CHAPTER 6

INVESTIGATIVE PROCEDURES

REVISED JUNE 2025

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CHAPTER 6

INVESTIGATIVE PROCEDURES

1. PURPOSE. The purpose of this chapter is to establish procedures to be used in the reconstruction of traffic crashes or in Multidisciplinary Accident Investigation Team (MAIT) involved investigations of other incidents.

2. POLICY.

a. Investigations conducted by MAIT shall be consistent with the procedures and guidelines established in this chapter.

b. The team leader is responsible for the safety of all MAIT personnel under their direct supervision.

3. INTRODUCTION.

a. The MAIT investigations are based on the nine-cell matrix for vehicle crash analysis.

(1) The nine-cell matrix associates the three basic phases of a crash (pre-crash, at-crash, and post-crash), with the three basic elements of a crash (human, mechanical, and environmental factors).

(2) Each cell in the matrix is evaluated in the course of the investigation. The evaluation seeks to identify all factors associated to the cause of the crash. The interrelationship of each cell with other cells in the matrix and their effects on the crash event are also evaluated.

(3) The ultimate goal of the investigation, using the nine-cell matrix as the basis of structuring the investigation, is the identification of all factors which were causative or contributory to the crash.

b. The MAIT Program conducts investigations in varying degrees based on the scope of analysis requested or required for each investigation.

(1) The investigation may include the evaluation of a specific area or areas of a crash, or the evaluation of one or more cells of the crash analysis matrix, or may involve the complete analysis of the crash and the evaluation of all pertinent and relevant evidence. Local Area office resources may be utilized at the team leader’s discretion, with concurrence of the Area commander, during

any investigation MAIT is requested to conduct. The local Area office will be responsible for the completion of any portion of the investigation that was not agreed upon in the scope of the MAIT's responsibility for any given investigation.

c. This chapter will outline the general format used in MAIT investigations. The format is not intended to be all-inclusive and should serve as a guideline for some of the more common aspects of investigations.

4. INVESTIGATION.

a. The following general format shall be followed in the reconstruction of investigations when the referenced factors are deemed relevant and necessary for the investigation by the team leader in conjunction with the Area commander:

(1) Response to Incident Location.

(a) Active Scene.

1 If the incident location is still active (i.e., vehicles are still at the crash site and the scene cleanup has not been completed), the responding team members should respond directly to the incident location.

2 On arrival at the incident location, MAIT personnel shall identify themselves to the scene manager or investigating officer and should begin work in their usual area of assignment as soon as reasonably possible.

3 On arrival at the crash site, the designated team leader shall meet with the scene manager and/or primary investigating officers. The situation shall be assessed, and investigation assignments made in cooperation with the investigating Area or agency.

(b) Inactive Scene.

1 If the crash scene is not active (i.e., vehicles removed and scene cleanup has been completed), the designated team leader should arrange to have team members respond at a convenient location in the area where the crash occurred, preferably the Area office or the headquarters of the agency having responsibility for the investigation.

2 The team leader shall meet with the Area commander, Office of Air Operations commander, chief of police, or other responsible

person having investigation jurisdiction. The situation shall be appraised, and personnel assignments made accordingly.

(2) Personnel Assignments and Responsibilities.

(a) Team Leader Responsibilities.

1 The team leader shall ensure that all requests for investigations are routed through the proper chain of command before committing MAIT personnel to the investigation. All investigation requests must be approved by the Area or agency having investigative responsibility for the crash.

2 The team leader or the delegated representative will meet with the requesting party to evaluate the investigation request and all elements of the incident. Based on this evaluation, the team leader or the delegated representative, in coordination with the Area commander or allied agency designee, will determine whether MAIT involvement is both practical and beneficial, and then determine the breadth and depth of the investigation and make the appropriate personnel assignments.

3 The team leader or the delegated representative shall ensure that all existing Area or agency reports, photographs, collected physical evidence, field notes, diagrams, etc., are made available to MAIT investigators assigned to the investigation.

4 The team leader or the delegated representative will coordinate all areas of the investigation and ensure that assignments are completed, and the necessary information is disseminated among assigned investigative personnel.

5 The team leader or the delegated representative shall conduct an ongoing evaluation of the investigation and make any necessary changes in the course of the investigation, or any individual assignment or combination of assignments.

6 The team leader or the delegated representative will coordinate investigation efforts and shall ensure that the requesting party and the responsible Area or agency commander are apprised of the status of the investigation.

(b) Human Factors Responsibilities. Qualified personnel shall be assigned to investigate the human-factor elements of the crash. The following outline is considered a guideline for a human-factors investigation. Each

investigative step should be included, unless deemed to be inapplicable to the case by the team leader in conjunction with the Area commander.

1 Autopsies.

a Personnel should be assigned to attend and monitor necessary autopsies.

b Sufficient photographs will be taken to adequately depict all external areas of the body or obtained from the coroner's office.

c Photographs will be taken of significant internal injuries or obtained from the coroner's office.

d Record significant injuries and ensure that all necessary items of physical evidence are collected (e.g., blood, tissue, hair samples, clothing, footwear, trace evidence).

2 Injured Parties.

a Personnel should be assigned to follow up on all injured parties.

1/ Obtain statements concerning the crash event.

2/ Ascertain the exact nature of injuries and obtain medical records if possible.

3/ Ensure that all necessary items of physical evidence are collected.

4/ Photograph all significant injuries.

3 Involved Parties.

a Personnel shall be assigned to contact all involved parties, including drivers, pedestrians, or any other party listed on CHP 555, Traffic Crash Report, page 1, as well as all passengers.

b Drivers.

1/ An investigator has the responsibility for the collection, evaluation, and documentation of all evidence used to establish who was operating each vehicle involved in the crash.

2/ Interview or interrogate the driver.

3/ Where appropriate, conduct a driver profile.

a/ Medical history and impairments.

b/ Mental history and impairments.

c/ Driving skills and experience.

d/ Chronological survey of activities leading up to impact.

e/ Employment history, if applicable.

f/ Driver's license status, record, and restrictions.

g/ Driver's familiarity with the surrounding area of the crash site.

h/ Functional impairment due to fatigue or lack of sleep.

c Sobriety.

1/ Field Sobriety Tests, where applicable.

2/ Objective symptom analysis.

3/ Chemical tests.

4/ In-custody arrangements, if applicable.

5/ Ensure collection of all pertinent evidence related to the state of intoxication of all involved parties.

NOTE: Confidential information, such as toxicology results, party histories, and autopsies, shall be relegated to the CHP 202, Driving Under the Influence Arrest – Investigation Report, or CHP 216, Arrest – Investigation Report, rather than the publicly releasable CHP 555.

d Passengers.

1/ An investigator should contact and interview all passengers in each of the crash-involved vehicles.

2/ Where possible, determine the seating position of all passengers.

e Pedestrians or Other Involved Parties.

1/ Interview or interrogate.

2/ Involved party profile.

a/ Medical history and impairments.

b/ Mental history and impairments.

1 Chronological survey of activities.

2 Point of origin of trip.

3 Intended destination, etc.

3/ Sobriety of involved party.

a/ The objective signs and symptoms of intoxication of all parties listed on the CHP 555, page 1, will be determined and documented in the investigation report.

b/ The general outline given for the sobriety of the driver in this chapter will be used in the investigation of the sobriety of other involved parties.

4 Witnesses. Personnel shall be assigned to contact and interview all relevant, identified witnesses.

5 Suspect/Witness Identification.

a Personnel shall be assigned to develop or follow up on suspect information in hit-and-run cases, or in cases where driver identification is in question.

b Personnel shall be assigned to develop witness information in cases where unidentified witnesses are known or suspected to exist, and their potential observations are crucial to the investigation.

6 Maintenance or Motor Carrier Records. Qualified investigators may be assigned to assist the Motor Carrier Specialist I (MCS I) in the

search for, examination of, or interview of persons associated with motor carrier or maintenance records.

7 Occupant Kinematics. Human-factors investigators should be assigned to work with the vehicle-dynamics investigators in the determination of occupant kinematics and injury mechanisms.

8 Statements, Interviews, and Interrogations. All statements, interviews, and interrogations should be digitally recorded and handled in accordance with Highway Patrol Manual (HPM) 70.1, Evidence Manual.

a In cases that may result in a charge of Section 187 of the California Penal Code (PC), the custodial interrogation of any suspect shall be conducted in a fixed place of detention and shall be electronically recorded in accordance with Section 859.5 PC. Recordings shall be made by video for juvenile suspects; interrogation of adult suspects may be recorded by video or audio alone. Pursuant to Section 859.5 PC, a fixed place of detention is any fixed location under the control of a law enforcement agency, such as a jail, a police or sheriff's station, or an Area office.

(c) Mechanical Factors Analyst Responsibilities.

1 An MCS I or other qualified person shall be assigned to evaluate the pre- and post-impact mechanical condition of all crash-involved vehicles, when relevant to the crash.

a All vehicles should be impounded pursuant to Section 22655.5 of the California Vehicle Code and stored in a secure area for the period of time necessary to complete the investigation. All impoundments shall be in accordance with HPM 81.2, Vehicle Procedures Manual.

1/ As soon as the vehicles are available for release, the Area commander or designee, and the district or city attorney having responsibility for filing of criminal charges shall be notified.

2/ The district or city attorney will have the responsibility for the final disposition of all impounded vehicles. However, in the cases involving a state vehicle or a state employee, the Department's Office of Legal Affairs or the Office of the Attorney General should be consulted.

b The mechanical inspection will consist of an evaluation of vehicle component systems relevant to the crash for each vehicle inspected. Where possible, the pre-impact and post-impact condition of each component system shall be identified.

c Other than general body damage, crash damage sustained by each relevant component system shall be evaluated and described by the person conducting the mechanical inspection.

d When pertinent to the case, the maintenance history of crash-involved vehicles shall be investigated. When the crash involves a vehicle subject to motor carrier regulations, the maintenance-history investigation will determine whether the carrier meets all the requirements of law.

e Pursuant to HPM 84.1, Motor Carrier Safety Operations, Chapter 2, Inspection Procedures, MCS personnel, other than MAIT members, shall not reassemble or reinstall brake components, steering components, or tires/wheels removed from vehicles as part of a crash investigation. The MAIT members may continue to reassemble and reinstall components on vehicles in order to conduct further mechanical testing as part of their investigation.

f Small parts/items which have been disassembled shall be left either inside the vehicle's passenger compartment or trunk (if practical), or other protected locations where they will be readily found by the vehicle owner, and larger items, such as tires/wheels, should be left underneath the vehicle, if possible. In all instances, a CHP 346A, Out-of-Service Vehicle, notice shall be affixed to vehicles from which parts have been removed. The CHP 346A shall indicate the disassembled parts in the "out of service condition(s) - section(s)" box, such as "brake components disassembled" or "steering gear box removed," etc., along with the statement "NOT DRIVEABLE" just below the word "UNSERVICEABLE."

2 An investigator should be assigned to examine each crash-involved vehicle to ascertain the nature and extent of the damage sustained in the crash.

a Any completed damage analysis shall include a description of all external, internal, and structural damage sustained from the

crash. The damage analysis shall include, but is not limited to, a description of the following areas:

1/ External damage, including undercarriage.

2/ Interior damage, including structural deformation of occupant compartment, as well as areas of occupant impact damage.

3/ Structural damage to chassis, body substructures, etc.

4/ Sites of transfer or imprint evidence.

5/ The principle direction of force for each area of contact damage.

b When relevant to the crash analysis, sufficient longitudinal, lateral, and vertical measurements shall be taken to locate damaged regions of the vehicle and to quantify the extent of that damage.

c Photographs shall be taken of each crash-involved vehicle to adequately depict the extent, nature, and location of all crash-related damage. Sufficient photos should also be taken to depict undamaged regions of each crash-involved vehicle.

d The damage analysis shall differentiate between areas of contact and induced damage.

(d) Environmental Factors Responsibilities.

1 An engineer or other qualified person should be assigned to evaluate the crash site. This evaluation should include, but is not limited to, the following areas:

a General roadway description, including directions of travel, number and width of lanes, delineation, shoulders and perimeter areas, roadway classification, roadway alignment and configuration, etc.

b Crash site geometrics, including grades, cross slopes and cross sections, radius and tangent points of curves, angles of intersection, etc.

c Road surface composition, including types of materials used, condition of road surface, road surface contamination, and testing of tire/road surface interface.

d Traffic controls, signs, and other regulatory devices.

e Sight distances and vision-obscuring objects.

f Evaluation of existing construction, or “as-built” plans.

g Evaluation of average daily traffic, peak traffic periods, and crash histories at, and adjacent to, the crash site.

h Ensure that sufficient measurements are taken to accurately describe and diagram the crash site.

i Ensure that photographs are taken to accurately depict the crash site and adjacent areas that are pertinent to the investigation.

j Arrange for drive-through photographs or video of the crash site, if pertinent to the investigation.

2 An investigator should be assigned to evaluate the physical evidence existing at, and adjacent to, the crash site. This evaluation should include, but is not limited to, the following areas:

a Assist in the setup of the total station survey system or other measurement system from which measurements may be taken.

b Identify by measurement and describe physical evidence found at, or adjacent to, the crash site, including, but not limited to:

1/ Tire friction marks.

2/ Gouge, scrape, and scratch marks.

3/ Vehicle fluid spatter, trails, and pools.

4/ Blood spatter, trails, pools, stains.

5/ Tire tracks and imprints.

6/ Vehicles and bodies at their respective areas of rest.

7/ Location of fixed or movable objects associated to the crash.

8/ Debris type, location, and distribution.

9/ Location and identification of detached vehicle components.

10/ Damage to fixed objects or other property associated with the crash sequence.

c Ensure that adequate measurements are taken to reconstruct the crash scene and document the location of all the physical evidence. Each team shall complete a scale diagram of the crash scene to accurately document the location of physical evidence.

d Ensure that all elements of physical evidence located at, or adjacent to, the crash site, which should be collected and preserved, are collected and preserved using methods consistent with existing policy and procedures.

e Ensure that adequate measurements using the most appropriate tools are taken to identify specific elements of physical evidence, including, but not limited to:

1/ Location and width of tire print and tire friction marks.

2/ Number of and spacing between tire ribs and sides or sidewall markings.

3/ Track width of tire friction marks belonging to opposing wheels of a particular vehicle.

4/ Wheel base measurement between the ending of front and rear wheel tire friction marks.

5/ Circumference, diameter, or width of fixed or moveable objects associated with the crash.

6/ Width, depth, and length of gouge, chop, and chip marks.

7/ Width, depth, length, and description of material displacement in metal gouges, scrapes, or scratches.

8/ Identification of specific elements of debris located at the crash site.

a/ Nature of debris.

b/ Source vehicle.

9/ Horizontal, vertical, and depth measurements of damage sustained by objects located at the crash site that are associated with contact by the crash-involved vehicle.

f Ensure that sufficient photographs are taken at, and adjacent to, the crash site to accurately depict all elements of physical evidence.

g Ensure that, after the required warrant procedures are followed, any relevant digital data imaged from the vehicles involved in the crash are preserved.

5. GENERAL INCIDENT RECONSTRUCTION PROCEDURE.

a. The following general outline should be followed in the reconstruction of all incidents investigated by MAIT.

b. The procedures may be modified to meet the specific needs of the investigation.

c. Team Leader Responsibilities.

(1) It is the responsibility of the team leader to ensure that the reconstruction of each incident follows the procedures set forth in this chapter.

(2) The team leader will coordinate the crash reconstruction phase of the investigation and shall ensure optimum communication and cooperation between all disciplines involved in the reconstruction effort.

(3) The team leader has the responsibility for the identification and documentation of all crash causation factors.

d. Reconstruction Procedures.

(1) Dynamics Analysis. The following procedures should be followed in reconstructing the motion of crash-involved vehicles.

(a) Scale Diagram. Using the data collected at, and adjacent to, the crash site, prepare a scale diagram which accurately depicts the crash scene and the physical evidence found therein.

(b) Scale Vehicles. Using the data collected during the damage analysis of crash-involved vehicles, prepare scale representations of each vehicle. These models may be either two- or three-dimensional, dependent on the needs of the investigation.

1 Two sets of models should be made—one model representative of the undamaged vehicle and the second model representative of the post-impact configuration of the vehicle.

2 Areas of contact damage, and pertinent areas of impressions or transfer evidence, should be identified to scale on the vehicle models.

(c) Physical Evidence Identification. The source of each element of physical evidence located at the crash site should, when possible, be identified to its source. Examples of this type of identification are tire friction marks ending at the wheels of a vehicle at its area of rest; comparison of track width, print width, and wheel base of a vehicle to the measurements of tire friction marks found on the pavement; comparison of tire print to source tire; and comparison of physical dimensions of chop or gouge evidence and its suspected source.

(d) Damage Analysis.

1 When possible, the source of each area of contact damage for each crash-involved vehicle should be identified. Examples of this type of identification are the physical match of damaged regions; comparison of transfer evidence; comparison of length, height, and depth of damaged regions; and comparison of imprint to imprinting source.

2 The principle direction of force should, when possible, be identified for each area of significant contact damage identified.

(e) Position Analysis.

1 Using the scale diagram, position the scale models of crash-involved vehicles at those places on the diagram which can be supported by physical evidence evaluation. Examples of these positions are the source of a vehicle fluid leak to a fluid trail or pool; a specific wheel to an identified tire friction mark belonging to that wheel; a gouge, chop, or chip mark on the road surface to the portion

of the vehicle producing the mark; and overlapping areas of contact damage between vehicles or between a vehicle and a fixed object.

2 Draw the scale outline of each crash-involved vehicle at as many positions on the diagram as can be supported by the physical evidence.

(f) Motion Analysis.

1 Use the scale diagram and vehicle positions determined from the position analysis to make a determination as to how each vehicle moved with respect to the incident scene and each other during the crash sequence.

2 Motion between reconstructed positions may be inferred from an analysis of the influences of the external forces acting on the center of mass of each vehicle.

3 Care must be taken to ensure that the position and motion analyses are compatible with the influence of all forces acting on each vehicle during the crash sequence.

4 Motion analysis should identify the areas of impact, areas of rest, and other significant events which occurred during the crash sequence.

5 Motion analysis should also include the effects of vehicle motion on the occupants of the crash-involved vehicles. This should include, but is not limited to, injury mechanisms, relative seating positions, mode of ejection, effectiveness of restraint systems, and occupant/rider safety equipment performance.

(g) Dynamics Diagram. Using the vehicle positions determined by the position and motion analysis, prepare a scale diagram or diagram overlay to depict the reconstructed motion of each of the involved vehicles.

(h) Other Crash Types.

1 The procedures outlined above may be applied to auto/pedestrian crashes, as well as other types of crashes (auto/motorcycle, auto/bicycle, etc.). In auto/pedestrian, auto/motorcycle, and auto/bicycle crashes, the injuries suffered in the crash shall, when possible, be matched to the source producing the injury. The projection and post-impact motion of the pedestrian, motorcycle, or bicycle shall, when possible, be determined from physical evidence, witness statements, etc.

2 Scale representations of the pedestrian, motorcycle rider, or bicycle rider should be used in the position and motion analyses.

(2) Velocity Reconstruction. The following procedures should be used in reconstructing the velocities of crash-involved vehicles.

(a) Velocity calculations should normally be evaluated in four phases.

1 Post-impact velocity analysis.

2 Impact velocity analysis.

3 Speed change analysis.

4 Pre-impact velocity analysis.

(b) Post-Impact Velocity Analysis.

1 Using the reconstructed motion of each vehicle in association with the corresponding elements of physical evidence, evaluate how each crash-involved vehicle dissipated or increased energy in the post-impact phase of motion.

2 From this evaluation, apply the existing velocity reconstruction procedures formulae, equations, estimates, etc., necessary to calculate or estimate the post-impact speed of each vehicle involved in the crash.

3 When nonenergy-related methods of calculating post-impact velocities exist (centrifugal motion, flip, vault, or other form of uniform projectile motion, etc.), the investigator shall ensure that the calculated post-impact velocities are consistent with the calculated or estimated post-impact energy available to each vehicle.

(c) Impact Velocity Analysis.

1 The velocity of each vehicle at impact should, when possible, be determined.

2 Only recognized and published velocity reconstruction procedures or techniques shall be used in the calculation or estimation of impact velocities.

3 When direct methods of impact velocity analysis are used to calculate or estimate the impact velocity (centrifugal motion, uniform

projectile motion, witness estimate, etc.), the investigator shall ensure that the calculated or estimated impact velocity is compatible with the energies dissipated in and remaining after impact.

(d) Speed Changes. The vector speed change based on the calculated or estimated post-impact and impact velocities should be calculated. The injuries suffered by occupants and the damage sustained by vehicles must be consistent with the calculated speed changes from the resultant deceleration or acceleration rates.

(e) Pre-Impact Velocity Analysis.

1 If evidence of pre-impact deceleration or acceleration exists, the pre-impact velocity of that vehicle, when possible, should be calculated.

2 Only recognized and published methods of velocity analysis and velocity combination shall be used in the pre-impact velocity determination.

(f) Documentation. The format outlined in Chapter 5, Report Format and Composition, of this manual shall be used to document velocity calculations.

(3) Event Data Recorder. In relevant crashes where the data is available and accessible, the Event Data Recorder (EDR) system within a vehicle's module (Airbag Control Module, powertrain control module, engine control module, etc.) should be imaged to preserve its data for evidentiary purposes.

(a) With proper analysis and consideration, information obtained from an EDR may be used to determine velocities, speed changes, and other relevant information leading up to and at the time of the crash.

(b) The ignition key(s) for a vehicle that requires an EDR to be imaged should be stored as evidence at the local Area office. Some EDRs will store ignition key cycles at the time of the crash and the time the image of the EDR was taken. An effort must be made to account for each ignition key cycle. It is important to keep these cycles as close as practicable to each other to help preserve the integrity of the evidence.

(c) With team leader approval, investigators may image a vehicle's EDR system without an accompanying analysis. This will preserve the information for relevant interested parties. However, any EDR data of this nature shall be accompanied by a disclaimer explaining the limitations of the data.

(d) Event Data Recorder imaging shall be done in a manner consistent with appropriate search and seizure law and departmental policy. Any questions regarding current legislation and case law should be directed to the Enforcement and Planning Division.

(4) Mechanical Analysis.

(a) All relevant component systems of each crash-involved vehicle should be evaluated. The evaluation shall, when possible, identify the pre-impact condition of each relevant system and whether the system was, or was not, defective or deficient prior to impact.

(b) If a relevant component system is determined to have been defective or deficient prior to impact, the exact nature of the defect or deficiency shall be documented along with the supporting evidence. The effect of each identified defect or deficiency on the operation of the vehicle shall be evaluated and its contribution to the crash identified.

(c) If a relevant component system failure was determined to have been caused by impact-related forces, the exact nature of the failure should be documented along with supporting evidence. The effect of the impact-related failure on the crash sequence will be evaluated and its contribution to the crash, if any, identified.

(d) If a relevant component system is determined not to have been defective, the general condition of the system should be documented along with the supporting evidence.

(e) If a determination cannot be made concerning the pre-impact condition of a relevant component system or any element within a component system and such a determination is pertinent to the investigation, the following procedure should be followed.

1 Collect and preserve the component system or system element.

2 Have the component system or system element examined by a qualified specialist or laboratory.

(5) Human Factors Analysis.

(a) A qualified investigator should evaluate the information obtained in the investigation. This evaluation should include the following areas:

1 Driver, occupant, and witness credibility. Are the statements consistent with known facts? Was the person in a position to make

these observations? Are special interests or biases involved in giving the statement?

2 Form an opinion of the sobriety of all involved parties, including witnesses, with special emphasis on all drivers.

3 When appropriate, make a determination of the physical and mental condition of involved parties. Was the driver fatigued? Was the driver impaired as a result of a physical or mental handicap, or from substance-use intoxication?

4 When appropriate, determine the degree of skill or experience of the driver. Was the driver properly licensed? Was the driver qualified to operate the vehicle? Was the driver familiar with the incident location?

5 Form an opinion as to how the driver, occupant, or other involved party influenced the crash. Identify each area that is considered a causative or contributory factor to the incident.

6 Work with the investigator performing the dynamics analysis to identify occupant seating positions, motion during the crash sequence, and correlation of injuries to the source or cause of those injuries.

7 In conjunction with the investigator performing the dynamics analysis, identify the driver of each crash-involved vehicle and list the elements from which this determination was made.

8 In cooperation with other team members, evaluate the actions of each involved party which are considered pertinent to the investigation. This evaluation should include, but is not limited to, the driver's or involved party's evasive tactics or lack thereof, delay or lack of perception of danger, and ability to react.

(6) Environmental Analysis.

(a) The information collected at the crash site relevant to the roadway and surrounding environment should be evaluated by the engineer assigned to the investigation. This evaluation should include, but is not limited to, the following areas:

1 Design Standards. Does the roadway and surrounding environment meet required design and construction standards?

2 Roadway Condition. Comment on the condition of the roadway, identifying any noted defect.

3 Crash Approach. Evaluate the approach to the crash site. Is the signal distance adequate? Are necessary signs in place and visible? Is the delineation of the roadway adequate, etc.?

4 Traffic Controls. Inspect traffic controls at the crash site to determine if they are adequate. Were they functional at the time of the crash?

5 Errant Vehicle Protection. Evaluate provisions for errant vehicles. Were guardrails, bridge rails, median barriers, or energy attenuators in place? If in place, did they function as intended?

6 Speed Limits. Evaluate posted speed limits at, and approaching, the incident location.

7 Traffic Volumes. Analyze traffic volumes at the area of the crash. Include the average daily traffic, peak month traffic, and peak hour traffic figures.

8 Crash History.

a Evaluate the crash history at the scene. The road section evaluated should normally be less than one mile in length and shall not include areas significantly different from the crash scene.

b Review the crash history for at least three years plus the current year.

c Determine if crash numbers are significantly high and if crashes similar to the one being investigated have occurred before.

d If there are significantly high numbers of similar crashes, identify the probable cause.

9 Conclusions. Form conclusions as to how the environment and any defect noted therein influenced the crash sequence.

(7) Causation Analysis.

(a) At an appropriate time in the investigation, the team leader should conduct a meeting of all the team members participating in the

investigation. The purpose of this team meeting will be to determine how and why the crash occurred.

1 More than one team meeting may be necessary to satisfactorily reach conclusions as to how and why the crash occurred.

2 Team leaders are encouraged to conduct team meetings or meetings between specific disciplines as often as is necessary to ensure the adequate exchange of information and ideas.

(b) Each team member should summarize their findings and outline the conclusions for each specific discipline.

(c) The significance of these conclusions and their interrelationships should be evaluated by the team to determine their overall effect on the events of the crash.

(d) From the evaluation of all the information provided by each discipline, conclusions should be drawn as to how and why the crash occurred. Each element considered a causative or contributory factor to the crash should be identified.

(e) When possible, the specific factor or combination of factors which, in the opinion of the team members, contributed most to the cause of the crash should be identified as the primary crash factor(s).

(f) The team leader shall ensure that all conclusions are consistent with the known facts, and that any differences of opinion within and between disciplines are resolved in favor of the facts on which these opinions are based.

(g) The team leader has the responsibility for the documentation of the findings and conclusions of the investigation. The team leader shall ensure that the findings and conclusion of the investigation are documented in a clear and logical manner consistent with the requirements of Chapter 5 of this manual.

(8) Recommendations. All recommendations made as a consequence of the investigation shall be documented as outlined in Chapter 5 of this manual.