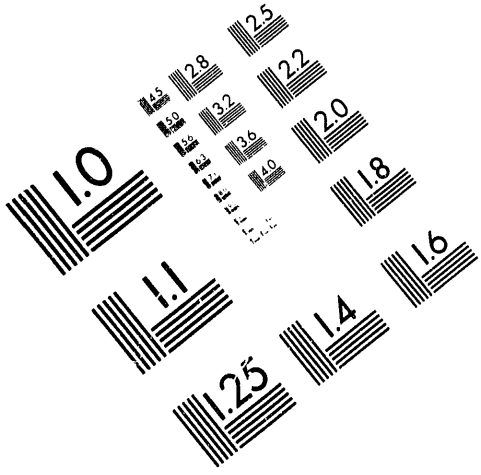
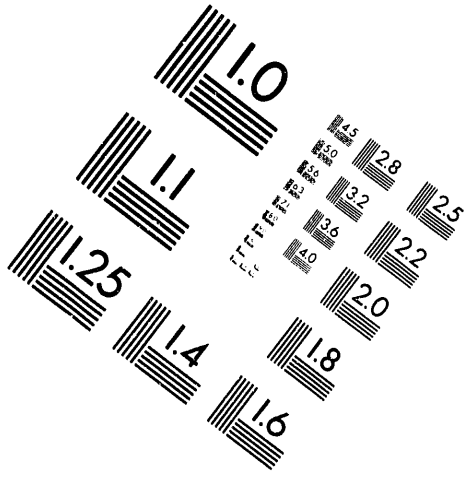
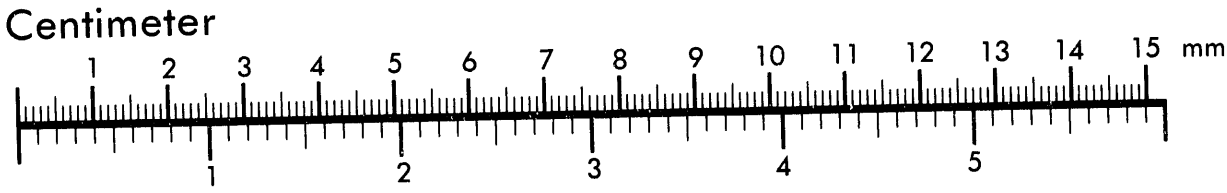
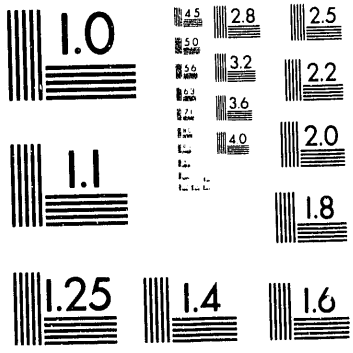
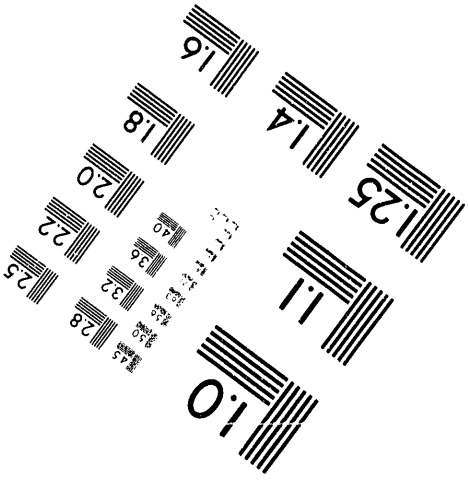


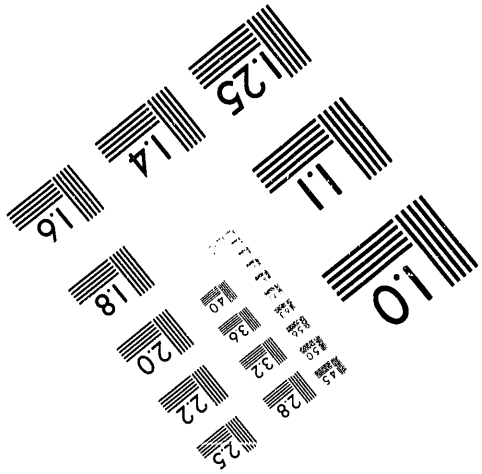
Association for Information and Image Management
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202











1 of 1

DOE/CH/10324--78

Alternative Routes for Highway Shipments of Radioactive Materials and Lessons Learned from State Designations

July 1990

Prepared for U.S. Department of Energy
under Cooperative Agreement
DE-FC01-87CH10324

by the

Southern States Energy Board
3091 Governors Lakes Drive, Suite 400
Norcross, Georgia 30071
(404) 242-7712

Table of Contents

Introduction

Pursuant to the Hazardous Materials Transportation Act (HMTA), the Department of Transportation (DOT) has promulgated a comprehensive set of regulations regarding the highway transportation of high-level radioactive materials. These regulations, under docket numbers HM-164 and HM-164A, establish interstate highways as the preferred routes for the transportation of radioactive materials within and through the states.

The regulations also provide a methodology by which a state may select alternative routes. First, the state must establish a "state routing agency", defined as an entity authorized to use the state legal process to impose routing requirements on carriers of radioactive material (49 CFR 171.8). Once identified, the state routing agency must select routes in accordance with DOT's ***Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials*** or an equivalent routing analysis. Adjoining states and localities should be consulted on the impact of proposed alternative routes as a prerequisite of final route selection. Lastly, the states must provide written notice to DOT of any alternative route designation before the routes are deemed effective.

The purpose of this report is to discuss the "lessons learned" by the five states within the southern region that have designated alternative or preferred routes under the regulations of the Department of Transportation (DOT) established for the transportation of radioactive materials. The document was prepared by reviewing applicable federal laws and regulations, examining state reports and documents and contacting state officials and routing agencies involved in making routing decisions. In undertaking this project, the Southern States Energy Board hopes to reveal the process used by states that have designated alternative routes and thereby share their experiences (i.e., lessons learned) with other southern states that have yet to make designations.

Under DOT regulations (49 CFR 177.826), carriers of highway route controlled quantities of radioactive materials (which include spent nuclear fuel and high-level waste) must use preferred routes selected to reduce time in transit. Such preferred routes consist of (1) an interstate system highway with use of an interstate system bypass or beltway around cities when available, and (2) alternate routes selected by a "state routing agency."

A state routing agency may designate an alternative or preferred route for highway route controlled quantity shipments of radioactive materials in accordance with the U.S. Department of Transportation's (DOT's) ***Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials*** or an "equivalent routing analysis" that adequately considers overall risk to the public. Once designations have been made and notice of the designations has been provided to the DOT, carriers transporting radioactive materials within a specified class of material must use these preferred routes. Under the DOT nuclear routing rule (49 CFR Part 177.825 or HM-164), carriers of highway route controlled quantity radioactive material must use preferred routes. A preferred route is an interstate or state highway, or a state-designated alternative. A state-designated alternative must be disclosed to DOT to become effective.

While a state may choose to designate alternative routes, there is no absolute requirement that a state make such designations. Indeed, many southern states have chosen not to make designations. These states have decided to use the interstate system highways. Only five states, Arkansas, Kentucky, Maryland, Tennessee and Virginia, have chosen to designate alternative routes. Maryland has since decertified all their alternative routes. Each of these states and the lesson(s) learned by the state's routing officials is discussed within these pages.

In some cases, alternative routes were established without the aid of a formal risk analysis envisioned by HM-164, the DOT rulemaking authority for routing. Even in situations where a structured, technical analysis did not occur, however, most states assembled a "core" working group to discuss routing issues. Often, the group consisted not only of the state's routing agency staff and officials, but also the state police, emergency services or emergency management agency, the state's department of transportation and so forth.

A number of states chose to conduct fairly detailed risk analyses; one state, Virginia, even spent $98,000 on an outside contractor study. Most states chose to perform their own study "in-house" pursuant to DOT's ***Guidelines***, mentioned above, thereby reducing the cost of contractor studies.

The lessons learned by states that have designated alternative routes are, among other things, that it is extremely important that the proper routing agency or agencies be identified and brought together for consultation. Many states expressed their confusion over which agency should take the lead in designating alternative routes. The identification of the appropriate agency or agencies allowed the process to run efficiently and in an organized manner.

Also, states indicated that it was important that guidelines for designating alternative routes be established and followed. Those states that did not follow DOT's guidelines expressed frustration at the process of formulating their own strategy. Sometimes a state simply examined a map of the interstate highway system. Other states indicated that the DOT guidelines were the most appropriate means of choosing the necessary routes.

Finally, the states emphasized the need for DOT to communicate requirements to them in a timely and effective manner. States such as Maryland and Virginia were under the impression that their alternative routes had been filed with the DOT when, in fact, this was not the case. The states vowed to comply with the department's regulations, but noted that had they been aware of their non-compliance they would have notified DOT earlier. Virginia's routes have subsequently been certified. Maryland's routes, as mentioned above, have been officially decertified by the state; however, DOT has never certified Maryland's routes.

This report also contains a table of state alternative route designations. Also included are persons to contact in the responsible state agencies for further information concerning the transportation of highway route controlled quantities of nuclear materials.

The primary lesson learned, therefore, was that communication among and between state agencies and DOT is integral to the establishment of alternative routes.

Statement of Purpose

The purpose of this report is to highlight state action regarding the designation of alternative routes for the transportation of radioactive materials. The report identifies states in the region that have established alternative routes, describes the routes designated by each state and provides the name of the appropriate contact person for information concerning alternative routing.

The report represents an extension of the work contained in the Southern States Energy Board's ***Southern States' Routing Agency Report***, which identified the state routing agencies and contact persons. Based on that information, telephone interviews were conducted with each contact person or his representatives to determine whether the state had designated alternative routes and which routes were in use. In order to verify and expand upon information gathered from telephone interviews, state responders were asked to provide available documentation on the process used to select alternatives. Additionally, U.S. Department of Transportation provisions under HM-164A were examined.

State Alternative Route Designations

State	Contact Person	Routing Regulation
Alabama	Aubrey Godwin, Director Radiological Health Branch State Board of Health (205) 261-5315	DOT routes only; no state designations; shippers may apply for permission to use alternative route.
Arkansas	Larry Fletcher Arkansas State Police (501) 224-2882	State designated routes are: Memphis to Fort Smith; I-40 to the Oklahoma state line Memphis to Texarkana; I-40 to I-440 (in lieu of I-430, I-630 or that portion of I-30 connecting I-40 and I-440); I-30 to the Texas state line.
Florida	Harlan Keaton, Director Florida Dept. of Health & Rehabilitative Services (407) 297-2095	DOT routes only
Georgia	Lucia Ramey, Director Compliance & Safety Transportation Division Georgia Public Service Commission (404) 559-6602	DOT routes only

State Alternative Route Designations

(continued)

State	Contact Person	Routing Regulation
Kentucky	Mel Jenkins, Civil Defense Coordinator Transportation Cabinet (502) 564-4556	State designated routes are: I-64 is the East/West route (with I-264 in the Louisville area prohibited from being used because I-65 is being designated as an alternative route); I-24 is the western Kentucky North/South route; I-65 is the central North/South route through Louisville (with I-264 in the Louisville area prohibited from being used because I-65 is being designated as an alternative route); I-71 is a North Central route (with I-264 in the Louisville area being prohibited); In the Cincinnati area use of I-285 is required.
Louisiana	William Spencer Louisiana State Police (504) 925-6113	DOT routes only
Maryland	George Harman Department of the Environment (301) 631-3794	State designated routes are: Route 301 from Delware to Virginia; Route 40 & 48 to Morgantown, West Virginia.

State Alternative Route Designations

(continued)

State	Contact Person	Routing Regulation
Mississippi	Robert Hollimon, Asst. Chief Engineer, Operations Highway Department (601) 354-1213	DOT routes only
Missouri	Sgt. Lewis Bound Commercial Vehicle Enforcement Missouri State Police (314) 751-3313	DOT routes only
North Carolina	Dayne Brown Radiation Protection Section North Carolina Department of Human Resources (919) 733-4283	DOT routes only
Oklahoma	Lt. Garry Thomas Oklahoma Department of Public Safety (405) 521-6104	DOT routes only

State Alternative Route Designations

(continued)

State	Contact Person	Routing Regulation
South Carolina	Heyward Shealy Bureau of Radiological Health South Carolina Department of Health & Environmental Control (803) 734-4634	DOT routes only
Tennessee	Paul Melander Tennessee Public Service Commission (615) 741-0484	State designated route: I-640 around Knoxville
Texas	David Lacker, Director Bureau of Radiation Control Texas Department of Health (512) 835-7000	DOT routes only

State Alternative Route Designations

(continued)

State	Contact Person	Routing Regulation
Virginia	James M. Holloway Technological Hazards Branch Department of Emergency Services (804) 674-2413	* (see below)
West Virginia	James Youngblood Safety & Roadside Service Department of Highway (304) 348-3338	DOT routes only

* Virginia has designated the following routes: State Highway 207 between Port Royal and I-95; U.S. Highway 29 between I-66 and I-64; U.S. 17 from U.S. 301 to I-81; State Highway 208 from I-95 to U.S. 522; U.S. 522 from State Highway 208 to I-64; State Highway 155 from I-64 to State Highway 5 at Charles City; State Highway 5 from Charles City to State Highway 156; State Highway 156 to State Highway 10; State Highway 10 to U.S. 58; U.S. 460 between Petersburg and U.S. 58; U.S. 58 from Portsmouth to I-95; U.S. 17/258 from I-64 to State Highway 10; U.S. 460 between Lynchburg (Mt. Athos Rd.) and U.S. 220Alt to U.S. 11 to I-81; U.S. 460 from the West Virginia state line to State Highway 100 at Pearisburg to Dublin to I-81; I-95 to I-85 to U.S. 460 to Lynchburg (Mt. Athos Rd.)

Arkansas

Routes were established after consultations among and between a number of state agencies, including the Arkansas Transportation Commission and the state police. Additionally, valuable input was provided by the emergency response agencies located in Little Rock, North Little Rock and Pulaski County. There is no single agency in the state at present, however, that exercises authority to designate alternative routes.

State designated alternative routes are:

Memphis to Fort Smith: - I-40 to the Oklahoma state line.

Memphis to Texarkana - I-40

Memphis - I-40 to I-440 in North Little Rock thru Little Rock to I-30.
I-440 to I-30 (in lieu of I-430, I-630 and that portion of I-30 connecting I-40 and I-440).
I-30 to the Texas state line.

For shipments from the north take I-55 to I-40.

For routes around Little Rock take I-440 to I-40 or I-30.

Lessons Learned:

Arkansas did not employ DOT's ***Guidelines for Selecting Preferred Routes for Large Quantity Shipments of Radioactive Materials*** as the basis for designating routes and, in fact, it is unclear what guidelines were used. The state police indicated that officials from the agencies mentioned above examined a map of Arkansas routes and selected the interstate highway systems listed there. The state intends to review the route designation process outlined in HM-164 and revise existing alternative routes in a manner consistent with DOT's Guidelines or an equivalent routing analysis. To date, however, the state has not consulted with DOT. Regardless, Arkansas' alternative routes apparently are simply state certification of DOT preferred routes.

Kentucky

Authority to designate alternative routes for the state of Kentucky is vested in the Kentucky Department of Transportation. The designation of existing alternative routes was accomplished in meetings of a core group of state agencies headed by the state DOT and including the radiation control office in the Cabinet for Human Resources and the Division of Disaster and Emergency Services of the Department of Military Affairs.

Kentucky employed a straightforward approach to designating routes that considered both population density and road conditions. For example, road conditions dictated the selection of I-64 through Louisville as opposed to the I-264 beltway owing to extreme congestion and construction work in and around the beltway. The state has not addressed the question of designating alternative routes once construction is completed, although officials are not likely to allow large numbers of shipments through downtown Louisville once the beltway congestion is alleviated.

Alternative routes for Kentucky are: I-64 is the East/West route (with I-264 in the Louisville area prohibited from being used because I-65 is being designated as an alternative route); I-24 is the western Kentucky North/South route; I-65 is the central North/South route through Louisville (with I-264 in the Louisville area prohibited from being used because I-65 is being designated as an alternative route); I-71 is a North central route (with I-264 in the Louisville area prohibited from being used because I-71 is being designated as an alternative route); I-71/I-75 is the central North/South route past Lexington and to and from Cincinnati except that I-275 in the Covington-Newport-Cincinnati area must be used as an alternative route to I-71/I-75 from the junction of I-71/I-75 with I-275 to the Ohio state line; and I-471 in the Newport area cannot be used because the beltway, I-275, is required to be used instead.

Lessons Learned:

Kentucky attributes the successful designation of alternative routes to the communication between state agencies. Face-to-face meetings allowed for input by affected agencies. Also, the state will sometimes use an interstate highway through a city, as is the case in the Louisville area, when the beltway around the city is undergoing construction or is otherwise too congested.

Maryland

In 1981, a core group of 10 state agencies, led by the Maryland Department of Transportation, issued a study entitled ***Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials*** to devise an acceptable highway routing plan for the shipment of radioactive materials through the state. Using the DOT's ***Guidelines*** the core group studied available routes and made designations based on factors such as road quality and population density. The results of this analysis indicated that use of the proposed non-interstate routes posed no greater risk than the use of the interstate highway system.

Alternative routes listed by the state are U.S. Highway 301 from Delaware to Virginia and Routes 40 and 48 to Morgantown, West Virginia. DOT has no record of these listings.

In May 1990 the State Highway Department eliminated both of these alternative routes. Based on a non-technical review of the designations, the Highway Department determined that the designated routes were unsafe.

Lessons Learned:

The process of establishing alternative routes outlined above was enhanced owing to the direct input of a number of state agencies. The fact that diverse agencies of state government acted in concert rather than as separate entities expedited the process.

One major lesson learned is that route selection must be reviewed periodically to account for changes in road conditions and population density. The state Highway Department was given this responsibility and chose to eliminate all alternative routes in the state.

This elimination resulted in Virginia being forced to decertify two of its alternative routes. More importantly, it forced shippers who had used the east-west routes along Routes 40 and 48 to use the much more circuitous routes interstate routes through Pennsylvania and West Virginia. These routes add approximately eight to ten hours to transportation times, demonstrating the effect decertifying routes may have on a shipper.

Route 40 and 48 is currently being upgraded to an interstate and within a year will become a DOT designated route.

There is also a question as to whether there were ever any official designated alternative routes in Maryland as the DOT never had any record of the routes being filed.

Tennessee

The Tennessee Public Service Commission is the lead state agency involved in the routing of high-level radioactive materials. Alternative routes presently in use in Tennessee were originally established due to the desire to reroute all truck traffic around Knoxville during the Tennessee World's Fair. This practice remained in force after the conclusion of the fair.

Beginning in 1985, the PSC staff conducted an analysis of potential routes as the initial step in the rulemaking process. This analysis considered a number of factors similar to those in DOT guidelines, including population density, road conditions, noise levels and access to the roadway in the event of an accident. The staff then proposed alternative routes for the transportation of hazardous materials, including high-level radioactive waste, based on the statistical data generated by this analysis.

In 1987, the PSC held public hearings on the designation of alternative routes. As a result of these proceedings, the commission promulgated rules restricting the routing of vehicles transporting hazardous materials in Knox County.

The alternative route in Tennessee is I-640 (in lieu of I-40 in the Knoxville area). This route has been filed with the U.S. Department of Transportation in compliance with HM-164A.

Lessons Learned:

The risk analysis and subsequent public hearings allowed for the input of interested parties prior to adoption of the proposed route. It is unclear what effect the alternative route designation had in Tennessee, as DOT regulations mandate the use of interstate beltways where available.

Virginia

Alternative routes have been established for Virginia using both outside contractor and internally-generated studies. No state agency has been vested with statutory authority to designate alternative routes in the state; however, the Department of Emergency Services has assumed such authority.

The internally-generated studies were based primarily on the DOT's ***Guidelines***. These studies were performed by Emergency Services in cooperation with the state radiation health agency and in conjunction with the Nuclear Regulatory Commission (NRC) and were accomplished in part by actually running the proposed route and conducting "table top" analyses of the proposed routes. The use of internally-generated studies, however, was eventually challenged by several interest groups based on the fact that the agency charged with responsibility for designating routes was also conducting the study. These groups favored the use of an independently-conducted routing study.

The state subsequently employed a contractor to recommend alternative routes. The contractor's report, like the internally-generated study, was based on the risk analysis methodology contained in DOT's ***Guidelines***.

Alternative routes for Virginia are: VA Route 207 between Port Royal and I-95; US Route 29 north and south between I-66 and I-64; US Route 17 north and south from US 301 to I-81; VA Route 208 from I-95 to US Route 522; US Route 522 from VA Route 208 to I-64; VA Route 155 from I-64 to VA Route 5 at Charles City; VA Route 5 east and west from Charles City to VA Route 156 south; VA Route 156 north and south to VA Route 10; VA Route 10 east and west to US Route 58; US 460 east and west between Petersburg and US 58; US 58 east and west from Portsmouth to I-95; US 17/258 from I-64 to VA Route 10; US 460 east and west between Lynchburg (Mt. Athos Road) and US 220 Alt. to US 11 to I-81; and US 460 east and west from the West Virginia state line to VA 100 at Pearisburg to Dublin to I-81.

Lessons Learned:

Cost is a major drawback to the use of contractor-generated studies. The study conducted for Virginia cost approximately $98,000.

In Virginia, alternative route designations have been part of an ongoing process; several of the initial routes have been replaced owing to changes in road conditions and population density. For example, the state, in consultation with the NRC, now bans shipments over I-77 to and from West Virginia. Additionally, new routes have been designated on an as-needed basis.

Virginia believes that the routes presently in use are sufficient and no significant changes are anticipated in the near future. However, two alternative routes in Virginia that connected with Maryland routes have been eliminated because of Maryland's decision to eliminate its alternative routes. These routes were: U.S. Route 15 between the Maryland state border and I-66; U.S. Route 301 between the Maryland state line and Virginia Route 207. This adjustment demonstrates the need for interstate cooperation and communication in designating alternate routes.

Conclusion

A review of the documentation concerning the process used to select alternative routes shows that states are primarily concerned with avoiding risks associated with travel through population centers and highway construction areas. Concern was also expressed for the overall suitability of certain highways for the transportation of radioactive materials.

To date, four of the 16 member states of the Southern States Energy Board have designated alternative routes; they are Arkansas, Kentucky, Tennessee and Virginia. Of these four, two states, Arkansas and Tennessee, have made alternative route designations that are apparently also DOT preferred routes. Kentucky decertified a DOT preferred route (I-264 around Louisville) because of particular traffic and construction problems with that road. Only Virginia has certified any non-interstate routes. Clearly, the vast majority of states have not selected alternative routes. However, it is unclear whether the relatively modest amount of route selection activity in the region is based on the states' satisfaction with the exclusive use of the interstate highway system or if states anticipate some rulemaking activity concerning routing issues in the near future. Given the expected increase in radioactive waste shipments on U.S. highways when disposal facilities become operational, greater attention will likely be focused on routing issues for the next several years. As part of its cooperative agreement with the U.S. Department of Energy, the Southern States Energy Board will continue to monitor the routing activities of its member states.

References

Annual Radioactive Materials Transportation Legal Developments Report. Battelle Project Management Division, Office of Transportation Systems and Planning, Columbus, Ohio. September 1988.

"Governors' Designees Receiving Advance Notification of Transportation of Nuclear Waste." ***Federal Register*** 53 (June 30, 1988): 24818-24820.

Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials. U.S. Department of Transportation, Research, and Special Programs Administration, Washington, D.C. June 1981. (DOT RSPA/MTB-81/5).

HM-164: Radioactive Materials: Routing and Driver Training Requirements. Sandia National Laboratories, Albuquerque, New Mexico. March 1986. (SAND-85-7160).

Inconsistency Ruling and Applications under §112(a) of the Hazardous Materials Transportation Act. U.S. Department of Transportation, Research and Special Programs Administration, Washington, D.C. January 5, 1988.

Index to Preemption of State and Local Laws and Regulations under the Hazardous Materials Transportation Act (49 App. U.S.C. 1801 et seq.). U.S. Department of Transportation, Research and Special Programs Administration, Washington, D.C. January 8, 1988.

Quarterly Radioactive Materials Transportation Legal Developments Report. Battelle Project Management Division, Office of Transportation Systems and Planning, Columbus, Ohio. August 1988.

Quarterly Radioactive Materials Transportation Legal Developments Report. Battelle Project Management Division, Office of Transportation Systems and Planning, Columbus, Ohio. February 1989.

Southern States Energy Board Legislative Digest 1986. Southern States Energy Board, Atlanta, Georgia. September 1986.

Southern States Energy Board Legislative Digest 1987. Southern States Energy Board, Atlanta, Georgia. October 1987.

Transportation of Radioactive Materials: A Summary of State and Local Legislative Requirements for the Period Ending December 31, 1985. Oak Ridge National Laboratory, Oak Ridge, Tennessee. April 1986. (ORNL/TM-9985).

"Transportation Routing Issues Related to the Shipments of High-Level Nuclear Waste." ***OCRWM Backgrounder***. U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Washington, D.C. January 1987. (DOE/RW-0122).

Appendix A

Letter Re: Kentucky Route Designations

SANDY

COMMONWEALTH OF KENTUCKY
TRANSPORTATION CABINET
FRANKFORT, KENTUCKY 40622

MILO D. BRYANT
SECRETARY
AND
COMMISSIONER OF HIGHWAYS

WALLACE G. WILKINSON
GOVERNOR

October 3, 1988

Ms. M. Cynthia Douglass, Administrator
Research and Special Programs Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Ms. Douglass:

In accordance with 49 C.F.R. 177.825 I am pleased to report to you the preferred routes in the Commonwealth of Kentucky for the transportation of route controlled quantities of radioactive materials. Kentucky state law, KRS 174.410, designates the Secretary of the Transportation Cabinet as the person responsible for controlling and regulating the movement of all radioactive materials within the Commonwealth.

Only the Interstate Highways in Kentucky may be used to transport these larger quantities of radioactive materials. These highways are I-24, I-64, I-65, I-71, I-75, and I-275. In northern Kentucky the use of I-71/75 is further restricted in accordance with our administrative regulation 601 KAR 5:190 (copy attached). In Jefferson County, I-264 was deliberately omitted from this list since because of high population densities around the Watterson Expressway and the reconstruction of that highway currently taking place we intend all of the subject materials to be transported on either I-65 or I-64.

If you need additional information or wish to discuss this further, please contact me.

Sincerely,

Milo D. Bryant

Milo D. Bryant
Secretary and
Commissioner of Highways

NOV 14 REC'D

permits are included in this chapter. (11 Ky.R. 1100; eff. 3-12-85.)

603 KAR 5:190. Vehicles prohibited on I-75 and I-71.

RELATES TO: KRS 189.231
PURSUANT TO: KRS 189.231
NECESSITY AND FUNCTION: KRS 189.231 authorizes the Secretary of Transportation to restrict or regulate traffic on state-maintained highways in such manner as is reasonably necessary to promote the safety and convenience of the traveling public. The purpose of this administrative regulation is to promote public safety by restricting and regulating the use of a specific portion of a state-maintained highway from certain types of vehicles.

Section 1. Definitions. As used in this regulation, the hereinafter set forth terms shall have the following meaning:
(1) "Truck tractor" means any self-propelled vehicle designed to support and/or to draw the front end of a trailer, semitrailer or mobile home.
(2) "Semitrailer" means a vehicle designed to be attached to and/or have its front end supported by a truck tractor. It is intended to be used for the carrying of freight, cargo, or merchandise and has a load capacity in excess of 1,000 pounds.
(3) "Mobile home" means a movable or portable dwelling in excess of 102 inches, constructed to be towed on its own chassis by a truck tractor, connected to utilities, and designed without a permanent foundation for year-round living.
(4) "Trailer" means any vehicle designed for carrying persons or property and being drawn by a motor vehicle and being so constructed that no part of its weight rests upon the towing vehicle.

Section 2. Prohibition. All truck tractor-mobile home combinations in excess of 102 inches in width, truck tractor-semitrailer combinations, and truck tractor-semitrailer-trailer combinations except as identified in Section 3 of this regulation, are prohibited from operating in a northbound direction on that portion of Interstate Highway 75 and 71 (I-75 and I-71) in Kenton County from the junction of I-75 and I-71 and Interstate Highway 275 (I-275) to the Ohio state line located on the I-75 Brent-Spence Bridge, a distance of seven and one-tenth (7.1) miles.

Section 3. Exceptions. Those truck tractor-mobile home combinations, truck tractor-semitrailer combinations, and truck tractor-semitrailer-trailer combinations having local trips in that portion of the Cincinnati-Northern Kentucky urbanized area located within the perimeter of I-275 or within a two (2) mile arc of I-275 on the northern side of I-275 between U.S. 22 and U.S. 27 may travel upon the restricted-use section of I-75 and I-71 northbound for the purpose of such local trips. Such a vehicle operator shall have in his possession a bill of lading, manifest or other proof showing the necessity for the local trip within the excepted area. Such proof is subject to inspection by Transportation Cabinet Vehicle Enforcement Officers and other local and state law enforcement officers. (13 Ky.R. 602; eff. 11-11-86; Am. 1258; eff. 2-10-87; 1908; ef 6-9-87.)

603 KAR 5:210. Extended weight coal haul ro system.

RELATES TO: KRS 177.9771, 189.230
PURSUANT TO: KRS 177.9771(10)
NECESSITY AND FUNCTION: KRS 177.9771(2 requires the Secretary of Transportation t certify those public highways which meet certai criteria as the extended weight coal haul roa system. KRS 177.9771(9) requires the Secretar of Transportation to meet with certain loca governing bodies and give consideration to thei concerns before adding to or deleting from th extended weight coal haul road system. Thi regulation identifies the extended weight coa haul road system and establishes procedures t be followed by local governing bodies requestin consideration be given to their concerns. The Transportation Cabinet will promulgate a separate administrative regulation pursuant t KRS 177.9771(10) and 189.230 regarding bridge weight limits.

Section 1. The following terms when used in the regulation shall have the following meanings:
(1) "Local governing body" means the fiscal court of any county, the city council or commission of a city of the first through fourth classes, or the council of an urban county government.
(2) "KY" means a state numbered highway maintained by the Kentucky Department of Highways.
(3) "US" means a United States numbered highway maintained by the Kentucky Department of Highways.
(4) "I" means an interstate and defense highway maintained by the Kentucky Department of Highways.
(5) "CR" means a public highway, road, or street not maintained by the Kentucky Department of Highways.
(6) "LENGTH" means the length of a road segment in miles.
(7) "FROM" means the beginning milepoint and terminus of a road segment.
(8) "TO" means the ending milepoint and terminus of a road.
(9) "LN" means line.
(10) "RD" means road.
(11) "CO" means county.

Section 2. Resolutions of local governing bodies issued pursuant to KRS 177.9771(9) making recommendations to the Secretary of Transportation shall be submitted to: Secretary of Transportation, Transportation Cabinet, State Office Building, Frankfort, Kentucky 40622. The resolution must set forth a specific description of the road or road segments under consideration. The resolution must further set forth with specificity those conditions which give rise to inherent and definite hazards or create special conditions which the Secretary of the Transportation Cabinet needs to consider.

Section 3. The following highways, or portions thereof, are certified as meeting the criteria of and are hereby designated as the extended weight coal haul road system:

Appendix B

Highway Routes for Shipment of Radioactive Materials (Maryland)

Maryland Department of Transportation

State Highway Administration
Baltimore, Maryland

Bureau of Highway Maintenance

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS

CORRIDOR COMPARISON STUDY

I-95 vs US 301

DECEMBER, 1981

PREFERRED HIGHWAY ROUTES

FOR

LARGE QUANTITY SHIPMENTS

RADIOACTIVE MATERIALS

MARYLAND DEPARTMENT OF TRANSPORTATION

DECEMBER 1981

APPENDIX

EXHIBIT

TABLE OF CONTENTS

INTRODUCTION

On January 19, 1981 the U.S. Department of Transportation issued final regulations for the routing of radioactive materials by highway.

On February 26, 1981 Governor Harry Hughes designated the Maryland Department of Transportation as the lead agency in preparing a highway routing plan.

A Core Group was established in the Spring of 1981 with representatives from the following agencies:

Department of Natural Resources
Department of Health & Mental Hygiene
Department of Public Safety & Correctional Services
  including Maryland State Police
State Fire Marshall's Office
Civil Defense & Disaster Preparedness Agency
Department of Transportation which includes:
  State Highway Administration
  Maryland Port Administration
  Toll Facilities Administration

PURPOSE

The purpose of the Core Group was to devise an acceptable highway routing plan for the shipment of radioactive materials. The implementation of the plan is to be effective February 1, 1982.

Using the "Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials" published by the US DOT Research and Special Programs Administration in June 1981, the Core Group studied available routes in Maryland including impact on adjacent States.

In most instances the Interstate Highway System was the best, if not only, route to be considered. There were no suitable alternate routes to I-83 in Baltimore County, I-70 between Baltimore City and Hancock or I-81 in Washington County.

As a result the Interstate Highway System with the exception of the sections through Baltimore City (I-83 Jones Falls Expressway, I-95 inside the Baltimore Beltway), I-295 inside the Capital Beltway and I-95 between the State of Delaware and the Commonwealth of Virginia is being recommended as the preferred highway routes.

Because of the large urban areas of Baltimore and Washington, a study was made to determine if US 301 would be preferred over I-95. The "Guidelines" previously mentioned were used and it was established that both Primary and Secondary Comparison Factors indicated that US 301 would be the preferred route. However, I-95 still must be considered because of other connecting interstate highways.

[illegible] has been made with adjacent [illegible] at a federally sponsored workshop in Columbia, South Carolina in September 1981 and by mail in October 1981.

The Commonwealth of Virginia has supported the use of US 301, as it has been the approved route for years, under the old standards.

The Commonwealth of Pennsylvania has not made a study for these routes, but they stated they would give consideration to their use.

The State of Delaware appears to support the use of US 301, but they have a problem area and their study is not complete.

No reply has been received from the State of West Virginia regarding the use of US 48.

RECOMMENDATION

The Core Group recommends the following routes be designated as the Preferred Highway Routes for the Shipment of Radioactive Materials.

INTERSTATE HIGHWAYS

I-70	Baltimore Beltway (I-695) to Pennsylvania State Line (north of Hancock) - 72.5 miles
I-81	Pennsylvania State Line to West Virginia State Line - 12.1 miles
I-83	Baltimore Beltway (I-695) to Pennsylvania State Line - 23.3 miles
I-270	Frederick Freeway (I-70) to Capital Beltway (I-495) - 32.8 miles
I-270Y	Capital Beltway (I-495) to I-270 - 2.0 miles

I-495 (I-95 (Capital Beltway)	Virginia State Line (Cabin John) to Virginia State Line (Alexandria) - 42.2 miles
I-695 (MD 695*	Baltimore Beltway via Key Bridge - 24.2 miles

*Not Interstate

OTHER STATE HIGHWAYS

US 48	I-70 (Hancock) to West Virginia State Line - 86.5 miles
US 301	Delaware State Line to Virginia State Line via William Preston Lane and Nice Memorial Bridges - 123.31 miles
J.F.Kennedy Memorial Highway	Delaware State Line via JFKMH, plus, I-95 (I-695 west of Baltimore City or MD 695 via Key Bridge), I-95 to Capital Beltway and I-95 or I-495 to Virginia State Line - 111.7 to 119.3 miles

U.S. 40 to 48

U.S. 50 from MD RT. 3 to I-95 ?

The procedure used in this study was based on the "Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials" published by the US Department of Transportation, Research and Special Programs Administration, Materials Transportation Bureau, June 1981.

The States are not required to use the "Guidelines" if they have their own procedures that will enable them to make "an equivalent routing analysis which adequately considers overall risk to the public."

The figures developed are not a true risk analysis because actual risk figures were not developed but for comparative purposes only. Factors that were common to the routes being considered were not included.

ROUTE COMPARISON FACTORS

Risk factors were divided into two (2) categories: Primary and Secondary.

Primary Risk Factors

Normal Radiation Exposure

Although a shipment may meet DOT regulations, safe levels of radiation still result in exposure of people along the route. The number of people subject to such exposure could vary with the route.

The radiation dose is figured by considering the persons along the route, in other vehicles, truck crew and at truck stops.

The principal difference affecting public health risks are frequency of severe transportation accidents and the number of people that could be affected.

Population was the major consideration using a ten and twenty mile wide band and applying "Health Consequences Band Multipliers."

Economic Risk from Accidents

The affect of a severe accident will result in the contamination of various types of land uses along considered routes, and include decontamination costs as well.

The land use in the two previously mentioned bands were identified and "Economic Consequences Multipliers" were applied.

Secondary Risk Factors

Emergency Response

The effectiveness of emergency response factors are manpower, timing, planning, equipment, mobilization of police, technical personnel and cleanup.

An overall factor has been determined for each land development type such as city, town, rural and industrial, etc.

Evacuation

Factors contributing to an effective evacuation include type of area to be evacuated, means of egress, planning, communications, large public and private facilities.

An overall factor has been determined for each land development type such as city, industrial, rural, etc.

Certain areas have sufficient economic or public safety importance to require special consideration. Hospitals, prisons, schools, churches, etc. are some of the facilities considered. The number of each of the special facilities is determined and a factor is applied to value established.

Traffic Fatalities and Injuries

Rates expressed in fatalities and injuries per vehicle mile are applied in this comparison analysis.

US Department
of Transportation

Research and
Special Programs
Administration

8 MAR 1982

Mr. Lowell K. Bridwell
Secretary
Maryland Department of Transportation
P. O. Box 8755
Baltimore-Washington International Airport
Maryland 21240-0755

Dear Mr. Bridwell:

Thank you for your letter of January 14, 1982 and the Maryland routing plan for nuclear materials which was enclosed. I would like to congratulate you and your staff on the organization of this task in the State of Maryland and the expeditious manner in which the routing plan was developed.

Your letter requests our approval of the routes selected by the State. The recent nuclear routing regulations promulgated by the Department do not entail our approval of State routing plans. Generally speaking, the regulations establish a framework by which States may designate additions to, or alternatives from, the Interstate highway system. Although we do encourage the States to review routes within their jurisdiction, we do not require the States to designate routes. Consequently, an advance approval process for those routes which are designated at the State-level and which are supported by a site-specific State routing analysis would serve no useful purpose unless a dispute arises.

A formal method for obtaining an advisory review of State actions, such as route plans, does exist in our inconsistency ruling procedures (49 CFR Part 107 Subpart C). If a serious dispute arises in comments received from county governments or from other affected parties, it may serve a purpose to mediate the matter. In the decision process you have documented, we see no indication that a substantial unresolved dispute exists.

Our primary concern for State route designation is that the criteria established by DOT are followed; i.e., the routes are designated by the appropriate State agency, a safety analysis (such as our DOT Guidelines) is performed showing the relative safety of the chosen route, and that appropriate coordination with adjoining States and affected local governments is pursued. I can say that it appears that the Maryland routing plan has thus far fulfilled those requirements.

If you have any further questions on this matter please contact me.

Sincerely,

cc: Jerry Day

L. D. Santman
Director
Materials Transportation Bureau

Committee
Mail Case

October 20, 1971

Mr. W.H. Aaroe
West Virginia Department of Health
Industrial Hygiene Division
151 Eleventh Avenue
South Charleston, West Virginia 25303

Dear Mr. Aaroe:

As a result of a regulation established by the US Department of Transportation regarding the shipment of radioactive materials, routing and driver training requirements, the Maryland Department of Transportation has initiated a study group to designate preferred routes in Maryland.

In Maryland, for the most part, we have designated the interstate system as our preferred route. However, since there are no interstate routes west of Hancock, we have designated US 40 as the preferred route.

We would appreciate you giving favorable consideration to the continuation of this designation in West Virginia. We would also welcome any comments or suggestions regarding this route.

Very truly yours,

Pierce E. Cody, III
Chief, Bureau of Highway Maintenance

PEC/dml

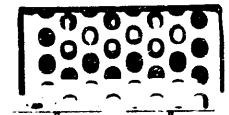
cc: Mr. F.L. Dewberry
Mr. J.H. Day

STATE HIGHWAY ADMINISTRATION

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I-95 VS US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
PRIMARY and SECONDARY RISK FACTORS

	1	2	3	4	5
			TOTAL	NORMALIZED VALUES	
PRIMARY RISKS FACTORS	I-95	US 301	FACTOR VALUES	I-95	US 301
NORMAL RADIATION EXPOSURE	2.5	2.2	4.7	0.53	0.47
PUBLIC HEALTH RISKS	35.73	8.95	44.68	0.80	0.20
ECONOMIC RISKS	6.906	9.691	16.597	0.42	0.58
TOTAL FIGURE OF MERIT				1.75	1.25
SECONDARY RISKS FACTORS					
EMERGENCY RESPONSE CAP	9.1	10.96	20.06	0.45	0.55
EVACATION	15.42	12.24	27.66	0.56	0.44
LOCATION OF SPECIAL FACILITIES	4140.0	630.0	4770.0	0.87	0.13
TRAFFIC FATALITIES	209.0	787.7	1082.7	0.19	0.81
TOTAL FIGURE OF MERIT				2.07	1.93

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I 95 VS US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
ROUTE DESCRIPTION I-95



SECTION	LOCATION	No. OF 12 FOOT LANES	MEDIAN WIDTH (FT)	AADT % TRUCKS NUMBER	TRI ANNUAL NO. OF TRUCK DEATHS	ACCIDENT RATE /100 MIL. VEH. MILES	ACCIDENT RATE /1000 SHIPMENTS	POPULATION 0-3 MILES	POPULATION 3-6 MILES
4	WOODROW WILSON BRIDGE	6	4	95700					
	W.W. BRIDGE TO I-495	8	50	11 %					
				10527	10	129.76	0.05	579261	509164
3	I-495 to MD 175	8	100+	63600					
	MD175 to SULPHUR SPRING RD	8	50	17 %					
	SULPHUR SP. RD to I-695	8	300	10812	4	52.96	0.01	279968	207525
2	I695/I-95 to ANNE ARUNDEL CO LINE	6	25						
	AA Co LINE to MD10	4-6	50						
	MD 10 to EAST of CURTIS CREEK BRIDGE	2	0						
	CURTIS CREEK BRIDGE to KEY BRIDGE	4	30	44600					
	KEY BRIDGE	4	2	10 %					
	KEY BRIDGE to MD20	4	30						
	MD20 to I95/I695	4	90	4460	0	126.89	0.03	389085	423271
1	I-695 to SUSQUEHANNA RIVER BRIDGE	6	32	46100					
	SUSQUEHANNA RIVER BRIDGE	6	4	16 %					
	SUSQUEHANNA RIVER BRIDGE to DELAWARE STATE LINE	6	52	7376	4	81.95	0.01	268815	95858

EXHIBIT 11

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I-95 vs US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
ROUTE DESCRIPTION US 301

SECTION	LOCATION	NO. OF 12 FOOT LANES	MEDIAN WIDTH (FT)	AADT % TRUCKS NUMBER	TRI-ANNUAL NO. OF TRUCK DEATHS	ACCIDENT RATE / 100 MIL. VEH MILES	ACCIDENT RATE / 1000 SHIPMENTS	POPULATION 0-3 MILES	POPULATION 3-6 MILES
4	GOV. NICE MEM. BRIDGE	2	0	18800					
	GOV. NICE BRIDGE to CHARLES/PR. GEO. CO. LINE	4	50	15%					
				2820	4	225.26	0.06	39067	10253
3	CHARLES/PR. GEO. CO. LINE to MD 5	4	50	21300					
	MD 5 to TRUMPS MILL RD.	4	75	15%					
	TRUMPS MILL RD to MD 2M	4	31						
	MD 2M to US 50/301	4	165	3195	5	170.07	0.09	68331	76096
2	US 50 to MD 70	4	30	32300					
	MD 70 to SEVERN RIVER BRIDGE	4	10						
	SEVERN RIVER BRIDGE	4	4						
	SEVERN RIVER BRIDGE to EAST OF MD 2	4	20	10%					
	EAST OF MD 2 to W.P. LANE MEM. BRIDGE	6	20						
	W.P. LANE MEM. BRIDGE	5	300+						
				3230	4	190.29	0.03	105655	51880
1	W.P. LANE MEM. BRIDGE to MD 8	4	70	12250					
	MD 8 to MD 18-B (WEST of KENT NARROWS)	4	50	10%					
	MD 18-B to KENT NARROWS	4	18						
	KENT NARROWS to DELAWARE STATE LINE	4	60						
				1225	9	171.91	0.05	217359	8917

EXHIBIT III

where,

D = normal radiation exposure comparison factor

P = average population density along the route (people per sq. mi.)

L = length of route (miles)

v = average speed of vehicles on the route (mph)

C_1 is a constant = 6.7×10^{-5}

T = average traffic count on the route (vehicles/hr)

C_2 = conversion factor determined from Table 3.2-1

C_3 = conversion factor determined from Table 3.2-1

These doses can be combined into a single comparison factor given by the following expression:

$$D = \frac{PL}{v}C_1 + \frac{LT}{2}C_2 + \frac{LT}{3}C_3 + \frac{L}{v}$$

TABLE 3.2-1. Conversion Factors for Use in Estimating Routine Radiation Exposure Factor

Distance Between Opposing Traffic Lanes (ft)	C_2	Vehicle Separation Distance V (ft)	C_3
10	1.9×10^{-9}	10	1.8×10^{-5}
20	9.5×10^{-10}	50	1.6×10^{-5}
30	6.0×10^{-10}	100	1.5×10^{-5}
40	4.4×10^{-10}	200	1.3×10^{-5}
50	3.7×10^{-10}	300	1.0×10^{-5}
60	2.9×10^{-10}	400	8.6×10^{-6}
70	2.5×10^{-10}	500	7.3×10^{-6}
80	2.2×10^{-10}	600	6.0×10^{-6}
90	1.9×10^{-10}	700	5.0×10^{-6}
100	1.6×10^{-10}	800	4.0×10^{-6}
150	1.0×10^{-10}	900	3.3×10^{-6}
200	7.4×10^{-11}	1000	3.0×10^{-6}
300	4.0×10^{-11}	1200	1.3×10^{-6}

Ref: Guidelines for Selecting Preferred Highway Routes for Large Quantity Shipments of Radioactive Materials - June 1981.

EXHIBIT IV

WORKSHEET ___ ROUTE I-95 Sheet 1 of 1

NORMAL TRANSPORT EXPOSURE

$$D = \frac{P L}{v} C_1 + \frac{L}{v^2} C_2 + \frac{L}{v^3} C_3 + \frac{L}{v}$$

Segment 1

P = 268,815 ÷ 274.92 = 978/sq. mi
L = 45.82 Miles
v = 55 MPH
I = 46,100/24 = 1921 veh/hr

C_1 = 6.7×10^{-5}
Avg Dist Opposing Lanes = 67'
C_2 (Table 3.2-1) = 2.5×10^{-10}
Avg Veh Separation Dist = $(55/1921)(5280) = 151$
C_3 (Table 3.2-1) = 1.8×10^{-5}

D_1 = 0.9

Segment 2

P = 384,035 ÷ 146.76 = 2617/sq. mi
L = 24.46
v = 55 MPH
I = 44,600/24 = 1858 veh/hr

C_1 = 6.7×10^{-5}
Avg Dist Opposing Lanes = 57'
C_2 (Table 3.2-1) = 2.9×10^{-10}
Avg Veh Separation Dist = $(55/1858)(5280) = 156$
C_3 (Table 3.2-1) = 1.3×10^{-5}

D_2 = 0.5

Segment 3

P = 279,968 ÷ 134.9 = 2083/sq. mi
L = 22.40
v = 55 MPH
I = 63,600/24 = 2650 veh/hr

C_1 = 6.7×10^{-5}
Avg Dist Opposing Lanes = 223'
C_2 (Table 3.2-1) = 7.4×10^{-11}
Avg Veh Separation Dist = $(55/2650)(5280) = 110$
C_3 (Table 3.2-1) = 1.5×10^{-5}

D_3 = 0.5

Segment 4

P = 379,961 ÷ 159.59 = 2382/sq. mi
L = 26.59
v = 55 MPH
I = 95,700/24 = 3988 veh/hr.

C_1 = 6.7×10^{-5}
Avg Dist Opposing Lanes = 80'
C_2 (Table 3.2-1) = 2.2×10^{-10}
Avg Veh Separation Dist = $(55/3988)(5280) = 73$
C_3 (Table 3.2-1) = 1.6×10^{-5}

D_4 = 0.6

ROUTE TOTAL $D_1 + D_2 + D_3 + D_4$ = 2.5

EXHIBIT V

WORKSHEET ___ ROUTE US 301 Sheet 1 of 1

NORMAL TRANSPORT EXPOSURE

$$D = \frac{Pk}{v} C_1 + \frac{kP}{v^2} C_2 + \frac{kP}{v^3} C_3 + \frac{k}{v}$$

Segment 1

P = 21,759 ÷ 154.42 = 141/sq.mi
L = 51.63 Miles
v = 55 MPH
T = 12,250/24 = 510 veh/hr.

C_1 = 6.7×10^{-3}
Avg Dist Opposing Lanes = 122'
C_2 (Table 3.2-1) = 1.6×10^{-10}
Avg Veh Separation Dist = $(55/510)(5280) = 569$
C_3 (Table 3.2-1) = 6.0×10^{-6}

D_1 = 0.9

Segment 2

P = 105,655/143.88 = 734/sq.mi
L = 21.33 Miles
v = 55 MPH
T = 32900/24 = 1371 veh/hr

C_1 = 6.7×10^{-3}
Avg Dist Opposing Lanes = 35'
C_2 (Table 3.2-1) = 4.4×10^{-10}
Avg Veh Separation Dist = $(55/1371)(5280) = 212$
C_3 (Table 3.2-1) = 1.3×10^{-5}

D_2 = 0.4

Segment 3

P = 68,331 ÷ 127.98 = 534/sq mi
L = 23.98 Miles
v = 55 MPH
T = 24,300/24 = 1013 veh/hr

C_1 = 6.7×10^{-3}
Avg Dist Opposing Lanes = 105'
C_2 (Table 3.2-1) = 1.6×10^{-10}
Avg Veh Separation Dist = $(55/1013)(5280) = 287$
C_3 (Table 3.2-1) = 1.0×10^{-5}

D_3 = 0.4

Segment 4

P = 34,067 ÷ 309.78 = 110/sq.mi
L = 26.57 Miles
v = 55 MPH
T = 18,800/24 = 783 veh/hr

C_1 = 6.7×10^{-3}
Avg Dist Opposing Lanes = 43'
C_2 (Table 3.2-1) = 4.4×10^{-10}
Avg Veh Separation Dist = $(55/783)(5280) = 371$
C_3 (Table 3.2-1) = 8.6×10^{-6}

D_4 = 0.5

ROUTE TOTAL $D_1 + D_2 + D_3 + D_4$ = 2.2

EXHIBIT VI

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I 95 VS US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
PUBLIC HEALTH RISK

	SEGMENT	0 to 3 MILES POPULATION (000)	MULTIPLIER	TOTAL	3 to 6 MILES POPULATION (000)	MULTIPLIER	TOTAL
I-95	1	268	.75	201	95	.25	24
	2	384	.75	288	422	.25	106
	3	279	.75	209	207	.25	52
	4	379	.75	284	503	.25	126
US 301	1	21	.75	16	9	.25	2
	2	105	.75	79	54	.25	14
	3	68	.75	51	76	.25	19
	4	34	.75	26	10	.25	3

SUMMARY

SEGMENT	0-3 MILES	3-6 MILES	PUBLIC HEALTH CONSEQ FACTOR	ACCID. PROB RATE	SEGMENT HEALTH RISK
1	201	24	225	.04	9.00
2	288	106	394	.03	11.82
3	209	52	261	.01	2.61
4	284	126	410	.03	12.30
TOTAL	I-95				35.73
1	16	2	18	.09	1.62
2	79	14	93	.03	2.79
3	51	19	70	.04	2.80
4	26	3	29	.06	1.74
TOTAL	US 301				8.95

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I-95 vs US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
ECONOMIC RISK

	LAND USE TYPE	SEGMENT 1 AREA	SEGMENT 1 WEIGHT	SEGMENT 1 WTD TOTAL	SEGMENT 2 AREA	SEGMENT 2 WEIGHT	SEGMENT 2 WTD TOTAL	SEGMENT 3 AREA	SEGMENT 3 WEIGHT	SEGMENT 3 WDT TOTAL	SEGMENT 4 AREA	SEGMENT 4 WEIGHT	SEGMENT 4 WDT TOTAL
I-95	0 to 5 Mile Band												
	FARMLAND	300	.01	3.00	25	.01	.25	100	.01	1.00	60	.01	.60
	SINGLE FAMILY RESIDENTIAL	25	.10	2.50	10	.10	1.00	10	.10	1.00	25	.10	2.50
	MULTI-FAMILY RESIDENTIAL	5	2.00	10.00	15	2.00	30.00	5	2.00	10.00	45	2.00	90.00
	COMMERICIAL	90	.15	13.50	175	.15	26.25	20	.15	3.00	110	.15	16.50
	PARKS	25	.03	0.75	10	.03	0.30	5	.03	.15	5	.03	.15
	PUBLIC AREAS	15	.05	0.75	5	.05	0.25	80	.05	4.00	25	.05	1.25
	TOTALS			30.50			58.05			19.15			111.00
	5 to 10 MILE BAND												
	FARMLAND	350	.001	.35	40	.001	.04	150	.001	.15	80	.001	.08
	SINGLE FAMILY RESIDENTIAL	10	.04	.40	20	.04	.80	5	.04	.20	25	.04	1.00
	MULTI-FAMILY RESIDENTIAL	5	.20	1.00	30	.20	6.00	5	.20	1.00	45	.20	9.00
	COMMERICAL	40	.01	.40	150	.01	1.50	20	.01	.20	85	.01	.85
	PARKS	30	.02	.60	—	—	—	5	.02	.10	5	.02	.10
	PUBLIC AREAS	25	.05	1.25	—	—	—	35	.05	1.75	80	.05	1.50
	TOTALS			4.00			8.34			3.40			12.53
US301	0 to 5 MILE BAND												
	FARMLAND	380	.01	3.80	150	.01	1.50	185	.01	1.85	185	.01	1.85
	SINGLE-FAMILY RESIDENTAL	50	.10	5.00	30	.10	3.00	20	.10	2.00	25	.10	2.50
	MULTI-FAMILY RESIDENTAL	20	2.00	40.00	10	2.00	20.00	15	2.00	30.00	10	2.00	20.00
	COMMERICAL	20	.15	3.00	10	.15	1.50	5	.15	0.75	15	.15	2.25
	PARKS	10	.03	.30	5	.03	0.15	5	.03	0.15	20	.03	0.60
	PUBLIC AREAS	40	.05	2.00	6	.05	0.30	10	.05	0.50	15	.05	0.75
	TOTALS			54.10			26.90			35.25			27.95
	5 to 10 MILE BAND												
	FARMLAND	420	.001	0.42	120	.001	0.12	185	.001	0.185	205	.001	0.205
	SINGLE FAMILY RESIDENTAL	15	.04	0.60	40	.04	1.60	15	.04	0.60	30	.04	1.20
	MULTI-FAMILY RESIDENTAL	5	.20	1.00	10	.20	2.00	10	.20	2.00	10	.20	2.00
	COMMERICAL	30	.01	0.30	20	.01	0.20	10	.01	0.10	10	.01	0.10
	PARKS	5	.02	0.10	10	.02	0.20	5	.02	0.10	10	.02	0.20
	PUBLIC AREAS	45	.05	2.25	10	.05	0.50	15	.05	0.75	5	.05	0.25
	TOTAL			4.67			4.62			3.735			3.955

EXHIBIT VIII

HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I-95 VS US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
EMERGENCY RESPONSE and EVACUATION

ROUTE	LAND DEVELOPMENT TYPE	SEGMENT 1	SEGMENT 2	SEGMENT 3	SEGMENT 4	TOTAL	ROUTE FRACTION	WEIGHT	WEIGHT TOTAL
	EMERGENCY RESPONSE								
I-95	CITY	50	35	30	50	165	.14	7	.98
	TOWN	50	5	70	40	165	.14	10	1.40
	RURAL	800	0	100	80	980	.40	12	4.80
	INDUSTRIAL	60	200	20	100	380	.32	6	1.92
	TOTAL					1190			9.10
US 301	CITY	25	5	10	15	55	.04	7	0.28
	TOWN	25	5	30	15	75	.06	10	0.60
	RURAL	950	175	175	180	980	.79	12	9.48
	INDUSTRIAL	20	25	25	60	130	.10	6	0.60
	TOTAL					1240			10.96
	EVACUATION								
I-95	RURAL	300	0	100	80	480	.40	11	4.40
	SUBURBAN	60	5	70	40	165	.14	13	1.82
	URBAN	50	35	30	50	165	.14	28	3.92
	COMMERICAL	80	100	10	50	190	.16	15	2.40
	INDUSTRIAL	30	100	10	50	190	.16	18	2.88
	TOTAL					1190			15.42
US 301	RURAL	950	175	175	180	980	.79	11	8.69
	SUBURBAN	25	5	30	15	75	.06	13	0.78
	URBAN	25	5	10	15	55	.04	28	1.12
	COMMERICAL	10	12	12	30	64	.05	15	0.75
	INDUSTRIAL	10	13	13	30	66	.05	18	0.90
	TOTAL					1240			12.24

EXHIBIT 1X

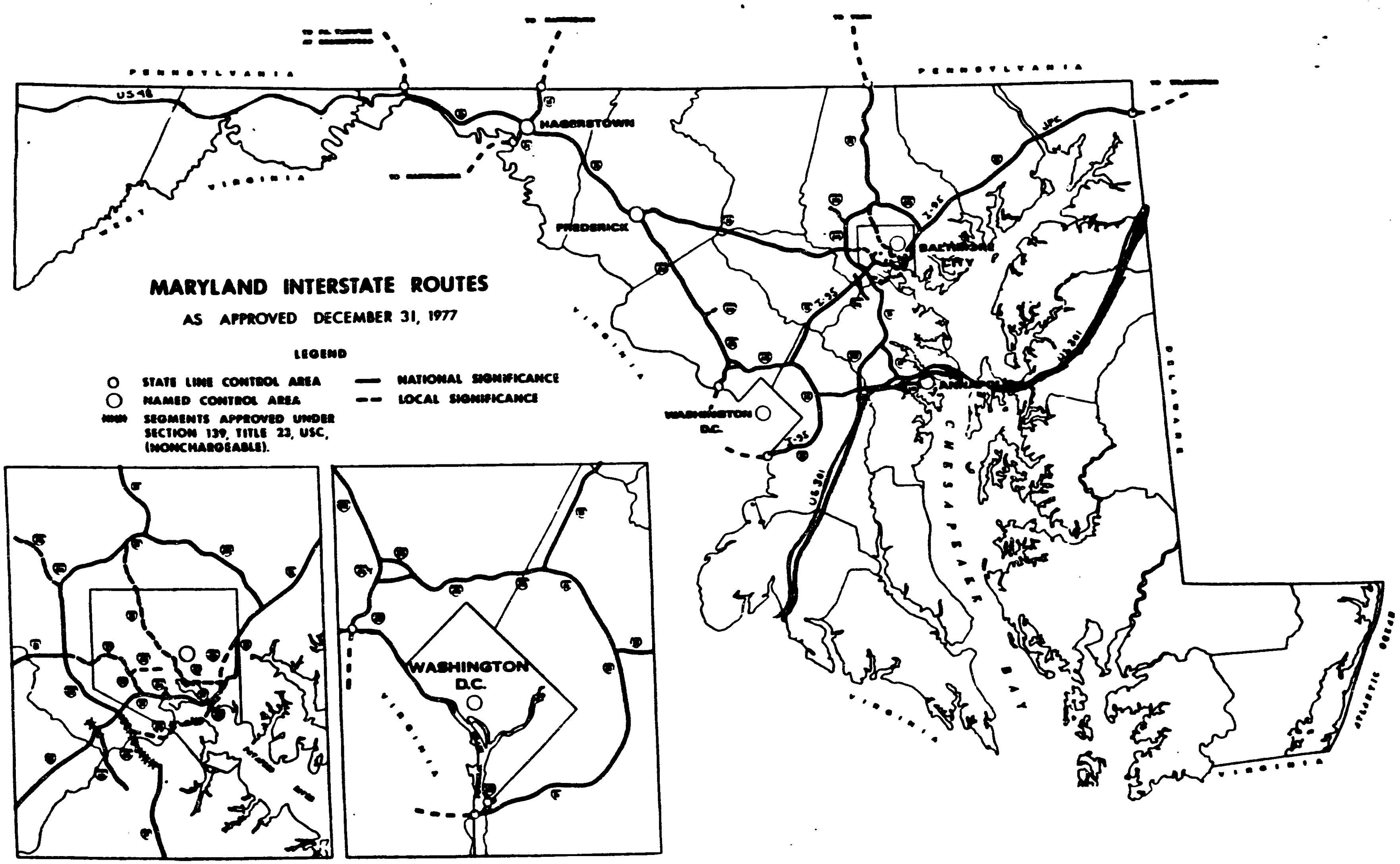
HIGHWAY ROUTES FOR SHIPMENT OF RADIOACTIVE MATERIALS
CORRIDOR COMPARISON STUDY - I-95 VS US 301
DELAWARE STATE LINE TO VIRGINIA STATE LINE
TRAFFIC FATALITIES and INJURIES (100 MILLION TRUCK MILES)

	ROUTE	SEGMENT	1 ACCIDENT RATE	2 SEGMENT MILEAGE	3 TOTAL	4	5
1	I 95	1	1.86	45.82	85.2		
2		2	0.0	24.46	0.0		
3		3	1.47	22.10	32.9		
4		4	3.23	26.59	85.9		
5							
6		TOTAL COMPARISON FACTOR			204.0		
7							
8							
9							
10							
11	US 301	1	10.00	51.63	516.30		
12		2	5.08	21.33	108.40		
13		3	5.33	23.98	127.80		
14		4	4.75	26.57	126.20		
15							
1		TOTAL COMPARISON FACTOR			878.70		
17							

SPECIAL FACILITIES

	ROUTE	TYPE	1 No. OF FACILITIES	2 WEIGHTING FACTOR	TOTAL	4	5
19							
20							
21							
22	I-95	SCHOOLS	416	9	3744		
23		HOSPITALS	33	12	396		
24							
25							
26							
27							
28							
29							
30		TOTAL			4140		
31							
32	US 301	SCHOOLS	62	9	558		
33		HOSPITALS	6	12	72		
34							
3							
36							
7							
38							
39							

EXHIBIT X


MARYLAND INTERSTATE ROUTES
AS APPROVED DECEMBER 31, 1977
LEGEND
STATE LINE CONTROL AREA
NAMED CONTROL AREA
SEGMENTS APPROVED UNDER SECTION 139, TITLE 23, USC, (NONCHARGEABLE).
NATIONAL SIGNIFICANCE
LOCAL SIGNIFICANCE
PENNSYLVANIA
WEST VIRGINIA
VIRGINIA
DELAWARE
ATLANTIC OCEAN
CHESAPEAKE BAY
HAGERSTOWN
FREDERICK
BALTIMORE CITY
WASHINGTON D.C.
US 40
US 301
WASHINGTON D.C.
VIRGINIA

Committee
Md. Co

October 29, 1981

Mr. C.W. Ramsey
State Office of Emergency and
Energy Services
7700 Midlothian Turnpike
Richmond, Virginia 23235

Dear Mr. Ramsey:

As a result of a regulation established by the US Department of Transportation regarding the shipment of radioactive materials, routing and driver training requirements, the Maryland Department of Transportation has initiated a study group to designate preferred routes in Maryland.

For the most part, the interstate system has been designated as the preferred route as it is the only viable route available. However, there is an alternate route available in the I-95 corridor. Utilizing the guidelines recommended by the US Department of Transportation, US Route 301, from the Delaware State Line west of Middletown to the Virginia State Line at the US Naval Ordnance Laboratory, has been so designated.

The I-95 corridor must still be designated as a route as it connects to other designated routes. However, US 301 is the preferred route as a bypass to the urban areas of Baltimore, Washington and Northern Virginia.

As we discussed at the Workshop in Columbia, South Carolina in September, we would appreciate you giving favorable consideration to the continuation of this route in your State. We would also welcome any comments or suggestions concerning this route.

Very truly yours,

Pierce E. Cody, III
Chief, Bureau of Highway Maintenance

PEC/dal

cc: Mr. F.L. Dewberry
Mr. J.N. Day

COMMONWEALTH of VIRGINIA

State Office of Emergency and Energy Services

November 23, 1981

Mr. Pierce L. Cody, III
Chief, Bureau of Highway Maintenance
Maryland Department of Transportation
P. O. Box [illegible]
[illegible] North Calvert Street
Baltimore, Maryland 21203

Dear Mr. Cody:

In response to your letter to Mr. Ramsey of October 26, 1981 regarding the routing of hazardous radioactive materials, I find your alternate routing suggestion to be acceptable. There appears to be no reason why the [illegible] alternate route to the I-95 corridor should not be continued as previously determined and published under the Nuclear Regulatory Commission guidelines.

Mr. Ramsey has talked with Mr. Charles Price, Director of the Radiological Health Bureau of the State Department of Health, and both feel that it would be pointless to apply the new DOT routing guidelines to the US 301 alternate since it has been an approved alternate under the old system for some years and since, by traffic density and population statistics, it appears abundantly clear that US 301 in Virginia would be a much preferable route to the overburdened I-95 corridor between Fredericksburg, Virginia and Washington, D.C.

At this time there is extensive road construction on I-95 in Caroline County near where the suggested alternate routing and I-95 merge. The [illegible] of I-95 to four lanes, each direction, in the Caroline County to Richmond corridor, as well as new bridge construction at several points is anticipated to be complete by December 1, 1982. Highway Department sources indicate that significant volume restrictions on traffic will continue through 1982 [illegible] sixteen mile stretch of the Interstate congested beyond normally acceptable limits. While the traffic problems will be sporadic, and at times unpredictable, it appears that during construction on the I-95 corridor in that area will be minimally acceptable for any spent fuel shipments and consideration should be given to helping shippers and carriers to plan use of both primary and alternate routes at low traffic volume periods (midnight to seven a.m.) through fiscal year 1982.

RECEIVED

NOV

If we [illegible] be of any assistance in [illegible] designating further alternate routing, please feel free to [illegible] with [illegible] office at any time. Should you have particular questions concerning implementation of the new DOT guidelines, please call Chuck Ramsey in our Operations Division at area code (804) 3[illegible]-[illegible]. While we do not plan to use the guidelines on any primary or alternate route chosen previously under NRC criteria, we will be happy to work with Maryland on any changes that need to be made on new primary or alternate routes. Thank you for your work on these routing designations and for the continued cooperation between our two states on the matter of these sensitive shipments of radioactive fuel waste.

Sincerely,

H. Kit Anderson

HK[illegible]/CWR [illegible]

Committee
Md. Co

October 20, 1981

Mr. Stephen T. Golding
Chairman, Subcommittee on the Designation of
Alternate Routes for Radioactive Materials
Delaware Department of Transportation
Dover, Delaware 19901

Dear Mr. Golding:

As a result of a regulation established by the US Department of Transportation regarding the shipment of radioactive materials, routing and driver training requirements, the Maryland Department of Transportation has initiated a study group to designate preferred routes in Maryland.

For the most part, the interstate system has been designated as the preferred route as it is the only viable route available. However, there is an alternate route available in the I-95 corridor. Utilizing the guidelines recommended by the US Department of Transportation, US Route 301 from the Delaware State Line west of Middletown to the Virginia State Line at the US Naval Ordnance Laboratory has been so designated.

The I-95 corridor must still be designated as a route as it connects to other designated routes. However, US 301 is the preferred route as a bypass to the urban areas of Baltimore, Washington and Northern Virginia.

As we discussed at the Workshop in Columbia, South Carolina, we would appreciate you giving favorable consideration to the continuation of this route in Delaware. We would also welcome the opportunity to meet with you at your earliest convenience if you feel such a meeting would be beneficial.

Very truly yours,

Pierce E. Cody, III
Chief, Bureau of Highway Maintenance

PEC/dnl

cc: Mr. F.L. Dewberry

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
OFFICE OF THE
SECRETARY

December 1, 1981

Mr. Pierce E. Cody, III
Chief, Bureau of Highway Maintenance
Maryland Department of Transportation
P. O. Box 717
707 North Calvert Street
Baltimore, MD 21203

Dear Mr. Cody:

I am in receipt of your letter of October 29, 1981, designating U.S. Route 301 from the Maryland State Line, west of Middletown, to the Virginia State Line, as Maryland's alternate route for the transportation of large quantities of radioactive material. At the present time, we of the State of Delaware, are still reviewing the statistical data that has been accumulated to determine if there are feasible alternate routes that we might designate in addition to the Interstate.

Part of our consideration has been to review several possibilities for channeling such traffic from the Delaware Memorial Bridge to 301 Southbound to the Maryland Line. At this time we do know that there is a serious traffic accident situation at Money's Truck Stop, which is just east of the Maryland/Delaware Boundary which must be reviewed very carefully before any final decision can be made. Knowing that this route is designed to serve not only your state but the communities in Northern Virginia, as well as Washington, D.C., Delaware is giving your request our serious consideration.

As part of our consideration, the Delaware Subcommittee on Alternate Routing is requesting that you consider designating Maryland Route 50 from Route 301 to Salisbury as an alternate route for large quantities of radioactive material. Our request stems from a study that identifies no suitable roads within the State of Delaware that bypass the Town of Smyrna and the City of Dover that could accommodate such shipments. Additionally, if an accident were to take place along Delaware Route 13, the economic and health impacts would be tremendous upon the residents of the

RECEIVED

Delmarva Peninsula at these locations. Our feeling that Route 50 might be more suitable is based on the fact that there are alternative routes which the residents of the State of Maryland might use just as readily without the same type of impact that the closing of Route 13 would have on the State of Delaware.

I would, therefore, be interested in your reviewing this request and then contacting us about your State's feelings on this matter. To that end, I look forward to hearing from you once your people have had an opportunity to do a study on this request. I thank you for your consideration and look forward to working with you.

Sincerely,

Stephen T. Golding
Subcommittee Chairman

STG:h
cc:
Honorable W. J. O'Rourke

December 1[illegible], 1[illegible]1.

Mr. Stephen T. Golding
Chairman, Subcommittee on the Designation of
Alternate Routes for Radioactive Materials
Delaware Department of Transportation
Dover, Delaware 19[illegible]1

Dear Mr. Golding:

Thank you for your letter of December 1, 19[illegible]1, regarding the transportation of large quantities of radioactive material.

We appreciate your giving consideration to the use of US [illegible]1 as an alternate to the interstate system. It is too bad some problem areas, but from an overall view, US [illegible]1 did appear more favorable.

Virginia has also selected US [illegible]1 as a preferred route and they advise that it has been an approved alternate under the old system for years.

In regard to your request to designate US [illegible] from Salisbury to US [illegible]1, we have the following comments:

(1) We do not anticipate any major shipments of radioactive material from Salisbury as there are no known generators of radioactive waste, except possibly the hospital.

(2) Virginia has indicated to us that they would not permit shipments through the Chesapeake Bridge-Tunnel complex. This would negate any interstate shipments along the coast through Delaware, Maryland and Virginia.

(3) Any radioactive material from the Salisbury vicinity would be considered in the "guidelines" as "pick-up and delivery" and we would direct they be shipped via US [illegible]0. This would be the most direct route if the material was being shipped to a southern site and it would not result in too many additional miles of travel if a northern site were the destination.

(-) T- two major to-s of -a-brid- -- -ston would be involved but to a lesser extent t-an -over and -yr-a. The two narrow bridges at Vienna and Cambridge would have to be traveled, but hopefully we will be replacing bot- in the near future.

The Maryland State Highway Administration appreciates your cooperation in this venture.

Very truly yours,

Pierce T. Cody, III
Chief, Bureau of Highway Maintenance

P- -/- 1

cc: Mr. F.L. De-erry
Mr. J. -. Day

Committee
Md. Cars

October 20, 1971

Mr. Eugene Sajeski
Pennsylvania Department of Transportation
Hazardous Material Division
Transportation & Safety Building
Harrisburg, Pennsylvania 17120

Dear Mr. Sajeski:

As a result of a regulation established by the US Department of Transportation regarding the shipment of radioactive materials, routing and driver training requirements, the Maryland Department of Transportation has initiated a study group to designate preferred routes in Maryland.

For the most part, the interstate system has been designated as the preferred route. Thus, the interstate routes connecting Maryland with Pennsylvania have been so designated. The following routes would connect to the Pennsylvania interstate system:

I-83 south of York, Pennsylvania

I-81 north of Hagerstown, Maryland

I-70 north of Hancock, Maryland

We would appreciate you giving favorable consideration to the designation of these routes in Pennsylvania. We would welcome any comments you may have concerning these routes.

Very truly yours,

Pierce E. Cody, III
Chief, Bureau of Highway Maintenance

PEC/dal

cc: Mr. F.L. Dewberry
Mr. J.N. Day

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
HAZARDOUS SUBSTANCES TRANSPORTATION BOARD
215 Transportation and Safety Building
Harrisburg PA 17120
(717) 787 7445

November 9, 1981

Mr. Pierce E. Cody, III
Chief, Bureau of Highway Maintenance
Maryland Department of Transportation
State Highway Administration
P.O. Box 717/707 North Calvert Street
Baltimore,Maryland 21203

Dear Mr. Cody:

Thank you for your letter concerning the transportation of radioactive materials over designated highways.

To-day no study of the interstate system has been made due to their federal status, but will be given every consideration as they relate to Pennsylvania and Maryland. This would be I-81, I-83 and I-70.

Sincerely,

Eugene Sajeski

Eugene Sajeski, Chief
Hazardous Substances Division

Appendix C

Rules and Regulations Re: Control of Motor Vehicles (Tennessee)

RULEMAKING HEARING RULES

TENNESSEE PUBLIC SERVICE COMMISSION

DIVISION OF MOTOR CARRIERS

CHAPTER 1220-2-1

RULES AND REGULATIONS AS TO SUPERVISION AND CONTROL OF MOTOR VEHICLES AND MOTOR BUSES

NEW RULE

1220-2-1-.46 ROUTING OF HAZARDOUS MATERIAL VEHICLES IN KNOX COUNTY, TENNESSEE

No person shall drive or cause to be driven a motor vehicle carrying a placardable quantity of hazardous material as specified in Title 49 of the Code of Federal Regulations Parts 172.500 through 172.558 along or upon Interstate 40 or Interstate 275 in Knox County, Tennessee, between the intersection of said interstates with Interstate 640 on the west, north, or east. This prohibition shall not apply to the following:

(1) to motor vehicles which have shipments originating at or destined to the City of Knoxville and to service points on U. S. Highway 129 in Blount County as verified by appropriate shipping papers.

(2) to motor vehicles which have shipments to be interlined with other carriers or which have shipments transferred to other motor vehicles or aircraft of the same carrier at facilities located in the City of Knoxville or service points on U. S. Highway 129 in Blount County.

(3) to motor vehicles which need emergency repairs or warranty work performed at authorized dealers or repair facilities as may be verified by a physical inspection of the vehicle, by warranty papers in the vehicle, or by other means of verification used by the investigating officer.

Statutory authority: T.C.A. §§ 65-2-102(2) and 65-15-113.

Signature of the agency officer directly responsible for drafting these rules:

Donald L. Scholes
Donald L. Scholes
Assistant General Counsel

The roll-call vote by the TENNESSEE PUBLIC SERVICE COMMISSION on these rulemaking hearing rules was as follows:

	Aye	No	Abstain
CHAIRMAN FRANK D. COCHRAN	✓		
COMMISSIONER KEITH BISSELL	✓		
COMMISSIONER STEVE HEWLETT	✓		

I certify that this is an accurate and complete copy of rulemaking hearing rules lawfully promulgated and adopted by the Tennessee Public Service Commission on the 25th day of February, 1987.

Further, I certify that these rules are properly presented for filing, a notice of rulemaking hearing having been filed in the Department of State on the 31st day of July, 1986, and such notice of rulemaking hearing having been published in the August, 1986 issue of the Tennessee Administrative Register, and such rulemaking hearing having been conducted pursuant thereto on the 22nd day of September, 1986.

Donald L. Scholes
Donald L. Scholes
Assistant General Counsel

Subscribed and sworn to before me this 25th day of February, 1987.

Margaret R. Heath
Notary Public

My commission expires on the 17th day of February, 1991.

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

W. J. Michael Cody
Attorney General and Reporter

The rulemaking hearing rules set out herein were properly filed in the Department of State and will become effective on the 15th day of May, 1987.

Gentry Crowell
Secretary of State

By Joanne Dair

Signed this 31st day of March, 1987.

Appendix D

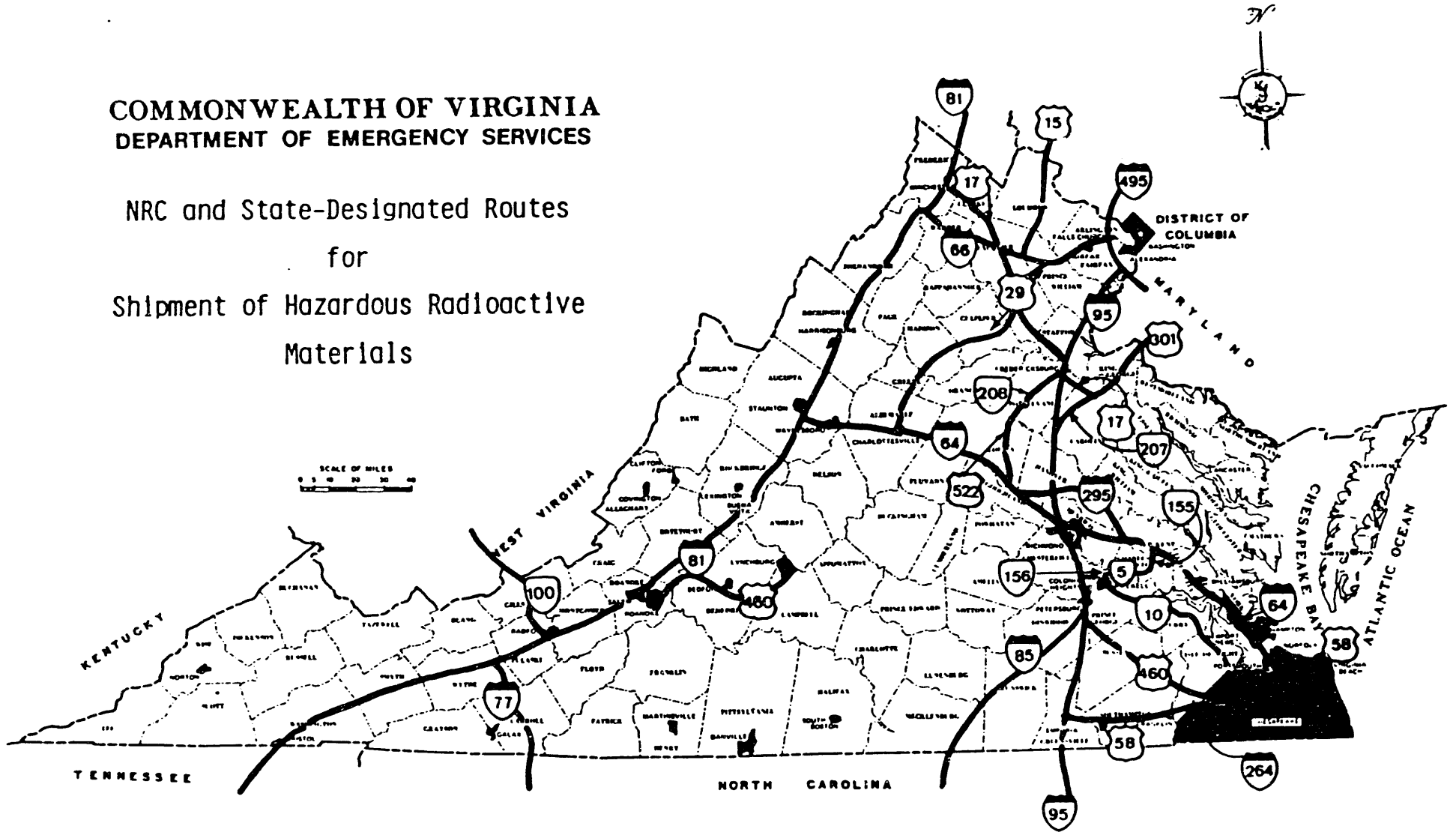
NRC and State-Designated Routes for Shipment of Hazardous Radioactive Materials (Virginia)

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF EMERGENCY SERVICES

NRC and State-Designated Routes

for

Shipment of Hazardous Radioactive Materials



DATE
FILMED
7/27/93
END