NEW JERSEY BROADBAND MAPPING AND PLANNING PROGRAM

TWO-YEAR MID-POINT SUMMARY

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Rutgers is involved in both the mapping and planning components of the program as a subcontractor to Applied Communication Sciences (formerly, Telcordia Technologies). In combination, the Rutgers work addresses three critical levels of assessment of broadband penetration and expansion:

- The Household Level, via the collection and analysis of a state-wide household survey on broadband, the modeling of broadband non-adoption at the household level, and the identification and assessment of the barriers that lead to non-adoption, including the assessment of poverty and broadband non-adoption;

- The Community Level, via literature review on broadband programs and the framework of Digital Human Capital, qualitative case-study analysis, and field work focused on the assessment of community-based collaborations as a method to bridge the Digital Divide; and

- The State Level, via econometric modeling in R/ECON of the impact of broadband on the state's economy and analysis of the impact of Internet-related training programs through the New Jersey Department of Labor and Workforce Development.

On March 31, 2012, the two-year mapping component ends and the four-year planning component is at its mid-point. All Activities and Milestones in each component—and within each of the individual projects that comprise the components—have been successfully completed, on-time and on-budget.

Organized according to the three levels of analysis listed above, this document summarizes to date the status and key results of these efforts. A graphic of the program, shown on page three of this document, maps these three key levels to the specific components of the program, and to specific projects within each component.

Household Level Work (Items (A), (B) and (C) of the Graphic)

During the first year of the household-level effort, Rutgers fielded an extensive landline-and-cell telephone survey yielding a high-precision statewide dataset, which continues to provide extensive and detailed information to support quantitative analyses and modeling of household-level broadband non-adoption. That effort concluded with the publication of a peer-reviewed article which uses those data to model, *demographically, attitudinally,* and *behaviorally,* broadband non-adoption in New Jersey and which is forthcoming in the respected Elsevier B.V. journal, *Socio-Economic Planning Sciences.* By addressing demographic, attitudinal and behavioral factors, this work supports detailed assessment of barriers to broadband adoption by households in New Jersey. The next major effort is the development

and submission for publication of a second paper, which uses the survey data to model and provide supporting quantitative evidence for the qualitative model on poverty and the Digital Divide that post-doctoral researcher Amy Bach and Professor Todd Wolfson developed as part of the Community Level work described next.

The Rutgers work is coordinated by the Principal Investigator, Marc D. Weiner, J.D., Ph.D., who is Associate Director of the Bloustein Center for Survey Research, and Assistant Research Professor at the Bloustein School of Planning and Public Policy at Rutgers University. Marc is also the key researcher and lead author on this Household-level work.

Community Level Work (Item D of the Graphic)

Researchers at this work-level produced an extensive qualitative analysis of the effects of the digital divide entitled "Poverty, Inequality, and the Social and Political Effects of the Digital Divide." That report by Bach and Wolfson guides continuing qualitative field research designed to understand what urban broadband adoption programs are doing to bridge the digital divide among disenfranchised groups, who the participants in these programs are, and what is and is not working with respect to these organizations' efforts. Using the project's survey data, the qualitative model derived in this report has been subsequently and successfully quantitatively assessed by Marc Weiner and his senior research specialist and doctoral student, Orin Puniello.

The community level work uses careful review of relevant literature, qualitative case-study analysis, and research field work to identify key success factors in the planning, development and implementation of successful broadband adoption programs. Cast in the framework of Digital Human Capital, this work has included the delivery of an inventory which summarized broadband adoption programs in the state and continues to focus on how to build community-based collaborations in underserved areas to bridge the Digital Divide.

The Community-level work is led by Todd Wolfson, Ph.D., Assistant Professor of Journalism and Media Studies in the School of Communication and Information at Rutgers.

State Level Work (Items (E) and (F) in the Graphic)

This work-level included a two-year effort of deploying R/ECON, a robust, well-established, large-scale econometric model of the New Jersey state economy, developed by Rutgers to study both the direct and indirect economic impacts of broadband on the overall state economy. This work-level's efforts extended the R/ECON model to incorporate variables and equations related to the information sector and telecommunications and to develop an expanded model to be used for state-level analysis and simulation of the impact of telecommunications and broadband on the state's economy. The analysis shows that broadband penetration is significantly and positively related to the economy.

Supported by evidence from the behavioral analysis of the non-adopter, which shows that lack of experience using the internet is a significant factor for non-adoption, the state-level work is now aimed at collection and analysis of information on state programs for broadband and internet training; specifically, training grants from the New Jersey Department of Labor and Workforce Development and the associated New Jersey Training Opportunities website.

The State-level work is led by Nancy H. Mantell, Ph.D., Director of the Rutgers Economic Advisory Service at the Bloustein School of Planning and Public Policy.

Graphical summary of Rutgers activities, under the direction of ACS

New Jersey Broadband Mapping and Planning Program: Rutgers' Participation

Broadband Mapping – Data Verification

A	Household Phone Survey (bilingual – Spanish/English) – Stratified over-sample to yield 1,860 broadband adopters and 1,240 non-adopters for a total sample size
B	Quantitative Modeling of Broadband Non-Adoption – Addressing Demographic, Experiential and Attitudinal Factors to Model the Non-Adopter

Broadband Planning

C	Household Level Quantitative Research on Understanding and Addressing Barriers to the Adoption of Broadband and Information Technology Services
D	Community Level Research on Addressing Gaps, Developing Programs and Assessing Progress in Improving Broadband Penetration
E	State Level Macroeconomic Analysis of the Impact of the Spread of Broadband on New Jersey's Economy
F	State Level Sector Data Collecting, Analyzing and Sharing Detailed Market Data Concerning Use and Demand for Broadband Service

Key Outcomes and Results

Outcome #1: The modeling effort on household non-adoption generated three empirical findings: (1) in New Jersey, household-level broadband adoption is colorblind: that is, once we control for socio-economic factors, race and ethnicity are neither explanatory nor predictive of the failure to adopt household-level broadband; (2) the strongest barrier to such adoption is lack of resources; and, (3) the strongest facilitator for household-level broadband adoption is the experience of first-time high-speed internet access via computer by the household decision-maker. These findings better inform and guide the efficient implementation of policies to establish universal broadband access. In particular, finding (3) indicates the potential for high-impact of training programs that provide experience in internet access and use to household decision-makers.

Outcome #2: The R/ECON modeling work analyzed the economic impact of the proliferation of broadband on relevant sectors of New Jersey business and industry, including collecting, and analyzing market data on the costing, use of, and demand for broadband service across different economic sectors. In addition, the R/ECON model was modified to include equations for telecommunications to characterize trends in the information industry in terms of employment and output. Preliminary findings, at 99% statistical confidence, include that at the state macroeconomic level broadband penetration is positively related to increasing output in telecommunications, thus laying the foundation for a positive assessment of the impact of the expansion and penetration of broadband on the state's economy.

Outcome #3: The community level qualitative analysis on the effects of the digital divide, summarized in the report entitled, "Poverty, Inequality, and the Social and Political Effects of the Digital Divide," asserts that the "digital divide is intricately intertwined with other forms of social and economic exclusion," which are driven by poverty and inequality. This work, by Todd Wolfson and his post-doctoral research associate Amy Bach, posits that social isolation and civic/political disaffection are defining features of poverty, which is the key driver of the digital divide. This argument formed the basis of a model of digital exclusion that Weiner and Puniello have tested and validated using the survey data. They found strong empirical evidence supporting this model of digital exclusion and, in particular, three key findings: (1) Poverty, whether expressed as economic exclusion or lack of resources, is the most significant stable barrier to the household-level adoption of broadband internet access; (2) Even among household broad adopters, i.e., those who have broadband access in the home (a category including those in poverty as well as not in poverty), the proportion of the sample in poverty actually using the internet for the common social, educational, civic, commercial transactions that typically signify inclusion in a digital economic society, is statistically significantly smaller than those not in poverty; and (3) Similar to those in poverty, dial-up only users use the internet less than high-speed broadband users, a dynamic apparently not demographically generated.

These findings strongly support the inference that a significant component of the Digital Divide is attitudinal and/or the product of a lack of exposure to the relevant technologies. While lack of resources as a barrier to household-level adoption is generally only addressable on the supply side, the finding that a measurable component of the Digital Divide is attitudinal and experiential is critical in that these are modifiable conditions that, if properly addressed, will serve to diminish digital exclusion and the Digital Divide in New Jersey.