A Cost-Benefit Analysis of a New Safety Net Clinic in Petersburg, Virginia

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Objectives

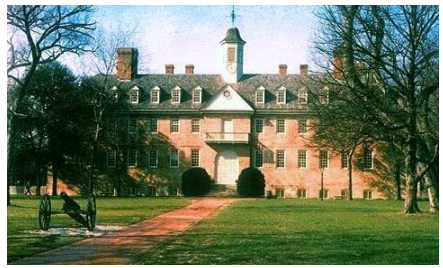
- Project Request and Purpose
- Research Questions
- Background
- Methodology
- Policy and Research Recommendations
- Questions

Project Request

- The Restructured Higher Education Financial and Administrative Operations Act of 2005

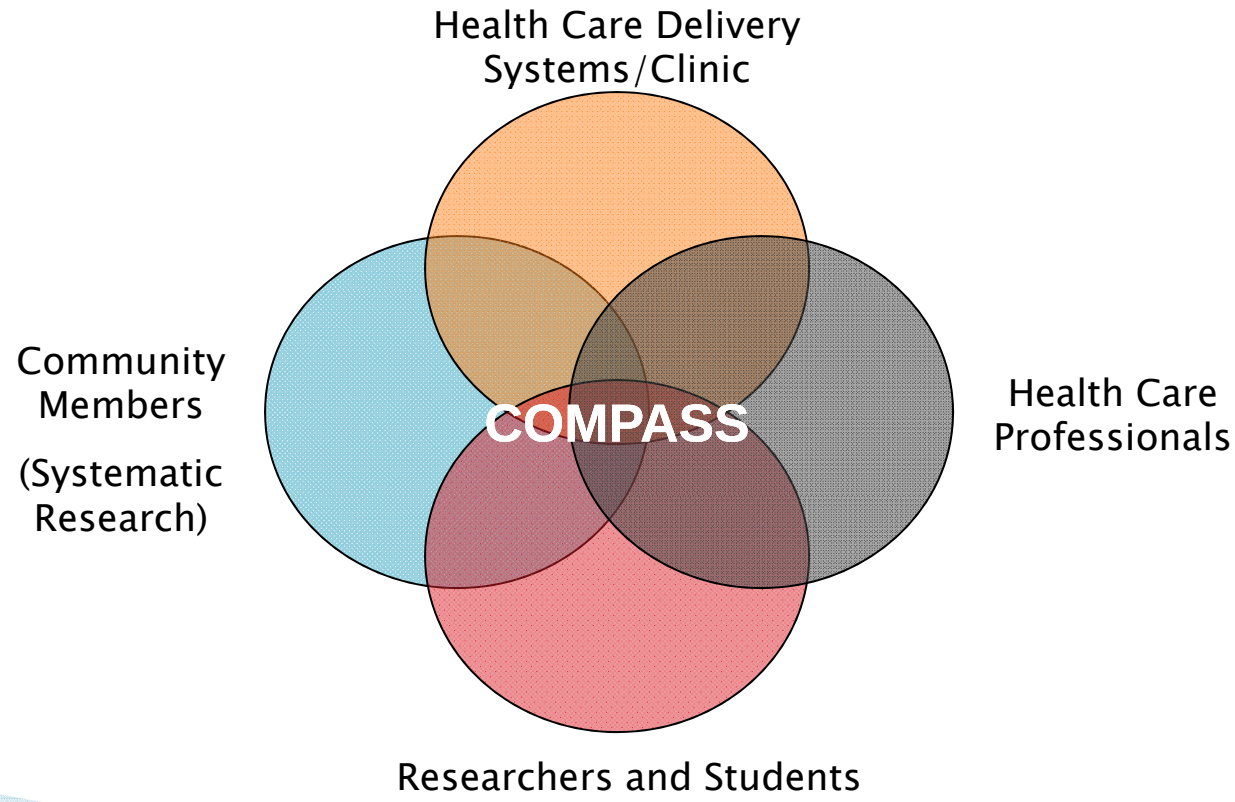
- The College's Management Agreement

  "to the Governor and the General Assembly to work meaningfully and visibly with an economically distressed region or local are of the Commonwealth, not smaller in size than a city or county, which lags the Commonwealth in education, income, employment, and other factors. The College commits to establish a formal partnership with that area to develop jointly a specific action plan that builds on the College's programmatic strengths and uses the College's faculty, staff, and where appropriate, student expertise to stimulate the economic development in the area to make the area more economically viable…"



Project Request

- Community Oriented Medical Partnerships And Sustainable Solutions
  - SOMOS
  - MANOS



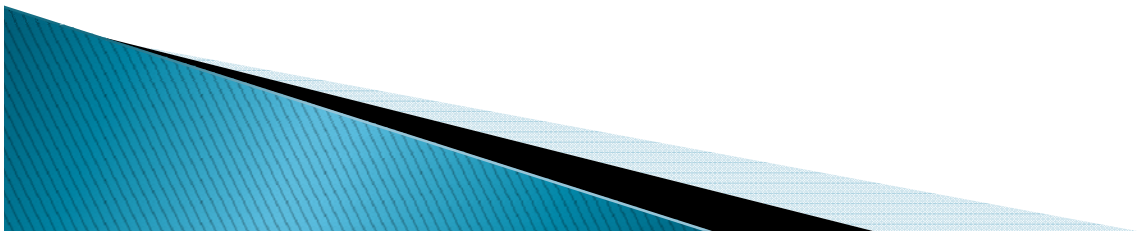
Project Purpose

- To provide the Office of Economic Development at W&M with an analysis of the costs and benefits of initiating a safety net clinic in Petersburg, VA

- To lay the foundations of a larger proposal to the City of Petersburg

Research Questions

- Is there unmet need for primary care in Petersburg?
- If so, what would be the costs and benefits of opening a new safety net clinic in Petersburg?



Background
Receiving Primary Care

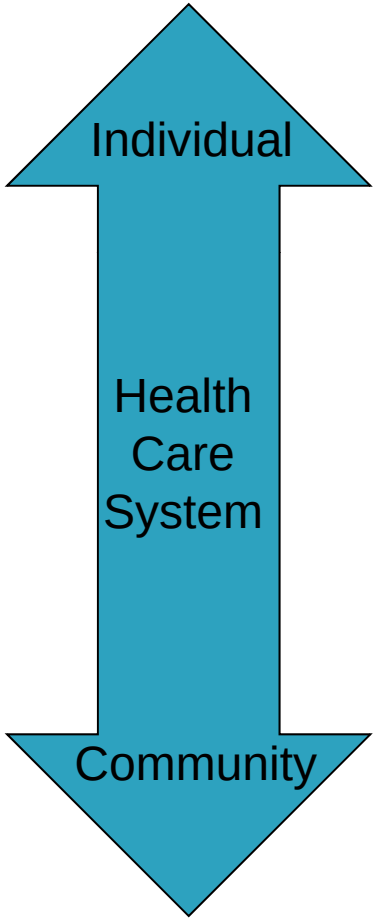
- What factors determine where a person goes for health care?
  - Cost
  - Quality
  - Access
  - Personal Preferences
  - Ability to pay
  - Proximity

Background
Safety Net Clinics

- Types of Community Health Clinics
  - Federally Qualified Health Centers (FQHCs)
    - Health Centers
    - FQHC Lookalikes
    - Outpatient Health Programs (operated by tribal organizations)
  - Rural Health Clinics
  - Free Clinics
  - Private Clinics

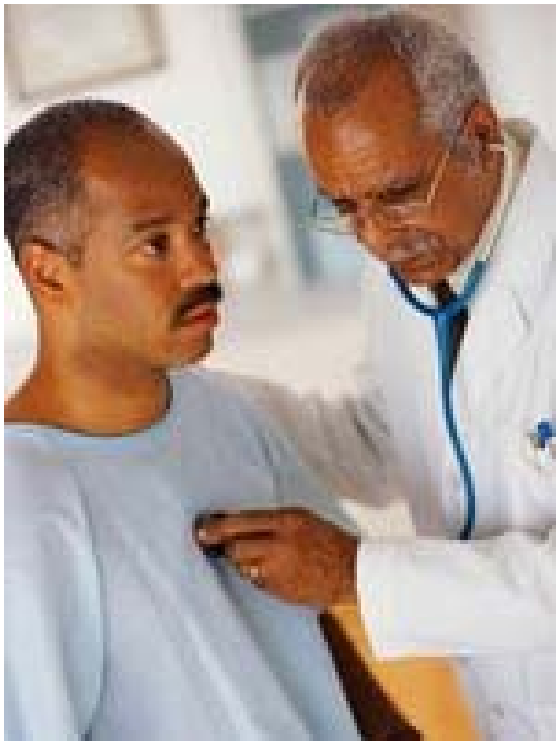
Background
Safety Net Clinics

- Benefits of Community Health Clinics:
  - Improve access to primary and preventive care
  - Increased worker productivity
  - Improve public health
  - Divert non-urgent care cases from local emergency departments (ED)
  - Assist in decreasing the number of preventable hospitalizations
  - Spur economic development in immediate and broader localities



Methodology

- Documenting the need and supply of health care in Petersburg
- Locating geographic patterns and hotspots
- Conducting a cost-benefit analysis



Documenting the Need:
Socioeconomic and Health Indicators

Table 1: Petersburg Health Profile (2003)

	Petersburg	Crater Health District	Virginia
Infant Mortality Rate (Rate/1,000 Live Births)	14.7	9.6	7.6
Percent of Low Weight Live Births (Under 2500 Grams) of Total Live Births	12.3%	10.9%	8.2%
Teen Pregnancy Rates (Cases per 1,000 Females between 10 and 19 yrs)	87.1	45.0	7.4
HIV Rates (per 100,000 population)	87.6	26.5	10.8
Heart Disease as a Leading Cause of Death (age adjusted rates per 100,000)	341.5	**	198.9
Chronic Lower Respiratory Disease as a Leading Cause of Death (age adjusted rates per 100,000	69.5	**	40.2
Diabetes as a Leading Cause of Death (age adjusted rates per 100,000)	45.3	**	21.4

Source: Crater Health District (Virginia Department of Health). *Health Profile 2005: Petersburg, Virginia*
Note: ** indicates no data available

Documenting the Need:
Emergency Room and Hospital Utilization

Table 2: 2007 Quality Indicators for Petersburg

Prevention Quality Indicators	Number of hospital discharges per year	Total Population at Risk for each Indicator	Petersburg Rate (# hospital discharges/100,00 people at risk)	Virginia Rate
Adult Asthma	77	24,592	313.10	104.60
Pediatric Asthma	24	7,231	331.90	93.60
Low Birth Weight	59	523	11.28	6.31
Complications from Diabetes – Short Term	76	24,592	309.00	57.80
Complications from Diabetes – Long Term	93	24,592	378.20	116.70
Chronic Obstructive Pulmonary Disease	130	24,592	528.6	157.60
Hypertension	47	24,592	191.10	49.10

Source: *Virginia Health Information*, http://www.vhi.org/ahrq_county.asp.

Documenting the Need:
Health Needs Assessment

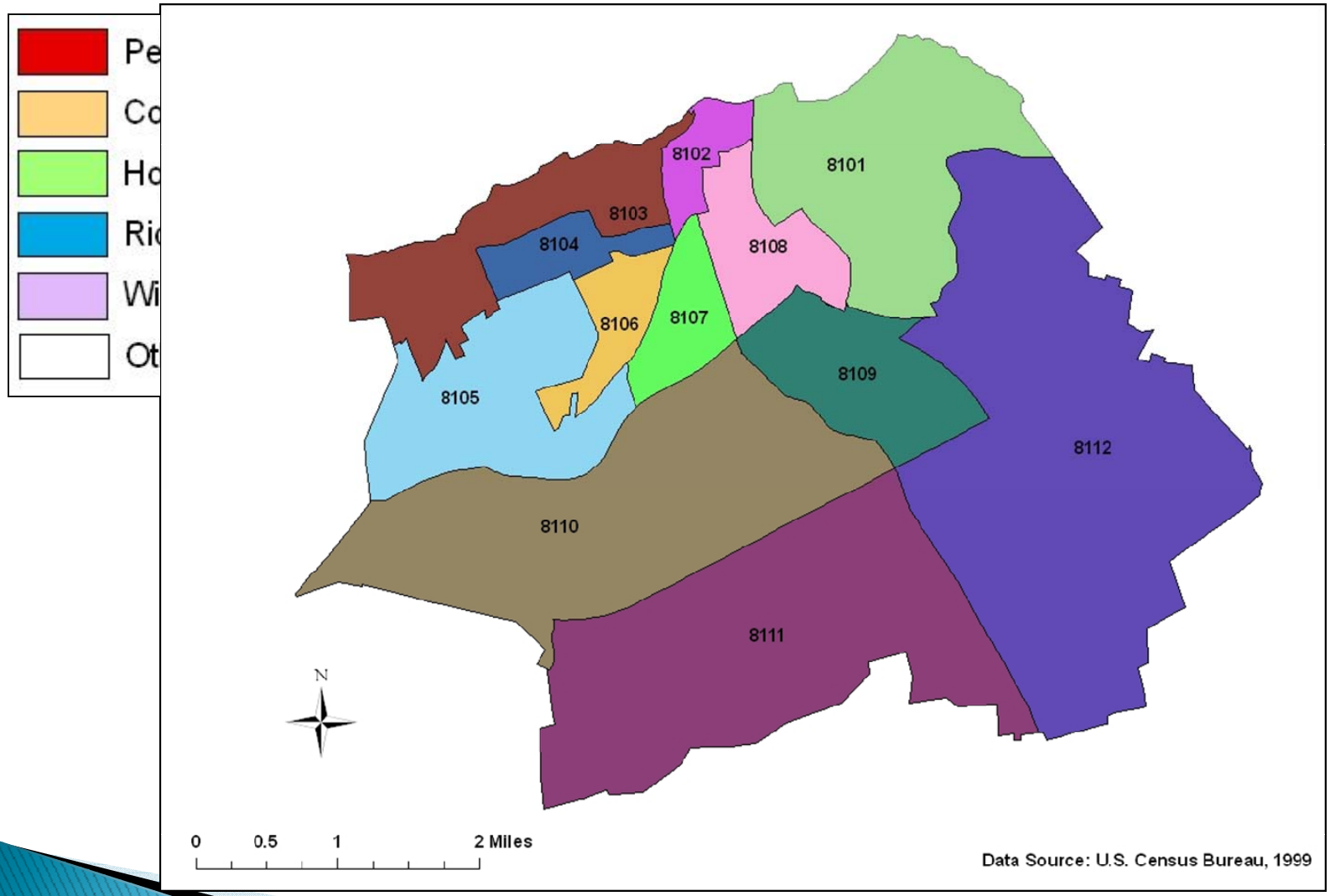
8% of people surveyed in Petersburg report problems receiving health care

-The Cameron Foundation's 2008 Health Needs Assessment

Documenting the Need:
Current Key Providers

- Southside Regional Hospital
- Petersburg Health Care Alliance (FQHC)
- Appomattox Wellness and Health Clinic (FQHC)
- Pathways (Free Clinic)
- Petersburg Health Department
- Private Physicians

Petersburg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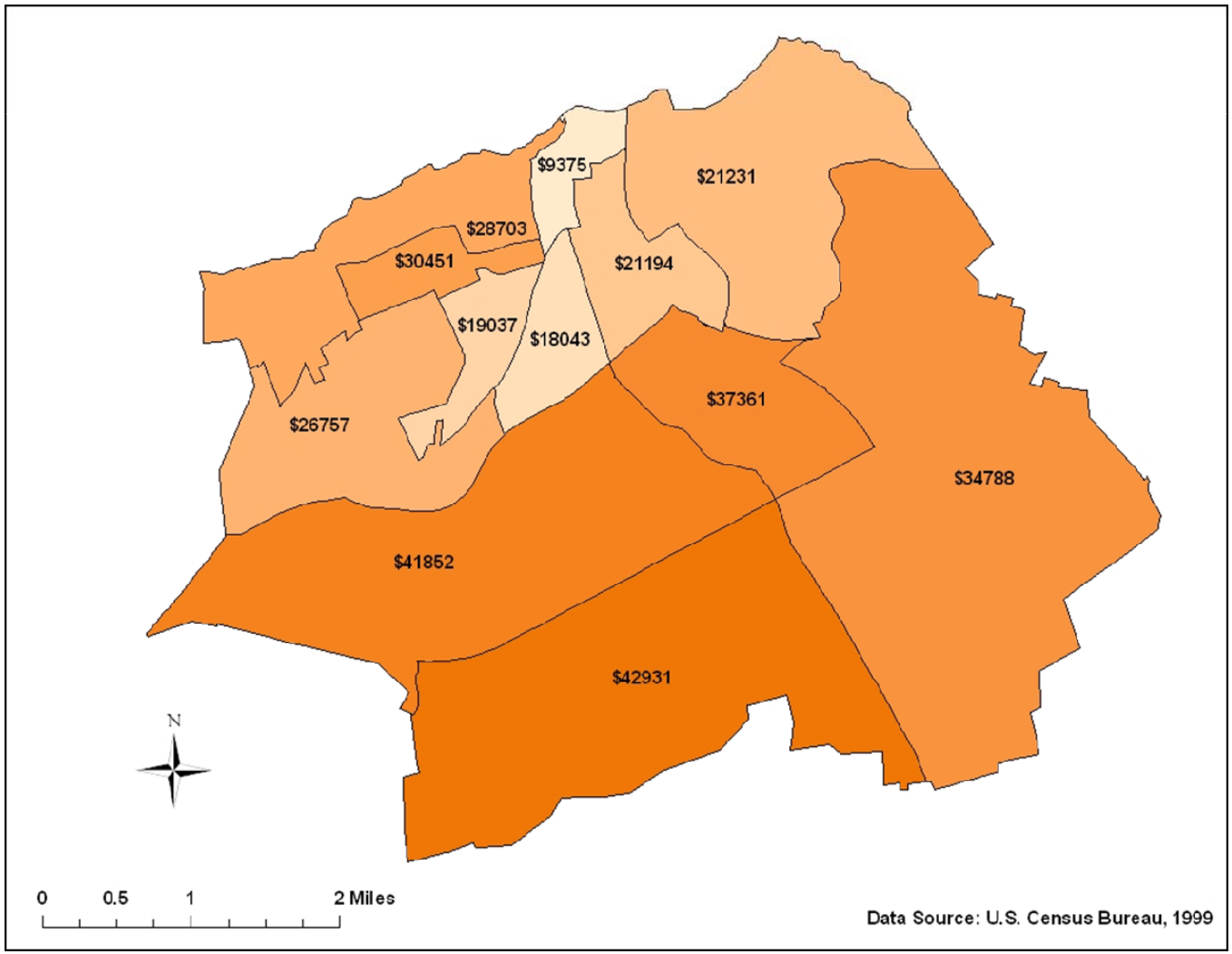
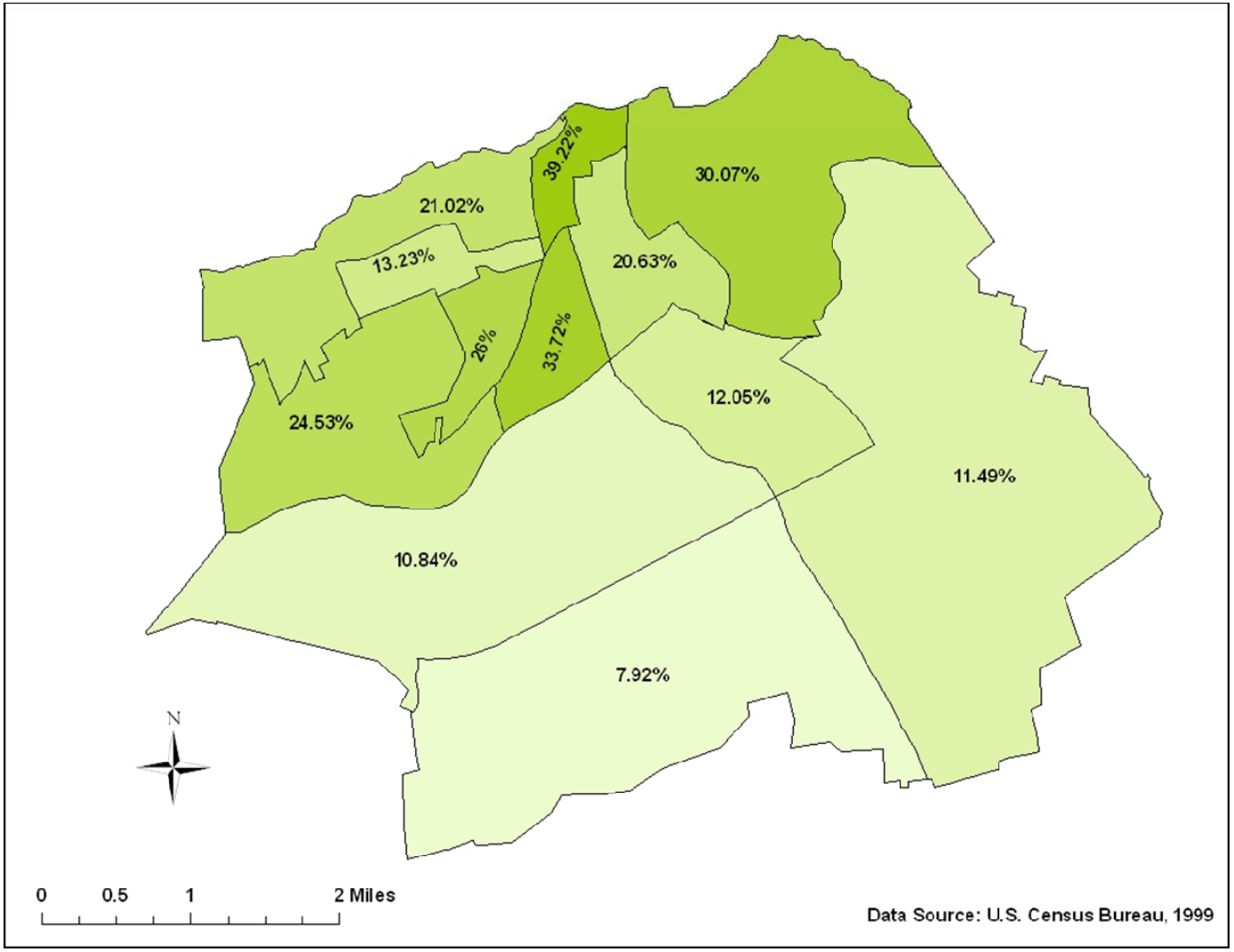
Data Source: U.S. Census Bureau, 1999

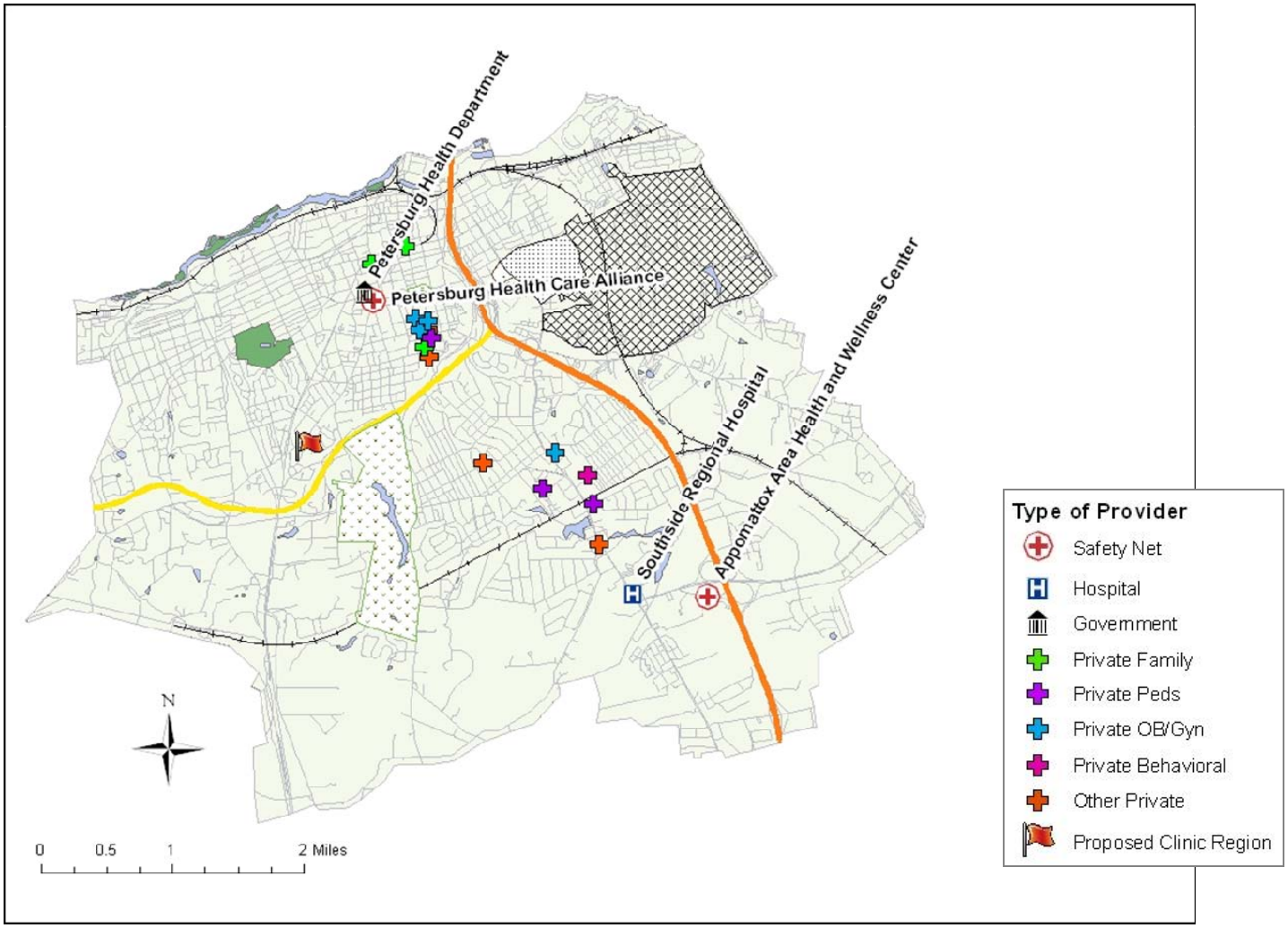
Population Density and Income



Working Population and Poverty Levels



Transportation and Providers



Clinic Attributes

- Aims to serve only unmet need
- Accepts all payer types
- Primary Care
  - Physicals
  - Check-ups
  - Influenza
  - Streptococcus
  - Mononucleosis
  - Immunizations
- Chronic Care
  - Diabetes
  - Hypertension
  - High Cholesterol
  - Asthma

Cost-Benefit Analysis

- A technique designed to determine the feasibility of a project by quantifying its costs and benefits over a time horizon
- Assumptions underlying this analysis:
  - Costs and benefits calculated from the viewpoint of the entire healthcare system in Petersburg, VA
  - Intention to close entire primary care gap

Patient Utilization Rates

- Annual calculations based on several factors
  - Population levels by gender and age
  - Physician office visit rates by gender and age
  - Percentage of total office visits that are with a primary care physician: 58.3%
  - Petersburg need for additional primary care: 8%
- Total patient visits served by the clinic: 5,059 annually or 20 visits per business day
- Total patients served by the clinic: 1,573 annually

Example of Utilization Rates for Females in Petersburg

Table 3: Annual Physician Office Visits by Females for Petersburg

Age	Population	Visit Rate	Total Visits	Primary Care Visits
Under 15	3,428.00	2.57	8,809.96	5,136.21
15-24	2,140.00	2.42	5,178.80	3,019.24
25-44	5,064.00	2.96	14,989.44	8,738.84
45-64	4,244.00	3.92	16,636.48	9,699.07
65-74	1,597.00	6.00	9,582.00	5,586.31
75+	1,709.00	7.25	12,390.25	7,223.52
Total	18,182.00		67,586.93	39,403.18

Note: Primary Care Visits total 58.3% of all office visits

Source: National Ambulatory Medical Care Survey, 2006; 2000 Census

Total Female Visits Served by this Clinic: 3,152 visits annually (8% of 39,403.18 total Primary Care visits)

Estimating Costs
Determining Staffing Needs

- A full-time physician can cover 13 patient visits/day
- A full-time physician assistant or part-time physician can cover the remaining 7 patient visits/day
- 2.5 nurses are needed based on a 1.71 physician-to-nurse ratio
- 2 Administrative assistants
- 1 Executive Director

Estimating Costs
Salaries and Benefits

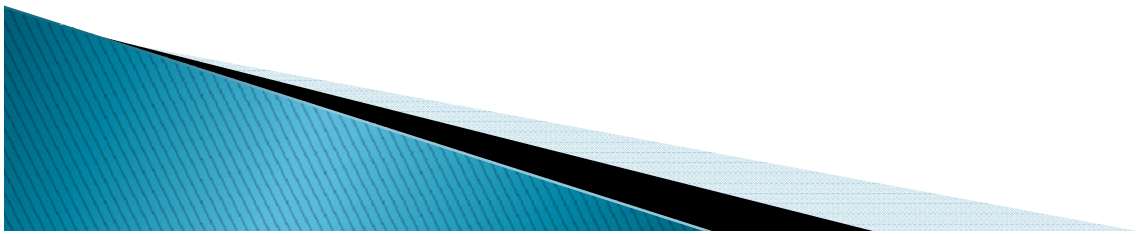
Table 4: Breakdown of Employee Salary and Benefits Costs

Position Description	Salary Cost	Benefits Cost
Full-time Physician	$162,013.68	$45,363.83
Full-time Physician Assistant	$65,975.76	$18,473.21
Full-time Registered Nurse	$61,744.56	$17,288.48
Full-time Licensed Practical Nurse	$38,018.88	$10,645.29
Part-time Registered Nurse	$30,872.28	$0.00
Full-time Administrative Assistant	$28,418.18	$7,957.09
Full-time Administrative Assistant	$28,418.18	$7,957.09
Full-time Executive Director	$62,250.24	$17,430.07
Total	$477,711.77	$125,115.06

Source: U.S. Bureau of Labor Statistics

Estimating Annual Costs
(2009 dollars)

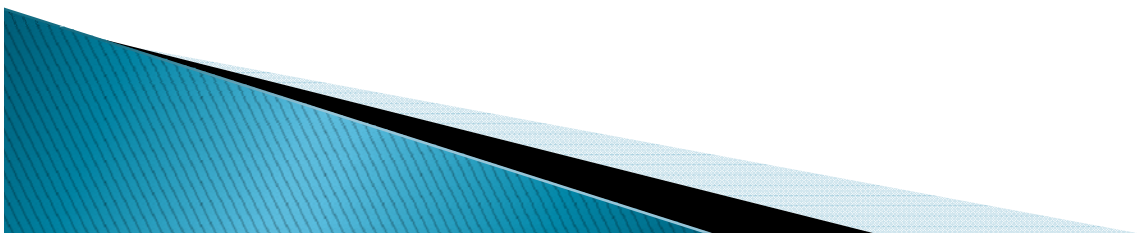
Salaries and benefits:	$602,826.82
Payroll taxes:	$ 32,824.10
Rent:	$ 80,325.26
Utilities:	$ 8,362.71
Equipment:	$ 10,577.00
Malpractice insurance:	$ 12,702.00
Administrative costs:	$ 36,498.02
Total:	**$784,115.91**



Estimating Annual Benefits
(2009 dollars)

- Revenues: $135,756.55
  - Based off patient load (5,059 annual visits)
  - Reimbursement method
    - Medicare: 15.50% at $57.45 per visit
    - Medicaid: 12.00% at $47.70 per visit
    - Uninsured: 59.50% at $7.40 per visit
    - Private insurance: 13.00% at $60.00 per visit

Revenues alone do not cover costs.



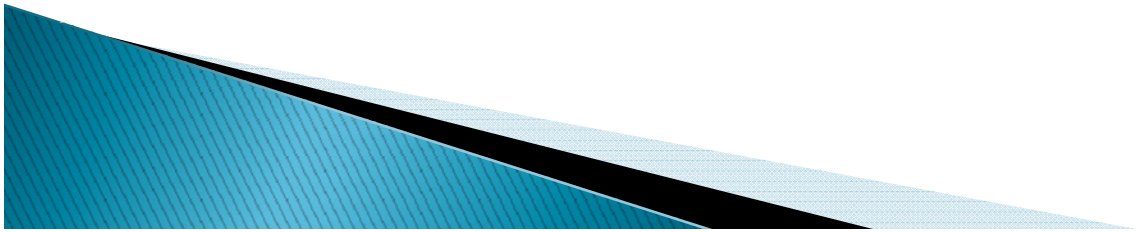
Additional System-wide Benefits
(2009 dollars)

- Diversions from Emergency Departments (ED) $547,040.55
  - 44,497 total visits at Southside Regional ED
  - 35% of visits are avoidable with primary care
  - 8% of avoidable visits caught by clinic: 1,245 visits
  - Average cost per avoidable ED visit: $439.39

Sources: Virginia Health Information, National Ambulatory Medical Care Survey, Medical Expenditure Panel Survey

All System-wide Benefits
(2009 dollars)

Preventable Hospitalizations:	$896,548.92
Increased Productivity:	$132,450.56
Increased Economic Development:	$100,000.00
Emergency Department Diversions:	$547,040.55
Clinic Revenues:	$135,756.55
Total Benefits:	**$1,811,796.58**

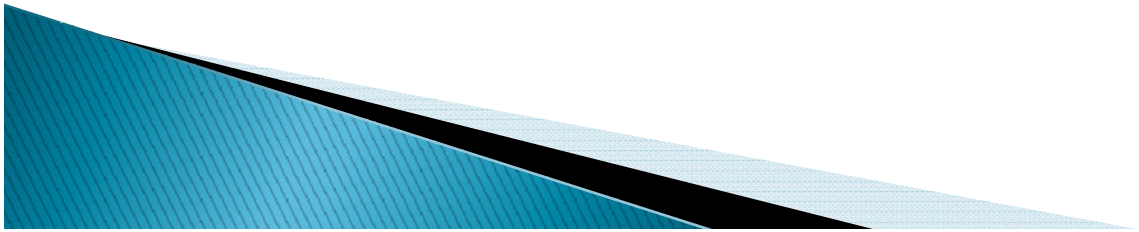


Performing the Cost-Benefit Analysis

- Formula used:

$$NPV = \sum_{t=0}^{T} (1/1+r)^t \ (B_t - C_t)$$

- Determines whether benefits outweigh the costs over a specified time horizon
- If net present value is positive, it may make sense to move forward with the clinic
- Takes into account the time-value of money with a discount factor



Inflating and Discounting over Time

- Time Horizon: 10 years
- Inflated costs and benefits with the Consumer Price Index (CPI)
  - The CPI represents changes in the prices of all goods and services purchased for consumption
  - Widely used as a measure of inflation
    - General Costs: General CPI (2.82%)
    - Medical Equipment Costs: Medical Commodities CPI (2.82%)
    - Medical Salaries: Medical Services CPI (3.46%)
    - Hospital Prices: Hospital Services CPI (6.63%)
- Discount rate: OMB 2009 guidelines (4.20%)
  - Reflects the cost of capital used to run the clinic

States of the World

- State of the World 1
  - Keep analysis in line with past trends
  - All costs and benefits are assumed to grow at a constant rate
  - Based on average growth rate of each CPI from the past decade
- State of the World 2
  - Allow all costs and benefits calculated with the medical CPIs to flatten over time
  - All costs and benefits calculated with a medical CPI decrease by 50% for years 6 through 10
- State of the World 3
  - Allow all costs and benefits calculated with a medical CPI to increase over time
  - All costs and benefits calculated with a medical CPI increase by 50% for years 6 through 10

Comparing Net Benefits

Table 5: Comparing Net Benefits Across States of the World

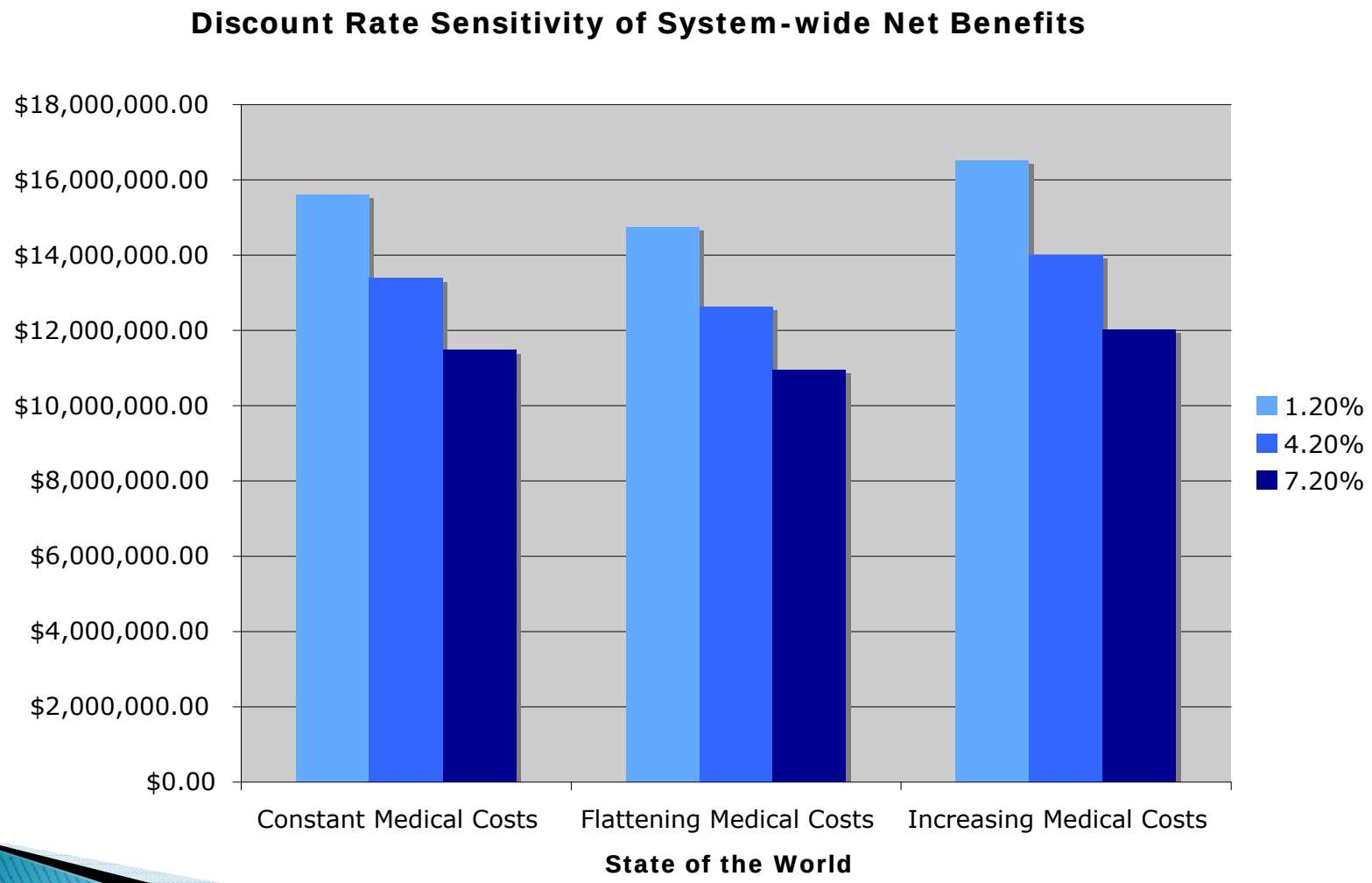
State of the World	System-wide Net Benefits	Stand-alone Clinic Net Benefits
Constant Medical Costs	$13,399,151.61	($6,902,078.41)
Flattening Medical Costs	$12,642,873.89	($6,849,319.53)
Increasing Medical Costs	$14,004,181.19	($7,154,817.86)

Please note that the discount rate used is 4.20%

Sensitivity Analysis

- Determines how sensitive outcomes of the cost-benefit analysis are to changes in assumptions
- Net present value of each state of the world depends heavily on discount rate chosen
- Evaluated each state of the world with a discount rate of 1.20%, 4.20%, and 7.20%

Sensitivity Analysis of System-wide Net Benefits



Recommendations

- Is there unmet need for primary care in Petersburg?

Yes

- If so, what would be the costs and benefits of opening a new safety net clinic in Petersburg?

System-wide benefits exceed costs

Recommendations

- Secure more patient-level data about Petersburg health care.
- The College of William and Mary is advised to continue to pursue a partnership with the City of Petersburg to investigate opening a new safety-net clinic in the City.
- Further care should be taken by the College to investigate existing health services in Petersburg.

Design Decisions

- Ownership status
  - Federally Qualified Health Center
  - Private non-profit or not-for profit
- Clinic attributes
  - Staffing
  - Types of patients and conditions treated
  - Hours
  - Location
- Decreasing private cost
  - Partner with Southside Regional Hospital
  - National Health Service Corps
  - Volunteers
  - Funding from grants and foundations
  - Angel investors/social entrepreneurs

Thank you

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Questions?