Final Report

Route 4 Corridor Study

Prepared for the Adirondack / Glens Falls Transportation Council

July 2005

Prepared by Buckhurst Fish & Jacquemart Inc.

In Association with:
Vollmer Associates LLP
Mathews Nielsen Landscape Architects, PC

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Buckhurst Fish & Jacquemart Inc.
115 Fifth Avenue
New York, NY 10003

www.bfjplanning.com

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Tables and Figures

1.0 Introduction

1.1 Purpose, Goals and Objectives

The purpose of this study is to develop a corridor management plan for U.S. Route 4 through the Washington County communities of the Town and Village of Fort Ann, the Town and Village of Whitehall, the Town of Kingsbury and the Town of Hampton. This report is a planning study, and is designed to stimulate ideas, rather than offer concrete solutions for any issue identified. All recommendations in this study will require further study by the engineers at the New York State's Department of Transportation before they can be implemented. The corridor is over 25 miles in length and runs from the Route 4/32 intersection in Kingsbury to the New York/Vermont State border (Figure 1.1). Buckhurst Fish & Jacquemart, Inc., together with Vollmer Associates and Mathews Nielsen as subconsultants were retained by the Adirondack-Glens Falls Transportation Council (A/GFTC) to provide a long-term vision of the corridor, improve safety and suggest improvements that may be needed to best serve its role within the surrounding community. A/GFTC is the metropolitan planning organization for the region.

This section of U.S. Route 4 is a two-lane principal arterial and is part of the National Highway System (NHS). The southernmost 1.8 miles lie within the Glens Falls Urban Area. The remaining 23.8 miles are classified as rural. Route 4 is the primary means of north-south travel in western Washington County and connects the northern areas of the county to the Glens Falls / Hudson Falls / Fort Edward area. It serves as the main street through a number of communities and crosses through the villages of Fort Ann and Whitehall. It is a vital component of the local transportation system, and serves as the primary connection between New England and Interstate 87. Route 4 carries a high volume of heavy trucks in addition to year-round recreational traffic.

BFJ analyzed existing conditions, traffic flows as well as accident rates and locations along Route 4. This report provides planning recommendations to manage the corridor with a focus on accident reduction. It is important to evaluate current and future conditions to both identify problems and offer solutions. By analyzing traffic patterns and data, problem areas can be brought to light and solutions put forward.

1.2 Public Participation Process

A Technical Advisory Committee was established to offer guidance to BFJ. The committee included representatives from Washington County and from the municipalities along the corridor as well as A/GFTC and the New York State Department of Transportation. BFJ met three times with the committee during different phases of the study.

A core element of the study was a wide public participation effort. Four public workshops were held at different stages of the study. The purpose of the workshops was to bring committee members and residents together and benefit from their combined local knowledge. At the Planning Workshops, held in Fort Ann on June 23rd, 2004 and in Whitehall on June 24th, 2004, BFJ presented the existing conditions along the corridor and then the workshop participants were asked to share their own visions for Route 4.

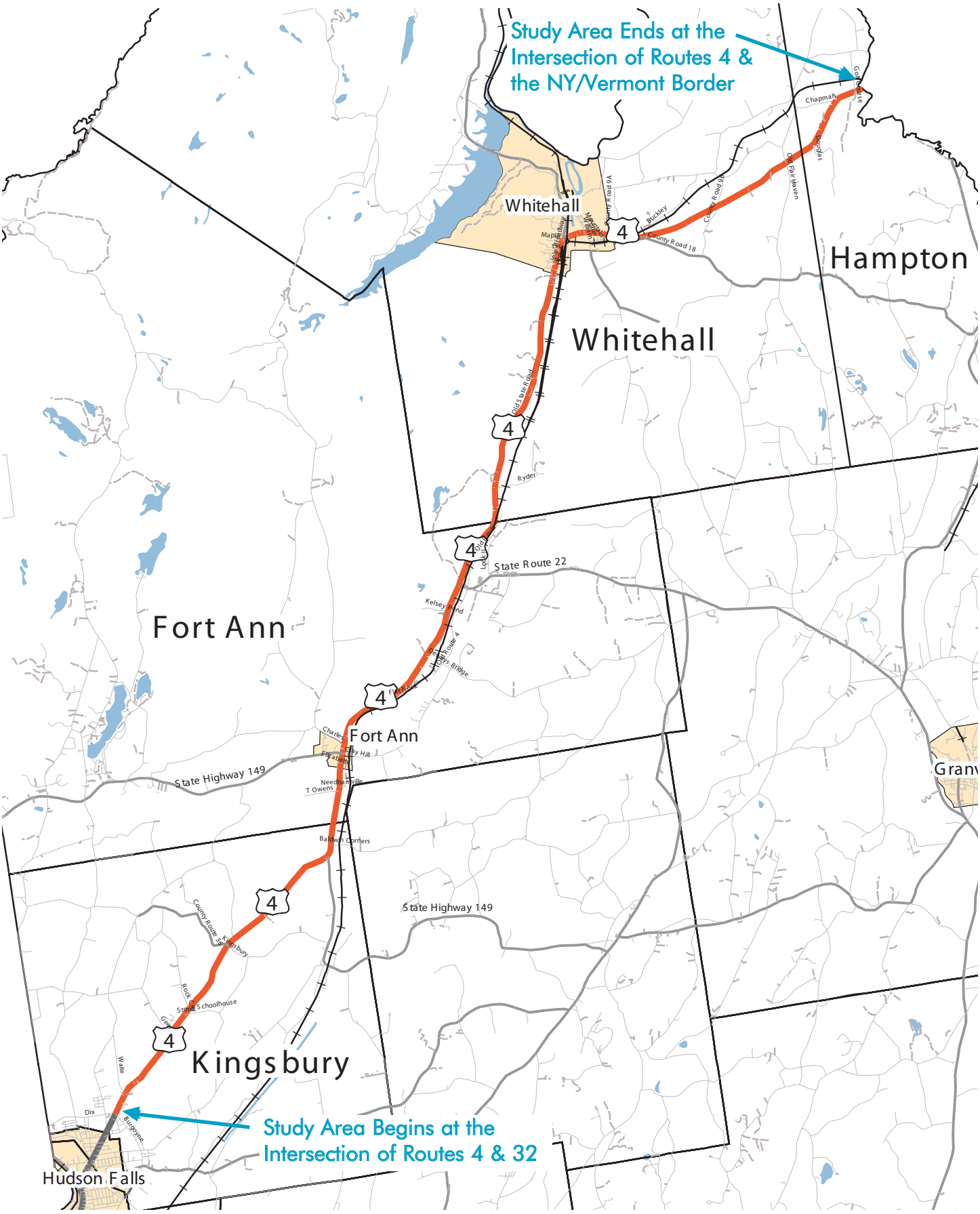

FIGURE 1.1 STUDY AREA FOR ROUTE 4

ROUTE 4 CORRIDOR STUDY

source: Census TIGER® 2000 Data from Geography Network

0 2 miles

April 2004

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Comments made at the workshop helped BFJ to further identify the core issues and opportunities along the corridor. At the Design Workshops on September 21st, 2004 in Fort Ann and September 22nd in Whitehall BFJ presented short, intermediate and long-term recommendations based on existing and future conditions. Workshop participants had the opportunity to respond to proposed improvement concepts and suggest other ideas and priorities.

2.0 Existing Conditions

2.1 Roadway Conditions

The Route 4 study corridor is a major north-south principal arterial approximately 25 miles in length that runs from the Town of Kingsbury to the New York/Vermont State border. The roadway generally consists of one travel lane in each direction (approximately 12' width) with shoulders (varying widths) provided on each side. Pavement conditions are generally perceived to be good. The study corridor passes through several communities in Washington County, including: the Town of Kingsbury, the Town and Village of Fort Ann, the Town and Village of Whitehall and the Town of Hampton. This is shown in Figure 1.1.

2.2 Daily Traffic Volumes (AADT)

A traffic report was obtained from New York State Department of Transportation (NYSDOT) for the different segments of Route 4. The hourly report shows traffic volumes taken at a certain location for a 24-hour period during one year, which are then multiplied by different factors (seasonal, local conditions) to get the estimated Average Annual Daily Traffic (AADT). Figure 2.1 shows the AADT volumes (with corresponding year taken) for the various locations along the Route 4 corridor. As can be seen, the average daily traffic along Route 4 from the intersection of Route 32 to Route 149 (north) in the Town of Fort Ann is from 5,880 to 6,876 vehicles. The section along Route 4 north of the intersection of Route 149 (north) to the New York/Vermont State line has an AADT of 8,726 to 9,873.

BFJ also installed Automatic Traffic Recorders (ATR) along the different sections of Route 4 to obtain the number of heavy vehicles that are passing through the various segments of Route 4. The survey shows that along Route 4, approximately 13% to 15% of the total vehicles are heavy vehicles. The average for this type of roadway is generally below 10%.

2.3 Peak-Hour Traffic Volumes

BFJ conducted manual turning movement counts at several critical intersections along the study corridor. The morning and afternoon traffic counts were conducted from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM in May of 2004 (See Appendix A for details). Table 2.1 summarizes the different intersections that were counted. Of the five study intersections that were counted, four are signalized and one is unsignalized.

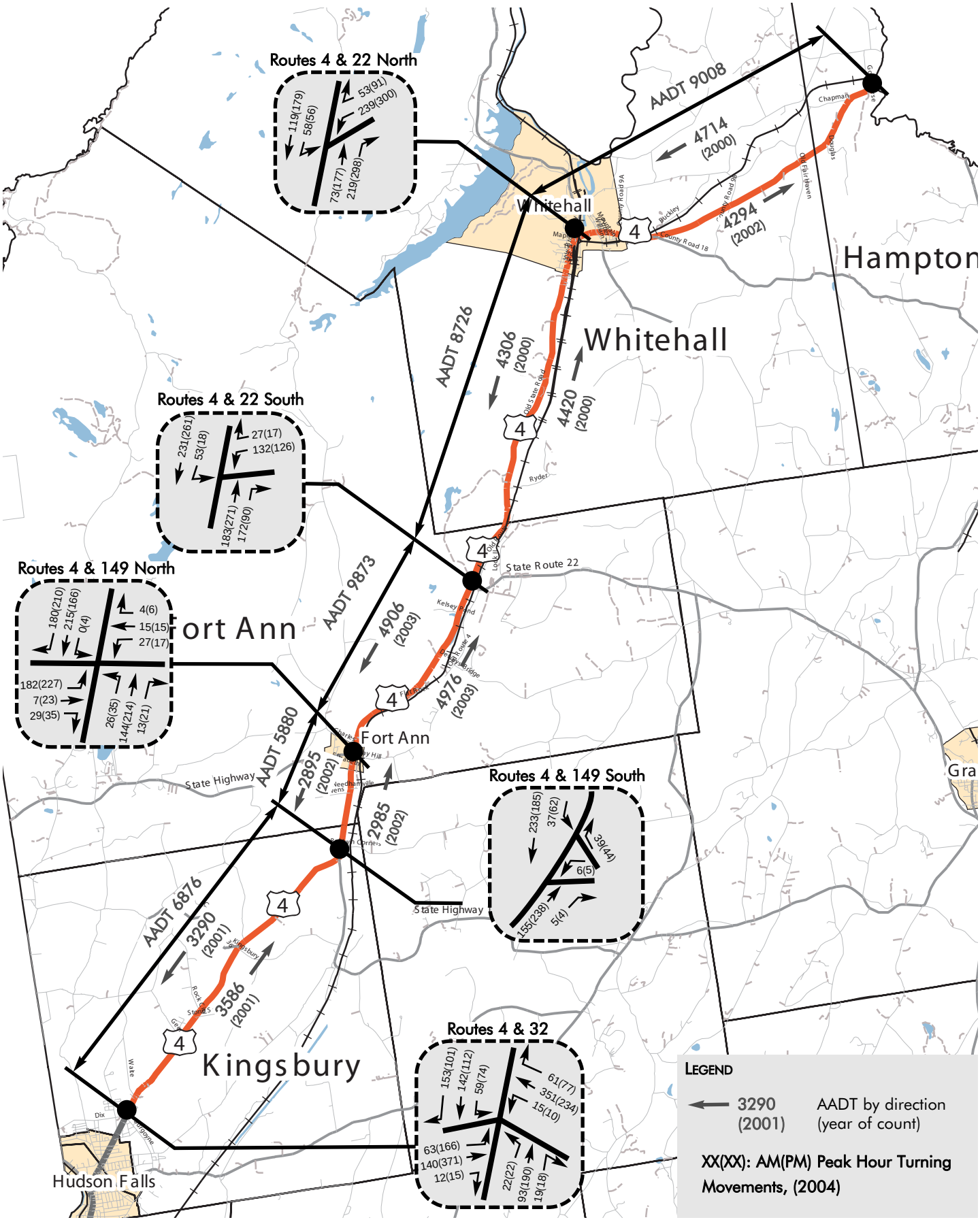

FIGURE 2.1 DAILY & PEAK-HOUR TRAFFIC VOLUMES

ROUTE 4 CORRIDOR STUDY

source: NYS DOT, BFJ Field Study

0 2 miles

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Table 2.1 – Study Intersections

Intersection	*Type*
Route 4 and Route 32	Signalized
Route 4 and Route 149 (south)	Unsignalized
Route 4 and Route 149 (north)	Signalized
Route 4 and Route 22 (south)	Signalized
Route 4 and Route 22 / Broadway / Poultney	Signalized

Figure 2.1 shows the traffic volumes at the different study intersections for the weekday morning and afternoon peak hours. Peak hours typically occurred from 7:15 AM to 8:15 AM in the morning, and 4:15 PM to 5:15 PM in the afternoon.

A comparison between the turning counts at Routes 4 & 32 between 1999[1] and 2004 showed an annual increase of 4% in traffic during the AM peak hour and an increase of 1% during the PM peak hour.

2.4 Existing Levels of Service

Based on the peak-hour traffic volumes and on geometric measurements made during the site evaluation, all intersections were analyzed using the Highway Capacity Manual method (Transportation Research Board Special Report 209, Fourth Edition, 2000 Update). Traffic conditions are described in terms of level of service (LOS) with the levels ranging from LOS A, the best, to LOS F, the worst. Level of service C is generally considered the design level of service, while LOS D is generally considered as the acceptable limit during peak hours. Level of service E is typically at or near the capacity of the roadway or intersection and generally involves unacceptable delays.

Levels of service for signalized intersections are defined in terms of average control delay per vehicle. Delay is dependent on a number of variables including the quality of signal progression, cycle length, green ratio and the volume/capacity ratio for the lane group or approach in question. For signalized intersections, levels of service can be calculated and expressed for each movement or approach and for the total intersection as a weighted average of all movements. Specifically, level of service criteria are stated in terms of the average control delay per vehicle for the worst 15-minute period within the peak hour, as shown in Table 2.2. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

1 Dix Avenue Corridor Study by the Sear-Brown Group, June 2000, pg. 35-36

Table 2.2 – Level of Service Criteria for Signalized Intersections

Level of Service	*Average Control Delay (seconds/vehicle)*
A	10.0 or less
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	more than 80.0

Source: Highway Capacity Manual, TRB Special Report 209, Fourth Edition, 2000 Update.

Level of service analyses for an unsignalized intersection are based on average control delay, defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The total delay for a particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. The level of service criteria for unsignalized intersections are shown in Table 2.3.

Table 2.3 – Level of Service Criteria for Unsignalized Intersections

Level of Service	*Average Control Delay (seconds/vehicle)*
A	10.0 or less
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	more than 50.0

Source: Highway Capacity Manual, TRB Special Report 209, Fourth Edition, 2000 Update.

Using the capacity analysis methodology described above, peak-hour traffic volumes were analyzed to determine the existing levels of service for the five study intersections for the weekday morning and afternoon peak hours. Figures 2.2 and 2.3 show the existing levels of service for each intersection approach as well as the overall level for the signalized intersections.

As can be seen, most of the intersections within the study area operate with good levels of service for the peak hours analyzed, except for the intersection of Route 4 and Route 32. This intersection operates with overall LOS E and LOS D during the morning and afternoon peak hours, respectively. The westbound approach operates with a LOS F with delays of about 2 minutes during the morning peak hour and a LOS E with delays of approximately 1 minute during the afternoon peak hour.

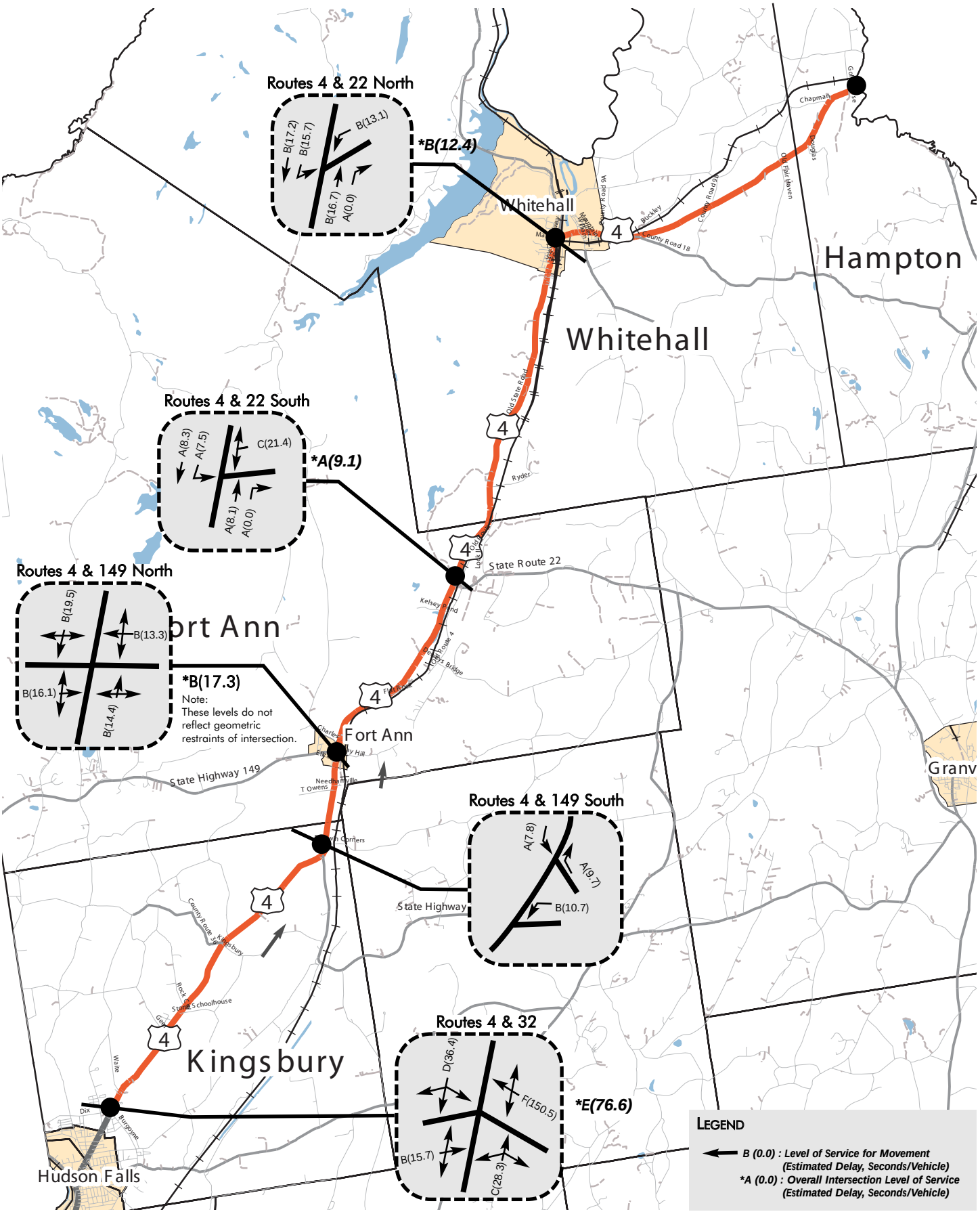

FIGURE 2.2 EXISTING AM PEAK HOUR LEVELS OF SERVICE

ROUTE 4 CORRIDOR STUDY

0 2 miles

April 2004

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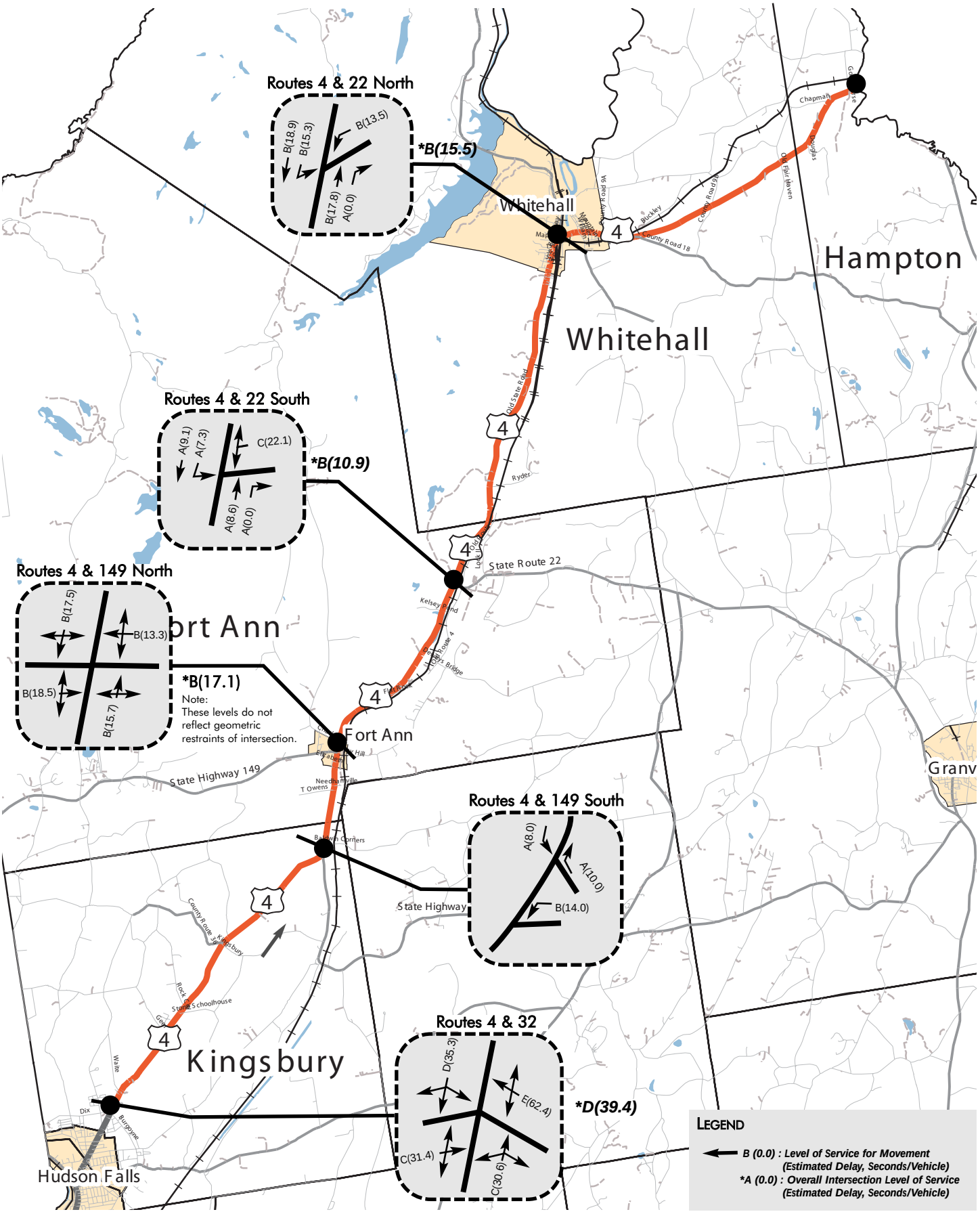

FIGURE 2.3 EXISTING PM PEAK HOUR LEVELS OF SERVICE

ROUTE 4 CORRIDOR STUDY

0 2 miles

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The intersection of Route 4 and Route 149 in Fort Ann is listed as operating at LOS B, based on the peak-hour traffic volumes. The traffic model indicates it operates with a 17.3 second delay in the AM peak and 17.1 seconds in the PM peak. However, this level of service calculation does not reflect the restricted geometry of the intersection and the fact that the large trucks have a hard time making their turns. BFJ performed a field survey at this intersection and found delays of 44 seconds in the PM peak, which corresponds to LOS D. The increased delay of about 25 seconds appears to be caused by a combination of the tight turning angles, the high percentage of heavy vehicles present and driver error. The tight turning radius at this intersection requires tractor-trailers to make a very sharp turn. In order to permit large trucks traveling southbound on Route 4 to turn westbound, the stop bar is set back from the intersection for traffic traveling eastbound. Occasionally drivers ignore or fail to notice the road markings and stop close to the pedestrian crossing, impeding traffic. The physical constraints are affecting the capacity of this intersection.

2.5 Vehicular Speeds

BFJ collected speed data along the study corridor. Automatic Speed Data recorders were installed at the following locations: 0.60 miles north of Route 4 and Charles Street; 1.10 miles north of Route 4 and Route 22; and 0.60 miles north of Route 4 and County Route 18, for a period of approximately one week to determine actual vehicle speeds along these sections of the roadway. Table 2.4 below shows the result of the speed survey.

Table 2.4 – Speed Statistics

Location	***Speed Limit***	***Percent of Vehicles Over the Speed Limit***	***85% Speed***
0.6 miles north of Route 4 & Charles Street	55 mph	31.2%	58 mph
1.1 miles north of Route 4 & Route 22(south)	55 mph	52.3%	62 mph
0.6 miles north of Route 4 & Route 18	55 mph	43.6%	61 mph

As shown in Table 2.4, vehicle speed data collected during this period indicated that the 85th percentile speeds along different sections of Route 4 range from 58 mph to 62 mph. This means that 85 percent of the drivers were driving at those speeds or lower, or that 15% of the vehicles drove faster than those speeds. It is also interesting to note that the vehicle speed data collected indicated that approximately 31% (0.60 miles north of Route 4 and Charles Street) to approximately 52% (1.1 miles north of Route 4 and Route 22 South) were traveling over the posted speed limit of 55 mph.

2.6 Accident History

An accident analysis was conducted along the Route 4 study corridor. Accident information obtained from NYSDOT for a three year period from June 1999 to May 2002 indicated that there were a total of 388 accidents during this time period. There were 6 vehicular accidents that involved a fatality, 132 vehicular accidents that involved injuries, 159 vehicular accidents that involved property damage only, 91 non-reportable accidents and no vehicular accidents that involved a pedestrian or a bicycle (Figure 2.4). The overall

accident rate for the entire corridor was 1.67 accidents / MVM (accidents per million vehicle miles). This is lower than the New York State average or expected accident rate for accidents on free access, rural, undivided two-lane roads, which is 2.81[2]. However, there are sections along Route 4 that have high accident frequencies. These high-accident segments are analyzed in Section 3.

2.7 Existing Land Uses

Along the entire corridor, there is a diverse mix of commercial, residential, and industrial uses, as well as some vacant, forest or agricultural land. The character of the corridor changes significantly. Figures 2.5 and 2.6 show the various land uses along Route 4 in the Village of Fort Ann and Whitehall. As shown in both figures, land uses in the Village of Fort Ann and Whitehall mostly consist of residential and commercial uses (i.e. retail, offices, and restaurant). Outside of the villages the adjacent land uses are largely agricultural, forests and some residential uses.

One of the major constraints along the corridor is the growth of suburban style development along Route 4. The proliferation of driveways along the corridor hampers Route 4 from functioning as an arterial. Every additional curb cut along the roadway has a direct effect of both lowering traveling speeds and increasing the expected accident rate.

2.8 Bus Transit

At the current time there is no regularly scheduled public transit service in the study area. The Greater Glens Falls Transit (GGFT) route #4 travels up to the intersection of Route 4 & 32, but does not travel within the Route 4 corridor. The only transit that exists in the corridor is run by the schools systems and social service organizations.

2.9 Sidewalk Conditions

The sidewalk system serving the residential and commercial areas in the Village sections of the study corridor are not continuous (Figure 2.7). In the Village of Fort Ann, sidewalks are provided on both sides of Route 4 for most of the village. A gap in the sidewalk network exists on the east side of Route 4 near the intersection of Route 149/Clay Hill Road. Pavement conditions are fair, and the sidewalk width is between four and five feet. In the Village of Whitehall, most of the west side of Route 4 has a continuous sidewalk starting from south of 7th Street to north of Park Avenue. On the east side of Route 4, the sidewalk is virtually non-existent, and is present only between the intersection of 1st Street and Adams Street and between the intersection of Skene Street and Park Avenue. Pavement conditions are fair to poor, with sidewalk widths between four and five feet and a lack of continuity.

[2] NYSDOT Traffic Engineering and Highway Safety Division - Information Files, average accident rates for state highways (http://dotweb2.dot.state.ny.us/traffic/files/tableii8.pdf)

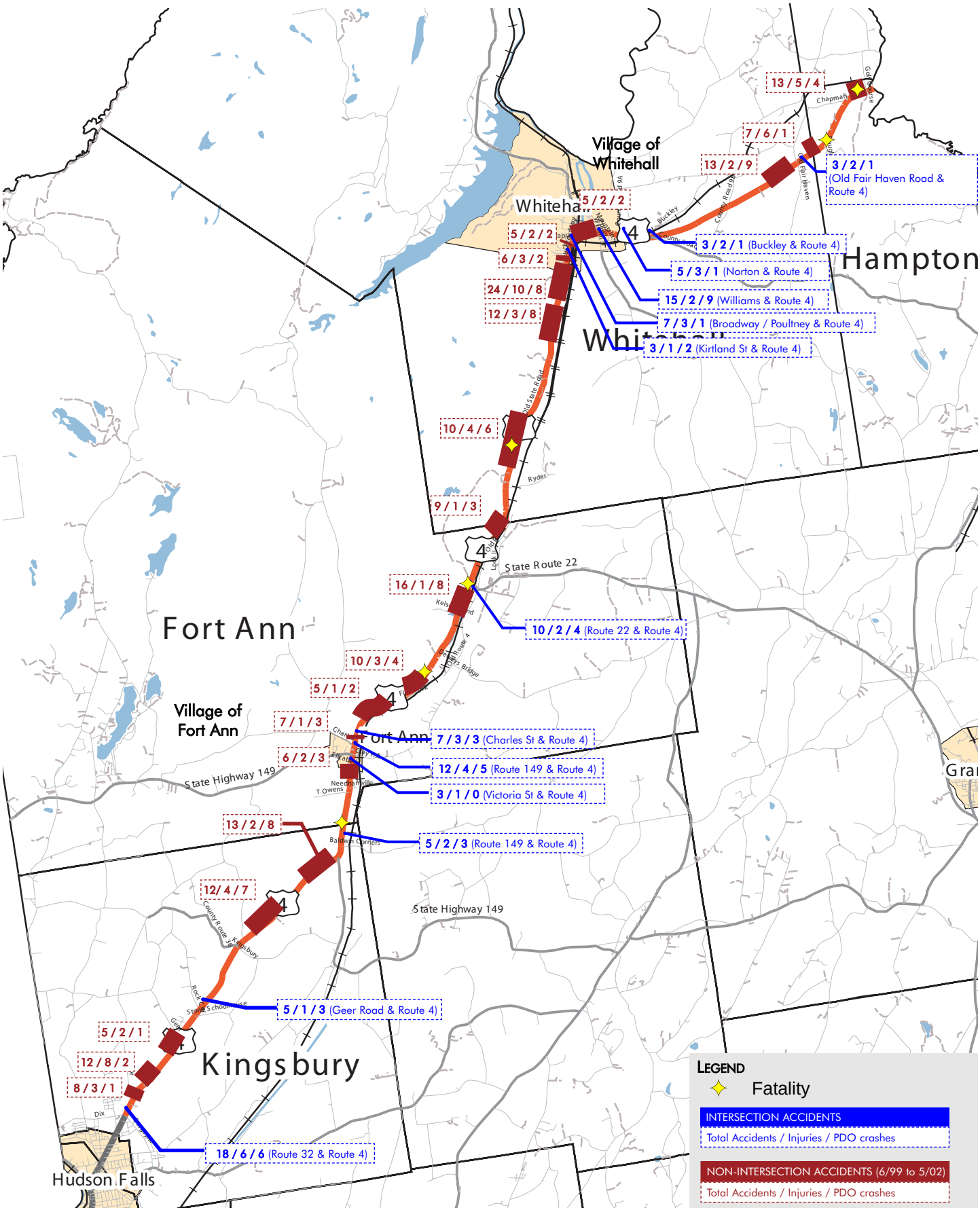

FIGURE 2.4 ACCIDENT SUMMARY (June 1999 to May 2002)

ROUTE 4 CORRIDOR STUDY

source:NYSDOT

0 2 miles

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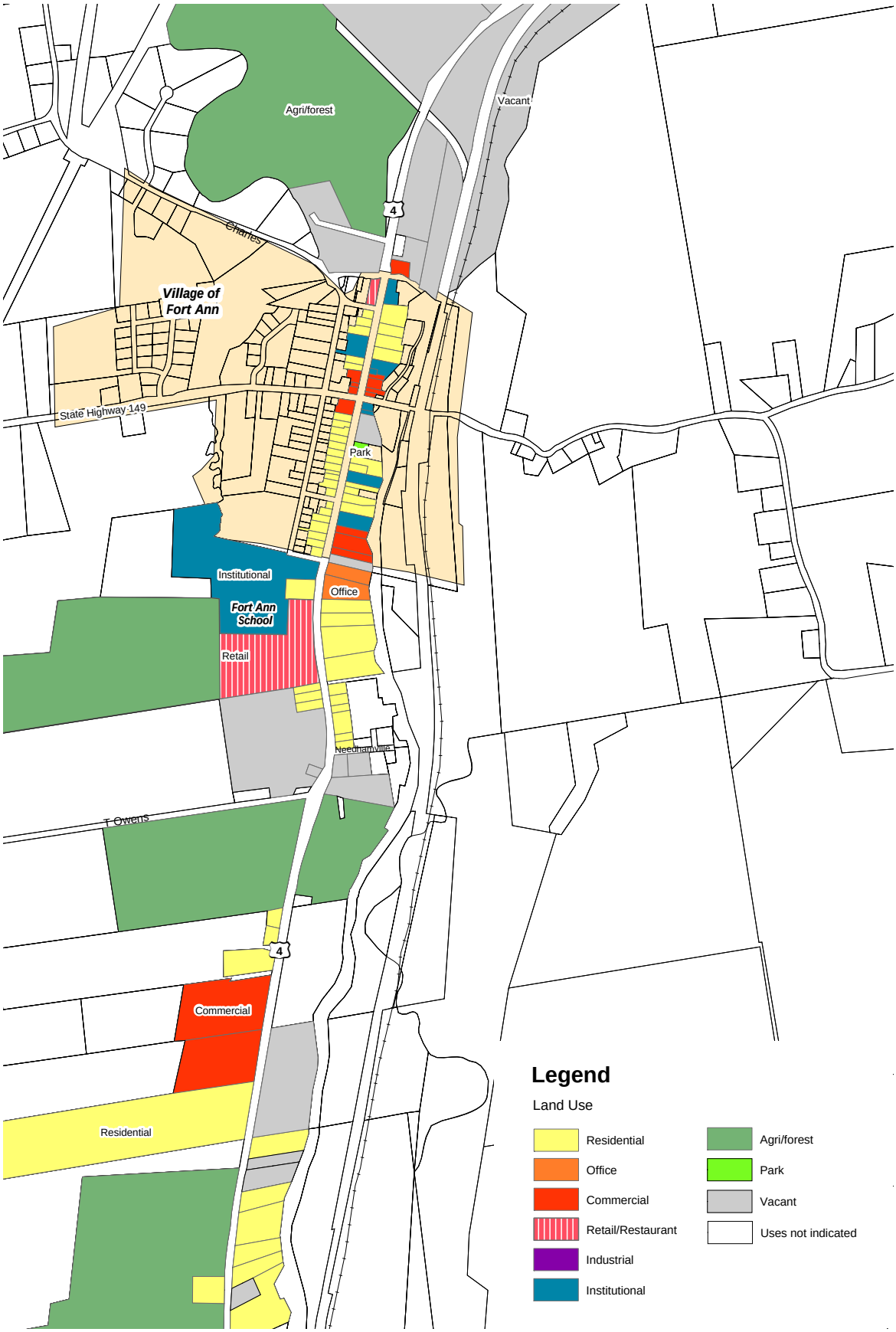

FIGURE 2.5 EXISTING LAND USES - FORT ANN

ROUTE 4 CORRIDOR STUDY

0 0.25 mile

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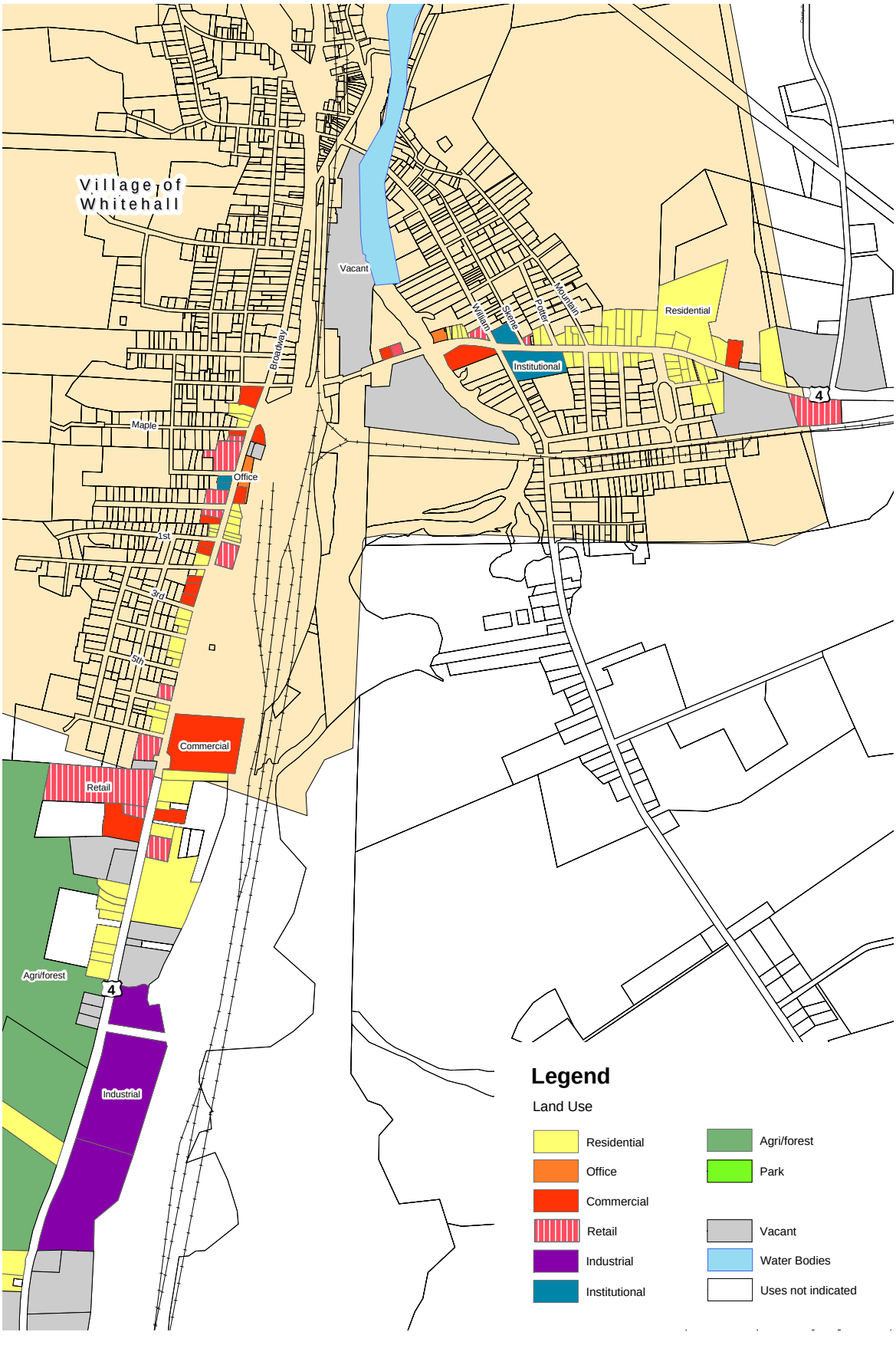

FIGURE 2.6 EXISTING LAND USES - WHITEHALL

ROUTE 4 CORRIDOR STUDY

0 0.25 mile

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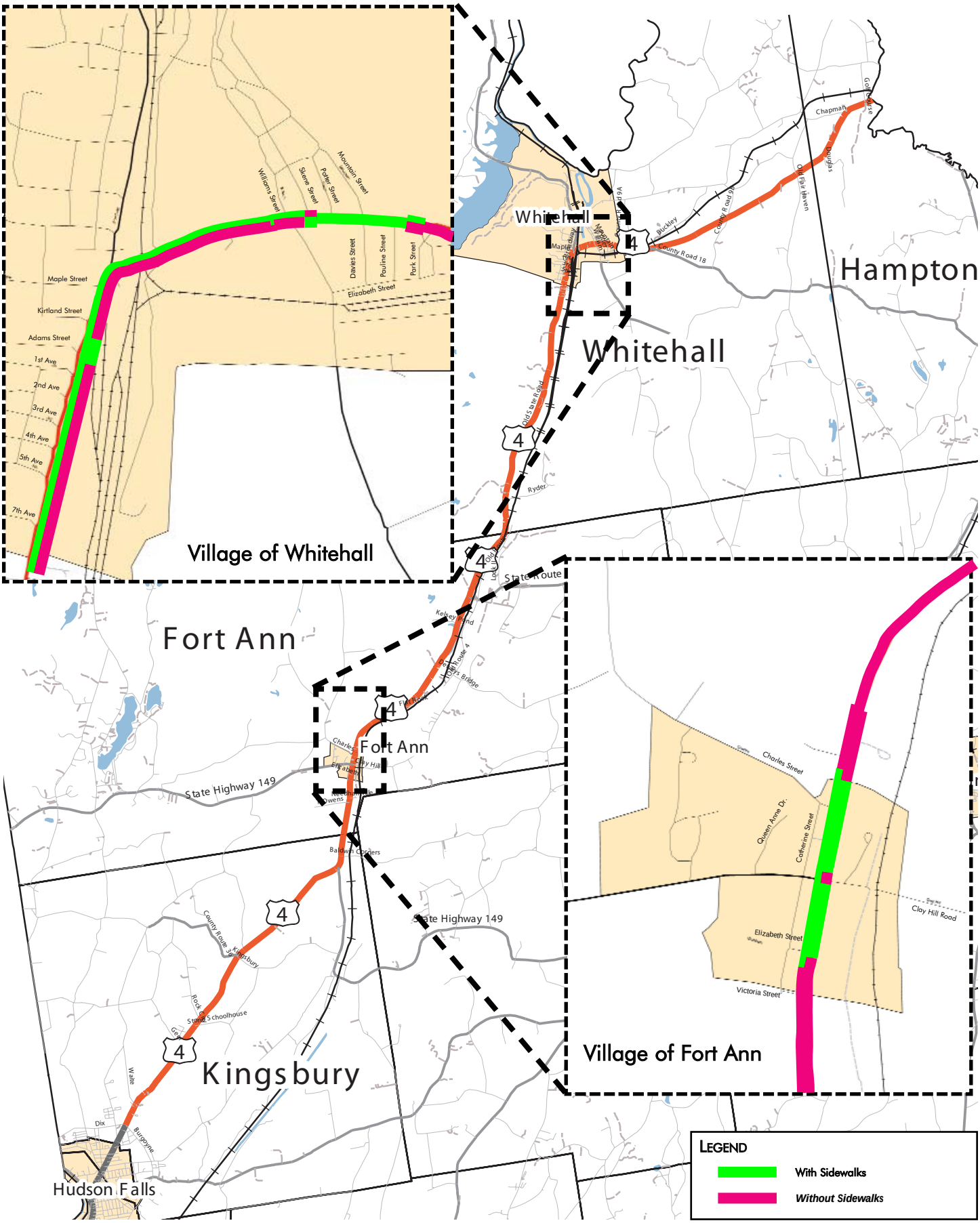

FIGURE 2.7 SIDEWALK INVENTORY

ROUTE 4 CORRIDOR STUDY

0 2 miles

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2.10 Bicycle Conditions

Route 4 is a component of New York State's Bike Route 9 from the Saratoga County boundary north to the divergence of Routes 22 and 4 in Whitehall. As there are no separate bike lanes provided along Route 4, cyclists are expected to use the shoulder. Most of the shoulders along Route 4 have widths greater than four feet, but there are several sections along Route 4 where the shoulders are too narrow or absent impeding convenient and safe cycling (See Figure 2.8). There were no reported bicycle or pedestrian accidents between June 1999 and May 2002, but areas within the corridor exist where the shoulders are too narrow for safe cycling or absent (Figure 2.8).

3.0 Accident Analysis

3.1 High Accident Non-Intersection Locations

As stated in Section 2.6, there were 388 accidents along the corridor from June 1999 to May 2002. The accident rate for the entire corridor was 1.67 accidents / MVM (accidents per million vehicle miles) which is lower than the statewide average on free access, rural, undivided two lane roads, which is 2.81. When the roadway is viewed in smaller segments (Table 3.1), there are two areas which stand out as being more than 30% above the expected accident rate of 2.81 accidents/MVM. As shown in Figure 3.1, starting from the south, segment one is from mile marker 1144 to 1159, which represents a 1.5 mile stretch of Route 4 from the intersection with Route 32 to just south of Geer Road. This segment has the highest accident rate in the corridor at 4.07 ACC/MVM. The segment with the second highest accident rate is the southern portion of the Village of Whitehall, south of the intersection of Route 22 (N) and Route 4. This 1.8 mile segment has a 3.66 ACC/MVM rate.

In addition, there are four segments which are more than 35% above the expected accident rate in New York State (0.74[3]) for fatalities + injuries. The two previously mentioned segments are also above the expected fatal + injury rate at 1.77 and 1.34 respectively. In addition, the 1.6 mile segment from mile marker 1159 to 1175, which begins just south of Geer Road and is contiguous with the other high accident location on the southern portion of the corridor, has a rate of 1.00 fatalities + injuries/MVM. The fourth location is the 1.9 mile segment north of the intersection of Route 4 with Route 149 (south) with a rate of 1.06 fatal + injury/MVM.

Route 4 was investigated in greater depth to analyze the non-intersection locations along the corridor in 0.3 mile segments. As shown in Figure 3.2 there are seven locations which contained more than nine non-intersection accidents over a three year period.

A site visit was made to these seven locations in an effort to determine the causes of the accidents. Ultimately, a more detailed look at the accidents that have occurred along the corridor will be needed to see if any recurring accident type or patterns exist that could benefit from specific improvements. Practically all segments are in transitional sections

[3] NYSDOT Traffic Engineering and Highway Safety Division - Information Files, average accident rates for state highways (http://dotweb2.dot.state.ny.us/traffic/files/tableii8.pdf)

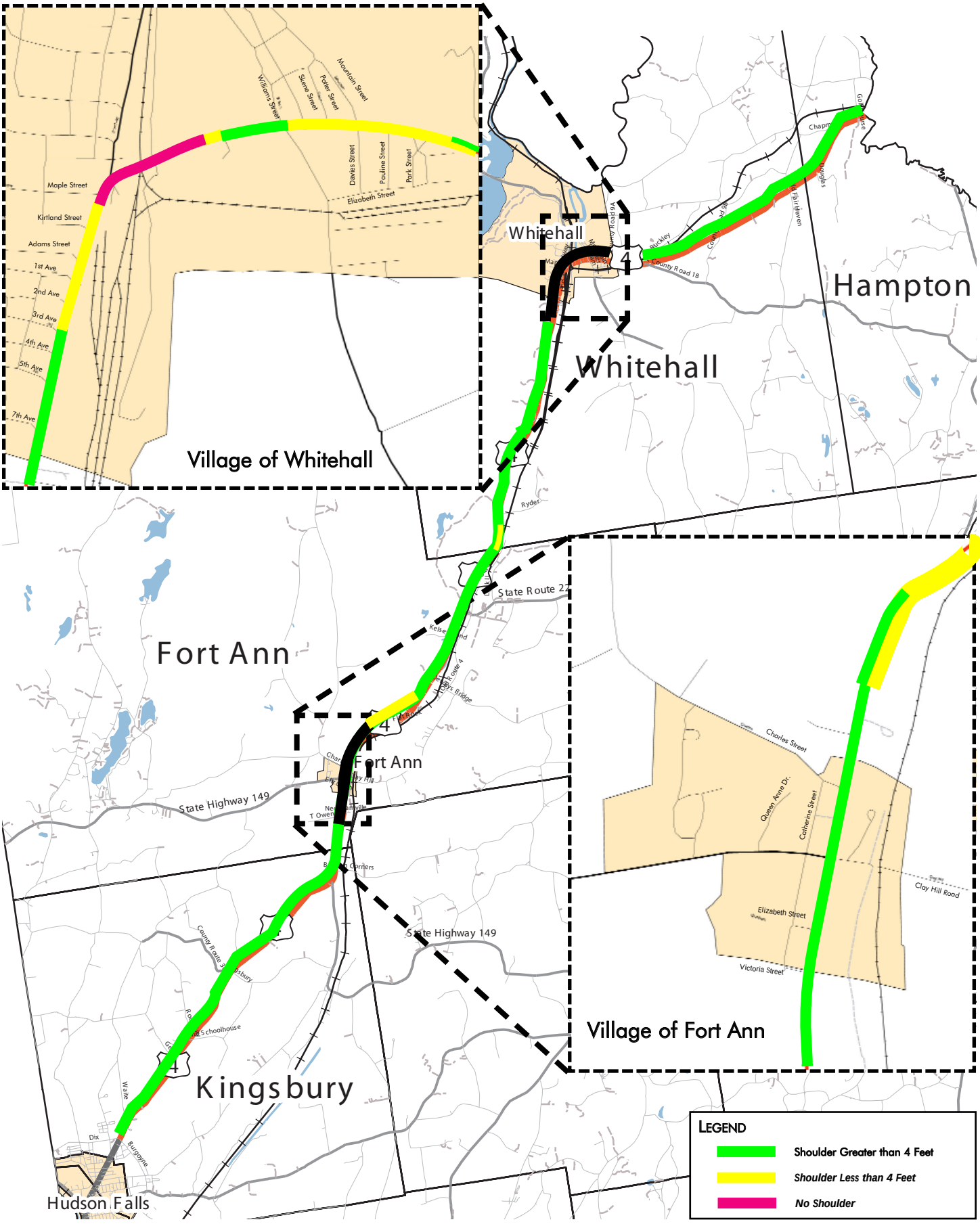

FIGURE 2.8 EXISTING BICYCLING CONDITIONS

ROUTE 4 CORRIDOR STUDY

0 2 miles

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Table 3.1 - Analysis of Accident Rates Along Route 4 in Washington County

Intersection with Route 4	*Starting Reference Marker*	*Finishing Reference Marker*	*Dist. (miles)*	*Accidents*	*Fatal*	*Injury*	*PDO*	*N/R*	*AADT*	*Accidents/ Year*	*MVM*	*Accidents/ MVM*	*Fatal + Injuries / MVM*	*PDO+N/R / MVM*
Rt. 32	***1144***	***1159***	1.5	46	0	20	11	15	6876	15.33	3.76	***4.07***	***1.77***	2.30
	1159	***1175***	1.6	21	0	12	6	3	6876	7.00	4.02	1.74	***1.00***	0.75
	1175	***1190***	1.5	18	0	6	12	0	6876	6.00	3.76	1.59	0.53	1.06
	1190	***1207***	1.7	25	1	5	14	5	6876	8.33	4.27	1.95	0.47	1.48
Rt. 149 S.	***1207***	***1226***	1.9	34	0	13	14	7	5880	11.33	4.08	2.78	***1.06***	1.72
	1226	***1245***	1.9	35	0	9	16	10	9873	11.67	6.85	1.70	0.44	1.27
	1245	***1265***	2	30	2	4	14	10	9873	10.00	7.21	1.39	0.28	1.11
Rt 149 N	***1265***	***1282***	1.7	11	0	1	5	5	8726	3.67	5.41	0.68	0.06	0.62
	1282	***1299***	1.7	13	1	6	6	0	8726	4.33	5.41	0.80	0.43	0.37
	1299	***1316***	1.7	10	0	5	1	4	8726	3.33	5.41	0.62	0.31	0.31
	1316	***1334***	1.8	63	0	23	24	16	8726	21.00	5.73	***3.66***	***1.34***	2.33
Rt 22 N.	***1334***	***1350***	1.6	35	0	13	14	8	9008	11.67	5.26	2.22	0.82	1.39
	1350	***1366***	1.6	5	0	0	3	2	9008	1.67	5.26	0.32	0.00	0.32
	1366	***1382***	1.6	17	0	4	11	2	9008	5.67	5.26	1.08	0.25	0.82
	1382	***1400***	1.8	25	2	11	8	4	9008	8.33	5.92	1.41	0.73	0.68
	Totals		***25.6***	***388***	***6***	***132***	***159***	***91***		***129.33***	***77.62***	***1.67***	***0.59***	***1.07***
	NYS Average / Expected Accident Rate											***2.81***	***0.74***	***2.07***

Shaded Areas are 30% above the New York Statewide Average also know as the expected accident rate

Source: NYSDOT Safety Information Management System
Dates: June 1, 1999 to May 31, 2002

Fatal = Crash which resulted in a fatality
Injury = Crash which resulted in an injury
PDO = Crash which resulted in Property Damage Only
N/R = Non-Reportable Accident (less than $2,500 in damage)
AADT= Annual Average Daily Traffic
MVM = Million Vehicle Miles

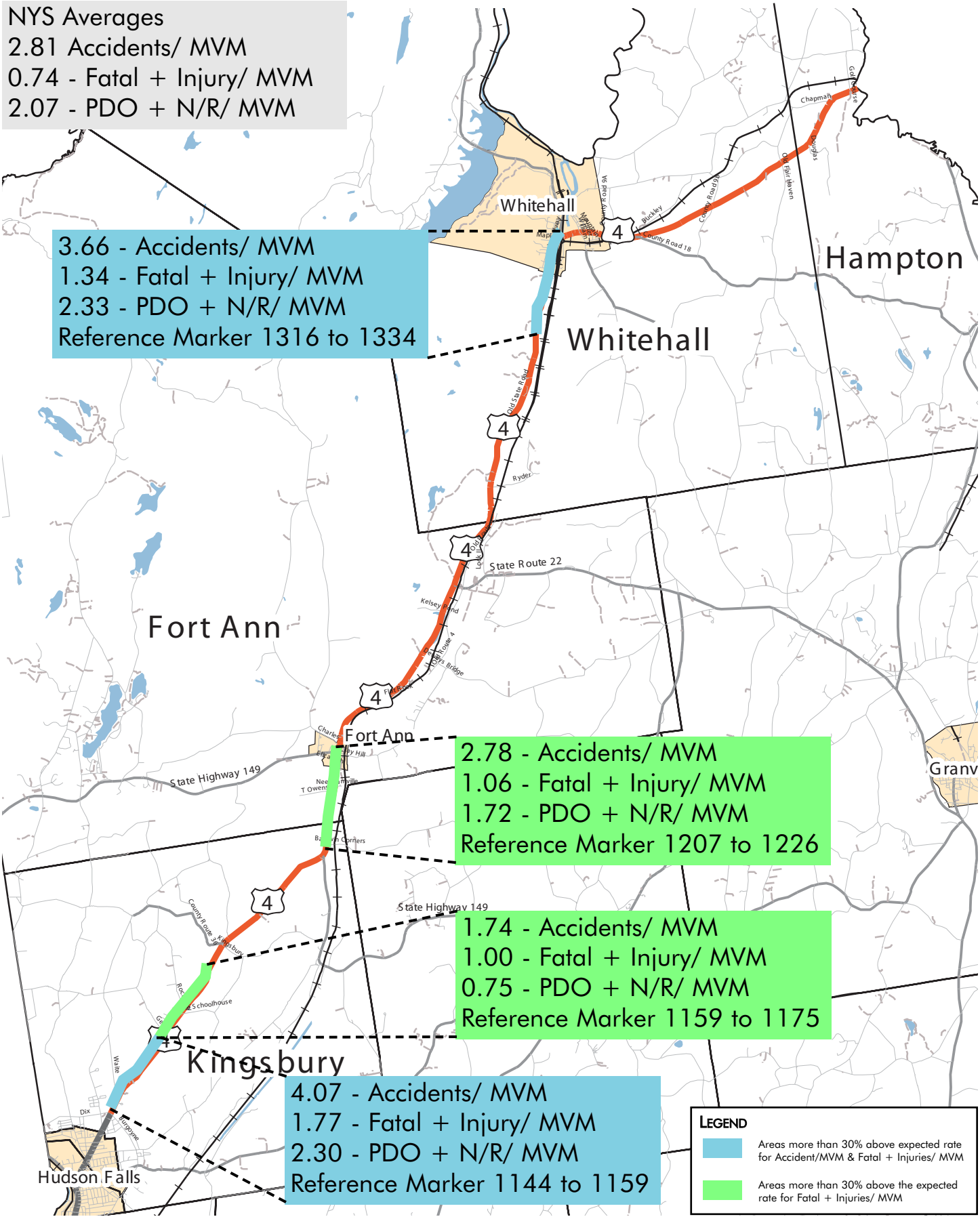

FIGURE 3.1 ABOVE AVERAGE ACCIDENT SEGMENTS

ROUTE 4 CORRIDOR STUDY

source: NYS DOT

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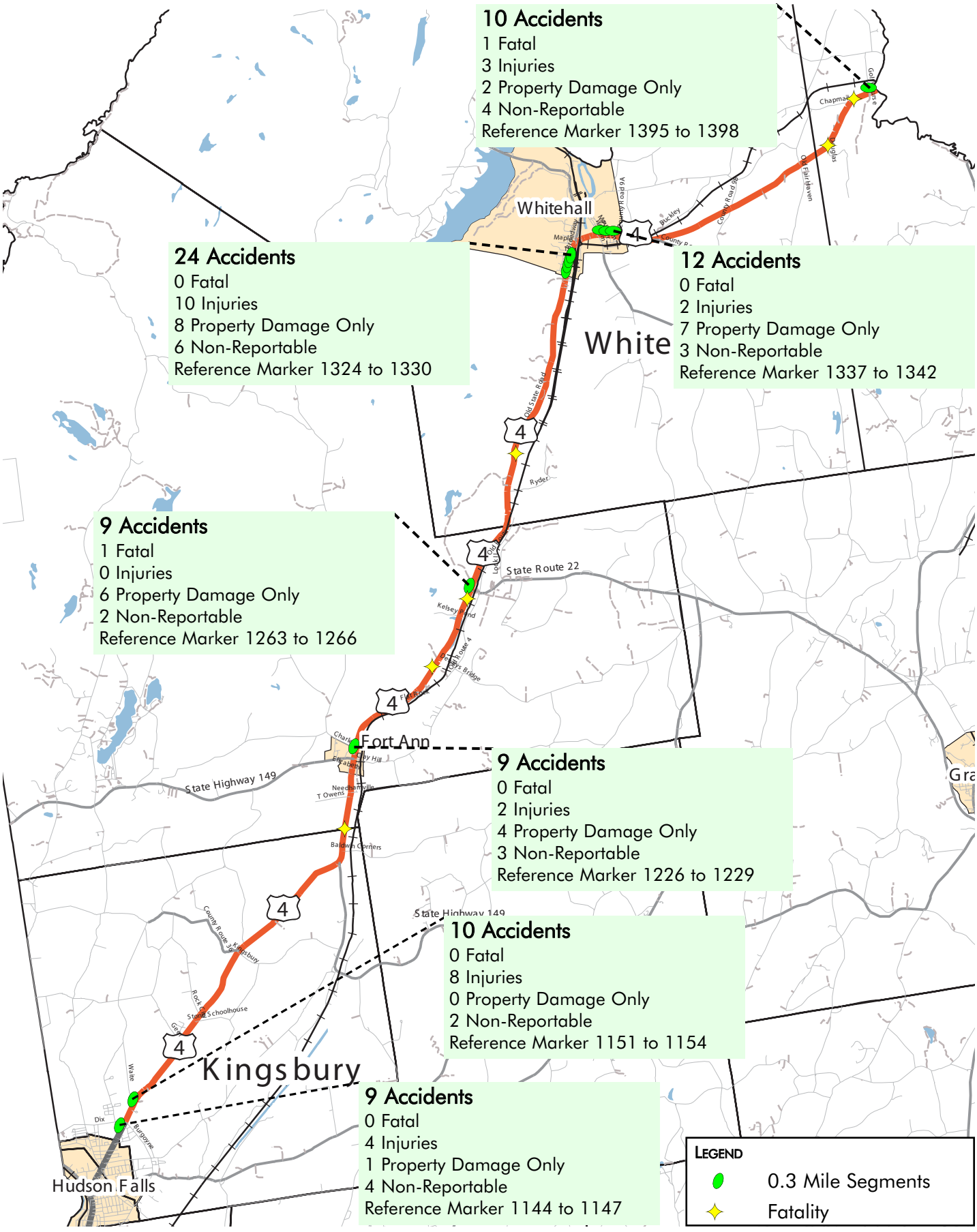

FIGURE 3.2 HIGH NON-INTERSECTION ACCIDENT LOCATIONS

source: NYS DOT

0 2 miles

April 2004

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where vehicles have to change speeds because they enter into a village or they approach a traffic light. These are also segments of Route 4 where there is a relatively high density of driveways. In addition, the majority of the locations are preceded by an extended straight stretch of roadway, where vehicles can attain high speeds.

The southernmost high accident location is where Route 4 intersects with Route 32, mile marker 1144 to 1147, which contained nine accidents. This area of the roadway is flat and straight with good sight lines. The number of curb cuts may be a reason for the high number of accidents.

The second high accident location moving from south to north (mile marker 1151 to 1154) is not directly adjacent to an intersection. For drivers headed southbound, this stretch of roadway contains a driveway located on the left hand side at a leftward turn of the roadway just after a dip in the road. This stretch of the roadway has an 80% injury rate, which is the highest of any location in the corridor.

The third location (mile marker 1226 to 1229) occurs in the Village of Fort Ann north of the intersection with State Highway 149. At this location a total of 9 crashes took place. The accidents in this area may be caused by southbound traffic traveling at high speeds which fail to reduce speed sufficiently as they enter the Village of Fort Ann. Just to the north of the intersection are a number of commercial establishments and their respective driveways which may also lead to the high number of crashes.

The next location (reference marker 1263 to 1226) straddles the intersection of Route 4 with Route 22 South. This intersection contains one of the six fatal crashes that occurred in the study area between June 1999 to May 2002. The intersection of Route 4 and Route 22 South is also one of the high accident locations in the corridor. As this location has very good sight lines, an excellent shoulder and is flat and straight, the crashes may be caused by excessive speeds combined with the presence of the signalized intersection.

The next location (reference marker 1324 to 1330) contains the greatest number and concentration of accidents in the study area. The area is in the Village of Whitehall just south of the intersection with Route 22, and is the location of 24 accidents in the distance of $6/10^{th}$ of a mile. It is believed the high accident rate is caused by the large number of access points connecting to Route 4. This small area contains curb cuts for private residences, restaurants and businesses including Family Dollar, McDonalds, and a pet store. A factor which exacerbates the problem is the rolling nature of the terrain which both reduces sight lines and makes it more difficult for neighboring lots to interconnect.

The next location (reference marker 1337 to 1342) is located at the intersection of Route 4 and Williams Street, where 11 accidents took place at mile marker 1139. It is believed that vehicles traveling westbound may be traveling at excessive speeds when entering the Village.

The northernmost high accident location in the study area occurs near the Vermont border (reference marker 1359 to 1398) where 10 accidents took place, including one fatality. This segment is relatively straight, contains good sight lines and is relatively flat. The accidents at this location are probably related to the transitional character of this section of

Route 4. The 4-lane expressway character on the Vermont side may encourage excessive speeds on the 2-lane section.

The northernmost portion of Route 4 has significant variations in the width of the roadway. Route 4 is wider on the flat, straight portions which accommodate and allow greater speeds. When the roadway contains hills and or turns, the width of the road narrows. This causes accident spots as drivers accelerate during the straight roadway sections, but are not always able to reduce speed sufficiently to avoid an incident along the narrower portion of the roadway. Due to the high proportion of heavy vehicles on this roadway, greater emphasis should be placed on maintaining consistent cross-sections.

3.2 High Accident Intersections

Starting from the south of the corridor, the intersection of Route 4 and Route 32 (Dix Ave / Burgoyne Ave) had 18 accidents and is the highest accident location in the corridor. This section is also adjacent to one of the high-accident non-intersection locations and is generally flat and straight with good sight lines. The combination of a high number of curb cuts with excessive speeds may explain the high number of crashes. The traffic calming effects of a roundabout should lead to a significant reduction in accidents.

The intersection of Routes 149 & 4 in the Village of Fort Ann is the site of 12 accidents between June 1999 and May 2002. Geometric constraints force the westbound stop bar to be placed to about 75 feet west of the intersection. This causes confusion among drivers and leads some drivers to stop abruptly and other to stop in the center of the intersection. The tight turning radius combined with the limited right-of-way and the drivers' tendency to accelerate through a traffic signal may influence a majority of the accidents.

At Route 4 and Route 22 South, 10 accidents occurred during the study period. This intersection is preceded by a long straightway when traveling northbound. An excellent shoulder is present. The area just to the north and south of the intersection is listed as a non-intersection high accident location. The presence of the long northbound straight section may lead to excessive speeds.

4.0 Future Traffic Volumes

4.1 Traffic Forecasts

Figure 4.1 summarizes the past growth trends in terms of traffic volumes along Route 4. It can be seen that traffic volumes along Route have increased in generally by 1% to 3% per year. Over the past 20 years traffic has grown more along the northern sections of Route 4. This is probably due to the fact that regional (through) traffic has increased more than local trips. Based on the past trends along Route 4 and general population forecasts, BFJ developed traffic forecasts for Route 4 for the years 2014 and 2024, which are shown in Figures 4.2 & 4.3. It can be seen that future AADTs are expected to reach flows as high as 13,900 in 2024 along the section where Route 4 overlaps with Route 22.

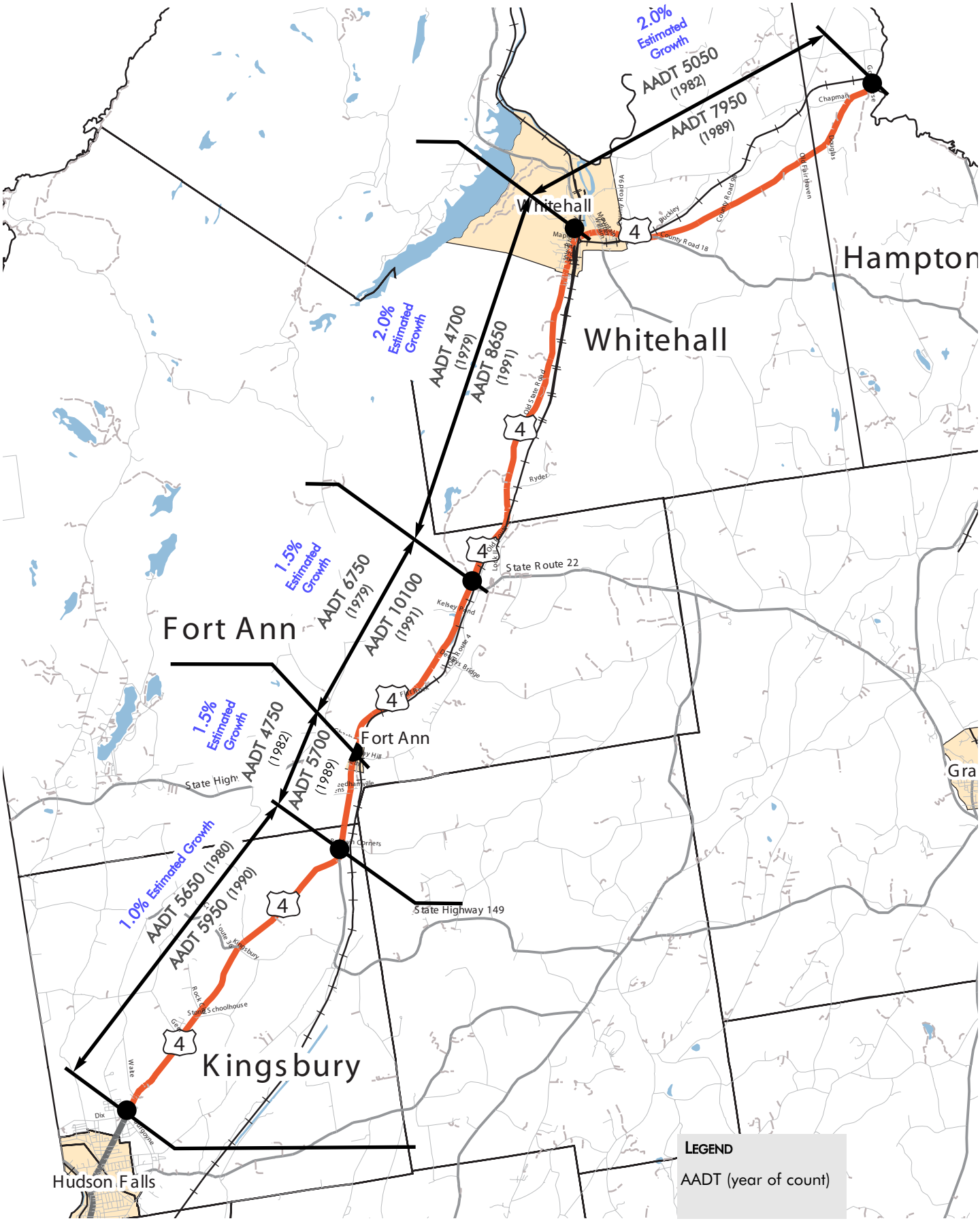

FIGURE 4.1 - HISTORICAL TRAFFIC VOLUMES AND EXPECTED GROWTH ALONG ROUTE 4

0 2 miles

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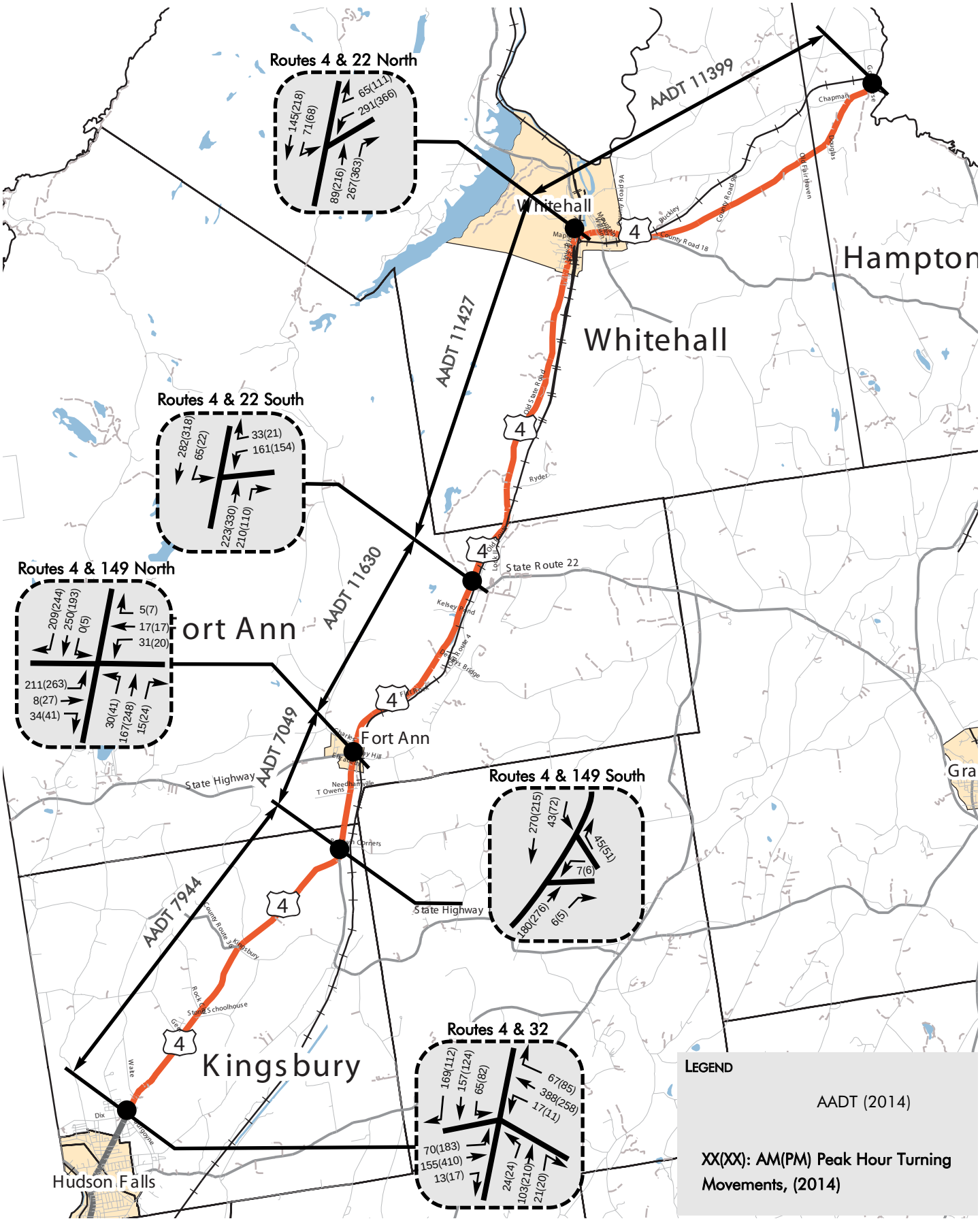

FIGURE 4.2 - TRAFFIC FORECASTS FOR 2014 ALONG ROUTE 4

ROUTE 4 CORRIDOR STUDY

source: Census TIGER® 2000 Data from Geography Network

0 2 miles

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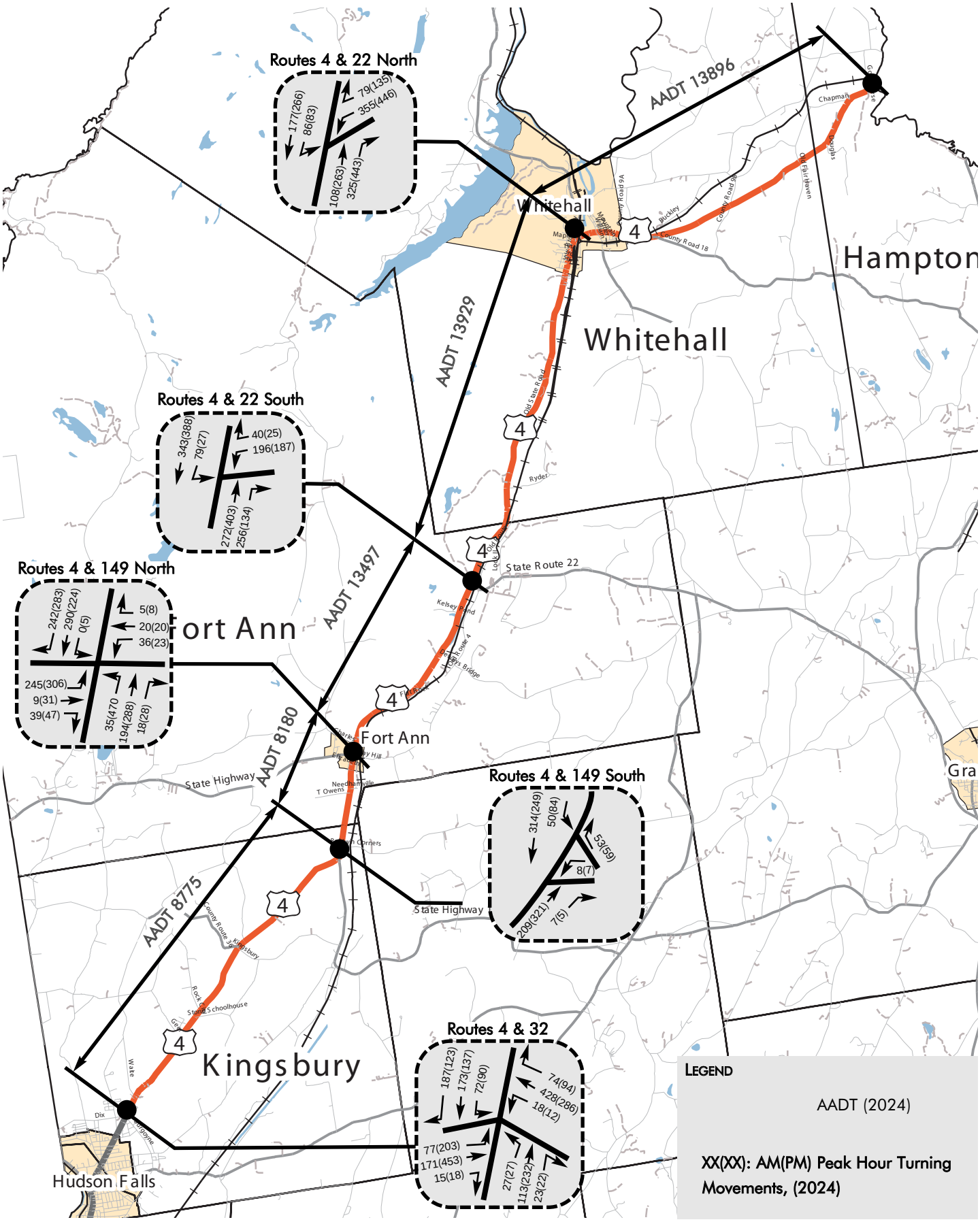

FIGURE 4.3 - TRAFFIC FORECASTS FOR 2024 ALONG ROUTE 4

ROUTE 4 CORRIDOR STUDY

source: Census TIGER® 2000 Data from Geography Network

0 2 miles

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Traffic volumes along Route 4 do not warrant widening from its current two-lane configuration into a four-lane roadway. The high volumes projected for 2024 are still within the capacity limits of a two-lane highway. The congestion that does exist along the corridor is primarily due to intersection issues and flow restrictions in the developed areas. Improving conditions along these key locations is the best way to improve traffic flow in the corridor. Table 4.1 shows the traffic forecasts for the major intersections along the corridor.

5.0 Route 4 Improvements Program

5.1 Traffic and Safety Improvements – Major Intersections

There were no unsignalized intersections in the study area which have sufficient traffic volumes and delays to warrant the installation of a traffic signal. BFJ proposes to modify two signalized intersections with roundabouts and alter the signal timings of other signalized intersections. The location of the intersection improvements can be found in Figure 5.1.

Table 5.1 summarizes the year 2024 traffic conditions (levels of service and delays) for the major corridor intersections without improvements and with improvements.

Table 5.1 – Future Traffic Conditions with Improvements

		2024 Traffic Conditions without Improvements				***2024 Traffic Conditions with Improvements***			
		AM Peak Hour		***PM Peak Hour***		***AM Peak Hour***		***PM Peak Hour***	
Intersection	***Approach***	***Delay***	***Level of Service***	***Delay***	***Level of Service***	***Delay***	***Level of Service***	***Delay***	***Level of Service***
						With Roundabout			
Route 32 & Route 4	Eastbound	15.7	B	31.4	C	4.2	A	9.0	A
	Westbound	150.5	F	62.4	D	6.6	A	6.6	A
	Northbound	28.3	C	30.6	C	4.8	A	10.2	B
	Southbound	36.4	D	35.3	D	9.0	A	6.0	A
	overall	***76.6***	***E***	***39.4***	***D***	***6.7***	A	***8.1***	***A***
						Shorter Cycle Length			
Route 149 (N) & Route 4	Eastbound	16.1	B	18.5	B	26.5	C	27.9	C
	Westbound	13.3	B	13.3	B	13.4	B	10.4	B
	Northbound	14.4	B	15.7	B	8.7	A	13.9	B
	Southbound	19.5	B	17.5	B	15.9	B	20.4	C
	overall	***17.3***	***B***	***17.1***	***B***	***17.0***	***B***	***20.4***	***C***
						Exclusive Left Turn Phase			
Route 22 (S) & Route 4	Westbound	21.4	C	23.1	C	23.5	C	26.6	C
	Northbound	4.2	A	6.5	A	12.2	B	19.6	B
	Southbound	8.2	A	9.0	A	9.2	A	10.8	B
	overall	***9.1***	***A***	***10.9***	***B***	***13.5***	***B***	***17.6***	***B***
						With Roundabout			
Route 22 (N)& Route 4	westbound	14.4	B	16.2	B	4.2	A	5.4	A
	northbound	3.9	A	6.2	A	5.4	A	9.6	A
	southbound	15.8	B	17.0	B	4.2	A	6.0	A
	overall	10.5	B	12.7	B	4.7	A	7.3	A

Table 4.1 - Rt 4 Traffic Foreasts

				Existing Volumes 2004		2014 Volumes		2024 Volumes	
				Weekday AM	Weekday PM	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Background Growth Rate 2.0%	**Route 4 & Broadway / Poultney**	**westbound**	left	239	300	291	366	355	446
Build Years: **2014** **2024**			right	53	91	65	111	79	135
10 20		**northbound**	thru	73	177	89	216	108	263
Compounded Growth Rate 1.22 1.49			right	219	298	267	363	325	443
		southbound	left	58	56	71	68	86	83
			thru	119	179	145	218	177	266
Background Growth Rate 2.0%	**Route 4 & Route 22 (south)**	**westbound**	left	132	126	161	154	196	187
Build Years: **2014** **2024**			right	27	17	33	21	40	25
10 20		**northbound**	thru	183	271	223	330	272	403
Compounded Growth Rate 1.22 1.49			right	172	90	210	110	256	134
		southbound	left	53	18	65	22	79	27
			thru	231	261	282	318	343	388
Background Growth Rate 1.5%	**Route 4 & Route 149 (north)**		left	182	227	211	263	245	306
Build Years: **2014** **2024**		**eastbound**	thru	7	23	8	27	9	31
10 20			right	29	35	34	41	39	47
Compounded Growth Rate 1.16 1.35			left	27	17	31	20	36	23
		westbound	thru	15	15	17	17	20	20
			right	4	6	5	7	5	8
			left	26	35	30	41	35	47
		northbound	thru	144	214	167	248	194	288
			right	13	21	15	24	18	28
			left		4		5		5
		southbound	thru	215	166	250	193	290	224
			right	180	210	209	244	242	283
Background Growth Rate 1.5%	**Route 4 & Route 149 (south)**	**westbound**	left	6	5	7	6	8	7
Build Years: **2014** **2024**			right	39	44	45	51	53	59
10 20		**northbound**	thru	155	238	180	276	209	321
Compounded Growth Rate 1.16 1.35			right	5	4	6	5	7	5
		southbound	left	37	62	43	72	50	84
			thru	233	185	270	215	314	249
Background Growth Rate 1.0%	**Route 4 & Route 32**		left	63	166	70	183	77	203
Build Years: **2014** **2024**		**eastbound**	thru	140	371	155	410	171	453
10 20			right	12	15	13	17	15	18
Compounded Growth Rate 1.10 1.22			left	15	10	17	11	18	12
		westbound	thru	351	234	388	258	428	286
			right	61	77	67	85	74	94
			left	22	22	24	24	27	27
		northbound	thru	93	190	103	210	113	232
			right	19	18	21	20	23	22
			left	59	74	65	82	72	90
		southbound	thru	142	112	157	124	173	137
			right	153	101	169	112	187	123

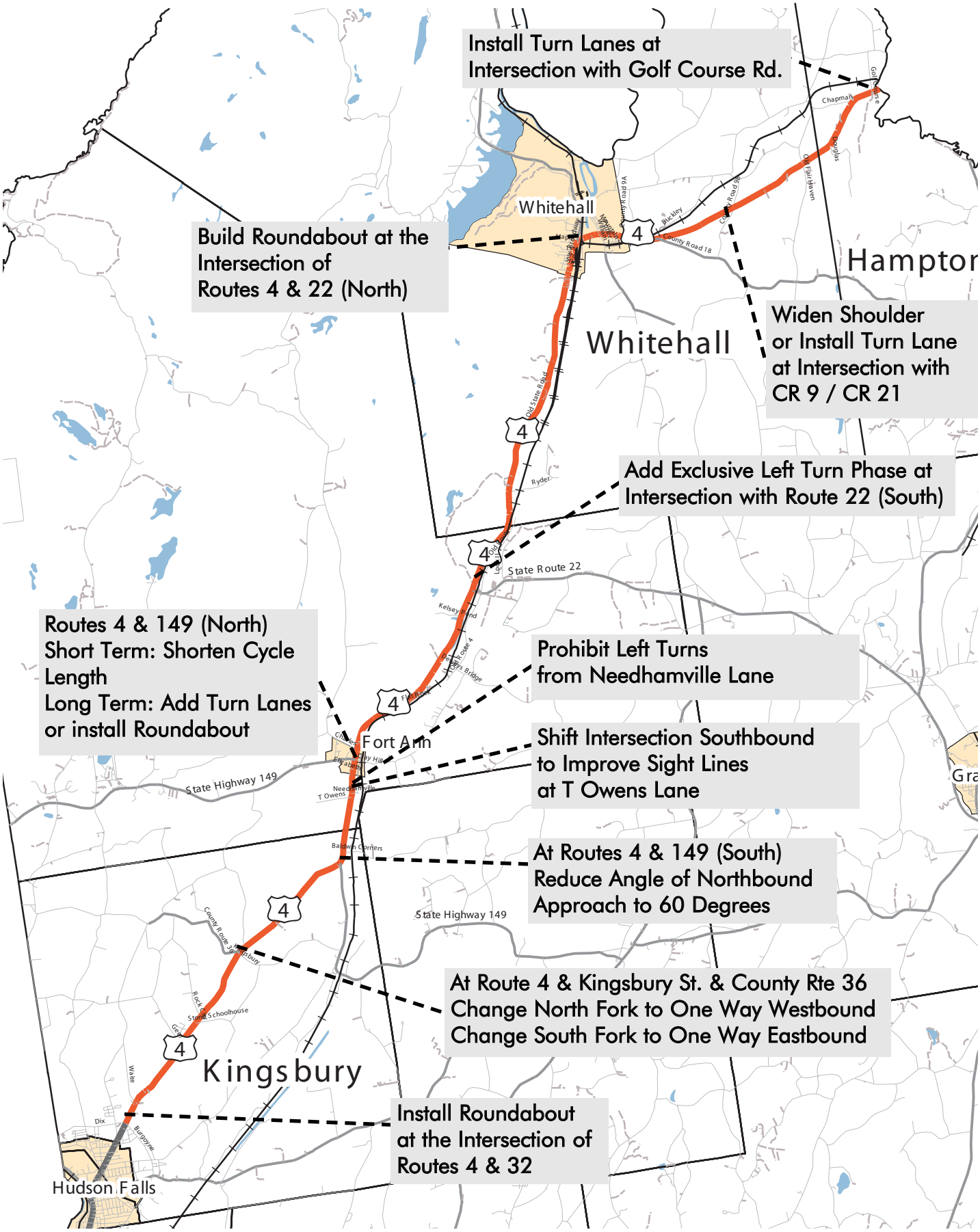

FIGURE 5.1 PROPOSED INTERSECTION IMPROVEMENTS

ROUTE 4 CORRIDOR STUDY

0 2 miles

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Routes 4 & 32

Starting from the southern portion of the corridor, BFJ recommends a roundabout to be installed at the intersection of Routes 4 & Route 32. A preliminary schematic for the proposed roundabout can be seen in Figure 5.2. Roundabouts are the safest form of at grade intersections and are expected to reduce the total number of crashes by about 37% and reduce the injury crashes by 75%[4]. This intersection is currently operating at LOS E with significant delays for westbound traffic at both the AM and PM peak periods. With the roundabout installed, the intersection will operate at LOS A, with greatest delay being 10.1 seconds for northbound traffic during the PM peak period. As shown in Figure 5.2, some minor right-of-way acquisitions are needed for the roundabout, which are discussed in Section 6.

Routes 4 & 149 in Fort Ann

The next signalized intersection is located at the corner of Routes 4 / 149 in Fort Ann. In the short term BFJ recommends shortening the cycle length of the traffic signal from an 80 second cycle to a 55 second cycle. Our models show this will reduce the existing level of delays at this intersection in the AM peak from 17.3 seconds to 12.1 seconds and in the PM peak from 17.1 seconds to 13.6 seconds. Shorter phases may reduce the theoretical capacity of the intersection, but it will also allow automobiles which are stopped in the incorrect place to get out of the intersection faster. This should reduce the actual delays as the shorter cycles will not lead to the extent of delays that occur under the current cycle lengths.

As the property on the north-west corner of the intersection of Route 4/149 currently has a willing seller, it could be acquired by NYSDOT. If the additional right-of-way at the intersection is acquired, the intersection could be reconfigured to increase the turning radius for tractor trailers and allow the addition of turning lanes (Figure 5.3). Alternatively, the right-of-way would permit the installation of a roundabout. A possible configuration for the proposed roundabout can be seen in Figure 5.4. In order to build a roundabout with the optimal design, acquisition of another property on either the northeast or the southwest corner may be required. This would have to be determined in the next design phase of the roundabout. Both options would be less expensive and faster to implement than a bypass around Fort Ann, but would have a negative impact on the village character when compared with the bypass.

The implementation of either option (roundabout or added turn lanes in conjunction with the purchase of the property on the north-west corner) would alleviate the congestion and delays this intersection, but it would not reduce the overall traffic nuisances and related impacts on the Village. Increasing amounts of traffic and trucks will drive through the Village and will affect this community negatively. Even if NYSDOT purchases the property on the north-west corner, the Town of Fort Ann should map a bypass alignment on the Town Plan bypassing the Village in the north-west quadrant to preserve this alternative for future generations. See Appendix C for the discussion of the bypass.

[4] Tollbox on Intersectoin Safety and Design, Institute of Transportaion Engineers, FHWA, Page 134, Table 8.1

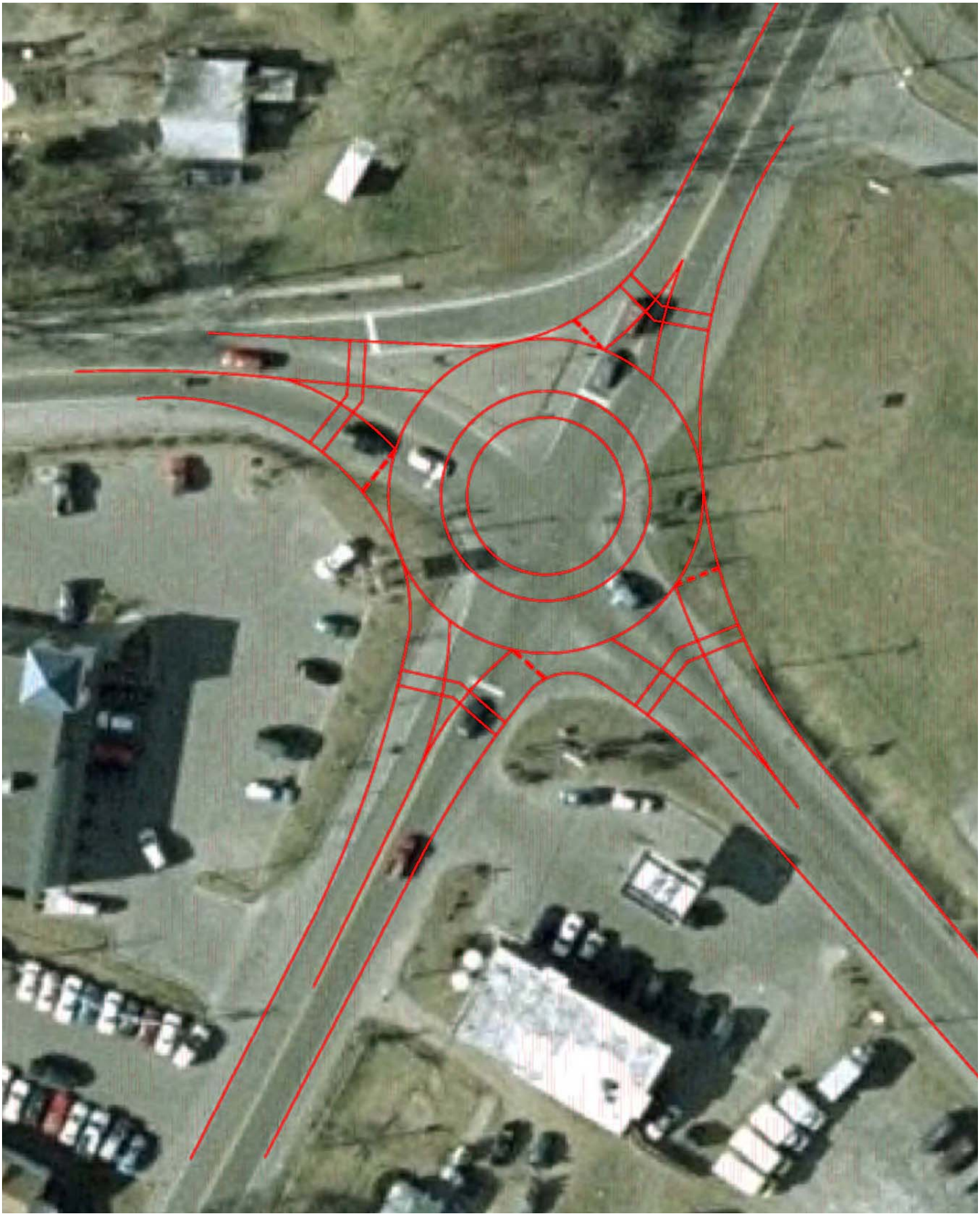

FIGURE 5.2 PROPOSED ROUNDABOUT ROUTE 4 & 32 INTERSECTION

source: NYS GIS Clearinghouse

0 1100 ft

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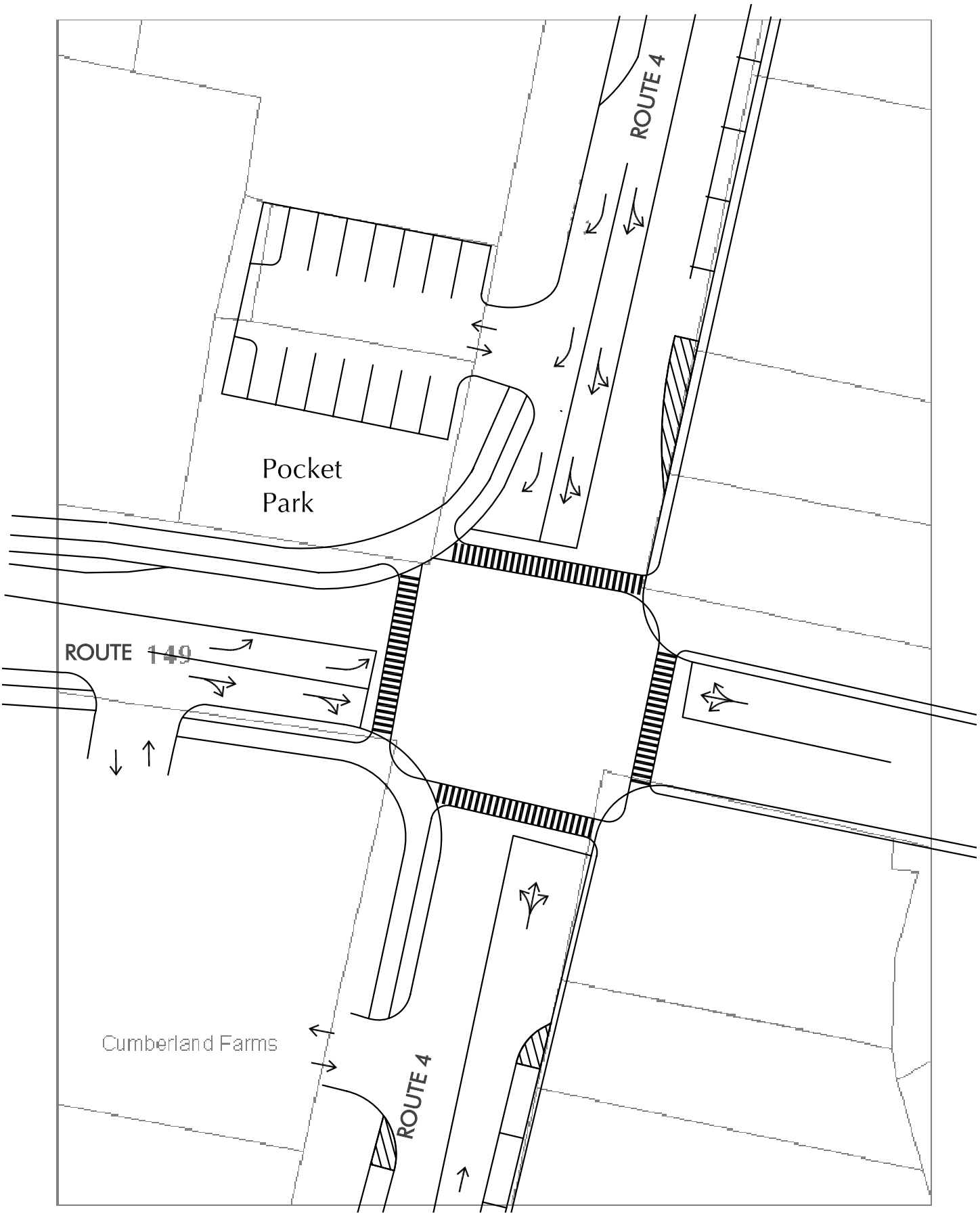

FIGURE 5.3 PROPOSED UPGRADE AT ROUTE 4 & 149 INTERSECTION - FORT ANN

0 40 ft

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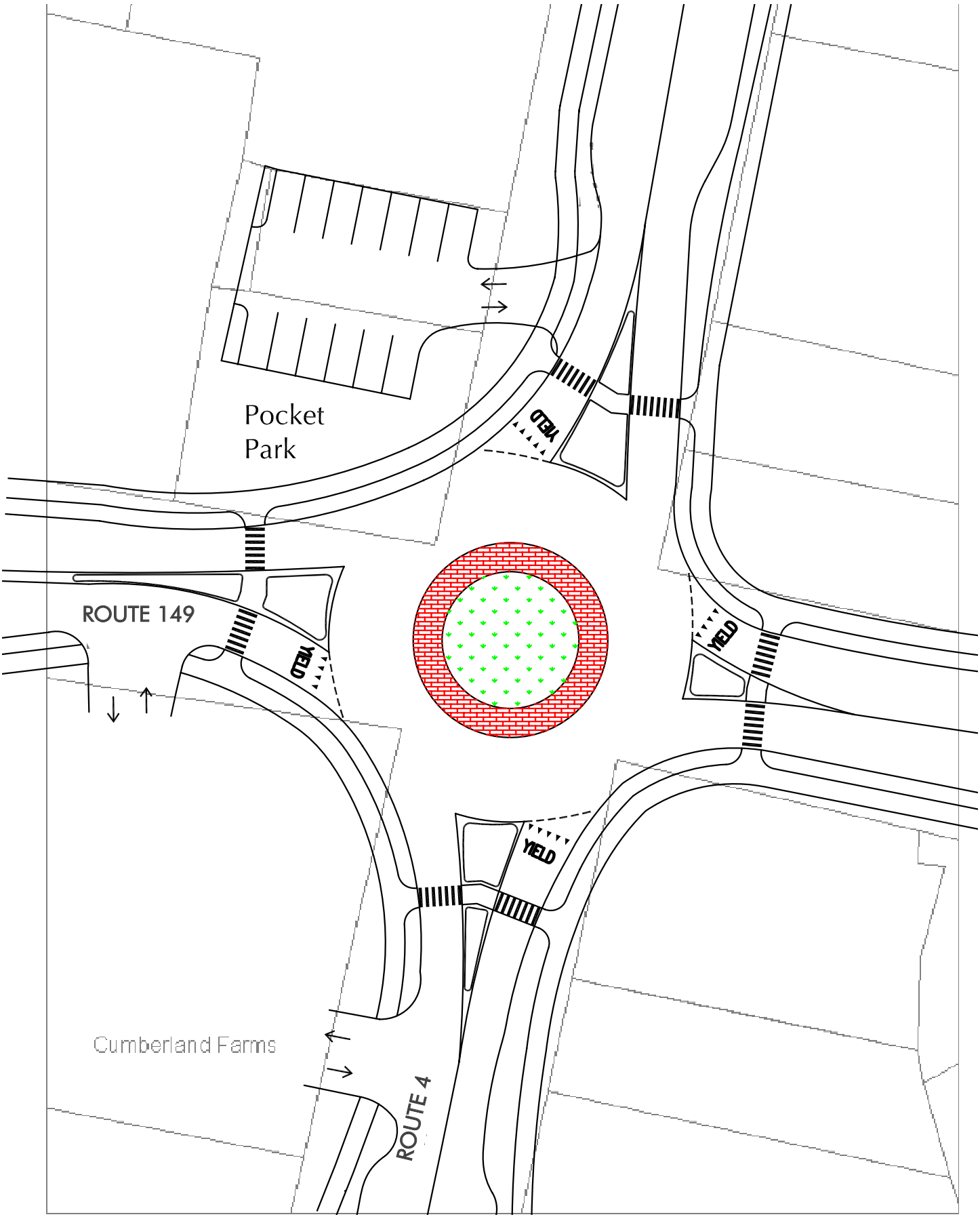

FIGURE 5.4 PROPOSED ROUNDABOUT AT ROUTE 4 & 149 INTERSECTION - FORT ANN

0 40 ft

April 2004

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Route 4 & 22 South

At the intersection of Route 4 and Route 22 South, BFJ advises the introduction of an exclusive southbound left-turn phase primarily to reduce accidents. With the exclusive phase, the intersection operates at LOS B in both the AM and PM peak periods. The introduction of an exclusive left-turn phase will reduce the capacity of this intersection slightly, but will improve safety. As this intersection is operating at LOS A, the improved safety outweighs the increased delays.

Route 4 & 22 North

Traveling northbound, into the Village of Whitehall, BFJ recommends the installation of a roundabout at the intersection of Route 4 and Route 22 North (Figure 5.5). This intersection is currently operating at LOS B, and seven accidents occurred at this intersection. A roundabout is recommended due to the configuration of the intersection and because it is in the middle of a high accident corridor where 26 accidents occurred in a half-mile distance. The presence of the roundabout will serve to calm traffic and lower the number of accidents in this section of the corridor. With the roundabout the level of service is expected to improve to LOS A. The roundabout will also improve access to the center of Whitehall. Preliminary engineering studies will have to determine whether this roundabout is feasible from the point of view of available right-of-way and grades.

5.2 Traffic and Safety Improvements – Unsignalized Intersections

There are several additional locations along the corridor where BFJ recommends a reconfiguration of the existing intersection. The intersections were brought to our attention during the public workshops and contain non-standard configurations. With slight modifications these intersections can operate more efficiently. Moving from south to north, the first location is the intersection where Route 4 intersects with Kingsbury St. / County Route 36. At the current time, the intersection on the west of Route 4 is a three-way fork connecting to Route 4 with all three forks permitting two-way traffic (Figure 5.6). In order to simplify this intersection, we advise that the northern fork (Kingsbury Street/ Route 36) be converted to one-way operation westbound. The southern fork (Church Road) should be modified to be one-way eastbound/southbound. The center fork (Kingsbury Road) should continue to permit two-way traffic. Eventually this central intersection could be signalized or could become a roundabout. The left turns would be made at this center fork. Both Kingsbury Street and Church Road legs should be narrowed, with the former right-of-way used to enlarge the park located in the triangular intersection. In addition, the trees located north of Kingsbury Street along Route 4 should be cut back, to permit greater visibility to the intersection.

The next intersection modification occurs at the intersection of 149 S and Route 4. (Figure 5.7) At this location the northbound approach connects with Route 4 at an angle which requires the driver to turn his head sharply to the left to check for the presence of northbound traffic on Route 4. The angle should be reduced to 60 degrees, which would provide easier viewing of northbound traffic.

The next mitigation occurs where Route 4 intersects with T Owens Lane (Figure 5.8), which is located just south of the Village of Fort Ann. At the current time, T Owens Lane has very

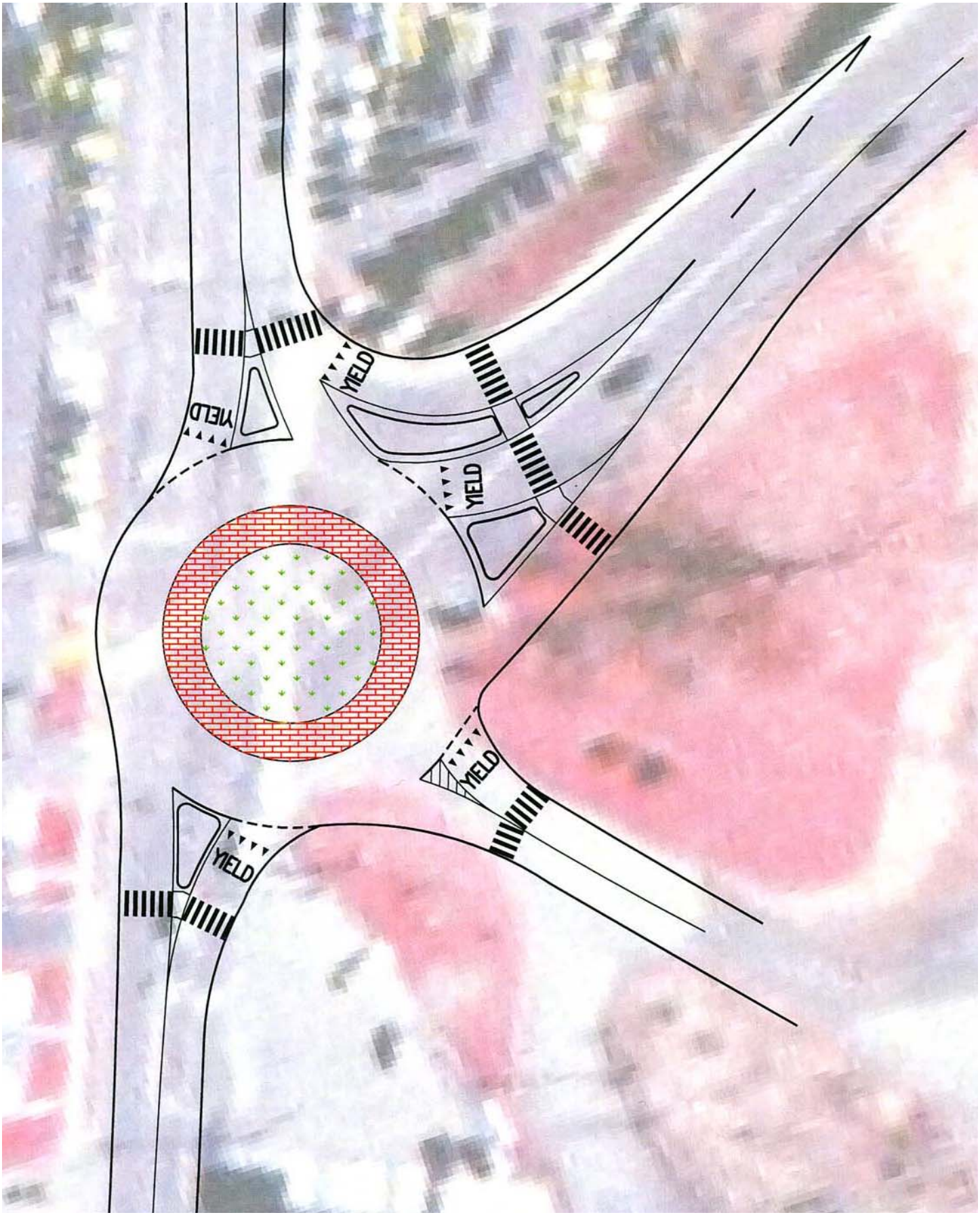

FIGURE 5.5 PROPOSED ROUNDABOUT AT ROUTE 4/ ROUTE 22/ BROADWAY - WHITEHALL

0 30 ft

April 2004

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FIGURE 5.6 INTERSECTION OF ROUTE 4 & KINGSBURY STREET

0 200 ft

April 2004

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VOLLMER

Date: OCTOBER 2004

Drawn By: K. NACHMAN

FIGURE 5.7 ROUTE 4 & 149S INTERSECTION IMPROVEMENT

source:Vollmer

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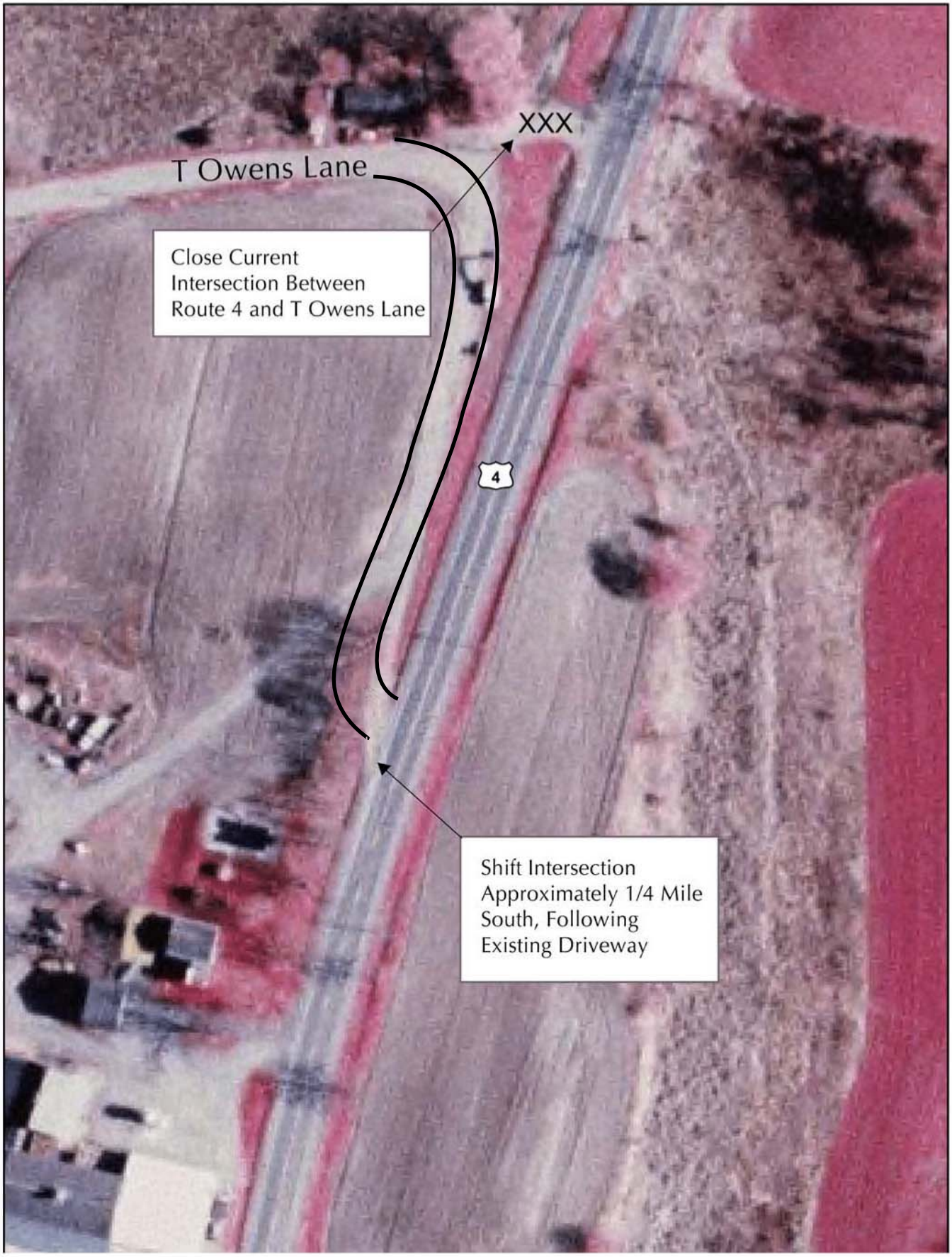

FIGURE 5.8 T OWENS LANE IMPROVEMENT

0 160 ft

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short sight distance owing to both the topography and angle of intersection with Route 4. BFJ recommends shifting the intersection southward approximately 100 yards along the current existing dirt road, which would improve the sight lines and reduce the potential for accidents at this location.

Another suggested modification is the installation of speed humps along Catherine Street in the Village of Fort Ann. As Catherine Street runs parallel with Route 4, some drivers take this residential street as a shortcut to avoid the intersection of Route 4 with Route 149. One speed hump should be installed along Catherine Street south of Route 149 in front of 44 Catherine Street and one north of Route 149 at 84 Catherine Street. The installation of speed humps will calm traffic along this street, encouraging drivers to stay on Route 4.

The next location is the intersection of Route 4 and CR 9 / CR 21 about 2 miles east of the Vermont Border. This four-way intersection is in a valley in the roadway. Trucks travel at high speeds down the hill to enable them to maintain speed on the uphill after the intersection. As the roadway dips down there is a narrow shoulder with insufficient room for a truck to pass. Widening of the road, either by putting in a dedicated left turn lane or by expanding the size of the shoulder would tend to improve safety at this intersection. Traveling southbound, the signage alerts drivers of the presence of a four-way intersection, but if the vehicle does not slow down, it is impossible to stop as the sight lines are too short for stopping.

The northernmost mitigation measure along the corridor is recommended at the intersection of Route 4 & Golf Course Road. This location may see an increase in truck traffic as an intermodal yard is planned just north of Route 4. BFJ recommends the installation of an eastbound left-turn lane on Route 4 at Golf Course Road. This should be accompanied by a right-turn lane/deceleration lane for traffic traveling westbound along Route 4. Landscape improvements are also proposed for this location (see section 5.6 for more information).

5.3 Traffic Improvements – Non-Intersection Locations

This section is a list of recommended improvements that are not located at a major intersection. The main focus of these improvements is to lower the number of crashes in the corridor. Secondary importance is to improve traffic flow and improve the quality of life along the corridor. The following suggestions are generally in order of location, traveling from the southern to the northern portion of the study area and are listed graphically in Figure 5.9. Any suggestion to flatten or straighten Route 4 needs to be balanced, as the unintended effect of these actions could be to increase speeds along the corridor.

- At mile marker 1151 & 1152 in Kingsbury, just north of the intersection with Wait Road, there exists a high accident location. At a minimum we advise that a blind driveway sign be erected to alert traffic prior to the sharp turn. Other mitigation measures include widening the shoulder in the curve to provide more room for vehicle avoidance for through vehicles to pass turning vehicles.

- Just to the south of the intersection of Route 4 with Geer Road we advise that the roadway be flattened. At this location the presence of rolling terrain makes for difficult visibility. By flattening the roadway, the sightlines can be improved. In

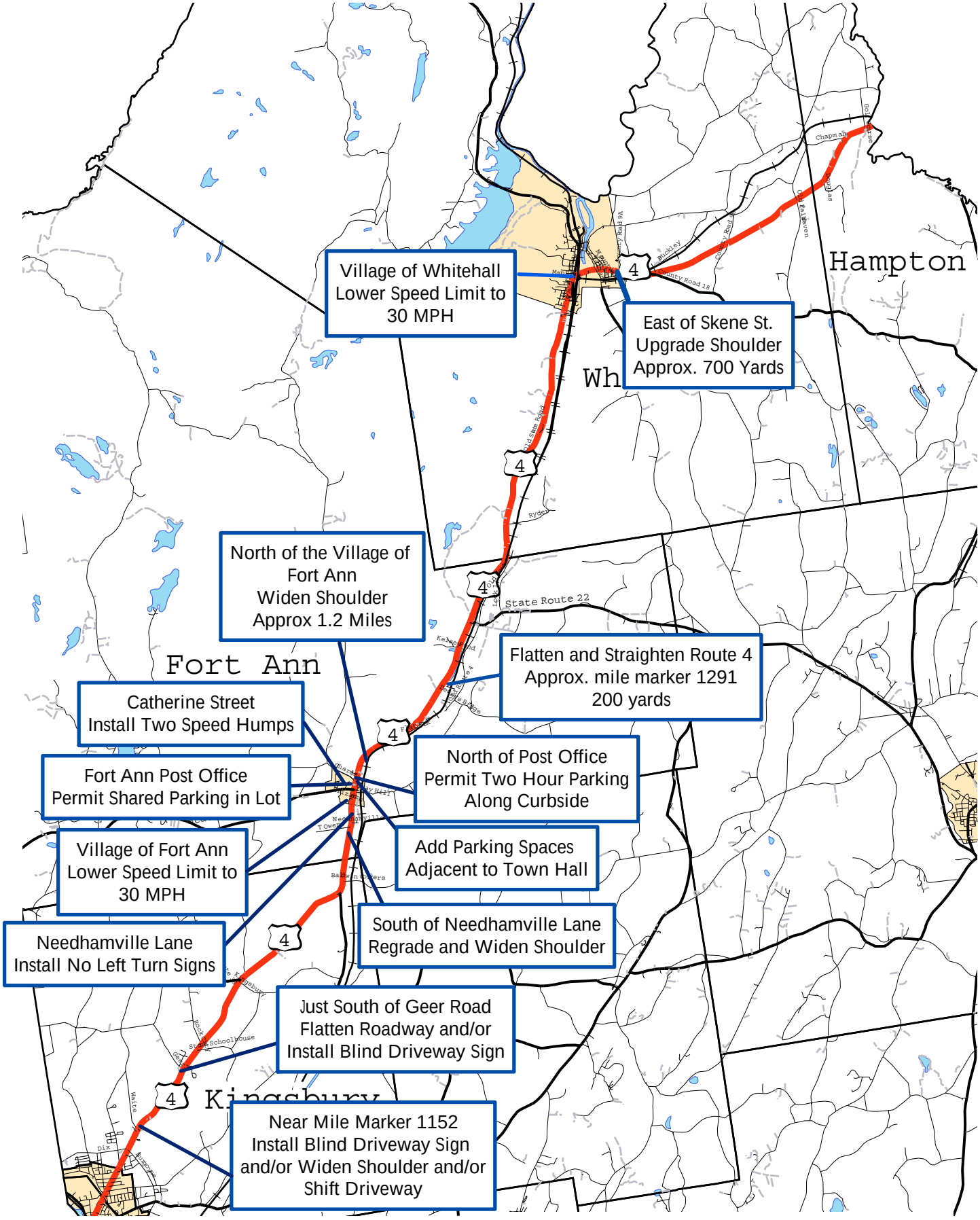

FIGURE 5.9 PROPOSED NON-INTERSECTION IMPROVEMENTS

0 2 miles

April 2004

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the short run, we recommend the installation of a "Blind Driveway - Reduce Speed" sign.

- Just north of the intersection of Route 4 with Kingsbury Street, the trees overhanging the roadway on the west side of the street need to be cut back to improve sight lines.

- In Ft. Ann, near the Walker's Home, Farm & Tack - 5565 Route 4 (south of Needhamville Rd.), the shoulder on the east side of the road is graded at a 20 degree angle. This makes it difficult to use by heavy vehicles and cyclists. We recommend that it be re-graded and made level.

- At the current time left turns are permitted from Needhamville Road onto Route 4. Due to the difficult sight lines, BFJ recommends that only right turns be permitted from Needhamville Road onto Route 4.

- The speed of traffic on the roadway directly affects the severity of any accident in a vehicular/pedestrian conflict. BFJ recommends the speed limit within the Village of Fort Ann to be lowered to 30 MPH to improve the pedestrian environment.

- Public parking spaces should be added in front of Fort Ann Town Hall.

- There appears to be capacity to open the United States Postal Service parking lot to use by the general public. In addition, to the north of the USPS Office some spaces only permit ten minute parking, we recommend that these spaces be changed to two-hour parking.

- North of Fort Ann, Route 4 has shoulders that are either non-existent or less than 6' in width. BFJ recommends that consistent 6' shoulders be provided for a length of about 2 KM.

- North of Fort Ann, from mile marker 1291- 1803, the curve of the road and the topography lead to short sight lines. This section of Route 4 (about 200 Meters) should be flattened. However, the estimated cost ($520,000) may make the improvement cost prohibitive.

- In the Village of Whitehall, we also advise that the speed limit should be reduced to 30 MPH.

5.4 Bicycle & Pedestrian Safety Improvements

In the Village of Fort Ann, sidewalks line both sides of the road except for minor gaps. We advise that the sidewalks be upgraded to be continuous within the Village. We also advise that the sidewalk be extended south of the Village line on the east side of the street to Needhamville Lane (approximately 500 meters) to accommodate existing foot traffic. Within the Village of Fort Ann, an additional crosswalk should be placed on Route 4 to facilitate access to Fort Ann Central School located at 1 Catherine Street.

Within the Village of Whitehall, sidewalks are generally only available on the west side of the street (Figure 2.7). We recommend that the sidewalk network be upgraded to be contiguous on both sides of the street throughout the entire village. In addition, the sidewalks should be extended on the west side of the street, south of the Village line to extend to McDonalds, to accommodate existing pedestrian traffic.

Regarding cycling, in order to improve the safety of cyclists along this corridor, we recommend that the shoulders be extended to a minimum of six feet along the entire corridor. Another improvement for cyclists would be the creation of off-street routes, especially along the canal network. We recommend the initiative to develop bike routes parallel to the existing canal corridor on land owned by the NYS Canal Corporation. The addition of off-street routes that connect to neighboring communities will create a valuable asset and lead to an increase in cycling. Finally, the villages should install bicycle racks at strategic locations to attract and serve recreational bicyclists along the corridor.

5.5 Buses and Public Transit

Operating transit in this corridor is difficult due to the low population density, coupled with long distances to neighboring destinations. The location within the corridor with the greatest population density is the Village of Whitehall. Unfortunately, the nearest destinations from Whitehall are Glens Falls, New York which is approximately 25 miles south and Rutland, Vermont, approximately 25 miles to the northwest. The travel time by transit is approximately one hour for each destination. The low density and dispersed nature of these automobile based communities lead to trip demand which is scattered over a wide area.

Only two regularly operating transit networks provide services to segments of the population. Social service networks operate services to transport the elderly and disabled, while the school bus network provides transportation for students. In order to provide transit to a greater number of residents, BFJ advises leveraging the current school bus network to provide services to the general public. The idea of using the existing school busses to carry non-students has been investigated by the GGFT, but they have not been able to overcome the regulatory hurdles. At the current time, there are no school districts in New York State which are integrating public transit with the school bus network.

Though there are both regulatory and logistical issues involved, pooling the resources of the school bus network with public transit can accommodate greater access for all residents. This would allow the area to leverage the limited funds that are dedicated for public transit and make better use of the assets owned by the community. Although use integration of school bus and public transit services is not widespread, there are several success stories in the United States.

The following areas have experimented with integrating school bus services[5]:

Cheraw, South Carolina
Idlewild, Michigan

[5] Integrating School Bus and Public Transportation Services in Non-Urban Communities, Transit Cooperative Research Program Report # 56, Washington DC, 1999

Trumbull County, Ohio
Glendale, Oregon
Bonifay, Florida
Nampa, Idaho
Selkirk, Washington
Gillette, Wyoming

Some cases are as simple as allowing non-profit organizations to rent busses for nominal fees during off hours (Gillette, Wyoming), while a Dial-A-Ride service (Idlewild Michigan) allows the general public to ride with students along routes that are geared toward students. A third method is being employed in Cheraw, South Carolina where parents, school volunteers and school employees may request to ride on regular school bus routes. They are looking to open this up to the general public, to fully utilize all capacity.

Another area to explore is ridesharing. As this is a low cost alternative, requiring only the organizational ability to couple drivers and passengers, it is feasible from a budgetary perspective. The main drawback of ridesharing is that it is difficult to recruit drivers to participate in ridesharing programs, as they limit their options once they have a passenger relying on them to be shuttled to their destination. By sharing a ride, the driver can reduce the cost of their commute by half, but at the cost of reduced flexibility. Much of the coordination between riders and passengers can be accomplished through the use of a website.

5.6 Landscaping Plan

Route 4 serves dual functions as both a Main Street or commercial strip within the Villages of Fort Ann and Whitehall, as well as in Kingsbury and a rural highway between the villages. This dual purpose leads to conflicts within the villages as drivers using the roadway as a rural highway may drive at speeds which are excessive for the villages. In order to slow traffic and extend a welcome to drivers passing through the villages, BFJ recommends the development of a set of landscape and traffic calming features along Route 4 which serve to reduce speeds and thereby lower accidents, beautify the roadway and enhance civic pride and a sense of place.

BFJ recommends the installation of a series of median gateways which serve to mark the entrance to the villages. Though these proposed median islands are not endorsed by the NYSDOT Highway Design Manual, we believe they would serve a valuable purpose for this corridor by acting as traffic calming devices which may reduce both vehicular speeds and crashes. The gateway median islands would have to be built on a demonstration basis. Three gateways are proposed for Fort Ann and two are proposed for Whitehall. The gateways will generally be located at the village entrance where traffic has to slow down (see Figure 5.10). In addition, an information kiosk is proposed along Route 4 in Hampton for drivers entering NYS from Vermont.

The proposed locations for the Village of Fort Ann gateways are on Route 4 (at southern portion of Green Thumb Nursery & near Village border in the north) and one on Route 149 (just east of Mountain View Road). Gateways are also recommended along Route 4 in the south of Whitehall (south of 7th Avenue, North of McDonalds) and east of Whitehall along

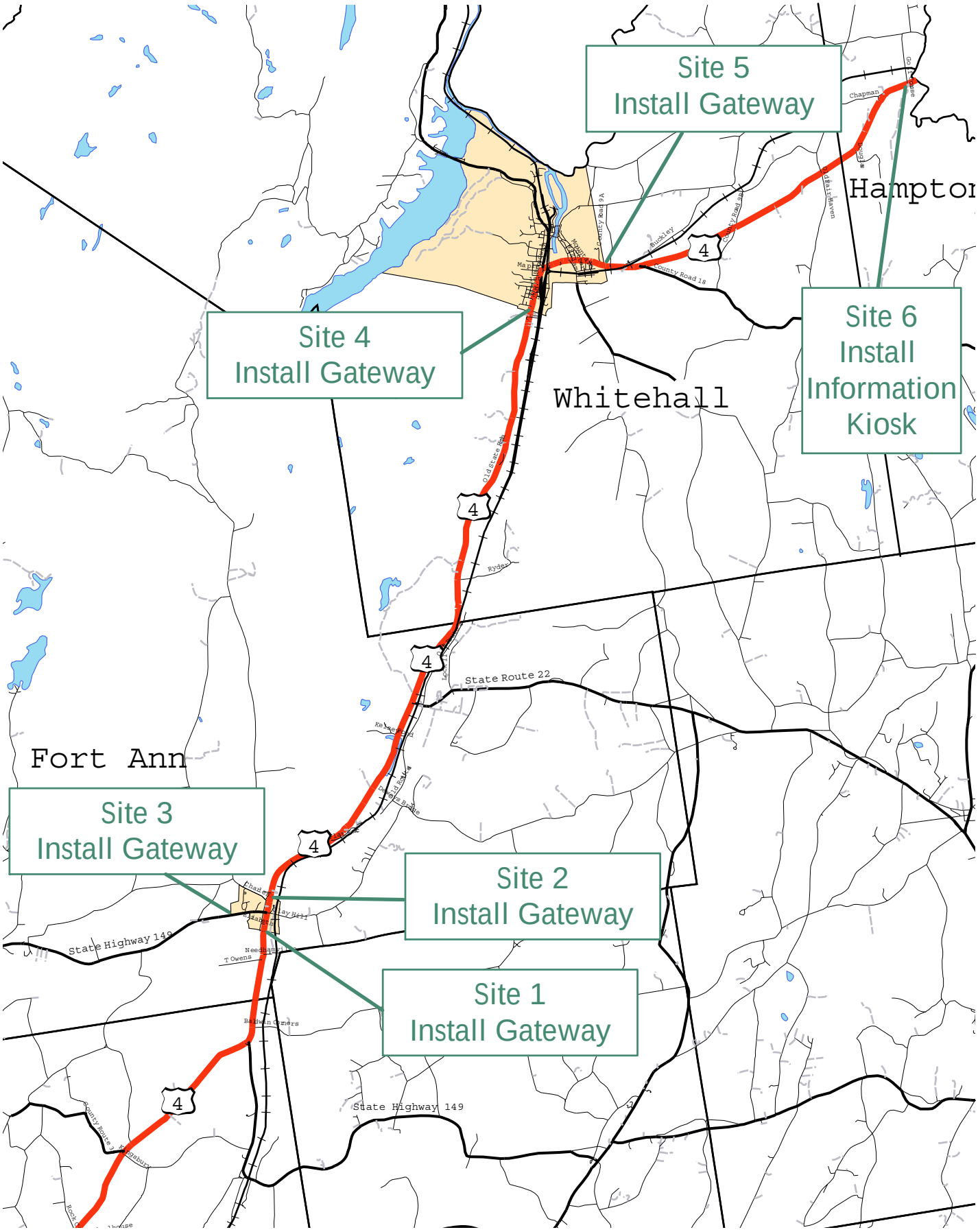

FIGURE 5.10 LANDSCAPING PLAN

ROUTE 4 CORRIDOR STUDY

0 2 miles

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FIGURE 5.11 GATEWAY DESIGN - FORT ANN ENTRY FROM SOUTH

ROUTE 4 CORRIDOR STUDY

source: Mathews Neilsen Landscape architects, P.C.

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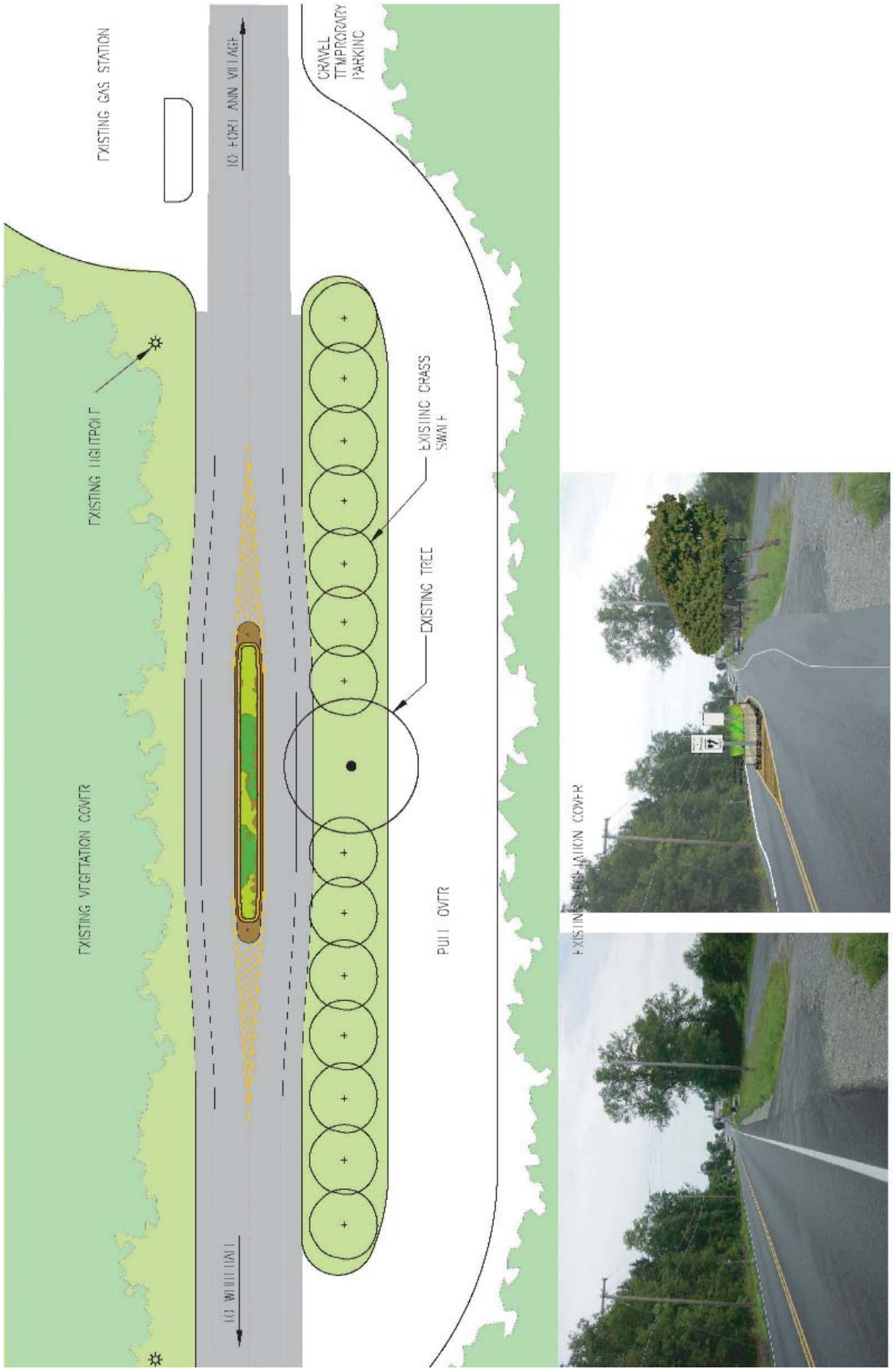

FIGURE 5.12 GATEWAY DESIGN - FORT ANN ENTRY FROM NORTH

ROUTE 4 CORRIDOR STUDY

source: Mathews Neilsen Landscape Architects, P.C.

0 45 ft

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Buckhurst Fish & Jacquemart Inc.

FIGURE 5.13 GATEWAY DESIGN - FORT ANN ENTRY FROM WEST

ROUTE 4 CORRIDOR STUDY

source: Mathews Neilsen Landscape Architects, P.C.

NTS

April 2004

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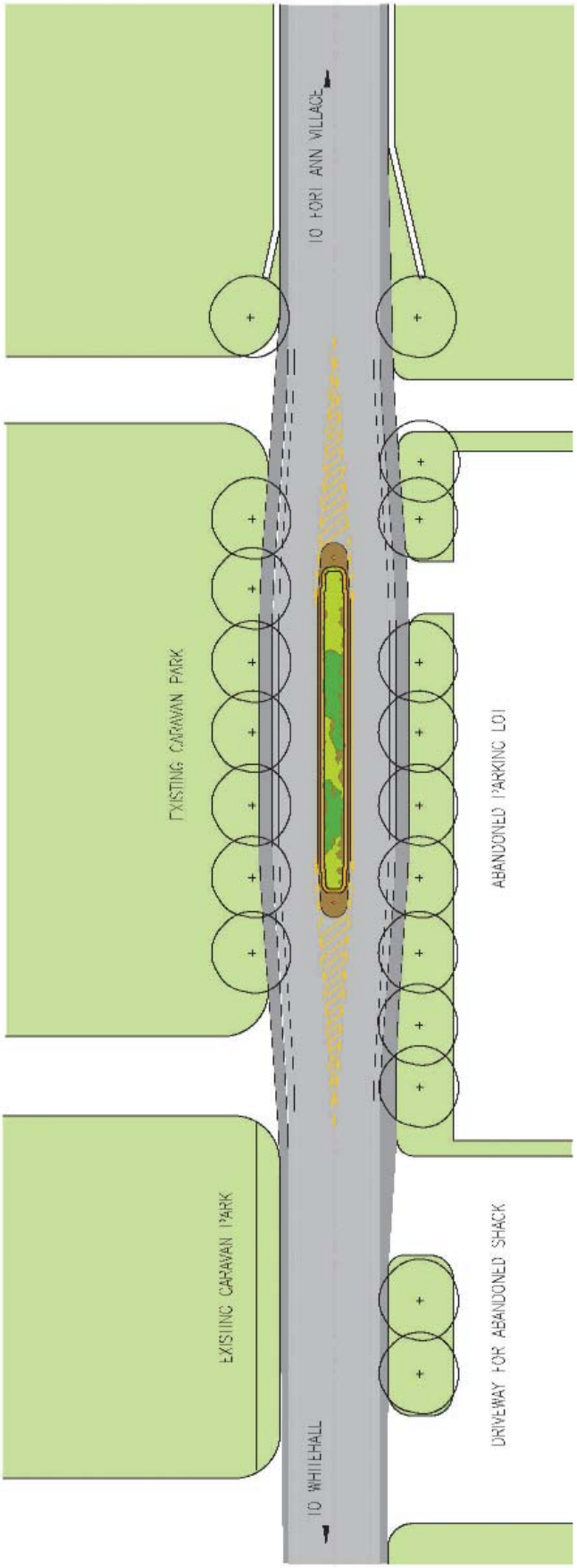

FIGURE 5.14 GATEWAY DESIGN - WHITEHALL ENTRY FROM SOUTH

ROUTE 4 CORRIDOR STUDY

source: Mathews Neilsen Landscape Architects, P.C.

0 45 ft

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Buckhurst Fish & Jacquemart Inc.

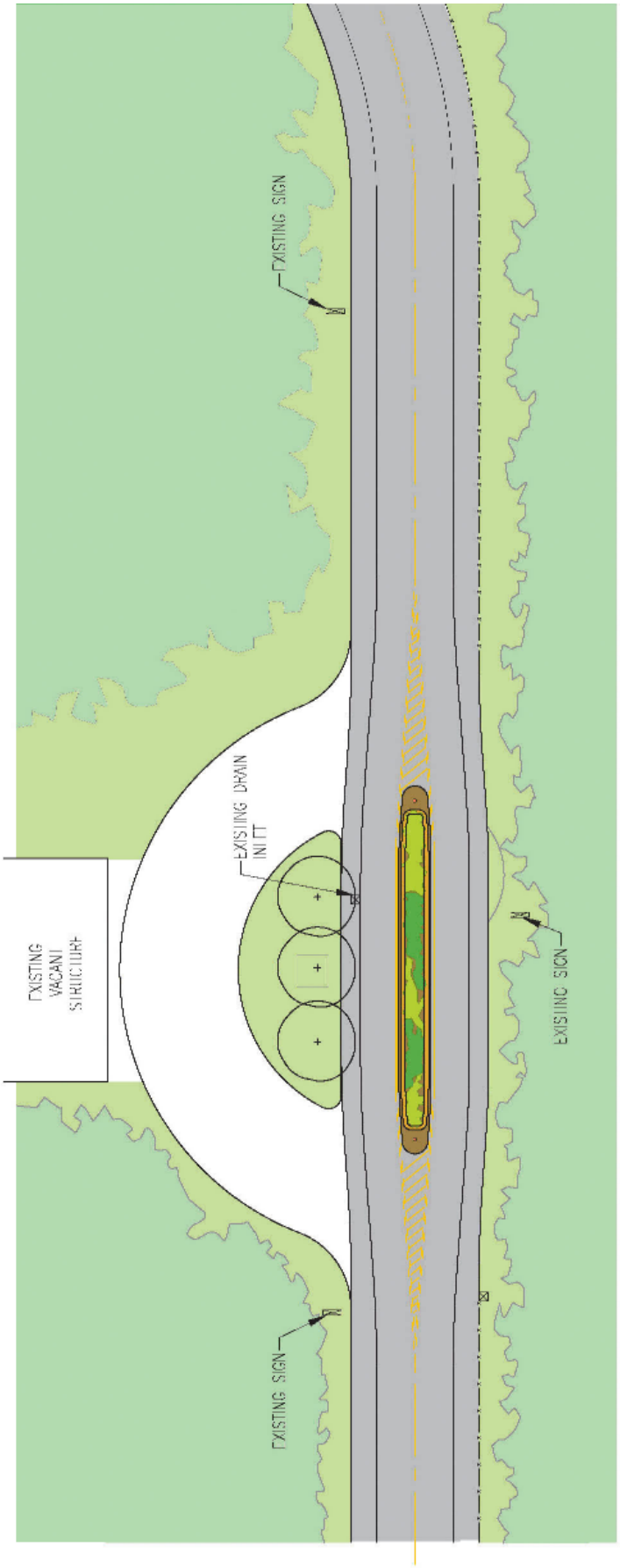


FIGURE 5.15 GATEWAY DESIGN - WHITEHALL ENTRY FROM EAST

source: Mathews Neilsen Landscape Architects, P.C.

0 45 ft

April 2004

Buckhurst Fish & Jacquemart Inc.

Route 4 (west of Country Club Drive). Designs for the proposed median gateways are displayed in Figures 5.11to 5.15. The primary purpose of these gateways will be to alert drivers that they are entering a village and are required to reduce their speed to 30 MPH. In addition, the gateways will be located in the center of the roadway, providing a slight deflection to the roadway, and forcing drivers to reduce their speed as they approach. The median gateway islands will act in a similar fashion as roundabouts placed in a very visible manner in the middle of the roadway and forcing drivers to slow down. The landscaping will also provide an attractive welcome into the village and serve notice that the driver is entering a different and important area within the corridor.

Figure 5.16 shows the proposed information kiosk to be located just to the west of Golf Course Road on the north side of Route 4. The purpose of this information kiosk is to alert drivers that they are entering the State of New York and to encourage them to visit locations of interest in Washington County as well as to patronize local restaurants and hotels/motels. The information kiosk is expected to be sheltered and open without any attendant. There would be shelves and features that can hold brochures and maps.

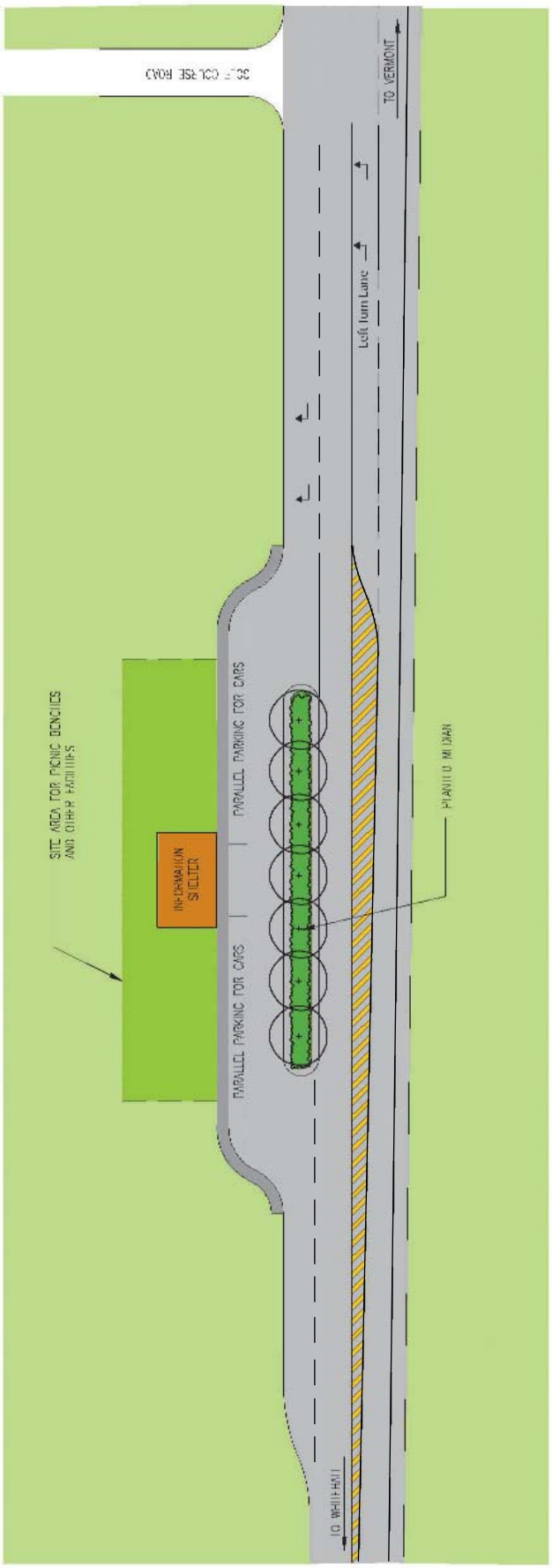
6.0 Recommendations for Municipalities

6.1 Future Land Use Plans

It is expected that the Route 4 corridor will be under development pressures and may face a loss of open space in the future. Efforts should be made to concentrate growth and development within the village settings. According to the Urban Land Institute, a home 10 miles from a village center on a lot that is a third of an acre costs taxpayers $69,000, while if it is located near the village on a compact lot, it costs taxpayers $34,500[6]. These one time costs are based on the need to extend the infrastructure as well as provide services to the location. Low-density growth patterns also produce traffic congestion and pollution, as drivers are required to travel by car and travel further to meet their daily needs. We recommend that smart-growth policies be adopted in an effort to maintain the historical character of the villages. Neighborhoods which are of a walkable scale and provide smaller stores in a village setting are a valuable resource for the area. By retaining and enhancing the villages, residents can leave their cars and perform multiple tasks on foot, which can lead to a reduction in auto trips. These types of villages are also more attractive to tourists and through travelers and will encourage them to stop and eat or shop.

Methods which can help strengthen the villages include the development of off-street municipal parking, coupled with reducing or removing the parking requirements. Programs such as these reduce the cost of development within the villages, as the cost associated with land acquisition, construction and maintenance of the parking facility is shifted to the municipality. Tax policies should favor businesses and homes situated in the village to encourage inward, rather than sprawling development.

[6] SMART GROWTH is Smart Business- Boosting the Bottom Line & Community Prosperity, NALGEP and Smart Growth Leadership Institute • 2004, pg. 5



FIGURES 5.16 DESIGN OF INFORMATION KIOSK AND TURN LANES AT NEW YORK STATE BORDER

source: Mathews Neilsen Landscape Architects, P.C.

0 45 ft

April 2004

Buckhurst Fish & Jacquemart Inc.

Zoning should be structured such that developments are encouraged in the villages and discouraged outside the villages. Maximum densities should be decreased significantly outside the villages, and setback and frontage requirements should be increased substantially. Such a development pattern will not only strengthen the character of the villages, but will also maintain the rural character along Route 4 and, more importantly, will maintain the function of through traffic of Route 4.

Smart-growth polices also encourage the development of mixed-use zoning in the villages, which allow multiple uses to be collocated in a small geographical area. Villages need to contain destination locations in order to remain relevant. Sidewalks need to be maintained in a good state of repair to encourage walking. At the current time there are gaps in the sidewalk network within the Village of Fort Ann and Whitehall. Crosswalks are another necessary feature to ensure the safety of pedestrians. Dense mixed-use zoning will also encourage cycling. To ensure safety for cyclists, a 6' continuous shoulder on both sides of the street should be maintained. In addition, installing bike racks at key destinations is an inexpensive way to promote cycling. Finally, off-street bicycle paths, especially along the canals are advised.

As discussed in the public workshops held for this study, a bypass on the northwest side of Fort Ann may one day become the solution to resolving the traffic issues in the village. The proposed route for the Fort Ann bypass road (see Figure in the Appendix) needs to be included into the Town's master plan to preserve this option for future generations.

6.2 Access Management

One way of improving the traffic flow and safety along the corridor is through the implementation of an access management plan. Access management strategies aim to alleviate the inherent conflicts between the function of through traffic of an arterial and the local function of access to abutting properties. As traffic volumes increase along these types of roads, these conflicts become more and more problematic in terms of congestion and accidents, and will eventually hamper the economic well being, as well as the quality of life along the corridor. Eventually it will become difficult to make left turns onto and off Route 4, which may lead to an increase in accidents. Access management attempts to group the turning movements in and out of properties, or shift them to side streets or service roads or to minimize the more problematic turns, i.e. the left turns. The basic goal is to improve traffic flow and safety along the arterial without reducing access. The elimination or discouragement of certain turns in and out driveways is often seen as a reduction in accessibility. However, this potential reduction is generally offset by increased accessibility to the property from side streets or from adjacent properties. By facilitating traffic flow along Route 4 these actions will make it easier for the volume of vehicles to grow in this corridor, which will be beneficial in the long term and will increase property values. Accident rates along arterials such as Route 4 are related to the density of driveways.

Studies have shown that an effective access management program can reduce crashes by as much as 50%, increase roadway capacity by 25% to 45%, and reduce travel time and delay

as much as 40% to 60%[7]. The towns and villages along Route 4 share the responsibility for the traffic flow along Route 4 even though it is a State Highway. Though property owners need to get a permit from NYSDOT, the State has limited authority to control and manage access along Route 4. The land use authority of the municipality offers the best regulatory means to manage access along an arterial. By developing an access management program, the towns and villages can work to minimize and possibly eliminate the most hazardous movements (left turns in and out) along the corridor.

Among the many benefits of a managed roadway are increased public safety, reduction of congestion, extended life of the roadway and improved appearance of the built environment. Access management also serves to both preserve the transportation functions of roadways as well as the long-term property values and the economic viability of abutting development[8]. A further benefit is the ability to concentrate commercial activity in a smaller area, which is less damaging to landscapes and the environment.

Access management strategies have beneficial impacts on pedestrian circulation in the sense that the actions encourage more walking between adjacent properties (by providing connections) and by making walking more pleasant along any sidewalk that may exist in the area, due to reduced numbers of driveways and vehicular turns. Aesthetics are generally also improved by access management plans.

The municipalities should consider the following actions for all properties along Route 4 and 149:

- Any subdivision plan must include side streets connecting to the State highway, and no driveways are allowed onto the State highways. The side streets (collectors) must connect as much as possible to other local streets to form a road network that allows flexibility and distributes the traffic loads over several roads. If no connection can be achieved in the short term, the applicant must provide easements for future connections.

- All commercial properties along Route 4 must provide a vehicular connection to adjacent properties to allow vehicles to drive from one to the other without driving onto the State highway. If no connection can be provided in the short term, the applicant must provide an easement for a future connection. When the neighboring property owner comes to the Town for a site plan approval or building approval, the Town can then require the connection. These interconnections may eventually lead to the equivalent of a service road between the commercial properties.

- Property owners along Route 4 are encouraged to combine and share their driveways.

[7] S&K Transportation Consultants, Inc. Access Management, Location and Design. Participant notebook for NHI Course 133078. National Highway Institute, Federal Highway Administration, April 1998, revised April 2000.

[8] Committee on Access Management - Access Management Manual. Transportation Research Board, Washington, D.C. 2003

- All driveways along Route 4 require a special permit and are allowed on a temporary basis only. If and when an alternate access can be found in the future the driveway would then be discontinued.

The above actions seem restrictive, however, they are required in the long term to maintain a safe and efficient highway. The access limitation off Route 4 will be more than offset by the access improvements from side streets and from adjacent properties. Businesses will benefit from the connections to adjacent properties, since a person in the adjacent property is more likely to patronize the business than the drivers on Route 4. Property owners along similar state highways with higher traffic volumes have learned that there is no other alternative to managing traffic along these arterials, and that eventually the left turns become very difficult anyway.

The access management plan along Route 4 does not require any municipal intervention in the short term, other than adopting the above policies and regulations. It is a long-term action plan requiring diligence and attention on the part of the Planning Boards. Access management gets implemented gradually as new development applications come in front of the Planning Boards.

7.0 Implementation of Corridor Plan

7.1 Summary of Route 4 Corridor Improvements

Table 7.1 lists all recommended improvements in the Route 4 corridor as discussed in previous chapters. The improvements are listed in geographical order starting at the southern end of the corridor. For each project we show the current condition/problem and the proposed improvement.

7.2 Priorities and Funding

Table 7.1 also lists the cost estimates for each project (see Appendix C for more details). The estimated cost is expressed in current 2004/2005 dollars. This table also indicates the level of priority for each improvement, whether they should be undertaken in the short term (less than 5 years), mid-term (5 to 8 years) or long term (more than 8 years). For example, the median island gateways in Fort Ann are listed as a short-term priority, whereas those in Whitehall are medium term. Since the median island gateways proposed at the entrances of Fort Ann and Whitehall may not be allowed under current State Highway Design Guidelines, it is recommended that they be installed on a demonstration basis. It is felt that Fort Ann is a better testing ground for these traffic calming features. Once these gateways have been tested successfully in Fort Ann, they can then be installed in Whitehall.

For the median island gateways to be implemented it is also necessary that the respective municipality agree to maintain the landscaped medians. This could either be done by the Town/Village or by a private civic organization or corporation. The Federal Highway Administration (FHWA) will also need to approve the median gateways, as Route 4 is on the National Highway System.

In the last column the table also lists the agency(ies) responsible for the implementation of the projects. A great majority of the proposed improvements would be the responsibility of NYSDOT and would have to become part of the regional improvement program. Some of the projects along Route 4 such as a minor shoulder widening or correction may be undertaken as part of major maintenance projects along the highway. Other projects fall under the jurisdiction of the municipalities, the County or in some cases the private property owners. It should be noted that currently there are no capital projects programmed for this corridor and that funding and resource limitations require that any future projects will need to be balanced against other regional and local priorities. It is up to the municipalities to advance and implement capital projects based upon their own assessments and that those assessments may or may not coincide with the findings of this report.

7.3 Right-of-way Restrictions

Some of the improvement recommendations contained in this document (such as the installation of roundabouts and wider shoulders) would require widening the existing roadway and may require additional right-of-way. For example, a roundabout is proposed for the intersection of Route 4 and 32 at the southern end of the corridor (see Figure 5.2). The existing right-of-way width would not permit the installation of a modern roundabout. Cooperation between municipalities and private landowners would be necessary to advance this concept.

Another example is in the Village of Fort Ann, where BFJ suggests that he Town adopts an official map showing a bypass of the Village (see Figure in Appendix). If the property is acquired for the bypass, BFJ recommends that access not be granted to adjacent property owners, but that the bypass be developed as a limited access roadway. It is important to prevent this stretch of road from becoming a commercial strip, and compete with Village.

Another right-of-way constraint is in the Village of Whitehall, where it is advised that the shoulder of Route 4 be widened. By analyzing aerial photographs, we have identified potential locations where the existing structures are located too close to the roadway and may require right-of-way acquisitions if the road is widened. Detailed engineering and surveys are required to determine if the widened roadway would impact the existing structures (see Figure 7.1).

Table 7.1- Route 4 Corridor - Upgrades and Improvements

	Figure	Location	Project	Length	Estimated Cost	Estimated Cost /Linear Foot	Priority	Jurisdiction / Municipality
1	**5.2**	Intersection of Route 4 and Route 32 (Dix Ave / Burgoyne Ave)	Installation of a Roundabout		$250,000		Short-Term	NYSDOT
2		Mile marker 1151 to 1154	Accident Mitigation / Widen Shoulder or shift driveway				Mid-Term	NYSDOT
3		Glen Falls - South of Intersection of Geer Rd / Route 4	Flatten Roadway	Roughly 50 Meters	$160,000	$970	Mid-Term	NYSDOT
4		Just South of Intersection of Geer Rd / Route 4	Install Sign	Approx 10 Meters			Short-Term	NYSDOT
5	**5.6**	Kingsbury -Intersection of Kingsbury St. / County Route 36 / Route 4	Redesign traffic flow at intersection				Mid-Term	Washington County
6	**5.7**	Kingsbury -Intersection 149 S and Route 4	Reconfigure Westbound approach		$110,000	$550	Short-Term	NYSDOT
7		Ft. Ann - Near Walker's (south of Needhamville La.)	Regrade and widen shoulder	Approx 200 Meters	$150,000	$224	Mid-Term	NYSDOT
8		Needhamville Lane	Prohibit left turns from Needhamville onto Route 3				Mid-Term	Town of Fort Ann
9	**5.8**	Ft. Ann T Owens Lane	Alter Intersection	Approx 100 Meters			Mid-Term	Town of Fort Ann / Private Property Owner
10	**5.11**	South of Village of Fort Ann at 5699 Route 4	Install median island "gateway"	Approx 30 Meters	$155,000	$646	Short-Term	NYSDOT
11	**2.7**	South of Ft. Ann Village Line	Extend Sidewalk	Approx 500 meters	$90,000	$55	Mid-Term	NYSDOT / Town of Fort Ann

Table 7.1- Route 4 Corridor - Upgrades and Improvements								
	Figure	**Location**	**Project**	**Length**	**Estimated Cost**	**Estimated Cost /Linear Foot**	**Priority**	**Jurisdiction / Municipality**
12		Village of Ft. Ann	Lower Speed Limit in Village to 30 MPH				Short-Term	NYSDOT
13	**2.7**	Village of Ft. Ann	Improve / Upgrade sidewalks	Approx 800 meters	$200,000	$76	Mid-Term	NYSDOT / Town of Fort Ann
14		Near Intersection of Route 4 and Catherine St (south)	Install Crosswalk				Short-Term	NYSDOT
15		Fort Ann Town Hall	Add Parking Spaces Adjacent to Town Hall				Mid-Term	Village of Ft. Ann
16		Fort Ann Post Office	Potential Public Parking at Back of Post Office				Short-Term	Village of Ft. Ann / USPS
17		North of Post Office	Change Ten Minute Parking Rule to Two Hour Parking				Short-Term	Village of Ft. Ann
18	**Append**	Route 149 to Route 4 -West and North of Ft. Ann	Bypass of Fort Ann	Approx 1.6 Miles	$11,300,000	$ 7.06 Million / Mile	Long-Term	Town of Fort Ann
19	**5.13**	West of Village of Ft. Ann - Route 149	Install - median island "gateway"	Approx 30 meters	$155,000		Short-Term	NYSDOT
20		Catherine St - Fort Ann	Install 2- Speed Humps				Short-Term	Village of Fort Ann
21	**5.12**	North of Village of Fort Ann	Install - median island "gateway"	Approx. 30 Meters	$155,000		Short-Term	NYSDOT
22		North of Fort Ann	Widen Shoulder	Approx 2 KM	$445,000	$67	Short-Term	NYSDOT
23		North of Fort Ann - Mile Marker 1291 - 1803	Flatten and Straighten Roadway	Approx 200 meters	$520,000	$793	Long-Term	NYSDOT
24	**5.14**	Village of Whitehall southern boundary	Install - median island "gateway"				Mid-Term	NYSDOT
25		Village of Whitehall	Lower Speed Limit in Village to 30 MPH				Short-Term	NYSDOT

Table 7.1- Route 4 Corridor - Upgrades and Improvements

	Figure	Location	Project	Length	Estimated Cost	Estimated Cost /Linear Foot	Priority	Jurisdiction / Municipality
26	**2.7**	Village of Whitehall, West side of Route 4	Extend Sidewalk	Approx 1.0 KM	$170,000	$52	Mid-Term	NYSDOT / Village of Whitehall
27	**2.7**	Village of Whitehall, East side of Route 4	Extend Sidewalk	Approx 1.0 KM	$170,000	$52	Mid-Term	NYSDOT / Property Owner
28	**5.5**	Village of Whitehall, Intersection of Route 4 and Route 22 (Bway)	Install Roundabout		$300,000		Mid-Term	NYSDOT
29	**2.7**	Village of Whitehall, East of Route 22 (Bway)	Extend Sidewalk	Approx 1.4 KM	$235,000	$52	Mid-Term	NYSDOT / Village of Whitehall
32		Village of Whitehall - East of Skene	Upgrade Shoulder	Approx 700 meters	$170,000	$74	Mid-Term	NYSDOT
33	**5.15**	East of Village of Whitehall	Install median island "gateway"	Approx 30 Meters	$155,000	$646	Mid-Term	NYSDOT
34		Intersection of Route 4 and CR 9 / CR 21	Widen Shoulder or Install Turn Lane				Short-Term	NYSDOT
35	**5.16**	Hampton - Just west of Golf Course Road	Information Booth	Approx 200 Meters	$75,000	$500	Mid-Term	NYSDOT
36	**5.16**	Hampton @ Golf Course Road	Turn Lanes		$155,000	$775	Short-Term	NYSDOT / Washington Co.
					$14,870,000			

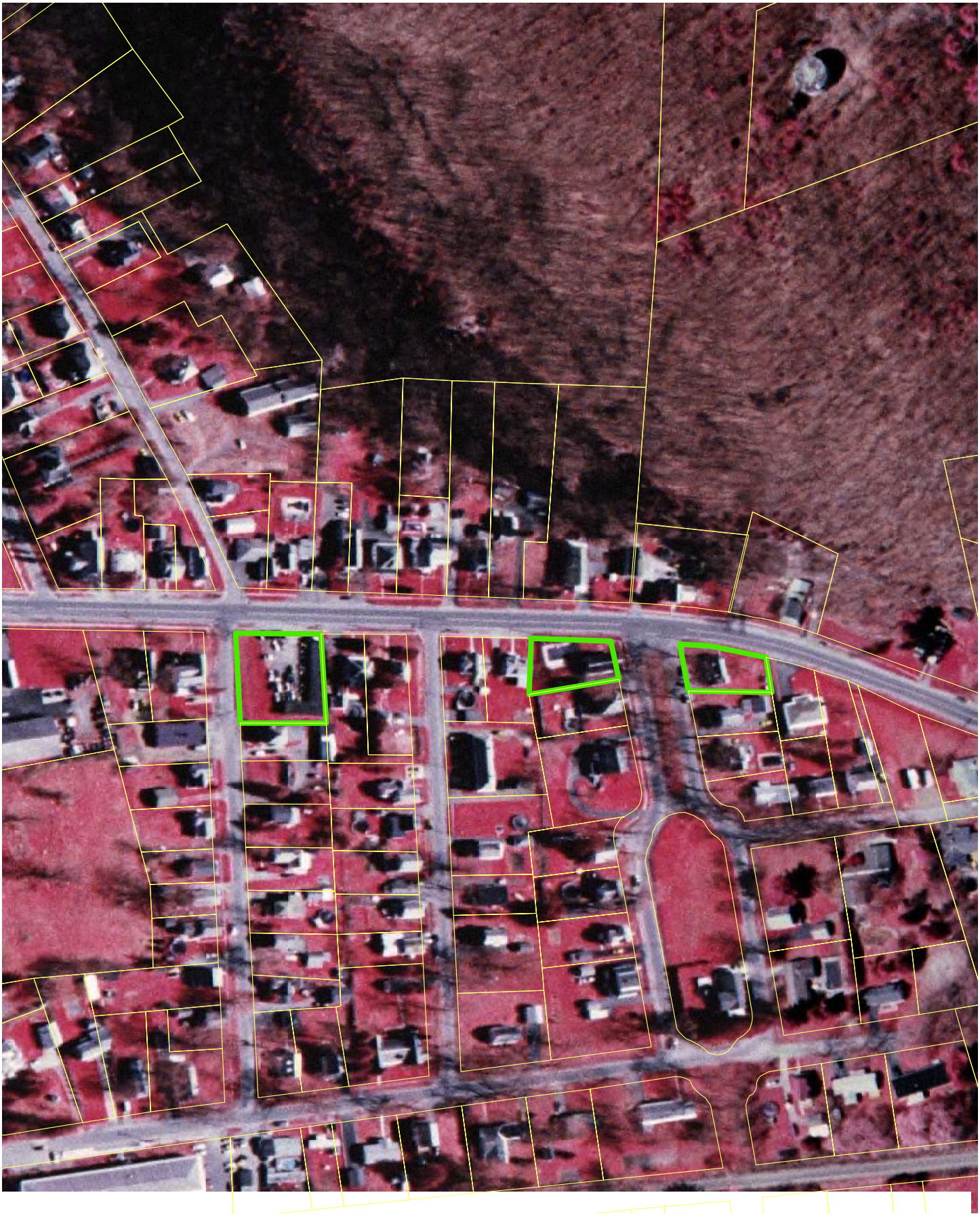


FIGURE 7.1 POTENTIAL RIGHT-OF WAY-ISSUES IN WHITEHALL

source: NYS GIS Clearinghouse

0 200 ft

April 2004

Buckhurst Fish & Jacquemart Inc.

Appendix

Appendix A – Traffic Counts

PEAK HOUR TRAFFIC VOLUMES

Intersection: **Route4 & Route 32**

Day/Date of Count: Wed-Thurs/May 19- 20, 2004
Project: Route 4 Traffic Study
Municipality/State: Kingsbury, NY

Morning Traffic Counts

		Route4 & Route 32																	
		Route 32 Eastbound				Route 32 Westbound				Route 4 Northbound				Route 4 Southbound				15 minute Totals	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV		
7:00	7:15	19	38	3	60	1	45	14	60	6	24	3	33	12	25	15	52	205	
7:15	7:30	16	42	1	59	2	79	16	97	13	47	1	61	27	26	20	73	290	Hourly Totals
7:30	**7:45**	**16**	**31**	**4**	**51**	**1**	**87**	**16**	**104**	**4**	**25**	**6**	**35**	**16**	**20**	**50**	**86**	**276**	1077
7:45	**8:00**	**10**	**35**	**2**	**47**	**3**	**99**	**16**	**118**	**4**	**27**	**6**	**37**	**11**	**52**	**41**	**104**	**306**	1116
8:00	**8:15**	**17**	**34**	**4**	**55**	**4**	**62**	**12**	**78**	**5**	**18**	**2**	**25**	**18**	**39**	**29**	**86**	**244**	1130
8:15	**8:30**	**20**	**40**	**2**	**62**	**7**	**103**	**17**	**127**	**9**	**23**	**5**	**37**	**14**	**31**	**33**	**78**	**304**	1084
8:30	8:45	12	35	4	51	2	73	8	83	8	21	5	34	9	20	33	62	230	1021
8:45	9:00	12	40	8	60	7	55	13	75	9	19	2	30	9	34	35	78	243	
		122	295	28	445	27	603	112	742	58	204	30	292	116	247	256	619	2098	
Peak Hour (7:30 - 8:30)		**63**	**140**	**12**	**215**	**15**	**351**	**61**	**427**	**22**	**93**	**19**	**134**	**59**	**142**	**153**	**354**	**1130**	**1130** hourly pk traffic vol
Peak Hour Factor		**0.79**	**0.88**	**0.75**	**0.87**	**0.54**	**0.85**	**0.90**	**0.84**	**0.61**	**0.86**	**0.79**	**0.91**	**0.82**	**0.68**	**0.77**	**0.85**	**0.92**	

Afternoon Traffic Counts

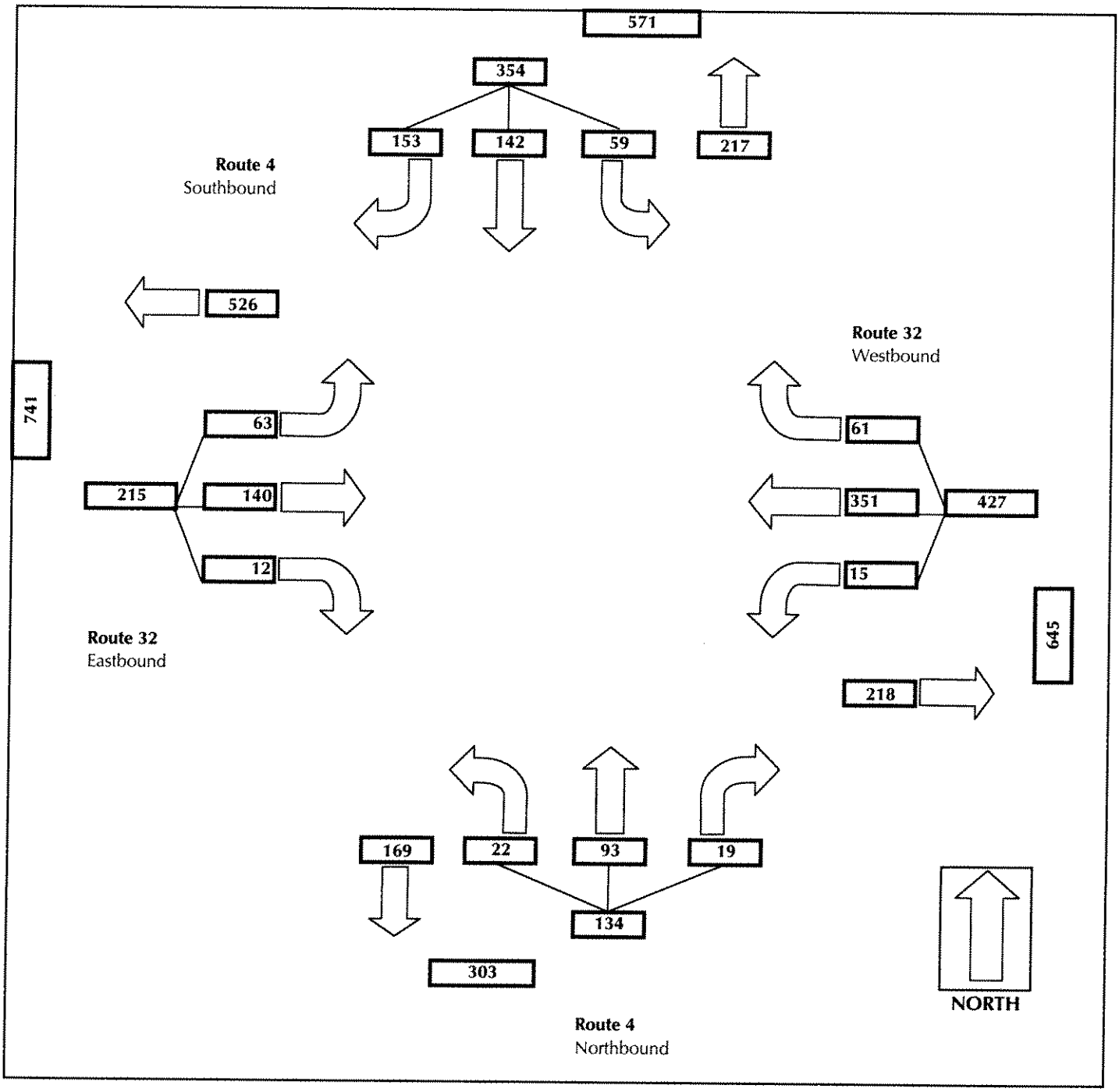
		Route4 & Route 32																	
		Route 32 Eastbound				Route 32 Westbound				Route 4 Northbound				Route 4 Southbound				15 minute Totals	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV		
16:00	16:15	37	72	9	118	6	64	15	85	6	45	7	58	14	34	21	69	330	
16:15	16:30	34	73	6	113	1	74	18	93	8	37	12	57	13	39	34	86	349	Hourly Totals
16:30	16:45	34	89	5	128	2	54	17	73	3	51	4	58	20	27	17	64	323	1334
16:45	**17:00**	**36**	**90**	**3**	**129**	**4**	**67**	**20**	**91**	**8**	**45**	**5**	**58**	**16**	**23**	**15**	**54**	**332**	1352
17:00	**17:15**	**47**	**100**	**3**	**150**	**2**	**54**	**16**	**72**	**4**	**40**	**4**	**48**	**18**	**32**	**28**	**78**	**348**	1381
17:15	**17:30**	**50**	**96**	**4**	**150**	**2**	**62**	**23**	**87**	**3**	**59**	**4**	**66**	**20**	**30**	**25**	**75**	**378**	1390
17:30	**17:45**	**33**	**85**	**5**	**123**	**2**	**51**	**18**	**71**	**7**	**46**	**5**	**58**	**20**	**27**	**33**	**80**	**332**	1390
17:45	18:00	39	64	3	106	0	59	26	85	3	39	3	45	8	18	25	51	287	1345
		310	669	38	1017	19	485	153	657	42	362	44	448	129	230	198	557	2679	
Peak Hour (4:45 - 5:45)		**166**	**371**	**15**	**552**	**10**	**234**	**77**	**321**	**22**	**190**	**18**	**230**	**74**	**112**	**101**	**287**	**1390**	**1390** hourly pk traffic vol
Peak Hour Factor		**0.83**	**0.93**	**0.75**	**0.92**	**0.63**	**0.87**	**0.84**	**0.88**	**0.69**	**0.81**	**0.90**	**0.87**	**0.93**	**0.88**	**0.77**	**0.90**	**0.92**	

BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 32
AM Peak Hour

Peak Hour: (7:30 - 8:30)
Day/Date: Wed-Thurs/May 19- 20, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Kingsbury, NY

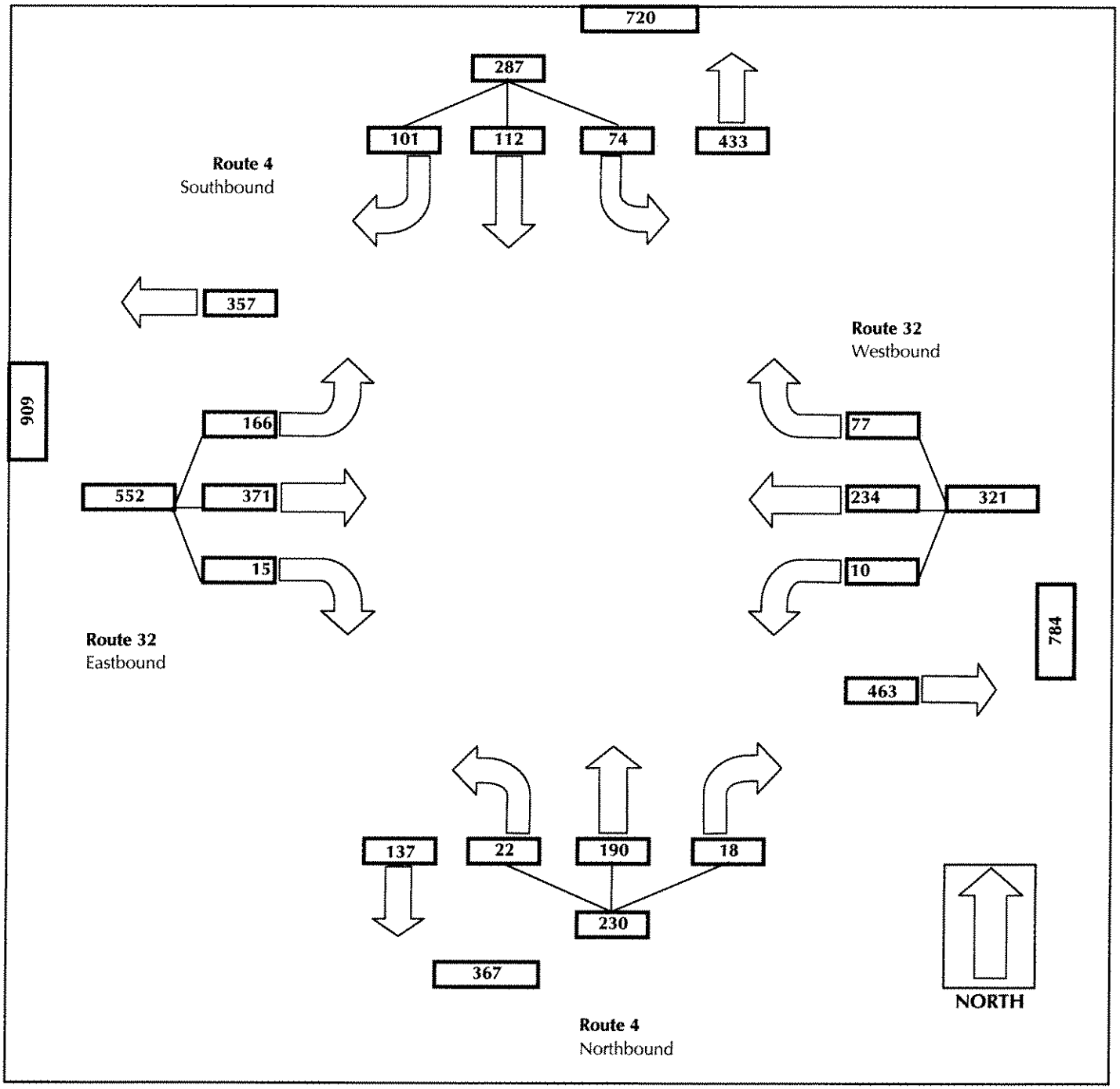


BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 32
PM Peak Hour

Peak Hour: (4:45 - 5:45)
Day/Date: Wed-Thurs/May 19- 20, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Kingsbury, NY



PEAK HOUR TRAFFIC VOLUMES

Intersection: **Route4 & Route 149 (south)**

Day/Date of Count: Wed-Thurs/May 19- 20, 2004
Project: Route 4 Traffic Study

Municipality/State: Kingsbury, NY

Morning Traffic Counts

		Route4 & Route 149 (south)																	
						Route 149 Westbound				Route 4 Northbound				Route 4 Southbound				15 minute	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	Totals	
7:00	7:15				0	3		7	10		45	0	45	4	40		44	99	
7:15	**7:30**				**0**	**1**		**9**	**10**		**54**	**3**	**57**	**13**	**55**		**68**	**135**	Hourly Totals
7:30	**7:45**				**0**	**1**		**13**	**14**		**42**	**0**	**42**	**4**	**63**		**67**	**123**	474
7:45	**8:00**				**0**	**2**		**10**	**12**		**37**	**1**	**38**	**9**	**58**		**67**	**117**	475
8:00	**8:15**				**0**	**2**		**7**	**9**		**22**	**1**	**23**	**11**	**57**		**68**	**100**	434
8:15	8:30				0	2		10	12		35	1	36	9	37		46	94	415
8:30	8:45				0	1		14	15		40	1	41	3	45		48	104	391
8:45	9:00				0	0		4	4		24	1	25	7	57		64	93	
					0	12		74	86		299	8	307	60	412		472	865	
Peak Hour					**0**	**6**		**39**	**45**		**155**	**5**	**160**	**37**	**233**		**270**	**475**	**475** hourly pk traffic vol
(7:15 - 8:15)																			
Peak Hour Factor						**0.75**		**0.75**	**0.80**		**0.72**	**0.42**	**0.70**		**0.92**		**0.99**	**0.88**	

Afternoon Traffic Counts

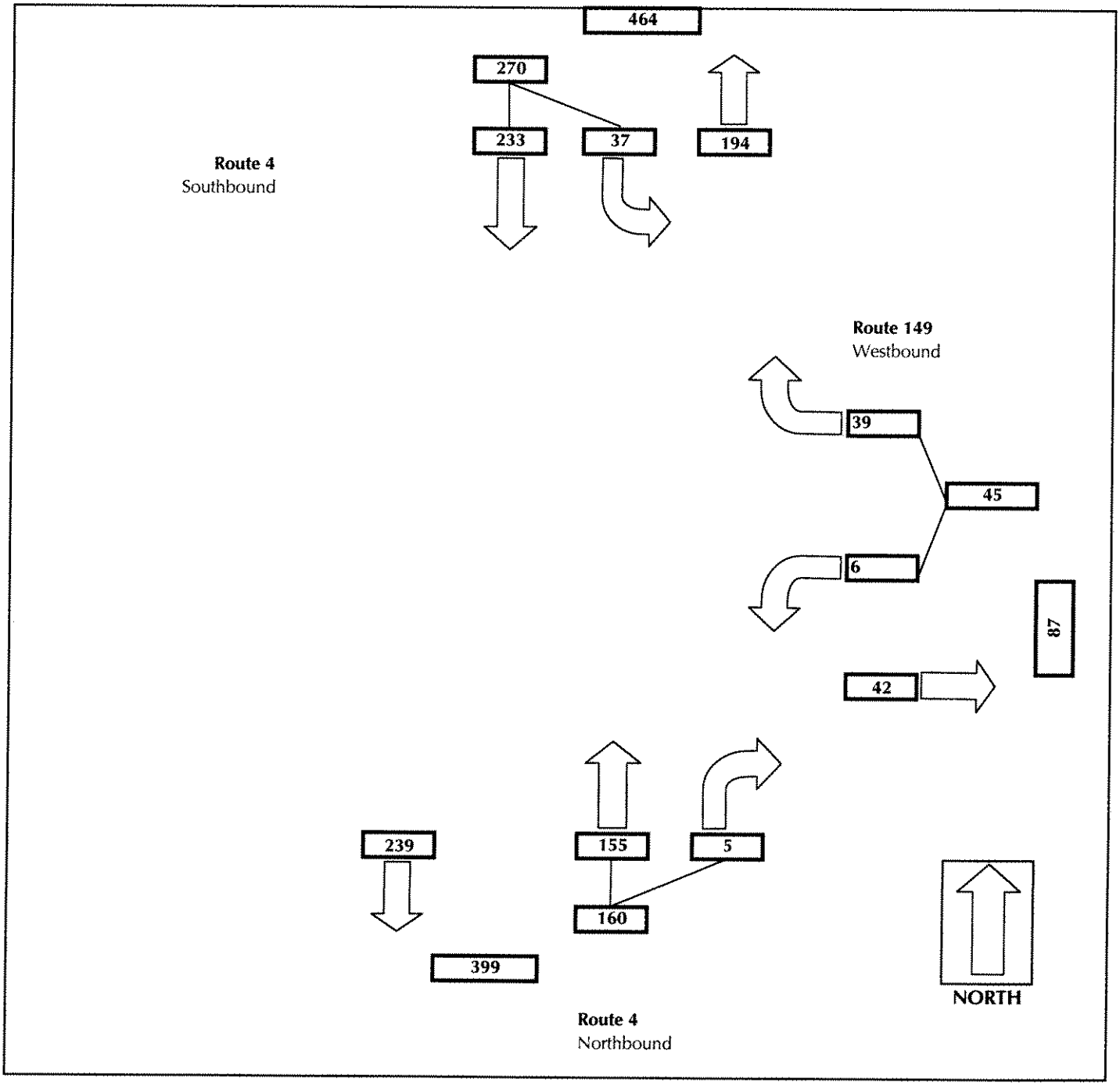
		Route4 & Route 149 (south)																	
		Route 149 Eastbound				Route 149 Westbound				Route 4 Northbound				Route 4 Southbound				15 minute	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	Totals	
16:00	**16:15**				**0**	**0**		**10**	**10**	**0**	**59**	**2**	**61**	**16**	**62**		**78**	**149**	
16:15	**16:30**				**0**	**2**		**11**	**13**	**0**	**67**	**1**	**68**	**11**	**56**		**67**	**148**	Hourly Totals
16:30	**16:45**				**0**	**2**		**11**	**13**	**0**	**52**	**1**	**53**	**9**	**39**		**48**	**114**	538
16:45	**17:00**				**0**	**1**		**12**	**13**	**0**	**60**	**0**	**60**	**26**	**28**		**54**	**127**	520
17:00	17:15				0	0		9	9	0	52	3	55	19	48		67	131	523
17:15	17:30				0	0		20	20	0	63	4	67	19	45		64	151	533
17:30	17:45				0	3		11	14	0	71	4	75	4	31		35	124	522
17:45	18:00				0	0		7	7	0	59	2	61	13	35		48	116	
		0	0	0	0	8	0	91	99	0	483	17	500	117	344		461	1060	
Peak Hour						**5**	**0**	**44**	**49**	**0**	**238**	**4**	**242**	**62**	**185**		**247**	**538**	
(4:00 - 5:00)																			
Peak Hour Factor						**0.63**		**0.92**	**0.94**		**0.89**	**0.50**	**0.89**	**0.60**	**0.75**		**0.79**	**0.90**	**538** hourly pk traffic vol

BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 149 (south)
AM Peak Hour

Peak Hour: (7:15 - 8:15)
Day/Date: Wed-Thurs/May 19- 20, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Kingsbury, NY

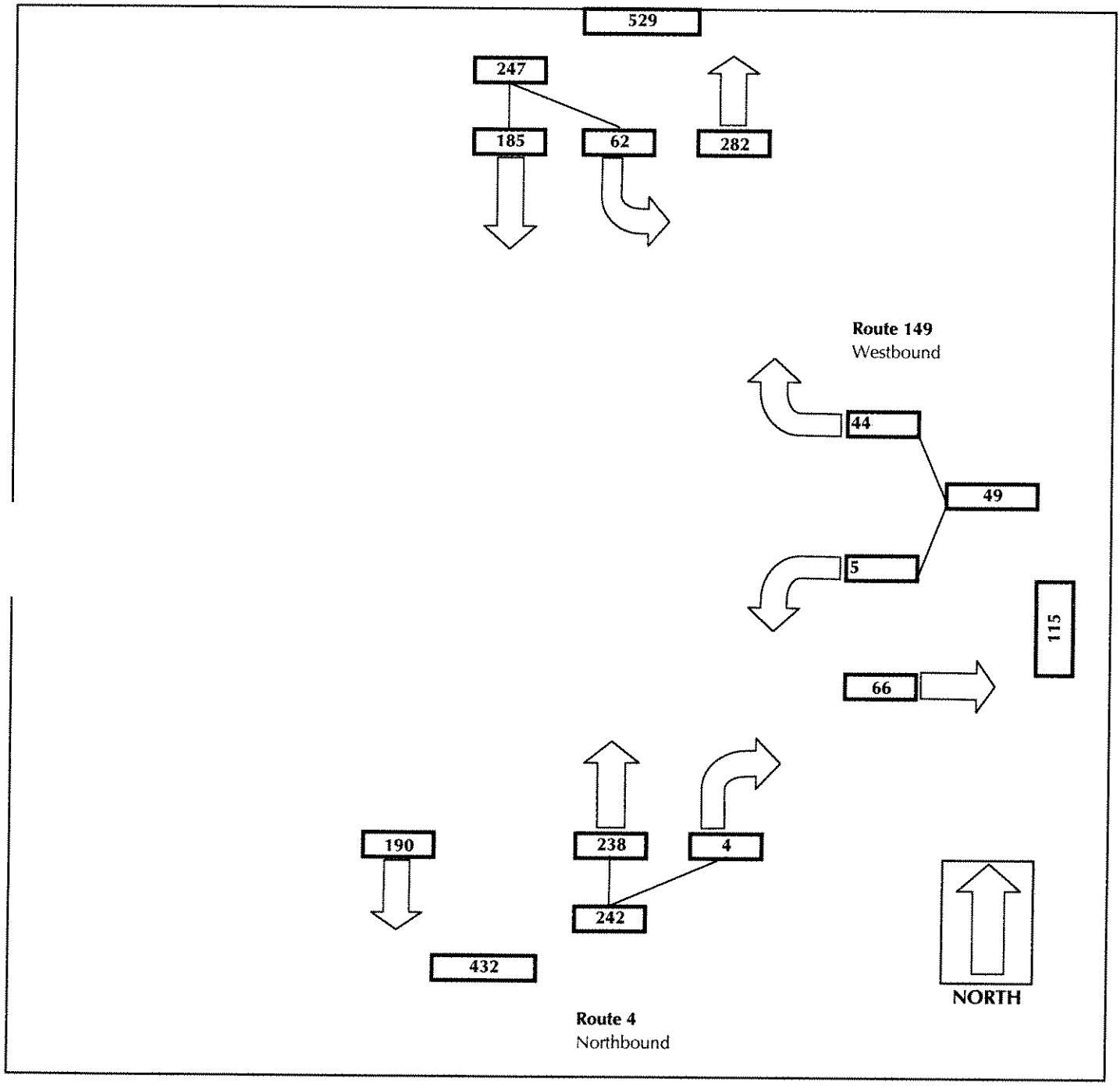


BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 149 (south)
PM Peak Hour

Peak Hour: (4:00 - 5:00)
Day/Date: Wed-Thurs/May 19- 20, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Kingsbury, NY



PEAK HOUR TRAFFIC VOLUMES

Intersection: **Route4 & Route 149 (north)**

Day/Date of Count: Wed-Thurs/May 19- 20, 2004 Municipality/State: Fort Ann, NY

Project: Route 4 Traffic Study

Morning Traffic Counts

		Route4 & Route 149 (north)																	
		Route 149 Eastbound				Clay Hill Road Westbound				Route 4 Northbound				Route 4 Southbound				15 minute Totals	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV		
7:00	7:15	48	2	3	53	2	4	0	6	6	55	2	63	0	42	34	76	198	
7:15	**7:30**	**48**	**2**	**3**	**53**	**3**	**1**	**1**	**5**	**5**	**42**	**0**	**47**	**0**	**50**	**43**	**93**	**198**	Hourly Totals
7:30	**7:45**	**37**	**1**	**6**	**44**	**8**	**5**	**1**	**14**	**5**	**40**	**0**	**45**	**0**	**59**	**64**	**123**	**226**	834
7:45	**8:00**	**47**	**2**	**10**	**59**	**12**	**4**	**0**	**16**	**9**	**30**	**5**	**44**	**0**	**62**	**31**	**93**	**212**	842
8:00	**8:15**	**50**	**2**	**10**	**62**	**4**	**5**	**2**	**11**	**7**	**32**	**8**	**47**	**0**	**44**	**42**	**86**	**206**	837
8:15	8:30	45	0	7	52	4	6	1	11	5	33	1	39	0	36	55	91	193	822
8:30	8:45	38	1	7	46	4	6	0	10	14	44	1	59	1	44	51	96	211	783
8:45	9:00	46	1	7	54	0	1	0	1	1	24	1	26	1	41	50	92	173	
		359	11	53	423	37	32	5	74	52	300	18	370	2	378	370	750	1617	
Peak Hour (7:15 - 8:15)		**182**	**7**	**29**	**218**	**27**	**15**	**4**	**46**	**26**	**144**	**13**	**183**	**0**	**215**	**180**	**395**	**842**	**842** hourly pk traffic vol
Peak Hour Factor		**0.91**	**0.88**	**0.73**	**0.88**	**0.56**	**0.75**	**0.50**	**0.72**	**0.72**	**0.86**	**0.41**	**0.97**		**0.87**	**0.70**	**0.80**	**0.93**	

Afternoon Traffic Counts

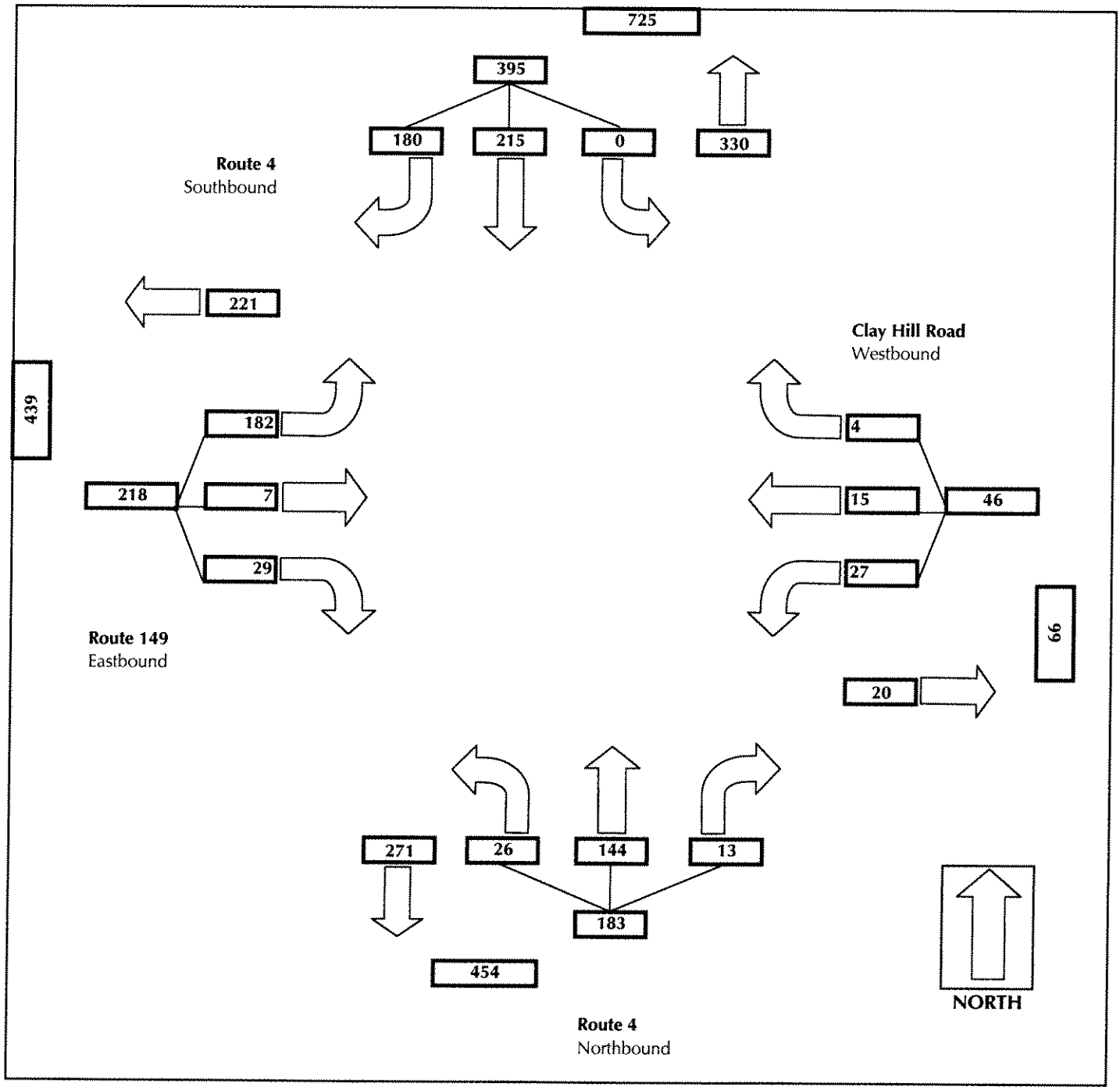
		Route4 & Route 149 (north)																	
		Route 149 Eastbound				Clay Hill Road Westbound				Route 4 Northbound				Route 4 Southbound				15 minute Totals	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV		
16:00	16:15	58	4	6	68	3	3	1	7	7	56	7	70	1	61	51	113	258	
16:15	**16:30**	**56**	**5**	**8**	**69**	**3**	**3**	**0**	**6**	**6**	**65**	**2**	**73**	**1**	**41**	**61**	**103**	**251**	Hourly Totals
16:30	**16:45**	**44**	**4**	**8**	**56**	**5**	**3**	**0**	**8**	**7**	**47**	**4**	**58**	**1**	**39**	**51**	**91**	**213**	965
16:45	**17:00**	**63**	**6**	**6**	**75**	**4**	**3**	**1**	**8**	**10**	**52**	**9**	**71**	**0**	**45**	**44**	**89**	**243**	973
17:00	**17:15**	**64**	**8**	**13**	**85**	**5**	**6**	**5**	**16**	**12**	**50**	**6**	**68**	**2**	**41**	**54**	**97**	**266**	967
17:15	17:30	57	7	12	76	3	1	0	4	10	69	3	82	0	44	39	83	245	932
17:30	17:45	37	7	6	50	3	1	0	4	6	53	5	64	2	19	39	60	178	898
17:45	18:00	46	3	5	54	4	5	1	10	6	49	13	68	0	36	41	77	209	
		425	44	64	533	30	25	8	63	64	441	49	554	7	326	380	713	1863	
Peak Hour (4:15 - 5:15)		**227**	**23**	**35**	**285**	**17**	**15**	**6**	**38**	**35**	**214**	**21**	**270**	**4**	**166**	**210**	**380**	**973**	**973** hourly pk traffic vol
Peak Hour Factor		**0.89**	**0.72**	**0.67**	**0.84**	**0.85**	**0.63**	**0.30**	**0.59**	**0.73**	**0.82**	**0.58**	**0.92**	**0.50**	**0.92**	**0.86**	**0.92**	**0.91**	

BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 149 (north)
AM Peak Hour

Peak Hour: (7:15 - 8:15)
Day/Date: Wed-Thurs/May 19- 20, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Fort Ann, NY

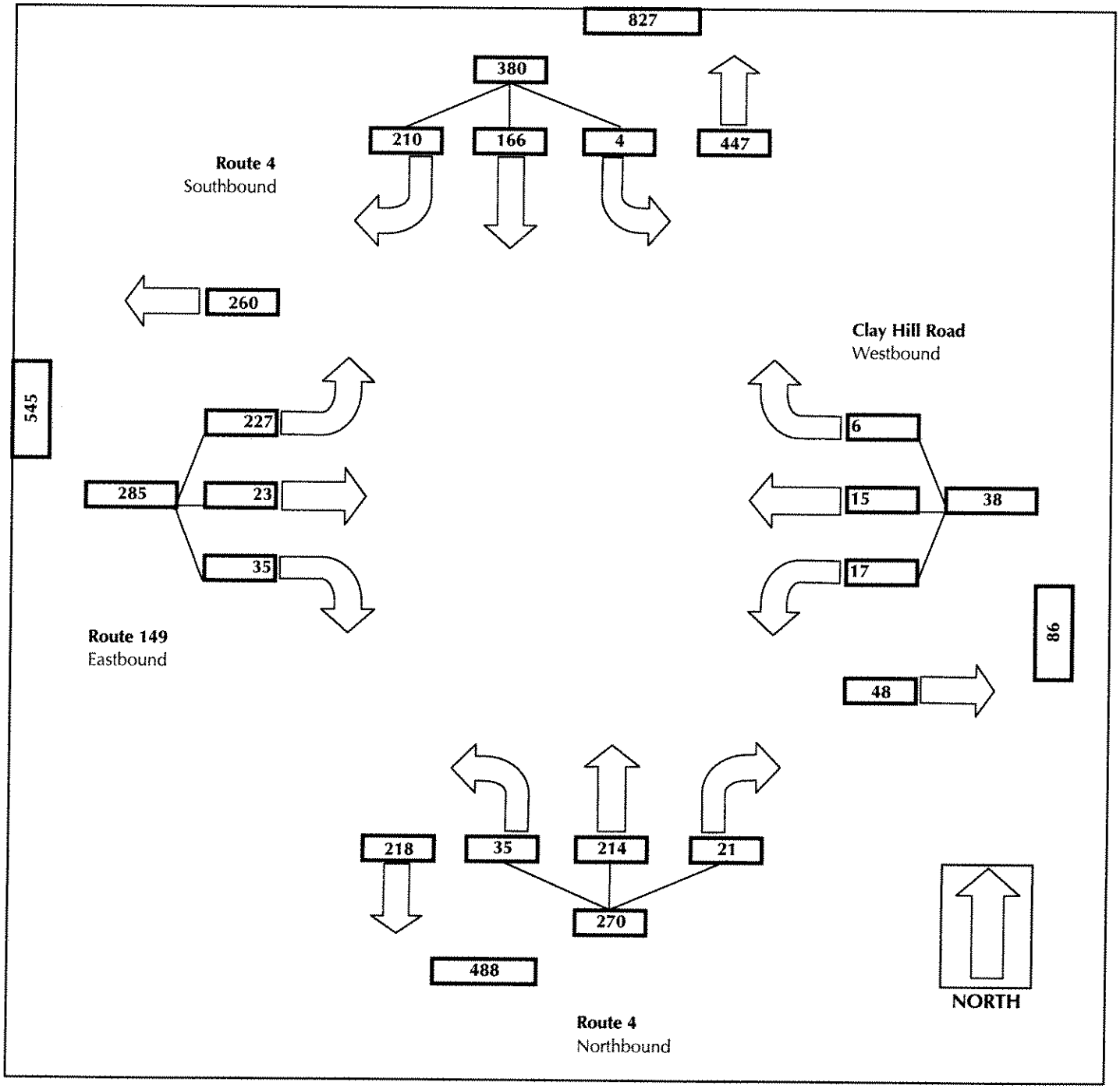


BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 149 (north)
PM Peak Hour

Peak Hour: (4:15 - 5:15)
Day/Date: Wed-Thurs/May 19- 20, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Fort Ann, NY



PEAK HOUR TRAFFIC VOLUMES

Intersection: **Route4 & Route 22 (south)**

Day/Date of Count: Tues-Wed/May 18-19, 2004
Project: Route 4 Traffic Study
Municipality/State: Fort Ann, NY

Morning Traffic Counts

		Route4 & Route 22 (south)																
		Route 22 Eastbound				Route 22 Westbound				Route 4 Northbound				Route 4 Southbound				15 minute
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	Totals
7:00	**7:15**				**0**	**31**	**0**	**11**	**42**	**0**	**49**	**51**	**100**	**11**	**57**	**0**	**68**	**210**
7:15	**7:30**				**0**	**31**	**0**	**6**	**37**	**0**	**48**	**49**	**97**	**15**	**61**	**0**	**76**	**210**
7:30	**7:45**				**0**	**32**	**0**	**3**	**35**	**0**	**41**	**38**	**79**	**16**	**60**	**0**	**76**	**190**
7:45	**8:00**				**0**	**38**	**0**	**7**	**45**	**0**	**45**	**34**	**79**	**11**	**53**	**0**	**64**	**188**
8:00	8:15				0	39	0	2	41	0	45	30	75	5	52	0	57	173
8:15	8:30				0	31	0	4	35	0	45	18	63	2	47	0	49	147
8:30	8:45				0	21	0	2	23	0	45	27	72	2	62	0	64	159
8:45	9:00				0	19	0	6	25	0	40	23	63	4	46	0	50	138
		0	0	0	0	242	0	41	283	0	358	270	628	66	438	0	504	1415
Peak Hour						**132**		**27**	**159**		**183**	**172**	**355**	**53**	**231**		**284**	**798**
(7:00 - 8:00)																		
Peak Hour Factor						**0.87**		**0.61**	**0.88**		**0.93**	**0.84**	**0.89**	**0.83**	**0.95**		**0.93**	**0.95**

Hourly Totals
798
761
698
667
617

798 hourly pk traffic vol

Afternoon Traffic Counts

		Route4 & Route 22 (south)																
		Route 22 Eastbound				Route 22 Westbound				Route 4 Northbound				Route 4 Southbound				15 minute
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	Totals
16:00	**16:15**				**0**	**47**	**0**	**8**	**55**	**0**	**73**	**26**	**99**	**7**	**93**	**0**	**100**	**254**
16:15	**16:30**				**0**	**38**	**0**	**1**	**39**	**0**	**67**	**16**	**83**	**2**	**57**	**0**	**59**	**181**
16:30	**16:45**				**0**	**17**	**0**	**3**	**20**	**0**	**70**	**21**	**91**	**5**	**68**	**0**	**73**	**184**
16:45	**17:00**				**0**	**24**	**0**	**5**	**29**	**0**	**61**	**27**	**88**	**4**	**43**	**0**	**47**	**164**
17:00	17:15				0	22	0	7	29	0	62	37	99	9	38	0	47	175
17:15	17:30				0	25	0	2	27	0	57	21	78	6	63	0	69	174
17:30	17:45				0	21	0	4	25	0	75	19	94	5	44	0	49	168
17:45	18:00				0	19	0	2	21	0	29	16	45	4	41	0	45	111
		0	0	0	0	213	0	32	245	0	494	183	677	42	447	0	489	1411
Peak Hour						**126**		**17**	**143**		**271**	**90**	**361**	**18**	**261**		**279**	**783**
(4:00 - 5:00)																		
Peak Hour Factor						**0.67**		**0.53**	**0.65**		**0.93**	**0.83**	**0.91**	**0.64**	**0.70**		**0.70**	**0.77**

Hourly Totals
783
704
697
681
628

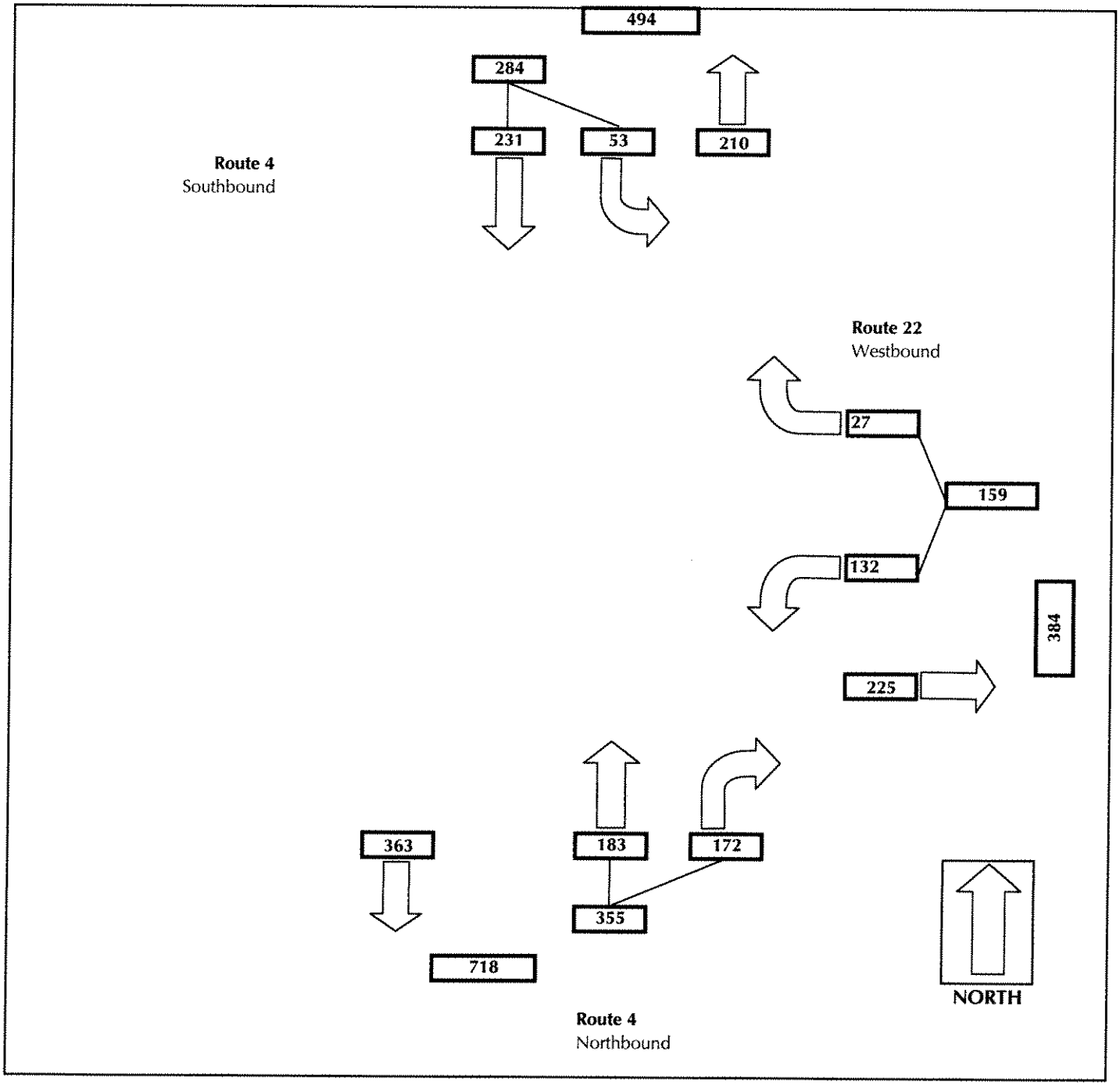
783 hourly pk traffic vol

BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 22 (south)
AM Peak Hour

Peak Hour: (7:00 - 8:00)
Day/Date: Tues-Wed/May 18- 19, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Fort Ann, NY

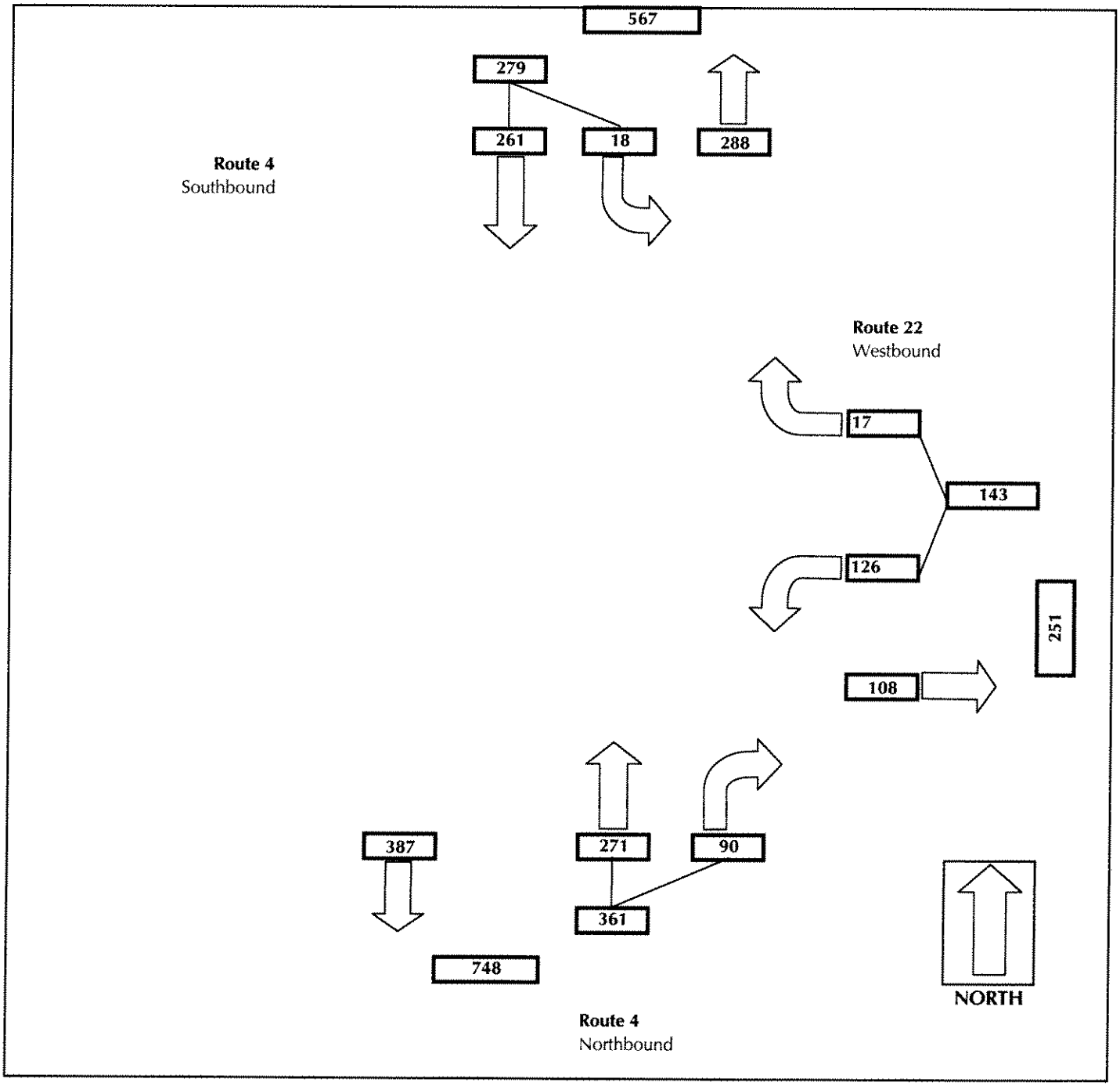


BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 22 (south)
PM Peak Hour

Peak Hour: (4:00 - 5:00)
Day/Date: Tues-Wed/May 18- 19, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Fort Ann, NY



PEAK HOUR TRAFFIC VOLUMES

Intersection: **Route4 & Route 22 (north)**

Day/Date of Count: Tues-Wed/May 18- 19, 2004
Project: Route 4 Traffic Study
Municipality/State: Whitehall, NY

Morning Traffic Counts

		Route4 & Route 22 (north)																	
						Route 4 Westbound				Route 4 Northbound				Route 22 Southbound				15 minute	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	Totals	
7:00	**7:15**				**0**	**51**		**13**	**64**		**21**	**59**	**80**	**15**	**37**		**52**	**196**	
7:15	**7:30**				**0**	**74**		**19**	**93**		**20**	**60**	**80**	**17**	**38**		**55**	**228**	**Hourly**
7:30	**7:45**				**0**	**55**		**16**	**71**		**15**	**53**	**68**	**13**	**16**		**29**	**168**	**Totals**
7:45	**8:00**				**0**	**59**		**5**	**64**		**17**	**47**	**64**	**13**	**28**		**41**	**169**	**761**
8:00	8:15				0	52		14	66		23	60	83	16	13		29	178	743
8:15	8:30				0	63		12	75		19	54	73	20	32		52	200	715
8:30	8:45				0	45		19	64		20	42	62	12	21		33	159	706
8:45	9:00				0	68		7	75		25	56	81	11	25		36	192	729
		0	0	0	0	467	0	105	572	0	160	431	591	117	210	0	327	1490	
Peak Hour						**239**		**53**	**292**		**73**	**219**	**292**	**58**	**119**		**177**	**761**	**761** hourly pk
(7:00 - 8:00)																			traffic vol
Peak Hour Factor						**0.81**		**0.70**	**0.78**		**0.87**	**0.91**	**0.91**	**0.85**	**0.78**		**0.80**	**0.83**	

Afternoon Traffic Counts

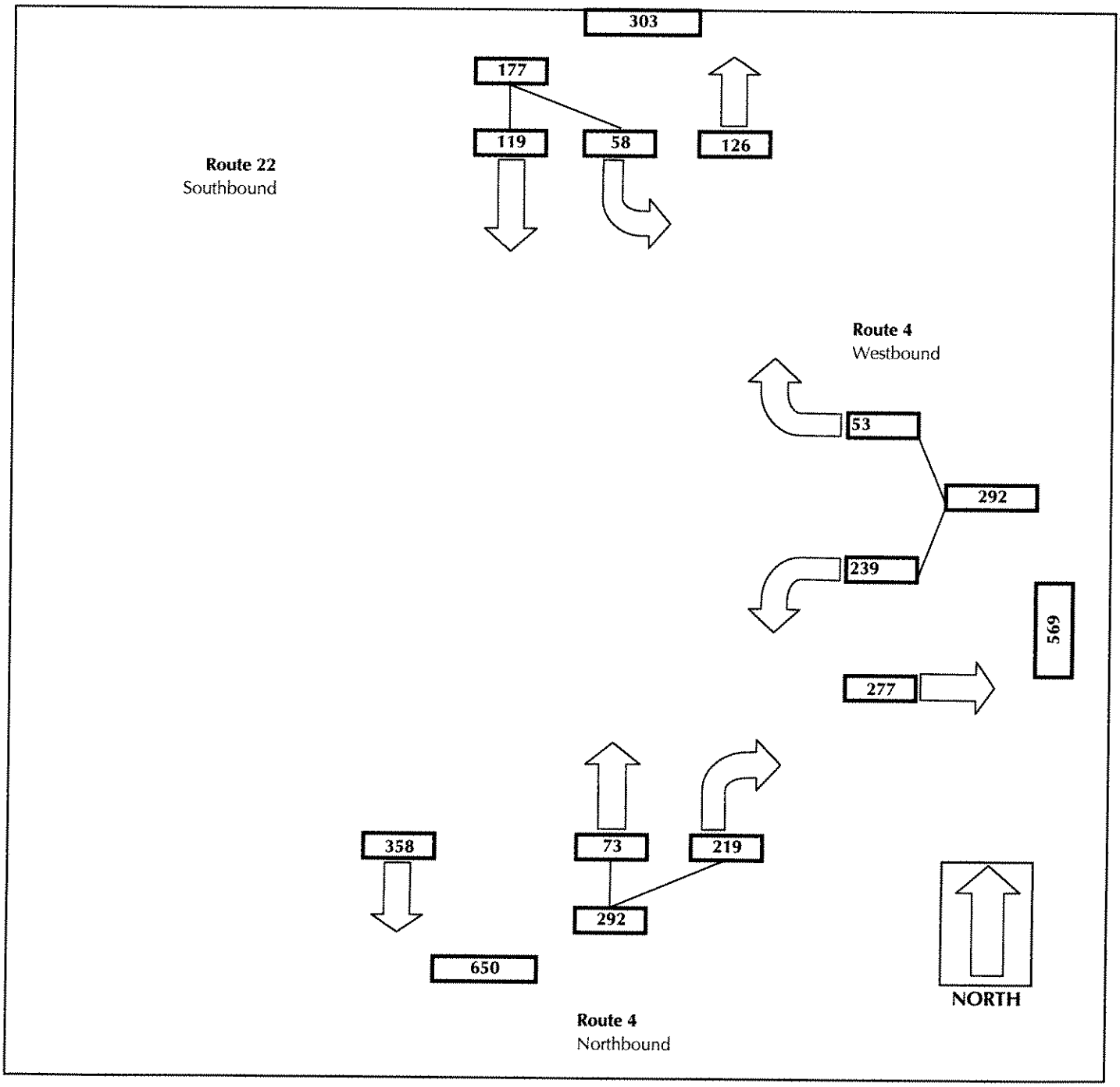
		Route4 & Route 22 (north)																	
						Route 4 Westbound				Route 4 Northbound				Route 22 Southbound				15 minute	
		left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	left	thru	right	TV	Totals	
16:00	**16:15**				**0**	**75**	**0**	**33**	**108**	**0**	**44**	**73**	**117**	**16**	**60**		**76**	**301**	
16:15	**16:30**				**0**	**86**	**0**	**21**	**107**	**0**	**43**	**90**	**133**	**15**	**41**		**56**	**296**	Hourly
16:30	**16:45**				**0**	**90**	**0**	**21**	**111**	**0**	**44**	**76**	**120**	**14**	**44**		**58**	**289**	Totals
16:45	**17:00**				**0**	**49**	**0**	**16**	**65**	**0**	**46**	**59**	**105**	**11**	**34**		**45**	**215**	1101
17:00	17:15				0	72	0	12	84	0	35	80	115	10	18		28	227	1027
17:15	17:30				0	64	0	17	81	0	39	61	100	10	52		62	243	974
17:30	17:45				0	65	0	13	78	0	27	67	94	15	19		34	206	891
17:45	18:00				0	58	0	13	71	0	39	63	102	13	29		42	215	891
		0	0	0	0	559	0	146	705	0	317	569	886	104	297	0	401	1992	
Peak Hour						**300**		**91**	**391**		**177**	**298**	**475**	**56**	**179**	**0**	**235**	**1101**	
(4:00 - 5:00)																			**1101** hourly pk
Peak Hour Factor						**0.83**		**0.69**	**0.88**		**0.96**	**0.83**	**0.89**	**0.88**	**0.75**		**0.77**	**0.91**	traffic vol

BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 22 (north)
AM Peak Hour

Peak Hour: (7:00 - 8:00)
Day/Date: Tues-Wed/May 18- 19, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Whitehall, NY

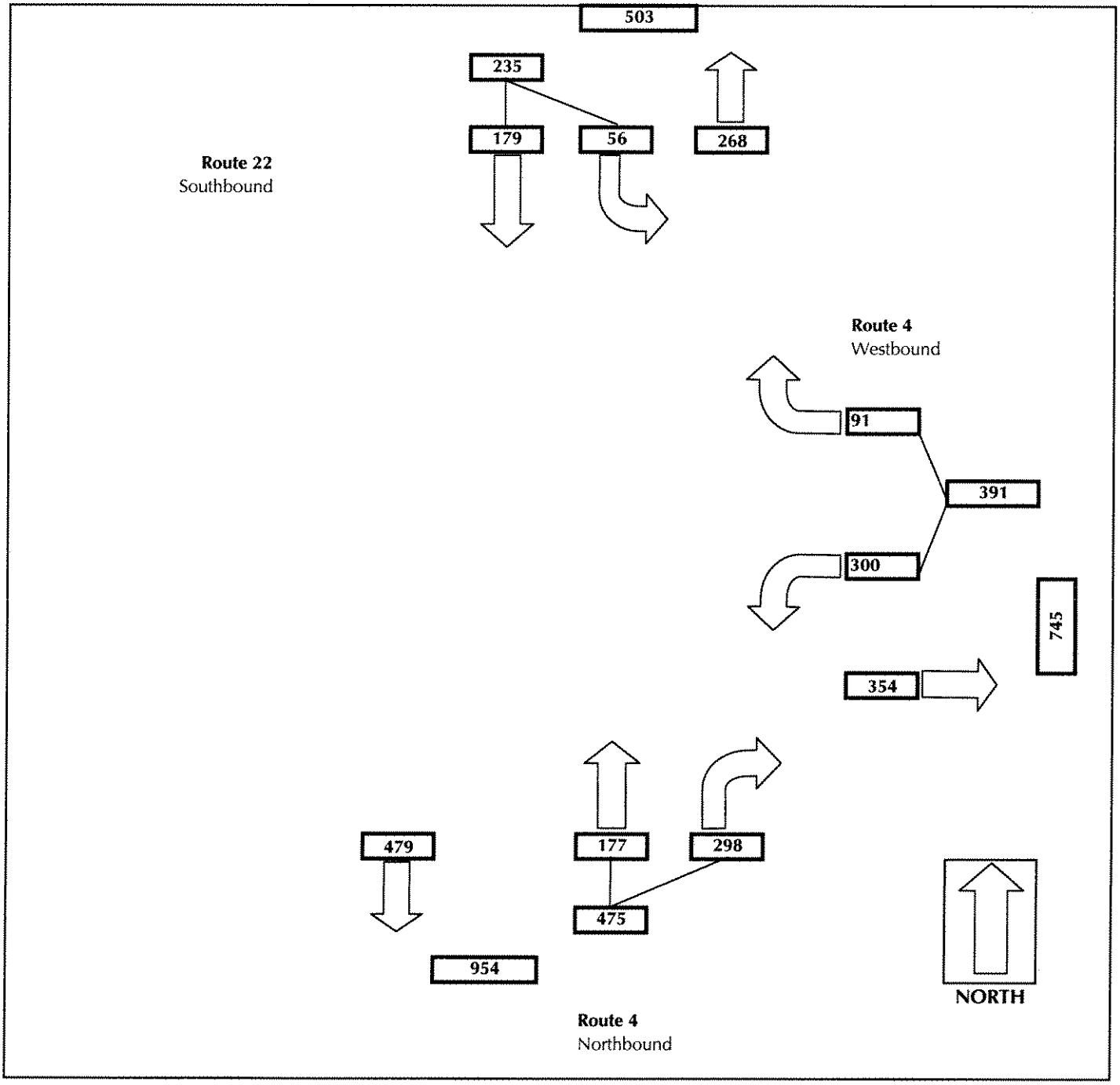


BFJ Buckhurst Fish & Jacquemart, Inc

PEAK HOUR TRAFFIC VOLUMES
Route4 & Route 22 (north)
PM Peak Hour

Peak Hour: (4:00 - 5:00)
Day/Date: Tues-Wed/May 18- 19, 2004
Notes:

Project: Route 4 Traffic Study
Municipality/State: Whitehall, NY



Appendix B – Detailed Cost Estimates

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 1

LOCATION:	Glens Falls - South of Intersection of Geer Road/Route 4							PROJECT: Flatten Roadway					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	165	165	80	7	-	-	-	-	92400	3422.222	-	$ 12.00	$ 41,066.67
SUBBASE	165	165	38	1	-	-	-	-	6270	232.2222	-	$ 40.00	$ 9,288.89
PAVEMENT	165	165	24	-	13	3960	440	-	-	-	328.9	$ 70.00	$ 23,023.00
SHOULDER	165	165	12	-	7	1980	220	-	-	-	88.55	$ 70.00	$ 6,198.50
TACK COAT	165	165	36	-	3	5940	660	-	-	-	990	$ 10.00	$ 9,900.00
TOPSOIL	165	165	44	-	3	7260	-	-	1815	67.22222	-	$ 44.00	$ 2,957.78
SEEDING	165	165	44	-	-	7260	-	0.1666667	-	-	-	$10,000.00	$ 1,666.67
** UNDERDRAIN	165	330	-	-	-	-	-	-	-	-	-	$ 6.00	$ 1,980.00
	165	330	-	-	-	-	-	-	330	12.22222	-	$ 45.00	$ 550.00
TREES	4	4	-	-	-	-	-	-	-	-	-	$ 500.00	$ 2,000.00
												SUBTOTAL	$ 98,631.50
SIDE ROAD													$ 20,000.00
MPT (15%)													$ 17,794.73
MISC (15%)													$ 17,794.73
MOBILIZATION (4%)													$ 4,745.26
												TOTAL	$ 158,966.21
												SAY	*$ 160,000.00*
												SAY	*$ 970/Lineal foot*

** Note: Total Length based on 2 sides

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 3

LOCATION:	Kingsbury - Intersection 149 S and Route 4							PROJECT: Reconfigure Westbound Approach					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	200	200	40	3	-	-	-	-	24000	888.8889	-	$ 12.00	$ 10,666.67
SUBBASE	200	200	38	1	-	-	-	-	7600	281.4815	-	$ 40.00	$ 11,259.26
PAVEMENT	200	200	24	-	13	4800	533.3333	-	-	-	398.6667	$ 70.00	$ 27,906.67
SHOULDER	200	200	12	-	7	2400	266.6667	-	-	-	107.3333	$ 70.00	$ 7,513.33
TACK COAT	200	200	36	-	3	7200	800	-	-	-	1200	$ 10.00	$ 12,000.00
TOPSOIL	200	200	44	-	3	8800	-	-	2200	81.48148	-	$ 44.00	$ 3,585.19
SEEDING	200	200	44	-	-	8800	-	0.2020202	-	-	-	$10,000.00	$ 2,020.20
** UNDERDRAIN	200	400	-	-	-	-	-	-	-	-	-	$ 6.00	$ 2,400.00
	200	400	-	-	-	-	-	-	400	14.81481	-	$ 45.00	$ 666.67
TREES	4	4	-	-	-	-	-	-	-	-	-	$ 500.00	$ 2,000.00
												SUBTOTAL	$ 80,017.98
MPT (15%)													$ 12,002.70
MISC (15%)													$ 12,002.70
MOBILIZATION (4%)													$ 3,200.72
												TOTAL	$ 107,224.09
												SAY	*$ 110,000.00*
												SAY	*$ 550/Lineal Foot*

** Note: Total Length based on 2 sides

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 4

LOCATION:	Fort Ann - Near Walker's (South of Needhamville Lane)							PROJECT: Regrade and Widen Shoulder					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	670	670	8	2	-	-	-	-	10720	397.037	-	$ 12.00	$ 4,764.44
SUBBASE	670	670	7	1	-	-	-	-	4690	173.7037	-	$ 40.00	$ 6,948.15
PAVEMENT	670	670	0	-	13	0	0	-	-	-	0	$ 70.00	$ -
SHOULDER	670	670	6	7	7	4020	446.6667	-	-	-	179.7833	$ 70.00	$ 12,584.83
TACK COAT	670	670	6	2	3	4020	446.6667	-	-	446.6667	-	$ 10.00	$ 4,466.67
TOPSOIL	670	670	8	3	3	5360	-	-	1340	49.62963	-	$ 44.00	$ 2,183.70
SEEDING	670	670	8	-	-	5360	-	0.12304867	-	-	-	$ 10,000.00	$ 1,230.49
** UNDERDRAIN	670	670	-		-	-	-	-	-	-	-	$ 6.00	$ 4,020.00
	670	670	-	-	-	-	-	-	670	24.81481	-	$ 45.00	$ 1,116.67
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 37,314.95
BOTH SIDES													$ 74,629.90
MPT (15%)													$ 16,791.73
MISC (15%)													$ 16,791.73
MOBILIZATION (4%)													$ 4,477.79
												TOTAL	$ 150,006.10
												SAY	*$ 150,000.00*
												SAY	*$ 224/Lineal Foot*

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 6

LOCATION:	South of Village of Fort Ann at 5699 Route 4							PROJECT:	Install median island "gateway"				
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	240	240	50	2	-	-	-	-	24000	888.8889	-	$ 12.00	$ 10,666.67
SUBBASE	240	240	40	1	-	-	-	-	9600	355.5556	-	$ 40.00	$ 14,222.22
PAVEMENT	240	240	24	13	13	5760	640	-	-	-	478.4	$ 70.00	$ 33,488.00
SHOULDER	240	240	12	7	7	2880	320	-	-	-	128.8	$ 70.00	$ 9,016.00
TACK COAT	240	240	36	3	3	8640	960	-	-	1440	-	$ 10.00	$ 14,400.00
TOPSOIL	400	400	8	3	2	6400	-		1600	59.25926	-	$ 44.00	$ 2,607.41
ISLAND	100	100	10	3		1000			250	9.259259		$ 44.00	$ 407.41
SEEDING	400	400	8	2	2	6400	-	0.14692378	1600		-	$10,000.00	$ 1,469.24
ISLAND	100	100	10			1000		0.02295684	250			$10,000.00	$ 229.57
** UNDERDRAIN	240	480	-		-	-	-	-	-	-	-	$ 6.00	$ 2,880.00
FILTER	240	480	-	-	-	-	-	-	480	17.77778	-	$ 45.00	$ 800.00
CURB	250	500										$ 20.00	$ 10,000.00
TREES	15	15	-	-	-	-	-	-	-	-	-	$ 600.00	$ 9,000.00
ISLAND	8											$ 600.00	$ 4,800.00
												SUBTOTAL	$ 113,986.51
MPT (15%)													$ 17,097.98
MISC (15%)													$ 17,097.98
MOBILIZATION (4%)													$ 4,559.46
SIGNS													$ 2,000.00
												TOTAL	$ 154,741.92
												SAY	*$ 155,000.00*
												SAY	*646/Lineal Foo*

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 7

LOCATION:	South of fort Ann Village Line							PROJECT:	Extend Sidewalk				
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	1640	1640	5	1	-	-	-	-	8200	303.7037	-	$ 20.00	$ 6,074.07
SUBBASE	1640	1640	5	0.5	-	-	-	-	4100	151.85185	-	$ 40.00	$ 6,074.07
SIDEWALK	1640	1640	5	4	4	8200	911.1111	-	2706	100.22222	-	$ 500.00	$ 50,111.11
TOPSOIL	1640	1640	2	3	-	3280	-	-	820	30.37037	-	$ 44.00	$ 1,336.30
SEEDING	1640	1640	2	-	-	3280	-	0.075298439	-	-	-	$ 10,000.00	$ 752.98
DRIVEWAY REPAIR			-		-	-	-	-	-	-	-	$ 2,500.00	$ 2,500.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 66,848.54
MPT (15%)													$ 10,027.28
MISC (15%)													$ 10,027.28
MOBILIZATION (4%)													$ 2,673.94
												TOTAL	$ 89,577.04
												SAY	*$ 90,000.00*
												SAY	*$ 55/Lineal Foot*

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 8

LOCATION:			Village of Fort Ann					PROJECT:	Improve/Upgrade Sidewalks				
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	2624	2624	5	1	-	-	-	-	13120	485.92593	-	$ 20.00	$ 9,718.52
SUBBASE	2624	2624	5	0.5	-	-	-	-	6560	242.96296	-	$ 40.00	$ 9,718.52
SIDEWALK	2624	2624	5	4	4	13120	1457.778	-	4329.6	160.35556	-	$ 500.00	$ 80,177.78
TOPSOIL	2624	2624	2	3	-	5248	-	-	1312	48.592593	-	$ 44.00	$ 2,138.07
SEEDING	2624	2624	2	-	-	5248	-	0.1204775	-	-	-	$ 10,000.00	$ 1,204.78
DRIVEWAY REPAIR			-		-	-	-	-	-	-	-	$ 5,000.00	$ 5,000.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 107,957.66
MPT (15%)													$ 16,193.65
MISC (15%)													$ 16,193.65
MOBILIZATION (4%)													$ 4,318.31
												SUBTOTAL	$ 144,663.27
												SAY	*$ 145,000.00*
CURBS	2624											$ 20.00	$ 52,480.00
												TOTAL	$ 197,480.00
												SAY	$ 200,000.00
												SAY	$ 76/Lineal Foot

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 14

LOCATION:	North of Fort Ann							PROJECT: Widen Shoulder					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	6600	6600	8	2	-	-	-	-	105600	3911.111	-	$ 12.00	$ 46,933.33
SUBBASE	6600	6600	7	1	-	-	-	-	46200	1711.111	-	$ 35.00	$ 59,888.89
PAVEMENT	6600	6600	0	-	13	0	0	-	-	-	0	$ 70.00	$ -
SHOULDER	6600	6600	6	7	7	39600	4400	-	-	-	1771	$ 65.00	$ 115,115.00
TACK COAT	6600	6600	6	2	3	39600	4400	-	-	4400	-	$ 6.00	$ 26,400.00
TOPSOIL	6600	6600	8	3	3	52800	-	-	13200	488.8889	-	$ 44.00	$ 21,511.11
SEEDING	6600	6600	8	-	-	52800	-	1.21212121	-	-	-	$ 7,000.00	$ 8,484.85
** UNDERDRAIN	6600	6600	-		-	-	-	-	-	-	-	$ 6.00	$ 39,600.00
	6600	6600	-	-	-	-	-	-	6600	244.4444	-	$ 45.00	$ 11,000.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 328,933.18
MPT (15%)													$ 49,339.98
MISC (15%)													$ 49,339.98
MOBILIZATION (4%)													$ 13,157.33
												TOTAL	$ 440,770.46
												SAY	*$ 445,000.00*
												SAY	*$ 67/Lineal Foot*

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 15

LOCATION:	North of Fort Ann - Mile Marker 1803-1291							PROJECT: Flatten and Straighten Roadway					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	656	656	80	7	-	-	-	-	367360	13605.93	-	$ 12.00	$ 163,271.11
SUBBASE	656	656	38	1	-	-	-	-	24928	923.2593	-	$ 40.00	$ 36,930.37
PAVEMENT	656	656	24	13	13	15744	1749.333	-	-	-	1307.627	$ 70.00	$ 91,533.67
SHOULDER	656	656	12	7	7	7872	874.6667	-	-	-	352.0533	$ 70.00	$ 24,643.73
TACK COAT	656	656	36	3	3	23616	2624	-	-	3936	-	$ 10.00	$ 39,360.00
TOPSOIL	656	656	44	3	3	28864	-	-	7216	267.2593	-	$ 44.00	$ 11,759.41
SEEDING	656	656	44	-	-	28864	-	0.6626263	-	-	-	$ 10,000.00	$ 6,626.26
** UNDERDRAIN	656	1312	-	-	-	-	-	-	-	-	-	$ 6.00	$ 7,872.00
	656	1312	-	-	-	-	-	-	1312	48.59259	-	$ 45.00	$ 2,186.67
TREES	4	4	-	-	-	-	-	-	-	-	-	$ 500.00	$ 2,000.00
												SUBTOTAL	$ 386,183.42
MPT (15%)													$ 57,927.51
MISC (15%)													$ 57,927.51
MOBILIZATION (4%)													$ 15,447.34
												TOTAL	$ 517,485.78
												SAY	*$ 520,000.00*
												SAY	*$ 793/Lineal Foot*
CULVERTS	?												
GUIDE RAIL													
SIGNS													

** Note: Total Length based on 2 sides

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 17

LOCATION:	Village of Whitehall, West Side of Route 4							PROJECT: Extend Sidewalk					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	3300	3300	5	1	-	-	-	-	16500	611.11111	-	$ 20.00	$ 12,222.22
SUBBASE	3300	3300	5	0.5	-	-	-	-	8250	305.55556	-	$ 40.00	$ 12,222.22
SIDEWALK	3300	3300	5	4	4	16500	1833.333	-	5445	201.66667	-	$ 450.00	$ 90,750.00
TOPSOIL	3300	3300	2	3	-	6600	-	-	1650	61.111111	-	$ 44.00	$ 2,688.89
SEEDING	3300	3300	2	-	-	6600	-	0.1515152	-	-	-	$10,000.00	$ 1,515.15
DRIVEWAY REPAIR			-		-	-	-	-	-	-	-	$ 6,000.00	$ 6,000.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 125,398.48
MPT (15%)													$ 18,809.77
MISC (15%)													$ 18,809.77
MOBILIZATION (4%)													$ 5,015.94
												TOTAL	$ 168,033.97
												SAY	*$ 170,000.00*
												SAY	*$ 52/Lineal Foot*

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 18

LOCATION:	Village of Whitehall, East Side of Route 4							PROJECT: Extend Sidewalk					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	3300	3300	5	1	-	-	-	-	16500	611.11111	-	$ 20.00	$ 12,222.22
SUBBASE	3300	3300	5	0.5	-	-	-	-	8250	305.55556	-	$ 40.00	$ 12,222.22
SIDEWALK	3300	3300	5	4	4	16500	1833.333	-	5445	201.66667	-	$ 450.00	$ 90,750.00
TOPSOIL	3300	3300	2	3	-	6600	-	-	1650	61.111111	-	$ 44.00	$ 2,688.89
SEEDING	3300	3300	2	-	-	6600	-	0.1515152	-	-	-	$10,000.00	$ 1,515.15
DRIVEWAY REPAIR			-		-	-	-	-	-	-	-	$ 6,000.00	$ 6,000.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 125,398.48
MPT (15%)													$ 18,809.77
MISC (15%)													$ 18,809.77
MOBILIZATION (4%)													$ 5,015.94
												TOTAL	$ 168,033.97
												SAY	*$ 170,000.00*
												SAY	*$ 52/Lineal Foot*

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 19

LOCATION:	Village of Whitehall, East of Route 22 (Bway)							PROJECT: Extend Sidewalk					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	4600	4600	5	1	-	-	-	-	23000	851.85185	-	$ 20.00	$ 17,037.04
SUBBASE	4600	4600	5	0.5	-	-	-	-	11500	425.92593	-	$ 40.00	$ 17,037.04
SIDEWALK	4600	4600	5	4	4	23000	2555.556	-	7590	281.11111	-	$ 450.00	$ 126,500.00
TOPSOIL	4600	4600	2	3	-	9200	-	-	2300	85.185185	-	$ 44.00	$ 3,748.15
SEEDING	4600	4600	2	-	-	9200	-	0.2112029	-	-	-	$ 10,000.00	$ 2,112.03
DRIVEWAY REPAIR			-		-	-	-	-	-	-	-	$ 6,000.00	$ 6,000.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 172,434.25
MPT (15%)													$ 25,865.14
MISC (15%)													$ 25,865.14
MOBILIZATION (4%)													$ 6,897.37
												TOTAL	$ 231,061.90
												SAY	*$ 235,000.00*
												SAY	*$ 51/Lineal Foot*

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 21

LOCATION:	Village of Whitehall- East of Skene							PROJECT: Upgrade Shoulder					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	2300	2300	8	2	-	-	-	-	36800	1362.963	-	$ 12.00	$ 16,355.56
SUBBASE	2300	2300	7	1	-	-	-	-	16100	596.2963	-	$ 40.00	$ 23,851.85
PAVEMENT	0	0	0	0	13	0	0	-	-	-	0	$ 70.00	$ -
SHOULDER	2300	2300	6	7	7	13800	1533.333	-	-	-	617.1667	$ 70.00	$ 43,201.67
TACK COAT	2300	2300	6	2	3	13800	1533.333	-	-	1533.333	-	$ 6.00	$ 9,200.00
TOPSOIL	2300	2300	8	3	1	18400	-	-	4600	170.3704	-	$ 44.00	$ 7,496.30
SEEDING	2300	2300	8	-	-	18400	-	0.42240588	-	-	-	$ 10,000.00	$ 4,224.06
** UNDERDRAIN	2300	2300	-		-	-	-	-	-	-	-	$ 6.00	$ 13,800.00
FILTER	2300	2300	-	-	-	-	-	-	2300	85.18519	-	$ 45.00	$ 3,833.33
DRIVEWAY REPAIRS												$ 4,000.00	$ 4,000.00
TREES	0	0	-	-	-	-	-	-	-	-	-	$ 500.00	$ -
												SUBTOTAL	$ 125,962.76
MPT (15%)													$ 18,894.41
MISC (15%)													$ 18,894.41
MOBILIZATION (4%)													$ 5,038.51
												TOTAL	$ 168,790.10
												SAY	*$ 170,000.00*
												SAY	*$ 74/Lineal Foot*

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 22

LOCATION:	East of Village of Whitehall							PROJECT:	Install median island "gateway"				
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	240	240	50	2	-	-	-	-	24000	888.8889	-	$ 12.00	$ 10,666.67
SUBBASE	240	240	40	1	-	-	-	-	9600	355.5556	-	$ 40.00	$ 14,222.22
PAVEMENT	240	240	24	13	13	5760	640	-	-	-	478.4	$ 70.00	$ 33,488.00
SHOULDER	240	240	12	7	7	2880	320	-	-	-	128.8	$ 70.00	$ 9,016.00
TACK COAT	240	240	36	3	3	8640	960	-	-	1440	-	$ 10.00	$ 14,400.00
TOPSOIL	400	400	8	3	2	6400	-		1600	59.25926	-	$ 44.00	$ 2,607.41
ISLAND	100	100	10	3		1000			250	9.259259		$ 44.00	$ 407.41
SEEDING	400	400	8	2	2	6400	-	0.146923783	1600		-	$ 10,000.00	$ 1,469.24
ISLAND	100	100	10			1000		0.022956841	250			$ 10,000.00	$ 229.57
** UNDERDRAIN	240	480	-		-	-	-	-	-	-	-	$ 6.00	$ 2,880.00
FILTER	240	480	-	-	-	-	-	-	480	17.77778	-	$ 45.00	$ 800.00
CURB	250	500										$ 20.00	$ 10,000.00
TREES	15	15	-	-	-	-	-	-	-	-	-	$ 600.00	$ 9,000.00
ISLAND	8											$ 600.00	$ 4,800.00
												SUBTOTAL	**$ 113,986.51**
MPT (15%)													$ 17,097.98
MISC (15%)													$ 17,097.98
MOBILIZATION (4%)													$ 4,559.46
SIGNS													$ 2,000.00
												TOTAL	**$ 154,741.92**
												SAY	***$ 155,000.00***
												SAY	***$ 646/Lineal Foot***

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
2004-4039.00

SITE 23

LOCATION:	Hampton - Just west of Golf Course Road							PROJECT: Information Booth					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	150	150	30	2	-	-	-	-	9000	333.3333	-	$ 12.00	$ 4,000.00
SUBBASE	150	150	30	1	-	-	-	-	4500	166.6667	-	$ 40.00	$ 6,666.67
PAVEMENT	150	150	30	13	13	4500	500	-	-	-	373.75	$ 70.00	$ 26,162.50
SHOULDER	0	0		0	7	0	0	-	-	-	0	$ 70.00	$ -
TACK COAT	150	150	30	3	3	4500	500	-	-	750	-	$ 10.00	$ 7,500.00
TOPSOIL	150	150	4	3	2	1200	-	-	300	11.11111	-	$ 44.00	$ 488.89
SEEDING	150	150	8	-	-	1200	-	0.0275482	-	-	-	$ 10,000.00	$ 275.48
** UNDERDRAIN	150	150	-		-	-	-	-	-	-	-	$ 6.00	$ 900.00
FILTER	150	150	-	-	-	-	-	-	150	5.555556	-	$ 45.00	$ 250.00
CURB	150											$ 20.00	$ 3,000.00
TREES	4	4	-	-	-	-	-	-	-	-	-	$ 600.00	$ 2,400.00
												SUBTOTAL	$ 51,643.54
MPT (15%)													$ 7,746.53
MISC (15%)													$ 7,746.53
MOBILIZATION (4%)													$ 2,065.74
SIGNS													$ 1,500.00
												TOTAL	$ 70,702.34
												SAY	*$ 75,000.00*
												SAY	*$ 500/Lineal Foot*

** Note: Total Length based on 1 side

STATE ROUTE 4
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SITE 24

LOCATION:	Golf Course Road Intersection with Route 4							PROJECT: Construct Left and Right Turn Lanes					
ITEM	Length (lf)	Total Length (lf)	Width (lf)	Depth (lf)	Depth (inches)	Area (sf)	Area (sy)	Area (acre)	Volume (cf)	Volume (cy)	Volume (tons)	Cost	Total
EXCAVATION	200	200	54	2	-	-	-	-	21600	800	-	$ 12.00	$ 9,600.00
SUBBASE	200	200	54	1	-	-	-	-	10800	400	-	$ 40.00	$ 16,000.00
PAVEMENT	200	200	48	13	13	9600	1066.667	-	-	-	797.3333	$ 65.00	$ 51,826.67
SHOULDER	200	200	6	7	7	1200	133.3333	-	-	-	53.66667	$ 65.00	$ 3,488.33
TACK COAT	200	200	54	3	3	10800	1200	-	-	1800	-	$ 10.00	$ 18,000.00
TOPSOIL	200	200	4	3	2	1600	-	-	400	14.81481	-	$ 44.00	$ 651.85
SEEDING	200	200	8	-	-	1600	-	0.03673095	-	-	-	$ 10,000.00	$ 367.31
STRIPPING												$ 10,000.00	$ 10,000.00
** UNDERDRAIN	200	200	-		-	-	-	-	-	-	-	$ 6.00	$ 1,200.00
FILTER	200	200	-	-	-	-	-	-	200	7.407407	-	$ 45.00	$ 333.33
TREES	4	4	-	-	-	-	-	-	-	-	-	$ 600.00	$ 2,400.00
												SUBTOTAL	$ 113,867.49
MPT (15%)													$ 17,080.12
MISC (15%)													$ 17,080.12
MOBILIZATION (4%)													$ 4,554.70
SIGNS													$ 1,500.00
												TOTAL	$ 154,082.44
												SAY	*$ 155,000.00*
												SAY	*$ 775/Lineal Foot*

** Note: Total Length based on 1 side

STATE ROUTE 4
WHITEHALL, NEW YORK
COST ESTIMATES
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LOCATION	PROJECT	SUMMARY OF SITES ESTIMATED COST	ESTIMATED COST /LINEAL FOOT	ROW COST
SITE #1	Flatten roadway	$ 160,000.00	$ 970.00	N/A
SITE #3	Reconfigure westbound approach	$ 110,000.00	$ 550.00	N/A
SITE #4	Regrade and widen shoulder	$ 150,000.00	$ 224.00	N/A
SITE #6	Install median island "gateway"	$ 155,000.00	$ 646.00	N/A
SITE #7	Extend sidewalk	$ 90,000.00	$ 55.00	NONE
SITE #8	Improve/Upgrade sidewalks	$ 200,000.00	$ 76.00	NONE
SITE #10	Bypass of Fort Ann	$ 12,000,000.00	$ 7.06 Million / Mile	N/A
SITE #14	Widen Shoulder	$ 445,000.00	$ 67.00	NONE
SITE #15	Flatten and straighten roadway	$ 520,000.00	$ 793.00	N/A
SITE #17	Extend sidewalk	$ 170,000.00	$ 52.00	NONE
SITE #18	Extend sidewalk	$ 170,000.00	$ 52.00	NONE
SITE #19	Extend sidewalk	$ 235,000.00	$ 51.00	NONE
SITE #21	Upgrade shoulder	$ 170,000.00	$ 74.00	NONE
SITE #22	Install median island "gateway"	$ 155,000.00	$ 646.00	N/A
SITE #23	Information booth	$ 75,000.00	$ 500.00	N/A
SITE #24	Contruct left and right turn lanes	$ 155,000.00	$ 775.00	N/A
TOTAL		**$ 14,960,000.00**		

Notes: 1) N/A = Not considered for Site
2) Utility Poles not looked at to see if in way of Construction

Appendix C – Expressway and Bypass Options

This study has led us to the conclusion that it is unrealistic to construct a new expressway from the Northway to the New York State/Vermont border, as was envisioned about 20 or 30 years ago. Such an undertaking would cost in the range of $220 to $300 million dollars. Shorter bypasses around the developed areas are a better and more cost-effective option. We have determined that there is an opportunity to build a bypass around the Village of Fort Ann connecting Route 149 to Route 4 northwest of Fort Ann.

BFJ believes the best long-term solution would be the creation of a bypass connecting Route 149 west of Fort Ann to Route 4 north of Fort Ann. A possible route for the bypass can be seen in Figure A1. This route was selected to follow the power line right-of-way for the western portion of the bypass and to follow the existing dirt road for the eastern portion. Detailed analysis would be required to determine the exact route. This solution would take the most significant through movement using the intersection out of the Village. The bypass option was selected since the current right-of-way in the village will not permit the installation of a roundabout nor the introduction of a right-turn lane for southbound traffic. We do not recommend the elimination of any of the buildings on the corners of this intersection, because we feel that the current buildings are an important part of the historical character of the village. In the long term, it could harm the vitality of the Village by reducing the street wall and reducing the building stock.

The proposed route for the Fort Ann bypass road needs to be included into the Town's master plan to preserve this option for the future. The bypass is envisioned as two-lane road (one lane in each direction) that could be widened to four lanes, if needed. A corridor width of 80 feet is recommended, enough for four lanes plus room for landscaping and grading. No development would be allowed along the bypass in order to maintain the through traffic function of the bypass and to maintain the businesses within the village. This means that the State should acquire the right-of-way together with the access rights. At most two intersections should be allowed along the bypass section to connect to existing roads or to future development areas. The intersections of the bypass road with Route 149 and Route 4 should be envisioned as roundabouts to force traffic to slow down and make a conscious decision on whether they want to continue on the through route or the local business route.

Regarding the timeframe of when the bypass should be constructed, BFJ recommends implementing the bypass when the eastbound traffic on Route 149 reaches LOS E. Given that eastbound traffic is currently operating at LOS D with a 44-second delay, an additional delay of 11 seconds will push the eastbound traffic to LOS E. As the predicted delays from the model are only 42% of the actual delays, we multiplied modeled delays at this intersection by 2.4 to reflect the restricted configuration of the intersection. Given that assumption, an additional 4.6 seconds of delay would be required to push delays to LOS E. It is expected that this threshold will be crossed in approximately 12 years. That appears to be a reasonable year for building the bypass. However, it is recommended that the Town of Fort Ann map the bypass alignment on the Town Plan as soon as possible.

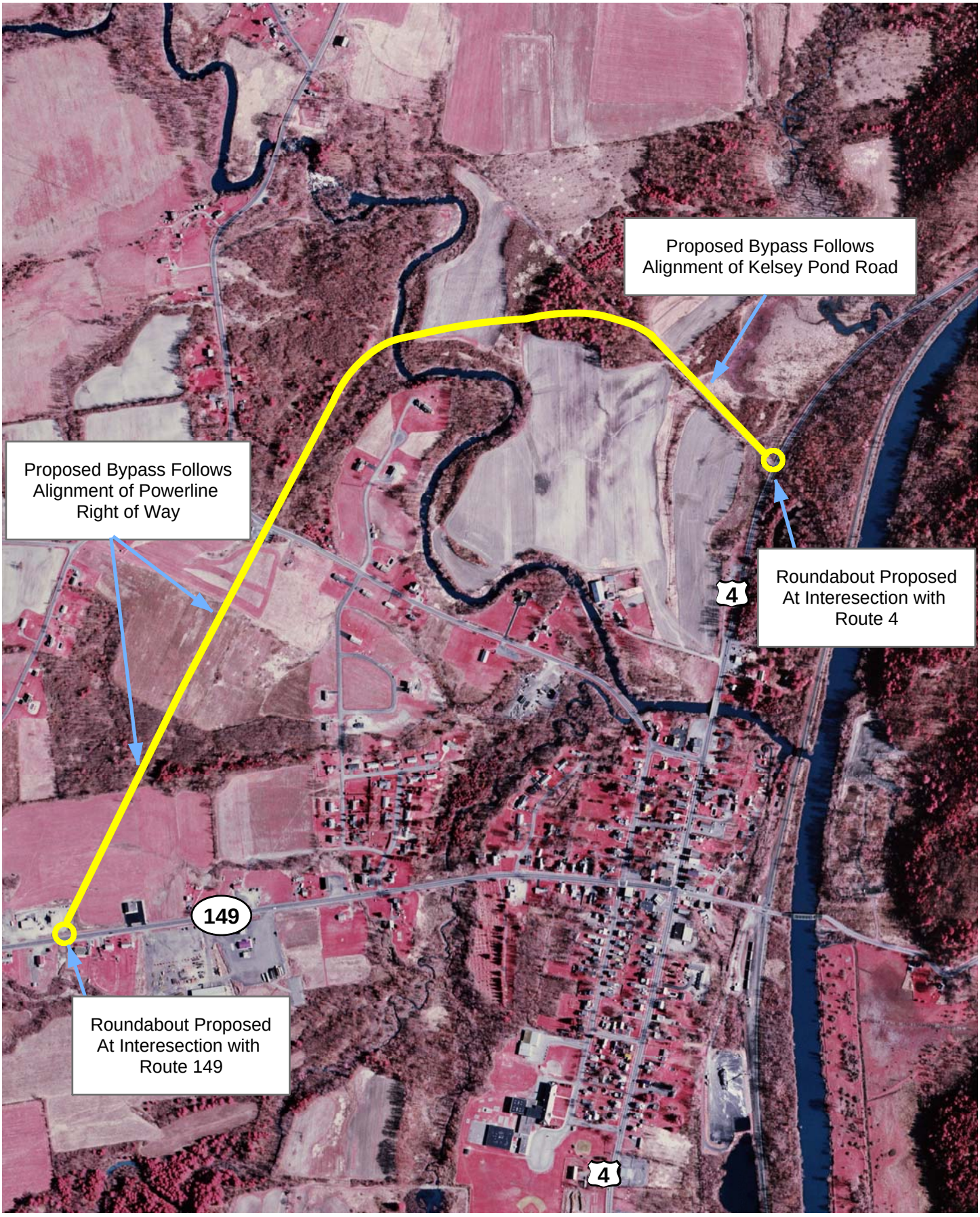

FIGURE A1 PROPOSED FORT ANN BYPASS ROUTE

ROUTE 4 CORRIDOR STUDY

0 0.5 mile

April 2004

Buckhurst Fish & Jacquemart Inc.