# AIGA 2006 Meeting

# *TRANSPORTATION SAFETY*



***12-13 SEPTEMBER 2006***
***SHANGHAI***

**Asia Industrial Gases Association**

# Accident Investigation / Road Vehicle Recovery

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**Air Products Asia**

An investigation is an In-Depth Analysis of the accident intended to provide understanding of:

*HOW?*

*WHEN?*

*WHY?*

# Goals of an Investigation

- **Preventing recurrence by determining causes.**
- **Protecting against excessive financial liability.**
- **Providing an adequate and fair basis for driver discipline.**

# Supplies Needed

- **Measuring wheel**
- **30 meter measuring tape**
- **Chaining pin to hold end of tape**
- **Spray paint and marking crayon**
  - **Several colors; be prepared to use different color than police.**
- **Pocket notebook and tablet or graph paper**
- **Micro-cassette recorder and camera ( w/ spare batteries)**
- **Flashlight**
- **Business cards**
- **Witness cards**
- **Cell phone**

# Witness Card

WITNESSES

Name_____

Address_____

Phone Number_____

Name_____

Address_____

Phone Number_____

# Area of Investigation

- **Walk / drive and closely examine the path of travel for each vehicle involved in the collision.**
- **Start 150-300 meters back**
- **Look for marks on road**
- **Disturbance to any roadside material**
- **Damage to fixed objects**
- **View at driver eye level**
- **Observe as close to same time of day as accident occurred**
- **Photograph any and or all of the above**

# What contributing factors should be recorded?

- **Roadway conditions such as slopes, curves, and markings.**
- **Surface conditions such as ruts, holes, and bumps.**
- **Weather conditions and time of day.**
- **Any thing that would distract drivers attention**

# Evidence Recording

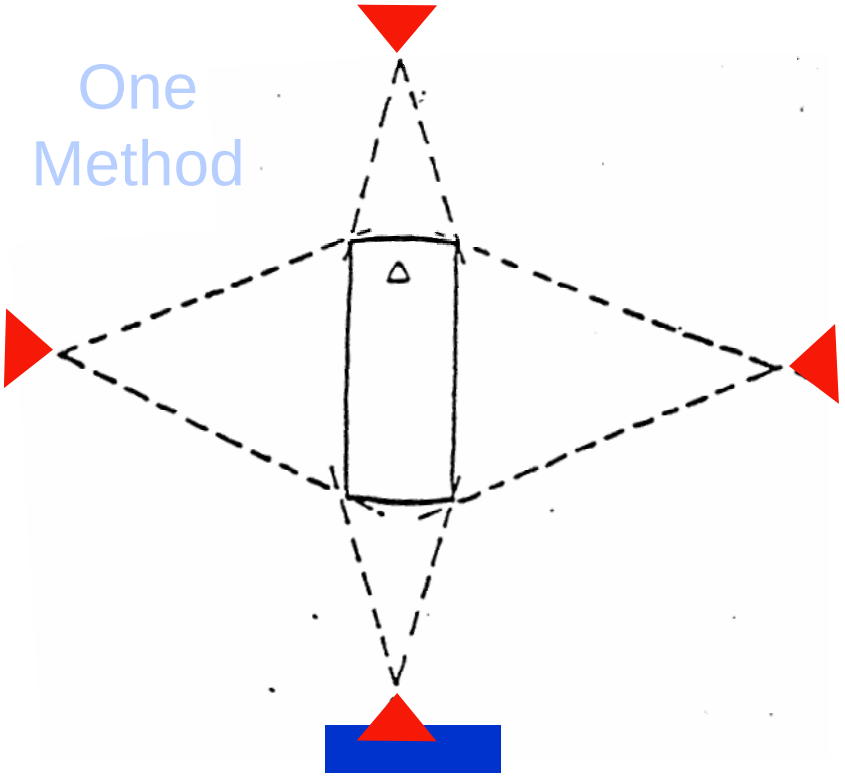
- **Get drivers' statements of what happened.**
- **Record statements from all witness even if statements conflict.**
  - **Keep witnesses separated when interviewing**
  - **Establish a warm and professional atmosphere**
  - **Your first impression will set the limit of how much info will be gained**
  - **Listen more than you speak**
  - **Note from where did the observation occur**
- **The number of vehicles involved and the conditions.**
  - **Distinguish old damage from new**
  - **Record condition of tires, windows, and interior**
  - **Most effective information about vehicles can be recorded by photographs**
- **Metal scars, tire skid marks, and yaw marks. Need size, location and description.**

# Photographs

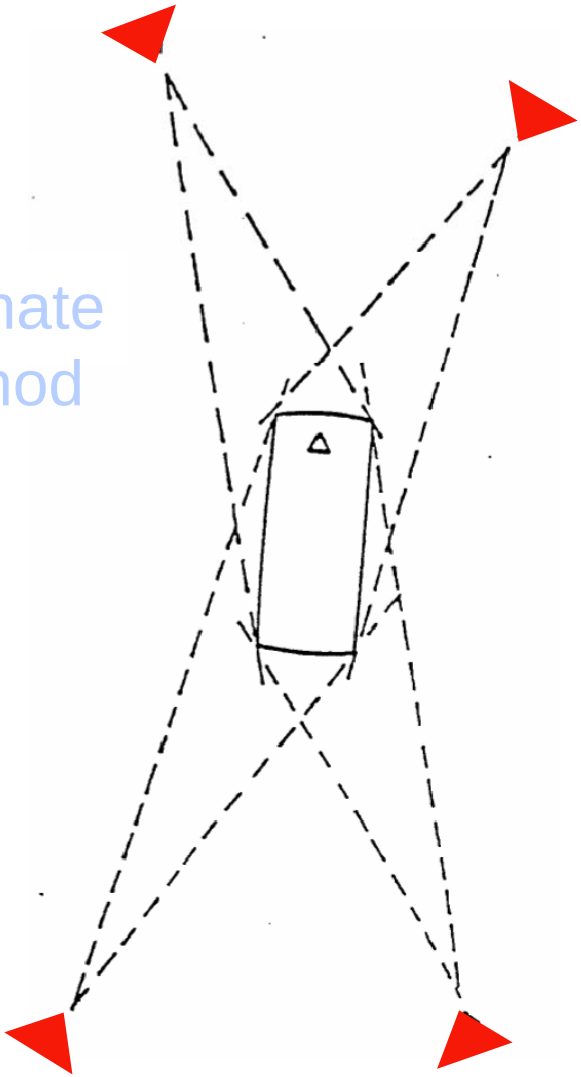
- **Taking a picture and photographing a specific item are two different things.**
- **Take pictures of the accident scene at distances to cover the whole scene from all four sides.**
  - **Determine direction of vehicles and tire marks**
  - **Final resting point of vehicles**
  - **Establish lane markings and traffic control devices.**
- **Photograph specific items up close.**
  - **Interior of vehicles / instrument panels / operating controls.**
  - **Point of impact, fluid, gouges, and scratches on pavement.**
  - **Debris– short lived evidence and if not documented immediately any information it provides can be lost.**

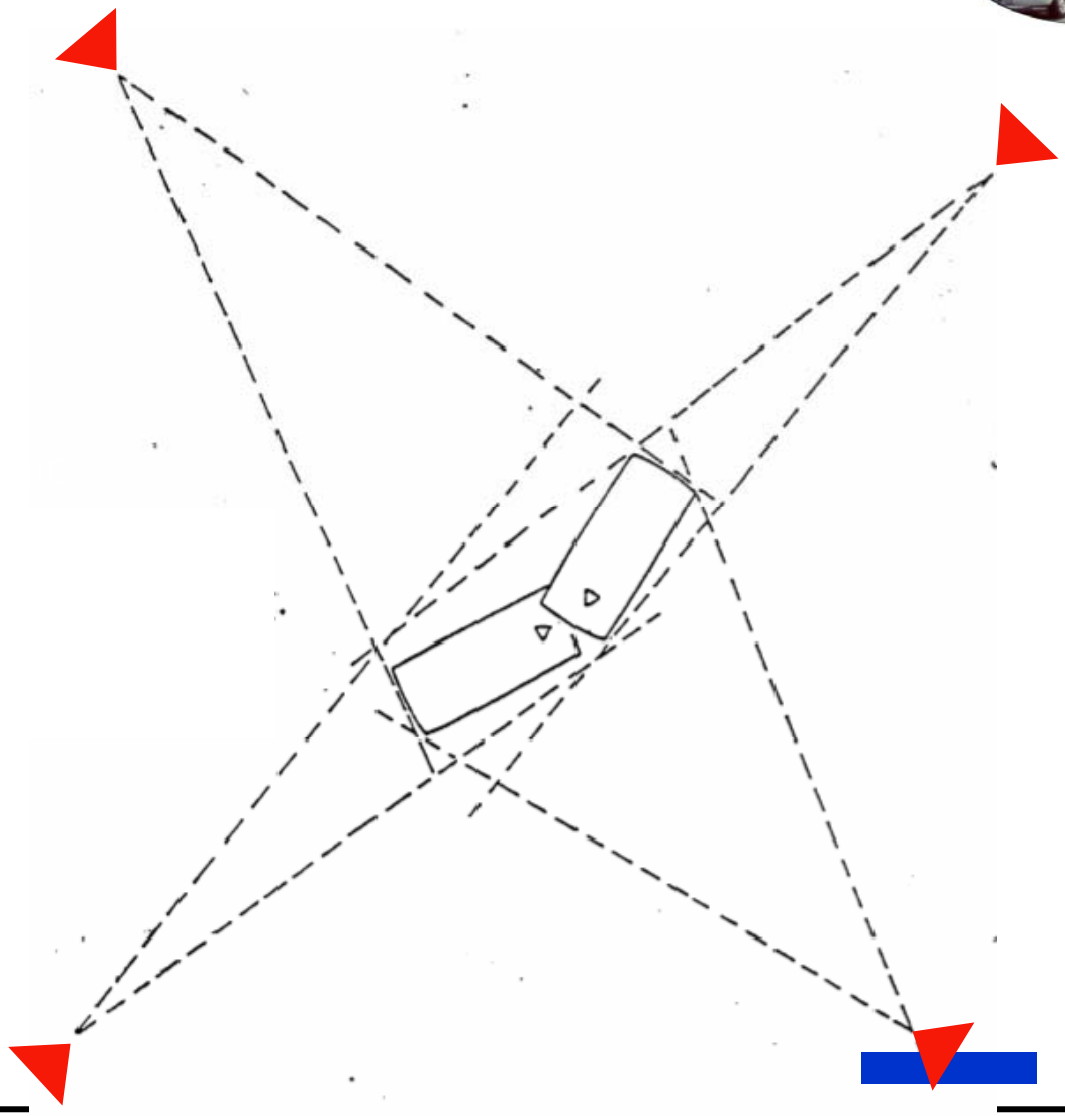
# Taking a Picture vs. Photography

One Method



Alternate Method





Camera

# Photograph of Instrument Panel

# Photograph of Instrument Panel

# Photograph of Instrument Panel

# On Board Data Recorders

- **APCI currently uses PDT.**
- **If possible hit the incident button and extract information.**
- **Put PDT in safe place to be brought back to terminal to be uploaded.**
- **In serious accidents where PDT recovery is impossible, the on board engine ECM should be recovered and sent for analysis.**

AIR PRODUCTS

# Air Products & Chemicals, Inc.

**Home Office**
7201 Hamilton Blvd
Allentown, PA 18195

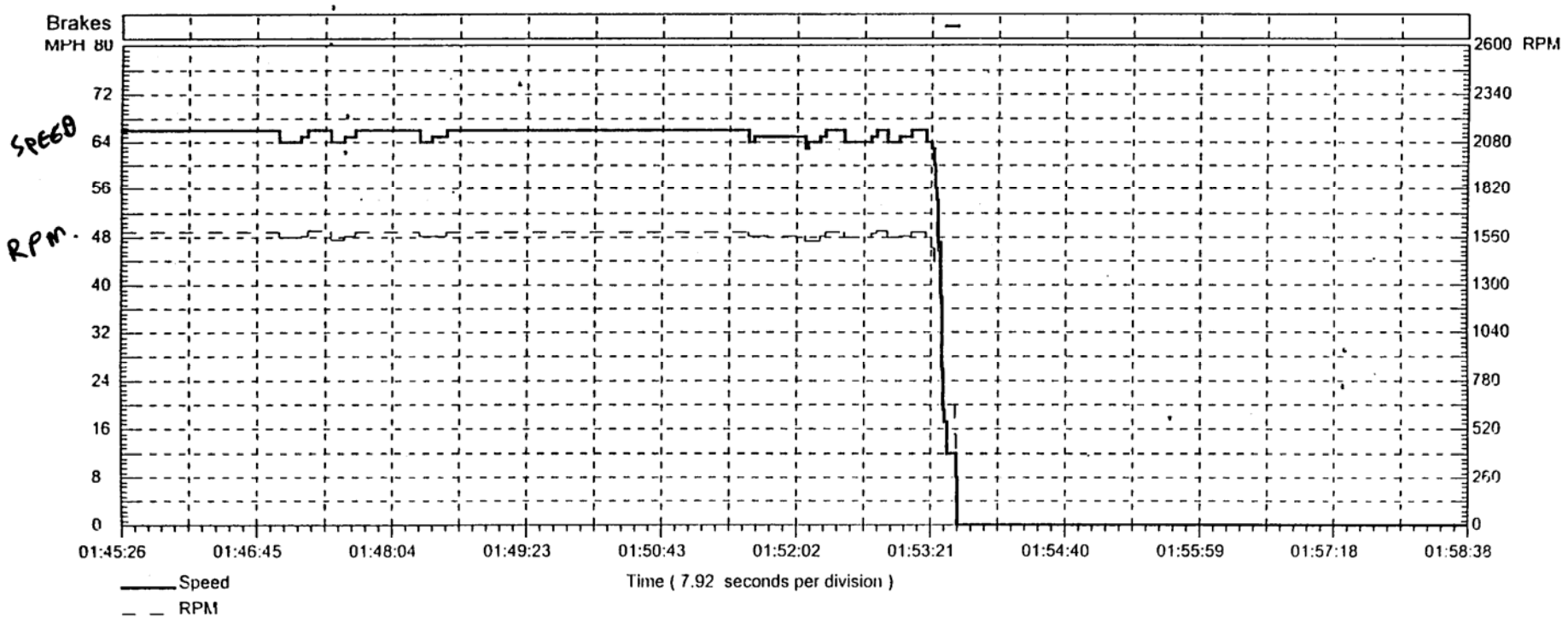
Date : 9/29/2000
Vehicle : 330654
Odometer : 33074.5

## Vehicle Event Report

Activity Number: 32
Detailed Data At: 9/28/2000 01:58:38

Data Sample Rat 1 Second Between Samples
Shortest Recorded Duration: 1 second

Cause : Power Down
Graph Number 2 of 2



# Air Products & Chemicals, Inc.

**Home Office**
7201 Hamilton Blvd
Allentown, PA 18195

Date : 5/13/2003
Vehicle : 330652
Odometer : 431882.9

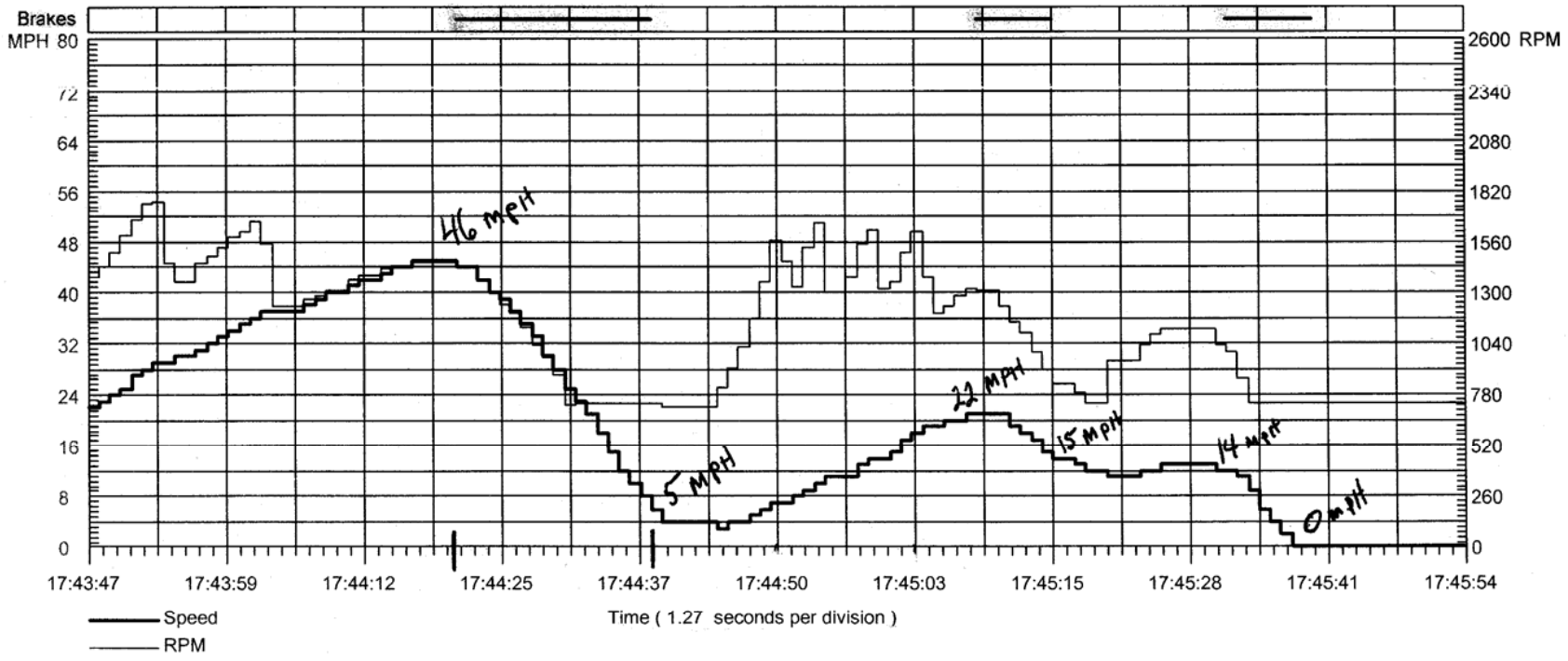
## Vehicle Event Report

Driver:

Activity Number: 137
Detailed Data At: 5/12/2003 17:45:54

Data Sample Rate 1 Second Between Samples
Shortest Recorded Duration: 1 second

Cause : Driving Period End
Graph Number 1 of 1



Unit #: _5579

CX613-5597

# 2 Tenths Sec

Incident Date: 9/28/00 2:49:21AM

| Time | Switch Status SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | Vehicle Speed | Engine Speed |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.80 sec before incident | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | 56 mph | 1350 RPM |
| 3.60 sec before incident | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | 55 mph | 1590 RPM |
| 3.40 sec before incident | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | 54 mph | 1870 RPM |
| 3.20 sec before incident | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | 54 mph | 1980 RPM |
| 3.00 sec before incident | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | 54 mph | 1890 RPM |
| 2.80 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 54 mph | 1780 RPM |
| 2.60 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 53 mph | 1710 RPM |
| 2.40 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 52 mph | 1650 RPM |
| 2.20 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 50 mph | 1600 RPM |
| 2.00 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 49 mph | 1510 RPM |
| 1.80 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 47 mph | 1480 RPM |
| 1.60 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 45 mph | 1410 RPM |
| 1.40 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 44 mph | 1370 RPM |
| 1.20 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 42 mph | 1310 RPM |
| 1.00 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 40 mph | 1260 RPM |
| 0.80 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 38 mph | 1200 RPM |
| 0.60 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 37 mph | 1160 RPM |
| 0.40 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 36 mph | 1110 RPM |
| 0.20 sec before incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 34 mph | 1080 RPM |
| Incident occurred | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 33 mph | 1210 RPM |
| 0.20 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 30 mph | 660 RPM |
| 0.40 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 22 mph | 440 RPM |
| 0.60 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 16 mph | 510 RPM |
| 0.80 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 14 mph | 550 RPM |
| 1.00 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 16 mph | 640 RPM |
| 1.20 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 18 mph | 660 RPM |
| 1.40 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 19 mph | 680 RPM |
| 1.60 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 20 mph | 700 RPM |
| 1.80 sec after incident | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | 19 mph | 640 RPM |
| 2.00 sec after incident | ON | ON | ON | OFF | OFF | OFF | ON | OFF | 19 mph | 620 RPM |
| 2.20 sec after incident | ON | ON | ON | OFF | OFF | OFF | ON | OFF | 17 mph | 670 RPM |

Switch Names:

SW1= Service Brake
SW2=Park Brake
SW3= Clutch Pushed
SW4= Engine Brake Low Bank Engaged
SW5= Engine Brake High Bank Engaged
SW6= Cruise Control Status
SW7= Key Switch Status
SW8= Undefined

# Evidence Collection

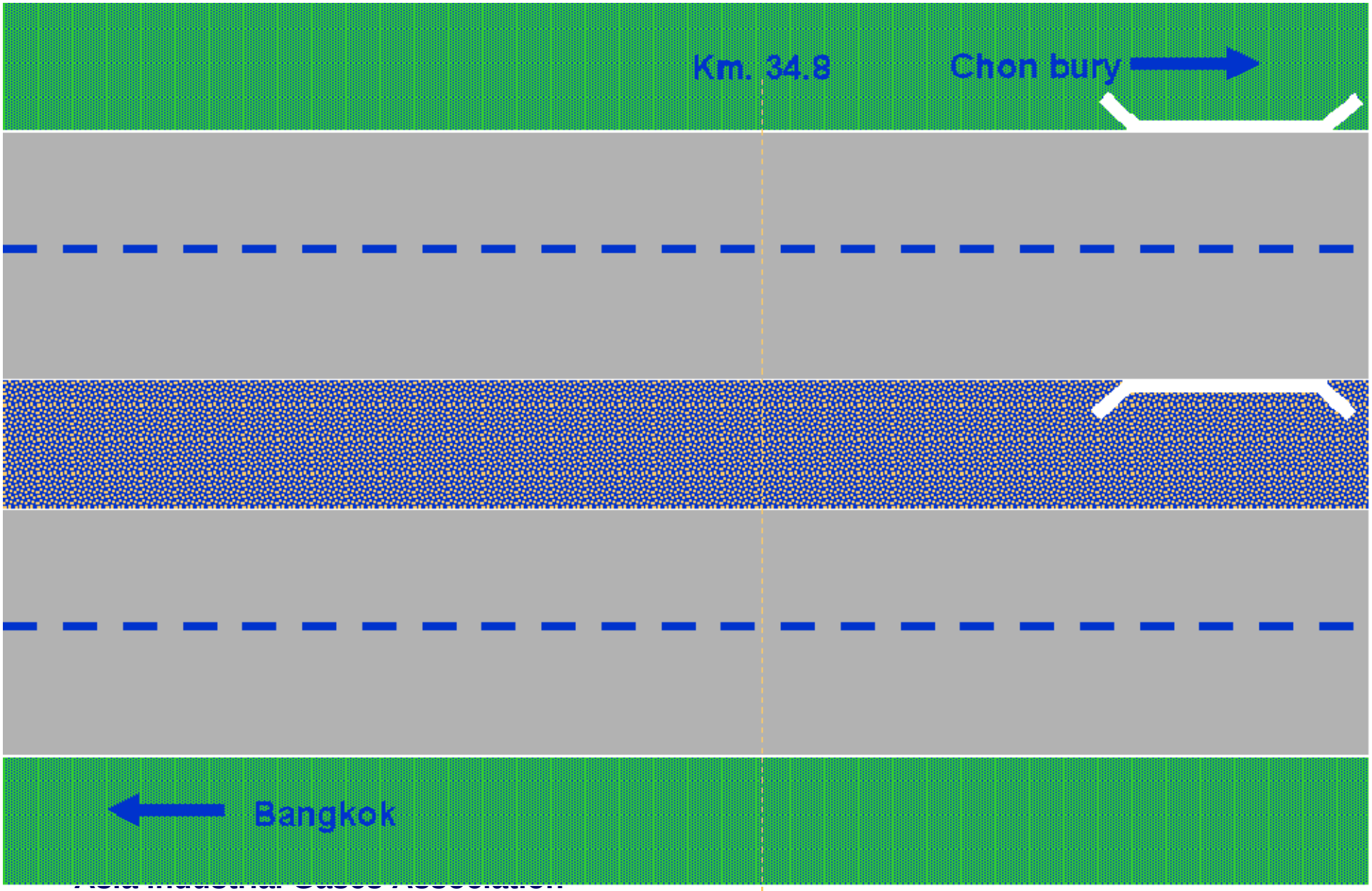
- **Any evidence collected must be kept in its original form.**
- **Loose pieces of paper and/or unorganized methods of collection *will* come back to cause problems**
- **Keep organized records of measurements, witness accounts, and photos.**
- **If retyped or rewritten, keep the original with it for litigation purposes.**

# Evidence Collection

- **Reports for Infotrax and the Electronic Control Module on the power units are also evidence.**
- **Any legal actions will usually take years to complete and this evidence will be gone over and over.**

# Accident Sequence

- From the information gathered, enact the accident sequence.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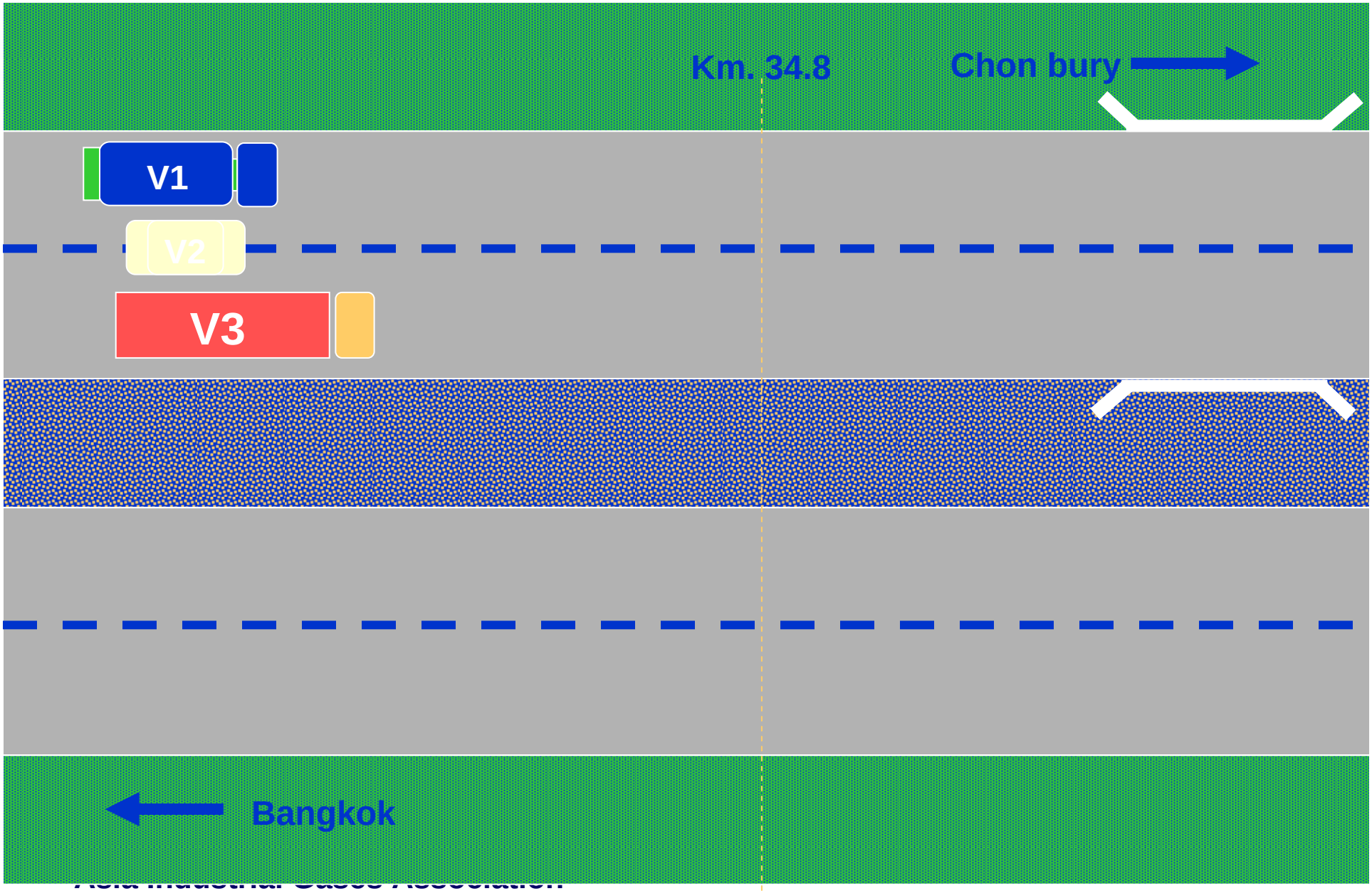
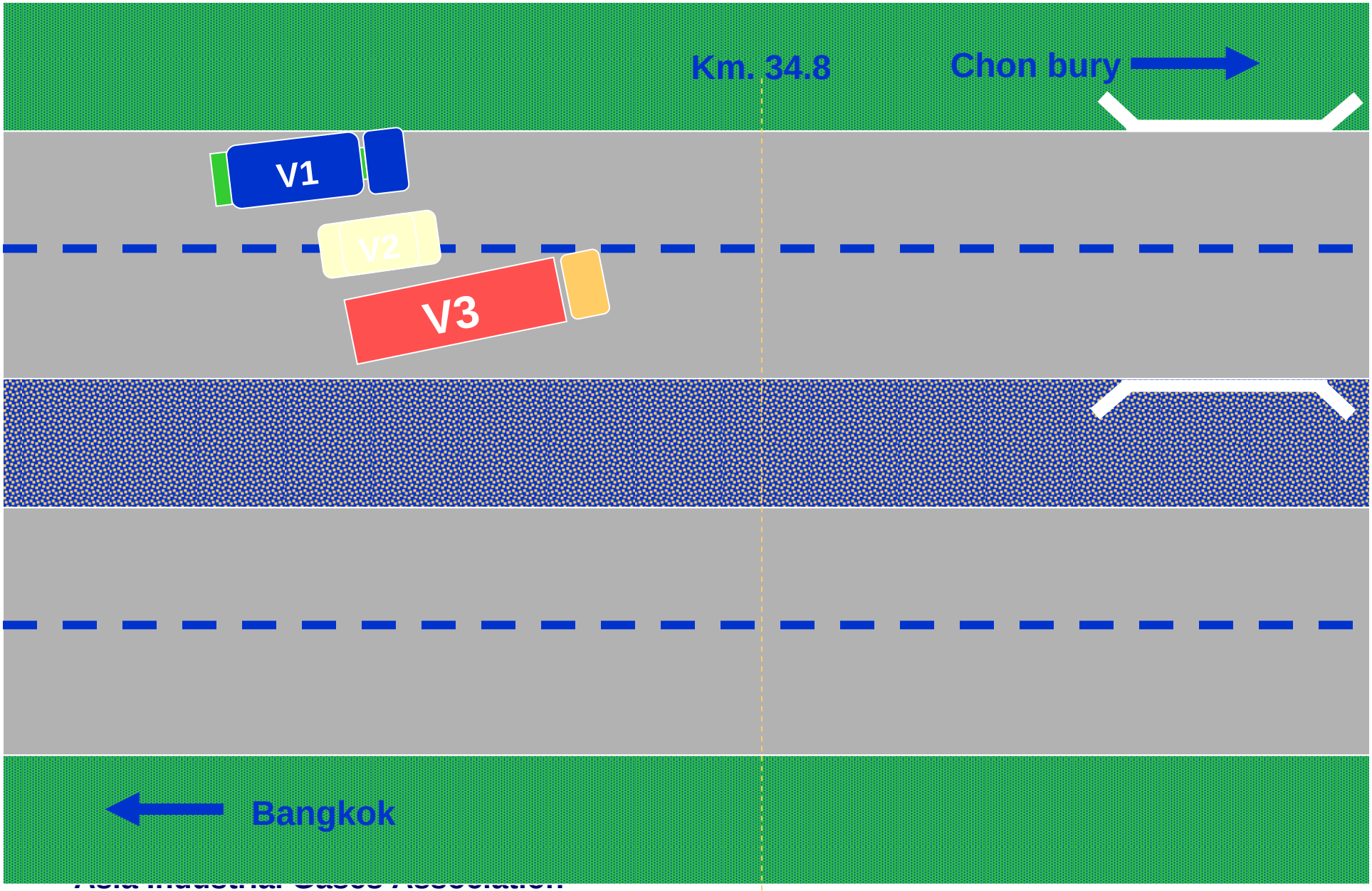
Chon bury
Bangkok


Km. 34.8
Chon bury
V1
V2
V3
Bangkok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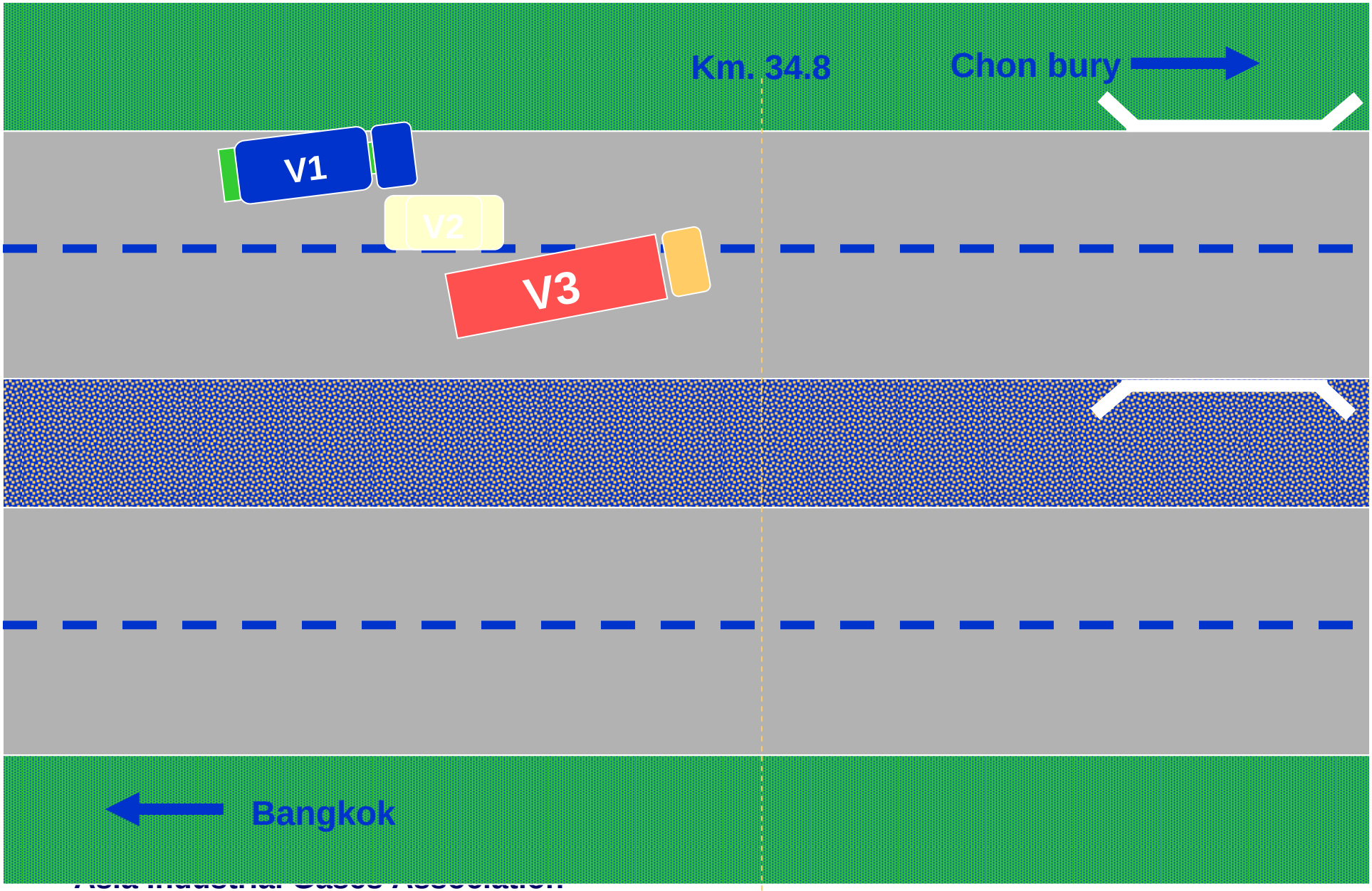
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Chon bury
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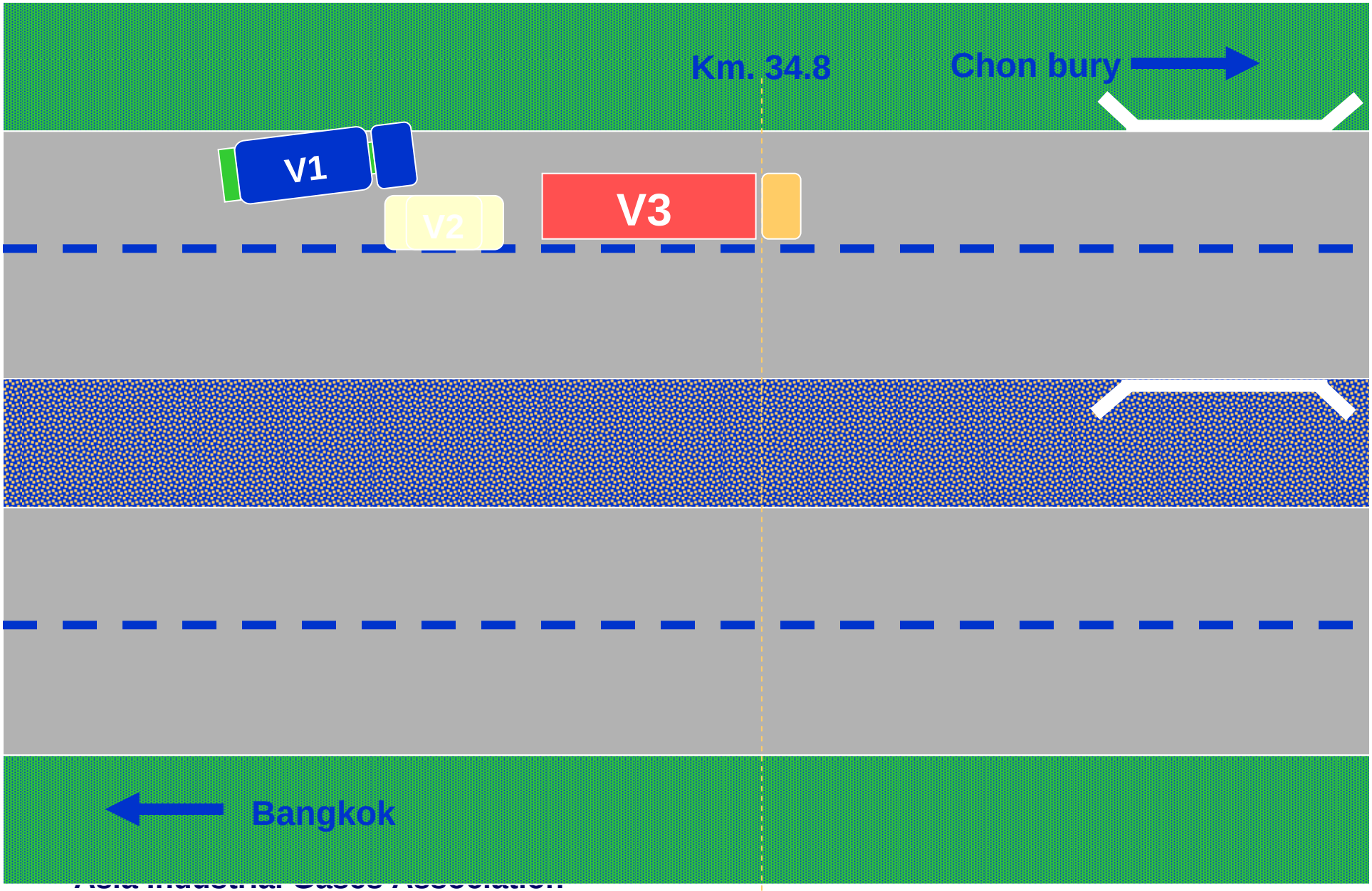
V2
V3
Bangkok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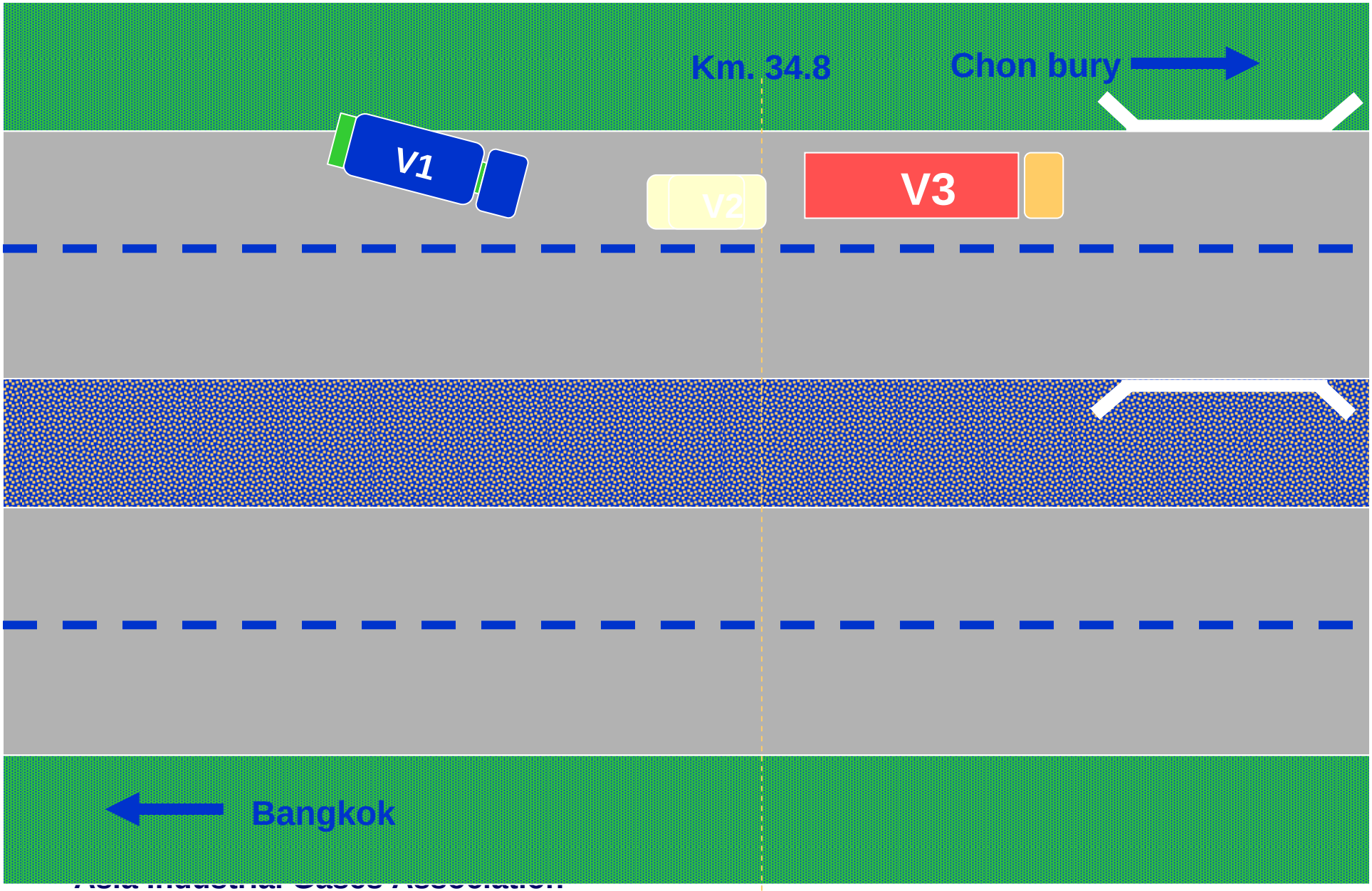
Chon bury
V1
V2
V3
Bangkok


Km. 34.8
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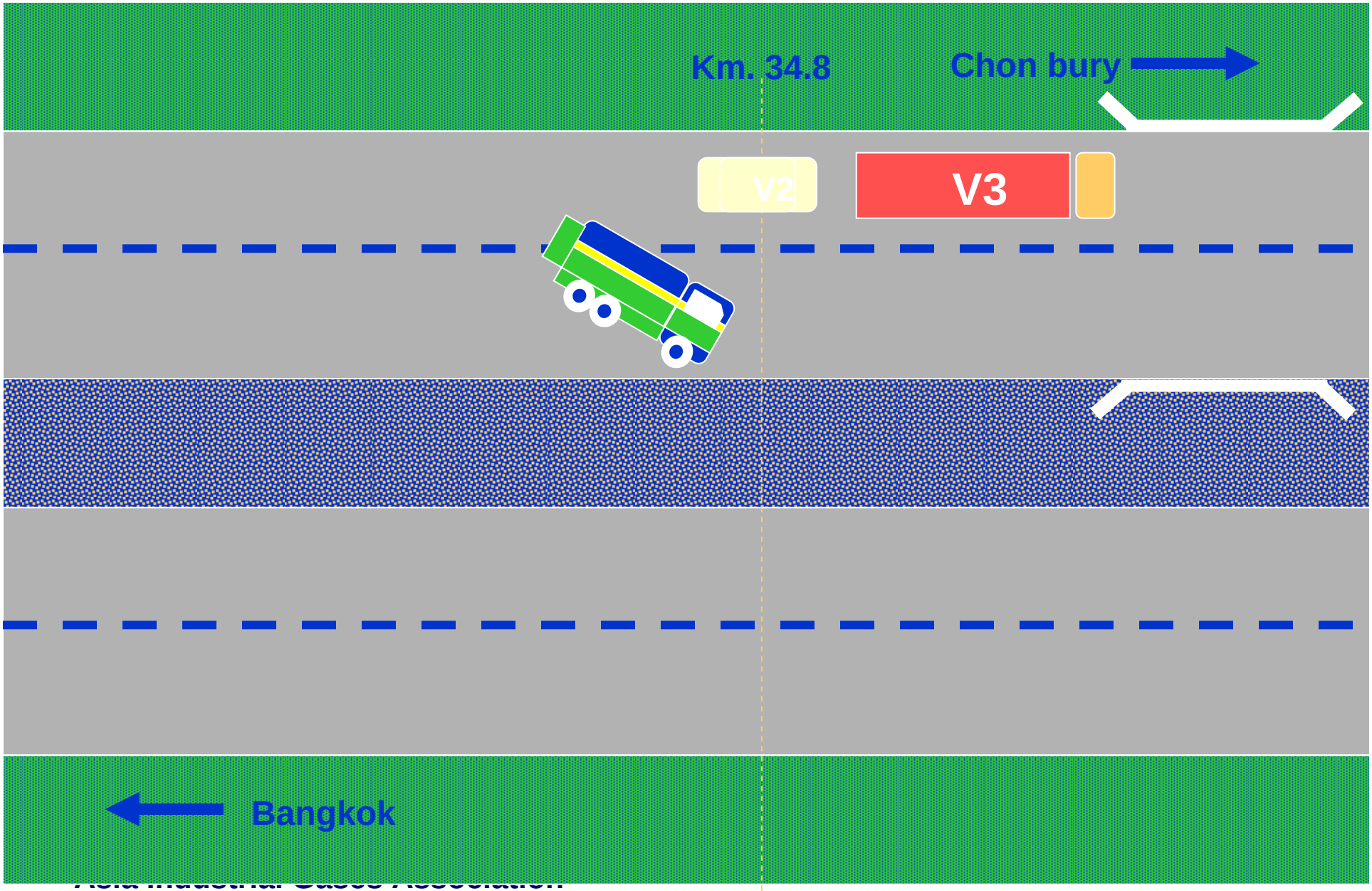
V1
V2
V3
Bangkok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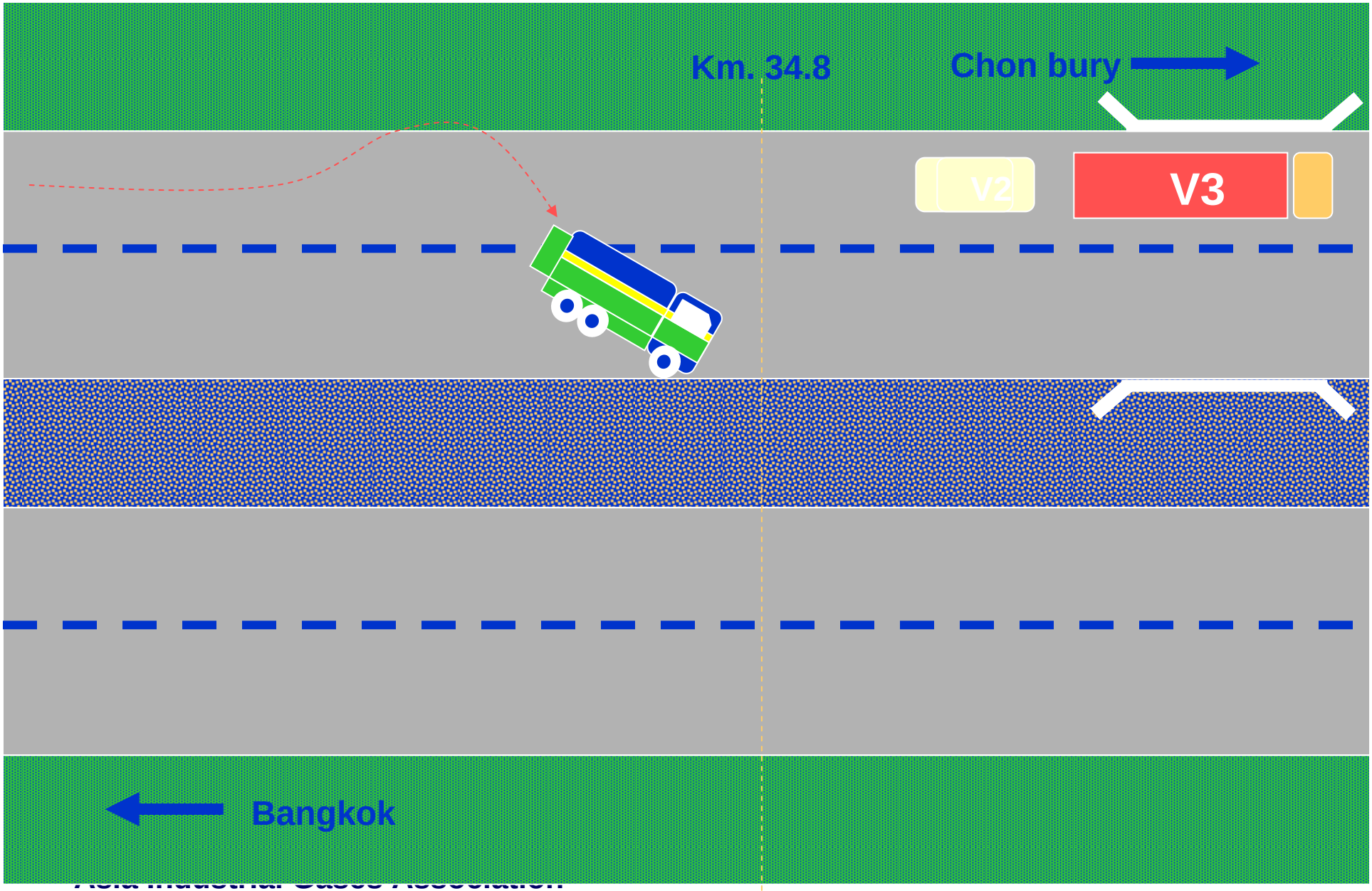
Chon bury
V2
V3
Bangkok


Km. 34.8
Chon bury
V2
V3
Bangkok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# Road Vehicle Recovery

**What do we need to have?**

- **Vehicle Recovery Team(s)**
- **Qualified and Trained Personnel**
- **Procedures**
- **Techniques**
- **Equipment**

# Questions????