

TRANSPORTATION

FINAL DESIGN REPORT

P.I.N. 3753.25
Hanshaw Road
County Route 109
Tompkins County

August 2007

U.S. Department of Transportation
Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
ELIOT SPITZER, Governor THOMAS J. MADISON JR., Commissioner

PROJECT REPORT



It is the policy of the NYSDOT to use metric units for all projects to be let for construction after September 30, 1996. This project is being designed using metric units and the text of this report uses metric units.

The following table of approximate conversion factors provides the relationship between metric and inch-pound units for some of the more frequently used units in highway design. The table allows one to calculate the Inch-Pound Unit by multiplying the corresponding Metric Unit by the given factor.

	<u>Metric Unit</u>	x	<u>Factor</u>	=	<u>Inch-Pound Unit</u>
<u>Length</u>	kilometer (km)	x	0.621	=	miles (mi)
	meter (m)	x	3.281	=	feet (ft.)
<u>Area</u>	hectare (ha)	x	2.471	=	acres (a)
	square meter (m ²)	x	1.196	=	square yards (sy)
	square meter (m ²)	x	10.764	=	square feet (sf)
<u>Volume</u>	cubic meter (m ³)	x	1.308	=	cubic yards (cy)
	cubic meter (m ³)	x	35.315	=	cubic feet (cf)
<u>Speed</u>	kilometer per hour (km/h)	x	0.621	=	miles per hour (mph)
	meter per second (m/s)	x	3.281	=	feet per second (ft/s)

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P.I.N. 3753.25
Hanshaw Road
County Route 109
Project Type – Rehabilitation/Reconstruction
Tompkins County

August 2007

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ABBREVIATIONS

AADT	-	Average Annual Daily Traffic
AASHTO	-	American Assoc. of State Highway Transportation Officials
ACC/MVKM	-	Accidents per Million Vehicle Kilometers
ADAAG	-	Americans with Disabilities Act Accessibility Guideline for Buildings & Facilities
BIN	-	Bridge Identification Number
BM	-	NYSDOT Bridge Manual
COE	-	Corps of Engineers
DHV	-	Design Hourly Volume (Two-Way)
DDHV	-	Directional Design Hourly Volume (One-Way)
DR	-	Design Report
EAP	-	Environmental Action Plan
EPA	-	Environmental Protection Agency
ETC	-	Estimated Time of Completion
FEMA	-	Federal Emergency Management Administration (U.S.)
FHWA	-	Federal Highway Administration
FIPS	-	Federal Information Processing Standard
HDM	-	New York State Department of Transportation Highway Design Manual
HSD	-	Headlight Sight Distance
LOS	-	Level of Service
NEPA	-	National Environmental Policy Act
NHS	-	National Highway System
NWI	-	National Wetlands Inventory
NYSDEC	-	New York State Department of Environmental Conservation
NYSDOT	-	New York State Department of Transportation
PE	-	Permanent Easement
PIN	-	Project Identification Number
PS&E	-	Plans, Specifications and Estimate
RMM	-	Reference Mile Marker
ROW	-	Right-of-Way
SEQR	-	State Environmental Quality Review
SH	-	State Highway
SPDES	-	Stormwater Pollutant Discharge Elimination System
SR	-	State Route
SSD	-	Stopping Sight Distance
USCG	-	United States Coast Guard

PREFERRED ALTERNATIVE

This project involves the restoration of Hanshaw Road within the Town of Ithaca located in Tompkins County. After analyzing the design alternatives developed in the Draft Design Report, Tompkins County has selected a Preferred Alternative, which is the Feasible Alternative. The Preferred Alternative includes one addition from the Feasible Alternative described in the Draft Design Report – striping improvements at the Hanshaw/Pleasant Grove intersection to more clearly define the travel and turning lanes.

The Preferred Alternative meets the project objectives while having no significant effect on the social, economic, and environmental characteristics of the area.

Refer to Chapter III of this report for a full description of the alternative. Refer to Appendix F for the typical sections, plans and profiles.

The total estimated construction cost for the Preferred Alternative is approximately \$3,800,000 (see table below).

COST ESTIMATE OF PREFERRED ALTERNATIVE	
Construction Costs	\$ 2,763,000
Anticipated Right of Way Cost	\$ 100,000
Contingencies	\$ 250,000
Design Engineering	\$ 495,000
Construction Inspection Costs	\$ 218,000
Total Project Cost	\$ 3,826,000

The Preferred Alternative is based on engineering considerations of each of the proposed alternatives; evaluation of the social, economic, and environmental effects of the proposed alternatives; comments received at the March 27, 2007 Public Meeting and on the Draft Design Report; and the total estimated construction cost.

CHAPTER I - INTRODUCTION

Tompkins County has prepared this Design Report to document the engineering studies completed and to inform all interested parties of the social, economic and environmental issues pertaining to the restoration of Hanshaw Road within the Town of Ithaca located in Tompkins County. This report presents a study of the existing conditions, the project's evolution and a discussion of the engineering solutions considered and their impacts.

This project is being funded using Federal, State and Local monies. The local entities providing funding are the Town of Ithaca, Village of Cayuga Heights and Tompkins County.

Coordination with key affected federal, state and local agencies has been undertaken and several public meetings regarding this project have been held for collaboration with the public. Upon approval, the project will progress through the final design phase, which will include the preparation of construction plans, engineer's estimate and specifications.

Environmental Classification: The project is classified as a National Environmental Policy Act (NEPA) Class II in accordance with 23 CFR 771 and a State Environmental Quality Review Act (SEQR) Unlisted Action (Non-Type II) in accordance with 6 NYCRR Part 617. The Federal Highway Administration (FHWA) is the lead agency for NEPA and Tompkins County is the lead agency for SEQR.

Contact: Further information regarding this project or the contents of this report may be obtained by contacting:

John Lampman
Tompkins County Highway Division
170 Bostwick Road
Ithaca, New York 14850
(607) 274-0307

Correspondence regarding this project should refer to PIN 3753.25.

CHAPTER II - PROJECT IDENTIFICATION, EVOLUTION, CONDITIONS AND NEEDS, AND OBJECTIVES

II.A. Project Identification

II.A.1. Project Type – This project is a Roadway Rehabilitation/Reconstruction Project.

II.A.2. Project Description/Location

II.A.2.a. Description

This project is located on Hanshaw Road in the Village of Cayuga Heights and the Towns of Ithaca and Dryden in Tompkins County. At its western end, the roadway project begins west of the Cayuga Heights village boundary, approximately 25 m (82 ft.) west of Pleasant Grove Road. On the eastern end, the project extends to 44 m (144 ft.) beyond Sapsucker Woods Road, which is the Town of Dryden line. The total project length is 2.4 km (1.5 miles). The roadway section beginning at the western project limit and ending at the intersection of Warren Road is classified as an Urban Minor Arterial. The roadway section beginning at Warren Road and ending at the eastern project limit is classified as an Urban Collector. Neither roadway section is a Truck Access Highway.

The official project designation is:

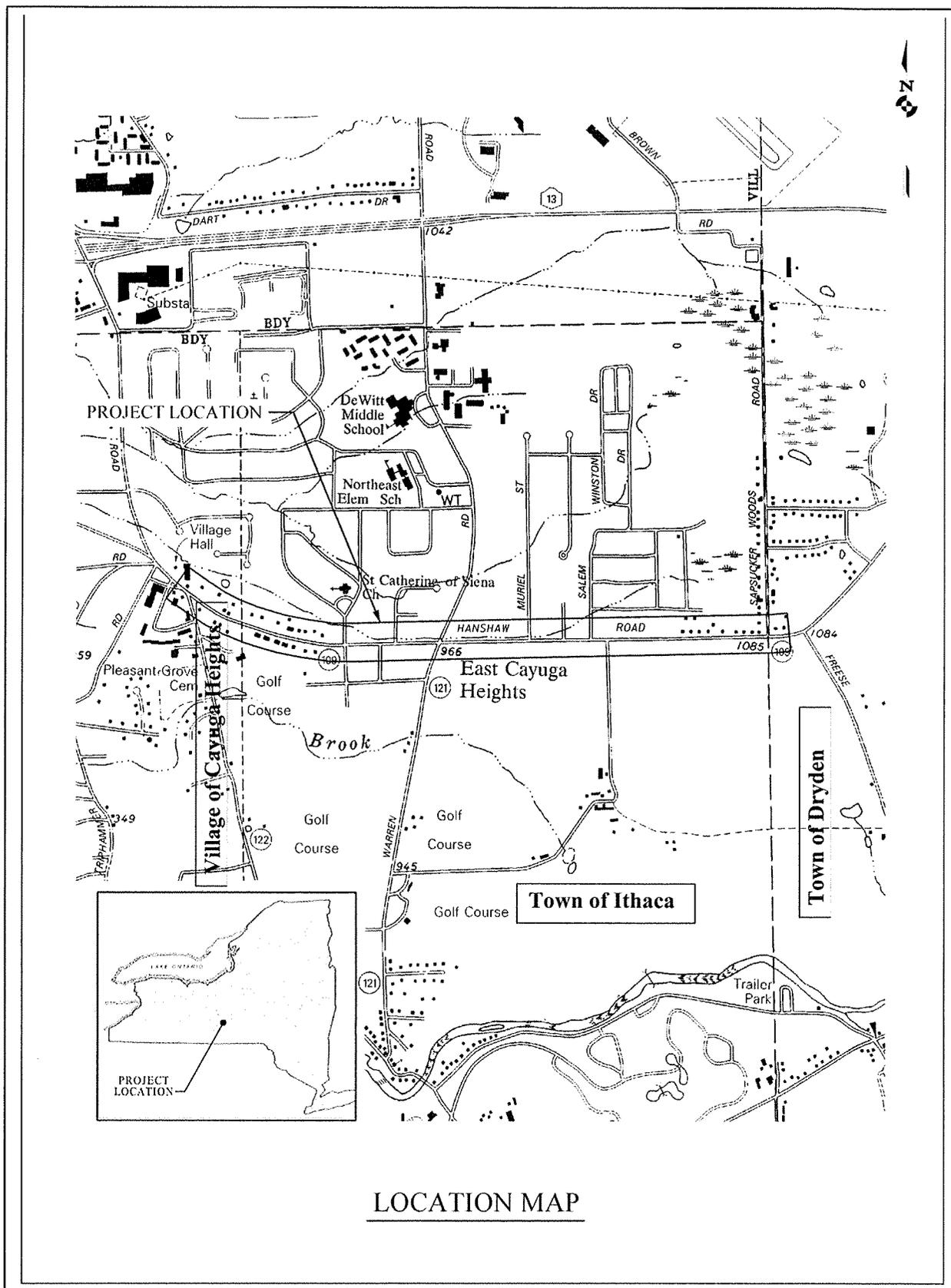
Hanshaw Road
Tompkins County
PIN 3753.25

II.A.2.b. Regional Map

Refer to the regional map on Page 2 of this chapter.

II.A.2.c. Project Map

Refer to the location map on Page 2 of this chapter.



LOCATION MAP

Figure II-1 Project Location Map

II.B. Project Evolution

The primary need for this project was identified due to the significant deterioration of the roadway and shoulder pavement conditions. In addition, the need for pedestrian and bicyclist accommodations along this corridor had been identified by the County and the Town of Ithaca as an important link in the area-wide multi-modal network. An Initial Project Proposal (IPP) with a subsequent update, which outlined the need for the project, was developed by Tompkins County and submitted to the New York State Department of Transportation. The project was approved for placement on the Statewide Transportation Improvement Program and Tompkins County secured the services of an engineering firm to progress the planning, design and construction of the project. This project is being administered by Tompkins County.

To date three public information meetings have been held for collaboration with the public. The initial meeting was held before any evaluation or design work was initiated and focused on obtaining information on the needs and concerns of the public in developing the project. The second meeting presented the initial alternatives that had been evaluated and which alternatives were economically feasible given the project's budget. Feedback on the feasible alternatives was obtained from the community. Individual project property meetings were offered and conducted for many of the corridor property owners to discuss and modify the project design. Most of the meetings focused on the potential impacts and avoidance and mitigation options for the installation of the sidewalk along the north side of the road. The third public meeting presented the modified design based upon changes from the on-site property owner meetings for additional comments by the community.

II.C. Conditions and Needs

II.C.1. Transportation Conditions, Deficiencies and Engineering Considerations

II.C.1.a. Functional Classification and National Highway System

- (1) Functional Classification: From the western project limit to its intersection with Warren Road, Hanshaw Road is classified as an Urban Minor Arterial. From the Warren Road intersection to the eastern project limit, it is classified as an Urban Collector.
- (2) NHS: Hanshaw Road is not on the National Highway System.
- (3) Qualifying or Access Highway: Hanshaw Road is not a Qualifying or Access Highway on the National Network of Designated Truck Access Highways. It is 1.7 km (1.0 miles) from a Qualifying highway.
- (4) Hanshaw Road is not on the Interstate System. The roadway is not part of the 4.9 m (16.0 ft.) vertical clearance network.

II.C.1.b. Ownership and Maintenance Jurisdiction

TABLE II-1 OWNERSHIP AND MAINTENANCE JURISDICTION (Western Project Limit to Village Line)		
Feature	Owner	Maintenance
Roadway	Village of Cayuga Heights	Village of Cayuga Heights
Ice and Snow Removal	N/A	Village of Cayuga Heights
Watermain	Village of Cayuga Heights	Village of Cayuga Heights / Bolton Point*
Water in Watermain	Bolton Point	N/A
Drainage System	Village of Cayuga Heights	Village of Cayuga Heights

* Day-to-day operation / maintenance of the water main are the responsibility of Bolton Point Water Authority. Repairs are done by the Village of Cayuga Heights.

TABLE II-2 OWNERSHIP AND MAINTENANCE JURISDICTION (Village Line to Eastern Project Limit)		
Feature	Owner	Maintenance
Roadway	Tompkins County	Tompkins County
Ice and Snow Removal	N/A	Town of Ithaca
Watermain	Town of Ithaca	Town of Ithaca / Bolton Point*
Water in Watermain	Bolton Point	N/A
Drainage System	Tompkins County	Tompkins County

* Day-to-day operation / maintenance of the water main are the responsibility of Bolton Point Water Authority. Repairs are done by the Town of Ithaca.

II.C.1.c. Culture, Terrain, and Climatic Conditions

- (1) Area Type: Suburban. For the majority of the corridor, the land use is primarily residential with a large agricultural field located at the eastern end of the project along the south side of the roadway.
- (2) The terrain in the project area is rolling.
- (3) Climatic conditions are typical to upstate New York.

II.C.1.d. Control of Access

Access for the entire project is uncontrolled.

II.C.1.e. Existing Highway Section

- (1) Right of Way Width – The existing right-of-way along Hanshaw Road is approximately 15.2 m (50 ft.) for the length of the project.

- (2) Lanes and Shoulders – The original construction date of Hanshaw Road is unknown, but a roadway existed at this location prior to 1830. The only record plans attainable for the roadway are for the segment between Warren Road and the Village of Cayuga Heights to its intersection with the former Ithaca and Cayuga Heights Railway. These record plans for State Highway No. 606 are dated 1906 and document the construction of a 3.6 m (12 ft.) wide macadam roadway. Hanshaw Road currently consists of two 3.0 m to 3.3 m (10 ft. to 11 ft.) travel lanes with gravel/paved shoulders varying from 1.2 m to 1.5 m (4.0 ft. to 4.9 ft.).
- (3) Curb – Hanshaw Road is not curbed within a majority of the project limits.
- (4) Median – Hanshaw Road has no median with the project limits.
- (5) Grades and curves

TABLE II-3 EXISTING VERTICAL GEOMETRY					
Approximate Station	Grade In	Grade Out	Curve Type	Curve Length	Sight Distance
Western Project Limit to Warren Road - Urban Minor Arterial					
1+341	6.59%	0.31%	Crest	60 m (197 ft.)	82 m (269 ft.) SSD
1+487	0.31%	1.10%	Sag	40 m (131 ft.)	HSD not limited by curve
1+569	1.10%	0.30%	Crest	40 m (131 ft.)	431 m (1414 ft.) SSD
1+705	0.30%	-0.67%	Crest	40 m (131 ft.)	360 m (1181 ft.) SSD
1+927	-0.67%	2.04%	Sag	150 m (492 ft.)	274 m (899 ft.) HSD
2+129	2.04%	2.83%	Sag	100 m (328 ft.)	HSD not limited by curve
Warren Road to Eastern Project Limit - Urban Collector					
2+346	2.83%	3.87%	Sag	100 m (328 ft.)	HSD not limited by curve
2+486	3.87%	4.37%	Sag	100 m (328 ft.)	HSD not limited by curve
2+676	4.37%	3.04%	Crest	60 m (197 ft.)	278 m (912 ft.) SSD
2+856	3.04%	2.27%	Crest	50 m (164 ft.)	450 m (1476 ft.) SSD
3+043	2.27%	3.17%	Sag	0 m (0 ft.)	HSD not limited by curve
3+116	3.17%	2.58%	Crest	0 m (0 ft.)	596 m (1955 ft.) SSD
3+162	2.58%	3.47%	Sag	0 m (0 ft.)	HSD not limited by curve
3+271	3.47%	-0.30%	Crest	50 m (164 ft.)	112 m (367 ft.) SSD
3+351	-0.30%	0.30%	Sag	0 m (0 ft.)	HSD not limited by curve

TABLE II-4 EXISTING HORIZONTAL GEOMETRY					
Approximate Station	Direction In	Direction Out	Delta	Curve Radius	Curve Length
Western Project Limit to Warren Road - Urban Minor Arterial					
1+052	131°53'52"	123°13'29"	08°40'23" Left	600 m (1969 ft.)	90.8 m (298 ft.)
1+277	123°13'29"	105°07'10"	18°06'19" Left	260.0 m (853 ft.)	82.2 m (270 ft.)
1+449	105°07'10"	105°22'24"	00°15'14" Right	None	None
1+572	105°22'24"	97°18'11"	08°04'13" Left	700.0 m (2297 ft.)	98.6 m (324 ft.)
1+715	97°18'11"	86°24'34"	10°53'37" Left	600.0 m (1969 ft.)	114.1 m (374 ft.)
1+916	86°24'34"	88°07'08"	01°42'34" Right	None	None
2+142	88°07'08"	88°04'04"	00°01'04" Left	None	None
Warren Road to Eastern Project Limit -Urban Collector					
2+716	88°04'04"	87°47'25"	00°16'39" Left	None	None
3+135	87°47'25"	88°13'31"	00°26'06" Right	None	None
3+498	88°13'31"	81°39'25"	06°34'06" Left	700.0 m (2297 ft.)	80.2 m (263 ft.)
3+589	81°39'25"	48°53'58"	32°45'26" Left	175.0 m (574 ft.)	100.0 m (328 ft.)

(6) Intersection Geometry

TABLE II-5 INTERSECTION GEOMETRY		
Intersecting Road	Control	Notes
Pleasant Grove Road	T-Intersection; Stop sign on Pleasant Grove Road	Pleasant Grove Road is at a 41° skew with Hanshaw Road
Blackstone Avenue	Four-legged Intersection; Stop sign on Blackstone Avenue	
Orchard Street	T-Intersection; Stop sign on Orchard Street	
Kay Street	T-Intersection; Stop sign on Kay Street	
Warren Road	Four-legged Intersection; 4-way stop sign controlled	Warren Road is at a 66° skew with Hanshaw Road
Muriel Street	T-Intersection; Stop sign on Muriel Street	
Salem Drive	T-Intersection; Stop sign on Salem Drive	
Sapsucker Woods Road	T-Intersection; Stop sign on Sapsucker Woods Road	

- (7) Parking Regulations and Parking Related Conditions – There are parking restrictions posted within the Village of Cayuga Heights from 2 a.m. to 6 a.m. No other parking restrictions are posted within the project limits. On-street parking has been observed in a few locations throughout the corridor.
- (8) Roadside Elements
 - (a) Snow Storage is accommodated along the edge of the paved areas. No sidewalks, bikeways, bus turnouts or transit shelters currently exist within the project corridor.
 - (b) Driveways – There are numerous residential driveways and a few commercial driveways closely spaced within the project limits. Typically, the driveways do not conform to the “NYSDOT Policy and Standards for Entrances to State Highways”.
 - (c) Clear Zone – The roadway clear zone is limited by utility poles, open ditches and trees. Table II-6 summarizes the existing clear zone.

TABLE II-6 EXISTING CLEAR ZONE		
Existing Feature	Approximate Offset from Travelway	Notes
Western Project Limit to Warren Road		
Utility Poles – North	2.5 m to 3.0 m (8 ft. to 10 ft.)	2 service poles
Utility Poles – South	1.5 m to 3.8 m (5 ft. to 12 ft.)	19 service poles, typically 2.0 m (6 ft.) offsets
Trees – North	2.9 m to 4.0 m (9 ft. to 13 ft.)	150 mm to 250 mm (6 in. to 10 in.) trees
Warren Road to Eastern Project Limit		
Utility Poles – North	3.0 m to 4.2 m (10 ft. to 14 ft.)	20 service poles, typically 3.0 m (10 ft.) offsets
Utility Poles – South	2.8 m to 4.0 m (9 ft. to 13 ft.)	23 service poles, typically 3.0 m (10 ft.) offsets
Trees – North Side	3.5 m to 4.5 m (11 ft. to 15 ft.)	150 mm to 250 mm (6 in. to 10 in.) trees
Open Ditch – North and South Side	1.8 m to 3.0 m (6 ft. to 10 ft.)	Ditch is typically at 2.0 m (6 ft.) offset

II.C.1.f. Abutting Highway Segments and Future Plans for Abutting Highway Segments

At the western project limit, the abutting roadway segment is owned by the Village of Cayuga Heights. This roadway is comprised of two 3.3 m (11 ft.) lanes with 1.1 m (3.5 ft.) asphalt shoulders. The pavement is in fair to good condition. There are currently no plans by the Village to improve this roadway in the next ten years.

At the eastern project limit, the abutting highway segment is owned by Tompkins County. This roadway consists of two 3.3 m (11 ft.) lanes with 1.2 m (4 ft.) gravel shoulders. The pavement is in good condition, having been rehabilitated in 2003. There are currently no plans by the County to improve this roadway in the next fifteen years.

The project on Hanshaw Road will be developed such that it will be compatible with these abutting roadway sections.

II.C.1.g. Speeds and Delay

- (1) The existing speed limits on Hanshaw Road are posted as follows:
 - ◆ Western project limit to Warren Road: 48.3 km/hr (30 mph)
 - ◆ Warren Road to eastern project limit: 64.4 km/hr (40 mph)
- (2) Speed Study - A floating car speed study conducted in June 2005 divided Hanshaw Road into two segments: from the western project limit to Warren Road and from Warren Road to the eastern project limit. The 85th percentile speed on the western segment was 63.4 km/hr (39.5 mph). The 85th percentile speed on the eastern segment was 75.6 km/hr (47.0 mph).

In addition to the floating car speed study, a continuous count on Hanshaw Road west of Sapsucker Woods Road, conducted in November 2004, by the Tompkins County Highway Department also recorded speed data. Based on this count, the 85th percentile speed was 75.6 km/hr (47.0 mph), which is consistent with the information obtained from the floating car speed study.

- (3) Delay Study – Based on field observations, there are no areas along Hanshaw Road within the study area that create substantial delay to traffic traveling through the project corridor, with the exception of the four-way stop controlled intersection at Warren Road. Therefore, a delay study was not performed; however counts for the peak hours were taken for analysis at the Hanshaw Road and Warren Road intersection.

II.C.1.h. Traffic Volumes

- (1) Existing Traffic Volumes - Hanshaw Road serves local access points and as a commuter route to and from the City of Ithaca and State Route 13. Hence, turning movement counts were conducted during the weekday morning and evening peak commuter hours at the Hanshaw Road and Warren Road intersection. Specifically, the turning movement count data was conducted from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on Wednesday, April 27, 2005. The peak periods occurred from 7:45 to 8:45 AM and 4:30 PM to 5:30 PM. Existing Conditions turning movement diagrams are provided in Appendix A.

Average Daily Traffic volumes (ADT) for two locations on Hanshaw Road east of Warren Road were provided by Tompkins County Highway Department. These two counts were conducted in November 2004. One count included vehicular speed information and one count included vehicular classification information. Seven percent of daily traffic on Hanshaw Road was determined to be heavy vehicles from the classification data. ADT information for Hanshaw Road west of Warren Road was provided in the Initial Project Proposal. The date of this count was 2003.

The Design Hour Volumes (DHV) and Directional Design Hour Volumes (DDHV) were determined from the available ADT information and/or turning movement counts as follows:

- ◆ **For the section of Hanshaw Road west of Warren Road,** the DHV and the DDHV were based on the evening hour turning movement count.
- ◆ **For the section of Hanshaw Road east of Warren Road,** the DHV generally occurred between 4:00 and 6:00 PM; however, this count data was not collected by direction. Therefore, the DHV was multiplied by a factor of 0.60 to obtain a theoretical DDHV. The 0.60 factor was determined from the peak evening hour turning movement count.

The Average Daily Traffic Volumes (ADT), Design Hour Volumes (DHV), and Directional Design Hour Volumes (DDHV) summarized in Table II-7 have been adjusted accordingly by a growth rate of 0.5% per year to represent 2006 (Existing) conditions. This growth rate was based on the potential for minor increases in ambient traffic volumes in an area that is predominately built out.

TABLE II-7 SUMMARY OF EXISTING ADT, DHV, AND DDHV (2006 VOLUMES)			
Location (Hanshaw Road)	ADT (Vehicles/Day)	DHV (Vehicles/Hour)	DDHV (Vehicles/Hour)
West of Warren Road	7,105	540	305
West of Salem Drive	4,575	465	280
West of Sapsucker Woods Road	3,670	380	230

Tompkins Consolidated Area Transit (T-Cat) buses provide transit service to the project area via routes 31, 32, 37, 40, 41 and 44. Bus stops along Hanshaw Road, within or immediately adjacent to the project limits include:

- ◆ Warren Road Intersection (Route 44)
- ◆ Pleasant Grove Intersection (Routes 31, 40, 41)
- ◆ Salem Drive, Muriel Street and Sapsucker Woods Road intersections, with additional bus routes on these side streets planned to begin by 2007.

(2) Future No Build Design Year Traffic Volume Forecasts – The estimated time of construction completion (ETC) will be the year 2008 with ETC+20 being 2028. Existing Conditions traffic volumes were projected by the growth rate of one half of one percent (0.5%) per year. The value of 0.5% was used for this corridor based upon the following considerations. First, the corridor has well defined terminal points (Village of Cayuga Heights and NYS Route 13). Between the terminal points, the majority of the corridor is fully built-out, with the exceptions of the Cornell University agricultural field and several parcels to the east of the project. The Village of Cayuga Heights and City of Ithaca are fully built-out and are not anticipated to generate a significant increase in future trip generations.

Additionally, the project corridor parallels NYS Routes 13 and 366, which offer a higher level of travel efficiency for through traffic. It is not anticipated that NYS Routes 13 and 366 will experience congestion levels within the projection period that would create diversions onto the project corridor as a bypass. Therefore, a 0.5% per year growth rate was applied to the existing volumes to project future traffic. Projections for the year 2028 (ETC+20) are provided in Table II-8. All existing and Future No Build turning movement volumes are provided in Appendix A.

TABLE II-8 SUMMARY OF PROJECTED ADT, DHV, AND DDHV ETC+20 (2028) VOLUMES			
Location (Hanshaw Road)	ADT (Vehicles/Day)	DHV (Vehicles/Hour)	DDHV (Vehicles/Hour)
West of Warren Road	7,850	600	340
West of Salem Drive	5,055	515	310
West of Sapsucker Woods Road	4,055	420	255

II.C.1.i. Level of Service

A capacity analysis was conducted for the intersection of Hanshaw Road and Warren Road to establish the existing and future Levels of Service (LOS). The capacity analysis was completed using Synchro, Release 6.0, which is compatible with the 2000 version of the Highway Capacity Manual. Table II-9 presents the overall existing LOS for the Hanshaw Road/Warren Road intersection during the AM and PM peak periods. All capacity analysis output is provided in Appendix B.

TABLE II-9 EXISTING AND FUTURE LEVEL OF SERVICE – WARREN ROAD INTERSECTION										
Approach, Geometry and Control			Existing (2006)				ETC+20 (2028) No Build			
			AM		PM		AM		PM	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EB	LTR	U	13	B	26	D	16	C	48	E
WB	LTR	U	28	D	21	C	56	F	32	D
NB	LTR	U	14	B	34	D	17	C	78	F
SB	LTR	U	26	D	35	D	48	E	81	F
Overall			23	C	30	D	42	E	63	F

EB – Eastbound Approach
WB – Westbound Approach
NB – Northbound Approach
SB – Southbound Approach

U – Unsignalized (four-way stop control)
LTR – Shared Left/Through/Right

Results of the existing conditions capacity analysis indicate that the intersection is working acceptably under four-way stop control, which is confirmed by field observations of the intersection working acceptably. The Future ETC+20 No Build capacity analysis results indicate that operations will deteriorate to poor levels of operation on all of the approaches and overall. In the PM, average vehicle delay is projected to increase from 30 seconds to 63 seconds, which results in an increase in the total driver delay of 13.15 hours.

II.C.1.j. Non-Standard Features and Other Non-Conforming Features

The design standards are based on the NYSDOT Highway Design manual. A design speed of 60 km/hr (37.3 mph) was used from the western project limit to the Warren Road intersection (Urban Minor Arterial) and an 80 km/hr (49.7 mph) design speed was used from the Warren Road intersection to the eastern project limit (Urban Collector). The following non-standard and non-conforming features were identified on the existing roadway:

- (1) Non Standard Features
 - (a) The existing 0.3 m to 1.2 m (1 ft. to 4 ft.) shoulder width is less than the minimum required (2.4 m (8 ft.)).
 - (b) The stopping sight distance for the crest vertical curve near Sta. 1+340 is 82 m (269 ft.), less than the required 85 m (279 ft.).
- (2) Other Non-Conforming Features
 - (a) A non-traversable ditch is present along the north side of Hanshaw Road between Salem Drive and Sapsucker Woods Road.

II.C.1.k. Safety Considerations, Accident History and Analysis

- (1) Accident History - Accident reports for the project corridor were investigated for location, type, number, possible cause and pattern. The accidents included in this review occurred during the three-year period from June 1999 through May 2002, which was the most current and complete data available at the time of the assessment. During this period, 39 accidents were documented within the study limits from immediately west of Pleasant Grove Road thru immediately east of Freese Road. Of the 39 accidents, 9 took place during the morning commuter period, 7 took place during the evening commuter period and 23 occurred during the off peak period. Sixty five vehicles were involved in the accident history.

The study area contained three distinct roadway segments as defined by traffic volume changes at intersecting roadways. Each of the three segments included minor side-street intersections. Table II-10 summarizes the accidents in each segment. Table II-11 summarizes the accidents occurring at the major intersections. Table II-12 reduces the total accident history into severity categories.

TABLE II-10 ACCIDENT INVESTIGATION RESULTS - ROADWAY SEGMENTS					
Accident Type	Roadway Segment and Number of Accidents			Total	Percent of Total
	West of Pleasant Grove Road to west of Warren Road [1.210 km (0.75 mi)]	East of Warren Road to Thru Salem Drive [0.609 km (0.4 mi)]	East of Salem Drive to thru Freese Road [0.920 km (0.5 mi)]		
Rear End	4	4	1	9	38%
Right Angle	1	0	2	3	13%
Fixed Object	2	0	2	4	17%
Overtaking	1	0	0	1	4%
Animal	2	2	1	5	20%
Left Turn	1	0	0	1	4%
Right Turn	0	0	1	1	4%
Total	11	6	7	24	100%
Percent of Total	46%	25%	29%	100%	

TABLE II-11 ACCIDENT INVESTIGATION RESULTS - INTERSECTIONS		
Accident Type and Number	Percent of Total	
WARREN ROAD		
Rear End	4	44%
Right Angle	4	44%
Fixed Object	1	12%
Total	9	100%
PLEASANT GROVE ROAD		
Rear End	1	16%
Right Angle	4	68%
Fixed Object	1	16%
TOTAL	6	100%

TABLE II-12 ANNUAL ACCIDENT SUMMARY					
Year	Fatal	Injury	Property Damage Only	Non - Reportable Accidents	Total
1999*	0	1	1	3	5
2000	0	2	10	3	15
2001	0	2	6	5	13
2002*	0	0	5	1	6
TOTALS	0	5	22	12	39

* Partial Year

Table II-13 compares the segment accident rates to the statewide average accident rates for similar facilities. Segment accident rates are shown in accidents per million vehicle kilometers (Acc/MVK). Table II-14 contains the intersection accident rate and compares it to the statewide average accident rates for similar facilities. Intersection rates are shown in accidents per million entering vehicles (Acc/MEV). Accident rate calculations are provided in Appendix C.

TABLE II-13 ACCIDENT RATE COMPARISON – PROJECT SEGMENTS		
Segment	Actual Accident Rate (Acc/MVK)	Statewide Average Accident Rate (Acc/MVK)*
West of Pleasant Grove Road to East of Warren Road	2.04	2.27
West of Warren Road thru Salem Drive	1.99	2.27
East of Salem Drive thru Freese Road	1.63	2.27

*Mainline and minor side-street intersections accidents included

TABLE II-14 ACCIDENT RATE COMPARISON – PROJECT INTERSECTIONS		
Intersection	Actual Accident Rate (Acc/MEV)	Statewide Average Accident Rate (Acc/MEV)
Pleasant Grove Road	0.52	0.16
Warren Road	0.69	0.22

As shown in Table II-13, all three of the segments analyzed had accident rates lower than the statewide average. As shown in Table II-14, both Pleasant Grove Road and Warren Road intersections had an accident rates higher than the corresponding statewide average for similar type intersections. The overall corridor accident rate was 2.45 Acc/MVK which is comparable to the statewide average accident rate of 2.27Acc/MVK.

A review of the collision diagrams for the three roadway segments comprising this corridor (contained in Appendix C), along with the information included in Table II-10, indicates an accident history (24 crashes) that is generally distributed over all three segments. Also, no distinguishable accident pattern was apparent within any of the segments.

The highest concentration of accidents within the project limits was at the Warren Road intersection, approximately 23% (9 of 39). Based on the collision diagram and accident history detail sheets, contained in Appendix C, there appears to be two predominant accident patterns. The first pattern involved three westbound rear end crashes that all happened during a winter month and included slippery conditions as a causative factor. The second pattern involved 4 right angle crashes, of which 3 involved a westbound motorist.

There was a moderate concentration of accidents at the intersection with Pleasant Grove Road, approximately 15% (6 of 39). Based on the collision diagram and accident history detail sheets, contained in Appendix C, there does not appear to be an accident pattern. However the skew of Pleasant Grove Road and the multiple driveways in the vicinity of this intersection may have played a contributing factor in four of the six accidents. Two of the accidents involved motorists stopping at the intersection then proceeding into the path of vehicles traveling along Hanshaw Road. The third accident involved a vehicle exiting a driveway on Pleasant Grove Road and proceeding into the path of a vehicle turning right from Hanshaw Road onto Pleasant Grove Road. The last accident involved a vehicle turning right from Hanshaw Road onto Pleasant Grove Road that struck a vehicle stopped at the stop sign on Pleasant Grove Road.

- (2) Accident Causes, Safety Deficiencies and Severity - An investigation was conducted at the accident cluster sites identified in Section II.C.1.k.(1) Accident History. The purpose of this investigation was to identify potential causative factors that could be attributed to the highway facility.

It was noted at the intersection of Warren Road and Hanshaw Road that there is considerable pavement rutting and 'wash boarding' at the

intersection on the westbound approach. These conditions do not allow water to drain off the pavement properly and in turn, can lead to a build up of ice that could result in a motorist being unable to stop and/or losing control of the vehicle. It was also noted that there is extensive vegetation around the intersection that obstructs visibility of stop signs on the eastbound and westbound approaches. The same condition was noted for the stop-ahead signs. A review of the MUTCD revealed that the posted distance from the "STOP" sign to the "STOP AHEAD" sign is less than the recommended for the design speed.

Of the 39 accidents that occurred within the project limits during the 3-year period analyzed, approximately 13% (5/39) involved injuries. Two of the accidents were located at the Warren Road intersection; one of which was a result of a right angle crash and one was the result of a rear end crash. Two accidents were located along Hanshaw Road; one in the vicinity of Blackstone Avenue and one between Salem Drive and Sapsucker Woods Road. Both of these accidents were fixed object crashes resulting from a motorist losing control of the vehicle. The last accident was located at the Pleasant Grove Road intersection and was the result of a rear-end collision.

At the Pleasant Grove Road intersection, the sharp skew angle (40°) at which the road intersects Hanshaw Road and the multiple roadway access points at this intersection are two possible contributing factors to the accident rate for this intersection exceeding the statewide average. Because of the skew angle, motorists tend to maintain a high rate of speed when negotiating the right hand turn from Hanshaw Road onto Pleasant Grove Road. Also, the multiple driveways and larger paved area make it difficult for motorists to make appropriate decisions when maneuvering their vehicle through the intersection. Adding new pavement striping, along with intersection warning signs, could help to mitigate the issues associated with this intersection.

II.C.1.I. Pavement and Shoulder Conditions

From the western project limit to Orchard Street the travel lane pavement condition is fair and the shoulder condition is poor. Pavement distress is typically moderate, and the pavement surface exhibits wheelpath cracking, longitudinal cracking, edge cracking, and wheelpath rutting. The shoulder surface exhibits significant deterioration and deformation.

From Orchard Street to the eastern project limit, the travel lane pavement and shoulder conditions are poor. The travel lane pavement distress typically ranges from moderate to severe, and the pavement surface exhibits wheelpath cracking, longitudinal cracking, and wheelpath rutting. The shoulder surface exhibits significant deterioration and deformation. These conditions indicate a failure of the road structure to the degree that future routine maintenance actions will not be sufficient to provide an adequate

riding surface.

Pavement cores reveal asphalt thicknesses ranging from 300 mm to 450 mm (12 in. to 18 in.) for the western end of the project, and from 150 mm to 330 mm (6 in. to 13 in.) towards the eastern end of the project. The western segment is performing better due to the thicker asphalt section that is present. For a detailed pavement analysis, refer to the Pavement Evaluation in Appendix D.

II.C.1.m. Guide Railing, Median Barriers and Impact Attenuators

There are no guide rails, median barriers or impact attenuators within the project limits.

II.C.1.n. Traffic Control Devices

There are no signalized intersections within the project limits. The intersection of Warren Road and Hanshaw Road is controlled by a 4-way stop sign. The side streets of Pleasant Grove Road, Blackstone Avenue, Orchard Street, Kay Street, Muriel Street, Salem Drive, Sapsucker Woods Road and Freese Road are all controlled with a stop sign at the intersecting side-street.

II.C.1.o. Structures

There are no bridges within the project limits.

II.C.1.p. Hydraulics of Bridges and Culverts

There are no bridges or large cross culverts within the project limits.

II.C.1.q. Drainage Systems

- (1) The existing storm drainage system along the project corridor is a combination of roadside ditches, swales, inlets and pipes that outlet into Renwick Brook on the north side of the roadway east of Blackstone Avenue.
- (2) Condition/Deterioration – The system is in fair to poor condition, with deteriorated drainage structures and pipes partially filled with sediment. Roadway shoulders exhibit localized areas of ponding and flooding during short-duration storm events.
- (3) Deficiencies/Needs – There is a localized area of flooding where a drainage channel enters the closed drainage system on the north side of Hanshaw Road, west of Salem Drive. The amount of runoff from the upland basin exceeds the inlet capacity of the roadway drainage system resulting in flooding of the upstream channels and several residential back yards. At some structures between Warren Road and Renwick

Brook, water is forced out through the top inlet grate due to excessive pressure head.

II.C.1.r. Geotechnical Conditions

The Tompkins County Soil Survey was reviewed, and the following soil types and characteristics were noted along the project corridor. The predominate soil types within the project limits are classified as Erie, Lansing and Arkport. These three soil types display very different drainage properties. The Erie soils are typically not well-drained, while the Lansing and Arkport soils tend to be well-draining. The predominant soil around Renwick Brook is classified as Wayland, which is very poorly-drained with a high concentration of organic matter.

Eight test borings were obtained along the corridor during May 2005. The test borings were advanced 4.6 m (15 ft.) deep, or until encountering rock or refusal. Shale was encountered within 2.4 m (8.0 ft.) at boring B-5, 2.7 m (8.8 ft.) at boring B-6, and within 1.5 m (5.0 ft.) at boring B-7. Ground water was encountered in the range of 1.6 m to 3.5 m (5.2 ft. to 11.5 ft.) below ground surface elevations. The location of the borings, test boring logs, and a summary investigation is included in Appendix D.

II.C.1.s. Utilities

Several public and private utility companies own, operate, and maintain facilities within the project limits that could be affected by the project. Table II-15 summarizes the facility type, owner, and general locations of the facilities.

TABLE II-15 SUMMARY OF EXISTING UTILITIES		
Utility	Owner	General Information and Location
Natural Gas	New York State Electric and Gas	From Pleasant Grove Road to just east (55 m (180 ft.)) of Salem Drive, a 100 mm (4 in) main runs along the south side of Hanshaw Road, outside of the roadway structure, and mostly outside of the ROW. From there, the main crosses to the north side of the road and runs to the project limit, again mainly outside the roadway and ROW. There are tie-ins at all side streets.
Electric	New York State Electric and Gas	Overhead distribution lines run the length of the project mainly on the south side of Hanshaw Road. There are several overhead crossings within the project limits.
Water	Town of Ithaca – hardware (main, hydrants, etc) Bolton Point - water	There is a 200 mm (8 in.) distribution main that runs on the north side of Hanshaw Road. Plans call for replacement of the existing main east of Warren Road on the south side of the road in 2007.
Telephone	Verizon	Overhead telephone lines run the length of the roadway. From the western limit to Salem Drive the lines are on the south side. From Salem Drive to the east the lines are on the north side. There is also buried cable along Warren Road, and between Salem Drive and Sapsucker Woods Road.
Cable Television	Time Warner	Overhead cable television lines follow the same route as the overhead telephone.
Sanitary Sewer	Town of Ithaca	From the western project limit to Warren Road, the sanitary sewer predominantly runs on the south side of Hanshaw Road. From Warren Road to the eastern project limit it runs predominantly on the north side of Hanshaw Road. The sewer size varies from 100 mm to 250 mm (4 in. to 10 in.) within the project limits. The piping materials are reinforced concrete pipe, clay tile, PVC and transite pipe. There are tie-ins at most side streets.
Fiber Optic	Elantic Telecom	Aerial fiber optic cable runs along the south side of Hanshaw Road from the western project limit to Warren Road.

II.C.1.t. Railroads

There are no railroads within a kilometer of the project limits.

II.C.1.u. Visual Resources

The visual environment for the project corridor is consistent with that of an established urban/suburban residential area. The largest viewing audiences are the area residents, motorists, pedestrians and bicyclists that use this section of Hanshaw Road during daily activities and as a route for traveling to regional destinations. There are varying types and maturity of landscaping throughout the corridor with the exception of the agricultural field on the eastern end of the project.

II.C.1.v. Provisions for Pedestrians and Bicyclists

Currently, there are no sidewalks within the project limits. There are sidewalks in the Village of Cayuga Heights at the western limit of the project. From field observations, pedestrians currently use the deteriorated roadway shoulders for mobility through the corridor.

There are no dedicated bicycle lanes within the project limits and bicyclists use the existing shoulder areas. Due to the deteriorated condition of the shoulders, bicyclists are often observed using the travel lanes for mobility. The corridor is not currently designated as a bike route.

A NYSDOT Pedestrian Generator Checklist was completed for the project vicinity and resulted in 5 “yes” responses out of the 9 questions indicating a need to provide adequate pedestrian and bicycle accommodation. The NYSDOT Pedestrian Generator Checklist is included in Appendix E.

The corridor is used by college students and employees who live in the area to access the Cornell campus via bicycle and by area-wide residents to access the bus routes and other destination points via walking. Pedestrian generators include numerous residences within the vicinity of Hanshaw Road, particularly to the north of the roadway. Pedestrians utilize Hanshaw Road to access informal bus stops/pick-up-points. Other key destination points include the commercial area at the west end of the project in the Village of Cayuga Heights, school on Warren Road, several trails, Cornell’s Laboratory of Ornithology on Sapsucker Woods Road and a church.

In January of 2006, the Town of Ithaca passed a resolution indicating their willingness to assist in the cost of constructing an asphalt walkway along Hanshaw Road, and that the Town would be responsible for all ownership, maintenance and liability associated with the facility. In June 2006, the Village of Cayuga Heights passed a resolution indicating a financial commitment to fund the portion of the sidewalk in the village.

II.C.1.w. Planned Development for Area

The area is expected to experience growth similar to the levels seen in recent years, with additional development occurring in the outlying areas to the north-east of the City of Ithaca.

II.C.1.x. System Elements and Conditions

The deficiencies outlined in this chapter are conditions reflective of the project area. It is not expected that the project will significantly affect or impact other transportation projects or mobility issues in the area-wide region.

II.C.1.y Environmental Integration

This project does not offer the opportunity to enhance any existing natural or manmade environmental features.

II.C.2. Needs

II.C.2.a. Project Level Needs

- (1) Pavement Needs – Pavement and shoulder conditions were evaluated and discussed in Section II.C.1.e Existing Highway Section. Serious structural pavement distress such as wheel path rutting, cracking and shoulder deterioration are evident throughout the majority of the project corridor. The degree of deterioration and failure of the pavement foundation is too far advanced to provide a safe and acceptable riding surface with routine maintenance activities.
- (2) Safety Needs - Safety conditions along the corridor were documented in Section II.C.1.k. Safety Considerations, Accident History and Analysis. All three of the roadway segments within this corridor had accident rates that were lower than the statewide average rates for similar facilities. The intersections with Pleasant Grove Road and Warren Road had accident rates that were higher than the statewide average rate for similar type intersections.
- (3) Capacity Needs – Levels of service were documented in Section II.C.1.i Level of Service. The intersection of Warren Road and Hanshaw Road is adequate for existing traffic volumes, but will not provide acceptable levels of service under the 20 year projected traffic volumes with anticipated growth.
- (4) Drainage Needs – There are localized areas of flooding where drainage channels enter the closed drainage system on Hanshaw Road. Generally, the closed drainage system is in poor condition with deterioration of the drainage structures and sediment in the pipes and structures. Additionally, the capacity of the system is inadequate for the flows.
- (5) Mobility Needs – Provisions for the transit (bus) accommodation (designation stops, shelters, and signage) and pedestrian and bicycle facilities are lacking throughout the project.

II.C.2.b. Area or Corridor Level Needs

- (1) Modal Interrelationship – The project corridor serves as an important link in the Tompkins County area wide transportation network. The corridor serves several transit routes that connect to major destination points in the region. The need to ensure that all travel modes are safe and easily traversable and that important passenger node points are enhanced is essential.
- (2) System Needs – Hanshaw Road is an important inter-municipal arterial. The project is necessary to provide adequate travel conditions within the project limits and to allow the roadway to serve as an important access and mobility link in the regional transportation network.
- (3) Mobility Needs – Pedestrian, bicycle, and transit accommodations are insufficient and do not provide adequate safety and mobility, given the setting and character of the area.

II.C.2.c. Transportation Plans

This project is not related to any Statewide Transportation Improvement Plan.

II.D. Project Objectives

The project objectives reflect the desired results of the project. The project objectives also provide the evaluation criteria for determining whether the alternatives being evaluated fulfill the project needs. This project has the following set of objectives:

1. Restore the pavement to a good condition using techniques that will minimize future maintenance costs and repairs;
2. Enhance safety by using cost effective accident reduction measures;
3. Accommodate pedestrian, bicycles, and transit users in a cost effective manner;
4. Provide a structurally and hydraulically adequate drainage system;
5. Provide a cost feasible project given the available funding.
6. Minimize negative impacts to aesthetic features and character of the corridor.

CHAPTER III - ALTERNATIVES

III.A. Design Criteria

III.A.1. Design Standards - NYSDOT Highway Design Manual, Chapter 2.

III.A.2. Critical Design Elements

TABLE III-1 DESIGN CRITERIA FOR HANSHAW ROAD - EXISTING AND PROPOSED CONDITIONS			
PIN:	3753.25	NHS (Y/N):	No
Route No. & Name:	Hanshaw Road (County Route 109)	Functional Class:	Urban Minor Arterial & Urban Collector
Project Type:	Rehabilitation		
% Trucks:	7%	Terrain:	Rolling
ADT:	From western project limit to Warren Road = 7,000 vehicles per day From Warren Road to the eastern project limit = 3600 to 4530 vehicles per day	Truck Access Rte.:	No

TABLE III-2 DESIGN CRITERIA FOR HANSHAW ROAD FROM WESTERN PROJECT LIMIT TO THE INTERSECTION OF WARREN ROAD AND HANSHAW ROAD (URBAN MINOR ARTERIAL)					
Element		Standard Criteria	HDM Reference	Existing Conditions	Proposed Conditions
1	Design Speed	60 km/h (37 mph)	2.7.2.2 A	30 mph (posted speed)	60 km/h (37 mph) 85 th Percentile
2	Lane Width	3.3 m (11 ft.)	2.7.2.2 B	3.3 m (11 ft.)	3.3 m (11 ft.)
3	Shoulder Width:	2.4 m (8 ft.)	2.7.2.2 C	Varies - 0.3 m to 1.2 m (1 ft. to 4 ft.)	1.2 m (4 ft.)
4	Bridge Roadway Width	N/A	2.7.2.2 D	N/A	N/A
5	Grade	7% max	2.7.2.2 E	6.84%	6.84%
6	Horizontal Curvature	135 m (443 ft.) @ e=4.0%	2.7.2.2 F	260 m (853 ft.) with no Superelevation	260 m (853 ft.) with no Superelevation
7	Superelevation Rate	4.0% max**	2.7.2.2 G	None	None
8	Stopping Sight Distance (Horizontal & Vertical)	85 m (280 ft.) min	2.7.2.2 H	82 m (269 ft.)	85 m (280 ft.)
9	Horizontal Clearance Without barrier Intersections	0.5 m (1.6 ft.) 1.0 m (3.3 ft.)	2.7.2.2 I	0.6 m (2.0 ft.) 1.0 m (3.3 ft.)	To Be Determined To Be Determined
10	Vertical Clearance	4.3 m (14 ft.) min	2.7.2.2 J	N/A	N/A
11	Pavement Cross Slope	1.5% to 2.0%	2.7.2.2 K	2.0% & Varies	2.0%
12	Rollover Between lanes At edge of traveled way	4.0% max 8.0% max	2.7.2.2 L	N/A	N/A
13	Structural Capacity Replace Rehabilitation	MS 23 MS 20	2.7.2.2 M	unknown	N/A
14	Pedestrian Accommodations	Pedestrian Facility	2.7.2.2 N	Shoulder Area	Pedestrian Facility *

* Sidewalk on north side only

** For urban conditions, superelevation may be eliminated for curves that would create substantial impacts and do not have a historical accident problem. (AASHTO, Chapter 3, under section "Design for Low-Speed Urban Street")

TABLE III-3 DESIGN CRITERIA FOR HANSHAW ROAD FROM THE INTERSECTION OF WARREN ROAD AND HANSHAW ROAD TO THE EASTERN PROJECT LIMIT (URBAN COLLECTOR)					
Element		Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions
1	Design Speed	80 km/h (50 mph)	2.7.3.2 A	40 mph (posted speed)	80 km/h (50 mph) 85 th Percentile
2	Lane Width (curbed / uncurbed)	3.3 m (11 ft.)*	2.7.3.2 B	3.3 m (11 ft.)	3.3 m (11 ft.)
3	Shoulder Width – Uncurbed	2.4 m (8 ft.)	2.7.3.2 C	Varies - 0.3 m to 1.2 m (1 ft. to 4 ft.)	1.2 m (4 ft.)
4	Bridge Roadway Width	N/A	2.7.3.2 D	N/A	N/A
5	Grade	7% max	2.7.3.2 E	4.33%	4.37%
6	Horizontal Curvature	280 m (920 ft.) @ e=4.0%	2.7.3.2 F	700 m (2297 ft.) with no Superelevation	700 m (2297 ft.) @ e=3.0% & varies
7	Superelevation Rate	4.0% max	2.7.3.2 G	None	None
8	Stopping Sight Distance (Horizontal & Vertical)	130 m (426 ft.)	2.7.3.2 H	115 m (377 ft.)	130 m (426 ft.)
9	Horizontal Clearance Without Barrier Intersections	0.5 m (1.6 ft.) 1.0 m (3.3 ft.)	2.7.3.2 I	1.0 m (3.3 ft.) 1.4 m (4.6 ft.)	To Be Determined To Be Determined
10	Vertical Clearance	4.3 m (14 ft.) min	2.7.3.2 J	N/A	N/A
11	Pavement Cross Slope	1.5% to 2.0%	2.7.3.2 K	2.0% & Varies	2.0%
12	Rollover Between lanes At edge of traveled way	4.0% max 8.0% max	2.7.3.2 L	N/A	N/A
13	Structural Capacity Replacement Rehabilitation	MS 23 MS 20	2.7.3.2 M	Unknown	N/A
14	Pedestrian Accommodations	Pedestrian Facility	2.7.3.2 N	Shoulder Area	Pedestrian Facility **

* May be constructed as 3.3 m (11 ft.) lanes if accident rates for these segments are acceptable.

** Sidewalk on north side of roadway.

II.A.3. Other Controlling Parameters

TABLE III-4 OTHER CONTROLLING PARAMETERS				
Element		Reference to Standard	Criteria	Proposed Condition
a	Design Vehicle	HDM Section 5.8.1	CITY-BUS	CITY-BUS
b	Level of Service (non-Interstate)	HDM Section 5.2	D	ETC+20 (2028) B
c	Design Storm:	HDM Chapter 8	50 years	50 years
	Culverts	HDM Chapter 8	5 years	5 years
	Storm Drainage Systems Ditches	HDM Chapter 8	10 years	10 years

III.B. Alternatives Considered

Several alternatives were considered for this project. They were all assessed based on their ability to satisfy the project objectives. The following section presents a description of each alternative considered and a determination of feasibility with reasons for eliminating or forwarding an alternative for further study under Section III.C – Feasible Alternatives.

Alternative #1 – NO BUILD “NULL” ALTERNATIVE

The Null/Maintenance Alternative retains the existing roadway section and geometry with no improvements other than routine maintenance such as patching of pot-holes or emergency drainage repairs. All existing pavement, drainage and mobility deficiencies would remain. The existing infrastructure would continue to deteriorate at advancing rates until severe impacts on user comfort, mobility and safety, and maintenance operations within the corridor would result. This alternative does not address any of the project needs or meet any of the project objectives; therefore, it was rejected as a feasible alternative.

Alternative #2 – PAVEMENT RECONSTRUCTION (Full Depth Pavement Replacement)

The Pavement Reconstruction alternative consists of full depth excavation and reconstruction of the pavement for the entire length of the project. The full depth pavement would include two travel lanes at 3.3 m (11 ft.) with 1.2 m (4 ft.) shoulders. The fully reconstructed roadway section would be lowered with curbing provided to accommodate all drainage runoff within the roadway. The centerline of the roadway would be shifted to the south approximately 1.0 m (3.3 ft.) to balance the impacts along the roadside for the construction of a new sidewalk on the north side of the roadway between the western project limit and Salem Drive. In addition, a new closed drainage system, landscaping features and signing and striping would be provided or replaced where needed. This alternative does address most of the project objectives; however, since the estimated project construction cost (\$3.9 Million) significantly exceeds the available project funding, it is not considered feasible.

Alternative #3 – PAVEMENT REHABILITATION (Resurfacing and Full Depth Reclamation)

The Pavement Rehabilitation alternative consists of the retention/reuse of the existing pavement structure in the travel lane areas using several rehabilitation techniques. The shoulder areas would be fully reconstructed due to the lack of asphalt and poor subbase conditions. In areas where the travel lane pavement structure is adequate but there are localized structural issues and surface deterioration the pavement would be milled and resurfaced with a new top course of asphalt. Full depth reclamation would be utilized in areas where the travel lane pavement structure is inadequate in strength due to subbase deficiencies or inadequacies in the asphalt pavement layers. There would be a limited amount of full depth reconstruction in areas where adjustments in the roadway profile are necessary. Approximately 28% would be milled and resurfaced, 63% of the travel lane pavement would be full depth reclamation, and the remaining 9% would be reconstructed.

The rehabilitated pavement would provide two 3.3 m (11 ft.) travel lanes with new full depth 1.2 m (4 ft.) wide shoulders. A sidewalk would be provided along the north side of the road from the western project limit in the Village of Cayuga Heights to Salem Drive. In addition, a new closed drainage system utilizing a shallow swale or concrete gutter, landscaping features, and signing and striping would be provided or replaced where needed.

This alternative could be constructed with a minimum amount of disruption to users. Since all of the project objectives have been met under Alternative #3, including being a cost effective solution (\$3.08 Million), it is considered to be a feasible alternative. Refer to Section III.C. for a more detailed description of this feasible alternative and engineering considerations.

III.C. Feasible Alternative

Alternative #3 – Pavement Rehabilitation (Resurfacing and Full Depth Reclamation) is being progressed as the feasible alternative. The final determination of the preferred alternative will not be made until after the alternative’s impacts, comments on the draft design approval document, and comments from the public involvement have been fully evaluated and incorporated, as appropriate.

III.C.1. Description of Feasible Alternative

Alternative #3 – Pavement Rehabilitation (Resurfacing and Full Depth Reclamation)

The Pavement Rehabilitation alternative consists of the retention/reuse of the existing pavement structure in the travel lane areas utilizing several rehabilitation techniques. The shoulder areas would be fully reconstructed due to the lack of asphalt and poor subbase conditions. In areas where the travel lane pavement structure is adequate but there are localized structural issues and surface deterioration, the pavement would be milled and overlaid with a new top course of asphalt. Full depth reclamation would be utilized in areas where the travel lane pavement structure is inadequate in strength due to subbase deficiencies or inadequacies in the asphalt pavement layers. There would be a limited amount of full depth reconstruction in areas where adjustments in the roadway profile are necessary. For clarity of discussion, the corridor is divided into the following segments:

<u>Segment</u>	<u>Station Limits</u>	<u>Treatment</u>
1	1+066 to 1+140	Sidewalk and Shoulder Construction
2	1+140 to 1+850	Milling with Resurfacing
3	1+850 to 2+100	Full Depth Reclamation
4	2+100 to 2+200	Full Depth Reconstruction
5	2+200 to 3+500	Full Depth Reclamation

Segment 1 consists of sidewalk and shoulder construction only, and does not comprise any percentage of travel lane rehabilitation.

Segment 2 includes 30% of the travel lanes within the project limits. Within this segment, 40 mm (1.5 in.) of the existing pavement section would be milled and resurfaced with 40 mm (1.5 in.) of new hot mix asphalt top course. Between Sta. 1+141 and Sta. 1+485, the centerline of the road would be shifted to the south to accommodate construction of the new sidewalk on the north side of the road. The widening areas would be constructed with a new full depth pavement section.

Segments 3 and 5 are comprised of 62% of the travel lanes within the project limits. The pavement section within the limits of these two segments would consist of 225 mm (9 in.) of fully reclaimed pavement, 75 mm (3 in.) of asphalt base, 65 mm (2.5 in.) of asphalt binder course and 40 mm (1.5 in.) of asphalt top course. The existing pavement would be converted to subbase to a depth of up to 225 mm (9 in.).

Segment 4 makes up the remaining 8% of the travel lanes within the project limits. The pavement section within the limits of Segment 4 would be fully reconstructed with 300 mm (12 in.) of subbase, 150 mm (6 in.) of asphalt base course, 65 mm (2.5 in.) of hot mix asphalt binder course and 40 mm (1.5 in.) of hot mix asphalt top course.

All shoulder areas would be fully reconstructed with 450 mm (18 in.) of subbase, 50 mm (2 in.) of hot mix asphalt binder course and 40 mm (1.5 in.) of hot mix asphalt top course. Perforated underdrain pipe would be installed throughout the project during the shoulder reconstruction to ensure that the pavement section attains its intended service life by minimizing the amount of water infiltration into the pavement structure. If budget allows, the asphalt pavement of the shoulders could be colored. The colored shoulders would visually narrow the roadway in an effort to reduce the operating speeds.

The rehabilitated pavement would provide two 3.3 m (11 ft.) travel lanes with new full depth, 1.2 m (4 ft.) wide shoulders. A sidewalk would be provided along the north side of the road between the western project limit and Salem Drive. The north side of the roadway is preferred for the sidewalk because there are many more houses along the north side of the corridor, most of the destination points are north of the corridor and the overall quality of landscaping is higher on the south side of the roadway.

As part of this alternative, a new closed drainage system consisting of a shallow swale or concrete gutter, new drainage pipe, and inlet and outlet structures would be provided. The shallow swale would be used in areas with adequate roadside width to provide a buffer for the sidewalk and for snow storage. The gutter would be used to avoid undesirable impacts to roadside landscaping and a wider sidewalk would be incorporated adjacent to the gutter to provide space for signage and mailboxes where feasible. A concrete curb would be provided on the north side of the western end of the project to match the section in the Village of Cayuga Heights. Guiderail would be required along the south side of the road between stations 1+170 to 1+250 due to the presence of a steep side slope adjacent to the roadway in this area.

Guiderail may also be needed in the area of the drainage system outlet at Renwick Brook depending upon the final structure configuration.

New landscaping features would be provided in areas to enhance the visual environment or mitigate the loss of existing landscaping. New signing and striping would be provided throughout the corridor to enhance safety. In addition, a new traffic signal would be installed at the Hanshaw Road/Warren Road intersection to improve operations at this existing 4-way stop intersection.

For details of Alternative 3, refer to the Typical Sections and Plans located in Appendix F.

III.C.2. Engineering Considerations for Feasible Alternative

III.C.2.a. Special Geometric Features

(1) Non-Standard Features

- (a) The proposed 1.2 m (4 ft.) shoulder width is less than the stated design criteria. See Appendix G for details of the Non-Standard Feature Justification.

(2) Non-Conforming Features

None

III.C.2.b. Traffic Forecasts, Level of Service, and Safety Considerations

- (1) Design Year Traffic Forecasts and Level of Service Analysis – Future No Build design year traffic volume forecasts and No Build design year level of service analysis results were discussed in sections II.C.1.h – Traffic Volumes, and II.C.1.i – Level of Service. This project is not expected to generate any new traffic or result in any significant changes to the existing volume of traffic utilizing this roadway. The only projected increases in traffic volumes along Hanshaw Road are attributed to minor growth within and surrounding the project corridor as discussed in section II.C.1.h. Therefore, design year traffic forecasts and level of service analysis results associated with construction of Alternative #3 are the same as future No Build forecasts and results. Volume figures and capacity analysis output is contained in Appendix A and B.

The 2003 National Manual on Uniform Traffic Control Devices (MUTCD) was consulted to review the warrants required to justify a traffic signal at the intersection of Hanshaw Road and Warren Road. The warrant analysis utilized the projected ETC+20 No-Build AM & PM peak hour volumes. Four-hour and eight-hour volume information was not available on the conflicting approaches of the intersection; therefore, the AM and PM peak travel hour volumes

were used to make estimations for warrants containing multi-hour volumes.

Table III-5 provides a summary of the signal warrant analysis.

TABLE III-5 SIGNAL WARRANT SUMMARY							
MUTCD Signal Warrants							
1	2	3	4	5	6	7	8
CY	CY	Y	N	N	N	N	Y

Y - Meets warrants

CY- Conditionally meets warrant in absence of 4-hour or 8-hour data

N - Does not meet warrant

The following list each warrant and a brief description of there of; with supporting information contained in the appendix.

Warrant 1 - (Eight-Hour Vehicular Volume) Condition A is conditionally met; therefore the warrant is assumed to be conditionally met.

Condition A (Minimum Vehicular Volume) States that there is excessive traffic entering the intersection or traffic volume on the major street is so severe that minor street traffic experiences extreme delay or conflict when entering the major street. For eight hours of an average day, the major street requires a total of 500 vehicles on both approaches per hour, while the minor street requires 150 vehicles on one approach leg per hour. The intersection exceeds the volume requirements for both the AM and PM peak hours. Therefore, it is assumed that this condition will meet the eight-hour warrant requirement for an average day.

Condition B (Interruption of continuous traffic) States that the traffic volume on the major street is so severe that minor street or driveway traffic experiences extreme delay or hazard when entering the major street. For eight hours of an average day, the major street requires a total of 750 vehicles on both approaches per hour while the minor street requires 75 vehicles on one approach leg per hour. The intersection does not meet the volume requirements for the AM peak hour or PM peak hour. Therefore, it is assumed that this condition will not meet the eight-hour warrant requirement for an average day.

Warrant 2 - (Four-Hour Vehicular Volume) States that for short periods of the day the side road traffic experiences excessive delays in attempting to enter or cross the artery. For four hours of an average day, the plotted points must fall above the appropriate curve on Figure 4C-1 of the MUTCD, shown in Appendix H. The plotted points fall above the single lane approach curve for both the AM and PM peaks; therefore, it is assumed that the warrant will meet the four-hour requirement for an average day.

Warrant 3 - (Peak Hour) States that for an hour of an average day, the side road traffic is subject to excessive delays in attempt to enter or cross the artery. A traffic signal may be warranted if either of the following conditions is met:

- For one hour of an average day, the total volume entering the intersection must be 800 or more vehicles and the side road has 100 or more entering vehicles and experiences four vehicle-hours or more of delay, or
- For one hour of an average day the plotted points must fall above the appropriate curve on Figure 4C-3 of the MUTCD (included in Appendix H).

Both the AM and PM peaks meet the volume and delay requirements and the plotted points for the PM peak hour fall above the appropriate curve, therefore, the peak hour warrant is considered met.

Warrant 4 - (Pedestrian Volume) States where the traffic volume on the major street is so heavy that pedestrians experience excessive delay crossing the major street. A traffic signal may be warranted if one of the following requirements is met:

- During each of any four hours of an average day 100 or more pedestrians cross the artery and there are fewer than 60 gaps per hour in traffic for them to cross, or
- During any one hour of an average day 190 or more pedestrians cross the artery and there are fewer than 60 gaps per hour in traffic for them to cross.

Based on field observations, there is not enough pedestrian traffic to meet either requirement of this warrant.

- Warrant 5 - (School Crossing) States that this warrant should be applied to locations where school children are crossing a major street, and there are insufficient gaps in the vehicle stream to allow for pedestrian crossing. There is no school or established school crossing at this intersection; therefore, the warrant is not met.
- Warrant 6 - (Coordinated Signal System) States that a signal, as part of a coordinated system, may be needed to necessitate a progressive movement. There are no signals in the vicinity of the project; therefore, a signal at this location is not required by this warrant.
- Warrant 7 - (Crash Experience) States that 5 of more correctable reportable accidents having occurred within a 12-month period for the location being analyzed; adequate trial of alternatives have been failed and 80% of warrant 1 & 4 are met. Section II.C.1.k – Safety Considerations, Accident History and Analysis, shows 9 accidents at the Warren Road intersection over a period of 3 years. Only 4 of these accidents could be remedied by the signal installation; therefore, this warrant is not met.
- Warrant 8 - (Roadway Network) States that a traffic signal may be warranted at an intersection of two major routes to encourage organization and concentration of traffic flow. Additionally, the intersection needs to meet the warrants for numbers 1, 2 and 3 using 5-year projected traffic volumes.

The proposed intersection does contain two major traffic routes; both are classified as urban minor arterials on the local transportation map. The 5-year projected volumes are expected to conditionally meet warrant 1 & 2, and meet warrant 3.

The projected levels of service for the study intersection for ETC+20 Future Build (2028) with a traffic signal is provided in Table III-6. The capacity analysis output sheets can be found in Appendix B.

TABLE III-6 PROJECTED LEVEL OF SERVICE – WARREN ROAD INTERSECTION						
Approach, Geometry and Control			ETC+20 (2028) Build			
			AM		PM	
			Delay	LOS	Delay	LOS
EB	LTR	S	9	A	13	B
WB	LTR	S	14	B	11	B
NB	LTR	S	9	A	9	A
SB	LTR	S	14	B	13	B
Overall			12	B	11	B

EB – Eastbound Approach
WB – Westbound Approach
NB – Northbound Approach
SB – Southbound Approach

S – Traffic Signal
LTR – Shared Left/Through/Right

The capacity analysis indicates that in ETC+20 (2028), the Hanshaw Road / Warren Road intersection would operate at acceptable LOS condition with the implementation of a traffic signal. Based on this analysis, as well as the signal warrant analysis, a new traffic signal is proposed at the Hanshaw Road/Warren Road intersection to replace the existing 4-way stop.

- (2) Safety Consideration – The accident history for the study area is discussed in section II.C.1.k – Accident History and Analysis.

A review of the project area determined that the Warren Road intersection location contained the highest concentration of accidents and had an accident rate that was higher than the statewide average accident rate for similar intersections. The following measures are proposed to reduce the accident occurrence at the Warren Road intersection:

- a. Install a new traffic signal.
- b. The rutted pavement should be replaced with new pavement to encourage water to drain away from the roadway.
- c. If budget permits, the intersection could be constructed with a color-imprinted concrete to increase the visibility of the intersection.

At the Pleasant Grove Road intersection, there were no discernable accident patterns identified. Therefore, no roadway safety improvements at this intersection are proposed as part of this project. The project will include striping improvements at this intersection to more clearly define the travel and turning lanes.

In addition, the proposed sidewalks and shoulder construction on the north side of Hanshaw Road in the vicinity of this intersection would not increase the accident potential at the intersection or create additional conflicting movements for vehicles at this intersection. Providing a designated walking area and an improved shoulder would improve the safety of pedestrians and bicyclists.

The three roadway segments that were assessed as part of the project all had accident rates that were lower than the statewide average rate, and the accident history for these segments did not reveal distinguishable accident patterns. However, all sections of the roadway have operating speeds that exceed the posted speed limits. To promote a more traffic-calmed environment and associated speed reductions, landscaping would be provided in appropriate areas along the project corridor. An additional measure that could be implemented if adequate funding is available is colored asphalt in the shoulder areas to create a sense of separation from the travel lanes, and the feeling of a narrower travel corridor to motorists to promote speed reduction.

III.C.2.c. Pavement

The Pavement Evaluation, which is included in Appendix D, details the existing pavement condition along the corridor. As described in this report, the poor condition of the pavement, including extensive cracking and inadequate foundation base, justifies the following rehabilitation and reconstruction treatments. Refer to Appendix F for Typical Sections and Plans.

- Segment 1 - Full Depth Shoulder Construction with 300 mm (12 in.) Subbase, 65 mm (2.5 in.) Asphalt Binder Course, 40 mm (1.5 in.) Asphalt Top Course
- Segment 2 - 40 mm (1.5 in.) Mill with 40 mm (1.5 in.) Asphalt Top Course Resurfacing
- Segment 3 - 225 mm (9 in.) of Full Depth Reclamation, 75 mm (3 in.) Asphalt Base Course, 65 mm (2.5 in.) Asphalt Binder Course, 40 mm (1.5 in.) Asphalt Top Course
- Segment 4 - Full Depth Rehabilitation with 300 mm (12 in.) Subbase, 150 mm (6 in.) Asphalt Base Course, 65 mm (2.5 in.) Asphalt Binder Course, 40 mm (1.5 in.) Asphalt Top Course
- Segment 5 - 225 mm (9 in.) of Full Depth Reclamation, 75 mm (3 in.) Asphalt Base Course, 65 mm (2.5 in.) Asphalt Binder Course, 40 mm (1.5 in.) Asphalt Top Course

III.C.2.d. Structures

There are no bridges within the project limits.

III.C.2.e. Hydraulics

There are no bridges within the project limits.

III.C.2.f. Drainage

A new closed drainage system is recommended for the project corridor from the western project limit to Sapsucker Woods Road. Based upon a preliminary hydraulic analysis and due to the location, age, condition and hydraulic capacity of the existing system, the existing storm drainage pipes and catch basins would need to be removed and an entirely new system constructed.

The new system would consist of either a shallow swale or concrete gutter with inlets spaced throughout the corridor. Due to the raising of the road profile and reduced roadway cross-slope, some properties may require the use of yard drains so that runoff can enter into the drainage system.

Along the north side of Hanshaw Road on the east end of the project, these inlets would feed into a trunk line outletting into Renwick Brook. Drainage at the west end of the project (approximately 540 meters of roadway) will be outlet to the Village of Cayuga Heights closed system located on the north side of the road.

Along the south side of Hanshaw Road from the western project limit to Warren Road, drainage would runoff to existing low areas. From Warren Road to Cornell's Agricultural field a new closed system would be installed consisting of shallow swales with inlets spaced throughout the corridor outletting to Renwick Brook. From Cornell's Agricultural field to east of Sapsucker Woods Road, the existing open drainage system would be retained.

Replacement of the existing drainage structure at Renwick Brook would be required. The new structure would be designed to control peak discharges to equal existing conditions. To handle the additional flows a new system would be constructed from the existing Renwick Brook outlet running along the north side of Hanshaw Road, then along the west side of Blackstone Avenue, outletting downstream of the structure at Renwick Brook.

III.C.2.g. Maintenance Responsibility

The maintenance responsibility for the highway, drainage features within the right-of-way, intersecting roads and streets, and affected utilities would remain as described in Tables II-1 and II-2 of Section II.C.1.b – Ownership and Maintenance Jurisdiction. The maintenance for the new sidewalk would be the responsibility of the Town of Ithaca and the Village of Cayuga Heights.

III.C.2.h. Maintenance and Protection of Traffic

It is anticipated that the project would be built in one phase with two stages. The first stage of construction would build the north side of the roadway and the second stage would build the south side of the roadway. During construction of Hanshaw Road, local and commuter traffic would be restricted to one lane in the eastbound direction. Westbound traffic would use a posted off-site detour. Through traffic using Warren Road will be maintained during the extent of the project. The detour route would remain in place for the duration of construction.

For motorists wanting to use Hanshaw Road traveling from NYS Route 13 west and Hanshaw Road west, the detour would begin on NYS Route 13 west at the intersection of Hanshaw Road. Signage would direct motorists to take NYS Route 13 past Hanshaw Road to the Triphammer Road exit. Motorist would turn left onto Triphammer Road and continue south to Hanshaw Road and their destination. NYS Route 13 is owned by the state of New York. The portion of Triphammer Road used for the detour route is owned by the Village of Cayuga Heights. Hanshaw Road from the western project to North Triphammer Road is owned by the Village of Cayuga Heights. There is no access for property owners adjacent to NYS Route 13 in the area used for the detour route. This route is approximately 6.9 km (4.3 mi.) long and bypasses approximately 3.9 km (2.4 mi.) of Hanshaw Road and North Triphammer Road. This off-site detour route is included in Appendix I.

For motorists wanting to use Hanshaw Road from around the eastern limit of the project, they would be directed to travel eastbound on Hanshaw Road to the intersection of NYS Route 13. Then they would turn left onto NYS Route 13. Once at NYS Route 13 the same detour would be used as described above. The portion of Hanshaw Road used for the detour route is owned by Tompkins County. Hanshaw Road is primarily agricultural with some residential areas. This route is approximately 8.5 km (5.3 mi.) long and bypasses approximately 2.4 km (1.5 mi.) of Hanshaw Road. This off-site detour route is included in Appendix I.

For eastbound traffic originating within the work limits, motorists would utilize the one designated eastbound travel lane through the construction zone. Motorists originating within the work limits and desiring westbound travel along Hanshaw Road would be required to proceed eastbound on Hanshaw Road through the work zone to the project limits. They would continue on Hanshaw Road and travel to NYS Route 13 where they would then proceed east back to Hanshaw Road.

Pedestrian traffic as well as driveway ingress and egress would be maintained at all times. Pedestrians would be accommodated on the shoulder at the beginning of stage one as it exists currently. Compacted subbase material would be placed in the permanent location of the proposed sidewalk shortly after work commences. The subbase would be used as a temporary sidewalk, until the permanent sidewalk is constructed. Bicyclists would be accommodated in the westbound direction through a shared-use roadway throughout construction.

III.C.2.i. Geotechnical

Review of the soil borings show that the roadway subbase is moist, indicating that the subbase is not draining. The groundwater levels range from 1.58 m to 3.51 m (5.2 ft. to 11.5 ft.) below ground surface elevation. Shale was encountered between Kay Street and Warren Road at a depth of 2.8 m (9.2 ft.) below the ground surface, and between Muriel Street and Salem Drive at a depth of 1.5 m (4.9 ft.) below the ground surface.

While reconstructing the roadway shoulders, underdrain pipe would be installed to address the subbase drainage problem and provide positive drainage of the roadway foundation.

III.C.2.j. Utilities

The project would affect existing utilities in varying degrees. The relocation of some overhead electric and telephone poles and wires owned by New York State Electric and Gas, Verizon, Time Warner, and Elantic Telecom, would be required. Currently it is anticipated that the poles would be located outside of the clear zone along the south side of the roadway and behind the proposed sidewalk along the north side.

In Segments 2, 3 and 4, sections of the existing watermain may conflict with the new storm sewer. These conflicts would be minimized through storm sewer design, but some watermain sections may require relocation to accommodate the new storm sewer along the north side of the roadway. Prior to construction of this project, the Town of Ithaca will be replacing and relocating the watermain east of Warren Road. The location and timing of this work will be coordinated with the proposed project. The storm sewer would replace an aging system with new smooth interior corrugated perforated pipe and generally be located between the sidewalk and proposed edge of pavement with routinely spaced small inlets at driveways.

New storm sewer would also be placed through Segments 1, 2 and 3 along the south side of the roadway requiring some relocation of the sanitary sewer system. The investigation of location and depth of all underground facilities continues to be verified.

Efforts to coordinate with both private and public utilities will continue throughout the design phases of this project. Utility agency meetings will be conducted to inform the utility owners of the various aspects of the project and to discuss potential improvements that they may want to make to their facilities during construction in the area.

III.C.2.k. Railroads

There are no railroads within the project area.

III.C.2.l. Right-of-Way

The proposed alternative would require acquisition of temporary and permanent easements along the corridor for grading and the installation and future maintenance of landscaping, landscaping amenities, sidewalk, drainage and utilities. It is estimated that 56 temporary easements may be required, with the predominance occurring along the north side of the road. The average width of the temporary easements would be approximately 5.0 m (16.4 ft).

It is estimated that 30 permanent easements may be required, with the majority occurring next to the sidewalk on the north side of the roadway. In most cases, the permanent easements would be narrow (approximately 1.0 m (3.28 ft.)) to accommodate the sidewalk. Two small fee acquisitions would be required at the outlets of the drainage system to Renwick Brook. It is anticipated that the County will obtain all right of way for the construction of the project and transfer jurisdiction for the parcels within the Village portion of the project. The estimated cost of the processing and acquisition of right of way is \$100,000.

III.C.2.m. Landscape Development

All disturbed areas would be reestablished with permanent stable materials that would blend into the natural environment. Several existing trees, hedges and shrubs would be removed to accommodate construction of the concrete sidewalk along the north side of Hanshaw Road. Landscape mitigation would be provided in areas where existing landscaping is disturbed.

Plantings would be used to establish a consistent treatment along the corridor to provide visual clues to drivers of approaching major decision areas, such as intersections, and create a traffic calming effect. The area between the sidewalk and edge of shoulder would be used for snow storage and drainage. A full landscaping plan will be incorporated into the plan set for the final design stage.

III.C.2.n. Provisions for Pedestrians, Including Persons with Disabilities

A new asphalt concrete sidewalk is proposed along the north side of Hanshaw Road from the just east of Pleasant Grove Road to Salem Drive. The sidewalk width will typically be 1.525 m (5.0 ft) but will be widened to a maximum of 2.1 m (7.0 ft) when the sidewalk is adjacent to the shoulder gutter to accommodate signage or mailboxes.

III.C.2.o. Provisions for Bicycling

Bicyclists would be accommodated on the proposed 1.2 m (4 ft.) wide, fully reconstructed, asphalt shoulder.

III.C.2.p. Lighting

No street lighting would be provided as part of this project.

III.D. Project Costs and Schedule

III.D.1. Costs

TABLE III-7 ESTIMATED PROJECT COSTS	
Construction Costs	\$ 2,763,000
Anticipated Right of Way Cost	\$ 100,000
Contingencies	\$ 250,000
Design Engineering	\$ 495,000
Construction Inspection Costs	\$ 218,000
Total Project Cost	\$ 3,826,000

III.D.2. Schedule

Design Approval:	August 2007
PS&E:	January 2008
Letting:	March 2008
Construction Completed:	May 2009

CHAPTER IV - SOCIAL, ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS

IV.A. Introduction

IV.A.1 National Environmental Policy Act (NEPA) Class and Lead Agency

The subject project is classified as a NEPA Class II project in accordance with 23 CFR 771. FHWA is the NEPA lead agency.

IV.A.2 State Environmental Quality Review Act (SEQR) Type and Lead Agency

The subject project is classified as a SEQR Unlisted Action (Non-Type II) in accordance with 6 NYCRR Part 617. Tompkins County is the SEQR lead agency.

IV.B. Social, Economic and Environmental Consequences

The assessment of environmental impacts is included in the NEPA Assessment in Appendix J. The following sections contain supporting documentation.

IV.B.1 Social Consequences

The rehabilitation/reconstruction of Hanshaw Road is not anticipated to significantly impact the surrounding community. The proposed pavement rehabilitation, shoulder replacement and sidewalk installation will result in improved safety, mobility and accessibility for pedestrians, bicyclists and motorists. The proposed project is in compliance with the current planning of the local municipalities. The project will have no significant long term adverse impacts on travel patterns, business districts, school districts, recreational areas or emergency services. Permanent right of way actions will be limited to narrow strip easements along the north side of the roadway for construction and future maintenance of the sidewalk by the Town of Ithaca and to mitigate landscaping impacts; and along the south side of the roadway in the Village of Cayuga Heights for shifting of the road to the south to accommodate the installation of sidewalk on the north side of the roadway.

IV.B.2 Economic Consequences

There will be no significant long term impacts on existing highway related businesses, established business districts, or the local or regional economies from the rehabilitation of Hanshaw Road. The valuation of properties along the corridor will not be significantly affected by the project.

IV.B.3 Environmental Consequences

IV.B.3.a. **Surface Waters / Wetlands**

- (1) Surface Waters - The project corridor is located within a rural area and the surface water generally drains to a combination of open and closed drainage features. The drainage system discharges to multiple locations along a tributary to Renwick Brook. Areas of open water drainage features occur in the eastern and western part of the project area. The surface water drainage discharges to Renwick Brook and ultimately discharges to Cayuga Lake.
 - (a) Corps of Engineers Permit (Section 404) - This project will require coordination with the US Army Corps of Engineers for disturbances to Renwick Brook associated with replacement of the existing drainage structure. Renwick Brook is identified as a perennial stream and therefore is considered waters of the United States under the jurisdiction of the USACE.
 - (b) Water Quality Certificate - As noted, the project corridor drains to a tributary of Renwick Brook, which is the major surface water body situated near or adjacent to the project corridor. The NYSDEC stream classification for this water body, as contained in 6 NYCRR, Chapter X and Part 701, is Class C Fresh Surface Waters and the water quality classification is C. The best use of Class C waters is fishing, and the waters are suitable for fish propagation and survival. The water quality is also suitable for primary and secondary recreation contact. It is noted that work within the portion of the tributary to Renwick Brook that runs under Warren Road is not anticipated.

It is noted that a significant portion of the project area is serviced by a combination of open and closed drainage systems that drains through the project corridor. It is also noted that the Town of Ithaca is designated as a regulated Municipal Separate Storm Sewer System (MS4). However, it is anticipated that a NYSDEC State Pollutant Discharge Elimination System (SPDES) permit will be required as the total project disturbance is expected will exceed the threshold disturbance area of 0.4–hectares (1.0-acre). The Project will also require a NYSDEC Section 401 Water Quality permit.

During construction, erosion from exposed surfaces may flow into the existing surface water conveyance system and/or into adjacent surface water streams and rivers.

These flows will be controlled by the use of sediment and erosion control techniques. These techniques will be part of a sediment and erosion control plan to be implemented during construction and will conform to the requirements of the NYS Department of Transportation Standard Specification for Temporary Soil Erosion and Water Pollution Control and the NYS Guidelines for Urban Erosion and Sediment Control and the SPDES Construction requirements noted above. As part of the SPDES requirements, a Notice of Intent (NOI), Erosion and Sediment Control Plan, and a Stormwater Pollution Prevention and Control Plan (SWPPP) will be required.

- (c) Protection of Bed and Banks of Streams - Since the water quality of the tributary to Renwick Brook is a Class C, there will be no permit required for the protection of bed and banks of the stream.
- (2) Wetlands
- (a) Freshwater Wetlands - The federal National Wetland Inventory (NWI) and NYSDEC Wetland Maps were reviewed for the presence of identified and mapped wetlands within or adjacent to the project corridor. Based on the map information, there are no NWI wetland areas situated at the project site or near the project vicinity that would be impacted by the project. However, Renwick Brook is identified as a perennial stream and, therefore, considered waters of the United States and is under the jurisdiction of the USACE.

The NYSDEC freshwater wetland map for the Ithaca East, New York Quadrangle was also reviewed. There are no NYSDEC regulated freshwater wetlands situated at or near the project site that would be affected by the proposed reconstruction. In addition, the open water drainage features in the project corridor are not considered to be wetlands that would be under either Federal or State jurisdiction.

IV.B.3.b. Water Source Quality

- (1) Groundwater - The proposed project area is not situated over an Environmental Protection Agency (EPA) Sole Source Aquifer. However, the project corridor is situated over a NYS Department of Environmental Conservation (NYSDEC) Primary or Principal aquifer as identified in Kantrowitz and Snavely (1982). However, based on the scope of work, the use of closed drainage systems,

and the anticipated disturbance, it does not appear that the surface water will be impacted that will affect the aquifer recharge area within the project corridor. Therefore, supplemental groundwater investigations and Toler analysis will not be required.

- (2) Surface Water – As previously stated the tributary to Renwick Brook is the major surface water body situated near or adjacent to the project corridor. The NYSDEC stream classification for this water body, as contained in 6 NYCRR, Chapter X and Part 701, is Class C Fresh Surface Waters and the water quality classification is C. The best use of Class C waters is fishing, and the waters are suitable for fish propagation and survival. The water quality is also suitable for primary and secondary recreation contact.

IV.B.3.c. General Ecology and Wildlife

- (1) Endangered or Threatened Species – State and federal agencies were contacted to determine the potential for encountering endangered or threatened species of plants or animals. The agencies each responded that except for transient individuals, there are no threatened or endangered species within the project corridor. Copies of the agency correspondence letters are included in Appendix K.
- (2) Endangered Species (Federal) - The United States Department of Commerce National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service and the United States Department of the Interior Fish and Wildlife Service (USFWS) were contacted regarding the possible presence of threatened and endangered species and habitat areas. NOAA responded that there are no endangered or threatened species under NOAA/Fisheries' jurisdiction in the project area. The USFWS responded that except for occasional transient individuals, no federally-listed or proposed endangered or threatened species under their jurisdiction are known to exist in the respective project impact areas.
- (3) Endangered Species (State) - The New York State Department of Environmental Conservation (NYSDEC) Wildlife Resources Center Natural Heritage Program and the NYSDEC Region 7 Division of Fish, Wildlife and Marine Resources were contacted regarding the presence of significant habitat areas and endangered and threatened species. Region 7 Division of Fish, Wildlife and Marine Resources office directed Fisher Associates to contact the Natural Heritage Program for listings of species and/or habitats. The NYSDEC Wildlife Resources Center Natural Heritage Program responded that they have no records of known occurrences of rare or state-listed animals or plants, significant

natural communities, or other significant habitats, on or in the immediate vicinity of the project site.

IV.B.3.d. Historical and Cultural Resources

National Historic Preservation Act (Section 106 Process) - In an effort to identify and evaluate the potential for the disturbance of documented historical properties or archeological areas within the project area, the Section 106 process was followed. The National Register of Historic Places was reviewed and the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) was contacted for input regarding any potential properties. The available record information reveals that there are no existing documented historic buildings/structures, historic districts, archeological sites, natural heritage sites, or State Historic sites currently identified within the project vicinity. A Phase 1A Structural and Phase 1B Archeological Report was completed for the proposed project and submitted to the New York State Office of Parks, Recreation and Historic Preservation on January 27, 2006. The New York State Office of Parks, Recreation and Historic Preservation responded by letter dated March 27th that based upon the evaluation of the report that the project will have "no adverse effect/impact on cultural resources in or eligible for inclusion in the State and National Registers of Historic Places".

IV.B.3.e. Visual Resources

The project area is located in an area that is largely urban/suburban residential properties with a large agricultural field at the eastern end of the project. Vegetation in the project area is a mixture of lightly to moderately wooded areas with low-lying brush, residential landscape plantings, and open fields immediately adjacent to the project site. Physical impact to the project area will be minimized to the extent practicable to avoid disturbance and/or change to the character of the natural surroundings. Loss of vegetation will be mitigated by planting new trees and shrubs. Additionally, there are no identified natural landmarks within the project corridor

IV.B.3.f. Parks and Recreational Facilities - There are no parks or recreational areas located along the project site.

- (1) Section 4(f) - The proposed project and the design alternatives do not require the acquisition of right-of-way from a park, recreational facility, or wildlife/waterfowl refuge. Therefore, further processing under Section 4(f) is not required.
- (2) Section 6(f) - The proposed project does not require the acquisition of additional right-of-way for the purpose of conversion to highway that has been federally funded through the Land and Water Conservation Fund Act (LWCFA). Therefore, further

processing under Section 6(f) is not required.

IV.B.3.g. Farmland Assessment

The project is not within a New York State Agricultural District. The project will have no effect on any active farmlands.

IV.B.3.h. Air, Noise and Energy

- (1) Clean Air Act (CAA) – The proposed project is located in an air quality attainment area as defined by the United States Environmental Protection Agency (USEPA). The project scope is such that there are no added travel lanes or traffic features that would increase vehicle delays that would lead to added air emissions within the project corridor. Therefore, further evaluations under the Clean Air Act are not required.
- (2) Energy – It is anticipated that the project will not adversely change travel patterns or alter vehicle-operating speeds in the project area. As such, energy consumption will not change as a result of the project. Therefore, an energy evaluation will not be required during design activities.

IV.B.3.i. Contaminated Materials Assessment

- (1) Asbestos - A visual asbestos assessment was conducted for the project corridor. The primary objective of the assessment was to determine the potential, based on visual observations, for encountering Asbestos Containing Materials (ACMs) in areas that may be affected by the proposed construction. The Asbestos Assessment was completed in general accordance with the February 2001 New York State Department of Transportation Environmental Analysis Bureau Environmental Procedures Manual, Volume II, Chapter 1.3 and the project scope.

Additionally, “as-built” drawings for the project corridor were reviewed as part of the asbestos assessment. The drawings did not indicate the presence of any ACM. A review of available utility records did indicate the presence of transite sewer pipe within the project area. Any alteration or removal of this pipe will require all construction practices to conform to accepted standards.

Based on the visual observations during the site reconnaissance, there does not appear to be asbestos-containing materials present within the project corridor. However, should suspect ACMs be encountered during construction, the materials should be sampled by a qualified sampling technician to determine asbestos content and disposal options.

- (2) Hazardous Waste - A Hazardous Waste/Contaminated Materials (HW/CM) Assessment was completed for the project area. The primary objective of this assessment was to render an opinion as to whether surficial or historical evidence indicates the presence of recognized environmental conditions that could result in the presence of hazardous materials in the environment. The assessment was completed in general accordance with the February 2001 EPM guidelines prepared by the New York State Department of Transportation - Environmental Analysis Bureau.

Public information was obtained from various federal, state, and local agencies that maintain environmental regulatory databases. These databases provide information about the regulatory status of a property and incidents involving use, storage, spilling or transportation of oil or hazardous materials. The search distances for the federal, state and local databases were in conformance with the search distances established in ASTM E-1527 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

A general site reconnaissance was conducted to make observations of surficial conditions and to observe possible evidence of recognized environmental conditions, which could result in the presence of hazardous materials in the environment. Visual observations made during the site reconnaissance revealed that there was no visible evidence of environmental concerns within the current limits of the project corridor. However, if the westerly limits of the project corridor extend beyond the intersection of Pleasant Grove Road, the gasoline station/mini-mart at the north side of Hanshaw Road at the intersection (910 Hanshaw Road) will require further evaluation.

In addition to the potential environmental concerns identified through visual observation, published Federal and State databases were reviewed to determine if sites within or adjacent to the project corridor have a history of use and/or disposal of contaminated/hazardous wastes.

The following list includes, but is not limited to, those databases researched.

Federal Agency Databases

- National Priorities List (NPL)
- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
- RCRA Corrective Action Sites (CORRACTS)
- Resource Conservation and Recovery Information System (RCRIS)
- Emergency Response Notification System (ERNS) Database
- Facility Index System/Facility Identification Initiative Program (FINDS)
- RCRA Administration Action Tracking System (RAATS)
- Toxic Release Inventory System (TRIS)
- Toxic Substances Control Act (TSCA)

State Agency Databases

- Leaking Tanks (LTANKS) Database
- State Hazardous Waste Site (SHWS) Inactive Hazardous Wastes Disposal Sites
- Solid Waste Facilities/Landfills (SWF/LF)
- Underground Storage Tank (UST) Petroleum Bulk Storage (PBS) Database
- Voluntary Cleanup Agreements (VCP)
- Above Ground Storage Tank (AST) Petroleum Bulk Storage (PBS) Database
- Chemical Bulk Storage (CBS) AST Database
- New York State Spills (SPILLS) Database
- CBS UST Chemical Bulk Storage Database
- UST Major Oil Storage Facilities (MOSF) Database

Review of the above-listed databases indicates that ten (10) State and local sites are identified within the project search radius limits. These sites include: three (3) PBS sites; and seven (7) NY Spills sites. Of the sites identified within the search distance, it should be noted that none of the sites are located immediately within or adjacent to the project corridor.

Based on the current project limits, as open regulatory agency files do not exist, and previous site uses of potential environmental concern were not identified, supplemental environmental investigations will not be warranted.

IV.B.3.j. Construction Impacts

A partial detour of vehicular traffic will be required to allow for construction of the project. The detour will divert eastbound traffic to an off-site route. The westbound traffic will be permitted to use the corridor to provide local access and for emergency vehicle responses throughout construction. Appendix I contains a map of the off-site detour routes.

IV.B.3.k. Anticipated Permits, Approvals and Coordination

The following permits are anticipated to be required for construction of the project:

- NYSDEC SPDES Construction Permit
- NYSDEC SPDES Notice of Intent (NOI)
- NYSDEC Section 401 Water Quality Permit
- USACOE Section 404 Permit (Nationwide permit may apply)
- FHWA Executive Order 11990 – Wetland Finding
- NYSDOT Highway Work Permit

CHAPTER V - SUMMARY AND ANALYSIS OF COMMENTS RECEIVED

Numerous comments were received at the March 27, 2007 Public Meeting. The comments received were both in written form (comment sheets) and verbal form (transcript). The Public Hearing transcript and all comment sheets received are included in Appendix L.

Comments/Responses from the Public Meeting Transcript

- Comment No. 1 - *Deb Cowan*: Where will the snow be stored?
- Response No. 1 - See Chap. 3 for description of the Preferred Alternative. The shallow swale proposed in some areas will provide for snow storage. In areas where a swale cannot be provided due to inadequate roadside width, snow storage will occur in the gutter or on the sidewalk. The Town of Ithaca or Village of Cayuga Heights will physically remove snow from the sidewalks when necessary.
- Comment No. 2 - *Ron Shewchuk*: Will there be room for delivery trucks and buses to pull off the road?
- Response No. 2 - The shoulder will provide an area for trucks or buses to pull partially off the road and allow vehicles to pass.
- Comment No. 3 - *Gary Turton*: Why can't this project provide wide shoulders to be used by bikes and pedestrians, similar to Warren Road?
- Response No. 3 - This project is being funded with 80% Federal money and must follow Federal standards.
- Comment No. 4 - *Peter Stein*: Concerned that new sidewalks on north side of Hanshaw will encourage pedestrians to cross Hanshaw to get to Community Corners, with fast moving traffic on Hanshaw.
- Response No. 4 - No new crosswalk is proposed at the Pleasant Grove intersection. Pedestrians will be required to cross at the existing crosswalks. The plan from the Village of Cayuga Heights includes a new crosswalk east of the Hanshaw/Pleasant Grove intersection.
- Comment No. 5 - *Teresa Jordan*: Concerned with high speed of traffic; can speed limit be temporarily lowered until construction is complete?
- Response No. 5 - The project does not propose to change the speed limits on Hanshaw Road.
- Comment No. 6 - *Teresa Jordan*: Will the Warren Road traffic signal have a button for pedestrians.
- Response No. 6 - Yes

- Comment No. 7 - *Sylvia Wahl*: Concerned with trees. Requests the project use a special kind of material for the sidewalks, which can go around the trees and allow for freezing and thawing.
- Response No. 7 - The Preferred Alternative includes both concrete and asphalt sidewalk. More specialized materials for the sidewalk are beyond the project budget. Structural soil will be used around sensitive trees.
- Comment No. 8 - *Sylvia Wahl*: Will the lighting on Salem remain?
- Response No. 8 - Any existing street lighting on Hanshaw or side streets will remain. No new street lighting will be installed as part of this project. A new traffic signal will be installed at the Hanshaw/Warren intersection.
- Comment No. 9 - *Bernie Hutchins*: Opposed to new sidewalks on Hanshaw.
- Response No. 9 - Noted.
- Comment No. 10 - *Peter Carruthers*: Where are the traffic calming measures in this plan? Other areas of Hanshaw Road in the Village of Cayuga Heights have curbs along the road.
- Response No. 10 - New curb along Hanshaw within the project limits is beyond the project budget. Traffic calming measures such as colored pavement for the shoulders and colored pavement for the Hanshaw/Warren intersection are currently included as project alternates and will be provided if the budget allows. The narrowed shoulders are a traffic calming measure over the design standards. The sidewalk and gutter sections would give visual queues to the driver that one is entering an area of a different character, and therefore are traffic calming measures.
- Comment No. 11 - *Klaus Beyenbach*: Opposed to widening the road and installing sidewalks. Concerned the widening will increase the amount of traffic on Hanshaw and stimulate speeding.
- Response No. 11 - The Preferred Alternative does not widen the roadway (travel lanes and shoulders) from the existing width. The project is not expected to generate any new traffic (see Chap. 3, Section III.C.2.b.) and is not expected to increase speeds along the corridor.
- Comment No. 12 - *Arno Selco*: Concerned with existing drainage problems and lack of coordination between this project and other drainage projects (Salem Dr. project and Briarwood II Project).
- Response No. 12 - Coordination has taken place between the County and the Town regarding existing drainage problems and proposed drainage projects. Coordination will continue with the Salem Drive and Briarwood II projects through final design and construction of this project.

- Comment No. 13 - *Bruce Levitt*: Opposed to project.
- Response No. 13 - Noted
- Comment No. 14 - *Gerald Gladstein*: Opposed to project.
- Response No. 14 - Noted
- Comment No. 15 - *David Collum*: Opposed to project.
- Response No. 15 - Noted.
- Comment No. 16 - *Unknown*: In favor of project, including sidewalks
- Response No. 16 - Noted.
- Comment No. 17 - *Diane Feldman*: Questions the need for this project at this time.
- Response No. 17 - See Chap. 2, Section II.C.2.a. – Project Level Needs and Section II.D – Project Objectives.
- Comment No. 18 - *Kevin Cowan*: Concerned with the design of the sidewalk (jogging in and out to avoid landscaping) and the lack of lighting.
- Response No. 18 - The design of the sidewalk takes into account the existing topography (grades/slopes of yards) and accommodations to meet requests of property owners regarding saving existing landscaping. No new lighting is included in the project.
- Comment No. 19 - *Victoria Wishart*: In favor of project, including sidewalks
- Response No. 19 - Noted.
- Comment No. 20 - *Dave Zajac*: In favor of project, including sidewalks with ADA accessibility.
- Response No. 20 - Noted.
- Comment No. 21 - *Deb Cowan*: Concerned that proposed sidewalks will be too close to the road and will be unsafe for children.
- Response No. 21 - Hanshaw Road is a low speed roadway and the width and location of the sidewalks meet Federal standards.
- Comment No. 22 - *Jinyong Hutchins*: Opposed to sidewalk; would prefer to have a wide roadway, similar to Warren Rd.
- Response No. 22 - Opposition noted. See Response No. 3 above regarding the Warren Road comment.

Comments/Responses from the Comment Sheets

- Comment No. 23 - *Cowans and Ptaks*: Requested the sidewalk in front of their properties be moved to the curb to reduce impacts and the need for ROW takings.
- Response No. 23 - Noted – the plans reflect this request.
- Comment No. 24 - *Property owner on Blackstone*: Requested that large trees at Hanshaw/Blackstone intersection be preserved, on both sides of Hanshaw. Owner feels the intersection does not need to be widened.
- Response No. 24 - The preferred alternative includes removal of a tree at the southeast corner of Hanshaw/Blackstone to accommodate the necessary radius and associated grading.
- Comment No. 25 - *Several*: Expressed concerns about pedestrian safety at Hanshaw/Pleasant Grove. A signal would be more appropriate at this intersection than at Warren Rd. New sidewalk would be better on the south side of Hanshaw in this area.
- Response No. 25 - The roadway reconstruction / rehabilitation limits of this project do not include the Hanshaw/Pleasant Grove intersection. The sidewalk along the north side of the roadway was extended to this intersection to connect with the existing sidewalk on the north side of the roadway. See Chap. III, Section III.C.2.b.2. for more information about this intersection and proposed improvements.
- Comment No. 26 - *Several*: A crossing beacon or signal at Hanshaw/Blackstone was suggested.
- Response No. 26 - The Hanshaw/Blackstone intersection does not meet the warrants for traffic signal installation.
- Comment No. 27 - *Janet Wagner*: A traffic signal is needed at Hanshaw/ Pleasant Grove; dangerous intersection and traffic back-ups occur on Pleasant Grove.
- Response No. 27 - See Response No. 25 above.
- Comment No. 28 - *Janet Wagner*: Please do not color the shoulders green or red. Natural color of asphalt blends into background.
- Response No. 28 - The project includes coloring the shoulders if budget allows. The colored shoulders would visually narrow the roadway in an effort to reduce the operating speeds.
- Comment No. 29 - *Doug and Bruce Brittain*: Widening Hanshaw Road by adding paved shoulders seems to be unjustified. It will encourage drivers to drive faster and will not benefit bicyclists. This plan calls for increasing the design

speed on Hanshaw Road to well above the speed limit. A narrower road and a meandering road centerline could do much to decrease speeds and preserve existing vegetation.

- Response No. 29 - The preferred alternative does not include widening Hanshaw Road. The preferred alternative does include replacing the mostly gravel shoulders with asphalt shoulders, per Federal standards. See Response No. 3 above. The posted speed limits are 30mph and 40mph; the proposed design speeds are 37mph and 50mph. The design speeds are based on the operating speeds (see Chap. II, Section II.C.1.g.).
- Comment No. 30 - *Doug and Bruce Brittain:* If the road is kept to more reasonable dimensions, then it should be possible to provide pedestrian facilities without encroaching on existing trees, lawns, etc... It should be possible to fit two cars and two pedestrians into a 50 ft. wide ROW.
- Response No. 30 - See Responses No. 18 and 29 above. Again, Federal standards must be followed in the design of this project.
- Comment No. 31 - *Doug and Bruce Brittain:* A narrower roadway and more curvature to the road should be able to preserve much of the vegetation. Shifting the road centerline slightly to the south would preserve landscaping on the north side. Large maple tree at southeast corner of Hanshaw/Blackstone should not be removed.
- Response No. 31 - See Response No. 29 above. The maple tree at Hanshaw/ Blackstone is being removed to accommodate the new radius and associated grading.
- Comment No. 32 - *Doug and Bruce Brittain:* There is no need to make the Hanshaw/Warren intersection wider.
- Response No. 32 - The preferred alternative includes enlarging the radii at the Hanshaw/ Warren intersection in order to accommodate buses. The proposed radii allow buses to make turns at the intersection and remain in the appropriate travel lanes.
- Comment No. 33 - *Doug and Bruce Brittain:* Installation of a traffic signal at the Hanshaw/ Warren intersection would be counterproductive for the following reasons (see comment sheet in Appendix L): 1) Warrants – old NYS MUTCD warrants were used to determine if a signal is warranted. The analysis should be redone using the new National MUTCD warrants; 2) Delay – a traffic signal will likely increase delay, congestion and travel time. Current delay was not measured, but modeled using software; 3) Left turns – traffic signal will make it harder to make left turns in the face of opposing traffic, thus increasing congestion; 4) Safety – all way stop intersections tend to have good safety records and this one is no exception.
- Response No. 33 - See Chap. III, Section III.C.2.b. for a complete discussion of why the proposed signal is warranted. 1) Warrants – The analysis was updated to

reflect the Federal MUTCD warrants and the signal is still warranted; 2) Delay - According to traffic analyses included in Chap. III, delays will not be increased with a signal (see Table III-6). The software used to model the intersection is approved by NYSDOT and FHWA. 3) Left turns – again, according to traffic analyses, left turns will not lead to additional congestions; 4) Safety - See Chap. II, Section II.C.1.k. for discussion regarding safety at this intersection. See page II-15: “The highest concentration of accidents within the project limits was at the Warren Road intersection...”

- Comment No. 34 - *Christopher and Celeste Ptak*: Concerned with impacts of project to property (1018).
- Response No. 34 - See Response No. 23
- Comment No. 35 - *Jack Young*: In favor of project; it will be beneficial for pedestrians.
- Response No. 35 - Noted
- Comment No. 36 - *Paul Allen*: In favor of project; it will be beneficial for pedestrians and bicyclists.
- Response No. 36 - Noted
- Comment No. 37 - *Charlotte and Kenneth Williams*: In favor of project; it will be beneficial for pedestrians and bicyclists.
- Response No. 37 - Noted
- Comment No. 38 - *Niels Ham*: The grading of Muriel Dr. at Hanshaw is very steep and dangerous in the winter. Cars on Muriel are in danger of sliding into Hanshaw traffic, as they try to stop at the intersection. Does the project include regrading Muriel at Hanshaw?
- Response No. 38 - The preferred alternative includes modifications to improve the slope on Muriel at Hanshaw. See Appendix F for profiles.
- Comment No. 39 - *Esref Doogan*: Wants pipe that is approximately 75 feet off the right-of-way under Stonybrook Lane replaced to increase capacity of existing swale; water currently jumps the ditch and floods his house.
- Response No. 39 - This pipe is outside the project limits and will not be replaced as part of this project.
- Comment No. 40 - *Lori Bushway*: In favor of project; it will be beneficial for pedestrians and bicyclists.
- Response No. 40 - Noted

- Comment No. 41 - *James Fenner*: Concerned about the quality of the proposed sidewalk; will it be thick enough to withstand the freezing and thawing as the seasons change?
- Response No. 41 - The sidewalk will be constructed to the standards required by NYSDOT.
- Comment No. 42 - *Chris Strebel*: In favor of sidewalks.
- Response No. 42 - Noted
- Comment No. 43 - *Kevin Mahaney*: In favor of the project and sidewalks. In favor of sidewalk extending further east.
- Response No. 43 - Noted. Per past discussions, the Town may install sidewalk on Hanshaw east of Salem in the future.
- Comment No. 44 - *Barbara Apt*: In favor of sidewalk.
- Response No. 44 - Noted
- Comment No. 45 - *Peter Carruthers*: Residents would prefer Hanshaw be classified a "Rural Road". Believes proposed project will diminish property values, privacy and quality of life.
- Response No. 45 - See Chap. II, Section II.C.1.a.(1) regarding the roadway classification. Chap. IV of this report details the social, economic and environmental impacts of the project. It is not anticipated that the project will have any long term detrimental impacts to property values, privacy or quality of life.
- Comment No. 46 - *Peter Carruthers*: Perhaps Cornell could provide some of their property to remove traffic from Hanshaw.
- Response No. 46 - Removing traffic from Hanshaw is not a project objective.
- Comment No. 47 - *Peter Carruthers*: Proposed traffic signal at Hanshaw/Warren will encourage speeders; 4-way stop sign works well.
- Response No. 47 - See Response No. 33 above.
- Comment No. 48 - *Peter Carruthers*: Consider adding 3 or 4-way stop signs at Salem or Muriel or Blackstone, to reduce traffic speeds and make the road less attractive as a shortcut.
- Response No. 48 - Traffic patterns and accident analyses do not indicate the need for additional traffic control at these intersections.
- Comment No. 49 - *Peter Carruthers*: Sidewalks along Hanshaw should be constructed similar to those in Cayuga Heights (narrower and closer to the road). Perhaps reconsider use of federal funds; instead reallocate local funds.

- Response No. 49 - See Response No. 3 above. There are not enough local funds available to fund this project.
- Comment No. 50 - *Peter Carruthers*: Requests physical re-marking of all trees to be removed.
- Response No. 50 - See the plans in Appendix F – landscaping to be removed is designated with an 'X'.
- Comment No. 51 - *Peter Carruthers*: Yew trees are erroneously classified as brush in the plans.
- Response No. 51 - Noted.
- Comment No. 52 - *Peter Carruthers*: Request a curb cut at 1008 Hanshaw at the east end of the property.
- Response No. 52 - The project will replace the existing curb cuts. New curbs cuts need to be applied for through the County permit process.
- Comment No. 53 - *Peter Carruthers*: Temporary easements seem excessive. It is not clear why they would be used to fill low areas and prevent water pooling at 1008 and 1010, since the land here is significantly higher than the road.
- Response No. 53 - The Temporary easements at 1008 and 1010 are for grading purposes. The grading is designed to eliminate any low points behind the sidewalk (in the lawn area) and to keep drainage flowing toward the roadway.
- Comment No. 54 - *Bernie Hutchins*: It is important to include in the official documents the opposition to the proposed sidewalks. Approximately 80% of the those at the March 27, 2007 public meeting raised their hands to oppose the sidewalks.
- Response No. 54 - This document reflects opposition to and concerns about the proposed sidewalk. This document also reflects support for the sidewalk. Considering all comments received, the majority of commenting residences favor a sidewalk, which is included in the Preferred Alternative.
- Comment No. 55 - *Bernie Hutchins*: In general, it seems that the design will result in a less safe neighborhood. I have read "...it is always assumed that when an improvement is completed to a road speeds have a tendency to increase between 5 to 8 miles per hour..."
- Response No. 55 - See Response Nos. 10 and 11 above.

- Comment No. 56 - *Bernie Hutchins:* At my property (1016 Hanshaw) you failed to notice my second entrance, gravel drive. A better option than a curb cut here would be the "no curb" option to the east.
- Response No. 56 - Noted. The limits of proposed curb and gutter will be reviewed and finalized during detailed design.
- Comment No. 57 - *Bernie Hutchins:* Under II.C.e (1) of the Draft Design Report it is noted the existing ROW is approximately 50 ft. for the length of the project. At my property the existing ROW is well argued to be just 17 ft. from the centerline, not 25 ft. Also, the ROW discussion on page III-15, Section III.C.2.I contradicts that under II.C.e (1).
- Response No. 57 - The existing ROW at 1016 Hanshaw is approx. 50 ft. wide and the distance from the centerline is approx. 25 ft., as shown on Drawing PL-02 in Appendix F. The sections regarding ROW in Chapters II and III are not contradicting. The section in Chapter III refers only to easements that are required outside of the existing 50 ft. ROW.
- Comment No. 58 - *Bernie Hutchins:* Under II.C.1.v. the Draft Design Report noted "...the Village of Cayuga Heights passed a resolution indicating a financial commitment to fund the portion of the sidewalk in the Village." They actually said "...there will be a resolution required in the future to make the commit to the actual financial obligation."
- Response No. 58 - Follow-up inter-municipal agreements are required with both the Town of Ithaca and Village of Cayuga Heights to commit funding and establish future walkway responsibilities.
- Comment No. 59 - *Bernie Hutchins:* A hazardous pedestrian condition is being created at the Hanshaw/Pleasant Grove intersection with proposed sidewalk on the north side of Hanshaw. (See Appendix L for full letter) It would be better to have an all-way stop at this intersection, with pedestrian crosswalks and good signage. Another alternative would be a traffic signal with pedestrian buttons.
- Response No. 59 - The County acknowledges that this could be a pedestrian safety issue. The Village is working with the County by proposing alternative crossings, one east of Pleasant Grove and one on Pleasant Grove in the firehouse vicinity. The County is also considering traffic calming techniques to complement a crossing on Hanshaw, as permitted by the State Highway Design Manual.
- Comment No. 60 - *Bernie Hutchins:* Section III.C.2.g. of the Draft Design Report noted maintenance will be the responsibility of the Town of Ithaca and the Village of Cayuga Heights. We know of the local law in the Town, but where has the Village assumed maintenance? On page III-15 the draft report says that ROW would be obtained by the County and then "transfer jurisdiction for the parcels within the Village portion of the project." What

about transferring to the Town? Is Town maintenance still on or is the County retaining ownership of the Town portion? Further, the County does not own the portion of the road in the Village, so how do they, as opposed to Cayuga Heights, even ask for an easement? If compensation for a granted easement is due for the portion within the Village, does this come from the County or the Village?

- Response No. 60 - As mentioned above, the County will be developing inter-municipal agreements with the Town and Village concerning walkway ownership, etc. The County would transfer acquired ROW to the Village in the Village because the road is Village jurisdiction. The County would retain ROW along the Town portion of Hanshaw since it is a County road. The Town would be permitted to work within the County ROW for walkway maintenance as they do at other locations.
- Comment No. 61 - *Bernie Hutchins*: Section II.C.1.q. of the Draft Design Report includes no mention of any existing drainage problems in the western portion of the project between Blackstone and the Village. There are no drainage facilities here at the present and none are needed. This area is a former delta of a former version of Fall Creek into high-level Lake Ithaca. The geological data in the report confirms this (water table at 11 feet). All that is accomplished with the proposed storm runoff efforts at this end is converting water that normally sinks into the ground into run-off. This is a waste of resources and is contrary to policies of trying to reduce storm runoff.
- Response No. 61 - Noted. These drainage issues will be considered during final design.
- Comment No. 62 - *Bernie Hutchins*: Where are the "traffic calming" measures? I believe smoothing the road and widening the perceived vista will increase speed by at least 5 mph. There is no point to include safety issues as reasons for doing anything related to this project. Here are three things that would work: speed bumps, stop signs at every intersection, and plywood silhouette cutouts of police officers.
- Response No. 62 - See Response Nos. 10 and 11 above. The County is considering traffic calming techniques, as permitted by the State Highway Design Manual.
- Comment No. 63 - *Bernie Hutchins*: What are the costs? It was noted at the March 27, 2007 meeting that costs had gone from an early estimate of \$2.4 million to \$2.9 million. The Draft Design Report says \$3.826 million.
- Response No. 63 - The \$3.826 million is the budget for the entire project. The \$2.9 million is the approx. construction cost.
- Comment No. 64 - *Mike Ludgate*: It would be better for our store to have the proposed detour keeping eastbound traffic on Hanshaw.

Response No. 64 - See Chapter III, Section III.C.2.h – the proposed detour will keep maintain eastbound traffic on Hanshaw and detour westbound traffic.