Management and Disposal of Vehicles Following a Wide Area Incident

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BACKGROUND/DRIVERS

• Large-scale disasters have the potential to generate a significant amount of waste
• Man-made chemical, biological, radiological or nuclear (CBRN) incidents have the potential to generate as much or more
• Following a wide area incident, it is assumed that a large number of vehicles will be contaminated
• Resource demands required to gather, transport, store, treat, recycle, or dispose of these vehicles may overwhelm local, state, and federal recovery efforts
PROJECT OVERVIEW

Phase 1 Literature Review
• Quantifying, assessing, collecting, and managing (recycling and/or disposal) contaminated vehicles

Stakeholder Workshop
• Government and private sector stakeholders

Phase 1 Report
• Literature Review and Workshop Findings

Phase 2 Literature Review
• Address needs identified in Phase 1
  • Emphasis on quantitative data

Stakeholder Interviews
• Vehicle scrap/parts recycling industry

Final Report
PHASE 1 RESEARCH TOPICS

- Collection and transportation of large numbers of inoperable vehicles
- Vehicle characterization
- Vehicle decontamination/reuse or recycling/disposal considerations
- Mass decontamination or disposal of large numbers of vehicles
- Identification and estimation of the amount and type of vehicles present in a geographical area
VEHICLE COLLECTION AND TRANSPORT: WHAT CAN BE LEARNED FROM NATURAL DISASTERS?

• Hurricane Katrina
  • 200,000 cars were lost in Louisiana alone
  • Widespread abandoned vehicles
  • Vehicles included: automobiles, trucks, buses, campers, motorcycles, golf carts, and marine vessels

• Vehicle Management Post-Katrina
  • Lessons Learned
  • Hazards
  • Waste Management
  • Additional Considerations
VEHICLE MANAGEMENT: LESSONS LEARNED

• Establish multiple staging areas and zones for collection and waste processing
• Locate vehicle processing sites close to ports
• Ensure availability of tow trucks
• Designate local neighborhoods as staging areas for insurance processing
• Prioritize material recycling and re-use as a secondary consideration
• Ensure viable markets for waste streams are in place
• Quickly establish tax credits and other financial incentives
• Properly handle hazardous materials

Hurricane Katrina Disaster Debris Management: Lessons Learned from State and Local Governments. SWANA, 2005.
VEHICLE MANAGEMENT: HAZARDS

- General heavy equipment operation
  - Tow trucks and cranes
- Leaking fuels, oils, and battery acid
- Contact with downed lines and live electrical equipment and other utilities
  - Gas, water
- Exposure to contaminated water and/or floodwaters
- Welding, cutting, and burning
- Discovery of human or animal remains
- Discovery of other unknown chemicals

OSHA’s Hazard Exposure and Risk Assessment Matrix for Hurricane Response and Recovery Work / Vehicle Removal and Salvage.
VEHICLE MANAGEMENT: WASTE MANAGEMENT

• Whole vehicles
• Segregation efforts
  • Recycling scrap metal
• Proper disposal of non-hazardous and hazardous materials
  • Lead-acid batteries, used motor oil, and whole tires
  • Oils, gasoline, diesel fuel, antifreeze, and minerals must be removed before they can be recycled, salvaged, or destroyed

Hurricane Katrina Disaster Debris Management: Lessons Learned from State and Local Governments. SWANA, 2005.
VEHICLE MANAGEMENT: ADDITIONAL CONSIDERATIONS

• Legality of handling vehicles or vehicle debris
• Abandonment and owner identification
• Insurance and reporting
• Security and storage of titled private property
ADDED COMPLEXITIES WITH A CBRN INCIDENT

• Natural disasters are a challenge, but what about a wide-area CBRN incident?
  • Vehicle identification and containment
  • Vehicle characterization and disposition
  • Decontamination considerations
VEHICLE IDENTIFICATION AND CONTAINMENT

- Remote sensing
- Models and records
- Parked vehicles
- Vehicle exposure (indoors vs. outdoors)
- Vehicles in transit (egress and ingress)
VEHICLE CHARACTERIZATION AND DISPOSITION

• Vehicle components
  • Metals
  • Plastics
  • Elastomers
  • Organic materials
  • Other inorganic materials

• Whole body and component separation

• Decontamination, disposal, recycle, reuse?
DECONTAMINATION CONSIDERATIONS

• Assess applicability of military technologies for vehicle decontamination
  • Identify technologies used to remediate military vehicles and equipment
  • Commercialize for civilian applications

• Understand impact of adsorption and desorption of chemical agents

• Decontamination due to weathering versus active decontamination processes
Insights Gained from the Stakeholder Workshop
STAKEHOLDER WORKSHOP

• Held November 13, 2017
• Federal, state, and local government officials
• Researchers and experts from:
  • Automotive industry
  • Waste management industry
  • Insurance industry
• Primary discussion topics:
  • Research, operational, and waste management considerations related to the characterization, management, reuse/resale, and disposal of vehicles following a wide-area man-made or natural incident
  • Identify information gaps and policy implications associated with managing, decontaminating, and disposing of a large quantity of vehicles
STAKEHOLDER WORKSHOP: GENERAL OBSERVATIONS

• Establish policies for how to track biologically and radiologically contaminated vehicles
• Consider adjusting clean-up level goals based on ultimate vehicle end-state (e.g., disposal vs. reoccupy)
• Complications exist related to vehicle titling
• Improve communication and transparency
• Develop vehicle identification mechanisms
STAKEHOLDER WORKSHOP: GENERAL OBSERVATIONS (CON’T)

• Pre-qualify and/or identify heavy towing companies
• Waste/debris will need to be removed from navigable waterways
• Consider physical constraints (e.g., truck clearance (top/sides), weight, sensitive areas)
• Increase the transparency of emergency response permitting
STAKEHOLDER WORKSHOP: OPERATIONAL CONSIDERATIONS

- Vehicle removal and towing operations
- Cities and states should plan for a 24/7 debris task force as part of OEM
- Protocols for dealing with vehicle-driven events
- Pre-identification of staging areas
- Management of a large vehicle waste stream
- Leaching of contaminants from temporary storage sites
- For large urban areas, space is at a premium
- Pressure to re-open locations of high importance
STAKEHOLDER WORKSHOP: DECONTAMINATION

• Limited methods for decontaminating large quantities of vehicles in a timely and effective manner
• Develop a report/compendium summarizing viable decontamination methods applicable to vehicles, vessels, planes, rail, and other transportation systems
• Identify and prioritize high-value vehicle components
• Identify problematic vehicle components
• Consider innovative technologies
STAKEHOLDER WORKSHOP: WASTE MANAGEMENT

• Characterization of the estimated contamination
• Quantification of the amount (mass/volume) of contaminated vehicles that will need to be managed
• Recycling viability
• Logistical constraints (e.g., lack of space, routes, etc.)
STAKEHOLDER WORKSHOP: INDUSTRY IMPACTS

• Understand the vehicle life cycle
• Vehicle and parts secondary markets
• Acceptable *de minimis* levels
• Waste classification
• Declaration of “clean”
• Contaminated personal property
• Insurance considerations
• Abandonment
• Bad actors
What is Needed
WHAT IS NEEDED

• Better understanding of: 1) private industry; 2) vehicle life cycle; and 3) vehicle cleanup
• Business economics of secondary markets
• Develop methods for identifying and quantifying vehicles
• Establish criteria for decontamination/reuse or recycling/disposal depending on incident and level of contamination
• Quantitative information defining vehicle characteristics
WHAT IS NEEDED – CON’T

• Identify potential waste volume reduction methods
• Develop technologies for mass decontamination of civilian vehicles
• Establish *de minimis* acceptance levels and opportunities for detecting contamination
• Analyze effectiveness of cabin filtration
• Assess impact of contaminants
• Identify vehicle processing, recycling and waste management facilities
• Develop procedures to reduce recycling workers’ exposure to waste
NEXT STEPS

• Finalize Phase 1 Report
• Complete Phase 2 Research
• Conduct stakeholder interviews with industry, federal, and/or state partners to gather additional information
• Complete Final Report
DISCLAIMER

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