PROJECT TITLE:
RIVERSIDE PUBLIC UTILITIES ADVANCED METER PROGRAM - FULL DEPLOYMENT

SPECIFIC TOPIC AREA:
SMART GRID GRANTS – AREA 2

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TEAM MEMBER ORGANIZATIONS:
City of Riverside, Riverside Public Utilities is the sole applicant.

PROJECT LOCATION(S):
Riverside, California

STATEMENT REGARDING CONFIDENTIALITY:
The City of Riverside claims no confidentiality regarding this grant application.

PROJECT AND/OR TECHNOLOGY DESCRIPTION

BACKGROUND

Riverside Public Utilities (RPU) initiated the development of a Strategic Technology Plan (Plan) under the guidance of the General Manager and with the assistance of RPU consultants. In 2015, the Plan was completed and adopted by the Board of Public Utilities (Board). The Plan outlines the strategic technology vision of RPU recognizing the crucial role of technology in improving operational efficiency, reliability, and customer satisfaction, as well as supporting broader initiatives in the areas of economic development and community service to Riverside citizenry.

TECHNICAL APPROACH

Implementation of an Advanced Meter Infrastructure (AMI) and Meter Data Management System (MDMS) are two of the most critical projects outlined in the Plan, and support three primary goals: "Customer Experience", "Reliability & Resiliency" and "Sustainability". An AMI system is an integrated system of smart meters, communications networks, and data that enables two-way communication between the utility and customers. An MDMS validates and edits the meter data to ensure the data is accurately transferred to the Customer Information System for billing. Together these systems, along with a new Customer Portal, make up RPU's Advanced Meter Program (Program) that will provide customers with near real-time information to make more informed decisions about energy usage.

The RPU legacy electric meters have not yet met their end-of-life expectancy. One of the primary goals of the Advanced Meter Program is to maximize the current residential ERT meter investment. The solution that was selected is an "ERT overlay", which means installing a fixed network utilizing new AMI meters and communication devices to collect data from the existing meters, as well as provide new AMI functionality. To effectively manage the implementation of the new system and the significant business process, policy and staffing changes that will occur, Riverside has implemented a phased approach. By exchanging approximately 20% of our legacy ERT meters with AMI meters and the fixed network, RPU can remotely read the remaining ERT meters. This allows for several benefits including immediate efficiencies in meter reading and maximizing the ROI on the legacy meters. It also allows the technological improvements and interfaces to be put in place and refined prior to full implementation. This phased approach allows for an efficient transition from ERT to AMI technologies over several years and budget cycles. RPU has exchanged 16% of the legacy meters to date and integrated the AMI and MDMS into our workflows.

RESILIENCE

The data provided by an AMI system improves resilience in several ways. AMI data allows for transformer loading analysis. By understanding the load profile on a transformer and combining it with voltage trending data, utilities can better utilize existing assets, avoid dangerous overloading and perform preventative transformer replacements that can be scheduled to minimize customer interruptions. Transformer and voltage analysis also help identifying energy

theft, illegal grid connections or unmetered service which could lead to a circuit overload or outage.

AMI outage, blink and voltage data can be utilized to detect areas where tree trimming may be required to eliminate nuisance blinks and short-term outages. AMI data can be used to prioritize system improvements and repairs. These use cases all improve grid reliability and resilience.

PROJECT OUTCOMES

Transitioning to a fully deployed AMI system benefits customers by enhancing and optimizing operations with access to near real-time system data. Benefits include improved reliability through more timely detection of outages, lower operational cost, and improved detection of power quality issues like voltage sags and swells. All operational efficiencies equate to lower energy cost for customers.

AMI data provides the information needed to design better consumer rates for solar customers and customers with electric vehicles. Properly design rates ensure all customer are paying for the energy they use and are not subsidizing energy used by other customers.

The AMI data is available for customers to view in a customer portal. This allows customers the ability to monitor and manage their usage and bill. The customer can set thresholds and receive notifications if these thresholds are met allowing the customer to adjust usage and impact the amount of their energy cost.

AMI helps the City of Riverside reduce its greenhouse gas (GHG) emissions. Reductions in truck rolls and drive time for meter reading and field activities related to non-pay disconnect/reconnect, re-reads, and move in/out reads will all contribute to a reduction in GHG output.

While RPU is already utilizing the available AMI data to enhance grid operations with improved visibility of outages and power quality issues, these advantages are only available in areas with AMI meter coverage. Additional benefits will be achieved with full AMI meter deployment. AMI data from a fully deployed service area will improve grid operations by providing data that can be used to balance the electrical system, manage customer renewable energy resources (solar) in near real time and improve electric vehicle charging infrastructure. AMI provides data for other advanced technologies like outage management and distribution automation systems.

PROJECT IMPACTS

RPU's Advanced Meter Program aids in compliance with future legislative requirements. The Energy Policy Act of 2005 requires states and non-regulated utilities to investigate and consider AMI for its customers. With the completion of AMI, RPU will better prepare itself to address all legislative and/or CA state requirements regarding conservation, time-based rates, and other energy-related issues.

AMI also enables future Smart City capabilities. The AMI communication network is compatible with various Smart City applications, such as street lighting networking and control. AMI systems allow partnerships with other value-add providers that enable and provide comprehensive solutions as RPU's needs grow for Smart City functionality.

DOE Funding Impact

Technology continues to evolve. Costs and material lead times continue to grow. The longer a technological project takes to be implemented the higher the risk it will not be completed due to these pressures. Current supply chain issues continue to impact cost of materials and lengthen project schedules. While some benefits of an AMI system are available as each meter is deployed, the most valuable benefits are realized when full deployment is achieved. RPU has a four-year CIP budget for meters which should purchase enough meters to exchange 72% of the electric meter population. Securing DOE funding will allow RPU to enter into a meter purchase agreement that would mitigate these concerns.

Project Readiness, Viability, and Timing

RPU is currently exchanging legacy electric meters with AMI meters and has completed the system integrations. Any grant funding received would be used to purchase additional AMI meters to replace the remaining legacy meters, install additional AMI network communication devices and to continue improving grid operations and reliability using AMI data.

RPU has already seen the value in the Advanced Meter Program and the data it provides. Operations and Engineering departments are beginning to use available data and request additional data from areas where AMI meters have yet to be deployed. The more quickly RPU gets to full deployment the sooner our customers and community realizes all the benefits.

If awarded the grant funding, RPU can accelerate the time frame for full implementation. RPU's current time frame is approximately 84 months, pending future budgets and supply chain issues. Additional funding would significantly improve this schedule. The timeframe of the accelerated schedule is directly proportional to the amount of any grant funds received.

COMMUNITY BENEFITS PLAN

Riverside Public Utility has been committed to engaging with the community since the onset of this project and to ensuring a high quality of employment for all staff. The city is dedicated to equal opportunity and advancing diversity, equity, inclusion, and accessibility and has made a commitment to equity in its strategic plan including regularly training staff on DEIA topics and recruiting for a DEI Officer. Additionally, this project significantly contributes to the Justice40 Initiative. This program will be rolled out to all our metered customers, 37% of which are located within Riverside's disadvantaged communities. These DAC customers will receive immediate benefits including the ability to manage their usage to help lower bills, minimization of outages, and the reduction of GHGs.

COMMUNITY AND LABOR ENGAGEMENT

Community engagement around our AMI meters has included several avenues of communication. At multiple stages in the project, including its initiation, there have been publicly accessible Board and City Council meetings. Prior to our initial launch, a publicly accessible webpage was created for the AMI project. Before the installation of meters, all customers received a letter and postcard informing them of the change and a door hanger was left following installation. After the initial deployment but before additional deployments were made, an interactive booth was set up at a community event for customers to ask questions and learn about the program.

The Advanced Meter Program is being installed and maintained by Electric Meter Shop staff that are represented by International Brotherhood of Electrical Workers Local Union (IBEW) No. 47. The City of Riverside will continue its efforts to coordinate this project with the labor unions, IBEW and the Service Employees International Union (SEIU).

INVESTING IN JOB QUALITY AND WORKFORCE CONTINUITY

RPU will utilize existing staff to implement the Advanced Meter Program and has relied on promotional recruitments to offset any meter reading jobs that may be impacted. Additionally, the Electric Meter Shop has added four (4) FTE and is in the process of hiring two (2) additional FTE to assist with the Program increasing the total meter shop staff to fourteen (14) FTE. The City of Riverside offers competitive salaries and comprehensive benefits including medical, dental, and vision. Additional benefits may include life insurance, long term disability insurance, a 457 deferred compensation plan, and a flexible spending account. Staff are represented by the International Brotherhood of Electrical Workers Local Union No. 47 and have a collective bargaining agreement in place with the city.

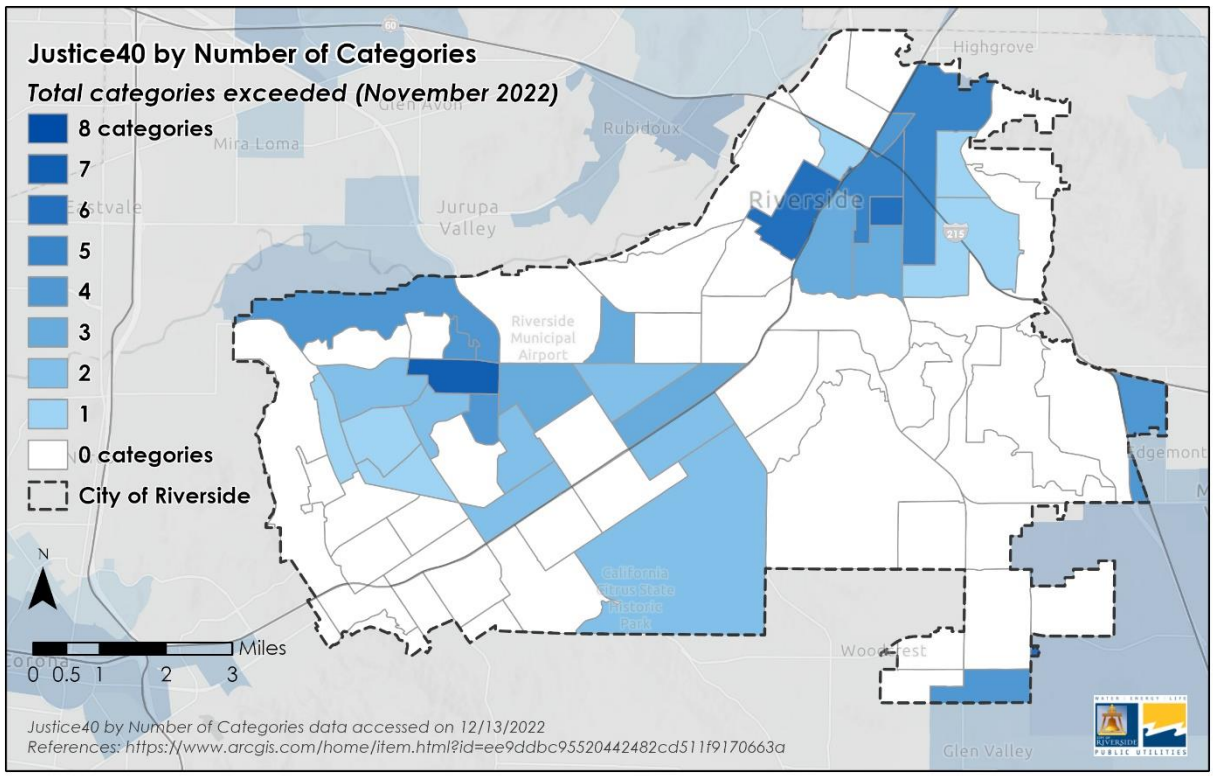
ADVANCING DIVERSITY, EQUITY, INCLUSION, AND ACCESSIBILITY (DEIA)

The City of Riverside is committed to equal opportunity employment, and it shows in our diverse workforce. Men and women of all ages, cultural and ethnic backgrounds, religious and political affiliations, national origins, and persons with disabilities are encouraged to apply. Currently, the Electric Meter Shop employs three (3) bilingual staff to assist our Spanish speaking customers.

RPU's Electric Meter Shop has a diverse staff of men and women providing professional metering service. RPU is committed to addressing issues of diversity, equity, inclusion, and accessibility and regularly trains staff on DEIA topics. The City of Riverside has recognized the importance of DEIA by including equity as a cross-cutting thread in its adopted strategic plan and that incorporates diversity, equity, and inclusivity as a foundational value. The city is also in the process of recruiting and hiring a Diversity, Equity, and Inclusivity Officer that will serve all employees including the employees that will work on this project. This person will also assist the department in developing the programs and outreach to the community to provide information on how to best utilize AMI infrastructure to help customers reduce costs and better manage their utility bills. Additionally, the department along with the DEI officer will build on existing and develop new relationships with a variety of community organizations.

JUSTICE40 INITIATIVE

By utilizing the *Justice40 by Number of Categories* data, our GIS team was able to map which census tracts in the city are considered disadvantage communities (DACs) and determine the number of customer accounts (based on meter location) located within these DACs. Our data shows that 37**%** of customer accounts are located within a DAC. Most customer accounts have more than a single customer, therefore the benefits of the Advanced meter Program will be realized by more than 40% of the City of Riverside's population that reside within our disadvantaged communities. Since the Advanced Meter Program will be rolled out to all customers, our project will contribute to the Justice40 Initiative by using the funding from this grant to provide direct benefits to Riverside's DACs. RPU has prioritized our Utilicare customers to receive AMI meters. Utilicare is a medical support program for RPU's residential electric customers.



Disclaimer: The GIS data represented on this map provides a visual display of data for your convenience. Every reasonable effort has been made to assure the accuracy of the map and associated data. The City of Riverside shall assume no liability for any decisions made or actions taken or not taken by the user of the applications in reliance upon any information or data furnished hereunder.

Customer Type	Total # of Customer Accounts	Total # of Customer Accounts in Justice 40 Identified Census Tracts	Percent of Customer Accounts in Justice 40 Identified Census Tracts
Commercial/Industrial	19,505	7,832	40%
Residential*	95,814	34,501	36%
All other (institutional, agricultural, etc.)	2,430	1,341	55%
Total	117,749	43,674	37%

*Note: Residential customer type only includes residents that have residential accounts. That the total population resides in a variety of housing is not always captured by our residential account class. This includes locations where housing units are covered under a consolidated single commercial account such as in group homes and care facilities, mobile home parks, student housing and some apartment housing. The AMI meter project will directly benefit residential customers that have their own meter. For the other facilities, the benefits are indirect as it will allow the commercial account holder to better understand their energy usage and reduce overall costs (that may or may not be transferred to the resident).

With the installation of AMI meters, our DAC customers will be able to monitor their electricity usage and set usage alerts that will help them to minimize their energy bills. The Advance

Meter Program allows RPU to reconnect power more quickly to customers if their service has been disconnected by utilizing the two-way communication capability in the AMI meters.

All community members will be able to use the information from their AMI meter to help minimize energy demand during Flex Alert events. Flex Alert events are becoming more frequent with California's increasing temperatures due to climate change. Widespread community response will minimize the chance of outages during these high heat events which will directly benefit our DACs who are often less equipped to handle such outages during heat events. Additionally, once full deployment is reached, RPU can utilize the remote disconnect function to reduce demand more equitably during a Flex Alert. Currently RPU must shut off the circuit that most closely sheds the load reduction required by CAISO. This impacts one geographic area for the duration of the event. Advanced Meter Program allows RPU to meet the CAISO requirement by shedding load at the meter level. Managing the outages at a meter level allows service disruption to be spread over a larger area for shorter durations and then rolled to a new group of meters thus minimizing how long any customer is without power.

The installation of AMI meters will minimize the truck rolls (when a crew truck must be dispatched) required to check legacy meters which will reduce vehicle GHGs and improve air quality. Individuals in DACs would begin to receive benefits immediately upon installation of an AMI meter. Additional benefits would increase as installation across the community continued.

ADDENDUM A

RPU will continue to exchange legacy meters with AMI meters and install additional network communication devices using the methods from the ongoing Advanced Meter Program project. RPU will increase community outreach and education on how customers can utilize AMI data to manage usage and lower their energy bills and expand the use of AMI data to improve grid operations.

PROJECT PERSONNEL SKILL AND EXPERTISE

- *Project Manager:*

Jennifer Tavaglione, RPU, Senior Project Manager
Jennifer is the Project Manager for the original Advanced Meter Program and managed RPU's CIS upgrade. Jennifer will obtain required approvals from City Council and the Board of Public Utilities for this project as well as oversee the schedule and budget. The Advanced Meter Program full deployment project will take approximately 25% of Jennifer's schedule.

- *Project Administrator:*

Tim Rezendes, RPU, Superintendent – Electric Meter Shop
Tim coordinates the Electric Meter Shops efforts for the Advanced Meter Program. As administrator he will develop budgets and schedules, procure required meters, and network equipment and oversee production and training of new staff. Tim will be dedicating 75% of his time to the Advanced Meter Program.

- *Financial Officer:*

Heather Solis, RPU, Administrative Analyst – Electric Field Operations
Heather manages the Electric Field Operations budget. We estimate the Advanced Meter Program project will represent 15-20% of Heather's efforts.

ORGANIZATIONAL EXPERIENCE

Riverside Public Utilities is a publicly owned water and electric utility that has been providing efficient, reliable services throughout the City of Riverside since 1895. We are committed to providing the highest quality water and electric services at the lowest possible rates to benefit the community.

RPU began our Advanced Meter Program in 2018 with a Proof of Concept that allowed for the setup and testing of all the system integrations and functional requirements. Upon successful completion of our Proof of Concept, RPU installed the communication network devices and began the meter exchanges. To date we have exchanged over 19,000 legacy meters. We also have setup the system integrations that allows us to remotely read the AMI meters, bill the usage and provide the customer access to their usage information via our customer portal.

Partners

Tantalus, TUNet Insight, AMI vendor, new partner, SAS
Tantalus is our AMI partner and provides the AMI communication equipment, head end, dashboard, training, and Software as a Service.

SmartWorks, Compass, MDMS vendor, new partner, SAS
Smartworks is our MDMS partner and processes the AMI data into meter reads for our billing system, stores the AMI data and provides dashboard, training and Software as a Service.

S&S, enQuesta, CIS vendor, partner since 2014, SAS
S&S is our CIS partner and provides our Customer Information and billing systems.

Facilities and Equipment Access

The RPU Electric Meter Shop is in our Utilities Operation Center located at 2911 Adams St., Riverside CA. The Electric Meter Shop installs, tests and maintains all electric meters and associated instrumentation and test equipment. Because our Advanced Meter Program is currently in progress, we have acquired all necessary facilities and equipment required to complete a full AMI deployment.

ADDENDUM B (TOPIC AREA 1 ONLY APPLICABLE TO SMALL UTILITIES)

Not applicable