Management and Disposal of Vehicles Following a Wide Area Incident

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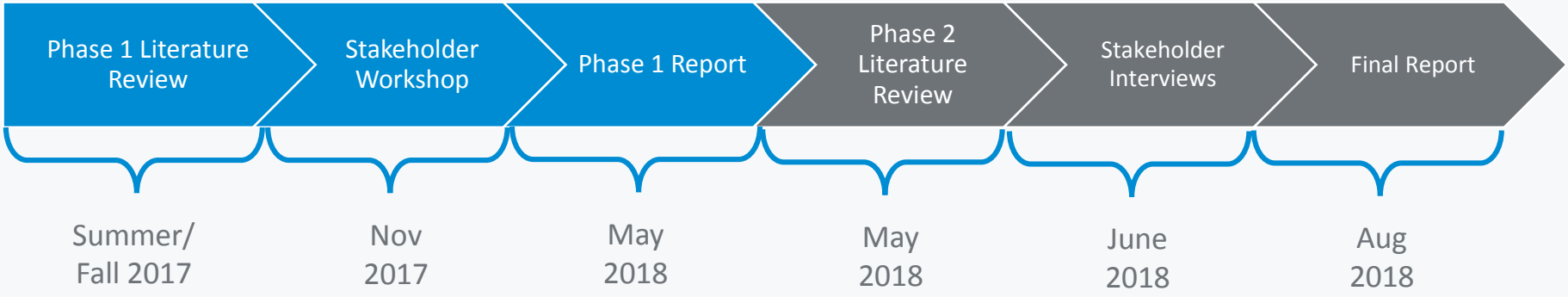
BACKGROUND/DRIVERS

- 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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