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Hazardous Materials Incident Costs: Estimating the costs of the March 25, 2004, tanker truck crash in Bridgeport, Connecticut

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13. ABSTRACT
Significant variations in the reporting of hazardous materials incident costs are illustrated using a case study of the March 2004 crash of a fuel tanker truck on Interstate 95 in Bridgeport, Connecticut. Three separate cost estimates are presented, based on the Hazardous Materials Incident Report filed by the carrier, reports in the media, and independent follow-up research and interviews. Overall, the costs of the incident, including emergency response, property damage, product loss and other costs, were estimated by the carrier to be $3.2 million. For reasons that are detailed in the report, this estimate substantially understated the actual total costs, which are estimated to be in the range of $7.4 to $8.4 million.

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EXECUTIVE SUMMARY

Federal regulations require that carriers file a Hazardous Materials Incident Report whenever there is an unintentional release of hazardous materials during transportation. These Incident Reports include a section addressing the costs of the incident in five categories: Product Loss, Carrier Damage, Public and Private Property Damage, Decontamination and Cleanup, and Other Costs. The reports provide a valuable source of information about hazardous materials incidents and their consequences. However, information on costs is subject to considerable variation and inaccuracy.

This report has been prepared by the Volpe National Transportation Systems Center on behalf of the Office of Hazardous Materials Safety. It is designed to illustrate this variation in the estimates of the impacts and costs of hazmat incidents, particularly with regard to economic damages. It uses a case study approach, looking at the impacts and costs of one incident in particular to highlight the range of cost estimates that can result from consulting different sources. The specific incident studied is the March 25, 2004, crash of a fuel oil tanker truck on Interstate 95 in Bridgeport, Connecticut. The fire that resulted from this crash caused severe roadway damage, requiring a stretch of Interstate 95 to be completely closed in both directions for several days.

Three separate estimates of the impacts and costs of this incident are presented, based on (1) the carrier's own Hazardous Materials Incident Report, (2) reports from the news media, and (3) independent research conducted by Volpe Center staff. The body of this report describes how these estimates were generated, the sources of variation between them, and decisions that were made that affected costs. The following chart summarizes the cost estimates that emerged from this research:

	Product Loss	**Carrier Damage**	**Property Damage**	**Decontam-ination/ Cleanup**	**Other**	**Total**
Hazardous Materials Incident Report	$7,000	$45,000	Unknown / $3 million	$150,000	$0	$3,202,000
Media Reports	$2,850 to $11,400	Unspecified	$3 million to $5 million	Unspecified	"More than" $3 to $5 million	$6 to $10 million or more
Volpe Research	$7,000	$60,000 to $70,000	$5.7 to $6.7 million	$165,000	$1.5 million	$7.4 to $8.4 million

The preparation of these three estimates highlighted several issues related to the variation in cost estimates. These issues, which are discussed in further detail in Section IV of this report, include the reporting timeframe, limited reporting guidance, organizational

complexity, and difficulties inherent in identifying the precise costs of large-scale incidents. The report also identifies policy questions regarding categories of cost that are excluded altogether from most estimates of incident-related costs.

The report concludes with a discussion of the policy implications of the findings, noting that many of the sources of variation have already been addressed via improvements to the Hazardous Materials Incident Report guidance. Two additional improvements to the guidance are suggested: first, to assist the carrier in identifying and contacting the lead agency in charge of incident response, and second, to provide more explicit instructions on the types of incident-related costs that, in the absence of an "Other Costs" category, do not obviously fit any of the other designations. Another suggestion is to reduce the uncertainly associated with revisions to cost estimates by considering somewhat more formal procedures for the revision and data-entry of Hazardous Materials Incident Reports.

I. BACKGROUND AND MOTIVATION

The transportation of hazardous materials is governed by regulations issued by the US Department of Transportation and administered principally by the Research and Special Programs Administration's Office of Hazardous Materials Safety. Included among these regulations is a general requirement for carriers to file a detailed report whenever there is an unintentional release of hazardous materials during transportation (see 49 CFR 171.15 – 171.16). Immediate telephone notification is also required if the incident meets certain severity criteria.

The Hazardous Materials Incident Report (form F 5800.1, see Appendix) includes sections for describing the nature of the shipment, the circumstances of the incident, and the type and quantity of the materials released. Also recorded are the contact details of the carrier, shipper, and other involved parties, as well as information on the consequences of the incident – injuries and hospitalizations, fatalities, property damage and other costs, and environmental contamination. Information from these HMIRs is entered into the Hazardous Materials Information System (HMIS), where it serves as a valuable resource for supporting policy analysis and decision-making.

However, information on the consequences of hazmat incidents, particularly costs, is often subject to wide variation and potential inaccuracy. This may be due in part to the HMIR instructions, which do not provide specific guidance about which costs should be included and how they should be calculated. Another factor is that the carrier may be unable to gather the necessary cost and damage information from all of the relevant parties – insurance companies, public agencies, private landowners, and so on – before the 30-day deadline for filing the HMIR.

This report is designed to illustrate this variation in the estimates of the impacts and costs of hazmat incidents, particularly with regard to economic damages. It uses a case study approach, looking at the impacts and costs of one incident in particular to highlight the range of cost estimates that can result from consulting different sources. The incident studied is the March 25, 2004, crash of a fuel oil tanker truck on Interstate 95 in Bridgeport, Connecticut. Although this crash is by no means "typical" of hazmat incidents as a whole, it is a well-known incident with a wide range of consequences and associated press coverage, and is well-suited to show the variability in cost estimates.

Three separate estimates of the impacts and costs of this crash are presented, based on (1) the carrier's own HMIR, (2) reports from the news media, and (3) independent research conducted by Volpe Center staff.

Section II of this report provides the necessary background, with a narrative description of the incident itself drawn from media reports and interviews. Section III presents the three sets of costs estimates, and includes some additional discussion of the variance in estimates and decisions that were made that affected costs. Section IV provides a summary, conclusions, and some potential policy implications.

II. SUMMARY OF THE INCIDENT

This section provides the necessary background information on the specific incident being studied in this report. The information presented has been consolidated from multiple sources, including official documentation, news media reports, and personal interviews conducted by Volpe Center staff. Care has been taken to verify this information, but it should not be regarded as authoritative in every detail.

On Thursday, March 25, 2004, at approximately 7:45 p.m., a tractor-trailer tanker truck carrying home heating oil was struck from behind by a passenger car on southbound Interstate 95 near Exit 26 in Bridgeport, Connecticut. As a result of the collision, the truck slid about a hundred yards on its side and collided with the concrete Jersey barrier. The tanker ruptured, releasing over 7,000 gallons of Fuel Oil No. 2, some of which spilled onto the local street below and into storm drains and nearby tributaries.

Fortunately, both drivers were able to escape the crash with no more than minor injuries. Shortly afterwards, the oil combusted and burned at estimated temperatures of 1,800 to 2,000 degrees. About 60 firefighters from the Bridgeport Fire Department, Fairfield County Hazmat Team, and other local fire services worked for hours to fight the fire, using over 13,000 gallons of water and foam mixture. Environmental crews also worked to clean up the oil and prevent contamination of the ground water and streams.

Before the fire could be extinguished, it melted the steel beams of the Howard Avenue overpass and destroyed much of the southbound side of the highway. Engineers from Connecticut DOT (ConnDOT) inspected the roadway on the day after the crash and determined that the southbound overpass was beyond repair, but that the northbound side could be salvaged despite some damage to its steel bearings. For several days after the crash, Interstate 95 was completely closed from Exits 25 to 27 in order to allow for around-the-clock repair work. Additional steel supports were brought in to shore up the northbound overpass, while the southbound overpass was demolished and replaced with a temporary steel bridge leased from Acrow Corporation.

During this period of closure, hundreds of thousands of vehicles were detoured, causing traffic delays throughout the region. Portable electronic message signs were put up to warn drivers of detours, and local and state police worked overtime to direct traffic. Traffic lights were reprogrammed to allow additional green time at high-volume junctions, and additional public transportation service was put in place to help commuters reach their destinations. The northbound roadway was reopened to traffic the following Sunday evening (March 28), while the southbound side was reopened mid-afternoon on Wednesday (March 31). A contingent of State Police remained in the area after the highway reopened, strictly enforcing the 45 mile-per-hour speed limit on I-95 in this area. This measure was needed in part because of concerns for safety in the construction zone and for the integrity of the temporary bridge; as of July 2003, over 16,000 speeding tickets have been issued in this area since the crash.

This stretch of highway was being reconstructed at the time of the crash as part of a multi-year, $113 million project to upgrade I-95 in the Bridgeport area. The southbound Howard Avenue overpass had in fact just been rebuilt and was nearly 100 percent complete by the time it was destroyed in the fire on March 25. The effects of the crash have caused construction plans to be modified significantly, with contractors working double shifts to accelerate the pace of construction. The current plan calls for traffic to be diverted to the center section of the roadway in September to allow the damaged northbound overpass to be repaired. At that time, the temporary steel bridge along the southbound overpass will also be removed and replaced.

The tanker truck was owned by Island Transportation Corporation of West Babylon, New York, and driven by Gilbert Robinson of Naugatuck, Connecticut. The car, a 1987 Toyota Corolla, was driven by Sarah Waddle of Derby, Connecticut. Ms. Waddle was later cited and fined for failure to drive in the designated lane.

III. ESTIMATES OF COSTS: THREE CALCULATIONS

Three separate estimates of the costs of the March 25 crash have been prepared, and each is presented in turn below. As stated earlier, the first estimate is based simply on those costs that were listed on the carrier's Hazardous Materials Incident Report, and the second is based on an analysis of crash-related reports that appeared in the news media. The third estimate combines elements of the prior two with the results of independent research conducted by Volpe Center staff.

Hazardous Materials Incident Report

After the crash, Island Transportation Corporation filed form DOT F 5800.1, the Hazardous Materials Incident Report (HMIR). The report was filed by the company's Director of Safety, James F. Cameron, on March 31 – just six days after the incident – and was received at DOT on April 6. The HMIR reported that the material spilled was approximately 7,300 gallons of Fuel Oil No. 2. It also reported that there were no fatalities or injuries associated with the incident. For the cost items on Line 23, the HMIR reported the following:

23a – Product Loss: $7,000. In a subsequent interview, Mr. Cameron explained that this represented the 7,300 gallons of heating oil, multiplied by the approximate "rack" (wholesale) cost per gallon prevailing at the time, which was roughly 95 cents per gallon. At the time of the interview, he did not have access to the exact invoice cost of the shipment, but believed that it was very close to the figure reported.

23b – Carrier Damage: $45,000. Mr. Cameron said that this figure represented damage to the tanker and tractor, and reflected his assumption (at the time of filing the report) that the tractor might be potentially salvageable. As it happened, however, both the tractor and the tanker had to be declared total losses, with Mr. Cameron estimating the total insured value of the losses as between $60,000 and $70,000.

23c – Public/Private Property Damage: This was listed as "Unknown" in the original report. When interviewed, Mr. Cameron said that he had no way to calculate this figure or to know what should be included. During RSPA's review and data-entry process, this figure was changed from "Unknown" to $3 million, reportedly after a RSPA contractor spoke with Mr. Cameron. However, Mr. Cameron stated that he does not recall having this conversation. As will be discussed below, the $3 million figure is consistent with what was being reported in the news media as the approximate cost of the initial overpass repairs.

23d – Decontamination/Cleanup: $150,000. This represents Mr. Cameron's initial estimate of the cost of the cleanup activities undertaken on Island Transportation's behalf by the environmental cleanup firm Connecticut Tank Removal. This firm cleaned up the spilled oil, decontaminated the tanker, and worked to mitigate the oil spills in nearby

waterways. The total bill ultimately came to approximately $165,000.

23e – Other Costs: This item was listed at zero. Mr. Cameron explained that he was not sure what items would be included here or how to calculate their cost.

Table 1. Incident Costs as Reported by the Carrier

	Product Loss	Carrier Damage	Property Damage	Decontam-ination/ Cleanup	Other	Total
Hazardous Materials Incident Report	$7,000	$45,000	Unknown / $3 million	$150,000	$0	$3,202,000

News Media Accounts

To develop a set of cost estimates based on media reports, Volpe Center staff first performed comprehensive searches for relevant reports using a number of media databases and search engines, including LexisNexis®, EBSCO*host*, Google™, and the archives of *The Connecticut Post*. The combined results of these searches produced an extensive list of articles from the national, regional, local, and industry press, covering the time period from one day after the crash to one month afterward. These results were then winnowed to exclude multiple appearances of the same wire-service report and those articles where no elements of cost were addressed. In total, Volpe Center staff examined over 50 articles from 15 distinct sources, as shown in Table 2.

Table 2. Media Sources Consulted in Preparing Cost Estimates

Media Source	Authors
AASHTO Journal	AASHTO staff
Boston Globe	Mac Daniel and Brian MacQuarrie
Boston Herald	J.M. Lawrence and Associated Press
CBS News	CBS/AP
The Connecticut Post	John Christoffersen, Sarah Coffey, Michael J. Daly, Pam Dawkins, Linda Conner Lambeck, Michael P. Mayko, Daniel Tepfer, Peter Urban, Frank Washkuch Jr.
CNN	Cherly Bonson
Engineering News-Record	William Angelo
Fairfield County Business Journal	Dan Strempel
Hartford Courant	Matt Burgard, Maryellen Fillo, Tracy Gordon Fox, Penelope Overton, Stephanie Reitz
NBC30 News	NBC 30 Connecticut News staff
The New York Times	Alison Leigh Cowan, Alan Feuer, Jeff Holtz, Robert McFadden, Michele O'Donnell, Avi Salzman, Sabrina Tavernise, Paul Von Zielbauer
Newsday (New York)	Mitchell Freedman, Joseph Mallia, John Riley
Star Ledger (New Jersey)	Diane Scarponi
Star Tribune (Minneapolis)	Associated Press
WTNH News	Bridgeport-WTNH/AP

As would be expected, the media reports tended to focus on recounting the story of the crash and on highlighting some of its effects on the region. Specific cost estimates were often not provided, and those that did appear did not necessarily align with the five categories used in the Hazardous Materials Incident Report. Indeed, the majority of media accounts presented information on at most a few types of costs, and did not attempt to provide a thorough accounting of the entire costs of the incident.

In order to create a comprehensive cost estimate from these disparate and incomplete media reports, Volpe Center staff analyzed and consolidated the available articles, making comparisons of the costs listed and reorganizing them into the five categories of the HMIR. This yielded media-reported cost estimates as described below:

23a – Product Loss: Estimates of how many gallons of oil the tanker carried ranged from 8,000 to 12,000 gallons, with the latter figure being the most frequently reported. Most news accounts failed to distinguish between the amount of oil the tanker truck carried and the amount of oil it lost, regarding the two quantities as the same. Of the two reports that did make this distinction, CNN reported 3,000 gallons spilled while local television station NBC-30 reported that the figure was 8,000 gallons.

Media estimates of the product lost thus ranged from 3,000 to 12,000 gallons. None of the reports placed a dollar value on this loss, so arguably the media estimate for product loss should be regarded as "unknown." However, a knowledgeable reader, applying an approximate wholesale price of 95 cents per gallon for home heating oil, could conclude from these media reports that the value of the lost heating oil was on the order of $2,850 (for the estimate of 3,000 gallons) or $11,400 (for the most common estimate of 12,000 gallons).

23b – Carrier Damage: Some media accounts noted that the truck was an 18-wheel tractor-trailer combination, with some also adding that the tractor was a 2000 Mack and that two of the tanker's three internal compartments ruptured as a result of the crash. Beyond this description, the media reports provided no further details about the degree of carrier damage. In particular, although one could reasonably infer from reports about the size and intensity of the ensuing fire that the damage to the vehicle was significant, the media reports failed to specify whether either part of the tractor-trailer combination was salvageable or beyond repair. Absent this information, the media estimate for costs of the carrier damage should be regarded as unknown.

23c – Public/Private Property Damage: Descriptions of the public and private property damage caused by the crash varied significantly across sources, with differences attributable to the focus of the stories and to the journalist's level of detail. The general consensus emerging from media reports was that the crash essentially destroyed the entire southbound side of I-95 over Howard Avenue; it was reported that the fire melted the steel beams of the overpass, causing it to sag three to four feet.

Numerous articles also recounted the decision by Connecticut officials to replace the southbound overpass with a temporary 90-ton, 80-by-36-foot bridge leased from the New Jersey-based Acrow Corporation. Construction crews from the on-site contractors, DeMatteo and Brunalli Construction, worked around the clock to install this bridge and later to pave a steel deck on top. At the time of reporting, the media noted that while leasing costs had not yet been determined, such a bridge would cost $300,000 to purchase.

On the northbound side, the fire also damaged the bridge's steel bearings and burned wooden scaffolding that had previously been erected for construction. Test results from a state lab in Rocky Hill revealed that, unlike its southbound counterpart, the northbound side could be repaired, requiring only additional support from 20 steel columns. In addition to the damage done to the highway, the explosion reportedly also melted nearby asphalt, singed utility wires, knocked down two light poles, and caused chunks of concrete to fall and leave "heat scars" onto the city street below.

It was widely reported that the federal government granted $11.2 million in highway funding to the state of Connecticut to cover reconstruction and response costs. Two articles clarified that this aid simply allowed the state to reallocate a portion of its existing share of federal highway funding from other projects to these reconstruction efforts. With the assistance of Senator Joseph Lieberman, Connecticut also received $2 million in additional emergency aid, bringing the reported total to $13.2 million.

Most articles did not provide a sense of how the $13.2 million would be divided between actual reconstruction costs and other related expenses, such as police overtime and traffic control. Of the handful of sources that did break down the $13.2 million figure to any extent, most stated that around-the-clock repair work would cost $250,000 per day. Several articles, citing statements by then-Governor John Rowland, estimated that the total price-tag for reconstruction of the damaged highway segments would be in the range of $3 million to $5 million. (The AASHTO Journal, perhaps splitting the difference, reported a figure of $4 million for reconstruction costs.) Absent any more precise estimates, these $3 million to $5 million figures stand as the consensus media estimate of total public and private property damage.

23d – Decontamination/Cleanup: The media accounts consistently reported that some oil seeped into storm drains and traveled to surrounding areas nearby. The exact locations, however, were sources of discrepancy. Among the locations named were Howard Avenue and Railroad Avenue below the overpass, Cedar Creek, Bridgeport Harbor, and Black Rock Harbor. The media often noted that absorbent booms were used to soak up oil in nearby waterways, but failed to provide cost estimates for this effort or for other aspects of the decontamination and cleanup work.

23e – Other Costs: Costs that fall under this category can be divided into three areas: response costs, costs incurred by transit agencies, and other miscellaneous costs. Of these, the media reports attempted to assign a monetary value only for response costs. Generally speaking, the media reported that "millions" out of the $13.2 million in federal funds would be spent to cover traffic control, extra road signage, and police and fire overtime. Some reports made this a bit more specific by stating that the response costs were likely to exceed the $3 million to $5 million estimated for bridge repair. None of the reports, however, was any more specific than this.

Media reports often covered in some detail the efforts of local transit agencies to increase their services during the days and weeks after the crash to help facilitate transportation in the Bridgeport area. It was reported that the Metro-North Railroad supplied six extra cars to avoid overcrowding during rush hours, reinstated certain services on the Waterbury branch line, and added several local Bridgeport stops to express train schedules. The Shore Line East railroad also doubled service the day following the incident, and ran three extra trains (for a total of five) from Old Saybrook to Stamford. Ferry companies in Bridgeport and New London added extra trips to Long Island, and the Greater Bridgeport Transit Authority launched a new half-hourly shuttle bus downtown. Other measures undertaken included relocating bus stops, opening new parking areas, and cutting the price of daylong parking in downtown Bridgeport in half to $3.

There was no attempt to place a dollar value on these service and schedule adjustments. This is not surprising given the constraints of newspaper deadlines and the fact that these costs would not be known until well after the fact. Projecting or estimating the costs would also be difficult because of the need to make complex calculations involving fuel and overtime costs for multiple agencies operating under different labor agreements.

Similarly, news accounts were not able to quantify other miscellaneous costs, such as medical expenses. Several media accounts reported that the tanker truck driver was hospitalized, and other reports mentioned the hospitalization of a firefighter who was overcome with fumes while battling the fire.

A number of media reports did describe the economic impact of the crash on local businesses, tourism, and the prices of shipped goods. These reports were largely anecdotal and there was no attempt to describe them in anything other than qualitative terms. All in all, the media-based estimate of other costs includes the "more than" $3 to $5 million for response costs plus unspecified costs for transit services, medical care, and ancillary costs.

Table 3. Media Estimates of Incident Costs

	Product Loss	Carrier Damage	Property Damage	Decontam-ination/ Cleanup	Other	Total
Media Reports	$2,850 to $11,400	Unspecified	$3 million to $5 million	Unspecified	"More than" $3 to $5 million	$6 to $10 million or more

Volpe Center Research

This third set of cost estimates comes from direct research by Volpe Center staff, who conducted interviews with representatives from the carrier, state DOT, transit agencies, emergency responders, and other affected parties. (See Table 4 for a list of interviewees.) The information from these interviews was combined with other available data to confirm and refine the cost estimates from the HMIR and media reports, and also to identify decisions made that affected the overall costs.

Volpe Center staff also planned to consider the estimates in light of the Office of Management and Budget's recommended methodologies for assigning monetary values to injuries and losses of life. However, this was rendered moot by the fact that there were no serious injuries as a result of the incident.

Table 4. Interviewees for Volpe Center Research

Organization	Interviewee
Acrow Corp.	Mark Joosten, Vice-President
Bridgeport Fire Department	Michael Maglione, Chief Gary Boyers, Administrative Office Manager
Bridgeport Public Facilities Administration	Bobby Kennedy, Roadway Maintenance
Bridgeport and Port Jefferson Steamboat Co.	Donald From, Security Officer
Connecticut DOT	Arthur Gruhn, Chief Engineer
Connecticut State Police	Major Peter Warren
Connecticut Tank Removal	Hugh Plunkett, Sr. Project Manager
Five Star Diner	Edith Van Horn, Manager
Greater Bridgeport Transit Authority	Roberta Yegidis, Administrative Officer
Island Transportation	James Cameron, Director of Safety Jim Wyne, Compliance Officer
Pro-Shine Hand Car Wash	Dennis Stanley, Proprietor
Rainy Faye Bookstore	Georgia Day, Proprietor
Shore Line East Railroad	Jean Stimolo, Rideworks Director
Westport Fire Department/ Fairfield County Hazmat Team	Jon Gottfried, Assistant Chief and Hazmat Supervisor

It should be noted that while the goal of this research was to generate an objective assessment of the costs of this incident, limited time and resources meant that it was not possible to conduct a full-scale investigative operation. The research presented here necessarily relies on publicly available information and on the informed estimates of the affected parties. It also reflects the limitations of gathering information on the costs of an extremely complex chain of events and reactions. Nonetheless, by gathering information from multiple sources and by anchoring estimates in external data, the following section should provide reasonably reliable estimates of the costs of this incident.

23a – Product Loss: Although media accounts varied in their reports of the quantity of fuel oil spilled, Island Transportation reported in its HMIR that 7,300 gallons were lost. Since the carrier itself is likely the most reliable source for this information, this appears to be the best estimate of the quantity lost. The Island Transportation safety official interviewed did not have ready access to the actual invoice for this particular shipment, but he believed that Island had paid roughly 95 or 96 cents per gallon for the fuel oil, and had used this figure to calculate the dollar value of the loss on the HMIR. This yielded a value of $7,000 in product loss.

Reports from the US Energy Information Administration[1] show that the average wholesale price of home heating oil in Connecticut was 93.4 cents per gallon during the week of March 15 (the latest date for which this "seasonal" data point is available). Therefore, Island Transportation's estimate, based on a value of 95 to 96 cents per gallon, appears to be quite consistent with market prices prevailing at the time. The use of wholesale, as opposed to retail, cost is also appropriate since this was a wholesale shipment and the wholesale cost reflects the price paid by the carrier. All in all, the carrier-reported figure of $7,000 seems to be the most reasonable estimate of the dollar value of the lost product.

23b – Carrier Damage: Island Transportation officials reported that both the tractor, a 2000 Mack, and the tanker trailer, a 1985 Heil, ultimately proved to be total losses. Volpe Center staff were not able to determine what the market value for comparable equipment would be (in part because of the question of whether it is more appropriate to use actual depreciated value or a replacement value, an issue that will be addressed in more detail in Section IV). Island Transportation reported that the total insured value of this equipment was between $60,000 and $70,000.

23c – Public/Private Property Damage: As noted in various press reports, the crash and ensuing fire caused extensive damage to sections of Interstate 95. The state of Connecticut received $2 million in emergency relief funds from the Federal Highway Administration, and was also allowed to redirect an additional $11.2 million in federal-

[1] US Department of Energy, Energy Information Administration, *Weekly Petroleum Status Report.* http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/weekly_petroleum_status_report/current/pdf/tablec2.pdf

aid highway funding toward the reconstruction project. These sums were authorized well before the actual rebuilding costs were known, and Gov. Rowland stated that any unused funds would be returned. Connecticut DOT was the lead agency for managing these funds and for rebuilding Interstate 95 over Howard Avenue in Bridgeport. As such, its cost accounting appears to offer the most comprehensive and reliable source of information on property damage and other costs associated with the crash. (As discussed below, however, it is not entirely complete.)

For accounting purposes, ConnDOT treated the recovery and rebuilding as two separate projects: an "emergency response phase" from March 25 to April 7, and a "restoration phase" from April 8 onward. During the first phase, engineering and construction costs totaled roughly $1.4 million. This comprises the round-the-clock emergency work to reinforce the northbound overpass and to replace the destroyed southbound overpass with a temporary steel bridge. (It does not, however, include the police and fire costs, which will be addressed later as part of Line 23e, Other Costs.)

For the second phase, engineering and construction costs are expected to total about $7.1 million. This represents the cost of installing permanent replacements for the Howard Avenue overpasses and completing the re-build of this section of roadway – including some work which would have been needed even if the March 25 crash had never occurred. Also included in the total are a $1.5 million "acceleration" payment and a $1 million on-time incentive to the contractors, both designed to allow work to be completed more quickly after the setbacks caused by the crash.

All told, the engineering and construction costs are expected to total about $8.5 million. However, ConnDOT Chief Engineer Arthur Gruhn estimated that this figure includes approximately $2 million to $3 million worth of work on the overpasses that was outstanding as of the date of the crash and so should not be included in the total for the purposes of this report. The net engineering and construction costs for repairing the damage associated with the March 25 crash are therefore in the range of $5.5 to $6.5 million.

Aside from roadway damage, the crash also damaged several utility transmission lines, including those of United Illuminating and SBC Telephone. Total costs for these repairs, including emergency electrical lighting services, are estimated at between $150,000 and $186,000. The local water and sewer authority, Aquarion/Bridgeport Water Pollution Control Authority, also incurred costs of roughly $3,000 to repair and decontaminate their service lines.

Island Transportation has received communications from several other local businesses alleging that they suffered property damage as a result of the crash. Likewise, ConnDOT has been contacted by businesses claiming that they lost business during the period of roadway closure. Neither Island Transportation nor ConnDOT had information on these claims or specific dollar figures, and Island Transportation has turned over all claims to its insurance company.

The City of Bridgeport's Office of Emergency Management has received one specific claim of incident-related property damage that appears credible but is not included in ConnDOT's accounting: $15,000 in clean-up costs for boats and personal water craft that were said to have been damaged by the spillage of heating oil into Cedar Creek. When this is added to the $5.5 to $6.5 million in engineering and construction costs for the roadway and the $153,000 to $189,000 in utility damages, the total for public and private property damage equals about $5.7 to $6.7 million.

23d – Decontamination/Cleanup: Island Transportation reported that it paid $165,000 to Connecticut Tank Removal, an environmental cleanup firm, for decontamination of the tanker, protection of local waterways, and other environmental mitigation activities. An assistant fire chief from the Fairfield County Hazmat Team confirmed that Connecticut Tank Removal, working under the supervision of the Connecticut Department of Environmental Protection and the US Coast Guard, conducted almost all of the decontamination, mitigation, and cleanup work. The Hazmat team had a limited role, and was largely there to assist in firefighting and communication efforts rather than for decontamination *per se*. Therefore, the expenses incurred by the Hazmat team are excluded from this section, but are included as part of Line 23e, Other Costs, as part of the emergency response costs.

Connecticut Tank Removal would not give precise numbers, but a manager was able to confirm that the $165,000 estimate for decontamination costs was roughly correct. This represented ten days of work for about two dozen employees, much of it around the clock.

23e – Other Costs: There were many other costs, both direct and indirect, associated with the March 25 crash. A number of media reports focused on the effects that the crash had on individuals and local businesses, including delayed freight shipments, travel delays and interference with family plans, lost business at area merchants, and even delayed school openings in Bridgeport.

Connecticut DOT has informed businesses that were indirectly affected by the crash and subsequent detours that they are not eligible for compensation from federal or state funds. (This decision will be discussed in Section IV.) ConnDOT has, however, reimbursed costs in a number of areas that fall under the heading of Other Costs, including: response costs for police and fire services, the costs of providing additional public transportation service in the area, and medical costs.

ConnDOT estimates that reimbursements to state and local public safety agencies will total just over $1.4 million. This includes reimbursements to the Connecticut State Police and Bridgeport City Police for police coverage and traffic control, and to the Bridgeport Public Facilities Administration for traffic rerouting and street cleanup. Firefighting costs – including overtime, apparatus charges, and firefighting foam – totaled about $37,000 at the Bridgeport Fire Department. A range of smaller costs were also incurred

by the fire departments of neighboring municipalities, who provided direct assistance to the fire containment efforts, as well as "backfill" coverage for the city of Bridgeport during the time when so many of Bridgeport's own firefighters were occupied at the crash site. Table 5 summarizes the emergency response costs associated with the incident.

Table 5. Response Agency Actions and Costs

Agency	Actions Taken	Nature of Costs	Approximate Cost
Bridgeport Fire Department	Led firefighting operations; brought decontamination trailer, communications equipment, other apparatus	Labor, apparatus, firefighting foam	$37,525
Bridgeport Police Department	Provided security and traffic control	Labor and equipment	$346,445
Bridgeport Public Facilities Administration	Set up traffic control barricades and provided street and debris cleanup services	Labor and equipment	$20,450
Fairfield County Hazmat Team	Responded to incident and assisted with firefighting and communications; hazmat capabilities had limited role but were available on standby	Labor, apparatus charges, firefighting foam	$10,975
Westport Fire Department	Provided mutual-aid coverage to Bridgeport and Fairfield	Labor	$955
Connecticut State Police	Stabilized the scene and provided traffic control; investigated the crash; conducting targeted enforcement during reconstruction phase	Labor	$497,219 for response phase $540,000 for ongoing enforcement
Waterbury Fire Department	Brought an additional trailer of firefighting foam	Labor, apparatus	Not available
Norwalk Fire Department	Assisted with firefighting efforts	Labor, apparatus	Not available
Fairfield Fire Department	Assisted with firefighting efforts and provided backfill coverage for Bridgeport	Labor, apparatus	Not available
Fairfield Police	Police coverage	Not available	$15,393

Note: Costs were taken from interviews with agency and/or from the ConnDOT project budget.

It should be noted that ConnDOT's budget for the reconstruction phase of the project includes $540,000 for State Police coverage, in order to provide intense enforcement of the 45 mile-per-hour speed limit on I-95 in the area near the crash. Because these enforcement efforts are partly motivated by the need to keep speeds down in the construction zone, especially on the temporary bridge, these police costs can be considered related to the incident, especially considering that they are being covered by federal highway funds. However, the State Police officer we interviewed stated that

some degree of enforcement would be taking place in the Bridgeport area anyway, since it is a high-volume location with a history of truck crashes. It is therefore difficult to say precisely what fraction of the enforcement costs should be attributed to the crash. For this estimate, the $540,000 figure is used since it is the value that ConnDOT attributed to the project in its cost accounting.

Since the post-crash closure of I-95 caused severe traffic congestion and made it difficult for travelers to reach their destinations, Connecticut officials ordered or requested additional transit service from a number of common carriers. These changes are summarized in Table 6.

For about two weeks after the crash, the local transit agency, the Greater Bridgeport Transit Authority, added a peak-period downtown shuttle route connecting Seaside Park with the main Bridgeport bus terminal. This shuttle ran on alternative routes, since Fairfield Avenue and other major local roads were completely overwhelmed with traffic diverted from I-95. GBTA also incurred some overtime costs during this period, as the running times of almost all of their routes were lengthened by the severe traffic congestion in the Bridgeport area. The total cost for the shuttle service and overtime amounted to about $5,000, which was reimbursed by ConnDOT. GBTA did not experience much change in ridership during this period or afterward, so these costs were not offset by ridership gains.

The Metro-North and Shore Line East commuter railroads both added service during this period. We were unable to reach officials at Metro-North, but media reports indicated that Metro-North added extra rail cars and trains, restored services on the Waterbury branch, and ordered some express trains to make local stops in the Bridgeport area. According to media reports, ridership was up significantly during this period, so some of the additional costs of these services were offset by ticket sales. All the same, Metro-North was reimbursed roughly $17,000 by ConnDOT as part of the project budget. The Shore Line East (SLE) railroad also added services, running extra trains and adding extra cars. The SLE representative interviewed could not place a dollar figure on the costs associated with these changes, and ConnDOT's project budget does not list a reimbursement for SLE.

At the request of Connecticut officials, both the Orient Point-New London and Bridgeport-Port Jefferson ferry lines added extra departures to and from Long Island. In the case of the Bridgeport and Port Jefferson Steamboat Company, an extra vessel was brought into service so that an additional five round trips each day could be provided. This schedule was kept in place for about 10 days after the crash. The company was not reimbursed for the roughly $15,000 in additional fuel and labor costs that this entailed. Fare revenues were also slightly down during this period, apparently due to real and perceived difficulties in reaching the Bridgeport docks by car.

Table 6. Changes to Transportation Services

Agency / Company	Service Changes / Expenses	Cost Estimate	Changes to Ridership
Greater Bridgeport Transit Authority	Downtown shuttle service; additional drivers needed to maintain service during congested periods	$5,025	No significant changes during or after recovery period
Metro-North Railroad	Additional departures and local stops; extra rail cars	$16,877	Media reports of increased ridership
Shore Line East	Additional departures and extra rail cars	Not available	Media reports of increased ridership
Bridgeport and Port Jefferson Steamboat Co.	Added third vessel, with 5 extra round trips to Long Island	$15,000	Slightly down for the period, especially southbound
Cross Sound Ferry	Added extra vessel	Not available	Not available

Note: Costs were taken from interviews with the organization and/or from the ConnDOT project budget.

While it was not possible to obtain a complete accounting of incident-related medical costs, all the evidence indicates that they were quite minor. According to the Bridgeport Fire Department, only two people were injured during the crash and its aftermath: the driver of the tanker truck, who injured his knee slightly while fleeing from the vehicle, and a Bridgeport firefighter who become nauseated after exposure to fumes. Both were examined at a local hospital and then released. The ConnDOT project budget also includes a $9,200 line-item to American Medical Response for medical expenses. American Medical Response declined to elaborate on the services it provided, but the Bridgeport Office of Emergency Management stated that this included $6,000 for overtime associated with "medical response and assessments" and $3,200 for equipment, supplies, and apparatus.

Other, less quantifiable costs associated with the crash include the economic impact on local area businesses. Volpe Center staff interviewed three Bridgeport companies that were quoted in *The New York Times* as having experienced either positive or negative effects from the crash and the subsequent highway closures and detours. These three companies – Five-Star Diner, Pro-Shine Hand Car Wash, and the Rainy Faye bookstore and art gallery – are all located very close to the crash scene in central Bridgeport. These three companies cannot, of course, be viewed as a representative sample of the entire Bridgeport economy, but their experiences are indicative of what occurred at some local businesses in the aftermath of the crash.

The media had reported that the Five-Star Diner benefited from the highway closure, with construction workers repairing the bridge and drivers detoured onto Fairfield Avenue reportedly dropping in for quick meals. However, a representative from the diner contradicted these accounts, saying that business suffered during this period. Workers were sent out to the diner's parking lot to attract new customers, selling coffee to the

slowly passing drivers, but had little success in drawing in customers for a meal. Meanwhile, regular customers were deterred from stopping by because of the heavy traffic in the area. Five-Star Diner estimates a decrease in businesses of (very roughly) 30 percent during the period of highway closings and detours. The Pro-Shine Hand Car Wash and Rainy Faye bookstore were reported by the media to have been negatively impacted by the crash, and these accounts were verified in interviews with the owners of both businesses. Heavy traffic congestion in the area seemed to reduce the willingness of would-be customers to stop and have their cars washed or shop for books or gifts. Rainy Faye employees also experienced trouble getting to work, particularly since their hours fall during the typical business hours. Both businesses also noted that neighboring gas stations and restaurants were unusually slow as well – by how much, however, is hard to say.

To generate a total estimate of Other Costs, it is necessary to set aside – at least temporarily – the monetary value associated with these effects on local businesses, as well as travel time delays and other effects that are too difficult to quantify. In the ConnDOT project budgets, quantifiable costs for emergency response and public safety, alternative transportation services, and medical expenses total just under $1.5 million. (As mentioned above, almost all of this represents police and fire costs.) In addition, there were certain costs incurred – e.g. by the Bridgeport-Port Jefferson ferry operator – that are entirely relevant but were not reimbursed by ConnDOT for one reason or another. Because these costs are relatively minor, however, adding them to the cost figures still yields a total of approximately $1.5 million in Other Costs.

Table 7. Estimates of Incident Costs Based on Volpe Center Research

	Product Loss	Carrier Damage	Property Damage	Decontam-ination/ Cleanup	Other	Total
Volpe Research	$7,000	$60,000 to $70,000	$5.7 to $6.7 million	$165,000	$1.5 million	$7.4 to $8.4 million

Discussion

Table 8 summarizes the three sets of cost estimates from the March 25 crash. As this chart and the preceding sections show, there are elements of both consistency and variation in the cost estimates generated from the Hazardous Materials Incident Report, from media reports, and from independent research. Product loss, for example, is a category that is fairly straightforward and discrete; it showed only minor variations across estimates. Other categories – in this case, particularly with regard to property damage and the inherently nebulous group of "Other Costs" – saw wide variation.

Table 8. Summary Chart of Cost Estimates

	Product Loss	Carrier Damage	Property Damage	Decontam-ination/ Cleanup	Other	Total
Hazardous Materials Incident Report	$7,000	$45,000	Unknown / $3 million	$150,000	$0	$3,202,000
Media Reports	$2,850 to $11,400	Unspecified	$3 million to $5 million	Unspecified	"More than" $3 to $5 million	$6 to $10 million or more
Volpe Research	$7,000	$60,000 to $70,000	$5.7 to $6.7 million	$165,000	$1.5 million	$7.4 to $8.4 million

Based on the research by Volpe Center staff, it appears that the HMIR for this incident significantly understated the cost of the incident, both in underestimating the reconstruction costs for the highway overpass and in excluding altogether the costs of fire, police, and transit services. (The HMIR also slightly underestimated the costs of carrier damage and decontamination, but the magnitude of the differences is quite small by comparison.) In fairness, it should be noted that the HMIR was filed only one week after the crash, so many of these costs would not yet have been incurred, much less known or calculated with any precision. Indeed, the carrier would have been able to provide a more accurate estimate had it waited longer than the 30-day period after the incident before filing. The HMIR that was filed was an attempt to supply cost estimates based on the information that was available, and it did not include any inappropriate items in its tallying of costs. Furthermore, when it was revised to include an estimate of property damage, the figure supplied was $3 million, which appears to reflect the most common estimate of reconstruction costs being presented by the media at that time. However, it is unclear as to whether the carrier was actually the source of this revision to the HMIR.

The news media reports, for their part, were valuable sources of additional information on the consequences of the crash, including the efforts of first-responders, changes to transit services, the effects on local businesses, and plans for reconstruction of the highway. However, most of this information came without specific references to cost. The perceived reliability of the media's information was also compromised by the discrepancies across accounts regarding basic aspects of the crash – where and when it occurred, how many gallons of fuel were lost, and so on. Reports that the emergency response costs would exceed the costs of rebuilding the highway overpass also turned out not to be true, at least according to ConnDOT's cost accounting of the project.

Decisions Affecting Costs

The ability of the HMIR and the media reports to offer accurate cost estimates was also limited by another factor: decisions that were made during the course of the clean-up and recovery phases that significantly affected the nature and size of the costs associated with the crash. One of the earliest of these was the decision by Connecticut DOT to replace the southbound overpass with a temporary, prefabricated steel bridge rather than attempt to construct a temporary bridge atop fill material. This latter option was rejected because of concerns about erosion and the effects on public utility lines. Had it been pursued, it might have allowed the highway to re-open slightly sooner, thus potentially avoiding some of the indirect costs of detours and traffic re-routing. However, ConnDOT officials said that this option would have raised overall construction costs.

Also relevant is ConnDOT's decision to provide acceleration funds and financial incentives for the highway construction contractors to work double shifts and speed up the project. These payments will increase the direct costs of reconstruction by as much as $2.7 million. By allowing the work to be completed sooner, however, it will also significantly reduce the delays and related economic impacts associated with the project. Another factor affecting costs, albeit in a relatively minor way, was the decision to expand public transportation services during the period after the crash rather than allow even more congestion on local roads.

Each of these decisions was a reasonable response to the crash and its aftereffects, but by no means inevitable. Cost estimates prepared before these decisions were made would therefore be subject to considerable uncertainty.

IV. SUMMARY AND CONCLUSIONS

Overall, estimates of the total costs associated with the March 25 incident range from the $3.2 million reported in the Hazardous Materials Incident Report to the $7.4 to $8.4 million estimated by Volpe Center staff, with the news media offering a somewhat imprecise estimate in the $6 to $10 million range. As this range suggests, there are several sources of potential variation and discrepancy in developing estimates, and several ways in which carriers face difficulties in preparing accurate estimates. In developing their own estimates, Volpe Center staff identified the following issues in particular:

First, the HMIR's **reporting deadline** is thirty days after the incident, and in this case the carrier filed only one week after the crash. In such a short timeframe, it can be difficult or impossible for the carrier to gather all of the necessary information for completing the cost section of the HMIR. The extent to which this is true varies significantly by cost category, with narrowly defined items such as product loss and carrier damage more readily calculable within a short time period after the incident. In this case, the carrier's original estimates for product loss, carrier damage, and decontamination/cleanup were all within a reasonable range of the actual total, though even here the costs turned out to be slightly higher than estimated once the final bills and insurance paperwork came in. Property damage and "other" costs are much more difficult to estimate, particularly since the scope of reconstruction activities and the magnitude of the costs may still be developing at the 30-day mark, as it was in this case. Large and complex incidents often involve multiple potential approaches to recovery and reconstruction – in this case, for example, there were two different options for putting a temporary southbound overpass in place. Until the final decisions are made, there is **no single accurate measure** of incident-related costs, only a range of estimates associated with each option. This again tends to reduce the degree to which an accurate cost estimate can be generated soon after the incident, though in this case most of the major decisions were made within a week after the crash.

When cost totals do change over time, there appears to be the **potential for confusion in the recording of revisions** to the HMIR cost figures. The HMIR filed for the March 25 crash listed Property Damage as "unknown," which was later changed to $3 million. The carrier's safety director, the ostensible source of this new information in a conversation with a RSPA contractor, has no recollection of this conversation or the $3 million figure. This new figure was written onto the form, which was then electronically scanned, so it is now difficult to determine what the original figure was, and the electronic database of incident reports includes only the revised figure.

Carriers filing a HMIR also have **limited guidance** as to what to include or how to calculate it. Items such as product loss and carrier damage are reasonably straightforward, but even here there are issues about whether to use wholesale or retail value for the product, and whether to use actual (depreciated) value or replacement cost for the carrier damage. The category of "Other Costs" is also not explained in any detail in the HMIR instructions; in this case, the carrier's safety officer said frankly that he had

no idea what to include there. Fortunately, many of these shortcomings are addressed in the new form of the HMIR, to be used from 2005 onward. The new instructions explain that the product loss is to be calculated using the per-unit price on the invoice, and that carrier damage should be based on the insured value in the case of a "totaled" vehicle. The "Other Costs" category has also been eliminated and the instructions for other categories clarified.

However, even the new guidance is fairly silent on another source of confusion, which is that, particularly for complex incidents, it can be **difficult to draw a bright line** between costs that are a result of the incident and costs that are not. In this case, for example, the crash disrupted an ongoing highway construction project and forced the plans to be rearranged. Some of the costs incurred in the reconstruction of the roadway and overpasses were thus entirely new, while others would have been incurred anyway, and it is not always easy to divide expenses between categories. It is even more difficult for a carrier trying to gather this information second-hand. An additional difficulty in the Property Damage category is that the carrier may **disclaim liability** for certain claims of property damage that it regards as frivolous, unsubstantiated, or lacking a sufficient nexus to the incident itself. It is therefore unlikely to include them in its estimate of property damage since this would constitute some degree of acknowledgement of the damage. This precludes a more comprehensive accounting of all of the potential costs.

Organizational complexity also hinders carriers from filing reports that are both comprehensive and timely. Responses to the March 25 crash involved nearly a dozen state and local public safety agencies, the federal and state departments of transportation, the US Coast Guard, utility companies, several local public transportation agencies and private ferry companies, an environmental clean-up firm, and numerous highway construction contractors and sub-contractors. Most carriers would find it difficult to discern the roles and responsibilities of each organization and to obtain detailed cost information from each. This task would have been even more complicated had the damaged property been anything other than a public highway, since this likely would have required coordination with multiple private landlords rather than just with the state DOT. Even among public agencies, it is worth noting that there are differences in internal accounting conventions, adding an additional element of complexity to any effort to create a consolidated cost total.

Certain types of costs are **excluded altogether** from the HMIR and from most tallies of incident-related costs. This includes the value of time lost to travel delays, the costs of delayed shipments, and foregone revenues at area businesses due to roadway closures and congestion. These costs are less easily quantified, though techniques from transportation economics can yield approximate values for travel delays and some other intangibles by applying monetary values of time. As a matter of policy, Connecticut DOT has informed businesses that they are not eligible for compensation for these kinds of indirect costs – essentially drawing a distinction between direct property damage caused by the crash and any sort of ancillary effect. It is also true that "slow" business days are also not easily translated into specific amounts of foregone revenue. For example, Bridgeport's Five-Star Diner estimated a 30 percent drop in business during the days after the crash, but

admitted that this was a rough "ballpark" figure and that there is no way to know the impact of the crash.

Two other types of non-monetary costs are also excluded, possibly because the approaches to quantifying them can be methodologically complex and politically contentious. These are the value of environmental damage (over and above the costs of the decontamination and clean-up efforts) and the value of loss of life or personal injury. In the present case, most of the environmental damage was mitigated by quick response, and the few injuries that were suffered were quite minor. However, in other incidents these types of costs could be substantial and would present policy questions about whether and how to quantify them.

Estimates of incident-related costs derived from **media reports** tend to vary from other calculations because of the fundamentally different way in which journalists approach the issue – i.e., with a focus on the information that is of greatest interest to their readership, regardless of its relationship to the HMIR reporting structure. In this case, that information included details on the crash itself and on reconstruction efforts, with a strong emphasis on the ramifications for local residents, businesses, and travelers. The reports thus proved useful for identifying consequences of the incident and in publishing some broad estimates of reconstruction and response costs. However, these reports were incomplete and imprecise, either leaving out cost estimates altogether or providing only broad ranges of potential costs; no single article presented a comprehensive cost accounting. The composite media estimate of total incident-related costs, however, was reasonably accurate – certainly within an order of magnitude of the estimates prepared by the carrier and by the Volpe Center.

Policy Implications

As the above section showed, some of the complexities and sources of variance in reports of the costs of hazardous materials incidents are inevitable. The final cost of an incident will, for example, often depend on the outcome of decisions made over the course of the response period, and will need to be compiled from the individual cost estimates of dozens of separate entities. Some of these entities may prove difficult to contact and slow to tally their costs, or may fail to distinguish precisely between incident-related and non-incident related cost items.

By contrast, some of these issues can be addressed through changes to the HMIR and accompanying guidance. For example, the ability (in some cases, the requirement) to file amended HMIRs will allow carriers to revise their cost estimates as additional information comes in, alleviating some of the difficulties currently associated with the 30-day reporting deadline. And as noted earlier, methodological questions about how to calculate certain costs have already been addressed by the updated guidance on calculating Product Loss and Carrier Damage.

With regard to Response Costs, however, the new HMIR still includes very little guidance on (1) how to determine which agencies were involved in incident response, (2) how to contact these agencies and collect their costs, and (3) how to assemble these individual reports into a coherent total cost estimate. Much the same can be said for Property Damage, where there is little information in the guidance about (1) how to identify affected property owners, (2) how to estimate their damages or verify their reported claims, and (3) how to record possible damage without necessarily acknowledging legal liability in cases where this is contested.

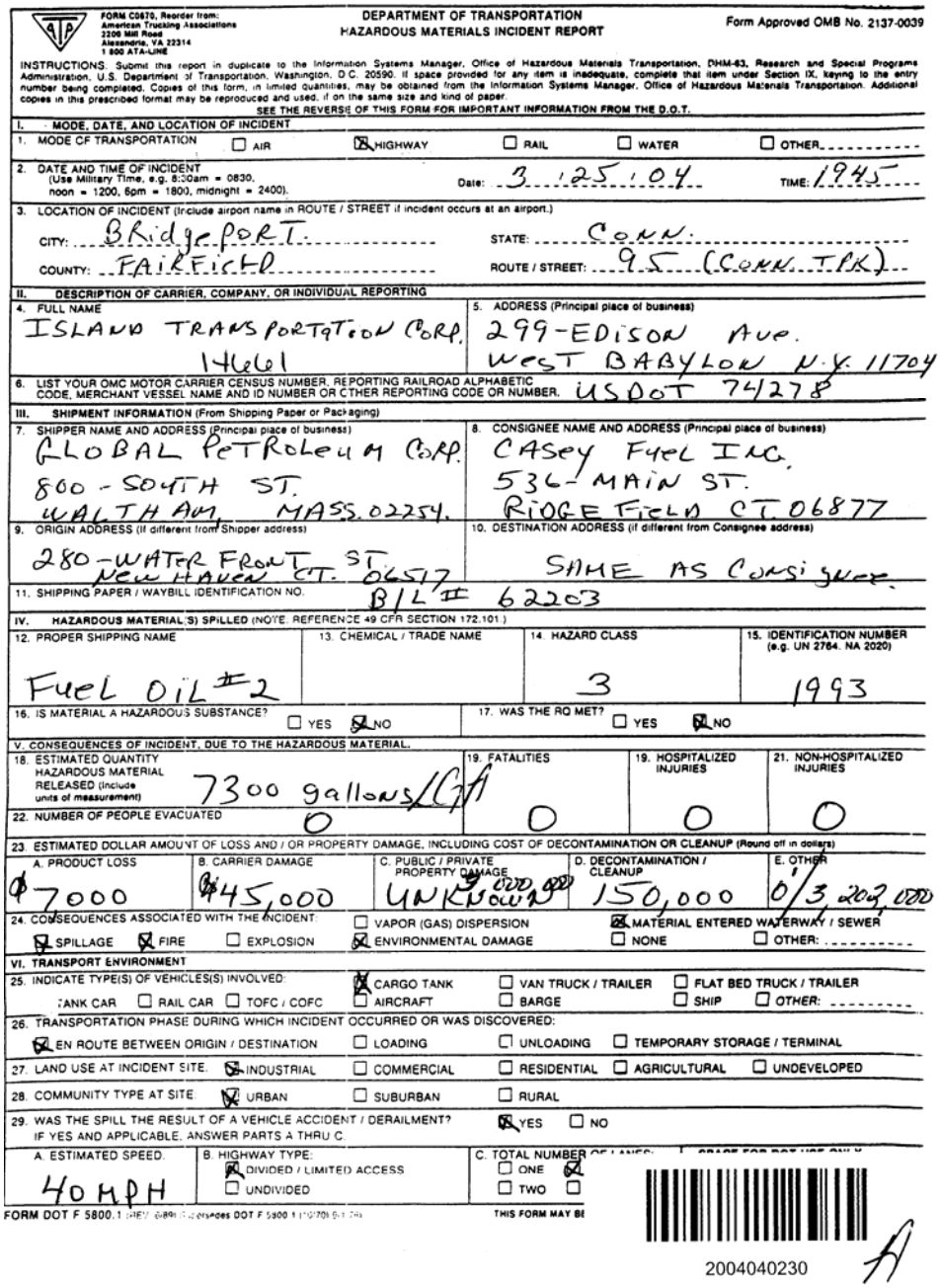
Additional HMIR guidance in these categories would be helpful in removing some of these barriers to accurate and timely reports. As a starting point, the HMIR guidance (and/or the Hazmat Office itself) could **assist the carrier in identifying the "lead" agency** directing incident response, wherever applicable. Early contact with the lead agency – in this case, Connecticut DOT – would allow the carrier to obtain a much more thorough, comprehensive picture of the incident-related costs than would be possible through individual contacts, and in a much shorter period of time. Because most organizations seeking reimbursement will be directed to the lead agency, this contact will also introduce some measure of standardization into accounting methods and totals.

On another point, the elimination of the "Other Costs" category from the HMIR is a step forward, in the sense that this category appears not to have been well-understood, and was therefore limited in its ability to provide data that were defined consistently across incidents and reports. On the other hand, **the lack of an "Other Costs" category now leaves certain types of tangible costs unaddressed in the HMIR guidance**. In the case studied here, these would include the costs of the additional public transit and ferry services that were ordered in response to the incident-related highway closure. Leaving these sorts of costs without an explicit category means that they are likely to be overlooked or left out of cost reports. The HMIR guidance might thus be revised to include a check-off list of potential "other" costs and instructions on whether and where to include them in the cost reporting.

Finally, **the system by which HMIRs are collected, revised, and converted to HMIS database entries could potentially benefit from additional consistency and recordkeeping**. As it stands now, a researcher looking at a scanned copy of an HMIR might not be able to tell which of two cost figures was the original figure and which was the revised number, nor when or by whom the revision was made. With regard to the March 25 incident, Volpe Center staff found that there were differing recollections as to how a revised figure for Property Damage came about, with no separate documentation of this revision available to resolve the doubt. One initial step in addressing these issues might be to create a more formalized process for generating cost revisions and entering these into HMIS.

APPENDIX

Hazardous Materials Incident Report as filed by Island Transportation



FORM C0670, Reorder from: American Trucking Associations 2200 Mill Road Alexandria, VA 22314 1 800 ATA-LINE

DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS INCIDENT REPORT

Form Approved OMB No. 2137-0039

INSTRUCTIONS. Submit this report in duplicate to the Information Systems Manager, Office of Hazardous Materials Transportation, DHM-63, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. If space provided for any item is inadequate, complete that item under Section IX, keying to the entry number being completed. Copies of this form, in limited quantities, may be obtained from the Information Systems Manager, Office of Hazardous Materials Transportation. Additional copies in this prescribed format may be reproduced and used, if on the same size and kind of paper.

SEE THE REVERSE OF THIS FORM FOR IMPORTANT INFORMATION FROM THE D.O.T.

I. MODE, DATE, AND LOCATION OF INCIDENT

1. MODE OF TRANSPORTATION: ☐ AIR ☒ HIGHWAY ☐ RAIL ☐ WATER ☐ OTHER

2. DATE AND TIME OF INCIDENT (Use Military Time, e.g. 8:30am = 0830, noon = 1200, 6pm = 1800, midnight = 2400). Date: 3/25/04 TIME: 1945

3. LOCATION OF INCIDENT (Include airport name in ROUTE / STREET if incident occurs at an airport.)
CITY: BRIDGEPORT. STATE: CONN.
COUNTY: FAIRFIELD ROUTE / STREET: 95 (CONN. TPK)

II. DESCRIPTION OF CARRIER, COMPANY, OR INDIVIDUAL REPORTING

4. FULL NAME: ISLAND TRANSPORTATION CORP. 14661

5. ADDRESS (Principal place of business): 299-EDISON AVE. WEST BABYLON N.Y. 11704

6. LIST YOUR OMC MOTOR CARRIER CENSUS NUMBER, REPORTING RAILROAD ALPHABETIC CODE, MERCHANT VESSEL NAME AND ID NUMBER OR OTHER REPORTING CODE OR NUMBER. USDOT 74278

III. SHIPMENT INFORMATION (From Shipping Paper or Packaging)

7. SHIPPER NAME AND ADDRESS (Principal place of business): GLOBAL PETROLEUM CORP. 800-SOUTH ST. WALTHAM MASS. 02254.

8. CONSIGNEE NAME AND ADDRESS (Principal place of business): CASEY FUEL INC. 536-MAIN ST. RIDGEFIELD CT 06877

9. ORIGIN ADDRESS (If different from Shipper address): 280-WATER FRONT ST. NEW HAVEN CT. 06517

10. DESTINATION ADDRESS (If different from Consignee address): SAME AS CONSIGNEE.

11. SHIPPING PAPER / WAYBILL IDENTIFICATION NO. B/L # 62203

IV. HAZARDOUS MATERIAL(S) SPILLED (NOTE: REFERENCE 49 CFR SECTION 172.101.)

12. PROPER SHIPPING NAME	13. CHEMICAL / TRADE NAME	14. HAZARD CLASS	15. IDENTIFICATION NUMBER (e.g. UN 2764, NA 2020)
FUEL OIL #2		3	1993

16. IS MATERIAL A HAZARDOUS SUBSTANCE? ☐ YES ☒ NO

17. WAS THE RQ MET? ☐ YES ☒ NO

V. CONSEQUENCES OF INCIDENT, DUE TO THE HAZARDOUS MATERIAL.

18. ESTIMATED QUANTITY HAZARDOUS MATERIAL RELEASED (Include units of measurement)	19. FATALITIES	19. HOSPITALIZED INJURIES	21. NON-HOSPITALIZED INJURIES
7300 gallons/GAL	0	0	0

22. NUMBER OF PEOPLE EVACUATED: 0

23. ESTIMATED DOLLAR AMOUNT OF LOSS AND / OR PROPERTY DAMAGE, INCLUDING COST OF DECONTAMINATION OR CLEANUP (Round off in dollars)

A. PRODUCT LOSS	B. CARRIER DAMAGE	C. PUBLIC / PRIVATE PROPERTY DAMAGE	D. DECONTAMINATION / CLEANUP	E. OTHER
$7000	$45,000	UNKNOWN	150,000	0/3 200,000

24. CONSEQUENCES ASSOCIATED WITH THE INCIDENT:
☒ SPILLAGE ☒ FIRE ☐ EXPLOSION ☒ ENVIRONMENTAL DAMAGE ☐ VAPOR (GAS) DISPERSION ☒ MATERIAL ENTERED WATERWAY / SEWER ☐ NONE ☐ OTHER:

VI. TRANSPORT ENVIRONMENT

25. INDICATE TYPE(S) OF VEHICLE(S) INVOLVED:
☐ TANK CAR ☐ RAIL CAR ☐ TOFC / COFC ☒ CARGO TANK ☐ AIRCRAFT ☐ VAN TRUCK / TRAILER ☐ BARGE ☐ FLAT BED TRUCK / TRAILER ☐ SHIP ☐ OTHER:

26. TRANSPORTATION PHASE DURING WHICH INCIDENT OCCURRED OR WAS DISCOVERED:
☒ EN ROUTE BETWEEN ORIGIN / DESTINATION ☐ LOADING ☐ UNLOADING ☐ TEMPORARY STORAGE / TERMINAL

27. LAND USE AT INCIDENT SITE: ☒ INDUSTRIAL ☐ COMMERCIAL ☐ RESIDENTIAL ☐ AGRICULTURAL ☐ UNDEVELOPED

28. COMMUNITY TYPE AT SITE: ☒ URBAN ☐ SUBURBAN ☐ RURAL

29. WAS THE SPILL THE RESULT OF A VEHICLE ACCIDENT / DERAILMENT? ☒ YES ☐ NO
IF YES AND APPLICABLE, ANSWER PARTS A THRU C.

A. ESTIMATED SPEED.	B. HIGHWAY TYPE:	C. TOTAL NUMBER OF LANES:
40 MPH	☒ DIVIDED / LIMITED ACCESS ☐ UNDIVIDED	☐ ONE ☒ TWO ☐

FORM DOT F 5800.1 (REV. 6/89) Supersedes DOT F 5800.1 (10/70) (6-1-74) THIS FORM MAY BE

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