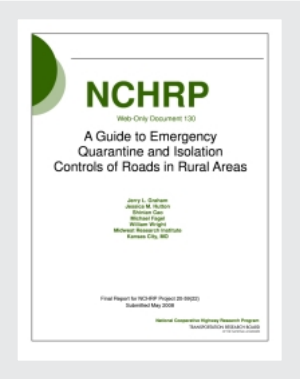

A Guide to Emergency Quarantine and Isolation Controls of Roads in Rural Areas

DETAILS

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Response to agricultural emergencies, whether attributed to agroterrorism or naturally occurring outbreaks of food contamination or animal disease, often requires immediate (within hours) isolation and/or quarantine of potential infection or contamination areas. For example, with a Foreign Animal Disease (FAD), federal, state, and local agencies will all be involved in a response. Research indicates that the economic impact of the outbreak is a function of the time it takes to enforce quarantine and eradicate or control the infection. It is essential that emergency quarantine and isolation control guidelines and procedures that can be implemented immediately at the local level are available to local responders. Traditional methods of containment (i.e., posting law enforcement officers to control travel) are not feasible in many potentially affected areas; thus, more innovative methods are needed that can be implemented in partnership with law enforcement, military (Active, Reserve, and Guard), the private sector, transportation agencies, media outlets, and others at the local and state levels.

The objective of this research is to prepare a guide that establishes recommended practices and procedures associated with traffic control on local and state roads during agricultural emergencies. The research will focus on quarantine and isolation controls that are related to identified containment areas and need to be established within a suitable time frame. There is a need to be able to implement recommendations with minimal resources typically available in a rural region.

Development of the guide began with a review of existing information on agricultural emergencies. Information reviewed included articles and reports related to agroterrorism, foreign animal diseases, case studies of past incidents of foreign animal and plant disease outbreaks, training exercises and simulations of outbreaks, state and federal response plans, and emergency traffic control.

Limited information on traffic control during quarantines was found in the literature review. To supplement the literature review, phone and email interviews were conducted with state and local enforcement, transportation, and agriculture officials. These interviews covered emergency response plans, training that was being offered to local agencies, and concerns of local law enforcement officials regarding traffic control in a quarantine or stop movement situation.

The lessons learned from the literature review and state and local interviews helped the research team identify the agencies involved in a response to an agriculture emergency and the timeline of the various phases of a response. These lessons were summarized in a taxonomy shown in Table 2-1 in the guide. The response to an outbreak was divided into three phases:

1. Phase 1—Planning
2. Phase 2—Initial Response
3. Phase 3—Long-term Response

Federal, state, and local agencies will all be involved in a response as soon as a veterinarian examines animals that are exhibiting symptoms that indicate a possible foreign animal disease. Local agencies will normally be responsible for organizing traffic control. The scope of the traffic control cannot be stated without knowledge of the specific disease, the number and location of susceptible animals, and other site-specific features such as weather and geography. However, the Guide uses a hypothetical scenario to illustrate the number of traffic control points that would be required for a six-mile quarantine radius. In the scenario described in the Guide, 27 sites would require traffic control. Since local law enforcement agencies in a small rural county would not have the resources to place a law enforcement officer at each of these sites, a route priority scale is provided in the Guide to aid in determining the appropriate level of traffic control at each site. The three levels of traffic control described for a quarantine are:

Level 1—Traffic Checkpoints With Cleaning and Disinfection Stations. Level 2 checkpoints with the added provision of a station to clean and disinfect vehicles or individuals exiting a quarantine area.

Level 2—Traffic Checkpoints. Vehicles are screened and those related to agriculture are returned to place of origin or holding sites, or allowed to proceed under permit.

Level 3—Road Closure. Roads are barricaded and all traffic movement is stopped.

Law enforcement officers would be required at Level 1 or 2 sites, but are not required at road closures. Diagrams and notes for each level of traffic control are in the guide. The use of nonstandard traffic control devices may be justified in early stages of a response, but these devices should be replaced as soon as standard devices are available.

To keep the Guide as short and understandable as possible and to emphasize the traffic control features of a response, the Guide avoids or minimizes discussion of legal basis for quarantines, law enforcement standard operating guidelines, specifics of cleaning and disinfection operations, and reimbursement and indemnity procedures that vary by state and should be discussed elsewhere.

Many state and local agencies would be involved in a response to an agricultural emergency. Exercises involving emergency managers, law enforcement, local and state DOT representatives, and agriculture officials should be conducted at multiple locations within a state. These exercises would require travel funds for county officials, and could be patterned after the workshops held in this research.

Section 1. Introduction

1.1 Background

There are new concerns about the vulnerability of U.S. agriculture to the deliberate introduction of animal and plant diseases (referred to as agroterrorism), detailed by the Homeland-Security-Council-led interagency working group in several of the national planning scenarios laid out in Homeland Security Presidential Directive/HSPD-8 National Preparedness. Transportation and law enforcement agencies are being called on to prepare for their roles in the National Incident Management System (NIMS), which provides "a consistent nationwide approach for federal, state, tribal, and local governments to work effectively and efficiently together to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity."

Response to agricultural emergencies whether attributed to agroterrorism or naturally occurring outbreaks of food contamination or animal disease often requires immediate (within hours) isolation and/or quarantine of potential infection or contamination areas. Research indicates that the economic impact of the outbreak is a function of the time it takes to enforce quarantine and eradicate or control the infection. It is essential that emergency quarantine and isolation control guidelines and procedures be available that can be implemented immediately at the local level. Traditional methods of containment (i.e., posting law enforcement officers to control travel) are not feasible in many potentially affected areas; thus, more innovative methods are needed that can be implemented in partnership with law enforcement, military (Active, Reserve, and Guard), the private sector, transportation agencies, media outlets, and others at the local and state levels.

Quarantine or isolation of even a limited area could involve many roads and could need to be in place for weeks to months. While federal support for the longer duration may arrive in a few days, vector control (i.e., containment of damages) requires an effective locally implemented response within hours.

There is a need to develop or identify appropriate emergency quarantine and isolation controls for road networks (e.g., all roads in a 3- to 6-mile (5- to 10-km) radius of a feed lot) in a short time frame (e.g., 6 to 12 hours). Although a typical state DOT usually has on hand enough signs and barricades to close and detour one route in a county, it would be hard pressed to close two or three roads in the same county. It is doubtful that any county has enough signs and barricades to restrict or control traffic on all county roads in a 3- to 6-mile (5- to 10-km) radius quarantine area.

1.2 Research Objective and Scope

The objective of this research is to establish recommended practices and procedures associated with traffic control on local and state roads during agricultural emergencies. The research will focus on quarantine and isolation controls that are related to identified containment areas and need to be established within a suitable time frame. There is a need to be able to implement recommendations with minimal resources typical for a rural region.

This project is primarily concerned with agricultural emergencies, such as outbreaks of foot-and-mouth disease, highly pathogenic avian influenza, or plant rusts where a rural county does not have the law-enforcement resources to respond quickly.

1.3 Research Approach

The project began with a thorough review of the literature, including national, state, and local response plans for agricultural emergencies, response training exercises and reports, and emergency traffic control guidelines. State and local emergency response agencies, departments of agriculture, law enforcement, and highway officials from several states were contacted to determine the types and levels of agricultural emergency response planning and training that are taking place, as well as the agencies' planning, training and resource needs. After compiling the information from the literature in an annotated bibliography and detailing the information discovered through the state and local contacts, the important concepts were analyzed and summarized in a brief description of the lessons learned from the literature and state and local contacts. A taxonomy of agricultural emergency response policies and procedures was then developed to capture the phases, timeline, and roles and responsibilities of the different agencies involved in the response as we understood it from the lessons learned.

The annotated bibliography, lessons learned and taxonomy, combined with the research team's expertise in traffic control, were then used to develop a draft guide to traffic control for an agricultural emergency, which provided a method for setting up traffic stops, road blocks and cleaning and disinfection stations. The guide included traffic control diagrams, a hypothetical agricultural emergency scenario to be used as a planning exercise, as well as planning information such as establishing a command structure, a communication plan, a resource list, and emergency compact agreements with other jurisdictions specific to an agricultural emergency response. The draft guide was presented in a series of one-day workshops to state and county officials, including representatives from the department of agriculture and the department of transportation, veterinarians, county emergency managers, county sheriffs and deputies, city police, and city and county public works officials, in four states. Workshop participants were invited to review the guide and provide the research team with feedback on how applicable they found the guide for their communities, such as how useful the different sections of the guide were, what was not included but would have been helpful, suggestions for different ways of presenting the information, and if anything was misleading, confusing, or

contradictory to their existing emergency response plans. The feedback from the workshop was combined with feedback from other federal, state, and local officials who were given the guide for review, and a revised guide was developed.

Finally, the results of the literature review, the information gathered through state and local contacts, the lessons learned, the taxonomy, and the traffic control guidelines developed for an agricultural emergency response, were compiled into this final report.

1.4 Organization of This Report

This final report presents an overview of the work conducted in the research. The final guide developed during the research and the project presentation used in the Task 7 workshops are presented in the appendices to this report. The sections of the report that follow are briefly described here.

Section 2 of this report is an annotated bibliography, citing and describing a variety of articles, reports, and emergency response plans found during the literature review. While very little information was found on traffic control procedures, the literature provided useful information for understanding the plant and animal diseases likely to be introduced, the level of economic harm caused by an outbreak, the timeline of the spread of the disease and the level of response required to contain and eradicate the disease. Section 3 provides a summary of the information gathered from interviews with state and local officials involved in agricultural emergency response. It also includes a brief discussion of an agroterrorism response planning session. Section 4 describes the lessons learned from the case studies, the literature review, and phone interviews with state and local officials. Information was gathered not only on how previous cases were handled, but also on the level of state and local preparedness. Section 5 discuss the development of the guide and provides a taxonomy of the existing general procedures for handling an agricultural emergency including incident response command structure, emergency mutual aid compacts, levels of control, prioritization of routes, enforcement, and traffic control layouts. Section 6 details the review of the guide by state and local officials, including the one-day workshops in four rural counties.

The Appendix presents the project presentation that was used to present the project, as well as basic emergency traffic control procedures, during the four one-day workshops. This presentation may also be used to present the project and to introduce the Guide to agencies that are interested in developing a traffic control plan for an agricultural emergency.

Section 2.
Annotated Bibliography

Section 2 provides an annotated list of the references reviewed for the preparation of this final report. The references are categorized into five groups: general citations on agroterrorism and foreign animal diseases; case studies; simulations, training exercises and preparedness reports; federal and state response plans; and articles on emergency traffic control. Many of the references were gathered from state and federal websites, where response plans and reports are made publicly available, and URLs are included where this is the case. In addition to the documents listed in this section, many websites were reviewed.

2.1 General Sources on Agroterrorism and Foreign Animal Disease

This section contains articles and reports related to agroterrorism awareness and preparedness, as well as references regarding foreign animal diseases. The literature summarized here will help the reader gain a general understanding of foreign animal diseases, the risk of infection and spread in the United States, and the general procedures in place for preventing introduction and spread of such diseases, as well as what further efforts should be made in this area.

Homeland Security: Much is Being Done to Protect Agriculture from a Terrorist Attack, but Important Challenges Remain
http://www.gao.gov/new.items/d05214.pdf

This document examines the federal agencies' roles and responsibilities to protect against agroterrorism, the steps taken by the agencies to manage the risks of an agroterrorism event, and the challenges that remain. It finds that the USDA and other agencies are coordinating development of plans and protocols to better manage the national response to agroterrorism and have conducted exercises to test the protocols and response capabilities. Vulnerability assessments of agriculture infrastructure have been conducted, and a network of testing laboratories has been established. It also finds management problems that inhibit the effectiveness of efforts to protect against terrorism.

Knowles, T., J. Lane, G. Bayens, N. Speer, J. Jaax, D. Carter, and A. Bannister. Defining Law Enforcement's Role in Protecting American Agriculture from Agroterrorism. *U.S. National Institute of Justice.* 30 June 2005.
http://www.ncjrs.gov/pdffiles1/nij/grants/212280.pdf

The National Institute of Justice authorized the study to determine the role of law enforcement in protecting against agroterrorism. The research points to an outbreak of foot-and-mouth disease (FMD) as the greatest threat to the United States' agricultural economy, with catastrophic consequences including full-scale quarantines, depopulation

of millions of animals, stop movement orders and economic chaos. Focus groups, simulation exercises, field surveys, and interviews were used to gain input from stakeholders including law enforcement, livestock producers, meat packers, truckers, feedlot managers, and animal health officials.

The research found that law enforcement would be required to remain on-site for two months or more to enforce quarantines and stop-movement orders, and that their focus should be on preventative strategies such as identifying threats, assessing vulnerability, developing partnerships, establishing a criminal intelligence network and developing community policing programs for agriculture. The report concluded that law enforcement does not have sufficient resources to respond to an FMD outbreak and that agencies have not been proactive in recognizing agroterrorism as a serious threat. Eight recommendations are presented to help strengthen America's defense against threats of agroterrorism.

Monke, J. Agroterrorism: Threats and Preparedness. Congressional Record Service Report for Congress. Order Code RL32521. 13 August 2004.
http://www.fas.org/irp/crs/RL32521.pdf

This report provides a brief history and description of agroterrorism and then discusses the actions taken by the federal government to recognize and address its potential threat, including congressional hearings, presidential directives, and federal funding. The report summarizes federal strategies at deterrence, detection, and response.

"Responding to the Threat of Agroterrorism: Specific Recommendations for the United States Department of Agriculture." BCSIA Discussion Paper 2000-29, ESDP Discussion Paper ESDP-2000-04, John F. Kennedy School of Government, Harvard University, October 2000.
http://ianrhome.unl.edu/inthenews/resources/bcsia_recommendations.pdf

This paper provides a history of the research and use of biological weapons on agricultural targets, then discusses the feasibility of and motivations for an agroterrorist attack. The author provides a brief description of the biology of several plant and animal diseases, as well as their means of transmission. Existing prevention and response strategies at the national level are presented and recommendations to improve them are provided.

Buhman, M., G. Dewell, and D. Griffin. Biosecurity Basics for Cattle Operations and Good Management Practices (GMP) for Controlling Infectious Diseases. NebGuide. Published by University of Nebraska-Lincoln Extension, Institute of Agriculture and Natural Resources
http://www.ianrpubs.unl.edu/epublic/pages/publicationD.jsp?publicationId=433

This guide introduces biosecurity strategies to cattle producers and provides recommendations for preventing or containing infections disease.

Chesser, A. et. al. Preparedness Needs Assessment in a Rural State: Themes Derived from Public Focus Groups. Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science. Vol. 4, No. 4, 2006.

Focus group participants in rural and urban Kansas discuss their awareness of and trust in emergency response plans. The research finds that people trust information sources closest to them and that receiving information from a trusted source eases stress and increases compliance with government orders, such as quarantines.

Foreign Animal Diseases, "The Gray Book." United States Animal Health Association. Sixth Edition. 1998.

This document serves as a reference manual for identifying, treating, and containing foreign animal diseases for veterinarians.

2.2 Case Studies

This section provides annotations of articles and reports related to specific incidents of foreign animal and plant disease outbreaks. Included are the foot-and-mouth disease (FMD) outbreak in the United Kingdom in 2003, the 1993 FMD outbreak in Italy, exotic Newcastle disease (END) in California in 2002, soybean rust across several states in 2006, and citrus canker in Florida in 2000. While the references provide information on the extent of the quarantine and, in the case of the plant diseases, the restrictions associated with moving plant material out of the quarantine zone, none of the case studies provided information specific to traffic control.

Maragon, S. and E. Fachin. The 1993 Italian Foot-and-mouth Disease Epidemic: Epidemiological Features of the Four Outbreaks Identified in Verona Province, The Veterinary Record, Vol. 135, July 1994, 53-57

FMD was introduced into southern Italy in 1993 by infected cattle imported from Eastern Europe. A protection zone of 3 km and a surveillance zone of 10 km were initially instituted. After the fourth outbreak, a protection zone of 5 km was requested.

The following measures were applied in the protection zone:

- Several fixed points were organized for the disinfection of feedstuff trucks and other vehicles. All vehicles visiting farms had to be disinfected before and after each visit.
- Police check points were instituted to avoid uncontrolled movement of animals and vehicles.
- The main highway crossing the surveillance zone was closed to trucks carrying cloven-hoofed animals.

Hawkins L., and L. Rico. ***News Release: CDFA Release #02-076***

The reporters have indicated that the early symptoms of Exotic Newcastle Disease (END) were identified in commercial egg-laying facilities in San Bernardino Country, California and reported to practicing veterinarians. The confirmation of the disease was made by the California Animal Health and Food Safety Laboratory in San Bernardino.

Department of Agriculture Animal and Plant Health Inspection Service Exotic Newcastle Disease; Designation of Quarantined Area ***Federal Register: November 26, 2002 Volume 67, Number 228 Rules and Regulations Page 70674-70675***

On October 1, 2002, END was confirmed in the State of California. The State of California and the Animal and Plant Health Inspection Service from the Department of Agriculture have begun an intensive END eradication program in the quarantined area in Los Angeles, Riverside, and San Bernardino Counties.

The State of California has taken action to restrict the intrastate movement of birds, poultry, products, and materials that could spread END from the quarantined area. Accordingly, to prevent the spread of END into other States, the Department of Agriculture has announced restricted interstate areas.

The quarantined areas were continually modified based on the progression of the disease. Many freeways were designated as boundaries of quarantined areas.

Department of Agriculture Office of the Secretary Declaration of Extraordinary Emergency Because of Exotic Newcastle Disease ***Docket No. 03-001-1***

The United States Department of Agriculture (USDA) has reviewed the measures being taken by California to control and eradicate END and has consulted with the appropriate State Government and Indian tribal officials in California. Based on such review and consultation, the USDA has determined that the measures being taken by the State are inadequate to control or eradicate END. Therefore, the USDA has determined that an extraordinary emergency exists because of END in California.

DEFRA (Department for Environment Food and Rural Affairs-UK) Exotic Animal Disease Generic Contingency Plan, Part II Food and Mouth Disease December 2005 FMD 6-39

This plan provides policy guidance for a foot-and-mouth disease response, establishing a 3 km protection zone and a 10 km surveillance zone around the infected premises. In both zones, requirements will include increased levels of biosecurity on farms, as well as cleansing and disinfection of vehicles, people, and machinery moving on and off farms.

A person moving from a premise where infection was present could transmit infective material on their skin, hair, clothes, or footwear. Vehicles could carry infection

from a premise where infection was present to other premises where susceptible livestock are present. Such vehicles could include:

- Livestock transports
- Vehicles moving between livestock under the same ownership
- Vehicles collecting agricultural products (e.g. milk, wool)
- Vehicles delivering agricultural products (e.g. feed, fertilizer, fuel)
- Vehicles delivering nonagricultural products (post)
- Vehicle transporting persons for working on the premises.

Checkoff Helps Keep Tabs on Rust. Delta Farms Press. 8 Feb 2007. http://deltafarmpress.com/soybeans/070208-rust-checkoff/

The article discusses the use of sentinel plots to track the spread of soybean rust, and describes the spread of the disease across the United States in 2006. Sentinel plots are soybean fields that are frequently scouted for early detection of soybean rust.

Chamberlain, H. L., P. D. Roberts, L. W. Timmer, K. Chung, and M. Zekri. Crop Alert: A Citrus Canker Fact Sheet for Homeowners. Document PP194, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original Publication Date: September 2001. Reviewed: June 2003.
http://edis.ifas.ufl.edu/pdffiles/PP/PP11600.pdf

This document provides pictures and descriptions of citrus canker and informs homeowners of Florida's eradication strategy. It discusses regulations and penalties regarding the shipment and transport of plant material within quarantine areas.

2.3 Simulations, Training Exercises, and Preparedness Reports

The references in this section include three reports that use models to predict the spread and impacts of a foot-and-mouth disease outbreak. In one of these reports, the model was used to determine the value of California's surveillance programs and procedures for dealing with an outbreak. Also included is an after action report for a table top exercise simulating an FMD event in Kansas. Two reports discussing the role of law enforcement in quarantines and public health emergencies are included here as well. These reports focus on planning and partnerships and do not discuss traffic control in detail.

Ekboir, J. M. Potential Impact of Foot-and-Mouth Disease in California: The role and contribution of animal health surveillance and monitoring services. Agricultural Issues Center, Division of Agriculture and Natural Resources, University of California, 1999.
http://aic.ucdavis.edu/pub/fmd.html

The research modeled the potential epidemiological and economic impacts of an FMD outbreak in California's South Valley to estimate the value of animal health monitoring and surveillance programs designed to minimize losses, to analyze California's procedures for dealing with a foreign animal disease, and to develop a methodology for evaluating alternative strategies for dealing with an outbreak. The author concluded that the value of public animal health services is high provided that sufficient resources are available to implement an effective early response to the outbreak.

Moutou, F., and B. Durand. Modeling the Spread of Foot-and-Mouth Disease (FMD) Virus, Vet. Res., Vol. 25, 1994, 279-285

Moutou and Durand analyzed airborne diffusion of FMD with a predictive model that links epidemiological data associated with viral particle excretion and meteorological data to the few days before the slaughter of animals. The model computed the expected quantity of viral particles that could be found in a 10 km radius around the outbreak in every direction, and that originated on the breath of a sensitive animal. The model was used to define a risk area, according to the number and size of farms in the surroundings.

Sanson, R. L., and R. S. Morris. The Use of Survival Analysis to Investigate the Probability of Local Spread of Foot-and-Mouth Disease: An Example Study Based on the United Kingdom Epidemic of 1967-1968, The Kenya Veterinarian, Vol. 18 No. 2, 1994, 186-188

The authors used survival analysis to estimate the probability of a farm contracting FMD due to local and windborne spread, where the independent factor is distance from a source infected farm. Historical data from the FMD epidemic of 1967-1968 in the UK were used to estimate diffusion probabilities, with the data set restricted to those farms in which the most likely reason for infection was recorded as local or windborne spread. Their findings showed that the probability of FMD infection in the period covering one day prior to the appearance of clinical signs to 2 days after the signs appeared was 0.13 for farms within a 3 Km radius from the source and 0.015 for farms within 3 and 5 Km from the source.

High Plains Guardian: Military Assistance to Civil Authorities, Tabletop Exercise After Action Report. National Agricultural Biosecurity Center, Kansas State University. July 2004.

This exercise simulated a Foot and Mouth Disease (FMD) outbreak and was designed to evaluate the role of the Kansas National Guard and Department of Defense personnel in assisting civil authorities in a FMD event, and to assist emergency managers with refining the state's foreign animal disease emergency plan. The following findings were reported at the conclusion of the exercise:

- State and federal interests will not always coincide during an outbreak.

- Response to a widespread FAD outbreak will require unique and unconventional partnerships with the private sector.
- A successful stop-movement effort will require the cooperation of both neighboring states and affected general populations.
- States would benefit from improved resource-modeling capabilities.
- Quarantine of affected premises and related activities will quickly exhaust limited state and regional resources.
- State emergency responders may lack adequate vehicles and equipment essential for a timely FAD response.
- Time required for transportation of samples may delay response.
- Department of Defense and Kansas National Guard and civil authorities lack adequate institutional linkages for supporting a coordinated response to a FAD event.

Friend, C. "Quarantines: The Law Enforcement Role." International Association of Chiefs of Police/National Law Enforcement Policy Center. Policy Review. Vol. 17 No. 2. Summer/Fall 2005.
http://www.theiacp.org/pubinfo/PRNewsltrVol17No2.pdf

This article discusses the role of law enforcement in quarantine enforcement, and acknowledges that as the risk of bioterrorism, new diseases such as the avian flu, and public health emergencies created by natural disasters increase, the possibility of a major quarantine scenario in the United States becomes more likely. While the military and state and federal response agencies will likely play a major role in managing broad quarantines, state and local law enforcement will be critical in the early stages of the emergency. Large quarantines are outside the expertise of most local law enforcement agencies, and resources to manage and enforce them are scarce at this level. Careful planning, preparation and training will be required to equip local law enforcement agencies for carrying out quarantine measures.

Richards, E. P., K. C. Rathbun, C. S. Brito, and A. Luna. Role of Law Enforcement in Public Health Emergencies: Special Considerations for an All-hazards Approach. U.S. Department of Justice. NCJ 214333. September 2006.
http://www.ojp.usdoj.gov/BJA/pdf/role_law_enforce.pdf

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade (e.g., the anthrax terrorist attacks) or naturally occurring (e.g., flu pandemics). Policing strategies will vary depending on the cause and level of the threat, as will the potential risk to the responding officers. In a public health emergency, law enforcement will need to quickly coordinate its response with public health and medical officials, many of whom they may not have worked with previously. An agency's ability to respond effectively to any emergency—public health or otherwise—greatly depends on its preparedness, and this is directly linked to the law enforcement agency's planning and its partnerships. Depending on the threat, law enforcement's role may include

enforcing public health orders (e.g., quarantines or travel restrictions), securing the perimeter of contaminated areas, securing health care facilities, controlling crowds, and investigating scenes of suspected biological terrorism. This document outlines key concerns that law enforcement officials must address in preparation for a virus-caused pandemic and other public health emergencies and identifies issues that may arise in the department's "all-hazards" approach.

2.4 Federal and State Response Plans

DEFRA (Department for Environment Food and Rural Affairs-UK) Exotic Animal Disease Generic Contingency Plan, Generic Annex I December 2005 154-156

This plan describes how the Department for Transport (DFT) will provide robust support to DEFRA, associated agencies and stakeholders by responding to demands for information on transport related issues in the case of an exotic animal disease. The DFT will provide practical advice and guidance and facilitate contact with the transport industry where necessary.

The police will assist wherever possible in:

- Enforcement of surveillance Zones and movement controls
- Stopping and checking vehicles transporting animals

Local authorities are responsible for erecting road signs for publicizing the protection and surveillance zones around a premise where foot and mouth disease has been confirmed. Signs are required on all roads at the boundaries of the protection and surveillance zones.

USDA APHIS Plant Protection and Quarantine Emergency Programs Manual. 2nd Edition. Feb 2002.
http://www.aphis.usda.gov/ppq/manuals/emergency/pdf_files/EPM.pdf

The Emergency Programs Manual serves as a guide for Project Directors, Rapid Response Team members, Regional Program Managers, PPQ Surveillance and Emergency Programs and Coordination Staff, and other to plan, conduct, and monitor successful eradication projects against introduced plant pests.

USDA Plant Protection and Quarantine Strategic Plan FY 2005-2009
http://www.aphis.usda.gov/ppq/strategic-plan.html

The strategic plan addresses emerging concerns with exotic plant pests and the increasing threat of foreign plant diseases and pests due to globalization.

U.S. Department of Agriculture Animal and Plant Health Inspection Service Plant Protection and Quarantine Incident Command System Guidelines (DRAFT). March 26, 2004.
http://www.aphis.usda.gov/ppq/ep/ics/docs/drafticsguidelines.pdf

The Plant Protection and Quarantine Incident Command System (PPQ-ICS) guidelines have been developed by the PPQ staff at all levels of government. PPQ-ICS provides an operational framework for confronting plant health emergencies, and provides a general description of the overall organizational structure of the ICS. In addition, the guidelines integrate PPQ's best practices in dealing with emergencies with a comprehensive ICS framework to maximize our efficiency and effectiveness in responding to agricultural emergencies.

Volume Two: Homeland Security, A Governor's Guide to Emergency Management. National Governors Association Center for Best Practices. 2002.
http://www.nga.org/cda/files/GOVSGUIDEHS2.pdf

Chapter 6 of this document deals directly with incidents of agroterrorism. It addresses the need for consideration of the movement of people and commerce, especially since many agents are zoonotics (communicable between animals and people). In the United Kingdom, tourism in rural areas had to be restricted severely through traffic blockades and, in some cases, tourists themselves had to be quarantined or decontaminated. Not only do populations have to be controlled in these events, but access to hospitals, airports, industry, military bases, and other key sites must also be accommodated. Other chapters of the report deal with communication among agencies and jurisdictions, defining authority and chain of command, and creating preparedness plans.

Kansas County Foreign Animal Disease Annex (Provided by Kansas Animal Health Department)

This is a template document provided by the State of Kansas to individual counties to assist in the development of a Foreign Animal Disease Annex to include with their existing emergency operations plan (EOP). The purpose of the Annex is to ensure the county's EOP includes all necessary policies and provisions for adequate response to an actual or impending foreign animal disease (FAD) outbreak. The template helps counties identify existing agreements and memoranda of understanding among responding agencies, whether county, state, federal, professional, or voluntary. It also lays out the roles and responsibilities of all responding agencies.

Kansas Country Foreign Animal Disease Standard Operating Guidelines (Provided by Kansas Animal Health Department)

This document is a template of a Standard Operating Guideline (SOG) provided by the State of Kansas to the individual counties, that provides guidance for local government officials to address organizational structures, authorities, roles, and

responsibilities related to emergency actions required to respond to a livestock health threat. The template can be modified to fit the individual county and includes actions for coordinating all available federal, state, local, and non-governmental resources and is intended to be a stand-alone plan for application to any FAD incident — from small, localized outbreaks to multi-state and federally declared disasters.

Kansas Department of Agriculture Plant Resource Biosecurity Response Guidelines. Kansas Department of Agriculture, Plant Protection, and Weed Program. 10 March 2004. (Provided by Kansas Department of Agriculture)

This document serves as a guide when a new plant pest is detected in Kansas. It incorporates many components of the traditional approach to plant pest control, but includes an additional dimension by addressing the potential of intentional introductions of plant pest by persons wishing to cause harm to Kansas plant resources. The plan outlines an effective rapid response, including detection, identification, and mitigation activities. It also fosters communication between local, regional, state, and federal government agencies, as well as academia and industry professionals.

Missouri SEMA Emergency Response Operations Plan (Provided by Missouri Department of Agriculture to the Research Team—Not publicly available.)

The purpose of this State Emergency Operations Plan (SEOP) is to direct the actions of state departments and agencies in the event of an incident requiring a response of unusual proportions. This Basic Plan provides a framework for emergency management activities in the State of Missouri. It outlines responsibilities of Missouri government officials, state agencies, and private organizations that the annexes specify in more detail. The document includes 23 functional annexes, including Annex W—Animal Emergency Disaster.

Missouri Department of Agriculture Animal Health Emergency Response and Recovery Plan (Provided by Missouri Department of Agriculture to the Research Team—Not publicly available.)

This document focuses on response to a large-scale animal health emergency beyond any single agency's capabilities. It coordinates response activities of the Missouri Department of Agriculture (MDA) with those of the USDA and other federal and local response organizations, while assuming that Missouri's initial response will be independent of the federal government. MDA's response plan is augmented by Missouri's SEMA Emergency Response Operations Plan.

North Carolina Emergency Operation Plan, Appendix 4 to Annex B, Foreign Animal Disease Operations Plan. Sept 2005. (pg B-4-1 to B-4-F-4; 361-402) http://www.dem.dcc.state.nc.us/NCEOP/NCEOP-Public-Sep2005.pdf

This operations plan supports the North Carolina Emergency Operations Plan (NCEOP) and outlines actions and procedures taken by the State Emergency Operations

Center (EOC), the State Emergency Response Team (SERT), and the State Animal Response Team (SART) when a FAD threatens susceptible animals in North Carolina. North Carolina will seek the assistance of and cooperate with the USDA on a local and national level in accordance with their FAD Plan.

Nebraska Emergency Management Agency State Emergency Operations Plan Emergency Support Function 11—Agriculture and Natural Resources
http://www.nema.ne.gov/content/operations/ESF11.pdf

The purpose of ESF 11 is to provide for interstate and interagency coordination during an emergency, ensure coordinated communications between state and federal agencies and the public, and establish policy and procedures for incident response.

Foreign Animal Disease Emergency Response Executive Overview, California Department of Food and Agriculture. Revised January 2006.
http://www.cdfa.ca.gov/ahfss/ah/pdfs/Overview_FAD_Response_1.pdf

The purpose of this document is to outline consideration related to a FAD response for executive managers, emergency operation center (EOC) personnel, and responders. Effective eradication of large FAD outbreaks will require coordination of not only the critical veterinarian response, but of the many expected missions in support of those specialized activities. This document focuses on response to a large-scale FAD outbreak beyond any single agency's capabilities. While the California Department of Food and Agriculture (CDFA) and USDA have the infrastructure to address most FAD outbreaks, CFDA does not have the ability to support personnel, redirect or obtain resources, or meet the financial requirements potentially associated with large or rapidly spreading outbreaks. California's statewide emergency response system will augment this plan.

California Response to Foreign Animal Disease: A Multi-Agency, Statewide Plan for Response. California Department of Food and Agriculture and Governor's Office of Emergency Services. April 2001.
http://www.cdfa.ca.gov/ahfss/ah/pdfs/Ca_Response_to_FAD.pdf

The purpose of this document is to outline considerations related to a FAD response for executive managers, emergency operation center (EOC) personnel, and responders. The California Department of Food and Agriculture (CDFA) and the U.S. Department of Agriculture (USDA) have developed infrastructure to efficiently address most FAD outbreaks. This document, however, focuses on response to a large-scale FAD outbreak beyond any single agency capabilities. CDFA does not have the ability to support personnel, redirect or obtain resources, or meet the financial requirements potentially associated with large or rapidly spreading outbreaks. California has planned to augment CDFA's capability with the proven statewide emergency response system. This document is intended to coordinate with rather than direct the USDA or other federal response organizations that are expected to cooperate with state and local response efforts. Though CDFA and the USDA enjoy similar roles and a cooperative relationship,

this document intentionally assumes an initial California response independent of the federal government.

Indiana Comprehensive Emergency Management Plan. September 2003.
http://www.in.gov/dhs/emerg_mgt/cemp.pdf

The Indiana State Comprehensive Emergency Management Plan establishes the basis for providing state assistance to local governments impacted by a disaster or emergency requiring state and possibly federal assistance. The Plan assumes that a disaster or emergency overwhelms the capability of local governments and covers all four phases of emergency management: mitigation, preparedness, response, and recovery. The Plan is in a checklist format that requires all state agencies to develop and implement Standard Operating Procedures and Guides. It uses the Federal Emergency Management Agency's Emergency Support Functions concept, and includes a section on animal health.

Rhode Island Department of Environmental Management, Division of Agriculture Animal Disease Plan
http://www.dem.ri.gov/topics/erp/6_9.pdf

This document provides a plan for a cooperative emergency response to highly contagious and zoonotic animal diseases in the State of Rhode Island. The goal of this emergency response plan is to detect, control, and eradicate a highly contagious disease or zoonotic disease of animals as quickly as possible and return Rhode Island and the United States to a disease free status. A presumptive positive case will generate immediate, appropriate local and national measures to accurately diagnose the disease and minimize any potential spread of infection. A confirmed positive case will generate additional measures on a regional, national, and international scale. The implementation of control and eradication protocols will be dependent on the epidemiology of the outbreak and state or federal regulations.

Virginia Department of Agriculture and Consumer Services Operating Plan for Foreign Animal Disease.
http://www.avma.org/disaster/state_resources/va_operating_plan_fad.pdf

This brief document provides an illustrative and written flow chart of events in a foreign animal disease response in the state of Virginia.

Oregon Animal Disease Emergency Plan. Oregon Department of Agriculture Animal Health and Identification Division.
http://www.oregon.gov/ODA/AHID/oadem_plan.shtml#Edits

The Oregon Department of Agriculture (ODA) is the primary state agency with statutory authority pertaining to animal and animal industry issues. ODA is responsible for, but not limited to, coordinating disease control procedures, disposition of abandoned, disabled, or dead animals, and agroterrorism. This plan recognizes certain catastrophic events related to animals, animal and production agriculture as events requiring activation

of the state emergency operations plan. This plan supports the control efforts of public health agencies in controlling zoonotic diseases and law enforcement in acts of terrorism where animal agriculture is the vehicle for dissemination of a chemical or biologic agent.

The purpose of the Oregon Animal Disease Emergency Management Plan (OADEMP) is consistent with the National Response Plan (NRP) and the National Incident Management System (NIMS) with the overall intention of protecting the agricultural resources by providing a guide for a rapid and coordinated response to a FAD or other disaster. This plan coordinates the application of local, state, federal, tribal, and volunteer resources in mitigation, preparedness, response and recovery efforts to assist domestic animals and animal agriculture in a livestock/poultry animal health emergency to provide for a seamless integration of county, state, and federal response. Wildlife disease emergency response is described in the Oregon Department of Fish and Wildlife emergency response plan.

This plan identifies the roles and responsibilities of the OADEMP participants to protect the public health and the agricultural industry of Oregon.

Ohio Emergency Operations Plan, Animal Disease Incident Plan. Ohio Emergency Management Agency.
http://www.ema.ohio.gov/Ohio_EOP/s_p_Animal_Disease_Incident_Plan.pdf

The Animal Disease Incident Annex addresses emergency management responsibilities for state-level organizations in the event of an animal disease outbreak that requires actions that are beyond the capabilities of the Ohio Department of Agriculture and may require a declaration of emergency by the governor. The primary goal is to coordinate state and federal efforts to prevent, stop and eliminate the spread of animal disease and minimize the human and economic impact of the disease.

USDA – APHIS and Vermont Cooperative Emergency Response Plan for a Highly Contagious Animal Disease. State of Vermont Emergency Operations Plan, Appendix 3E. 30 April 2005.
http://www.dps.state.vt.us/vem/eop/appendix_3e_highlycontagiousdisease.doc

The goal of this emergency response plan is to detect, control, and eradicate a highly contagious disease as quickly as possible to return Vermont and the United States to disease-free status. The plan provides guidance for a response to a highly contagious animal disease in Vermont and includes a concept of operations, movement control guidelines, and foot-and-mouth disease operational guidelines.

State of Texas Foreign and Emerging Animal Diseases (FEAD) Response Plan, Appendix 3 to Annex O.
http://www.tahc.state.tx.us/emergency/State_FEAD_Plan_8-23-04.pdf

The purpose of this plan is to provide guidance for mitigating against, preparing for, identifying and responding to, and recovering from any highly contagious animal disease affecting Texas livestock and wildlife.

Emergency Animal Disease and/or Animals in Disaster (Wisconsin)
http://www.astswmo.org/Working%20Folder%20with%20Publications%20-%20Sept.%2026%202005/SW%20Foot%20Mouth%20Web%20Page/Wisconsin/FMDisasterinWI.doc

The purpose of this document is to coordinate the initial as well as ongoing response of state and federal agencies and private organizations and entities in response to and recovery from an outbreak of an emergency animal disease or disaster (EAD/D). In as much as some EAD's are zoonotic, this coordination may also involve the identification and control of diseases of public health significance. Issues of major concern in preparedness and response to an EAD outbreak or disaster include: prevention of introduction, disease surveillance, rapid identification, initiation of steps to reduce the further spread of the disease, and disposal of infected, exposed, and dead animals during an outbreak, and provide for adequate housing and care of animals displaced during a disaster.

2.5 Articles on Traffic Control During Emergencies

The literature specifically relevant to traffic control is included here. While not all of the articles are specific to quarantine and isolation, the principles discussed may prove to be transferable to quarantine-related traffic control. Topics include traffic control for incident management, sobriety check-points in low-staffing situations (very relevant to rural counties), and emergency alternate routes. Also included is Nebraska's traffic control monograph to be used in the event of a foreign animal disease outbreak, and a discussion of the Incident Command Structure specific to transportation professionals.

Nebraska Department of Agriculture. Agricultural Response Monograph No. 1: Traffic Control
http://www.agr.state.ne.us/homeland/monograph_001.doc

The monograph provides functional guidance about the establishment, operation, and maintenance of traffic-control points associated with a contagious animal disease outbreak resulting in animal quarantine. It serves as a template for local emergency management officials to develop an operational plan for traffic control.

Simplified Guide to the Incident Command Structure for Transportation Professionals
http://www.ops.fhwa.dot.gov/publications/ics_guide/index.htm

This document, published by the US Department of Transportation, presents the Incident Command Structure (ICS) as part of the National Incident Management System (NIMS) to stakeholders responsible for managing and clearing incidents on the highway system. It is also used as a means to provide health and safety officials already familiar with the ICS with an understanding of how it applies to transportation agencies.

Model Procedures Guide for Highway Incidents. First Edition (Draft Version 8) Prepared by the National Fire Service Incident Management System Consortium Model Procedures Committee. Fire Protection Publications, Oklahoma State University. March 2003.

This document provides guidance for highway incident responders to mitigate the incident, maintain the flow of traffic, and support responder safety. It discusses command procedures, organizational structure, command structure, safety, unified command, and specific information related to highway incidents.

NHTSA article on Low-Staffing Sobriety Checkpoints
http://www.nhtsa.dot.gov/people/injury/enforce/LowStaffing_Checkpoints

This article discusses traffic control and check-point operations in low-staffing situations.

Implementing Emergency Alternate Routes: Wisconsin Experience
http://www.ctre.iastate.edu/pubs/midcon2005/MielkeEmergency.pdf

While this discussion focuses on quickly clearing incidents on freeways and reducing delay and secondary collisions, the principals can be applied to rerouting traffic around quarantined areas. The primary focus of creating emergency alternate routes is threefold:

1. Identify, in advance, alternate routes to use along each corridor
2. Establish procedures for when and how to implement alternate routes
3. Enhance interagency communication during events

Lessons learned from the references summarized above are presented in Section 4 of the final report.

Section 3.
State and Local Interviews

Limited information on emergency traffic control for quarantines was identified through the literature review. Therefore, in order to better understand the level of agroterrorism awareness and preparedness at the state and local levels, the literature review was supplemented with phone and email interviews with state agency officials and rural county sheriffs. Through these contacts, we obtained several emergency response plans, became aware of the training being offered to counties regarding agricultural security, and learned of some of the concerns that local responders have regarding the potential need for large-scale traffic control. A summary of interview topics is presented below as well as a discussion of some of the responses that were obtained.

3.1 State-Level Interviews

Phone calls were made and emails sent to state-level officials in Kansas, Missouri, Iowa, Nebraska, California, and Texas, as well as to USDA officials, representatives of industry organizations, and agroterrorism response trainers. However, some of our contact attempts went unanswered. A summary of the contacts made at the state level is shown in Table 1. In addition to these contacts, state-level planning documents were reviewed for California, Indiana, Kansas, Missouri, Nebraska, North Carolina, Ohio, Oregon, Rhode Island, Texas, Virginia and Wisconsin (See Section 2.4).

Table 1. List of Contacts Made at the State Level

Organization	State	Title	Contact
MO Department of Agriculture	MO	Agro-Security and Operations Officer	Phone, In person
SES, Inc.	MO	Training Coordinator	Phone
SES, Inc.	MO	Vice President, Trainer	In Person, Email
KS Department of Animal Health	KS	Administrative Specialist	Phone, Email
KS Department of Agriculture	KS	Plant Protection and Weed Control Manager	Phone, Email
NE Department of Agriculture	NE	Administrator, Laboratory Division	Email
TN Department of Agriculture	TN	State Veterinarian	Phone
US Department of Agriculture	MO	Foreign Animal Disease Diagnostician	In person

In contacts with agency staff at the state and federal levels, the research team attempted to gather responses to the following questions:

- Does your state have an official response plan to be implemented in the event of a foreign animal disease or plant pest outbreak? If so, would it be possible to obtain a copy of it?
- Do counties in your state have their own county-specific response plans?
- Are local authorities trained to implement the state or local response plans?

- Do counties have adequate resources to implement the plans or the means to acquire those resources?
- At what point is the response plan implemented? (i.e., is it implemented when a veterinarian identifies that an animal is showing clinical symptoms of a foreign animal disease, or only after the disease has been verified by test results from Plum Island?)
- Are you aware of any plans that specifically address the procedure for identifying roads to be blocked or closed and the steps to get them blocked or closed?
- Are there any plans that address law enforcement's role in enforcing quarantines or stop movement orders?
- Who, in your state, has the authority to issue a quarantine or movement restrictions? How soon after a foreign animal disease is suspected might this happen?
- Can you think of anyone else we might want to talk to in order to get more information? Do you have names or contact information for people in a similar position to yours in other states or people in other agencies in your state that are involved with similar response plans?

3.2 Summary of State Responses

Interviews with the state contacts were very productive, giving the research team a greater perspective on the overall agricultural emergency response structure. However, since the responses obtained were from a limited number of states, the information gathered through these interviews was supplemented with information gained from reading several states' response plans found online. Several of these plans are listed in the annotated bibliography in Section 2, along with the websites where the plans were found. A more thorough list of all the lessons learned from a combination of the state-level interviews and response plans are presented in Section 4. Below is a summary of what was gathered from the interviews with state- and federal-level officials.

Kansas

Kansas provides each county training and information to help them coordinate their response planning with efforts at the state level. In addition, the Kansas Incident Specific Plan for Foreign Animal Disease is undergoing revision to be made compliant with the National Incident Management System (NIMS) and National Response Framework (NRF). The Kansas Animal Health Department (KAHD) is working with the state's Department of Emergency Management to ensure the response plans are compatible. Electronic files of the Kansas County Foreign Animal Disease Annex and the Kansas County Foreign Animal Disease Standard Operating Guideline were obtained. These documents were provided to each of the counties for use as a template, and only minimal changes and additions were required to make them county specific. Several additional

documents used in training counties for a foreign animal disease (FAD) incident response were obtained, including a FAD emergency planning checklist, a list of county plan components, a list of potential equipment needed for a FAD, and a list of potential holding, quarantine, and disposal sites. A contact at the Kansas Department of Agriculture provided the research team with an electronic copy of the Plant Resource Biosecurity Response Guidelines, but this is not carried down to the local level as are the FAD response plans.

KAHD developed Stop Movement Permit books which were distributed to all Kansas Sheriff's offices and to the Kansas Highway Patrol. The research team was provided a copy of Kansas' movement permit, movement permit instructions, and guidelines for officers examining permits. A practice stop movement in western Kansas gave the Highway Patrol an opportunity to use the permits and recommend changes to make them more user-friendly for law enforcement.

Kansas recently completed a project in which a vendor was hired to secure an emergency animal disease response plan from every county in the state. All counties have now submitted their plans to the KAHD. These plans include instructions for response, a list of the personnel that the county will use in ICS positions, and lists of local resources needed for the response.

Kansas' response plan is enacted when a foreign animal disease diagnostician (FADD) from either KAHD or USDA is dispatched to investigate suspicious symptoms. A FADD can be anywhere in the state within 4 hours of being called. If the FADD determines that a clinical diagnosis for a FAD is highly likely, he or she can issue an oral quarantine for the premises where there are infected animals and a semi-full response is implemented while awaiting the test results to confirm the disease. The FADD will remain on site to initiate the trace back and forward of the disease. The FADD also notifies the county law enforcement and emergency manager of the quarantine so that the local response plan can go into effect.

There are four levels of response, which are detailed in the state and local response plans. Level 1 is normal operations and surveillance; Level 2 is a FAD investigation in response to suspicious symptoms; Level 3 is a diagnosis of "highly likely" for a FAD in the state; and Level 4 is a confirmed FAD in the state when the state emergency operations center (EOC) is activated. Until the tests are confirmed at Plum Island (the USDA's Animal Disease Center), Kansas' response is at Level 3. A stop movement order will not be issued by the Livestock Commissioner (with authority from the Governor) until a Level 4 response is in place, after confirmation of a FAD by USDA authorized laboratory.

Missouri

Missouri's State Emergency Operating Plan (SEOP) contains an annex that deals specifically with animal emergency disasters. The annex lists all agencies that may be

included in the response and what their specific roles would be, and identifies the Missouri Department of Agriculture (MDA) as the lead agency in an animal emergency response. The MDA also has an internal Animal Health Emergency Response and Recovery Plan, which compliments SEMA's SEOP but provides specific direction for MDA employees. Both of these documents were provided to the research team electronically by our contact at MDA. Missouri has no plan specific to plant health emergencies.

Missouri is in the process of providing a six-hour agroterrorism preparedness training to each county in the state. The training is being provided by SES, Inc., a consultant in Kansas City that has already provided training to Nebraska and Kansas. The training focuses on emergency responders and gives a brief overview of potential agroterrorism incidents, their consequences, and the roles of both the county and the state in prevention and response efforts. It focuses on a response to a foot and mouth disease outbreak and devotes the second half of the class to discussing a few potential scenarios. The responders are encouraged to think outside of the box to identify resources that are easily accessible to the county and that could be used for holding and feeding animals. However, the training does not focus on aspects of traffic control. The training provides a template for the counties to develop their own response plan that coordinates with the state plan but is specific to the county's resources and vulnerabilities. The MDA has provided additional training to a few counties to help them develop these county plans.

In Missouri, any practicing veterinarian who observes symptoms of a foreign animal disease will contact the state Department of Agriculture. The state veterinarian will then assign one of ten foreign animal disease diagnosticians (FADD) to the case, who can be anywhere in the state within four hours of a call. The FADD will make a preliminary diagnosis of "not likely," "possible," or "highly likely" and collect samples for testing. The Highway Patrol has an available jet that can be used to send samples to Plum Island or another USDA authorized laboratory 24 hours a day. The FADD will be in contact with the state veterinarian, who can authorize him or her to initiate a quarantine as an agent of the state. If the FADD's diagnosis is "possible" or "highly likely" that the symptoms are those of a foreign animal disease, he or she will stay on the premise as the incident commander until the test results are available.

Animal health quarantines give law enforcement officials authority to stop the movement of animals, but not necessarily people. They do have the authority to make sure people are decontaminated before crossing the quarantine boundary. However, there is still confusion and uncertainty among law enforcement officials as to what they can and cannot do to enforce a quarantine.

Missouri is considering providing additional training to law enforcement officials and agriculture producers. Missouri is also one of 12 state members of the Multi-state Partnership for Security in Agriculture, which practices a great deal of information sharing. The **Multi-State Partnership for Security in Agriculture** (Partnership) is a collaborative forum of State Departments of Agriculture, State Veterinarian's Offices, Homeland Security Advisors, Animal Health Departments, and Emergency Management

Divisions from the following states: Illinois, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, and Wisconsin (http://www.agpartnership.org/aboutus.asp). Many elements of Missouri's response plans and trainings are similar to those used in other states in the partnership.

Nebraska

Nebraska's Emergency Operations Plan includes several emergency support functions, including ESF 11: Agriculture and Natural Resources. Its purpose is to protect against, detect, and eradicate contamination and contagions to animals, plants, and food as quickly as possible within the State of Nebraska. The Nebraska Department of Agriculture (NDA) has also written four agricultural response monographs, which cover traffic control, catastrophic mortality disposal, temporary housing and care for livestock and poultry, and decontamination and disinfections. Monograph No. 001—Traffic Control in an Agricultural Response—is the only document the research team has located that specifically discusses traffic control for an agriculture-related movement restriction.

Nebraska has conducted substantial training at the local level. They began in 2004 with the training of local officials, including elected officials and local agencies. All 93 counties attended one of the nearly 60 presentations given by SES, Inc., NDA's training contractor. The purpose of the workshops was to assist the county emergency managers in the creation of or improvements to their local plans for agriculture. This county training was followed up with producer training in 2005. More recently, NDA has provided training to educational facilities, and has also asked SES to conduct vulnerability assessments for livestock facilities throughout the state. In cooperation with the Nebraska State Emergency Management Agency, NDA updated the generic Local Emergency Operations Plan, Annex G, Appendix 2, which deals specifically with agriculture. Currently, SES is visiting counties for the purpose of refining the county Standard Operations Procedures developed in conjunction with the generic county plan annex. Nebraska has also conducted a statewide functional exercise, called "Terrex '06," which deals with a response to a FMD outbreak. Cherry County local responders took part in that exercise. The After Action Report is not yet available.

Nebraska has six FADDs in the Department of Agriculture and there are four more with the local APHIS office. Like Missouri and Kansas, they can respond within four hours to any area of the state. Nebraska has four levels of contagious animal disease (CAD) response. Level 1 is a confirmed CAD in North America, but not the US; Level 2 is a confirmed case in the U.S. but not confirmed or suspected in a bordering state; Level 3 is a confirmed case in a bordering state; and Level 4 is a confirmed or strongly suspected CAD in Nebraska. Each of Nebraska's five regions maintains an emergency response trailer that can be driven to a site and used as part of the response. At the recommendation of the FADD, following an investigation that indicates a FAD is possible or highly likely, ESF #11 is activated and samples are rushed to Plum Island. Upon confirmation of a positive FAD, a stop movement order can be issued by NDA, and the FADD would implement the order locally. In a highly suspicious case, the state does everything it can to stop animal and human movement as quickly as possible. NDA

avoids use of the word "quarantine" because of confusion regarding the differences between stopping human and animal movement.

Law enforcement officials are invited to participate in the training provided by NDA through SES. Our contact at NDA reported that he believes the counties' greatest difficulties in traffic control would be drivers defeating the roadblocks by driving through fences, through fields, or into ditches to get around them. He stated that the other challenge is the shear manpower required to stop movement within a 10-km, or larger, radius. Some responders are livestock owners, which could further compromise the manpower issue.

Nebraska is also a member of the Multi-state Partnership for Agricultural Security.

3.3 Local Interviews

To gain an understanding of local awareness, attitudes, and preparedness for an agricultural emergency, the research team contacted several sheriffs around the country from counties ranging in population from 1,000 to 50,000. Law enforcement officials, rather than local emergency managers, were interviewed because they are responsible for enforcing quarantines and movement restrictions. While some agencies were hesitant to share information they considered to be sensitive about their emergency response plans, over 40 local and state contacts provided helpful information. These contacts are shown in Table 2.

When county sheriffs were contacted, interviewers attempted to obtain responses to the following questions:

- Does your county have an official response plan to be implemented in the event of a foreign animal disease or plant pest outbreak? (Could be a standalone plan or an annex to the county emergency management plan.) If so, would it be possible to obtain a copy of it?
- If there is a specific county response plan, what was your role in preparation of the plan?
- Have you participated in any training related to foreign animal disease outbreak?
- Does your county have adequate resources to implement the plans or the means to acquire those resources?
- At what point is the response plan implemented? Who makes this decision?
- Are you aware of any plans that specifically address the procedure for identifying roads to be blocked or closed and the steps to get them blocked or closed in the event of a quarantine?
- Are there any plans that address law enforcement's role in enforcing quarantines or stop movement orders? Have you identified other county agencies or officials that might be of help if these orders were implemented (organizations such as public works, highway maintenance, volunteer groups, or private contractors, who may have additional personnel, equipment, or other resources available for the response)?

Table 2. List of Contacts Made at Local Level

County/jurisdiction	State	Population	Title	Contact
Clinton	IA	49,717	Sheriff	Email
Scott	IA	158,668	Sheriff	Phone
Warren	IA	40,671	Sheriff	Phone
Henry	Il	51,020	Chief Deputy	Phone
Kane	Il	404,119	Retired Sheriff	Phone
Ford	KS	33,715	Under Sheriff	Phone
Sedgewick	KS	452,869	Emergency Manager	Phone
Stanton	KS	2,245	Sheriff	Phone
St. Charles Parrish	LA	48,072	Chief	Phone
Hickory	MO	8,940	Emergency Manager	Phone
Howell	MO	37,238	Sheriff	Email
Livingston	MO	34,492	Sheriff	Phone
Worth	MO	2,382	Sheriff	Fax
Big Horn	MT	12,671	Sheriff	Phone
Liberty	MT	2,158	Sheriff	Phone
Mineral	MT	3,884	Sheriff	Phone
Pondera	MT	6,424	Sheriff	Phone
Wibaux	MT	1,068	Sheriff	Phone
Eddy	ND	2,757	Sheriff	Phone
Golden	ND	1,924	Sheriff	Phone
Oliver	ND	2,065	Sheriff	Phone
Rolette	ND	13,674	Sheriff	Phone
Steele	ND	2,258	Sheriff	Phone
Franklin	NE	3,421	Sheriff	Email
Fremont (city)	NE	25,314	Emergency Manager	Phone
Hall	NE	53,534	Retired Sheriff	Phone
Scotts Bluff	NE	36,951	Chief Deputy	Phone
Beaverton (city)	OR	85,775	Emergency Manager	Phone
Anderson	SC	165,740	Emergency Manager	Phone
Campbell	SD	1,782	Sheriff	Phone
Hamiln	SD	5,540	Sheriff	Phone
Hanson	SD	3,139	Sheriff	Phone
Jerault	SD	2,295	Sheriff	Phone
Union	SD	12,584	Sheriff	Phone
Salt Lake	UT	898,387	Chief Deputy	Phone
Albany	WY	32,014	Sheriff	Phone
Converse	WY	12,052	Sheriff	Phone
Eastern Shoshone	WY	2,019	Tribal Government	Phone
Hot Springs	WY	4,882	Sheriff	Phone
Johnson	WY	7,075	Sheriff	Phone
Northern Arapahoe	WY	3,633	Tribal Government	Phone
Torrington (City)	WY	5,533	Police Chief	Phone

- Who, in your state or county, has the authority to issue a quarantine or stop movement order? How soon after a foreign animal disease is suspected might this happen?
- Can you think of anyone else we might want to talk to in your county in order to get more information?
- What types of resources do you have readily available for a response to an agroterrorism event? What resources do you anticipate needing? (Examples include personal protective equipment, vehicles, signs, barricades, funding for overtime work, etc.)

3.4 Summary of Local Responses

The responses gathered from county sheriffs varied considerably. Some sheriffs were unwilling to discuss the topic at all, others indicated that their county had not considered the possibility of an agroterrorism attack, some indicated that they were aware and had received training, but did not have the resources needed to respond, while others demonstrated a high level of awareness and preparedness. Though the responses were quite diverse, there were common concerns that were raised by several sheriffs and responders.

Some of the concerns cited by sheriffs included:

- State fairgrounds, sale barn, etc. in the county, which create high volumes of transported livestock
- Major state highway or interstate through the county, which means high traffic volumes to control in movement restrictions
- County borders another state, country, Indian reservation, national forest, etc., which can make coordination of response efforts more complicated
- Extensive agriculture in the county, but no veterinarians nearby
- Local agencies communicate and coordinate well, but no written agreements
- Unsure of how to handle a sustained quarantine
- Extensive coordination required between local and state and federal
- Lack of agroterrorism related drills or exercises
- Every business in the county relies on agriculture
- Insufficient staff/vehicles to enforce quarantine
- Uncertainty regarding standard operating guidelines in a quarantine situation
- Lack of personal protective equipment appropriate for a biohazard
- No training in disinfection

3.5 County Training

Through state and local contacts made in Missouri, the research team became aware of training being offered to counties in Missouri. The training provider and Hickory County, Missouri, generously offered to allow a member of the research team to attend their training session on agroterrorism planning on January 30, 2007. SES, Inc. developed the one-day training course and is presenting it to each county in Missouri through a contract with the Missouri Department of Agriculture (MDA). SES has provided workshops and trainings in other states and to other groups, such as producer organizations, as well.

Participants in the training included a deputy sheriff, the county emergency manager, the county assistant emergency planner, water patrolmen, conservation agents, the public information officer, EMT, volunteer fire, county health department officials, the foreign animal disease diagnostician for the area, and representatives from the Department of Natural Resources. The training focused on planning priorities for the county in case of a foreign animal disease (specifically foot and mouth disease), including housing and care of livestock stopped in the county, storage of trailers or other agricultural vehicles stopped in the county, location of burial sites for animals, and other emergency functions, such as locating and obtaining needed resources and providing food, shelter and transportation for responders, volunteers and others affected by the outbreak. The training described the likely flow of events in the case of a FAD outbreak, and described quarantines and stop movement orders, but spent little time discussing how these would be actually carried out. Some time was spent discussing disinfection at entry/exit points along the boundary of the buffer or surveillance zone. Three FMD scenarios were presented to the group for discussion to stimulate thinking about how the county would respond in similar situations.

3.6 Summary of State and Local Interviews and Training

In many states, a foreign animal disease diagnostician (FADD) can be on the scene to investigate a suspected foreign animal disease (FAD) within four hours of receiving a call from a local veterinarian or livestock producer. The state veterinarian can grant the FADD authority to issue a verbal quarantine around the location where a FAD is suspected. Local law enforcement officials are responsible for enforcing the quarantine once it has been issued. Even though confirmation of a FAD may take a few days, response begins within a few hours of a suspected infection.

There is confusion and debate among responders, especially law enforcement officials, as to what their enforcement authority entails when a quarantine has been issued. During the time between the initial order by the FADD and the official order by a state or federal official once the diagnosis is confirmed, deputies and police are even less clear on their role. It may be required by quarantine to block the movement of livestock, agricultural vehicles, all vehicles that have passed through a certain area, and sometimes

even the movement of people in the area. When people do not choose to comply with the quarantine voluntarily, law enforcement officers reported having limited resources to stop them.

In rural counties, the availability of resources to enforce a quarantine and manage traffic is a major concern. In the most rural counties, the sheriff may have only a few deputies with one or two squad cars. They realize that they simply do not have the manpower to man traffic check points at more than one or two locations in their counties. Clearly, this will do little to keep potentially infected people, animals, and plants, as well as potentially contaminated vehicles, from crossing the quarantine boundary. In addition to the lack of manpower, rural counties have fewer resources such as barricades, signs, and other traffic control devices. Effectively enforcing quarantines also requires law enforcement to find and direct traffic to holding areas for vehicles and animals that cannot go into or out of the quarantined area.

Counties also realize that state or federal aid will likely not be available in the very early stages of the incident. Incidents may be occurring in several states or counties simultaneously, spreading state and federal resources thin. The county emergency manager and local law enforcement will be responsible for implementing the initial response to the suspected FAD and managing the response until state or federal aid become available.

Each state has an emergency response plan to be followed in all emergency situations. Many of these plans have an annex that specifically addresses bioterrorism, foreign animal diseases, and/or animal health. Some state departments of agriculture or animal health also have internal response plans to be used in such instances. Many states are working to help their counties develop local foreign animal disease response plans that supplement the state's plans. Counties are in different stages of preparedness, ranging from having no plan or training specific to a FAD, to having a detailed plan, resource list, and training in this area. Some counties have even participated in tabletop exercises to test their level of preparedness. Most states and counties focus more resources and planning on animal, rather than plant, diseases. One state official reported that their trainings and exercises deal with a hypothetical Foot and Mouth Disease outbreak because they view it as a high-probability, worst-case scenario.

Training provided to local officials at the county level focuses on thinking out of the box to identify non-traditional resources that may be used to aid in traffic control. Emergency management assistance compacts with surrounding counties and other law enforcement agencies (water patrol, conservation, highway patrol) can help increase manpower. These types of agreements can also be used with public works and highway departments to provide additional signs, detour planning, and other maintenance and traffic operations tasks. Volunteer organizations, producer groups, and local farmers can also be trained to assist local law enforcement with non-law enforcement tasks. When these types of partnerships are established prior to an emergency event, a county will likely see an increase in voluntary compliance with a quarantine as well as in available resources to enforce it.

It should also be noted that in the case of an agricultural emergency or foreign animal disease (FAD) outbreak, local law enforcement will be required to maintain their regular law enforcement roles in addition to investigating possible criminal activity related to the agricultural emergency and enforcing the quarantine or stop movement order.

Section 4.
Lessons Learned

This section presents lessons learned from the literature review, case studies, and interviews, which were summarized in Sections 2 and 3 of this report. The key lessons learned are those that have the greatest impact on traffic control requirements for quarantine and had the greatest impact on the development of a guide to traffic control of rural roads in an agricultural emergency. These key lessons learned are highlighted first. The remainder of the section presents other lessons learned and is organized by the following topics:

- Background on agroterrorism and animal disease
- Case studies
- Awareness and attitudes
- Local, state, and federal response plans
- Agencies involved and command structure
- Preparation and resource availability
- Quarantine, isolation, and traffic control

Familiarity with general FAD response procedures may aid the reader in understanding the lessons described in this section. Therefore, the reader may want to refer to Table 2-1 in NCHRP Report 525 Volume 13: *A Guide to Traffic Control of Rural Roads in an Agricultural Emergency* that illustrates the sequence of events and agencies involved in an agricultural emergency.

4.1 Key Lessons Learned

- From the state emergency response plans reviewed, it appears that a foreign animal disease diagnostician (FADD), Area Veterinarian in Charge (AVIC), or other trained veterinarian acting on behalf of the state can issue a quarantine on a farm or other agricultural premises if animals are exhibiting symptoms that indicate a possible FAD. If the FADD determines a FAD to be likely, local, state and federal officials will be notified so that a response can be planned while waiting for sample test results. State and federal officials will become immediately involved in the response, since the FADD will be in communication with the state veterinarian and his or her federal counterpart in the state, the AVIC, from the initiation of the investigation.
- **Plum Island, NY, is the only lab in the U.S.** that can test samples for some FADs, such as Foot and Mouth Disease. While most states have provisions to send samples by private or state owned jet as soon as they are taken, results from APHIS Lab on Plum Island may not be available until 24 to 48 hours after the sample is taken. This response time establishes a timeline for a full response to a positive confirmation of a FAD.

- The local agencies will be responsible for organizing traffic control, storing, and caring for animals that are stopped or held, locating areas for carcass disposal, caring for the mental and physical welfare of the people in the area, and assisting the state with public information. Rural county law enforcement officials have very few resources for wide-scale traffic control (barricades, signs, disinfection equipment). Local highway maintenance buildings, contractors, utility companies, fire departments, emergency responders, and public works may all have resources that could be used in times of emergency. Few counties have formal agreements between agencies or jurisdictions to share such resources.
- Agroterrorism exercises and plans typically revolve around Foot and Mouth Disease (FMD), as many experts feel that this is not only one of the more likely FADs, but also that it is highly contagious and could cause the most economic damage to the country.
- Many officials in rural counties do not perceive a biological attack on their livestock or crops to be very likely. They believe an accidental or natural disease outbreak to be more likely than an attack, but still not a high probability.
- County officials expressed concern about their lack of resources and manpower to respond to a large-scale event. Most rural sheriff's departments have between three and eight deputies and patrol cars. County sheriffs in particular do not feel that traffic control during a quarantine would be one of their biggest problems. One sheriff interviewed stated, "We can stop trucks on our roads; we do it every day."
- Most states have a plan for addressing foreign animal disease response. Many state departments of agriculture have stand alone plans, and some states have an Annex that addresses animal health issues in the State Emergency Operations Plan. While state plans acknowledge that the federal government will be aware of a FAD situation from the earliest stages, their plans are, for the most part, self-sufficient, since they know that resources from the federal government may be either tied up in other responses or slow to arrive. Many state plans are very similar to one another and follow a standard template that assigns responsibilities to the various state organizations involved in the response (DOT, National Guard, Fish and Wildlife, Highway Patrol, DNR, Department of Health, etc.).
- If a FAD is confirmed, two zones may be established: (1) a hot, protection, or exposed zone [1.5- to 2-mile (2.4- to 3.2-km) radius around infected premises], and (2) a buffer or surveillance zone [6-mile (10-km) radius around the infected premises]. Local authorities will be responsible for coordinating and handling traffic control along the perimeters of these zones, although most state plans assign additional state resources to aid in this effort. Since it is evident that local law enforcement agencies will not have personnel or resources to man the number of stops that would be required in a 6-mile (10-km) buffer zone, manned stops would need to be located according to route priority. One example suggested having two entry/exit points along the hot zone perimeter and six along the buffer zone, equipped with disinfection equipment, closing all other roads along the perimeters.

- Responses to foreign animal diseases will require a Unified Command System (UCS), since several agencies with different priorities and areas of expertise will be involved, and their cooperation is essential. The UCS is a central feature of the National Incident Management System (NIMS) and Counties are required to be NIMS compliant to receive funding from the federal government for emergency response planning and activities. Section 3 of the guide provides incident command structures used in an agricultural emergency. These ICS examples were adapted from state emergency operations plans.
- While rural counties have limited manpower and resources for a response, they may be better equipped for response, since local responders are more likely to be familiar with agriculture and livestock producers and volunteers, and may be able to access private resources (hay bales, pens, gates, feed, etc.) more quickly than in areas with greater populations.
- Most of the local response should occur in the planning phases before an incident occurs. Counties should be aware of the animals in the county, be familiar with the producers, know where animal care resources can be obtained if needed, understand the routes used to transport animals in the county, identify all sources (public and private), of traffic control devices, and have detour plans for high-volume routes. When counties have this information at the start of an incident, it should ensure a quicker, more efficient response to management of the incident.
- Trust and cooperation of livestock producers can be a tremendous help to local officials in a FAD emergency. Response plans and reimbursement procedures should be part of an informational packet for livestock producers.
- The states and the federal government have formal, thorough response plans in place to respond to a foreign animal disease outbreak. Some Midwest states are working with their counties to develop local plans and to provide training for response preparation.
- Many elements of an animal health emergency response will be the same as those for any other emergency and will already be covered in existing LEOPs. Some modifications or additions, such as procedures for animal housing and care and quarantine-related traffic control, can be added to the existing plan to ensure it covers animal health emergencies.

4.2 Other Lessons Learned

Background on Agroterrorism and Animal Diseases

- Homeland Security Presidential Directive 9 (HSPD-9), signed on January 30, 2004, deals specifically with the defense of the agriculture and food system in the U.S. It establishes a policy to defend it against intentionally or unintentionally introduced diseases, pests or other poisonous agents that could result in a disaster and/or emergency and have catastrophic effects on health and economy.

- The World Organization for Animal Health (OIE) is made up of 168 member countries who voluntarily report outbreaks of animal diseases so the OIE can pass the information along to other countries, allowing them to take preventative measures. The OIE maintains a list of reportable diseases, and the US keeps a careful watch over which countries are currently detecting those diseases.
- The purpose of agroterrorism is to create fear and undermine the stability of the food supply. This can be accomplished by introducing agents into the food supply that affect the health of the consumers or by damaging or destroying livestock and crops. While the latter may not result in direct harm to the health of humans, it can have severe economic consequences for producers and the nation as a whole.
- Even FAD agents that are not a direct threat to human health can be carried and spread by humans, their domestic pets, and their vehicles. Biological agents can live on clothing, shoes, skin, tires, pet hair, and other items and be carried from sick animals and plants to healthy animals and plants when biosecurity procedures are not carefully followed.

Case Studies

- Case studies of soybean rust in the U.S. point to fungicidal treatments as a means of management and control. Livestock producers and the federal government use soybean sentinel plots to monitor the movement of soybean rust and to act as an early detection system. No information regarding quarantines or traffic control was found.
- Case studies of citrus canker in Florida since the mid-nineties indicated an initial strategy of eradication, requiring the destruction of infected and exposed trees within a perimeter of infected trees. In January 2006, it was determined that eradication was no longer feasible, and since then APHIS has worked with state officials to implement new strategies to manage the disease. New federal shipping regulations are in place to prevent citrus plant material in Florida from entering other citrus-producing states and territories. Commercial businesses have been subject to mandatory sanitation procedures statewide since April 2000, including growers, lawn care services, and utility workers in quarantine areas. However, no information was found regarding traffic control, detours, or checkpoints.
- During the 2002 outbreak of Exotic Newcastle Disease in California, owners of illegal fighting game cocks had increased incentive to smuggle birds out of the quarantine area, since they were both illegal and valuable. Because individual birds can be easily hidden in passenger vehicles, enforcing restriction of animal movement became much more difficult.
- The 2001 outbreak of foot and mouth disease in the U.K. spread so quickly that traffic control was ultimately under military enforcement.

- Animal-borne, or zoonotic, diseases have afflicted human populations throughout history. The ability to rapidly transport people and commercial goods over long distances increases the possibility that susceptible populations will be exposed to new and previously eradicated diseases. Examples of national global events include West Nile virus, monkeypox, severe acute respiratory syndrome (SARS), and avian influenza. Monkeypox drew attention to the potential for introduction of communicable diseases via the exotic pet trade. Most states have taken measures to create legislation that helps to reduce the risk of future zoonotic disease outbreaks associated with pet animals.
- While the U.S. has experienced intentional attacks on the food supply chain (e.g., salmonella in salad bars in Oregon in 1984), nearly all of the case studies involved foreign animal diseases or plant pests that occurred accidentally or naturally. The distinction is only relevant to the response plan in that a coordinated intentional attack will stretch the resources of the federal and state governments and place more responsibility on local governments to contain and control the outbreak with limited outside help.

Awareness and Attitudes

- In rural counties, many emergency response officials are also producers of crops and/ or livestock. For the most part, they are aware of the potential for diseases and pests that could damage their crops or harm their animals.
- Rumors of foreign animal diseases can spread quickly in rural areas and can be as destructive as a confirmed case. These suspicions can cause local markets to crash.

Local, State, and Federal Response Plans

- From the very beginning of a FAD response, the state and federal governments are involved. In some cases, state and federal officials might be aware of a suspected foreign animal disease before local officials are. Table 2-1 in NCHRP Report 525 Volume 13: *A Guide to Traffic Control of Rural Roads in an Agricultural Emergency* provides a chart adapted from state response plans that illustrate the sequence of events and agencies involved in a FAD response.
- The Federal government has implemented an infrastructure for diagnosing foreign animal diseases and notifying the proper agencies and authorities.
- State Animal Health or Agriculture Disaster plans reviewed include: Missouri, Kansas, Nebraska, California, Vermont, Virginia, North Carolina, Indiana, Ohio, Oregon, Rhode Island, Arizona, Wisconsin, and Texas. Additional policies on plant and animal disease preparedness in Michigan and Nevada were reviewed.
- US Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Veterinary Services (VS) has two Regional Animal Disease

Eradication Organization READEO teams (in Fort Collins and Raleigh), each with three-person Emergency Response Teams (ERTs). READEO members are highly trained and ready to fight exotic diseases and parasites anywhere in the US, and the Emergency Response Teams can be anywhere in the US within 24 hours to diagnose foreign animal diseases.

- Most counties have Local Emergency Operations Plans (LEOPs) that cover general emergency response protocol. In some Midwest states, counties have been encouraged and aided in developing annexes to these plans, or stand alone plans that specifically address animal health emergencies.

Agencies Involved and Command Structure

- The State Veterinarian will communicate with the USDA Area Veterinarian in Charge (AVIC) to determine quarantine and stop-movement orders.
- Local officials will be required to assist the FADD in enforcing any quarantine issued around the premises. This could include stopping the movement of animals or aiding in disinfection of people and vehicles exiting the premises.
- In most cases, the state department of agriculture will be the lead agency in coordinating the response. Other agencies involved in the emergency response include local law enforcement, wildlife agencies, public health agencies (state and local), national guard, producer organizations, emergency management (state and local), and others.
- A positive test result will almost necessarily cause the governor to issue a state of emergency for the area or the entire state. If the state's resources become overwhelmed, the state may request the federal government to declare an emergency. At this point, FEMA will become involved.
- The state and federal government will manage the incident in terms of the epidemiology, quarantine and isolation requirements and boundaries, disinfection strategies, and animal depopulation.

Preparation and Resource Availability

- Some states are providing training to local county officials regarding emergency response in an FAD incident. In a few states, counties are also encouraged to add a FAD response plan to their LEOP.
- Federal and state governments are prepared to handle an occurrence of FAD in one location, as might happen in an accidental or naturally occurring outbreak. However, it is unlikely that the states and federal government could handle a simultaneous outbreak in several locations across the county, as might occur in a terrorist attack. In this type of situation, the local governments will be even more burdened with the responsibility of containing the disease.

Quarantine, Isolation, and Traffic Control

- Laws and regulations concerning quarantine and stop movement orders differ from state to state. The local law enforcement officers contacted indicated that they were unsure of their authority to stop animals or people in the early stages of a response (prior to confirmation from test results). Most indicated an unwillingness or hesitation to engage with quarantine violators until a formal quarantine or stop-movement order was issued from a state official.
- Voluntary compliance and cooperation can go a long way to help prevent the spread of a foreign animal disease, especially in the earliest stages, before test results have been received.
- Producer organizations have a great deal of influence on how their members will respond to emergency quarantine.

Section 5.
Traffic Control in Agricultural Emergencies

This section presents a taxonomy of policies and procedures that would be used in an agricultural emergency. The taxonomy of policies and procedures was developed to provide a context for the traffic control procedures that were developed for the guide. Traffic control is required by quarantine and is one of the important components of a response plan. All the actions required by quarantine are associated, so it is difficult and unrealistic to address traffic control without addressing the other components of the response. The taxonomy, presented in Table 3, is based on lessons learned from the literature review and from interviews with state and local officials. It represents the research team's best assessment of how most emergency response plans would operate in an agricultural emergency, including the roles and responsibilities of the many responders to the emergency. For purposes of structuring a guide for quarantine and isolation controls in a rural area, parts of the taxonomy have been defined in specific terms which may or may not agree with procedures found in all state and local agencies.

This section addresses the timeline of an agricultural emergency, the considerations for traffic control that are evident based on this timeline, the command structure that would be used in most incidents, and resource lists and emergency management assistance compacts that should be developed during planning for an agricultural emergency.

5.1 Timeline of an Agricultural Emergency Response

The taxonomy of policies and procedures is divided into three phases based on our understanding of how an agency would respond to an outbreak of a foreign animal disease (FAD). The first phase is termed the "planning" phase and describes actions to be taken prior to a FAD detection. The second phase covers a short period between when symptoms of a disease are reported to when a complete diagnosis is received from a USDA authorized laboratory. We estimate this period to be 24 to 72 hours long. This time may vary according to the geographical location of the outbreak, but we believe this is a reasonable estimate. During this period of time the LEOPs and SEOPs of affected agencies can be initiated; however, the quarantine boundaries will not encompass a greater area than the immediate infected premises until a diagnosis from a USDA authorized laboratory is received. The third phase covers a longer period, beginning with a positive confirmation of a foreign animal or plant disease and ending when the disease is eradicated. It is assumed that a quarantine (road blocks or stops) beyond the immediate vicinity of the infected premises can only be established in the third phase.

Table 3. Transportation Policy Procedure Taxonomy

	Phase 1: Planning Prior to Incident		Phase 2: Initial Response: Detection to Confirmation		Phase 3: Long-term Response: Confirmation to Restoration	
	Personnel	**Tasks**	**Personnel**	**Tasks**	**Personnel**	**Tasks**
Responsible Person or Incident Commander	**County Emergency Manager**	Initiate planning, preparation and training for the county's response to a FAD.	**Law Enforcement**	Provide enforcement for Foreign Animal Disease Diagnostician (FADD) issued quarantine if necessary. Begin to assess required traffic control if test results are positive and a six-mile radius buffer zone is required.	**Incident Commander**	Request state or federal resources or assistance if needed. Act as liaison between local, state and federal response. Identify no-access points and controlled-access points.
Other Personnel	**Fire and EMT personnel**	Become familiar with disinfection procedures for different possible foreign animal diseases. Identify what equipment is needed and where it can be obtained.	**Land owner where disease is suspected** (farmer, producer, grower, etc.)	Comply with FADD's instructions regarding animal movement and care and disinfection of vehicles and persons. Stop scheduled deliveries and visits to the premises.	**Law Enforcement**	Supervise staffing at traffic stops and road blocks, ensure problems are being addressed and training and guidance are provided as needed.
	Local producers and producer organizations	Implement biosecurity measures. Educate about all producers and livestock in the area (by required or voluntary registration). Encourage voluntary cooperation with quarantines and stop movement orders.	**FADD** (Foreign Animal Disease Diagnostician) or other qualified veterinarian who can act on behalf of the state veterinarian	Remain on premises, issue verbal quarantine if necessary, monitor, and control traffic into and out of infected premises. Maintain communication with state veterinarian. Make contact with county and state emergency manager. Direct law enforcement in securing immediate premises. Assist fire department or other responders with disinfection for people and vehicles that must enter and exit the premises.	**State Department of Agriculture personnel**	Coordinate care of animals stopped in the county. Study epidemiology of outbreak to determine quarantine area and necessary biosecurity and disinfection measures.
	Law Enforcement	Assess ability to enforce traffic stops. Determine availability and location of additional resources for closing roads or implementing traffic stops (signs, barricades, patrol cars, etc.). Create emergency management assistance compacts with surrounding jurisdictions to provide help with and resources for traffic control efforts.	**County Emergency Response Team**	Use county's Local Emergency Operations Plan (LEOP) to begin preparing for an emergency response. Provide support to FADD in basic emergency support function areas as needed. Public Information (PI) Officer should coordinate with PI personnel at the state level to prepare statements for the public if the FAD is confirmed.	**County Emergency Response Team (and SEMA, FEMA if needed)**	Implement county's Local Emergency Operations Plan (LEOP) [in conjunction with State Emergency Operations Plan (SEOP) if SEMA is involved] to provide and manage emergency support functions.
	County engineer and public works	Work with sheriff to identify signs, barricades, and other equipment. Help identify local roads with high livestock traffic. Determine roads suitable to serve as detours for truck traffic.	**State Department of Agriculture personnel and SEMA**	Prepare for state emergency response if FAD is confirmed.	**County Engineer and Area DOT Engineer**	Finalize and implement detour plans according to quarantine area developed by epidemiologists.
	Area engineer and maintenance crew from state DOT	Work with law enforcement and county public works to identify signs, barricades, and other equipment. Help identify state routes with high livestock traffic. Develop highway detour plans.	**Public Health Department**	Advise on PPE needed according to disease suspected.	**Public Health Department**	Ensure health of responders
					Public Works and DOT Maintenance Crews	Install and maintain barricades and signs at road closures, detours, and traffic stops.

Table 3. Transportation Policy Procedure Taxonomy (Continued)

	Phase 1: Planning Prior to Incident		Phase 2: Initial Response: Detection to Confirmation		Phase 3: Long-term Response: Confirmation to Restoration	
	Personnel	**Tasks**	**Personnel**	**Tasks**	**Personnel**	**Tasks**
	State Department of Agriculture representatives	Provide training and information regarding the state policies and procedures during an FAD outbreak.			**State and Federal Agencies** (DOT, Dept. of Conservation, Highway Patrol, National Guard)	Fulfill roles as defined in SEOP. Support local authorities as needed.
	Public Health Department	Prepare information about risk to humans from various FADs.			**Other Volunteers** (firefighters, contractors, off-duty officers or maintenance staff, community groups)	Provided additional support and equipment as needed (traffic control, disinfection, care of animals, provide equipment).
Authority for Quarantine or Stop Movement	**State Veterinarian, Governor, Livestock Commissioner or State Department of Agriculture Director**	Depending on the state, one of these officials may issue quarantines or stop movement orders when a FAD is suspected or detected in his or her state or in other states in the United States.	**Foreign Animal Disease Diagnostician or other qualified veterinarian**	States may have varying policies on who has the authority to issue a quarantine on behalf of the state veterinarian, but in all cases, a FADD who has inspected the animals and believes that a FAD is possible or highly likely can issue a quarantine on behalf of the state veterinarian. The quarantine can prohibit the movement of animals and can require disinfection of people who must leave the premises.	**State Veterinarian, Governor, Livestock Commissioner or State Department of Agriculture Director, Secretary of Agriculture (USDA)**	States may have varying policies on who is responsible to declare a quarantine or stop movement order, but once a FAD is confirmed, it is likely that livestock movement in the region, and potentially across the county, will be stopped completely.
Traffic Control	Identify routes of high animal traffic. Locate producers. Estimate livestock moved into, out of, and through the county. Plan detours for major routes and routes that pass through farms or near feedlots, sale barns, slaughterhouses, etc.		Restricting movement into and out of infected and surrounding premises. Farm entrances blocked with patrol cars, or other barriers in place. Certain local roads around the premises might be closed using patrol cars, barricades, hay bales or other devices.		Epidemiologists will determine size of infected zone and buffer zone (estimated 6-mile radius). All routes in and out should be closed or staffed as a traffic stop and disinfection station. Stops and closures should be to MUTCD standards as resources and time allow.	

5.2 Considerations for Traffic Control

The *Manual on Uniform Traffic Control Devices (MUTCD)* specifies the required traffic control devices for a work zone or incidents based on the duration of the work or incident. The duration categories are:

- *Long-term stationary*—work that occupies a location for more than three days
- *Intermediate-term stationary*—work that occupies a location for more than one daylight period and up to three days, or nighttime work lasting more than one hour
- *Short-term stationary*—daytime work that occupies a location for more than one hour within a single daylight period.
- *Short duration*—work that occupies a location for up to one hour
- *Mobile*—work that moves intermittently or continuously

Chapter 6I of the MUTCD covers control of traffic in incident management areas and states that the purpose of traffic control at an incident is to move road users reasonably safely and expeditiously past or around the traffic incident, to reduce the likelihood of secondary traffic crashes, and to preclude unnecessary use of the surrounding road system. It also states that for traffic incidents of an emergency nature, temporary traffic control (TTC) devices on hand may be used for the initial response as long as they themselves do not create unnecessary hazards. It also states that if temporary devices such as flares are used, they should be replaced by more permanent devices as soon as possible.

The research team's interpretation of the MUTCD is that traffic control at a quarantine boundary would be categorized as "long-term stationary" and that available materials such as hay bales, old tires, gates, or even vehicles with yellow flashing lights could be used in the early part of a response. However, these minimal traffic control measures should be replaced with more standard traffic control devices as soon as they become available. Also, the traffic control devices should not create unnecessary hazards. For example, vehicles should not be placed across a road where a driver who doesn't stop has no recourse but to run into the side of the vehicle. Traffic control devices used at night should be lighted or retroreflective.

A confirmed foreign animal disease will require an immediate 3- to 6-mile (5- to 10-km) radius quarantine. In a rural county, an estimated 10 to 35 vehicle entry and exit points along the quarantine boundary will have to be barricaded or manned in order to control traffic into and out of the area. The following groups of vehicles will have to be handled:

- Agriculture vehicles passing through quarantined area
- Agriculture vehicles trying to enter quarantined area to make deliveries/pickups, etc.
- Agriculture vehicles trying to exit quarantined area

- Any vehicles being used to smuggle livestock or poultry
- Nonagricultural vehicles passing through
- Nonagricultural vehicles entering or leaving
- Emergency vehicles

Very few formal quarantine traffic control plans were found in the literature review with the exception of Nebraska's Traffic Control Monograph. This monograph is included in Section 2.5 and discussed in more detail in Section 6. Almost every response plan indicated that law enforcement would be responsible for enforcing quarantines and movement restrictions, but no information was found concerning the details of how the enforcement would be implemented. Stakeholders outside of the law enforcement community tend to leave traffic control tasks up to local law enforcement. While police officers and sheriff's deputies have the most experience with law enforcement road blocks and traffic stops, they are not aware of the nature of a quarantine, and they are poorly equipped to handle traffic control on a scale necessitated by a quarantine that covers over 100 mi^2 (259 km^2) and may last up to two months or longer. While work zone traffic control and law enforcement traffic stop principles can be applied in a quarantine situation, additional planning and training, as well as some creative thinking, will be required to develop methods of controlling and monitoring traffic flow in such a large area with such limited resources.

5.3 Prioritizing Routes

In the case of an agricultural emergency, the quarantine boundaries will often be drawn at a 3- or 6-mi (4.8- or 9.6-km) radius from the point of diagnosis. The quarantine boundary may intersect all types of roads, from interstates to local roads. In small counties with small county and municipality law enforcement staffs, officers will not be able to provide enforcement at every entrance or exit point. In order to use available resources as efficiently as possible, routes and road blocks need to be prioritized in order of necessity of enforced traffic control.

Possible criteria for prioritizing routes include:

- Average Daily Traffic (ADT)
- Livestock/Agriculture vehicle ADT
- Routes that pass directly through the "Hot Zone" [within 1.5 mi (2.4 km) of infected premises]
- Proximity to animal holding areas
- Access to detours
- Locations for turn around, pull-over, or disinfection stations
- Routes where access is critical, such as roads to hospitals

A route priority scheme is included in the guide.

5.4 Levels of Traffic Control

The levels of traffic control will be determined by the route priority and the available resources of the responding agency. We expect at least three levels of traffic control to be necessary. The three levels of traffic control are:

1. Traffic checkpoint with cleaning and disinfection stations—Manned checkpoints with a station to clean and disinfect vehicles, equipment, and people exiting a quarantine zone.
2. Traffic checkpoint—Checkpoint manned by a law enforcement officer where vehicles are screened for entry to or exit from the quarantined area.
3. Road Closure—Road is barricaded and all traffic is stopped (may be manned or unmanned).

We expect that initially most roads will simply be blocked. Some training examples have discussed only two disinfection stations for a 6-mile (10-km) buffer area. Check points would normally be placed where there was a critical need for access, without heavy volumes of agriculture vehicles.

As additional human resources become available to help work the traffic stops, more access points can be effectively managed, and fewer roads will be closed. Additionally, air surveillance may be used to monitor traffic through non-designated routes (i.e., across fields or private access routes rather than on public roads), and traffic through road blocks not manned by law enforcement personnel.

5.5 Command Structure

The National Incident Management System (NIMS) uses the Incident Command System (ICS) model for organizing roles and responsibilities. All states, counties, and municipalities are required to be NIMS compliant in order to maintain eligibility for preparedness funding from the federal government. The procedures developed in the Guide must fit into the ICS and be NIMS compliant in order to be applicable for county government use.

The ICS used in Kansas counties' foreign animal disease response plans is presented in Figure 1. Traffic control would fall into both the Operations Section and the Planning Section. The example shown here illustrates a Quarantine Branch in the operations section, housing Enforcement, Stop Movement, and Surveillance groups. These groups may or may not make sense for different jurisdictions. The Control Branch deals with diverting, housing, and euthanizing livestock, as well as with disinfection and cleaning. The main focus of this project lies in the Quarantine branch, although consideration must be given to the location of diverted and held livestock when prioritizing and locating roadblocks and traffic stops. Certain traffic control points will also likely double as disinfection points, although, it is likely that personnel more familiar with animal diseases and disinfection will manage the tasks under the control branch.

Prioritization of routes for closure, control and/or surveillance, as well as detour planning should be thoroughly considered in the preparedness stages before an incident occurs and should be covered in the Local Emergency Operation Plan for foreign animal diseases or agricultural emergencies. However, because the quarantine boundaries cannot be determined prior to the incident, some additional planning and prioritization will be required. Once the foreign animal disease diagnostician (FADD) has issued the initial quarantine order, a list of prioritized routes specific to the quarantine area and an associated traffic control plan should be developed based on the general prioritization guidelines, uniqueness of biological agents, and availability of resources. The Planning Section also handles equipment, and traffic control will require the acquisition of equipment such as signs for road closures, traffic stops and detours, advanced warning signs and variable message boards, sign posts and installation equipment, barricades and other resources used to block or close roads, vehicles, lighting, and decontamination equipment.

Determining the location of road blocks, traffic stops, decontamination stations, detours, livestock holding areas, and agriculture vehicle storage areas requires expertise in law enforcement, traffic operations, public health, animal health, and emergency response. All of these focus areas should be represented in the operations section, since they are also required for quarantine enforcement and disease control.

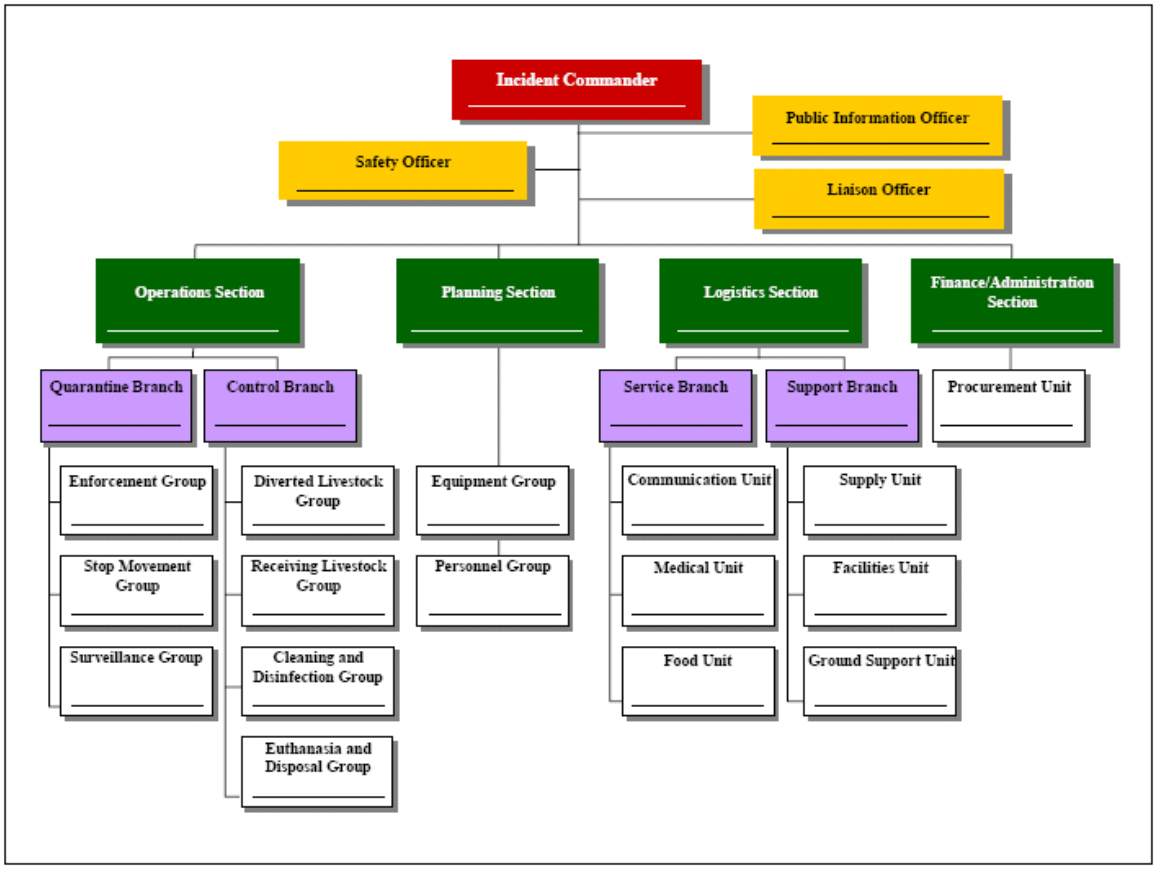

Figure 1. ICS Structure Used in Kansas for FAD Response

5.6 Resource List

Prior to an incident, a list of local resources should be compiled. The list should include the location and quantity of any type of equipment needed, as well as contact information and instructions for how to obtain the resources from the owner. An example spreadsheet for itemizing traffic control resources is provided in Table 4. A separate sheet can be stored electronically or printed out for each resource owner. These might include local state DOT maintenance facilities, county maintenance facilities, utility companies, highway contractors, and any other local business or agency that keeps signs, vehicles with flashing lights, sign installation equipment, variable message boards, or barricades. When compiling a list of resources, it is important to think out of the box. For example, hay bales may be used to block roads when barricades are not available. It would be important to have information immediately accessible regarding who may be contacted to obtain hay bales.

5.7 Emergency Management Assistance Compacts

Because rural counties have such limited man power and resources, Emergency Management Assistant Compacts with the private sector and with surrounding jurisdictions are critical. Planning efforts with neighboring counties are also crucial, since it is likely that any quarantine would cross county boundaries and require a great deal of cooperation between the jurisdictions. It is important to establish compacts between agencies in the planning stages so that when an emergency occurs, means of sharing resources are already in place.

Table 4. Example Traffic Control Resource List

County:	Johnson	Date: 7/1/2006	
Owner:	State DOT, Springfield Maintenance building	**Item**	**Quantity**
		Signs	
Contact		Stop	20
Name:	Jim Jones,	Stop Ahead	5
	Maintenance Supervisor	Road Closed	10
Phone		Detour	20
Numbers:	Office: 123-456-7890	Arrows	20
	Cell: 123-456-0987	US / State highway identifier signs	various
	After 4 pm: 123-456-7089	road name signs	various
		Sign Posts	50
Address:	111 County Road R.	Biohazard	
		Variable Message	2
		ITS Message Boards	
Additional	If building doors are locked and maintenance	Flashers	
Information:	staff is unavailable, extra	**Barricades**	
	key is located inside door	Hay bales	
	of west shed.	portable barricades	10
		Gates	
		Vehicles	
	Maintenance supervisor	officer vehicles	
	keeps all vehicle keys	trucks with sign capacity, installation equipment	2
	locked after hours. If	trucks with towing/hauling capacity	2
	needed, call cell or after	other vehicles with flashers/rotating lights	2
	hours number.	**Maps**	
		State road maps	1 box
		County road maps	
		Property Maps	
		Land use maps	

Section 6.
Development of the Guide to Traffic Control of Rural Routes in an Agricultural Emergency

The guide was developed in three steps:

- Develop initial draft guide
- Review the initial draft guide with local, state and federal representatives
- Revise the guide and submit it as part of the final report

This section describes the development of the initial draft guide and Section 7 discusses the review with local, state, and federal representatives.

6.1 Develop Initial Draft Guide

The contacts with state and local agencies revealed that there is little guidance available for local law enforcement agencies concerning traffic control in quarantine or stop movement emergencies. Of greater concern is the fact that many sheriffs have little appreciation of the size and complexity of this effort, which is almost universally assigned to local law enforcement. Therefore, we are convinced that furnishing a guide for local officials is very necessary and critical to our nation's security. An effective guide will allow local officials to plan and perform traffic control in an agricultural emergency. The guide is written in simple everyday language in a manner that answers traffic control questions for local officials. Although the *Manual of Uniform Traffic Control Devices* was used in preparing the guide, we did not assume that all users are familiar with the provisions of the manual.

The final guide has been published as NCHRP Report 525 Volume 13: *A Guide to Traffic Control of Rural Roads in an Agricultural Emergency* and is to be used by local and state officials that are responsible for traffic control during an agricultural emergency. It may also be possible to use the guide as an annex or appendix to a county's LEOP.

The guide discusses planning for an agricultural emergency, information needed to prioritize roads, the process of determining the level of traffic control for each road that crosses the quarantine boundary, and typical layouts for each type of road closure or stop.

The guide discusses traffic control in the three phases shown in the taxonomy in Section 5. In the planning phases, the recommended command structure used for the Operations Section, where the responsibilities for quarantine enforcement are held, is presented in Figure 3 below. This example was taken from the Kansas example shown in Section 5, but includes a third branch for Traffic Flow Management. This branch is specific to the operations, rather than the enforcement, side of traffic control and includes

responsibilities such as monitoring queues at traffic stops and checkpoints, monitoring the condition of detour routes, and managing sign installation and maintenance. These responsibilities would likely be carried out by a state DOT or local public works engineer who would supervise DOT and public works maintenance crews.

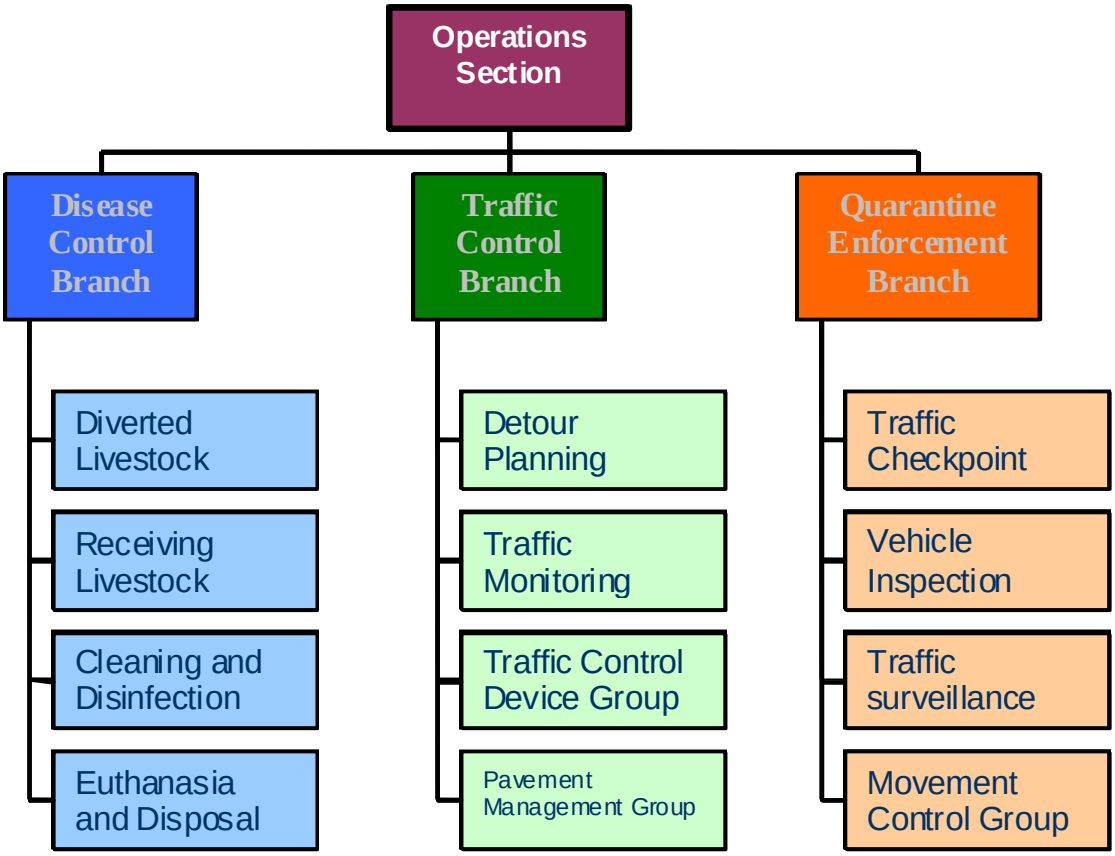

Figure 2. Suggested Additional Branch in Operations Section for Agricultural Emergency Response

The process of determining the level of traffic control during the second phase of an agricultural emergency is illustrated using a hypothetical example scenario. This hypothetical scenario simulates a FAD outbreak on a small farm about 6 mi (10 km) southeast of Linn, Missouri, which is about 20 mi (32 km) east of Jefferson City, the state capitol.

Response Planning for Hypothetical Scenario

The Guide explains how to prioritize the roads and choose the level of traffic control. Based on the findings from our study, several key officials from varying agencies must work together to determine the level of traffic control at each site or traffic control point.

These officials would include the FADD, a public health officer, the county emergency manager, the county sheriff, the county public works director and the area DOT engineer. In this example, major routes would require check point traffic control to screen the large number of vehicles traveling through the quarantine area. Predetermined detours would be instituted to divert traffic to alternate routes. Trucks with animals traveling in the quarantine zone would be sent to holding sites, trucks with animals coming to the quarantine area would be turned around to avoid the infection site. One site on a major route includes a disinfection station to disinfect vehicles leaving the quarantine area. The crossing of other state routes would also have a traffic check, and animals going to the feed lot would be sent to a holding point. Animals coming from the feed lot would be sent back to the lot. This site would include a disinfection station as additional resources became available. The state area engineer would be asked to furnish traffic control for the US and MO route traffic control points and the Missouri Highway Patrol would be asked to provide law enforcement officers.

Initially all other roads would be blocked. Three of the roads could have an auxiliary deputy or volunteer, but the additional road blocks would be unmanned by law enforcement personnel. Some of the road blocks could be eliminated by considering the road network. The Phase 2 response, which occurs between the FADD's preliminary diagnosis and confirmation from the USDA authorized laboratory, will produce a map showing the level of traffic control for each road crossed by the boundary line. The traffic control layouts will show the traffic control devices and personnel required at each TC point. The guide discusses the priority of installing the traffic control devices and how the point of road closure should be chosen. For example, roads should be closed near intersections to allow people to select alternate routes without turning around. At least one advanced warning sign should be in place if a road is blocked. The Guide lists the required devices and personnel for each type of TC point. Local officials can compare these requirements with the inventories of traffic control devices. If there are shortfalls in available devices, then other agencies will need to be contacted or other non-standard devices will need to be used for some TC points. Non-standard materials such as hay bales should be used on low priority routes saving standard devices for higher volume closures or for level 1 or 2 traffic control points. Plastic fence or other farm materials can be used for barricades, but should be replaced when standard devices are available. Early in Phase 3, which goes into effect after a confirmation of a FAD is received from the USDA authorized laboratory, a vehicle with a yellow flashing light may be used to block roads until closure traffic control devices are available. Signs should be specific to this type of hazard (Biohazard signs) but can be purchased as rollup or fabric signs. It may also be necessary to post public information sheets at each road closure to warn drivers of the hazard of proceeding into the quarantined area. Some signs should probably be purchased and stored as part of Phase 1 planning, and public information sheets can be made in Phase 2 response.

The typical layouts for the traffic check points and the disinfection stations include notes which specify the equipment that will be at the TC point for control of traffic. Nebraska Department of Agriculture's "Monograph 001: Traffic Control" (included in Section 2.5 of the annotated bibliography) is the only document found by the research

team that specifically address traffic control in an agriculture quarantine. The personnel and equipment sections of this document were especially helpful in developing notes for the traffic control diagrams in the guide.

Because of the small size of law enforcement staff in rural counties, the guide does not recommend that the county furnish an officer for each TC point. Also, the extensive equipment listed in the Nebraska monograph will not be available, at least initially, for each control point. Again, the guide discusses how to prioritize the personnel and equipment used at a site, since some roads will need to be blocked without law enforcement personnel present.

Overall, our goal was to keep the guide as short and as easily understood and followed by law enforcement and first responder personnel as possible, emphasizing the traffic control features of the response. The guide avoids or minimizes discussions of legal basis of quarantines, law enforcement standard operating guidelines at traffic stops, specifics of cleaning and disinfection operations and reimbursement and indemnity procedures. These are difficult issues that vary by state and infection type and that should be discussed elsewhere.

The guide was developed in draft form. This draft guide was reviewed by state and local officials as described in Section 7. The NCHRP project panel also reviewed and commented on the initial draft guide at this stage. The initial draft guide was revised in response to all comments received from state and local officials and from the NCHRP project panel and is has been published as NCHRP Report 525 Volume 13: *A Guide to Traffic Control of Rural Roads in an Agricultural Emergency*.

Section 7.
State and Local Evaluation of the Guide

The evaluation of the guide was accomplished with the following steps:

1. The guide was sent to state agriculture and DOT agencies.
2. State officials were phoned to get their comments on the guide, and on their advice the guide was sent to local officials in two to five counties. The local officials asked to review the guide included the county emergency manager, the local sheriff, and the public works director.
3. After local officials reviewed the guide, they were contacted and asked for their comments on the guide. They were also asked if they would be willing to host a one-day workshop to discuss the guide.
4. A total of four workshops were held. The locations and dates of the workshops were:
    - Dodge City, Kansas-December 20, 2007
    - Mankato, Minnesota-January 29, 2008
    - West Plains, Missouri-February 8, 2008
    - Athens, Tennessee- February 29, 2008

The guide was sent to between one and four state agencies in each of ten states. The complete list of state agencies that received the guide is shown in Table 5.

Each agency that received the guide was called and asked for their comments. Response to the guide was generally positive and, in many cases, additional copies of the guide were requested and other officials in the state were identified as reviewers of the guide. The most extensive comments on the guide were received from Dr. Janice Mogan of the Nebraska Department of Agriculture. We received many comments from the NCHRP panel also. In many cases, the panel reviewers and state agency reviewers agree, but in some instances, comments were contradictory.

Some of the most important comments on the guide from state officials included:

1. Very comprehensive and straight forward.
2. In some cases overstates the role of local agencies.
3. May overemphasize a quarantine area of 3- to 6-mi (4.8- to 9.6-km) radius. This area could easily expand to include an entire county or even an entire state.
4. The Traffic Control Diagram for the cleaning and disinfection station should be modified to ensure that the disinfection takes place in the quarantine area and that clean vehicles and personnel are not exposed to vehicles that have not been disinfected.

Table 5. State Agencies Asked to Review "A Guide to Traffic Control of Rural Roads in an Emergency Quarantine"

State agencies
California Department of Agriculture
Illinois Emergency Management Agency
Illinois Department of Transportation
Illinois Department of Agriculture
Iowa Department of Agriculture and Land Stewardship
Iowa Homeland Security Emergency Management
Iowa Department of Transportation
Kansas Animal Health Department
Kansas Department of Agriculture
Kansas Department of Transportation
Minnesota Homeland Security and Emergency Management
Minnesota Department of Transportation
Minnesota Board of Animal Health
Minnesota Department of Agriculture
Missouri Department of Agriculture
Missouri Department of Transportation
Nebraska Department of Agriculture
Nebraska Department of Roads
Nebraska State Patrol
North Carolina Department of Agriculture and Consumer Services
North Carolina Division of Emergency Management
North Carolina Department of Transportation
North Carolina Highway Patrol
Tennessee Department of Agriculture
Tennessee Department of Transportation
Wisconsin Department of Transportation

5. The guide should make it clear that the information is not state-specific and that some statements may not be true for every state.
6. Several reviewers recommended that rather than use agroterrorism incident (ATI) that we use the more inclusive term of "agricultural emergency." This term applies whether the disease was introduced deliberately or accidentally.

The research team has made a great deal of effort to provide specific guidance to local agencies while at the same time acknowledging the differences in emergency response procedures between states. While most reviewers from state agencies have provided favorable feedback, the most common concern has been that certain elements of the guide are not applicable to their state or incorrectly describe procedures or responsibilities in their state. Additionally, several states commented that local agencies play little to no role in developing or managing an emergency response plan for a foreign animal disease. State agencies expect to be notified of potential cases of foreign animal diseases immediately and do not envision local agencies managing the response even at the earliest stages. (While this attitude may be shortsighted, it is found in some states.)

While the research team believes that the task of traffic control will likely still be left to local law enforcement officials, all other elements of the response will be handled by

state or federal agencies and officials. For this reason, we believe it is important to clearly and specifically describe traffic control planning and procedures in the guide, but we also believe that the remainder of the content is included for context and should remain less prescriptive. The goal of the guide is to complement the emergency response plans and training already in place in state and local agencies, and the review team has worked to avoid including detailed instruction that may contradict these existing plans.

The states of Iowa, Kansas, Minnesota, Missouri, and Tennessee recommended local agencies to review the guide. The complete list of local agencies that have received the guide are shown in Table 6.

Table 6. Local Agencies Receiving "A Guide to Traffic Control of Rural Roads in an Emergency Quarantine"

Local agencies
Bremer County, Iowa
Dallas County, Iowa
Keokuk County, Iowa
Mahaska County, Iowa
Story County, Iowa
Ford County, Kansas
Grant County, Kansas
Norton County, Kansas
Pratt County, Kansas
Saline County, Kansas
Scott County, Kansas
Blue Earth County, Minnesota
Freeborn County, Minnesota
Kittson County, Minnesota
Stearns County, Minnesota
Barry County, Missouri
Clinton County, Missouri
Howell County, Missouri
Jasper County, Missouri
Newton County, Missouri
Henderson County, Tennessee
Jefferson County, Tennessee
Lincoln County, Tennessee
Monroe County, Tennessee
McMinn County, Tennessee
Sparta-White County, Tennessee

Some of the comments received from the county reviewers of the guide included:

- Guide is good resource for a county in making plans for a stop movement due to FAD or other incident.
- Procedure for prioritizing roads is a "general guide."

- There are three types of stop movement:
  - Nationwide
  - Regional
  - Local
- Cleaning and disinfection may need to be discussed further. A vehicle should not be taken to a car wash to clean off mud or manure from an infected site.
- Listing products that can be used for disinfecting would add value to the guide.

The results of each of the four workshops held are discussed below.

7.1 Ford County, Kansas, Workshop

There were seven attendees at the Ford County workshop held in Dodge City on December 20, 2007. Agencies represented were:

- Ford County Sheriff's Office
- Ford County Fire Department
- A representative of a local slaughter house who coordinated the shipping of cattle to the slaughter house.
- Two representatives of the Kansas DOT, one from headquarters and the area emergency coordinator for KDOT that covered eight counties including Ford County.
- Two representatives from the Kansas Animal Health Department including the state veterinarian and a livestock inspector who covered western Kansas

The agenda used for this and all other workshops is shown in Table 7.

The Ford County and Kansas DOT attendees at this workshop had recently worked together in response to the destruction of Greensburg, Kansas by a tornado. They all confirmed the necessity of good channels of communication during an emergency and felt that the first 24 hours were the most critical time of any response. While they thought the guide was very helpful, they also wanted a smaller pocket guide that could be given to personnel who were setting up the traffic control at each site. The emergency manager who was also the fire chief furnished a fire line handbook as an example of this type of pocket guide. The importance of the area office of the DOT was emphasized during the workshop because the DOT has a bigger area of concern and can divert traffic from a much larger distance than local highway departments. DOT representatives also emphasized that traffic check points should be set up at locations where there is room to store vehicles. In Kansas, that might be on a state road that has an asphalt mixing area beside the roadway. The DOT also has changeable message signs that are very valuable for diverting traffic. The benefit of getting producers involved was also evident. The local meat packer representative could divert all trucks hauling cattle to slaughter in Ford

County and could also reroute them away from the quarantine area. Discussion during the exercise centered on the fact that some traffic stops or diversion points might be outside the quarantine area. The participants also discussed leaving major roads open but not allowing any local traffic onto or off the route (in other words, creating a controlled access route that could be used for through traffic). The undersheriff of Ford County has written reports on agroterrorism and it was evident that Ford County has a good plan. Even so, all workshop attendees felt that the guide was a good resource and that the workshop was valuable in getting the right group of people together to discuss agricultural emergencies.

Table 7. Workshop Agenda

A Guide to Traffic Control of Rural Roads in an Emergency Quarantine

Task 7 Workshop

Agenda

9:00	Welcome and Introductions (Presenters and attendees) (Federal or State Agriculture official)
9:15	Project Overview
9:45	Purpose of Stop Movement and Quarantine Operations
10:00	Break
10:15	Review of "A Guide to Traffic Control of Rural Roads in an Emergency Quarantine"
11:15	Biosecurity Procedures for Responders
11:45	Introduction to Exercise Scenario
12:00	Lunch
1:00	Team Exercises
1:45	Discussion of Solutions (MRI team)
2:00	Comments about applicable policies specific to the state (State Ag officials)
2:15	Break
2:30	Comments on guide and exercise (Participants)
3:00	Closing

A scenario specific to Ford County, along with quarantine and traffic volume maps, were used for the exercise at the end of the day. The exercise scenario is shown in Table 8. Exercises in each workshop were similar in format to this workshop, but tailored to the county where the workshop was held.

Table 8. Exercise Scenario

A Guide to Traffic Control of Rural Roads in an Emergency Quarantine

Task 7 Workshop

Hypothetical Exercise Scenario

A county vet has been called to the Jones Ranch, about 1 mile south of Judge on State Route CC.

Dr. Wilson, The vet from the County Extension office, has been called to the Jones Ranch by the Jones's vet, Doc Carlson.

After Doc Carlson was notified of drooling and lesions on the cattle, he called in Dr. Wilson.

They have taken samples and had them rushed to the lab at Ames and at Plum Island, but it will be 24-48 hours before the test is back.

Wilson calls the USDA Foreign Animal Disease Officer, Dr. Smith, and gets the samples expedited, as Smith pulled the samples himself yesterday.

All are concerned by what they are seeing on the Jones Ranch, and Smith feels that he needs to impose the precautions as outlined in the USDA Protocol, Lockdown of 6 mi (10 km) Radius

Maps of the quarantine area are available, along with traffic volume maps for major and minor roads.

You are a member of a working group that is responsible for traffic control.

Use the maps and information in Section 4 of the guide plus local knowledge to select the type of traffic control to establish at each numbered traffic control point.

If time permits, discuss available resources to implement this type of traffic control.

7.2 Blue Earth County, Minnesota, Workshop

There were eight attendees at the Blue Earth County workshop held in Mankato on January 29, 2008. Agencies represented at this work shop were:

- Blue Earth County Emergency Management
- Two representatives of the Blue Earth County Sheriff's office
- Blue Earth County Public Works
- Nicollet County Emergency Management
- Two representatives of the Minnesota DOT
- Minnesota Homeland Security-Regional Program Coordinator

Blue Earth County has a large poultry processing plant nearby and is therefore concerned with the possibility of avian flu as well as other animal diseases. Those present were also concerned about the prospect of having to hold poultry for several days at a time. The State of Minnesota has different laws than Kansas and therefore slightly different procedures for an agricultural emergency. Minnesota officials were hesitant to use the procedures outlined in Phase 2, as described in the guide, because they felt that warning of a FAD prior to confirmation and proclamation by the governor would depress markets and lead to widespread concern. There was considerable discussion about how the response will be affected by this policy, and despite some disagreement by the county emergency mangers present, the state representative stated that this was how the process would be handled.

The law enforcement officers were somewhat skeptical of their ability to enforce quarantine, and based this opinion on the fact that they felt they could not quarantine individuals with contagious diseases. They also felt that there were too few staff in the sheriff's office to support the stop movement or quarantine efforts. The area office of the DOT was supportive and also felt that they could divert much traffic from the quarantine area. They felt that the use of changeable message signs should be discussed when detours were mentioned, based on their procedures and the usefulness of the signs.

The use of a hard card, or pocket-sized traffic control reference book with diagrams, as discussed in Kansas, was presented to the attendees and was deemed to be a good idea to facilitate the fast installation of traffic controls at traffic control points.

A comment specific to the Guide was that public health should be added to Table 2-1 that discussed roles and responsibilities of those involved in the response.

The exercise was cut short due to inclement weather. One point that came out during the exercise was that the city of Mankato had its own emergency management that would operate separately from the county emergency management. Thus there was another level of government that would be involved in a response; however, there might also be additional resources available in some of the municipal offices.

7.3 Howell County, Missouri, Workshop

There were eight attendees at the Howell County workshop held in West Plains on February 8, 2008. Agencies represented were:

- West Plains Police Chief
- West Plains Emergency Manager
- Howell County Emergency Manager
- Missouri Department of Agriculture (two representatives from agro-security and the district veterinarian)
- Missouri DOT (one liaison engineer from the central office and the incident response coordinator from the area office)

There was considerable discussion in this workshop about the word quarantine and its use in the title of the Guide and in an emergency response. The district veterinarian furnished a copy of the "Official Order of Quarantine" from the Missouri Department of Agriculture. He stated that these orders are filled out on a routine basis and would be used by a FADD responding to a suspicious disease. Violation of this order is a misdemeanor with a penalty up to $10,000 per violation. Law enforcement attendees were comfortable with the use of the word and thought it should be in the title to the Guide. Overall the attendees at this workshop did not note the difficulties with quarantines that were evident in Minnesota. Jurisdictional issues were also discussed. The City of West Plains has its own emergency manager, and there are two other cities in Howell County that also have an emergency manager. However, unlike Minnesota, where these are separate, the Howell County EMA director has jurisdiction over all cities in Howell County. The importance of the area office of the DOT was again evident and the Missouri DOT personnel stated their willingness to help in a quarantine or stop movement with the request of the county EMA director. They discussed a large scale evacuation plan that covered the response to a severe earthquake in southeast Missouri. This plan called for evacuations and relocation of residents in Howell County and in Springfield. The state agro-security officer discussed many of the on-going efforts of the Department of Agriculture to ensure that local agencies were prepared and that producers were also aware of the threat of an agricultural emergency and what personnel and equipment a response would require. Southern Missouri also has large numbers of poultry farms, and the differences between an avian flu or END response and a Foot and Mouth outbreak were discussed.

7.4 McMinn County, Tennessee, Workshop

There were eight attendees at the McMinn County workshop held in Athens, Tennessee on February 29, 2008. Agencies represented were:

- McMinn County emergency management (three representatives including the director)
- McMinn County Highway Department
- Tennessee Highway Patrol
- Tennessee Emergency Management Agency
- Tennessee DOT-HQ Emergency Management Coordinator
- Tennessee Department of Agriculture-Disaster Animal Response Coordinator

The Department of Agriculture representative, a veterinarian, had been at the Foot and Mouth Disease outbreak in England and discussed his experiences with that emergency. Also, the Tennessee DOT representative had recently been on duty in Macon County, Tennessee, where the DOT had removed debris from roads and fields after several tornados had crossed Tennessee. He stressed the need for flexibility in planning and said that many things come up in an emergency that cannot be foreseen. The DOT engineer was also a farmer, so he had a unique perspective on the nature of animal quarantines. Disposal of dead animals was discussed at some length. Burial is not practical in this area due to a high water table, and burning was seen as too slow for disposing of a large number of carcasses. The Tennessee Department of Agriculture representative recounted how a large landfill was used in England, and warned that it might be necessary to haul carcasses some distance if euthanasia and disposal were necessary. There were several specific comments on the Guide, including a suggestion to remove the ATI acronym, and to substitute “emergency equipment” for vehicles rather than discussing “flashing lights.” There was some discussion of the need to control wild animals and a suggestion to add state wildlife agencies to the list of agencies that should be notified. There was also a request that Table 2-1 in the guide use a larger font to be more readable. The comment was made that large piles of gravel could be used to block roads in an emergency. The county highway department had reviewed the Guide prior to the workshop and said that their county commissioner had said that no roads could be blocked in the county. He also felt that it would be hard to fund a quarantine within the county highway budget.

There was a nearby nuclear plant and a great deal of planning had been done in regard to a potential incident at this plant. The differences between a nuclear and an agricultural disaster were discussed. The representative of the Tennessee Highway Patrol was the first state law enforcement person who had attended a workshop and the research team learned that the aid that could be provided by the state highway patrol would be very beneficial to local law enforcement agencies.

7.5 Summary of State and Local Comments on the Guide

Overall there were many helpful comments on the Guide. More comments were received from State agencies than local agencies and many of those were incorporated into the revised version of the Guide published as NCHRP Report 525 Volume 13: *A*

Guide to Traffic Control of Rural Roads in an Agricultural Emergency. The comments on the workshop could be best summarized by the message received from Dr. Robert Linnabary of the Tennessee Department of Agriculture:

> "From what I heard from others attending, they also felt it was valuable and time well spent. …. I can see a real need for bringing county and state people together to work through some of the issues with traffic stoppages."

During each of the workshops, it was mentioned that the use of volunteers was absolutely necessary and that training for these personnel was needed.

The attendance at the workshops was not as large in numbers as hoped, and there were few county personnel who attended from counties outside the county hosting the workshop. Some state personnel felt that the county emergency managers would need to be reimbursed for travel to get many of them to attend a meeting outside their county. The agencies represented at the workshops felt that most local officials could probably choose the level of traffic control without the priority procedure presented in the Guide, but that it was valuable to have a more formal way to choose the level of traffic control. They liked the traffic control diagrams and felt that they should be summarized in a small field booklet or hard card.

In most of the workshops, the county emergency staff, the area DOT office, local public works, and local law enforcement had worked together in other emergencies and had established relationships. The state agricultural officials, while very knowledgeable about agricultural emergencies, were not as accustomed to working with local law enforcement and highway agencies.

Section 8. Summary

In a global economy where people and products can so easily be transported many miles, the possibility of an agricultural emergency involving either the deliberate or naturally occurring outbreak of a foreign plant or animal disease is too large to ignore. These outbreaks are most likely in rural agricultural areas where government agencies are low on personnel, equipment, and expertise needed to stop the spread of the disease and eradicate it.

The guide produced in this research should aid state and local officials in responding to agricultural emergencies. However there are a number of remaining challenges and implementation issues that will need to be overcome.

First, local law enforcement officials must be educated to the scope of a major quarantine in a rural area. The research team found that many sheriffs are complacent or simply ignoring the possibility of this type of operation because they have no recent experience with emergencies where quarantines were necessary and because they lack the funds to conduct such an operation. Education and planning can go a long way in making people aware of potential emergency response resources and the other agencies than can aid in traffic control and help set priorities for handing the response.

A county sheriff stressed that education and trust of the producer community was absolutely essential if quarantine or stop movement orders are to be successful. Biosecurity and detection of disease must begin on the farm and extend through the entire food production system.

Many state and local agencies would be involved in a response to an agricultural emergency. Exercises involving emergency managers, law enforcement, local and state DOT representatives, and agriculture officials should be conducted at several locations. These exercises would require travel funds for county officials and could be patterned after the workshops held in this research.

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Appendix

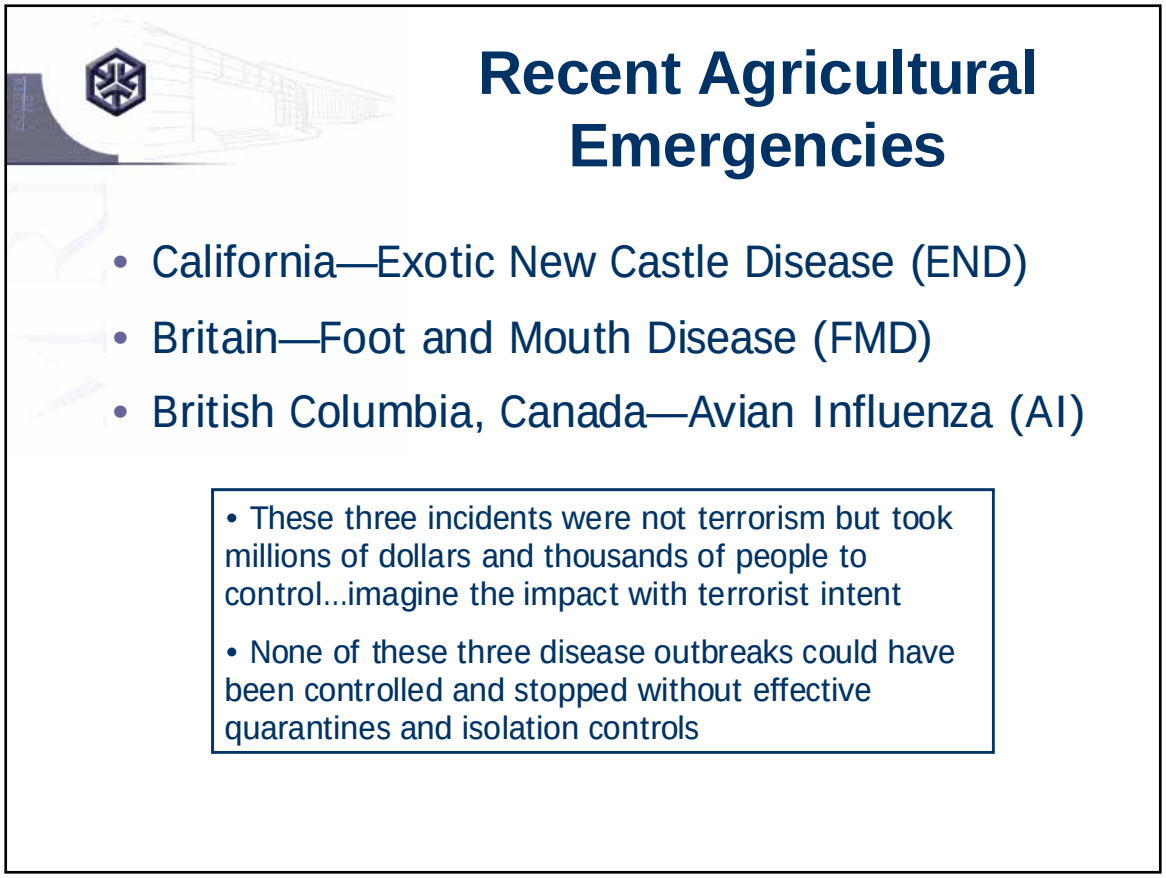
Final Project Presentation

Midwest Research Institute

Solutions through science and technology

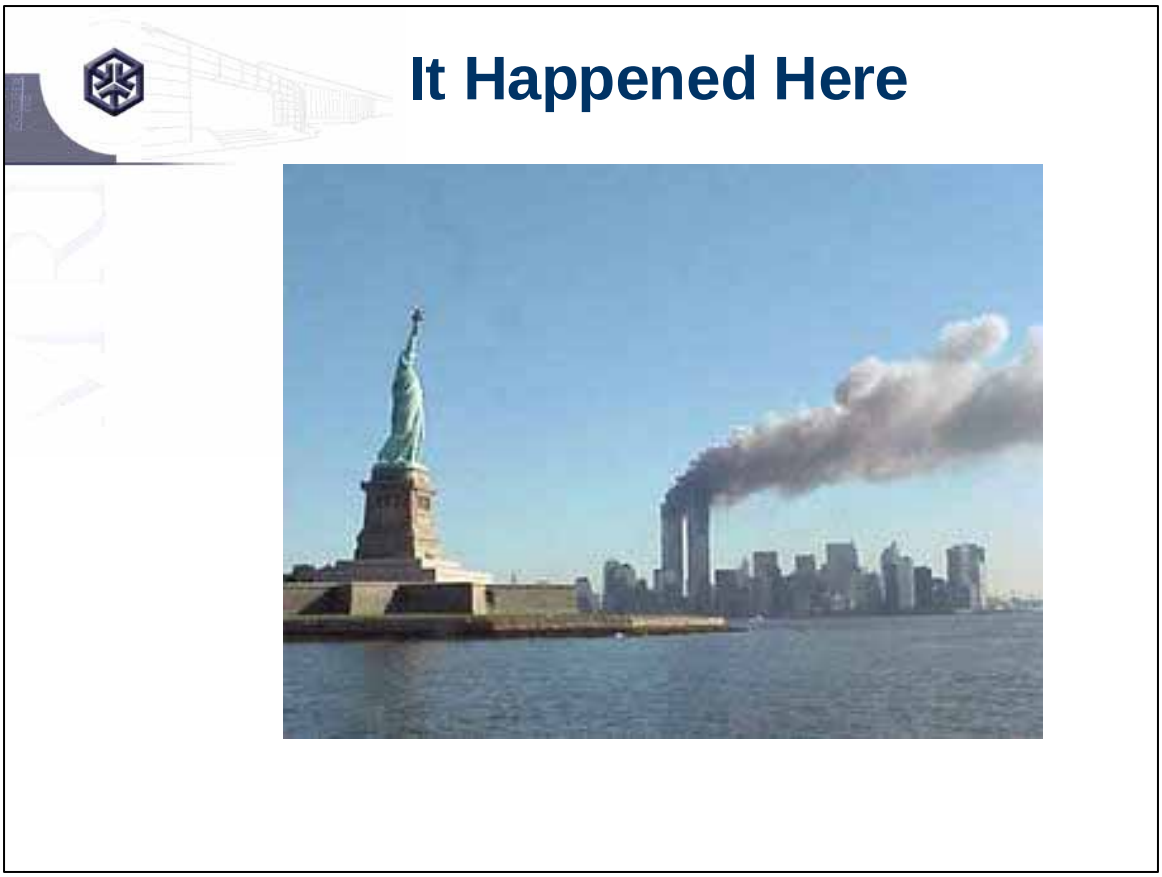
A Guide to Traffic Control of Rural Roads in an Agricultural Emergency

Midwest Research Institute, headquartered in Kansas City, MO, has conducted research to aid local agencies in the event of an agricultural emergency including a terrorist attack on our food supply. Specifically, this guide covers traffic control if stop movement or quarantine operations are necessary due to the deliberate or accidental introduction of foreign plant or animal diseases into the U. S. food supply system.



Although these incidents were not related to terrorism, they do illustrate the tremendous damage done by any outbreak. The main weapon to combat the spread of any of these diseases is quarantines and stop movement orders for all affected species.

As you can see from these quotes, the possibility of an attack on our food supply was being discussed even before 9\11 and members of the cabinet still see it as a distinct possibility.



We were all shocked when the World Trade Center and Pentagon were attacked on 9/11/01.

Is it possible that terrorists would attack our food supply system?

What is Agroterrorism?

- Agroterrorism can be defined as the deliberate introduction of a pathogen into the pre harvest or post harvest stages of food and fiber production

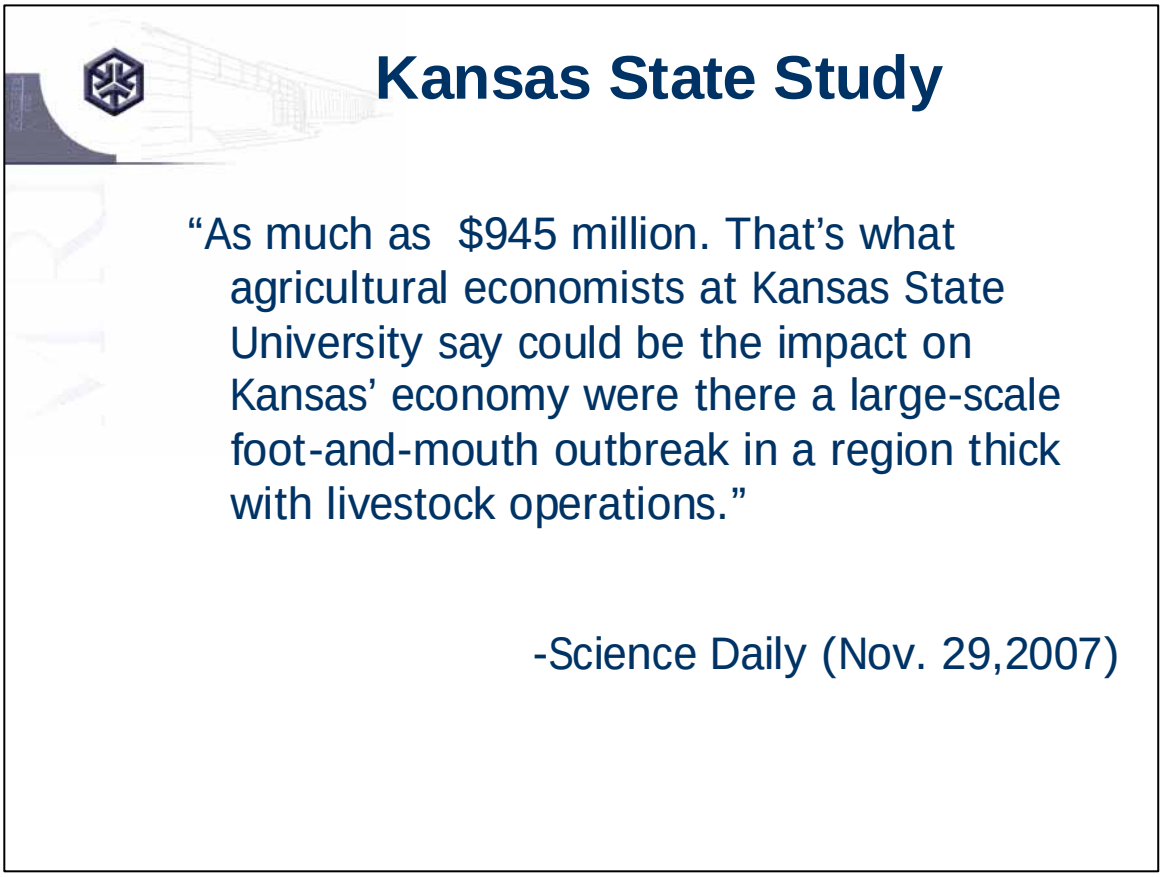
Agroterrorism is not about killing people; it is a form of terrorism to deplete resources, destroy an economy and cause social unrest

If an enemy can attack our means of providing food to those living in the United States, they will cause tremendous disruption to our economy and could destroy confidence in American agricultural products for years to come.

Outcomes

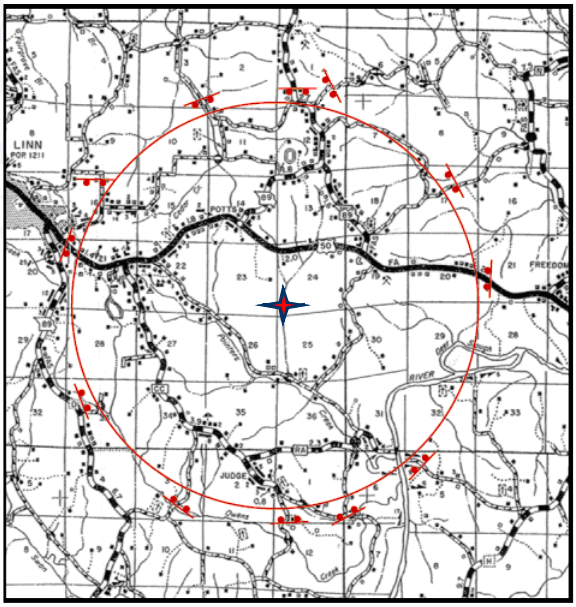
- It has been estimated that it will cost $1,000,000.00 for each hour that foot and mouth disease goes undetected in the United States
- Social unrest if eradication and quarantines are long term operations
- Significant mental health impact for agriculture producers

Britain has recently suffered another outbreak of foot and mouth disease that was kept to a much smaller area thanks to swift quarantines.



An outbreak of a disease can cost a tremendous amount whether it is introduced intentionally or naturally. The food industry is aware of the need for serious measures to control the spread of the infection.

Possible Scenario



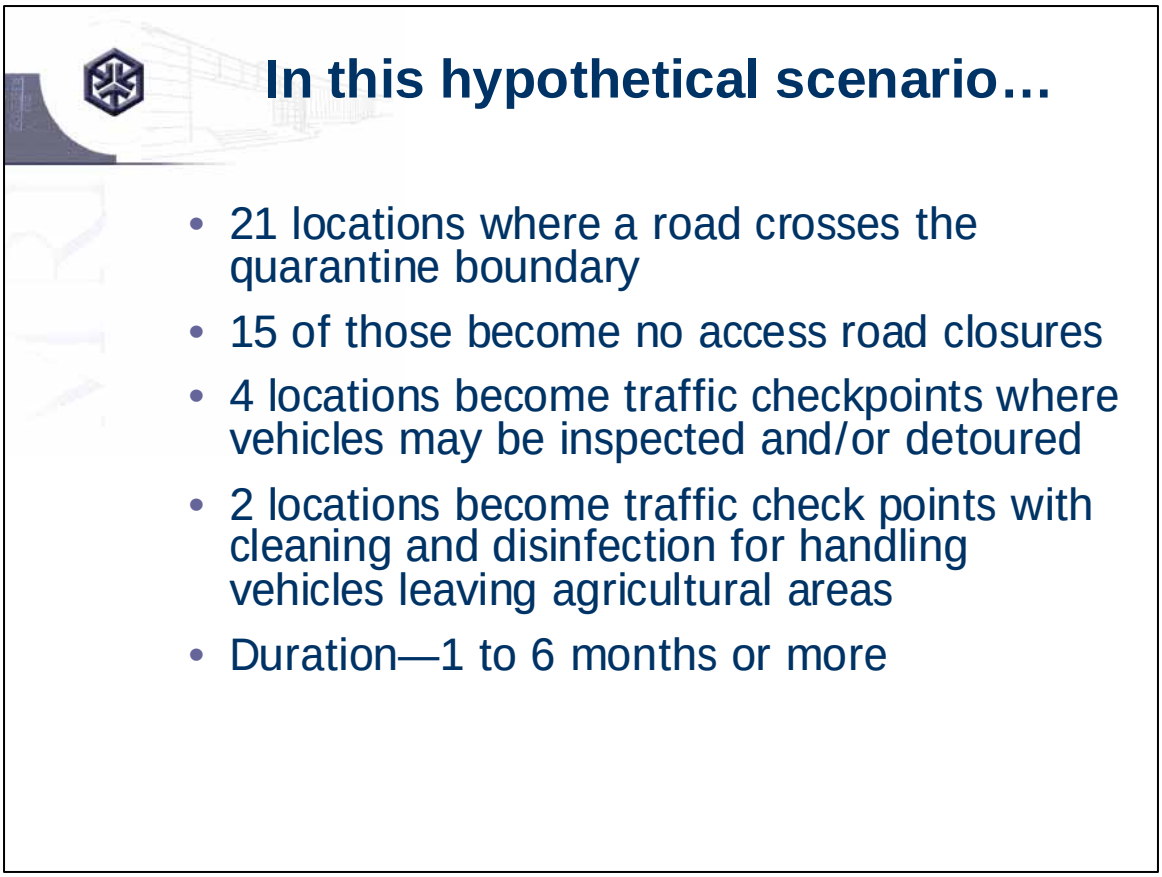
- Assume a Quarantine that covers the area within 6 miles of the site of infection

For some areas and diseases, a 6-mile quarantine may be necessary to stop the spread of an infection.

Possible Scenario

- How many road checks or blocks will be needed to contain movement of agriculture produce, animals or infection?

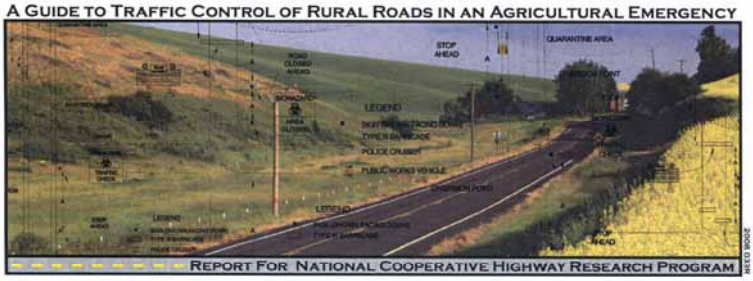
In many circumstances, the minimum area that would be affected would be a 6-mile radius circle from the point of infection. How many check points would that mean for your county? In most rural counties that will entail 15 to 35 road closures or traffic control points.



The traffic control required for such a scenario, even in a rural area, can be extensive, as described in this scenario.

The Guide

A GUIDE TO TRAFFIC CONTROL OF RURAL ROADS IN AN AGRICULTURAL EMERGENCY



REPORT FOR NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

TRANSPORTATION RESEARCH BOARD
NATIONAL RESEARCH COUNCIL

NCHRP PROJECT 20-59(22)
MRI PROJECT NO. 110514

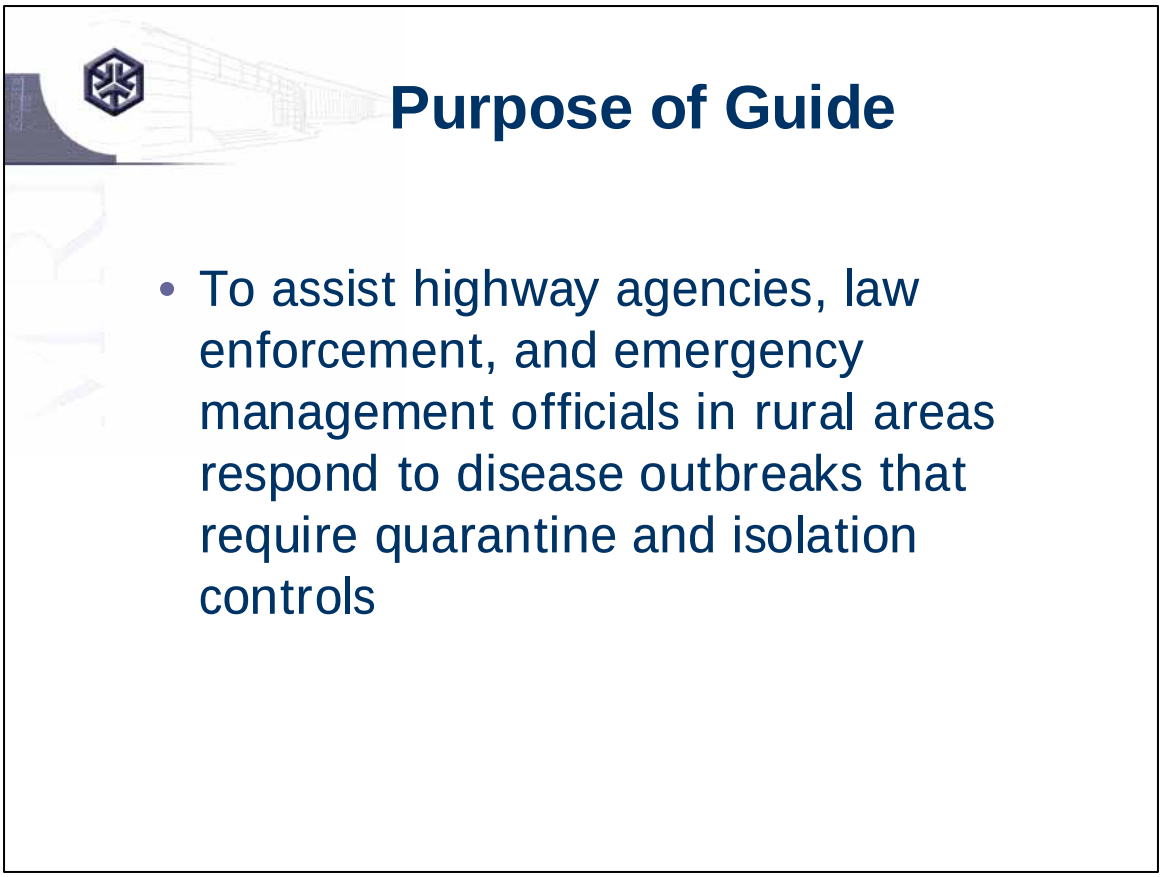
PREPARED BY:
MIDWEST RESEARCH INSTITUTE
KANSAS CITY, MISSOURI

MAY 2008

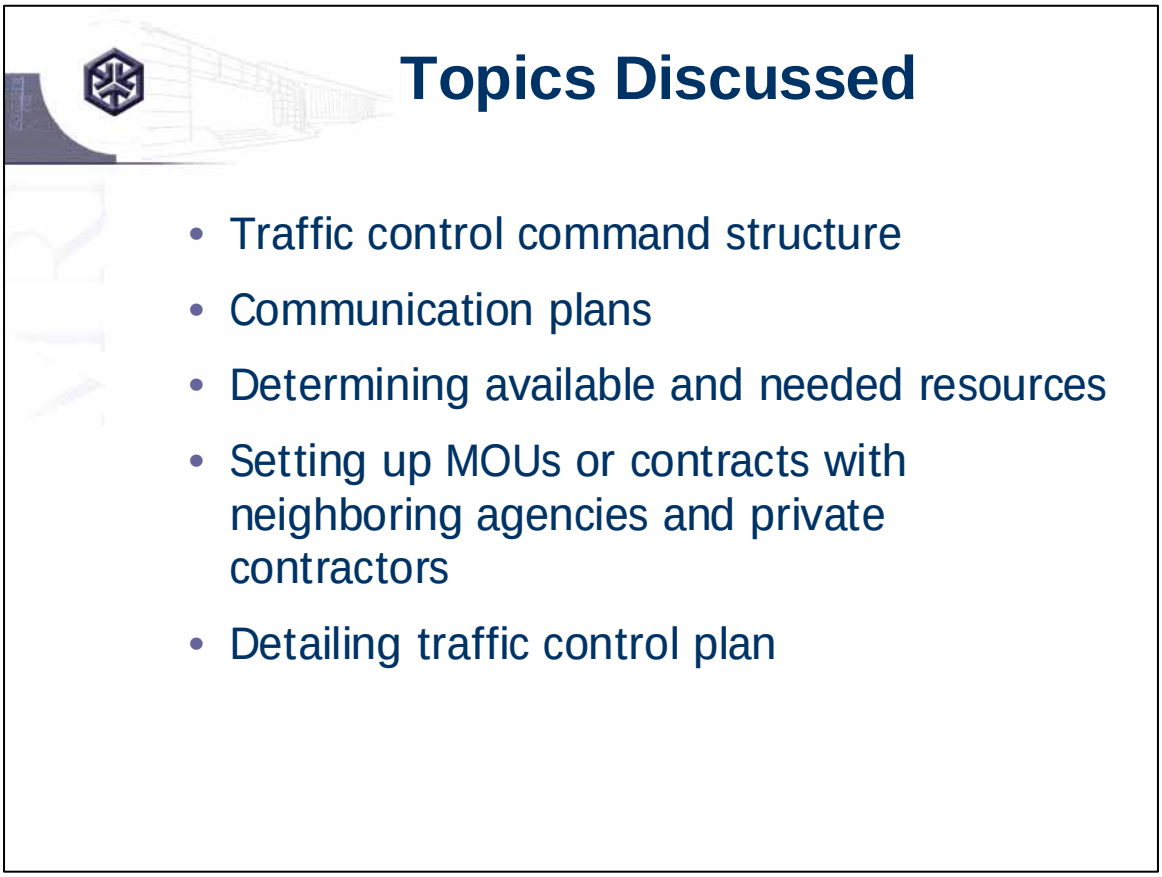
TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
PRIVILEGED DOCUMENT

This report, not released for publication, is furnished only for review to members of or participants in the work of the CRP. This report is to be regarded as fully privileged, and dissemination of the information included herein must be approved by the CRP.

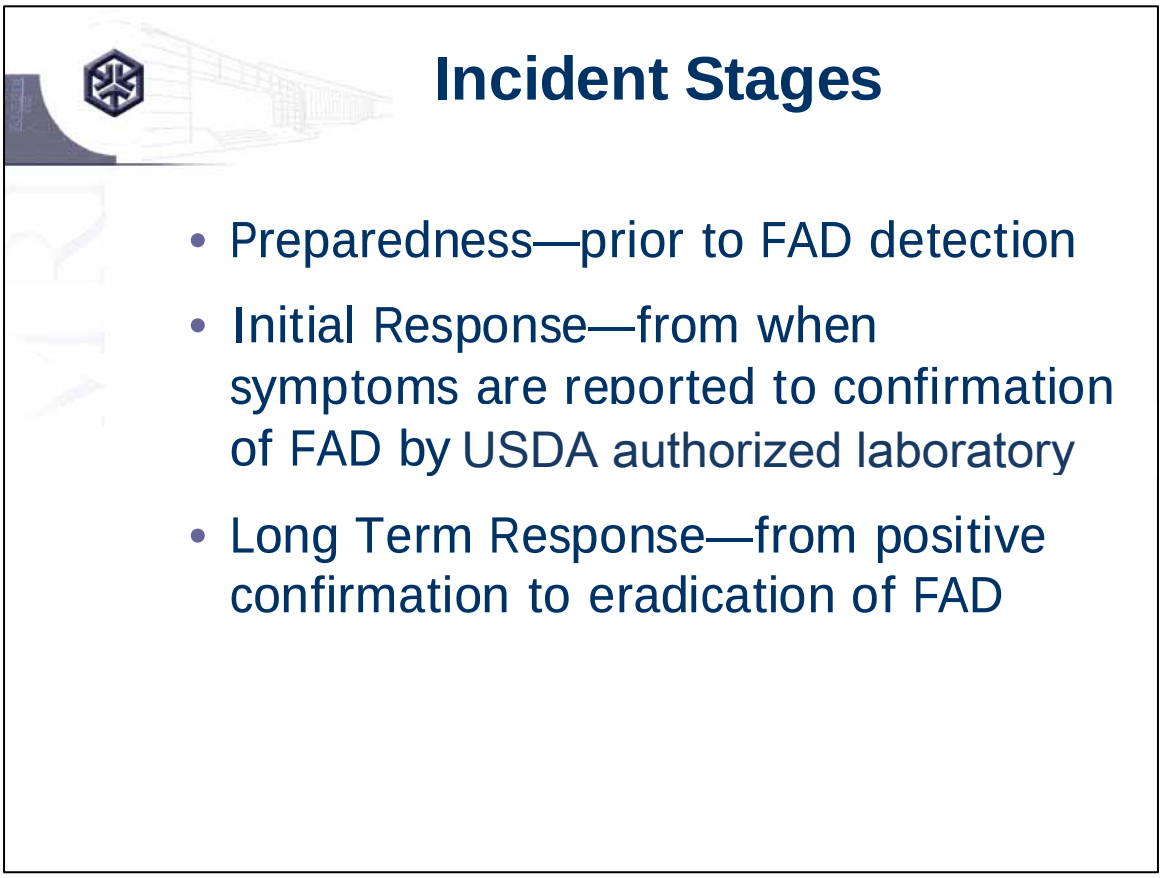
MRI has contracted with the National Cooperative Highway Research Program to develop a guide for emergency traffic control in rural areas. This guide includes input from many state and local animal health and agriculture experts, as well as traffic engineers, law enforcement officials, veterinarians and public health experts.



The responsibility for traffic control is usually left to local law enforcement agencies. In quarantine operations that may last two months or longer; local law enforcement will need assistance from a number of other local and state agencies. The guide discusses a response structure that will include the local highway department, state law enforcement agencies, and state highway offices.



Hopefully the first four bullets are things you've already covered when developing any other emergency response plan. These are the kinds of things that are discussed in NIMS and ICS training, which many of you may have already had. The purpose of this guide is not to focus on those, but to briefly discuss how they come in to play in an agricultural emergency and to give you an opportunity to make sure the structures and plans you already have in place will cover the kinds of emergencies we're discussing today. The fifth bullet, which covers developing an actual traffic control plan, is what is described in the guide.



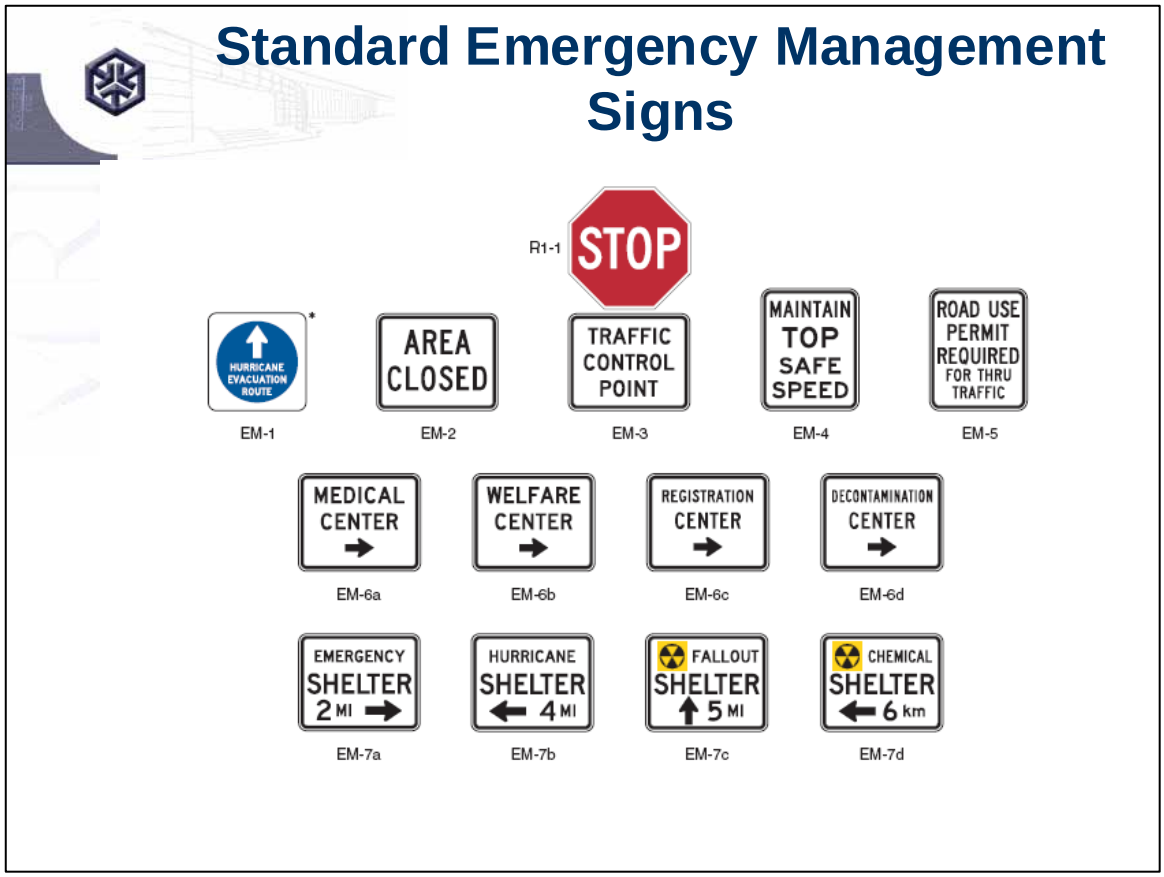
These stages refer to traffic control and are somewhat different than the four stages mentioned in NIMS which are prevention, preparedness, response and recovery. Of course, the best case scenario is that your prevention is so good that an incident never occurs. But if an incident does occur, the response can only be as good as your preparedness. Preparedness includes an analysis of potential vulnerabilities, a careful look at agricultural travel patterns as well as alternate routes around agricultural areas, and an inventory of resources that could be used in a response.

The initial response takes place in the time between when a FAD is first suspected to when its presence is confirmed. The actions taken during this stage may vary significantly from region to region depending on the local and state legislations, policies, and authority. The emphasis should be placed on keeping animals suspected of being infected away from other animals, and on reducing the spread of contamination via people, vehicles, equipment, etc. Because local law enforcement may not be given the authority to restrict movement of people or animals until the suspected disease is confirmed, this stage requires a good working relationship and cooperation with and from local producers in order to increase voluntary compliance.

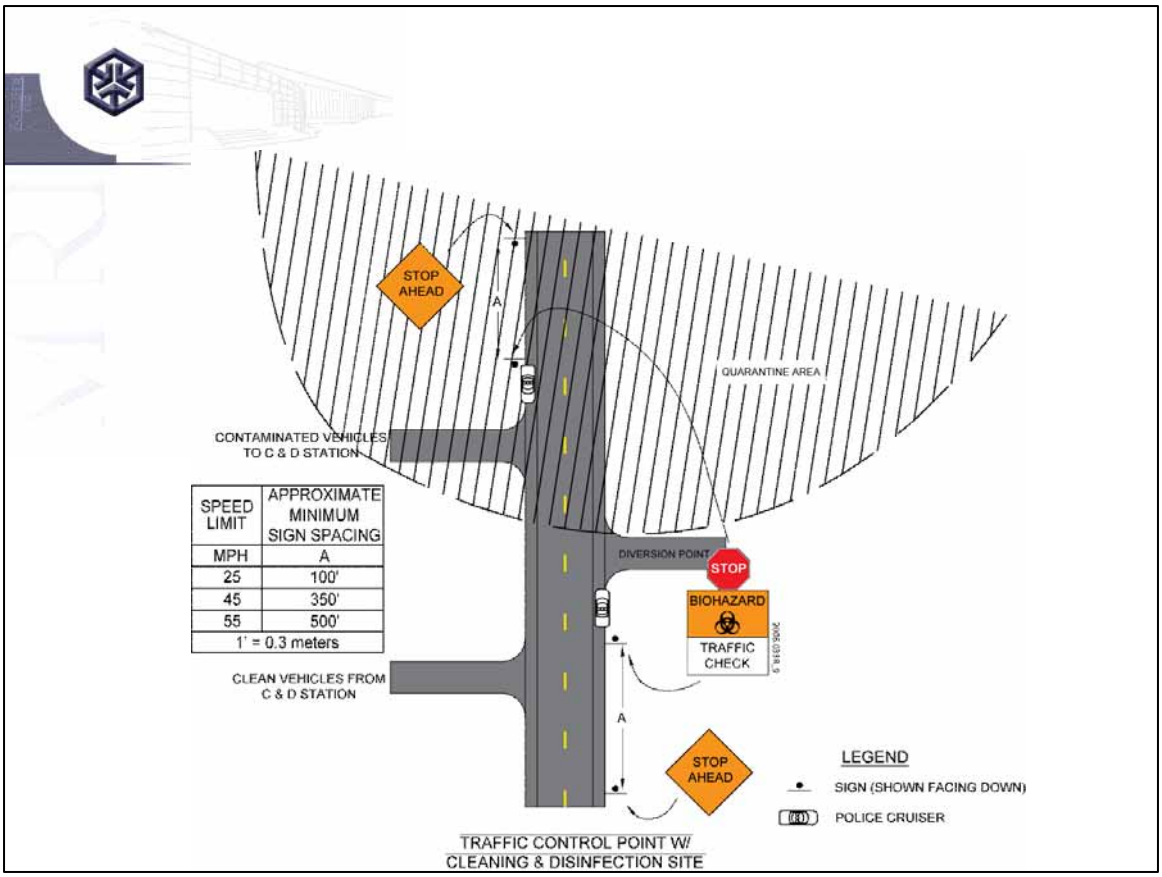
The long term response begins once the disease has been confirmed and may last weeks or months, depending on how early the disease is identified and how well contamination is contained. The long term response will be a joint effort between local, state and federal authorities, but if the quarantine area is large (the disease has been identified in more than one location), resources may be stretched thin, and local responders may bear the burden of the response.

Traffic control for other incidents is usually handled by law enforcement—when a signal goes out, when cars have to be directed around a crash scene or debris in the roadway, when a high traffic event clogs intersections (after a football game at the high school, etc.) Public works employees and state maintenance and construction crews have experience directing traffic around temporary work zones. Who else in your area has responsibilities for traffic control? Who in your county has drawn and/or implemented traffic control plans?

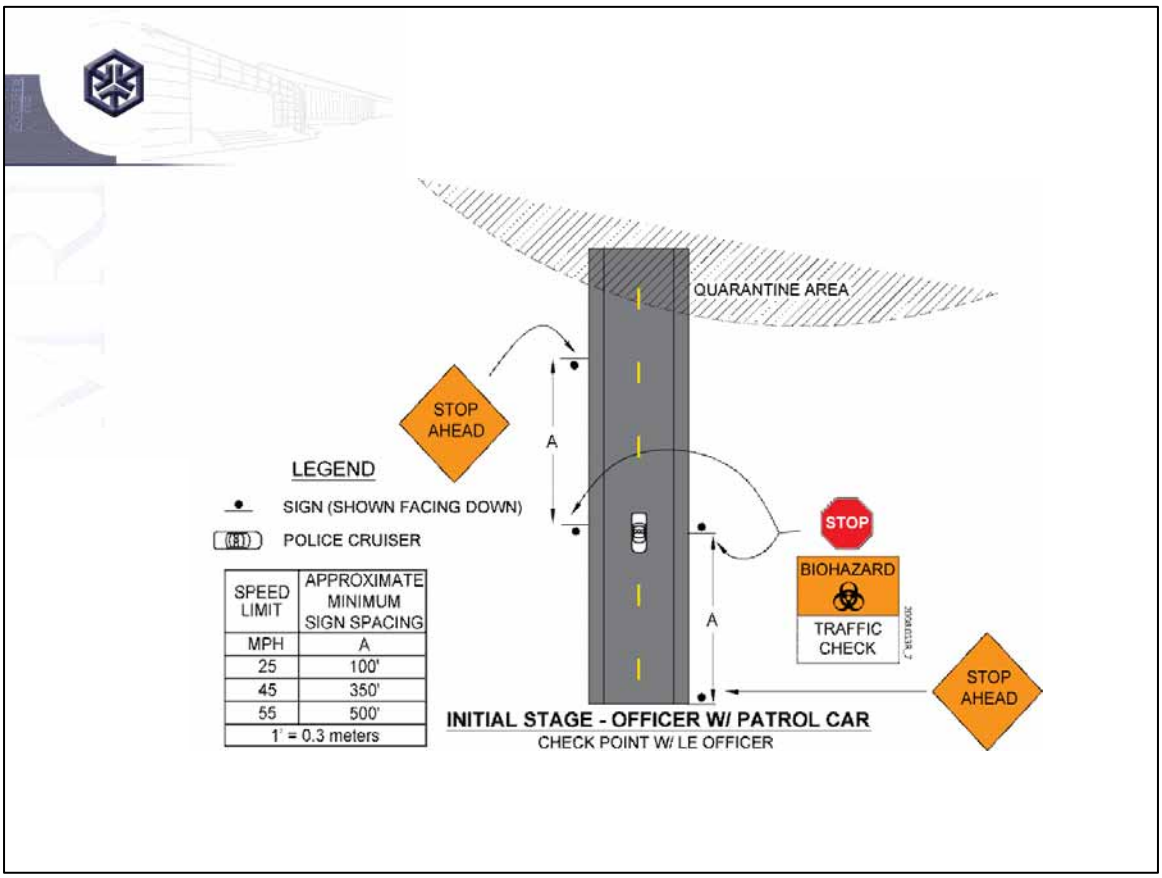
We've developed three different levels of traffic control, and for each location where a road enters and/or exits the quarantined area, a decision must be made as to which level will be used at that location. Of course, there is a fourth level, which is not listed here, and that is no control at all. In the earliest stages, you may have to leave some boundaries without control while resources and manpower are gathered. You will have to make decisions about the most critical locations that should be addressed first.



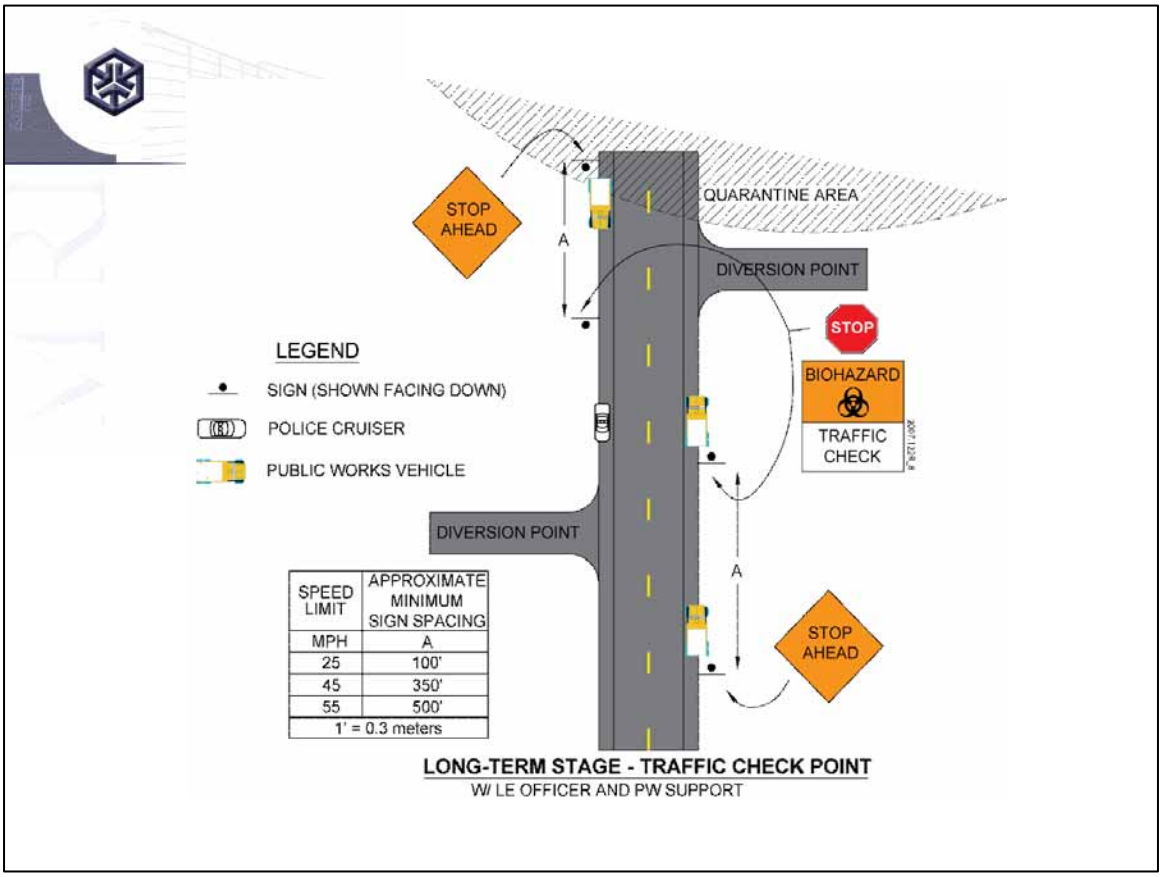
These signs are taken from the *Manual on Uniform Traffic Control Devices* (FHWA). The use of standard official traffic control devices is recommended when possible; however, in emergencies other non-standard devices may have to be used until standard devices are available. Pink fluorescent signs can also be used for emergency traffic control.



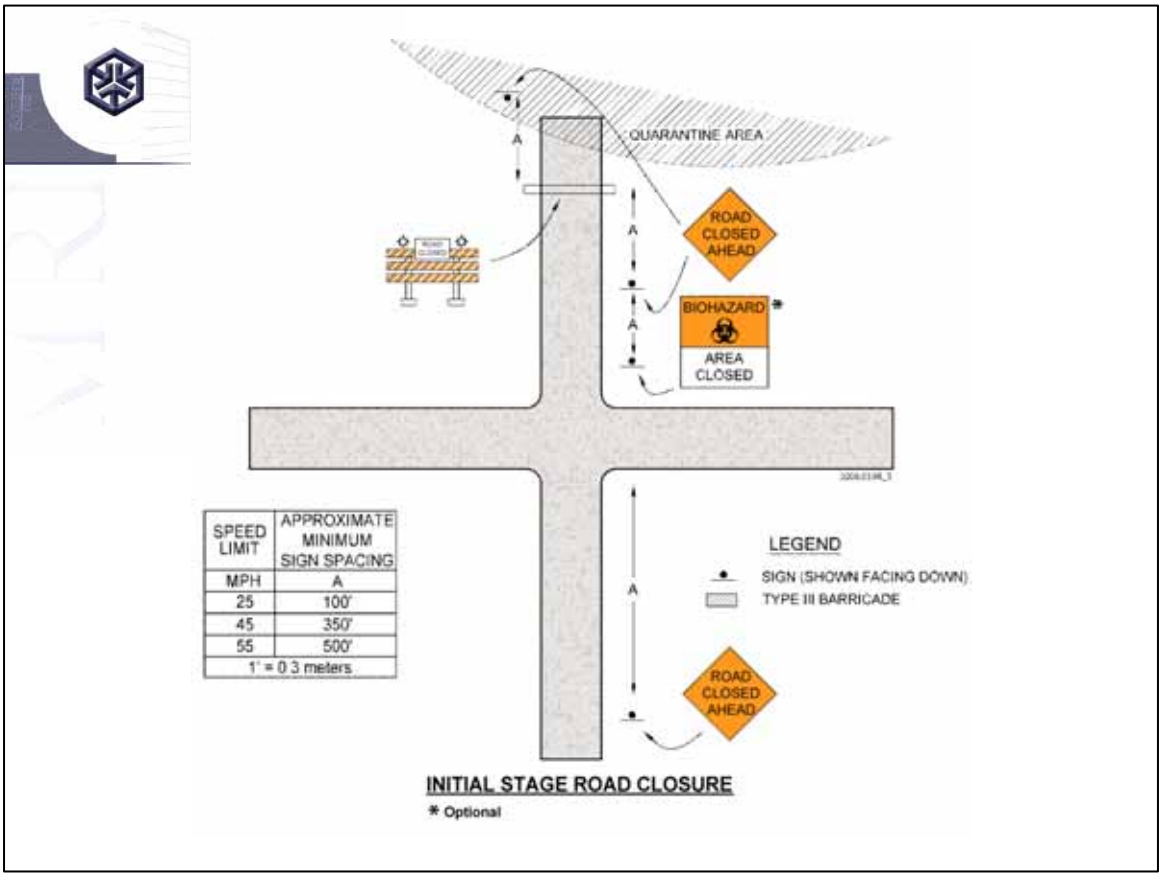
Sites with cleaning and disinfection facilities will be the most difficult to locate and maintain. In many cases agencies may prefer to disinfect personnel rather than vehicles which will take considerable time and disinfectant.



Early control for traffic check points may be signs and a law enforcement vehicle.



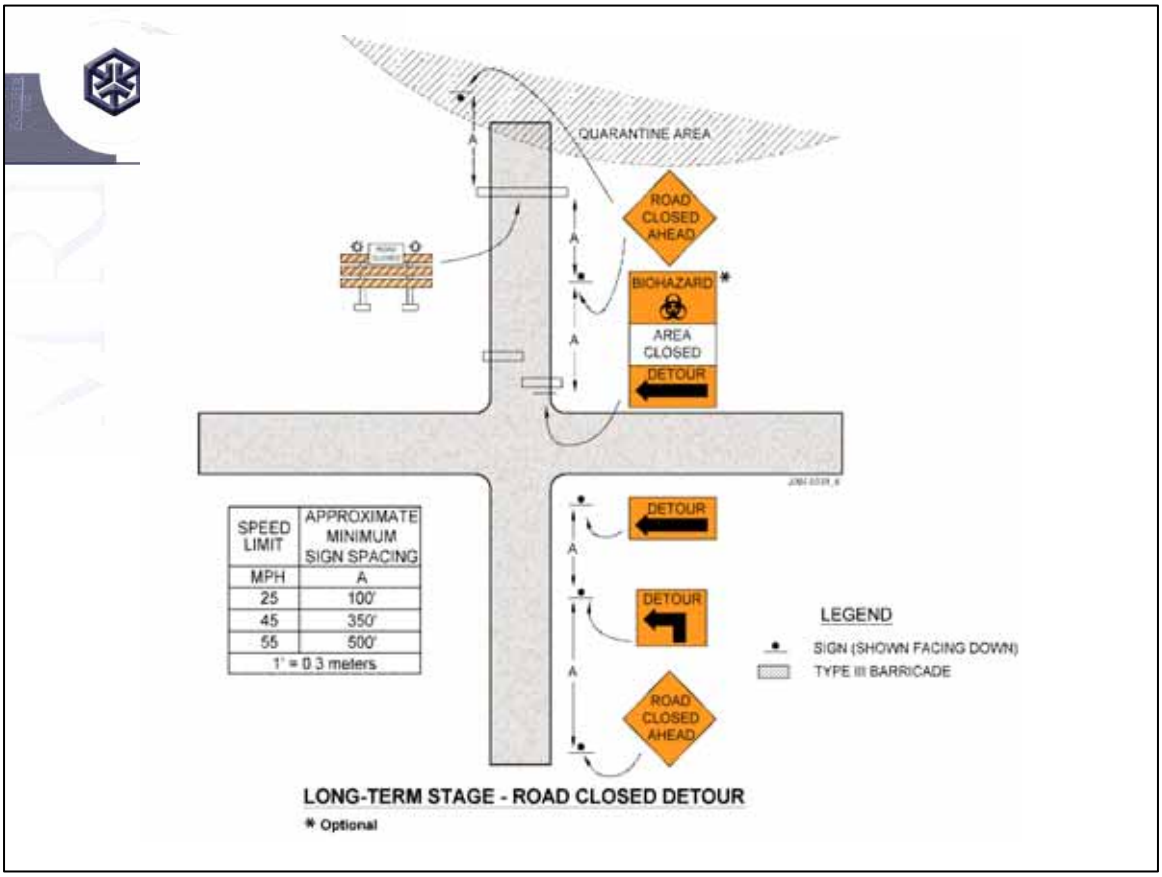
However, long-term controls at traffic check points will add additional personnel and provision for diversion points that can be used to turn around or detain vehicles.



For road closures, the road is simply barricaded and no access is permitted. This plan shows minimal traffic controls used for early stages of the response. Non-standard traffic controls may be used during this phase if standard traffic controls are not available.

Traversable barricades with road closed signs indicate that no access is allowed.

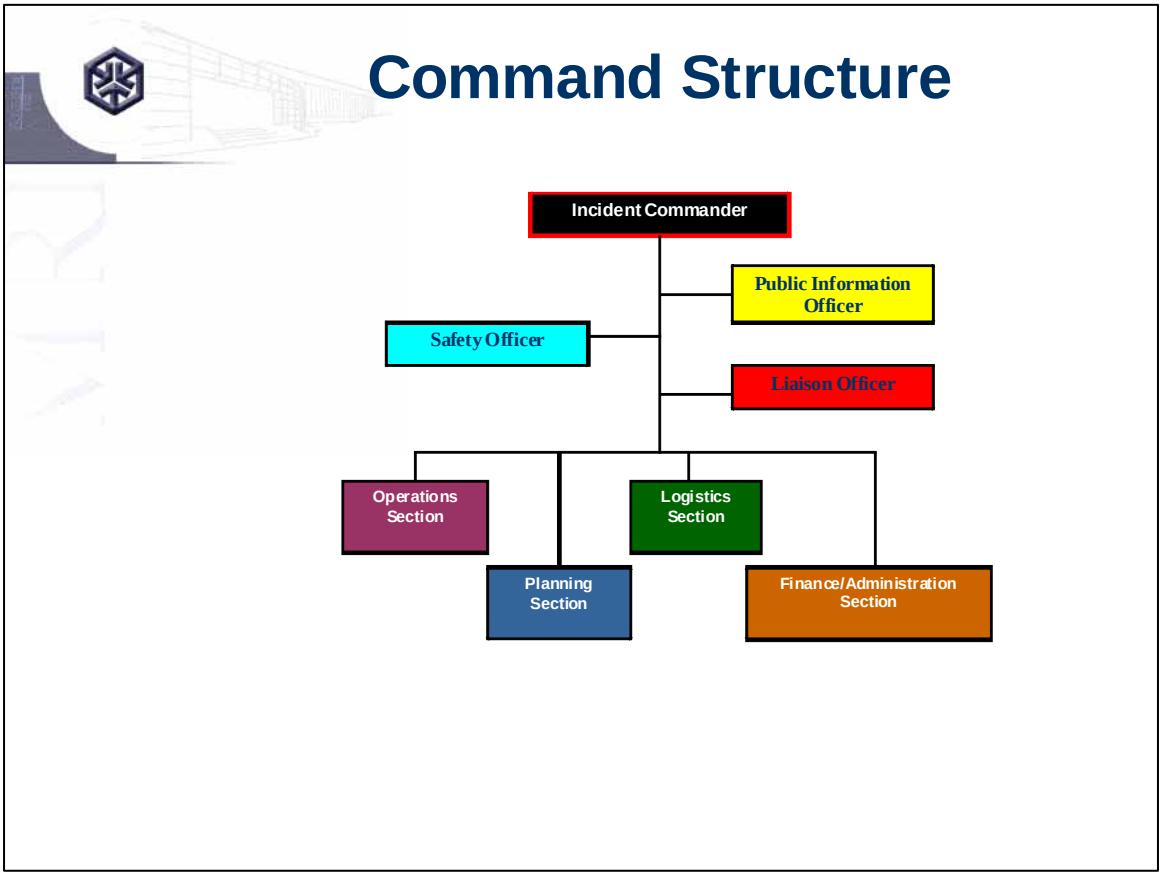
Similar to previous barricade with fencing.



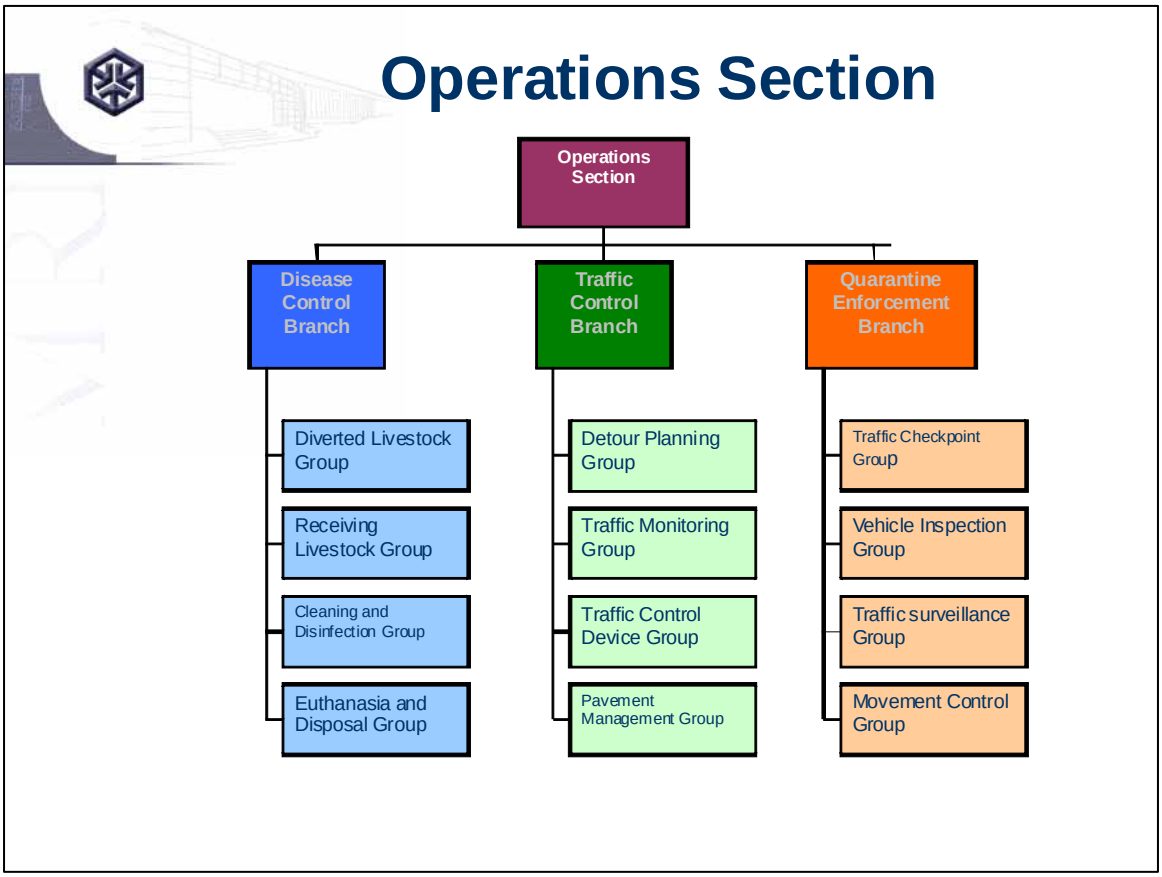
As time permits, additional signs and controls can be added to the road closures and detours can be signed to take traffic around the quarantine area or direct them to traffic check points where they can enter the quarantine area under permit.

All of these agencies and others could provide equipment or expertise in traffic control during an agricultural emergency. Take some time to think about who in your area has vehicles with flashers, barricades, hay bales, signs, sign installation equipment, fencing, gates, etc. Determine what your community's resources are ahead of time so that you can access them easily when needed.

If a foreign animal or plant disease is confirmed in your county, chances are high that neighboring counties will also soon be responding to their own cases. Consider forming aid agreements with agencies in counties farther away. Have detailed plans ahead of time for what tasks those agencies will assist with, what the command structure will be (who will oversee them and give them orders, etc.), and how communication will be handled.



You should have your own ICS already defined, and it may or may not look like the example shown here. Whatever yours is, make sure that you can define which section, branch and group will be responsible for traffic control. Different aspects may be handled by different groups. You may choose to add a new branch under the operations section to deal specifically with traffic control, as shown here.



This is just an example structure and may be changed to fit the circumstances of the emergency.

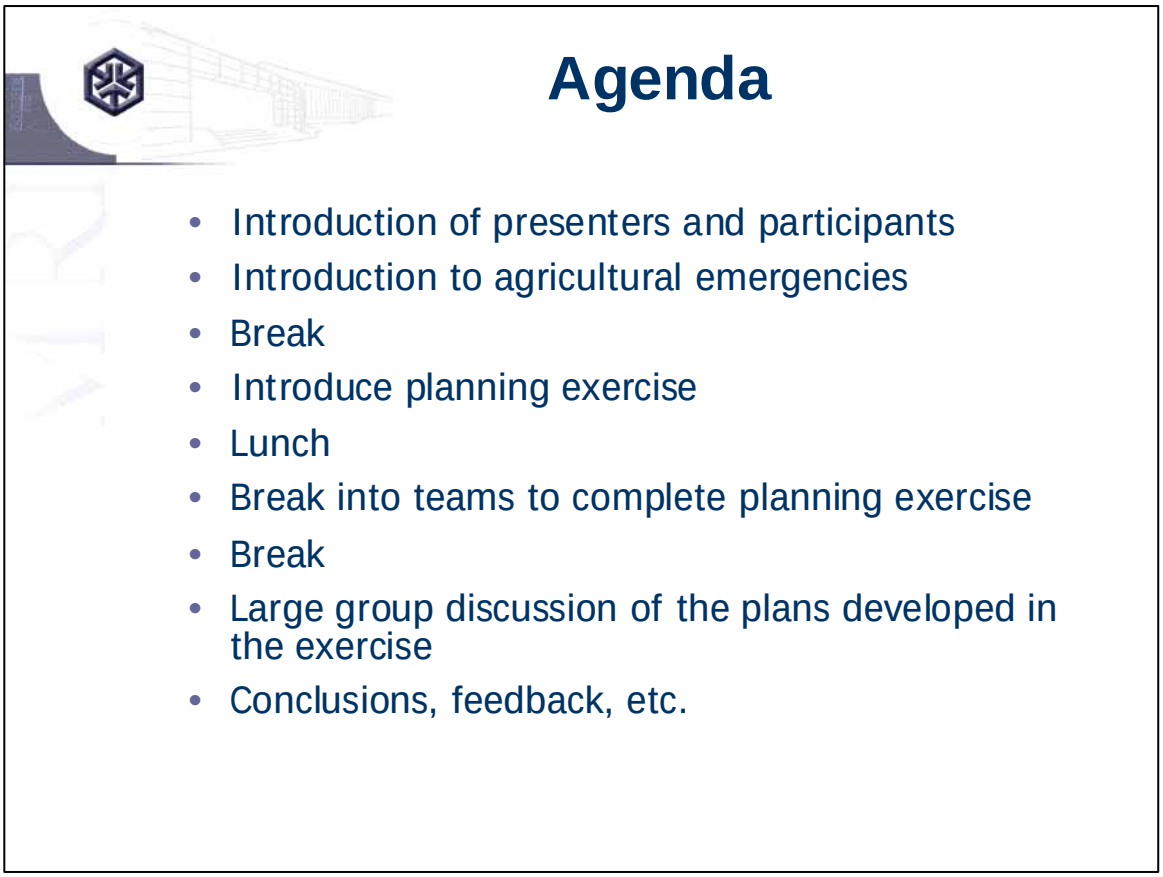
Perhaps more than in many other types of emergencies, an agriculture emergency requires the coordination of many different agencies and disciplines, including animal health, public health, agriculture, law enforcement, producers, public works, media and others. Clear and concise communications along predetermined chains of command are essential. Information to the media should be managed by the joint information center.

Biosecurity is no joke, responders must know what type of personal protective equipment is required.

Conclusion

- Importance of planning ahead
  - Identify manpower needs
  - Identify equipment needs
  - Identify alternative transportation routes
- Need for flexibility
  - Requirements will change depending on the pathogen
  - Quarantine and investigation must effectively coexist

While the guide is not prescriptive in nature, it should be beneficial in planning for and reacting to an agricultural emergency.



Workshops were held to evaluate the manual; this agenda can also be used to introduce the manual to rural agencies.