteriorate further in 2015 with both scenarios.

- The Ramp C junction with I-89 southbound is projected to drop to Level of Service F in the AM peak hour for both 2015 scenarios.

- Previous studies project a level of service E at the Williston Road intersection with Staples and Sheraton. The eastbound approach to the intersection confuses motorists attempting to use the southbound on ramp "A".

- The Ramp H junction with I-89 northbound is projected to perform at LOS F for both the base and build-out network scenarios.

- The network build-out is projected to improve the PM peak hour level of service from F to D at the Williston Road intersection with Dorset Street.

- Level of service is projected to drop to F for both 2015 scenarios at the signalized intersection of Ramp F with US 2.

- The problem at the Ramp C Junction with U.S. 2 westbound will not improve as volumes increase on the ramp and U.S. 2 over time. However, the network build-out scenario is projected to drop AM peak hour traffic on the ramp by approximately 7% and therefore has a positive impact on this problem.

Exit 15 Interchange

Exit 15 is a half diamond interchange located in the City of Winooski connecting VT 15 to I-89. This is a partial interchange with a northbound I-89 off ramp and a southbound I-89 on ramp. Although no capacity was added, a paving project was completed in 1996 that included the replacement of antiquated signals at the ramp\VT 15 intersections. With coordinated signals, operation on VT 15 through this interchange has been improved.

The Ramp A junction with I-89 southbound is not a typical ramp to main line junction. Ramp A converts into a third lane as it meets the main line. The three lanes merge into two lanes approximately 0.6 miles south at the bridge over the Winooski River. Therefore, there is no ramp junction and a LOS analysis has not been performed.

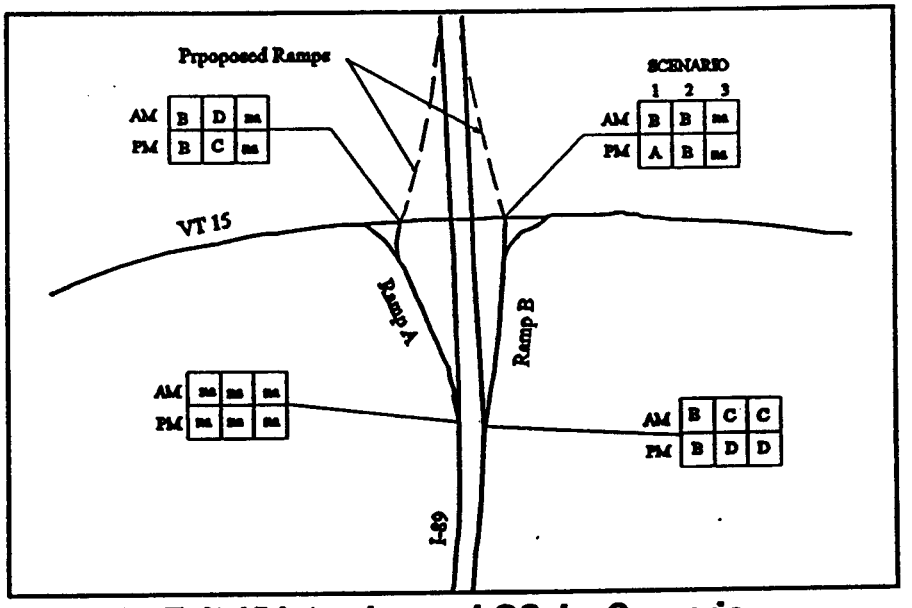

Figure 8. Exit 15 Interchange LOS by Scenario

Exit 15 Performance Summary

- In 1995, there were no operational deficiencies at the Exit 15 interchange.
- Performance remains at acceptable levels of service for both 2015 scenarios and time periods assuming that the addition of the proposed ramps includes the necessary changes to the VT 15 intersection with the ramps.

Exit 16 Interchange

The Exit 16 interchange connects U.S. Routes 2 and 7 with I-89 in the Town of Colchester. This interchange serves the City of Winooski and the Exit 16 Growth Center. Exit 16 is a full diamond interchange reconstructed in 1992. Capacity was added to accommodate expected development in the growth center.

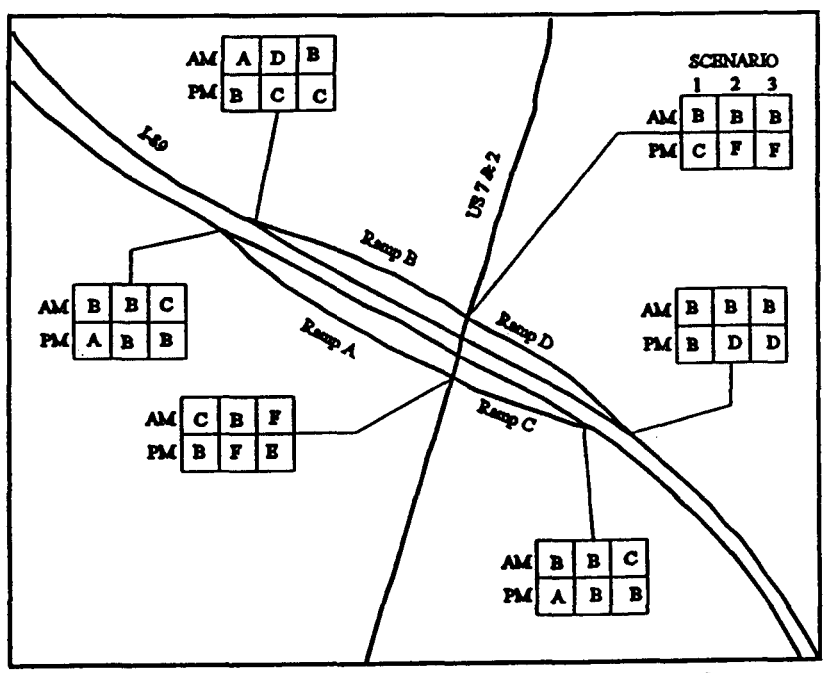

Figure 9. Exit 16 Interchange LOS by Scenario

Exit 16 Performance Summary

- In 1995 all ramp junctions and intersections were operating at acceptable level of service.
- In 2015, all interstate ramp junctions will operate at acceptable levels of service for both scenarios.
- Level of service at both ramp junctions with US 7 is projected to drop to F for each 2015 scenarios

Exit 17 Interchange

The Exit 17 interchange is located in the Town of Colchester and connects I-89 with US 2 and nearby US 7. The intersection of US 2 with US 7 (Chimney Corners) is located in close

proximity to the interchange and was upgraded in 1994 to include a traffic signal and additional turning lanes. The interchange also provides access to the interstate for travelers from Grand Isle County. The Town of Colchester has planned a growth center around this interchange. 2015 scenarios include a build-out estimate for this growth center. Exit 17 also serves the Town of Milton. The Catamount Industrial Park is located a couple of miles north of Chimney Corners on US 7. Traffic to and from the Husky Plant in Milton will also be using this interchange. The ramp intersections with US 2 are controlled by a stop signs.

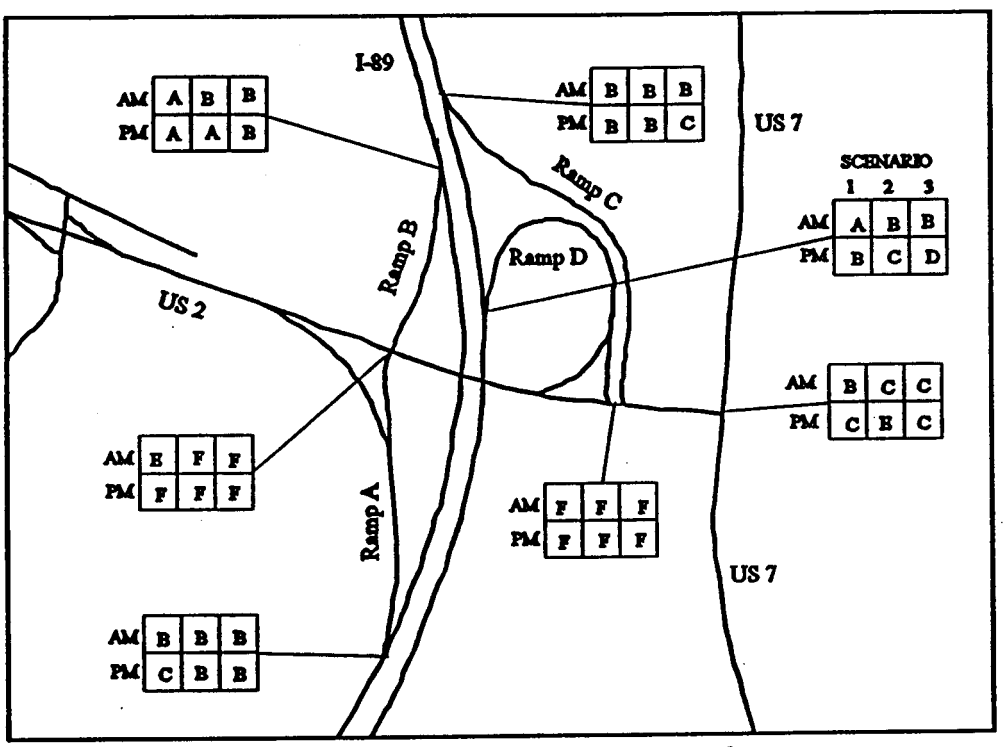

Figure 10. Exit 17 Interchange LOS by Scenario

Exit 17 Performance Summary

- In 1995, the ramp junctions with US 2 were operating at unacceptable levels of service. The poor levels of service are attributed to vehicles waiting on the ramps to make left turns.

- Level of service will not improve at the ramp\US 2 intersection in 2015, even with a new interchange at Mayo Road. With the Chimney Corners Growth Center surrounding the interchange, large amounts of traffic will continue to use this interchange.

- The network build-out is projected to improve the level of service at the US 2 intersection with US 7 from E to C.

- There are no deficiencies projected at ramp to mainline junctions under any scenario.

Safety Analysis

Based on accident records collected and maintained by VAOT for Federal-aid highways, this safety analysis summarizes the rate, severity, type and cause of crashes on I-89 and I-189 in the study area from 1992 through 1995. The amount of crashes is analyzed by comparing the actual accident rate for a road segment or intersection (or ramp junction) with a statewide average critical crash rate. When this ratio exceeds 1.0 for intersections and 2.0 for road segments the location is classified as a High Accident Location (HAL).

From 1992 through 1995, there were 269 reported crashes on I-89 and I-189. These crashes resulted in 188 injuries and 2 fatalities. Despite these numbers, there are no HALs on any of the segments of I-89 and I-189 or at the ramp to main line junctions. Appendix D summarizes the crashes at each location and presents the ratio of actual to critical crash rate. In all cases, the ratio is well below 2.0 for segments and 1.0 at ramp junctions.

There are two HALs at ramp to arterial intersections identified by VAOT and listed in **Table 18** below. The intersection of VT 15 with the northbound off ramp at Exit 15 in Winooski is the 6th worse intersection in the state and 2nd worse in Chittenden County. However, there has been work performed at the Exit 15 with VT 15 since these data were collected.

Municipality	Location	Actual/Critical Rate	State Ranking	County Ranking
Winooski	Exit 15 Northbound Ramp with VT 15	2.175	6	2
Colchester	Exit 17 Southbound Ramps with US 2	1.096	88	27

Table 18. High Accident Locations at Ramp\Arterial Intersections

Accident severity is defined as the average cost per crash. The cost is computed with average values for injuries, fatalities and property damage. The severity index is given for each segment and ramp to mainline junction in Appendix D. Statewide, the average severity index is $41,150 per crash. This average is for all highway functional classes. The severity index for the interstate segments and ramp to mainline junctions in the study area is $31,500.

Referring to **Tables 19 and 20** on the following page, the vast majority of interstate segments and ramp to mainline junction crashes (223 out of 269) are due to driver behavior. There does not appear to be any cause or type of crash that suggests road design contributes is causing a safety problem. This conclusion is not surprising given that the interstate is designed and constructed to the highest standards.

EXCESSIVE SPEED	51
CARELESS & NEGLIGENT	41
FOLLOWING TOO CLOSE	36
LIQUOR, CITED	33
INATTENTION	25
FAILURE TO YIELD	16
U-TURN	12
DRIVER FELL ASLEEP	9
OTHER OP. CAUSE	9
OTHER VEHICLES	8
SLIPPERY ROAD	4
OTHER	25
Total	269

Table 19 Crash Causes

REAR END COLLISION	106
OTHER COLLISION	32
HIT GUARDRAIL	40
ROLLED OVER	27
SIDESWIPE	16
TURNING	11
HIT LEDGE	10
RT. ANGLE - BROADSIDE	4
HEAD ON COLLISION	3
HIT BOULDERS	3
HIT SIGN	3
OTHER	14
	269

Table 20. Crash Types

Level 1 Analysis Summary: Interstate Segments and Interchanges

There are two High Accident Locations in the study area located at Exit 17 in Colchester and Exit 15 in Winooski. Accident rates for all other interstate elements are not critical. The severity of crashes in the study area is below the state average and crash data implies there are no design issues that need to be addressed.

Table 21 on the following page lists the locations on the Interstate where performance deficiencies exist in 1995 and are projected to exist in 2015 (indicated by ✖). The facility is considered deficient if the level of service is E or F.

In 1995, performance deficiencies existed at Exit 14 in South Burlington and Exit 17 in Colchester.

In 2015, with the base network scenarios, performance deficiencies are projected on ramp to arterial intersections at Exits 12, 13, 16 and 17. Performance deficiencies are also projected at several elements of the clover leaf interchange at Exit 14 including both weaving areas, two ramp to mainline junctions and at two off ramp intersections' with US 2. North and southbound I-89 freeway segments between Exit 14 and the Winooski River bridge are also projected to have operational deficiencies.

The network build-out scenario eliminates performance deficiencies at the Exit 12 southbound ramp intersection with VT 2A in Williston and at the intersection of US 2 and US 7 near Exit 17 in Colchester. All other performance deficiencies at interchanges described above remain.

With the network build-out scenario, the extent of operationally deficient freeway segments increases. In general, volumes are projected to exceed capacity on I-89 between Exits 13 and 16, I-89 southbound between the Winooski River Bridge and Exit 14, and I-189 eastbound.

		✖ = LOS E or F		
Facility	Location	1995 Existing	2015 Base	2015 Network Build-Out
I-89 Northbound	Exit 13 to Exit 14			✖
	Exit 14 to Winooski Bridge		✖	✖
	Exit 15 to Exit 16			✖
I-89 Southbound	Winooski Bridge to Exit 14		✖	✖
I-189 Eastbound	US 7 to I-89			✖
I-89 Exit 12 Interchange with VT 2A	SB Ramp intersection with VT 2A		✖	
I-89 Exit 13 Interchange with I-189	I-189\Kennedy Dr.\Dorset St. Intersection		✖	✖
I-89 Exit 14 Interchange with U.S. 2	NB I-89 Weaving Area	✖	✖	✖
	SB I-89 Weaving Area	✖	✖	✖
	NB On Ramp "H" Junction with I-89 NB		✖	✖
	SB Off Ramp "C" Junction with I-89 SB		✖	✖
	NB Off Ramp "F" intersection with U.S. 2		✖	✖
	SB Off Ramp "C" with U.S. 2	✖	✖	✖
I-89 Exit 16 Interchange with U.S. 7	SB Off Ramps intersection with U.S. 7		✖	✖
	NB Off Ramps intersection with U.S. 7		✖	✖
I-89 Exit 17 Interchange with US 2	I-89 Northbound Off Ramp "D" w/ US 2	✖	✖	✖
	Southbound Off Ramp "B" with U.S. 2	✖	✖	✖
	US 2 intersection with US 7		✖	

Table 21. Summary of Deficient Locations On I-89 Freeway Segments and Interchanges

LEVEL 2 ANALYSIS: SOUTH BURLINGTON CENTER SUB AREA

This section of the study analyzes the effect of the full network build-out on the Williston Road\Dorset St\Kennedy Drive corridor (referred to from this point on as South Burlington Center Sub Area). The network build-out also includes the construction of Corporate Way between Dorset Street and VT 116 and the Kimball Avenue Connector planned to link VT 116 north of I-89 and south of Old Farm Road to Marshall Avenue in Williston. This full network build-out analysis will quantify the extent to which these new roads and interchanges can alleviate congestion in the South Burlington Center Sub Area.

Figure 11 identifies the study area and presents level of service results at key signalized intersections for all three scenarios. The level of service analyses assumes the existing lane configuration at the intersections with the exception of the Kennedy Drive intersection with Timberlane. It has been assumed that this intersection will have two through lanes on both Kennedy Drive approaches.

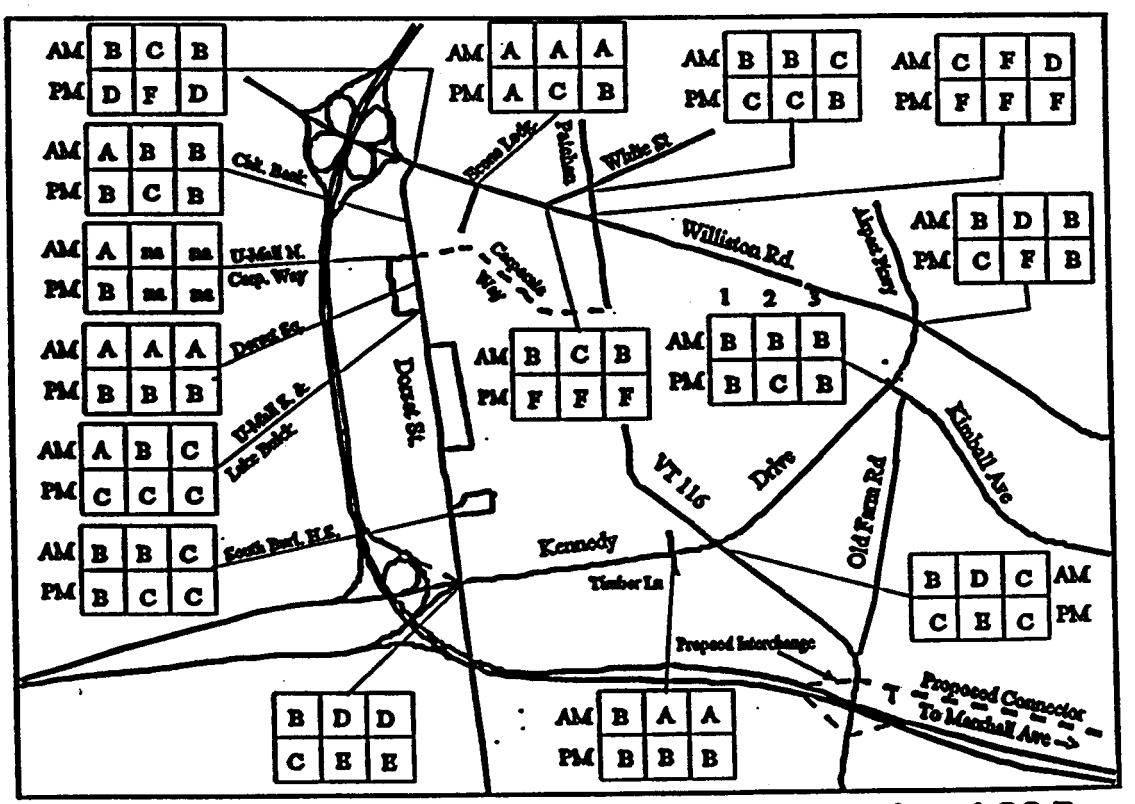

Figure 11. Williston Road Corridor Signalized Intersections LOS By Scenario

South Burlington Center Sub Area Performance Summary

- The only two intersections that were over capacity in 1995 are located on Williston Road at its intersections with Patchen Road and White Street. All other intersection have adequate capacity.

- In 2015 with the base network, LOS E or F is projected at the following additional intersections:

    - Williston Road with Dorset Street,
    - Williston Road with Kennedy Drive
    - Dorset Street with Kennedy Drive,
    - Kennedy Drive with VT 116

- The network build-out scenario has a positive effect towards reducing congestion in the South Burlington Center Sub Area. Level of service is improved to acceptable levels at the following intersections:

    - Williston Road and Dorset Street
    - Williston Road, VT 116 and Patchen Road (During the AM Peak Only)
    - Williston Road and Kennedy Drive
    - VT 116 and Kennedy Drive

- With or without the network build-out, deficiencies are projected at the following intersections:

    - Williston Road with White Street
    - Williston Road with Hinesburg and Patchen Roads
    - Kennedy Drive with I-189 and Dorset Street

LEVEL 3: COUNTY-WIDE ANALYSIS

This section of the study considers changes in the performance of the county wide transportation system under the three scenarios. Vehicle Miles of Travel (VMT), congested VMT, activity area through traffic, average travel time per vehicle trip and system wide delay are explained and presented below.

Vehicle Miles of Travel

Tables 22-24 compare AM and PM peak hour VMT by scenario for the entire county, the interstate\freeway system and the local\arterial street system. VMT is projected to increase by 24 and 36% in the AM and PM peak hours respectively between 1995 and the 2015 base network scenario. The network build-out scenario shifts VMT from the local\arterial streets to the interstate\freeway system without significantly increasing total VMT (1.5% in the AM and +0.9% in the PM). VMT is projected to increase by 20% in the AM and 12% in the PM on the interstate system. VMT is projected to decrease by 7% in the AM and 8% in the PM on the arterial and local street system This shift is demonstrated further in **Figure 12.**

	1995 Existing	2015 Base	2015 Build-Out
AM	339,100	421,700	428,200
PM	403,300	547,500	552,800

Table 22. County-Wide Peak Hour VMT

	1995 Existing	2015 Base	2015 Build-Out
AM	101,700	131,800	158,700
PM	125,700	185,000	218,300

Table 23. Interstate\Freeway Peak Hour VMT

	1995 Existing	2015 Base	2015 Build-Out
AM	237,300	289,900	269,500
PM	277,600	362,600	334,500

Table 24. Local & Arterial Streets Peak Hour VMT

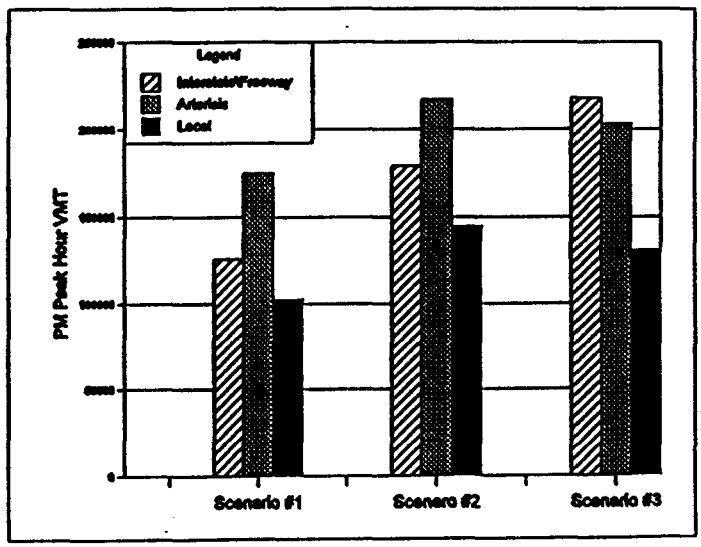

Figure 12. Total PM Peak VMT by Scenario and Functional Class

Congested Vehicle Miles of Travel

Tables 25-27 present the amount of congested vehicle miles of travel by scenario for the entire county, the interstate\freeway system and the local\arterial street system. For the purpose of this comparison, congested VMT is defined as VMT at LOS D, E or F. From 1995 to 2015, congested VMT is projected to increase 84% in the AM peak hour and 67% in the PM peak hour county-wide. Congested VMT is projected to increase from 10 to 20% of total VMT during the PM peak hour. **Table 25** show that congested VMT is projected to increase county-wide due to the network build-out. As demonstrated in the tables and in **Figure 13**, the increase in congested VMT is carried by the interstate and freeway segments while congested VMT decreases on the arterial and local streets. Congested VMT is projected to decrease 24 and 22% during the AM and PM peak hours on local and arterial streets. This shift consolidates congestion from the local\arterial street system to the interstate and freeway system and provides an opportunity to effectively address the problem.

	1995 Existing	2015 Base	2015 Build-Out
AM	18,500	34,100	38,300
PM	41,300	110,200	114,000

Table 25. County-Wide Peak Hour Congested VMT

	1995 Existing	2015 Base	2015 Build-Out
AM	1,000	3,200	14,800
PM	17,800	42,800	61,300

Table 26. Interstate and Freeway Peak Hour Congested VMT

	1995 Existing	2015 Base	2015 Build-Out
AM	24,000	31,000	23,600
PM	23,400	67,400	52,800

Table 27. Local & Arterial Streets Peak Hour Congested VMT

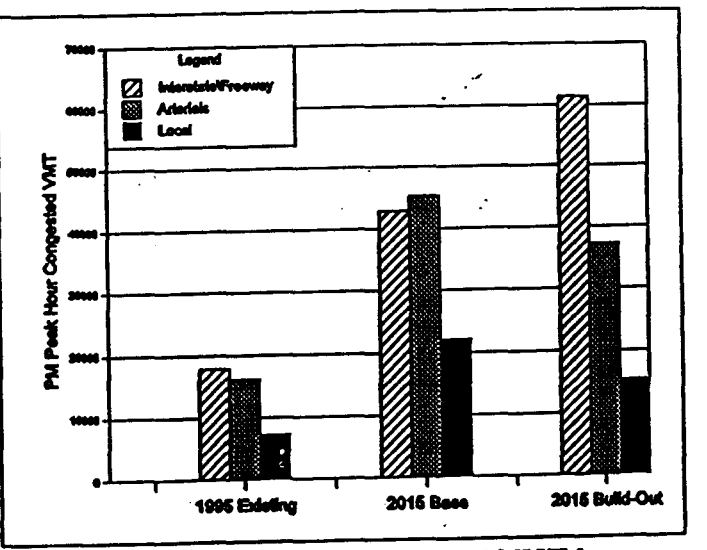

Figure 13. PM Peak Congested VMT by Scenario and Functional Class

Through Traffic Analysis

One of the functions of the interstate is to provide a direct and highly mobile route for through traffic. To measure how well this goal is served, a through traffic analysis was conducted using the Chittenden County Transportation Model for the sub areas listed in the table below and shown in Appendix E. This analysis focuses only on the PM peak hour.

The analysis shows that the network build-out significantly reduces through traffic in all but one of the sub areas. The one exception is the New North End of Burlington. The increase in through traffic in the New North End occurs entirely on the Northern Connector (VT 127). Since VT 127 is a fully controlled access facility designed for through traffic, the increase is not surprising. There is no significant change in through traffic projected on North Avenue or through the local streets of the New North End due to the network build-out scenario.

Sub Area	1995 Existing	2015 Base Network	2015 Network Build-Out	% Change Scenarios 2 to 3
So. Burl. Center Sub Area	4,110	4120	3390	-18%
Burlington South End, Downtown and Hill Section	2,940	3,990	3,590	-10%
Burlington Old North End	4,220	5,000	4,440	-11%
Burlington New North End	1,110	1,130	1,330	+18%
Taft Corners	3,150	3,190	2,590	-19%
Essex Junction	970	1,360	760	-44%
Winooski	2,440	2,480	1,950	-22%
Colchester Village	1,530	1,800	720	-60%

Table 28. Sub Area PM Peak Hour Through Traffic (Vehicles per Hour)

Average Travel Time and Delay

Average travel time per vehicle trip was estimated with the Chittenden County Transportation Model for each scenario during the PM peak hour and is given below. Both total delay for all vehicle trips made in the County and average delay per vehicle trip are presented. Total delay is equal to the sum of all vehicle trips multiplied by the estimated delay per trip. The estimated delay per trip is equal to the difference in travel time between a trip made on the congested

network less the travel time for the same trip made on an uncongested network. This approach includes both the delay incurred due to congestion and delay that results when alternative routes are chosen to avoid congestion. Average delay per vehicle trip, which may be more meaningful to most, is equal to the total delay divided by the number of total vehicle trips.

Total delay is projected to increase by more than 200% from 1995 to 2015. This increase is due to more congestion and vehicle trips. In 1995, the average trip takes about 3 minutes longer than it would if there was no congestion. This delay increases by 60% in 2015 assuming only the base network. The table below clearly shows that the network build-out scenario significantly reduces delay. In fact, average delay per vehicle trip and the average trip length decrease back to 1995 levels. Relative to the base network scenario, the network build-out reduces total delay by 34%, average delay per vehicle trip by 35% and average vehicle travel time by 8%.

Scenario	Average Vehicle Trip Length (Minutes)	Total Delay (Hours)	Average Delay per Vehicle Trip (minutes\vehicle trip)
1995 Existing	15.9	2,470	3.0
2015 Base Network	17.4	5,190	4.8
2015 Network Build-Out	16.0	3,450	3.1

Table 29. County-Wide Travel Time and Delay

Regional Transportation System Performance Findings

- The network build-out improves the efficiency of the transportation system. Total VMT remains unchanged while total delay, average delay per vehicle trip and average travel time per trip decrease.

- The network build-out improves the flow of through traffic in the county by removing it form the local and arterial system and from key activity areas. The network build-out removes both congested and total VMT from the local and arterial street system. Through traffic in sub areas is also reduced by the network build-out.

- VMT and congested VMT removed from the local and arterial system, increase on the interstate due to the network build-out. This shift provides an opportunity to address congestion in a confined area on a facility that is designed for mobility.

PROJECT PRIORITIZATION

This study has identified safety problems and both current and projected performance deficiencies in the Chittenden County I-89 Corridor. The following locations are currently deficient and require near term solutions:

- Exit 14 I-89 waving areas (operational deficiency)
- Exit 14 southbound off ramp intersection with westbound US 2 (operational deficiency)
- Exit 17 North and Southbound Ramps with US 2 (operational and safety deficiencies)
- Exit 15 NB Ramp Intersection with VT 15 (safety deficiency)

Beyond these existing problems, this study has identified the benefits of proceeding with the interchange projects and the Circumferential Highway. The CCMPO Technical Advisory Committee (TAC) discussed these results at its November 13, 1997, meeting and directed staff to provide additional information to help prioritize the interchange projects.

Tables 30 and 31 present general descriptive information for each project and how each supports regional transportation policy. In addition, the projects listed were modeled separately to quantify their individual effects on the transportation system using several performance measures defined below.

1. New interchange between VT 116 and I-89
2. Northbound on ramp from Dorset Street to I-89 northbound
3. Construct a full Interchange at Exit 15
4. Construct a new Interchange at Mayo Road in Milton
5. Circumferential Highway

Each project was modeled for the years 2005 and 2015. In 2005, the Circumferential Highway was modeled from I-89 in Williston to I-89 in Colchester. In 2015, the complete Circumferential Highway is modeled.

Tables 32 and 33 present transportation system performance measures for each project, as modeled independently. The performance measures are defined prior to the tables. A cost per change in performance measure has also been developed for each factor to help compare the relative benefits of individual projects. The Chittenden County Transportation Model was used to develop these measurements. (Given the inherent uncertainty of models, any change within plus or minus three percent is considered equal to zero.)

Project/ Item	Circ Highway	VT 116 Interchange	Exit 13 NB Ramp	Full Exit 15 Interchange	Mayo Rd. Interchange
Cost (Millions)	$75.3	$2.9	$0.80	$3.4	$4.6
Location	Williston, Essex, Colchester	South Burlington	South Burlington	Winooski	Milton
Description	Limited access highway	New interchange with VT 116	Add on ramp from Dorset St. to I-89 NB	Add NB on ramp and SB off Ramp to create a full interchange	New interchange at Mayo Road.
Area Served	Northeast Chittenden County	So. Burlington Commercial & Residential Areas & Burl. Int. Airport	So. Burlington commercial area	City of Winooski	Milton commercial and industrial areas
Status	I-89 to I-89: 2-3 yrs. if funds for construction are available I-89 to VT 127 : ?	Last studied in 1987	Scoping report pending (see bullet on page 38)	Last studied in 1987	Last studied in 1987

Table 30. General Information

Project/Item	Circ Highway	VT 116 Interchange	Exit 13 NB Ramp	Full Exit 15 Interchange	Mayo Rd. Interchange
Specifically included in LRTP	Yes	No	Yes	No	No
Supports Key LRTP Goals**	5 & 6	2 & 6	2, 5 & 6	2 & 6	2 & 6
Supported by Local Community	Yes	Yes	Yes	Yes	Yes

Table 31. Policy Factors

** 1997 LRTP Goals

1. Maintain the existing system
2. Facilitate mobility with efficiency Improvements
3. Limit congestion through growth center based land use
4. Increase public transportation mode share
5. Complete key highway improvements
6. Support goods movement and freight mobility

Transportation System Performance Measures

- AADT Served

  AADT = Average Annual Daily Traffic carried by the new project. For the Circumferential Highway, the AADT is equal to the sum of the AADTs of each new segment added. For an interchange project, the AADT is equal to the sum of the AADTs for each new ramp added.

  $/AADT = Capital Cost of the project divided by the new AADT served.

- County-wide Peak Hour VMT Change

  Peak Hour VMT = Vehicle miles of travel during the PM peak hour

  Act Change = (County-wide peak hour VMT with the project) less (County-wide peak hour VMT for the base network)

  Annual Reduction/$1,000 = Estimated annual reduction in county-wide VMT per $1,000 of project capital costs.

- County-wide Congested Peak Hour VMT Change

  Congested VMT = Vehicle miles traveled under congested conditions.

  Act Change = (County-wide peak hour VMT with the project) less (County-wide peak hour VMT for the base network)

  Annual Reduction/$1,000 = Estimated annual reduction in county-wide congested VMT per $1,000 of project capital costs.

- Arterial and Local Roads VMT Change

  This factor measures whether or not a project removes traffic from arterial and local roads.

  Act Change = (Arterial\Local Roads peak hour VMT with the project) less (Arterial\Local Roads peak hour VMT for the base network)

  Annual Reduction/$1,000 = Estimated annual reduction in VMT on arterial and local roads per $1,000 of project capital costs.

- Arterial and Local Roads Congested VMT Change

  This factor measures whether or not a project reduces congestion on arterial and local roads.

Act Change = (Arterial\Local Roads peak hour Congested VMT with the project) less (Arterial\Local Roads peak hour congested VMT for the base network)

Annual Reduction/$1,000 = Estimated annual reduction in congested VMT on arterial and local roads per $1,000 of project capital costs.

- Change in County-wide Total Delay

Total delay = The sum of all delay experienced during the peak hour.

Act Change = (County-wide total delay with the project) less (County-wide total delay for the base network)

Annual Reduction/$1,000 = Estimated annual reduction in county wide total delay per $1,000 of project capital costs.

Transportation System Performance Measures		Circ A-H	VT 116 Interch.	Exit 13 NB On Ramp	Exit 15 Full Inter.	Mayo Rd. Interch.
Estimated Cost (Millions)		$62.70	$2.90	$0.80	$3.40	$4.60
AADT Served	AADT	48,560	25,320	5,010	8,380	13,640
	$/AADT Served	$1,291	$115	$160	$406	$337
County-wide Peak Hour VMT Change	Act Change	-3220	-460	190	280	-1240
	% Change	-1%	0%	0%	0%	0%
	Annual Red./$1,000	0	0	0	0	0
County-wide Congested VMT Change	Act Change	-3850	1670	1330	0	1360
	% Change	-6%	-3%	-2%	0%	2%
	Annual Red./$1,000	224	0	0	0	0
Arterial & Local Roads VMT Change	Act Change	-17350	-2850	-150	-900	-5540
	% Change	-17%	-1%	-4%	-2%	-6%
	Annual Red./$1,000	1,010	0	684	0	4,396
Arterial & Local Road Congested VMT Change	Act Change	-6260	530	1275	-520	2170
	% Change	-5%	-1%	0%	0%	-2%
	Annual Red./$1,000	364	0	0	0	0
Change in County-wide Peak Hour Total Delay	Act Change	-470	-160	-20	-10	-180
	% Change	-15%	-5%	-1%	-0%	-6%
	Annual Red./$1,000	2	14	0	0	10

Table 32. Year 2005 Performance Measures by Project

Transportation System Performance Measures		Circ A-J	VT 116 Interch.	Exit 13 NB On Ramp	Exit 15 Full Inter.	Mayo Rd. Interch.
Estimated Cost (Millions)		$75.30	$2.90	$0.80	$3.40	$4.60
AADT Served	AADT	75,030	27,810	6,040	10,090	14,590
	$/AADT Served	$1,004	$104	$132	$337	$315
County-wide Peak Hour VMT Change	Act Change	-6110	-820	-180	320	-2200
	% Change	-1%	0%	0%	0%	0%
	Annual Red./$1,000	0	0	0	0	0
County-wide Congested VMT Change	Act Change	-18120	-6110	-170	-2750	-5100
	% Change	-18%	-6%	0%	-3%	-5%
	Annual Red./$1,000	878	7,690	0	0	4,047
Arterial & Local Roads VMT Change	Act Change	-26890	-3310	-420	-1070	-5660
	% Change	-8%	-1%	0%	0%	-2%
	Annual Red./$1,000	1,303	0	0	0	0
Arterial & Local Road Congested VMT Change	Act Change	-13650	-1670	440	-3130	-4150
	% Change	-23%	-3%	-1%	-5%	-7%
	Annual Red./$1,000	662	0	0	3,360	3,293
Change in County-wide Peak Hour Total Delay	Act Change	-950	-220	-60	-30	-220
	% Change	-21%	-5%	-1%	-1%	-5%
	Annual Red./$1,000	3	20	0	0	12

Table 33. Year 2015 Performance Measures by Project

Observations and Comments

- The Circumferential Highway produces the largest reduction in county-wide congested VMT, congested and total VMT on local and arterial roads and county-wide peak hour delay.
- Referring to **Table 31**, a scoping study was started in 1994 for the Exit 13 northbound on ramp making this project further along the planing process than the other interchange projects.
- **Table 32** shows that all the projects satisfy at least two of the goals of the LRTP. The Exit 13 northbound on ramp satisfies three of the goals.
- For each project, $/AADT served and Annual Reduction in Peak Hour Total Delay per $1,000 provide a distinct contrast.
- The Annual Reduction per $1,000 in Arterial and Local Roads Congested VMT provides a distinct contrast between projects.
- None of the projects result in a significant change in county-wide peak hour VMT. Therefore, this parameter is not useful in helping to prioritize these projects.

CONCLUSIONS and RECOMMENDATIONS

In the long term, the network build-out scenario is projected to improve the overall efficiency of the transportation system, remove congestion from local and arterial streets, remove through traffic from activity areas, and improve the performance of key intersections in the South Burlington Center Sub Area. This study has also identified existing safety problems and both current and projected future performance deficiencies in the Chittenden County I-89 corridor.

After reviewing the results of the study and the general information, policy factors, and transportation system measurements, the TAC recommended that interchanges and issues be placed in two categories: (1) interchanges that should be scoped and (2) issues that need additional study. The Circumferential Highway is not included in either category because different segments of this project are already in the permitting, design or right of way phases.

INTERCHANGES FOR SCOPING:

The projects below are valid candidates for scoping. Once the projects have been scoped, they would be placed on the project candidate list and would be prioritized against all other projects in Chittenden County.

Exit 14

Purpose: Address existing deficiencies in the I-89 weaving areas, the southbound off ramp intersection with US 2 westbound (Ramp C). Address projected deficiencies as identified in the I-89 Study. Include an analysis of the Staples/Sheraton Intersection.

Justification

- Existing operational deficiencies result in large queues and create safety problems
- Projected deficiencies exist with or without additional interchanges.
- Addressing the operational problems satisfies the goal of the LRTP related to improving the efficiency of the existing system

Exit 17

Purpose: Address existing safety and operational deficiencies.

Justification

- Existing deficiencies cause safety and congestion problems.
- Projected deficiencies exist with or without additional interchanges
- Addressing the operational problems satisfies the goal of the LRTP related to improving the efficiency of the existing system

Exit 13 Northbound On Ramp

Purpose: Improve the efficiency of the existing system, improve the connection between two NHS routes, support goods movement and freight mobility and implement a component of a key highway project identified in the LRTP.

Justification

- Satisfies three of the six LRTP Goals..
- Has the second to lowest cost per AADT served.
- Could be implemented in a short range time frame.

Interchange with VT 116

Purpose: Improve the efficiency of the existing system, support goods movement, improve access to an NHS intermodal facility (Burlington International Airport) and to help reduce congestion on local and arterial streets.

Justification

- Satisfies two of the LRTP's goals
- Has the lowest cost per AADT served
- Provides a connection between two NHS facilities (I-89 and Kennedy Drive)
- Of the four interchange projects studied, is the most effective at reducing county wide congestion per dollar.

ISSUES FOR ADDITIONAL STUDY:

Exit 15 Interchange Safety Improvements

Objective: Collect accident data and perform a safety analysis to determine if the safety problem still exists following the paving, re-striping and signal timing work that was completed in 1996.

I-89 From Exit 13 to Exit 16 and I-189

Objective: Perform a planning study to develop, analyze and select alternatives that address the congestion issues projected in 2015 on freeway segments between Exit 13 and 16 and on I-189.

New Milton Interchange

Objective: Determine where the best location for a Milton Interchange would be. Update benefit to cost analysis in light of Husky, the Chimney Corners Growth Center and new development in the Catamount Industrial Park.

Full Interchange at Exit 15

Objective: Update the benefit to cost ratio and include a possible link to with the Airport.

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APPENDIX A

LAND USE

Table A-1 presents the county-wide land use totals used as the base for traffic projections. The projections include specific estimates for the South Burlington Williston Road Corridor, Taft Corners Area, the Chimney Corners Growth Center at Exit 17 and Husky Injection Moldings in Milton.

	1993	2015	Avg Annual Growth
Residential Units	50463	66233	1.24%
Retail Employ.	15819	22562	1.63%
Non Retail Employ.	64098	84893	1.29%
Total Employ	79917	107455	1.35%

Table A-1. County-Wide Land Use Projections

The Chittenden County Transportation Model refines the residential and employment categories listed above into the eight listed below.

1. Single Family Dwelling Units
2. Multi Family Dwelling Units
3. Retail Employment
4. High Commercial Employment
5. Low Commercial Employment
6. Industrial Employment
7. Institutional Employment
8. Hotel\Motel Employment

Land use projections for the Williston Road Corridor were made in the 1988 JHK Study South Burlington City Center/Dorset Street Corridor Traffic Impact Analysis Final Report. These projections, summarized in Table A-2 below, were converted to the Chittenden County Model format as shown in Table A-3 on the following page. The conversion of residential units was direct. The conversion of retail was based on 400 employees/square foot. The conversion of office was based on 550 employees per square foot.

Res Units	Retail	Office
599	853,200 GSLA 2133 employees	692,174 GSLA 1258 employees

Table A-2. Williston Road Corridor Land Use Projections

In the Taft Corners Area, the land use estimates were prepared by the Williston Town planner working with the Chittenden County Regional Planning Commission. The projections are based on projects with approved Act 250 permits that have yet to be constructed and also include Maple Tree Place. Refer to Table A-4.

Build out employment estimates are 2,000 and 4,445 industrial employees for Husky Injections Molding and the Chimney Corners growth center respectively. These estimates are based on the Husky Traffic Impact Study which included estimates for Chimney Corners. The land use estimates for the Williston Road Corridor, Taft Corners, Husky and Chimney Corners was set. The Chittenden County Model distributed the balance of the land use to all transportation analysis zones accordingly.

South Burlington Land Use Projections from JHK 1998 Study

From Table 4 - Forecast Land Development Scenarios & Added Traffic

Chittenden County Model TAZ	JHK STUDY TAZ	Single Family Units	Multi Family Units	Retail GSLA	Hotel Rooms	Office GSLA	Major Retail GSLA	Medical Office GSLA
101	1			63240		122750		
106	2	30						
110	3			9500		9500		
103	4							
102	5			20600				
97	6				40			
98	7							
99	8		11	31910	108	13000		
100	9							
104	10							
119	11							
118	12							
115	13					125250		
107	14					26200		
95	15					24000	90000	
96	16					39204		
92	17							
92	18		59					
113	19							
123	20	24	34			20000		
Totals		54	104	125250	148	379914	90000	

Table 8 - 1997 Forecast Land Development Scenarios & Added Traffic

Single Family Units	Multi Family Units	Retail GSLA	Hotel Rooms	Office GSLA	Major Retail GSLA	Medical Office GSLA
		66240		122750		
5						
				41750		
			68	51150	127950	
	200					
11	225					
16	425	66240	68	215650	127950	

Table 9 - 2002 Forecast Land Development Scenarios & Added Traffic

Single Family Units	Multi Family Units	Retail GSLA	Hotel Rooms	Office GSLA	Major Retail GSLA	Medical Office GSLA
		141830		287960		
		190900		190900		
				7820	3850	
				28400	28400	
				7050		
				36730		36730
				11470		
				6340	6340	
				15680	6230	
		51160			17050	
			163	122000		
		383890	163	713360	59870	36730

Conversion to Chit. County Regional Model Land Use Format

1991 Land Use Increase: Assume this is added in 2000

CCTAZ	JHKZON	SFDU	MFDU	LOCOM	HICOM	REATIL	INDUST	INSTUT	HOTE
92	18	0	59	0	0	0	0	0	0
95	15	0	0	44	0	225	0	0	0
96	16	0	0	71	0	0	0	0	0
97	6	0	0	0	0	0	0	0	36
98	7	0	0	0	0	0	0	0	0
99	8	0	11	24	0	60	0	0	95
100	9	0	0	0	0	0	0	0	0
101	1	0	0	223	0	158	0	0	0
102	5	0	0	0	0	62	0	0	0
103	4	0	0	0	0	0	0	0	0
104	10	0	0	0	0	0	0	0	0
106	2	30	0	0	0	0	0	0	0
107	14	0	0	48	0	0	0	0	0
110	3	0	0	17	0	24	0	0	0
113	19	0	0	0	0	0	0	0	0
115	13	0	0	228	0	0	0	0	0
118	12	0	0	0	0	0	0	0	0
119	11	0	0	0	0	0	0	0	0
123	20	24	34	36	0	0	0	0	0

1997 Land Use Increase: Assume this is added in 2005

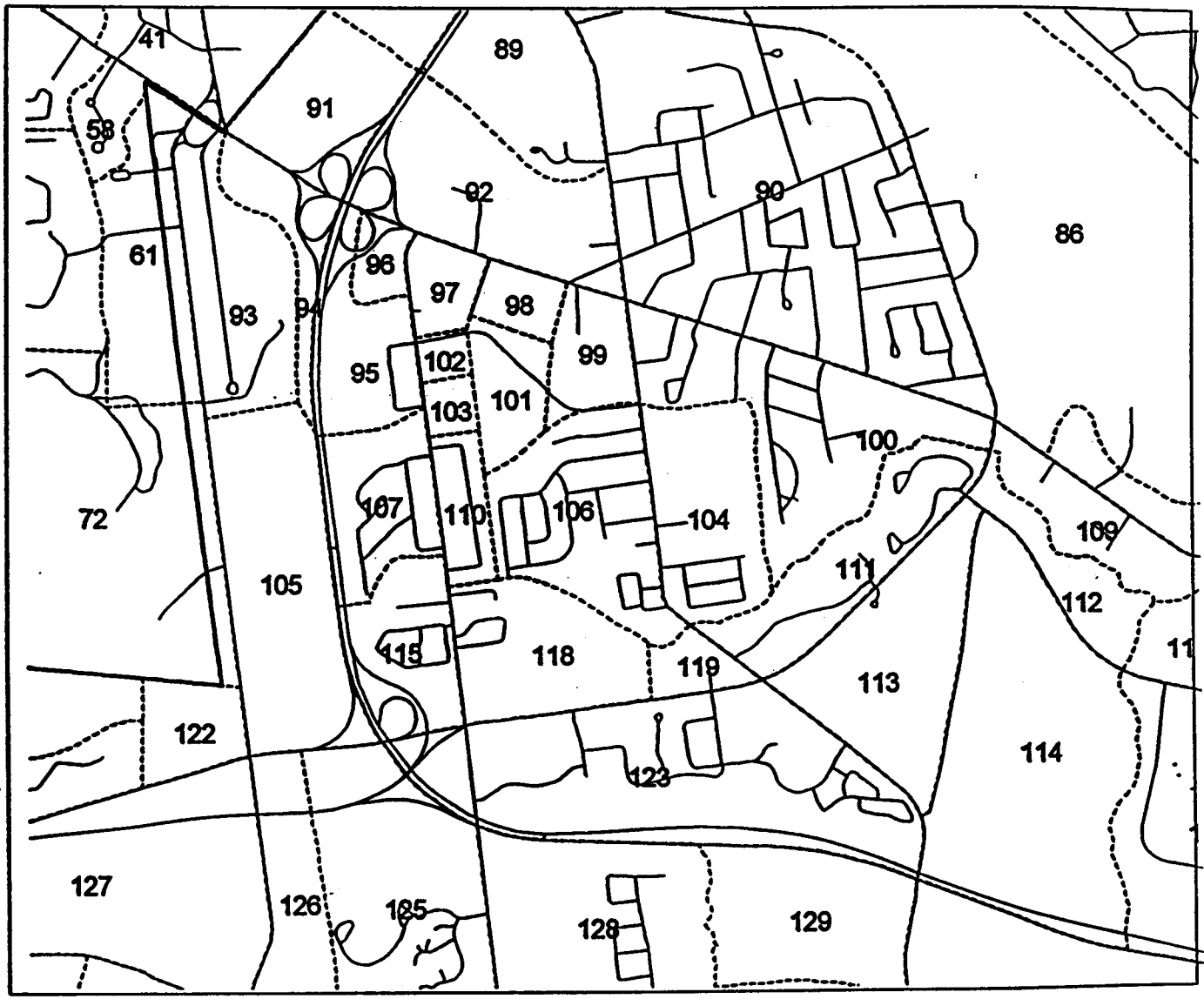
SFDU	MFDU	LOCOM	HICOM	REATIL	INDUST	INSTUT	HOTEL
0	200	93	0	320	0	0	61
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	223	0	166	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
11	225	0	0	0	0	0	0
0	0	76	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Assume this is added in 2010

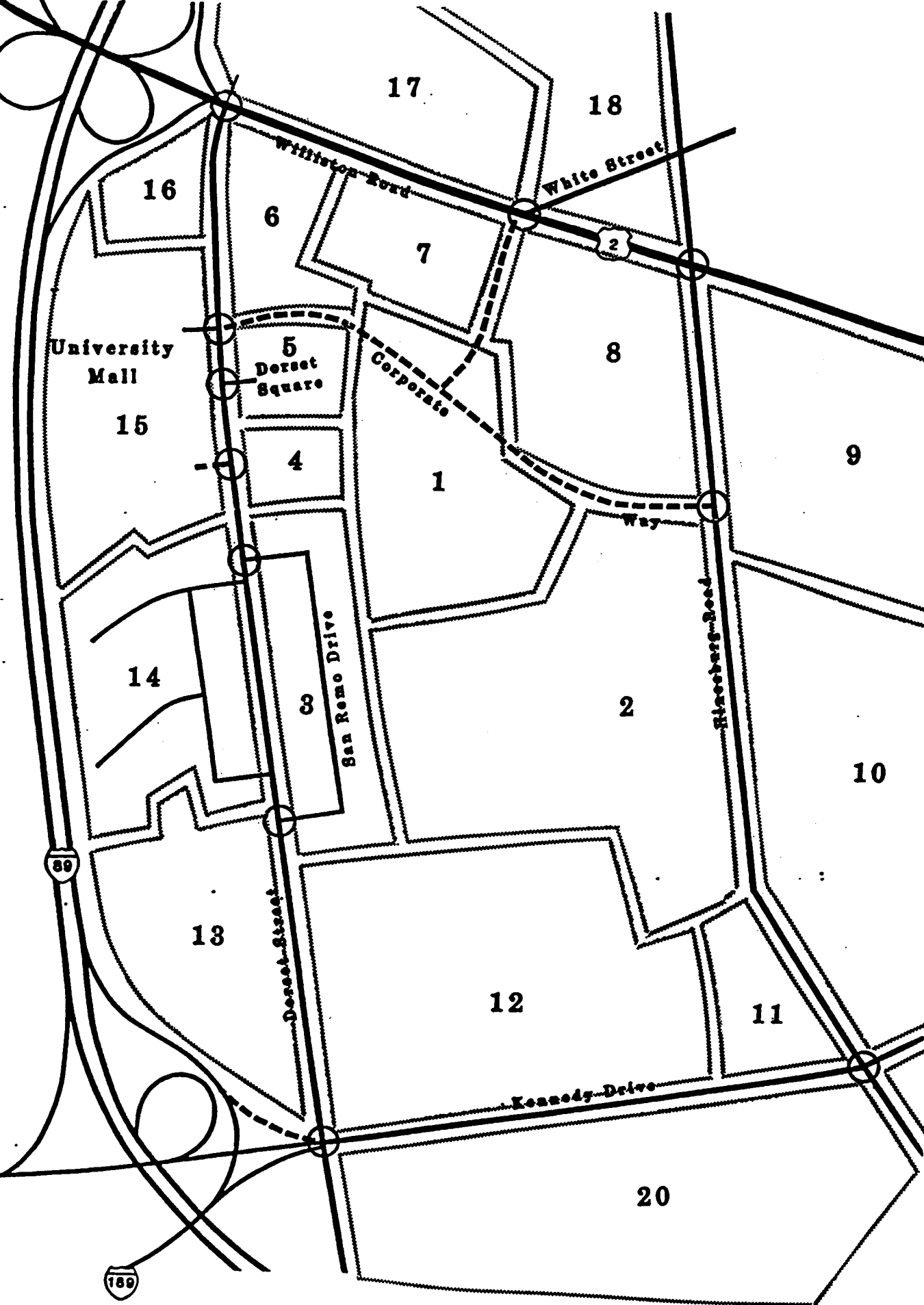
SFDU	MFDU	LOCOM	HICOM	REATIL	INDUST	INSTUT	HOTEL
0	0	222	0	171	0	0	147
0	0	10	0	13	0	0	0
0	0	29	0	13	0	0	0
0	0	52	0	71	0	0	0
0	0	0	0	0	0	0	0
0	0	13	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	524	0	255	0	0	0
0	0	14	0	10	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	21	0	0	0	0	0
0	0	347	0	477	0	0	0
0	0	0	0	0	0	0	0
0	0	67	67	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

TABLE A-3

Note: See the maps on the following pages for TAZ locations.



Williston Road Corridor
Chittenden County Model
Transportation Analysis Zones


17
18
16
6
7
Whittington Road
White Street
2
University Mall
5
Dorset Square
Corporate
8
15
4
1
9
Way
14
3
San Remo Drive
Ritenberg Road
2
10
89
13
Dorset Street
12
11
Kennedy Drive
20
189

Change in Land Use due to Build Out -- Taft Corners Area

TAZ	SFDU	MFDU	LOCOM	HICOM	REATIL	INDUST	INSTUT	HOTEL
197	0	50	168	181	973	0	0	0
178	0	0	0	0	0	0	0	0
198	0	0	0	0	0	0	0	0
200	0	0	59	59	613	152	0	30
199	0	0	91	149	516	30	0	0
193	0	15	80	21	100	44	0	0
191	0	0	84	60	16	204	0	0
188	0	90	29	49	13	47	0	18
186	0	0	0	0	79	0	0	0
183	0	72	25	20	33	0	0	0
184	0	0	0	0	74	24	0	0
205	0	0	0	0	0	0	0	0
206	0	0	75	42	0	106	0	30

Added by 2000

197	0	25	84	91	487	0	0	0
178	0	0	0	0	0	0	0	0
198	0	0	0	0	0	0	0	0
200	0	0	59	59	613	152	0	30
199	0	0	91	149	516	30	0	0
193	0	8	40	11	50	22	0	0
191	0	0	42	30	8	102	0	0
188	0	90	29	49	13	47	0	18
186	0	0	0	0	79	0	0	0
183	0	36	13	10	17	0	0	0
184	0	0	0	0	74	24	0	0
205	0	0	0	0	0	0	0	0
206	0	0	75	42	0	106	0	30
173	45	0	0	0	0	0	0	0
192	46	0	0	0	0	0	0	0

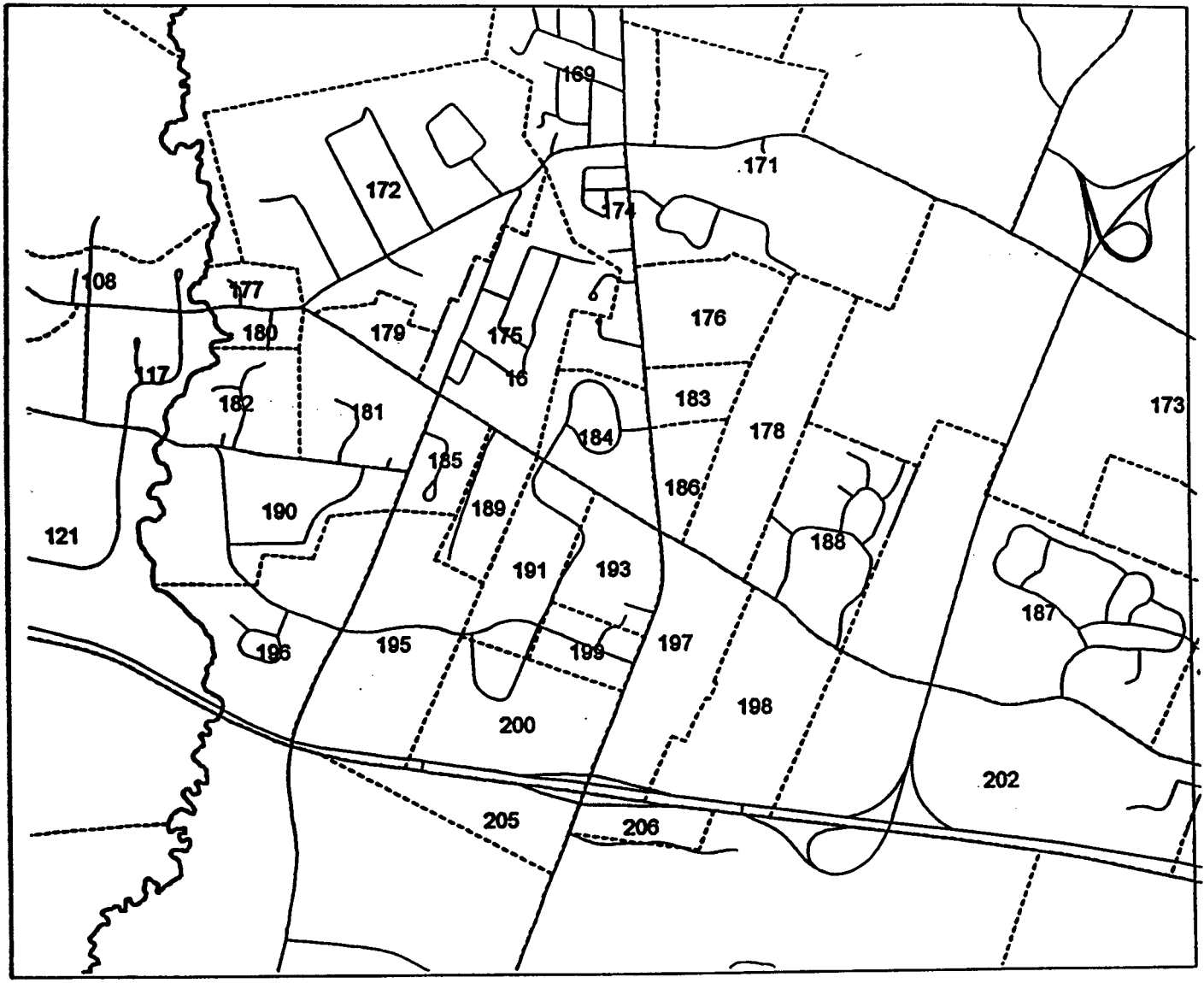
Added from 2000 to 2005

197	0	25	84	91	487	0	0	0
178	0	0	0	0	0	0	0	0
198	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0
199	0	0	0	0	0	0	0	0
193	0	8	40	11	50	22	0	0
191	0	0	42	30	8	102	0	0
188	0	0	0	0	0	0	0	0
186	0	0	0	0	0	0	0	0
183	0	36	13	10	17	0	0	0
184	0	0	0	0	0	0	0	0
205	0	0	0	0	0	0	0	0
206	0	0	0	0	0	0	0	0
173	75	0	0	0	0	0	0	0

Added from 2005 to 2010

173	54	0	0	0	0	0	0	0

TABLE A-4



Taft Corners Area
Chittenden County Model
Transportation Analysis Zones

APPENDIX B

TRAFFIC VOLUMES BY SCENARIO

Scenario	1
Year	1995
Time	PM
Network	Existing
Land Use	Existing

95 PM DHV	N	E	S	W
R	0	0	66	229
T	383	0	367	0
L	278	0	0	348
1661	661	0	423	577

VT 2A/SB I-89 Exit 12

95 PM DHV	N	E	S	W
R	437	162	0	0
T	590	0	564	0
L	0	71	141	0
1965	1027	233	705	0

VT 2A/NB I-89 Exit 12

95 PM DHV	N	E	S	W
R	162	289	66	21
T	235	386	163	445
L	405	184	41	276
2865	802	839	312	742

Dorset St/Kennedy/I-189

DHV	N	E	S	W
R	0	0	0	0
T	0	0	0	879
L	0	436	0	0
1315	0	436	0	879

VT 15N-89 SB On Ramp

DHV	N	E	S	W
R	0	0	562	0
T	0	1235	0	879
L	0	0	437	0
2551	0	1235	437	879

VT 15N-89 NB Off Ramp

95 PM DHV	N	E	S	W
R	0	0	333	161
T	695	0	942	0
L	612	0	0	36
2519	1047	0	1275	197

US 7/SB I-89 Exit 16

95 '95 PM D	N	E	S	W
R	104	700	0	0
T	802	0	615	0
L	0	144	363	0
2629	1006	844	978	0

US 7/NB I-89 Exit 16

95 '95 PM D	N	E	S	W
R	280	0	0	282
T	148	0	367	0
L	0	0	601	488
3044	408	0	968	770

US 7 & US 2 (Chimney Corners)

95 '95 PM D	N	E	S	W
R	556	249	0	0
T	0	811	0	359
L	411	0	0	32
2120	969	760	0	391

US 2 & NB I89 Exit 17 Ramps C&D

95 '95 PM D	N	E	S	W
R	32	0	0	0
T	0	852	0	247
L	144	186	0	0
1483	176	1070	0	247

US 2 & SB I89 Exit 17 Ramps A&B

95 PM DHV	N	E	S	W
R	20	26	786	1230
T	6	946	3	1525
L	7	278	250	38
6084	32	1250	1009	2793

Dorset St/Williston Road

Scenario	2
Year	2015
Time	PM
Network	Base
Land Use	Includes Buildout Land Use

Scen 2 PM	N	E	S	W
R	0	0	164	262
T	468	0	467	0
L	423	0	0	491
2315	891	0	651	773

VT 2A/SB I-89 Exit 12

Scen 2 PM	N	E	S	W
R	532	220	0	0
T	820	0	802	0
L	0	71	176	0
2721	1452	291	978	0

VT 2A/NB I-89 Exit 12

Scen 2 PM	N	E	S	W
R	643	469	127	116
T	465	374	361	321
L	724	288	67	458
4325	1782	1111	555	897

Dorset St/Kennedy/I-189

Scen 2 PM	N	E	S	W
R	0	0	0	0
T	0	0	0	923
L	0	952	0	0
1875	0	952	0	923

VT 15N-89 SB On Ramp

Scen 2 PM	N	E	S	W
R	0	0	592	0
T	0	1674	0	923
L	0	0	711	0
3900	0	1674	1303	923

VT 15N-89 NB Off Ramp

Scen 2 PM	N	E	S	W
R	0	0	476	119
T	799	0	1254	0
L	938	0	0	6
3591	1737	0	1730	124

US 7/SB I-89 Exit 16

Scen 2 PM	N	E	S	W
R	26	1521	0	0
T	1449	0	737	0
L	0	288	823	0
4544	1476	1809	1260	0

US 7/NB I-89 Exit 16

Scen 2 PM	N	E	S	W
R	382	0	0	886
T	814	0	474	0
L	0	0	871	714
3463	706	0	1345	1412

US 7 & US 2 (Chimney Corners)

Scen 2 PM	N	E	S	W
R	646	423	0	0
T	0	844	0	764
L	979	0	0	145
3621	1425	1267	0	929

US 2 & NB I89 Exit 17 Ramps C&D

Scen 2 PM	N	E	S	W
R	96	0	0	0
T	0	1356	0	861
L	268	334	0	0
2715	364	1690	0	861

US 2 & SB I89 Exit 17 Ramps A&B

Scen 2 PM	N	E	S	W
R	20	26	850	1793
T	6	1311	3	1721
L	7	329	1514	38
7617	32	1666	2367	3552

Dorset St/Williston Road

Scenario	3
Year	2015
Time	PM
Network	Network Buildout
Land Use	Includes Buildout Land Use

Scen 3 PM	N	E	S	W
R	0	0	77	207
T	459	0	446	0
L	328	0	0	406
1923	787	0	523	613

VT 2A/SB I-89 Exit 12

Scen 3 PM	N	E	S	W
R	654	266	0	0
T	897	0	874	0
L	0	90	178	0
2559	1351	356	852	0

VT 2A/NB I-89 Exit 12

Scen 3 PM	N	E	S	W
R	547	351	251	34
T	497	171	146	153
L	805	352	417	355
3600	1649	874	815	552

Dorset St/Kennedy/I-189

Scen 3 PM	N	E	S	W
R	169	0	0	550
T	0	1005	0	1006
L	205	728	0	0
3666	378	1733	0	1556

VT 15N-89 SB On Ramp

Scen 3 PM	N	E	S	W
R	0	317	1630	0
T	0	1213	0	799
L	0	0	732	415
5106	0	1530	2362	1214

VT 15N-89 NB Off Ramp

Scen 3 PM	N	E	S	W
R	0	0	682	143
T	951	0	1009	0
L	1202	0	0	3
3600	1763	0	1691	146

US 7/SB I-89 Exit 16

Scen 3 PM	N	E	S	W
R	33	1344	0	0
T	1473	0	902	0
L	0	290	210	0
4152	1906	1634	1012	0

US 7/NB I-89 Exit 16

Scen 3 PM	N	E	S	W
R	117	0	0	614
T	274	0	390	0
L	0	0	636	383
2516	391	0	1228	997

US 7 & US 2 (Chimney Corners)

Scen 3 PM	N	E	S	W
R	515	312	0	0
T	0	811	0	503
L	415	0	0	92
2546	1030	923	0	595

US 2 & NB I89 Exit 17 Ramps C&D

Scen 3 PM	N	E	S	W
R	62	0	0	86
T	0	1067	6	496
L	96	159	0	0
1976	159	1225	6	586

US 2 & SB I89 Exit 17 Ramps A&B

Scen 3 PM	N	E	S	W
R	20	27	845	1912
T	6	1078	3	1699
L	7	175	1247	38
6757	32	1260	1796	3649

Dorset St/Williston Road

Scenario	1
Year	1995
Time	PM
Network	Existing
Land Use	Existing

95 PM DHV	N	E	S	W
R	49	20	17	13
T	0	1799	0	1827
L	121	20	19	39
	3508	61	1836	30	1879

Williston Rd.\Econolodge\Ramada

95 PM DHV	N	E	S	W
R	282	8	27	105
T	0	1006	28	810
L	0	28	167	243
	2838	282	1078	220	1258

Williston Rd\Wills St.\Mildes Dr.

95 PM DHV	N	E	S	W
R	13	127	113	178
T	283	697	321	764
L	78	139	178	35
	3079	364	1177	612	997

Williston Rd\ Ireesburg Rd.\Patchen

95 PM DHV	N	E	S	W
R	104	39	105	60
T	261	151	228	121
L	69	39	69	93
	1364	409	279	404	274

Patchen Rd\Wills Street

95 PM DHV	N	E	S	W
R	42	227	188	126
T	142	729	185	559
L	161	202	199	24
	2718	345	1149	590	899

Williston Rd\Kennedy Dr\Airport Parkway

95 PM DHV	N	E	S	W
R	42	84	36	23
T	1208	8	1186	0
L	80	84	41	36
	2741	1207	128	1268	82

Dorset St\EMS\Chittenden Bank

95 PM DHV	N	E	S	W
R	669	12	7	60
T	997	3	994	6
L	17	6	9	604
	2819	1223	20	701	670

Dorset St\U Mall No.\Corporate Way

95 PM DHV	N	E	S	W
R	0	127	88	0
T	483	0	859	0
L	139	76	0	0
	1439	669	302	648	0

Dorset St\Dorset Square

95 PM DHV	N	E	S	W
R	168	14	3	231
T	390	1	386	0
L	3	0	364	238
	1716	649	23	678	469

Dorset St\U MAll So.\Lake Buck

95 PM DHV	N	E	S	W
R	32	114	61	13
T	711	0	661	0
L	61	89	29	36
	1765	784	203	737	51

Dorset St\SHS

95 PM DHV	N	E	S	W
R	8	2	80	72
T	0	714	1	679
L	1	85	117	0
	1847	0	771	206	959

Kennedy Dr\Timber Lane

95 PM DHV	N	E	S	W
R	198	60	23	136
T	225	480	263	477
L	48	83	136	290
	2248	459	872	412	905

Kennedy Dr\Ireesburg Rd

95 PM DHV	N	E	S	W
R	16	241	185	12
T	260	12	260	6
L	82	260	16	16
	1514	367	693	641	33

Kennedy Dr\Kimball Ave

Scenario	2
Year	2015
Time	PM
Network	Base
Land Use	Includes Buildout Land Use

Scen 2 PM	N	E	S	W
R	49	20	36	13
T	0	2199	0	1817
L	12	24	29	39
	4240	61	2243	67	1869

Williston Rd.\Econolodge\Ramada

Scen 2 PM	N	E	S	W
R	371	1	27	105
T	0	1201	28	1215
L	0	28	167	300
	3501	371	1230	220	1560

Williston Rd\Wills St.\Mildes Dr.

Scen 2 PM	N	E	S	W
R	36	118	193	361
T	267	671	338	782
L	83	143	267	99
	3857	407	1232	778	1243

Williston Rd\ Ireesburg Rd.\Patchen

Scen 2 PM	N	E	S	W
R	176	26	124	46
T	365	167	266	93
L	0	67	80	197
	1605	538	280	462	336

Patchen Rd\Wills Street

Scen 2 PM	N	E	S	W
R	46	276	264	98
T	203	802	261	721
L	205	285	183	28
	3362	454	1369	709	837

Williston Rd\Kennedy Dr\Airport Parkway

Scen 2 PM	N	E	S	W
R	78	194	87	84
T	1728	8	2564	2
L	105	109	63	112
	4662	1911	349	2824	179

Dorset St\EMS\Chittenden Bank

Scen 2 PM	N	E	S	W
R	705	621	214	62
T	700	22	1237	28
L	366	339	9	710
	5062	1631	862	1451	799

Dorset St\U Mall No.\Corporate Way

Scen 2 PM	N	E	S	W
R	0	188	120	0
T	1027	0	1267	0
L	147	119	0	0
	2646	1174	287	1387	0

Dorset St\Dorset Square

Scen 2 PM	N	E	S	W
R	168	14	3	362
T	864	1	1128	0
L	1	0	357	239
	3256	1154	23	1488	601

Dorset St\U MAl So.\Lake Buck

Scen 2 PM	N	E	S	W
R	32	204	90	13
T	1599	0	1161	0
L	118	201	23	36
	3461	1709	405	1298	51

Dorset St\SHS

Scen 2 PM	N	E	S	W
R	8	2	116	72
T	0	966	1	1068
L	1	82	117	0
	2462	0	1060	234	1160

Kennedy Dr\Timber Lane

Scen 2 PM	N	E	S	W
R	265	78	14	128
T	264	653	293	657
L	108	89	281	356
	3074	978	690	668	1141

Kennedy Dr\Ireesburg Rd

Scen 2 PM	N	E	S	W
R	14	329	279	12
T	378	12	464	6
L	71	297	16	16
	1841	481	809	779	33

Kennedy Dr\Kimball Ave

Scenario	3
Year	2015
Time	PM
Network	Network Buildout
Land Use	Includes Buildout Land Use

Scen 3 PM	N	E	S	W
R	49	20	62	64
T	0	1801	0	1879
L	12	18	36	39
	3478	61	1839	101	1972

Williston Rd.\Econolodge\Ramada

Scen 3 PM	N	E	S	W
R	264	4	27	105
T	0	808	28	1079
L	16	28	167	340
	2853	280	929	220	1424

Williston Rd\Wills St.\Mildes Dr.

Scen 3 PM	N	E	S	W
R	13	165	291	362
T	309	765	338	764
L	74	236	149	92
	3365	396	1164	787	1078

Williston Rd\ Ireesburg Rd.\Patchen

Scen 3 PM	N	E	S	W
R	132	27	102	38
T	332	123	262	88
L	0	71	80	192
	1969	464	222	454	228

Patchen Rd\Wills Street

Scen 3 PM	N	E	S	W
R	50	301	35	125
T	166	717	165	623
L	164	162	16	26
	2720	390	1161	165	874

Williston Rd\Kennedy Dr\Airport Parkway

Scen 3 PM	N	E	S	W
R	72	119	34	66
T	1770	6	1848	1
L	65	91	67	110
	4264	1977	210	1967	180

Dorset St\EMS\Chittenden Bank

Scen 3 PM	N	E	S	W
R	705	478	272	62
T	840	121	858	282
L	311	296	9	865
	4874	1660	895	1211	908

Dorset St\U Mall No.\Corporate Way

Scen 3 PM	N	E	S	W
R	0	188	120	0
T	1061	0	1018	0
L	150	94	0	0
	2602	1211	274	1117	0

Dorset St\Dorset Square

Scen 3 PM	N	E	S	W
R	168	14	3	238
T	894	1	870	0
L	1	0	241	238
	2776	1183	23	1114	476

Dorset St\U MAl So.\Lake Buck

Scen 3 PM	N	E	S	W
R	32	161	90	13
T	1411	0	810	0
L	118	226	23	36
	3934	1561	397	923	51

Dorset St\SHS

Scen 3 PM	N	E	S	W
R	8	2	80	72
T	0	746	1	885
L	1	104	120	0
	2050	0	852	220	959

Kennedy Dr\Timber Lane

Scen 3 PM	N	E	S	W
R	77	45	337	163
T	364	377	290	709
L	80	131	120	46
	2727	511	952	747	917

Kennedy Dr\Ireesburg Rd

Scen 3 PM	N	E	S	W
R	12	283	147	12
T	266	12	241	6
L	80	266	16	16
	1414	316	660	493	33

Kennedy Dr\Kimball Ave

Scenario	1
Year	1995
Time	AM
Network	Existing
Land Use	Existing

95 AM DHV	N	E	S	W
R	0	0	28	97
T	256	0	563	0
L	93	0	0	222
1288	349	0	822	318

VT 2A/SB I-89 Exit 12

95 AM DHV	N	E	S	W
R	226	147	0	0
T	283	0	619	0
L	0	45	170	0
1509	528	192	789	0

VT 2A/NB I-89 Exit 12

95 AM DHV	N	E	S	W
R	70	210	216	12
T	89	300	167	385
L	285	140	41	73
1975	451	730	424	370

Dorset St/Kennedy/I-189

95 AM DHV	N	E	S	W
R	0	0	0	0
T	0	0	0	720
L	0	821	0	0
1242	0	821	0	720

VT 15N-89 SB On Ramp

95 AM DHV	N	E	S	W
R	0	0	0	0
T	0	1666	0	703
L	0	0	171	0
2541	0	1666	171	703

VT 15N-89 NB Off Ramp

95 AM DHV	N	E	S	W
R	0	0	214	412
T	548	0	413	0
L	559	0	0	117
2283	1106	0	627	529

US 7/SB I-89 Exit 16

95 AM DHV	N	E	S	W
R	26	374	0	0
T	575	0	369	0
L	0	189	130	0
1995	603	563	529	0

US 7/NB I-89 Exit 16

95 95 AM D	N	E	S	W
R	666			490
T	320		137	
L			320	183
2056	916	0	457	683

US 7 & US 2 (Chimney Corners)

95 95 AM D	N	E	S	W
R	182	215		
T		701		653
L	172			36
1829	324	916	0	689

US 2 & NB I89 Exit 17 Ramps C&D

95 95 AM D	N	E	S	W
R	44			
T		285		378
L	211	668		
1466	255	953	0	378

US 2 & SB I89 Exit 17 Ramps A&B

95 AM DHV	N	E	S	W
R	21	12	104	466
T	3	1664	2	1144
L	23	108	267	13
3346	47	1173	474	1663

Dorset St/Williston Road

Scenario	2
Year	2015
Time	AM
Network	Base
Land Use	Includes Buildout Land Use

Scen 2 AM	N	E	S	W
R	0	0	35	193
T	328	0	641	0
L	116	0	0	553
1866	444	0	677	745

VT 2A/SB I-89 Exit 12

Scen 2 AM	N	E	S	W
R	300	213	0	0
T	363	0	1046	0
L	0	82	149	0
2161	662	295	1194	0

VT 2A/NB I-89 Exit 12

Scen 2 AM	N	E	S	W
R	285	476	261	62
T	304	297	385	439
L	426	219	20	458
3236	885	995	666	949

Dorset St/Kennedy/I-189

Scen 2 AM	N	E	S	W
R	0	0	0	0
T	0	0	0	800
L	0	1257	0	0
2058	0	1257	0	800

VT 15N-89 SB On Ramp

Scen 2 AM	N	E	S	W
R	0	0	0	0
T	0	2295	0	783
L	0	0	417	0
3496	0	2295	417	783

VT 15N-89 NB Off Ramp

Scen 2 AM	N	E	S	W
R	0	0	177	340
T	894	0	712	0
L	819	0	0	102
3538	1307	0	888	442

US 7/SB I-89 Exit 16

Scen 2 AM	N	E	S	W
R	22	642	0	0
T	1099	0	649	0
L	0	206	165	0
2795	1131	850	814	0

US 7/NB I-89 Exit 16

Scen 2 AM	N	E	S	W
R	677	0	0	862
T	463	0	469	0
L	0	0	463	349
3189	1140	0	932	1101

US 7 & US 2 (Chimney Corners)

Scen 2 AM	N	E	S	W
R	449	208	0	0
T	0	852	0	783
L	436	0	0	89
2857	885	1160	0	872

US 2 & NB I89 Exit 17 Ramps C&D

Scen 2 AM	N	E	S	W
R	141	0	0	0
T	0	758	1	496
L	328	638	4	0
2264	467	1396	5	496

US 2 & SB I89 Exit 17 Ramps A&B

Scen 2 AM	N	E	S	W
R	21	12	199	1664
T	3	969	2	1616
L	23	298	793	13
5611	47	1277	995	3493

Dorset St/Williston Road

Scenario	3
Year	2015
Time	AM
Network	Network Buildout
Land Use	Includes Buildout Land Use

Scen 3 AM	N	E	S	W
R	0	0	48	205
T	330	0	664	0
L	120	0	0	512
1679	450	0	719	716

VT 2A/SB I-89 Exit 12

Scen 3 AM	N	E	S	W
R	281	300	0	0
T	365	0	858	0
L	0	86	216	0
2207	645	386	1176	0

VT 2A/NB I-89 Exit 12

Scen 3 AM	N	E	S	W
R	200	402	262	28
T	345	178	183	283
L	437	203	260	406
3215	853	808	825	899

Dorset St/Kennedy/I-189

Scen 3 AM	N	E	S	W
R	192	0	0	829
T	0	1020	0	691
L	269	669	0	0
3590	461	1909	0	1219

VT 15N-89 SB On Ramp

Scen 3 AM	N	E	S	W
R	0	172	622	0
T	0	1748	0	812
L	0	0	445	37
3937	0	1920	1067	849

VT 15N-89 NB Off Ramp

Scen 3 AM	N	E	S	W
R	0	0	365	952
T	459	0	950	0
L	852	0	0	143
3153	1312	0	1045	795

US 7/SB I-89 Exit 16

Scen 3 AM	N	E	S	W
R	45	612	0	0
T	1050	0	823	0
L	0	262	170	0
2762	1095	874	794	0

US 7/NB I-89 Exit 16

Scen 3 AM	N	E	S	W
R	281	0	0	740
T	493	0	265	0
L	0	0	445	278
2504	786	0	709	1018

US 7 & US 2 (Chimney Corners)

Scen 3 AM	N	E	S	W
R	390	86	0	0
T	0	908	0	800
L	423	0	0	64
2143	813	695	0	855

US 2 & NB I89 Exit 17 Ramps C&D

Scen 3 AM	N	E	S	W
R	198	0	0	12
T	0	672	0	444
L	212	267	0	0
1825	410	959	0	456

US 2 & SB I89 Exit 17 Ramps A&B

Scen 3 AM	N	E	S	W
R	21	11	127	1713
T	3	729	2	1709
L	23	72	864	13
5056	47	823	994	3495

Dorset St/Williston Road

Scenario	1
Year	1995
Time	AM
Network	Existing
Land Use	Existing

95 AM DHV	N	E	S	W
R	21	14	10	6
T	1	1434	1	1421
L	23	6	11	19
2995	45	1454	22	1445

Williston Rd.\Econolodge\Ramada

95 AM DHV	N	E	S	W
R	221	6	4	35
T	0	906	3	899
L	0	8	71	139
2295	221	922	78	1073

Williston Rd\White St.\Wides Dr.

95 AM DHV	N	E	S	W
R	8	64	63	109
T	193	630	179	748
L	130	37	222	9
2363	331	721	465	866

Williston Rd\Ineaburg Rd.\Patchen

95 AM DHV	N	E	S	W
R	95	22	46	29
T	209	191	148	77
L	30	79	36	36
935	333	228	232	142

Patchen Rd\White Street

95 AM DHV	N	E	S	W
R	13	108	179	138
T	164	445	89	585
L	153	156	94	20
2135	320	709	363	743

Williston Rd\Kennedy Dr\Airport Parkway

95 AM DHV	N	E	S	W
R	16	66	21	26
T	1167	1	1197	0
L	35	60	16	26
2632	1217	130	1234	52

Dorset St\EMS\Chittenden Bank

95 AM DHV	N	E	S	W
R	378	28	23	13
T	471	3	508	0
L	19	24	0	76
1639	867	49	533	89

Dorset St\U Mall No.\Corporate Way

95 AM DHV	N	E	S	W
R	0	5	7	0
T	419	0	426	0
L	17	7	0	0
891	436	12	433	0

Dorset St\Dorset Square

95 AM DHV	N	E	S	W
R	36	4	6	33
T	330	1	407	0
L	9	1	98	28
956	377	6	511	61

Dorset St\U Mall So.\Lake Buick

95 AM DHV	N	E	S	W
R	114	44	172	6
T	718	0	535	0
L	108	84	32	32
1825	940	108	839	38

Dorset St\BSHS

95 AM DHV	N	E	S	W
R	11	4	61	96
T	1	908	1	874
L	8	100	80	3
1548	20	719	143	973

Kennedy Dr\Timber Lane

95 AM DHV	N	E	S	W
R	111	27	33	34
T	167	340	305	337
L	31	22	148	164
1709	309	389	486	535

Kennedy Dr\Ineaburg Rd

95 AM DHV	N	E	S	W
R	7	97	7	20
T	179	6	179	6
L	203	148	6	34
826	289	247	190	61

Kennedy Dr\Kimball Ave

Scenario	2
Year	2015
Time	AM
Network	Base
Land Use	Includes Buildout Land Use

Scen 2 AM	N	E	S	W
R	21	14	37	69
T	1	1643	1	1934
L	23	62	0	19
3705	45	1610	39	2012

Williston Rd.\Econolodge\Ramada

Scen 2 AM	N	E	S	W
R	378	6	4	35
T	0	1033	3	1137
L	0	8	71	193
2689	378	1047	79	1365

Williston Rd\White St.\Wides Dr.

Scen 2 AM	N	E	S	W
R	49	69	128	202
T	220	726	154	859
L	199	66	261	17
2970	468	863	661	1078

Williston Rd\Ineaburg Rd.\Patchen

Scen 2 AM	N	E	S	W
R	194	22	29	29
T	337	191	170	73
L	31	86	35	93
1291	562	299	234	196

Patchen Rd\White Street

Scen 2 AM	N	E	S	W
R	15	157	263	112
T	185	615	138	736
L	208	275	104	24
2632	408	1047	503	874

Williston Rd\Kennedy Dr\Airport Parkway

Scen 2 AM	N	E	S	W
R	121	108	60	46
T	2598	2	1656	1
L	66	80	48	48
4831	2772	201	1764	95

Dorset St\EMS\Chittenden Bank

Scen 2 AM	N	E	S	W
R	701	217	295	16
T	1011	25	745	12
L	635	116	3	175
3951	2346	359	1043	203

Dorset St\U Mall No.\Corporate Way

Scen 2 AM	N	E	S	W
R	0	34	82	0
T	963	9	907	0
L	80	18	0	0
2084	1073	82	959	0

Dorset St\Dorset Square

Scen 2 AM	N	E	S	W
R	39	4	8	89
T	905	1	833	0
L	8	1	312	28
2336	952	6	1250	127

Dorset St\U Mall So.\Lake Buick

Scen 2 AM	N	E	S	W
R	112	108	160	6
T	1062	0	1546	0
L	77	139	32	32
3274	1251	247	1738	38

Dorset St\BSHS

Scen 2 AM	N	E	S	W
R	11	4	85	96
T	1	871	1	943
L	8	133	80	3
2237	20	1008	167	1042

Kennedy Dr\Timber Lane

Scen 2 AM	N	E	S	W
R	196	79	35	111
T	156	369	283	617
L	66	13	284	290
2411	410	481	802	819

Kennedy Dr\Ineaburg Rd

Scen 2 AM	N	E	S	W
R	7	120	105	20
T	284	6	291	6
L	240	147	6	34
1286	531	272	401	61

Kennedy Dr\Kimball Ave

Scenario	3
Year	2015
Time	AM
Network	Network Buildout
Land Use	Includes Buildout Land Use

Scen 3 AM	N	E	S	W
R	21	15	38	134
T	1	1067	1	1940
L	23	29	0	19
3309	45	1132	40	2093

Williston Rd.\Econolodge\Ramada

Scen 3 AM	N	E	S	W
R	237	7	4	35
T	0	845	3	1122
L	17	7	71	174
2323	254	859	79	1331

Williston Rd\White St.\Wides Dr.

Scen 3 AM	N	E	S	W
R	23	73	62	206
T	302	669	79	805
L	140	218	86	13
2628	465	960	247	1026

Williston Rd\Ineaburg Rd.\Patchen

Scen 3 AM	N	E	S	W
R	124	0	16	29
T	305	149	148	78
L	31	126	33	71
1106	460	273	197	178

Patchen Rd\White Street

Scen 3 AM	N	E	S	W
R	24	100	62	134
T	227	560	119	696
L	19	100	134	18
2232	270	779	335	848

Williston Rd\Kennedy Dr\Airport Parkway

Scen 3 AM	N	E	S	W
R	103	93	66	50
T	2258	1	1364	1
L	16	98	63	54
4167	2377	193	1493	105

Dorset St\EMS\Chittenden Bank

Scen 3 AM	N	E	S	W
R	656	183	269	15
T	961	162	546	81
L	421	221	4	137
3644	2037	665	809	233

Dorset St\U Mall No.\Corporate Way

Scen 3 AM	N	E	S	W
R	0	43	36	0
T	1021	0	884	0
L	104	9	0	0
1576	1125	82	999	0

Dorset St\Dorset Square

Scen 3 AM	N	E	S	W
R	39	4	6	78
T	934	1	473	0
L	9	1	208	28
1977	961	6	896	103

Dorset St\U Mall So.\Lake Buick

Scen 3 AM	N	E	S	W
R	111	104	161	6
T	1053	0	1221	0
L	73	133	32	32
2826	1237	237	1414	38

Dorset St\BSHS

Scen 3 AM	N	E	S	W
R	11	4	93	96
T	1	884	1	772
L	8	109	80	3
1863	20	797	179	871

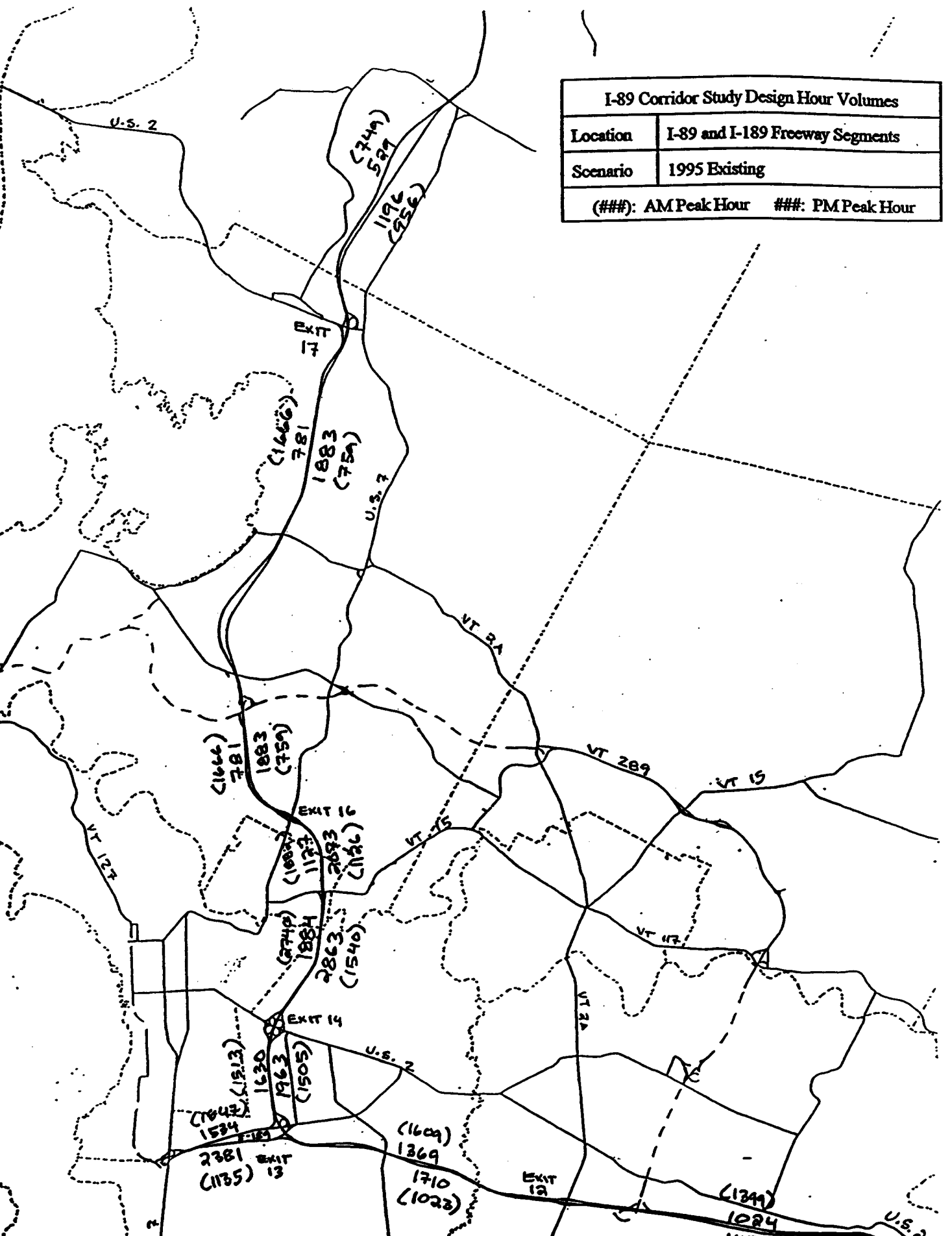
Kennedy Dr\Timber Lane

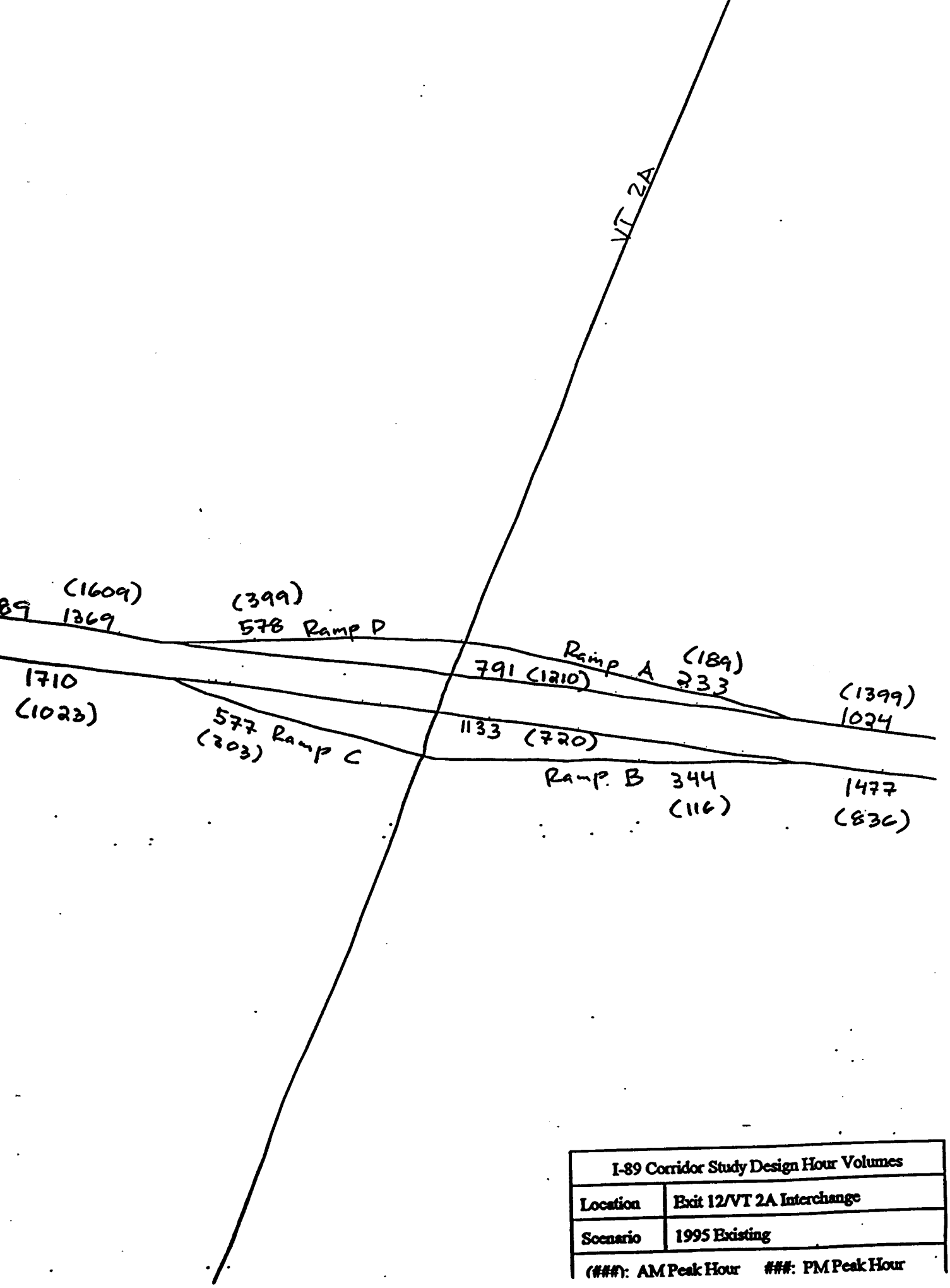
Scen 3 AM	N	E	S	W
R	12	31	131	179
T	202	401	161	376
L	28	238	85	147
2010	241	670	399	702

Kennedy Dr\Ineaburg Rd

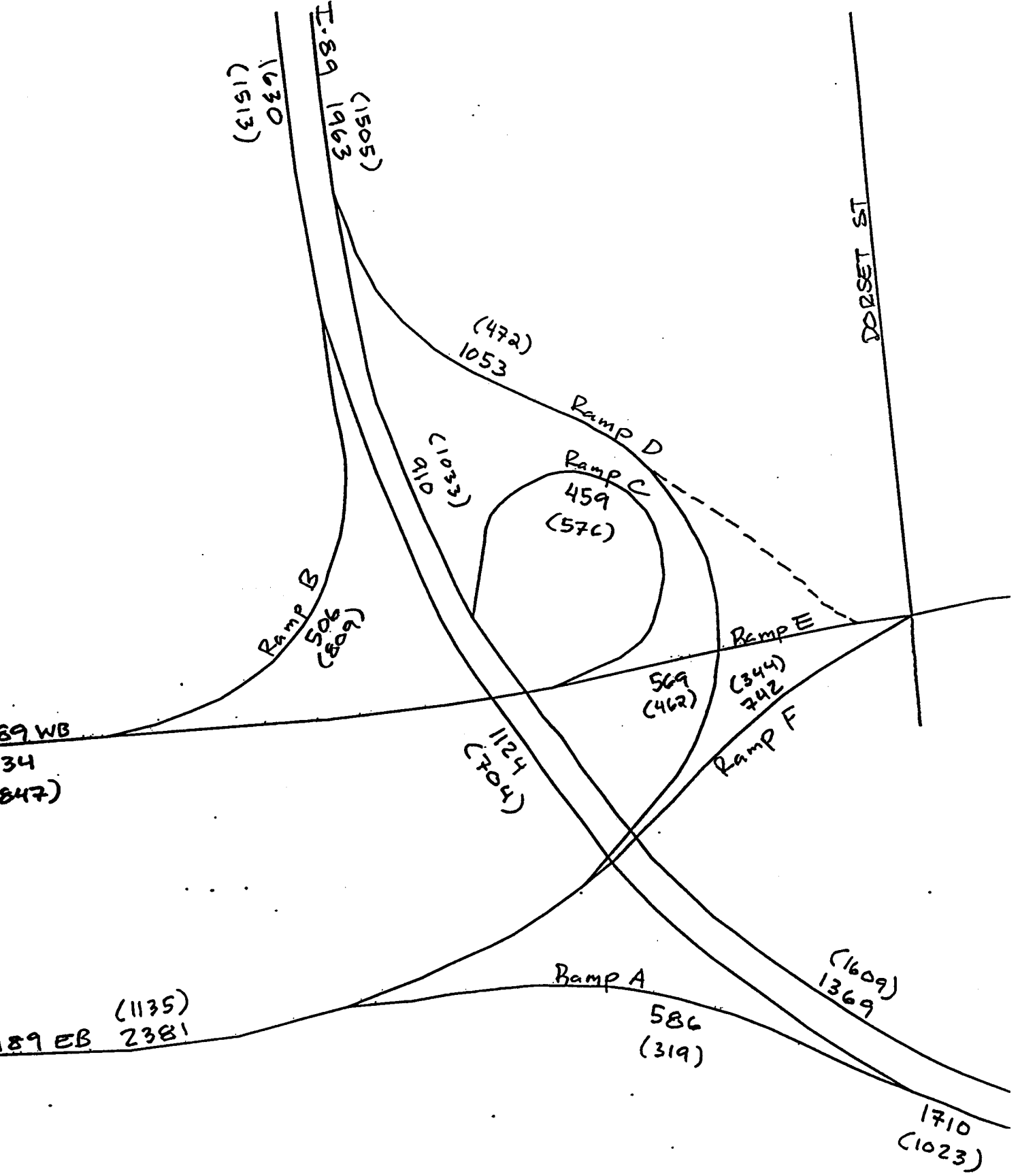
Scen 3 AM	N	E	S	W
R	7	116	23	20
T	163	6	121	6
L	158	170	4	34
826	329	290	148	61

Kennedy Dr\Kimball Ave

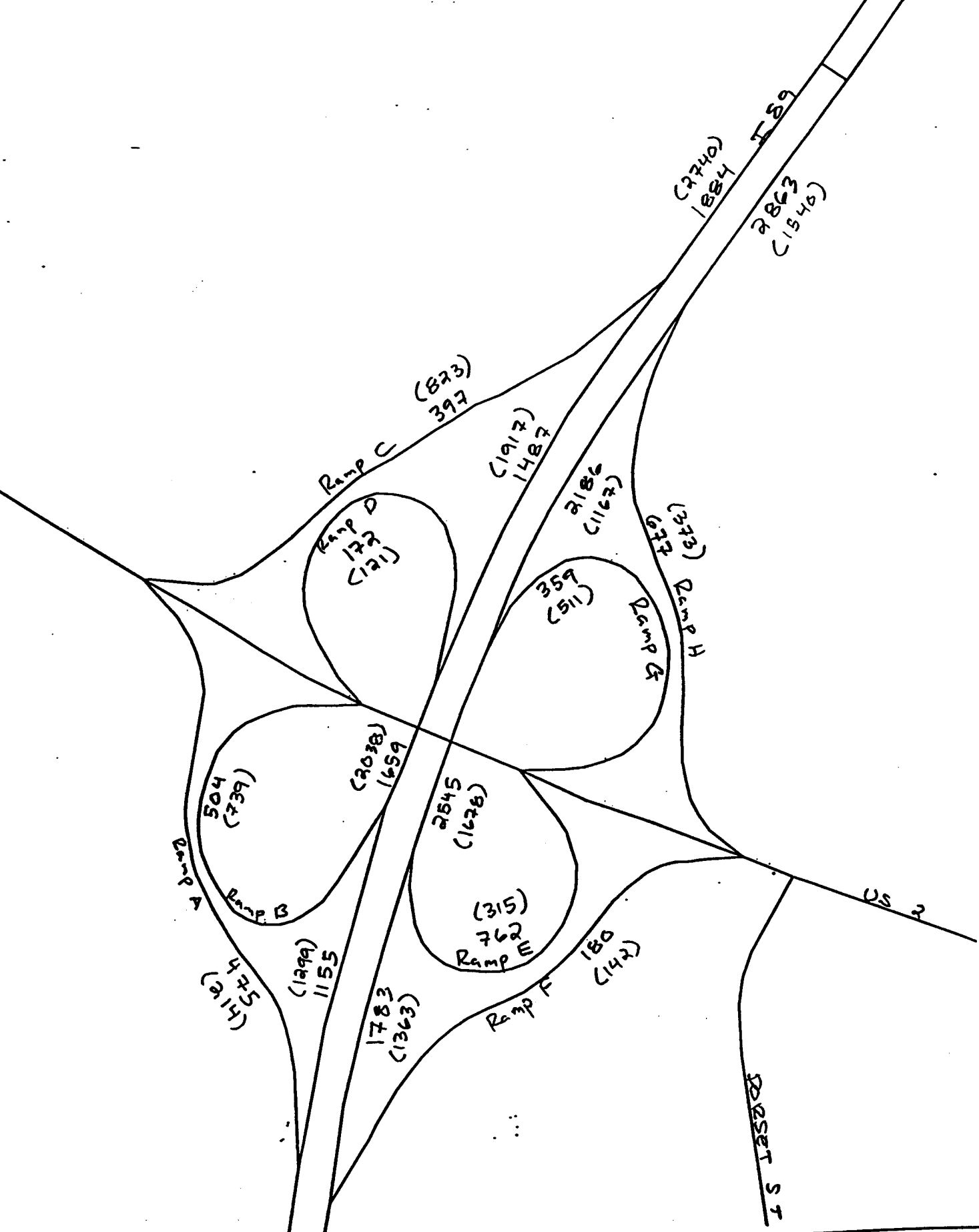

I-89 Corridor Study Design Hour Volumes
Location
I-89 and I-189 Freeway Segments
Scenario
1995 Existing
(###): AM Peak Hour ###: PM Peak Hour
U.S. 2
(749) 539
1196 (956)
EXIT 17
(1666) 781
1883 (759)
U.S. 7
VT 2A
VT 289
VT 15
VT 127
EXIT 16
(1666) 781
1883 (759)
(1082) 1127
2863 (1126)
(2740) 1884
2863 (1540)
EXIT 14
U.S. 2
VT 2A
VT 117
(1513) 1630
1963 (1505)
(1642) 1534
I-189
2381 (1185)
EXIT 13
(1609) 1369
1710 (1023)
EXIT 12
(1349) 1084
U.S.



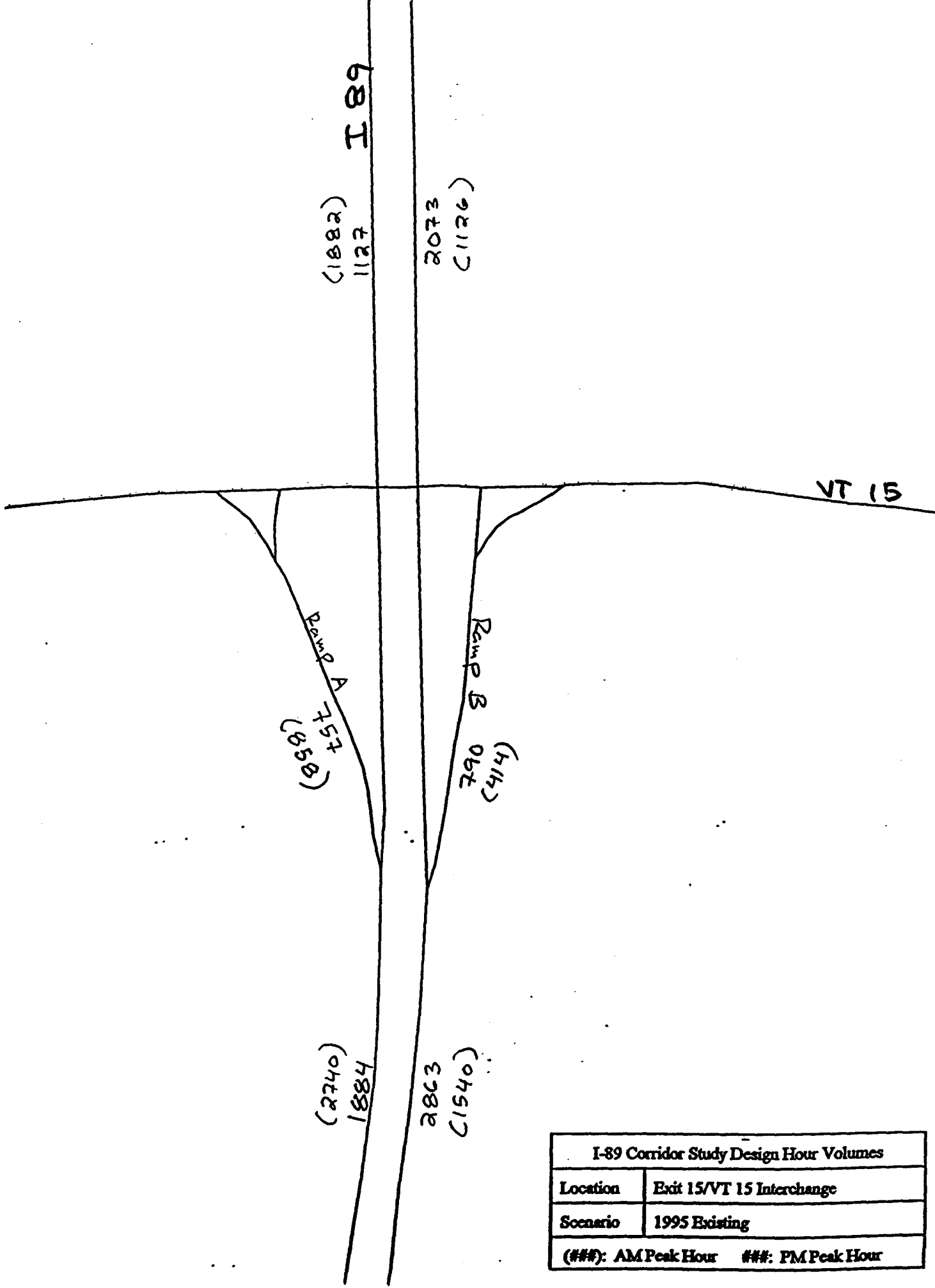
I-89 Corridor Study Design Hour Volumes	
Location	Exit 12/VT 2A Interchange
Scenario	1995 Existing
(###): AM Peak Hour ###: PM Peak Hour	



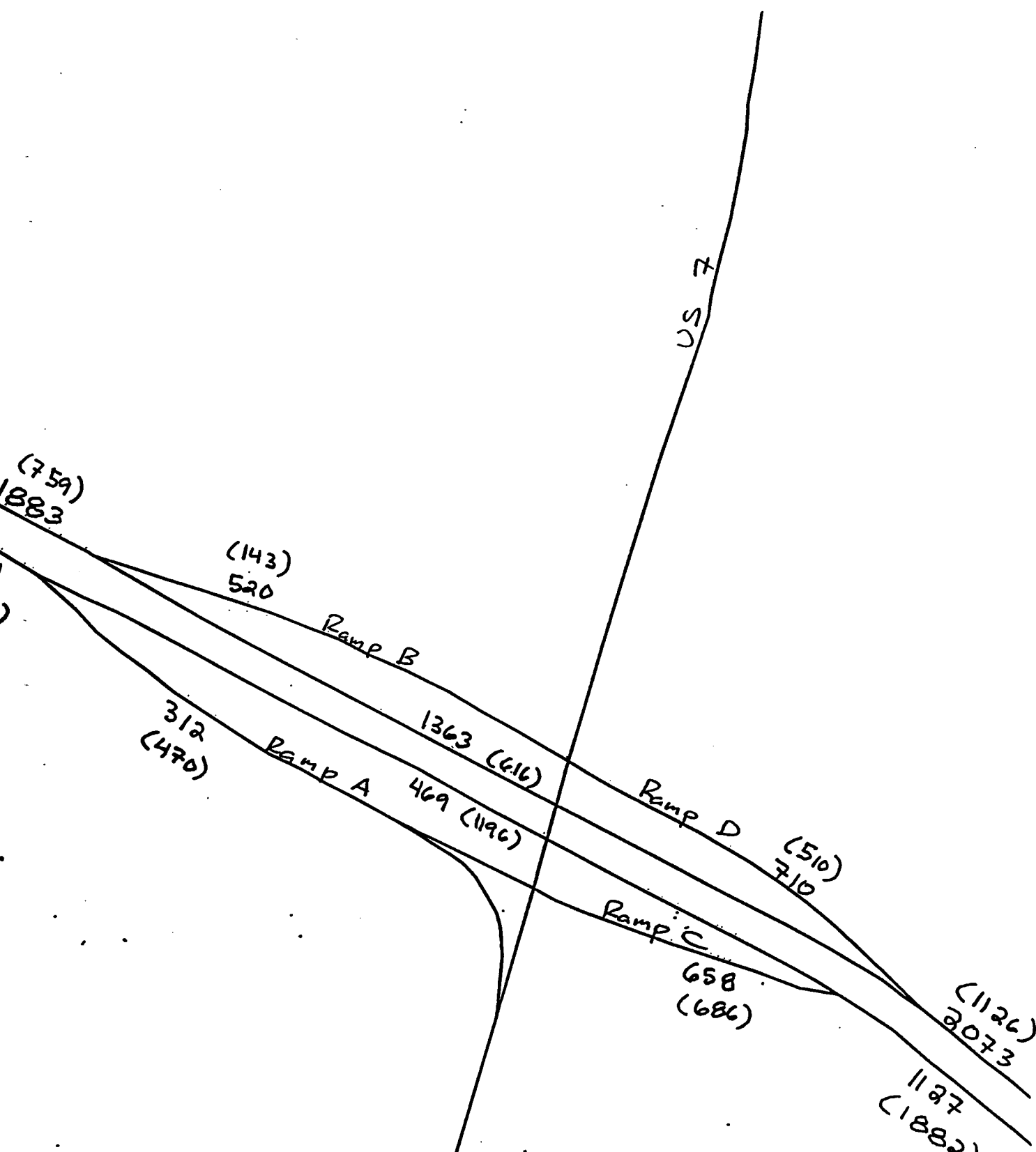
I-89 Corridor Study Design Hour Volumes	
Location	Exit 13/I-189 Interchange
Scenario	1995 Existing
(###): AM Peak Hour ###: PM Peak Hour	



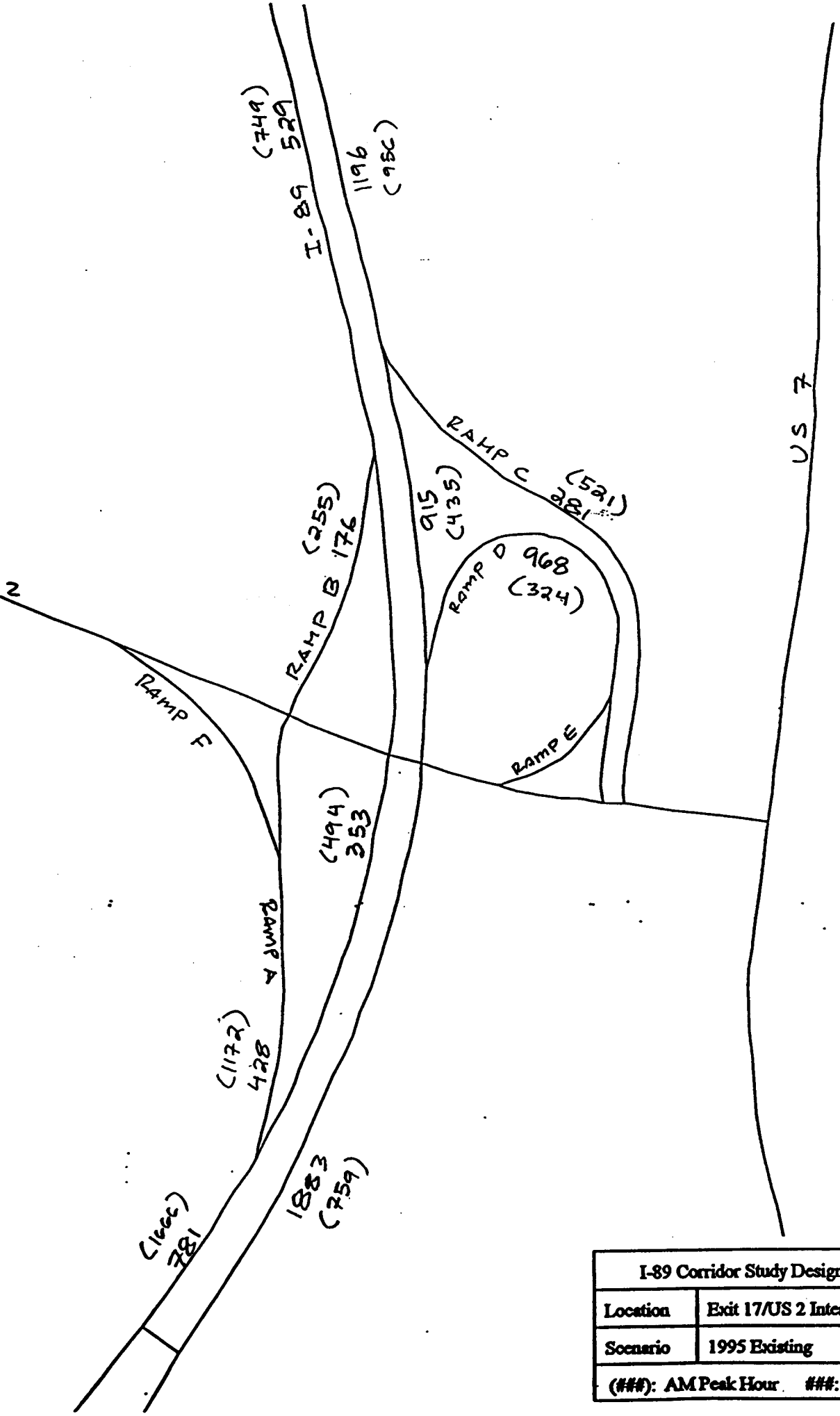
I-89 Corridor Study Design Hour Volumes	
Location	Exit 14/US 2 Interchange
Scenario	1995 Existing
(###): AM Peak Hour	###: PM Peak Hourur



I-89 Corridor Study Design Hour Volumes	
Location	Exit 15/VT 15 Interchange
Scenario	1995 Existing
(###): AM Peak Hour ###: PM Peak Hour	

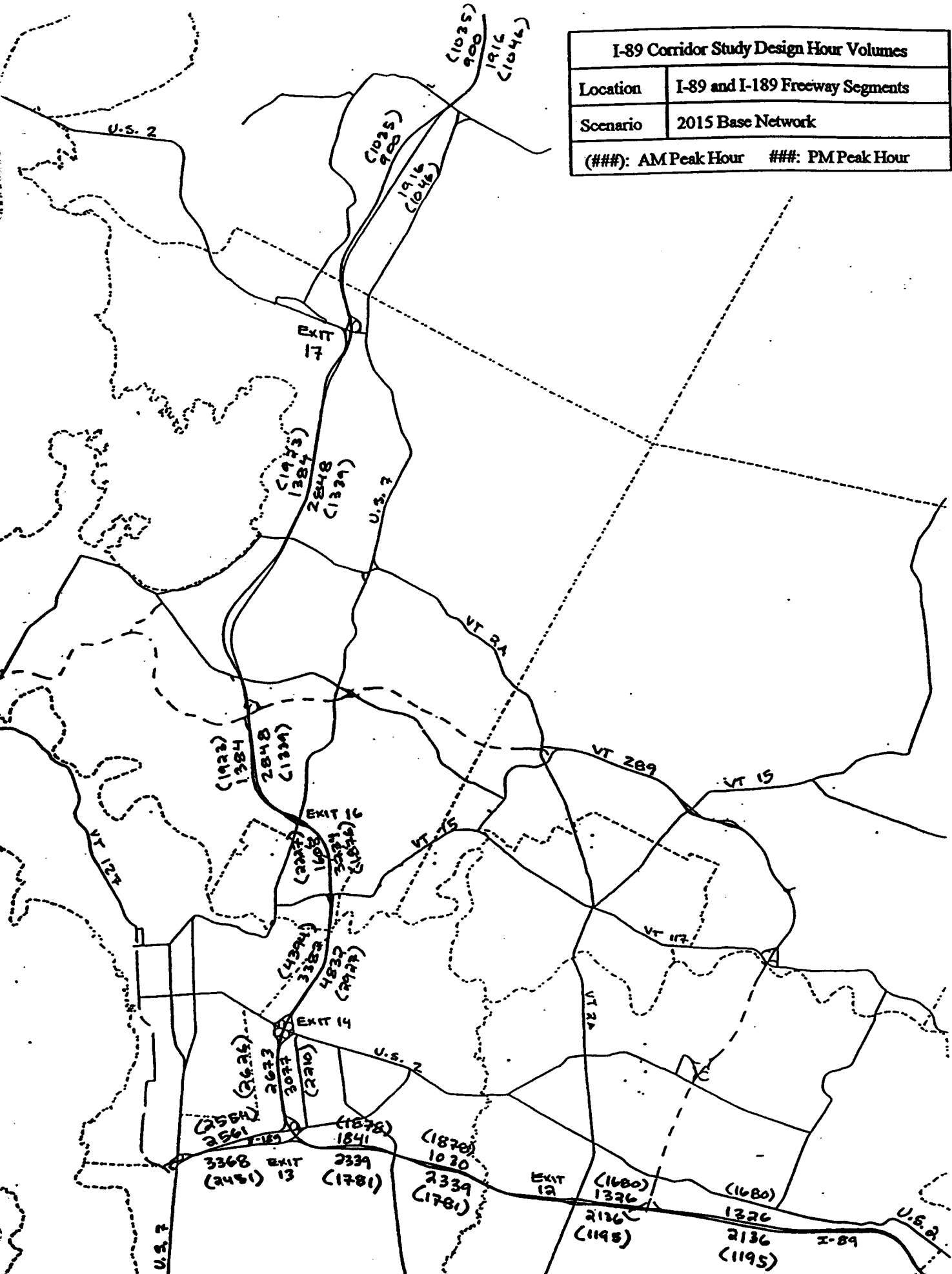


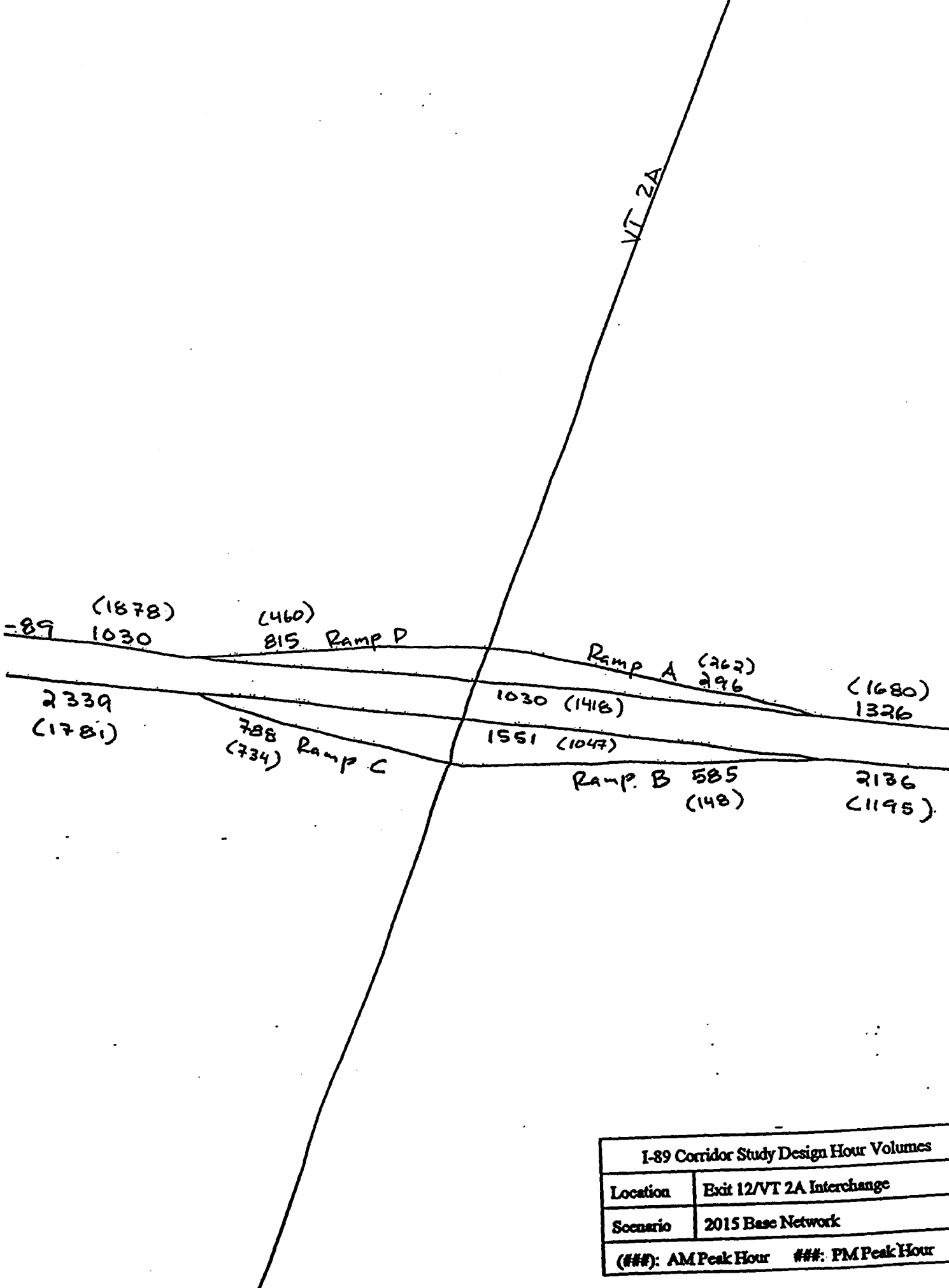
I-89 Corridor Study Design Hour Volumes	
Location	Exit 16/US 2&7 Interchange
Scenario	1995 Existing
(###): AM Peak Hour ###: PM Peak Hour	



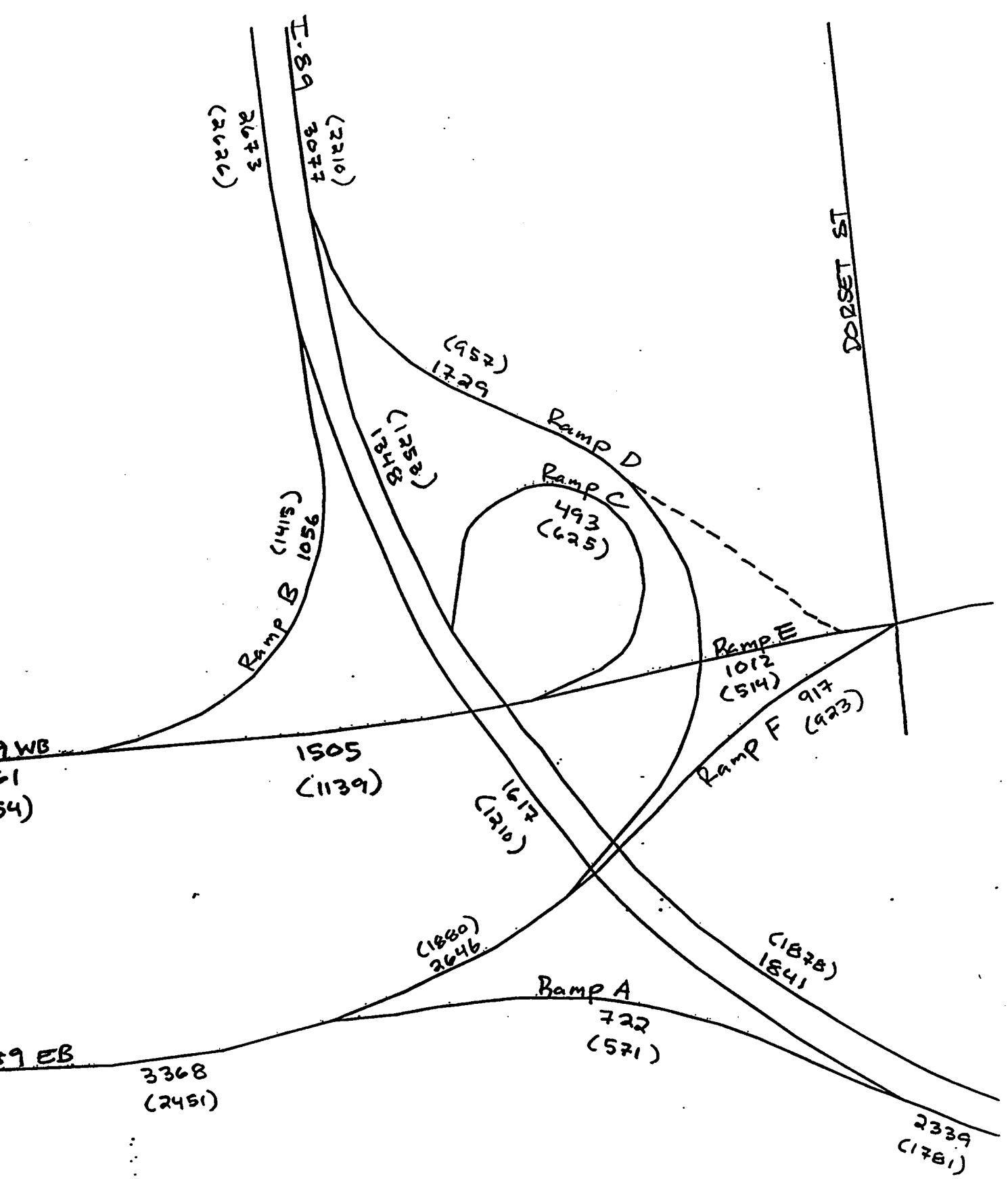
I-89 Corridor Study Design Hour Volumes	
Location	Exit 17/US 2 Interchange
Scenario	1995 Existing
(###): AM Peak Hour ###: PM Peak Hour	

I-89 Corridor Study Design Hour Volumes	
Location	I-89 and I-189 Freeway Segments
Scenario	2015 Base Network
(###): AM Peak Hour	###: PM Peak Hour

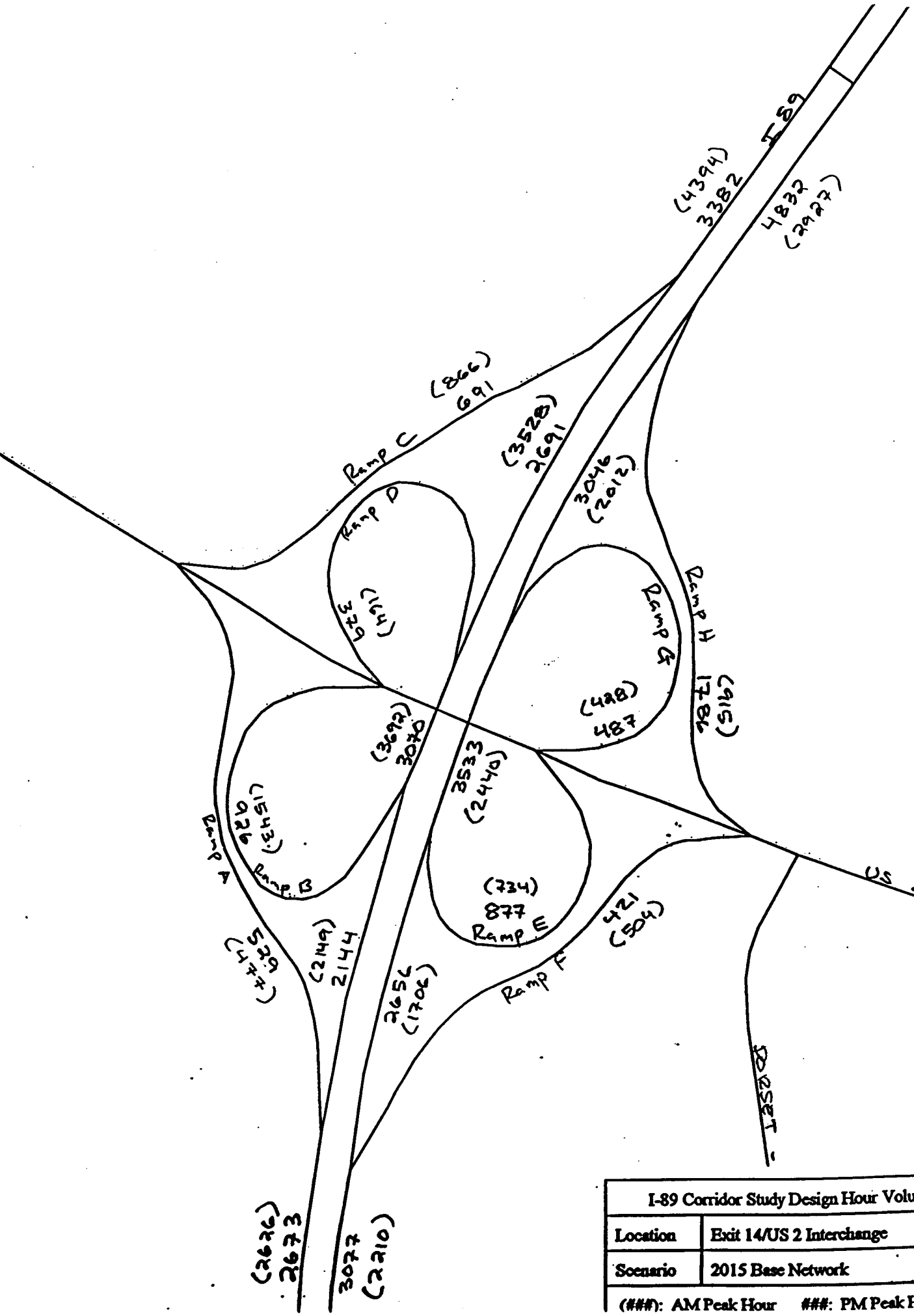




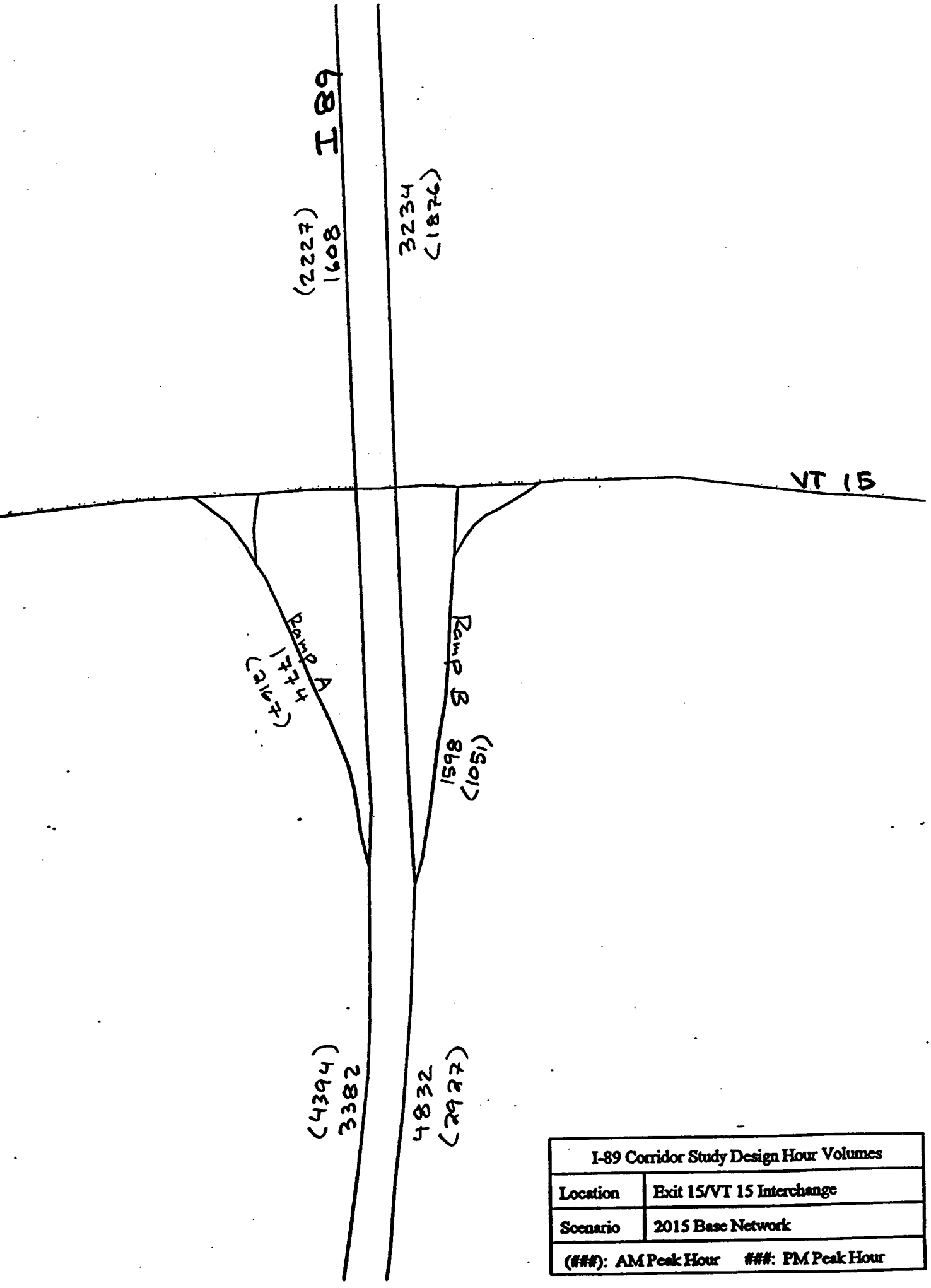
I-89 Corridor Study Design Hour Volumes	
Location	Exit 12/VT 2A Interchange
Scenario	2015 Base Network
(###): AM Peak Hour	###: PM Peak Hour



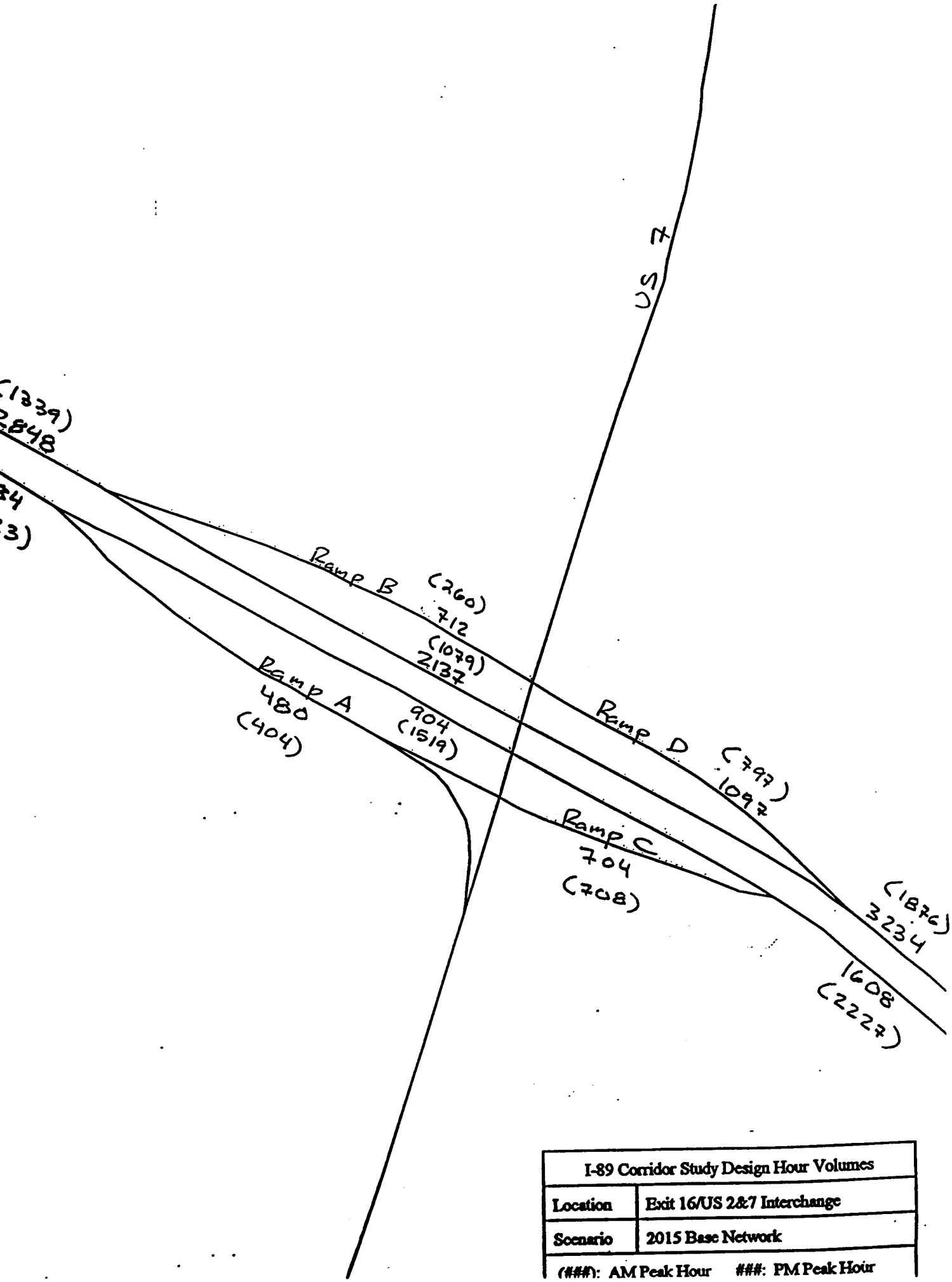
I-89 Corridor Study Design Hour Volumes	
Location	Exit 13/I-189 Interchange
Scenario	2015 Base Network
(###): AM Peak Hour ###: PM Peak Hour	



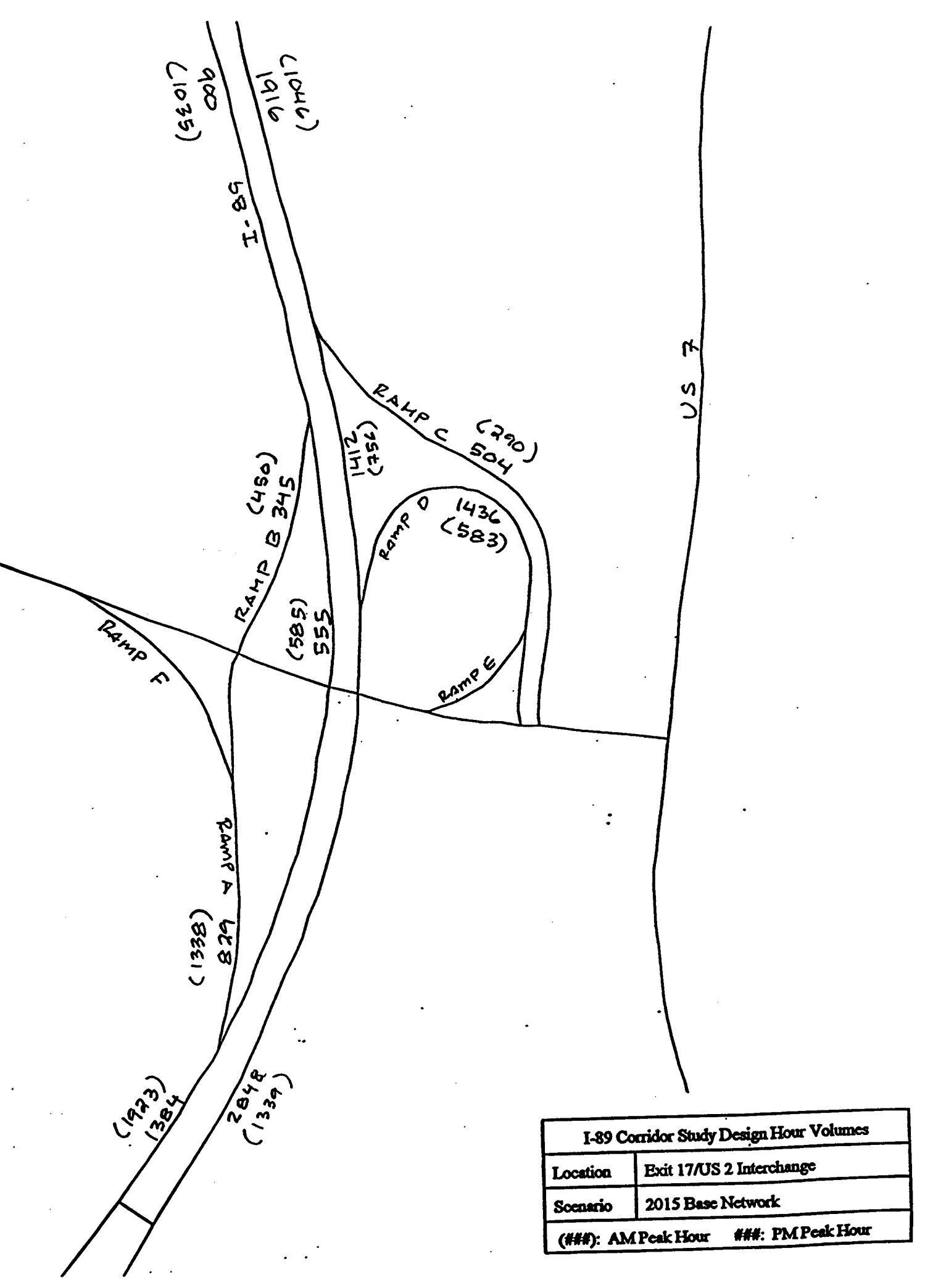
I-89 Corridor Study Design Hour Volumes	
Location	Exit 14/US 2 Interchange
Scenario	2015 Base Network
(###): AM Peak Hour ###: PM Peak Hour	



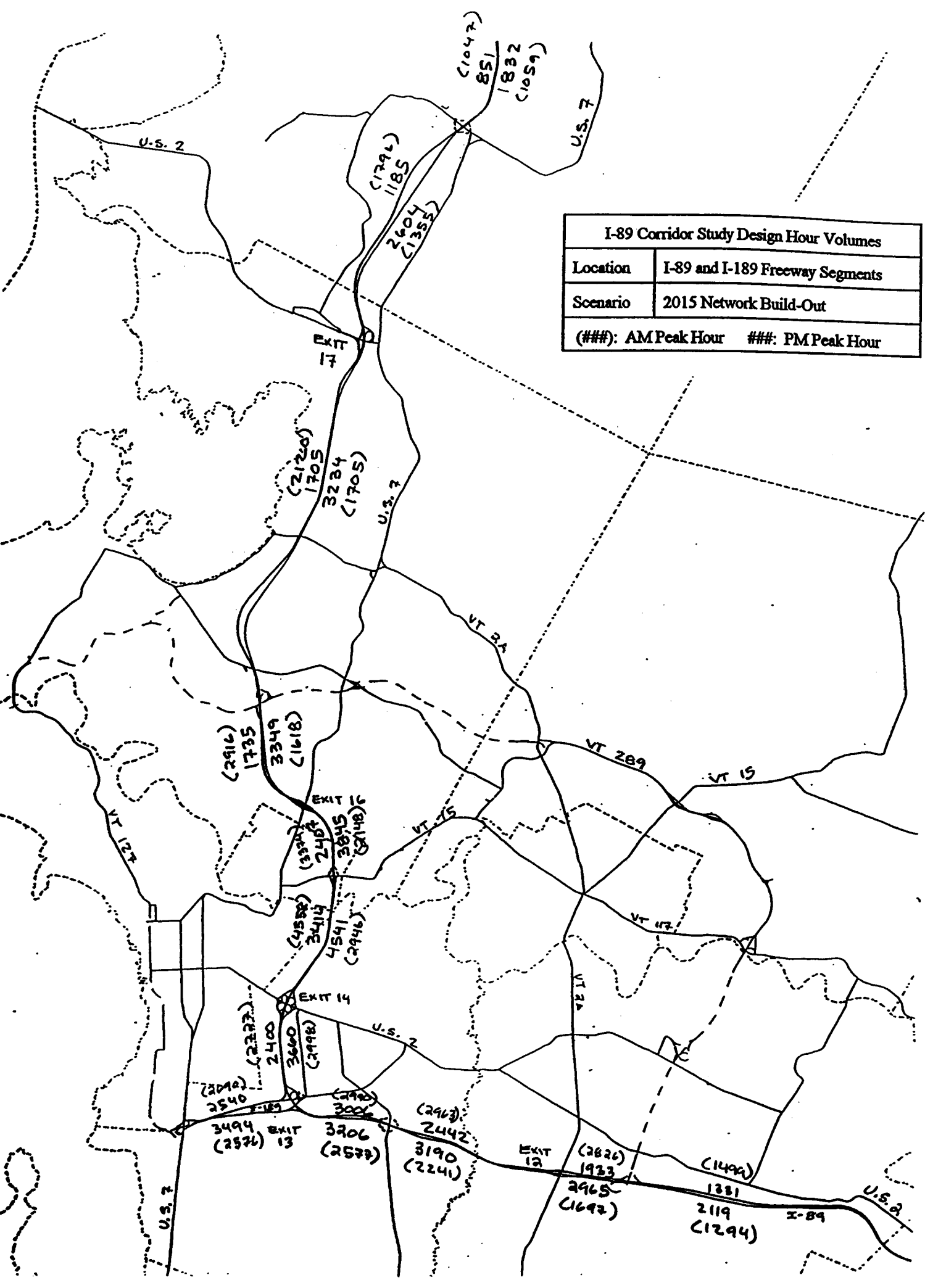
I-89 Corridor Study Design Hour Volumes	
Location	Exit 15/VT 15 Interchange
Scenario	2015 Base Network
(###): AM Peak Hour ###: PM Peak Hour	

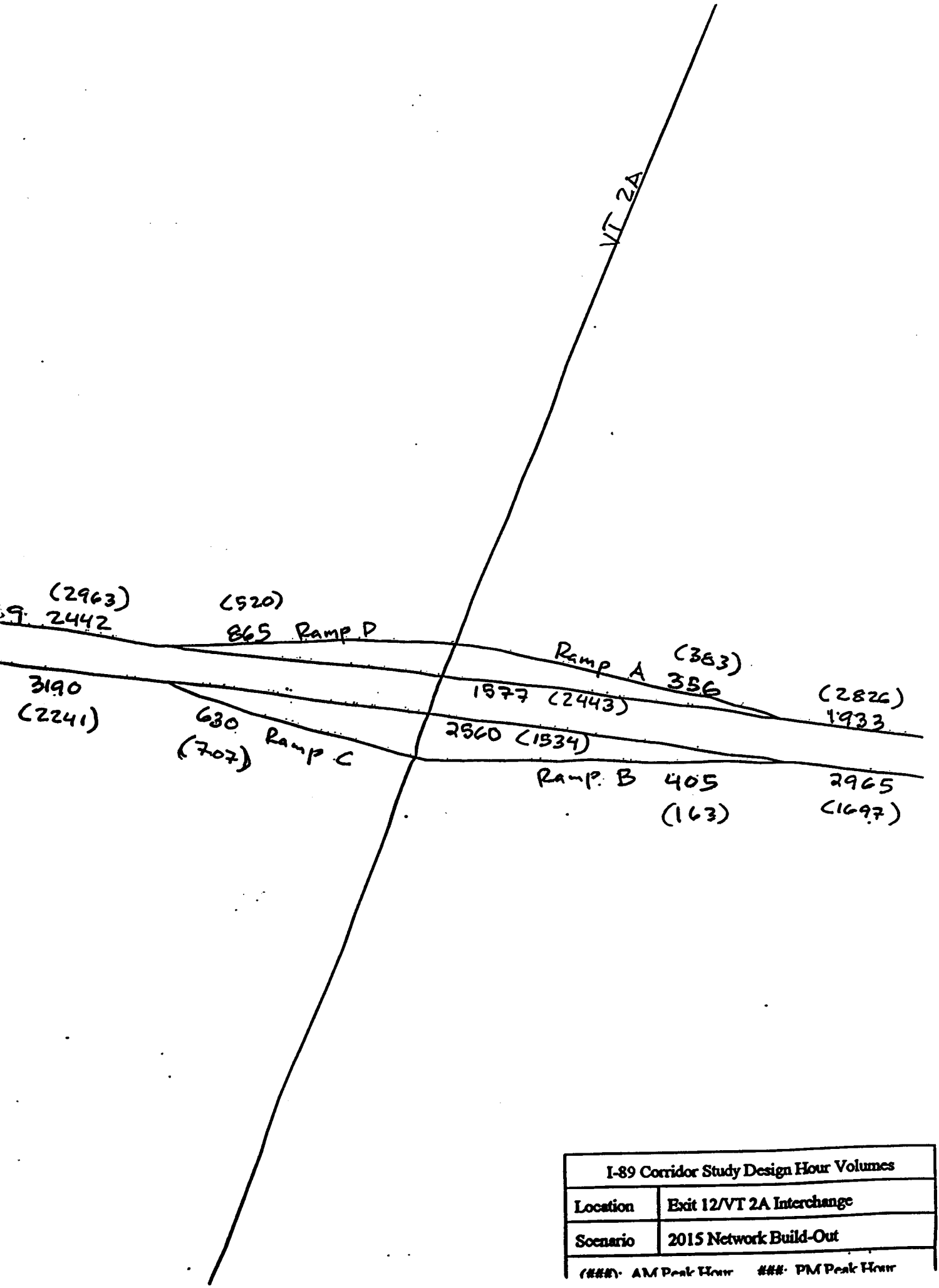


I-89 Corridor Study Design Hour Volumes	
Location	Exit 16/US 2&7 Interchange
Scenario	2015 Base Network
(###): AM Peak Hour ###: PM Peak Hour	

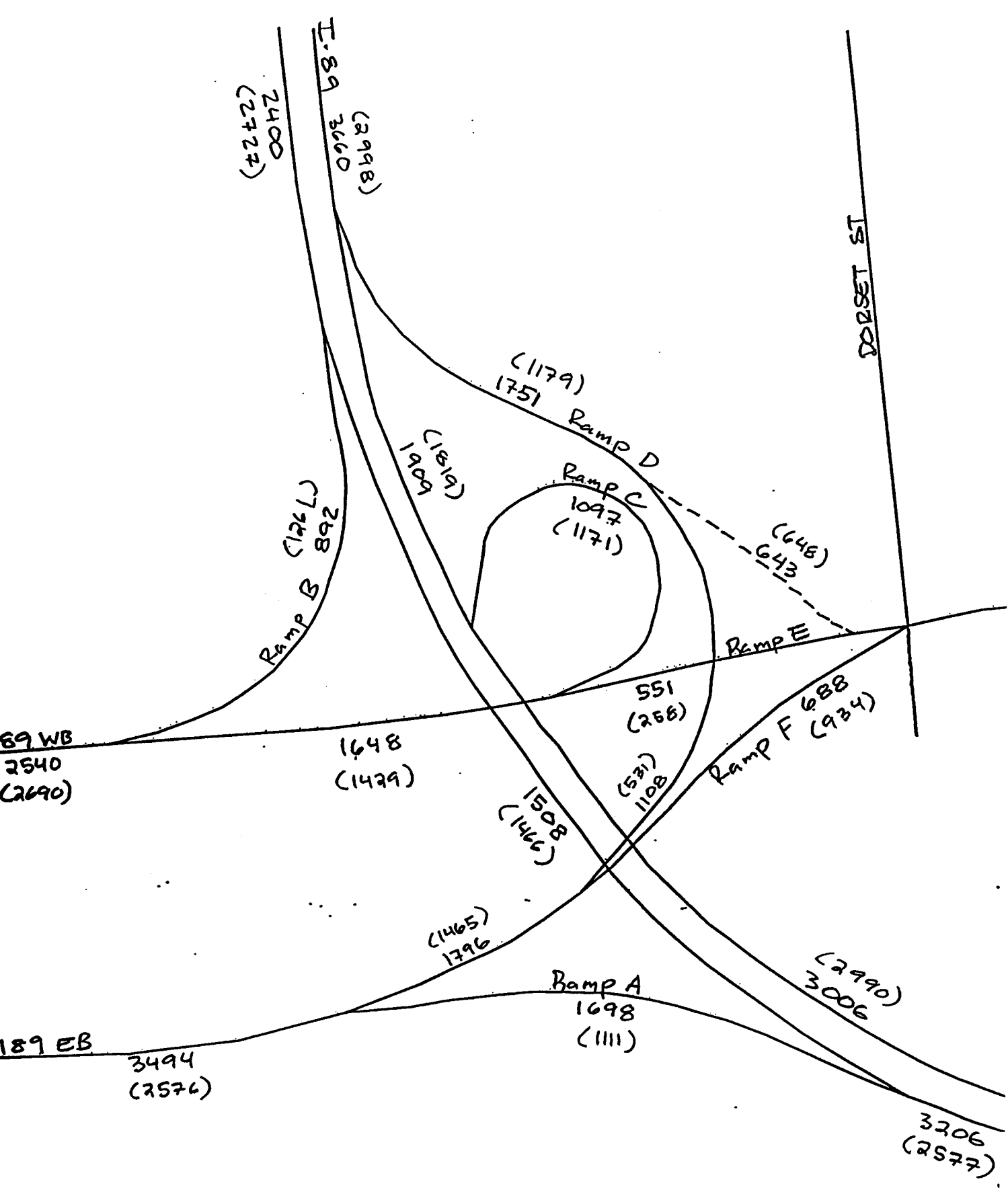


I-89 Corridor Study Design Hour Volumes	
Location	Exit 17/US 2 Interchange
Scenario	2015 Base Network
(###): AM Peak Hour ###: PM Peak Hour	


I-89 Corridor Study Design Hour Volumes
Location
I-89 and I-189 Freeway Segments
Scenario
2015 Network Build-Out
(###): AM Peak Hour ###: PM Peak Hour
U.S. 2
U.S. 7
VT 2A
VT 289
VT 15
VT 127
VT 117
EXIT 17
EXIT 16
EXIT 14
EXIT 13
EXIT 12
I-189
I-89
(1042) 851 1832 (1059)
(1296) 1185 2604 (1355)
(2120) 1705 3234 (1705)
(2916) 1735 3349 (1618)
(3327) 2464 3845 (2748)
(4582) 3414 4541 (2946)
(2237) 2400 3660 (2998)
(2090) 2540 3494 (2576)
(2990) 3006 3206 (2678)
(2963) 2442 3190 (2241)
(2826) 1933 2965 (1697)
(1499) 1381 2119 (1294)



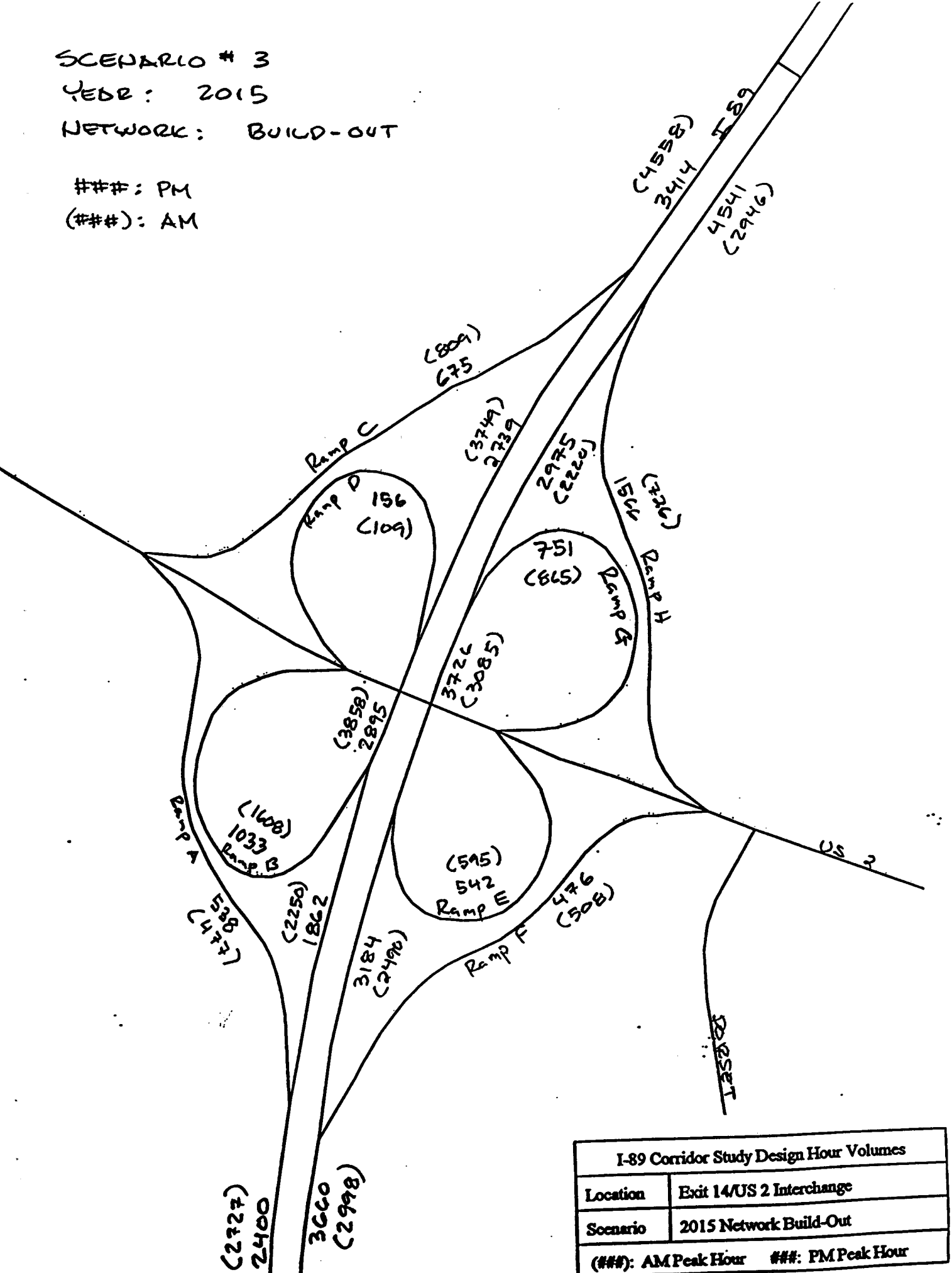
I-89 Corridor Study Design Hour Volumes	
Location	Exit 12/VT 2A Interchange
Scenario	2015 Network Build-Out
(###) AM Peak Hour ### PM Peak Hour	



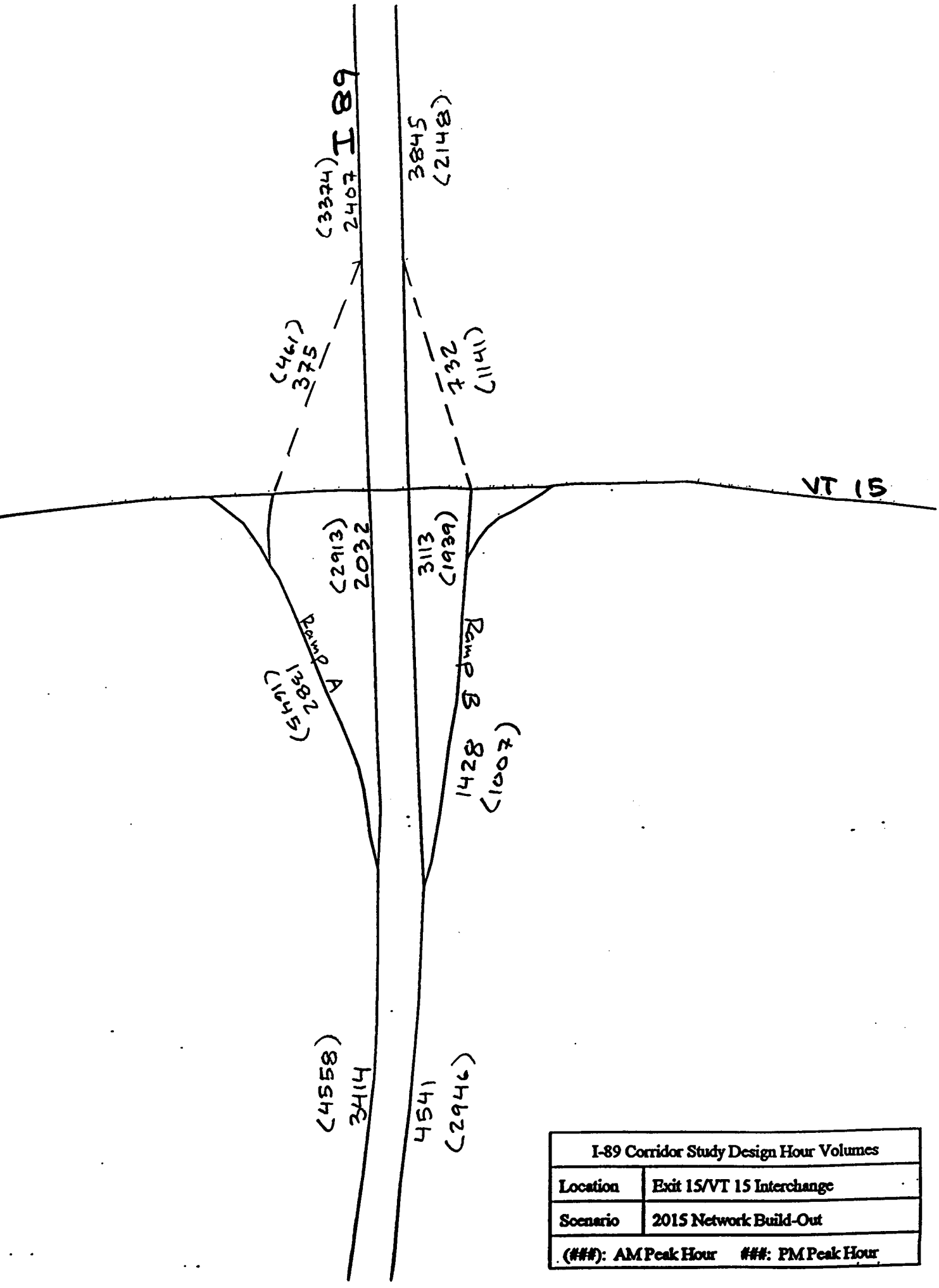
I-89 Corridor Study Design Hour Volumes	
Location	Exit 13/I-189 Interchange
Scenario	2015 Network Build-Out
(###): AM Peak Hour ###: PM Peak Hour	

SCENARIO # 3
YEAR: 2015
NETWORK: BUILD-OUT

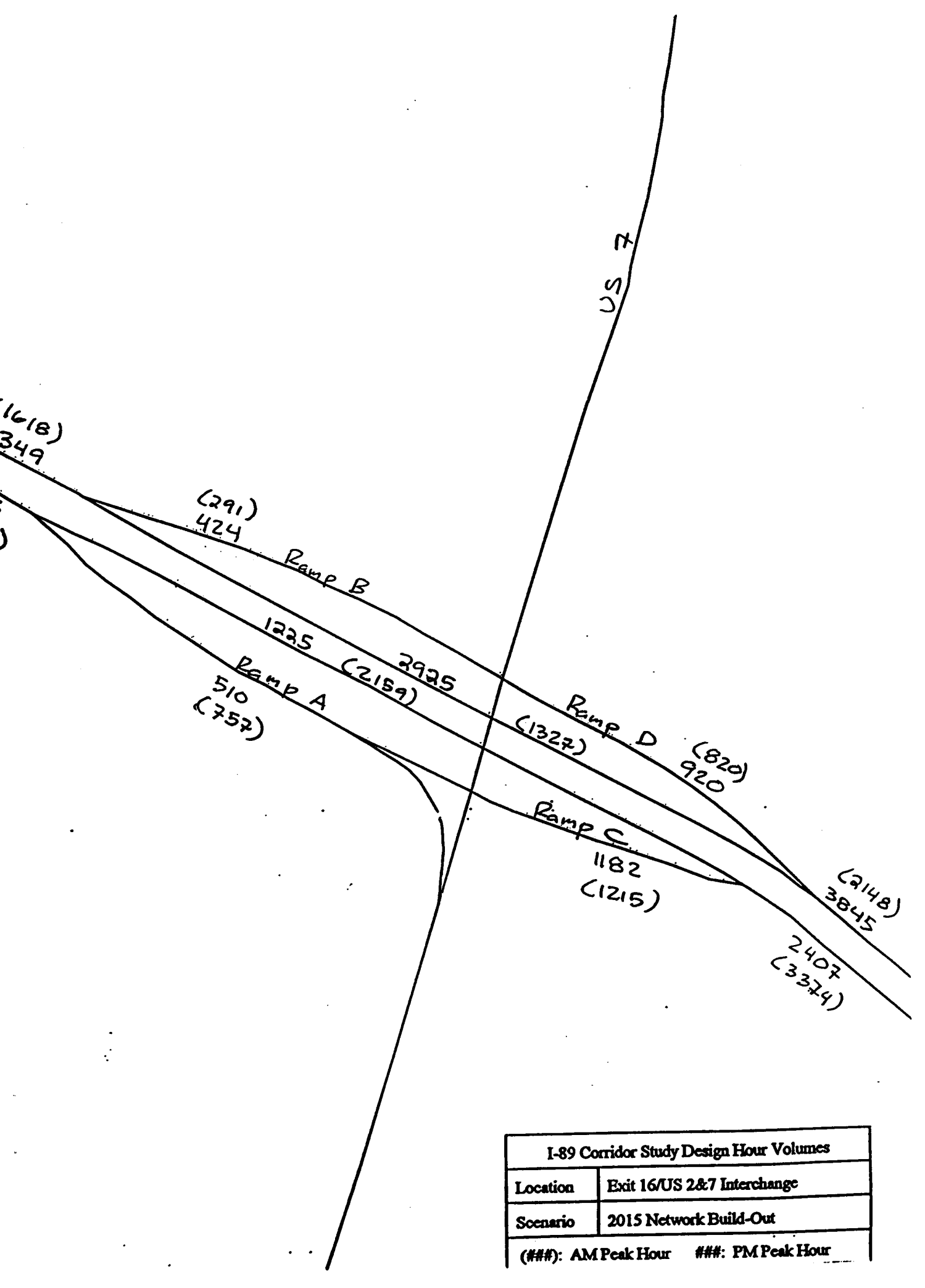
###: PM
(###): AM



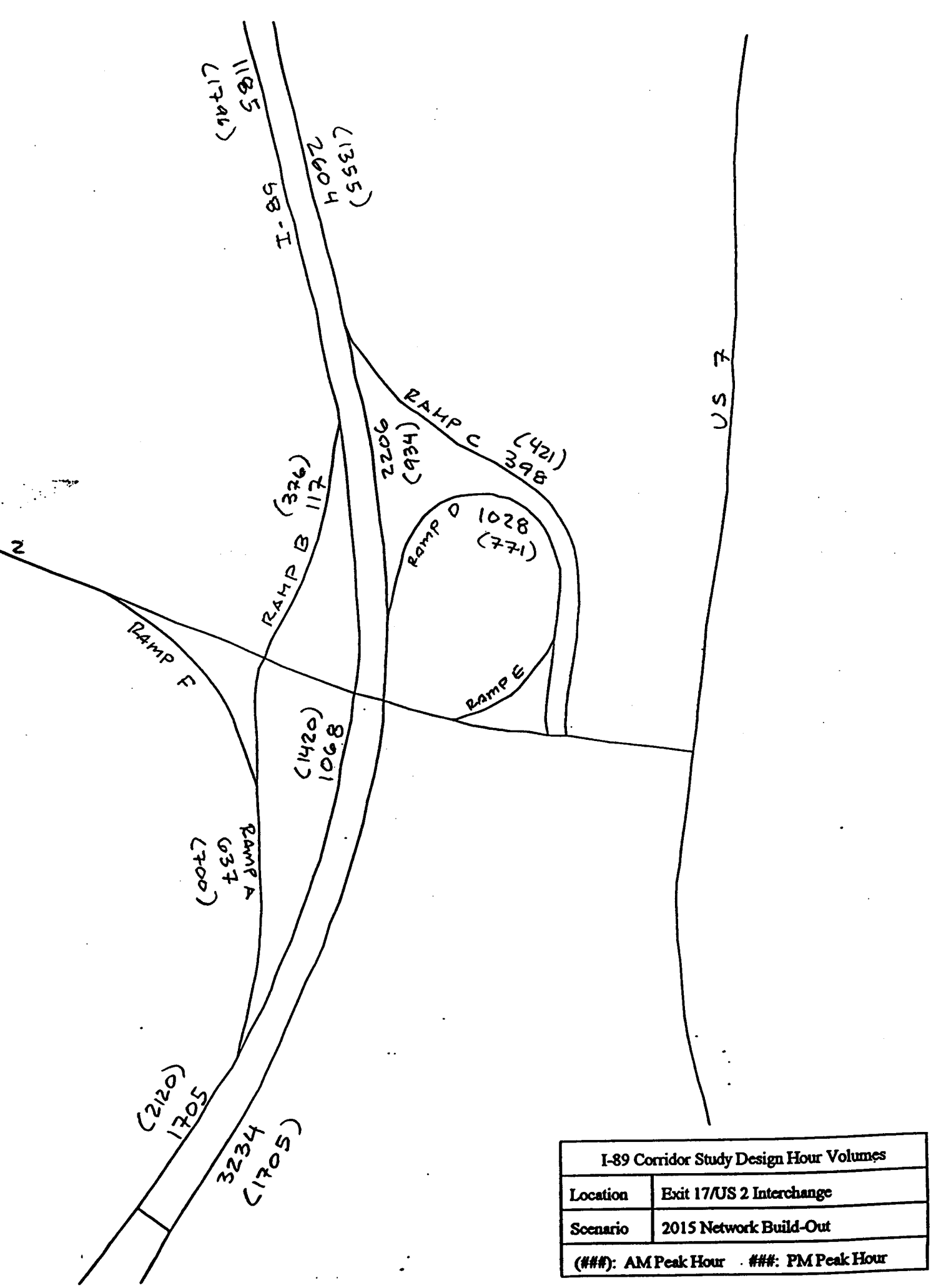
I-89 Corridor Study Design Hour Volumes	
Location	Exit 14/US 2 Interchange
Scenario	2015 Network Build-Out
(###): AM Peak Hour ###: PM Peak Hour	



I-89 Corridor Study Design Hour Volumes	
Location	Exit 15/VT 15 Interchange
Scenario	2015 Network Build-Out
(###): AM Peak Hour ###: PM Peak Hour	



I-89 Corridor Study Design Hour Volumes	
Location	Exit 16/US 2&7 Interchange
Scenario	2015 Network Build-Out
(###): AM Peak Hour ###: PM Peak Hour	



I-89 Corridor Study Design Hour Volumes	
Location	Exit 17/US 2 Interchange
Scenario	2015 Network Build-Out
(###): AM Peak Hour ###: PM Peak Hour	

APPENDIX C

VERMONT AGENCY OF TRANSPORTATION LOS POLICY

VERMONT AGENCY OF TRANSPORTATION
HIGHWAY DESIGN "LEVEL OF SERVICE" POLICY

Purpose:

To define appropriate qualitative measures of performance, for highway design in Vermont. Measures of performance relating to the capacity and Level of Service of various elements of the transportation system used in this policy are as defined in the 1994 Highway Capacity Manual (Transportation Research Board Special Report 209).

Policy:

It is the Agency's policy to design its highways and to require others accessing its facilities to effect improvements that will maintain Level of Service "C" for the prescribed design period.

However, given present traffic volumes and in anticipation of substantial future increases in traffic volumes, especially within densely settled areas, reduced Level of Service criteria may be appropriate when approved by the Secretary of Transportation in consultation with the Directors of Engineering and Planning on a case-by case basis.

Such a determination should consider at a minimum, the following:

- The delay incurred by the traveling public.
- The volume-to-capacity relationship.
- The negative impacts which may result to the surrounding area, because of improvements which would be required to achieve LOS C.

In extreme circumstances, where the existing Level of Service is "F" and where the necessary geometric improvements are not feasible, Level of Service "F" may be acceptable as long as an improvement over existing conditions can be demonstrated. An improvement over the existing conditions may include the implementation of travel demand management strategies or alternative transportation improvements. Prior to the implementation of any TDM or alternative transportation measures, all traditional traffic engineering approaches should be explored. These would include, but are not limited to, installation of signal, adjustment to signal phasing, modification to existing lane configurations, etc. Examples of alternative strategies/improvements are listed in Attachment 1. The attached listing is not intended to be all inclusive, it is only provided for informational purposes. Preferred mitigation strategies for any particular project or area should be developed by consulting the Town and Regional plans.

This policy supersedes the policy dated May 22, 1987.

EFFECTIVE DATE: 7/25/96

APPROVED: _____ DATE: 7/25/96

Glenn Gershaneck
Secretary of Transportation

APPENDIX D

ACCIDENT DATA

Accident Rates for Interstate Segments

Road Sect.	DIR.	# of Crashes	Injuries	Fatalitie	Prop Damage	Length (mL)	ADT	M	RC	RMVM	Ratio	HAL?	Severity Index
Exits 11-12	NB	22	15	0	22	4.90	12110	21.66	0.321	0.203	0.633	NO	26,614
	SB	12	4	0	12	4.90	12110	21.66	0.321	0.111	0.345	NO	16,333
Exits 12-13	NB	18	16	0	16	2.77	14655	14.82	0.353	0.243	0.688	NO	32,000
	SB	17	18	0	15	2.47	14655	13.21	0.364	0.257	0.707	NO	36,971
Exits 13-14	NB	0	0	0	0	0.21	17440	1.34	0.593	0.000	0.000	NO	0
	SB	0	0	0	0	0.23	17440	1.46	0.589	0.000	0.000	NO	0
Exits 14-15	NB	5	3	0	5	0.79	22358	6.45	0.438	0.155	0.354	NO	24,200
	SB	6	5	0	6	0.79	22358	6.45	0.438	0.186	0.425	NO	31,083
Exits 15-16	NB	3	1	0	3	0.67	15385	3.76	0.499	0.159	0.319	NO	16,333
	SB	4	1	0	4	0.70	15385	3.93	0.494	0.204	0.412	NO	13,875
Exits 16-17	NB	12	13	1	12	5.66	11832	24.44	0.311	0.096	0.315	NO	111,792
	SB	5	2	0	5	5.30	11832	22.89	0.316	0.044	0.138	NO	18,900
Exit 17-	NB	11	18	1	13	6.67	8115	19.76	0.328	0.111	0.339	NO	135,955
	SB	11	17	0	12	6.72	8115	19.90	0.328	0.111	0.337	NO	52,682
US7 to I-89	WB	4	6	0	4	0.38	19052	2.64	0.538	0.303	0.562	NO	50,750
	EB	3	1	0	3	0.46	19052	3.20	0.518	0.188	0.362	NO	16,333

Accident Rates at Ramp\Mainline Junctions

Ramp	# of Crashes	Length (mL)	Injuries	Fatalitie	Prop Damage	ADT	M	RC	RMVM	Ratio	HAL?	Severity Imdex
12A	0	0.29	0	0	0	12110	1.28	0.594	0.000	0.000	NO	0
12B	0	0.29	0	0	0	12110	1.28	0.594	0.000	0.000	NO	0
12C	4	0.29	5	0	4	14655	1.55	0.585	0.150	0.256	NO	43,375
12D	6	0.29	5	0	6	14655	1.55	0.585	0.224	0.383	NO	31,083
12A-D	3	0.47	7	0	3	9250	1.59	0.584	0.178	0.304	NO	75,333
12B-C	0	0.47	0	0	0	9250	1.59	0.584	0.000	0.000	NO	0
13A	2	0.29	2	0	4	14655	1.55	0.585	0.075	0.128	NO	42,500
13B	4	0.29	2	0	1	17440	1.85	0.573	0.126	0.219	NO	16,375
13C	0	0.29	0	0	0	14655	1.55	0.585	0.000	0.000	NO	0
13D	0	0.29	0	0	0	17440	1.85	0.573	0.000	0.000	NO	0
13A-B	0	0.45	0	0	0	9779	1.61	0.583	0.000	0.000	NO	0
13C-D	1	0.22	0	0	1	9779	0.79	0.583	0.056	0.096	NO	6,500
14A	0	0.29	0	0	0	17440	1.85	0.573	0.000	0.000	NO	0
14C	0	0.29	3	0	2	22358	2.37	0.550	0.000	0.000	NO	0
14F	1	0.29	1	0	1	17440	1.85	0.573	0.031	0.055	NO	36,000
14H	4	0.29	1	0	4	22358	2.37	0.550	0.096	0.178	NO	13,875
14A-B	0	0.25	0	0	0	14240	1.30	0.594	0.000	0.000	NO	0
14B-D	0	0.04	0	0	0	20394	0.30	0.215	0.000	0.000	NO	0
14D-C	0	0.22	0	0	0	18000	1.45	0.589	0.000	0.000	NO	0
14F-E	1	0.17	3	0	1	14240	0.88	0.592	0.038	0.065	NO	95,000
14E-G	4	0.12	2	0	4	20394	0.89	0.592	0.107	0.181	NO	21,250
14G-H	0	0.15	0	0	2	18000	0.99	0.596	0.000	0.000	NO	0
15A	7	0.29	8	0	7	22358	2.37	0.550	0.172	0.312	NO	40,214
15B	7	0.29	6	0	6	22358	2.37	0.550	0.172	0.312	NO	30,857
16A	1	0.29	1	0	1	11832	1.25	0.595	0.046	0.078	NO	36,000
16B	3	0.29	5	0	3	11832	1.25	0.595	0.139	0.233	NO	55,667
16C	3	0.29	5	0	3	15385	1.63	0.582	0.107	0.184	NO	55,667
16D	4	0.29	3	0	4	15385	1.63	0.582	0.142	0.245	NO	28,625
16C-A	0	0.46	0	0	0	8806	1.48	0.588	0.000	0.000	NO	0
16D-B	0	0.45	0	0	0	8806	1.45	0.589	0.000	0.000	NO	0
17A	1	0.29	0	0	1	11832	1.25	0.595	0.046	0.078	NO	6,500
17B	0	0.29	0	0	0	8115	0.86	0.590	0.000	0.000	NO	0
17C	1	0.29	0	0	1	8115	0.86	0.590	0.068	0.114	NO	6,500
17D	0	0.29	4	0	2	11832	1.25	0.595	0.000	0.000	NO	0
17A-B	0	0.40	0	0	0	6096	0.89	0.592	0.000	0.000	NO	0
17D-C	1	0.16	1	0	1	6096	0.36	0.340	0.090	0.264	NO	36,000
7-RAMP-C	2	0.29	2	0	2	19052	2.02	0.565	0.058	0.102	NO	36,000
7-RAMP-D	6	0.29	1	0	1	19052	2.02	0.565	0.173	0.305	NO	6,000
89-RAMP-A	1	0.29	1	0	1	19052	2.02	0.565	0.029	0.051	NO	36,000
89-RAMP-B	1	0.29	0	0	1	19052	2.02	0.565	0.029	0.051	NO	6,500

RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	RICHMOND	5570	11-12	N	N	78.75	12	16	91	1900	MON	SNOW	EXCESSIVE SPEED	HIT BRIDGE RAIL RT.	1	0	3300
89	RICHMOND	5439	11-12	N		78.80	11	21	91	700	THU	CLEAR	OTHER OP. CAUSE	HIT GUARDRAIL RT.	1	0	2200
89	RICHMOND	2685	11-12	N	N	79.10	6	14	91	1800	FRI	CLEAR	OTHER OP. CAUSE	TURNING - SAME DIR.	0	0	2000
89	RICHMOND	3925	11-12	N	N	79.35	12	21	95	700	THU	SNOW	EXCESSIVE SPEED	REAR END COLLSION	0	0	12000
89	RICHMOND	2229		S	S	999.99	7	23	95	1900	SUN	RAIN	EXCESSIVE SPEED	OTHER COLLISION	0	0	2500
89	WILLISTON	3997	11-12	S	S	79.54	6	29	95	900	THU	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	4510
89	WILLISTON	1686	11-12	S		79.55	5	3	94	200	TUE	CLEAR	CARELESS & NEGLIGENT	ROLLED OVER ON RT.	1	0	35000
89	WILLISTON	5744	11-12	S	S	79.59	4	4	91	800	THU	CLEAR	DEFECTIVE BRAKES	REAR END COLLSION	0	0	8500
89	WILLISTON	1259	11-12	S	S	79.60	2	25	95	800	SAT	OTH./?	CARELESS & NEGLIGENT	OTHER COLLISION	0	0	12000
89	WILLISTON	3071	11-12	N		79.65	6	5	92	9900	FRI	CLEAR	CARELESS & NEGLIGENT	HIT LEDGE TO LT.	1	0	12000
89	WILLISTON	3962	11-12	S	S	79.72	2	9	95	900	THU	CLEAR	INATTENTION	REAR END COLLSION	0	0	674
89	WILLISTON	4926	11-12	S	S	79.73	10	8	94	200	SAT	CLOUDY	LIQUOR, CITATED	REAR END COLLSION	0	0	3500
89	WILLISTON	5730	11-12	S	S	79.73	1	20	91	1600	SUN	CLOUDY	SLIPPERY ROAD	REAR END COLLSION	0	0	1220
89	WILLISTON	3990	11-12	W	W	79.76	4	30	95	1600	SUN	CLEAR	LIQUOR, CITATED	REAR END COLLSION	1	0	3500
89	WILLISTON	5755	11-12	N	N	79.79	7	10	91	1300	WED	CLEAR	INATTENTION	REAR END COLLSION	0	0	2700
89	WILLISTON	1854	11-12	S	S	79.95	3	19	93	1600	FRI	CLEAR	FAILURE TO YIELD	OTHER COLLISION	0	0	7300
89	WILLISTON	2936	11-12	N	W	80.10	7	4	91	1500	THU	CLEAR	INATTENTION	REAR END COLLSION	2	0	5100
89	WILLISTON	2658	11-12	S		80.10	8	2	94	1300	TUE	RAIN	OTHER	ROLLED OVER ON LT.	1	0	9000
89	WILLISTON	2743	11-12	N	N	80.10	7	8	92	1900	WED	RAIN	U-TURN	OTHER COLLISION	0	0	3500
89	WILLISTON	411	11-12	N	N	80.15	1	16	92	1700	SAT	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	3500
89	WILLISTON	4571	11-12	N		80.40	10	23	93	0	SAT	CLOUDY	MOOSE	ROLLED OVER ON LT.	0	0	3000
89	WILLISTON	4259	11-12	N	N	81.28	10	8	92	700	THU	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	100
89	WILLISTON	568	11-12	N		81.43	1	31	93	1300	SUN	SNOW	EXCESSIVE SPEED	ROLLED OVER ON RT.	1	0	10000
89	WILLISTON	2075	11-12	N		81.45	6	4	94	200	SAT	CLEAR	LIQUOR, CITATED	HIT SIGN TO RT.	1	0	3000
89	WILLISTON	739	11-12	N	N	81.45	1	29	94	1200	SAT	CLEAR	OTHER VEHICLES	OTHER COLLISION	2	0	7500
89	WILLISTON	943	11-12	N	N	81.65	1	31	93	1000	SUN	SNOW	EXCESSIVE SPEED	REAR END COLLSION	0	0	3750
89	WILLISTON	1061	11-12	S	S	81.75	2	1	93	1300	MON	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	3200
89	WILLISTON	3180	11-12	N	N	81.80	6	26	91	1000	WED	CLEAR	U-TURN	SIDESWIPE - SAME DIR.	1	0	1600
89	WILLISTON	473	11-12	N	N	82.15	1	17	94	1400	MON	SNOW	EXCESSIVE SPEED	OTHER COLLISION	0	0	3900
89	WILLISTON	4620	11-12	N	N	82.15	11	11	93	1300	THU	CLOUDY	FAILURE TO YIELD	SIDESWIPE - SAME DIR.	1	0	5500
89	WILLISTON	2969	11-12	S	S	82.22	7	8	91	2300	MON	CLEAR	CARELESS & NEGLIGENT	REAR END COLLSION	0	0	3700
89	WILLISTON	3846	11-12	N	N	82.30	9	15	92	800	TUE	CLEAR	EXCESSIVE SPEED	REAR END COLLSION	0	0	10000

RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	WILLISTON	1699	11-12	S	S	82.60	4	11	92	900	SAT	SNOW	CARELESS & NEGLIGENT	HIT GUARDRAIL RT.	1	0	4900
89	WILLISTON	2172	11-12	N		83.05	4	9	94	300	SAT	CLEAR	LIQUOR, CITATED	ROLLED OVER ON RT.	1	0	6000
89	WILLISTON	3303	11-12	N	N	83.30	6	18	93	1300	FRI	CLOUDY	DRIVER FELL ASLEEP	REAR END COLLSION	0	0	3500
89	WILLISTON	3946	12A-D	N	N	83.96	9	15	93	800	WED	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	2	0	12700
89	WILLISTON	4122	12A-D	N	N	84.00	9	15	93	800	WED	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	23600
89	WILLISTON	3812	12A-D	N	N	84.00	8	20	93	1700	FRI	RAIN	FOLLOWING TOO CLOSE	REAR END COLLSION	5	0	22000
89	WILLISTON	3060	12D	N	N	84.16	8	24	94	1000	WED	CLEAR	FAILURE TO YIELD	TURNING - SAME DIR.	0	0	6000
89	WILLISTON	3775	12C	S	S	84.20	12	5	95	2100	TUE	CLEAR	FAILURE TO YIELD	SIDESWIPE - SAME DIR.	0	0	2000
89	WILLISTON	1072	12C	S	S	84.24	1	31	93	1200	SUN	SNOW	EXCESSIVE SPEED	OTHER COLLISION	1	0	5500
89	WILLISTON	879	12C	S	S	84.25	2	13	93	2200	SAT	SNOW	CARELESS & NEGLIGENT	REAR END COLLSION	2	0	3500
89	WILLISTON	2007	12C	S		84.40	5	8	92	100	FRI	CLEAR	CARELESS & NEGLIGENT	HIT EMBANKMENT TO RT.	2	0	10000
89	WILLISTON	2723	12D	N	N	84.42	7	1	93	1800	THU	CLEAR	EXCESSIVE SPEED	REAR END COLLSION	1	0	7500
89	WILLISTON	3624	12D	N		84.42	9	10	92	9900	THU	CLEAR	EXCESSIVE SPEED	HIT TREE TO LT.	1	0	40000
89	WILLISTON	4266	12D	N	N	84.42	10	25	92	1600	SUN	CLOUDY	FAILURE TO YIELD	REAR END COLLSION	2	0	8200
89	WILLISTON	2696	12D	N	N	84.45	7	22	94	600	FRI	RAIN	U-TURN	REAR END COLLSION	0	0	7500
89	WILLISTON	2013	12D	N	N	84.45	5	26	94	1500	THU	RAIN	EXCESSIVE SPEED	REAR END COLLSION	1	0	11000
89	WILLISTON	3060	12-13	N	N	84.55	10	21	95	1600	SAT	RAIN	LIQUOR, CITATED	SIDESWIPE - SAME DIR.	0	0	7000
89	WILLISTON	1671	12-13	S		84.60	4	21	91	1300	SUN	RAIN	EXCESSIVE SPEED	ROLLED OVER ON LT.	3	0	6500
89	WILLISTON	4955	12-13	S		84.65	11	26	93	1000	SUN	RAIN	EXCESSIVE SPEED	HIT LEDGE TO RT.	2	0	10000
89	WILLISTON	2226	12-13	S		84.96	4	12	94	1400	TUE	CLEAR	EXCESSIVE SPEED	HIT GUARDRAIL LT.	3	0	8545
89	WILLISTON	4299		S	S	999.99	10	9	92	1600	FRI	RAIN	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	3300
89	WILLISTON	3169		S	S	999.99	8	4	92	800	TUE	RAIN	CARELESS & NEGLIGENT	OTHER COLLISION	0	0	2200
89	S. BURL.	2469	12-13	N	N	85.01	6	6	93	1500	SUN	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	7000
89	S. BURL.	5158	12-13	S	S	85.01	7	14	93	1500	WED	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	0
89	S. BURL.	5756	12-13	N		85.02	6	1	91	200	SAT	CLEAR	LIQUOR, CITATED	HIT GUARDRAIL RT.	1	0	0
89	S. BURL.	5163	12-13	E		85.02	9	11	93	200	SAT	CLEAR	LIQUOR, CITATED	ROLLED OVER ON RT.	1	0	6000
89	S. BURL.	5400	12-13	E	E	85.02	9	29	92	800	TUE	CLEAR	BACKING IN ROADWAY	REAR END COLLSION	0	0	3300
89	S. BURL.	488	12-13	N	N	85.10	1	22	94	1000	SAT	OTH./?	INATTENTION	REAR END COLLSION	2	0	6000
89	S. BURL.	4002	12-13	N		85.10	10	4	95	2200	WED	CLOUDY	LIQUOR, CITATED	ROLLED OVER ON RT.	0	0	1500

RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	S. BURL.	5403	12-13	E	E	85.12	10	10	92	1100	SAT	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	3000
89	S. BURL.	5150	12-13	E	E	85.15	1	29	93	2300	FRI	SNOW	LIQUOR, CITATED	REAR END COLLSION	0	0	1600
89	S. BURL.	5390	12-13	E	E	85.16	1	10	92	1500	FRI	SNOW	FOLLOWING TOO CLOSE	REAR END COLLSION	2	0	4000
89	S. BURL.	5749	12-13	W		85.20	3	15	91	2200	FRI	CLOUDY	LIQUOR, CITATED	ROLLED OVER ON LT.	1	0	5000
89	S. BURL.	5401	12-13	E	E	85.24	9	28	92	1700	MON	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	0
89	S. BURL.	5397	12-13	E	E	85.25	7	23	92	1000	THU	RAIN	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	1500
89	S. BURL.	5738	12-13	W	W	85.25	3	7	91	1300	THU	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	0
89	S. BURL.	5157	12-13	S	S	85.26	7	11	93	1900	SUN	CLEAR	CARELESS & NEGLIGENT	REAR END COLLSION	1	0	4000
89	S. BURL.	5146	12-13	W	W	85.26	2	20	93	800	SAT	CLEAR	INATTENTION	REAR END COLLSION	2	0	1300
89	S. BURL.	2611	12-13	E	E	85.27	6	12	91	2100	WED	CLOUDY	FAILURE TO YIELD	TURNING - SAME DIR.	0	0	2100
89	S. BURL.	5754	12-13	W	W	85.28	7	9	91	1600	TUE	CLEAR	INATTENTION	REAR END COLLSION	0	0	0
89	S. BURL.	3994	12-13	W	W	85.28	6	29	95	1700	THU	CLEAR	INATTENTION	REAR END COLLSION	1	0	0
89	S. BURL.	5065	12-13	S		85.35	11	30	92	800	MON	CLEAR	INATTENTION	SIDESWIPE - SAME DIR.	0	0	2600
89	S. BURL.	3302	12-13	S	S	85.35	6	7	93	1600	MON	CLEAR	FAILURE TO YIELD	SIDESWIPE - SAME DIR.	0	0	2020
89	S. BURL.	2525	12-13	N		85.40	5	25	92	500	MON	CLEAR	DRIVER FELL ASLEEP	HIT BOULDERS TO LT.	1	0	20000
89	S. BURL.	729	12-13	N		85.79	1	11	92	900	SAT	CLEAR	CARELESS & NEGLIGENT	HIT LEDGE TO RT.	1	0	4000
89	S. BURL.	4490	12-13	N		86.15	11	22	93	2200	MON	CLEAR	CARELESS & NEGLIGENT	HIT GUARDRAIL RT.	1	0	4500
89	S. BURL.	4645	12-13	N	N	86.20	10	26	91	1600	MON	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	2	0	19700
89	S. BURL.	2769	12-13	S	N	86.22	9	13	95	600	WED	RAIN	EXCESSIVE SPEED	HEAD ON COLLISION	1	0	7000
89	S. BURL.	2769	12-13	W	W	86.26	6	14	91	1600	FRI	CLEAR	FOLLOWING TOO CLOSE	SIDESWIPE - SAME DIR.	1	0	1510
89	S. BURL.	2956	12-13	S	S	86.80	7	22	93	1600	THU	RAIN	INATTENTION	REAR END COLLSION	0	0	3500
89	S. BURL.	1620	12-13		S	86.85	3	3	94	1900	THU	SNOW	FOLLOWING TOO CLOSE	TURNING - SAME DIR.	0	0	1000
89	S. BURL.	3214	12-13	N	N	86.95	10	6	95	2200	FRI	CLEAR	OTHER OP. CAUSE	REAR END COLLSION	3	0	12400
89	S. BURL.	2587	12-13	N	N	87.05	6	23	92	1000	TUE	CLEAR	FAILURE TO YIELD	OTHER COLLISION	0	0	5650
89	S. BURL.	1947	12-13	N		87.15	4	25	91	2300	THU	CLEAR	EXCESSIVE SPEED	HIT GUARDRAIL RT.	1	0	2500
89	S. BURL.	1113	13A	S	S	87.20	2	2	93	2000	TUE	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	2	0	5000
89	S. BURL.	2132	13A	S	S	87.20	4	9	94	1600	SAT	CLEAR	INATTENTION	OTHER COLLISION	0	0	5100
89	S. BURL.	3210	13B	S	S	87.67	9	14	95	2100	THU	CLOUDY	CARELESS & NEGLIGENT	HEAD ON COLLISION	1	0	6000
89	S. BURL.	3934	13C-D	N	N	87.70	12	22	95	600	FRI	SNOW	EXCESSIVE SPEED	REAR END COLLSION	0	0	25000
89	S. BURL.	1742	13B	S	S	87.80	3	11	93	800	THU	SNOW	EXCESSIVE SPEED	REAR END COLLSION	0	0	6000

RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	S. BURL.	1316	13B	S	S	87.89	2	15	91	200	FRI	SNOW	LIQUOR, CITATED	OTHER COLLISION	1	0	5000
89	S. BURL.	2262	13B	S	S	87.92	7	12	95	1200	WED	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	3000
89	S. BURL.	3739	14F	N	N	88.51	12	14	95	1200	THU	SNOW	EXCESSIVE SPEED	OTHER COLLISION	1	0	8000
89	S. BURL.	3615	14F-E	N		88.67	8	19	91	1100	MON	CLEAR	OTHER VEHICLES	RAN OFF LT. SIDE	3	0	7000
89	S. BURL.	3816	14E-G	N	N	88.68	8	28	94	1600	SUN	OTH./?	UNKNOWN	REAR END COLLSION	0	0	550
89	S. BURL.	925	14E-G	N	N	88.68	1	4	94	1500	TUE	SNOW	SLIPPERY ROAD	OTHER COLLISION	1	0	5500
89	S. BURL.	2298	14E-G	N	N	88.68	5	3	91	1800	FRI	RAIN	FAILURE TO YIELD	REAR END COLLSION	0	0	1500
89	S. BURL.	1323	14E-G	N		88.82	1	16	94	100	SUN	CLEAR	LIQUOR, CITATED	HIT POLE TO RT.	1	0	2000
89	S. BURL.	2848	14H	N		88.95	5	27	91	2200	MON	CLOUDY	LIQUOR, CITATED	ROLLED OVER ON RT.	0	0	300
89	S. BURL.	3417	14H	N	N	89.05	8	26	94	1700	FRI	CLEAR	U-TURN	REAR END COLLSION	0	0	4400
89	S. BURL.	2609	14C	S	N	89.14	6	12	91	1700	WED	RAIN	OTHER VEHICLES	HEAD ON COLLISION	2	0	6500
89	S. BURL.	4264	14H	N		89.15	8	23	91	2300	FRI	CLEAR	LIQUOR, CITATED	HIT GUARDRAIL LT.	1	0	3800
89	S. BURL.	3948	14H	N	N	89.18	12	26	95	500	TUE	CLEAR	FAILURE TO YIELD	OTHER COLLISION	0	0	4500
89	S. BURL.	2652	14-15	N	N	89.25	6	14	91	1900	FRI	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	3500
89	S. BURL.	380	14C	S	S	89.25	1	13	93	800	WED	SNOW	EXCESSIVE SPEED	REAR END COLLSION	1	0	3000
89	S. BURL.	430	14-15	N	N	89.43	1	4	94	1500	TUE	SNOW	EXCESSIVE SPEED	OTHER COLLISION	1	0	5000
89	S. BURL.	2206	14-15	S	S	89.44	5	2	91	1600	THU	CLOUDY	OTHER VEHICLES	REAR END COLLSION	3	0	5550
89	S. BURL.	858	14-15	S	N	89.50	1	13	93	1500	WED	SNOW	EXCESSIVE SPEED	OTHER COLLISION	0	0	23000
89	S. BURL.	877	14-15	S		89.60	2	9	91	1600	SAT	CLEAR	LIQUOR, CITATED	ROLLED OVER ON LT.	1	0	2750
89	S. BURL.	4906	14-15	S		89.70	12	30	93	700	THU	SNOW	EXCESSIVE SPEED	REAR END COLLSION	0	0	7000
89	S. BURL.	1527	14-15	N	N	89.70	2	29	92	1400	SAT	CLEAR	OBJ. THROWN FROM VEH.	OTHER COLLISION	0	0	7500
89	S. BURL.	718	14-15	S	S	89.81	1	17	94	1100	MON	SNOW	EXCESSIVE SPEED	OTHER COLLISION	0	0	7000
89	S. BURL.	890	14-15	N	N	89.90	1	23	92	1700	THU	RAIN	CARELESS & NEGLIGENT	REAR END COLLSION	0	0	2000
89	S. BURL.	5735		N		999.99	1	18	91	1700	FRI	CLEAR	INATTENTION	HIT GUARDRAIL RT.	0	0	3300
89	S. BURL.	5743		S		999.99	3	1	91	2300	FRI	CLOUDY	LIQUOR, CITATED	HIT SIGN TO LT.	0	0	2400
89	WINOOSKI	3128	14-15	S	S	89.97	10	6	95	800	FRI	RAIN	U-TURN	OTHER COLLISION	1	0	10000
89	WINOOSKI	4912	14-15	N	N	89.98	2	9	94	1700	WED	SNOW	INATTENTION	REAR END COLLSION	2	0	9100
89	WINOOSKI	1373	15B	N	N	90.10	3	17	92	2000	TUE	SNOW	CARELESS & NEGLIGENT	OTHER COLLISION	1	0	3500
89	WINOOSKI	2313	15A	S	E	90.11	5	10	93	1300	MON	CLOUDY	U-TURN	RT. ANGLE - BROADSIDE	0	0	4000
89	WINOOSKI	5148	15A	E	E	90.12	3	22	93	1100	SUN	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	3000

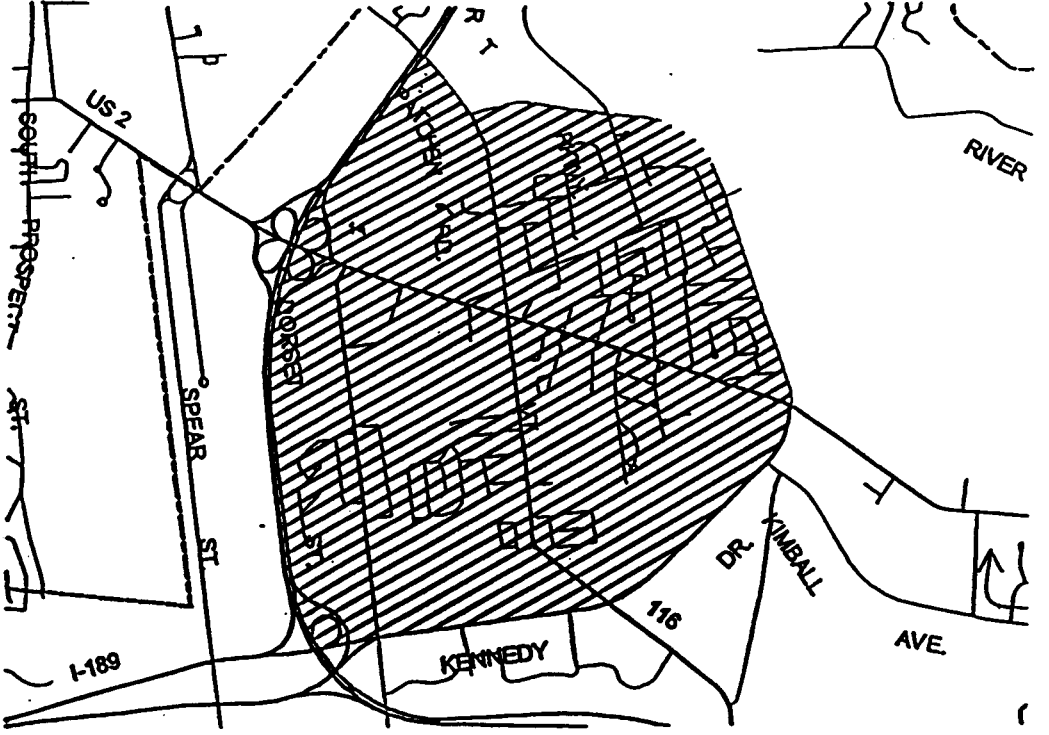
RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	WINOOSKI	3996	15B	N	N	90.13	7	4	95	0	TUE	CLEAR	INATTENTION	REAR END COLLSION	1	0	0
89	WINOOSKI	5145	15B	W	W	90.13	3	3	93	1500	WED	CLOUDY	INATTENTION	REAR END COLLSION	1	0	700
89	WINOOSKI	5391	15A	E	E	90.13	1	18	92	100	SAT	SNOW	SLIPPERY ROAD	REAR END COLLSION	0	0	2500
89	WINOOSKI	4917	15A	E	E	90.13	5	13	94	1000	FRI	CLEAR	HIT & RUN VEH.	REAR END COLLSION	2	0	550
89	WINOOSKI	5762	15A	E	E	90.13	8	30	91	1500	FRI	CLEAR	INATTENTION	REAR END COLLSION	0	0	1950
89	WINOOSKI	5728	15B	N	N	90.13	1	3	91	1700	THU	CLEAR	STOP/SIGN VIOLATION	REAR END COLLSION	0	0	1000
89	WINOOSKI	2345	15B	N	N	90.15	5	16	91	1700	THU	CLEAR	EXCESSIVE SPEED	REAR END COLLSION	0	0	3500
89	WINOOSKI	2210	15B	N	N	90.15	5	16	91	1700	THU	CLEAR	CARELESS & NEGLIGENT	REAR END COLLSION	0	0	1300
89	WINOOSKI	868	15A	S	S	90.30	3	17	95	1000	FRI	CLOUDY	FAILURE TO YIELD	OTHER COLLISION	2	0	4000
89	WINOOSKI	4919	15B	N	N	90.31	11	1	91	1900	FRI	CLEAR	OTHER OP. CAUSE	REAR END COLLSION	3	0	1800
89	WINOOSKI	2361	15A	S	S	90.34	5	14	93	1400	FRI	CLEAR	U-TURN	SIDESWIPE - SAME DIR.	4	0	5000
89	WINOOSKI	3891	15-16	S	S	90.45	12	15	95	700	FRI	SNOW	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	17750
89	WINOOSKI	3596	15-16	N		90.46	7	22	91	300	MON	CLOUDY	CARELESS & NEGLIGENT	HIT GUARDRAIL LT.	1	0	52225
89	WINOOSKI	2861	15-16	S		90.70	8	8	94	200	MON	CLEAR	CARELESS & NEGLIGENT	RAN OFF LT. SIDE	0	0	1000
89	WINOOSKI	4282	15-16	N	N	90.77	10	4	91	2000	FRI	CLOUDY	OTHER OP. CAUSE	OTHER COLLISION	0	0	6100
89	COLC.	4927	15-16	N	N	90.92	7	25	94	1800	MON	CLEAR	CARELESS & NEGLIGENT	REAR END COLLSION	0	0	1000
89	COLC.	5394	15-16	E	E	90.93	3	4	92	1000	WED	CLEAR	INATTENTION	REAR END COLLSION	0	0	1100
89	COLC.	5751	15-16	S	S	90.93	5	27	91	1100	MON	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	1210
89	COLC.	5764	16C	S	W	91.05	9	11	91	1600	WED	CLEAR	FAILURE TO YIELD	OTHER COLLISION	2	0	3600
89	COLC.	5154	16C	S	S	91.06	5	21	93	700	FRI	CLEAR	DEFECTIVE BRAKES	REAR END COLLSION	2	0	15500
89	COLC.	5752	16C	S	S	91.06	6	21	91	1600	FRI	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	1	0	3500
89	COLC.	3980	16D	N	N	91.10	1	4	95	1500	WED	CLEAR	DEFECTIVE BRAKES	SIDESWIPE - SAME DIR.	0	0	1700
89	COLC.	5396	16D	N	N	91.12	4	26	92	1900	SUN	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	2200
89	COLC.	4906	16D	N	N	91.12	2	7	94	1600	MON	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	850
89	COLC.	3919	16D	N	N	91.27	12	21	95	1700	THU	SNOW	FOLLOWING TOO CLOSE	REAR END COLLSION	3	0	150
89	COLC.	3096	16A	S		91.80	7	23	93	1300	FRI	CLEAR	OTHER VEH. FAULT	HIT LEDGE TO RT.	1	0	2500
89	COLC.	1896	16B	N		91.82	2	24	94	1900	THU	CLEAR	INATTENTION	HIT BOULDERS TO RT.	0	0	500
89	COLC.	4767	16B	N	N	91.82	12	9	94	1900	FRI	SLEET	CARELESS & NEGLIGENT	REAR END COLLSION	3	0	5000
89	COLC.	3084	16B	N	N	91.88	7	30	92	1600	THU	CLEAR	INATTENTION	TURNING - SAME DIR.	2	0	4500
89	COLC.	5633	16-17	S	S	92.25	12	22	91	300	SUN	CLEAR	EXCESSIVE SPEED	REAR END COLLSION	1	0	17500

RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	COLC.	1945	16-17	N	N	93.55	3	22	94	1900	TUE	CLEAR	CARELESS PARKING	SIDESWIPE - SAME DIR.	1	0	20500
89	COLC.	3327	16-17	N		93.85	7	23	94	100	SAT	CLOUDY	CARELESS & NEGLIGENT	HIT GUARDRAIL LT.	0	0	5090
89	COLC.	2824	16-17	N		93.90	9	1	95	100	FRI	CLEAR	LIQUOR, CITATED	HIT GUARDRAIL LT.	0	0	4400
89	COLC.	3444	16-17	S	S	94.00	8	7	91	1900	WED	CLEAR	LIQUOR, CITATED	HIT GUARDRAIL LT.	0	0	6000
89	COLC.	3086	16-17	S	S	94.00	7	14	94	1300	THU	CLEAR	FAILURE TO YIELD	TURNING - SAME DIR.	0	0	1500
89	COLC.	2778	16-17	N		94.25	7	9	93	800	FRI	CLOUDY	FLAT TIRE	ROLLED OVER ON RT.	1	0	20000
89	COLC.	344	16-17	S	S	94.80	1	9	92	700	THU	CLOUDY	OTHER OP. CAUSE	TURNING - OPP. DIR.	0	0	9400
89	COLC.	4845	16-17	N		94.80	10	19	91	200	SAT	CLEAR	LIQUOR, CITATED	HIT LEDGE TO RT.	2	0	6000
89	COLC.	1680	16-17	N		95.25	4	4	93	0	SUN	SNOW	CARELESS & NEGLIGENT	HIT GUARDRAIL LT.	2	0	5000
89	COLC.	3500	16-17	S		95.35	7	30	93	1700	FRI	CLEAR	DEFECTIVE TIRES	HIT GUARDRAIL LT.	1	0	10000
89	COLC.	2462	16-17	N	N	95.45	5	12	91	0	SUN	CLEAR	LIQUOR, CITATED	REAR END COLLSION	2	0	12000
89	COLC.	44	16-17	N	S	96.31	9	11	94	1800	SUN	CLEAR	CARELESS & NEGLIGENT	RT. ANGLE - BROADSIDE	1	1	2000
89	COLC.	2510	16-17	N	N	96.57	6	12	93	1300	SAT	CLOUDY	FAILURE TO YIELD	TURNING - SAME DIR.	2	0	3000
89	COLC.	3724	16-17	N		97.25	8	5	92	2300	WED	CLEAR	EXCESSIVE SPEED	ROLLED OVER ON RT.	1	0	2500
89	COLC.	2067	16-17	N	N	97.53	4	24	92	1700	FRI	CLOUDY	U-TURN	REAR END COLLSION	0	0	6000
89	COLC.	4585	17A	S	S	97.53	10	8	91	700	TUE	CLEAR	U-TURN	REAR END COLLSION	0	0	3700
89	COLC.	1851	16-17	N		97.85	4	7	91	400	SUN	CLEAR	DRIVER FELL ASLEEP	HIT GUARDRAIL LT.	1	0	4500
89	COLC.	1005	17D-C	N	N	98.05	1	28	91	1600	MON	CLEAR	OTHER OP. CAUSE	OTHER COLLISION	1	0	8000
89	COLC.	3395	17C	N	N	98.25	11	16	95	1600	THU	CLEAR	INPROPER TURN	SIDESWIPE - SAME DIR.	0	0	2000
89	COLC.	67	17-	N	N	98.41	8	30	91	1100	FRI	CLEAR	INATTENTION	OTHER COLLISION	4	1	22000
89	COLC.	4562	17-	N		98.45	11	10	94	2300	THU	CLEAR	LIQUOR, CITATED	ROLLED OVER ON LT.	1	0	4000
89	COLC.	2791		N	N	999.99	6	8	91	200	SAT	CLEAR	HIT & RUN VEH.	SIDESWIPE - SAME DIR.	0	0	700
89	COLC.	1390		N		999.99	2	15	91	1700	FRI	CLEAR	CARELESS & NEGLIGENT	HIT GUARDRAIL RT.	2	0	6000
89	COLC.	2692		S		999.99	5	26	91	1700	SUN	RAIN	OBJ. THROWN FROM VEH.	HIT GUARDRAIL RT.	1	0	3000
89	MILTON	4735	17-	N		98.50	12	3	94	1100	SAT	CLEAR	EXCESSIVE SPEED	ROLLED OVER ON RT.	1	0	5000
89	MILTON	509	17-	N	N	99.45	1	23	92	1600	THU	RAIN	CARELESS & NEGLIGENT	REAR END COLLSION	1	0	3000
89	MILTON	829	17-	N		99.85	2	12	93	1700	FRI	SNOW	EXCESSIVE SPEED	ROLLED OVER ON RT.	1	0	8000
89	MILTON	4615	17-	N		100.10	9	9	91	1300	MON	CLEAR	DRIVER FELL ASLEEP	HIT GUARDRAIL RT.	1	0	5030
89	MILTON	804	17-	S	S	100.45	1	28	91	1600	MON	CLOUDY	INATTENTION	SIDESWIPE - SAME DIR.	0	0	2000
89	MILTON	372	17-	S		100.85	1	4	91	2100	FRI	CLEAR	EXCESSIVE SPEED	HIT GUARDRAIL LT.	1	0	900

RTE.	TOWN	SEQ.	SECT.	DIR 1	DIR 2	MILE	MM	DD	YY	TIME	D.O.W.	WEA.	CAUSE	TYPE	INJ	FAT	PROP DAMGE
89	MILTON	1090	17-	N		101.20	2	26	94	200	SAT	CLEAR	LIQUOR, CITATED	HIT GUARDRAIL LT.	1	0	5000
89	MILTON	487	17-	S		101.25	1	22	94	1100	SAT	SNOW	CARELESS & NEGLIGENT	ROLLED OVER ON LT.	1	0	5000
89	MILTON	3843	17-	S	S	101.40	12	23	95	200	SAT	SNOW	INATTENTION	REAR END COLLSION	1	0	16000
89	MILTON	3256	17-	S		101.45	8	15	92	800	SAT	CLOUDY	INATTENTION	HIT SIGN TO LT.	0	0	6500
89	MILTON	4374	17-	N		101.54	8	26	91	0	MON	CLEAR	LIQUOR, CITATED	HIT GUARDRAIL RT.	3	0	5000
89	MILTON	4305	17-	S	S	101.55	10	10	92	700	SAT	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	7	0	7000
89	MILTON	318	17-	N	N	101.60	1	3	93	1500	SUN	OTH./?	EXCESSIVE SPEED	REAR END COLLSION	1	0	21000
89	MILTON	3501	17-	S		102.35	7	30	93	1600	FRI	CLEAR	DRIVER FELL ASLEEP	HIT GUARDRAIL RT.	1	0	8000
89	MILTON	3219	17-	S		102.52	7	16	94	1000	SAT	CLEAR	CARELESS & NEGLIGENT	HIT GUARDRAIL LT.	1	0	1350
89	MILTON	935	17-	S	S	102.65	2	11	91	800	MON	SNOW	FOLLOWING TOO CLOSE	REAR END COLLSION	3	0	2200
89	MILTON	4607	17-	N		102.70	11	2	91	1100	SAT	CLOUDY	CARELESS & NEGLIGENT	ROLLED OVER ON LT.	2	0	6500
89	MILTON	453	17-	N	N	103.24	1	14	94	1000	FRI	SNOW	EXCESSIVE SPEED	HIT GUARDRAIL RT.	0	0	6200
89	MILTON	4429	17-	S		103.56	9	22	91	300	SUN	CLEAR	CARELESS & NEGLIGENT	HIT GUARDRAIL RT.	4	0	10445
89	MILTON	510	17-	S	S	104.60	1	23	92	1600	THU	RAIN	EXCESSIVE SPEED	TURNING - SAME DIR.	0	0	4500
189	BURL.	4916	7-RAMP-D	W	W	0.00	7	5	94	800	TUE	CLEAR	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	5500
189	BURL.	5765	7-RAMP-D	W	W	0.00	9	21	91	1500	SAT	CLOUDY	INATTENTION	REAR END COLLSION	0	0	2500
189	BURL.	4913	7-RAMP-D	N		0.01	4	26	94	800	TUE	RAIN	CARELESS BICYCLIST	HIT BICYCLIST	1	0	0
189	BURL.	4573	7-RAMP-D	W		0.05	12	28	94	2000	WED	CLEAR	STOP/SIGN VIOLATION	HIT CURBING TO RT.	1	0	0
189	BURL.	5392		E	E	999.99	2	7	92	1400	FRI	CLEAR	OTHER OP. CAUSE	TURNING - SAME DIR.	0	0	0
189	S. BURL.	5729	7-RAMP-D	W	W	0.03	1	19	91	1500	SAT	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	2000
189	S. BURL.	5407	7-RAMP-C	E		0.04	11	8	92	1800	SUN	CLEAR	LIQUOR, CITATED	HIT EMBANKMENT TO RT.	1	0	500
189	S. BURL.	3902	7-RAMP-D	W	W	0.10	9	30	93	800	THU	CLEAR	EXCESSIVE SPEED	REAR END COLLSION	2	0	12000
189	S. BURL.	4663	7-RAMP-C	E	E	0.22	11	21	92	1200	SAT	RAIN	CARELESS & NEGLIGENT	HIT GUARDRAIL LT.	1	0	4000
189	S. BURL.	1353	7-89	W		0.31	3	11	95	1600	SAT	SNOW	LIQUOR, CITATED	ROLLED OVER ON LT.	4	0	12000
189	S. BURL.	4402	7-89	W	W	0.36	10	15	92	700	THU	CLOUDY	CARELESS & NEGLIGENT	REAR END COLLSION	0	0	4000
189	S. BURL.	1948	7-89	W	N	0.50	4	29	94	1400	FRI	CLEAR	U-TURN	RT. ANGLE - BROADSIDE	2	0	6500
189	S. BURL.	4677	7-89	E		0.55	10	10	93	1600	SUN	CLEAR	CARELESS & NEGLIGENT	ROLLED OVER ON LT.	1	0	4000
189	S. BURL.	2966	7-89	E	E	0.70	9	18	95	1600	MON	CLEAR	OTHER VEHICLES	REAR END COLLSION	0	0	17200
189	S. BURL.	3909	7-89	E	E	0.70	12	20	95	2200	WED	SNOW	LIQUOR, CITATED	REAR END COLLSION	0	0	19500
189	S. BURL.	4745	7-89	W	W	0.75	10	18	91	800	FRI	CLOUDY	FOLLOWING TOO CLOSE	REAR END COLLSION	0	0	17100
189	S. BURL.	1603	89-RAMP-A	E		1.00	5	20	95	1000	SAT	CLEAR	OTHER	HIT GUARDRAIL RT.	1	0	300
189	S. BURL.	2774	89-RAMP-B	W	W	1.25	6	27	92	1500	SAT	CLEAR	FAILURE TO YIELD	SIDESWIPE - SAME DIR.	0	0	2500

APPENDIX E

ACTIVITY CENTER MAPS FOR THROUGH TRAFFIC ANALYSIS



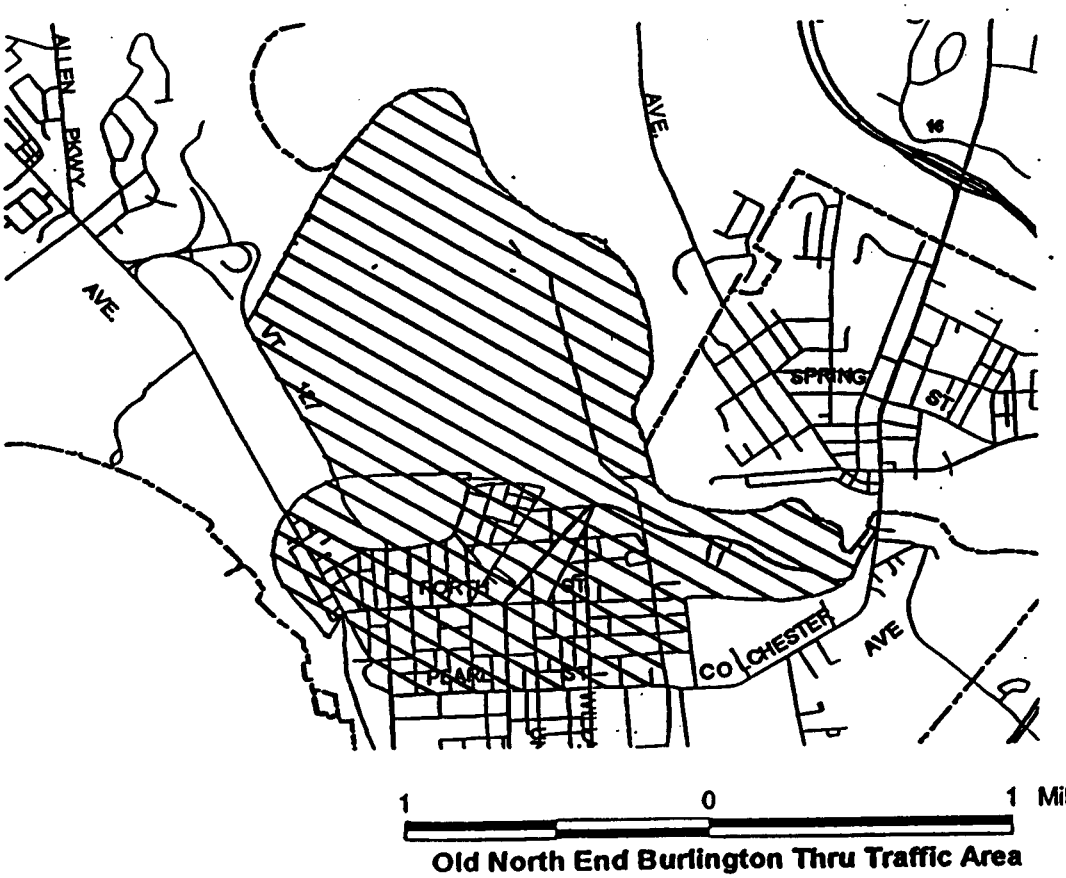
0.9 0 0.9 Miles

Williston Road Corridor Thru Traffic Area

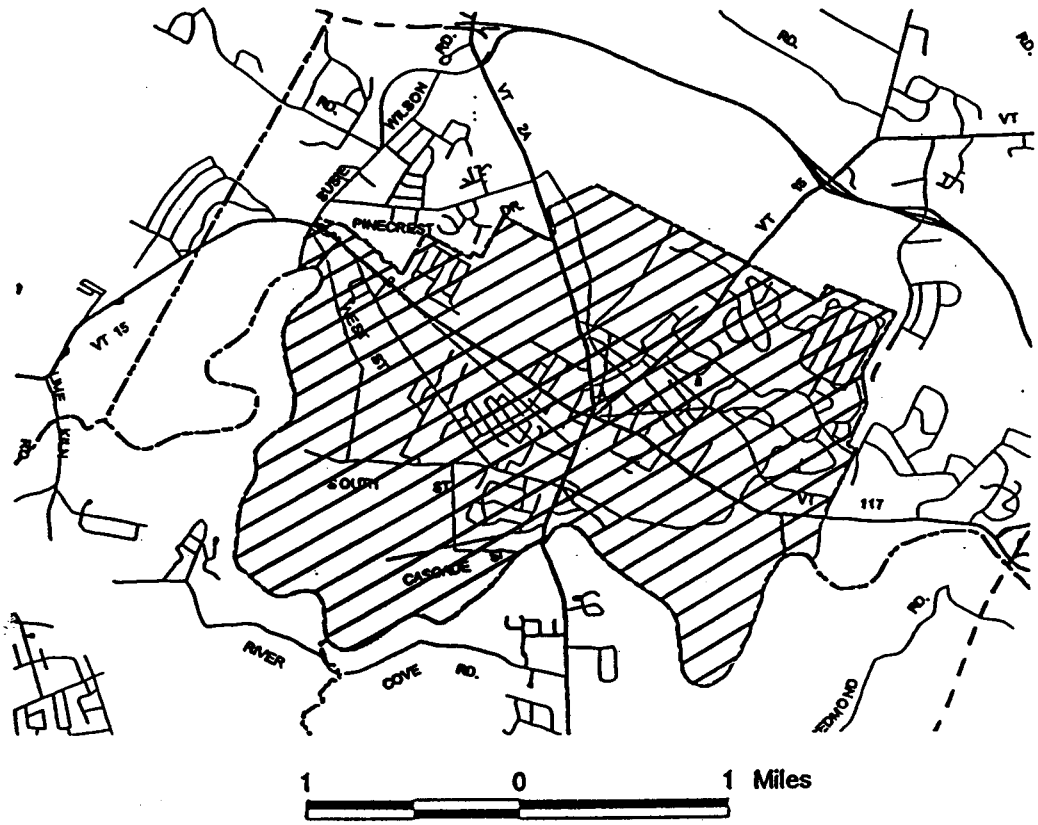
1 0 1 Miles

So. End, Downtown, Hill Section
Burlington Thru Traffic Area

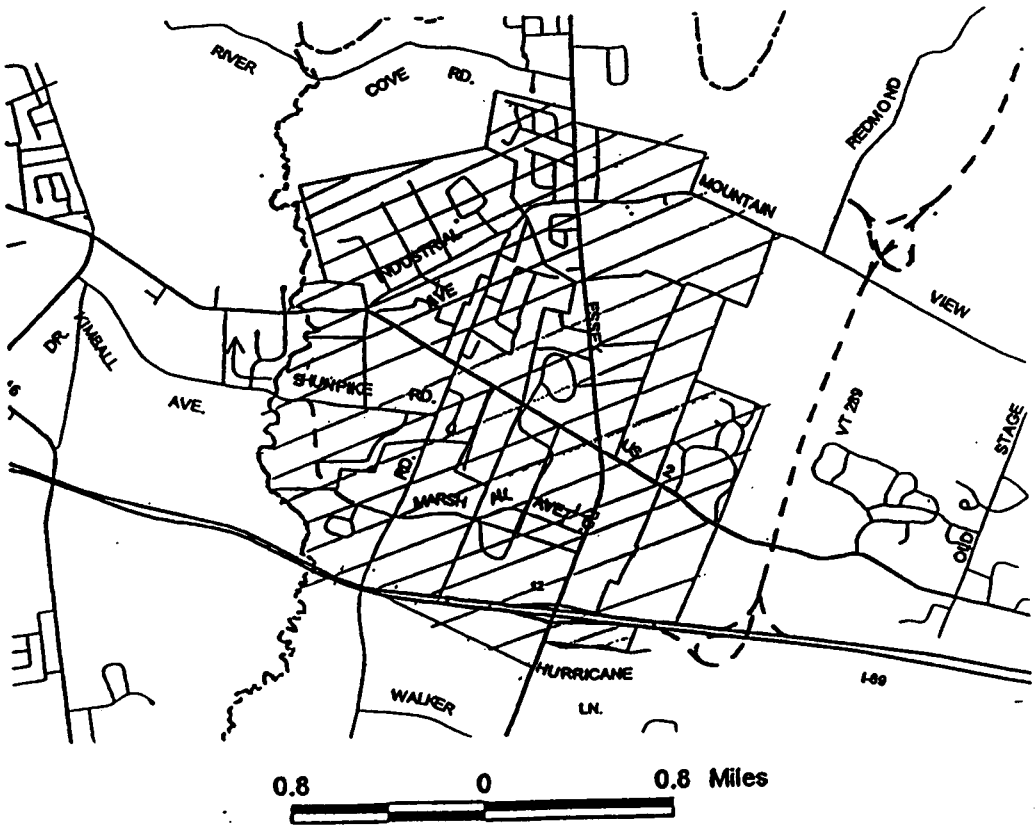
New North End Burlington Thru Traffic Area



Old North End Burlington Thru Traffic Area



Essex Junction Thru Traffic Area



Taft Corners Thru Traffic Area

APPENDIX F

Vermont Agency of Transportation Comments

STATE OF VERMONT
AGENCY OF TRANSPORTATION
133 State Street, Administration Building
Montpelier, Vermont 05633-5001

November 21, 1997

Mr. Peter E. Plumeau
100 Dorset Street, Suite 22
P. O. Box 9217
South Burlington VT 05407-9217

Re: Draft Chittenden County I-89 Corridor Study, October 24, 1997

Dear Mr. Plumeau:

I am writing in response to your request for comments concerning this draft and would offer some initial comments as follows:

Overall, the study appears to have been a useful exercise in identifying current and potential deficiencies on the I-89 corridor.

I note the study is not recommending solutions to problems at this point, and properly so. It does, however, recommend a Major Investment Study (MIS) to develop and compare alternatives for addressing deficiencies and recommending the best solutions.

An MIS is a complex, time consuming and, frequently very costly means of addressing transportation needs, usually in a large urban corridor or sub-area, which I believe to be unwarranted under these circumstances. However, I am in full agreement with the recommendation of creating a forum for reviewing the findings and recommending possible solutions - solutions realistic within the funding and resource constraints of the state and affected communities.

This leads to my fundamental concern with the draft. The study straightforwardly states its value as quantifying the performance of the interstate system in light of several changes, or projects, that have been proposed over the years. However, these proposed changes presume that large amounts of funding and other resources will be available for completing the Chittenden County Circumferential Highway and for substantially increasing the capacity of the I-89, including new interchanges.

This assumption is inconsistent with the AOT's view of the funding and other resources that will be available to the state in the coming decade for highways and highway improvements. Since the Long Range Transportation Plan was completed in 1995, many state officials have been working hard to convey the message that the foreseeable future will involve a careful husbanding of transportation resources, with emphasis on system preservation and maintenance.

In reviewing the level of service analysis, the improvements gained for the level of investment implied by the network build out scenario appear to be minimal. Related to this, the AOT Level of Service policy acknowledges that within urban areas we will accept lower levels of service in the future.

It is for these reasons that I am in full agreement with the study's recommendation of creating a forum to include members of interested communities, the AOT, the FHWA and, I would offer, other parties and jurisdictions that can contribute to reviewing the functions and recommending possible solutions - solutions realistic within the previously cited constraints. With respect to the question of who else should participate, I would strongly recommend involvement of modal providers that can contribute positively to a discussion of passenger transportation needs and solutions of the region.

In summary, I think the study is extremely useful as it is represented, to identify potential (and in some instances existing) problems. However, I believe the network build out scenario being tested is impractical in that it reflects outdated and impractical assumptions about the type, nature and affordability of transportation projects for solving highway problems. I agree the key to moving forward on this is creating a forum to recommend realistic, and given an intermodal perspective, well balanced solutions.

Thank you for the opportunity to comment on this draft.

Sincerely,

K. Micque Glitman
Director of Policy & Planning