# Can Lessons Be Learned From Litigation?

Richard A. Bragg

Hugh L. Davidson

# Overview of Session

- Part 1: An Engineer's Perspective on Litigation – Hugh Davidson
- Part 2: Example of lessons Learned from Litigation – Al Bragg
- Part 3: Example of Lessons Learned from Litigation – Hugh Davidson
- Part 4: What Can Be Learned from Litigation – A Personal Opinion – Al Bragg

# Part 1 –An Engineer’s Perspective on Litigation

# Introduction

- An engineering firm or highway agency is sued - Tort Litigation.
  - A tort (from the French word for “wrong”) is simply a civil wrong - compensate a “grieving party.”
  - Such litigation often results from a traffic accident.

- Purpose of tort litigation –is not to further highway safety - but, plaintiff’s attorneys to juries (“SEND A MESSAGE TO PENNDOT”).

- Unintended up side of litigation - can potentially learn valuable lessons for improved highway design, construction and maintenance.

# The Litigation Process

- Complaint and defendant response – discovery – trial.
- Lawsuit involving technical Issues - “expert opinion” is permitted.
  - Opinions are offered by an “expert witness.”
  - Lay witnesses offer “facts” not “opinions.”
  - In Pennsylvania - expert witnesses typically are not deposed – are required to prepare a report.
  - In Federal Court and in state courts of some states - experts will typically be deposed.

# Expert Witnesses

- Who can be an expert witness in Pennsylvania Common Pleas Court?
  - “A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
    - The expert’s scientific, technical, or other specialized knowledge is beyond that possessed by the average layperson;
    - The expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact at issue; and
    - The expert’s methodology is generally accepted in the relevant field.”

# Expert Witnesses

- An engineering expert in highway litigation can offer opinions on the following:
  - Was there a defect in the design, construction and/or maintenance of the highway?
  - Was that defect causal in the accident in question?
    - Causation – expert may “reconstruct” what happened in the accident.

# Role of an Attorney in Litigation

- Is an attorney required to be an advocate for his/her client?

# Role of an Expert in Litigation

- Is an expert required to be an advocate for his/her client?
- Is an expert permitted to be an advocate for his/her client?
- Is an expert required to present independent, professional opinions?
- Are experts often advocates for their clients, offering non-professional opinions?
- Can an expert offer a “personal” opinion that is at odds with consensus guidelines, standards or practices?

# How Many Deaths Does it Take to Question "Standard Practice"? - Bill Schultheiss, P.E. PE Magazine, December 2018

The expert’s methodology is generally accepted in the relevant field.

# Part 2 – Example (Al Bragg)

# Case 1

## Starr v. Veneziano v. PennDOT v. Richland Township

Allegheny County, PA


Click to travel back in time.
1993
2016
Cunningham Rd
8
William Flynn Hwy
Sandy Hill Rd
Image U.S. Geological Survey
Google Earth
1993
Imagery Date: 4/26/1993 40°39'50.11" N 79°56'02.65" W elev 1227 ft eye alt 2151 ft


4/1993
Bellefield Dr
Corey Dr
Cunningham Rd
Glasgow Rd
William Flynn Hwy
8
Heckert Rd
Tractor Ln
Sandy Hill Rd
Estates Dr
Image U.S. Geological Survey
Google Earth
1993
Imagery Date: 4/26/1993 40°39'50.90" N 79°56'01.80" W elev 1227 ft eye alt 4179 ft


4/2002
Cunningham Rd
8
William Flynn Hwy
Sandy Hill Rd
Image © 2019 Maxar Technologies
Google Earth
1993
Imagery Date: 4/12/2002 40°39'50.11" N 79°56'02.65" W elev 1227 ft eye alt 2151 ft


45


STOP

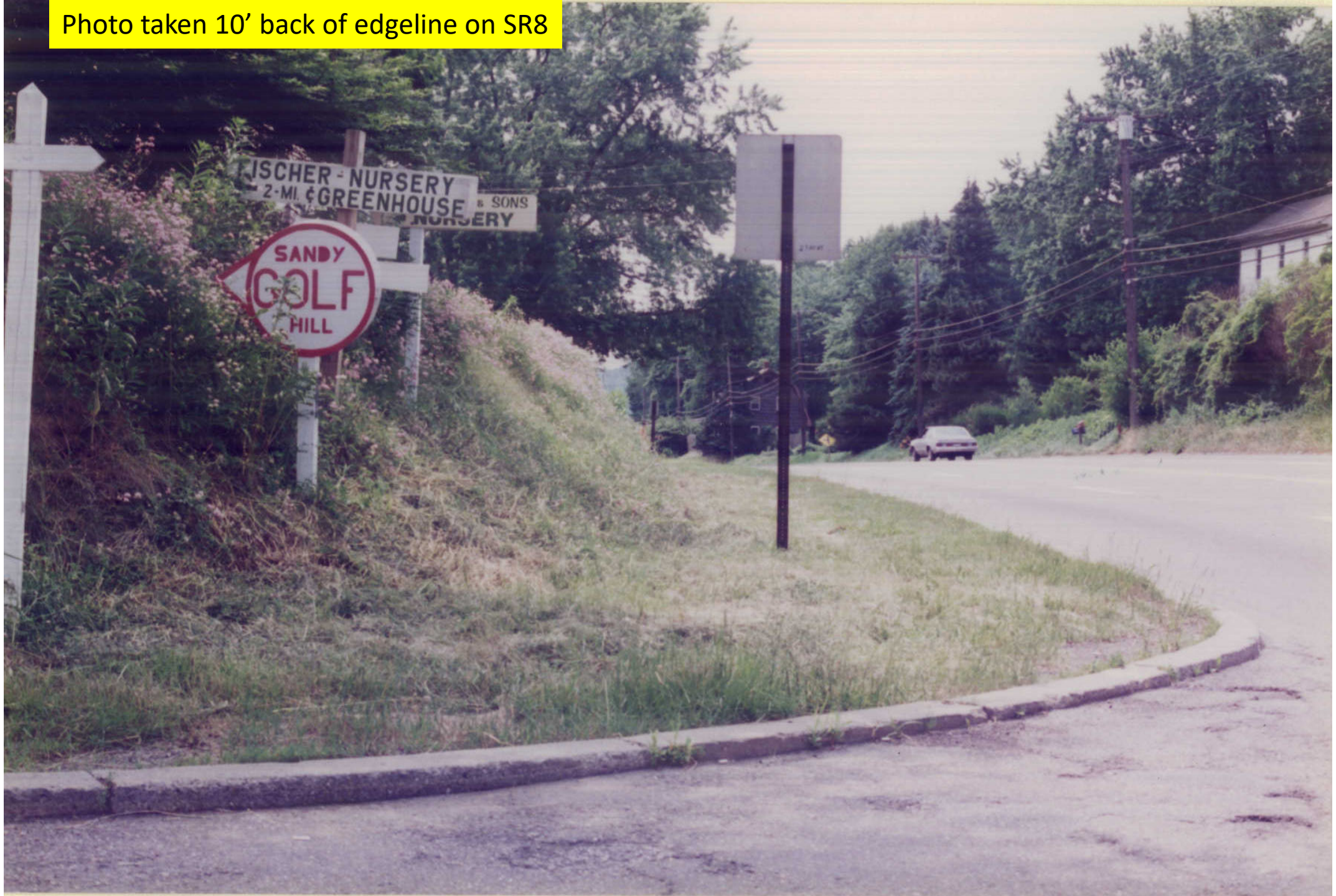


Photo taken 10’ back of edgeline on SR8
ISCHER - NURSERY
2-MI. ¢GREENHOUSE
& SONS
SANDY
GOLF
HILL

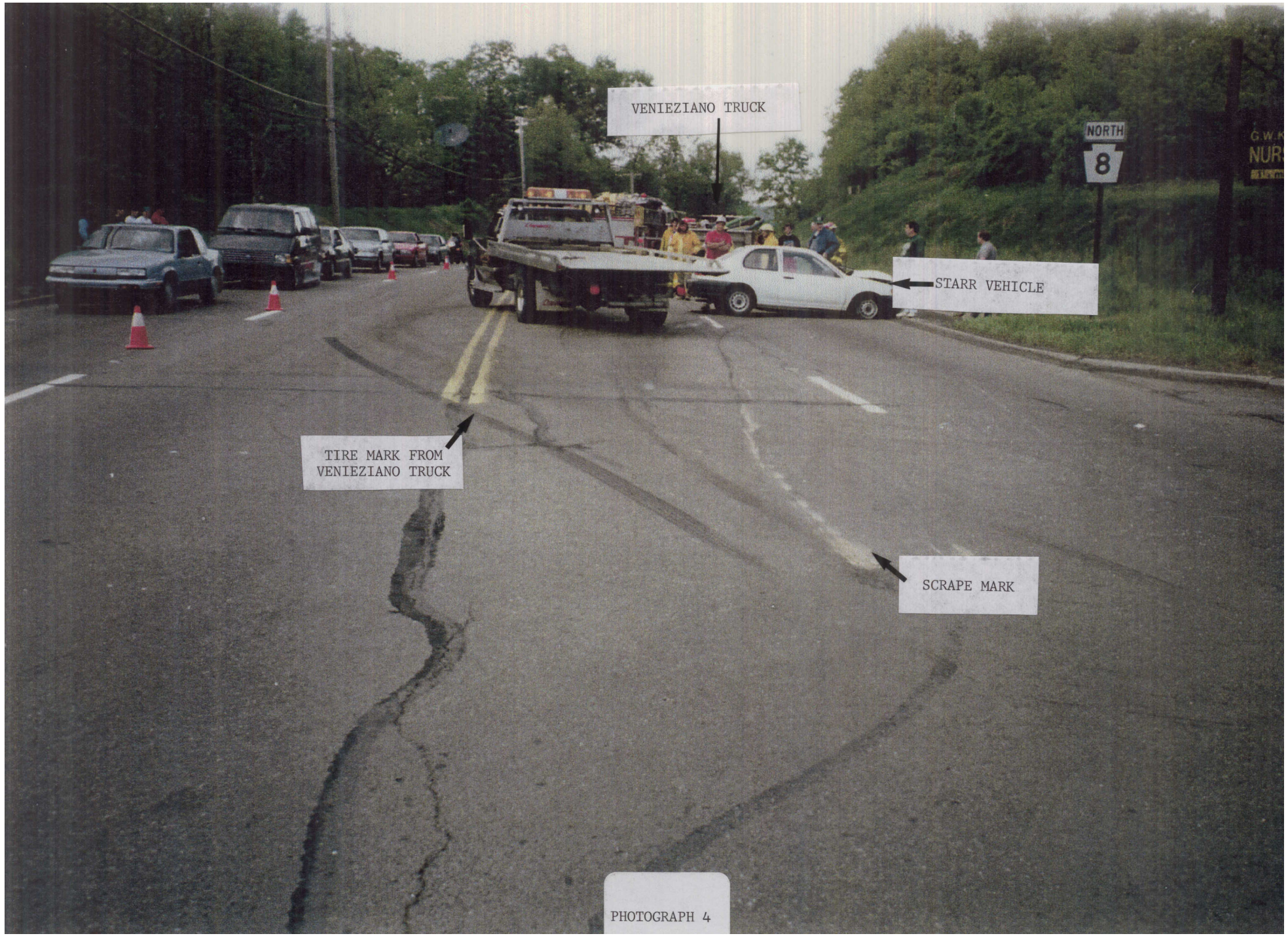
# Accident Description

- 2-vehicle accident at the intersection of State Route 8 (SR8) and Sandy Hill Rd. in Richland Township, Allegheny County, PA on May 20, 1993.
- SR8 is a 4-lane asphalt roadway with 2 northbound and 2 southbound lanes separated by a double-yellow centerline
  - Posted Speed Limit is 45 mph.
- Sandy Hill Rd. intersects SR8 from the east and is a 2-lane asphalt roadway carrying traffic in east-west direction. The centerline and edges of the roadway are unmarked.
  - Posted Speed Limit is 25 mph
  - STOP sign posted for westbound motorists.

- Ms. Starr was attempting to make a left turn from Sandy Hill Rd. to travel south on SR 8 (1992 Toyota Tercel).

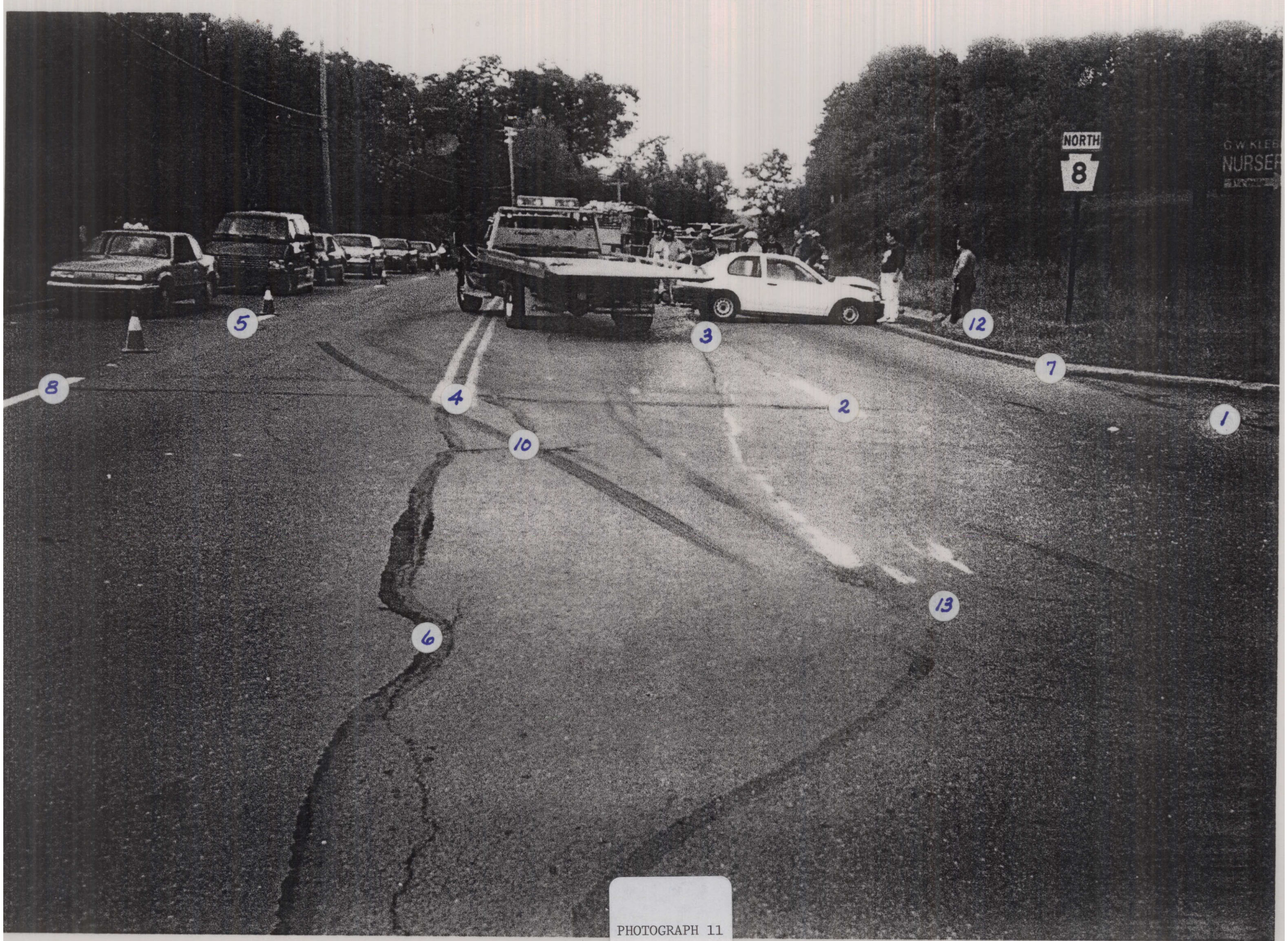
- Mr. Veneziano was traveling in left northbound lane (Ford F-350 Super Duty truck with dump bed).

- The truck struck the left (driver's) side of the Toyota automobile.




PHOTOGRAPH 4


PHOTOGRAPH 10




PHOTOGRAPH 11

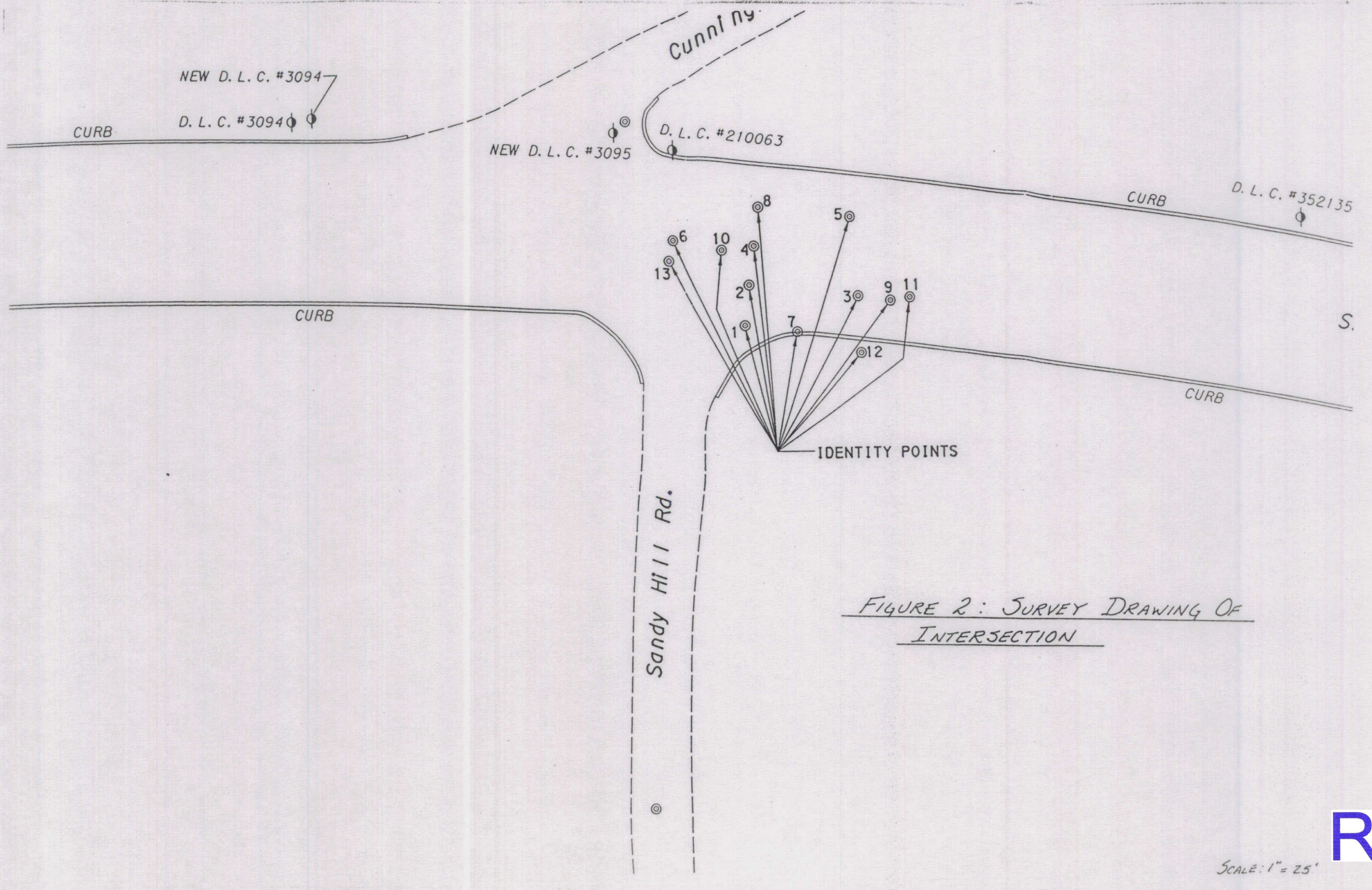



FIGURE 2: SURVEY DRAWING OF INTERSECTION

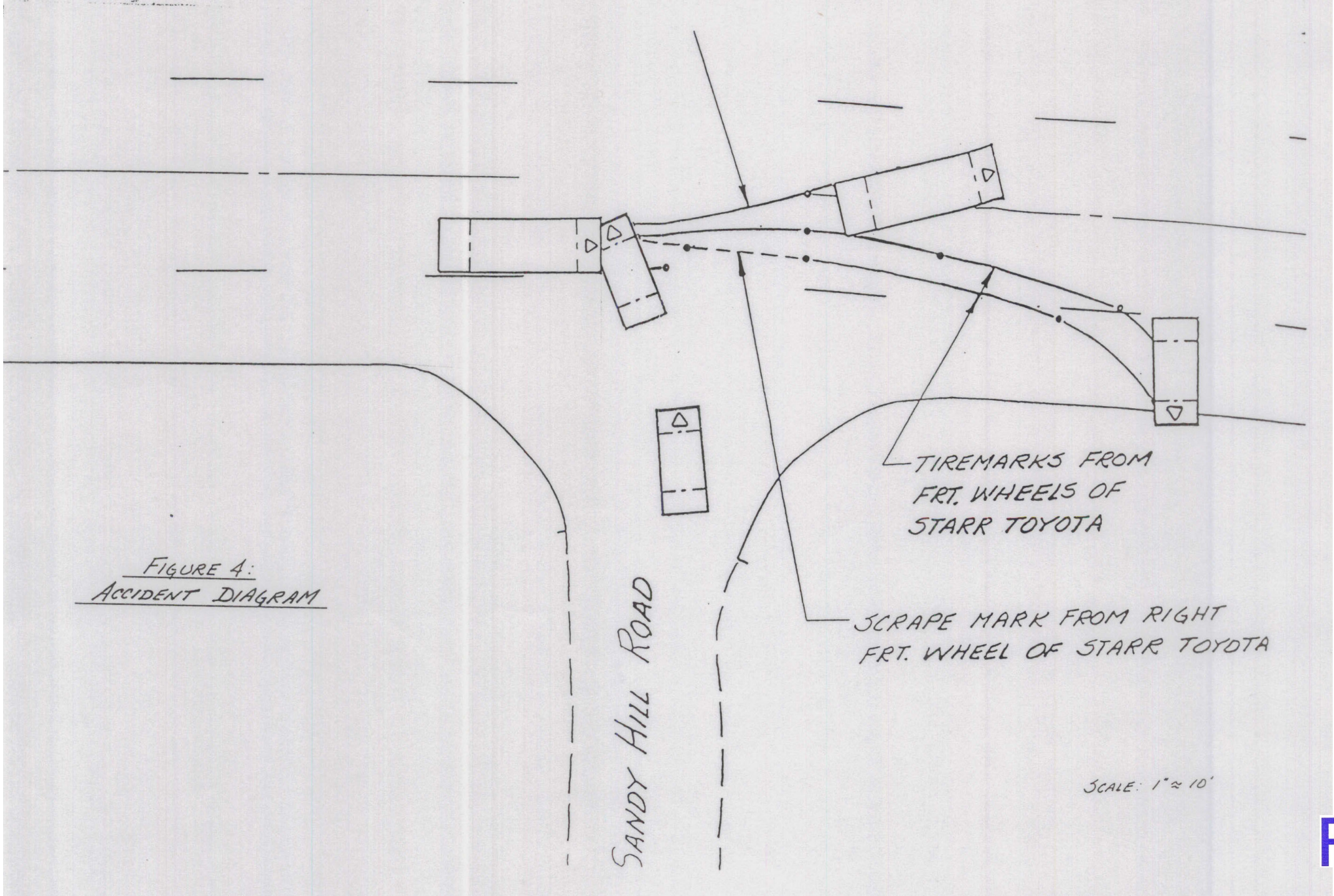



FIGURE 4:
ACCIDENT DIAGRAM

# Accident Reconstruction

- Computer-aided reconstruction to determine speeds of vehicles at impact:
  - EDCRASH – Engineering Dynamics Corporation Reconstruction of Accident Speeds on the Highway.
  - EDSMAC – Engineering Dynamics Simulation Model of Automobile Collisions.
  - V(Toyota TercelI) = 13 to 14 mph

    V(F350) = 38 to 41 mph.
    - Used speeds obtained from EDCRASH in simulation analysis with EDSMAC (simulation closely matched actual trajectories of vehicles).

Cont.

- Time for Tercel to reach P.O.I. after starting to accelerate (d ≅ 27 feet, V = 13 to 14 mph at impact):
  - Acceleration ≅ 0.2g = 6.44 ft/sec²
  - T ≅ 2.7 to 2.9 sec to P.O.I
  - T(with reaction) ≅ 1+ (2.7 to 2.9)
    - To move foot from brake to accelerator ≅ 1 sec

# Evaluation of Sight Distance

- Measured Corner Sight Distance to left from Sandy Hill Road (10 feet back of edgeline of SR8, Eye Height = 3.5', Target Height = 3.5').
  - SD (right NB lane) ≅ 325 feet
  - SD (left NB lane ) ≅ 420 feet.

- Distance to truck when Ms. Starr reacted to pull out:
  - $d_{(truck)}$ ≅ 218 to 223 feet
  - Truck was within available sight distance when Starr began to react to pull out.
  - Truck would have entered line-of-sight of Starr ~ 3.5 seconds before she initiated action to pull out.

Cont.

- Recommended Corner Sight Distance:
  - AASHTO, A Policy on Geometric Design of Highways and Streets, 1990, for passenger vehicle on 4 lane highway

    SD (left) ≅ 450 feet.

- PennDOT Minimum for Existing Roadway:
  - Stopping Sight Distance on Major Roadway ≅ 360 feet.

# History of Traffic Signal:

- As early as January 1967, letters of concern were received by PennDOT about the safety of the intersection.
- Some mention in discovery materials of regrading of the northeast and/or southeast quadrant of the intersection by Richland Township or PennDOT around 1968.
- A petition was circulated in 1968 requesting safety improvements be made at the intersection. In 1991, a second petition from concerned citizens (signed by 40 people) was submitted to the Richland Township Board of Supervisors requesting that PennDOT conduct a safety study.
- A total of 3 similar accidents were reported at the intersection between 1986 and 1990.

Cont.

- In September 1991, PennDOT conducted a traffic study. Warrants for a traffic signal were not met.
- In May 1994, PennDOT conducted a traffic study. Warrants for traffic signals were not met.
- In August 1994, a local resident submitted survey of local residents concerning their use of intersection if signal was installed.
- September 1994, PennDOT reviewed survey of residents and concluded that peak hour warrant could be satisfied based on survey.
- 1995 traffic signal installation was partially funded by PennDOT.
- At trial, judge allowed the installation of traffic signal into evidence (improvements made after the event are usually excluded from evidence).

# Outcome of Case at Trial:

- Jury awarded $5 million against PennDOT and Richland Township.
- Plaintiff's attorney argued a case of Civics 101. Accident occurred because two government agencies unable to take action:
  - Township refused to prohibit left turns
  - PennDOT unwilling to install traffic signal
- PennDOT paid statutory limit.

cont.

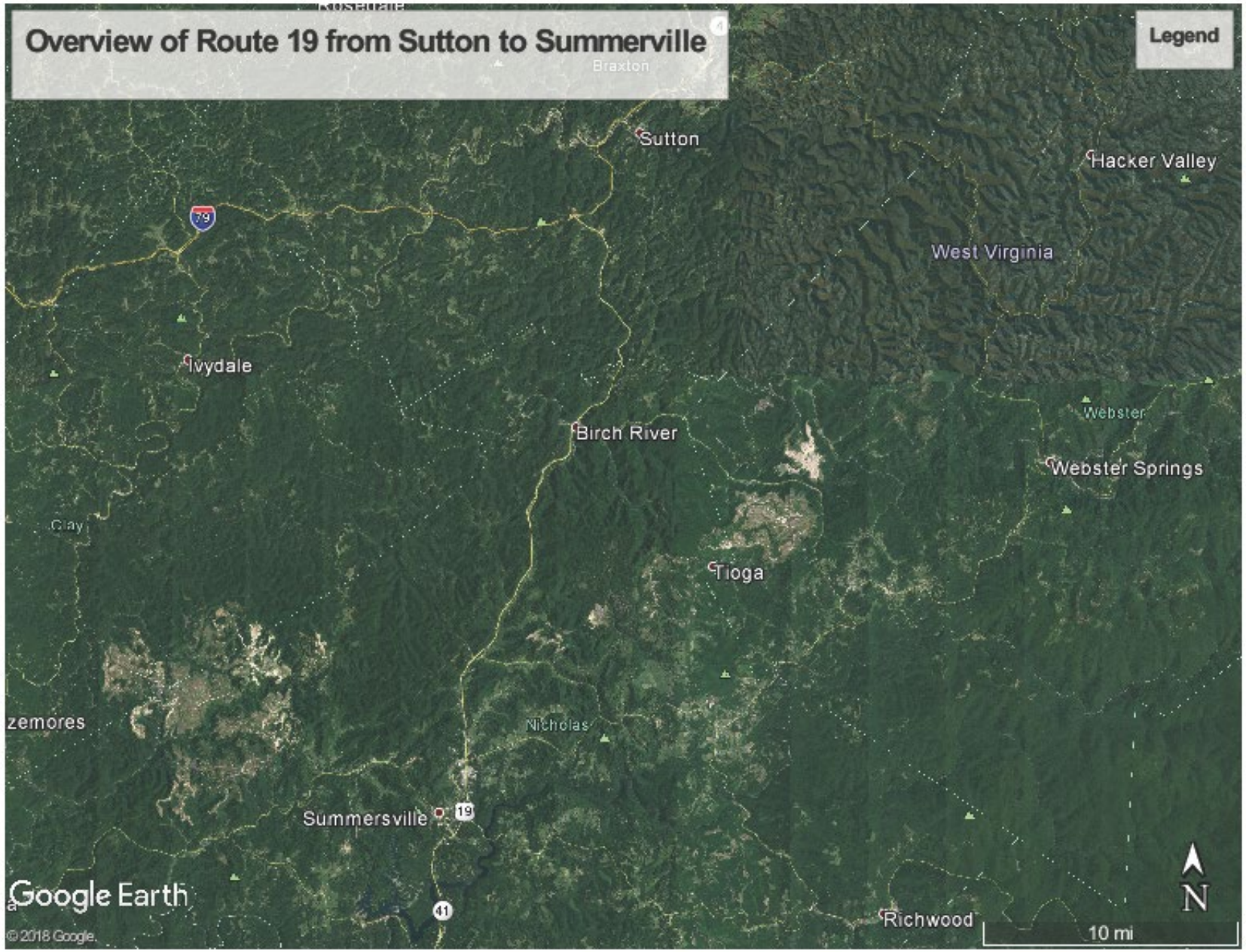
Cont.

- Township appealed the case to Pennsylvania Supreme Court.
  - Plaintiff's expert opined that left-turns should have been prohibited, but did not conduct a study to assess feasibility of prohibition.
  - Testimony of Plaintiff's expert in that regard was dismissed. No feasible solution was presented by plaintiff's expert.
  - Jury's verdict against the township was reversed.

# Part 3 – Example (Hugh Davidson)

# Case 2

## An Accident in a Construction Zone


Overview of Route 19 from Sutton to Summerville
Legend
Braxton
Sutton
Hacker Valley
West Virginia
79
Ivydale
Webster
Birch River
Webster Springs
Clay
Tioga
zemores
Nicholas
Summersville
19
41
Richwood
Google Earth
© 2018 Google
N
10 mi

# Specifics of the Construction Project

- The project – two-lane highway changed to a controlled-access, four-lane, divided highway, plus a climbing lane going up Powell Mt. in both directions.
- The specific contract in question involved 1.3 miles spanning the crest of Powell Mt.
- This contract was divided into four phases.
- Phase IV was a long-term, semi-permanent phase.
- The accident occurred during Phase IV.

# Phase IV

- Included a transition from three Lanes southbound to one lane.
- No construction was done in this phase.
- Once the contractor completed the Phase IV traffic control setup, his work was finished.
- Phase IV was to last for months.

# The Issues

- Was the traffic control setup negligently designed?
- If so, was this negligent design causal in the accident?
- Professional responsibility.


7400 Ft. North of Crest, Looking South
Legend
Google Earth
© 2018 Google
© 2019 Google
8.23 ft


2100 Ft. North of Crest, Looking South
Legend
Google Earth
©2018 Google
©2019 Google
N
8.24 ft


1450 Ft North of Crest, Looking South
Legend
RIGHT LANE ENDS
1000 FT
RIGHT LANE ENDS
1000 FT
Google Earth
©2018 Google
©2019 Google
N
8.14 ft


840 Ft North of Crest, Looking South
Legend
Google Earth
©2018 Google
©2019 Google
N
8.24 ft


At Crest of Powell Mt., Looking South
RIGHT LANE ENDS
Legend
Google Earth
© 2018 Google
© 2019 Google
N
8.24 ft


1270 Ft. South of Crest, Looking South
Legend
Google Earth
© 2018 Google
© 2019 Google
N
10 ft


2600 Ft. South of Crest, Looking South
Legend
Google Earth
© 2018 Google
© 2019 Google
N
10 ft


RIGHT
TWO LANES
CLOSED
AHEAD
7 3'98


7 3'98


7 3'98


RIGHT LANE
ENDS
1000 FT
7 3'98


7 3'98


RIGHT LANE
ENDS
RIGHT LANE
CLOSED
RIGHT LANE
CLOSED
7 3'98


6 27'98

# Does Anyone Have Concerns About the Traffic Control Setup?

# These are my Concerns

- Permanent warning signs are not covered, and there is some conflict with temporary warning signs.
- There are no Type B  (flashing) lights on the first warning signs.
- There are no arrow boards at the starts of the two lane closures.

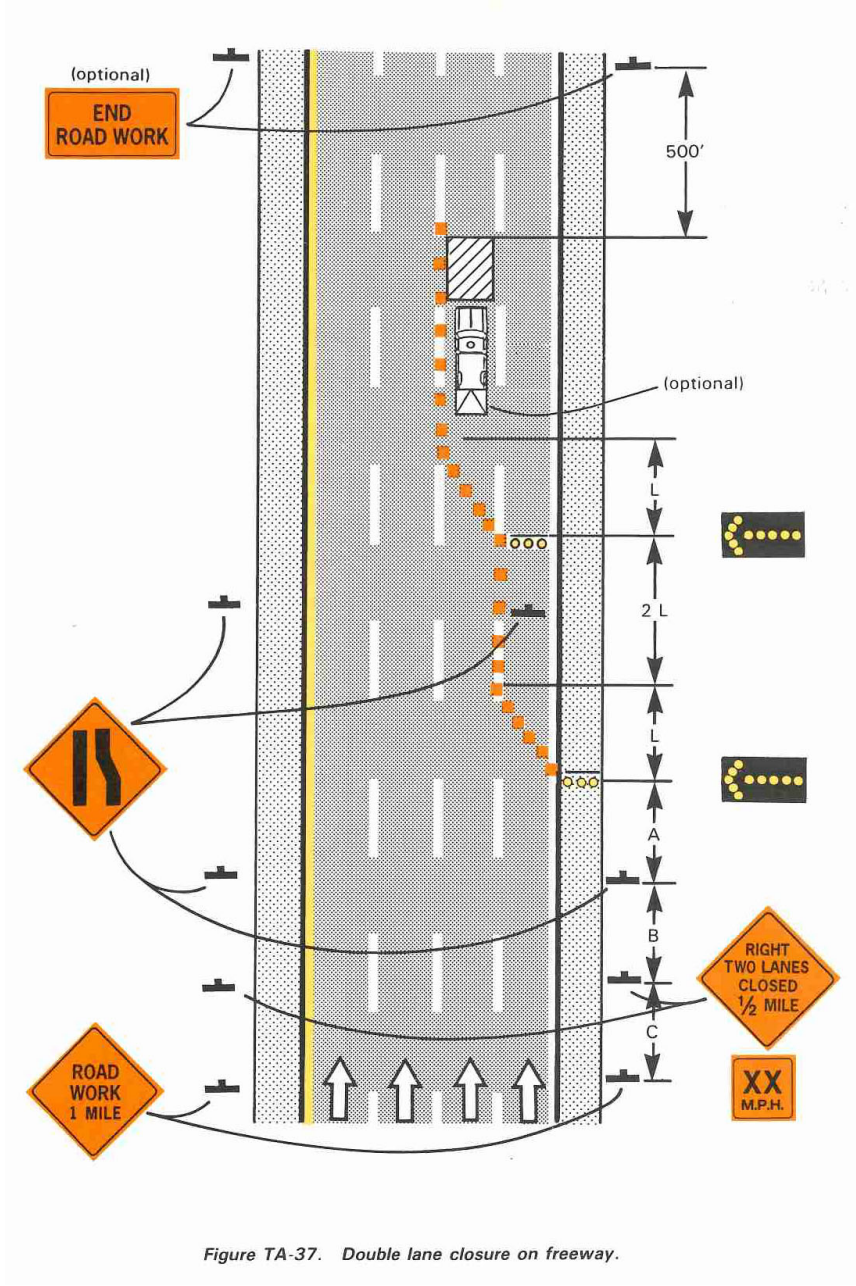
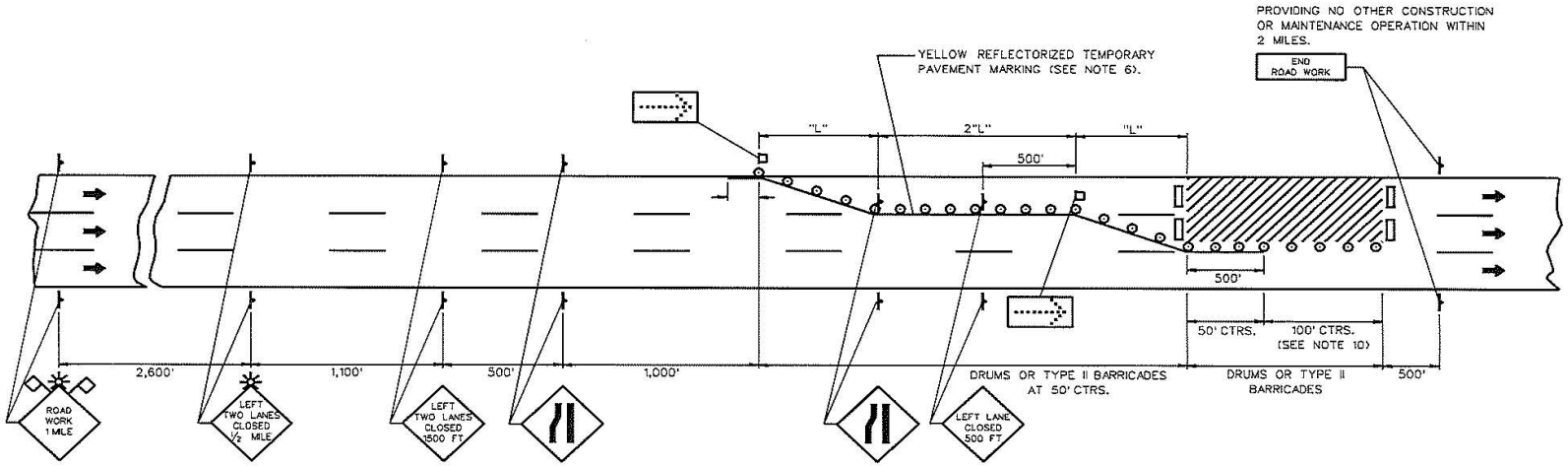



*Figure TA-37. Double lane closure on freeway.*

1988 Ed. MUTCD, Rev. 3, September 3, 1993, Part IV, Standards and Guides for Traffic Control for Street and Highway Construction, Maintenance, Utility, and Incident Management Operations




## GENERAL NOTES

### SYMBOLS

- WORK AREA.
- SIGN WITH 18 IN. BY 18 IN. (MINIMUM) ORANGE FLAGS ATTACHED. (2 FLAGS PER SIGN) AND TYPE 'B' LIGHT (AS REQUIRED).
- TYPE III BARRICADES.
- SIGN ON PORTABLE OR PERMANENT SUPPORT.
- CHANNELIZATION DEVICE.
- ELECTRIC ARROW

### TYPICAL APPLICATIONS

PAVEMENT REPAIR
SLIDES
BRIDGE DECK REPAIRS

1. THE "L" DISTANCE EQUALS THE TAPER LENGTH.

| NORMAL POSTED SPEED M.P.H. | MINIMUM TAPER LENGTH (FOR 12' CLOSURE) FEET |
|---|---|
| 65 | 800 |
| 60 | 725 |
| 55 | 650 |
| 50 | 600 |
| 45 | 550 |
| 40 OR LESS | 350 |

2. OVERNIGHT OPERATIONS ILLUSTRATED, AND IF SUCH, USE DRUMS. FOR DAYLIGHT OPERATIONS ONLY, DELETE TYPE 'B' LIGHTS (MAY ALSO SUBSTITUTE CONES FOR DRUMS).
3. WHEN CONSTRUCTION OPERATIONS CAUSE EQUIPMENT TO ENCROACH ON THE TRAVELED WAY, A FLAGGER WILL BE REQUIRED IN THE WORK ZONE WITH A FLAGGER SIGN PLACED 500' IN ADVANCE OF THE FLAGGER.
4. THIS CASE ALSO APPLIES WHEN WORK IS BEING PERFORMED IN THE TWO LANES ADJACENT TO THE SHOULDER ON A DIVIDED HIGHWAY. UNDER THESE CONDITIONS ALL SIGNS SHALL BE CHANGED TO REFLECT THE CLOSURE OF THE RIGHT LANES.
5. ALL SIGNS EXCEPT THOSE IN ROADWAY SHALL BE POST MOUNTED IF CLOSURE TIME EXCEEDS SEVEN DAYS.
6. REFLECTORIZED TEMPORARY PAVEMENT MARKING MAY BE OMITTED IF CLOSURE TIME IS LESS THAN SEVEN DAYS.
7. WHEN A SIDE ROAD INTERSECTS THE HIGHWAY ON WHICH WORK IS BEING PERFORMED OR MAINLINE OPPOSITE DIRECTION IS AFFECTED, ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE ERECTED AS DIRECTED BY THE ENGINEER.
8. ALL VEHICLES, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE RESTRICTED AT ALL TIMES TO THE WORK AREA SIDE OF THE TRAFFIC CONTROL DEVICES UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.
9. CARE MUST BE TAKEN TO INSURE 24 HOUR OPERATION OF THE ELECTRIC ARROW. THEY SHALL BE POSITIONED BEHIND THE CHANNELIZATION DEVICES AND SHALL NOT BE AN UNPROTECTED OBJECT TO THE MOTORIST. MINIMUM SIGHT DISTANCE IS 1,000 FT.
10. DEVICES SPACED AT 50' CENTERS SHALL BE USED TO SUPPLEMENT DEVICES SPACED AT 100' CENTERS WHEN WORK IS PERFORMED IN THIS AREA.

### CASE E5

MULTILANE, ONE WAY TRAFFIC, OPERATIONS

WHERE AT ANY TIME ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ANY PORTION OF THE TWO LANES IMMEDIATELY ADJACENT TO THE SHOULDER OR MEDIAN.

Traffic Control for Street and Highway Construction and Maintenance Operations, Traffic Engineering Division, West Virginia Division of Highways, November 1994

# What Happened in the Accident?


3'98


6 27 98


STEAM CLEANING
304-877-

# Drivers' Descriptions of the Accident

## Truck Driver

He was in the right-most lane. As he started to merge into the center and left lanes, he saw headlights behind him. He then moved into the left-most lane, and at that time the other vehicle was 1/8 to 1/4 mile behind him. The vehicle behind him went into the median and passed him. It then made a hard right turn and came across the road in front of him.

## Toyota Driver

She was in the left lane and saw the truck in the right slow lane. She was passing the truck and didn't realize the lanes were changing. The truck turned into her lane. She deliberately steered into the median to avoid the truck, and at some point steered back onto the road surface. The car started to spin and then rolled onto its roof.

# Are These Causal Conditions?

## Truck Driver's Description

- Permanent warning signs are not covered, and there is some conflict with temporary warning signs - **NO**
- There are no Type B (flashing) lights on the first warning signs - **NO**
- There are no arrow boards at the starts of the two lane closures - **NO**

## Toyota Driver's Description

- Permanent warning signs are not covered, and there is some conflict with temporary warning signs – **Can't Know**
- There are no Type B (flashing) lights on the first warning signs – **Can't Know**
- There are no arrow boards at the starts of the two lane closures - **YES**

# Did the Traffic Control Setup Conform with the Maintenance and Protection of Traffic Plans for the Contract?

- Other Than the Conflicting Permanent and Temporary Signs – Yes.
  - Plans Did not Require Type B lights.
  - Plans Did not Require Arrow Boards.

# Arrow Boards

- They were used in other contracts and in other phases of this contract.
- Here's what West Virginia's Traffic Control Manual for Construction has said in the past:
  - "At night, they are effective where other control devices cannot provide adequate advance warning of a roadway path diversion."

# Why Didn’t the Design Consultant Specify Arrow Boards in Phase IV?

# What Would You Have Done?

# Part 4 –What can be Learned from Litigation – a Personal Opinion (Al Bragg)

# A Broad Question: Has litigation had a net positive impact on engineering design?

- The constructed and manufactured environment we live in is probably somewhat safer because of litigation.

# Caveats Concerning Litigation

- Litigation may offer lessons to engineers/constructors/maintainers of highways, but not in all cases. For example:
  - A jury (or judge) will not always reach a rational decision.
  - Litigation should not alter good design/construct/maintain practices.
  - In Pennsylvania, the Department of Transportation cannot argue that its budget constraints are responsible for not upgrading a highway to current standards, even though these constraints are very real.
  - Problems with expert testimony.
  - Litigation may stifle innovation.
  - Litigators often treat safety as an absolute, whereas most design can be considered to be a trade-off between cost, efficiency and safety.

# Some Specific Lessons

- Design practices in conformance with national guidelines and state guidelines are rarely challenged in court.
- We have never been involved in litigation in which such guidelines have been challenged.
- If one deviates from these guidelines, the reason should be well thought out, and be documented.
- No guidelines or standards can cover all situations one might encounter in highway design.  Design decisions made in this context also should be well documented.

# Some Specific Lessons (continued)

- Upgrades of old highways, when some aspects of the highway have been brought up to current standards and some have not, are a ripe area of litigation.
  - This practice is, of course, perfectly reasonable and reflects real-world budget constraints; it should not be changed because it is a source of litigation. However:
    - Document reasons to include some updates and not others.
- Maintenance is a constant source of litigation, but:
  - Is hard for a plaintiff to make a case if national guidelines and state guidelines have been followed. However:
    - In my experience, these guidelines are sometimes not clearly followed, or if followed, not well documented.

# • Some Specific Lessons (continued)

- Even if a design is defective, that doesn't necessarily mean it caused a specific accident.
- Should a warrant, for the installation of a traffic signal, be added to address limited sight distance?
- You (who signed and sealed the drawings) own the design, even if the client put a gun to your head.

# The End