HIGHWAY FACTORS GROUP
FACTUAL REPORT

Fatal Truck Collision
Miami, OK; 6/26/2009

HWY-09-FH-015
(17 Pages)

NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C. 20594

HIGHWAY FACTORS GROUP
FACTUAL REPORT

A. ACCIDENT

LOCATION:	Interstate 44 (I-44) East, Will Rogers Turnpike, at Milepost 321.5, in Ottawa County, Oklahoma, approximately 8 miles northeast of Miami, Oklahoma
VEHICLE 1:	2008 Volvo Tractor Semi-Trailer and 2009 Great Dane Refrigerated Trailer Combination Unit
OPERATOR:	Associated Wholesale Grocers Inc. of Springfield, Missouri
VEHICLE 2:	2003 Land Rover SUV
VEHICLE 3:	2003 Hyundai Sonata Passenger Car
VEHICLE 4:	2004 Kia Spectra Passenger Car
VEHICLE 5:	2000 Ford Windstar Minivan
VEHICLE 6:	2004 Ford F350 Pickup Truck and 16-foot Livestock Trailer
VEHICLE 7:	2008 Chevrolet Tahoe SUV
DATE:	June 26, 2009
TIME:	Approximately 1:16 p.m. CDT

NTSB #: **HWY-09-MH-015**

B. HIGHWAY FACTORS GROUP

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C. ACCIDENY SYNOPSIS

About 1:13 p.m. CDT on Friday June 26, 2009 an 18-year-old driver operating a 2001 Ford Focus passenger car eastbound on I-44 Will Rogers Turnpike near milepost 321.76 drifted into a parked truck tractor semi-trailer on the right-hand shoulder. After the Ford side-swiped the semi-trailer wheels the driver overcorrected, lost control and struck the concrete median barrier twice, before coming to rest in the roadway and blocking the dual eastbound lanes. Traffic began stopping and a queue developed before passing motorists could push the disabled vehicle to the right-hand shoulder. The queue of stopped and slowing vehicles extended back approximately 1500 feet to milepost 321.5.

About one-third mile west of the traffic queue, an eastbound 2008 Volvo truck tractor and a 2009 Great Dane refrigerated semi-trailer (combination unit) driven by a 76 year-old driver crested a hill on the left lane as it passed a slower moving combination unit. The operator of the slower moving combination unit stated that as both vehicles crested the hill he observed, ahead of him, traffic congestion and brake lights in both lanes and began to slow. The witness also stated that after the accident truck passed him, it changed back to the right lane; never slowed or applied it's; brakes, and crashed into the stopped traffic ahead. Additional witness statements estimated the speed of the accident truck at about 70 mph in the posted 75 mph zone, and indicated that brakes were not applied before the accident truck collided with the rear of the traffic queue. This accident occurred at 1:16 p.m. CDT three minutes after the first accident.

At initial impact, the combination unit struck a 2003 Land Rover SUV, pushing it forward into a 2003 Hyundai Sonata passenger car; the Land Rover continued off to the right where it came to rest on the right-hand grassy right-of-way. The combination unit continued forward approximately 42 feet and collided into the Hyundai, overriding it and pushing it forward about 29 feet to where the combination unit then struck and overrode a 2004 Kia Spectra passenger car. The combination unit and the two passenger vehicle continued forward into the rear of a 2000 Ford Windstar minivan, which was also partially overridden by the combination unit. The Ford minivan was pushed forward into the rear of a 16-foot livestock trailer (loaded with 10 head of sheep) being towed by a 2004 F350 pickup truck. The F350 pickup truck was then pushed forward into a 2008 Chevrolet Tahoe. The combination unit came to final rest on top of the Hyundai, Kia, and a portion of the Ford minivan. From the initial impact to final rest, the combination unit traveled approximately 270 feet, leaving gouges and friction tire marks on the pavement.

At the time of the accident the weather was clear and the pavement was dry.

As a result of the collision, 10 occupants in the passenger vehicles were fatally injured; nine passengers were fatally injured at the crash site and one passenger died at an area hospital and four passengers received minor to serious injuries. The driver of the combination unit received serious injuries. Four of the passenger cars were destroyed from impact. The Ford F350, livestock trailer, and Chevy Tahoe had moderate damage. The Volvo truck tractor sustained extensive damage, and the Great Dane trailer was undamaged. (See Figure 1)

Figure 1. Accident location

D. INTRODUCTION

This report provides the reader with a factual record of the highway conditions that existed at the time of the accident. For a better understanding of all the circumstances and facts readers are encouraged to also examine the Vehicle Factual Report, the Human Performance Factual Report, the Bus Driver's Medical Records Factual Report, the Survival Group Report, the Motor Carrier Operations Group Report, the Recorder Group Report and the Mapping Group Report. For a complete understanding of how the accident occurred readers must refer to the Board Members analysis and probable cause which will be available at the completion of the NTSB investigation and Board Meeting.

The report is organized in the following manner: First an outline is provided showing what details will be covered. Then prefatory data and highway data will be presented along with detailed information about the geometric alignment and scene documentation.

E. DETAILS OF THE INVESTIGATION

Prefatory data was obtained that included construction history, average daily traffic, vehicle classification data, traffic accidents, and fatal accidents.

Highway data was obtained that included the functional classification, highway design, posted speed limit, and 85th percentile speed[1]. Other highway data obtained included highway markings, design speed, horizontal and vertical geometry of the eastbound I-44 lanes.

[1] The 85th percentile speed is the speed at which 85% of the vehicle traffic is traveling either at or below that speed or, 15% of the vehicle traffic is traveling above that speed.

F. PREFATORY DATA

The Northeastern Turnpike later named the Will Rogers Turnpike and designated as Interstate Highway 44 (IH 44) was originally constructed in 1955-1957. The facility was a 4-lane highway with the dual east and westbound lanes separated by a 29-inch-high, Jersey shaped, TL-4[2] concrete median barrier. The adjacent roadside had a 4H:1V traversable slope. The dual, 11.5-foot-wide lanes in each direction are delineated by dashed, white pavement stripes. The 10.0 foot-wide, right-hand shoulders on both sides of the turnpike have alert grooves cut into the pavement and the shoulder is delineated from the main travel lanes by a solid white pavement stripe. The left-hand or median shoulders are 7.5 feet-wide, and are delineated from the travel lanes by solid yellow pavement stripes. The left-hand shoulders are also equipped with rumble strips.

G. TRAFFIC COUNTS & ACCIDENT HISTORY

Annual Average Daily Traffic (AADT) counts between 2004 and 2008 averaged 20,642 vehicles per day for the I-44 turnpike. The Oklahoma Transportation Authority (OTA) indicated that the commercial vehicle AADT was approximately 35 percent of this total. (See Attachment A OTA Traffic Counts for more Details)

Accident records from OTA showed that in the five-year-period from 2004-2008, along a six-mile-segment from milepost 318.5 to milepost 324.5, 70 accidents occurred. There were 31 injury accidents, 37 property damage accidents, and 2 other fatal accidents. One of the two fatal accidents was a commercial motor vehicle. (See Attachment B for more details)

H. GENERAL TURNPIKE HISTORY

The Will Rogers Turnpike is one of 10 turnpikes in the Oklahoma Turnpike System. This turnpike was authorized by the State Legislature in 1953 and opened in 1957. It is a four-lane, limited access highway extending 88.5 miles from Tulsa to the Oklahoma-Missouri state line about, and 1000 feet south of the southeast corner of Kansas. The turnpike carries the I-44 designation. Major interchanges are located at Claremore (SH-20), Adair (SH-28), Big Cabin (SH-69), Vinita, Afton (SH-59), and Miami (SH-10). Fueling facilities, convenience stores and restaurant with free restrooms are located at Vinita which is the approximate mid-point of this turnpike.

Safety Features:

In project WR-MC-71 plans dated 4/23/99 was the last pavement rehab from milepost 320 to 329. Some of the project specifics include:

- Variable depth milling to establish a 2% cross slope on the driving lanes and a 4% slope on the shoulder
- 6” PG Grade AC overlay (4” of Type AH and 2” of Type BH)
- Rumble strips were included
- Shoulder widening for guardrail was performed
- 10,650 ft. of new guardrail and 23 GETS were installed.

Median barrier was installed on project WR MC 62 in 1996.

[2] A Test level 4 (TL-4) barrier is required by National Cooperative Highway Research Project Report 350 to safely re-direct a 19000-pound truck colliding into the barrier at a speed of 50 mph and a 15 degree encroachment angle.

I. WEATHER INFORMATION

Internet weather reports for the Miami, Oklahoma area indicated that at the time of the accident the temperature was 104 degrees and 42 percent humidity. The atmospheric conditions were clear and the pavement was dry. The winds were from the south at 12 mph.

J. GENERAL HIGHWAY DATA AND DESIGN INFORMATION

The I-44 Turnpike in the accident area was functionally classified as a principal rural arterial. The speed limit was 75 mph. The design speed for this segment of highway was 75 mph. A speed survey was conducted in the week after the accident. The survey showed that the 85^{th} percentile speed was 78 mph for trucks and 77 mph for cars. The average running speed for cars was 73 mph and the average running speed for trucks was 69.5 mph. (See Attachment C for more Details)

ROADWAY GEOMETRY

The roadway was tangent or straight from eastbound milepost 320 to milepost 323.5 which includes the accident area. About 2,335 feet west of the accident site a 1800-foot-long crest vertical curve began. The design plan profile showed the roadway had a 3.00 percent downgrade for approximately 1200 feet that transitioned into a 1.70 percent downgrade 900-foot-long sag vertical curve began. Next, the roadway transitioned into a 1.13 percent upgrade. (See Attachment D Design Plans for More Detailed Information)

K. SCENE DOCUMENTATION

Following the collision, the accident scene and related physical evidence was examined and evaluated by members of the Oklahoma Highway Patrol (OHP). Using a total station, the accident scene was documented by the OHP, and provided to the NTSB. (See Figure 2)

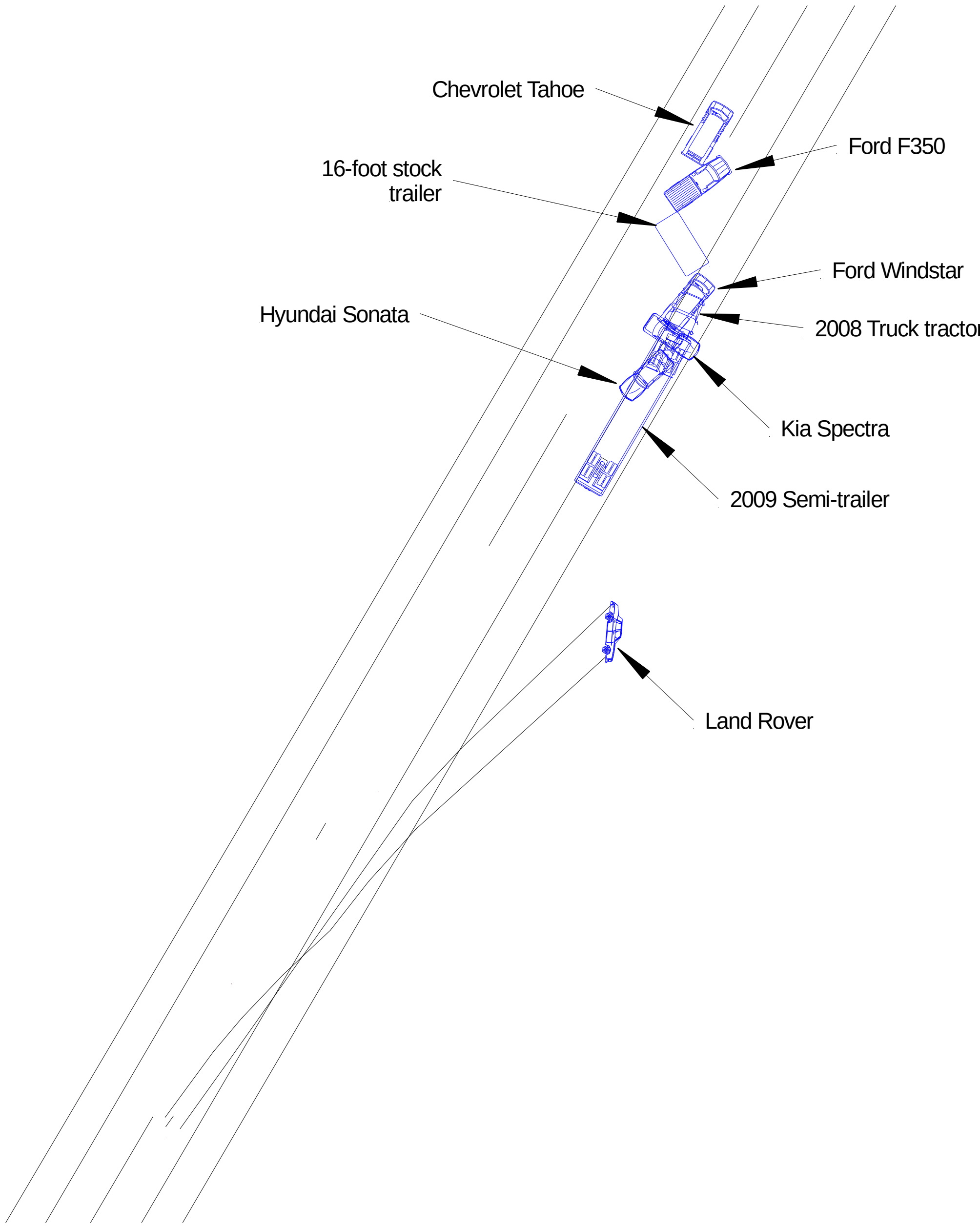


Figure 2. Post-collision Scene

There were gouges in the pavement from the undercarriage of the struck passenger cars on the pavement followed by tire friction marks from both the overridden cars and the combination unit. These marks began at the initial impact and continued until the combination unit came to a final stop near a drainage structure adjacent to the roadway.

L. SIGHT DISTANCE AND VERTICAL CURVE DESIGN

The following table from the 2001 AASHTO Policy on Geometric Design of Highways and streets compares the minimum sight distance needed with the 1954 AASHTO Geometric Design of Rural Highways.

Publication	Driver Eye Height	Object Height	Brake Reaction Time (sec.)	Minimum Stopping Sight Distance 60mph	Minimum Stopping Sight Distance 70mph	Rate of Crest Vertical Curvature (K Value)[25] 60mph	Rate of Crest Vertical Curvature (K Value)[25] 70mph
2001 AASHTO Publication	3.5 feet	2.0 feet	2.5 sec.	570 ft.	730 ft.	151	247
1954 AASHO Publication	4.5 feet	4 inches	2.5 sec.	475 ft.	600 ft.	150	240

The 2004 AASHTO policy recommends an 820-foot sight distance for a speed of 75 mph. Essentially, a roadway designer must select a vertical curve length that provides an approaching motorist time to react and brake to a stop before striking an object that has the approximated object height as the rear or brake lights on an automobile or approximately 2.0 feet height when viewed from an eye height of 3.5 feet.

AASHTO—Geometric Design of Highways and Streets

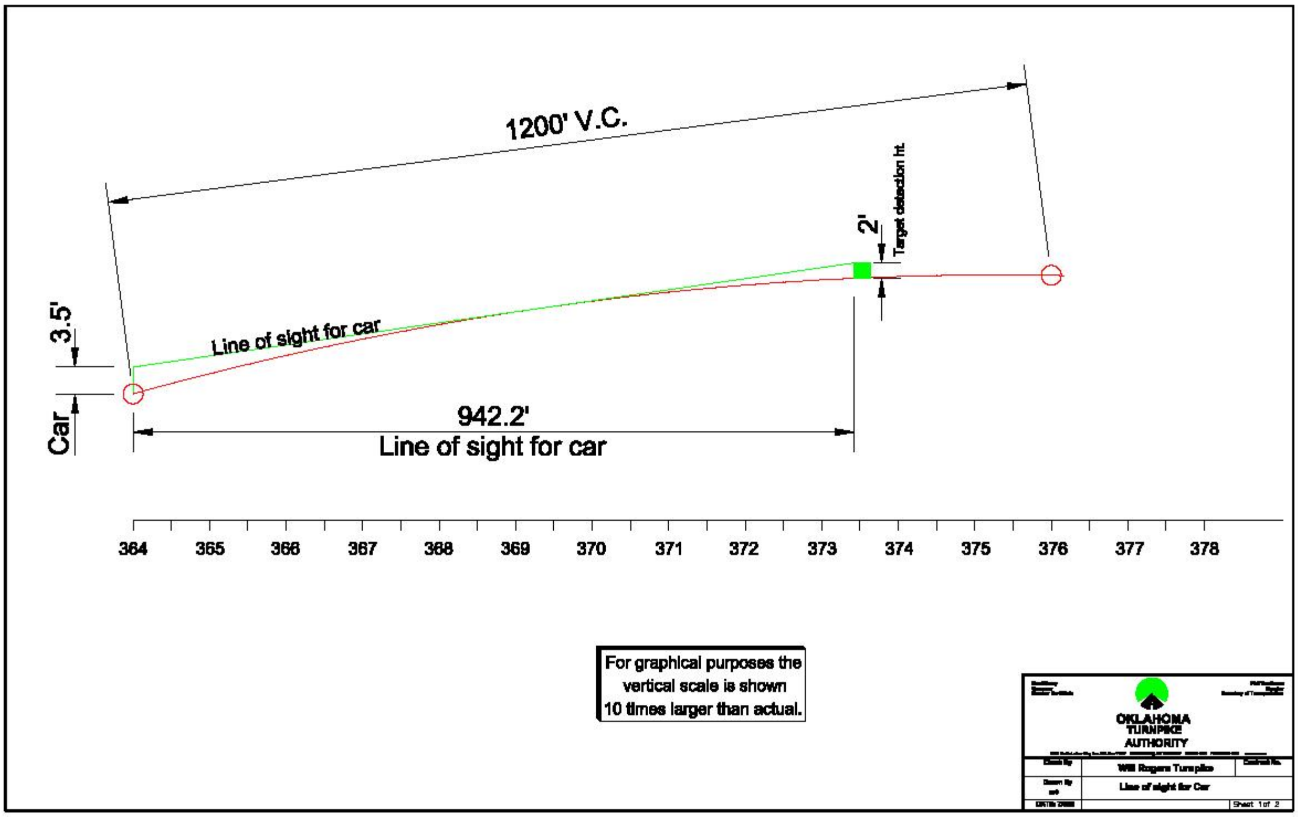
Metric				US Customary			
Design speed (km/h)	Stopping sight distance (m)	Rate of vertical curvature, K^a Calculated	Rate of vertical curvature, K^a Design	Design speed (mph)	Stopping sight distance (ft)	Rate of vertical curvature, K^a Calculated	Rate of vertical curvature, K^a Design
20	20	0.6	1	15	80	3.0	3
30	35	1.9	2	20	115	6.1	7
40	50	3.8	4	25	155	11.1	12
50	65	6.4	7	30	200	18.5	19
60	85	11.0	11	35	250	29.0	29
70	105	16.8	17	40	305	43.1	44
80	130	25.7	26	45	360	60.1	61
90	160	38.9	39	50	425	83.7	84
100	185	52.0	52	55	495	113.5	114
110	220	73.6	74	60	570	150.6	151
120	250	95.0	95	65	645	192.8	193
130	285	123.4	124	70	730	246.9	247
				75	820	311.6	312
				80	910	383.7	384

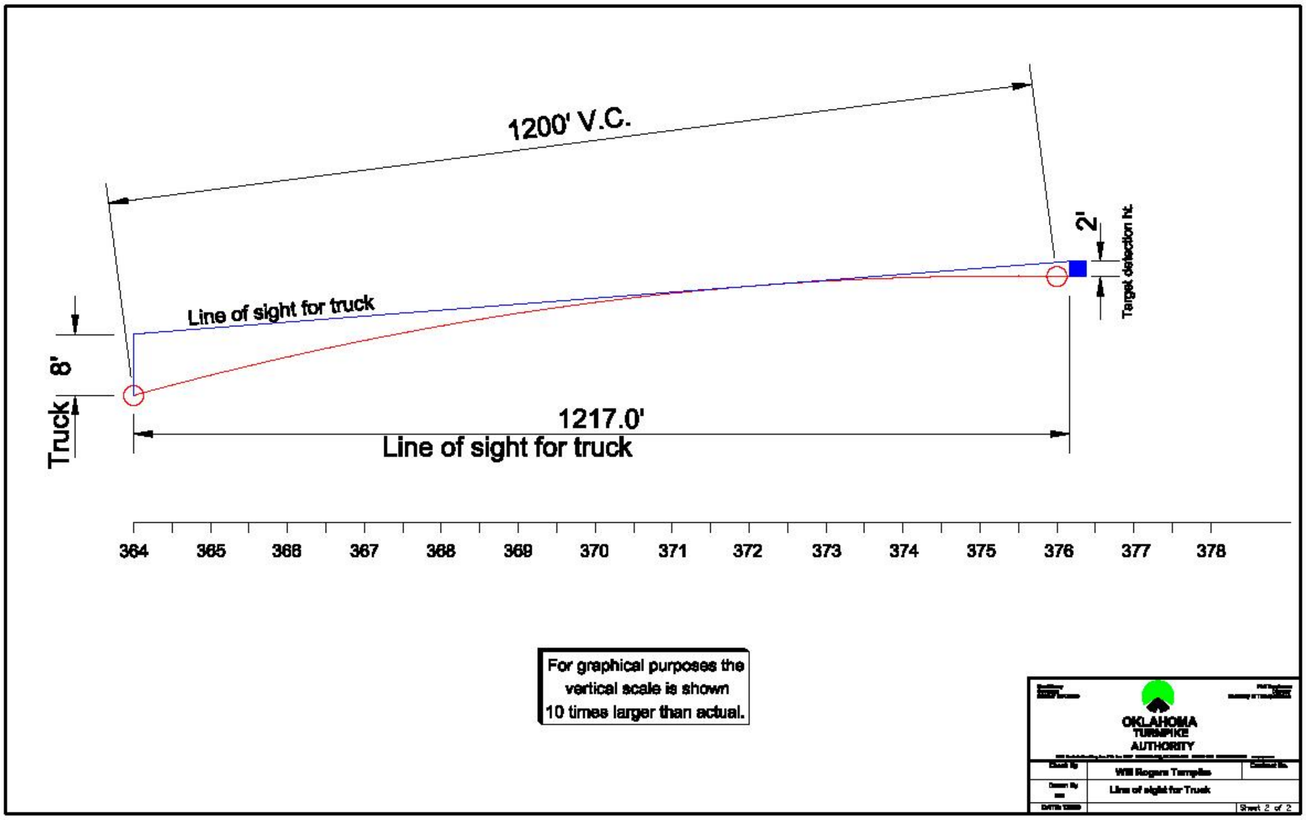
[a] Rate of vertical curvature, K, is the length of curve per percent algebraic difference in intersecting grades (A). $K = L/A$

Exhibit 3-72. Design Controls for Stopping Sight Distance and for Crest Vertical Curves

SIGHT DISTANCE TESTING

Field measurements and observations showed that when the roadway was viewed at the accident site from an eye height of 96 inches a 2.0-foot-tall object height could be seen from the beginning of the crest vertical curve 1,260 feet away. The minimum sight distance from the crest of the vertical curve to the accident site was 4,965 feet. The actual sight distance would have been shorter if the traffic had been backed up further to the area just beyond the crest vertical curve. The following graphics show what the design sight distance of the crest vertical curve was.





The following calculations provide the sight distance for a vertical curve:

Equation 3-41 from Page 267 of 2004 AASHTO Green Book

When S is less the L
S= Sight distance in feet
L=Length of vertical curve

$$L = \frac{[A]S^2}{100\left(\sqrt{2h_1} + \sqrt{2h_2}\right)^2}$$

Solve for S

$$S = \sqrt{\frac{L(100)\left(\sqrt{2h_1} + \sqrt{2h_2}\right)^2}{[A]}}$$

L = 1200 Feet

h_1 = 2.0 feet

h_2 = 3.5 feet for car And 8.0 feet for truck

A = algebraic difference in grades or 2.75-(-.167804) = 2.917804

CAR $S = \sqrt{\frac{1200(100)\left(\sqrt{2(2)} + \sqrt{2(3.5)}\right)^2}{2.917804}}$ =942 Feet

TRUCK S = Equation 3-42 When S is more than L

$$L = 2S - \frac{200\left(\sqrt{h_1} + \sqrt{h_2}\right)^2}{[A]}$$

Solve for S

$$L + \frac{200\left(\sqrt{h_1} + \sqrt{h_2}\right)^2}{[A]} = 2S$$

$$S = 1/2\left(L + \frac{200\left(\sqrt{h_1} + \sqrt{h_2}\right)^2}{[A]}\right)$$

$$= 1/2\left(1200 + \frac{200\left(\sqrt{2} + \sqrt{8}\right)^2}{2.917804}\right)$$

S= 1,217 feet

K= L/A or 1200/2.917804 = 411

As can be seen from the graphic representations and calculations the available sight distance exceeds the recommended sight distance in the 2004 AASHTO publication.

DRY PAVEMENT SKID TESTING

Dry pavement skid testing was performed at the accident site on July 1, 2009 at 12.33 p.m. A "G" Analyst accelerometer recorded an average friction number of 0.77 longitudinal g's at 65 mph with antilock brakes engaged. At 2.57 p.m. a dry pavement skid test was performed at 35 mph with the antilock brakes disengaged on the test vehicle. The sliding test showed the average deceleration was 0.72 g's.

CHANGEABLE OR DISPLAYABLE MESSAGE BOARD SIGN PLANNED IMPROVEMENTS

The OTA responded to NTSB questions about future technological improvements in signing with the following explanation

"Any type of ITS incident warning devices you have planned or approved."

1. We have a joint $1,827,000 DMS construction project with ODOT that currently involves the installation of 9 DMS. Pads and utilities have been installed and the signs should be installed later this summer. 7 of the DMS will be mounted in the medians and 2 on the Turner Turnpike will be shoulder mounted. All of these signs are currently single sided. We plan to mount signs on the other sides in 2011.
   2 on I-35 in OKC prior to entry on the Turner Turnpike

1 on the John Kilpatrick Turnpike in OKC EB prior to entry on I-35 and Turner Turnpike
1 on the west end of the Turner Turnpike prior to entry on I-35 and the John Kilpatrick Turnpike
1 on the west end of the Will Rogers Turnpike prior to entry on I-44and 1-244 in Tulsa and the Creek Turnpike
1 on I-44 in Tulsa prior to entry on US 75 and I 44
1 on I-244 in Tulsa prior to entry on Turner Turnpike and US 66
2 on the Turner Turnpike(shoulder mounted) at Wellston and Kellyville prior to US 66 interchanges

2. The OTA Capital Plan for 2011 has funding provided for erection of DMS on the east end of the Will Rogers for WB traffic and on the southern entrance to the HE Bailey Turnpike. Funding is also provided to complete mounting signs on both sides of the median signs referenced in #1.

3. Also in a joint venture with ODOT and the Oklahoma Corporation Commission a Port of Entry is planned for West Bound MP 326.5. The design phase should commence in 2011 for this facility. It will have the latest size and weight technology, and infrared brake detection equipment.

MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES

The State of Oklahoma has adopted the Federal Manual for Uniform Traffic Control Devices (MUTCD). Part 6 I of the manual provides guidance for the safe movement of vehicles through incident management areas, such as, accidents, by establishing procedures for Temporary Traffic Control (TTC). In the initial accident that caused the traffic queue to develop preceding this accident official first responders did not arrive on scene prior to the fatal accident. The fatal accident occurred at 1:16 p.m. and the first Oklahoma trooper did not arrive on scene until 1:24 p.m. The MUTCD only provides guidance once responders or on scene. However, the manual is provided below so that the reader has an understanding of what responder responsibilities are once they have arrived. As indicated in the text responders should determine the magnitude of the incident, estimate vehicle queue lengths and begin to start providing warning in 15 minutes. A third traffic accident occurred at 1:40 p.m. or about 16 minutes after the first state trooper arrived on scene. This accident involved a truck tractor semi-trailer that skidded into the median barrier and two stopped truck tractor semi-trailers that were stopped about .8 miles from the fatal accident.

MUTCD PART 6I

CHAPTER 6I. CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

Section 6I.01 General

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control". **Standard:**

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

A traffic incident management area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of TTC zone and extends from the first warning device (such as a sign, light, or cone) to the last TTC device or to a point where vehicles return to the original lane alignment and are clear of the incident.

Traffic incidents can be divided into three general classes of duration, each of which has unique traffic control characteristics and needs. These classes are:

A. Major—expected duration of more than 2 hours;
B. Intermediate—expected duration of 30 minutes to 2 hours; and
C. Minor—expected duration under 30 minutes.

The primary functions of TTC at a traffic incident management area are to move road users reasonably safely and expeditiously past or around the traffic incident, to reduce the likelihood of secondary traffic crashes, and to preclude unnecessary use of the surrounding local road system. Examples include a stalled vehicle blocking a lane, a traffic crash blocking the traveled way, a hazardous material spill along a highway, and natural disasters such as floods and severe storm damage.

Guidance:

In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Responders arriving at a traffic incident should, within 15 minutes of arrival on-scene, estimate the magnitude of the traffic incident, the expected time duration of the traffic incident, and the expected vehicle queue length, and then should set up the appropriate temporary traffic controls for these estimates.

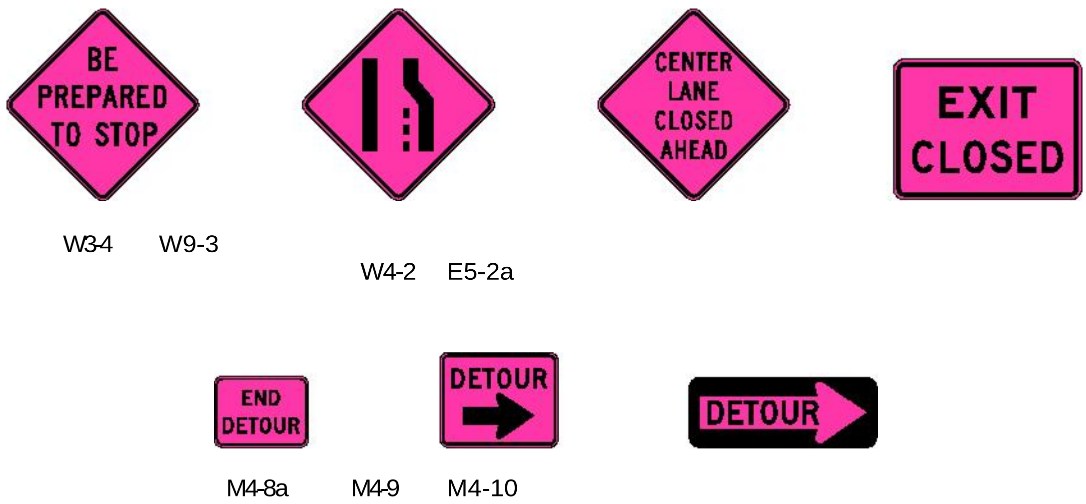
Option:

Warning and guide signs used for TTC traffic incident management situations may have a black legend and border on a fluorescent pink background (see Figure 6I-1).

Support:

While some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders, victims, and other personnel at the site while providing reasonably safe traffic flow. These operations might need corroborating legislative authority for the implementation and enforcement of appropriate road user regulations, parking controls, and speed zoning. It is desirable for these statutes to provide sufficient flexibility in the authority for, and implementation of, TTC to respond to the needs of changing conditions found in traffic incident management areas.

Figure 6I-1. Examples of Traffic Incident Management Area Signs



Option:

For traffic incidents, particularly those of an emergency nature, TTC devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.

Section 6I.02 Major Traffic Incidents

Support:

Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.

Guidance:

If the traffic incident is anticipated to last more than 24 hours, applicable procedures and devices set forth in other Chapters of Part 6 should be used.

Support:

A road closure can be caused by a traffic incident such as a road user crash that blocks the traveled way. Road users are usually diverted through lane shifts or detoured around the traffic incident and back to the original roadway. A combination of traffic engineering and enforcement preparations is needed to determine the detour route, and to install, maintain or operate, and then to remove the necessary traffic control devices when the detour is terminated. Large trucks are a significant concern in such a detour, especially when detouring them from a controlled-access roadway onto local or arterial streets.

During traffic incidents, large trucks might need to follow a route separate from that of automobiles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous material might need to follow a different route from other vehicles.

Some traffic incidents such as hazardous material spills might require closure of an entire highway. Through road users must have adequate guidance around the traffic incident. Maintaining good public relations is desirable. The cooperation of the news media in publicizing the existence of, and reasons for, traffic incident management areas and their TTC can be of great assistance in keeping road users and the general public well informed.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by interagency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for all major traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue. Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic control devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.03 Intermediate Traffic Incidents

Support:

Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by interagency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for intermediate traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.

Section 6I.04 Minor Traffic Incidents

Support:

Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles.

Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Guidance:

When a minor traffic incident blocks a travel lane, it should be removed from that lane to the shoulder as quickly as possible.

Section 6I.05 Use of Emergency-Vehicle Lighting

Support:

The use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. It is often confusing to road users, especially at night. Road users approaching the traffic incident from the opposite direction on a divided facility are often distracted by emergency-vehicle lighting and slow their vehicles to look at the traffic incident posing a hazard to themselves and others traveling in their direction.

The use of emergency-vehicle lighting can be reduced if good traffic control has been established at a traffic incident scene. This is especially true for major traffic incidents that might involve a number of emergency vehicles. If good traffic control is established through placement of advanced warning signs and traffic control devices to divert or detour traffic, then public safety agencies can perform their tasks on scene with minimal emergency-vehicle lighting.

Guidance:

Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to on-coming road users.

Vehicle headlights not needed for illumination, or to provide notice to other road users of the incident response vehicle being in an unexpected location, should be turned off at night.

This report consists of the following documents:

1.	Highway Group Chairman's Factual Report	17 Pages
2.	Attachment A Traffic Counts	02 Pages
3.	Attachment B Turnpike Accident History	34 Pages
4.	Attachment C Speed Survey	03 Pages
5.	Attachment D Turnpike Design Plans	09 Pages
6.	Attachment E Oklahoma Highway Patrol Accident Report	46 Pages
7.	42 Color Photographs	

//END of REPORT///////////////////////////////////////