

# *Progress Updates:*

## *Calculating the Social Burden of Community Power Outages*



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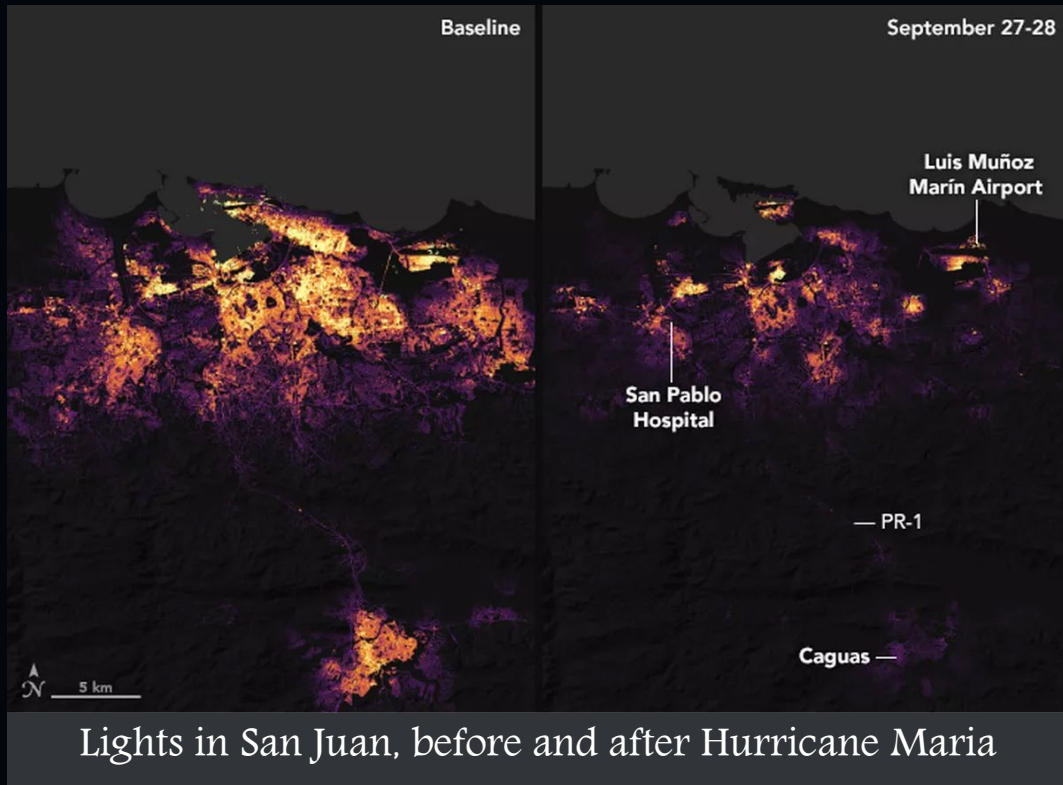
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# Social Burden Research

## Objective:

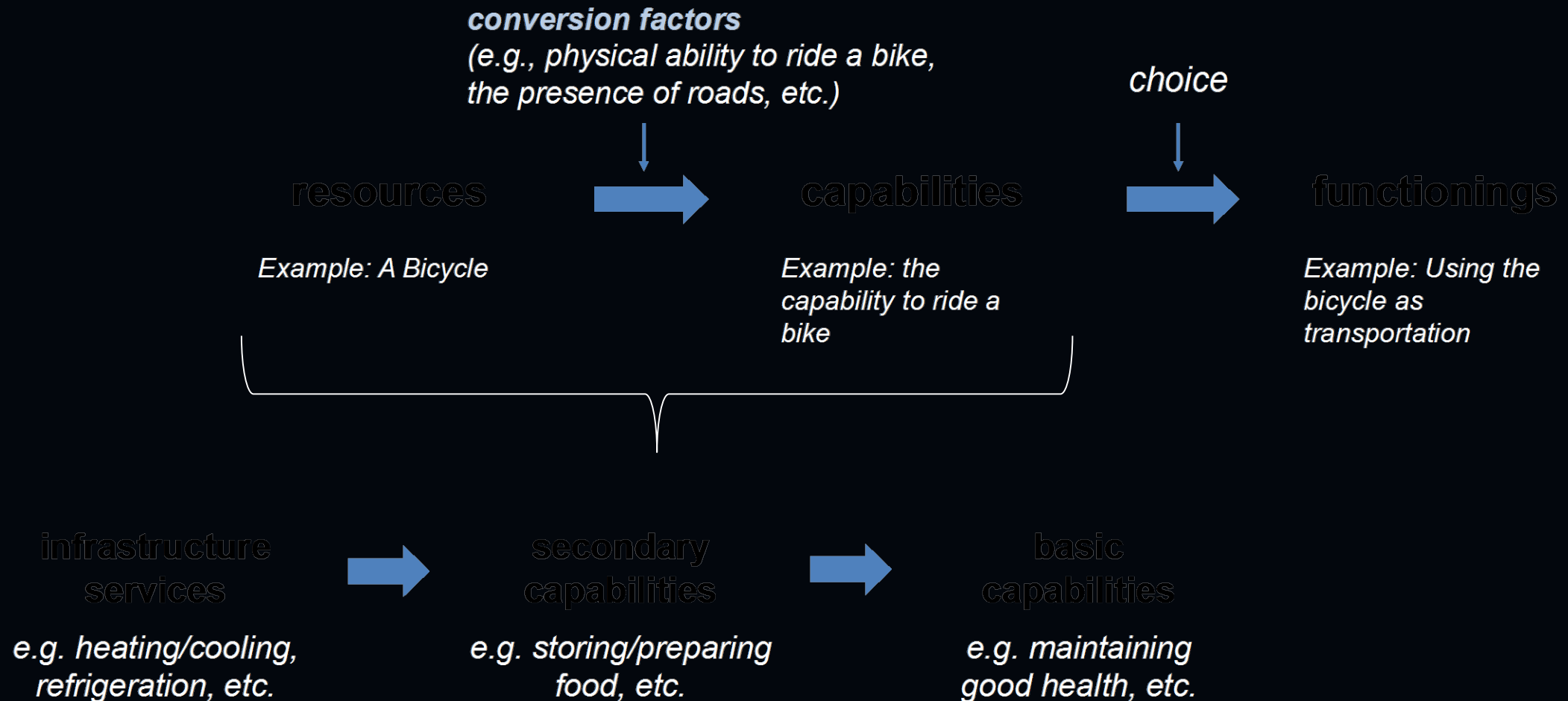
*Develop and validate a resilience metric quantifying the **social burden** of energy loss across different types of communities*



# Social Burden Research

## Theoretical Grounding:

## Capabilities approach to measuring human wellbeing



# Social Burden Research

## **Guiding Premise:**

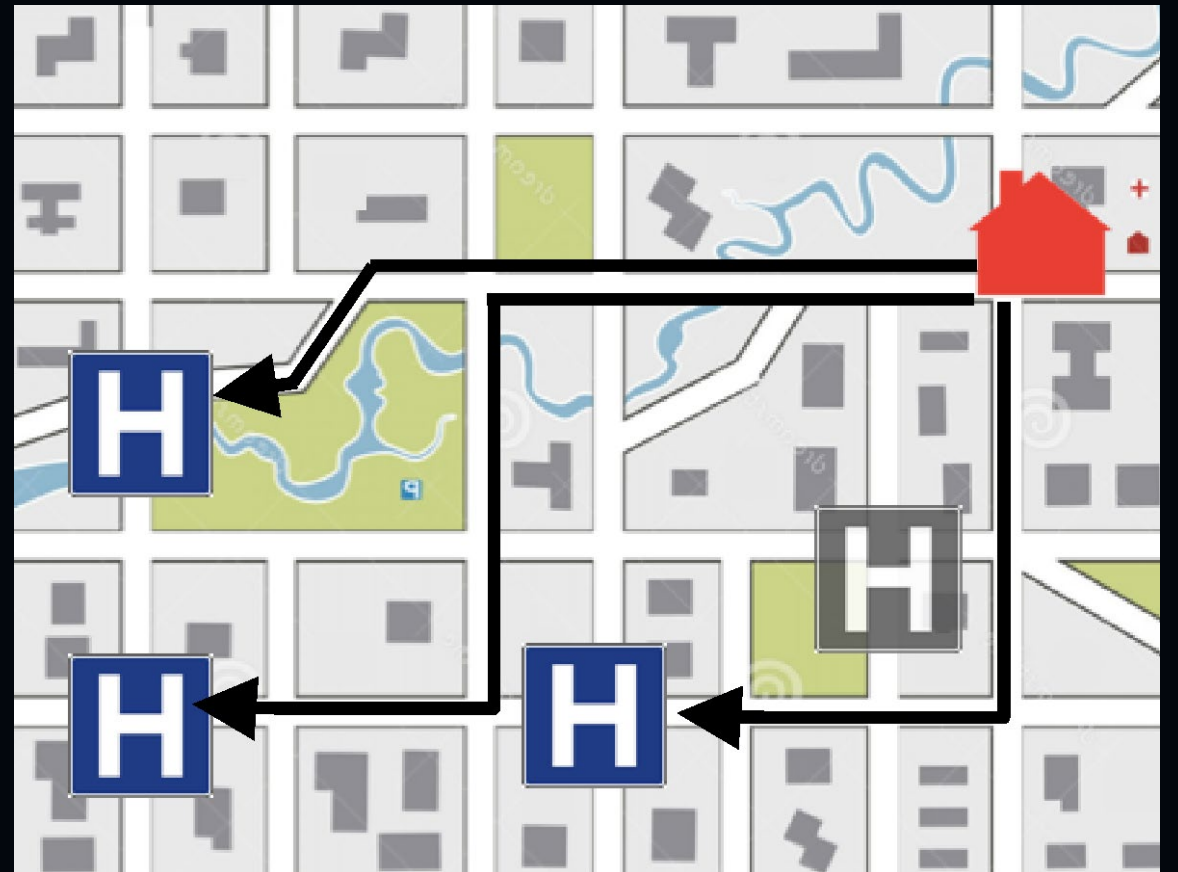
*In power outages, people may have to undertake additional travel in order to meet important secondary capabilities*

## **Approach:**

***gravity weighted model**  
to capture the potential  
benefits of having service  
locations available during  
outage*

- *measures sum of  
separation-discounted  
benefits across all locations*

*reflects the **choice** tenet  
of capabilities framework*



# Social Burden Research

*to test & validate our approach's applicability across multiple contexts, we are using questionnaires in three case study locations to better understand what additional travel was undertaken in power outages*

## **First Case Study Visit (December, 2019)**



ENLACE & Caño Martín Peña Communities | San Juan, Puerto Rico

# UB Trip to San Juan | Intentions & Actions

## **Objectives:**

1. *Establish relationships with ENLACE & community leaders in The District*
2. *Improve questionnaire based upon ENLACE & community leader feedback*

## **Key Activities:**

- *Presented aims & approach of research and the context of this project to ENLACE staff members*
- *Learned about ENLACE's scope of work in the communities*
- *Toured communities & gained first-hand understanding of experiences*
- *Presented research, conducted questionnaire session, and facilitated focus group of 10 community leaders*



# UB Trip to San Juan | Results

## OBJECTIVE 1: ESTABLISHING RELATIONSHIPS

- *Established trustworthiness and developed strong professional relationship with contacts at ENLACE*
- *Established credibility with & gained interest of community leaders*
  - *Strong turnout for focus group*
  - *High levels of interest in research*
  - *Multiple recommendations of techniques to gain community member engagement*
  - *Excitement about future trips*



# UB Trip to San Juan | Results

## OBJECTIVE 2: IMPROVING QUESTIONNAIRE

### QUESTIONNAIRE RESULTS:

Responses indicated that our basic approach of focusing on travel to meet critical needs makes sense:

- **Most frequently reported needs:**
  - *Food*
  - *Water*
  - *Gas*
  - *Medications*
- **Increased travel as a result of outage – respondents reported having to:**
  - *travel further to meet certain needs*
  - *travel more frequently to meet certain critical needs*
  - *visit multiple locations in search of certain needs (e.g. gas)*

Handwritten survey form with Spanish text and handwritten responses. The form includes questions about the use of facilities, access to medical care, and travel during an outage. The responses are written in cursive.

Uso del inodoro Si

Bañarse Si

Lavar platos Si

Lavar ropa viajar a bario obreo

Acceso a atención médica fuera del hogar (por ejemplo: hospital, clínica, etc.) Si

Mantenerse al día con los tratamientos médicos en el hogar (por ejemplo: diálisis)

Acceso a medicamentos no aplica

Almacenamiento de medicamentos no aplica

Acceso a información importante en los centros comunitarios

Comunicarse con otros a través del teléfono celular. no tengo celular x 2

Otro (explicar) \_\_\_\_\_

Otro (explicar) \_\_\_\_\_

6. ¿El apagón le obligó a viajar para las actividades que normalmente haría en casa? (Por ejemplo, por lo general lavas la ropa en casa, pero durante el apagón tenías que viajar a otro lugar para lavar la ropa).

Si \_\_\_\_\_

No \_\_\_\_\_

Si respondió Sí a la pregunta anterior, por favor circule todas las necesidades de la Tabla 1 (en la página siguiente) que normalmente se hacen en casa pero que tuvieron que viajar para cumplir durante el apagón.

Para cada actividad seleccionada en la Tabla 1, haga lo siguiente:

- Consulte el mapa proporcionado para completar la columna DESTINO CELDA en la Tabla 1 (por ejemplo, C3, J10) donde viajó durante el apagón para satisfacer cada necesidad.
- Utilice la columna FRECUENCIA DE VIAJE de la Tabla 1 para indicar la frecuencia por semana durante el apagón que viajó para satisfacer cada necesidad.
- Utilice la columna MODO DE TRANSPORTE de la Tabla 1 para indicar cómo viajó para satisfacer cada necesidad. en su carro



# UB Trip to San Juan | Results

## OBJECTIVE 2: IMPROVING QUESTIONNAIRE

### FOCUS GROUP FEEDBACK:

Overall, the questionnaire was an appropriate length and asked the right questions, but we should:

#### *Simplify the Questions*

- *Wording*
- *Multiple choice options, where possible*

#### *Change the Maps*

- *Increase geographic area covered by map*
- *Increase detail visibility*
- *Add icons of key destinations (e.g. stores, hospitals, etc.)*



# UB Trip to San Juan | Results

## OBJECTIVE 2: IMPROVING QUESTIONNAIRE

### OBSERVATIONS FROM FOCUS GROUP DISCUSSION:

- **Traveling was a burden**
  - *Time spent waiting was also a significant burden*
- **Self-identified needs:**
  - *Ice*
  - *Fans*
  - *Television*

*items not explicitly mentioned in questionnaire*
- **Responses may lack internal consistency**
  - *Disconnect between conversation and questionnaire responses -- many community leaders spoke about additional travel, but did not necessarily report the travel on the questionnaires*



# UB Trip to San Juan | Takeaways

- **Relevance of research**
  - *presentation of theoretical grounding & approach was well-received by both ENLACE and community leaders; conversations reflected this*
- **Allure of storytelling**
  - *people want to share what they want to share about their experiences, even if it doesn't directly correspond to the questions we asked*
- **Costs of detail**
  - *people either skipped certain data-intensive questions or relied heavily on focus group facilitators to complete these sections*
- **Challenges of language**
  - *language barrier was far more significant than anticipated*
  - *questions can be honed to better reflect lived experiences & increase internal consistency between questionnaire responses & conversational disclosures*

# Improvements for Next Case Study Locations

## REFINING QUESTIONNAIRE TO IMPROVE:

- *Clarity of purpose*
  - Want to simultaneously express compassion for full range of experiences & also reiterate focus of our research on travel behavior
- *Simplicity*
  - Want to simplify language & hone questions so as to improve user-friendliness & reduce internal inconsistencies
- *Open-endedness*
  - Want to allow participants to identify where they went & why rather than frame questions around pre-defined services

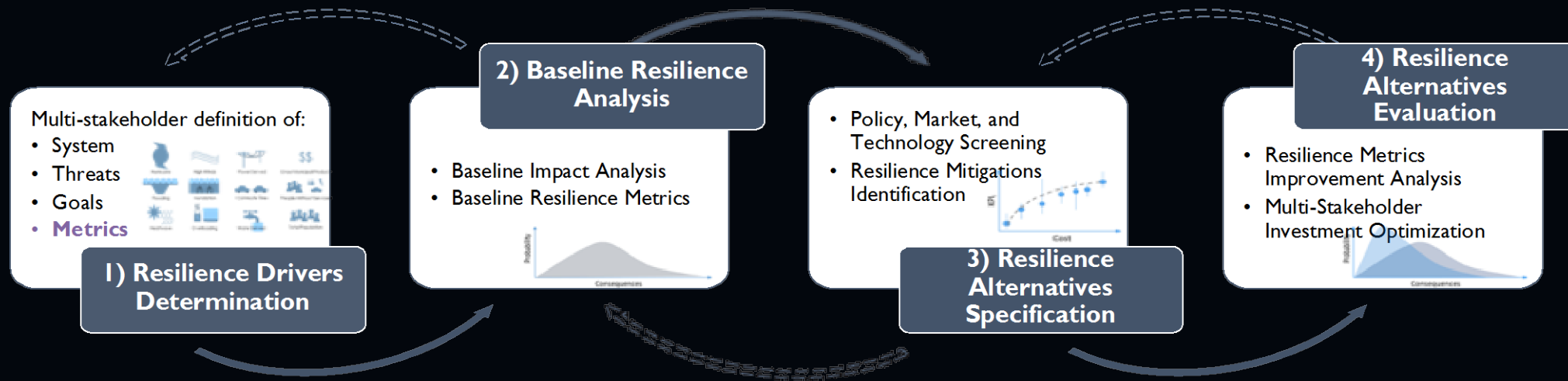
Necesita	DESTINO ANTES DEL APAGON	FRECUENCIA DE VIAJE (por semana) ANTES DEL APAGON	Destino LUEGO DEL APAGON	FRECUENCIA DE VIAJE (por semana) LUEGO DEL APAGON	MODO DE TRANSPORTE
Obtener alimentos	Dz	dos veces a/mes	Dz	dos veces a/mes	Caminar Bicicleta Vehículo personal Transporte público Otro
Agua potable					Caminar Bicicleta Vehículo personal Transporte público Otro
Bañarse, lavado de ropa, aseos, etc.					Caminar Bicicleta Vehículo personal Transporte público Otro
Servicios médicos					Caminar Bicicleta Vehículo personal Transporte público Otro
Medicamentos					Caminar Bicicleta Vehículo personal Transporte público Otro
Comunicación (por ejemplo: teléfono de carga, información, etc.)					Caminar Bicicleta Vehículo personal Transporte público Otro
Otras necesidades (explicar)					Caminar Bicicleta Vehículo personal Transporte público Otro

Tabla 2: Necesidades generalmente satisfechas fuera del hogar

# Broader Takeaways & Future Directions

## KEY ATTRIBUTES OF METRIC

REPRESENTATIVENESS | SIMPLICITY | REPLICABILITY | USEFULNESS



- Improving questionnaire → Improving confidence?
- Improving confidence → Improving usefulness?
- Usefulness across different scales & systems?

THANK YOU!

Questions? Feedback?