

Introduction to the Toolkit for Hazardous Materials Transportation Education (THMTE)

The THMTE provides eight modules and supporting material to facilitate post-secondary education for hazardous materials transportation. The curricula was designed to be adaptable for the needs of post-secondary students, including multiple disciplines, undergraduate and graduate, community college, professional and executive development. Instructors should adapt and supplement the materials to address their specific course objectives, characteristics of the student group, and the instructional time available.

THMTE contains eight (8) modules in PowerPoint format. Module #1 serves as an introduction and a summary of the other seven. Modules are arranged in a recommended order of presentation for an entire course. Additionally, individual modules or excerpts of modules may be used independently to supplement another course. The titles of the modules are as follows:

- Module 1: Introduction to Hazardous Materials Transportation
- Module 2: Hazmat Transportation Logistics
- Module 3: Hazmat Legal and Regulatory Environment
- Module 4: Hazmat Mode and Route Selection
- Module 5: Hazmat Risk Management
- Module 6: Hazmat Transportation Incident Management
- Module 7: Security of Hazmat Transportation Shipments
- Module 8: Hazmat Transportation Workforce Development Issues

At the end of each module are suggested student exercises or homework assignments as well as a listing of resources for additional learning.

The toolkit was designed with the expectation that instructors will condense, combine, rearrange, or expand the modules to meet the goals and constraints of specific courses for specific audiences. The goal was for each module to be useable separately or in combination with one or more of the other modules. Instructors should also be mindful of the following:

- Some slides contain a lot of information, graphics, and/or small fonts that may not be easily visible when projected in a typical classroom setting. Instructors may want to convert such slides (or the original material from the cited sources) to a student handout to supplement or substitute for projected slides.

- Links to multimedia and online materials as well as references to current regulations, standards, and policies in the modules will change over time; thus, requiring updating of the materials and links.
- A limited number of slides include notes to expand on content or to suggest ways to facilitate classroom discussion, but more work is needed to enhance these notes and to develop notes for other slides based on experience in actual use of the modules.

In addition to the eight modules, the following are suggested as supplementary materials:

- Definitions of Hazardous Materials (Appendix E)
- Hazmat Transportation Glossary of Terms and Acronyms (Appendix F)
- Suggested Student Handouts (Appendix H)
- Incident Reports, Reviews, and Case Studies
 - U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration Calendar Year 2010 Notice of Hazardous Materials Regulations Enforcement
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/2010 Penalty Action Report II.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/2010%20Penalty%20Action%20Report%20II.pdf)
 - U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration Calendar Year 2011 Notice of Hazardous Materials Regulations Enforcement
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/2011 Hazmat Penalty Action Report.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/2011_Hazmat_Penalty_Action_Report.pdf)
 - Case Studies of Transportation Accidents Involving Hazardous Materials by S. Becker and S. Clark
<http://rpitt.eng.ua.edu/Class/EffectsandFates/Module9/Module9.htm>
 - National Hazardous Materials Fusion Center Hazmat History, Kingman, Arizona
[http://www.hazmatfc.com/hazmatResources/HazmatHistory/Documents/Kingman Arizona Incident.pdf](http://www.hazmatfc.com/hazmatResources/HazmatHistory/Documents/Kingman%20Arizona%20Incident.pdf)
 - National Hazardous Materials Fusion Center Hazmat History, Miamisburg, Ohio Train Derailment
[http://www.hazmatfc.com/hazmatResources/HazmatHistory/Documents/HAZMAT HISTORY MIAMISBURG.pdf](http://www.hazmatfc.com/hazmatResources/HazmatHistory/Documents/HAZMAT%20HISTORY%20MIAMISBURG.pdf)
 - National Hazardous Materials Fusion Center Hazmat History, The Texas City Disaster
[http://www.hazmatfc.com/hazmatResources/HazmatHistory/Documents/Hazmat History Texas City Disaster_Final.pdf](http://www.hazmatfc.com/hazmatResources/HazmatHistory/Documents/Hazmat%20History%20Texas%20City%20Disaster_Final.pdf)
 - FEMA Emergency Management Institute *Hazardous Materials Tabletop Exercises Manual*

[http://training.fema.gov/EMIWeb/pub/HazMat Tabletop Manual.pdf](http://training.fema.gov/EMIWeb/pub/HazMat%20Tabletop%20Manual.pdf)

- National Transportation Safety Board Hazardous Materials Accident Reports Links
http://www.nts.gov/investigations/reports_hazmat.html
- NTSB Safety Recommendation letter A-08-1 and -2
http://www.nts.gov/doclib/reletters/2008/A08_1_2.pdf
- NTSB HZM-99/02 Hazardous Materials Accident Report, Overflow of Gasoline and Fire at a Service Station-Convenience Store, Biloxi, Mississippi, August 9, 1998
<http://www.nts.gov/doclib/reports/1999/HZM9902.pdf>
- NTSB original letter regarding Safety Recommendations H-11-4 thru 6
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/NTSB/NTSB response to H-11-4 to -6 to PHMSA 1-10-2012.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/NTSB/NTSB_response_to_H-11-4_to_-6_to_PHMSA_1-10-2012.pdf)
- NTSB Safety Recommendation letter P-11-8 through -20 and P-11-1 and P-11-2.
<http://www.nts.gov/doclib/reletters/2011/P-11-008-020.pdf>
- NTSB PAR-11/01 Pipeline Accident Report, Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire
<http://www.nts.gov/doclib/reports/2011/PAR1101.pdf>
- NTSB Safety Recommendation letter H-95-37 Propane with Reference to Memphis incident
http://www.nts.gov/doclib/reletters/1995/H95_37.pdf
- NTSB Safety Recommendation letter R-12-5 through -8 and R-07-4
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/NTSB/R-12-5 thru-8 PHMSA Original Letter.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/NTSB/R-12-5_thru-8_PHMSA_Original_Letter.pdf)
- NTSB Railroad Accident Report, Department of Louisville & Nashville Railroad Company's Train No. 584 and Subsequent Rupture of Tank Car Containing Liquefied Petroleum Gas, Waverly, Tennessee, February 22, 1978
<http://fire.omeka.net/items/show/595>
- *SS Santa Clara Case Study: An Environmental and Transportation First* by Robert D. Jaffin
<http://www.trb.org/Main/Blurbs/169272.aspx>
- U.S. Fire Administration Technical Report Series, *Gasoline Tanker Incidents in Chicago, Illinois and Fairfax County, Virginia*, USFA-TR-032
<http://www.usfa.fema.gov/downloads/pdf/publications/tr-032.pdf>
- U.S. Fire Administration Technical Report Series, *Major Ship Fire Extinguished by CO₂*, USFA-TR-058
<http://www.usfa.fema.gov/downloads/pdf/publications/tr-058.pdf>
- U.S. Fire Administration Technical Report Series, *CSX Tunnel Fire*, USFA-TR-140
<http://www.usfa.fema.gov/downloads/pdf/publications/tr-140.pdf>

Instructors who use this material are encouraged to share their experiences with the toolkit and to note any errors, omissions, or suggested additions by contacting:

Dr. Michael Bronzini, Principal
3 Sigma Consultants, LLC
Nashville, TN
mbronzin@gmu.edu