

CO 80571

UNIVERSITY OF CALIFORNIA, DAVIS
Accounting & Financial Services Office
Extramural Accounting

Please include the following
claim number on your
remittance advice:
Claim No. XZ14172

CONTRACTOR'S INVOICE

INVOICE TO

AIR RESOURCES BOARD
P.O. BOX 1436
SACRAMENTO, CA 95812-1436
ATTN: ACCOUNTING SECTION

Invoice Number: 83384-1
Date: January 26, 2009
Amount: \$17,779.29

Direct questions regarding this invoice to Amy Joy at (530) 757-8526 or aejoy@ucdavis.edu

Federal Employer ID # 94-6036494

Period Billed

Contract/Grant/Agreement/Purchase Order #07-407

From
07/01/08

To
12/31/08

Project Title:
PI /Director:
Department:

Description of Services

PER TERMS OF INTERAGENCY AGREEMENT

RCVD FEB 2 2009

Salaries

PAYMENT APPROVED:

\$9,211.50

Benefits

[Signature]

\$2,099.37

Supplies & Expenses

ROBERT D. FLETCHER, CHIEF
STATIONARY SOURCE DIVISION

\$25.80

Travel

DATE 3-10-09

\$0.00

Indirect Costs @ 10.0%

\$1,133.67

Graduate Student Fee Remission (Exempt from Indirect Costs)

\$5,308.95

RCVD MAR 11 2009

Please Return Invoice Copy with Check

PAY THIS AMOUNT>>>>>

\$17,779.29

Remarks:

OUTSTANDING INVOICES:

[Signature]

for Kathleen Hass/aej, Extramural Funds Division Manager

Make Check Payable and Remit To:

The Regents of The University of California
Cashier's Office
P.O. Box 989062
West Sacramento, CA 95798-9062

To the best of my knowledge and belief this report is correct and complete, and all outlays
are for the purposes set forth in the award documents.

UNIVERSITY OF CALIFORNIA, DAVIS
Accounting & Financial Services Office
Extramural Accounting

Please include the following
claim number on your
remittance advice:
Claim No. X23022

CONTRACTOR'S INVOICE

INVOICE TO

AIR RESOURCES BOARD
P.O. BOX 1436
SACRAMENTO, CA 95812-1436
ATTN: ACCOUNTING SECTION

Invoice Number: **83384-2**
Date: **April 13, 2009**
Amount: **\$1,670.13**

Direct questions regarding this invoice to Sheila Lame' at (530) 754-9532 or slame@ucdavis.edu

Federal Employer ID # 94-6036494

Period Billed

Contract/Grant/Agreement/Purchase Order #07-407

From
01/01/09

To
03/31/09

Project Title: **Sustainable transportation energy pathways (STEPS) program**
PI/Director: **Joan Ogden**
Department: **Institute of Transportation Studies**

Description of Services

PER TERMS OF INTERAGENCY AGREEMENT

Salaries	\$982.50
Benefits	(\$260.41)
Supplies & Expenses	\$2.75
Indirect Costs @ 10.0%	\$72.48
Graduate Student Fee Remission (Exempt from Indirect Costs)	\$872.81

Please Return Invoice Copy with Check

PAY THIS AMOUNT>>>>

\$1,670.13

Remarks:

OUTSTANDING INVOICES:

83384-1 \$17,779.29 (01/26/09)

James Rungo
Kathleen Hass/sml, Extramural Funds Division Manager

Make Check Payable and Remit To:

The Regents of The University of California
Cashier's Office
P.O. Box 989062
West Sacramento, CA 95798-9062

To the best of my knowledge and belief this report is correct and complete, and all outlays are for the purposes set forth in the award documents.

Ly, Ginh@ARB

From: Leuterio, Kathy@ARB
Sent: Monday, August 31, 2009 1:52 PM
To: Ly, Ginh@ARB
Subject: RE: invoice

Yes, thank you!

Kathy Leuterio

MSCD/STTB Grants & Contracts
CA Air Resources Board MS 14-47B
1001 J Street, Sacramento, CA 95812
☎ (916) 323-2966 ☎ (916) 323-1337

From: Ly, Ginh@ARB
Sent: Monday, August 31, 2009 1:44 PM
To: Leuterio, Kathy@ARB
Subject: FW: invoice

Hi Kathy,

Please see note below. Is this invoice belong to you? Thank you.

Ginh

From: Clymer, Pam@ARB
Sent: Monday, August 31, 2009 1:23 PM
To: Ly, Ginh@ARB
Subject: FW: invoice

Hi Ginh,

The invoice for UC Davis #07-407, invoice #83384-2, invoice date 4/13/09 for \$1,670.13 should be forwarded to Kathy Leuterio with MSCD. This contract used to be SSD's however MSCD took it over.

Thank you.

Pam

From: Ly, Ginh@ARB
Sent: Friday, August 28, 2009 9:00 AM
To: Clymer, Pam@ARB
Subject: re: invoice

Hi Pam,

Please see attachment for invoices description. Is it ok to paid for the invoices?

UNIVERSITY OF CALIFORNIA, DAVIS
Accounting & Financial Services Office
Extramural Accounting

Please include the following
claim number on your
remittance advice:
Claim No. X23195

CONTRACTOR'S INVOICE

INVOICE TO

AIR RESOURCES BOARD
P.O. BOX 1436
SACRAMENTO, CA 95812-1436
ATTN: ACCOUNTING SECTION

Invoice Number: **83384-3**
Date: **July 15, 2009**
Amount: **\$69,283.50**

Direct questions regarding this invoice to Sheila Lame' at (530) 754-9532 or slame@ucdavis.edu

Federal Employer ID # 94-6036494

Period Billed

Contract/Grant/Agreement/Purchase Order #07-407

From	To
04/01/09	06/30/09

Project Title:	Sustainable transportation energy pathways (STEPS) program
PI /Director:	Joan Ogden
Department:	Institute of Transportation Studies

Description of Services

PER TERMS OF INTERAGENCY AGREEMENT

"NOT FINAL INVOICE"

Salaries		69,283.50 +
Benefits	<i>Approved</i>	10,857.34 +
Supplies & Expenses	<i>Withhold</i>	80,140.84 *
Indirect Costs @ 10%		
Graduate Student Fee Remission (Exempt from Indirect Costs)		\$17,203.09
	002	

Please Return Invoice Copy with Check

PAY THIS AMOUNT>>>>>

\$69,283.50

Remarks:

OUTSTANDING INVOICES:

83384-2 \$1,670.13 (04/13/09)

James Ringo
for Kathleen Hass/sml, Extramural Funds Division Manager

Make Check Payable and Remit To:

The Regents of The University of California
Cashier's Office
P.O. Box 989062
West Sacramento, CA 95798-9062

To the best of my knowledge and belief this report is correct and complete, and all outlays are for the purposes set forth in the award documents.

Harman, Guy@ARB

From: Keddie, Elise@ARB
Sent: Thursday, October 01, 2009 3:40 PM
To: Harman, Guy@ARB
Cc: Leuterio, Kathy@ARB
Subject: RE: Invoice Approval: UC Davis 07-407 #83384-3

I have reviewed the invoice from UC Davis and it is OK to process for payment.

Thanks, Elise

Elise Keddie, PhD
Manager, ZEV Implementation Section
Mobile Source Control Division
California Air Resources Board
916-323-8974

-----Original Message-----

From: Harman, Guy@ARB
Sent: Thursday, October 01, 2009 2:53 PM
To: Keddie, Elise@ARB
Cc: Leuterio, Kathy@ARB
Subject: Invoice Approval: UC Davis 07-407 #83384-3

If charges are correct please approve attached invoice by 10/06/09 via e-mail.

Thank You

Guy Harman
Accountant I (Specialist)
California Air Resources Board
Phone (916) 322-9390
Fax (916) 322-9612

-----Original Message-----

From: sharpcopier@arb.ca.gov [mailto:sharpcopier@arb.ca.gov]
Sent: Thursday, October 01, 2009 2:56 PM
To: Harman, Guy@ARB
Subject: Scanned image from Accounting Sharp Copier 20th Floor

DEVICE NAME: Accounting Sharp Copier 20th Floor
DEVICE MODEL: SHARP AR-M550U
LOCATION: 20th floor-South Side-Center

FILE FORMAT: PDF MMR(G4)
RESOLUTION: 300dpi x 300dpi

Attached file is scanned image in PDF format.
This file can be read by Adobe Acrobat Reader.
The reader can be downloaded from the following URL:

<http://www.adobe.com/>

UNIVERSITY OF CALIFORNIA, DAVIS
Accounting & Financial Services Office
Extramural Accounting

Please include the following
claim number on your
remittance advice:
Claim No. XA00184

CONTRACTOR'S INVOICE

INVOICE TO

AIR RESOURCES BOARD
1001 I STREET - MS 14-47B
SACRAMENTO, CA 95812
ATTN: KATHY LEUTERIO

Invoice Number: **"FINAL" 83384-4**
Date: **September 10, 2009**
Amount: **\$10,857.34**

Direct questions regarding this invoice to **Sheila Lame' at (530) 754-9532 or slame@ucdavis.edu**

Federal Employer ID # 94-6036494

Period Billed

Contract/Grant/Agreement/Purchase Order **#07-407**

From **06/01/09** To **06/30/09**

Project Title: **Sustainable transportation energy pathways (STEPS) program**
PI /Director: **Joan Ogden**
Department: **Institute of Transportation Studies**

Description of Services

PER TERMS OF INTERAGENCY AGREEMENT

"FINAL INVOICE"

Salaries	\$7,082.13
Benefits	\$2,756.30
Supplies & Expenses	\$31.87
Indirect Costs @ 10%	\$987.04
Graduate Student Fee Remission (Exempt from Indirect Costs)	\$0.00

OK to pay E. K. K. K.

Please Return Invoice Copy with Check

PAY THIS AMOUNT >>>>>

\$10,857.34

Remarks:

OUTSTANDING INVOICES:

83384-2 \$1,670.13 (04/13/09)
83384-3 \$69,283.50 (07/15/09)

James Ringo
for Kathleen Hass/sml, Extramural Funds Division Manager

Make Check Payable and Remit To:
The Regents of The University of California
Cashier's Office
P.O. Box 989062
West Sacramento, CA 95798-9062

To the best of my knowledge and belief this report is correct and complete, and all outlays are for the purposes set forth in the award documents.

SL0910091

AGREEMENT NUMBER 07-407
REGISTRATION NUMBER

1. This Agreement is entered into between the State Agency and the Contractor named below:

STATE AGENCY'S NAME Air Resources Board (State)
CONTRACTOR'S NAME The Regents of the University of California, Davis (UC Davis, UC, or Contractor)

2. The term of this Agreement is: **June 30, 2008** through **June 30, 2009**

3. The maximum amount of this Agreement is: **\$100,000.00**
 One Hundred Thousand Dollars and No Cents

4. The parties agree to comply with the terms and conditions of the following exhibits which are by this reference made a part of the Agreement.

Exhibit A – Scope of Work	1 page
Exhibit A – Attachment 1	6 pages
Exhibit B – Budget Detail and Payment Provisions	2 pages
Exhibit B - Attachment 1	1 page
Exhibit C* – General Terms and Conditions	GIA 101
Exhibit D - Special Terms and Conditions	1 page
Exhibit E – Additional Provisions	5 pages
Exhibit F – Contract Report Format Guidelines	7 pages

Items shown with an Asterisk (*), are hereby incorporated by reference and made part of this agreement as if attached hereto. These documents can be viewed at www.ols.dgs.ca.gov/Standard+Language

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR	
CONTRACTOR'S NAME (if other than an individual, state whether a corporation, partnership, etc.) The Regents of the University of California, Davis	
BY (Authorized Signature) <i>[Signature]</i>	DATE SIGNED (Do not type) 6/24/08
PRINTED NAME AND TITLE OF PERSON SIGNING Ahmad Hakim-Elahi, Ph.D., J. D., Director of Sponsored Programs	
ADDRESS 1850 Research Park Drive, Suite 300, Davis, CA 95618	

STATE OF CALIFORNIA	
AGENCY NAME Air Resources Board	
BY (Authorized Signature) <i>[Signature]</i>	DATE SIGNED (Do not type) 06.30.08
PRINTED NAME AND TITLE OF PERSON SIGNING Socorro Watkins, Chief, Business Management Branch	
ADDRESS P.O. Box 2815, Sacramento, CA 95812	

California Department of General Services Use Only

APPROVED

JUL - 9 2008

DEPT OF GENERAL SERVICES

Exempt per:

[Signature]

for
SS
6/24/08

EXHIBIT A

SCOPE OF WORK

1. The Regents of the University of California, Davis (UC Davis) agrees to provide the ARB Stationary Source Division research to develop theory, tools, and methods that allow for consistent and transparent comparisons of promising alternative energy and vehicle pathways in accordance to the attached Statement of work titled, "Sustainable Transportation Energy Pathways Programs" (Exhibit A - Attachment I).
2. The Project Representatives during the terms of this Agreement will be:

Requesting Agency: Air Resources Board	Contractor: UC, Davis
Section/Unit: Stationary Source Division	Section/Unit: Institute of Transportation Studies
Attention: John Courtis	Attention: Joshua Cunningham
Address: Air Resources Board 1001 I Street, 6 th Floor Sacramento, CA 95814	Address: UC, Davis Institute of Transportation Studies 2028 Academic Surge Davis, CA 95616
Phone: (916) 323-2661	Phone: (530) 752-1934
Fax: (916) 324-5684	Fax: (530) 752-6572
Email: jcourtis@arb.ca.gov	Email: jmcunningham@ucdavis.edu
Website: http://arb.ca.gov/fuels/lcfs/lcfs.htm	Website: http://steps.ucdavis.edu/People/jmcunningham/index.html

Direct all Administrative inquiries to:

Requesting Agency: Air Resources Board	Contractor: UC, Davis
Section/Unit: Administrative Services Division	Section/Unit: Office of Research
Attention: Josie Ramirez	Attention: Paula Noble
Address: Air Resources Board 1001 I Street, 20 th Floor Sacramento, CA 95814	Address: Sponsored Programs Office 1850 Research Park Drive, Suite 300 Davis, CA 95618
Phone: (916) 445-5596	Phone: (530) 747-3921
Fax: (916) 327-2940	Fax: (530) 747-3929
Email: eramirez@arb.ca.gov	Email: pnoble@ucdavis.edu

California Air Resources Board

Statement of Work

For

Sustainable Transportation Energy Pathways
Program (STEPS)

Dated: January 23, 2008

Period of Performance: March 1, 2008 – June 30, 2009

Table of Contents

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Scope of Work (Pooled Fund Study).....	3
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Project Overview

Contractor, through its Institute of Transportation Studies at the University of California, Davis (ITS-Davis), through the study "Sustainable Transportation Energy Pathways" (STEPS), is to conduct a four-year research and outreach program to address the technical, operational, and logistical issues related to the transition to an alternative fuel-based economy. Throughout this document, the STEPS research team will be referred to as "Contractor".

The goals of the STEPS program are to inform the public debate and to assist our public and private sponsors by providing tools and knowledge concerning sustainable transportation alternatives. The program will carefully analyze potential transitions in the transportation sector by addressing markets and consumer behavior, engineering and economics of vehicles and fuel infrastructure systems, societal and lifecycle environmental impacts (climate change, air quality, energy security), and public policy. The intent is to generate a strong understanding and solid foundation of knowledge for companies and government agencies analyzing technology, investment and policy questions.

The overarching objectives of the STEPS program are:

- To develop the theory, tools, and methods that allow for self-consistent and transparent comparisons of promising alternative energy and vehicle pathways
- To apply these tools and methods in comparative assessments of four general transportation energy pathways – hydrogen, biofuels, electricity and fossil fuels.

This program is funded and managed through a consortium of organizations which includes major energy companies (e.g. BP, Chevron, ConocoPhillips, Indian Oil Co, Shell Hydrogen, PG&E, and TOTAL), automotive companies (Ford, General Motors, DaimlerChrysler, Honda, Toyota, Nissan, Subaru, BMW, and Volkswagen) and government agencies (US EPA, US DOT, Caltrans, Natural Resources Canada, California Air Resources Board) including The California Air Resources Board.

The program will draw upon research methods from a broad range of academic fields, including vehicle engineering and design, systems analysis and operations research, chemical and mechanical engineering, lifecycle cost and emissions analysis, market research, sociology and anthropology, economics and business strategy, and policy and political analysis. The focus will be on understanding transitions toward a more sustainable *transportation system*. As was learned in the Hydrogen Pathways Program, the evolving transportation system will not rely on one solution (such as hydrogen and fuel cells). In the STEPS program, Contractor will take a systems view of the emergence of multiple technologies, gaining insight into transition scenarios. Contractor will consider both near-term and long-term technologies to analyze possible paths forward. A key issue is to understand how one technology path can enable another, and how multiple technologies can be either synergistic or competitive.

ITS-Davis will engage sponsors and interested parties in developing this alternative vehicle and fuel evaluation and disseminate all research findings. This goal is to be achieved in a variety of ways, including:

- The preparation and distribution of publications and applicable documents on key issues and topics
- An ongoing series of specially designed workshops that will engage and educate program sponsor members, public officials, and key agency leaders on the issues of transition to an alternative fuel-based transportation system

Scope of Work (Pooled Fund Study)

Four main transportation energy categories will be investigated, and interdisciplinary projects will study the differences between specific energy-vehicle pathways. All research projects will be conducted in parallel and remain active throughout the program. All research among energy categories will be coordinated with continuous feedback among them.

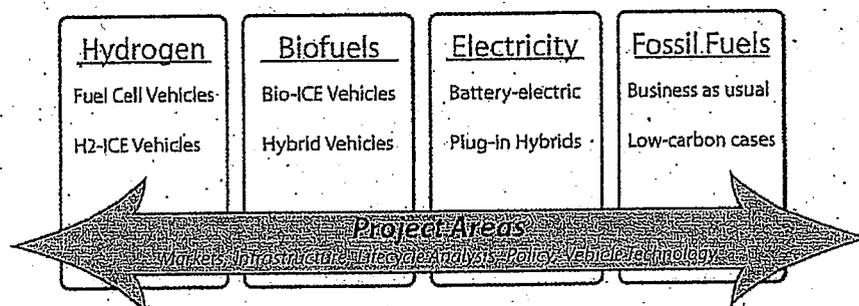


Figure 1. STEPS Research Scope and Project Areas

- **Hydrogen.** We will continue research conducted under the Hydrogen Pathways Program exploring new areas such as hydrogen/electricity systems, conducting regional transition case studies, understanding the impact of alternative policies, and enhancing key hydrogen pathways models for infrastructure development strategies.
- **Biofuels.** This track will build upon UC Davis's current work within the California Biomass Collaborative and the considerable agricultural and biological expertise of the university. The biofuels track will include analysis of various biorefinery production systems, infrastructure strategies, environmental & land-use impacts, & vehicle analysis.
- **Electricity.** Electricity production methods, total grid capacity, and time-of-day charging impacts on the utility sector will be studied. Additionally, research will be conducted on consumer behavior and preferences for electric drive attributes, including all-electric range and charging time.
- **Fossil Fuels.** This track includes both the business as usual reference case, where petroleum-based fuels continue to dominate transportation energy, and the evolution of fuels produced from other fossil fuel resources, including tar sands, oil shale, and coal with carbon sequestration. Expanded use of diesel fuel will also be studied.

Making consistent comparative analyses among different energy and vehicle pathways is a major analytic task. This becomes increasingly challenging when accounting for factors such as market dynamics (including consumer choices and strategic behavior of firms), technological change, geographic location, and infrastructure interactions. To deal with these complexities, the STEPS program will involve three types of comparative analysis, as illustrated in Figure 2:

- Study the dynamics of long-term transitions in the transportation sector with the intent of understanding how transitions might occur with minimal private sector investment risk and maximum public benefits.
- Conduct comparative analyses that involve integration of technologies into complete systems, incorporating geography, resource availability, market dynamics, public policy, and interactions with other parts of the energy system.
- Generate data and enhance the models to facilitate self-consistent metrics for comparing costs, emissions, energy use, and vehicle performance.

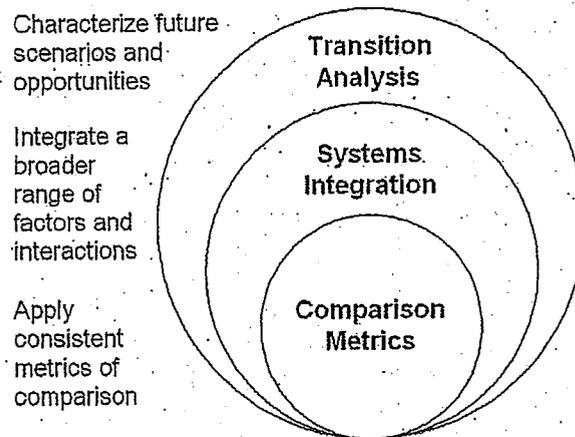


Figure 2. Spheres of Comparative Technology Assessment

Deliverables

1. ITS-Davis will issue publications and reports each year to all Program Sponsors on the progress of the program. The California Air Resources Board will have the opportunity to provide feedback on draft reports through the sponsor's website. Quarterly news letters shall be issued to CARB highlighting the current research projects. Refer to the Reporting section below.
2. At least one high-level, invitation-only annual conference will be conducted to provide a review of the research outputs from the program. In addition, a program review of recent related technology and policy developments related to alternative fuel infrastructure and use in the transportation sector will be provided. The conference will be exclusively for Program Sponsors, invited technical experts, and senior government and public interest organization leaders. The materials from each conference will be distributed to all Program Sponsors via the program website and an annual compilation CD.
3. As a Program Sponsor, California Air Resources Board will be allocated a seat on the program's Advisory Board that will meet to advise the program's leadership on the coming year's research and public process programs. The Advisory Board will meet during the invitation-only annual conference.
4. At least one invitation-only research workshop will be held each year on critical technical issues and topics. These workshops are intended for technical experts, researchers, program managers, and others with a strong interest in the topics. These workshops will be exclusively for program sponsors and invited technical experts. The materials from each conference will be distributed to all Program Sponsors via the program website and an annual compilation CD.
5. Each year at least one special public process event will be held. These may include tutorial workshops for public agency leaders and staff, policy issue forums, and information gathering sessions requested by public agencies. Tutorial materials will be developed for each workshop.
6. If developed during the period of performance, The California Air Resources Board will be provided the opportunity to participate in near-term pilot projects facilitated by or perhaps led by ITS-Davis.

Reporting

- a. On a monthly basis, the program website will be updated to include all materials generated during the month including publications, meeting notices, agendas, meeting minutes of the above deliverable events, presentations from the events, reports, etc.
- b. Quarterly Newsletters will be submitted to CARB (in electronic formats), highlighting current research projects within the STEPS program.
- c. An in-depth annual report, a cumulative review of the year's research, will be issued at the end of each fiscal year. This will include both a report and a CD with the year's event material. This will be distributed in both electronic and hard-copy formats.

Budget

CARB will commit to the STEPS program for 2008 and 2009, with the option to renew sponsorship at the end of the term. The total sponsorship commitment for this period of performance will be \$100,000.

EXHIBIT B

BUDGET DETAIL AND PAYMENT PROVISIONS

1. Invoicing and Payment

- A. For services satisfactorily rendered in accordance with this Agreement and upon receipt and approval of the invoices which properly detail all charges the ARB agrees to compensate the Regents of the University of California, Davis for actual expenditures incurred in accordance with the rates specified herein or attached hereto.
- B. Invoices shall include the Agreement Number and shall be submitted in triplicate not more frequently than quarterly in arrears to:

Air Resources Board
Attn: Accounting Section
P.O. Box 1436
Sacramento, CA 95812-1436

2. Budget Contingency Clause

- A. It is mutually agreed that if the Budget Act of the current year and/or any subsequent years covered under this Agreement does not appropriate sufficient funds for the program, this Agreement shall be of no further force and effect. In this event, the State shall have no liability to pay any funds whatsoever to Contractor or to furnish any other considerations under this Agreement and Contractor shall not be obligated to perform any provisions of this Agreement.
- B. If funding for any fiscal year is reduced or deleted by the Budget Act for purposes of this program, the State shall have the option to either cancel this Agreement with no liability occurring to the State, or offer an agreement amendment to Contractor to reflect the reduced amount.

3. Payment

- A. Costs for this Agreement shall be computed in accordance with State Administrative Manual Sections 8752 and 8752.1.
- B. Nothing herein contained shall preclude advance payments pursuant to Article 1, Chapter 3, Part 1, Division 3, Title 2 of the Government Code of the State of California.

EXHIBIT B

- D. University will be paid for the payment period completed upon receipt, by ARB, of an invoice and progress report satisfying the requirements of this Agreement. The invoice and progress report must be deemed by ARB to reflect reasonable work performed in accordance with the Agreement.
- E. The amount to be paid to University under this Agreement includes all sales and use taxes incurred pursuant to this Agreement. University shall not receive additional compensation for reimbursement of such taxes and shall not decrease work to compensate therefor.

**California Air Resources Board
Sustainable Transportation and Energy Pathways**

Air Resources Board/UC Davis
Interagency Agreement No. 07-407
Exhibit B - Attachment 1
Page 1 of 1

BUDGET

	<u>Year 1</u>	<u>Year 2</u>	<u>TOTAL</u>
	3/1/08 - 6/30/08	7/1/08 - 6/30/09	
Personnel			
GSR III @ \$3,229/month			
Academic Year @ 50%	4,843.50	14,966.42	\$ 19,809.92
+ Benefits @ 3%	62.97	194.56	\$ 257.53
Summer Months @ 100%	-	9,687.00	\$ 9,687.00
+ Benefits @ 1.3%	-	290.61	\$ 290.61
Tuition			
Academic Year 07-08 @ \$3,217.16/quarter (minus campus 25% buy-down)	2,412.87	-	\$ 2,412.87
Academic Year 08-09 @ \$3,378.02/quarter (minus campus 25% buy-down)	-	7,600.55	\$ 7,600.55
GSR III @ \$3,229/month			
Academic Year @ 50%	4,843.50	14,966.42	\$ 19,809.92
+ Benefits @ 3%	62.97	194.56	\$ 257.53
Summer Months @ 100%	-	9,687.00	\$ 9,687.00
+ Benefits @ 1.3%	-	290.61	\$ 290.61
Tuition			
Academic Year 07-08 @ \$3,217.16/quarter (minus campus 25% buy-down)	2,412.87	-	\$ 2,412.87
Academic Year 08-09 @ \$3,378.02/quarter (minus campus 25% buy-down)	-	7,600.55	\$ 7,600.55
GSR III @ \$3,229/month			
Academic Year (Spring 08 @ 50%; Fall 08 @ 25%)	4,843.50	2,494.40	\$ 7,337.90
+ Benefits @ 3%	62.97	32.43	\$ 95.39
Tuition			
Academic Year 07-08 @ \$3,217.16/quarter (minus campus 25% buy-down)	2,412.87	-	\$ 2,412.87
Academic Year 08-09 @ \$3,378.02/quarter (minus campus 25% buy-down)	-	2,533.52	\$ 2,533.52
Sub-Total Personnel	21,958.01	70,538.61	\$ 92,496.62
Supplies	100.00	582.76	\$ 682.76
Total Direct Costs	\$ 22,058.01	\$ 71,121.37	\$ 93,179.38
Modified Total Direct Costs (excludes tuition)	\$ 14,819.40	\$ 53,386.77	\$ 68,206.16
Indirect Costs @ 10%	1,481.94	5,338.68	\$ 6,820.63
TOTAL BUDGET	\$ 23,539.95	\$ 76,460.05	\$ 100,000.00

EXHIBIT D

SPECIAL TERMS AND CONDITIONS

1. Termination

- A. This Agreement may be canceled at any time by either party, upon thirty (30) days written notice to the other party.
- B. In the case of early termination, Contractor shall submit an invoice in triplicate and a report in triplicate covering services to termination date, following the invoice and progress report requirements of this Agreement. A copy and description of any data collected up to termination date shall also be provided to State.
- C. Upon receipt of the invoice, a final payment will be made to the performing agency. This payment shall be for all ARB-approved, actually-incurred costs in accordance with Exhibits A and B, and shall include labor, and materials purchased or utilized (including all noncancellable commitments) to termination date, and pro rata indirect costs as specified in the proposal budget.

2. Disputes

- A. ARB reserves the right to issue an order to stop work in the event that a dispute should arise, or in the event that the ARB gives the performing agency a notice that this Agreement will be terminated. The stop-work order will be in effect until the dispute has been resolved or this Agreement has been terminated.
- B. Any dispute concerning a question of fact arising under the terms of this Agreement which is not disposed of within a reasonable period of time by agency employees normally responsible for the administration of this agreement, shall be brought to the attention of the Executive Officer or designated representative of each agency for joint resolution.

3. Amendments

ARB reserves the right to amend this agreement for additional time and/or additional funding.

EXHIBIT E

ADDITIONAL PROVISIONS

1. Travel & Per Diem

- A. Any reimbursement for necessary travel and per diem shall be the University's approved travel rates
- B. No foreign travel shall be reimbursed unless prior written authorization is obtained from State.

2. Meetings

- A. Initial meeting. Before work on the contract begins, the Principal Investigator and key personnel will meet with the ARB Contract Manager and other staff to discuss the overall plan, details of performing the tasks, the project schedule, items related to personnel or changes in personnel, and any issues that may need to be resolved before work can begin.
- B. Progress review meetings. The Principal Investigator and appropriate members of his or her staff will meet with ARB's Contract Manager at quarterly intervals to discuss the progress of the project. This meeting may be conducted by phone.
- C. Technical Seminar. The Contractor will present the results of the project to ARB staff and a possible webcast at a seminar at ARB facilities in Sacramento or El Monte.

3. Reports and Data Compilations

- A. With respect to each invoice period, Contractor shall forward to the Project Representative an electronic copy of the progress report and mail one copy of the progress report with each invoice. (Do not use Express Mail.) When e-mailing the progress report, the "subject line" should state the contract number and the billing period. Each progress report will begin with the following disclaimer:

The statements and conclusions in this report are those of the Contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

- B. Each progress report will also include:
 - 1. A brief narrative account of project tasks completed or partially completed since the last progress report.
 - 2. A brief discussion of problems encountered during the reporting period and how they were or are proposed to be resolved.

EXHIBIT E

3. A brief discussion of work planned, by project task, before the next progress report.
 4. A graph showing allocation of the budget and amount used to date for each task.
 5. A graph showing percent of completion for each task.
- C. If the project is behind schedule, the progress report must contain an explanation of reasons and how Contractor plans to resume the schedule.
- D. Six months prior to Agreement termination date, University will deliver to ARB twenty (20) bound copies of a draft final report. The reports may be stapled or spiral bound, depending on size. The draft final report will conform to Exhibit F.
- E. Within forty-five (45) days of receipt of ARB's comments on the draft Final Report (Exhibit F), University will deliver to ARB's Contract Manager two (2) copies of the Final Report incorporating all reasonable alterations and additions requested by ARB. Upon approval of the amended final report approved by ARB in accordance to Exhibit F, University will within two (2) weeks, deliver to ARB two (2) camera ready UNBOUND originals of a Final Report incorporating all final alterations and additions. The final report will conform to the Contract Final Report Format, Exhibit F.
- F. Together with the reports, University will deliver a copy of the reports on diskette, using Microsoft Word 6.0 (or newer) and a set of all data compilations as specified by the ARB's Project Representative. The reports will conform to the Contract Report Format, Exhibit F.
- G. University's obligation under this Agreement shall be deemed discharged only upon submittal to ARB of an acceptable final report; in accordance to Exhibit F, report diskette/CD, all required data compilations, and any other project deliverables.
- H. Prior to completion of this Agreement, University shall be entitled to release or make available reports, information, or other data prepared or assembled by it pursuant to this Agreement, in scientific journals and other publications and at scientific meetings, provided, however, that a copy of the publication be submitted to ARB for review and comment 45 days prior to such publication. Further, University shall place the disclaimer statement in a conspicuous place on all such reports or publications. Nothing in this provision shall be construed to limit the right of State to release information obtained from the University or to publish reports, information, or data in State publications.

EXHIBIT E

4. Copyrightable Materials

In recognition of the policy of ARB and University to promote and safeguard free and open inquiry by faculty, students and the members of the public and in furtherance of such policy, both parties agree to the following with respect to rights in data and copyrights under this Agreement:

- A. The term "Subject Data" shall mean all original and raw research data, notes, computer programs, writings, sound recordings, pictorial reproductions, drawings or other graphical representations, and works of any similar nature, produced by University in performance of this Agreement, but specifically excluding "Reports," as defined in this Agreement. Subject Data also excludes financial reports, cost analyses, and similar information incidental to contract administration.
- B. The term "Reports" shall have the meaning assigned to it in this Exhibit F of this Agreement.
- C. Ownership of all Subject Data and copyrights arising from Subject Data shall be vested in University while ownership of all Reports and copyrights arising from the Reports delivered under this Agreement shall be vested in ARB. University agrees to make available to the public for public benefit, to the extent the University shall have the legal right to do so, without license or fee, any scholarly articles which are published from the Subject Data.
- D. Nothing in this exhibit or Agreement shall be construed to limit the right of University faculty, students or staff to publish the Subject Data in the form of scholarly articles in academic journals nor to affect, abrogate or limit the right of University faculty, staff or students to make use of the Subject Data.

5. Confidentiality

- A. It is understood that in the course of carrying out this Agreement, State may wish to provide University with proprietary or confidential information of State (Proprietary Information). University agrees to use its best efforts to hold proprietary information in confidence and shall return it to State upon the completion of the project.
- B. This obligation shall apply only to proprietary information that is designated or identified as such in writing by State prior to the disclosure thereof. All proprietary information shall be sent only to the Principal Investigator. Moreover, this obligation shall not apply to any proprietary information which: a) is or becomes publicly known through no wrongful or negligent act on the part of University; b) is already known to University at the time of disclosure; c) independently developed by University without breach of this agreement; or d) is generally disclosed to third parties by State without similar restrictions on such third parties.

EXHIBIT E

6. Equipment Provisions

- A. Equipment is defined as movable articles of nonexpendable property that meet the following requirements:
1. have a normal useful life (including extended life due to repairs) of at least one year;
 2. have a unit acquisition cost of at least \$5,000 for other than land and structures (for example, identical assets costing \$3,000 each for a \$12,000 total would not meet the requirements); and
 3. be used to conduct work under this contract, and/or
 4. any and all EDP equipment used to conduct work under this contract.
- B. The cost of equipment includes the purchase price plus all costs to acquire, install, and prepare equipment for its intended use.
- C. The ARB reserves the right to purchase total equipment whose cost is greater than \$25,000 and any and all EDP equipment for this contract, through the State procurement process. Contractor's proposed cost of this equipment will be deducted from the total amount payable to the Contractor. The equipment provided by ARB will be equivalent to Contractor's specifications, as described in Contractor's proposal.
- D. In the event Contractor purchases with ARB funds, procures, uses, or otherwise takes possession of equipment owned by ARB to perform work under this contract, title to such equipment shall remain with ARB and such equipment shall become ARB's equipment upon delivery thereof into the Contractor's control or possession.
- E. Contractor shall obtain written approval from ARB prior to the purchase of equipment that is not specifically identified and listed in the approved budget and which is valued at more than \$5,000. The contract funding shall be adjusted for any equipment or supplies furnished by ARB.
- F. ARB reserves the right to full and adequate access to ARB equipment.
- G. Contractor shall maintain and administer a program for the utilization, maintenance, repair, protection, and preservation of ARB equipment, whether acquired from the ARB or purchased with ARB funds from a third party, so as to assure its full availability and usefulness for performance of this contract or as long as this equipment remains in the control or possession of the Contractor. The Contractor will install upon each item of equipment a tag identifying the equipment as belonging to the ARB and will maintain location records of all equipment. The Contractor shall take steps to comply with all appropriate directions or instructions that the ARB may prescribe for the protection of ARB equipment.

EXHIBIT E

- H. Contractor shall provide to ARB, with the final invoice, a final equipment inventory. The final invoice shall contain an itemization of equipment purchased with ARB funds or procured through the State procurement process, including the type of equipment, manufacturer, serial number, and cost. All ARB equipment shall be returned to the ARB at ARB's expense in full operating condition upon termination of this contract, unless ARB approves a different disposition in writing. Disposition of the equipment shall be in accordance with the instructions from ARB, to be issued after receipt of the final inventory.

EXHIBIT F

CONTRACT REPORT FORMAT GUIDELINES

RESEARCH FINAL REPORT FORMAT

The Research Contract Final Report (Report) is as important to the contract as the research itself. The Report is a record of the project and its results, and is used in several ways. Therefore, the Report must be well organized and contain certain specific information. This Appendix outlines the requirements that must be met when producing the Report.

Note: In partial fulfillment of the Final Report requirements, the Contractor shall submit a copy of the Report on a CD in PDF format and in a word-processing format, preferably in Word - Version 6.0 or later. This is in addition to the submission of any paper copies required. The diskette shall be clearly labeled with the contract title, ARB contract number, the words "Final Report", and the date the report was submitted.

Legibility. Each page of the approved Final Report must be legible and camera-ready.

Binding. The draft Report, including its appendices, must be either spiral bound or stapled, depending on size. The revised Report and its appendices should be spiral bound, except for two unbound, camera-ready originals.

Cover. Do not supply a cover for the Report. The ARB will provide its standard cover.

One-sided vs. two-sided. To conserve paper, both the draft Report and the revised Report, except for the unbound camera-ready copies, should be printed on both sides of the page. The unbound camera-ready copies must be printed on only one side of the page.

Title. The title of the Report should exactly duplicate the title of the contract unless a change is approved in writing by the contract manager.

Spacing. In order to conserve paper, copying costs, and postage, please use single or one-line (1) spacing.

Page size. All pages should be of standard size (8 1/2" x 11") to allow for photo-reproduction.

Large tables or figures. Foldout or photo-reduced tables or figures are not acceptable because they cannot be readily reproduced. Large tables and figures should be presented on consecutive 8 1/2" x 11" pages, each page containing one portion of the larger chart.

EXHIBIT F

Color. Color presentations are not acceptable; printing shall be black on white only.

Corporate identification. Do not include corporate identification on any page of the Final Report, except the title page.

Unit notation. Measurements in the Reports should be expressed in metric units. However, for the convenience of engineers and other scientists accustomed to using the British system, values may be given in British units as well in parentheses after the value in metric units. The expression of measurements in both systems is especially encouraged for engineering reports.

Section order. The Report should contain the following sections, in the order listed below:

Title page
Disclaimer
Acknowledgment (1)
Acknowledgment (2)
Table of Contents
List of Figures
List of Tables
Abstract
Executive Summary
Body of Report
References
List of inventions reported and copyrighted materials produced
Glossary of Terms, Abbreviations, and Symbols
Appendices

Page numbering. Beginning with the body of the Report, pages shall be numbered consecutively beginning with "1", including all appendices and attachments. Pages preceding the body of the Report shall be numbered consecutively, in ascending order, with small Roman numerals.

Title page. The title page should include, at a minimum, the contract number, contract title, name of the principal investigator, contractor organization, date, and this statement: "Prepared for the California Air Resources Board and the California Environmental Protection Agency"

Disclaimer. A page dedicated to this statement must follow the Title Page:

The statements and conclusions in this Report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

EXHIBIT F

Acknowledgment (1). Only this section should contain acknowledgments of key personnel and organizations who were associated with the project. The last paragraph of the acknowledgments must read as follows:

This Report was submitted in fulfillment of [ARB contract number and project title] by [contractor organization] under the [partial] sponsorship of the California Air Resources Board. Work was completed as of [date].

Acknowledgment (2). Health reports should include an acknowledgment to the late Dr. Friedman. Reports should include the following paragraph:

This project is funded under the ARB's Dr. William F. Friedman Health Research Program. During Dr. Friedman's tenure on the Board, he played a major role in guiding ARB's health research program. His commitment to the citizens of California was evident through his personal and professional interest in the Board's health research, especially in studies related to children's health. The Board is sincerely grateful for all of Dr. Friedman's personal and professional contributions to the State of California.

Table of Contents. This should list all the sections, chapters, and appendices, together with their page numbers. Check for completeness and correct reference to pages in the Report.

List of Figures. This list is optional if there are fewer than five illustrations.

List of Tables. This list is optional if there are fewer than five tables.

Abstract. The abstract should tell the reader, in nontechnical terms, the purpose and scope of the work undertaken, describe the work performed, and present the results obtained and conclusions. The purpose of the abstract is to provide the reader with useful information and a means of determining whether the complete document should be obtained for study. The length of the abstract should be no more than about 200 words. Only those concepts that are addressed in the executive summary should be included in the abstract.

Example of an abstract:

A recently developed ground-based instrument, employing light detecting and ranging (lidar) technology, was evaluated and found to accurately measure ozone concentrations at altitudes of up to 3,000 meters. The novel approach used in this study provides true vertical distributions of ozone concentrations aloft and better temporal coverage of these distributions than other, more common methods, such as those using aircraft and ozonesonde (balloon) techniques. The ozone and aerosol measurements from this study, in conjunction with temperature and wind measurements, will provide a better characterization of atmospheric conditions aloft and the processes involved in the formation of unhealthy ozone concentrations than can be achieved with traditional ground-based monitors.

EXHIBIT F

Executive Summary. The function of the executive summary is to inform the reader about the important aspects of the work that was done, permitting the reader to understand the research without reading the entire Report. It should state the objectives of the research and briefly describe the experimental methodology[ies] used, results, conclusions, and recommendations for further study. All of the concepts brought out in the abstract should be expanded upon in the Executive Summary. Conversely, the Executive Summary should not contain concepts that are not expanded upon in the body of the Report.

The Executive Summary will be used in several applications as written; therefore, please observe the style considerations discussed below.

Limit the Executive Summary to two pages, single spaced.

Use narrative form. Use a style and vocabulary level comparable to that in Scientific American or the New York Times.

Do not list contract tasks in lieu of discussing the methodology.

Discuss the results rather than listing them.

Avoid jargon.

Define technical terms.

Use passive voice if active voice is awkward.

Avoid the temptation to lump separate topics together in one sentence to cut down on length.

The Executive Summary should contain four sections: Background, Methods, Results, and Conclusions, described below.

THE BACKGROUND SECTION. For the Background, provide a one-paragraph discussion of the reasons the research was needed. Relate the research to the Board's regulatory functions, such as establishing ambient air quality standards for the protection of human health, crops, and ecosystems; the improvement and updating of emissions inventories; and the development of air pollution control strategies.

EXHIBIT F

THE METHODS SECTION. At the beginning of the Methods section, state what was done in general, in one or two sentences.

The methodology should be described in general, nontechnical terms, unless the purpose of the research was to develop a new methodology or demonstrate a new apparatus or technique. Even in those cases, technical aspects of the methodology should be kept to the minimum necessary for understanding the project. Use terminology with which the reader is likely to be familiar. If it is necessary to use technical terms, define them. Details, such as names of manufacturers and statistical analysis techniques, should be omitted.

Specify when and where the study was performed, if it is important in interpreting the results.

The findings should not be mentioned in the Methods section.

THE RESULTS SECTION. The Results section should be a single paragraph in which the main findings are cited and their significance briefly discussed. The results should be presented as a narrative, not a list. This section must include a discussion of the implications of the work for the Board's relevant regulatory programs.

THE CONCLUSIONS SECTION. The Conclusions section should be a single short paragraph in which the results are related to the background, objectives, and methods. Again, this should be presented as a narrative rather than a list. Include a short discussion of recommendations for further study, adhering to the guidelines for the Recommendations section in the body of the Report.

Body of Report. The body of the Report should contain the details of the research, divided into the following sections:

INTRODUCTION. Clearly identify the scope and purpose of the project. Provide a general background of the project. Explicitly state the assumptions of the study.

Clearly describe the hypothesis or problem the research was designed to address. Discuss previous related work and provide a brief review of the relevant literature on the topic.

EXHIBIT F

MATERIALS AND METHODS. Describe the various phases of the project, the theoretical approach to the solution of the problem being addressed, and limitations to the work. Describe the design and construction phases of the project, materials, equipment, instrumentation, and methodology. Describe quality assurance and quality control procedures used. Describe the experimental or evaluation phase of the project.

RESULTS. Present the results in an orderly and coherent sequence. Describe statistical procedures used and their assumptions. Discuss information presented in tables, figures and graphs. The titles and heading of tables, graphs, and figures, should be understandable without reference to the text. Include all necessary explanatory footnotes. Clearly indicate the measurement units used.

DISCUSSION. Interpret the data in the context of the original hypothesis or problem. Does the data support the hypothesis or provide solutions to the research problem? If appropriate, discuss how the results compare to data from similar or related studies. What are the implications of the findings? Identify innovations or development of new techniques or processes. If appropriate, discuss cost projections and economic analyses.

SUMMARY AND CONCLUSIONS. This is the most important part of the Report because it is the section that will probably be read most frequently. This section should begin with a clear, concise statement of what, why, and how the project was done. Major results and conclusions of the study should then be presented, using clear, concise statements. Make sure the conclusions reached are fully supported by the results of the study. Do not overstate or overinterpret the results. It may be useful to itemize primary results and conclusions. A simple table or graph may be used to illustrate.

RECOMMENDATIONS. Use clear, concise statements to recommend (if appropriate) future research that is a reasonable progression of the study and can be supported by the results and discussion.

References. Use a consistent style to fully cite work referenced throughout the Report and references to closely related work, background material, and publications that offer additional information on aspects of the work. Please list these together in a separate section, following the body of the Report. If the Report is lengthy, you may list the references at the end of each chapter.

EXHIBIT F

List of inventions reported and publications produced. If any inventions have been reported, or publications or pending publications have been produced as a result of the project, the titles, authors, journals or magazines, and identifying numbers that will assist in locating such information should be included in this section.

Glossary of terms, abbreviations, and symbols. When more than five of these items are used in the text of the Report, prepare a complete listing with explanations and definitions. It is expected that every abbreviation and symbol will be written out at its first appearance in the Report, with the abbreviation or symbol following in parentheses [i.e., carbon dioxide (CO₂)]. Symbols listed in table and figure legends need not be listed in the Glossary.

Appendices. Related or additional material that is too bulky or detailed to include within the discussion portion of the Report shall be placed in appendices. If a Report has only one appendix, it should be entitled "APPENDIX". If a Report has more than one appendix, each should be designated with a capital letter (APPENDIX A, APPENDIX B). If the appendices are too large for inclusion in the Report, they should be collated, following the binding requirements for the Report, as a separate document. The contract manager will determine whether appendices are to be included in the Report or treated separately. Page numbers of appendices included in the Report should continue the page numbering of the Report body. Pages of separated appendices should be numbered consecutively, beginning at "1".