

State of California  
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 08-3

January 24, 2008

Agenda Item No.: 08-1-2

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WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2648-258, entitled "Development of a California-Specific Intermodal Freight Transport Model," has been submitted by the University of Delaware, in response to RFP No. 07-314;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

Proposal Number 2648-258 entitled "Development of a California-Specific Intermodal Freight Transport Model," submitted by the University of Delaware, for a total amount not to exceed \$199,937.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

Proposal Number 2648-258 entitled "Development of a California-Specific Intermodal Freight Transport Model," submitted by the University of Delaware, for a total amount not to exceed \$199,937.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed \$199,937.

I hereby certify that the above is a true and correct copy of Resolution 08-3, as adopted by the Air Resources Board.

/s/

Lori Andreoni, Clerk of the Board

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## ATTACHMENT A

### “Development of a California-Specific Intermodal Freight Transport Model”

#### Background

Air pollution from international trade and goods movement in California is a major public health concern on local, regional, and statewide levels. From the 2002 to 2020, the volume of international trade in California is projected to double. This will lead to significant increases in traffic and emissions associated with mobile equipment used to transport imported and exported goods through California’s ports and transportation networks, such as ocean-going vessels, trucks, and locomotives. To accommodate the growth in international trade through California’s ports, state and regional governments are planning a wide range of transportation infrastructure improvements to make goods movement more efficient. The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 (Proposition 1B) provides more than \$3 billion to improve goods movement infrastructure and reduce emissions from sources involved in goods movement. ARB will be responsible for allocating \$1 billion in bond funding to projects designed to generate immediate emissions reductions. In order to assess the impact of future infrastructure projects on emissions, a statewide freight model is required and should be developed based on a thorough understanding of how goods move through California’s highway and rail infrastructure.

#### Objective

The objective of this research project is to develop a California-specific intermodal freight transport model to describe the movement of goods into California’s ports and through California’s highway and rail systems.

#### Methods

This project will review existing freight models and apply a selected freight transport modeling system to describe the movement of imported and exported intermodal goods through California’s ports, highway and rail systems. The project will use publicly available data on commodity flows, truck and train movements, and emissions models.

#### Expected Results

This project is intended to result in a Geographic Information System (GIS)-compatible model to 1) quantify emissions (including criteria pollutants and greenhouse gases) from land-side and water-side freight transport alternatives, 2) evaluate tradeoffs among emissions, cost, and travel time for moving freight between two points, and 3) identify a multi-criteria optimization framework, by analyzing preferred routing and tradeoffs under existing and alternate transportation scenarios. This project will also result in selected and compiled datasets appropriate for using in California-specific freight transport modeling.

#### Significance to the Board

Improving the movement of goods in California is a very high priority for state government because the state’s economy and quality of life depend upon the efficient and safe delivery of goods to and from the state. Understanding the impact of planned transportation infrastructure projects on emissions is necessary to help identify new ways to reduce emissions associated with goods movement, and reduction of these

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emissions is essential to ensure protection of public health and to meet the state's greenhouse gas reduction target. In order to assess the impact of future infrastructure projects on emissions, a statewide freight model is required and should be developed based on a thorough understanding of how goods move through California's highway and rail infrastructure.

**Contractor:**  
University of Delaware

**Contract Period:**  
19 months

**Principal Investigator (PI):**  
Drs. James J. Corbett (University of Delaware) and James J. Winebrake (Rochester Institute of Technology)

**Contract Amount:**  
\$199,937

**Basis for Indirect Cost Rate:**  
While the University of Delaware has a higher normal overhead rate (53% - Organized Research On-Campus), they reduced it to the Delaware in-state rate of 38% to be very competitive. The Delaware in-state rate is provided to the contractor by the State of Delaware's Associate Treasure's Office for Financial Services.

**Past Experience with this Principal Investigator:**  
Dr. Corbett is an expert in freight transport and the environment, and Dr. Winebrake is an expert in transportation systems and optimization modeling.

**Prior Research Division Funding to the University of Delaware:**

Year	2007	2006	2005
Funding	\$47,954	\$0	\$0

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## BUDGET SUMMARY

University of Delaware

Development of a California-Specific Intermodal Freight Transport Model

### DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$ 41,521
2.	Subcontractors	\$113,700 <sup>1</sup>
3.	Equipment	\$ 0
4.	Travel and Subsistence	\$ 3,000
5.	Electronic Data Processing	\$ 0
6.	Reproduction/Publication	\$ 800
7.	Mail and Phone	\$ 800
8.	Supplies	\$ 1,500
9.	Analyses	\$ 0
10.	Miscellaneous	\$ 0
	Total Direct Costs	\$161,321

### INDIRECT COSTS

1.	Overhead	\$ 38,616
2.	General and Administrative Expenses	\$ 0
3.	Other Indirect Costs	\$ 0
4.	Fee or Profit	\$ 0
	Total Indirect Costs	\$38,616

**TOTAL PROJECT COSTS** **\$199,937**

**Commented [slf1]:** Note—subcontractors' budget summaries sum to \$108,694 = \$84,700 + \$11,994 + \$12,000.

**Commented [a2]:** Another \$5000 for the 4<sup>th</sup> subcontractor Alex Farrel does appear in the proposal. According to Prof. Corbett (PI), Prof. Farrel will work in the project as an independent consultant. According to Prof. Corbett, a separate budget form can be exempted according to some rules on budget preparation.

<sup>1</sup> Subcontractors (70.5% of the total direct costs) will bring requisite expertise regarding research planning, data compilation, modeling, and report writing (Eastern Research Group); data acquisition (SDV/ACCI); and support of all phases and tasks of the study (Rochester Institute of Technology).

Alex Farrell (\$5,000) will be assisting in the evaluation oand choice of data to be formatted for use in the modeling.

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Attachment #1

**SUBCONTRACTORS' BUDGET SUMMARY**

Subcontractor: Rochester Institute of Technology

Description of subcontractor's responsibility: RIT will contribute to this project along all task activities.

**DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$ 51,941	
2.	Subcontractors	\$ 0	
3.	Equipment	\$ 4,000	
4.	Travel and Subsistence	\$ 5,000	
5.	Electronic Data Processing	\$ 0	
6.	Reproduction/Publication	\$ 0	
7.	Mail and Phone	\$ 497	
8.	Supplies	\$ 0	
9.	Analyses	\$ 0	
10.	Miscellaneous	\$ 0	
	Total Direct Costs		\$61,438

**INDIRECT COSTS**

1.	Overhead	\$ 23,262	
2.	General and Administrative Expenses	\$ 0	
3.	Other Indirect Costs	\$ 0	
4.	Fee or Profit	\$ 0	
	Total Indirect Costs		<u>\$23,262</u>

**TOTAL PROJECT COSTS** \$84,700

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Attachment #2

**SUBCONTRACTORS' BUDGET SUMMARY**

Subcontractor: Eastern Research Group

Description of subcontractor's responsibility: ERG will participate in preparing the refined research plan, data compilation, model selection and modification, and writing, review and response to comments for the final report.

**DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$	4,923
2.	Subcontractors	\$	0
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	0
5.	Electronic Data Processing	\$	151
6.	Reproduction/Publication	\$	13
7.	Mail and Phone	\$	30
8.	Supplies	\$	0
9.	Analyses	\$	0
10.	Miscellaneous	\$	<u>0</u>

Total Direct Costs \$5,117

**INDIRECT COSTS**

1.	Overhead	\$	4,402
2.	General and Administrative Expenses	\$	1,592
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>889</u>

Total Indirect Costs \$6,883

**TOTAL PROJECT COSTS**

**\$12,000**

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Attachment #3

**SUBCONTRACTORS' BUDGET SUMMARY**

Subcontractor: SDV/ACCI

Description of subcontractor's responsibility: SDV/ACCI will assist in compiling available data from identified data sources.

**DIRECT COSTS AND BENEFITS**

11.	Labor and Employee Fringe Benefits	\$	5,296	
12.	Subcontractors	\$	0	
13.	Equipment	\$	0	
14.	Travel and Subsistence	\$	880 <sup>1</sup>	
15.	Electronic Data Processing	\$	0	
16.	Reproduction/Publication	\$	6	
17.	Mail and Phone	\$	0	
18.	Supplies	\$	0	
19.	Analyses	\$	0	
20.	Miscellaneous	\$	<u>0</u>	
	Total Direct Costs			\$6,182

**INDIRECT COSTS**

5.	Overhead	\$	3,283	
6.	General and Administrative Expenses	\$	1,444	
7.	Other Indirect Costs	\$	0	
8.	Fee or Profit	\$	<u>1,091</u>	
	Total Indirect Costs			<u>\$5,818</u>

**TOTAL PROJECT COSTS** **\$12,000**

<sup>1</sup> Travel and Subsistence Costs are around 14.2% of total direct costs. This is mainly because SDV/ACCI is California-based and the rest of the project team are mostly located in the East Coast. It is more cost-effective for SDV/ACCI staff to fly east should a team meeting be deemed necessary.

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