New England Vehicle Classification and Truck Weight Program
Phase I Final Report

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16. Abstract

Recognizing state fiscal problems, personnel shortages and other factors, federal and state highway officials in the region have raised questions regarding the collection of vehicle classification and truck weight data required by the Federal Highway Administration in the Traffic Monitoring Guide. One major question centers around the possibility of coordinating the collection and analysis efforts so that existing staff, funds, equipment and other resources can be used more efficiently. More specifically, this project intends to examine the appropriateness and workability of combining the vehicle classification and truck weight data collection efforts of the six states so that a minimal number of classification and weight locations are required.

This project consists of two phases. The purpose of this report is to present the results of the three major tasks of Phase One including 1) a review of vehicle classification and truck weight data collection procedures in each state, 2) an analysis of vehicle classification and truck weight data in each state, and 3) a formulation of a regional vehicle classification and truck weight program.

The results of Phase One provide a basis for the detailed design of the scope of work in Phase Two which has been proposed to focus on the definition of appropriate data reporting procedures and the development of an associated software to implement a coordinated, regional vehicle classification and truck weight program.

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PREFACE

The Phase I Final Report consists of 4 documents:

1. The Executive Summary presents the major results and findings of the project and also proposes a regional vehicle classification and truck weight program. This program is proposed for consideration by all states involved and serves as a starting point for region wide vehicle classification and truck weight data collection.

2. Technical Report No. 1 examines the vehicle classification program of each state in the region and presents a methodology for the development of the regional vehicle classification program proposed in the Executive Summary. In addition, the report reviews relevant literature related to the collection of vehicle classification data in other states.

3. Technical Report No.2 reviews the truck weight program of each state in New England and offers a methodology for the development of the regional truck weight vehicle classification program proposed in the Executive Summary. The report also reviews the truck weight data collection experiences in other states.

4. Technical Report No. 3 summarizes the results of a supplemental analysis of truck weight data collected at a group of continuous count stations in New England. The aim of this analysis is to examine monthly variation in truck weight for selected vehicle classes. Truck weight is measured in terms of equivalent single axle loads (ESAL) per vehicle and gross vehicle weight (GVW).

EXECUTIVE SUMMARY

SYNOPSIS

Recognizing state fiscal problems, personnel shortages and other factors, federal and state highway officials in the region have raised questions regarding the collection of vehicle classification and truck weight data required by the Federal Highway Administration in the Traffic Monitoring Guide. One major question centers around the possibility of coordinating the collection and analysis efforts so that existing staff, funds, equipment, and other resources can be used more efficiently. More specifically, this project intends to examine the appropriateness and workability of combining the vehicle classification and truck weight data collection efforts of the six states so that a minimal number of classification and weight locations are required.

The project consists of two phases. The purpose of this report is to present the results of the three major tasks of Phase 1:

- Task 1- A review of vehicle classification and truck weight data collection procedures in each state
- Task 2- An analysis of vehicle classification and truck weight data in each state
- Task 3- A formulation of a regional vehicle classification and truck weight program

The results of Phase I provide a basis for the detailed design of the scope of work in Phase II which has been proposed to focus on the definition of appropriate data reporting procedures and the development of associated software to implement a coordinated, regional vehicle classification and truck weight program. The major results of Phase I are as follows:

- In general, continuous vehicle classification and truck weight counting procedures in

the six states are relatively similar, as compared to the short term counting procedures. Continuous counts, where carried out, are performed 24 hours per day, 365 days per year in most instances. Short term count procedures on the other hand, exhibit greater variation from state to state particularly in the acquisition of truck weight data and to a lesser degree in the collection of vehicle classification data. An implication regarding the variation in short term counting procedures is that such procedures should be uniform and consistent if a regional vehicle classification and truck weight plan is to be implemented effectively; for example, short term procedures should be uniform in terms of frequency, length, direction, weekday/weekend definitions, selection of lanes, and other traffic count characteristics.

• The existing vehicle classification data collection effort on a whole in the region is much more developed and extensive than the truck weight data collection activities. For example, the precision levels associated with the existing vehicle classification effort are better than ±7% on a statewide basis and on a functional classification basis about two thirds are better than ±20%. However, the existing truck weight precision levels are generally unacceptable with the exception of several functional classes; these relatively poor precision levels are due largely to the relatively small number of short term count sites and in some cases to the relatively large coefficients of variation.

• A regional vehicle classification and truck weight program is proposed. An underlying assumption of the vehicle classification component of the program is that the states would share data with contiguous states, if vehicle classification data are not significantly different as determined from statistical analyses coupled with the consideration of local factors . By virtue of sharing data the states would be able to improve their precision levels at the functional class level without significantly increasing the current short term vehicle classification effort.

An underlying assumption of the truck weight component is that the entire six state region is considered to be one jurisdiction (i.e. one state) with one regional highway system consisting of the ten standard functional classes. The intent here is to provide an initial, simplified, and low cost strategy to facilitate the development of a more sound regional vehicle classification and truck weight plan in the future.

BACKGROUND

At present, state highway agencies (SHAs) in the United States collect and analyze data as part of the Federal Highway Administration's (FHWA) Highway Performance Monitoring System (HPMS). Three major sub-elements of the HPMS, as outlined in the FHWA Traffic Monitoring Guide (TMG), concern traffic volume, vehicle classification, and truck weight data. According to the TMG, these data may be used to examine general travel patterns and, more specifically, to estimate annual vehicle miles traveled (AVMT) by functional class; annual average daily traffic (AADT) at selected locations; AVMT by vehicle type; axle correction factors; percentage distribution of vehicles by type, weight, and equivalent axle loads (EAL) by vehicle type; and other parameters.

In light of state fiscal problems, personnel shortages, and other factors, SHA officials in New England have raised questions regarding the collection of these data. Moreover, selected SHAs have indicated that, due to SHA staff and budgetary limitations, some data are not being collected and other data are not being fully utilized. In addition, it has been suggested that the sampling design requirements in the TMG should be re-evaluated and that consideration should be given to coordinating certain TMG data collection efforts among the six states. Such

coordination is proposed on the basis that it may result in a decrease in the total number of locations at which vehicle classification and truck weight data would have to be collected in New England. A reduction in the number of such station locations, it is believed, may lead to the establishment of a more efficient, low cost data collection effort and a more reliable database.

PROJECT OBJECTIVE

The primary objective of this project is to determine the suitability of combining vehicle classification and truck weight data collection efforts in the six-state region of New England. At present, TMG procedures suggest that each state collect classification data at 100 locations and weight data at 30 locations each year regardless of road mileage, VMT, and size of the state. Recognizing the proximity of state boundaries and other factors, the aim of this project is to formulate a suitable regional data collection program with fewer locations than suggested in the TMG. Such a program is intended to streamline data collection activities in light of the staff and budgetary constraints imposed on SHA planning efforts.

FINDINGS AND RESULTS BY TASK

Task I Identify and review existing vehicle classification and truck weight data collection activities in each state.

All states are required to collect continuous and short term vehicle classification data and truck weight data in accordance with the guidelines outlined in FHWA's Traffic Monitoring Guide. It was learned that in general continuous counting procedures in the six states are

relatively similar, as compared to the short term counting procedures. Continuous counts, when carried out, are for 24 hours per day, 365 days per year in most instances. However, there is more variation in short term counting methods particularly in the acquisition of truck weight data and to a lesser degree in the collection of vehicle classification data. Each state's volume, vehicle classification, and truck weight data collection procedures were reviewed in terms of the number of stations, equipment, actual data, transfer techniques, and available software. In addition, it was determined that each state used the TMG standards as a basis to conduct their volume vehicle classification and truck weight data collection activities. However, due to funding and staff constraints it has not been possible to meet all of these standards. Further details on each state's vehicle classification and truck weight activities are discussed in Technical Report No. 1 (pp. 20-29) and Technical Report No. 2 (pp. 28-36).

Task 2 Analyze vehicle classification and truck weight data

Vehicle classification and truck weight data were obtained from each state, where available. Vehicle classification data were available for 1083 sites and truck weight data were secured for 176 sites. The geographic dispersion of the vehicle classification and truck weight sites is shown in Figures 1 and 2, respectively. Analyses were conducted at the regional, statewide, and functional classification levels using generally accepted statistical principles, concepts, and procedures. The major results of these analyses are presented below.

Vehicle Classification Data Analyses

An initial step carried out in the analysis of vehicle classification data was to identify the

dominant vehicle type by functional classification and then to examine the variability of such dominant vehicles with the use of the ***coefficient of variation***. Estimates of the coefficients of variation were then employed to determine the existing ***precision levels*** associated with the current vehicle classification activities in each state.

The ***dominant vehicle*** is defined as the vehicle class with the greatest percentage of all vehicles (excluding vehicle types 1, 2, and 3). As presented in Technical Report No. 1(pp. 32-33), the dominant vehicle class for urban and rural interstates highways (01 and 11) is class 9; for the other functional classes, the dominant vehicle is typically class 5.

The ***coefficient of variation*** is a statistical measure of variability and is estimated by dividing the standard deviation by the arithmetic mean. Coefficients of variation for the dominant vehicle for each functional class were used to estimate the corresponding ***precision levels*** (D) for the existing vehicle classification effort in each state, as summarized in Table 1. Precision levels are also estimated at the statewide level with the coefficient of variation for the rural or urban interstate functional class, whichever is larger. All precision levels were estimated using the standard statistical formula proposed in the TMG which associates precision level with confidence level, sample size, and the coefficient of variation, as presented in Technical Report No. 1 (p. 42). This formula employs the "z" statistic and was used when n exceeds 30 ; when n was 30 or less the equation was used with the student's "t" statistic and (n - 1) degrees of freedom (see Technical Report No. 1 p. 53). It was assumed that the precision levels for principal arterials would be estimated with a 90% confidence level and that the precision levels for other functional classes would be calculated at an 80% confidence level. The vehicle

classification data used to determine the coefficient of variation is included in Technical Report No. 1, Appendix A.

It can be observed from Table 1 that the existing precision levels in general are quite good. For example, on a statewide basis all existing precision levels are better than ±7%, and on a functional class basis in each state the majority of existing precision levels (approximately two thirds) are better than ±20%.

Truck Weight Data Analyses

The ***dominant vehicle*** is defined as the vehicle with the greatest damage factor which accounts for the relative number of ESALs in each class. As discussed in Technical Report No. 1 (pp. 44-46), the dominant vehicle is the class 9 vehicle at the higher functional classes in New Hampshire, Connecticut, and Rhode Island, respectively; for the region as a whole the class 9 vehicle is dominant in all functional classes.

Coefficients of variation for the dominant vehicle were used, where available, to estimate the corresponding ***precision levels*** for the existing truck weight effort in each state, as presented in Table 2; precision levels are provided at the statewide level and by functional class in each state. These precision levels were calculated using the standard formulas as employed in the vehicle classification data analysis and confidence levels were assumed to be 90% for principal arterials and 80% for all other functional classes. The truck weight data used to estimate the coefficient of variation in this analysis are in Technical Report No. 2, Appendix A .

It can be observed from Table 2 that the existing precision levels are generally unacceptable with the exception of several functional classes. These relatively low precision levels are due largely to the relatively small number of sites and in some cases the relatively large coefficients of variation. It should be noted that the large coefficients of variation may be associated with the uncertainty surrounding "outlier data" from several sites. In addition, in many instances (as indicated by the dash -) there are no weight data collected on one or more functional classes in each state.

Task 3 Formulate a regional vehicle classification and truck weight program

The major aim of task 3 was to develop a regional vehicle classification and truck weight program. For the purpose of presentation this program will be discussed below in two parts: 1) a proposed regional vehicle classification plan, and 2) a proposed regional truck weight plan.

Regional Vehicle Classification Plan

Table 3 presents the precision levels (D) for a proposed regional vehicle classification plan. An underlying assumption of this plan is that the states would share data with contiguous states, if the data are not significantly different as determined from the analysis of variance (ANOVA) results, and presented in Technical report No.1 (pp. 60-63).

It is important to note that by virtue of sharing data the states are able to improve their precision levels at the functional class level (as can be observed by comparing Table 1 to 3) without significantly increasing the current level of effort associated with existing vehicle

classification counts. In fact, if deemed appropriate by the states this current level of effort could be reduced on some functional classes in selected states if lower levels of precision (i.e. higher values of D) are considered to be acceptable; for example, the states may view the high precision levels at some lower functional classes in Table 3 to be unwarranted, and hence, could reduce the number of sites at which they are presently collecting vehicle classification data on these lower functional classes.

It should also be noted that if data sharing takes place between states, it is important that such data be collected to the extent possible in a uniform and consistent manner. This does not necessarily mean that all states need to have the same equipment (i.e. not every state needs to use a Streeter 241 with road tubes) but it suggests that the output should be available in a format and medium which all states can accommodate relatively easily and efficiently. In addition, consistency in terms of frequency, length, direction, weekday/weekend definitions, selection of lanes and other traffic count characteristics should be considered. Efficient data exchange methods should be used including readily available software and, where appropriate, telecommunications techniques.

Finally, it should be pointed out that continuous count stations should be established at one or more locations on each functional class or functional grouping in each state; to the extent possible at these stations vehicle class data should be collected 24 hours per day for 365 days per year so that temporal variations can be examined and appropriate adjustment factors to the extent necessary, can be estimated. To the extent possible truck weight data should also be obtained at those locations which are required as part of the proposed truck weight plan proposed below.

Also, where possible and appropriate, existing continuous count stations should be employed in recognition of the fact that some states and SHRP have made a major investment and commitment in the conduct of a continuous count program.

Regional Truck Weight Plan

Table 4 presents the precision levels for a proposed regional truck weight plan. An underlying assumption of this plan is that the entire six state region is considered as one jurisdiction (i.e., one state) with one regional highway system consisting of the ten standard functional classes. While it is recognized that such an assumption must be made with caution, the proposed plan provides an initial, simplified and low cost strategy to facilitate the development of a more sound regional plan in the future. Implicit in this assumption is that each functional class in all six states exhibit similar truck weight characteristics. Preliminary indications suggest that both similarities and differences exist among states. Furthermore, it should be noted that the comparative analysis of ESAL per vehicle from state to state was limited to a comparison of averages because the relatively small amount of truck weight data available in most states (as compared to the availability of vehicle class data) precluded the use of the analysis of variance (ANOVA) test.

A total number of required sites for each functional class was initially estimated using the standard statistical formula as discussed above, and an initial precision level of 20 percent. The final number of sites by functional class at the regional and state levels were then determined based on the proportion of truck VMT and the number of existing sites by functional class in

each state. In those instances where the existing number of sites by functional class were greater than the estimate based on VMT, the existing number of sites were used.

It can be observed from Table 4 that many of the precision levels by functional class in each state are superior to the existing precision levels presented in Table 2; in fact the majority of the precision levels (about two thirds) are within a precision level of ±25 percent. It should be noted further that these precision levels were estimated at a 90% confidence level for principal arterials and 80% for other functional classes and that the number of sites for each functional class in each state assumes that each state uses 100% of all data available for contiguous states only.

It is important to recognize that if data sharing takes place between states that such data be captured by each state and summarized in a uniform and consistent manner using readily available software, where possible. Each state should be able to produce output in a format and medium which each state can handle efficiently, and in addition data collection to the extent possible should be consistent in terms of frequency, length, direction, selection of lanes, and other truck weight counting characteristics deemed important.

Finally, it should be mentioned that continuous count stations should be established at one or more locations possibly on each functional class (or groups of functional classes); as mentioned above this should be done in coordination with the selection of continuous count stations for vehicle classification purposes. Where possible and appropriate, existing state and SHRP continuous count stations should be utilized as part of this regional truck weight program. In addition, the results in Technical Report No. 3 regarding the variability of truck weight from site to site, from year to year, and from month to month should also be considered in the establishment of a continuous count program.

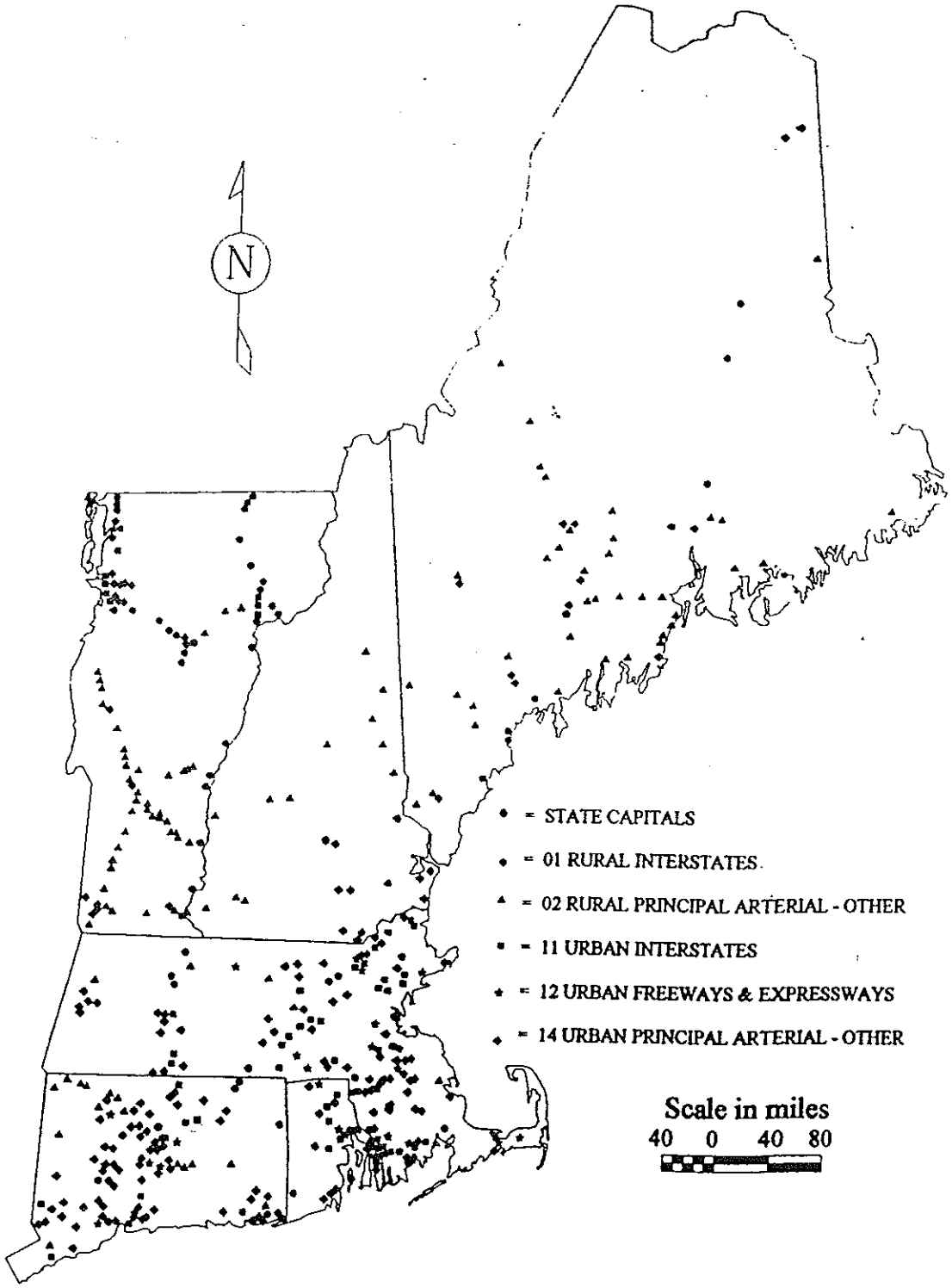

Figure 1: Map of Existing Vehicle Classification Sites on Principal Arteries

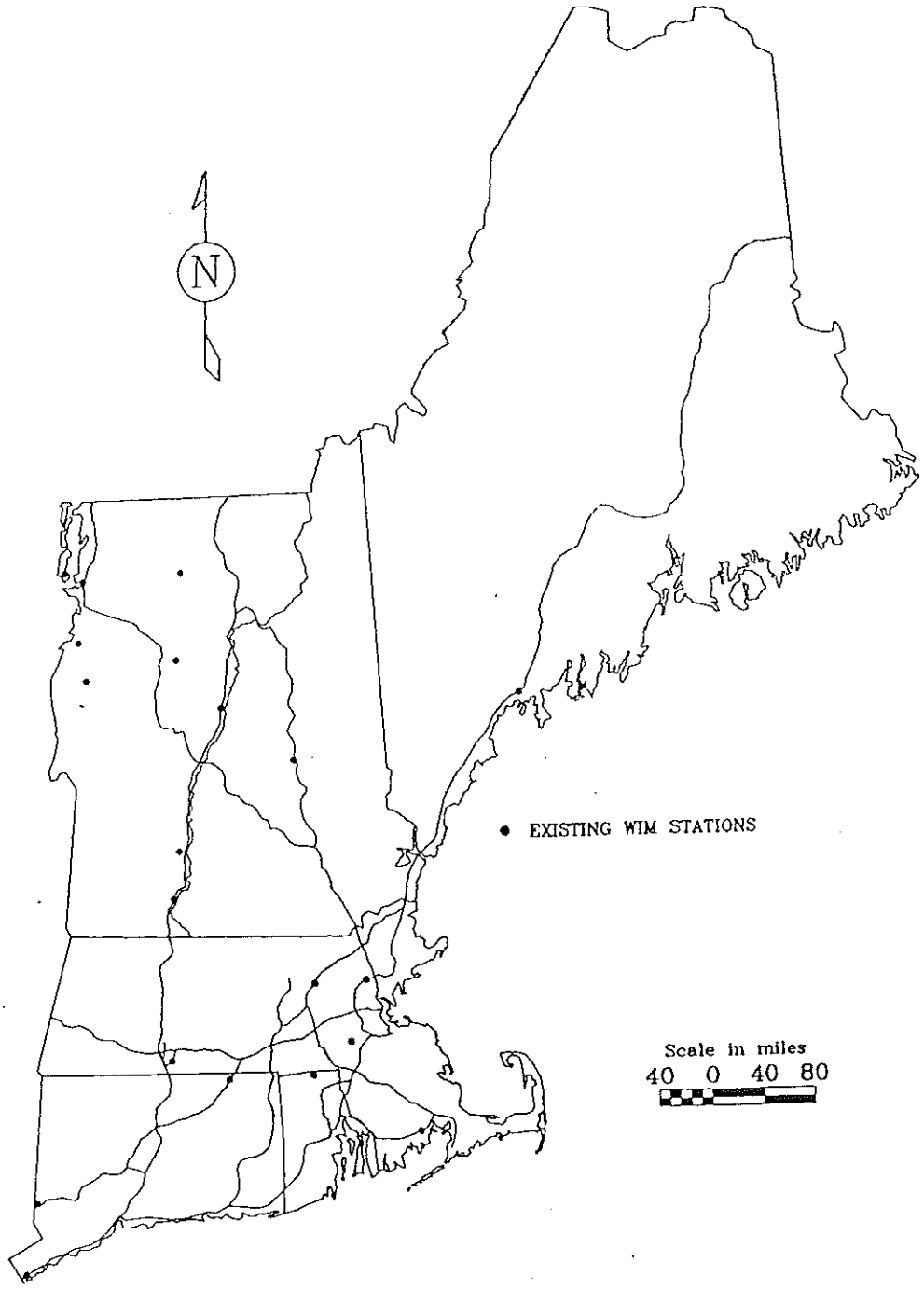

Figure 2: Map of Existing Weigh-in Motion Stations

Table 1 : Existing Precision Levels for Vehicle Classification

Rural Functional Class	CT			ME			MA			NH			RI			VT		
	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D
01 Principal Arterial - Interstate	5	5.6	5.3	5	15.0	14.3	9	30.8	19.1	0	***21.7***	-	2	0.2	0.9	26	19.9	6.7
02 Principal Arterial - Other	17	31.1	13.2	39	38.4	10.1	6	41.9	34.6	13	28.3	14.0	4	33.7	39.6	44	34.5	8.5
06 Minor Arterial	42	34.3	6.8	47	38.6	7.2	12	31.4	12.3	28	43.1	10.7	0	***33.7***	-	57	27.1	4.6
07 Major Collector	43	39.7	7.7	60	43.8	7.2	13	41.1	15.5	25	36.1	9.5	0	***33.7***	-	80	25.8	3.7
08 Minor Collector	7	22.7	12.4	13	27.4	10.3	3	96.6	105.4	14	39.9	14.4	0	***33.7***	-	6	29.4	17.8

Urban Functional Class	CT			ME			MA			NH			RI			VT		
	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D
11 Principal Arterial - Interstate	9	19.8	12.3	2	13.4	59.8	34	45.3	12.7	1	***36.2***	228.4	8	22.7	15.2	9	16.2	10.0
12 Other Freeways and Expressways	7	13.8	10.1	0	***13.4***	-	13	24.6	12.1	2	3.0	13.4	3	21.0	35.4	1	***16.2***	102.2
14 Principal Arterial - Other	72	37.8	7.3	13	35.6	17.6	70	41.9	8.2	10	24.3	14.1	10	22.5	13.0	20	34.6	13.4
16 Minor Arterial	53	30.0	5.3	19	31.8	9.7	36	46.0	9.8	16	43.9	14.7	3	18.7	20.4	11	35.0	14.5
17 Collector	9	50.5	23.6	2	4.6	10.0	17	58.1	18.9	10	45.6	19.9	2	9.9	21.6	1	***35.0***	107.8
STATE WIDE LEVEL	264	28.5	2.9	200	26.2	3.0	213	45.8	5.1	119	32.2	4.8	32	23.0	6.7	255	27.4	2.8

Notes:

1. n = number of existing vehicle classification sites as listed in Table 1; there are a total of 1,083 sites.
2. COV = coefficient of variation (%)
3. D = precision level in percent (%)
4. The COV for the vehicle class with the higher proportion of truck traffic (class 4 - 11) is used for each functional class precision level estimate.
5. The average COV for all functional class is used in the calculation of a state wide precision level.
6. Values in 'bold-italics' denote COVs for the next highest functional class is used due to lack of data; If there are no data for the next highest functional class, the New England wide COV estimate, from Table A.23 is used.
7. A dash (-) indicates that a precision level can not be calculated.

Source: The number of vehicle classification sites came from Table 1 and the COVs for each state came from Tables A.1 through A.12 and Table A.23

Table 2 : Existing Precision Levels for Truck Weight

Strata	Functional Class	CT			ME			MA			NH			RI			VT		
		n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D
Rural	01-Interstate	10	23	13	-	37	-	-	37	-	1	37	233	2	37	165	2	37	165
	02-Other Principal Arterial	18	52	21	-	78	-	-	78	-	3	27	46	3	49	83	4	24	26
	06-Minor Arterial	18	56	18	-	54	-	2	54	118	4	36	30	-	49	-	2	54	118
	07-Major Collector	2	56	122	-	54	-	2	54	118	1	28	177	-	49	-	-	54	-
	08-Minor Collector	2	56	122	-	54	-	-	54	-	-	28	-	-	49	-	-	54	-
Urban	11-Interstate	15	71	32	-	53	-	4	26	31	3	36	61	9	46	29	1	53	334
	12-Other Principal Arterial	10	33	19	-	54	-	2	54	230	-	36	-	3	30	51	1	54	341
	14-Other Frwy and Expwy	17	56	24	-	76	-	11	91	50	1	33	102	5	72	69	-	76	-
	16-Minor Arterial	13	97	37	-	76	-	-	76	-	2	35	76	1	72	222	-	76	-
	17-Collector	-	97	-	-	76	-	2	76	-	-	35	-	-	72	-	-	76	-
	STATE WIDE LEVEL	105	71	11	-	53	-	23	37	13	15	37	17	23	46	16	10	53	31

Notes:

1. Definitions:

   n = number of truck weight sites avialable to each state under sharing plan

   COV = coefficient of variation

   D = precision level (% of estimate)

2. Boldface signifies regional class 9 COV values.
3. A dash (-) indicates that no data are available, precision level cannot be calculated.
4. Class 5 COV's used in some lower FC's where data shows dominance.
5. Class 9 COV's for upper functional classes used were lower FC data are unavailable.
6. [illegible] adequate [illegible] data [illegible] precision levels [illegible].
7. COV for statewide precision is higher interstate.

Source: State Departments of Transportation/Highways

Table 3: Precision Levels for Vehicle Classification (Assuming Contiguous States Share Data as Appropriate)

90% confidence level for principal arterials and
80% confidence level for other functional classes

Rural Functional Class	CT			ME			MA			NH			RI			VT		
	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D
01 Principal Arterial - Interstate	11	5.6	3.1	5	15.0	14.3	26	30.8	10.3	20	***21.7***	8.4	9	0.2	0.1	31	19.9	5.9
02 Principal Arterial - Other	22	31.1	11.4	46	38.4	9.3	45	41.9	10.2	58	28.3	6.1	16	33.7	14.7	54	34.5	7.7
06 Minor Arterial	42	34.3	6.8	61	38.6	6.3	55	31.4	5.4	86	43.1	5.9	0	***33.7***	-	77	27.1	4.0
07 Major Collector	50	39.7	7.2	73	43.8	6.6	87	41.1	5.6	102	36.1	4.6	0	***33.7***	-	99	25.8	3.3
08 Minor Collector	9	22.7	10.6	20	27.4	8.1	17	96.6	31.4	25	39.9	10.5	0	***33.7***	-	15	29.4	10.2
Urban Functional Class	**CT**			**ME**			**MA**			**NH**			**RI**			**VT**		
	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D
11 Principal Arterial - Interstate	30	19.8	6.1	3	13.4	22.6	48	45.3	10.7	24	***36.2***	12.6	30	22.7	6.8	27	16.2	5.3
12 Other Freeways and Expressways	7	13.8	10.1	0	***13.4***	-	15	24.6	11.2	3	3.0	5.1	10	21.0	12.2	9	***16.2***	10.0
14 Principal Arterial - Other	112	37.8	5.9	18	35.6	14.6	121	41.9	6.2	62	24.3	5.1	46	22.5	5.4	60	34.6	7.3
16 Minor Arterial	73	30.0	4.5	27	31.8	8.1	78	46.0	6.7	49	43.9	8.0	48	18.7	3.5	37	35.0	7.4
17 Collector	19	50.5	15.4	7	4.6	2.5	28	58.1	14.4	20	***45.8***	13.6	15	9.9	3.5	15	***35.0***	12.2
STATE WIDE LEVEL	375	19.8	1.7	260	15.0	1.5	520	45.3	3.3	449	36.2	2.8	174	22.7	2.8	424	19.9	1.6

Notes:

1. n = number of vehicle classification sites including shared sites from contiguous states
2. COV = coefficient of variation (%)
3. D = precision level in percent (%)
4. The COV for the vehicle class with the higher proportion of truck traffic (class 4 - 11) is used for each functional class precision level estimate.
5. The higher interstate COV is used in the calculation of a state wide precision level.
6. Values in 'bold-italics' denote COVs for the next highest functional class is used due to lack of data; if there are no data for the next highest functional class, the New England wide COV estimate, from Table C-24 is used.
7. A dash (-) indicates that a precision level can not be calculated.
8. 90% confidence level is used in the calculation of the statewide precision level.
9. From Table 2, where the analysis shows that there are no significant difference (NS), 50% of the existing sites are assumed to be shared by contiguous states; for the other two designations (SD and X) there will be no sharing.

Source: The COVs for each state came from Tables C-2 through C-13 and Table C-24.

Table 4: Precision Levels for Proposed Truck Weight Sites
(All data shared with contiguous states)

Strata	Functional Class	CT			ME			MA			NH			RI			VT			REGIONAL		
		n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D	n	COV	D
Rural	01-Interstate	16	23	10	8	37	25	19	37	15	10	37	21	16	37	16	7	37	20	22	37	14
	02-Other Principal Arte	26	52	17	29	78	25	41	78	20	34	27	8	26	49	16	20	24	9	55	78	18
	06-Minor Arterial	20	56	17	8	54	27	26	54	14	10	36	16	20	49	15	8	54	27	28	54	12
	07-Major Collector	4	56	46	6	54	33	6	54	33	7	28	15	4	46	38	4	54	44	9	54	23
	08-Minor Collector	3	56	61	6	54	33	5	54	37	6	28	17	3	49	53	3	54	59	8	54	25
Urban	11-Interstate	35	71	20	14	53	25	39	26	7	15	36	16	35	46	13	15	53	24	39	53	15
	12-Other Principal Arte	22	33	12	11	54	29	25	54	18	12	36	19	22	30	11	11	54	29	26	54	18
	14-Other Frwy and Exp	38	56	15	20	76	29	41	91	24	21	33	12	38	72	20	19	76	30	43	76	16
	16-Minor Arterial	17	97	32	6	76	46	19	76	23	6	35	21	17	72	23	5	76	52	20	76	19
	17-Collector	5	97	66	5	76	52	7	76	41	6	35	21	5	72	49	5	76	52	8	76	32
STATE WIDE LEVEL		186	71	9	113	53	8	228	37	4	127	37	5	186	46	6	97	53	10	258	53	6

Notes:

1. Definitions:
   n = number of truck weight sites avialable to each state under sharing plan
   COV = coefficient of variation (%)
   D = precision level (% of estimate)
2. Boldface signifies regional class 9 COV values.
3. Class 5 COV's used in some lower FC's where data shows dominance.
4. Class 9 COV's for upper functional classes used were lower FC data are unavallable.
5. The confidence level for the statewide precision levels is 90%.
6. COV for statewide precision is higher interstate.

Source: State Departments of Transportation/Highways

Sharing Scheme:
Conn shares with Ma and RI.
RI shares with Ct and Ma.
Ma shares with CT, RI, NH and Vt.
NH shares with Me, Vt and Ma.
Vt shares with NH, and Ma.
Me shares with NH and Ma.