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IMPROVING INCIDENT MANAGEMENT RESPONSE AND COORDINATION OF RESOURCES

by

Kentucky Transportation Center
College of Engineering
University of Kentucky
Lexington, Kentucky

in cooperation with

Kentucky Transportation Cabinet
Commonwealth of Kentucky

and

Federal Highway Administration
U.S. Department of Transportation

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16. Abstract

Highway crashes cause a major impact to the transportation network by critically limiting the operational efficiency of the roadway. Traveler delay is the problem most often associated with highway crashes, but by far the most serious problem is the resulting secondary crashes that occur. Another related issue is the danger posed to response personnel serving the public at the scene. The magnitude of these problems is severe. A coordinated plan for managing the scene is needed to reduce the impact of highway crashes and improve the safety for everyone.

A Checklist and interagency workshop has been developed to address ways to secure and coordinate the resources necessary to restore the roadway's operation in a safe and timely manner. This Checklist and workshop serve as a reminder to responding agencies of the activities that need to be performed and who needs to perform them. A highway crash scenario activity is part of the workshop and helps all the agencies involved at a crash scene to gain a better understanding of each other's roles.

After the first workshop, 30 participants evaluated the Checklist and workshop. Ninety percent agreed that the workshop was helpful to them personally, and nearly 97% said they would encourage others to attend the workshop. Nearly 80% said they would use the Checklist on scene. Comments reflected that the interagency training was beneficial to them because it promoted communication and better understanding of everyone's role at a crash scene.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

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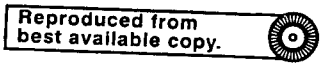

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Nancy Albright	Kentucky Transportation Cabinet
Andy Alphin	Bluegrass Towing Service
Jim Booth	Kentucky State Police
Jennifer Branham	Cumberland Gap Tunnel Authority
Don Breeding	Kentucky Transportation Cabinet – District 11
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John Burke	Cumberland Gap Tunnel Authority
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Ralph Lockard	Kentucky State Police
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Rodney Raby	State Fire Marshal's Office
Joe Riley	LFUCG – Division of Fire
Alton Roberts	AAA Kentucky
Gordon Roberts	Kentucky Transportation Cabinet
Tom Ross	Transit Authority of River City
Tim Schoch	TRW, Inc - ARTIMIS
Paul Simms	LFUCG – Division of Police
Carl Sumner	Insurance Institute of Kentucky
Brent Sweger	Federal Highway Administration
Al Tronzo	Louisville Fire Department

Also, special thanks to the Lexington Incident Management Committee and the workshop participants.

1.0 INTRODUCTION

An incident is any non-recurring event that reduces roadway capacity or increases roadway demand. Such events include highway crashes, disabled vehicles, spilled cargo, highway maintenance and construction projects, and special non-emergency events such as ballgames or concerts (1). Although all these events can have a significant impact on traffic, this report focuses solely on highway crashes.

Crashes affect the traveling public in numerous ways, including: increased response time by emergency personnel; lost time/reduced productivity; increased cost of goods and services; increased fuel consumption; reduced air quality; increased vehicle maintenance costs; reduced quality of life; and a negative public image of public agencies involved in crash management activities. Traveler delay is the problem most often associated with highway crashes, but by far the most serious problem is the resulting secondary crashes that occur. It is not unusual for the secondary crash to be more severe than the original crash. Another related issue is the danger posed to response personnel serving the public at the scene of a crash. The longer a crash is in place, the longer the responders are vulnerable and exposed to injury.

The magnitude of these problems is severe. Crashes critically limit the operational efficiency of our roadways and put the traveling public at risk. A systematic, coordinated plan for managing the scene is needed to reduce the impact of highway crashes and improve the safety of motorists, crash victims, and emergency response personnel. Various regions and cities around the country are developing incident management plans to improve their response, management, and clearance of an incident. Kentucky recently developed a Highway Crash Site Management Checklist for emergency response personnel. The Checklist along with a interagency training workshop clearly defines the roles of each agency, promotes communication on scene, provides resource information to all agencies, and provides suggestions to decrease the time spent on the scene of a crash.

1.1 Objective

The objective of this project was two-fold. The first objective was to identify the issues surrounding highway crash site management in Kentucky from the emergency response personnel's perspective. The second objective was to implement solutions to address these issues that would reduce the time required to manage and clear a highway crash site and therefore improve safety.

2.0 BACKGROUND

In order to discover and understand the issues surrounding highway crash site management, a group of stakeholders was identified and invited to participate in a focus group meeting. Some of the key agencies invited to attend the meeting included: Kentucky Vehicle Enforcement, Kentucky Emergency Management, Kentucky Transportation Cabinet, Kentucky State Police, Federal Highway Administration, ARTIMIS, Lexington Division of Traffic Engineering, TRIMARC, AAA Kentucky, Cumberland Gap Tunnel Authority, Transit Authority

of River City, and the Insurance Institute of Kentucky. An invitation was also extended to various city police, fire, and emergency medical service (EMS) agencies and towing companies. A list of those in attendance can be found in Appendix A.

Stakeholders were asked to concentrate on highway crashes using the following classification system: 1) crash with no injuries, 2) crash with injuries, 3) crash with fatal injuries, 4) crash involving a commercial vehicle, and 5) crash involving hazardous material. Within each of these classifications, they were asked to identify the activities that should be performed at a highway crash scene along with the corresponding agency that would perform these activities. The stakeholders noted that actions would be handled differently depending on the specific situation and the region of the state. Through this exercise, necessary equipment and policy/procedures were also identified.

Next, the stakeholders identified issues or problems related to the specific activities and possible solutions to these issues. These issues were grouped and categorized by the participants based on a common theme. Fifty-three issues were identified and grouped into 10 basic categories: planning on scene, receiving a call of notification, technology, crash investigation, communications, motorist information, personnel, equipment, traffic, and cargo. The data from the focus group meeting is summarized in Appendix B.

Eighteen key issues and corresponding solutions resulted. Several of these key issues could be addressed directly by this project. Table 1 shows these issues and the corresponding methods used to address the issues.

Key Issue	**Solution**
Constant evaluating and updating of plan on site is necessary.	Checklist, resource information
Who is "in charge" of the overall scene and how are activities prioritized?	Checklist, interagency training workshop
Emergency personnel do not understand others' duties and the importance of those duties.	Checklist, interagency training workshop
Personnel and equipment required on scene are usually not realized until specific response teams arrive on scene.	Interagency training workshop
Personnel on scene may not know who to call or where to get resources.	Checklist, interagency training workshop, resource information
Personnel on scene may not have the appropriate training.	Checklist, interagency training workshop
As the severity of the crash increases, so do the number of people on site and the amount of equipment.	Checklist, interagency training workshop
Who determines when and where traffic will be rerouted?	Interagency training workshop, detour maps

Table 1. Key Issues and Solutions

Several others issues were addressed indirectly by the efforts of this project. These issues included: poor communication among and within agencies, limited access to the scene, certain agencies may not respond quickly, and how will cargo be treated. The Checklist, workshop, and detour maps provided information to help address these issues. There were also issues that would not be addressed by this project. In general, these issues involved problems with callers/call takers, technology, and litigation.

3.0 METHODOLOGY

The Kentucky Transportation Center would complete four major tasks as a result of this project.

1. Develop a checklist of prioritized activities necessary on scene. The Checklist would initially be targeted toward rural regions, where more volunteer responders are involved and less training is available.
2. Develop a workshop with emphasis on interagency training and encourage use of the Checklist for highway crashes. The workshop would also encourage implementation of technology intended to improve the incident management process, enhance communication among responders, and recommend other innovative approaches to effective site management.
3. Distribute limited resource information (equipment and personnel) to the workshop attendees.
4. Provide regional detour maps for interstates and parkways to workshop attendees.

The first step toward creating the Checklist and workshop was the development of a list of highway crash-related activities. The input from the stakeholders was used to develop a flow chart of activities, seen in Appendix C. This flow chart makes several assumptions (including that law enforcement is the first agency to arrive on scene), but serves to demonstrate the complexity of the process due to the number of agencies involved and the necessary activities to be performed. Additional input was gathered from personnel interviews with specific agencies, such as Kentucky Emergency Management and the State Fire Marshal's Office, and national and local incident management manuals.

All of the collected information was used to create a draft of the Checklist and workshop material (including a course outline and scenario activity). This data was reviewed several times by a core group of stakeholders and then revised accordingly. (See highlighted participants in Appendix A for a list of the core group members.)

4.0 RESULTS

4.1 Checklist

The Checklist is a tool to institute a simplified, coordinated effort at the scene of a crash. It serves as a reminder to agencies of the activities that need to be performed and who is responsible for performing them. It also helps all the agencies involved at a crash scene to gain a

better understanding of the roles of other agencies. The content of the Checklist is found in Appendix D.

The Checklist was developed as a statewide tool, and therefore must be tailored to a specific region of the state for a workshop. Participants are encouraged to discuss and write region specific information in the Checklist. Each page of the Checklist is laminated so participants can make changes and/or take notes by using a wet-erase marker. It is also understood that every crash is different and the same tasks will not be performed at every scene. The Checklist serves as a general list of activities to be performed, but it is the responsibility of the responding personnel to decide which tasks are applicable for a particular crash.

4.1.1 Purpose and Organization

The goal of the Checklist is to secure and coordinate the resources necessary to restore a roadway's operation in a safe and timely manner. Restoring normal conditions more quickly makes everyone's job easier and improves the public's perception of each of the agencies involved (2). In order to achieve this goal, several objectives must be met. These objectives include: assessing the crash by determining the situation type; examining the site characteristics; establishing priorities such as managing traffic; establishing and maintaining communication with other responders; and implementing an Incident Command system.

The Checklist and workshop emphasize that communication is the key for effective management of a highway crash scene. In order for the correct resources to be available at the scene, communication is critical. Responding personnel must have accurate information on the location of the crash, how to access the scene, and the resources they need to provide. Miscommunication causes delay and compromises safety for everyone. Responders can clear the scene more effectively when they maintain communication with other agencies and their own personnel (1).

The Checklist is organized by agency with Law Enforcement, Fire and Rescue, and Emergency Medical Services (EMS) being the three primary responding agencies. There is an Initial Response page for the agency that is first on the scene of the crash. There are also pages to address the responsibilities of other agencies or private companies that are sometimes involved with management and clearance of a crash. These agencies/companies include: the Kentucky Transportation Cabinet, Kentucky Vehicle Enforcement, Kentucky Emergency Management, and towing companies.

4.1.2 Initial Responder

The Initial Response pages list activities that have been identified as critical based upon safety and/or time factors. The first agency on the scene should refer to this page. The activities for the initial responder include: determine the need for assistance; contact the appropriate agencies; provide help as needed until assistance arrives; and establish a command post. The initial responder will need to contact the appropriate agencies early in the process. This is to

ensure that time is not wasted at the scene waiting for others to arrive. Some agencies have limited resources and should be given as much time as possible to respond.

4.1.3 Primary Responders

The primary responders, Law Enforcement, Fire and Rescue, and EMS should refer to their agency-specific pages. (The initial responder, regardless of the agency, will refer to their agency-specific pages after performing the activities on the Initial Response pages.) The agency pages address key issues such as the parking of vehicles at the scene, controlling traffic at and around the scene, opening traffic lanes quickly, notifying the public of the crash, and the handling of any evidence at the scene.

With regard to parking, vehicles should be used to protect the site and the responders while minimizing the number of lanes blocked. The placement of vehicles will affect the flow of traffic. Responders should consider who has already arrived, and if the site is already protected, they should minimize distraction and lane restrictions (1).

Although traffic control is not usually the primary concern of responders, it is critical to the site management process at a crash scene. Without traffic control, motorists are left to find their own way around a crash scene. Delays can be significant, and secondary crashes may occur. Traffic control must be considered on scene and around the scene of the crash. At the scene, the roadway space needs to be managed so lanes are only closed as necessary. All open shoulders and lanes should be used as long as safety at the scene is not compromised. Detour routes around the scene should be well thought out in advance. The Checklist provides space for inserting region-specific detour maps for the interstates and parkways. Effective traffic control methods on scene and around the scene will make use of message signs, highway advisory radio, and other methods to disseminate information to the public (1).

The responders are encouraged to open lanes to traffic as soon as safety allows. Vehicles that can be driven or pushed out of the lanes of traffic should be moved. Safety is most important, but moving the vehicle will reduce congestion around the scene of the crash. Also, lanes should be left open to the flow of traffic as long as possible. If an investigation will require that all lanes be closed, the responders are encouraged to wait until the investigation is ready to begin before closing the roadway. Other ways to reduce the duration of a road closure include: equip responders with push bumpers, clear the scene from left to right, remove debris of a small spilled load if that will allow traffic flow in one lane, and require that towing companies remove vehicles and cargo safely but aggressively (1).

4.1.4 Supporting Agencies

Other agencies, such as the Kentucky Transportation Cabinet, Kentucky Vehicle Enforcement, Kentucky Emergency Management, and towing companies, will provide support to the primary agencies as needed. The Checklist reserves at least one page for each of these agencies. At the workshop, each person is encouraged to record specific information on what these agencies in their specific region can do and provide at the scene of the crash. The

Checklist provides space to incorporate important notes, phone numbers, and other information of benefit to the responders.

For example, the Kentucky Transportation Cabinet is available to assess and repair damaged roadways or bridges, provide additional resources (such as message signs, arrow boards, etc.), coordinate regional or multi-state detours, notify states that will be affected by the traffic congestion, notify rest areas and truck stops of the crash and possible delays, and assist in clearing the debris from the roadway.

Kentucky Vehicle Enforcement is called to inspect a commercial vehicle when it is involved in a crash with physical injuries or hazardous materials. Kentucky Emergency Management is called to provide support and additional resources to the responders and to coordinate the efforts of all state and local agencies involved in the event of a catastrophic crash. A towing company can be called to remove the vehicle(s) and/or cargo from the roadway, provide transportation for the uninjured vehicle occupants, and clear the crash debris from the roadway. By providing a clear, concise description of the vehicle(s) and the scene to the towing company, they are able to anticipate the type of equipment needed.

4.2 Workshop

The workshop material, seen in Appendix E, was finalized based upon the content of the Checklist and information from various incident management handbooks. There were seven major sections to the workshop. The first part of the workshop was the welcome and introduction of staff and attendees. As the attendees introduced themselves, they were asked to voice their number one concern about working a crash scene. (These concerns were listed, and at the end of the workshop it was shown that the majority of the list had been addressed during the workshop.) Next was a communication icebreaker where participants learned the importance of observation and clear, concise communication. Third was an introduction to the basics of incident management. This included simple definitions of an incident and incident management. The objective of the workshop, to improve safety and reduce congestion, was also emphasized at this point in the workshop. The fourth section of the workshop was a brief overview of the incident management process, including: detection, verification, motorist information, response, site management, traffic management, and clearance.

Part Five, one of the most critical sections of the workshop, was a close look at the Checklist. This included slowly walking through each section of the handbook and giving the participants an opportunity to discuss regional issues. Participants were provided with local phone numbers, equipment information, and detour routes for the interstates and parkways in the region. Emphasis was placed on effective site and traffic management to improve safety and reduce congestion.

Participants were asked to take part in a scenario activity, which was part six of the workshop. Participants were provided with emergency personnel roles to play (different from their real life role) and instructed to respond, manage, and clear a mock crash scene using the Checklist. This was an important part to the workshop because it allowed the participants to

become familiar with the Checklist, get to know other responders in the area by interacting with them, and understand the roles of others at the scene. Lastly, the workshop was closed and the participants were asked to fill out an evaluation form.

One workshop was conducted and evaluated as part of this project. The workshop was held in Bowling Green, Kentucky and targeted agencies in Barren, Edmonson, Hart, Simpson, and Warren Counties. Approximately forty people representing local and state law enforcement, fire departments, ambulance services, Kentucky Emergency Management, Kentucky Vehicle Enforcement, Kentucky Transportation Cabinet, State Fire Marshal's office, and local towing companies attended the workshop.

4.3 Evaluation of the Workshop

Thirty of the participants completed an evaluation form (Appendix F) for the workshop. The participants could choose one of the following answers on the evaluation form: strongly agree, agree, disagree, or strongly disagree. The results of the evaluations were favorable with ninety percent strongly agreeing/agreeing that the workshop was helpful to them. Comments reflected that the interagency training was beneficial to them because it promoted communication and better understanding of everyone's role at a crash scene.

Eighty percent strongly agreed/agreed that they would use the Checklist on scene. Ninety percent strongly agreed/agreed that the scenario activity helped them become familiar with the Checklist. Eighteen out of thirty (or sixty percent) strongly agreed/agreed that other agencies needed to be invited to the workshop. Other agencies mentioned included: dispatch, environmental agencies, more fire and EMS, hazardous material cleanup contractors, and media. Nearly ninety-seven percent strongly agreed/agreed that they would encourage others to attend this workshop. According to their comments, the most beneficial parts of the workshop were the scenario, the Checklist, and the interagency training. Some of the comments on how to improve the workshop included using experienced responders for trainers, inviting more people to participate, and including real crash photographs or video. The evaluation results are in Appendix G.

5.0 WORKSHOP RECOMMENDATIONS

Feedback from the initial workshop and the Kentucky Transportation Cabinet has concluded that more workshops will be beneficial. The Kentucky Transportation Center project staff will print more copies of the Checklist and plan to do four to six more workshops around the state. However, before more workshops are completed, a few revisions will be made. Some of the revisions to the workshop will include: 1) incorporating an experienced responder as a trainer, 2) inviting more agencies to the workshops, 3) using actual video or pictures to enhance the scenario or adding another activity using these resources, and 4) reducing time spent on introductory material and review of the Checklist and increasing time spent for hands-on activities. The Kentucky Transportation Center will continue to provide local resource information to attendees and will update detour maps for all interstates and parkways in Kentucky before the next workshop.

6.0 CONCLUSIONS

With highway crashes becoming more of a problem for the public, the Checklist is a method to address this concern. The goal of the Checklist is to secure and coordinate the resources necessary to restore a roadway's operation in a safe and timely manner. To accomplish this goal, the Checklist provides a prioritized list of activities for the responders to follow when working a crash scene. By utilizing the notes and phone number pages, it becomes an excellent and convenient source for resource information. The interagency workshop allows for responders to understand the importance of good communication and improve their method of crash response. The workshop also encourages the responders to get acquainted with personnel from other agencies and understand their roles so everyone can work better as a team. By clearing a highway crash as quickly as possible, safety is increased for everyone involved.

7.0 REFERENCES

1. "Traffic Incident Management Handbook" PB Farradyne for the Federal Highway Administration, Office of Travel Management. November 2000.

2. "Incident Management Manual Lexington Fayette Urban County Area" Lexington Fayette Urban County Government, Division of Traffic Engineering. May 1997.

8.0 APPENDICES

8.1 APPENDIX A

Focus Group Attendees

Name	Organization
Nancy Albright	Kentucky Transportation Cabinet
Andy Alphin	Bluegrass Towing Service
Jim Booth	Kentucky State Police
Jennifer Branham	Cumberland Gap Tunnel Authority
Don Breeding	Kentucky Transportation Cabinet – District 11
Howard Burch	Louisville Fire Department
John Burke	Cumberland Gap Tunnel Authority
Glendon Carlton	Lexington Fire Department
Rodney Cline	TRIMARC
Roger Coffey	Coffey's Towing
John Crossfield	Kentucky Transportation Cabinet
Roy Eddington	Bluegrass Towing Service
Neil Gilreath	Covington Police Department
Rudy Gruenke	Cincinnati Police Department
Ron Herrington	Lexington Division of Traffic Engineering
Glenn Jilek*	Federal Highway Administration
Jack Prindle	Boone County Police
Joe Riley	Lexington Fire Department
Alton Roberts	AAA Kentucky
Gordon Roberts	Kentucky Vehicle Enforcement
Tom Ross	Transit Authority of River City
Tim Schoch	ARTIMIS
Paul Simms	Lexington Police Department
Carl Sumner	Insurance Institute of Kentucky
Brent Sweger	Federal Highway Administration
Al Tronzo	Louisville Fire Department

Gray entry denotes members of the core group.

*Mr. Jilek was unable to attend the focus group meeting, but did participate in the core group.

8.2 APPENDIX B

Summary of Data Collected at the Focus Group Meeting

Activities List

1 Receive crash report (or observe)

2 Verification of crash

A. Dispatch Patrol Officer, OR

B. Receive pre Officer/EMS/Fire arrival verification through use of cameras, service patrols, etc.

3 Report on the severity/extent of the crash/incident

What is the exact location of the crash/incident?

Was HazMat involved?

Are there any injuries? If yes, how many people are injured and severity of injury (if obvious)?

How many lanes of traffic are affected?

What type of vehicles are involved?

How many vehicles are involved?

4 Police, Fire and Rescue, EMS units dispatched (as requested)

5 Assess situation - What resources (both people and equipment) are needed?

Is EMS, Fire and Rescue, a coroner, towing, or additional police needed?

What type of equipment is needed to remove the vehicle, cargo, debris, etc.?

Has there been damage to the roadway or infrastructure that will need to be fixed prior to opening the roadway?

6 Make request for additional resources

A. Request for EMS

B. Request for Fire and Rescue

C. Request for additional police

D. Request for KYEM personnel

E. Request for KY Motor Vehicle Enforcement personnel

F. Request for coroner

G. Request for tow operator

H. Request for DOT personnel

7 EMS respond

Determine extent of injuries

Possible request for additional EMS (air care, etc.)

Remove injured people from the scene

8 Fire and Rescue respond

Assess situation

Extricate occupants from wreckage, extinguish fire (as necessary)

9 KYEM personnel assess HazMat incident

Request additional resources (people and equipment) including the Health Dept. and OSHA

Evacuate area as needed

Stabilize situation

10 Establish command structure

11 Prioritize tasks
12 Establish a perimeter (traffic control)
13 Address news media personnel (if applicable)
14 Establish detour route
15 Update VMS/HAR* to notify motorist of incident/detour plans
16 Coroner examines and removes body or bodies from the scene
17 Police begin incident/crash investigation
For possible criminal charges
Completion of reconstruction diagramming/investigation
18 Motor Vehicle Enforcement Officer inspects commercial vehicle(s)
19 Remove debris/cargo from roadway
20 Removal of vehicles
21 DOT inspects/corrects structural problems
Notification and arrival of repair crews and equipment
22 Emergency/incident response teams clear area
23 Restore traffic flow
24 Update VMS/HAR* to notify motorist of open roadway

* VMS/HAR is (variable message sign)/(highway advisory radio)

Issues by Category

Planning on Scene

1. As the severity of the crash worsens there are more and more vehicles on the scene.
2. Real time assessment of the situation is needed.
3. How are the activities prioritized?
4. Continual evaluation and possible changes in "the plan" are necessary.

Receiving a Call

1. Cellular service is not available everywhere.
2. Not everyone has a cellular phone.
3. Callers report inaccurate or conflicting information.
4. Some callers do not speak English (or do not speak English well).
5. Call takers need training in taking emergency calls and sensitivity in handling the callers.
6. Call takers need a protocol to following when taking information from a caller.
7. Some calls may need to be transferred to the correct jurisdiction.

Technology

1. Technology is not always functioning properly. (HAR when cell phones are being used for transmission of information.)
2. Technology is not always available, especially in rural areas.

Crash Investigation

1. Police find it difficult to maintain evidence while other emergency personnel are working at the scene.
2. Litigation is common after some vehicle crashes, making crash investigation a long and tedious process.
3. All activities must be documented for crash reconstruction.
4. Which person/unit maintains control of the evidence?

Communications

1. Information is "passed down" too many times losing important details.
2. Communication among the different agencies is complicated by different radio systems and lingo.

Motorist Information

1. HAR and VMS only cover very specific areas (cannot be used to reach all motorist).

2. VMS and HAR messages must be continually updated to be timely and accurate.

Personnel

1. The severity of injuries can not be determined until you get there.
2. There may be a pileup of unnecessary resources on site.
3. Access to the scene may be limited by concrete barriers (with no crossovers) along the interstates.
4. May not know who to call for certain resources.
5. The Kentucky Transportation Cabinet's incident management teams are sometimes hard to get in touch with.
6. The nature of the injury (and therefore the resources needed) is not known until the EMS arrive on the scene.
7. Landing air care services on site may be a problem.
8. Motor Vehicle Enforcement has too few officers in rural areas.
9. In many situations, volunteers (or people unfamiliar with the situation) are working on the HazMat teams.
10. Getting the correct people on site with a plan for removal is a problem for HazMat crashes.

11. Multiple agencies/companies may need to be called out for HazMat cleanup.
12. In rural areas, crash reconstruction team may be all volunteers.
13. Police are usually first on the scene, but not always EMT trained.
14. Media will be present for some fatal, tractor-trailer, and HazMat crashes.
15. HazMat teams are usually "ultraconservative", slowing down the clearance process.

Equipment

1. The equipment needed (towing, EMS, fire, etc.) is not known until the specific responding agency reaches the scene.
2. There may be a pileup of unnecessary resources on site.
3. The severity of injuries can not be determined until you get there.
4. Access to the scene may be limited by concrete barriers (with no crossovers) along the interstates.
5. May not know who to call for certain resources.
6. The nature of the injury (and therefore the resources needed) is not known until the EMS arrive on the scene.
7. Landing air care services on site may be a problem.
8. Some tractor trailers are not properly marked and don't have the proper paperwork for their HazMat load.
9. Multiple agencies/companies may need to be called out for HazMat cleanup.
10. There is no standardized vehicle classification system.
11. A list of "driveability" factors is needed to determine if a vehicle is "driveable" or not.

Traffic

1. Through traffic can slow down the clearance process and jeopardize the safety of the response teams.
2. Who decides what happens with the traffic?
3. Diversion facilities and timing plans are inadequate to accommodate detoured traffic.

Cargo

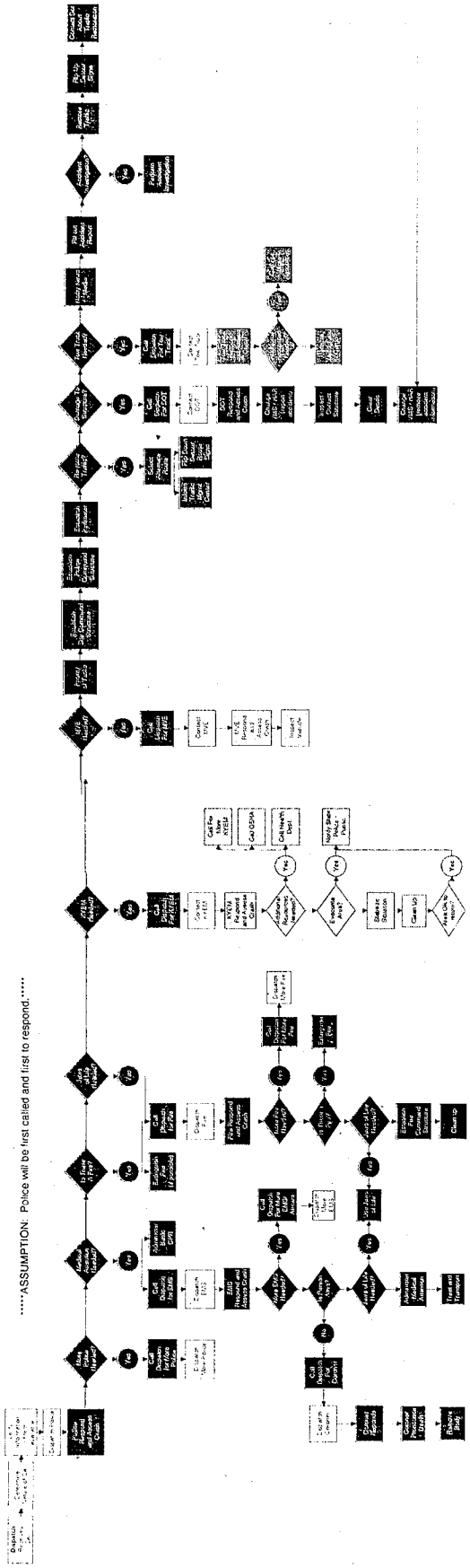
1. Contacting the owner.
2. Storing/getting rid of the cargo.
3. No one wants to assume liability for destroying a tractor-trailer's cargo.

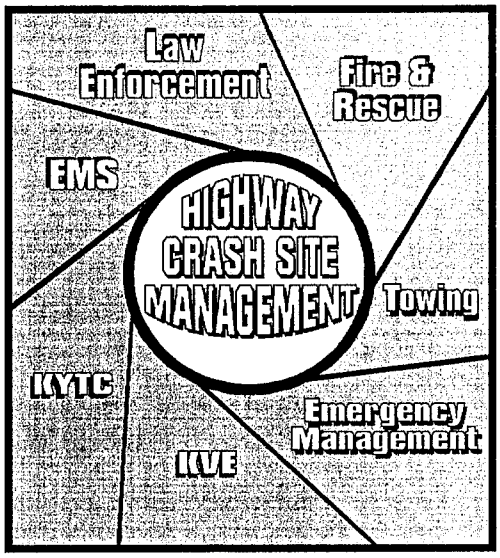
Key Issues and Corresponding Solutions

Key Issues	Potential Solutions
Constant evaluating and updating of plan on site is necessary.	Develop a checklist of things to do, develop a resource list (people and equipment).
Who is "in charge" of the overall scene and how are activities prioritized?	Planning with all parties involved, coordinated training, checklist of items.
Callers report inaccurate or conflicting information.	Expand detailed reference markers, education, technology improvements (On-Star, mayday systems, etc.).
Dispatchers/call takers need a protocol to follow and training to handle various callers.	Develop a protocol for call takers, additional training (including sensitivity).
Calls come in to the wrong jurisdiction.	Expand Detailed Reference markers.

Technology does not always function properly.	Continue technology improvements.
Technology is not available in all areas or to all motorist.	Use override of radio.
Emergency personnel do not understand each others duties and the importance of those duties.	Coordinated training.
With litigation becoming more popular, police must do a tedious investigation.	Take more pictures and video to preserve the scene.
Poor communication among the various agencies and within agencies.	Need more direct communication, use uniform communication system and lingo.
The personnel and equipment required on scene is usually not realized until the specific response teams already arrive on scene.	More direct communication with those already on site.
Access is sometimes limited to the scene.	Mutual aid agreements with other jurisdictions, air care.
Personnel on scene may not know who to call or where to get resources.	Develop a resource list (people and equipment).
Some agencies may not respond quickly. (MVE - too few personnel, KYTC - hard to reach)	Impound commercial vehicle and inspect later, designated on-call KYTC employees.
The personnel on scene may not have the appropriate training.	Training for volunteers in rural areas.
As the severity of the crash increases, so do the number of people on site and the amount of equipment.	Plan for parking on scene, command station.
Who determines when and where traffic will be rerouted?	Alternate route plan, coordinated planning and training.
How will cargo on the roadway be treated (destroyed, removed and stored, salvaged, etc.)?	Immunity for tow operators, storage plan for various types of HazMat.

8.3 APPENDIX C - Flowchart





A Checklist

Developed by the
Kentucky Transportation Center
University of Kentucky

in cooperation with the
Kentucky Transportation Cabinet

Organization of the Checklist

This Highway Crash Site Management checklist is organized by agency. The checklist provides agency representatives from Law Enforcement, Fire & Rescue, and EMS with a prioritized checklist of activities to reference. There is also an "Initial Response" page for the agency that is first on the scene of the crash. The activities on the "Initial Response" pages have been identified as activities that need to be performed early in the process for the sake of safety and time. The "Initial Response" agency takes responsibility for these activities and the activities on their corresponding agency page.

The remaining pages of the checklist contain information on a few of the agencies that play a supporting role in highway crash site management. These agencies include the Kentucky Transportation Cabinet, Kentucky Vehicle Enforcement, Kentucky Emergency Management, and towing companies. The checklist provides a description of each agency's role and resources the agency may provide.

The following key is used throughout the checklist:

- ✓ **Prioritized activity**
- ♦ **Additional information to consider about the activity**
- ⓘ **Information to provide to other responders**
- ☎ **Important contact information**

Highway Crash Site Management

Goal: Secure and coordinate the resources necessary to restore a roadway's operation in a safe and timely manner.

Objectives:

- **Assess Crash**
  - **Determine situation type**

Situation Type

- **Crash Without Injuries**
- **Crash With Injuries**
- **Crash With Fatal Injuries**
- **Crash Involving Commercial Vehicle**
- **Crash Involving HAZMAT**

  - **Examine site characteristics**

Site Characteristics

Where are you located?

- How accessible is the crash scene?
- Where is the nearest assistance?
- Where is the nearest intersection/interchange?

(Continued on Next Page)

Site Characteristics

(continued)

What are the roadway conditions?

- What is the condition of the pavement (wet/dry/snow/ice)?
- Is there adequate visual warning for drivers?
- How many lanes are involved?
- What is the location of the vehicles?
- How much traffic control is needed?
- Should a detour route be established?

- **Establish Priorities**
  - **Stabilize the situation**
  - **Manage the traffic**
  - **Acquire adequate resources**
- **Establish and Maintain Communication**
  - **Notify appropriate agencies**
  - **Coordinate with other responders**
- **Implement Incident Command System**

(Activities are not necessarily performed sequentially.)

Initial Response

Assess the Situation

- ✓ **What is the nature of the crash?**
- ✓ **What are the characteristics and hazards of the site that might affect management and clearance of the crash?**
- ✓ **Which agency should take the lead for the crash?**

✓ Determine need for assistance

- ♦ ***Call EMS when someone requires medical attention.***

  ⓘ
  - Exact location of crash
  - Number injured
  - Nature of injuries
  - Access to the scene

- ♦ ***Call Law Enforcement to record and possibly investigate the crash. Law enforcement should also be called when traffic or crowd control is needed.***

  ⓘ
  - Exact location of crash
  - Description of the crash
  - Access to the scene

- ♦ ***Call Fire & Rescue when smoke, fire, or hazardous material is present or if extrication is required.***

  ⓘ
  - Exact location of crash
  - Description of the crash
  - Access to the scene

✓ Provide help as needed until assistance arrives

- ♦ ***Establish a safe perimeter around the scene.***
- ♦ ***Administer basic first aid.***
- ♦ ***Extinguish fire (if possible).***

Nothing should be moved or handled at the scene, unless aiding a victim, until Law Enforcement arrives.

✓ If there are hazardous materials or mass casualties, contact your local Emergency Management agency and/or Kentucky Emergency Management

Stay upwind and uphill from the hazardous material until it has been identified.

✓ Establish a command post where other agencies can check in when they arrive at the crash

- ♦ ***Command is dependent on the nature of the crash and may change as the situation changes.***

✓ Call a towing company if any of the vehicles cannot be driven

ⓘ
- Exact location of crash
- Access to the scene
- Number and type of vehicles to be removed*
- Type of cargo and approximate weight
- Description of the scene*

*** See Towing Tab for further information.**

- ✓ **If a commercial vehicle is involved in a crash that involves serious physical injuries or hazardous material, contact Kentucky Vehicle Enforcement to inspect the vehicle**
- ✓ **Assess the damage to the roadway/bridge infrastructure**
  - ♦ ***If damage is evident or probable on state maintained roadways, call the Kentucky Transportation Cabinet. For all other roadways, call the local public works department or the county road supervisor.***
- ✓ **If the crash involves fatalities, call the coroner**
- ✓ **Ask your communications center to inform others* of the crash**

ⓘ { Location and severity of the crash
Anticipated length of delay
Possible alternative routes

* Contact the Kentucky Transportation Cabinet, local law enforcement of affected communities, and local traffic management centers if congestion and/or delays are expected.

Remind your communications center to notify these agencies again when the crash has been cleared and the roadway is reopened.

Notes

Law Enforcement

✓ Call for additional resources as needed

ⓘ
- Exact location of crash
- Number injured
- Nature of injuries
- Access to the scene

Vehicles should be parked to protect the scene while minimizing the number of lanes blocked.

✓ Prioritize tasks

- ♦ *Tasks to consider: traffic control, filling out crash report, crowd control, crash investigation, re-routing traffic, evacuation, etc.*

✓ Work with other responders to establish an incident command structure

- ♦ *Command is dependent on the nature of the crash and may change as the situation changes.*

✓ Establish law enforcement command structure for crash

- ♦ *Which officer(s) will be in charge of each law enforcement activity?*

✓ Establish a perimeter around the scene

- ♦ *Provide traffic control as needed.*
- ♦ *Keep the public away from the injured and the crash scene.*
- ♦ *Insure other responders are careful with possible evidence at the crash scene.*

Consider whether any lanes of the roadway can be used to direct traffic safely around the crash scene.

✓ Consider whether traffic should and can be detoured around the crash

? Will traffic be delayed long enough to warrant a detour?

Consider how long it will take to establish the detour route.

? Is there a suitable detour around the site?

Consider how far out of the way the detour will take motorists.
Consider if there are any weight or size restrictions on the detour route and if the route is under any type of construction.
Consider if the detour can be marked properly (either with law enforcement or signs) so motorists won't get confused.

To detour traffic: Notify the Kentucky Transportation Cabinet, the local traffic management center, and local law enforcement of affected communities of the planned detour route. *Make use of flip down detour signs or message signs where available.*

- ✓ If the roadway is closed and long delays are expected, address or contact the news media or your local traffic management center
- ✓ Begin the crash investigation
- ✓ Restore traffic
- ✓ Fill out the crash report
- ✓ Supervise scene clearance
- ✓ Notify the Kentucky Transportation Cabinet and local traffic management centers when the roadway is reopened

Remember that message signs and detour signs will need to be updated!

Notes

Notes

Fire & Rescue

- ✓ **Call for additional resources as needed**

  ⓘ
  - Exact location of crash
  - Number injured
  - Nature of injuries
  - Access to the scene

Vehicles should be parked to protect the scene while minimizing the number of lanes blocked.

Until directed by law enforcement, do not remove or handle anything at the scene except when aiding a victim.

- ✓ **Extinguish fire**
- ✓ **Rescue crash victim(s)**
- ✓ **Establish landing zone for air care**
- ✓ **Identify and initiate cleanup of hazardous materials**
  - ♦ *Establish a safe perimeter and activate the community emergency response plan by alerting the local 24-hour warning point.*
  - ♦ *Also alert Kentucky Emergency Management, the State Fire Marshal's Office, the Cabinet for Natural Resources and Environmental Protection (Environmental Response Team), the carrier and originator of the material.*

DO NOT assist with the removal of hazardous material.

- ✓ **If evacuation is necessary, contact local law enforcement**
- ✓ **Work with other responders to establish an incident command structure**
  - ♦ *Command is dependent on the nature of the crash and may change as the situation changes.*
- ✓ **Assist with removal of debris from the roadway**

Notes

EMS

- ✓ **Call for additional resources as needed**
  - ⓘ Exact location of crash
    Access to the scene
    Resources needed

Vehicles should be parked to protect the scene while minimizing the number of lanes blocked.

Law Enforcement and Fire & Rescue on scene will need to be notified if Air Care will be responding to the crash.

- ✓ **Begin or take over life saving medical attention**
- ✓ **Begin medical attention for other victims**
- ✓ **If a victim needs to be extricated from the vehicle, call Fire & Rescue**
- ✓ **If there is a fatality, contact the coroner**
- ✓ **Transport victim(s) to the hospital**
- ✓ **Remove medical waste from the scene**

EMS

Notes

The Role of ...

KYTC

Kentucky Transportation Cabinet
Department of Highways

The Kentucky Transportation Cabinet* may be called to:

- ✓ **Assess and repair damaged roadways or bridges**
- ✓ **Provide additional resources**
  - ♦ ***KYTC may have access to message signs, arrow boards, traffic cones, construction equipment, cleanup materials and labor, and other resources that could assist in the management and clearance of the crash.***
- ✓ **Coordinate regional or multi-state detours**
- ✓ **Notify states that will be affected by the traffic congestion**
- ✓ **Notify rest areas and truck stops of the crash and possible delays**
- ✓ **Assist in clearing the debris from the roadway**

KYTC

* *KYTC will assist with crashes on state maintained roadways. For all other crashes, contact the* ***local public works department or the county road supervisor.***

☎ **For KYTC Call:**

☎ **For the Local Public Works Department or the County Road Supervisor Call:**

The Role of ...

KVE

Kentucky Vehicle Enforcement

If a commercial vehicle is involved in a crash with physical injuries or hazardous material, Kentucky Vehicle Enforcement should be called to:

✓ **Inspect the vehicle**

☎ **For KVE Call:**
1-800-928-2402

Notes

KVE

Notes

The Role of ...

Emergency Management

State and Local Emergency Management should be called to:

- ✓ **Provide support and additional resources to the responders**
- ✓ **Coordinate the efforts of all state and local agencies involved in the event of a catastrophic crash**

A catastrophic crash may involve hazardous material or mass casualties.

☎ For Emergency Management: 1-800-255-2587

☎ For Local Emergency Management:

_____

_____

_____

_____

Notes

The Role of ...

Towing

A towing company may be called to:

- ✓ **Remove the vehicle(s) and/or cargo from the roadway**
- ✓ **Provide transportation for uninjured vehicle occupants**
- ✓ **Clear the crash debris from the roadway**

Information to provide the towing company:

- **Exact location of the crash**
- **Access to the scene**
- **Number and type of vehicle(s)***
- **Type of cargo**
- **Description of the scene***

By providing a description of the vehicle(s) and the scene to the towing company, they are able to anticipate the type of equipment needed.

fold

*Questions to Consider

1. **Is the vehicle a passenger vehicle?** **Y** **N**

   If **NO**, what type?

   Motorcycle Bus Commercial Vehicle

2. **If a commercial vehicle is involved...**

   How many axles does the truck have? _____

   What type of trailer does the truck have? _____

   What type of cargo is the truck hauling? _____

   What is the estimated weight of the cargo? (Check manifest) _____

   Is the cargo organized on pallets? **Y** **N**

   If so, is the cargo dislodged from the pallet? **Y** **N**

3. **Does the vehicle have a flat tire?** **Y** **N**

   If **YES**, how many and which tire(s)? _____

4. **Is the vehicle still on the roadway?** **Y** **N**

☎ For Towing Call:

_____

_____

_____

_____

Notes

Important Phone Numbers

Phone Numbers

24-Hr Warning Point
911

_____
_____
_____
_____

Environmental Response Team
1-800-928-2830

Kentucky Emergency Management
1-800-255-2587

Kentucky Transportation Cabinet

Kentucky Vehicle Enforcement
1-800-928-2402

State Fire Marshal's Office
1-800-255-2587

Coroner

_____
_____
_____

Local Public Works Department or the County Road Supervisor

_____
_____
_____
_____

Phone Numbers

Notes

Kentucky Transportation Center
College of Engineering
176 Raymond Building
University of Kentucky
Lexington, KY 40506-0281
(859) 257-4513
(859) 257-1815 (fax)
www.engr.uky.edu/ktc

Kentucky Transportation Cabinet
501 High St.
Frankfort, KY 40622
(502) 564-4890
www.kytc.state.ky.us

8.5 APPENDIX E

Highway Crash Site Management
Workshop Course Material
Bowling Green, Kentucky - May 17, 2001

I. Welcome & Introductions – (45 minutes)

A. Local representative - Lancie Meredith (5 minutes)
   1. Welcomes the group and thanks them for making this priority. Briefly talks about the importance of a coordinated effort for managing highway crashes in the region.

B. KYTC representative - Nancy Albright (10 minutes)
   1. Reason for the Course – why KYTC considers this a priority
   2. Development of Course
      a. Study conducted by Kentucky Transportation Center
         i. Focus Group Meeting – issues identified and potential solutions generated
            1. Interagency training
            2. Resources
         ii. Core Group Meeting – key representation from all agencies for development of the workshop and checklist
      b. National incident management handbook

C. KTC Representative - Jerry Pigman (30 minutes)
   1. Introduction of KTC Staff
   2. Facilitate introduction of participants
      a. Name
      b. Agency
      c. Years of Service
      d. Question to answer: "What is your number 1 concern when working a crash scene?
   3. Overview of Workshop – We want to make sure that the things we talk about today do not compromise your number 1 concern.
      a. Who has been invited
      b. Review agenda

II. Communications Icebreaker - Monica Barrett or Jennifer Walton (15 minutes)

A. Participants

Ask 4 or 5 people to volunteer to leave the room; everyone else gets to look at the artwork.

B. How to Play

Identify 1 person in the room to communicate the artwork to the first person brought in the room. That person will then need to communicate the artwork to the next person, and so on. The last person will describe the artwork to the entire group.

C. Purpose

The purpose is to emphasize that communication is key. In order for the correct resources to get to the scene, communication will be critical. Responding personnel must receive accurate information so that other appropriate responding agencies are notified.

What you communicate and how you communicate it has to be considered before you're placed in the situation. That's one of the reasons why getting together for interagency training is important. It gives agencies a chance to communicate prior to a crash situation where they have to communicate. It also gives agencies the opportunity to better understand the resources and capabilities of the various agencies.

Today we will talk about some of the things that need to be communicated and to whom they should be communicated.

III. The Basics of Incident Management – Jennifer Walton (20 minutes)

A. Purpose of the Workshop

The purpose is to bring all the major players together and help them understand the importance of a unified, coordinated effort when managing and clearing a highway crash. To provide the agencies with information that might help with the management and clearance processes.

Site Management of a crash should be seen as a team effort in which each agency present has a part to play[1].

Effective site management requires understanding and respect for the priorities of other responders while working together cooperatively and productively. Regular planning, training, and communications with other responders produce the best results[2].

It is generally accepted that incident sites that are managed by experienced personnel that work together professionally can significantly reduce the length of incidents. Agencies that have a plan of action for managing incident sites that they have

[1] "Incident Management Manual Lexington Fayette Urban County Area." Lexington Fayette Urban County Government, Division of Traffic Engineering. May 1997.
[2] "Traffic Incident Management Handbook." PB Farradyne for the Federal Highway Administration, Office of Travel Management. November 2000.

coordinated with the other agencies will be much more successful in keeping confusion and delays to a minimum[2].

B. Definition of Incident Management

Incident management is the systematic, planned, and coordinated use of human, institutional, mechanical, and technical resources to reduce the duration of impact of incidents, and improve the safety of motorists, crash victims, and incident responders[2].

Incidents occurring on roadways cannot be completely prevented. However, their impact on traffic can be controlled through incident management[1].

By implementing a plan for incident management, we can reduce the duration of impact of incidents. The result is improved safety (for responders, motorists, and crash victims) and we can get traffic moving.

C. Definition of Incident

An incident is defined as any non-recurring event that causes a reduction of roadway capacity or an abnormal increase in demand.

An incident includes: highway crashes, disabled vehicles, spilled cargo, highway maintenance and reconstruction projects, and special non-emergency events[2].

1. Our focus will be on highway crashes.
2. Problems associated with highway crashes, include:

    a. Major concerns: secondary crashes, dangers to personnel on site, traveler delays
    b. Other concerns: increased response time by police, fire, and emergency medical services, lost time and a reduction in productivity, increased cost of goods and services, increased fuel consumption, reduced air quality and other adverse environmental impacts, increased vehicle maintenance costs, reduced quality of life, and negative public image of public agencies involved with the incident[2].

D. Objectives of the Workshop and Checklist
    1. To Improve Safety

        a. Secondary Crashes

        When crashes occur, traffic not only is delayed but it also creates additional safety hazards as drivers unexpectedly approach slow or stopped traffic[1].

        It is easy to get caught up in your responsibilities at the scene and not consider what is occurring miles upstream. The fact is vehicles traveling at highway

speeds (60, 70, even 80 mph) are coming to an abrupt stop. Not only is safety a concern at the scene, but also with the backed up traffic.

A study in Minnesota found that 13% of all peak period crashes were the direct result of a previous incident[3].

The severity of secondary crashes is often greater than that of the original crash. The longer an incident is in place, the greater the exposure to additional crashes[2].

A 1995 analysis of collision statistics on several arterials and expressways in California showed that secondary crashes represent an increase in collision risk of over 600 percent[4].

b. Danger for Responders

The longer the crash is in place, the longer response personnel are exposed to this danger.

Those responding to the crash are at risk for being struck by a passing vehicle as they are performing their duties. In 1997, nearly 40 percent of all law enforcement officers who died in the line of duty died in traffic[5]. Some of those occurred while the officer was operating a vehicle, but many occurred when the officer was outside the vehicle.

Top Ten leading causes of law enforcement fatalities during the past century (does not include 1999 figures)[6]:

1. Firearm (49%)
2. Automobile Crash (15%)
3. Motorcycle Crash (7%)
4. Struck by Vehicle (7%)
5. Job-Related Illness (4%)
6. Aircraft Crash (311 or 2%)
7. Stabbing (1%)
8. Fall (1%)
9. Drowning (1%)
10. Beating (1%)

---

[3] "I-35 Incident Management and the Impact of Incidents on Freeway Operation." Minnesota Department of Transportation. January 1992.
[4] "Intelligent Transportation Systems Impact Assessment Framework." Final Report. Volpe National Transportation Systems Center. September 1995.
[5] "National Police Week Observed May 10-16." The Police Chief, International. Association of Chiefs of Police. May 1998.
[6] http://www.nleomf.com

In 2000, 20 police officers died after being struck by vehicles while outside their squad cars, according to the National Law Enforcement Officers Memorial Fund. Fatal crashes are just a fraction of the total involving emergency vehicles. In Illinois alone, 162 state police cars were involved in crashes from January 1998 through December, and 88 were parked with their emergency lights flashing. State police Sgt. Joe Donley has been hit nine times - once outside his squad car and eight times while sitting in it. Not once was his car moving[7].

There is a fine line between providing safety for other motorists in backed up traffic and providing safety for responders at the scene. Responders must consider the safety implications for themselves and the other motorist affected by the crash when opening lanes of traffic around the scene. The bottom line is that the situation becomes more and more dangerous for both motorists and responders the longer the crash is in place.

2. To Reduce Congestion

Blocking one lane of a three-lane freeway reduces capacity by almost 50 percent, even though only a third of the lanes are blocked. This means traffic is affected more than just the single lane that has been closed.

In urban areas, incident related delay account for 50-60 percent of total congestion delay. In small urban areas, it can account for an even larger proportion[8].

Traveler delay is costly. In Kentucky, the estimated cost is $1.9 to $5.3 billion. That includes economic cost (wage loss, medical expense, administration costs, property damage, and employer costs) and comprehensive cost (a measure of the value of lost quality of life associated with deaths and injuries)[9].

In 1998, the top ten most congested urban areas had incident-related congestion ranging from 218,000 to 1,295,000 person-hours[10]. The additional fuel consumed ranged from 48 to 318 million gallons. This means an annual cost to each eligible driver of $140 to $291[2].

In fact, the cost of highway crashes are more significant than most people realize. If a crash is allowed to block one lane of traffic on an interstate (running at capacity) for just 20 minutes, the resulting delay would be over 1200 vehicle-hours. At $8/hour (a conservative figure), the cost due to delay would be almost $10,000[1].

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[7] Babwin, Don. "Motorist Ignore Emergency Workers." Newswire AP Report. 2001.
[8] "Incident Management: Challenges, Strategies, and Solutions for Advancing Safety and Roadway Efficiency." Final Technical Report. ATA Foundation in association with Cambridge Systematics. February 1997.
[9] Kentucky Traffic Safety Facts. Prepared by the Kentucky Transportation Center for the Kentucky State Police. 1999.
[10] Lomax, Tim, Shawn Turner, Herbert S. Levinson, and Richard H. Pratt. "Quantifying Congestion: Phase III Final Report, National Cooperative Highway Research Program, Transportation Research Board, National Research Council. September 1996.

Traveler delay is inconvenient and frustrating. When a major crash occurs, many hours and gallons of gasoline are wasted, and motorists experience the frustrations of being late for work, missing appointments, or just sitting in traffic[1].

Increased road congestion is one of the main causes of driver aggression or road rage. People are more busy than ever and time is precious. So road congestion causes more frustration than ever before. Law Enforcement officers report that many aggressive driving behaviors are the same as those that are contributing factors in crashes[11].

IV. The Overall Highway Crash Management Process – Monica Barrett (10 minutes)

A. Detection

Process by which an incident is brought to the attention of the agency or agencies responsible for maintaining traffic flow and safe operations on the facility.

Methods include: cell phones, CCTV, AVI w/ detection software, sensor technology w/ algorithms, call boxes, police patrols, aerial surveillance, DOT crews reporting via two-way radio, traffic reporting services, fleet vehicles, and roaming service patrols[2].

B. Verification

Confirming that an incident has occurred, determining its exact location, and obtaining as many relevant details as possible. Once verified, the proper initial response can be dispatched.

Methods include: CCTV, police, service patrols, communication with aircraft, and combining info from several cell calls[2].

C. Motorist Information

Involves the dissemination of incident-related information to motorist. Information should be provided from the start and continually updated until traffic flow is returned to normal.

Methods include: radio, HAR, VMS, telephone information systems (511), in-vehicle systems or PDAs, television, internet, and others via ISPs.

D. Response

Includes dispatching the appropriate personnel and equipment and beginning the dissemination of motorist information[2].

---

[11] "Aggressive Driving Enforcement." Department of Transportation. DOT HS 809 031, c.1.

E. Site Management

The process of effectively coordinating and managing resources on scene.

Foremost objective: to ensure the safety of response personnel, victims, and other motorists[2].

F. Traffic Management

The application of traffic control measures in areas affected by an incident.

Traffic management includes: establishing point traffic control, managing roadway space (opening and closing lanes, blocking only the portion of the incident scene that is needed for safety, staging and parking emergency vehicles and equipment to minimize impact on traffic flow), deploying appropriate personnel to assist in traffic management, actively managing traffic control devices, and designating, developing, and operating alternate routes[2].

G. Clearance

The process of removing wreckage, debris, or any other element that disrupts the normal flow of traffic or forces lane closures and the restoring of the roadway to capacity to its pre-incident condition[2].

Today, our focus will be on motorist information, site management, traffic management and clearance.

V. Take A Break! (15 minutes)

VI. A Look at the Checklist – Monica Barrett and Jennifer Walton (1 hour 15 minute)

A. The Intent (JW)

The Checklist should serve as a tool to help institute a simplified, coordinated effort at the scene of a crash. It serves as a reminder to agencies about activities that need to be performed or at least that they need to be aware of. And it helps all agencies involved better understand the roles of others on the scene.

The handbook was developed as a statewide tool. Therefore you may need to make minor adjustments or additions in order to tailor it to this region. We will discuss those things as we go through the handbook. If we get to an activity that should be performed by a different agency or anything needs to be clarified or changed, then please speak up. We want to discuss the activities and/or issues as they pertain to this region.

We also understand that every crash is different and the same tasks will not be performed at every scene. The Checklist serves as a general list. It will be up to the responding personnel to decide which tasks are applicable to the particular crash and in the specific region.

B. Content
   1. Organization
   2. Introduction
   3. Initial Response
   4. Agency Pages
   5. Phone Numbers
   6. Detour Maps

C. Organization

   1. Initial Response

      The activities under "Initial Response" should be completed by the responding agency that is first to the scene.

   2. Three Primary Responding Agencies

      The Checklist addresses the activities performed during site and traffic management and crash clearance of the following agencies: Law Enforcement (includes local and state authorities), Fire and Rescue, and EMS.

   3. Other Agencies

      The Checklist also addresses the responsibilities of other agencies that are sometimes involved with the site and traffic management and clearance of a crash. These agencies include: the Kentucky Transportation Cabinet, Kentucky Vehicle Enforcement, Kentucky Emergency Management, and towing companies.

      Other agencies not mentioned in this handbook may also get involved. This Checklist includes a few of the major players.

   4. Key to the Checklist
      a. Prioritized activities
      b. Additional information
      c. Information to provide
      d. Important contact information

D. Introduction

   1. Goal: Secure and coordinate the resources necessary to restore a roadway's operation in a safe and timely manner.

Restoring normal conditions more quickly makes everyone's job easier, and improves the public's perception of each of the agencies involved[1].

2. Objectives
   a. Assess Crash
      i. Situation Type

         Crash without injuries
         Crash with injuries
         Crash with fatal injuries
         Crash involving commercial vehicle
         Crash involving HazMat

      ii. Site Characteristics

         Where are you located?
         What are the roadway conditions?

   b. Establish Priorities

      i. Stabilize the situation
      ii. Manage the traffic
      iii. Acquire adequate resources

   c. Establish and Maintain Communication

      i. Notify appropriate agencies
      ii. Coordinate with other responders

      Different agencies do not typically have the means to communicate directly with one another. **What is the case in Bowling Green area? (ask participants)** Can any of the responders (from different agencies) communicate directly?

      Multi-agency response complicates scene management. Poor communication can delay and inhibit the flow of the most current information. Responders are effective when they maintain continuous communication with other agencies and their own personnel[2].

      Improvements that allow for direct communication should be considered: installation of other agencies' radios, use of common frequency for emergencies and incidents, cell phones, trunked 800 MHz radio systems, and other communication devices. Some agencies are now using video and data to transmit information from the incident scene (snapshot images, or full video)[2].

Communication prior to a crash is important also. Resource lists are helpful. Refer to the list of agencies and phone numbers with their handouts. Other important information to share: equipment lists with location, available supplies and materials, and interagency agreements.

d. Implement Incident Command System

An incident command system is a formalized system that lends consistency to the way agencies and service providers function in an emergency and fosters efficiency by eliminating the need to develop response plans for each incident.

The ICS provides a planned and organized approach to the management of incidents and emergencies. It is expandable and flexible but clearly designates one person as incident commander. ICS should be viewed as a set of guidelines in which each responder understands his or her roles and responsibilities.

Components of an ICS include:
Common terminology
Modular organization (allowance for expansion/contraction)
Integrated communications
Unified command structure
Consolidated action plans (identification of goals and objectives, other agency roles and resources, and procedures)
Manageable span of control
Designation of incident facilities (command posts and staging areas)
Comprehensive resource management

(1)

Unified Command System

This structure provides a management structure to facilitate cooperative participation by representatives from varying agencies and/or jurisdictions. It encourages the incident commanders of the major agencies to work together in a unified command post. Functions include: provide overall response direction, coordinate effective communication, coordinate resource allocation, establish resource allocation, establish incident priorities, develop incident objectives, develop strategies to achieve objectives, assign objectives within the response structure, review and approve incident action plans, insure the integration of response organization into the unified command structure, and establish protocols.

Benefits include: allowing all parties with functional or jurisdictional interests to work together, maintaining a cooperative environment, promoting common objectives, avoiding duplication of operational tasks or activities, enhancing

efficiency of individual agencies, promoting teamwork, and reducing the likelihood of single-minded decisions.

Who is in charge?

The first responder at the site of any incident is in charge until relieved by higher authority. The IC is the commander of the agency that has the priority mission at the time. The role of IC changes depending on the task being performed.

E. Initial Response (First agency at the scene would turn to this page.) (MB)

These activities have been identified as critical based upon safety and/or time factors.

1. "Assess the Situation"
   a. Goes back to the introduction where we talked about situation type and site characteristics. You assess the scene in order to understand the level of response that is required for a specific crash.

2. Communication: consider the agency you are communicating with and the type of information they might need to respond to the crash.

3. Crash Investigation: There is a burden on police to treat some traffic collisions as felony crime scenes (death or injury hit and run). Collection of data is important, and investigators are often meticulous. There is often a difference of opinion on where the priority should be, even within police agencies (traffic control or investigation). This type of investigation is not necessary with all crashes, and quick clearance should be considered if possible.

4. Command Posts: At major crashes, a command post may be established as a center of communication and coordination, as well as a reporting point for incoming personnel[1].

5. Towing company: Different towing companies have access to different types of equipment: wheel lift slings, ramp trucks, and under-lift systems. Towing companies need enough information to determine what type of equipment to dispatch to the scene. Every towing company will not have the appropriate equipment.

   Incident management programs establish high performance criteria and minimum levels of experience (and formal training) for towing operators that wish to respond to highway crashes. Rotation list of towing companies –needs to be broken down by type of towing equipment available to the company. Need to put specification and performance requirements in writing[2].

6. Motorist Information: Congestion may be lessened if motorists are given information early and at strategic locations upstream of a crash allowing them to avoid the area of a roadway closure[1].

7. Reminder: Although it is easily forgotten, it is important to notify everyone when the roadway is reopened.

F. Law Enforcement (Each agency will then perform the activities on their own page. The initial responder will perform "initial response" activities then turn to his/her agency page.)

1. Placement of vehicles: Vehicles may be used to protect the site and the responders, deliver resources to the scene, or for use to perform recovery and clearance. Vehicle placement is critical to the smooth flow of traffic around the site. Vehicle should be placed to protect the scene and provide access to needed equipment while minimize the number of lanes occupied by the vehicles. Incidents are always unique so a set of rules is hard to come by.

   Consider who has already arrived. If an emergency agency has already protected the scene and it will be safe to undertake whatever activity is necessary, the responder should minimize distraction or additional lane restrictions that might result from the placement of the arriving vehicle.

   Law Enforcement may stay behind the backed up traffic, direct traffic through the scene, assist other responders to the scene, or do paper work off site[2].

2. Prioritize tasks: Complete the tasks that must be done on scene and do the others off the roadway. Close, partially open, then completely open the roadway. Use total station surveying systems to quickly document information at the scene. Photogrammetry may also be used. Crash investigation sites may be established off the roadway.

3. Traffic Control: The goal of traffic management is to minimize traffic disruption while maintaining a safe workplace for responders.

   Traffic control is not usually the primary concern of responders. The result is motorists who are unfamiliar with the area that are left to find their own way past the crash scene. Traffic is often unnecessarily delayed. With the delay come costs in terms of lost time, fuel waste, and pollution. This shortsighted approach can also generate secondary crashes, which result in injury, property damage, and additional risk to responders.

   Actions with regard to the crash itself and the affected traffic have a tremendous bearing on the safe and successful resolution of the crash. We must recognize that the traffic and its smooth and safe movement is critical to incident management.

Traffic control must be consider on-scene and around the scene.

a. On-scene traffic control

   Merge traffic onto shoulder or lanes that will remain open around the scene. Cones and flares may be used to channel traffic. DMS may be used depending on the length of the closure.

   Manage the roadway space (opening and closing lanes, etc) and close only lanes that are absolutely essential for protection of responders and victims. Minimize the time the lanes are closed.

   Traffic control may be established and then changed several times during a single crash. As traffic control changes, motorist information should be updated. You will need sufficient personnel to manage the traffic control – usually law enforcement and KYTC.

b. Around the scene (detour routes)

   In general, responders in Lexington will consider implementing one of the designated detour routes if 2 or more lanes of an interstate are expected to be closed for 2 hours or more. Understand, however, that people will detour even if a detour route has not been recommended.

   Refer to the detour routes in the back of the Checklist. The detour route has to be well thought out. It should be driven prior to activating it. This is to ensure that the route is free of construction and other traffic bottlenecks. Also, you must be attentive to maneuvering problems or load restrictions that trucks may encounter.

   Use traffic control devices such as variable message signs and highway advisory radio systems. Adjust signal timing. What traffic control devices are available in the area, and who has access to them?

4. Methods for reducing the duration of crashes or the number of lanes closed may include:

   a. Immediately move any vehicle which can move under its own power
   b. Equip responders with push-bumpers to facilitate expedient clearance
   c. Open individual lanes as soon as they are clear
   d. Clear the scene from left to right (moving toward the right shoulder and the nearest off ramp
   e. Remove debris or small portions of spilled load if that may open one or two lanes (first responder)
   f. Require wreckers to aggressively clear the scene in a safe manner
   g. Make sure type and number of tow units are requested very early in the crash

h. Towing companies should have push bumpers

Driveable vehicles should be moved from the traffic lanes whenever possible. It is a simple solution to what could otherwise be a major congestion problem. Good judgment is needed when pushing a vehicle to maximize safety for the officer, the driver, and the motoring public[1].

Quick clearance policies – removal of vehicle off shoulder. Texas and Florida have laws that require removal of vehicles in non-injury crashes. This requires a good public information campaign.

If the roadway needs to be closed due to investigation, traffic should be allowed to flow until adequate scene safety and traffic control resources have responded and are in place. Traffic should also continue until the investigate resources are on scene and ready to do their portion of the investigation[2].

Cargo removal: Sometimes the carrier and/or insurance companies will be contacted. Progressive insurance agencies will want the scene cleared as soon as possible to cut down on the secondary crashes that might occur. They may be able to "total" the cargo even though they request a specific towing company or owner representatives to salvage the cargo. Police should discourage this. Experience has shown that liability is not a significant issue – so clear the roadway more quickly.

5. Clean-up: Sometimes with crashes involving clean-up and debris removal, final cleanup can wait until after the peak commuting period is over.

G. Fire & Rescue

1. Placement of vehicles: Vehicles may be used to protect the site and the responders, to deliver resources to the scene, or to perform recovery and clearance. Vehicle placement is critical to the smooth flow of traffic around the site. Vehicles should be placed to protect the scene and provide access to needed equipment while minimize the number of lanes occupied by the vehicles. Crashes are always unique so a set of rules is hard to come by.

Consider who has already arrived. If an emergency agency has already protected the scene and it will be safe to undertake whatever activity is necessary, the responder should minimize distraction or additional lane restrictions that might result from the placement of the arriving vehicle.

Fire & Rescue may send more than one vehicle that constitutes a "team". Place equipment where it can be functional without further inhibiting traffic. When other responders are protecting the crash scene and there isn't an obvious threat of fire, the engine can park on the shoulder, behind, or in front of the units without closing additional lanes[2].

Excessive use of flashing lights unnecessarily distracts motorists and can increase the congestion associated with the crash[1].

When a fire hose is needed, park the vehicle on the shoulder so the hose doesn't cross over lanes. This allows for quicker restoration of traffic once the damaged vehicles are removed because the hose can be recovered outside of the traveled lanes.

Example: Phoenix, AZ Fire Department - the first fire unit is responsible for determining need for additional fire equipment. Other units stop and stage on a surface street adjacent to a freeway on-ramp. They wait for direction, and if not needed, they return to active status without entering the freeway. This keeps equipment from being tied up in backed-up traffic and also keeps unnecessary vehicles away from the scene.

H. EMS

1. Placement of vehicles: Vehicles may be used to protect the site and the responders, to deliver resources to the scene, or to perform recovery and clearance. Vehicle placement is critical to the smooth flow of traffic around the site. Vehicles should be placed to protect the scene and provide access to needed equipment while minimize the number of lanes occupied by the vehicles. Crashes are always unique so a set of rules is hard to come by.

   Consider who has already arrived. If an emergency agency has already protected the scene and it will be safe to undertake whatever activity is necessary, the responder should minimize distraction or additional lane restrictions that might result from the placement of the arriving vehicle.

   Ambulances should park ahead or on the shoulder adjacent to the vehicles containing the injured victims (if ahead, allow 60 feet for the towing vehicle)[2].

I. KYTC (JW)

1. Are there other resources KYTC can provide?

2. Write in local public works department and county road supervisor's phone numbers.

J. KVE

1. Are there other instances when KVE should be notified?

K. Emergency Management

1. What types of resources can be provided?

2. Write in local Emergency Management numbers.

L. Towing companies

1. Placement of vehicles: Tow trucks should be parked out of the way with lights turned off (if in a position to be protected by another response vehicle). The best place for the tow truck is ahead of the wrecked vehicle and out of the way.

2. Are there other things the towing companies would like to know?

M. Additional Phone Numbers

1. Review numbers to write in blank spaces.

VII. Highway Crash Scenario – Monica Barrett (45 minutes)

A. Purpose of the Scenario

1. Familiarize yourself with the Checklist.
2. Learn the roles of other responders; therefore, working better as a team.
3. Get to know other responders from the region.

B. Assign roles to participants but make sure the roles are not their real life roles. Roles include: caller, dispatcher, law enforcement officer, fireman, EMT, tow truck driver, vehicle enforcement officer, emergency management representative, and KY Transportation Cabinet representative.

C. Role-play through the scenario, starting with the caller, until the scene is cleared.

D. Facilitator reviews the lessons learned through exercise.

1. Notify agencies early to reduce delays.
2. Park vehicles appropriately.
3. Work as a team.
4. Communication is key! Must convey all pertinent information.

VIII. Summary & Closing – Jerry Pigman (15 minutes)

A. Effective site management requires understanding and respect for the priorities of other responders while working together cooperatively and productively.

B. Effective site management means less time spent on scene which results in improved safety and reduced congestion.

C. Show that most of their concerns from the start of the workshop have been addressed.

8.6 APPENDIX F

Workshop Evaluation Form

1. **This workshop was helpful for me as a crash responder.** [Strongly Agree] [Agree] [Disagree] [Strongly Disagree]

Comments _____

2. **I will use this checklist for site management.** [Strongly Agree] [Agree] [Disagree] [Strongly Disagree]

Comments _____

3. **The ice breaker communication exercise was beneficial.** [Strongly Agree] [Agree] [Disagree] [Strongly Disagree]

Comments _____

4. **The scenario helped me become familiar with the checklist.** [Strongly Agree] [Agree] [Disagree] [Strongly Disagree]

Comments _____

5. **Having actual responders there to answer questions as they arose was helpful.** [Strongly Agree] [Agree] [Disagree] [Strongly Disagree]

Comments _____

6. **There were other agencies that should have been invited to the workshop.** [Strongly Agree] [Agree] [Disagree] [Strongly Disagree]

If so, please list _____

7. **I would encourage other responders to attend this workshop.**

Strongly Agree	Agree	Disagree	Strongly Disagree

Comments _____

_____

_____

8. **List any subject presented that could be eliminated from this workshop.**

_____

_____

_____

_____

_____

9. **List the subject presented that was most beneficial to this workshop.**

_____

_____

_____

_____

_____

10. **Ways to improve this workshop.**

_____

_____

_____

_____

_____

11. **Additional Comments:**

_____

_____

_____

_____

_____

Optional Information:

Name _____
Agency _____
Phone Number _____
Email _____

8.7 APPENDIX G

Evaluation Results

	Question	Strongly Agree	Agree	Disagree	Strongly Disagree
1	**This workshop was helpful for me as a crash responder.**	7	20	3	0
Comments: *Warren County seems to be ahead of what was presented, some information was not correct.* *Communication between agencies.* *Anytime you get all the agencies together, helps them with face-to-face contact.* *Good to get all agencies together.* *Better understanding of other jobs.* *Promote interagency communication and support.*				
2	**I will use this checklist for site management.**	5	19	4	1
Comments: *Yes.* *Could use some additional information.* *A limited - because I am one of the last on scene.* *I won't personally, but I feel it is a good idea for an inexperienced responder.* *I'll probably use it more to train myself and others, but may not get it out during an actual event.* *Will use as a resource.* *Rather good guide.*				
3	**The icebreaker communication exercise was beneficial.**	7	19	4	0
Comments: *Communication between people (agencies).* *I certainly agree, because it changed as the facts go down the line.* *Apparently, MVE officers aren't required to be observant.* *Gets everyone awake.* *Promotes interagency communication and support.*					
4	**The scenario helped me become familiar with the checklist.**	6	21	3	0
Comments: *I agree it did show that some judgment is involved.* *Knew most already, but again I feel it is probably for others.* *The scenario was useful in helping me understanding other agencies roles, but not so much in becoming familiar with the checklist.* *Helps you understand you can miss things.*					

5	**Having actual responders there to answer questions as they arose was helpful.**	20	10	0	0

Comments:
Most of the presenters failed to present information based upon actual experience.
Very good.
Totally, I agree that more other meetings would be good.
We are the ones actually doing it.
Lot of experience available.
Promote interagency communication and support.

6	**There were other agencies that should have been invited to the workshop.**	7	11	11	0

Comments:
National Park Service, Local Water and Electric Companies
Dispatch
Communications personnel, dispatch
More Fire Department and EMS
Media
Dispatchers and Cleanup people
911 Dispatchers
Dispatchers, park service, environmentalist
Yes, NREPC
Dispatchers
Emergency services dispatchers
More departments should have been invited from more counties such as fire department in Edmonson did not receive notification of this workshop
?
Commercial HazMat cleanup companies

7	**I would encourage other responders to attend this workshop.**	13	16	1	0

Comments:
Do it again in the area.
Especially for perspective incident commanders.
Very good.
County sheriffs and city police.

8 List any subject presented that could be eliminated from this workshop.

None.
Icebreaker.
None.
Regulations that deal with crashes.
None.
I think it is all pertinent.
Good workshop, keep everything in place.
N/A

9	List the subject presented that was most beneficial to this workshop.
The practical exercise. *Various agency response ideas and different ideas on the same problem.* *All of the above.* *The little checklist book is nice.* *The checklist.* *Going through the checklist.* *Detour maps are good, but only tools - not mandatory.* *Scenario with mixed up responsibilities was a good idea and well presented.* *Checklist - hope to go back to area - and possibly put on a class reviewing the checklist.* *The scenario - more hands on or scenario (role playing) would make the workshop more beneficial maybe to different ones to use different resources.* *Who is in charge?* *Highway Crash Scenario.* *Building interagency communication and promote opening the road ASAP.* *Exercise.*	

10	Ways to improve this workshop.
Someone who has actually been to a crash site who teach the class. Actual scene photos could be added or EMS videos. *Ask (invite?) other people.* *Invite each agency to give their perspective.* *Work harder to involve all state agencies, NREPC.* *Good class.* *Get more people involved.* *Make it longer than half a day.* *Research all applicable regulations (whether KRS or interagency policy) and have someone with that knowledge present to advise and answer as questions arise.* *Should be required, annual training for responders.* *Couple of presenters may have been nervous and as such gave impression of not being familiar with material.*	

11	Additional Comments:
Presenters need to have more credibility as having actual experience at crash scenes. *Statistics and related information need to be supplemented with hands on experience.* *Need to know more about how things are done in the area.* *Very good program overall.* *Overall a lot better than the last conference in Bowling Green.* *More discussion on control at crash sites. Food was great. Good representation at the BRADD meeting.* *Great snacks.* *Should have any agency that works wrecks to be made to take this.* *KSP should be incident commander and trained accordingly.*	

Participants Providing Comments:
Tony Keithly
Steve Killman
Eddie Lawson
John Matheny
Steve Meeks
Lancie Meredith
Ronnie Pearson
Steve Pedigo
Chuck Phillips
Jeff Sams
James Stinson
William Vaughn
D.T. Wilkinson
Gina Yoakem
Ronnie Yoakem
15 unidentified