



STATE OF VERMONT
OFFICE OF THE STATE AUDITOR

To: Justin Johnson, Secretary of Administration
Date: 23 February 2015
Re: Gruber contract
Cc: Bill Sorrell, Vermont Attorney General

The State of Vermont entered into a personal services contract with Dr. Jonathan Gruber in July 2014 for the purpose of “research and economic modeling related to the implementation of Green Mountain Care as passed into law as Act 48 of 2011” (contract #27277¹). Following news reports of certain remarks made by Dr. Gruber, the administration renegotiated the contract with Dr. Gruber in November 2014.² Subsequent public records requests yielded invoices and other documents that raised questions about Dr. Gruber’s billing practices and the State’s monitoring and enforcement of particular contract provisions. In response to requests from several state legislators, I have undertaken a limited review of the available documents.

There are a number of appendices, including comments from the Agency of Administration, which was sent a copy of this memorandum to ensure there are no factual errors. Here are my findings.

Invoices – Part 1

The contract requires the Contractor to “submit monthly invoices describing the work performed.”³

Dr. Gruber’s invoices referred only to “consulting and modeling” and offered no details about specific tasks.⁴ In the broadest sense, those three words describe the work performed, but such generalities do not appear to satisfy the intent of the contract.

Attachment A of the contract “Specifications of Work to be Performed” describes “Professional Services” in some detail, including “Modeling and Analysis” using the Gruber Microsimulation Model, “Describing the Impact of Green Mountain Care” (predicted impact on individuals, businesses, the economy, and federal and state governments), and other deliverables.⁵ Therefore, the parties had a very clear understanding of the scope of work. And since the Agency of Administration’s two key contacts— Robin Lunge and Michael Costa — were in frequent, sometimes daily, contact with Dr. Gruber, they were well aware of the nature and extent of the work being performed.⁶

¹ Appendix B, Gruber contract.

² Appendix C, Gruber amended contract.

³ Appendix B, Attachment B, item #1.

⁴ Appendix D, Gruber invoices dated September 3, 2014 and October 16, 2014.

⁵ Appendix B, Attachment A.

⁶ January 22, 2015 telephone conversation with Robin Lunge.

Nevertheless, contract terms have a purpose and should be enforced. In this case, the record shows that Ms. Lunge and Mr. Costa were aware of the need for more details in the invoices,⁷ but approved them nonetheless. Notwithstanding their intimate knowledge of the work, Ms. Lunge and Mr. Costa had an obligation to request additional detail from Dr. Gruber, and they failed to do so.

Invoices – Part 2

The contract also requires the invoice to describe “the [billed] amounts associated with [the] work” performed.⁸

Dr. Gruber’s invoices included charges for hours worked by Dr. Gruber and his research assistant(s) at the hourly rates stipulated in the contract. While the hours billed were undoubtedly spent on “consulting and modeling,” this broad characterization does not satisfy the contract requirement.

As noted above, the State was well-informed of Dr. Gruber’s incremental progress, so the responsible parties appeared to have a good idea of whether the hours billed reflected the work performed. But, here again, the administration should have insisted upon sufficient detail to meet the requirements of the contract.

It is noteworthy that Dr. Gruber’s first invoice reported round numbers of hours worked (100 for Mr. Gruber and 500 for the research assistants). This is possible, but unlikely. In addition, the second invoice reported exactly the same figures, which is implausible. Note that Dr. Gruber’s second invoice was submitted before the first had been paid, and at that time the State had not challenged or questioned him about the round numbers and lack of detail in the first invoice.

The deliverables were expected in a relatively short time (about five months), and payment for Dr. Gruber’s team was not to exceed \$400,000 (excluding \$50,000 for Moody’s Analytics). It appears Dr. Gruber assumed that the contract allowed him to bill in round figures (perhaps four invoices for \$100,000 each), although the plain language of the contract says otherwise. When asked for documentation of the hours worked and billed, this was Dr. Gruber’s response:

“My RA did not submit his hours to me in writing. My understanding with my RA regarding billing and work was based upon oral communications with my RA. During the relevant period, we worked very closely with the State and the pertinent State officials were aware of the nature and amount of work that we were performing under the contract.”⁹

If Dr. Gruber had a team of programmers, the total hours billed might appear reasonable (ignoring the round numbers for the moment). But we now know that Dr. Gruber used only one RA during this period, so it seems unlikely that the RA could have worked 1,000 hours in 10 weeks (the total from the first two invoices). To do so, the RA would have worked exclusively on this project for more than 14 hours per day – every day.

The evidence suggests that Dr. Gruber overstated the hours worked by the RA and that the Agency of Administration ignored the obvious signs that something was amiss. Even if the State was not overly concerned about the first invoice, Ms. Lunge and Mr. Costa should certainly have been alarmed by the second. But except for one brief e-mail exchange,¹⁰ there is no evidence that they were troubled, nor

⁷ September 21, 2014 e-mail exchange between Robin Lunge and Michael Costa.

⁸ Appendix B, Attachment B, item #1.

⁹ E-mail attachment received from Dr. Gruber on January 23, 2015.

¹⁰ See footnote #7.

did they communicate any concern to Dr. Gruber. Despite the tight deadline and their close working relationship with Dr. Gruber, they were obligated to ensure compliance with contract terms.

Invoices – Part 3

Two invoices have been submitted since the contract was amended in late November.¹¹ The first included hours for Dr. Gruber, which the State contends is expressly forbidden by the amended contract. As Robin Lunge explained,

*“The state, however, is not satisfied with the last 2 invoices received [from] Dr. Gruber, which are dated December 30, 2014...In essence, we are concerned that one invoice bills for Dr. Gruber’s time in violation of the contract amendment. Additionally, we are no longer satisfied with the level of detail provided.”*¹²

As of this writing, the State has not paid Dr. Gruber any portion of the last two invoices.¹³

Invoices – Part 4

The last two invoices call for payment for 500 hours of work by the RA. The period covered by the two invoices was October 15 to December 19, which is a little over nine weeks. Though possible, this is not realistic, as the RA would have had to work almost eight hours per day every day, or 11 hours each weekday (and exclusively on this project).

Research Assistants – Part 1

Item 15 of Attachment C of the contract (“Sub-agreements”) states that the contractor “shall not assign, subcontract or subgrant the performance of [the] agreement or any portion thereof to any other party without the prior written approval of the State.”¹⁴

Some have questioned whether the State is obligated to pay the research assistants / programmers because they were not named in the contract.¹⁵ Although no RAs were named in the contract, Attachment B included “programmers” in the cost schedule, which means the State was aware of their role and expected to be billed for their services. In addition, Dr. Gruber’s proposal in response to the RFP includes the names and experience of all those identified as likely members of his team, including the primary programmer.¹⁶ As I will discuss below, this individual was an employee of Dr. Gruber and, therefore, not a subcontractor to whom performance had been “assigned.”

It is unclear why Dr. Gruber used both terms (programmer and research assistant), but the individual identified in the proposal had considerable experience working with Dr. Gruber’s microsimulation model, which was an essential tool for the analysis and a major factor in the decision to award him the contract.¹⁷ So, while the invoices did not specify the work performed by the “research assistants,” the proposal made clear their responsibilities.

Research Assistants – Part 2

¹¹ Appendix E. Both were dated December 30, 2014, but each dealt with a different time period.

¹² February 12, 2015 e-mail attachment from Robin Lunge to Auditor Hoffer.

¹³ February 9, 2015 e-mail from Deputy Secretary of Administration Michael Clasen to Auditor Hoffer.

¹⁴ Appendix B.

¹⁵ November 2014 requests via e-mail for an investigation by State Senator Joe Benning and State Representative Oliver Olsen.

¹⁶ Appendix F.

¹⁷ February 10, 2015 phone conversation with Tom Kavet, the Legislature’s economist who reviewed the proposals.

The employment status of the programmers / research assistants has also been questioned.¹⁸ Were they employees, independent contractors, or MIT students working under Dr. Gruber's supervision? When first asked, Dr. Gruber stated that the RA was an independent contractor.¹⁹ Later, when asked for documentation, Dr. Gruber provided a W-2 for his sole RA for the Vermont contract, which means he was an employee.²⁰ Dr. Gruber stated that he relies upon a payroll service to handle these issues because they are "outside [his] area of expertise."²¹

Research Assistants – Part 3

The cost schedule in Attachment B allowed Dr. Gruber to pay programmers up to \$100 per hour, which is what was billed. Some have questioned whether the programmer / RA was actually paid \$100 per hour and whether Dr. Gruber will profit from the contract.²²

First, it is not uncommon for an employer or contractor to bill an hourly rate that is higher than what is actually paid to an employee. The difference allows the contractor to pay for benefits (if offered), payroll taxes, overhead, and to earn a profit.

Second, since the State agreed to pay up to \$100 per hour for the programmers' work, and the contract is silent about agreements the contractor may have to perform that work, the wage rate is between the contractor and his or her employee(s).

The first two invoices billed a total of \$100,000 for the RA's time, and the State paid \$80,000 (withholding 20 percent as permitted by contract until the final deliverables are received). The W-2 provided by Dr. Gruber indicated that the RA was paid just over \$32,000 in wages for 2014. The \$32,000 was not solely for work the RA performed on the Vermont contract, as Dr. Gruber said the figure "reflects some work on other projects as well."²³

Insurance

Item #7 in Attachment C of the contract requires the contractor to "provide certificates of insurance to show that [certain] minimum coverages are in effect." The required insurance included Workers Compensation, General Liability and Property Damage, and Automotive Liability. The Deputy Secretary of Administration "was not able to locate an insurance certificate in the contract file."²⁴ Thus, it appears Mr. Gruber failed to provide the required certificates and the administration made no effort to obtain them.

Work Product

In spite of concerns about the invoices, it appears the administration was satisfied with the work of Dr. Gruber and his RA. According to Ms. Lunge,

"Dr. Gruber provided the state with requested outputs from his economic model. This model was modified to include state-specific data received pursuant to data use agreements with the relevant agencies who hold that data. The model was also modified to provide state specified policy choices. The result of this modeling is available

¹⁸ November 2014 requests via e-mail for an investigation by State Sen. Joe Benning and State Rep. Oliver Olsen.

¹⁹ January 19, 2015 e-mail from Dr. Gruber to Robin Lunge.

²⁰ February 4, 2015 e-mail attachment from Dr. Gruber to Auditor Hoffer.

²¹ February 4, 2015 e-mail from Dr. Gruber to Auditor Hoffer.

²² November 2014 Requests via e-mail for an investigation by State Senator Joe Benning and State Representative Oliver Olsen.

²³ February 4, 2015 e-mail from Dr. Gruber to Auditor Hoffer.

²⁴ February 9, 2015 e-mail from Deputy Secretary of Administration Michael Clasen to Auditor Hoffer.

on my website: hcr.vermont.gov and is contained in the Green Mountain Care report and appendices. In addition, Dr. Gruber contributed to the Appendices as requested by state staff, specifically, he provided technical information about his model and modeling for Appendix C. The work was received in the time frame requested by the state. His work fulfills the work requested under the contract.”²⁵

Conclusion

In the end, one can certainly find fault with Dr. Gruber’s bookkeeping and his inattention to administrative details. As noted above, the evidence suggests that Dr. Gruber overstated the hours worked by the RA, but we have insufficient documentation to say any more about his inconsistencies and questionable billing practices. I have referred the matter to the Attorney General for his consideration, which is standard procedure in such circumstances.

The State has withheld the allowed retainage (\$20,000 for Dr. Gruber and \$20,000 for the RA). In addition, no payments have been made for the final two invoices, which gives the State considerable leeway and leverage in concluding this relationship.

Finally, it’s clear that the Agency of Administration failed to exercise due diligence and enforce important provisions of the contract. The Agency of Administration should be a model of best practices in contract administration. Hopefully, it will work to improve its oversight and control functions to ensure greater accountability.

²⁵ February 11, 2015 e-mail from Robin Lunge to Auditor Hoffer.

Appendix A: Chronology

- May 27, 2014: RFP released.
- June 19, 2014: Dr. Gruber submitted his proposal (one of three submissions).
- July 16, 2014: Contract is signed (#27277) and work commences.
- Sept. 3, 2014: First invoice submitted by Dr. Gruber for \$100,000 covering the period mid-July through the end of August.
- Sept. 19, 2014 Mr. Costa sends first invoice to Ms. Lunge for approval.
- Sept. 21, 2014 Ms. Lunge asks Mr. Costa if the invoice is detailed enough. She suggests contacting Deputy Secretary of Administration Michael Clasen before approving payment and indicates a need to check the contract terms.
- Sept. 21, 2014 Mr. Costa agrees to ask Mr. Clasen about the level of detail in the invoice.
- Sept. 30, 2014 Mr. Costa informs staff that the first invoice has been approved and asks that it be paid.
- Oct. 14, 2016 Eighty-percent of first invoice is paid (\$80,000). As per the contract, the state withheld 20 percent “until the final deliverable has been delivered and accepted by the state.”
- Oct. 16, 2014: Second invoice submitted by Dr. Gruber for \$100,000. It is identical to the first.
- Oct. 17, 2014 Mr. Costa informs staff that the second invoice has been approved.
- Nov. 10, 2014 Eighty-percent of second invoice paid (\$80,000). Once again, the state withholds 20 percent “until the final deliverable has been delivered and accepted by the state.”
- Nov. 25, 2014 Contract amendment approved effective Nov. 18, 2014.
- Dec. 1, 2014: Auditor Hoffer asked Secretary of Administration Jeb Spaulding for information related to Dr. Gruber’s invoices, including hours billed, the employment status of the RAs, names and contact information for the RAs and how much each has been paid.
- Dec. 11, 2014 Auditor Hoffer sent a follow-up e-mail to Secretary Spaulding indicating that no reply to the Dec. 1 request had been received.
- Dec. 12, 2014 Mr. Clasen acknowledged the Dec. 1 information request and indicated that the administration was pursuing the information requested by the Auditor. In addition, Mr. Clasen noted that the administration had “placed a hold on any future payments, including the release of funds held as retainage, until such time as deliverables and associated information requests are provided.”
- Dec. 30, 2014 Auditor Hoffer asked Mr. Clasen if he had received anything from Dr. Gruber and also asked if Ms. Lunge had asked for a reply by a date certain.
- Dec. 31, 2014 Deputy Secretary Clasen said he would check with Ms. Lunge the following week.
- Jan. 7, 2015 Auditor Hoffer contacted Mr. Clasen and expressed concern about the continuing delay.

- Jan. 7, 2015 Ms. Lunge apologized and explained that the release of the GMC report and the need to respond to multiple public records requests had prevented a more timely response. In addition, she noted that Dr. Gruber had been occupied with congressional requests for information and documentation.
- Jan. 12, 2015 Ms. Lunge reported to Mr. Clasen that Dr. Gruber's contract receivables had been completed so the State could release the 20 percent retainage withheld from the RA portion of the first two invoices. These payments have not been made.
- Jan. 19, 2015 Ms. Lunge forwarded Dr. Gruber's response, which included no documentation.
- Jan. 20, 2015 Auditor Hoffer expressed disappointment and indicated his intent to contact Dr. Gruber directly.
- Jan. 22, 2015 Auditor Hoffer requested Dr. Gruber's proposal in response to the RFP, and it was delivered the same day.
- Jan. 23, 2015 Auditor Hoffer contacted Dr. Gruber directly and repeated his requests first made through the administration.
- Jan. 25, 2015 Dr. Gruber responded, but stated that he was about to leave the country and would reply to the information requests on his return.
- Feb. 2, 2015 Auditor Hoffer sent a reminder to Dr. Gruber asking when the requested information would be provided.
- Feb. 4, 2015 Dr. Gruber responded to the questions posed.
- Feb. 5, 2015 Auditor Hoffer asked Dr. Gruber two follow-up questions, and he responded the same day.
- Feb. 9, 2015 Auditor Hoffer asked Mr. Clasen several questions related to the source of funds for the Gruber contract, insurance coverage, outstanding invoices, and whether there were any other communications related to all of these issues that were not included in the materials provided earlier (mostly e-mail traffic).
- Feb. 9, 2015 Auditor Hoffer asked Ms. Lunge if the administration was satisfied with the quality, quantity, and timeliness of the work provided by Dr. Gruber and his team.
- Feb. 10, 2015 Auditor Hoffer requested copies of the other bids in response to the RFP, and they were delivered the following day.
- Feb. 13, 2015 Ms. Lunge sent a letter to Dr. Gruber contesting certain parts of the last two invoices.

**STATE OF VERMONT, CONTRACT FOR PERSONAL SERVICES
AGENCY OF ADMINISTRATION
JONATHAN GRUBER, CONSULTANT**

Contract # 27277

1. **Parties.** This is a contract for services between the State of Vermont, Agency of Administration (hereafter called "State"), and Jonathan Gruber, consultant with a principal place of business in Lexington, MA, (hereafter called "Contractor"). The Contractor's local address is 83 Pleasant Street, Lexington, MA 02421. It is the contractor's responsibility to contact the Vermont Department of Taxes to determine if, by law, the contractor is required to have a Vermont Department of Taxes Business Account Number.
2. **Subject Matter.** This is a personal services contract for policy expertise, research, and economic modeling related to the implementation of Green Mountain Care as passed into law by Act 48 of 2011. Detailed services to be provided by the contractor are described in Attachment A.
3. **Maximum Amount.** In consideration of the services to be performed by Contractor, the State agrees to pay Contractor, in accordance with the payment provisions specified in Attachment B, a sum not to exceed \$450,000.00.
4. **Contract Term.** The period of contractor's performance shall begin on July 21, 2014 and end on February 15, 2015. The State and the Contractor have the option of renewing this contract for up to one (1) one-year extension.
5. **Prior Approvals.** If approval by the Attorney General's Office or the Secretary of Administration is required, (under current law, bulletins, and interpretations), neither this contract nor any amendment to it is binding until it has been approved by either or both such persons.
 - Approval by the Attorney General's Office is required.
 - Approval by the Secretary of Administration is required.
 - Approval by the CIO/Commissioner DII is not required.
6. **Amendment.** No changes, modifications, or amendments in the terms and conditions of this contract shall be effective unless reduced to writing, numbered and signed by the duly authorized representative of the State and Contractor.
7. **Cancellation.** This contract may be canceled by either party by giving written notice at least 30 days in advance. Notwithstanding this provision, in the event that federal funds supporting this contract become unavailable or are reduced, the State may cancel this contract with no obligation to pay the Contractor from State revenues.

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8. *Attachments.* This contract consists of 14 pages including the following attachments which are incorporated herein:

Attachment A - Specifications of Work to be Performed

Attachment B - Payment Provisions

Attachment C – “Standard State Provisions for Contracts and Grants” a preprinted form (revision date 11/17/2012).

9. *Order of Precedence.* Any ambiguity, conflict or inconsistency in the Contract Documents shall be resolved according to the following order of precedence:

(1) Standard Contract

(2) Attachment C (Standard Contract Provisions for Contracts and Grants)

(3) Attachment A

(4) Attachment B

WE THE UNDERSIGNED PARTIES AGREE TO BE BOUND BY THIS CONTRACT.

By the State of Vermont:

Date: 7/16/14

Signature: Jeb Spaulding

Jeb Spaulding, Secretary
Agency of Administration

By the Contractor:

Date: 7/16/14

Signature: Jonathan Gruber

Jonathan Gruber, Consultant
ADDRESS

ATTACHMENT A

SPECIFICATIONS OF WORK TO BE PERFORMED

Goal

Overall, the goal of this engagement is to assist the State in analyzing finance and coverage proposals for Green Mountain Care to be presented to the Legislature by January 15, 2015. Specifically, the Agency of Administration is contracting for policy expertise and economic modeling to understand and assess the impact of moving from the current health care coverage and finance system to a publicly financed health care system in accordance with Act 48 of 2011.

General Conditions

- This Contract is funded in part by federal funds. All terms of this Contract are subject to any requirements necessary to obtain and maintain such funding.
- Robin Lunge and Michael Costa shall serve as the State's primary contacts for this Contract. Jonathan Gruber shall serve as the Contractor's primary contact for this Contract. Such contacts may be changed by written notice to the other party.
- The State and the Contractor shall meet weekly, in person or by conference call, to review progress on contract work, the status of specific project activities, identify and discuss outstanding issues, and identify any additional areas for research, modeling, or follow-up. The frequency of the meetings may be changed upon agreement of the parties.
- Contractor and the State acknowledge that some of the work performed under this Contract is interrelated with other work being performed by the State and other contractors simultaneously. The Contractor and its subcontractors will coordinate with other State contractors to ensure that their work is consistent with other research and work being completed.
- Contractor, and any of his staff that he deems necessary, shall attend a kickoff meeting on July 21, 2014 in Boston at the University of Massachusetts Medical School Center for Health Law and Economics. The kickoff will include participation from the State, Consultant, staff from the University of Massachusetts Medical School, and Wakely Consulting. The kickoff will focus on project goals, background, policy assumptions, data, expected output, development of a timeline, and project management expectations.
- The Contractor may advise the Governor on policy matters related to the project to assist the Governor in deliberations and decision-making related to the project. The Contractor's advice may include recommendations to contribute to the Governor's deliberations as part of the decision-making process.

Professional Services to be Rendered

A. Modeling and Analysis

- Use the Gruber Microsimulation Model (GMSIM) to simulate the implementation of Green Mountain Care and related tax changes and assess the impacts on the economy. This shall include but not be limited to the following:
 - Calibration of the GMSIM with Vermont data and assumptions to the extent possible.
 - Determining incidence for the current Vermont health care system.
 - Simulation of each individual in the population based on various coverage and financing alternatives.
 - Simulation of each Vermont employer based on various coverage and financing alternatives.
 - Utilization of various federal and state tax provisions.
 - Assessing options for an orderly transition from the current system to Green Mountain Care.
 - Estimation of the impact on state and local government spending.
- Contractor may subcontract with Moody's Analytics for macroeconomic modeling that analyzes the impacts of Green Mountain Care coverage and financing proposals on Vermont's economy.
- The Contractor and his subcontractor shall assist the State in analyzing the triggers set forth in Act 48 for future consideration by the Green Mountain Care Board:
 - When implemented, Green Mountain Care will not have a negative aggregate impact on Vermont's economy.
 - The financing for Green Mountain Care is sustainable.
- Additionally, the consultant will assist the Administration in the creation of a three year budget for Green Mountain Care and five year health care cost and revenue forecast.

B. Describing the Impact of Green Mountain Care

- The Contractor shall provide proper documentation of data sources, assumptions, and methodology.
- In describing the impact on individuals, the Contractor shall describe the following impacts by age, employment, gender, race, education, and geography within the State:
 - Impact on insurance generosity
 - Impact on health care utilization

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- Impact on out of pocket medical spending
 - Impact on income
- In describing the impact on businesses, the Contractor shall describe the following impacts:
 - Industry
 - Firm size
 - Mix of full time and part time employment
 - Ex-ante insurance offering
 - Revenues
 - Wages of employees
 - Ex-ante actuarial value of insurance offered
 - Ex-ante insurance take up
 - Current employer premium contribution share
- In describing the impact on the federal government, the Contractor shall describe the following impacts:
 - Impacts on expenditures of those on public insurance
 - Impact on expenditures and penalties under the ACA
 - Impact on deductibility of federal taxes by Vermonters
 - Impact on income taxation for individuals and businesses
 - Impact of changes in payment of federal payroll taxation
- In describing the impact on the state budget, the Contractor shall describe the following impacts:
 - Impact on state spending on public insurance
 - Impact on public health programs other than green Mountain Care
 - Impacts on state unemployment insurance
 - Impact on state tax collections
- In describing the impact on Vermont's economy, the Contractor or his subcontractor shall describe the following impacts:
 - Impacts on total state employment and GDP
 - Impacts on employment and GDP by industry within the State
 - Impacts on population changes, including migration
 - Impacts on aggregate and sectoral wages paid to employees
 - Impacts on aggregate and sectoral profits of business
 - Impacts on aggregate and sectoral prices from shifting costs to consumer prices
- Set forth a three year budget for Green Mountain Care and a five year health care cost and revenue forecast.

C. Development of a Final Work Product

- The Contractor shall assist the Administration and other consultants in the development of final policy recommendations that form the basis of a comprehensive report to the state legislature. The Administration will submit its report with findings and recommendations to the state legislature on or before January 15, 2015. The report should include a comparison of the baseline to the proposed future state using the following categories:

- Household
 - by AGI
 - family size
 - premiums, including average by family income and size;
 - out of pocket expenses, including average by family income and size;
 - indirect payment of health care through taxes (federal, state, and municipal),
- Employers
 - Size: by number of employees and size of payroll
 - Type of business: NAICs code, industry, or other category
 - Business by current health insurance offered
- Health Care
 - Household by health status
 - Insurance coverage
 - Employment relationship
 - Age

D. Other Deliverables

- The Contractor will produce ad hoc reports as needed.
- The Contractor should expect to travel to Montpelier for several days in December 2014 and/or January 2015 to present the report to key administrative officials, legislative committees, and stakeholder groups.
 - Other travel may be required and will be authorized via mutual consent of the State and Contractor.

**ATTACHMENT B
PAYMENT PROVISIONS**

The maximum dollar amount payable under this agreement is not intended as any form of a guaranteed amount. The Contractor will be paid for services specified in Attachment A, for services actually performed, up to the maximum allowable amount specified in this agreement. State of Vermont payment terms are net 30 days from date of invoice; payments against this contract will comply with the State's payment terms. The payment schedule for delivery products, or rates for services performed, and any additional reimbursements, are included in this attachment. The following provisions specifying payments are:

1. Payment Schedule: Contractor shall submit monthly invoices describing the work performed and the amounts associated with such work. The hourly rates and total costs shall not exceed the amounts listed in the table below, except that addition travel for meetings in Vermont may be billed in an amount not to exceed \$2,500 per day per visit. From each invoice the State shall withhold 20% of the billed amount until the final deliverable has been delivered and accepted by the State. After acceptance of the final deliverable, the State shall pay the retained amounts to the Contractor.

Cost Schedule

Resource	Hourly Rate	Total
Jonathan Gruber	\$500	\$400,000
Programmers	Not more than \$100	
Moody's Analytics		\$50,000
TOTAL		\$450,000

2. Invoices shall be submitted on the Contractor's official letterhead, signed by an authorized representative of the Contractors organization, reference this contract's number and be submitted to:

Robin Lunge, Director of Health Care Reform
Agency of Administration
109 State Street, 5th floor
Montpelier, VT 05609

3. Total maximum payable under this contract is \$450,000. Total maximum payable under this Contract for Contractor's services shall not exceed \$400,000. The Contractor may subcontract for macroeconomic modeling and analysis with Moody's Analytics for not more than \$50,000 as described above in Attachment A.

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4. Payments by State to Contractor will be made in the name of Jonathan Gruber and will be sent to: Jonathan Gruber, 83 Pleasant Street, Lexington, MA 02421.

ATTACHMENT C:
STANDARD STATE PROVISIONS FOR CONTRACTS AND GRANTS
11/7/2012

1. **Entire Agreement:** This Agreement, whether in the form of a Contract, State Funded Grant, or Federally Funded Grant, represents the entire agreement between the parties on the subject matter. All prior agreements, representations, statements, negotiations, and understandings shall have no effect.
2. **Applicable Law:** This Agreement will be governed by the laws of the State of Vermont.
3. **Definitions:** For purposes of this Attachment, "Party" shall mean the Contractor, Grantee or Subrecipient, with whom the State of Vermont is executing this Agreement and consistent with the form of the Agreement.
4. **Appropriations:** If this Agreement extends into more than one fiscal year of the State (July 1 to June 30), and if appropriations are insufficient to support this Agreement, the State may cancel at the end of the fiscal year, or otherwise upon the expiration of existing appropriation authority. In the case that this Agreement is a Grant that is funded in whole or in part by federal funds, and in the event federal funds become unavailable or reduced, the State may suspend or cancel this Grant immediately, and the State shall have no obligation to pay Subrecipient from State revenues.
5. **No Employee Benefits For Party:** The Party understands that the State will not provide any individual retirement benefits, group life insurance, group health and dental insurance, vacation or sick leave, workers compensation or other benefits or services available to State employees, nor will the state withhold any state or federal taxes except as required under applicable tax laws, which shall be determined in advance of execution of the Agreement. The Party understands that all tax returns required by the Internal Revenue Code and the State of Vermont, including but not limited to income, withholding, sales and use, and rooms and meals, must be filed by the Party, and information as to Agreement income will be provided by the State of Vermont to the Internal Revenue Service and the Vermont Department of Taxes.
6. **Independence, Liability:** The Party will act in an independent capacity and not as officers or employees of the State.

The Party shall defend the State and its officers and employees against all claims or suits arising in whole or in part from any act or omission of the Party or of any agent of the Party. The State shall notify the Party in the event of any such claim or suit, and the Party shall immediately retain counsel and otherwise provide a complete defense against the entire claim or suit.

After a final judgment or settlement the Party may request recoupment of specific defense costs and may file suit in Washington Superior Court requesting recoupment.

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The Party shall be entitled to recoup costs only upon a showing that such costs were entirely unrelated to the defense of any claim arising from an act or omission of the Party.

The Party shall indemnify the State and its officers and employees in the event that the State, its officers or employees become legally obligated to pay any damages or losses arising from any act or omission of the Party.

7. **Insurance:** Before commencing work on this Agreement the Party must provide certificates of insurance to show that the following minimum coverages are in effect. It is the responsibility of the Party to maintain current certificates of insurance on file with the state through the term of the Agreement. No warranty is made that the coverages and limits listed herein are adequate to cover and protect the interests of the Party for the Party's operations. These are solely minimums that have been established to protect the interests of the State.

Workers Compensation: With respect to all operations performed, the Party shall carry workers' compensation insurance in accordance with the laws of the State of Vermont.

General Liability and Property Damage: With respect to all operations performed under the contract, the Party shall carry general liability insurance having all major divisions of coverage including, but not limited to:

Premises - Operations
Products and Completed Operations
Personal Injury Liability
Contractual Liability

The policy shall be on an occurrence form and limits shall not be less than:
\$1,000,000 per Occurrence
\$1,000,000 General Aggregate
\$1,000,000 Products/Completed Operations Aggregate
\$ 50,000 Fire/ Legal/Liability

Party shall name the State of Vermont and its officers and employees as additional insureds for liability arising out of this Agreement.

Automotive Liability: The Party shall carry automotive liability insurance covering all motor vehicles, including hired and non-owned coverage, used in connection with the Agreement. Limits of coverage shall not be less than: \$1,000,000 combined single limit.

Party shall name the State of Vermont and its officers and employees as additional insureds for liability arising out of this Agreement.

8. **Reliance by the State on Representations:** All payments by the State under this Agreement will be made in reliance upon the accuracy of all prior representations by the

Party, including but not limited to bills, invoices, progress reports and other proofs of work.

- 9. Requirement to Have a Single Audit:** In the case that this Agreement is a Grant that is funded in whole or in part by federal funds, the Subrecipient will complete the Subrecipient Annual Report annually within 45 days after its fiscal year end, informing the State of Vermont whether or not a single audit is required for the prior fiscal year. If a single audit is required, the Subrecipient will submit a copy of the audit report to the granting Party within 9 months. If a single audit is not required, only the Subrecipient Annual Report is required.

A single audit is required if the subrecipient expends \$500,000 or more in federal assistance during its fiscal year and must be conducted in accordance with OMB Circular A-133. The Subrecipient Annual Report is required to be submitted within 45 days, whether or not a single audit is required.

- 10. Records Available for Audit:** The Party will maintain all books, documents, payroll papers, accounting records and other evidence pertaining to costs incurred under this agreement and make them available at reasonable times during the period of the Agreement and for three years thereafter for inspection by any authorized representatives of the State or Federal Government. If any litigation, claim, or audit is started before the expiration of the three year period, the records shall be retained until all litigation, claims or audit findings involving the records have been resolved. The State, by any authorized representative, shall have the right at all reasonable times to inspect or otherwise evaluate the work performed or being performed under this Agreement

- 11. Fair Employment Practices and Americans with Disabilities Act:** Party agrees to comply with the requirement of Title 21 V.S.A. Chapter 5, Subchapter 6, relating to fair employment practices, to the full extent applicable. Party shall also ensure, to the full extent required by the Americans with Disabilities Act of 1990, as amended, that qualified individuals with disabilities receive equitable access to the services, programs, and activities provided by the Party under this Agreement. Party further agrees to include this provision in all subcontracts.

- 12. Set Off:** The State may set off any sums which the Party owes the State against any sums due the Party under this Agreement; provided, however, that any set off of amounts due the State of Vermont as taxes shall be in accordance with the procedures more specifically provided hereinafter.

13. Taxes Due to the State:

- a. Party understands and acknowledges responsibility, if applicable, for compliance with State tax laws, including income tax withholding for employees performing services within the State, payment of use tax on property used within the State, corporate and/or personal income tax on income earned within the State.

- b. Party certifies under the pains and penalties of perjury that, as of the date the Agreement is signed, the Party is in good standing with respect to, or in full compliance with, a plan to pay any and all taxes due the State of Vermont.
- c. Party understands that final payment under this Agreement may be withheld if the Commissioner of Taxes determines that the Party is not in good standing with respect to or in full compliance with a plan to pay any and all taxes due to the State of Vermont.
- d. Party also understands the State may set off taxes (and related penalties, interest and fees) due to the State of Vermont, but only if the Party has failed to make an appeal within the time allowed by law, or an appeal has been taken and finally determined and the Party has no further legal recourse to contest the amounts due.

14. Child Support: (Applicable if the Party is a natural person, not a corporation or partnership.) Party states that, as of the date the Agreement is signed, he/she:

- a. is not under any obligation to pay child support; or
- b. is under such an obligation and is in good standing with respect to that obligation; or
- c. has agreed to a payment plan with the Vermont Office of Child Support Services and is in full compliance with that plan.

Party makes this statement with regard to support owed to any and all children residing in Vermont. In addition, if the Party is a resident of Vermont, Party makes this statement with regard to support owed to any and all children residing in any other state or territory of the United States.

15. Sub-Agreements: Party shall not assign, subcontract or subgrant the performance of this Agreement or any portion thereof to any other Party without the prior written approval of the State. Party also agrees to include in all subcontract or subgrant agreements a tax certification in accordance with paragraph 13 above.

16. No Gifts or Gratuities: Party shall not give title or possession of any thing of substantial value (including property, currency, travel and/or education programs) to any officer or employee of the State during the term of this Agreement.

17. Copies: All written reports prepared under this Agreement will be printed using both sides of the paper.

18. Certification Regarding Debarment: Party certifies under pains and penalties of perjury that, as of the date that this Agreement is signed, neither Party nor Party's principals (officers, directors, owners, or partners) are presently debarred, suspended, proposed for debarment, declared ineligible or excluded from participation in federal programs, or programs supported in whole or in part by federal funds.

Party further certifies under pains and penalties of perjury that, as of the date that this Agreement is signed, Party is not presently debarred, suspended, nor named on the State's debarment list at: <http://bgs.vermont.gov/purchasing/debarment>

**STATE OF VERMONT, CONTRACT FOR PERSONAL SERVICES
AGENCY OF ADMINISTRATION
JONATHAN GRUBER, CONSULTANT**

Contract # 27277

- 19. Certification Regarding Use of State Funds:** In the case that Party is an employer and this Agreement is a State Funded Grant in excess of \$1,001, Party certifies that none of these State funds will be used to interfere with or restrain the exercise of Party's employee's rights with respect to unionization.

(End of Standard Provisions)

Appendix C: Contract Amendment

STATE OF VERMONT CONTRACT SUMMARY AND CERTIFICATION ----- Form AA-14 (8/22/11)

Note: All sections are required. Incomplete forms will be returned to department.

I. CONTRACT INFORMATION:

Agency/Department: Administration/ Secretary's Office **Contract #:** 27277 **Amendment #:** 1
Vendor Name: Jonathan Gruber **VISION Vendor No:** 336001
Vendor Address: 83 Pleasant Street, Lexington, MA 02421
Starting Date: 7/21/2014 **Ending Date:** 2/15/2015 **Amendment Date:** 11/24/14
Summary of agreement or amendment:

II. FINANCIAL INFORMATION

Maximum Payable: \$280,000.00 **Prior Maximum:** \$ 450,000.00 **Prior Contract # (If Renewal):**
Current Amendment: \$-170,000.00 **Cumulative amendments:** \$ - 170,000.00 **% Cumulative Change:** 37.00 %
Business Unit(s): ; ; - [notes:] **VISION Account(s):** ;

III. PERFORMANCE INFORMATION

Does this Agreement include Performance Measures tied to Outcomes and/or financial reward/penalties? Yes No

Estimated Funding Split: G-Fund % S-Fund % F-Fund % GC-Fund 100.00 % Other %

III. PUBLIC COMPETITION

The agency has taken reasonable steps to control the price of the contract or procurement grant and to allow qualified organizations to compete for the work authorized by this contract. The agency has done this through:
 Standard bid or RFP Simplified Bid Sole Sourced Qualification Based Selection Statutory

IV. TYPE OF AGREEMENT & PERFORMANCE INFORMATION

Check all that apply: Service Personal Service Architect/Engineer Construction Marketing
 Information Technology Other, describe:

V. SUITABILITY FOR CONTRACT FOR SERVICE

Yes No n/a If this is a Personal Service contract, does this agreement meet all 3 parts of the "ABC" definition of independent contractor? (See Bulletin 3.5) If NO, then contractor must be paid through Payroll

VI. CONTRACTING PLAN APPLICABLE:

Are one or more contract or terms & conditions provisions waived under a pre-approved Contracting Plan? Yes No

VII. CONFLICT OF INTEREST

By signing below, I certify that no person able to control or influence award of this contract had a pecuniary interest in its award or performance, either personally or through a member of his or her household, family, or business.
 Yes No Is there an "appearance" of a conflict of interest so that a reasonable person may conclude that this party was selected for improper reasons: (If yes, explain)

VIII. PRIOR APPROVALS REQUIRED OR REQUESTED

Yes No Agreement must be approved by the Attorney General under 3 VSA §311(a)(10) (personal service)
 Yes No I request the Attorney General review this agreement as to form
 No, already performed by in-house AAG or counsel: _____ (initial)
 Yes No Agreement must be approved by the Comm. of DII; for IT hardware, software or services and Telecommunications over \$100,000
 Yes No Agreement must be approved by the CMO; for Marketing services over \$15,000
 Yes No Agreement must be approved by Comm. Human Resources (privatization and retiree contracts)
 Yes No Agreement must be approved by the Secretary of Administration

IX. AGENCY/DEPARTMENT HEAD CERTIFICATION; APPROVAL

I have made reasonable inquiry as to the accuracy of the above information:

11/24/14 _____ Date Agency / Department Head
 _____ Date Agency Secretary or Other Department Head (if required)
 _____ Date Approval by Attorney General
 _____ Date Approved by Commissioner of Human Resources
 _____ Date CIO _____ Date CMO 11/24/14 _____ Date Secretary of Administration

NOV 21 2014

The signatures of the undersigned indicate that each has read this amendment to Contract # 26266 in its entirety and agrees to be bound by the provisions enumerated therein.

By the State of Vermont:

Date: 11/25/14
Signature: [Handwritten Signature]
Name: Job Spaniolini
Title: Sec of Admin

By the Contractor:

Date: 11/24/2014
Signature: [Handwritten Signature]
Name: Jonathan Gruber
Title: Consultant

AMENDMENT

It is agreed by and between the State of Vermont, Agency of Administration (hereafter called the "State") and Jonathan Gruber (hereafter called the "Contractor") that the contract for services for policy expertise, research, and economic modeling related to the implementation of Green Mountain Care as passed into law by Act 48 of 2011, effective July 21, 2014, is hereby amended effective November 19, 2014, as follows:

1. Updating the maximum amount in the contract term referred to in section 3, Maximum Amount, on page 1 of the base contract and replaced to read as follows:

3. Maximum Amount

In consideration of the services to be performed by Contractor, the State agrees to pay Contractor, in accordance with the payment provisions specified in Attachment B, a sum not to exceed \$280,000.00.

2. In Attachment B, Payment Provisions on page 7, of the base contract: update to reflect the total maximum of \$280,000 with future invoices only for work performed by Contractor's research assistants (programmers) up to an additional \$100,000, resulting in a maximum of \$200,000 for Contractor's research assistants (programmers), including \$100,000 invoiced for services prior to this amendment and \$80,000 invoiced for services from Contractor prior to this amendment; delete provision for payment for travel; and delete provision for payment for Moody's analytics.
3. For Attachment B, Payment Provisions, on page 7, section 3, of the base contract amending the total maximum payable under the contract from \$450,000 to \$280,000.
4. For Attachment A, Specifications of Work to Be Performed, on page 4, section A, of the base contract amending the Modeling and Analysis to remove the bullet relating to subcontracting with Moody's Analytics and the reference to the subcontractor in the following bullet.

Required Certifications

Taxes Due to the State. Contractor certifies under the pains and penalties of perjury that, as of the date this contract amendment is signed, the Contractor is in good standing with respect to, or in full compliance with a plan to pay, any and all taxes due the State of Vermont.

Certification Regarding Suspension or Disbarment. Contractor certifies under the pains and penalties of perjury that, as of the date this contract amendment is signed, neither Party nor Party's principals (officers, directors, owners, or partners) are presently debarred, suspended, proposed for debarment, declared ineligible or excluded from participation in federal programs, or programs supported in whole or in part by federal funds.

Except as modified by this Amendment No. 1, all provisions of the original contract remain in full force and effect.

336000/27277

Gruber, Jonathan

83 Pleasant St.

Lexington, MA 02421

September 3, 2014

Approved for
10/1/14

Vendor # 336000
SDA - Health Care Reform
1100020400

Michael Costa

State of Vermont

OK
JSB

PO 709

V6524
CA

Dear Michael,

This letter serves as the first invoice for my work for the State of Vermont under contract #27277, consulting and modeling on the Green Mountain Care proposal. Over the period from mid-July through the end of August, total costs were:

Jonathan Gruber: 100 hours at \$500/hour	\$50,000
Research Assistants: 500 hours at \$100/hour	\$50,000
Total:	\$100,000

100,000
20,000 Less 20%
80,000

Please remit this total to me at the address above.

Sincerely,

507600
10000

Jonathan Gruber

Jonathan Gruber

10/14/14
2981008

OK Less 20% hold back per contract
see attached.

Michael J. Costello
Dep. Sec. Admin

10/21/14

336000/27277

83 Pleasant St.

Lexington, MA 02421

October 16, 2014

Michael Costa
State of Vermont

OK
BSS

V 7254

Dear Michael,

PO730

This letter serves as the first invoice for my work for the State of Vermont under contract #27277, consulting and modeling on the Green Mountain Care proposal. For the month of September, costs were:

Jonathan Gruber: 100 hours at \$500/hour	\$50,000
Research Assistants: 500 hours at \$100/hour	\$50,000
Total:	\$100,000

100,000
 20,000 less 20%

 80,000 retainage

Please remit this total to me at the address above.

Sincerely,

507600
10000

Sept 15 1000 to 1000
ADM

Jonathan Gruber

Approved
10/21/14

Jonathan Gruber

[Handwritten signature]

[Handwritten signature]
10/21/14
- less retainage as specified in contract.

Appendix E - 1: Gruber Invoice #3

83 Pleasant St.

Lexington, MA 02421

December 30, 2014

Michael Costa

State of Vermont

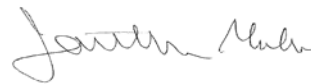
Dear Michael,

This letter serves as the third invoice for my work for the State of Vermont under contract #27277, consulting and modeling on the Green Mountain Care proposal. From October 15 to November 15, my total bill is:

Jonathan Gruber: 80 hours at \$500/hour:	\$40,000
Research Assistants: 250 hours at \$100/hour	\$25,000
Total:	\$65,000

Please remit this total to me at the address above.

Sincerely,



Jonathan Gruber

Appendix E - 2: Gruber Invoice #4

83 Pleasant St.

Lexington, MA 02421

December 30, 2014

Michael Costa

State of Vermont

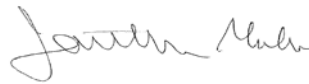
Dear Michael,

This letter serves as the fourth and final invoice for my work for the State of Vermont under contract #27277, consulting and modeling on the Green Mountain Care proposal. From November 15 through December 19, Vermont will reimburse me only for the cost of my research assistant. So my total bill is:

Research Assistants: 250 hours at \$100/hour	\$25,000
Total:	\$25,000

Please remit this total to me at the address above.

Sincerely,



Jonathan Gruber

**Response to RFP: Modeling Potential Green Mountain Care
Financing Proposals**

Jonathan Gruber, MIT

June, 2014

The state of Vermont has embarked on an unprecedented path towards single payer health care for its residents. This is a bold experiment which has the potential to fundamentally alter the delivery of health care in the state, and potentially in the nation as a whole. When implemented, this change will also fundamentally alter the Vermont state budget, and perhaps the economy as a whole. As such, state decisions about the path forward with Green Mountain Care must be informed by a solid understanding of these potential changes.

In this proposal, we outline a strategy for providing a comprehensive overview of the impact of Green Mountain Care on Vermont. The centerpiece of this strategy is the use of the Gruber Microsimulation Model (GMSIM), the leading health policy microsimulation model, as well as the model used as the basis for the influential Hsaio report which first developed the single payer alternative for Vermont. We will use this model to provide a rich description of the structure of the Vermont health economy in the wake of the Affordable Care Act (ACA), but before the implementation of Green Mountain Care. We will then simulate the implementation of Green Mountain Care and assess the broad range of impacts on the state.

This modeling exercise will draw on expertise from health economics, actuarial sciences, and macroeconomics. The underlying microsimulation model is based on the best available evidence from health economics, incorporating how both individuals and employers respond to changes in the health care market in the state. This modeling will be integrated with actuarial expertise to assess not only impacts on insurance coverage and incomes, but also on pricing in the insurance market. And the results will be incorporated into a state-based macroeconomic model to assess the effects of reform on the state economy as a whole as well as specific sectors. Despite the complicated nature of the exercise, we will set up a work process that is maximally transparent, open, and inclusive of others in the state who have a strong interest in understanding how Green Mountain Care will affect the state.

As described below, while the starting point is our previous model of Vermont used for the Hsaio report, we will update this model with newer data, revised assumptions, and new evidence on how the ACA is affecting Vermont. We will then estimate models to address the wide variety of questions around the equity and efficiency consequence of Green Mountain Care. On the equity side, we will develop a rich model of the incidence of health care spending both before and after Green Mountain Care, allowing us to carefully document how different groups in society are impacted by reform. On the efficiency side, we will measure changes in health care spending, incomes, and jobs from health care reform. Our model will allow for any one of a possible range of financing alternatives for Green Mountain Care.

This proposal begins with a description of the GMSIM and how it can be used to address the central questions posed by this RFP. We then describe the comprehensive state-specific data that are available for this modeling exercise. We lay out the particulars of how the

modeling will work, and then describe the wide variety of outcomes that will be available to policy makers as they move forward with their work on Green Mountain Care. We discuss the qualifications of our outstanding team, as well as the proposed work schedule and budget.

The Gruber Microsimulation Model

The Gruber Microsimulation Model (GMSIM) computes the effects of health insurance policies on the distribution of health care spending and private and public sector health care costs. This model has been used over the past 15 years by a wide variety of state and federal policy makers to analyze the impacts of health insurance reforms. This model was first developed in 1999 for use in estimating the impact of tax credits on health insurance coverage, with funding from the Kaiser Family Foundation. Over the subsequent 15 years, the model's capability has been expanded to consider the full variety of possible health interventions, including public insurance expansions, employer or individual mandates, purchasing pools for insurance, single payer systems, and more. This model is widely used for a variety of health insurance modeling tasks; a partial list of sponsors for modeling work include: The Kaiser Family Foundation; The Commonwealth Fund; The California Endowment; The California Health Care Foundation; The AFL-CIO; The Blue Cross/Blue Shield Association; the Universal Health Care Foundation of Connecticut; The Robert Wood Johnson Foundation; The Small Business Majority; the Manufacturers Alliance for Productivity and Innovation; and the Bipartisan Policy Commission.

GMSIM has been used by a number of states to model state-specific health insurance reforms. In particular, GMSIM modeling for the Commonwealth of Massachusetts was a basis for fundamental health insurance reform in that state in 2006. This model was used first by Governor Romney's administration as they developed their proposals, and then for the legislature as they considered alternative paths to translating this proposal into legislation. During the mid-2000s, the model was used by a variety of states to model health reform alternatives, including California, Connecticut, Delaware, Kansas, Michigan, Minnesota, Oregon, Wisconsin and Wyoming.

GMSIM was then used widely by both Congressional and Administration officials during the development of the ACA. GMSIM became an important resource during this process because of the close similarity between this model and the microsimulation model used by the Congressional Budget Office (CBO). GMSIM was able to mimic CBO's predicted impacts of the ACA on insurance coverage and government costs, making it an invaluable resource for policy makers who relied on CBO for the official scores of their legislative proposals. Most recently, Dr. Gruber has used GMSIM to model the implementation of ACA, and the key policy issues that

it raises for establishing exchanges, in the states of Colorado, Connecticut, Maine, Michigan, Minnesota, West Virginia, and Wisconsin.

Most relevant for this proposal was the use of GMSIM as the basis for the empirical modeling in the well-known February, 2011 report by Professor William Hsaio that set the stage for Vermont's transition to a single payer system. This report provided a comprehensive overview of the factors involved in transitioning to a single payer system. Central to that report was a careful modeling of the Vermont health care economy, and how it would be impacted by that transition. The model for this report is now somewhat out of date; in particular, recent survey data of Vermont households on their insurance status can be used to update the model. But the basic structure provides an excellent starting point for modeling the incidence of current health care spending.

GMSIM is a maximally flexible and transparent model. The use of GMSIM for a wide variety of policy options, ranging from individual market tax credits to public insurance expansions to individual mandates to universal coverage, allows us to incorporate any policy alternatives that Vermont wishes to consider for GMC. And we have a long track record of making the underlying assumptions of GMSIM readily available to stakeholders, allowing for an open and honest discussion of modeling alternatives and their impacts on results.

Background: Previous Modeling of Green Mountain Care

There have been three major efforts to model Green Mountain Care (GMC), and they provide important lessons for the current proposed modeling effort. The initial effort was the report prepared by a team led by William Hsaio. The "Hsaio report" was a pathbreaking analysis of the introduction of a single payer system in Vermont. The study began with an excellent overview of the evidence and a framework for modeling how single payer will change the delivery and costs of health care in Vermont. It then incorporated those lessons into microsimulation modeling of how single payer health care would impact health care coverage and spending in the state. The report included as well an overview of macroeconomic impacts of reform, as well as a discussion of financing alternatives.

Two subsequent reports have extended the work in the Hsaio report. A subsequent joint report by the Governor's Office and the Legislature considered alternatives to several key assumptions and how they would impact the total revenue requirements for reform. Another report by Avalere Health for Vermont Partners for Health Care Reform went further in reviewing and critiquing a number of key assumptions behind the Hsaio report.

The Hsaio report was a huge undertaking, and subsequent reports have questioned some of the key assumptions, but have not revisited the underlying modeling. As such, the model that underlies the Hsaio report provides a natural starting point for any modeling of

Green Mountain Care and its financing alternatives. Such work should incorporate the insights of the subsequent reports on key assumptions and financing alternatives. But a major advantage of working with the Gruber team is that we have already developed the key model of GMC that can provide the basis for understanding financing alternatives.

Data

Our modeling of the incidence of health care spending in Vermont will draw upon a wide variety of rich data sources that are available for the state.

The 2012 Vermont Household Health Insurance Survey

In 2012, the state of Vermont undertook a detailed collection of data on households and their insurance coverage through the VHHIS. This survey gathered data from more than 4600 Vermont households, with data on almost 11,000 state residents. This is a very large sample for a state of this size; in contrast, the three year pooled sample from the Current Population Survey that was used in the Hsaio report was only about two-thirds as large. The data collection was cutting edge, including collection both from landlines and cell-phone only households. And there was an oversample of the uninsured which allows for more comprehensive modeling of the behavior of this group.

The data include a rich battery of information for each household member, including but not limited to:

- Type of insurance coverage
- Source of insurance coverage
- Duration of insurance coverage/uninsurance
- Medical expenditures
- Medical utilization and location of care
- Health Insurance premiums
- Barriers to health care receipt
- Health status
- Demographics (age, gender, education, etc)
- Employment and wages
- Job characteristics, including firm size and provision of health insurance
- Family income

As described below, these data provide the ideal basis for the type of micro-simulation modeling that is required for a rich incidence analysis in Vermont.

Augmenting the VHHIS

While the VHHIS is the most comprehensive data source available for this analysis, it has three limitations. First, it is two years out of date. Second, there is well known under/mis-reporting of key measures in survey data, such as coverage by public insurance or medical expenditures. Such measurement problems could lead to important mis-statements of the incidence of health care spending and the subsequent effects of reform. Finally, a number of important expenditure items are not collected by the VHHIS but are central to understanding the incidence of health care spending in Vermont.

We will therefore carefully augment the VHHIS in a number of ways to produce the best possible estimates:

- Medicare coverage. As highlighted below, it is important to distinguish between those enrolled in traditional fee for service (FFS) Medicare and those enrolled in Medicare Advantage (MA). We will use data from the federal government on state by state FFS vs. MA enrollment to impute coverage source within the Medicare population.
- Medicaid coverage. Underreporting of public insurance coverage is a well-known problem. We will recalibrate to state and federal reports of enrollment by type of enrollee (e.g. child, disabled & blind, elderly, etc). We will also use state and federal data to distinguish enrollment in Managed Care Organizations from enrollment in direct state-funded insurance.
- Public insurance spending. The VHHIS has no data on the insured spending of those who are enrolled in public insurance. We will use data from state and federal sources to impute per capita spending by type of enrollee.
- Other state public health spending. A major fiscal benefit to the state from universal single payer coverage will be a reduction in other public health spending. We will model public health spending by individual in the VHHIS to estimate how that spending falls with Green Mountain Care's implementation.
- Employer-sponsored insurance premiums. The survey includes data on the employee portion of employer-sponsored insurance premiums, but not on the employer portion. Excellent data on premiums by firm size (both total premiums and the employer/employee shares) are collected by the Medical Expenditure Survey-Insurance Component for a large sample of firms. We will use these to impute employer premiums and to recalibrate employee premium payments.
- Individual market insurance premiums. The data include information premiums paid by those with individual market coverage, but such data can be quite noisy. Given the community rating in force in Vermont's individual insurance market, it is fairly easy to impute the correct premium payments based on enrollee age and location.

- Income. The VHHIS is not designed to focus on income collection in the same way as Census data sets such as the Current Population Survey or the American Community Survey. We will therefore recalibrate the income distribution in the VHHIS to match the distribution from these more precise Census data sets.

Microsimulation Model Construction

Structure of GMSIM

The GMSIM is a very complicated model that has evolved over the past 15 years to address the wide variety of health policy questions of the type discussed in this RFP. A detailed description of the model and how it functions is available at: <http://econ-www.mit.edu/files/5939>. In this section, we provide a brief overview of the model to help inform our responses below.

The GMSIM builds upon micro-data on individuals, such as that available for Vermont residents in the VHHIS. The GMSIM model is flexible enough to be applied to a wide variety of underlying data sources such as this one. The VHHIS, as augmented above, contains all the information necessary to implement the model for the incidence analysis as well as for later analyses of the impact of single payer health care in the state.

This data on individuals is then carefully supplemented by data on employers. The fundamental problem faced by most individual-based micro-simulation models is that data on individuals does not reflect the nature of their co-workers, so that it is impossible to know the features of a firm's workforce. GMSIM addresses this problem by building "synthetic firms" in the CPS, assigning each CPS worker a set of co-workers selected to represent the likely true set of co-workers in that firm. The core of this computation is data from the Bureau of Labor Statistics that show, for workers of any given earnings level, the earnings distribution of their co-workers. Using these data, other sample individuals are randomly selected in order to statistically replicate the earnings distribution for that worker's earnings level. These workers then become the co-workers in a worker's synthetic firm.

Assigning Incidence

A starting point for any analysis of financing reform is a rich understanding of the incidence of existing health care spending. Only by first understanding how the burden of health care costs are borne in Vermont today can we paint a rich picture of how financing alters that burden.

Addressing questions such as the incidence of health care spending requires assigning the incidence of different types of health care spending to different entities. In this section we discuss each element of health care spending and to whom it will be assigned for incidence purposes, drawing importantly on economic theory and evidence for making such assignments

Medicare Expenditures: As noted earlier, it is important to distinguish between those enrolled in the FFS portion of Medicare and those enrolled in Medicare Advantage. In either case, the incidence of insured spending is fully on the Federal government. But for ultimate modeling of the implications of the insurance industry versus the government of the move to single payer, it is important to understand how much of this spending is done directly by the government versus run through private insurance companies. With only 7% of Vermont Medicare recipients enrolled in Medicare Advantage, this is a relatively small consideration.

Medicaid Expenditures: The incidence of Medicaid expenditures is 54% on the federal government and 46% on the state government, using the most recent data on the state FMAP. Once again, however, it is ultimately important to distinguish those receiving their medical service directly from the state rather than through contracting with Medicaid Managed Care Organizations. This is an important issue as over half of those enrolled in Medicaid in Vermont are in MMCOs.

Other Government Insurance: For those covered by other government insurance (primarily military coverage) the incidence will be fully on the Federal government.

Family Premiums and Out-of-Pocket Medical Spending: The incidence of family spending on health insurance and medical spending is directly on the family, with one important exception: federal tax breaks to insurance spending. These exist in five forms. The first is the deduction from federal income taxation for health insurance premiums for the self-employed. The second is the deduction of employee premiums from state and federal taxable income for the vast majority of employees who have a Section 125 account at their workplace. The third is the deduction from state and federal taxable income of money set aside in a flexible spending account to cover out of pocket medical spending. The fourth is the deduction from federal taxable income of any family medical spending that exceeds 10% of family income. Finally, there is the deduction from taxes of any money set aside in a Health Savings Account (HSA) or Health Reimbursement Account (HRA). We will impute each of these items for residents in order to assign the relative incidence between the family and the state and federal government.

Private Employer Health Insurance Premiums: The single largest element of health care spending in the state is employer-sponsored health insurance premiums. There is a large literature in economics, to which Jonathan Gruber is a primary contributor, showing that the

incidence of employer premium payments is on employee wages. But this literature raises several questions which must be addressed in the modeling of this incidence process:

- Speed: How quickly are employer costs shifted to wages?
- Shifting barriers: What about cases where shifting is impossible because of the minimum wage?
- Process: Are these costs shifted equally to all employees? In a lump sum? As a proportion of income?

The GMSIM was used to address these issues in earlier work modeling the labor market impacts of the Affordable Care Act for both the Small Business Majority and the Manufacturers Alliance for Productivity and Innovation. In both cases, we began with the typical economics assumption that health insurance premiums were fully shifted to workers' wages in a lump sum (constant dollar) fashion across all employees. We then augment that modeling with a minimum wage constraint – wages cannot be reduced below the minimum wage, so any extra costs induced by this constraint are borne by the employer. We also assume that shifting to wages is immediate, but only to the extent that this doesn't involve lowering the cash wages paid to employees (e.g. if it can be shifted by just reducing upward inflation adjustments). If the shifting is large enough that it requires reducing cash wages, then the incidence will once again be partially on employers.

Incidence on employers in turn raises the net cost of labor and leads to a reduction in employment. This will further offset employer costs. To the extent that there are remaining employer costs, those will be borne through consumers in higher prices or by firms in lower profits.

State Health Care Spending: The state of Vermont and its localities spend a large share of their budgets on health care, ranging from employee health insurance spending, to the state share of Medicaid spending, to other state public health programs. For state and local health insurance spending, I will assume the same incidence on wages as for private employers. For state and local direct health spending, we will assume that the incidence is on state taxpayers; that is, the state has to balance its budget so that any health care spending is passed on in the form of higher taxes. We will then use data on the distribution of tax mechanisms in the state to translate this to person-specific tax payments. That is, if 50% of taxes in the state are collected via the state income tax, we will use the details of the state tax system to model the incidence of higher taxes through this mechanism. Likewise, the share of state taxes that are collected on businesses will be assigned to employers as part of their incidence.

The various elements of incidence described above can have multiple impacts on any family, through their own health care spending, health insurance premiums, and state taxes. A

key feature of GMSIM is the integration of all these changes into one total incidence measure for each family.

Modeling Green Mountain Care

The GMSIM will take as its starting point the situation in Vermont post-ACA. The model will incorporate the latest available information on the impacts of the ACA in Vermont in setting the baseline for any analysis. This will include the most recent available data on exchange enrollment across plans; plan prices and characteristics; enrollment in Medicaid; and other insurance coverage information. The GMSIM fully incorporates all aspects of the ACA, and is well regarded for its ability to mimic CBO scoring of the impacts of the ACA.

We will then model the transition to Green Mountain Care in 2017. We will model the “steady state” situation in Vermont after full transition to begin, and then turn to various scenarios for transition paths to that steady state.

Modeling the impact of GMC involves several steps. First, all individuals will be enrolled in GMC as a default. The impacts of this default enrollment will vary by type of individual:

- Uninsured individuals will be directly enrolled into GMC. But the modeling will account for the fact that, even in steady state, some hard to reach populations may remain outside the system. Even in countries with single payer systems there remains a small (1-2%) share of the population that does not use their insurance privileges.
- Those who currently purchase individual insurance will also be directly enrolled into GMC.
- Those who are on public insurance will also be directly enrolled. However, for those low income individuals who have benefits packages more generous than GMC, we will also model the “wrap-around” benefits to which they are entitled.
- The most difficult case is those who have employer-sponsored insurance, since employers can choose to continue to offer ESI in order to “top off” GMC.

The key aspect of modeling the behavioral response to GMC is therefore modeling the behavior of employers and their employees. The fundamental problem faced by most individual-based micro-simulation models is that data on individuals does not reflect the nature of their co-workers, so that it is impossible to know the features of a firm’s workforce. As noted earlier, GMSIM addresses this problem by building “synthetic firms” in the CPS, assigning each CPS worker a set of co-workers selected to represent the likely true set of co-workers in that firm. This allows us to undertake detailed modeling of how employers will respond to the incentives put in place by the ACA.

In the model, employers face three decisions about insurance: offering (whether to offer if now not offering, or whether to drop if now offering); the division of costs between employer and employees; and the level of insurance spending. Each of these decisions will respond to the introduction of GMC.

In doing this type of analysis, a number of assumptions must be made about how individuals will and employers respond to changes in the price of insurance. These assumptions have been developed based on the available empirical evidence from the health economics literature, to which I am a major contributor, and are outlined in the detailed documentation cited above.

Indeed, one of the most important features of GMSIM is its transparency. Due to the proprietary nature of such models, many other modelers are unwilling to share in detail the underlying assumptions that are so critical to the analysis. Professor Gruber has made it a clear feature of all of his engagements that all assumptions that underlie the analysis are publicly available and that he is willing to engage in any necessary “sensitivity analyses” around those assumptions. This has been vital in driving widespread acceptance and use of the GMSIM results in state and federal analyses.

Modeling Single Payer Financing Alternatives

While the Hsaio report discussed the issues around financing alternatives for single payer, it did not include explicit modeling of these alternatives. The major contribution of this next round of modeling will be to explicitly incorporate financing alternatives. Our modeling will allow for any one of a very wide range of financing alternatives. Previous work for other funders and states has considered funding ranging from sales taxes to income taxes to employer assessments, and beyond. The GMSIM can readily handle any of the possible financing approaches, and we plan on assessing a number of them to compare their implications for the efficiency and equity of the health care system.

In terms of equity, we will model the incidence of these financing alternatives following the same principles laid out earlier for modeling the incidence of the existing system. For example, if the financing comes through payroll taxation of firms, we will follow the same incidence rules that we used for modeling the incidence of existing ESI spending. If the financing comes through broader state taxation, we will extend our incidence modeling to incorporate these alternatives. If the financing is through state income taxation, for example, then we will model directly the distribution of the tax burden from alternative state tax mechanisms. On the other hand, if the financing is through sales taxation, then we will assume that the incidence of sales taxation is through higher prices for consumer goods, and we will use data on consumer consumption patterns by income to determine household incidence.

In terms of efficiency, it is critical to recognize that major changes in financing can place financial burdens on employers or households that impact their underlying incomes. For example, substantial new taxes on individuals may reduce the amount of labor that is supplied to the market, as well as migration into and out of the state. We will incorporate these behavioral responses into the microsimulation model, but they may also have important macroeconomic or “general equilibrium” effects as well. For this reason we will incorporate macroeconomic modeling into our analysis, as described below.

Modeling Population and Migration Dynamics

Another limitation of the Hsiao report is that it did not consider any impacts of the transition to single payer on either population growth or migration dynamics. In terms of population growth, the expansion of insurance coverage can have two effects. First, there may be a fertility increase from expanded insurance coverage. Second, the death rate is likely to fall due to more complete and comprehensive insurance coverage. For both of these concepts, there is strong recent research to draw on in empirical modeling of how insurance changes will change fertility and mortality.

In terms of migration, this is a more uncertain area. There is little compelling evidence on how insurance expansion in one state impacts migration into and out of that state. The impacts are likely to be modest, due to high pre-existing insurance coverage levels in neighboring states, and the expansion towards universal coverage nationwide through the ACA. To model the extent of migration, we will use nationally available data from the American Community Survey to assess the insurance coverage of those living near Vermont and the value of moving into Vermont once GMC is available. We will also use the best available information on the impact of taxation on mobility to understand how any new taxes that finance GMC might impact migration out of the state.

Incorporating Actuarial Assistance

Moving to a single payer system is a major reform to the insurance system which goes well beyond the types of reforms that have been studied in the past. As such, it is critical to have a sophisticated insurance pricing model which accounts for the impact of population flows and insurance design on insurance markets.

There are two options for incorporating such actuarial assistance. The first is to rely on Wakely, Inc., who have already been engaged by the state for modeling GMC. This would work well from our perspective as we have worked closely with Wakely in other states, in particular Colorado, to integrate their actuarial insights into economic microsimulation model (as described below). Alternatively, or additionally, I can integrate into my team actuarial assistance from Ian Duncan, Ph.D., whose qualifications are described below.

Incorporating actuarial assistance is critical for understanding three aspects of the GMC reform. The first is changes in health care utilization due to the changes in the nature of the health insurance package. As noted above, these changes will vary depending on the initial starting point of individuals. The actuary will provide estimates of how these changes impact utilization of various types of medical care, as well as total medical spending.

The second is incorporating the system-wide savings from GMC into insurance pricing. This includes a number of the administrative and other savings identified in the Hsiao report, along with revisiting key assumptions as suggested in subsequent reports.

The third is modeling the ultimate cost of care within the GMC pool based on the health mix and utilization decisions of those who enroll in GMC. Recent use of GMSIM to model state-level impacts of the ACA have involved collaboration with actuaries to integrate their expertise in insurance price modeling. We have worked iteratively with these actuaries to consider the effect of insurance market change on population movements (the focus of GMSIM) and pricing (the focus of actuarial analysis). The result has been cutting edge modeling of insurance pricing that was very valuable to states as they considered the price implications of the ACA.

In particular, the integration between actuarial and economic modeling works as follows:

- Initial insurance market prices and conditions are integrated into the model as described above
- Based on these initial conditions, as well as the policy change and form of financing, GMSIM is used to model population and income flows
- This information is passed to the actuary
- These population and income flows, as well as other changes to the insurance market (such as restrictions on the nature of insurance benefits packages), will then be incorporated into an actuarial model to capture the impact on insurance pricing. This will importantly account for the potentially massive changes in insurance pools arising from the transition to single payer.
- This information is passed back to GMSIM by the actuary
- GMSIM incorporates this information in the form of new prices in insurance markets. This in turn can have important feedback effects on population flows and income changes. A new version of GMSIM is estimated that incorporates those changes.
- The information from this second iteration of GMSIM is passed to the actuaries
- The process repeats until we reach a stable point where additional runs do not meaningfully impact insurance pricing or population flows. In past cases, this has occurred after two iterations.

Incorporating Macro Modeling

The GMSIM is a “partial equilibrium” model: the model incorporates population flows and income shifts, but all within an economy of a fixed size. This is an inappropriate restriction when the changes implied by health care reform are of the scale considered by the Vermont reform. In that case, it is critical that analysts incorporate as well the “general equilibrium” impacts of shifts in the Vermont macroeconomy.

In our previous work on the Hsaio report, the results from GMSIM were integrated with the REMI to model macroeconomic impacts on Vermont. It is unclear whether the REMI model will be available for this round of modeling. I am therefore prepared, if necessary, to engage the services of one of the nation’s leading macroeconomic modeling firms, Moody’s Analytics.

In particular, the integration of GMSIM and the Moody’s macro model would occur in a number of steps:

- GMSIM will be used to produce the change in wages and health care costs by industry.
- These results will be incorporated into IMPLAN, the tool used by Moody’s to translate the type of “partial equilibrium” changes that come out of GMSIM to “general equilibrium” impacts on all industries. This is essentially a very sophisticated input-output matrix that translates how shocks to any given industry affects all others. The IMPLAN results are produced by very disaggregated industry and then aggregated to the “supersector” classifications that are used in Moody’s Analytics Vermont macro model.
- IMPLAN provides results for a single point in time. Given a transition period following the initial implementation of the single-payer healthcare system before the Vermont economy hits a steady state growth path. IMPLAN will be run several times to capture the different impacts at different points along the transition path. The point estimates will be linked together to form a set of time series adjustments that can be fed into the Moody’s Analytics Vermont macroeconomic model.
- Moody’s Analytics will feed the IMPLAN output into the Vermont macroeconomic model and simulate the statewide impact. The process will involve “exogenizing” or adjusting the industry gross output series based on the IMPLAN output and solving for equilibrium.

Modeling the Transition to GMC

For a system change as bold as GMC, it is critical to properly model the transition. The transition may be quite different depending on the specifics of how GMC is implemented and financed. We can draw on extensive experience modeling the transition of health reform in

Massachusetts and of the ACA to carefully incorporate the behavior of individuals and employers along the transition path to GMC.

Describing the Impact of Green Mountain Care Implementation and Financing

Having carried out this detailed modeling, we are well positioned to carefully describe the impact of GMC, and its associated financing, on the state.

Impact on Individuals

We will begin by describing the impact on individuals. Our analysis will cover

- Impact on insurance generosity. For those on GMC, this is legislated. But some individuals will have no insurance (those falling through the cracks), some will have more generous public insurance, and some will retain more generous insurance through their employer
- Impact on health care utilization, which as noted above will arise due to changes in the nature of insurance coverage from the transition to GMC. This will include impacts of gaining insurance coverage, as well as changes in the generosity of insurance coverage (which will incorporate actuarial modeling of how health benefits changes impact medical utilization).
- Impact on out of pocket medical spending. After modeling total medical spending, we can apply the parameters of GMC or other coverage to ascertain how much of the cost is borne by individuals.
- Impact on income. This will reflect changes in labor income due to labor market adjustments arising from GMC (e.g. changes in wages from changes in employer insurance provision), as well as changes in taxation that arise from the financing of GMC

On net, we can show the change in the total health care spending and taxation burden changes. We can present these results both in terms of aggregate burden shifts, considering the overall impact on the progressivity/regressivity of the Vermont health care system and its financing, as well as variance within these groups. We can also tabulate for each group the number of “winners” and “losers” from reform; Of particular interest is the likely case where some groups sees significant number of losers, yet net gains in terms of reduced burden because the winners are seeing such large benefits. We can show the effects on individuals and families in aggregate and along a wide variety of dimensions

- Income
- Insurance coverage type

- Employment
- Age
- Gender
- Race
- Education
- Location within the state

Impact on Employers

As noted earlier, a key component of modeling the impact of GMC will be modeling the response of employers to the GMC alternative. Using our behavioral model of employers, we will be able to assess for each employer whether they continue to offer insurance or drop that coverage; if they continue to offer, how much of the cost of insurance will be borne by employees; and, if they continue to offer, how generous that coverage will be. We will present these facts in aggregate and also by type of employer, along a variety of dimensions:

- Industry
- Firm size
- Mix of full time and part time employment
- Ex-ante insurance offering
- Revenues
- Wages of employees
- Ex-ante actuarial value of insurance offered
- Percentage of employees who took up insurance offer ex-ante
- Current employer premium contribution share

Impact on the Vermont Economy

The transition to GMC could have major impacts on the Vermont economy. These effects are difficult to predict without fully modeling how GMC, and its financing, change health care spending and incomes. As noted above, we will incorporate the model results from GMSIM into the macroeconomic model of Moody's Analytics. The result will be a detailed description of the impact of GMC on the state economy, including:

- Impacts on total state employment and GDP
- Impacts on employment and GDP by industry within the state
- Impacts on population changes through fertility, mortality and migration changes
- Impacts on aggregate and sectoral wages paid to employees
- Impacts on aggregate and sectoral profits of business
- Impacts on aggregate and sectoral prices from shifting of costs to consumer prices

Impact on the Federal Government

Cooperation with the federal government around Medicare and Medicaid policy is critical to the success of GMC. As such, it is important to paint an accurate picture of the effects of GMC on the federal budget. This will involve incorporating a number of different aspects of GMC:

- Impact on expenditures of those on public insurance
- Impact on Federal individual income taxation through changes in income of Vermont residents; this will include the transition for many firms from employer insurance (which is tax protected) to wages (which are taxed).
- Impact on Federal individual income taxation through any increases in state and local taxes, which are deductible from Federal taxable income
- Impact on Federal corporate taxation through any net changes in compensation spending as employers move away from ESI
- Impact on expenditures under the Affordable Care Act, including tax credits to individuals and small businesses, and employer assessment payments on businesses of 50 employees or more.

Impact on State Budget

GMC will have transformative impact on the state budget, on both the spending and revenue sides. A central part of this engagement will be working with state budget analysts to carefully model these budgetary effects. Importantly, this incorporates interactions between GMC and the larger state budget.

On the spending side, there are a variety of effects both direct and indirect. The direct effect includes the budgetary cost of covering state residents with GMC. As noted earlier, the size of the population enrolled in GMC will come from GMSIM modeling, while the cost per capita of enrollment in that program will be derived from joint modeling between GMSIM and actuaries. Importantly, this will incorporate the lower administrative costs of a single payer system, as discussed in the Hsaio report and subsequent studies.

There are a variety of indirect effects that either offset or augment this direct spending effect, all of which will be incorporated into the modeling and subsequent budget projections, including:

- Reductions in state spending on public insurance as individuals transition to GMC (based on the ex-ante state share of the spending)
- Reductions in other state public health programs that supplement the existing patchwork of insurance coverage

- Changes in state unemployment insurance payments if the transition leads to a transitional rise or fall in employment levels

There will also be significant impacts on the revenue side. These will depend primarily on the type of financing used for GMC. But above and beyond the direct effect of such financing there will be a variety of indirect effects as well:

- Changes to household incomes will impact state income tax collections; once again this will incorporate the differential income taxation of health insurance and wages
- Changes to household income will also impact state sales tax receipts through changes in consumption. We will use models of the marginal propensity to consume by income group to translate income to consumption changes for modeling state sales tax impacts
- Changes in business income will impact state corporate tax collections

Interaction with State Fiscal Planning

As is clear from the description above, the implementation of Green Mountain Care will have significant effects on the state budget. Therefore it is critical that any modeling be integrated with broader state fiscal planning and budget development. We will work hand in hand with state fiscal planners to understand how GMC will impact the state through factors such as enrollment in state programs, revenue increases or decreases, and associated changes in federal funds.

Trigger Analysis

As noted in the RFP, an important component of the GMC legislation is “triggers” that ensure that the law will not have a negative impact on the Vermont economy, and that it is budget neutral. The former is directly related to the macroeconomic modeling that we will integrate into our analysis, while the latter is directly related to the state budgetary analysis discussed above. We will work with the Administration and Legislature to assess whether these triggers are met, and which changes to program design may be required to meet them.

Project Staffing

The lead for this project will be Jonathan Gruber, Ph.D. He will supervise the development and implementation of the GMSIM modeling for the entire project. He will also serve as the coordination point for the integration of actuarial and macroeconomic modeling.

Jonathan Gruber is uniquely qualified to lead the research required for this project along three dimensions. The first is his broad experience and professional recognition in both Health Care Economics and broader Public Finance. Over the past two decades Gruber has published more than 150 articles in economics, mostly focused on health care and public finance issues. He has also edited six research volumes, and his textbook *Public Finance and Public Policy* is the market leader in Public Finance. He is a member of the Academy of Arts and Sciences, the Institute of Medicine, and the National Academy of Social Insurance. He directs the Health Care Program at the prestigious National Bureau of Economic Research, and was recently elected incoming President of the American Society of Health Economists. He is also an Associate Editor of both the *Journal of Health Economics* and the *Journal of Public Economics*. Gruber received the American Society of Health Economists inaugural medal for the best Health Economist in the nation age 40 and under in 2006. In 2011 he was named “One of the Top 25 Most Innovative and Practical Thinkers of Our Time” by Slate Magazine, and in both 2006 and 2012 he was rated as one of the top 100 most powerful people in health care in the United States by Modern Healthcare Magazine.

Jonathan Gruber’s second major qualification is his development and management of the Gruber Microsimulation Model (GMSIM). As noted earlier, this model was used to develop the proposal for Green Mountain Care, and therefore sets a natural basis for modeling its implementation.

Gruber’s third major qualification is as a policy maker. Having served on the Board of the Commonwealth Health Connector, Jonathan Gruber was a key architect of the last state-based major health insurance reform. This puts him in a unique position to consider from a policy perspective the issues that will arise in future stages of this work as Vermont makes the transition to single payer. In particular, if policy adjustments are required (for example to meet the standards of the trigger analysis), Gruber will be well positioned to discuss the policy pros and cons of alternative adjustment strategies.

[REDACTED]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[REDACTED]

Collaboration

The RFP specifically highlights the importance of collaboration both among contractors and between the contractors and the state. Such collaboration is a strong feature of past engagements involving Jonathan Gruber and GMSIM.

In terms of within-team collaboration, each of the state engagements using GMSIM in recent years has involved coordination with actuarial experts. The GMSIM team has worked hand-in-hand with the actuarial experts, using the methodology described above, to produce an integrated view of the impact of health care reform on population flows and insurance market pricing. We have worked successfully with a number of different actuarial firms, including [REDACTED]

In terms of collaboration with state policy makers, staff, and other interested stakeholders, Professor Gruber and GMSIM have an excellent track record. This arises from two important features of our team. The first is the transparency of our modeling process and our ability to clearly explain the results. The results of microsimulation modeling can often be confusing and counterintuitive. It is critical not to force such results down the throat of stakeholders; results that are treated as a “black box” will be resisted by skeptical audiences. Rather, we work with stakeholders to make the underlying assumptions transparent, and to consider requests from stakeholders for sensitivity analysis that helps them understand the findings.

The second is that Professor Gruber has extensive experience explaining health care policy issues, and how they related to microsimulation modeling, to policy audiences. He has worked with policy makers in more than a dozen states to carefully explain policy options and how the microsimulation results speak to the pros and cons of these options. He advised both the Obama Administration and the U.S. Congress on dozens of features of the Affordable Care

Act, using his model to carefully explain the implications of their policy decisions. The end result of past engagements with policy makers has been a rich understanding of how policy changes impact their constituencies, as well as the uncertainties that they face in predicting these outcomes.

Project Plan

The timeline for this analysis is as follows:

- July 1 – August 31, 2014: Gruber and GMSIM team will work to update the GMSIM Vermont model using the 2012 VHHIS and the data updates described above.
- September 1 – November 15, 2014: GMSIM will be used for initial modeling of the implementation of GMC under several financing alternatives. This will include joint work with both the actuarial and macroeconomic teams
- November 15, 2014: Initial results presented to relevant state policy makers
- November 15, 2014 – December 14, 2014: Work with state policy makers to consider alternative financing options and finalize options to be considered for final report.
- December 15, 2014- December 30, 2014: Draft final report incorporating consensus options.

Project Financing

Given the existing development of GMSIM, available computer resources, and short travel time for Gruber to Montpelier, the only costs for this initial stage of the project will be personnel.

The major costs will be for the GMSIM team:



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Additional costs will be incurred if the GMSIM team's efforts are augmented by the assistance of either Ian Duncan or Moody's Analytics. Whether these services will be required will depend on the state's existing arrangements with Wakely and/or the REMI model. If they are required, the costs are as follows:



A table with two rows and two columns. The first row has a small black box in the first column, a long black bar in the second column, and a small black box in the third column. A red line connects the first and third columns. The second row has a small black box in the first column, a long black bar in the second column, and a small black box in the third column. A red line connects the first and third columns.

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References for Jonathan Gruber and GMSIM

Scott Leitz

Chief Executive Officer

MNsure

81 Seventh Street East, Suite 300

St. Paul, MN 55101-2444

Office: 651-539-1320

Email: Scott.Leitz@state.mn.us

Chris Priest

Senior Strategy Advisor

Office of Governor Rick Snyder

517-373-3400

[Priestc1@michigan.gov](mailto: Priestc1@michigan.gov)

Jeremiah Samples

Deputy Secretary

Public Insurance and Strategic Planning

West Virginia Department of Health and Human Resources

1 Davis Square, Suite 100E

Charleston, WV 25301

304-356-5405 (office phone)

304-380-5944 (cell phone)

Jeremiah.samples@wv.gov

(LETTER OF REFERENCE ATTACHED)




State of Vermont
Agency of Administration
Office of the Secretary
Pavilion Office Building
109 State Street
Montpelier, VT 05609-0201
www.adm.state.vt.us

[phone] 802-828-3322
[fax] 802-828-3320

Justin Johnson, Secretary

MEMORANDUM

DATE: February 23, 2015
TO: Doug Hoffer, Vermont State Auditor
FROM: Justin Johnson, Secretary of Administration
RE: Gruber Contract



Thank you for the opportunity to respond to the report of your Office's limited review of the documents associated with the personal services contract with Dr. Jonathan Gruber. Your report focused on the invoices and monitoring and enforcement of certain contract provisions.

Questions have been raised as to whether the level of detail contained in the invoices was sufficient to authorize payment. As noted in your report, "*Dr. Gruber's invoices referred only to "consulting and modeling" and offered no details about specific tasks in the broadest sense, those three words describe the work performed, but such generalities do not appear to satisfy the intent of the contract.*"

Your report also notes, "*since the Agency of Administration's two key contacts— Robin Lunge and Michael Costa — were in frequent, sometimes daily, contact with Dr. Gruber, they were well aware of the nature and extent of the work being performed.*" You further state, "*In spite of concerns about the invoices, it appears the administration was satisfied with the work of Dr. Gruber and his RA. According to Ms. Lunge,*

"Dr. Gruber provided the state with requested outputs from his economic model. This model was modified to include state-specific data received pursuant to data use agreements with the relevant agencies who hold that data. The model was also modified to provide state specified policy choices. The result of this modeling is available on my website: hcr.vermont.gov and is contained in the Green Mountain Care report and appendices. In addition, Dr. Gruber contributed to the Appendices as requested by state staff, specifically, he provided technical information about his model and modeling for Appendix C. The work was received in the time frame requested by the state. His work fulfills the work requested under the contract."

It is precisely because the "two key contacts" were in frequent discussions, usually involving multiple interactions per day, there was a high degree of understanding of the level of work being performed that warranted paying the first two invoices as submitted.

With respect to going forward, the contract amendment effective November 24, 2014, limited the total payments to Dr. Gruber for his specific work activities to no more than \$80,000. As you pointed out, my Office is currently holding \$40,000 in retainage associated with this contract which will serve as leverage as we continue to work closely with the Attorney General's Office to bring this matter to a close.

While we found payment of the first two invoices acceptable at the time in light of our detailed familiarity with the work performed, we are withholding any further payments for Dr. Gruber's research assistant until we receive more detailed invoices, given the concerns regarding contract compliance.

I take very seriously any concern that the State may have overpaid for services under any state contract, and I appreciate your review of this matter. At the end of the day, in this particular instance, I believe the State will have paid significantly less than what was initially estimated for the cost of Dr. Gruber's services and work product. That being said, in addition to insisting on greater specificity in all invoices before any further payments are made under this contract, I have sent notice throughout the Office of the Secretary of Administration, including to the Office of Health Care Reform, to remind all relevant staff of the controls surrounding all contracts and associated invoices to ensure my Office documents proper levels of accountability and models best practices going forward. To the extent any issues remain unresolved under this contract, we look forward to continuing to work with the Attorney General's Office, as well as your Office, to address them.