

Road Safety Audit Review

Browns Trace Road

Town of Jericho

July 10, 2008



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Browns Trace Road Road Safety Audit Review Review Report

Definitions

A *Road Safety Audit Review* (RSAR) is a formal examination of an existing road in which an independent, multi-discipline team (the Audit Team) reports on potential safety issues. "Independent" means that the members of the team will not be directly involved with the location being audited.

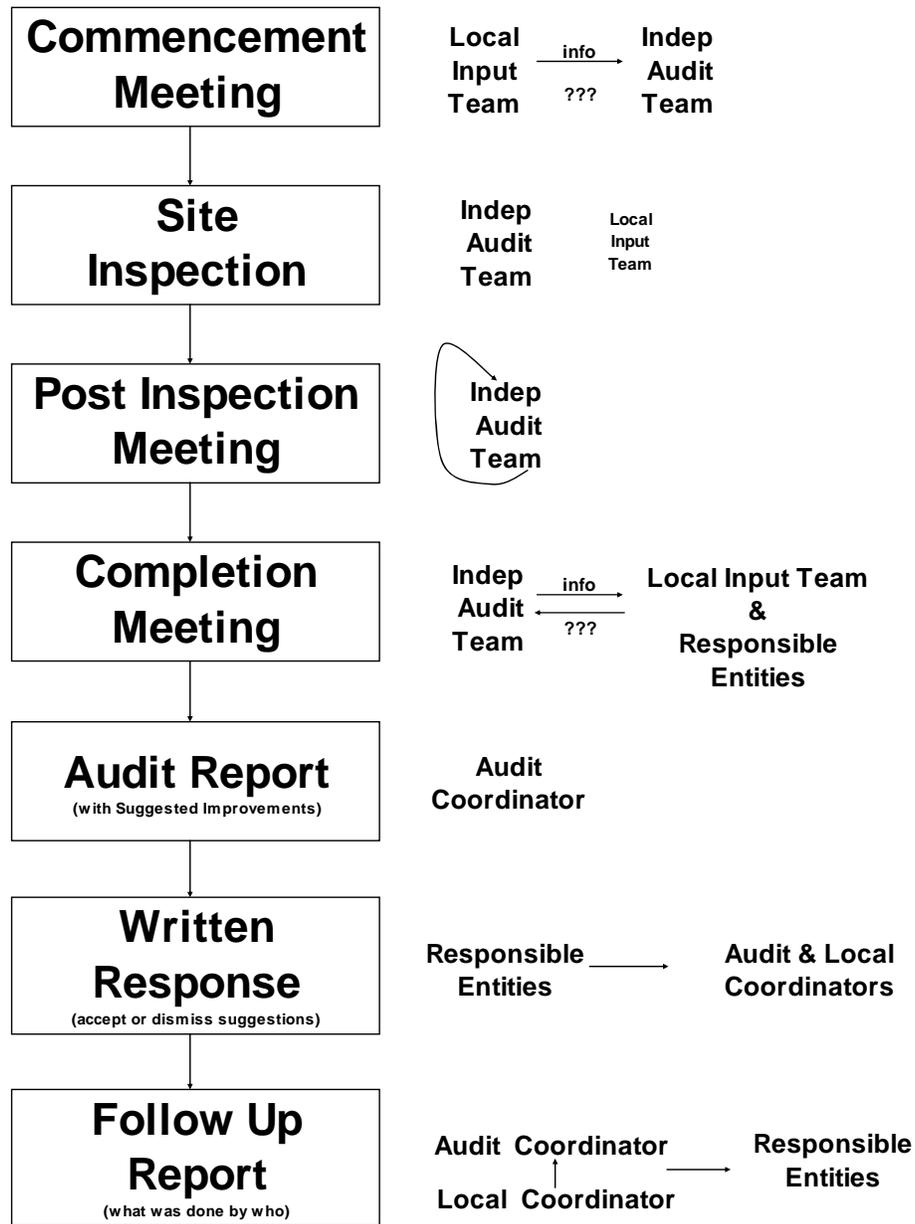
In addition to the Audit Team, a RSAR involves the following key players: Local Coordinator, Local Input Team and Responsible Entities.

The *Local Coordinator* is either a representative of the Town/City or the local regional planning commission. His/her role is to put a Local Input Team together, aggregate traffic and safety information, lead the commencement meeting and follow-up with local responsible entities. The role of the *Local Input Team* is to provide a local perspective at the commencement meeting. It is composed of representatives from the community such as Selectboard Members, Police, EMT, VAOT District, and Other Local People. The *Audit Team* is responsible for performing a site visit, identifying safety issues and coming to a consensus with respect to possible guidance. *Responsible Entities* are any groups who own a roadway feature or who are responsible for making an improvement or initiating further studies. These could include for example, the VTRANS Design Section, the Local Town, the Police or the Local RPC/MPO. The role of the Responsible Entities is to assess the viability of the suggestions provided by the Audit Team and provide a written response to the Audit Coordinator, to schedule and/or perform the improvements if deemed necessary and to follow-up with the audit or local coordinator when the project is completed. Finally, the *Audit Coordinator* is the person responsible for setting up the audit and other meeting dates, to put the audit team together, to facilitate the post inspection meeting and the completion meeting, and to prepare the audit report.

RSAR Process

The RSAR process is composed of several steps as shown in the diagram below. The process starts with a *Commencement Meeting* between the Local Input Team and the Audit Team. The purpose of the meeting is for the Local Input Team to present community concerns to the Audit Team. A *Site Inspection* is then performed by the Audit Team. Members from the Local Input Team can accompany the Audit Team to further explain concerns. The site visit involves the identification of safety deficiencies as seen in the field. The Audit Team will usually drive through the location of interest to

Figure 1. ROAD SAFETY AUDIT PROCESS



“get a feel” for the area, traveling through each approach in the case of intersections. The team is to then drive at a slower posted speed to make observations. If needed, the team will also walk the location. Following the site inspection, the Audit Team holds a *Post Inspection Meeting*. It is during this meeting that the team members discuss their observations and identify safety issues. The team is to reach a consensus on the importance of each safety issue mentioned. Only those issues for which a consensus is reached are included in the RSAR findings. The final RSAR report (Written Report) is finalized following the Completion Meeting during which the issues identified by the audit team are discussed with the Local Input Team and Responsible Entities. The meeting is to be constructive and

foster dialogue between the parties involved. The **Written Report** identifies safety concerns and proposes guidance. These issues and solutions are presented in a tabular format associated to each Responsible Entity for ease of reporting. The Responsible Entities are to provide a Written Response on every finding of the Written Report as to its implementation. The Responsible Entity is not obliged to implement the findings in the Written Report. However, the reasons for not implementing a finding should be documented (e.g. physical constraints, excessive cost, environmental constraints, etc.).

The RSAR herein covers physical features which may affect road user safety and it has sought to identify potential safety hazards. However, the audit team points out that no guarantee is made that every deficiency has been identified. Further, it should also be understood that the adoption of the guidance in this report should improve the level of safety of the facility but not necessarily remove all the risks.

Location

The location of this RSAR is the section of road on Browns Trace Road in Jericho between Bolger Hill Road and Lee River Road.

Figure 2.
Location Map
Source: CCMPO



Purpose of the RSAR

This RSAR was conducted as part of the Agency of Transportation's Transportation Planning Initiative in conjunction with the High Risk Rural Roads Program (HRRR). The location was selected by the Chittenden County Metropolitan Area (CCMPO) pursuant to the prioritization process established by CCMPO with the intent of identifying hazardous locations on rural local roads.

It is to be noted that Browns Trace Road in its entirety was also selected by CCMPO for a complete programmatic corridor sign review also through the HRRR program. As a consequence, signs suggested by the road safety audit team will be incorporated into the recommendations of the corridor review.

RSAR Team

The Road Safety Audit Review Team included the following representatives from the Vermont Agency of Transportation (VAOT):

Hank Lambert, Traffic Safety (VAOT)
Jim Cota, Operations, District 5 (VAOT)
Patrick Gilligan, Operations, District 5 (VAOT)

RSAR Team Coordinator

The road safety audit review coordinator was:

Mario Dupigny-Giroux, Traffic Safety (VAOT)

Local Coordinator

The local coordinator was:

Jason Charest, CCMPO

Local Input Team

The following individuals from the local community were present at the Commencement Meeting:

David Spitz, Jericho Town Administrator
Doug Siple, Jericho Highway

Also present were Erin Parizo and Jen Wheeler, both interns with CCMPO.

Commencement Meeting

The commencement meeting was held at the Town of Jericho offices on July 10, 2008.

Mario Dupigny-Giroux mentioned that this RSAR was conducted as part of the HRRR Program. Mr. Dupigny-Giroux explained that the HRRR Program included two types of locations, namely, Programmatic Corridors and High Hazard Locations and that Programmatic Corridors were sections of roads of several miles in length while High Hazard Locations were isolated locations or short segments of roads of no more than 1 mile in length. Mr. Dupigny-Giroux then clarified that High Hazard Locations were reviewed with a multi-discipline road safety audit team and that a larger number of improvements were eligible for funding.

Mr. Dupigny-Giroux further explained that Browns Trace Road had also been selected by CCMPO for a programmatic corridor sign review and that this review would be done by Mr. Lambert in the weeks to follow the RSAR.

Jason Charest explained that the site had been selected based on crash data provided by VAOT for the period 2001 to 2006.

The audit team reviewed the following information presented at the commencement meeting by local members.

Eleven crashes were identified within this corridor between 2001 and 2006. Concentrations of crashes were found near Plains Road and at the Lee River intersection.

A review of the crash reports identified three reported crashes for the period 2003-2006 at the intersection with Lee River Road. Two crashes (right-angle and same direction sideswipe) involved a vehicle coming down the hill and one coming from Ethan Allen. The third crash was a rear-end crash at the stop sign on Brown's Trace Rd.

The signs within the segment consist mainly in speed limit signs, stop signs and emergency vehicles signs.

A turning movement count was performed during the morning and afternoon peak hours by CCMPO in July 2008 (Figure 3). It was found that the largest volume of traffic in the morning was between 7:00 and 8:00 am with 396 vehicles and that in the afternoon, the hours of 5:00 pm to 6:00 pm had the largest amount of traffic with 420 vehicles.

Going southbound on Browns Trace Road, the predominant movement is the through movement and it is heavier in the morning (277 vehicles vs 81). In the afternoon, in the northbound direction, the through movement is also the predominant movement with heavier traffic in the afternoon (225 vehicles vs 53).

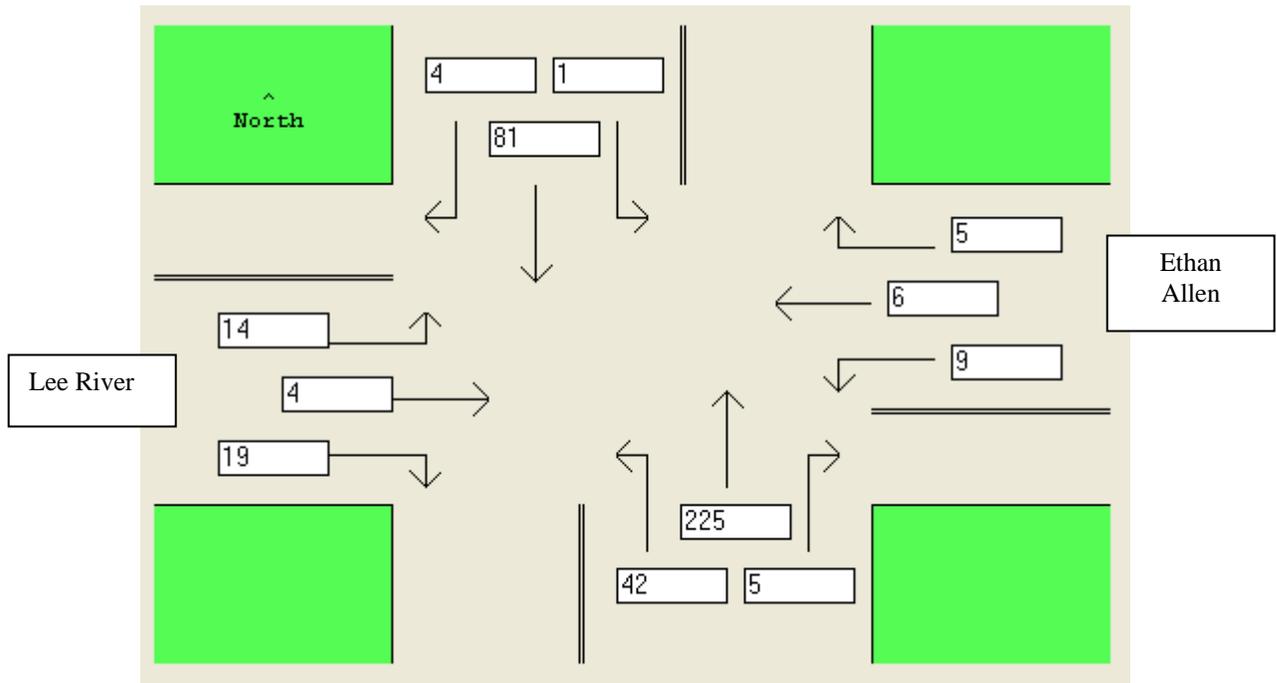
The Town expressed concern with limited corner sight distance at the intersection of Plains Road due to a tree.

The slip ramp at the Lee River intersection is favored by the selectboard.

At the Lee River intersection, the military needs wide radii.

Enforcement is regular.

Figure 3. PM Peak Hour Volumes



Following the commencement meeting, the audit team, with members of the community, performed the site review of the section and discuss their observations.

Potential Safety Concerns

This section lists the areas of safety concern identified by the audit team during the field visit and from their analysis of available data. The concerns are not listed in order of importance. The safety concerns are also reported on the observation tables that are specific to each entity responsible for the improvements. These tables are found at the end of the report.

- ✓ Limited corner sight distance to the left when stopped at the Plains Road approach
- ✓ The conspicuity of the approach to the intersection on Plains Road could be improved
- ✓ Potential of edge drop-offs that could eventually cause motorists to lose control
- ✓ Information pertaining to emergency vehicles is too far from the area of concern in the northbound direction
- ✓ The operation of the Lee River Rd intersection is unusual

Many of these safety concerns are illustrated in the next few pages.

Problem:

Limited corner sight distance to the left when stopped at the Plains Road approach

Immediate:

Southbound, install a 30" x 30" side road sign (W2-2) with a Plains Rd name plaque underneath (W16-8)

Review the location of the beginning of the 25 mph speed zone in the southbound direction. Ideally, this zone should start at the same location as the 35 mph zone in the northbound direction

Replace the reduce speed ahead sign with a new 36" x 36" W3-5. Cut brush/relocate depending on previous action

Short Term:

Promote a clear sight triangle as recommended by AASHTO

From the edge of the road, measure 15 ft back (this is the vertex of the sight triangle)

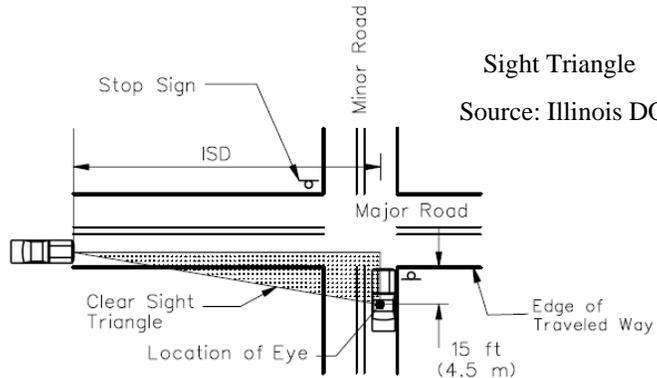
For an estimated traveling speed of 25 mph, "ISD" is 280 ft

For an estimated traveling speed of 40 mph, "ISD" is 445 ft

Anything within the triangle area such defined should be as much as possible trimmed/removed/ relocated



New W3-5 on 2 posts



Problem:

The conspicuity of the approach to the intersection on Plains Road could be improved

Immediate:

Cut brush in front of the stop sign

Refresh the stop bar but reinstall 4 feet back from the edge of the road



Problem:

Information pertaining to emergency vehicles is too far from the area of concern in the northbound direction

Immediate:

Relocate the sign within 1000 ft of the area of concern



Problem:

The operation of the Lee River Rd intersection is unusual

Comment:

It is very unusual to have a major movement that is significantly heavier than the opposing traffic to be controlled by a stop sign

Immediate:

Replace the two stop signs (R1-1) with new 30" x 30" type III signs. Install the bottom of the sign not less than 5 ft above the surface of the road

On Lee River (west), replace the left turn Yield to oncoming traffic sign with a new 30" x 36" type III sign

Short Term:

If the alignment is kept as it is currently, then stripe the centerline markings so that the south to west movement is shown as the primary movement. Add a curve sign right (W1-2R) up the hill for the southbound direction and a modified curve right sign with a side road (AOT W1-mg R) for traffic approaching Lee River from the west

Alternatively, instead of a W1-2R, could simply add an intersection sign (W2-2) with a road name plaque (W16-8)

Promote a clear sight triangle as recommended by AASHTO

Consider redesigning this intersection into a regular 90-degree three-way intersection



clear sight triangle

Problem:

Potential of edge drop-offs that could eventually cause motorists to lose control

Immediate to Short Term:

Review the locations where edge drop-offs exist

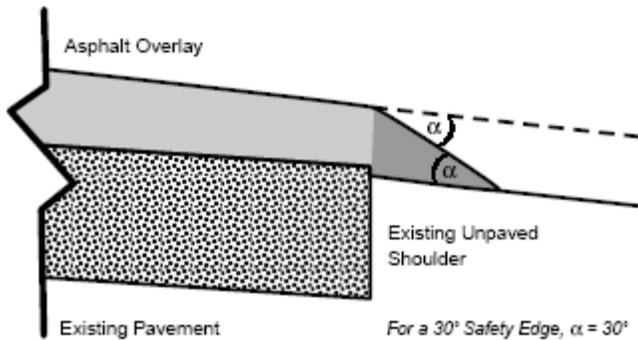
The edge drop that is being created could cause a motorist that went of the road to lose control when trying to get back on the pavement

Drop-offs of three or more inches are unsafe if the roadway edge is at a 90-degree angle to the shoulder surface

Pull up the shoulder area where applicable

Long Term:

Consider specifying a 30-35 degree angle asphalt fillet (called the "Safety Edge" by FHWA) in the contract specification of the next paving project for this road



Road Safety Audit Review Observations

Instruction

The next section of the RSAR Written Report contains tables that display observations and guidance. The safety issues in the first column have been identified through this road safety audit review. For each observation, the Audit Team suggests the guidance listed in the second column as a possible remedial solution. Each Responsible Entity will receive their respective tables. Please indicate in the appropriate column if you agree to implement this measure and if not, support your decision by writing a reason in the last column. Responsible Entities are not obliged to follow the findings of this Written Report. However, the reasons for not implementing a finding should be documented (e.g. physical constraints, excessive cost, environmental constraints, etc.). A written response should be submitted to the Audit Coordinator within three weeks of receipt of the Written Report.

**Written Response
Town of Jericho (1 of 3)**

Issue	Possible Solution	<u>Decision</u> Agree/Reject	Planned Completion Date	Comments
<p>Limited corner sight distance to the left when stopped at the Plains Road approach</p>	<p>Immediate: Southbound, install a 30" x 30" side road sign (W2-2) with a Plains Rd name plaque underneath (W16-8)</p>			
	<p>Review the location of the beginning of the 25 mph speed zone in the southbound direction. Ideally, this zone should start at the same location as the 35 mph zone in the northbound direction</p>			
	<p>Replace the reduce speed ahead sign with a new 36" x 36" W3-5. Cut brush/relocate depending on previous action</p>			
	<p>Short Term: Promote a clear sight triangle as recommended by AASHTO</p> <p>Anything within the triangle area such defined should be as much as possible trimmed/removed/relocated</p>			

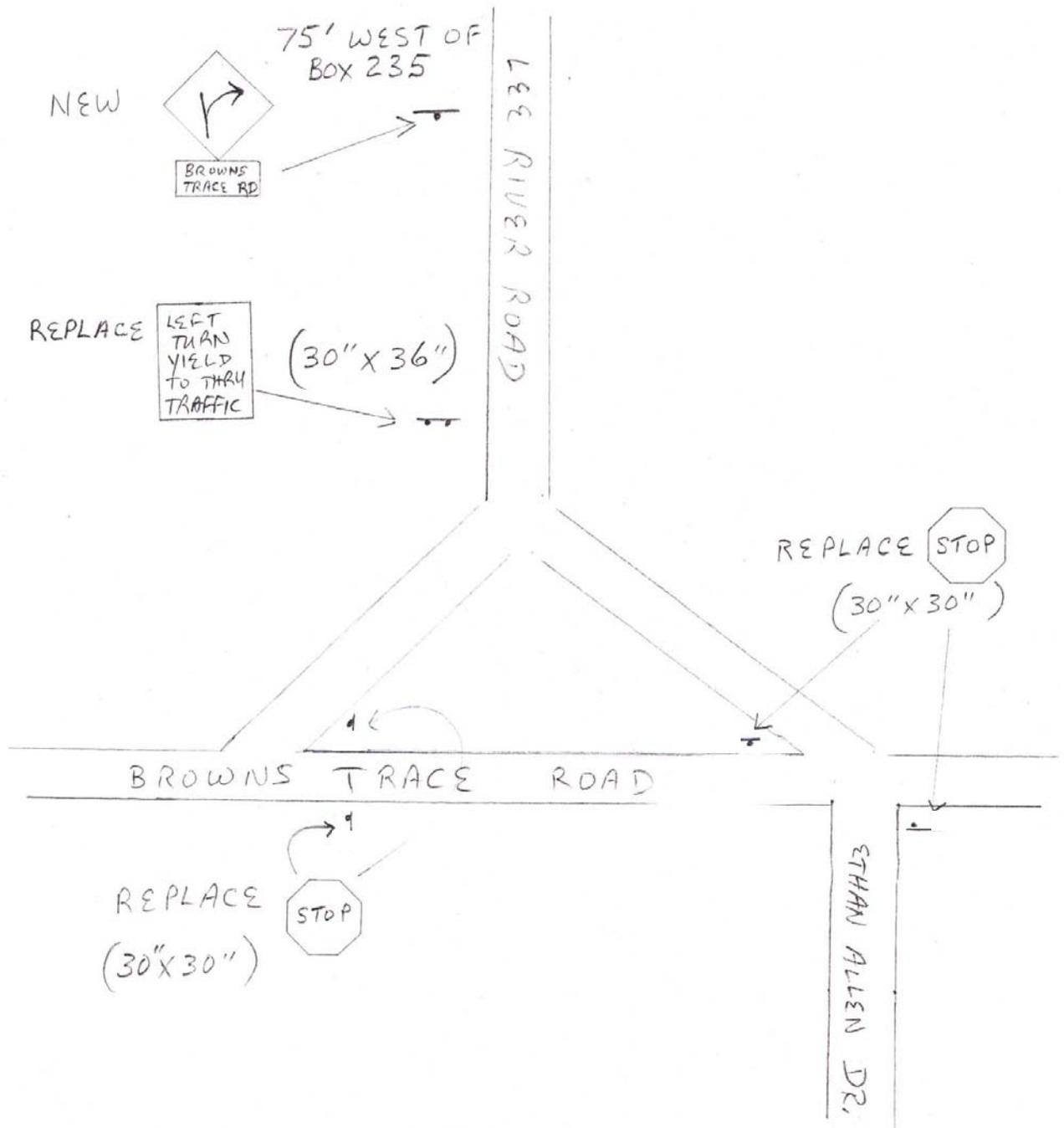
**Written Response
Town of Jericho (2 of 3)**

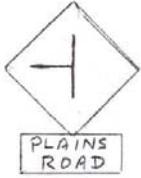
Issue	Possible Solution	<u>Decision</u> Agree/Reject	Planned Completion Date	Comments
<p>The conspicuity of the approach to the intersection on Plains Road could be improved</p>	<p>Immediate: Cut brush in front of the stop sign</p>			
	<p>Refresh the stop bar but reinstall 4 feet back from the edge of the road</p>			
<p>Information pertaining to emergency vehicles is too far from the area of concern in the northbound direction</p>	<p>Immediate: Relocate the sign within 1000 ft of the area of concern</p>			
<p>Potential of edge drop-offs that could eventually cause motorists to lose control</p>	<p>Immediate to Short: Review the locations where edge drop-offs exist</p>			
	<p>Pull up the shoulder area where applicable</p>			
	<p>Long Term: Consider specifying a 30-35 degree angle asphalt fillet (called the "Safety Edge" by FHWA) in the contract specification of the next paving project for this road</p>			

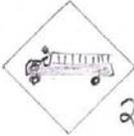
**Written Response
Town of Jericho (3 of 3)**

Issue	Possible Solution	<u>Decision</u> Agree/Reject	Planned Completion Date	Comments
The operation of the Lee River Rd intersection is unusual	Immediate: Replace the two stop signs (R1-1) with new 30" x 30" type III signs. Install the bottom of the sign not less than 5 ft above the surface of the road			
	On Lee River (west), replace the left turn Yield to oncoming traffic sign with a new 30" x 36" type III sign			
	Short Term If the alignment is kept as it is currently, then stripe the centerline markings so that the south to west movement is shown as the primary movement. Add a curve sign right (W1-2R) up the hill for the southbound direction and a curve right sign (AOT W1-mg R) with a side road for traffic approaching Lee River from the west			
	Promote a clear sight triangle as recommended by AASHTO			
	Consider redesigning this intersection into a regular 90-degree tree-way intersection			

Appendix A –Proposed Signage



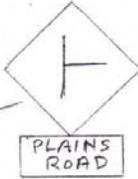
NEW  PUT IN PLACE OF CURRENT "FIRE EQUIPMENT ENTERING"

REPLACE  AND MOVE 25' NORTH OF POLE 349 A 89

NEW  ±150' SOUTH OF SIGN: ETHAN ALLEN TRAINING SITE

BROOKS TRACE ROAD

REPLACE  AND MOVE OPPOSITE 35 MPH SIGN

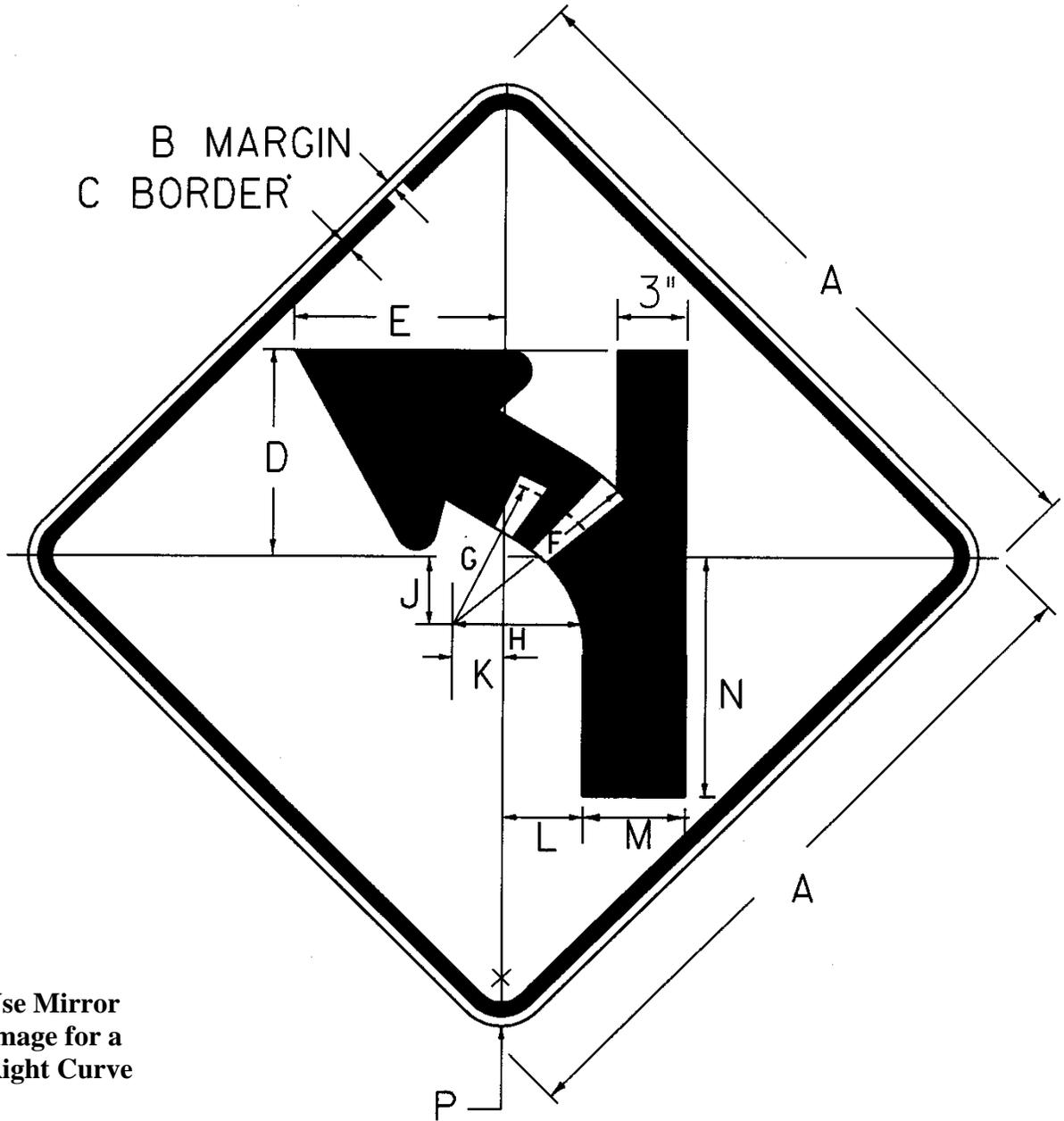
NEW  (30" x 30") 83' SOUTH OF POLE 349 A 89

REPLACE  AND MOVE ACROSS FROM POLE 30C

HIGH RISK RURAL ROAD PROGRAM

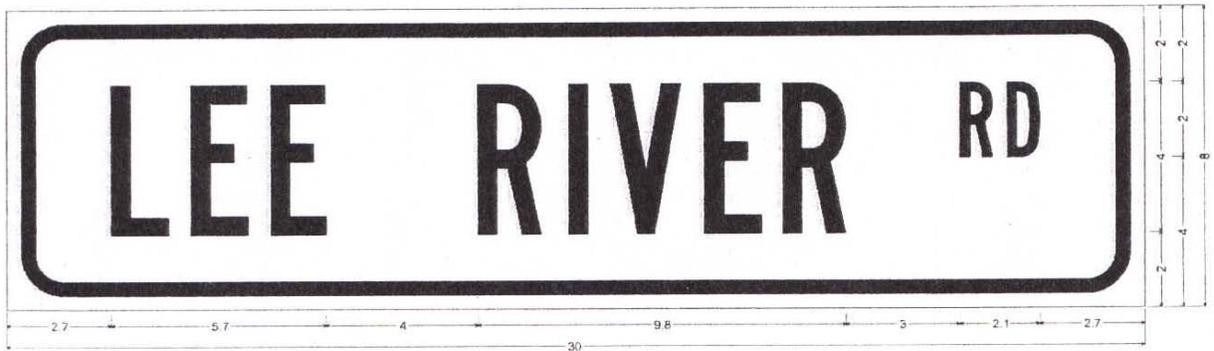
Appendix B –Sign Details

AOT W1-mg, Curve Sign



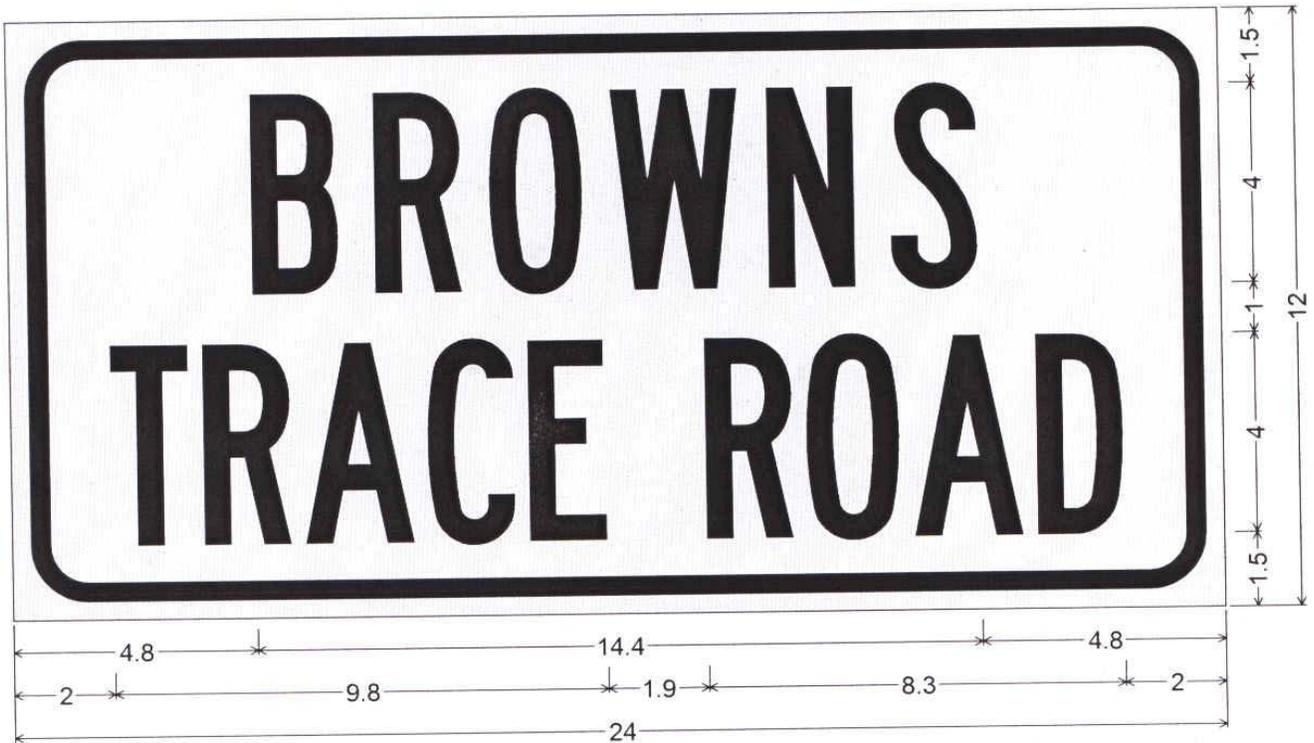
Use Mirror
Image for a
Right Curve

W16-8, Lee River Rd Supplemental Road Name Plaque



1.5" Radius, 0.4" Border, 0.4" Indent, Black on Yellow
"LEE RIVER RD" B.

W16-8, Browns Trace Rd Supplemental Road Name Plaque



1.5" Radius, 0.4" Border, 0.4" Indent, Black on Yellow;
"BROWNS" B; "TRACE ROAD" B specified length;

W16-8, Plains Rd Supplemental Road Name Plaque



1.500" Radius, 0.375" Border, 0.375" Indent, Black on Yellow;
"PLAINS RD" B;

VR-615, Left Turn Yield To Thru Traffic



VR-615

COLORS:

BLACK TEXT & BORDER
WITH WHITE BACKGROUND

