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TOWN of MARSHALL

Roadway Inventory and Recommended Roadway Improvement Report

July 2004

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TOWN OF MARSHALL
Roadway Inventory and Recommended Roadway Improvement Report

Project No. 2003-096

7/13/04

Prepared for:
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July 2004

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Town of Marshall

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Table of Contents

E.0 Executive Summary

1.0 Introduction
- 1.1 Purpose and Scope

2.0 Existing Conditions
- 2.1 General
- 2.2 Road Classifications
  - Low Volume Collector
  - Residential Access
  - Farm Access
  - Resource / Industrial Access
  - Agricultural Land Access
  - Recreational Land Access
  - Minimum Maintenance Road
- 2.3 Daily Traffic
- 2.4 Rehabilitation Design Type
- 2.5 Roadway Conditions

3.0 Analysis
- 3.1 Analysis Method
- 3.2 Importance Rating
- 3.3 Condition Rating
- 3.4 Priority Rating
- 3.5 Treatment Strategies

4.0 Recommendations and Conclusion
- 4.1 Ranking by Action
- 4.2 Budget
- 4.3 Cost of Work
  - 4.3.1 Rehabilitation
  - 4.3.2 Reconstruction
- 4.4 Schedule of Work
- 4.5 Maintenance
- 4.6 Conclusion

Town of Marshall

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Project No. 2003-096

Table of Contents

Appendices

A	Manual: Guidelines for Rural Town and County Roads
B	Guidelines and Standards for Classifying and Managing Roads and Streets
C	Nuggets & Nibbles - The "Guidelines for Rural Town and County Roads"
D	Questions and Answers about the Guidelines for Low-Volume Rural Roads
E	Procedure for Implementation of Low-Volume Roads Designation
F	Standards for New Roads
G	Local Law Filing Instruction
H	Model Local Law

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report was developed by Bernier, Carr & Associates for the Town of Marshall to provide an inventory and condition assessment of the Town roadways. The report outlines the method used to categorize roadways and determine the need for repairs or reconstruction. Determination for the appropriate work at each roadway was according to the type of traffic, the amount of traffic, and the current roadway condition.

The rating system described in Section 3.0 of this report resulted in a priority list of the work to be done on Town roads. From the priority list, a recommended five year schedule of work was created with consideration of the available budget. Estimated costs are provided for the work that is recommended.

Also included in this report is a discussion of the Minimum Maintenance Road designation. The advantages of adopting this designation and what it means are outlined within. Simply stated, it allows the future upgrade of seasonal use roads to become a local decision instead of a mandate by state law. A list of roads that should be considered for this designation are included in Section 4.5 of the report.

In conclusion, it is recommended that the Town adopt the guidelines that were utilized in developing this report. The guidelines are included in Appendix A and are titled "Guidelines for Rural Town and County Roads". Upon adopting the guidelines, we recommended the following actions:

1. Proceed with the five year schedule of work developed in this report.
2. Review and update the priority list annually
3. Continue roadway maintenance as recommended by the guidelines.
4. Enact local law for Minimum Maintenance Road designation and use where appropriate.
5. Consult with an engineer for specific roadway reconstruction design.

SECTION 1.0: Introduction

1.1 PURPOSE AND SCOPE

Bernier, Carr & Associates was retained to provide engineering assistance with the inventory and roadway conditions assessment for the Town of Marshall. The inventory and roadway condition assessment is used to determine roadway improvements. For this report, the Manual of Guidelines for Rural Town and County Roads (Appendix A) was utilized to establish criteria for condition assessments and determining roadway improvements. The manual was created by the NYS Local Roads Research and Coordination Council in 1992 for use on rural roads. The intention of the manual is to provide Towns and Counties with a standard for rural roadway maintenance and improvement. As a statewide accepted standard, the manual can be used by the Town as a defendable means for planning road work based on the needs of the community and the available budget.

Having a set of guidelines can assist the Town in making difficult decisions about how to spend limited highway funds. It is understood that there are typically not sufficient funds available to a Town highway department to correct all deficiencies in the road system in a given time period. The manual provides the tools to assess the deficiencies and plan for the correction of each over time with the funds available.

Without having the standards provided in the manual, the Town may be held to the standards of the American Association of State Highway Transportation Officials (AASHTO) "Greenbook". These are national standards that may not be realistic for rural roadways with an average traffic of less than 400 vehicles per day like those in the Town of Marshall.

Another benefit of adopting the guidelines for rural roads is the designation of Minimum Maintenance Roads. According to the manual, "The Minimum Maintenance Road designation has been developed to define an appropriate level of maintenance on town and county roads, which primarily serve as access to agricultural land and recreational land." This designation is similar to the currently used Seasonal Limited Use Highway designation. New York State law allows Town's to discontinue snow removal on seasonal roads that do not provide residential access. However, the law requires that the Town resume full year around service if a residence is constructed on the once seasonal road. This can often mean making significant improvements to a little used road that can costs hundreds of thousands of dollars. By adopting the Minimum Maintenance guidelines, upgrading any minimum maintenance road to a full maintenance road becomes a local decision.

SECTION 2.0: Existing Conditions

2.1 GENERAL

The Town of Marshall is located in southern Oneida County and has an area of approximately 31 square miles. There are approximately 2100 residents in the Town according to the 2000 census. There are nearly 44 miles of Town owned and maintained roads in Marshall. It is a rural area that consists primarily of farmland. The terrain is varying with large hills that create as much as 1200 feet elevation difference within the Town.

Nearly all Town roads with residential traffic have a finished surface with asphalt or oil and stone. There are some gravel road segments that receive only seasonal maintenance. The traffic volume is generally low and is primarily residential. There is little commercial use of Town roads other than occasional delivery vehicles servicing the farms.

2.2 ROAD CLASSIFICATIONS

The first step of the "Manual: Guidelines For Rural Town And County Roads" (referred to in this report as "the manual") is to classify the roads of the local system according to the use of each road. Listed below are the classifications provided in the manual to identify the traffic characteristics of each road.

Low Volume Collector - collects traffic from any of the other classifications and channels it to higher level roads, such as arterials, interstates, etc.

Residential Access - provides access to residences. The traffic volume generated depends on the number of residences. All year access for fire trucks, ambulances and school buses must be provided.

Farm Access - provides access to a farm's center of operations including the residence. Traffic volume is generally low - but may include occasional heavy trucks and farm equipment.

Resource / Industrial Access - provides access to industrial or mining operations. Traffic volume can vary and can include heavy trucks and significant numbers of employee's cars.

Agricultural Land Access - provides access to farm land. Traffic volumes are low and vary seasonally. These roads should accommodate farm equipment that can be up to 20 feet wide.

Recreational Land Access - provides access to recreational land including seasonal dwellings and parks. Volumes of traffic can vary with the type of recreational facility and season of the year, and may include recreational vehicles.

Minimum Maintenance Road - a low-volume road or road segment which may be of a seasonal nature, in a rural county or town having an average traffic volume of zero to fifty vehicles per day which principally or exclusively provides agricultural or recreational land access. A road, or road segment, which has been so designated, shall be maintained at a level which allows such road to remain passable and functional in accordance with standards contained in this section of the Guidelines Manual. In no way shall the term "minimum maintenance" be construed to mean "no maintenance" or "abandonment". Further, such term shall not apply to those roads, or road segments, which provide farm access to an individual year-round residence.

Information obtained from the New York State Department of Transportation, the Town Highway Department and from a visual inspection was used to classify each road in the Town of Marshall. The classifications are intended for low volume roads with an average daily traffic less than 400 vehicles per day. According to the Highway Superintendent, no Town of Marshall roads exceed this volume of traffic. The NYS DOT performs a highway inventory that identifies low volume collectors. The remaining low volume local roads are then classified according to the land use adjacent to the road. Whether a road serves as residential access, farm access, or recreational access will determine the appropriate road design and maintenance. The classification of Town roads is given in Table A.

2.3 DAILY TRAFFIC

If no local traffic counts have been performed recently, then local knowledge of traffic patterns is used to estimate the traffic volume. Traffic volume estimates for this report were provided by the Town Highway Superintendent.

2.4 REHABILITATION DESIGN TYPE

Following the classification of each road on Table A of this report is the Rehabilitation Design Type. The design type is a function of two factors, road classification and traffic volume. The manual provides a table that assigns a design type to various road classifications and traffic volumes (see Table 1 - Rural Low Volume Road Classification). There is also a description of design guidelines for each rehabilitation design type. The guidelines set forth minimum travel way widths, shoulder widths, operating speeds, surface materials, and surface conditions (see Table 2 - Design Guidelines For Road Rehabilitation By Road Type). Once a roadway is assigned a design type, a comparison should be made between the existing conditions and the road condition guidelines for that design type. Roads that do not meet the minimum conditions for their design type should be cited for road work. There are no Town of Marshall roads that do not meet the guidelines for their respective design type.

2.5 ROADWAY CONDITIONS

The roadway conditions were determined by a "windshield survey" and from the input of the Town Highway Superintendent. The manual provides a numerical rating system for roadway conditions. All roads are given a score between 1 and 10 according to the surface conditions (see Table B in Section 3.0). A description of the surface conditions for each score is provided in the manual (see Table 6 - Rating Scores For Pavement Surface in Section 3.0).

TABLE A

TOWN OF MARSHALL
EXISTING ROAD CONDITIONS AND CLASSIFICATIONS

ROAD NAME	EXISTING CONDITIONS					ROAD CLASSIFICATION	REHABILITATION DESIGN TYPE
	Length	Pavement Width	Shoulder Width	Pavement Type	Estimated Daily Traffic		
Alabam Rd	0.24	16	3	Oil & Stone	<50	Residential Access	C
Austin Rd	0.11	20	3	Oil & Stone	>50	Residential Access	B
Beerhalter (North)	0.10	20	3	Oil & Stone	<50	Farm Access	B
Beerhalter (South)	0.40	12	3	Gravel	<50	Minimum Maintenance	C
Bogan Rd	1.75	20	3	Modified Binder & Slurry Seal	>50	Residential Access	B
Brouillette Rd (South)	0.93	20	5	Oil & Stone	<50	Farm Access	B
Brouillette Rd (North)	0.37	18	2	Oil & Stone	<50	Farm Access	B
Buell Rd	0.36	16	3	Oil & Stone	<50	Farm Access	B
Burkert Rd	0.52	18	4	Oil & Stone	<50	Residential Access	C
California Rd	1.29	20	3	Modified Binder Asphalt	>50	Residential Access	B
Canning Factory Rd (East)	0.98	18	3	Oil & Stone	>50	Residential Access	B
Canning Factory Rd (West)	2.00	20	3	Top Asphalt	>50	Residential Access	B
Daytonville Rd (North)	1.16	20	3	Modified Binder Asphalt	>50	Residential Access	B
Daytonville Rd (South)	2.62	20	3	Oil & Stone	>50	Residential Access	B
Earl Manor	0.27	18	2	Slurry Seal	<50	Residential Access	C
Ford Rd (North)	0.54	22	3	Oil & Stone	<50	Farm Access	B
Ford Rd (Middle)	0.98	20	3	Oil & Stone	<50	Farm Access	B
Ford Rd (South)	0.88	11	3	Gravel	<50	Minimum Maintenance	C
Fuess Cleary Rd	1.42	20	3	Oil & Stone	<50	Farm Access	B
Grant Hill Rd	1.60	22	3	Cold Mix Asphalt	>50	Residential Access	B
Green Rd	1.98	20	3	Oil & Stone	<50	Farm Access	B
Green Vedder Rd (North)	1.10	20	5	Oil & Stone	<50	Residential Access	C
Green Vedder Rd (Middle)	0.59	20	5	Oil & Stone	<50	Residential Access	C
Green Vedder Rd (South)	1.55	20	3	Oil & Stone	<50	Residential Access	C

TOWN OF MARSHALL

EXISTING ROAD CONDITIONS AND CLASSIFICATIONS

ROAD NAME	EXISTING CONDITIONS					ROAD CLASSIFICATION	REHABILITATION DESIGN TYPE
	Length	Pavement Width	Shoulder Width	Pavement Type	Estimated Daily Traffic		
Gridley Paige Rd (North)	1.60	20	4	Modified Binder Asphalt	>50	Residential Access	B
Gridley Paige Rd (South)	1.35	20	3	Oil & Stone	>50	Residential Access	B
Hardscrabble Rd	0.63	10	1	Gravel	>50	Minimum Maintenance	C
Hughes Rd (West of SR 315)	0.50	14	1	Gravel		Minimum Maintenance	C
Hughes Rd (East of SR 12B)	0.13	15	3	Oil & Stone	<50	Residential Access	C
Hughes Rd (West of SR 12B)	0.11	18	3	Oil & Stone	<50	Farm Access	B
Jasek Rd	0.30	20	3	Oil & Stone	<50	Residential Access	C
Kane Rd	0.65	20	3	Oil & Stone	<50	Residential Access	C
Lewis Rd (North of SR 12)	0.81	20	3	Oil & Stone	<50	Residential Access	C
Lewis Rd (South of SR 12)	0.59	19	3	Oil & Stone	<50	Residential Access	C
Lewis Rd (SR 12 - Canning Factory)	0.43	12	3	Gravel	<50	Minimum Maintenance	C
Lewis Rd (N. of Canning Factory)	0.38	18	2	Oil & Stone	<50	Residential Access	C
Lewis Rd (S. of Canning Factory)	0.42	10	3	Gravel	<50	Minimum Maintenance	C
Maxwell Rd	3.49	20	4	Oil & Stone	>50	Residential Access	B
McAdam Rd	0.10	14	1	Oil & Stone	<50	Residential Access	C
Peck Rd	1.22	22	3	Cold Mix Asphalt	<50	Residential Access	C
Sally Rd	2.96	20	3	Oil & Stone	>50	Residential Access	B
South St	0.17	18	3	Oil & Stone	<50	Residential Access	C
Tassel Hill Rd	1.57	10	1	Gravel	<50	Minimum Maintenance	C
Tormey Rd	0.06	26	2	Top Asphalt	<50	Residential Access	C
Van Hyning Rd (E. & W. Ends)	0.97	18	2	Oil & Stone	<50	Residential Access	C
Van Hyning Rd (Middle)	0.20	18	2	Oil & Stone	<50	Recreational Land Access	C
Zwiefel Rd	1.35	20	4	Oil & Stone	<50	Residential Access	C
Total	43.73						

TABLE 1

RURAL LOW VOLUME ROAD CLASSIFICATION

ROAD USE			GUIDELINES		
Road Classification	Vehicle Type	ADT[1]	Rehabilitation Design Type	Maintenance	Traffic Control
Low volume Collector	All vehicles	50-400 <50	A B	Normal	MUTCD[2]
Residential Access	Cars, emergency and service vehicles	50-400 <50	B C	Normal Normal	MUTCD MUTCD
Farm Access	Cars, light trucks occasional heavy trucks, farm equip	250-400 <250	A B	Normal Normal	MUTCD MUTCD
Resource/ Industrial Access	Trucking, employees cars	50-400 <50	A B	Normal Normal	MUTCD MUTCD
Agricultural Land Access	Occasional farm equip seasonal	--	C	Min Maint	MUTCD
Recreational Land Access	Cars, RV's seasonal	50-400 <50	B C	Normal Min Maint	MUTCD MUTCD

NOTE:

[1] Average Daily Traffic.

[2] "Manual of Uniform Traffic Control Devices" Supplemented by "Traffic Sign Handbook for Low Volume Roads", New York State Department of Transportation Traffic and Safety Division, June 1985.

TABLE 2

DESIGN GUIDELINES FOR ROAD REHABILITATION BY ROAD TYPE

	TYPE A ALL PURPOSE ROAD	TYPE B AREA SERVICE 2 WAY 2 LANE ROAD	TYPE C AREA SERVICE SINGLE LANE 2 WAY ROAD
Minimum Width			
Traveled Way	18 ft [1]	16 ft [1]	10 ft [2]
Shoulder	2 ft	2 ft	
Opposing Vehicle Interactions	All vehicles pass with no speed reductions	1. Trucks cannot meet without reducing speed. 2. Cars cannot meet trucks without reducing speed. 3. Cars pass with almost normal speed.	All vehicles require special widening for passing
Operating Speed 3	45 mph or greater	25 mph to 45 mph	40 mph or less
Typical Surface Material 4	More than 150ADT: Asphalt Concrete Less than 150 ADT: Aggregate	More than 150 ADT Asphalt Concrete Less than 150 ADT: Aggregate	Usually unsurfaced
Surface Condition	No adverse effect on operating speed	May cause reduction in operating speed	Reduced operating speed

[1] Add 2 ft to the traveled way if significant truck traffic is present.
[2] If farm vehicles are present, maintain 20 ft horizontal clearance. Widening of traveled way should be provided at approximately 1000 ft intervals to allow vehicles to pass.
[3] Applicable to normal maintenance roads.
[4] ADT thresholds recommended based on economic analysis, "Economic Evaluation of Pavement Design for Low Volume Roads," Proceedings of the Third International Low Volume Roads Conference, Transportation Research Board, National Research Council, Washington, D.C., 1983.

SECTION 3.0: Analysis

3.1 ANALYSIS METHOD

Upon completion of gathering information on the existing conditions and determining the road classifications, the roadway work can be prioritized by use of a procedure provided in the manual. It is suggested that the roads be divided into three lists based upon the appropriate action for each road. The three lists are titled maintenance, rehabilitation, and reconstruction. Within the rehabilitation and reconstruction categories, the roads should be listed according to the priority rating established by the procedure in the manual. The priority rating will identify the roads that have the greatest need for repair. Priority rating is determined by three factors; the roadway use (classification), traffic volume, and condition.

3.2 IMPORTANCE RATING

The importance rating is the combination of two of the three factors that determine the priority rating. These two factors are the road classification and the traffic volume. Table 7 of the manual provides a numerical score for each road classification. The highest score is assigned to the collector roads and the lowest score to recreational land access roads. There is also a numerical score for traffic volume. Roadways that experience higher traffic volumes receive higher scores. The purpose of these two factors is to generate a higher rating for roads that will benefit the most taxpayers in the local road system. The importance rating for each Town road is listed in Table B.

3.3 CONDITION RATING

The condition rating is simply the numerical rating established in Section 2.5 of this report. Roads with lower condition ratings will yield higher priority ratings. Table B shows the condition rating for each Town road.

3.4 PRIORITY RATING

Calculating the priority rating is done by a simple equation that includes the three factors mentioned previously. The equation is as follows:

$$\textit{Importance Rating} = \textit{Road Classification Score X Average Daily Traffic Score}$$

$$\textit{Priority Rating} = \frac{\textit{Importance Rating}}{\textit{Condition Rating}} \; X\,10$$

The priority rating is calculated for each road and is shown in Table B.

3.5 TREATMENT STRATEGIES

As mentioned in Section 3.1 of this report, the roads are divided into three lists according to the appropriate action for each road. The condition rating is used as a gauge to determine if a road should receive only maintenance or should be rehabilitated or reconstructed. Routine maintenance is recommended for Town roads with condition ratings greater than 7. Roads with conditions ratings of 7 or less are listed to receive rehabilitation or reconstruction. The need for rehabilitation or reconstruction was determined by a visual inspection. Roads that have poor surface conditions and require moderate structural strength improvements can be rehabilitated. This can be accomplished by an overlay of greater than two inches or by in-place recycling. Roads with poor surface conditions that also require greater structural strength improvements may require reconstruction. Severe cracking and rutting are signs that a road may require more extensive structural improvements. This would involve base stabilization with a new or recycled surface or a total reconstruction with new materials.

TABLE B

TOWN OF MARSHALL

ROAD PRIORITY RATING

ROAD NAME	ROAD CLASSIFICATION	REHABILITATION DESIGN TYPE	A IMPORTANCE RATING Road Classification Score	B IMPORTANCE RATING Ave. Daily Traffic Score	C CONDITION RATING	PRIORITY RATING $\frac{A \times B \times 10}{C}$
Alabam Rd	Residential Access	C	5	1	5	10
Austin Rd	Residential Access	B	5	3	8	19
Beerhalter (North)	Farm Access	B	5	1	9	6
Beerhalter (South)	Minimum Maintenance	C	2	1	3	7
Bogan Rd	Residential Access	B	5	3	10	15
Brouillette Rd (South)	Farm Access	B	5	1	7	7
Brouillette Rd (North)	Farm Access	B	5	1	7	7
Buell Rd	Farm Access	B	5	1	9	6
Burkett Rd	Residential Access	C	5	1	9	6
California Rd	Residential Access	B	5	3	10	15
Canning Factory Rd (East)	Residential Access	B	5	3	8	19
Canning Factory Rd (West)	Residential Access	B	5	3	7	21
Daytonville Rd (North)	Residential Access	B	5	3	10	15
Daytonville Rd (South)	Residential Access	B	5	3	6	25
Earl Manor	Residential Access	C	5	1	8	6
Ford Rd (North)	Farm Access	B	5	1	7	7
Ford Rd (Middle)	Farm Access	B	5	1	6	8
Ford Rd (South)	Minimum Maintenance	C	2	1	3	7
Fuess Cleary Rd	Farm Access	B	5	1	9	6
Grant Hill Rd	Residential Access	B	5	3	9	17
Green Rd	Farm Access	B	5	1	6	8
Green Vedder Rd (North)	Residential Access	C	5	1	6	8
Green Vedder Rd (Middle)	Residential Access	C	5	1	8	6
Green Vedder Rd (South)	Residential Access	C	5	1	6	8

TABLE B

TOWN OF MARSHALL

ROAD PRIORITY RATING

ROAD NAME	ROAD CLASSIFICATION	REHABILITATION DESIGN TYPE	A IMPORTANCE RATING Road Classification Score	B IMPORTANCE RATING Ave. Daily Traffic Score	C CONDITION RATING	PRIORITY RATING A x B x 10 / C
Gridley Paige Rd (North)	Residential Access	B	5	3	10	15
Gridley Paige Rd (South)	Residential Access	B	5	1	6	8
Hardscrabble Rd	Minimum Maintenance	C	1	1	2	5
Hughes Rd (West of SR 315)	Minimum Maintenance	C	5	1	4	13
Hughes Rd (East of SR 12B)	Residential Access	C	5	1	8	6
Hughes Rd (West of SR 12B)	Farm Access	B	5	1	8	6
Jasek Rd	Residential Access	C	5	1	9	6
Kane Rd	Residential Access	C	5	1	6	8
Lewis Rd (North of SR 12)	Residential Access	C	5	1	7	7
Lewis Rd (South of SR 12)	Residential Access	C	5	1	7	7
Lewis Rd (SR 12 - Canning Factory)	Minimum Maintenance	C	1	1	3	3
Lewis Rd (N. of Canning Factory)	Residential Access	C	5	1	4	13
Lewis Rd (S. of Canning Factory)	Minimum Maintenance	C	1	1	4	3
Maxwell Rd	Residential Access	B	5	3	8	19
McAdam Rd	Residential Access	C	5	1	3	17
Peck Rd	Residential Access	C	5	1	6	8
Sally Rd	Residential Access	B	5	3	7	21
South St	Residential Access	C	5	1	6	8
Tassel Hill Rd	Minimum Maintenance	C	1	1	2	5
Tormey Rd	Residential Access	C	5	1	10	5
Van Hyning Rd (E. & W. Ends)	Residential Access	C	5	1	7	7
Van Hyning Rd (Middle)	Recreational Land Access	C	1	1	8	1
Zwiefel Rd	Residential Access	C	5	1	6	8

TABLE 6
RATING SCORES FOR PAVEMENT SURFACE

Score	General Condition	Unpaved Roads Distress Frequency*	Paved Roads Distress	Severity
10	Excellent	None, recently constructed or reconstructed	None, recently constructed or reconstructed	---
9	Excellent	None, recently regraveled or bladed	None, recently resurfaced	---
8	Good	Infrequent (0 -5%)	Ravelling, cracking, wheel track wear	Very Slight
7	Good	Infrequent to occasional (5 -10%)	Ravelling, cracking, wheel track wear	Slight
6	Fair	Occasional (10 -20%)	Ravelling, cracking, rutting, patching may exist	Moderate
5	Poor	Occasional to frequent (20 -50%)	Ravelling, cracking, rutting, patching may exist	Moderate to severe
4	Poor	Frequent (50 -75%)	Ravelling, cracking, rutting, patching may exist	Severe
3	Poor	Very frequent (75%+)	Ravelling, cracking, rutting, patching may exist	Severe
2	Poor	Extremely deteriorated motorist discomfort, travel difficulty	Extremely deteriorated, motorist discomfort, travel difficulty	
1	Poor	Impassable	Impassable	

Note: * Percent of surfaced distress is in parenthesis

SECTION 4.0:
Recommendations and Conclusions

4.1 RANKING BY ACTION

The results of the priority rating calculations are shown in Table B. These results were then carried over to Table C where the roads were divided into three lists. The lists provide a clear illustration of the roads that have the greatest need for rehabilitation and reconstruction. All roads that were determined to be in good condition and requiring only routine maintenance are listed in no particular order.

4.2 BUDGET

As discussed previously in this report, it is understood that any given Town typically does not have sufficient funds to perform all necessary road rehabilitation and reconstruction in one year. It was conveyed by the Highway Superintendent that there is approximately $85,000 per year of Town funds available for capital improvements to roadways. The Highway Department also receives $52,000 per year in CHIPs funds. These available funds should be directed toward those roads with the highest priority ratings first since roads with the highest priority rating have the greatest importance and are in the poorest condition.

4.3 COST OF WORK

The cost of performing the rehabilitation and reconstruction work can vary due to fluctuations in the economics of the construction industry. Costs can also vary by geographic location. The costs used for this report are estimated based upon previous construction projects performed by the Town Highway Department and are based upon an average 20' wide roadway.

4.3.1 Rehabilitation

The technique currently utilized by the Town to rehabilitate roads involves in-place recycling and incorporation of new materials. This approach makes the best use of existing base material while recognizing that greater base stabilization is needed. Approximately four inches of existing material is milled and is mixed with two or three inches of new aggregate. This new base is then compacted to an acceptable density. The cost of this procedure, including the new stone, is approximately $15,000 per mile including both lanes of traffic.

Following the compaction of the new composite base material, an asphalt binder mix is placed to a compacted thickness of two inches. The binder has structural integrity and will serve as the riding surface for two to three years prior to placing the wearing surface. The cost of placing the asphalt binder is approximately $45,000 per mile and includes both lanes of traffic. The two most economical and widely used wearing surfaces are the "slurry seal" and the "chip seal". A slurry seal is an economical wearing surface that provides protection to the underlying structural components of the roadway. It is a mixture of fine

aggregate and emulsified asphalt that is placed in a thin layer. A chip seal, being slightly more expensive than the slurry seal, also provides protection to the underlying structural components of the roadway. It is an application of emulsified asphalt binder that is sprayed on the roadway and immediately followed by the placement of a single layer of clean, crushed stone particles that are pressed into the asphalt binder as it sets.

There are many similarities between the slurry seal and the chip seal. Both wearing surfaces seal aged pavements, fill and seal minor cracks and raveled pavement surfaces, restore skid resistance and friction, waterproof the pavement surface, offer an economic solution for preventative maintenance, improve the aesthetics of the roadway, prolong the life of pavement anywhere from 3-8 years, minimize the effects of aging, and are practical feasible solutions for low traffic volume roads.

The differences between the two seals are as follows. The slurry seal offers a smooth but a less durable surface, while the chip seal offers a more durable but very rough surface. Neither seal offers a solution to save failed pavement or increase strength of pavement, but both offer a useful tool for surface maintenance. Both seals are recommended only for moderate cracking in the road. The chip seal has several disadvantages associated with it. The seal does not correct any drainage or rideability problems, there can be a significant amount of dust and clogging of the storm sewer system associated with the wearing surface, and stone chips frequently break loose as a result of passing vehicles and disturbance on the roadway. The stone chips can cause damage to both vehicles and pedestrians.

The wearing surface currently used in the Town is a slurry seal. It offers good skid resistance and works well to fill surface voids, cracks, and minor depressions. Both lanes of traffic can be slurry sealed for an additional $12,000 per mile. The cost of chip sealing a single lane of roadway can vary from $15,000 to $30,000 per single lane mile and costs approximately 15-20% of a pavement overlay.

It is recommended that the Town of Marshall use the slurry seal wearing surface for those roads in need of rehabilitation. This recommendation is in consideration of the cost savings of slurry seal and the advantages in comparison to chip seal.

4.3.2 Reconstruction

Reconstruction of a roadway may be required when the existing base material has proven insufficient to support the road use. This is apparent when the road has excessive rutting and cracking. Reconstruction of a road involves a greater degree of base stabilization and is at a greater cost. Most often this requires that

all new base material be used. It is recommended that a minimum of six inches of new aggregate be added to the existing base. Greater depths of base may be needed if the subbase material is not suitable. It is recommended that an Engineer be consulted to determine the appropriate roadway design for each reconstruction project. The cost of placing six inches of base aggregate is approximately $75,000 per mile for both lanes of traffic. Once this base is constructed, the placement of asphalt binder or asphalt base mix can be done as described above. An asphalt base mix is recommended for roadways with greater volumes of traffic or where heavy vehicle traffic is anticipated. Base mixes should be placed at greater thicknesses depending on traffic loading. For most low volume rural roads like those in the Town of Marshall, it is sufficient and economical to use the binder mix mentioned in Section 4.3.1. Slurry seal can also be used on reconstructed roadways and would be at the same cost as on rehabilitated roadways.

4.4 SCHEDULE OF WORK

The ranking of roads shown on Table C is the starting point for establishing a road work schedule. There are other factors that will influence the order that work will be done. For example, the 0.38 mile road segment of Lewis Road north of Canning Factory Road did not receive the highest priority rating, however, improvements to the road are needed this year to provide access for construction of a new home. Other changes in the order may be preferable such that each year's construction cost best fits the budget. Below is the recommended schedule of work for the Town over a five year period.

6.	Lewis Road - Construct new 12" gravel base, 0.38 miles:	$38,000
	Sally Road - Rehabilitation, 1.4 miles:	$99,000
		$137,000
7.	Lewis Road - Place oil & stone surface, 0.38 miles:	$8,000
	Sally Road - Rehabilitation, 1.6 miles:	$115,000
		$123,000
8.	Daytonville Road - Reconstruction, 1.4 miles:	$104,000
	Kane Road - Rehabilitation, 0.65 miles:	$47,000
		$151,000
9.	Daytonville Road - Reconstruction, 1.2 miles:	$90,000
	Zwiefel Road - Rehabilitation, 0.55 miles:	$40,000
		$130,000
10.	Canning Factory Road - Rehabilitation, 2.0 miles:	$144,000

The above schedule of work is in general accordance with the priority rating established

by this report. These ratings were determined by the roadway conditions that existed at the time this report was prepared. It is important that the roadway conditions of the Town road system continue to be monitored so that ratings can be updated annually. Increased deterioration of a roadway over a years time may improve it's priority rating and necessitate that repair be performed sooner than originally planned.

As can be seen in Table C, there are roadways that are listed as needing rehabilitation or repair that are not the highest priority. A deferred action for these roads is suggested by the manual. The manual states that planning for rehabilitation or reconstruction should begin for these roads but only vital maintenance activities should be performed that are necessary to protect the safety of the traveling public.

4.5 MAINTENANCE

The roadways that are listed in Table C as requiring only maintenance are those that are currently in good condition. It is important that routine maintenance be performed on these roadways since it is more cost-effective than rehabilitation and reconstruction. The manual provides a list of suggested maintenance activities to be performed.

The manual also provides maintenance guidelines for a road designated as a Minimum Maintenance Road. As mentioned in Section 1.0 of this report, the Minimum Maintenance designation allows for a decreased level of maintenance for roads that do not provide residential access and have very low traffic volumes. It is recommended that several road segments in the Town of Marshall be considered for Minimum Maintenance designation. The following is a list of those roads to be considered:

1.	Beerhalter Road (South)	0.40 miles
2.	Ford Road (South)	0.88 miles
3.	Hardscrabble Road	0.63 miles
4.	Lewis Road (SR 12 - Canning Factory Rd)	0.43 miles
5.	Lewis Road (South of Canning Factory Rd)	0.42 miles
6.	Tassel Hill Road	1.57 miles
	Total	4.33 miles

4.6 CONCLUSION

It is the recommendation of this report that the Town adopts the "Guidelines for Rural Town and County Roads" as the standard for roadway management. Additional information concerning the adoption of these guidelines is provided in Appendices B through H. The guidelines will serve as an effective planning tool and a defendable standard for roadway construction and maintenance.

Furthermore, it is recommended that the roads listed in Section 4.6 of this report be designated as Minimum Maintenance. The adoption of the Minimum Maintenance designation allows the Town to decide if Town funds should be spent on future improvements for these roads instead of the Town possibly being required to do so by State Law.

We recommend that the Town begin with the five year schedule of work developed in this report but it is important that the Town review and update the priority list annually since roadway conditions are ever changing. As mentioned in Section 4.3.2, an engineer should be consulted to determine the appropriate roadway design for each specific reconstruction project. Finally, maintenance of all roads should continue as suggested in the guidelines.

TABLE C

TOWN OF MARSHALL
RANKING BY ACTION

Maintenance	Rehabilitation			Reconstruction		
Road Name	Rank	Road Name	Priority Rating	Rank	Road Name	Priority Rating
Austin	1	Sally Rd	21	1	Daytonville Rd (South)	25
Beerhalter Rd (North)	2	Canning Factory Rd (West)	21	2	McAdam Rd	17
Beerhalter Rd (South)	3	Lewis Rd (North of Canning Factory Rd)	13	3	Alabam	10
Bogan Rd	4	Kane Rd	8			
Buell Rd	5	Zwiefel Rd	8			
Burkett Rd	6	Green Vedder Rd (South)	8			
California Rd	7	Ford Rd (Middle)	8			
Canning Factory Rd (East)	8	Green Rd	8			
Daytonville Rd (North)	9	Green Vedder Rd (North)	8			
Earl Manor	10	Gridley Paide Rd (South)	8			
Ford Rd (South)	11	Peck Rd	8			
Fuess Clearly Rd	12	South St	7			
Grant Hill Rd	13	Brouillette Rd (South)	7			
Green Vedder Rd (Middle)	14	Brouillette Rd (North)	7			
Gridley Paige Rd (North)	15	Ford Rd (North)	7			
Hardscrabble Rd	16	Lewis Rd (North of SR 12)	7			
Hughes Rd (West of SR 315)	17	Lewis Rd (South of SR 12)	7			
Hughes Rd (East of SR 12B)	18	Van Hyning Rd (E. & W. Ends)				
Hughes Rd (West of SR 12B)						
Jasek Rd						
Lewis Rd (SR 12 - Canning Factory Rd)						
Lewis Rd (South of Canning Factory Rd)						
Maxwell Rd						
Tassel Hill Rd						
Tormey Rd						
Van Hyning Rd (Middle)						

APPENDIX A:
Manual: Guidelines for Rural Town and County Roads

LOCAL ROADS RESEARCH AND COORDINATION COUNCIL

MANUAL:

GUIDELINES FOR RURAL TOWN AND COUNTY ROADS

December 1992

Edited and reprinted by the
Cornell Local Roads Program with permission from the
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March 1997

Local Roads Research and Coordination Council
New York State Department of Transportation
5 Governor Harriman State Campus
Albany, NY 12232

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Editorial corrections made in 1996 edition:

Page 3 - Min. Maintenance changed to Normal for Class 6, Type B

Page 7 - 150 ADT> changed to ADT>150, 100 ADT> changed to ADT>150, <150 ADT changed to ADT <150, <100 ADT changed to ADT<150
Footnote 4 citation corrected

Page 11- 2.0% -- 6.0% changed to 4.0% -- 6.0%

Page 23 - (0.5%) changed to (0 - 5%)

Page 24 - As shown in Figure 1 was removed

Editorial corrections made in 1997 edition:

Page 7 - The "greater than" symbol (>) and the "less than" symbol (<) were changed to words

STATE OF NEW YORK
LOCAL ROADS RESEARCH AND COORDINATION COUNCIL
Albany, New York

December 30, 1992

Dear Manual User:

Contained herein is the Manual: Guidelines for Rural Town and County Roads, revised and approved by the Local Roads Research and Coordination Council for voluntary use by town and county governments.

The guidelines, as revised, establish a procedure for local designation of Minimum Maintenance Roads or road segments allowing for reduced levels of maintenance on infrequently used rural roads.

The Council believes that these guidelines provide a realistic framework for the rehabilitation and maintenance of rural town and county roads.

Sincerely,

DONALD N. GEOFFROY, P.E.
Chairman Designee
Local Roads Research and
Coordination Council

Room 5-503, 1220 Washington Avenue, Albany, New York 12232

INTRODUCTION

In 1985, the New York State Legislative Commission on Rural Resources conducted a series of Rural Development symposiums. At meetings held at various locations in rural New York State, rural issues were discussed and analyzed and solutions were developed. One concern that was repeatedly expressed was that the guidelines for design and maintenance of rural highways having low traffic volumes were not appropriate for the actual uses of these roads.

In 1986, the New York State Legislature responded by enacting legislation creating the Local Road Classification Task Force. The Task Force was charged with developing alternative guidelines for classifying town or county roads in rural areas according to principal uses and traffic volume; for each class of road, the width of the driving surface and guidelines necessary to construct such roads and bridges; for each class of road the guidelines for maintenance and operation that may be required; and signs that may be needed to designate each class of road along with designated speed limits and other applicable guidelines."[1] A Task Force consisting of the Commissioner of the New York State Department of Transportation or his designee as Chairman, the Commissioner of the New York State Department of Agriculture and Markets or his designee, the Dean of the College of Agriculture and Life Sciences of Cornell University or his designee, four rural town highway superintendents, three rural county highway superintendents, three rural business people, prepared Local Road Classification Guidelines and issued their report in December 1988. In December 1989, the Task Force issued a "Manual: Guidelines For Rural Town and County Roads" to facilitate the use of the local classifications by local officials.

In July of 1990, the Legislative Commission on Rural Resources worked with the Senate, Assembly, State Department of Transportation and the Governor's Office to establish a NYS Local Roads Research and Coordination Council[2]. Intended to continue the groundbreaking work of the Local Roads Classification Task Force, the Council will provide a dedicated presence for promoting increased state attention to, and support of local roads management efforts. Comprised of a mix of state and local highway officials, the Council has been empowered to work with the Department of Transportation and localities to:

1. Promote the training of municipal officials and employees to encourage the utilization of innovative and cost-cutting procedures as well as more efficient highway maintenance and construction methods;

2. Encourage use of the Local Road Classification Guidelines as initially presented by the Task Force and updated by the Council;

3. Explore the potential for encouraging greater efficiency and cost-savings by counties, towns and villages through coordination of maintenance and construction efforts by entering into joint agreements, including but not limited to (a) purchase of materials and equipment, (b) coordination of maintenance and storage facilities and, (c) contracting with each other for maintenance of local roads and bridges;

[1] *Senate Bill 7189-B, January 29, 1986*

[2] *Article 16-B, Executive Law, Chapters 565 and 652 of the Laws of New York*

4. Develop a minimum maintenance road classification addressing repair and service standards for low-volume rural roads, as well as procedures to be followed by local governments for designating minimum maintenance roads within their communities.

The Guidelines

These guidelines were reviewed and commented upon at the annual Cornell Local Roads Program School for Highway Superintendents, at meetings of the New York State County Highway Superintendents' Association, the New York State Association of Towns, the New York State Supervisors and County Legislators Association, and the New York State Association of Town Highway Superintendents, as well as an ongoing technical review within the New York State Department of Transportation. In addition, an informational forum was held on November 2, 1988 at which the guidelines were presented and the public was given an opportunity to comment. The guidelines have been modified to reflect the opinions and comments expressed during this review process.

At their August, 1988 Conference in Niagara Falls, the New York State County Highway Superintendents' Association voted to endorse the draft guideline report, reflecting significant professional peer group recognition of the guidelines.

Both the Task Force and the Local Roads Research and Coordination Council believe that the guidelines provide a realistic framework for the rehabilitation and maintenance of rural town and county roads. Accordingly they have approved these guidelines for voluntary use by town and county governments.

The guidelines have been developed to serve rural towns and counties across the state. For the purposes of applying the guidelines, both the Task Force and the Local Roads Research and Coordination Council define rural town and county roads as those within counties of less than 200,000 population or towns having less than 150 persons per square mile. However, there is nothing that prevents these guidelines from being used by other local governmental agencies where the traffic meets the criteria, especially to maintain continuity or consistency. Those NYS towns and counties meeting these criteria are listed in Appendix 3 at the end of the manual.

Chapter I of the manual outlines a classification system for low traffic volume rural roads. The classification system is the basis for closely matching the kind of vehicle use each road serves and the design, maintenance and traffic control guidelines that are applied. Chapter I also includes a process that town and county governments may use to classify their low traffic volume roads.

Chapter II contains guidelines for the rehabilitation of low traffic volume rural roads including a design process intended to be used for road rehabilitation projects on these roads.

Chapter III contains local road maintenance guidelines. These include a simplified pavement management system (Road Surface Management System) that provides a systematic method for developing, prioritizing, scheduling and budgeting road improvement and maintenance projects. It also provides a framework for the establishment by localities of a minimum maintenance road designation, which would help highway superintendents set road maintenance priorities and practices as well as enhance driver awareness of local road conditions where reduced maintenance practices are in effect.

Chapter IV contains recommendations for traffic control on low volume rural roads.

LOCAL ROADS RESEARCH AND COORDINATION COUNCIL

MANUAL GUIDELINES FOR RURAL TOWN & COUNTY ROADS

TABLE OF CONTENTS

	Introduction	I – iii
CHAPTER		
I.	Classification for Low Volume Local Roads	1
	Process for Classifying a Local System	4
II.	Rehabilitation Design Guidelines	6
	Design Process for Road Rehabilitation Projects	8
	Bridge Width Decision Process	12
III.	Local Road Maintenance Guidelines	14
	Minimum Maintenance Road	15
	Procedure and Process for Designating a Minimum Maintenance Road or Road Segment	17
	Maintenance Activities	19
	Effect of Surface Condition on the Choice of Maintenance Versus Rehabilitation	22
IV.	Guidelines for Traffic Control on Low Volume Local Roads	26
Appendix 1: Economic Analysis Worksheet for Bridges		30
Appendix 2: Forecasting Traffic on Rural Roads		34
Appendix 3: NYS Rural Counties and Towns		36

CHAPTER I

CLASSIFICATION FOR LOW VOLUME LOCAL ROADS

In the legislation enacting the Local Road Classification Task Force, the New York State Legislature noted "if a closer relationship can be made between the type of road and bridge use and the type of construction and design of such a road including bridges, savings in construction and maintenance costs will be achieved without impairing travel or highway safety."

The following classifications have been developed to establish such a close relationship between the uses of low volume rural roads and their design, maintenance and operation. The classifications identify the significant use characteristics, including traffic volumes, vehicle types and seasonal use characteristics, that are present on New York State's low volume, rural roads. Guidelines for design, maintenance and traffic control have been developed that are closely matched to those use characteristics.

Land use adjacent to the road was used as the basis for classification because it is a convenient and accurate way of identifying the kind of use that a low volume road serves.

The Task Force defined low volume rural roads as roads with fewer than 400 vehicles per day. In rural New York State, these roads comprise more than 75 percent of the combined town and county mileage.

Local Road Classifications

Low Volume Collector—collects traffic from any of the other classifications and channels it to higher level roads, such as arterials, interstates, etc.

Residential Access—provides access to residences. The traffic volume generated depends on the number of residences. All year access for fire trucks, ambulances and school buses must be provided.

Farm Access—provides access to a farm's center of operations including the residence. Traffic volume is generally low- but may include occasional heavy trucks and farm equipment.

Resource/Industrial Access—provides access to industrial or mining operations. Traffic volume can vary and can include heavy trucks and significant numbers of employees' cars.

Agricultural Land Access—provides access to farm land. Traffic volumes are low and vary seasonally. These roads should accommodate farm equipment that can by up to 20 feet wide.

Recreation Land Access—provides access to recreational land including seasonal dwellings and parks. Volumes of traffic can vary with the type of recreation facility and season of the year, and may include recreational vehicles.

Minimum Maintenance Road—a low-volume road or road segment which may be of a seasonal nature, in a rural county or town having an average traffic volume of zero to fifty vehicles per day which principally or exclusively provides agricultural or recreational land access. A road, or road segment, which has been so designated, shall be maintained at a level which allows such road to remain passable and functional in accordance with standards contained in this section of the Guidelines Manual. In no way shall the term "minimum maintenance" be construed to mean "no maintenance" or "abandonment". Further, such term shall not apply to those roads, or road segments, which provide farm access as previously defined, or access to an individual year-round residence.

Each of these rural road classifications generates its own unique characteristic pattern of vehicle type, traffic volume and seasonal use characteristics, which in turn generate design, maintenance and operational guidelines. These guidelines are outlined in Table 1 and represent the desirable minimums to provide a reasonable and safe level of service for each of the six low volume road classifications.

TABLE 1

RURAL LOW VOLUME ROAD CLASSIFICATION

	ROAD USE		GUIDELINES		
Road Classification	Vehicle Type	ADT[1]	Rehabilitation Design Type	Maintenance	Traffic Control
Low volume	All vehicles	50-400	A	Normal	MUTCD[2]
Collector		<50	B		
Residential Access	Cars, emergency and service vehicles	50-400	B	Normal	MUTCD
		<50	C	Normal	MUTCD
Farm Access	Cars, light trucks occasional heavy trucks, farm equip	250-400	A	Normal	MUTCD
		<250	B	Normal	MUTCD
Resource/ Industrial Access	Trucking, employees cars	50-400	A	Normal	MUTCD
		<50	B	Normal	MUTCD
Agricultural Land Access	Occasional farm equip seasonal	--	C	Min Maint	MUTCD
Recreational Land Access	Cars, RV's seasonal	50-400	B	Normal	MUTCD
		<50	C	Min Maint	MUTCD

NOTE:

[1] Average Daily Traffic.

[2] "Manual of Uniform Traffic Control Devices" Supplemented by "Traffic Sign Handbook for Low Volume Roads", New York State Department of Transportation Traffic and Safety Division, June 1985.

The guidelines for rehabilitation design (explained in Chapter II) include three rehabilitation design types. Rehabilitation Design Type A is an all purpose road on which vehicles can pass without a reduction in speed. Rehabilitation Design Type B is an area service, two lane road on which vehicles may have to reduce their speeds to pass. Rehabilitation Design Type C is an area service, one lane road on which either of two passing vehicles must slow, stop or briefly leave the roadway to allow the other to pass.

Vehicle interaction characteristics were used as the basis for assigning the design types to the respective Classifications. Vehicle size (as determined by the absence or presence of significant truck traffic) and traffic volumes (of either greater or equal to 50 vehicles per day, or less than 50 vehicles per day) were the criteria used. The 50 vehicle per day threshold was used because, at fewer than 50 vehicles per day, vehicle interactions become so infrequent that the effect on vehicle operation is negligible.

The guidelines for maintenance (explained in Chapter III) include provisions for a Minimum Maintenance designation that allows a reduced level of maintenance on roads which are used for land access. A simplified pavement management system is provided for scheduling and prioritizing maintenance and repair activities on normally maintained roads.

The guidelines for traffic control (explained in Chapter IV) parallel the maintenance guidelines. They include recommendations for signs on normally maintained roads and a Minimum Maintenance road sign to be posted at the entrance points to Minimum Maintenance roads. The only other signs recommended for Minimum Maintenance roads are those mandated by Law (for all roads).

Process for Classifying a Local System

The following process was designed by the Task Force to be used by rural town and county governments to classify low volume roads. The classifications then provide the basis for applying the design, maintenance and traffic control guidelines. A permanent written record of this process should be prepared and maintained by each government using it, to provide documentation for future reference.

Step 1: Determine the Low Volume System. Since the guidelines focus on low volume roads (defined as having fewer than 400 vehicles per day), the first step is to obtain traffic data to identify these roads. There are two major sources of traffic data available to local officials.

- **Local Traffic Counts**. If the local government collects and records traffic counts, this information should be used.
- **Local knowledge of traffic and development**. The local official can usually estimate average daily traffic with a reasonable degree of accuracy, using knowledge of traffic patterns and development in the jurisdiction.

All sources should be used to identify the low volume road system and estimate the average daily traffic on each segment. (A segment is defined as a section of roadway between two intersections.)

Step 2: Identify Low Volume Collectors. A functional classification map, available at New York State Department of Transportation Regional offices, can be used to identify which of the low volume roads are functionally classified as Collectors. These roads form the first classification Low Volume Collector.

CHAPTER II

REHABILITATION DESIGN GUIDELINES

Design guidelines have been developed for the rehabilitation of low volume rural roads, because it is the most frequent type of project undertaken at the local level that is more extensive than maintenance. It is also the area in which the potential for cost savings is the greatest.

Because of a lack of generally accepted guidelines for rehabilitation of rural low volume roads, AASHTO[1] new construction and reconstruction guidelines are often inappropriately applied. The indiscriminate application of these guidelines is not appropriate for rehabilitation design on the low volume rural system, because it is not necessary to comply with them from a functional, safety or operational standpoint. Further, local highway departments do not have sufficient financial resources to improve all their roads to comply with these guidelines. The AASHTO new construction and reconstruction guidelines should be used for their intended purpose - for the design for higher volume facilities, both for new roads and for major reconstructions of existing roads.

Rehabilitation guidelines appropriate for higher volume two lane rural roads are available. The New York State Department of Transportation's Standard for Non-Freeway Resurfacing, Restoration and Rehabilitation and the AASHTO Guideline for Resurfacing, Restoration and Rehabilitation are two such guidelines. What is needed is a rehabilitation guideline for the design of low volume rural roads that reflects the realities -- both operational and financial -- of New York State's rural system and which will provide a safe, functional and consistent design for all **low volume** roads.

Rehabilitation on low volume paved roads is defined as resurfacing a continuous road section with greater than 1 ½" of material or reconstructing on essentially the same right of way. On unpaved roads, rehabilitation is defined as resurfacing a continuous segment with new aggregate or other surface material.

The safe operation of any road is dependent upon drivers traveling at a reasonable speed and becoming aware of hazards in time to react appropriately. Maintaining driver's expectations is the key to safe operation. Designing a reasonable, safe and affordable local rural road system, that adequately serves the varying requirements that users place on it, should be based on consistently providing a road that is appropriate to the uses that it serves.

The guidelines are based on three typical local road types commonly found in rural New York State that, for the most part, can adequately serve user demands in a safe and cost effective manner. The three types, all purpose road (Rehabilitation Design Type A); area service two-lane, two way road (Rehabilitation Design Type B); and area service one-lane, two way road (Rehabilitation Design Type C); correspond to three distinct packages of physical characteristics, each with its own range of prudent operating speeds (see Table 2). Drivers routinely perceive the road conditions and adjust their driving behavior accordingly. The guidelines recognize this reality, and call for a design that is both consistent with drivers' expectations and provide appropriate service for the use that the road is serving.

[1] American Association of State Highway and Transportation Officials

TABLE 2

DESIGN GUIDELINES FOR ROAD REHABILITATION BY ROAD TYPE

	TYPE A ALL PURPOSE ROAD	TYPE B AREA SERVICE 2 WAY 2 LANE ROAD	TYPE C AREA SERVICE SINGLE LANE 2 WAY ROAD
Minimum Width Traveled Way	18 ft [1]	16 ft [1]	10 ft [2]
Shoulder	2 ft	2 ft	
Opposing Vehicle Interactions	All vehicles pass with no speed reductions	1. Trucks cannot meet without reducing speed. 2. Cars cannot meet trucks without reducing speed. 3. Cars pass with almost normal speed.	All vehicles require special widening for passing
Operating Speed 3	45 mph or greater	25 mph to 45 mph	40 mph or less
Typical Surface Material 4	More than 150ADT: Asphalt Concrete Less than 150 ADT: Aggregate	More than 150 ADT Asphalt Concrete Less than 150 ADT: Aggregate	Usually unsurfaced
Surface Condition	No adverse effect on operating speed	May cause reduction in operating speed	Reduced operating speed

[1] Add 2 ft to the traveled way if significant truck traffic is present.
[2] If farm vehicles are present, maintain 20 ft horizontal clearance. Widening of traveled way should be provided at approximately 1000 ft intervals to allow vehicles to pass.
[3] Applicable to normal maintenance roads.
[4] ADT thresholds recommended based on economic analysis, "Economic Evaluation of Pavement Design for Low Volume Roads," Proceedings of the Third International Low Volume Roads Conference, Transportation Research Board, National Research Council, Washington, D.C., 1983.

Design Process For Road Rehabilitation Projects

After the decision to rehabilitate a section of low volume road has been made, the following process should be used to develop an appropriate design. The design process is not intended to be applied to all roads in a local jurisdiction at one time. Only those roads scheduled for a rehabilitation project should be subjected to the process.

The process contains the following elements: 1) A survey of the existing road...its type, use, volume of traffic, condition, geometry, operating speed, and accident history; 2) A determination of the minimum "design type" needed to provide reasonable and safe service to the users of the road; 3) A decision as to what design type will be used in the actual design; and 4) a detailed analysis of the adequacy of each design feature. A brief design "report" should be prepared that documents the major finding of each element of the design process. The report need not be elaborate; however, it is important that the local government official follows a logical, consistent process in making such decisions and then document (on paper) the decisions based on that process.

This process is intended to provide a consistent, economic and safe design that is appropriate for the actual uses that the road is serving and to provide documentation of the process used to develop the design.

1. Survey of the Existing Road.

The following data should be collected:

- **Surface**—The NYS Department of Transportation "windshield condition survey" method is the preferred type of condition survey. If a condition survey is used for road surface management, the score for the segment to be rehabilitated should be used. If not, a brief written description of surface condition will suffice.
- **Pavement and Shoulder Width**—These should be recorded for the segment. For U11paved roads, total roadway width (traveled way plus shoulder) should be measured and recorded.
- **Curves**—The safe operating speed of each curve should be determined using a ball bank indicator (explained under 4 below).
- **Cross Slope**—Determine if the road has enough crown elevation to provide positive drainage. Ponding indicates surface distortion and deterioration and that drainage is inadequate.
- **Roadside Environment**—The location of immovable objects in the right of way should be noted. Special consideration should be given to the outside of sharp curves in the road.
- **Accident History**—An accident history is an important analytical tool. Local accident records should be used when available. Accident data may also be obtained from the New York State Department of Transportation CLASS computer file. To get this information contact:

CLASS Program, Room 314
New York State Department of Transportation
5 Governor Harriman State Office Campus
Albany, NY 12232

- **Traffic**—If estimated traffic was used to classify the road (Chapter 1), an actual count averaged over several typical days should be produced for the design process.
- **Classification**—The validity and accuracy of the Classification of the road (as developed in Chapter 1) should be checked.
- **Operating Speed**—Preferably, the determination of the operating speed should be made by following typical vehicles and recording their operating speed. However, it may not be possible to do so on low volume roads. On these roads a test vehicle should be driven on the road to determine a reasonable and prudent operating speed. This speed shall be used as a basis for evaluating the road's features.

2. Determination of Minimum Recommended Design Type

Once the classification and traffic volume of a segment of roadway are known, the recommended minimum Rehabilitation Design Type can be determined from Table 1, Chapter 1. The recommended Minimum Design Type represents a reasonable and safe facility type and level of service for the traffic volume level and vehicle type patterns characteristic of each classification. Table 2, Chapter II, describes the major geometric and operational characteristics of the three types of roadways: Type A (All Purpose Road), Type B (Area Service, Two Lane-Two Way Road), and Type C (Area Service, Single Lane Two Way Road).

3. Determination of Design Type to be Used

Consistency in roadway attributes is important because it allows prudent drivers to adjust their speeds to a level that is appropriate for all features of the road. In addition to the need for consistency, it is equally important that the road provide adequate services for the type of vehicle use it will be accommodating.

To achieve a design that meets both these criteria, the existing road should first be examined to determine whether it is operating as Rehabilitation Design Type A, B, or C. Are the operating speeds within the acceptable ranges for the existing pavement and shoulder widths (as defined in Table 2)? A road with a narrow pavement and high operating speed indicates a need to consider upgrading the pavement width to accommodate higher operating speeds safely.

Second, the accident history of the road should be examined in detail, Is there a pattern of accidents suggesting that a higher design type is needed? For example, repeated head on collisions or run-off-the-road accidents (resulting from vehicles meeting) may indicate that a higher rehabilitation design type should be considered.

Third, does the existing road as it is currently functioning meet the recommended guidelines for the design type established in Table 2? If the guidelines are not met, consideration should be given to upgrading the design type identified for that road classification.

After all the above have been considered and documented in the design report, an overall design type for the rehabilitation of the road can be identified.

4. Detailed Analysis of Design Features

Once the overall design type for the road has been determined, the next step is an analysis of each design feature to identify those that are inconsistent with the driving environment and, therefore, should be either signed or upgraded. Since operating speed is the criterion used to evaluate many of the

features, it should be recognized that upgrading a road to a higher design type requires a new estimated operating speed, based on the upgraded road. For example, a type B road, 16 ft wide and currently operating at 40 mph is upgraded to a type A road, 18 ft wide. The new operating speed would probably rise as drivers' perceptions of the road change due to the widening and this new operating speed should be used to evaluate the road. For roads that are not upgraded to a higher design type, the existing operating speed should be used.

- **Horizontal Alignment**. Is evaluated by comparing the safe operating speed of each curve to the operating speed of the road.

  The safe operating speed of a curve can be determined with a ball bank indicator (or slope meter). The speed at which the meter will give a reading of 10 is the safe operating speed of the curve. If the safe operating speed of the curve is less than the operating speed of the road, then the curve requires further study. On very sharp curves where the safe operating speed is less than the road operating speed by at least 15 mph, (especially after a long straight section and on curves with a history of accidents), consider increasing super elevation or realigning. Curves with safe operating speeds that are less than the general operating speed on the road should be signed if the local highway superintendent determines that the curves are inconsistent with the general driving environment and require positive guidance to enable the driver to negotiate them safely.

- **Vertical Alignment**. The road should be driven to identify vertical crests that restrict sight distance. Where sight distance to a potential hazard is severely restricted, consider providing warning devices as recommended by the MUTCD. Potential hazards include turning vehicles, sharp curves, narrow bridges, or other conditions that demand specific driver responses.

- **Cross Slopes**. Rehabilitation projects should conform to the following criteria to provide adequate drainage.

TABLE 3

CROSS SLOPE DRAINAGE CRITERIA, BY SURFACE TYPE

Surface Type	Range in Cross Slope
High (asphalt, etc.)	1.5%--2.0%
Intermediate (surface treated)	1.5%--~3.0%
Low (unpaved)	4.0%--6.0%

- **Clear Zone**—The width of the roadside area that should be studied for possible hazard mitigation measures varies with the operating speed, traffic level and degree of curvature of the road. Desirable clear zones are indicated below. (Clear zone is measured from the edge of the traveled way.)

  Type A Road—a la-foot clear zone is desirable.

  Type B Road—a 2- foot to 5- foot clear zone is desirable; a 10- foot clear zone on the outside of sharp curves and on curves at the bottom of long grades is desirable.

  Type C Road—a 2-foot clear zone is desirable; a wider clear zone on the outside of sharp curves is suggested. On minimum maintenance roads (see chapter III), a clear zone may not be provided.

  Hazard mitigation measures to be considered include:

  - Improved delineation of the road including edgelines, delineators and reflectors.
  - Guiderail
  - Berms and earth work
  - Drainage modifications
  - Removal of the hazard

  Property owners should recognize the legal right of local government to remove fixed objects within the right of way of the road.

- **Guiderail**—New York State Department of Transportation Guiderail and Bridge rail designs are intended for high volume, high speed highways and are often too expensive for many low volume road applications. Alternative designs that are less expensive and adequately tested to assure performance may be used on low volume rural roads.

Source: AASHTO Policy for Geometric Design of Highways and Streets, 1984.

BRIDGE WIDTH DECISION PROCESS

The following paragraphs detail a decision process for determining desirable minimum bridge widths on low volume rural town and county roads. On roads with higher volumes (more than 400 vehicles per day), the New York State Department of Transportation's Standards for Non Freeway Resurfacing, Restoration and Rehabilitation should be used. If the bridge is to be rehabilitated or replaced, an economic analysis should be done to determine if the bridge work is a cost effective use of public funds compared to closing the bridge (see Appendix 1, Bridge Economic Analysis Worksheet). Since the bridge decision process requires developing forecasts of average daily traffic, a simple method for producing forecasts has been included (see Appendix 2). Forecasts should be prepared prior to using the bridge decision process.

The decision process for low volume rural bridges is based on the width of the approach lanes, compared to the existing bridge width.

1. Existing Bridge width is equal to or greater than the width of the approach lanes (traveled way)

These bridges generally may be replaced, rehabilitated or remain in place without being widened after the accident history has been considered. A decision to widen the bridge would generally be made after an analysis of the accident history showed that accidents can be attributed to the width of the bridge. If a decision to widen a bridge to remain in place or to widen a bridge to be rehabilitated has been made, the bridge widths shown in Table 4B should be used as a guide. If a decision to provide a wider replacement bridge has been made, the bridge width shown in Table 4B should be met.

2. Existing Bridge width is less than the width of the approach lanes (traveled way)

If the conditions shown in Table 4A are satisfied, a bridge may be replaced, rehabilitated or remain in place at its existing width. Consider a wider bridge if the conditions in Table 4A are not satisfied (or else take action to satisfy the unmet conditions, such as signing, providing reflectors, etc.). If a decision to widen a bridge to remain in place or a bridge to be rehabilitated has been made, then the bridge widths shown in Table 4B should be used as a guide. If a decision to provide a wider replacement bridge is made, the bridge width shown in Table 4B should be met.

TABLE 4A
CONDITIONS FOR THE DECISION PROCESS FOR BRIDGES

1. Is the design year ADT less than 400?
2. Is the operating speed less than 40 mph?
3. Have there been no accidents attributable to the bridge width?
4. Is there adequate sight distance?
5. Are there no plans for highway geometric improvements?
6. Are there few trucks?
7. Is there adequate bridge railing?
8. Is the bridge adequately signed?
9. Are reflectors and speed advisory signs used?

TABLE 4B

GUIDELINES FOR BRIDGE WIDTH DECISIONS, BY TYPE OF WORK
(Design year less than 400 ADT)

Type of Work	Bridge Width
1. New and replacement	Approach lanes width plus 2 feet on each side or 20 feet, which ever is less
2. Rehabilitation and remain in place*	20 feet, 18 feet if few trucks

NOTE: * Remain in place is defined as bridges within highway project limits for which no bridge work is anticipated.

CHAPTER III

LOCAL ROAD MAINTENANCE GUIDELINES

Many rural governments have road systems with miles of pavement in poor condition. Their road maintenance budgets may be inadequate. To improve the road system from poor to excellent condition, however, may require more than just a larger road maintenance budget. It may require adopting a new approach to the management of the road system by systematically targeting limited resources more effectively, and by use of a wider range of new technologies for road maintenance.

By doing the right thing at the right time it is possible to extend the life of a road and to postpone the day when it will have to be rehabilitated or reconstructed. Conversely, money spent on maintenance of a badly deteriorated road will have little beneficial effect and will be largely wasted. It is the road manager's task to decide whether to spend money on maintenance measures, or whether to defer maintenance because the road has deteriorated beyond the point where maintenance would be cost-effective. In the latter case it will be necessary to schedule the road for rehabilitation, as described in Chapter II.

Most maintenance activities are referred to as being preventive, that is, they prevent the deterioration of the road surface, roadside, bridges, signs, etc. An example of preventive maintenance might be cleaning out a ditch. Generally speaking, the time and location of preventive maintenance activities can be scheduled in advance. In contrast, certain maintenance activities tend to be reactive, such as patching a pothole. Neither the timing nor the exact location of such activities can be scheduled before they are necessary. These are demand maintenance activities.

The highest degree of cost-effectiveness of road maintenance activities is generally associated with preventive maintenance. Such activities lend themselves to being "managed," whereas reactive maintenance can be inefficient. The road maintenance crew is going around "putting out fires," more or less. This usually happens when maintenance is being done on a badly deteriorated road system, and if it represents a large portion of the time that is being spent on maintenance, this indicates that more money and effort should be given to road rehabilitation, and on getting the road system "into shape."

Due to liability considerations it may not be possible or wise for a road manager to consider the total elimination of maintenance on a deteriorated road, and this is not being suggested here. Every local government has a responsibility to maintain its road system at a level that renders it safe for the traveling public. If certain segments of a road system are in deteriorated condition it may be necessary to perform some demand maintenance activities, particularly road surface maintenance, to protect the safety of the public.

While road condition is a factor in selecting which maintenance activities to perform, road classification and traffic volumes must be considered in selecting how often to perform road maintenance. This was illustrated in Table 1. Most road classes are designated in Table 1 to receive maintenance at a Normal frequency. However, these guidelines allow for Minimum Maintenance for very low-volume rural roads, which provide land access only.

The Minimum Maintenance Road

The Minimum Maintenance Road designation has been developed to define an appropriate level of maintenance on town and county roads, which primarily serve as access to agricultural land and recreational land.

Shortfalls in available highway funds have forced many towns and counties to reduce maintenance on their lowest volume roads. The Minimum Maintenance designation recognizes and standardizes this already widespread practice. A number of states, including Washington, Nebraska, Kansas, Iowa and Minnesota, have already empowered localities to implement Minimum Maintenance Road standards. In these states general policies and guidelines have been set with the expectation that localities will determine the exact level of maintenance for their respective roads or road segments.

The road classifications where the Minimum Maintenance designation would apply are indicated in Table 1. They are the Agricultural Land Access and Recreational Land Access classifications, with average daily traffic less than 50 vehicles per day.

The Minimum Maintenance designation provides an alternative to closing a little used road. The level of maintenance provided is set by the local government and must be sufficient for the road to provide reasonable access. However, the level of maintenance is less than that provided on Normal maintenance roads. The list of Maintenance Activities shown in Table 5 contrasts Normal and Minimum Maintenance Roads for some major maintenance activities.

Generally, the level of maintenance provided on a Minimum Maintenance Road will be the minimum that is necessary to permit use of the road, consistent with its classification. Once designated by the local town or county legislative body[1] in the manner prescribed in this manual, a Minimum Maintenance Road or road segment would be maintained by the county or town highway superintendent according to the volume and type of traffic traveling on such road. Any maintenance practice would be defined and conducted by the county or town highway superintendent responsible for each road or road segment classified as a Minimum Maintenance Road in accordance with the guidelines in Table 5.

[1] "Legislative body" means a town board of a town or a board of supervisors or legislature of a county.

TABLE 5
MAINTENANCE ACTIVITIES

ACTIVITY	NORMAL MAINT ROADS	MINIMUM MAINT ROADS
Surface Maintenance		
Crack Sealing	As necessary	"May be omitted, consistent with the decision about the need to keep the road in service."
Patching & potholes	On demand	
Surface Seals	As necessary	
Thin Overlays	As necessary	
Snow Removal	Roads kept clear	
Shoulder Maint	Grading cleaning	
Blading	Regular	Infrequent
Roadside Maintenance		
Cleaning	As necessary	"May be omitted, Regular consistent with the decision about the need to keep the road in service."
Mowing		
Brush Control	Site distance maintained	
Guide Rail Maint	Regular	
Drainage:		
-Structure	As necessary	
-Ditches	Positive drainage maintained	
-Slopes	Repair failures	
Bridges		
Cleaning	As necessary to preserve bridge	"May be omitted, consistent with the decision about the need to keep the structure in service at the rated (or posted) load."
Lubrication	As necessary to preserve bridge	
Painting	As necessary to preserve bridge	
Deck	As necessary to preserve bridge	
Drainage	As necessary to preserve bridge	
Signs	MUTCD	MUTCD

NOTE: MUTCD is the Manual of Uniform Traffic Control Devices

The Minimum Maintenance designation would apply on infrequently used roads -primarily roads with no year around residences or businesses. Under a similar existing New York State law, towns have the option of designating a Seasonal Limited Use Highway and discontinuing snow removal. However, once a residence or business is established on the road, the law requires the town to resume full year around service. This often means widening a narrow road to accommodate snowplows.

Use of Minimum Maintenance guidelines would extend local decision making power in two important ways. First, all maintenance, not only snow removal, could legally be reduced, thereby adopting the already widespread (and financially necessary) practice of reducing maintenance on the least traveled roads. Second, the decision to provide full services to new residences or businesses, established after the designation as a Minimum Maintenance Road, would be at the discretion of the local government and not required by New York State law.

Some rural towns have many miles of unimproved and uninhabited roads and are experiencing substantial second home development and conversion of seasonal camps to year around homes. The result has often been a sharp increase in the demand for all year, improved roads, without sufficient increases in tax revenues to pay for them. The potential is great for this trend to become even more pronounced. Establishing the Minimum Maintenance designation would help to return control to local government by making the decision to improve roads a local one -not one that is mandated by state law. Minimum Maintenance Roads will continue undiminished in federal and state-aid formula calculations and not impair overall funding levels received by participating localities.

The Local Roads Research and Coordination Council is concerned that a proper and equitable balance be struck between the interests of property owners wishing to develop their land and local government efforts to control spending. In order to promote this balance, the Council has developed the following framework for local designation of Minimum Maintenance Roads or road segments.

Procedure and Process for Designating a Minimum Maintenance Road or Road Segment

I. **Local designation**. The legislative body of any rural county or town (the town board of a town, or a board of supervisors or legislature of a county) may, by local law or resolution, designate as a Minimum Maintenance Road any low-volume rural road or road segment that affords agricultural or recreational land access at the time of such designation. Ensuring, however, that such roads or road segments do not provide farm centers of operation and/or individual year-round residences with principal motor vehicle access to goods and services necessary for effective support of such farms and/or year-round residences. A public hearing shall be held by the legislative body prior to taking action on a proposed Minimum Maintenance Road designation. At least ten days before such public hearing, written notice of the hearing shall be served by certified mail upon every owner of real property abutting said road or road segment as determined by the latest, completed assessment roll. No local law or resolution designating a Minimum Maintenance Road shall take effect until Minimum Maintenance standards are adopted and signs are posted by the highway superintendent advising the public that such road is a Minimum Maintenance Road. No road, once designated a Minimum Maintenance Road, shall be determined to have been abandoned pursuant to the provision of subdivision one of section two hundred five of the New York State Highway Law until at least six years have elapsed since the termination of the designation of said road as a Minimum Maintenance Road.

II. County and town legislative findings. Prior to any public hearing relating to the designation of a low- volume rural road or road segment as a Minimum Maintenance Road by local law or resolution, the legislative body having jurisdiction shall issue findings that such road or road segment should be designated a Minimum Maintenance Road. Such findings shall include but not be limited to:

1. the volume and type of motor vehicle traffic on such road;

2. a determination that the property owners of land abutting the road shall continue to have reasonable access to their property; and

3. a determination that such road, or road segment, does not constitute a farm access or year-round residential access road as defined above

III. School board and planning board review.

1. At least sixty days prior to the hearing on the proposed Minimum Maintenance Road designation, a copy of the findings shall be made available for public inspection. A copy of the findings shall also be sent to the local school board of the county or town having jurisdiction over such road.

2. Such school board and planning board shall have 45 days to review the findings and file with the clerk of the legislative body of such town or county a resolution that reports its recommendation on the proposed road designation. Where the designation is not recommended, the school board or the planning board shall set forth in said resolution the reasons for not recommending such designation.

3. The legislative body may, by resolution, accept, accept in part, or reject the recommendations of either the school board or planning board prior to any vote upon the proposed local law or resolution.

IV. Posting of signs. In order to promote driver awareness and safety, the rural county or town legislative body shall direct the county or town highway superintendent to post Minimum Maintenance Road signs as designed by the New York State Department of Transportation in conformance with the New York State Manual of Uniform Traffic Control Devices.

V. Discontinuation of local designation.

1. Any person or persons owning or occupying real property abutting a road or road segment which has been designated a Minimum Maintenance Road in accordance with these guidelines may petition the county or town having jurisdiction over such road. The petition shall identify the road or road segment to be discontinued as a Minimum Maintenance Road, and set forth the reasons for such discontinuance. The county legislature of the county or the town board of the town having jurisdiction over such road or road segment shall hold a public hearing upon such petition within 45 days after its receipt, with at least ten days public notice given prior to the conduct of the public hearing. Where the county legislature or the town board after such public hearing determines that the road or road segment shall continue as a Minimum Maintenance Road, no further petitions may be submitted for discontinuing the designation until the lapse of at least two years from the date of the filing of a petition as noted above. Where it is determined that the road or road segment shall be discontinued as a Minimum Maintenance Road, such discontinuance shall take effect six months after the commencement of the next fiscal year of the affected town or county.

2. As an alternative to the above petition process for discontinuation of a Minimum Maintenance Road designation, the county or town legislative body having jurisdiction over a Minimum Maintenance Road may adopt a local law or resolution on their own initiative to discontinue such Minimum Maintenance Road designation, where it determines such action to be in the public interest.

Maintenance Activities

Table 5 lists a variety of activities that can be used for maintenance of the road surface, roadside, bridges, and signs. These activities will be briefly described here.

Surface Maintenance

Crack Sealing -manually pouring hot asphalt, with or without a fiber reinforcement material, into road surface cracks that have first been cleaned of all loose debris, vegetation, etc. The cracks may occur at construction joints, utility cuts, or just be random due to the effects of time, weather, loads, etc. Crack sealing has been found to be a very cost-effective measure, because it prevents the entry of water into the base course and sub grade. By blocking the entry of water, crack sealing indirectly strengthens the load supporting capability of the road.

Patching and Potholes -placement and compaction of asphalt concrete into surface defects, such as potholes, which have first been cut back to sound material and cleaned of loose debris, water, etc. While a certain amount of this work will have to be done on an emergency basis during inclement weather to provide a safe road, expedient patches should be replaced with permanent patches using proper methods and materials when conditions are favorable. Extensive patching and potholes is all indication that a pavement has reached the end of its functional life, and the road should be scheduled for rehabilitation in accordance with the guidelines in Chapter II.

Surface Seals -also known as "chip seals," this method involves spraying a rapid-setting emulsified asphalt onto the road surface, followed immediately by the placement of a single layer of clean, crushed stone particles. A pneumatic, rubber-tired compactor is used to press the stones into the asphalt before the emulsion sets up. Chip sealing is used where the surface cracking is more extensive, while manual crack sealing is used where the cracking is less extensive. Chip sealing may also be used to enhance skid resistance on a slippery road. Where water entry is prevented by the surface seal, some strengthening of the road will result.

Thin Overlays- while "thin" is a relative term; it is used here to refer to hot-mix or cold-mix overlays having a thickness of 1 ½ inches or less. This method adds more to the structural capability of the pavement than does a chip seal. However, it performs much the same function as a chip seal, although it can be expected to have a more lasting effect. When a thin overlay is placed on a paved road, it is customary to use a tack coat to promote a bond between the old surface and the overlay. According to the Asphalt Institute, the tack coat should be sprayed from a distributor, allowing adequate time for it to become "tacky" before paving. Traffic should be kept off the tacked area before paving. They recommend using an SS-1 or a CSS-1 asphalt emulsion diluted 50-50 with water, and applied at a rate of 0.05 to 0.15 gallons per square yard. Application of tack coat a higher rates should be avoided, as this can lead to slippage of the overlay or "bleeding" and loss of skid resistance on the surface of the overlay.

Snow Removal - Snow and ice control are performed to foster safety and to expedite travel during the winter months. Blading of snow is done to remove it from the roadway to prevent the buildup of ice. Abrasives (sand, usually mixed with salt) are used to enhance traffic ability during a storm or immediately afterward when a thin layer of ice or snow remains on the road. Salt is used to lower the melting temperature of the ice, and to diminish the bond of the ice on the road surface.

Shoulder Maintenance -activities may differ depending on whether the shoulder is paved or unpaved. The objective is to keep the surface smooth so that moving vehicles can leave the main roadway safely, and also to assure that water from the road will move across the shoulder and into the ditch or gutter. It is particularly important to remove the accumulated winter maintenance abrasives from the shoulders to prevent the retention of water near the edge of the pavement.

Blading -for aggregate roads and unpaved shoulders, blading removes potholes, corrugations, and other surface defects, rendering the surface smoother and safer to travel on. Blading is usually preceded by scarification to a depth slightly deeper than the deepest surface defects. Blading should be used to establish a cross-slope of 4 to 6 percent (½ to ¾ inch per foot) for good drainage and to reduce the development of potholes in the aggregate surface.

Regraveling -the addition of aggregate materials to re-establish the crown and grade of the road. This activity is commonly done at the same time as blading, but less frequently. The new aggregate is needed periodically to make up for materials that have been lost due to traffic, water erosion, dusting, and blading losses.

Dust Palliation -application of water, calcium chloride, sodium chloride (salt), lignin sulfonate, or other non-toxic chemicals to bind the surface and prevent loss of dust. Dust loss leads to the gradual erosion of the road surface, reducing its thickness and load supporting capability. Dust can make summertime travel hazardous when traffic volumes are sufficient to require passing maneuvers. Sometimes the use of dust palliatives will reduce the need for blading and regraveling to a sufficient degree to be highly cost-effective.

Roadside Maintenance

Cleaning -picking up litter and other roadside debris, principally for aesthetic reasons, but also to protect the flow capacity of culverts and ditches.

Mowing -cutting grass and weeds. This is particularly important near driveways and intersections, to provide a clear line of sight for traffic.

Brush Control -cutting woody shrubs to prevent encroachment onto the right-of-way. This is important to provide adequate sight distance, particularly around the inside of curves, and at driveways and intersections.

Guiderail Maintenance -replacement of damaged, ineffective guiderail. This may also involve use of herbicides to retard the growth of weeds and shrubs in front of and immediately behind the guiderail.

Drainage -cleaning debris from the inlets and outlets around culverts, and cleaning ditches to maintain flow capacity. When possible, ditches should be cleaned in the late spring of the year, so that vegetation will be quickly re-established to protect against erosion. At other times, reseeding may be necessary for erosion protection.

Slope Maintenance -remove landslide debris, cut and remove trees from fill slopes, protect against erosion due to runoff from the road surface or ditches, seed slopes to retard erosion.

Bridges

Bridge Maintenance -cleaning of drainage scuppers, lubrication of pins and bearings, painting of beams and railings, cleaning and patching of deck surface defects, removal of winter maintenance abrasives and salt residues, protection of bridge abutments against scour and erosion, inspection of abutments, clearance of the waterway to maintain flow capacity.

Signs

Sign Maintenance –clearance of shrubs and trees obstructing visibility, replacement of damaged signs, verification that signs aloe used and placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

Effect of Surface Condition on the Choice of Maintenance Versus Rehabilitation

Road surface condition can be rated from poor to excellent using a 1 - 10 scale as shown in Table 6. The rating system is applicable to segments of a road system (lengths ranging from one-quarter mile to over one mile), not to individual locations on a given road. Both paved and unpaved roads can be rated using this system.

The rating system can be useful in two ways. First, it can be used to determine whether a road segment needs maintenance or rehabilitation or reconstruction. Second, it can be used to prioritize projects where funds are too limited to take care of all of the rehabilitation needs in a single year. Generally, preventive maintenance activities are cost effective on pavements with a Surface Condition Rating of 6 or higher and rehabilitation techniques are appropriate for pavements with a Surface Condition Rating of 5 or lower.

Four treatment strategies might be considered for roads, depending upon their Condition Rating:

A. **Routine Maintenance** -perform the various preventive maintenance activities described previously in this chapter. Every effort should be made to completely fund all road preventive maintenance needs every year, since in the long run this is the most cost-effective alternative.

B. **Defer Action** -begin planning for rehabilitation. Perform only those vital maintenance activities that are necessary to protect the safety of the traveling public.

C. **Rehabilitation** -perform a capital improvement such as

- Overlay (thickness greater than I Y2 inches)
- In-place Recycling

to restore the structural strength and ride quality of the road. Projects should be selected on a priority basis, according to a procedure that considers the condition and the importance of the road. However, for a variety of reasons it may not be possible to do all projects in priority order.

D. **Reconstruction** -perform a more extensive capital improvement such as

- Base stabilization with a new or recycled surface
- Total reconstruction with new materials

TABLE 6
RATING SCORES FOR PAVEMENT SURFACE

Score	General Condition	Unpaved Roads Distress Frequency*	Paved Roads Distress	Severity
10	Excellent	None, recently constructed or reconstructed	None, recently constructed or reconstructed	---
9	Excellent	None, recently regraveled or bladed	None, recently resurfaced	---
8	Good	Infrequent (0 -5%)	Ravelling, cracking, wheel track wear	Very Slight
7	Good	Infrequent to occasional (5 -10%)	Ravelling, cracking, wheel track wear	Slight
6	Fair	Occasional (10 -20%)	Ravelling, cracking, rutting, patching may exist	Moderate
5	Poor	Occasional to frequent (20 -50%)	Ravelling, cracking, rutting, patching may exist	Moderate to severe
4	Poor	Frequent (50 -75%)	Ravelling, cracking, rutting, patching may exist	Severe
3	Poor	Very frequent (75%+)	Ravelling, cracking, rutting, patching may exist	Severe
2	Poor	Extremely deteriorated motorist discomfort, travel difficulty	Extremely deteriorated, motorist discomfort, travel difficulty	
1	Poor	Impassable	Impassable	

Note: * Percent of surfaced distress is in parenthesis

Generally reconstruction is done where the surface condition is badly deteriorated, and where the in situ materials are insufficient in thickness or in quality to warrant constructing additional layers on the surface of the old road. Reconstruction is usually required where a substantial increase in structural strength is needed, due to increased traffic or heavier vehicles. Due to the high cost of such projects, a lead time of several years is usually required for planning, design, and budgeting. Usually, these types of projects will be most cost-effective if done under contract.

After funds have been provided for the cost effective preventive maintenance activities, project ranking for rehabilitation and reconstruction projects can be done by jointly considering the Condition Rating and the Importance Rating of each road segment. One scheme for determining the Importance Rating is given in Table 7. In this method, the classification score is multiplied by the traffic score to determine the Importance Rating.

A road that has a high Importance Rating and which has a very low Condition Rating would have a high Priority Rating. It is possible that a Collector Road with an ADT above 400 and a Condition Rating around 2 might have a Priority Rating near 300. Most typical Priority Ratings for low-volume roads will fall between 20 and 100.

Projects with the highest Priority Ratings should be rehabilitated or reconstructed first. For a road system that is badly deteriorated, there will ordinarily not be sufficient money to rehabilitate all of the projects in a single year. By use of this management method, the most beneficial rehabilitation and reconstruction projects will be identified so that they can be built first.

The systematic approach outlined in this section illustrates how a surface Condition Rating can be used to identify roads and road segments that should be scheduled for maintenance versus those that should be scheduled for rehabilitation. Furthermore, in combination with an Importance Rating, roads can be prioritized for rehabilitation or reconstruction by use of the Condition Rating. This method of management assures that the limited resources of every rural local government can be targeted to the projects that will produce the widest range of benefits for the taxpayers. The method is simple, and straightforward, and it does not require the use of a computer, although a computer can certainly be used if one is available.

TABLE 7
DETERMINATION OF IMPORTANCE RATING

Road Classification	Score
Collector	6
Residential Access	5
Farm Access	5
Resource/Industrial Access	4
Agricultural Land Access	2
Recreational Land Access	1

Average Daily Traffic	Score
More than 400	10
250 to 400	6
50 to 250	3
Less than 50	1

To illustrate the use of Table 7 to determine an Importance Rating, presume that a road segment was classified as Farm Access, and that it had 150 ADT. The Road Classification Score is 5, and the ADT Score is 3, so the Importance Rating is 5 x 3 = 15.

To establish the Priority Rating, divide the Importance Rating by the Condition Rating according to the following equation:

$$Priority\ Rating = \frac{Importance\ Rating}{Condition\ Rating}\ X\ 10$$

Thus, if the Farm Access Road in the example above had a Condition Rating of 5, its Priority Rating would be:

$$Priority\ Rating = \frac{15}{5}\ X\ 10 = 30$$

CHAPTER IV

GUIDELINES FOR TRAFFIC CONTROL ON LOW VOLUME LOCAL ROADS

This chapter delineates recommendations for traffic control on low volume rural town and county roads. It is intended to describe methods of traffic control that are cost effective, promote safety and do not subject local government or officials to unwarranted potential liability.

SIGNS ON NORMAL MAINTENANCE ROADS

Local authorities are authorized in Section 1682 of the Vehicle and Traffic Law to decide conditions to which drivers are to be alerted with traffic control devices. It is mandatory to provide signs indicating weight restrictions, low clearances, dead end roadways, railroad crossings and road closures. These are specified elsewhere in Law. On low volume-roads subject to normal maintenance activities, the decision regarding the need for other signs should be based on the principle of positive guidance. In essence, this principle suggests that hazard warnings be provided whenever a driver cannot anticipate a hazard in time to react safely.

When a local highway official decides that a condition on the local highway system is potentially hazardous, appropriate signing, in conformance with the NYSMUTCD, is to be provided. The New York State Department of Transportation's "Traffic Sign Handbook for Low Volume Roads" may be helpful in determining the type and location of signs to be used, once the need for a sign has been established.

Features that are inconsistent with the general driving environment should be identified and analyzed for the possible installation of signs. Identification can be made by driving over the highway and noting if a reduction in speed is necessary or if a surprising or unanticipated feature is encountered. Such things as isolated curves or narrow bridges, especially those with limited sight distance, should be evaluated for a "surprise" factor. Signs at every curve are generally not necessary on low volume local roads as drivers are cognizant of conditions. Signs should be restricted to those features that the superintendent determines are inconsistent with the general highway environment and cannot be anticipated early enough for drivers to take appropriate defensive action. Records of all determinations should be made and properly filed for future reference.

SIGNS ON DESIGNATED MINIMUM MAINTENANCE ROADS

Design of road signs. The NYS Department of Transportation has designed signs for posting minimum maintenance roads. Such signs notify and advise motorists that reduced levels of maintenance are in effect. These signs are contained in the NYS Manual of Uniform Traffic Control Devices.

Installation of signs. Minimum maintenance road signs shall be installed at each end of the minimum maintenance section and immediately beyond intersections with other public roads. The maximum distance between signs should not exceed two miles. Additional installation conditions are set forth in the Manual. Posting of minimum maintenance road signs will not relieve rural counties or towns of their responsibility to post other legally-required signs such as railroad crossings, dead ends, bridge capacity, low clearance and road closures.

APPENDICES

APPENDIX 1

8/86

Date: _____
By: _____

ECONOMIC ANALYSIS WORKSHEET FOR BRIDGES
(see instructions)

PIN (when available): _____
BIN: _____

Project Characteristics:
replacement _____
rehabilitation _____

COUNTY: _____
DESCRIPTION:

NYS condition rating (CR): _____
Crossing life w/ project: _____ yrs.
Crossing life w/out project: _____ yrs.

Functional Class System: _____

Present Link Length (between detour limits)
PL = _____
Detour Length DL = _____
DL/PL = _____
Current Traffic AADT: _____

Construction cost ($1000): _____
Design & Const Engr: _____
ROW cost: _____
Other (approach, MOT): _____

Estimated project cost: _____

BASE BENEFITS ($1000):
See following pages for Unit Benefits (VB) and Life Factor:
UB _____ x PL _____ x AADT _____ x LIFE FACTOR _____ = BB = _____

OTHER CONSIDERATIONS (check and detail below as per instructions):

Dead end road: _____
School bus use: _____
Emergency service: _____
Community sentiment: _____
Related investments: _____

BENEFIT COST RATIO:

PROJECT USER BENEFITS/PROJECT COST = _____

INSTRUCTIONS FOR
BRIDGE ECONOMIC ANALYSIS WORKSHEET

1. An economic analysis should be done for all proposed bridge replacements and rehabilitations. The worksheet provides a rapid and uniform method to demonstrate that a proposed bridge replacement or rehabilitation is a cost-effective use of public funds. The proposed analysis gives a reasonable measure of the bridge's relative economic value to the transportation network. It does this by assessing the hypothetical costs of abandoning the bridge against the costs of needed improvements. The economic analysis is not, however, the only factor, or necessarily the most important factor in project selection. Other factors that should receive appropriate weight are indicated under "other considerations. 'I

2. Estimated project costs should include all costs associated with the project. This includes the costs of approach work, design and construction engineering, right of way, construction, maintenance of traffic (MOT) and improvements for construction detours. Costs should be in 1985 dollars as the worksheet is calibrated to a 1985 present worth analysis.

3. Detour limits, detour lengths and present link lengths are defined as follows for the link network shown here.

   Detour Limits: A and B

   Present Link Length (PL): AB

   Detour Length (DL): ACDB

This diagram represents the general Case. In more complex instances, where an accounting for diverse traffic origins and destinations and several detour possibilities is needed, estimate the proportion of the present bridge traffic diverting to each significant detour. Label and fill out a worksheet for each detour. The benefits are additive, so then sum them on the primary worksheet.

4. The average annual daily traffic (AADT) is available from the current deficient bridge listing. Explain if another source is used.

5. BASE BENEFITS are calculated as shown on the worksheet. Unit Benefits (VB) and the life factor are obtained using the following tables.

The UNIT BENEFIT is the savings of not having to use the detour, per vehicle mile of present link lengths. The LIFE FACTOR provides the relative present worth value of the project based on its life and the remaining life in the current structure.

UNIT BENEFIT values reflect consideration of vehicle operating costs, time costs, and construction detour costs. Benefits are in $1000s. ASSUMED: 50 year project life; 10% interest rate; 1985 dollars; detour speed 40 mph with at least 5 mph higher speed on present routes; 10% trucks; 5% reverse traffic with half having both origin and destination within detour limits.

UNIT BENEFITS

($1000s)

DL/PL	UB	DL/PL	UB
1.0	0.085	3.0	1.952
1.2	0.272	3.5	2.419
1.4	0.459	4.0	2.885
1.6	0.645	4.5	3.352
1.8	0.832	5.0	3.819
2.0	1.019	6.0	4.752
2.2	1.205	7.0	5.685
2.4	1.392	8.0	6.619
2.6	1.579	10.0	8.485
2.8	1.765	20.0	17.819

6 The LIFE-FACTOR is 1.00 for a bridge replacement with estimated 50 year project life and no significant remaining life of the existing bridge. For rehabilitation projects, and for replacement where there is remaining life, determine the life-factor from the following table:

LIFE FACTORS**
CROSSING LIFE WITHOUT PROJECT (YEARS)

CROSSING LIFE WITH PROJECT	0	2	4	6	8	10	15	20	25	30	35	40
5	0.38	0.21	0.06									
10	0.62	0.44	0.30	0.18	0.08							
15	0.77	0.59	0.45	0.33	0.23	0.15						
20	0.86	0.68	0.54	0.42	0.32	0.24	0.09					
25	0.92	0.74	0.60	0.48	0.38	0.30	0.15	0.06				
30	0.95	0.78	0.63	0.51	0.41	0.33	0.18	0.09	0.04			
35	0.97	0.80	0.65	0.53	0.43	0.35	0.21	0.11	0.06	0.02		
40	0.99	0.81	0.67	0.55	0.45	0.37	0.22	0.13	0.07	0.04	0.01	
45	0.99	0.82	0.68	0.56	0.46	0.38	0.23	0.14	0.08	0.04	0.02	0.01
50	1.00	0.82	0.68	0.56	0.46	0.38	0.23	0.14	0.08	0.05	0.03	0.01

NOTE: (1)**Assumed 10% Interest rate.

Remaining crossing life without project (L) should be estimated based on professional judgement. The following formula based on the NYS Bridge Condition Rating (CR) maybe used as a guide:

Est. Life -high: L = CR x (CR—1)
-low: L = CR x (CR--2)

7. OTHER CONSIDERATIONS should be used to describe circumstances or unique problems that influence programming decisions and/or project priority.

- SCHOOL BUSES: indicate the total number of round trips per day, when available.
- EMERGENCY SERVICE: indicate those services materially dependent on the bridge (e.g., a nearby hospital or firehouse)
- COMMUNITY SENTIMENT: indicate how this bridge, compared to similar bridge projects, is viewed. Rate the intensity of sentiment from 1 to 5, where 1 is indifference, 2 is average, and 5 is extraordinary.
- DEAD END ROADS: check the box and indicate the number of people or households served; the nature and probable value of property on the dead-end portion of the road. In this case, the B/C calculation is simply the property value divided by the project cost.
- NEARBY INVESTMENT: indicate other upcoming projects, major needs, or developments which will affect this roadway link.
- ADDITIONAL CIRCUMSTANCE: point out other items of unusual significance if relevant.

APPENDIX 2

Forecasting Traffic on Rural Roads

A reasonably accurate forecast of traffic on local rural roads can be easily calculated by using the following formula: Forecast traffic = present traffic x (1 +0.314 x % change in town households)[1].

Percent change in households over the forecast period in the town in which the road is located can be obtained from the NYSDOT regional office or county planning department. Generally, traffic should be forecast over the projected life of the improvement. The following tables[2] lists some guidelines for projecting traffic and definitions of the types of projects.

EXAMPLE CALCULATION: 10 year projection

Present traffic = 100 vehicles/day
Town households 1988 = 2500
Projected households 1998 = 3500
Change = 3500-2500 = 1000
% change = $\frac{1000}{2500}$ = 40%

FORECAST TRAFFIC = Present traffic (1+0.314 x % change in town households).

= 100 (1 + 0.314 x .40)
= 113

PROJECT TYPE	PROJECTION
Highways	
New Construction	Completion date + 20 years
Major Reconstruction	Completion date + 20 years
Minor Reconstruction	Completion date + 10 years
Rehabilitation	Completion date
Bridges	
New Bridge	Completion date + 30 years
Replacement	Completion date + 30 years
Major Rehabilitation	Completion date + 20 years
Minor Rehabilitation	Completion date + 10 years
Nonstructural	Completion date

[1] *Source: NYSDOT Transportation Analysis Report #3 "Quick Response Procedures to Forecast Rural Traffic"*
[2] *Source: NYSDOT Design Traffic Forecast Policy, 1983.*

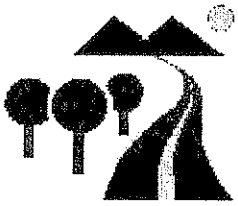
Bridge project types are defined as follows:

New Bridge	Construction of anew bridge where none existed previously.
Replacement	Replacement of an existing bridge at essentially the same location. Includes new superstructure on existing substructure.
Major Rehabilitation	Structural restoration of an existing bridge, which includes the complete removal and replacement of the bridge deck.
Minor Rehabilitation	Structural restoration of an existing bridge, which does not included total deck replacement, but may include deck overlays.
Non-Structural	Work that occurs at a bridge but is not structural in nature, such as resurfacing, minor deck patching or repair, curb or railing repair, scupper or drainage repair, etc.

APPENDIX B:
Guidelines and Standards for Classifying and Managing Roads and Streets

Guidelines and Standards for classifying and managing roads and streets

April 2002



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Municipalities should have a set of realistic road construction standards to: reduce liability, improve planning and scheduling, and provide consistent information to the motoring public. While there is no legal requirement to have a set of standards, the municipality could be held to a very uncompromising set of standards in a lawsuit. Having a set of appropriate standards and following it is defendable in court. In addition, municipalities need to have a plan to correct deficiencies. Roadway standards will be used help define deficiencies. Four alternative standards are available to municipalities in New York State:

A Policy on Geometric Design of Highways and Streets, 2001 , AASHTO ;
Manual: Guidelines for Rural Town and County Roads, 1992,;
Guidelines for Geometric Design of Very Low-Volume Local Roads, 2001, AASHTO;
Locally developed municipal-specific standards.

***A Policy on Geometric Design of Highways and Streets,* 2001, AASHTO "Greenbook"**

The American Association of State Highway Transportation Officials (AASHTO) "Greenbook" is a set of national standards for geometric design and construction of all types of roadways from freeways to local roads and streets. The standards were developed for a national audience and portions may not be applicable for every municipality. The "Greenbook" provides good information and details about design and construction of the geometry of all roadways, particularly for roads with an average traffic of more than 400 vehicles per day (ADT).

Manual: Guidelines for Rural Town and County Roads, NYS Guidelines

The *NYS Guidelines* are an alternative set of standards for classification and management of low-volume roads (i.e., less than 400 ADT). Developed specifically for New York State, the *NYS Guidelines* establish appropriate standards for speed, construction and maintenance which are consistent with the needs and uses of these roads. A new designation, the *Minimum Maintenance Road*, allows reduced maintenance on certain classes of roads and may allow better utilization of tax dollars. The *NYS Guidelines* also provide an easy mechanism for judging existing conditions, determining needs, and establishing priorities.

Guidelines for Geometric Design of Very Low-Volume Local Roads,* 2001, *AASHTO LVR Guidelines

The *AASHTO LVR Guidelines* is a national standard for geometric design of ver low-volume (<400 ADT) local roads. Developed under a national committee, the *AASHTO LVR Guidelines* examine the challenge of designing for very low traffic volumes and address "the unique needs of such roads and the geometric designs appropriate to meet those needs." Many of the recommendations in the *AASHTO LVR Guidelines* are similar to the *NYS Guidelines* but more details are provided on geometric aspects of road design. Also, there is guidance for very low-volume urban streets.

Locally developed municipal-specific standards

A municipality may elect to develop its own standards and adopt them as the official municipal policy. They should be defendable in court. The municipality should have the standards developed by a Professional Engineer and reviewed by the municipal attorney. A municipality may elect t use portions of the above three standards but need to be sure to decide which standard to follow when there is a conflict.

WHICH STANDARD TO USE

Unless a municipality develops its own standards, it should choose between one of the three standards described above. For roads with more than 400 vehicles per day (400 ADT), the AASHTO "Greenbook" is the standard which must be followed.

Traffic Volume	AASHTO "Greenbook"	*NYS Guidelines*	*AASHTO LVR Guidelines*	Municipal-specific
400 ADT	Appropriate	Appropriate	Appropriate	Appropriate
> 400 ADT	Appropriate	NOT Appropriate	NOT Appropriate	Appropriate

Implementation Process for roadway standards

The following is a recommended implementation process which should be used with **all** standards so as to provide the maximum protection from liability and consistent information to the public.

- *Adopt* the AASHTO "Greenbook," the *Guidelines,* a combination of the two, or Municipal-specific standards
- *Classify* local roads by volume, type of vehicles, land use, and seasonality of use
- *Determine* existing conditions of the pavement, roadside, signs, drainage, and alignment
- *Identify* what needs to be done to meet design standards
- *Rank* the needs and *prioritize* the work to be done
- *Develop* and *implement* an action plan

Myth 1: Municipalities do not need to have adopted standards.

If a municipality does not have standards for constructing and maintaining roadways, it may be held to the AASHTO "Greenbook" or other prevailing standards if it is taken to court. The "Greenbook" does not, for example, have standards that match the way many low-volume local roads are actually constructed and maintained in New York State. Without adopted standards, the municipality may have to defend the work on a road based upon a standard brought to court by the plaintiff's attorney. Can you?

Having adopted standards which are realistic and defendable in court reduces the risk to a municipality.

Myth 2: Having a plan to repair deficiencies highlights the deficiencies and puts more risk on the municipality.

When taken to court for negligence, the municipality will be asked whether a reasonable plan was in place to repair the deficiency and whether the plan was being followed. The courts do not say that all deficiencies must be fixed immediately. That would be unreasonable and unattainable. However, in lieu of a written plan, the municipality has to prove it was acceptable not to fix a given condition before an accident occurred. Can you?

Having a written plan to repair deficiencies which is being followed reduces the risk to a municipality.

How can the Cornell Local Roads Program help?

Guidelines

The Cornell Local Roads Program provides training and assistance for implementation of the *Guidelines*. The information is also applicable for implementation of any set of standards. Municipalities can receive, for free, a package of items

including the *Manual: Guidelines for Rural Town and County Roads* and a model local law written with the help of the Association of Towns of the State of New York. Please call us at (607)-255-8033 for further information and assistance.

APPENDIX C:
Nuggets & Nibbles:
"An Option for Adoption"

NUGGETS & NIBBLES

Volume XVI, Number 3

Summer 1997

The "Guidelines for Rural Town and County Roads"

Lori French, Program Assistant
Lynne H. Irwin P.E., Director

An option for adoption

IN THIS ISSUE...

1997 Cornell Local Roads Program LTAP Center survey: And the survey says.....4

The 25% solution: Roadway and Roadside Drainage.....5

Publications.....6

Multimedia training for loan.....7

52nd Annual School for Highway Superintendents.....10

Hazard trees = Accidents waiting to happen.....11

Calendar.....12

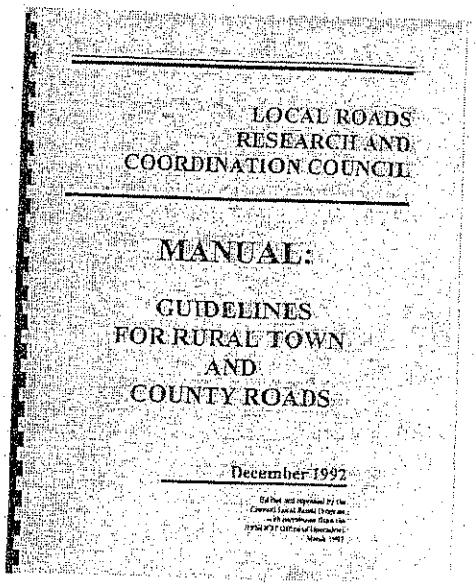
Since its inception several years ago the manual, ***Guidelines for Rural Town and County Roads***, has caused local municipalities across the state to take notice and begin action to adopt it into local law. One of the critical elements in making the *Guidelines* a success is having the active support of the town supervisor.

Bob Spaulding, Town of Caroline Supervisor, plays a unique role in that he has made the adoption of the *Guidelines* by local municipalities a personal mission.

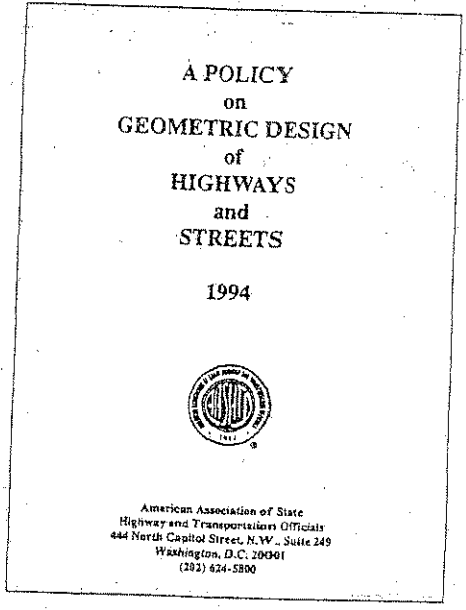
Spaulding speaks at local government meetings and conferences informing rural towns of the liability protection that adopting the *Guidelines* can afford them, and stressing the importance of town supervisors to take leadership in the adoption process.

The *Guidelines* are an alternative to the only existing design standards for local roads, the American Association of State Highway and Transportation Officials (AASHTO) manual, *A Policy on Geometric Design of Highways and Streets*.

The *Guidelines* are more closely tailored to the prevailing standards that rural, local roads in New York State use. The *Guidelines* are based on the traffic volume and roadside land use of a road. Appropriate



VS.



[Continued on page 2, see "Guidelines..."]

RSMS
SIMS
MEMS

Computer programs for highway agencies...

What's happening!

- **RSMS – Road Surface Management System**
  The last DOS–based version, RSMS96, is out. This summer's student intern program was still using RSMS96. When sites are found, we will plan ½–day training sessions on the new program, ***RSMS97,*** near Rochester and the Hudson River valley. Release of the RSMS97 program is expected in Spring 1998.
- **SIMS – Sign Inventory Management System**
  The BETA version of the first Windows version of SIMS is being tested. Expected release is late fall 1997. We may have a summer program similar to RSMS next summer if there is interest.
- **MEMS – Municipal Equipment Management System**
  The release date of the new version of MEMS is currently unknown.

Watch coming newsletters for more details. ■

["...Guidelines," continued from page 1]

maintenance levels for low–volume local roads are also recommended in the *Guidelines*. The AASHTO manual does not address the issue of maintenance levels.

Minimum maintenance designation

Another option offered by the *Guidelines* is enabling a municipality to designate a road as minimum maintenance. The designation can be made only after extensive public hearings, and then only on non–residential roads with fewer than 50 vehicles per day. The procedure for designating minimum maintenance roads is defined in the *Guidelines*.

"Minimum maintenance does not mean no maintenance nor is it a means to abandonment," points our Bob Spaulding. A minimum maintenance designation is an *alternative* to abandonment and to a seasonal limited–use designation. The road is still maintained, but only according to its usage and need. The best candidates for minimum maintenance are those roads currently named as seasonal limited–use.

Public hearings

Before adopting the *Guidelines* by means of a local law, the municipality should first inform its residents at a public hearing. Announcing the hearing and providing basic information on the *Guidelines* in the local newspaper provides excellent coverage.

The public hearing is necessary to address the questions and concerns of the municipal residents. Following the hearing, the Board can then vote on the resolution.

Typically, the towns that have already adopted the *Guidelines* have found that one public hearing is sufficient. However, depending on the concerns of the public and the conditions of the town roads, more than one hearing may be necessary.

Public hearings are necessary to address the questions and concerns of municipal residents

Although residents voice concerns at public hearings over the new standards, they soon reap the benefits due to more uniform travel conditions. As neighboring towns complete the *Guidelines* adoption process and begin implementing its standards, the general public realizes greater safety while traveling. They become accustomed to a consistent standard of road construction and maintenance across townships.

If a municipality chooses *not* to adopt the *Guidelines*, its roads may be held to the AASHTO standards for local roads and streets in the event of a motor vehicle accident.

...the theme often remains the same, reducing costs and liability...

While liability protection is a major concern, towns are also benefiting by an easing in their tightly–belted budgets.

Differing sets of circumstances and road issues have led towns to consider adopting the *Guidelines*. However, the theme often remains the same, *reducing costs and liability*.

Town of Caroline

In the Town of Caroline (Tompkins County), a property owner on a seasonal, limited–use road asked the Town Board to keep the road open all year. A projected cost of $400,000 for approximately a half–mile section was estimated to provide up–to–standard maintenance on the road that accessed a single property valued at $45,000.

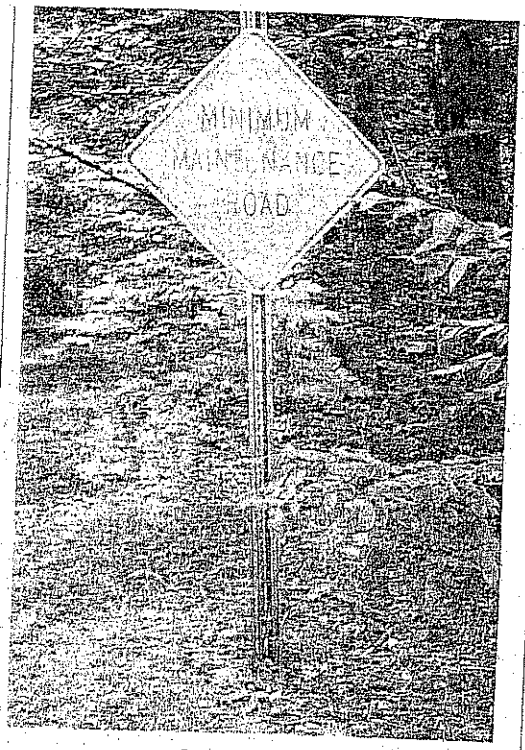
Much of this cost comes from the need to widen the traveled way, lengthen the culverts, and relocate and enlarge the ditches in order to permit modern equipment to keep the road open throughout the winter months.

The low–volume road did not have enough traffic to justify the expense to allow year–around use. Prior to the *Guidelines*, the town would have had no option to spending the money, but the *Guidelines* were adopted into local law in the Town of Caroline last year. Thus, the town was able to designate the road as a minimum maintenance road, thereby reducing the $400,000 figure.

Similar situation

A similar situation is happening in a town in Livingston County. A very short section of a town road (less than a half mile) leads to a parcel of land on which there is no dwelling. The property owner, who is considering selling the land, is insisting that the town improve the road.

The road section, more properly identified as a farm lane, will cost $250,000 to $300,000 to improve and bring up to AASHTO standards. If the town adopts the *Guidelines* into local law, it may be able to designate that road as minimum maintenance.



Posted sign, "Minimum Maintenance Road," Town of Caroline

Other towns which have adopted the "Guidelines"

We are aware of several towns in the process of adopting the "Guidelines." The following towns have informed us that they have completed the process:

- Town of Busti, Cattaraugus County
- Town of Mount Morris, Livingston County
- Town of Martinsburg, Lewis County
- Town of Enfield, Tompkins County

As this list continues to grow, we are interested in knowing about the successes, concerns, and solutions, you experience.

[Continued on page 8, see "Guidelines..."]

Towns ONLINE

The Association of Towns of the State of New York is now offering a new on–line service for folks involved in Town government.

The three layers of Towns ONLINE are:

- **NYTOWNS homepage**
  This service is available to *all* at ***www.nytowns.org***. It includes basic information about the Association and New York State towns in general. The second layer, *Members Only*, will be accessible from here.
- **Members Only**
  Officials and employees of member towns will be able to access this site via a code given to member Town Supervisors. It includes legislative information, resolutions, links to other sites, and other valuable information. Members who choose to subscribe to *Towns ONLINE* will eventually be able to log on from here. This service is currently being developed and will be available in the future.
- **Towns ONLINE**
  This optional, individual subscription–based service will include list services, conferencing, database and document searching, frequently asked questions, and much more.

For more information contact Tom Bodden at (518) 465–7933.

Get software assistance online

Have you noticed the manuals that come with software are getting thinner? Where has all the information that you used to get in print gone? ONLINE!

Many companies have set up Frequently Asked Questions (FAQ), troubleshooting, how–to guides, and newsgroups included in their Web pages.

Here are a few addresses of popular software companies to help you along:

Adobe Systems, Inc.:
http://www.adobe.com

America Online:
http://www.aol.com

Claris:
http://www.claris.com

CompuServe:
http://www.compuserve.com

Corel and WordPerfect:
http://www.corel.com

Lotus:
http://www.support.lotus.com

Microsoft:
http://www.microsoft.com

Netscape Communications:
http://www.home.netscape.com

Novell:
http://www.novel.com

Peachtree software:
http://www.peachtree.com

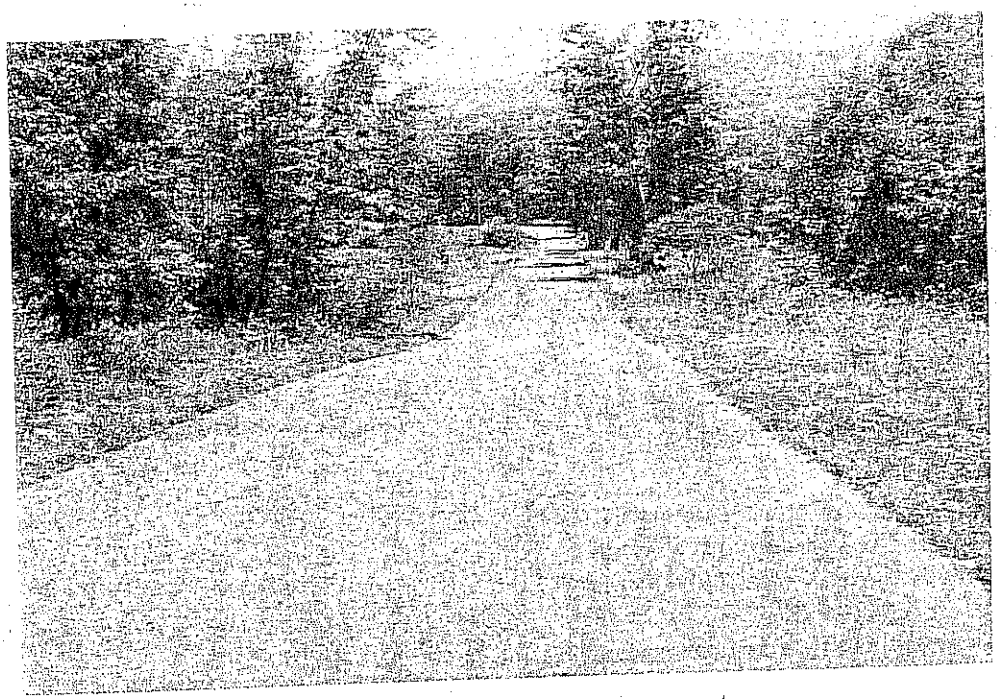
Prodigy:
http://www.prodigy.com

["...Guidelines," continued from page 3]

Upgrading a seasonal limited–use road to AASHTO standards

Let's look at a prime example of upgrading a seasonal limited–use road to meet AASHTO standards. This information is provided by a suburban town in upstate New York. The town in this case has not adopted the *Guidelines* into local law.

Town road in Tompkins County prior to upgrading



Same road after upgrading for year–around use

Due to pressure from a property owner, the town was forced to take on the major task of upgrading just under a half mile (.4 mile) of this seasonal limited–use road to meet AASHTO standards.

The reconstruction work included:

- Widening the road to 30 feet (two 10–foot lanes and two five–foot shoulders)
- Relocating the ditches
- Lengthening culverts to 40 feet
- Installing 18 inches of gravel
- Chip sealing

Based on reports from local highway officials, the cost for this sort of reconstruction ranges from $250,000–$450,000 per mile. The figures do not include maintenance costs. All rural roads may not require a 30–foot width, however, widening the traveled way, lengthening culverts, and relocating and enlarging ditches is essential for winter maintenance operations.

After the "Guidelines" adoption

Let's say you have presented the *Guidelines* adoption proposal to your board and the public, addressed their questions and concerns, and the *Guidelines* have been adopted into local law. What's next?

- Classify your local roads by doing an inventory, obtaining traffic data, and identifying adjacent land use
- Determine the existing conditions of road surfaces, pavement and shoulder width, drainage, signs, and accident history
- Identify work which needs to be done in terms of rehabilitation, maintenance, and traffic control in order to comply with the *Guidelines*
- Rank the needs and prioritize the work
- Develop an action plan

Classifying your roads

A low–volume road is defined as a road carrying less than 400 vehicles per day.

The *Guidelines* define six types of low–volume road designations depending on the traffic volume and existing use of the road. And, each type of designation has its own standards for construction and maintenance.

Low–volume road designations

The low–volume road designations, as defined by the *Guidelines*, are:

- Low–volume collector
- Residential access
- Farm access
- Resource/industrial areas
- Agricultural land access
- Recreational land access

For more information...

For further information on the *Guidelines* adoption process, or to inform us of your experience with the adoption process, please contact Lori French at the Local Roads Program, (607) 255–7733.

Resources available from the Cornell Local Roads Program

We will be happy to do all that we can to help you in the process of adopting the classification *Guidelines for Rural Town and County Roads*.

The following resources are available from our program:

- The *Guidelines*
- *Classifying and Managing Low–Volume Local Roads* manual
- Model local law
- Instructions for filing the law
- Referrals to highway superintendents or town supervisors who have experienced the process and can answer your specific questions

To order any of these items, *free of charge for local highway officials*, please complete the order form insert in this newsletter and mail or fax it to us:

Cornell University
Local Roads Program
416 Riley–Robb Hall
Ithaca, NY 14853–5701

phone: (607) 255–8033
fax: (607) 255–4080
e–mail: clrp@cornell.edu

APPENDIX D:
Questions and Answers about the Guidelines for Low-Volume Rural Roads

QUESTIONS and ANSWERS
about the
GUIDELINES FOR LOW-VOLUME RURAL ROADS

What: The *Guidelines* are an alternative set of standards for classification of low-volume rural roads. The *Guidelines* establish appropriate standards of speed, construction, and maintenance which are consistent with the needs and uses of these roads. At present there is a single standard (AASHTO) for all rural roads.

Why: Increase costs and a shrinking resources ensure that there will never be enough money available to make all necessary improvements in a given period of time. The *Guidelines* provide realistic standards for road maintenance based on their usage. Reduced maintenance is permitted on roads with very low volumes, thus permitting scarce tax dollars to be utilized in maintenance of more highly traveled roads. The *Guidelines* also provide an easy mechanism for judging existing conditions, determining needs, an establishing priorities.

How: The following process can be used to classify and manage roads in our town:

1. Adopt the *Guidelines* by local law.
2. Classify local roads by doing an inventory, obtaining traffic data, and identifying adjacent land use.
3. Determine the existing conditions of road surfaces, pavement and shoulder width, drainage, signs, and accident history.
4. Identify of work which needs to be done in terms of rehabilitation, maintenance, and traffic control.
5. Rank the needs and prioritize the work.
6. Develop an action plan.

APPENDIX E:
Procedure for Implementation of Low-Volume Road Designation

TUG HILL COMMISSION TECHNICAL PAPER SERIES

TUG HILL COMMISSION
Dulles State Office Building, 317 Washington Street, Watertown, New York 13601
315-785-2380/2570 or 1-888-785-2380 fax: 315-785-2574
E-mail: tughill@tughill.org Web site: http://www.tughill.org

Procedure for Implementation of Low-Volume Roads Designation

Prepared by the NYS Tug Hill Commission

Information current as of January 2003

The following publications are necessary or useful to the process of low-volume roads designation and minimum maintenance road designation.

- "Adopting Local Laws in New York State," James A. Coon Local Government Technical Series, New York State Department of State, May 1998.

  Contact: NYS Department of State, 41 State Street, Albany, New York 12231, (518) 473-3355, 1-800-367-8488, www.dos.state.ny.us

- "A local law in relation to the classification of low-volume rural town roads; the establishment of maintenance and rehabilitation guidelines for such roads and the procedure to be followed to designate particular roads according to classification." A model local law prepared by the NYS Legislative Commission on Rural Resources.

  Contact: Tug Hill Commission, Dulles State Office Building, 317 Washington Street, Watertown, New York 13601, (315) 785-2380/2570, 1-888-785-2380, www.tughill.org, e-mail tughill@tughill.org

- "Manual: Guidelines for Rural Town and County Roads", Local Roads Research and Coordination Council, December 1992

  Contact: Cornell Local Roads Program, 416 Riley-Robb Hall, Ithaca, New York 14853, (607) 255-5437, www.aben.cornell.edu/extension/localroads/index.htm

- "Classifying and Managing Low-Volume Local Roads", by Donald N. Geoffroy, P.E., Cornell Local Roads Program, March 1996

  Contact: Cornell Local Roads Program, 416 Riley-Robb Hall, Ithaca, New York 14853, (607) 255-5437, www.aben.cornell.edu/extension/localroads/index.htm

The following are the steps to carry out low-volume roads designation and minimum maintenance road designation.

1. Town board holds public hearing on local law to implement "Guidelines for Rural Town and County Roads." Town board may use model local law developed by NYS Rural Resources Commission.

2. Town board adopts local law to implement "Guidelines for Rural Town and County Roads."

3. Highway superintendent establishes low-volume road classifications and findings for each road or road segment based on the workbook "Classifying and Managing Low-Volume Roads." Note: it is recommended that the superintendent establish the proposed ma intenance regime for each road or road segment for the first year or two as well, so as to inform the town board and the public of the superintendent's intentions.

4. Proposed low-volume road designations and findings are filed with the town clerk and a copy of the designation presented to each member of the town board by the town clerk within 10 days of filing.

5. Town board adopts resolutions accepting low-volume road designations. Designation becomes effective immediately.

The further "minimum maintenance" designation of roads classified as either agricultural or recreational access roads must follow the following additional procedures.

6. Highway Superintendent submits recommendations to town board on roads that should be designated minimum maintenance.

7. Town board prepares findings on any proposed minimum maintenance roads and a local law designating such roads, files them with the town clerk, and issues them to the board of education of the school district, town planning board, county planning board, and the general public for comment at least 60 days before the hearing.

8. The planning boards and school board shall file their recommendations with the town clerk within 45 days.

9. Town board notifies any property owners adjacent to proposed minimum maintenance roads by certified mail, 10 days before hearing.

10. Town board holds a public hearing on proposed minimum maintenance road designation local law.

11. Town board accepts, accepts in part or rejects the recommendations of the school board or planning board on proposed minimum maintenance roads.

12. Town board takes action on proposed minimum maintenance roads designation local law.

13. Minimum maintenance roads posted. Designation becomes effective upon posting.

APPENDIX F:
Standards for New Roads

Standards for new roads.
The following standards should be adopted by the municipality prior to their use. The items underlined like Town of Anytown should be replaced the correct information for the municipality. In addition, Some of the minimum values for the roadway design may be changed if necessary. Recommended values are included.

Town of Anytown

Supervisor - John Q. Public
Clerk – Jane Doe
1 Town Lane
Anytown, NY 12345

Highway Superintendent. – Tim Taylor
2 Town Road
Anytown, NY 12345

Standards for New Roads – Town of Anytown

GENERAL

1. The Town of Anytown, herein referred to as the Town, has adopted these standards for construction of new roadways to be dedicated as part of the Town road system.

2. All roadways to be taken over by the Town shall be certified they are in compliance with these standards by a Professional Engineer licensed to practice in New York State, herein referred to as the Project Engineer.

3. Before the roadway is taken over by the Town, a set of as–built plans approved by the Project Engineer shall be submitted to the Town Clerk and the Town Highway Department at the addresses shown on the top of these standards. Approval by the Highway Superintendent that the project meets the standards shall be required prior to acceptance by the Town board. Both the Highway Superintendent and the Town board must accept the roadway before it is accepted as part of the Town road system. The Town reserves the right to not accept a roadway, notwithstanding that all portions of these standards have been met.

4. All applications for the dedication of a roadway shall be accompanied by a proposed warranty deed conveying said highway to the Town, with all necessary releases from mortgages or other claimants. All deeds and plans must meet requirements for filing with the County Clerk.

5. For a subdivision, the plans must be submitted prior to start of construction. A construction plan showing erosion control and other pertinent information must be supplied for subdivisions.

6. As a minimum, the plans for the roadway shall provide the following:
   - Design criteria used,
   - The names of all the streets approved by County 911 Coordinator,
   - Location and alignment survey performed by a licensed surveyor that includes:
     - Original and finished grades
     - The layout and locations of all roads and streets and their metes and bounds,
     - The location of any property lines and their metes and bounds,
     - The location of the Town's right–of–way,
     - The location of other rights–of–way and easements including a statement of their allowable uses,
     - The location of all drainage structures,
     - The location of any utilities in the right–of–way,
     - The names of adjacent property owners to the roadway,
   - A maintenance plan for the roadway,
   - Location of all signs and traffic control devices, and
   - A cross section of a typical tangent section.

7. Clarification or exceptions to these standards shall be approved, in advance, by the Town Highway Superintendent in writing. Oral responses by the Town Highway Superintendent will not be considered as approved.

DESIGN and CONSTRUCTION

1. The roadway shall be certified to meet the requirements of the:
   a. *Manual: Guidelines for Rural Town and County* Roads, Local Roads Research and Coordination Council, December 1992; and
   b. *Local Low Volume Roads and Streets*, American Society of Civil Engineers, November 1992.

2. The requirements listed in these specifications are for low volume roads and streets with a maximum Average Daily Traffic (ADT) of 400 vehicles per day.
   a. Any roadway that does not meet the definition of a low volume roadway will require standards that are more stringent than those defined in these specifications. In such a case, the entire design must be approved before construction.
   b. Where a conflict exists between the two publications, the *Manual: Guidelines for Rural Town and County Roads* shall govern.
   c. All design criteria shall be listed on the roadway plans and any criteria not listed in the two publications listed above shall be determined using current engineering practice.
   d. The plans shall designate the source of any design assumptions.

3. In addition, as a minimum, the road shall meet the following criteria:
   a. A design life of not less than 15 years with routine maintenance,
   b. A right–of–way of not less than 60 feet (18.3 m),
   c. Drainage facilities designed to handle a 50–year storm under the roadway and 25–year storm on all other facilities, The minimum size opening of any pipe is 12 inches (300 mm) in diameter or equivalent,
   d. The combined thickness of the base and the surface courses shall be at least 18 inches (450 mm) thick,
   e. A minimum design speed of 40 mph (65 k/hr).

4. Definitions of design criteria:
   a. Design life: the time in years from original construction until the present serviceability index has dropped to 2.0.
   b. Present serviceability index – p (also known as the terminal serviceability index –p_t): the ability of a roadway to handle traffic as defined by the AASHO (American Association of State Highway Officials – the precursor to AASHTO) road test performed in the 1950's.
   c. A right–of–way: the width of land owned or controlled by a highway agency for the purpose of maintaining or constructioning roads and streets.
   d. A __–year storm: a runoff event with a probability of occurring in a given year equal to the inverse of the value of the year. A 50–year storm would have a 1 in 50 (2%) chance of occurring in a given year.
   e. A 12" diameter equivalent opening: an area of 113 in^2 (70,685 mm^2).
   f. Design speed: the typical operating speed on a roadway. Also, the speed used in the geometric design of a roadway controlled by terrain, traffic volume, and roadway classification.

5. All materials and all work shall meet the requirements of the latest revision of the *New York State Department of Transportation Standard Specifications for Construction and Materials*, including any Engineering Instructions or Bulletins, unless alternatives are approved by the Town Highway Superintendent, in writing, in advance.

APPENDIX G:
Local Law Filing Instruction

Local Law Filing Instructions

NEW YORK STATE DEPARTMENT OF STATE
162 WASHINGTON AVENUE
ALBANY, NY 12231

PLEASE OBSERVE THESE RULES FOR FILING LOCAL LAWS WITH THE SECRETARY OF STATE:

1. Each local law shall be filed with the Secretary of State within five days after its final adoption or approval as required by section 27 of the Municipal Home Rule Law. The cited statute provides that a local law shall not become effective before it is filed in the office of the Secretary of State.

2. Each local law shall be filed ~~in triplicate~~ with the Secretary of State. At least one copy shall be an original or first copy. ~~The others may be legible carbons or photocopies~~.

3. Each local law shall be filed on a form provided by the Department of State, as attached hereto. In case additional pages are required, they must be on the same letter size as the form provided. For convenience, printed, mimeographed or typewritten copies of the local law may be pasted on the form, but these must not be of a size larger than the form and printing must be on only one side of the sheet. Only true and legible copies will be accepted for filing.

4. ONLY THE NUMBER, TITLE AND TEXT OF THE LOCAL LAW SHALL BE FILED. In case of a local law amending a previously enacted local law or ordinance, the text must be that of the law as amended. Do not include in copy parts of old law to be omitted.

5. For the purpose of filing with the Secretary of State, number local laws consecutively, and start with the number one in each calendar year. It is suggested that introductory identifying numbers be used while a proposed local law is being considered.

6. Each copy of a local law filed with the Secretary of State shall have affixed to it a certification by the Clerk of the County legislative body or the City, Town or Village Clerk or other officer designated by the local legislative body. There shall also be attached or annexed thereto a certification executed by the County Attorney, Corporation Counsel, Town Attorney, Village Attorney or other authorized attorney that the local law contains the correct text and that all proper proceedings have been had or taken for its enactment. Certification forms are provided herewith.

7. For filing purposes, local laws shall be mailed or delivered as follows:
   ~~Three~~ One copies for the Secretary of State
   (including at least one original):

   State Records and Law Bureau
   Department of State
   162 Washington Avenue
   Albany, NY 12231

(DO NOT FILE THIS INSTRUCTION SHEET WITH THE LOCAL LAW.)

Local Law Filing

NEW YORK STATE DEPARTMENT OF STATE
162 WASHINGTON AVENUE, ALBANY, NY 12231

(Use this form to file a local law with the Secretary of State.)

Text of law should be given as amended. Do not include matter being eliminated and do not use italics or underlining to indicate new matter.

~~County~~
~~City~~
Town
~~Village~~ of.....

Local Law No. ..... of the year 19.....

A local law in relation to the classification of low volume rural town roads; (Insert Title)
the establishment of maintenance and rehabilitation guidelines for
such roads and the procedure to be followed to designate particular
roads according to classification.

Be it enacted by the Town Board (Name of Legislative Body) of the

~~County~~
~~City~~
Town
~~Village~~ of..... as follows:

(If additional space is needed, attach pages the same size as this sheet, and number each.)

(Complete the certification in the paragraph that applies to the filing of this local law and strike out that which is not applicable.)

1. (Final adoption by local legislative body only.)

I hereby certify that the local law annexed hereto, designated as local law No. ---------- of 19------ of the (County)(City)(Town)(Village) of ---------- was duly passed by the ---------- on ---------- 19 ----, in accordance with the applicable provisions of law.
(Name of Legislative Body)

2. (Passage by local legislative body with approval, no disapproval or repassage after disapproval by the Elective Chief Executive Officer*.)

I hereby certify that the local law annexed hereto, designated as local law No. ---------- of 19------ of the (County)(City)(Town)(Village) of ---------- was duly passed by the ---------- on ---------- 19 ---, and was (approved)(not approved)(repassed after
(Name of Legislative Body)
disapproval) by the ---------- and was deemed duly adopted on ---------- 19----,
(Elective Chief Executive Officer)*
in accordance with the applicable provisions of law.

3. (Final adoption by referendum.)

I hereby certify that the local law annexed hereto, designated as local law No. ---------- of 19------ of the (County)(City)(Town)(Village) of ---------- was duly passed by the ---------- on ---------- 19----, and was (approved)(not approved)(repassed after
(Name of Legislative Body)
disapproval) by the ---------- on---------- 19----. Such local law was submitted
(Elective Chief Executive Officer)*
to the people by reason of a (mandatory)(permissive) referendum, and received the affirmative vote of a majority of the qualified electors voting thereon at the (general)(special)(annual) election held on ---------- 19---, in accordance with the applicable provisions of law.

4. (Subject to permissive referendum and final adoption because no valid petition was filed requesting referendum.)

I hereby certify that the local law annexed hereto, designated as local law No. ---------- of 19------ of the (County)(City)(Town)(Village) of ---------- was duly passed by the ---------- on ---------- 19----, and was (approved)(not approved)(repassed after
(Name of Legislative Body)
disapproval) by the ---------- on ---------- 19 ---. Such local law was subject to
(Elective Chief Executive Officer)*
permissive referendum and no valid petition requesting such referendum was filed as of ---------- 19---, in accordance with the applicable provisions of law.

* Elective Chief Executive Officer means or includes the chief executive officer of a county elected on a county-wide basis or, if there be none, the chairperson of the county legislative body, the mayor of a city or village, or the supervisor of a town where such officer is vested with the power to approve or veto local laws or ordinances

5. (City local law concerning Charter revision proposed by petition.)

I hereby certify that the local law annexed hereto, designated as local law No. ---------- of 19------ of the City of ---------- having been submitted to referendum pursuant to the provisions of section (36)(37) of the Municipal Home Rule Law, and having received the affirmative vote of a majority of the qualified electors of such city voting thereon at the (special)(general) election held on---------- 19----, became operative.

6. (County local law concerning adoption of Charter.)

I hereby certify that the local law annexed hereto, designated as local law No. ---------- of 19------ of the County of ---------- State of New York, having been submitted to the electors at the General Election of November ---------- 19----, pursuant to subdivisions 5 and 7 of section 33 of the Municipal Home Rule Law, and having received the affirmative vote of a majority of the qualified electors of the cities of said county as a unit and a majority of the qualified electors of the towns of said county considered as a unit voting at said general election, became operative.

(If any other authorized form of final adoption has been followed, please provide an appropriate certification.)

I further certify that I have compared the preceding local law with the original on file in this office and that the same is a correct transcript therefrom and of the whole of such original local law, and was finally adopted in the manner indicated in paragraph----------, above.

Clerk of the County legislative body, City, Town or Village Clerk
or officer designated by local legislative body

Date: _____

(Seal)

(Certification to be executed by County Attorney, Corporation Counsel, Town Attorney, Village Attorney or other authorized attorney of locality.)

STATE OF NEW YORK
COUNTY OF _____

I, the undersigned, hereby certify that the foregoing local law contains the correct text and that all proper proceedings have been had or taken for the enactment of the local law annexed hereto.

Signature

Title

County
City
Town
Village
of _____

Date: _____

APPENDIX H:
Model Local Law

Section 1. Legislative purpose. The Town of _____, hereby enacts this local law for the purpose of reducing the cost of maintaining and rehabilitating low volume rural town roads while providing that such roads when used in a manner consistent with the road classification will be safe for the users thereof. While there are generally accepted standards for the design, maintenance and rehabilitation of high volume roads, there are no such comparable standards for roads over which a relatively low volume of traffic passes. In the event there can be a savings in the cost of maintaining or rehabilitating a road that has relatively few vehicles traveling over it, the money saved could be spent on more intense maintenance of roads over which travel is greater. The result could be greater overall safety for the general public. Since the town resources to be expended for highways is limited, it is incumbent upon the town to utilize such limited resources in a manner which targets expenditures on the most heavily traveled roads. It is for such purposes that this local law is enacted.

Section 2. Legislative findings. In 1986 the New York State Legislature created the Local Road Classification Task Force (Chapter 708 of the Laws of 1986). Such task force was charged with developing alternative guidelines for classifying town and county roads in rural areas according to principal uses and traffic volume. The task force consisted of the Commissioner of Transportation or his designee, the Dean of the College of Agriculture and Life Sciences of Cornell University or his designee, four rural town highway superintendents, three rural county highway superintendents and three rural business people. Such task force after considerable discussions and upon hearing many experts prepared local road classification guidelines and issued a report in December of 1988. In December of 1989 the task force issued "A Manual: Guidelines For Rural Town and County Roads" to facilitate the use of the local classification by local officials. In July of 1990, the Legislative Commission on Rural Resources worked with the Senate, Assembly, State Department of Transportation and the Governors office to establish a New York State Local Roads Research and Coordination Council (see Article 16-B Executive Law and Chapters 565 and 652 of the laws of 1990). The Council was empowered to work with the Department of Transportation to:

1. Promote the training of municipal officials and employees to encourage the utilization of innovative and cost cutting procedures as well as more efficient highway maintenance and consolidation methods;

2. Encourage the coordination of local road maintenance and storage facilities;

3. Encourage towns and counties to contract with each other for the maintenance of local roads and bridges;

4. Develop a minimum maintenance road classification addressing repair and service standards for low volume rural roads, as well as procedures to be followed by local governments for designing minimum maintenance roads within their communities. Accordingly, the Council revised the 1989 Local Roads Classification Task Force Report and published it for use by rural towns and county governments December 30,1992.

Section 3. The town superintendent of highways, in the event he (or she) finds it to be in the best interests of the town, may classify one or more roads or portions thereof as one of the following types of roads: low volume collector; residential access; farm access; resource/industrial access, agricultural land access; recreational land access or minimum maintenance road. However, no road shall be finally determined to be a minimum maintenance road until so designated by the town board by local law. The classification of any road or designated portion thereof shall be consistent with the definitions of such type of road as set forth in section ten of this local law. Upon the classification of any road or portion thereof by the town superintendent such designation shall be filed in the office of the town clerk and a copy shall be presented to each member of the town board by the town clerk within 10 days of such filing. Such designation shall be accompanied by a finding by the town superintendent, which shall contain the information upon which the highway superintendent relied when designating such road or portion thereof. The town board may at a town board meeting following the filing of such designation adopt a resolution accepting such designation except that the designation of a minimum maintenance road shall be by local law as provided in section four of this local law. Upon the adoption of such resolution, the road or portion thereof shall be classified as determined by the town highway superintendent and such town highway superintendent shall take into consideration the guidelines for maintaining such road or portion thereof as set forth in section ten of this local law.

Section 4. Notwithstanding the provisions of section three of this local law no road or portion thereof shall be designated as a minimum maintenance road except after following the procedure set forth in sections four through six, inclusive.

a. The town superintendent of highways shall submit to the town board a recommendation that a road or portion thereof should be designated as a minimum maintenance road. No road or portion thereof shall be recommended as a minimum maintenance road by the town superintendent of highways unless the traffic volume is less than 50 vehicles per day as determined by the town superintendent of highways and such road or portion thereof is an agricultural land access road or a recreational land access road, and that such road or portion thereof does not provide farm centers of operation and/or year-round residences with principal motor vehicle access to goods and services necessary for the effective support of such farms and/or year-round residences.

b. The town upon the approval of such recommendation shall by local law designate such road or portion thereof as a minimum maintenance road.

c. At least ten days before the public hearing on such local law, written notice of such hearing shall be served by certified mail upon every owner of real property, as determined by the latest completed assessment roll, abutting such road or portion thereof to be designated a minimum maintenance road.

d. No local law designating a minimum maintenance road shall be effective until signs pursuant to sections six and eleven of this local law are first posted advising the public that such road is a minimum maintenance road.

e. No road or portion thereof, once designated a minimum maintenance road shall be determined to have been abandoned pursuant to the provisions of subdivision one of section two hundred five of the highway law until at least six years have elapsed since the termination of the designation of said road or portion thereof as a minimum maintenance road.

f. Prior to any public hearing relating to the adoption of a local law designating a low volume road or portion thereof as a minimum maintenance road, the town board shall issue findings that such road or portion thereof should be designated a minimum maintenance road. Such findings shall include but not be limited to:

1. the volume and type of motor vehicle traffic on such road;

2. a determination that the property owners of land abutting the road shall continue to have reasonable access to their property.

3. a determination that the users of the road or portion thereof traveling at a reasonable and prudent speed, under the circumstances, shall not be placed in a hazardous situation; and

4. a determination that such road, or portion thereof, does not constitute a farm access as defined pursuant to section ten of this local law.

5. a determination that such road, or portion thereof, does not constitute access to a year- round residence.

Such findings shall be on file in the office of the town clerk and be available for public inspection for at least 60 days before the public hearing on the local law.

Section 5. School board and planning board review. A copy of the findings in section four shall also be sent to the board of education of the central school, town and county planning boards in which each road or road segment is located. Such school board and planning boards shall review the findings and within forty-five days file with the town clerk a resolution recommending such road designation or, in the event such designation is not recommended, the school board or planning board shall set forth ill a resolution the reasons for not recommending such designation. The town board may, by resolution, accept, accept in part or reject the recommendations of either the school board or town planning board or county planning board prior to any vote upon the proposed local law. In the event the school board, county planning board or town planning board take no action upon the findings issued by the town board, the town board shall consider such inaction as a recommendation for the proposed minimum maintenance designation.

Section 6. Posting of signs. Appropriate signs shall be placed on a minimum maintenance road. Such signs shall notify and advise motorists of the need to exercise caution when traveling such road and shall conform to the manual of uniform traffic control devices. Properly posted signs shall be prima facie evidence that adequate notice of a minimum maintenance road designation has been given to the public.

Section 7. Minimum maintenance practices. Minimum maintenance roads shall be maintained in a manner determined by the town highway superintendent to be consistent with the volume and type of traffic traveling on such road. Nominal road maintenance practices such as, but not limited to paving, patching, blading, dragging or mowing may be done less frequently depending upon the existing condition and use of the road as shall be determined by the town superintendent of highways. The guidelines for the method and manner of maintaining a minimum maintenance road are set forth in section ten of this local law.

Section 8. Discontinuance of minimum maintenance road. Any person or persons owning or occupying real property abutting a road or portion thereof which has been designated a minimum maintenance road may petition the town board to discontinue the designation of such road or portion thereof as a minimum maintenance road. Such petition shall be filed with the clerk of the town. Such petition shall identify the road or portion thereof to be discontinued as a minimum maintenance road and set forth the reasons for such discontinuance. The town board shall hold a public hearing upon such petition within thirty days after its receipt; at least ten days public notice shall be given prior to the conduct of such public hearing. At least ten days before the public hearing on such petition, written notice of such public hearing shall be served by certified mail upon every owner of real property, as determined

by the latest assessment roll abutting such road or portion thereof. In the event the town board after such public hearing determines that such road or portion thereof shall continue as a minimum maintenance road, no petition may be submitted pursuant to this section until the lapse of at least two years from the date of the filing of the petition. In the event it is determined that such road shall be discontinued as a minimum maintenance road, the town board, by local law shall discontinue such road or portion thereof as a minimum maintenance road and such discontinuance shall take place six months after the commencement of the next succeeding fiscal year.

Section 9. Notwithstanding the provisions of section eight of this local law, the town board may adopt a local law discontinuing such minimum maintenance road designation in the event it determines such discontinuance to be in the public interest.

Section 10. The following tables and accompanying data shall be used as guides by the town superintendent of highways to classify low volume roads in the Town of _____and shall be used to enable the town superintendent to determine the guidelines he may follow to enable him to determine the manner in which low volume rural roads may be designed, maintained and operated.

CLASSIFICATION FOR LOW VOLUME ROADS AND GUIDELINES FOR THEIR DESIGN. MAINTENANCE. AND OPERATION

The following classifications have been developed to establish a close relationship between the uses of low volume roads and their design, maintenance and operation and are hereby adopted by the Town of _____. The classifications identify the significant use characteristics, including traffic volumes, vehicle types and seasonal use characteristics, that are present on New York State's low volume roads. Guidelines for the design, maintenance and traffic control have been developed that are closely matched to those use characteristics. Such guidelines shall be used by the town superintendent of highways.

Land use adjacent to the road shall be the basis for classification because it is a convenient and accurate way of identifying the kind of use that a low volume road serves.

A low volume road is a road with zero to 400 vehicles per day.

Low Volume Road Classifications in the Town of _____

- **Low Volume Collector**--collects traffic from any of the other classifications and channels it to higher level roads, such as arterials and interstates.
- **Residential Access**--provides access to residences. The traffic volume generated depends on the number of residences. All year access for fire trucks, ambulances and school buses should be provided.
- **Farm Access**--provides access to a farm's center of operations including the residence. Traffic volume is generally low, but may include occasional heavy trucks and farm equipment.
- **Resource/Industrial Access**--provides access to industrial or mining operations. Traffic volume can vary and can include heavy trucks and significant numbers of employees' cars.
- **Agricultural Land Access**--provides access to farm land. Traffic volumes are low and vary seasonally. These roads should accommodate farm equipment that can be up to 20 feet wide.

- **Recreation Land Access**-provides access to recreational land including seasonal dwellings and parks. Volumes of traffic can vary with the type of recreation facility and season of the year, and may include recreational vehicles.

- **Minimum Maintenance Road**-a low-volume road or road segment which may be of a seasonal nature, having an average traffic volume of less than fifty vehicles per day which principally or exclusively provides agricultural or recreational land access. A road, or road segment, which has been so designated may be maintained at a level which allows such road to remain passable and functional in accordance with standards contained in this section of the Guidelines. In no way shall the tern "minimum maintenance" be construed to mean "no maintenance" or "abandonment". Further, such tern shall not apply to those roads, or road segments, which provide farm access as previously defined, or access to an individual year-round residence.

The guidelines for rehabilitation design shall include three rehabilitation design types. Rehabilitation Design Type A is an all purpose road on which vehicles can pass without a reduction in speed. Rehabilitation Design Type B is an area ser- vice, two lane road on which vehicles may have to reduce their speeds to pass. Rehabilitation Design Type C is an area service, one lane road on which either of two passing vehicles must slow, stop or briefly leave the roadway to allow the other to pass.

Vehicle interaction characteristics shall be considered by the town superintendent of highways as the basis for assigning the design types to the respective Classifications. Vehicle size (as determined by the absence or presence of significant truck traffic) and traffic volumes (of either greater or equal to 50 vehicles per day, or less than 50 vehicles per day) are the criteria used. The 50 vehicle per day threshold is used because, at fewer than 50 vehicles per day, vehicle interactions become so infrequent that the effect on vehicle operation is negligible.

The guidelines to be followed by the town superintendent of highways for maintenance shall include provisions for a minimum maintenance designation that allows a reduced level of maintenance on roads which are used for agricultural or recreational land access.

The guidelines for traffic control parallel the maintenance guidelines. They may include recommendations for signs on normally maintained roads and a minimum maintenance road sign shall be posted at the entrance points to minimum maintenance roads. The only other signs recommended for minimum maintenance roads are those mandated by Law (for all roads).

TABLE 1

RURAL LOW VOLUME ROAD CLASSIFICATION

Road Use			Guidelines		
Road Classification	**Vehicle Type**	**ADT[1]**	**Rehabilitation Design Type**	**Maintenance**	**Traffic Control**
1. Low-volume collector	All vehicles	50 - 400	A	Normal	MUTCD[2]
		< 50	B	Normal	MUTCD
2. Residential access	Cars, emergency and service vehicles	50 - 400	B	Normal	MUTCD
		< 50	C	Normal	MUTCD
3. Farm access	Cars, light trucks, occasional heavy trucks, farm equip.	250 - 400	A	Normal	MUTCD
		< 250	B	Normal	MUTCD
4. Resource / Industrial access	Trucking, employees' cars	50 - 400	A	Normal	MUTCD
		< 50	B	Normal	MUTCD
5. Agricultural land access	Occasional farm equip. seasonal	< 400	C	Minimum Maint.	MUTCD
					MUTCD
6. Recreation land access	Cars, R.V.s, Seasonal	50 - 400	B	Normal	MUTCD
		< 50	C	Minimum Maint.	MUTCD

Notes: 1 Average Daily Traffic.
2 "Manual of Uniform Traffic Control Devices" Supplemented by "Traffic Sign Handbook for Low Volume Roads", New York State Department of Transportation Traffic and Safety Division, June 1985.

TABLE 2

DESIGN GUIDELINES FOR ROAD REHABILITATION BY ROAD TYPE

	TYPE A All Purpose Road	TYPE B Area Service 2-Way 2 Lane Road	TYPE C Area Service Single Lane 2-Way Road
Minimum Width Traveled Way	18 feet[1]	16 feet[1]	10 feet[2]
Shoulder	2 feet	2 feet	
Opposing Vehicle Interactions	All vehicles pass with no speed reductions.	1. Trucks cannot meet without reducing speed. 2. Cars cannot meet trucks without reducing speed. 3. Cars pass with almost normal speed.	All vehicles require special widening for passing.
Operating Speed[3]	45 mph or greater	25 mph to 45 mph	40 mph or less
Typical Surface Material[4]	Asphaltic Concrete ADT>150 Aggregate ADT<150	Asphaltic Concrete ADT> 150 Aggregate ADT<150	Usually unsurfaced
Surface Condition	No adverse effect on Operating speed	May cause reduction in operating speed	Reduced operating speed

[1] *Add 2 ft. to the traveled way if significant truck traffic is present.*

[2] *If farm vehicles are present, maintain 20 foot horizontal clearance. Widening of traveled way should be provided at approximately 1000 foot intervals to allow vehicles to pass.*

[3] *Applicable to normal maintenance roads.*

[4] *ADT thresholds recommended based on economic analysis, "Economic Evaluation of Pavement Design for Low Volume Roads," Proceedings of the Third International Low Volume Roads Conference, 1983, Cornell University.*

TABLE 3

CROSS SLOPE DRAINAGE CRITERIA, BY SURFACE TYPE

Surface Type	Range in Cross Slope
High (asphalt, etc.)	1.5%--2.0%
Intermediate (surface treated)	1.5%--3.0%
Low (unpaved)	4.0%--6.0%

- **Clear Zone**-- The width of the roadside area that should be studied for possible hazard mitigation measures varies with the operating speed, traffic level and degree of curvature of the road. Desirable clear zones are indicated below. (Clear zone is measured from the edge of the traveled way.)

  Type A Road--a 10-foot clear zone is desirable.

  Type B Road--a 2-foot to 5-foot clear zone is desirable; a 10-foot clear zone on the outside of sharp curves and on curves at the bottom of long grades is desirable.

  Type C Road--a 2-foot clear zone is desirable; a wider clear zone on the outside of sharp curves is suggested. On minimum maintenance roads a clear zone may not be provided.

  Hazard mitigation measures to be considered include:

  - Improved delineation of the road including edgelines, delineators and reflectors.
  - Guiderail
  - Berms and earth work
  - Drainage modifications
  - Removal of the hazard

Property owners should recognize the legal right of local government to remove fixed objects within the right of way of the road.

Guiderail-- New York State Department of Transportation Guiderail and Bridge rail designs are intended for high volume, high speed highways and are often too expensive for many low volume road applications. Alternative designs that are less expensive and adequately tested to assure performance may be used on low volume rural roads.

Source: AASHTO Policy for Geometric Design of Highways and Streets, 1984.

TABLE 4

MAINTENANCE ACTIVITIES FOR LOW VOLUME ACTIVITIES AND MINIMUM MAINTENANCE TOWN ROADS

ACTIVITY	NORMAL MAINTENANCE ROADS	MINIMUM MAINTENANCE ROADS
	Surface Maintenance	
Crack Sealing Patching and Potholes Surface Seals Thin Overlays Snow Removal Shoulder Maintenance Blading	As necessary On demand As necessary As necessary Roads kept clear Grading cleaning Regular	Maintain in a manner determined by highway superintendent consistent with volume and type of traffic and the manner stated in section seven of this local law. Infrequent
	Roadside Maintenance	
Cleaning Mowing Brush Control Guide Rail Maint. Drainage: - Structure - Ditches Slopes	As necessary Regular Site distance maintained Regular As necessary Positive drainage maintained Repair failures	Maintain in a manner determined by highway superintendent consistent with volume and type of traffic and the manner stated in section seven of this local law.
	Bridges	
Cleaning Lubrication Painting Deck Drainage	As necessary to preserve bridge As necessary to preserve bridge As necessary to preserve bridge As necessary to preserve bridge As necessary to preserve bridge	Maintain in a manner determined by highway superintendent consistent with volume and type of traffic and the manner stated in section seven of this local law.
Signs	MUTCD[1]	MUTCD[1]

Note:

[1] *MUTCD is the Manual of Uniform Traffic Control Devices.*

Surface Maintenance

Crack Sealing - manually pouring hot asphalt, with or without a fiber reinforcement material, into road surface cracks that have first been cleaned of all loose debris, vegetation, etc. The cracks may occur at construction joints, utility cuts, or just be random due to the effects of time, weather, loads, etc. Crack sealing has been found to be a. very cost-effective measure, because it prevents the entry of water into the base course and sub grade. By blocking the entry of water, crack sealing indirectly strengthens the load supporting capability of the road.

Patching and Potholes - placement and compaction of asphalt concrete into surface defects, such as potholes, which have first been cut back to sound material and cleaned of loose debris, water, etc. While a certain amount of this work will have to be done on an emergency basis during inclement weather to provide a safe road, expedient patches should be replaced with permanent patches using proper methods and materials when conditions are favorable. Extensive patching and potholes is an indication that a pavement has reached the end of its functional life, and the road should be scheduled for rehabilitation in accordance with the guidelines set forth in this local law.

Surface Seals -also known as "chip seals," this method involves spraying a rapid-setting emulsified asphalt onto the road surface, followed immediately by the placement of a single layer of clean, crushed stone particles. A pneumatic, rubber-tired compactor is used to press the stones into the asphalt before the emulsion sets up. Chip sealing is used where the surface cracking is more extensive, while manual crack sealing is used where the cracking is less extensive. Chip sealing may also be used to enhance skid resistance on a slippery road. Where water entry is prevented by the surface seal, some strengthening of the road will result.

Thin Overlays -while "thin" is a relative term, it is used here to refer to hot-mix or cold-mix overlay paving a thickness of 1 ½ inches or less. This method adds more to the structural capability of the pavement than does a chip seal. However, it performs much the same function as a chip seal, although it can be expected to have a more lasting effect. When a thin overlay is placed on a paved road, it is customary to use a tack coat to promote a bond between the old surface and the overlay. According to the Asphalt Institute, the tack coat should be sprayed from a distributor, allowing adequate time for it to become "tacky" before paving. Traffic should be kept off the tacked area before paving. They recommend using an SS-1 or a CSS-1 asphalt emulsion diluted 50-50 with water, and applied at a rate of 0.05 to 0.15 gallons per square yard. Application of tack coat a higher rates should be avoided, as this can lead to slippage of the overlay or "bleeding" and loss of skid resistance on the surface of the overlay.

Snow Removal - Snow and ice control are performed to foster safety and to expedite travel during the winter months. Blading of snow is done to remove it from the roadway to prevent the buildup of ice. Abrasives (sand, usually mixed with salt) are used to enhance trafficability during a storm or immediately afterward when a thin layer of ice or snow remains on the road. Salt is used to lower the melting temperature of the ice, and to diminish the bond of the ice on the road surface.

Shoulder Maintenance -activities may differ depending on whether the shoulder is paved or unpaved. The objective is to keep the surface smooth so that moving vehicles can leave the main roadway safely, and also to assure that water from the road will move across the shoulder and into the ditch or gutter. It is particularly important to remove the accumulated winter maintenance abrasives from the shoulders to prevent the retention of water near the edge of the pavement.

Blading -for aggregate roads and unpaved shoulders, blading removes potholes, corrugations, and other surface defects, rendering the surface smoother and safer to travel on. Blading is usually preceded by scarification to a depth slightly deeper than the deepest surface defects. Blading should be used to

establish a cross-slope of 4 to 6 percent (1/2 to 3/4 inch per foot) for good drainage and to reduce the development of potholes in the aggregate surface.

Regraveling - the addition of aggregate materials to re-establish the crown and grade of the road. This activity is commonly done at the same time as blading, but less frequently. The new aggregate is needed periodically to make up for materials that have been lost due to traffic, water erosion, dusting, and blading losses.

Dust Palliation - application of water, calcium chloride, sodium chloride (salt), lignin sulfonate, or other non-toxic chemicals to bind the surface and prevent loss of dust. Dust loss leads to the gradual erosion of the road surface, reducing its thickness and load supporting capability. Dust can make summertime travel hazardous when traffic volumes are sufficient to require passing maneuvers. Sometimes the use of dust palliatives will reduce the need for blading and regraveling to a sufficient degree to be highly cost-effective.

Roadside Maintenance

Cleaning - picking up litter and other roadside debris, principally for aesthetic reasons, but also to protect the flow capacity of culverts and ditches.

Mowing - cutting grass and weeds. This is particularly important near driveways and intersections, to provide a clear line of sight for traffic.

Brush Control - cutting woody shrubs to prevent encroachment onto the right-of-way. This is important to provide adequate sight distance, particularly around the inside of curves, and at driveways and intersections.

Guiderail Maintenance - replacement of damaged, ineffective guiderail. This may also involve use of herbicides to retard the growth of weeds and shrubs in front of and immediately behind the guiderail.

Drainage - cleaning debris from the inlets and outlets around culverts, and cleaning ditches to maintain flow capacity. When possible, ditches should be cleaned in the late spring of the year, so that vegetation will be quickly re-established to protect against erosion. At other times, reseeding may be necessary for erosion protection.

Slope Maintenance -remove landslide debris, cut and remove trees from fill slopes, protect against erosion due to runoff from the road surface or ditches, seed slopes to retard erosion.

Bridges

Bridge Maintenance -cleaning of drainage scuppers, lubrication of pins and bearings, painting of beams and railings, cleaning and patching of deck surface defects, removal of winter maintenance abrasive and salt residues, protection of bridge abutments against scour and erosion, inspection of abutments, clearance of the waterway to maintain flow capacity.

Signs

Sign Maintenance -clearance of shrubs and trees obstructing visibility, replacement of damaged signs, verification that signs are used and placed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

Section 11. Guidelines for Traffic Control on Rural Low Volume and Minimum Maintenance Roads. This section lists guidelines for traffic control on rural low volume and minimum maintenance roads. It describes methods of traffic control that are cost effective and promote safety.

Signs on Low Volume Roads

The town superintendent of highways is authorized in Section 1682 of the Vehicle and Traffic Law to decide conditions to which drivers are to be alerted with traffic control devices. It is mandatory to provide signs indicating weight restrictions, low clearances, dead-end roadways, railroad crossings and road closures. These are specified elsewhere in Law. On low volume roads subject to normal maintenance activities, the decision regarding the need for other signs should be based on the principle of positive guidance. In essence, this principle suggests that hazard warnings be provided whenever a driver cannot anticipate a hazard in time to react safely.

When the town superintendent of highways decides that a condition on a town road is potentially hazardous, appropriate signing, in conformance with NYCRR Volume 17B, is to be provided. The Cornell Local Roads Program's "Traffic Sign Handbook for Local Roads" may be helpful in determining the type and location of signs to be used, once the need for a sign has been established.

Features that are inconsistent with the general driving environment should be identified and analyzed for the possible installation of signs. Identification can be made by driving over the road and noting if a reduction in speed is necessary or if a surprising or unanticipated feature is encountered. Such things as isolated curves or narrow bridges, especially those with limited sight distance, should be evaluated for a "surprise" factor. Signs at every curve are generally not necessary on low volume roads as drivers are cognizant of conditions. Signs should be restricted to those features that the town superintendent of highways determines are inconsistent with the general highway environment and cannot be anticipated early enough for drivers to take appropriate defensive action. Records of all determinations should be made and properly filed for future reference.

Signs on Designated Minimum Maintenance Roads

1. **Design of road signs**. The NYS Department of Transportation has designed signs for posting minimum maintenance roads. Such signs notify and advise motorists that reduced levels of maintenance are in effect. These signs are contained in the NYCRR 17B.

2. **Installation of signs**. Minimum maintenance road signs shall be installed at each end of the minimum maintenance section and immediately beyond intersections with other public roads. The maximum distance between signs should not exceed two miles. Additional installation conditions are set forth in NYCRR 17B. Posting of minimum maintenance road signs will not relieve the town of its responsibility to post other legally-required signs such as railroad crossings, dead ends, bridge capacity, low clearance and road closures.

Section 12. This local law shall take effect immediately.