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Crowdsourcing, Co-Production and Collaborative Governance towards Modernizing Local Public Transport Services

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Session Topic: Transportation Data
Crowne Plaza Galleria Manila
8:00-10:00 AM, 5 October 2022

Outline

- Public Transport Modernization Issues and Challenges
- Imperatives for Collaborative Governance
- Crowdsourcing and Digital Co-Production
- SafeTravelPH App and Platform
- PH Use Cases
- Key Findings

Public Utility Vehicle Modernization Program (PUVMP)

- Moratorium on issuances of new franchises since 2003
- Massive reforms under the Omnibus Franchising Guidelines (OFG) issued in 2017
  - Jointly issued by the Department of Transportation (DOTr) and Department of Interior and Local Government (DILG)
  - Higher capacity transportation modes have priority in terms of Certificate of Public Convenience (CPC) allocation
  - Certain modes are designated to operate on corridors based on passenger demand, i.e. passenger per hour per direction (pphpd)
    - Public Uility Buses (PUBs) – higher than 5,000 pphpd
    - Mini-buses – more than 1,000 up to 5,000 pphph
    - Public Utility Jeepneys (PUJs) and Utility Vehicle (UV) Express – more than 500 up to 1,000 pphpd
    - Filcab Service – up to 500 pphpd; meant to replace tricycles
- No specific provisions for Tricycles
  - Devolved functions under 1991 Local Government Code
  - Tricycle operation is covered by a 2008 joint circular that it should only be confined along or municipal roads and limited to routes not traversed by higher modes of public transport; Devolved function to cities and municipalities

Omnibus Franchising Guidelines (OFG)

- Policy objectives
  - Reliability, Safety, Accessibility, Environmental soundness, Comfort
- OFG required all local government units to prepare their respective Local Public Transport Route Plans (LPTRP)
- Capacity-building on LPTRP preparation were conducted by DOTr in 2019
  - Local governments are struggling to produce their local transport plans
  - As of April 2022, only half of around 1,500 local governments have submitted their LPTRPs and less than 10% have approved Notice of Compliance (NOC)

Local Public Transport Route Plan (LPTRP) Bottlenecks

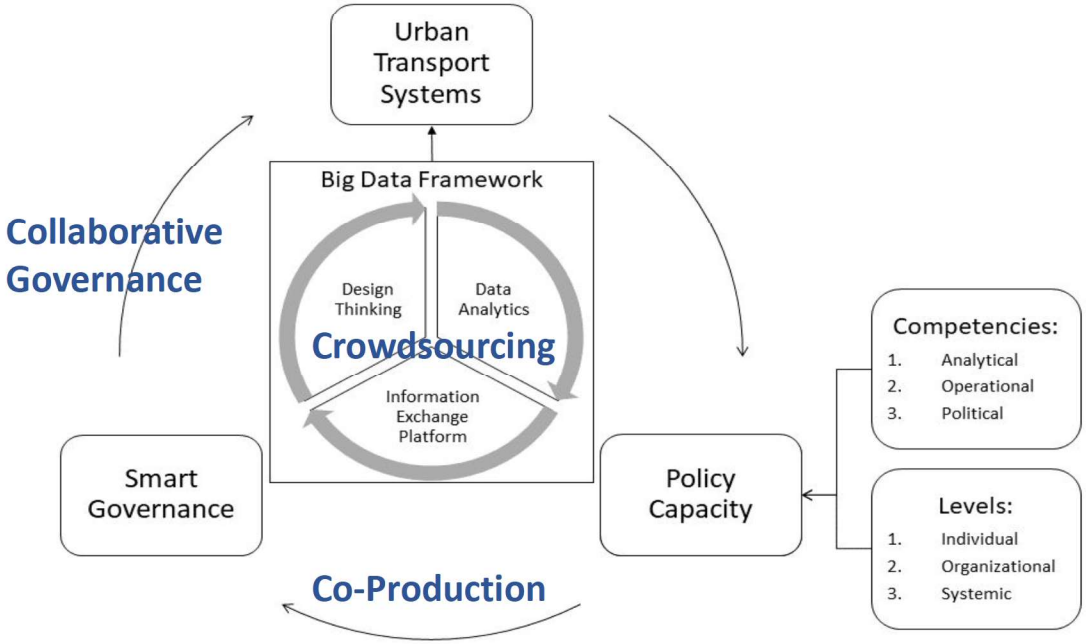
- Concerned agencies severely lack the necessary resources for comprehensive public transport planning
  - No dedicated unit mandated under the 1991 Local Government Code
  - Technical works are relegated to ad hoc technical units or few personnel
- Lack of policy capacity (analytical, operational and political) at the individual, organizational and systematic levels
- Subject to highly politicized decision-making
- Overall, there is a weak mechanism for public transport governance

Need for Collaborative Governance Approach!

Imperatives for Collaborative Governance

- There is momentum for modernizing the country's public transport system
- Solutions for policy success however can be framed from an informed governance perspective (Mateo-Babiano et al., 2020)
- Need for collaborative governance to sustain the reforms of modernization and identify innovations
  - "the processes and structures of public policy decision making and management that engage people across the boundaries of public agencies, levels of government, and/or the public, private, and civic spheres to carry out a public purpose that could not otherwise be accomplished". (Emerson, et al., 2012)
- Explore a multi-stakeholder approach in terms of sense-making as well as evaluating the present state of the public transport

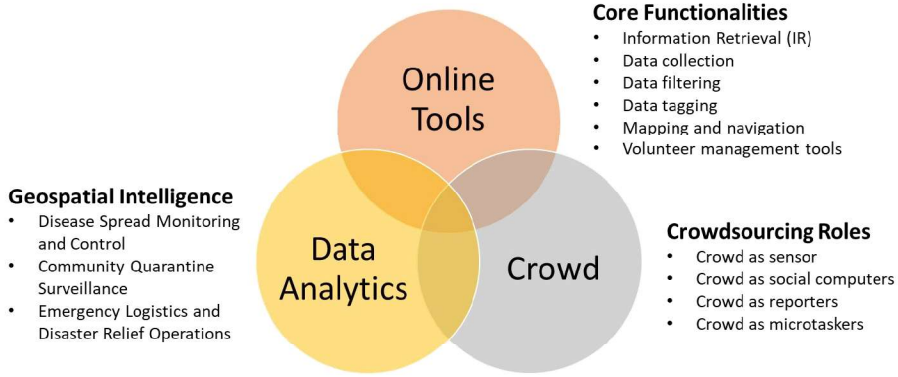
Collaborative Governance in Public Transport



Source: Ng, A.C.L, Perez, R.E. and Tiglao, N.C.C (2020) Building Policy Capacity of Local Government for Big Data Applications in Public Transportation. Philippine Journal of Public Administration, Vol. 64, No. 1. https://ncpag.upd.edu.ph/wp-content/uploads/pjpa2020.1.pdf

Crowdsourcing

- Governments are able to tap into the collective wisdom and viewpoints of the masses by being able to systematically collect data from citizens, especially service users
  - 'Citizen Science', 'Participatory Action Research'
- Increasingly facilitated by gamification strategies, such as using game-thinking or game mechanisms in non-game contexts to motivate users to participate in and provide input for public service delivery
- Different forms of data from multiple sources, such as data from social media, geo-locational data, or even sensor data can be combined



Source: Poblet, M., García-Cuesta, E., & Casanovas, P. (2014). Crowdsourcing tools for disaster management: A review of platforms and methods. Lecture Notes in Computer Science, 261-274. https://doi.org/10.1007/978-3-662-45960-7_19

Co-Production

- Digital technology is an enabler of reforms in public administration
- Allows for improvement in efficiency and productivity of government agencies
  - Improve the civic consciousness of citizens and deepens the democratic process, as citizens are empowered to participate in policy formulation
- There have only been a few attempts to adopt participatory co-production methods in designing inclusive mobility solutions

ICT-enabled Co-Production

Crowdsourcing Co-design

- Active participation of individuals or groups of citizens along with governments in the design of policies or public services

Crowdsourcing Design and Government Delivery

- Clusters the information, such as complaints and pothole reports, transmitted by the citizens via online or mobile channels to the government, whose actors then use the data for policy implementation and service delivery

Government Design and Crowdsourcing Delivery

- Classifies those situations in which governments involved in the planning and design stages provide citizens with open databases containing information for public services that the lay actors use to develop service apps

Government and Citizens Co-delivery

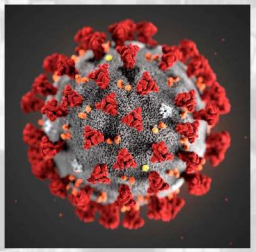
- Sees lay actors work with state actors to deliver public services, for example, to develop integrated public service apps and make them available to the public

Jae Moon, M. (2018). Evolution of co-production in the information age: crowdsourcing as a model of web-based co-production in Korea, Policy and Society, 37:3, 294-309, https://doi.org/10.1080/14494035.2017.1376475

Potential Impacts of Digital Co-Production

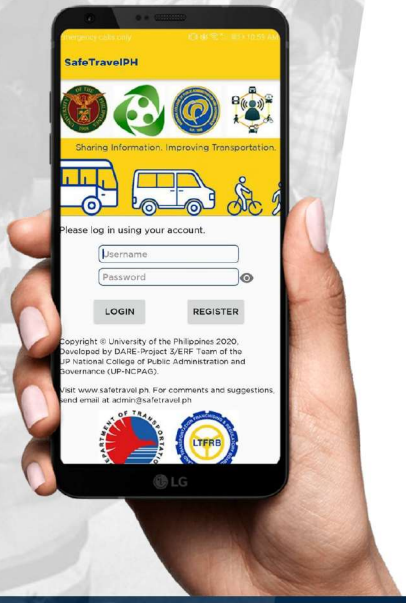
- Establishing direct interaction
  - Not necessarily have to be face-to-face contact, but there should be the opportunity for direct interaction
- Motivating
  - People involved must be willing to play an active role in the co-production process. This applies on both sides
- Bringing resources to the service
  - Both citizens and employees bring individual resources into the process. Both will at least offer time and their particular expertise
- Sharing decision-making
  - Co-production and co-creation presumably shift decision-making power from employees to citizens. However, organizational control over the process may still be significant (if only, by limiting the range of potential decisions)
  - Studies have shown that the role of citizens can range from providers of services, with full responsibilities, to active co-producers, to consumers, to passive beneficiaries

Design Challenges in Public Transport



Due to the pandemic, the public transport system faces serious capacity constraints and needs to ensure that safety protocols are in place to limit the spread of COVID-19:

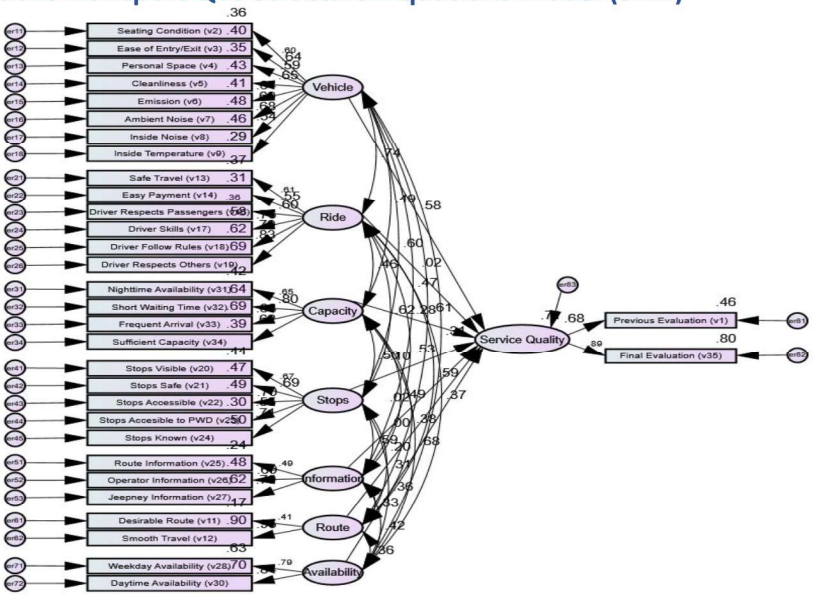
- Lack of real-time transit information restricts citizens' mobility and leads to longer waiting lines and overcrowding inside public transport vehicles
- Lack of proper management on route-based fleet schedules increases citizens' exposure due to packed stops waiting for public transport vehicles to arrive
- Lack of safe public transport contact tracing mechanisms increases risk of transmission
- Lack of monitoring and feedback systems reduces government and operators' ability to ensure compliance of operations with safety and sanitary protocols



Public Transport Quality of Service (QoS)

- The perception of service quality of public transport can be analyzed based on several factors:
  - Vehicle Condition, Customer Care, Reliability, Stop's Condition, Information Provision, Convenience, and Availability
- These factors exert varying degrees of influence but Vehicle Condition has the most effect on the overall quality of service followed by Reliability

Public Transport QoS Structural Equations Model (SEM)



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SafeTravelPH App and Platform

BENEFECIARIES	1 GET REAL-TIME TRANSIT INFO See live information on nearby buses: location, estimated time of arrival, and occupancy	2 STAY SAFE FROM TRANSMISSION Scan the buses' QR codes and record your trips for easier and safer contact tracing	3 IMPROVE THE PUBLIC TRANSPORT SYSTEM Rate the quality and service of your trips; report violations; and give recommendations
COMMUTER	Guide for individual trip-making and efficient use of time	Avoid transmission via pen-and-paper contact tracing; Easily recall trips at any given day	Become an active evaluator of services through the app's feedback feature
OPERATOR	Monitor the location of your fleet to effectively manage resources, such as time and fuel	Keep track of passengers boarding and alighting at any given trip in case of positive COVID cases	Serves as a basis for the development of performance-based mechanisms
GOVERNMENT	Gather data on travel demand and supply for transport planning	Link to healthcare databases to match travel history in the event of a positive case	Evaluate and monitor public transport operations and compliance with safety protocols

SafeTravelPH

Sharing Information. Improving Public Transportation.

SafeTravelPH App and Platform

- A mobile application and information-exchange platform that actively engages government, transport industry providers, and passengers in sharing transformative information
  - Developed at the beginning of the COVID-19 Pandemic in March 2020
  - Aimed to help improve the quality, sustainability, and reliability of public transport services (Tiglao, et al., 2020)
- Intended to provide an open platform for public transport data collection and information exchange

SafeTravelPH Public Transport Crowdsourcing

- Emphasizes the importance of co-design and crowdsourcing through strong partnerships between the system developers, government, and private institutions in the creation of systems, data collection, and policy development
  - **Partnerships** between the stakeholders – commuters, operators, government, academe, and private sector – are crucial
  - Conduct of a series of **Design Thinking Workshops** to discuss user experience and propose the services/ products upon which the platform is built

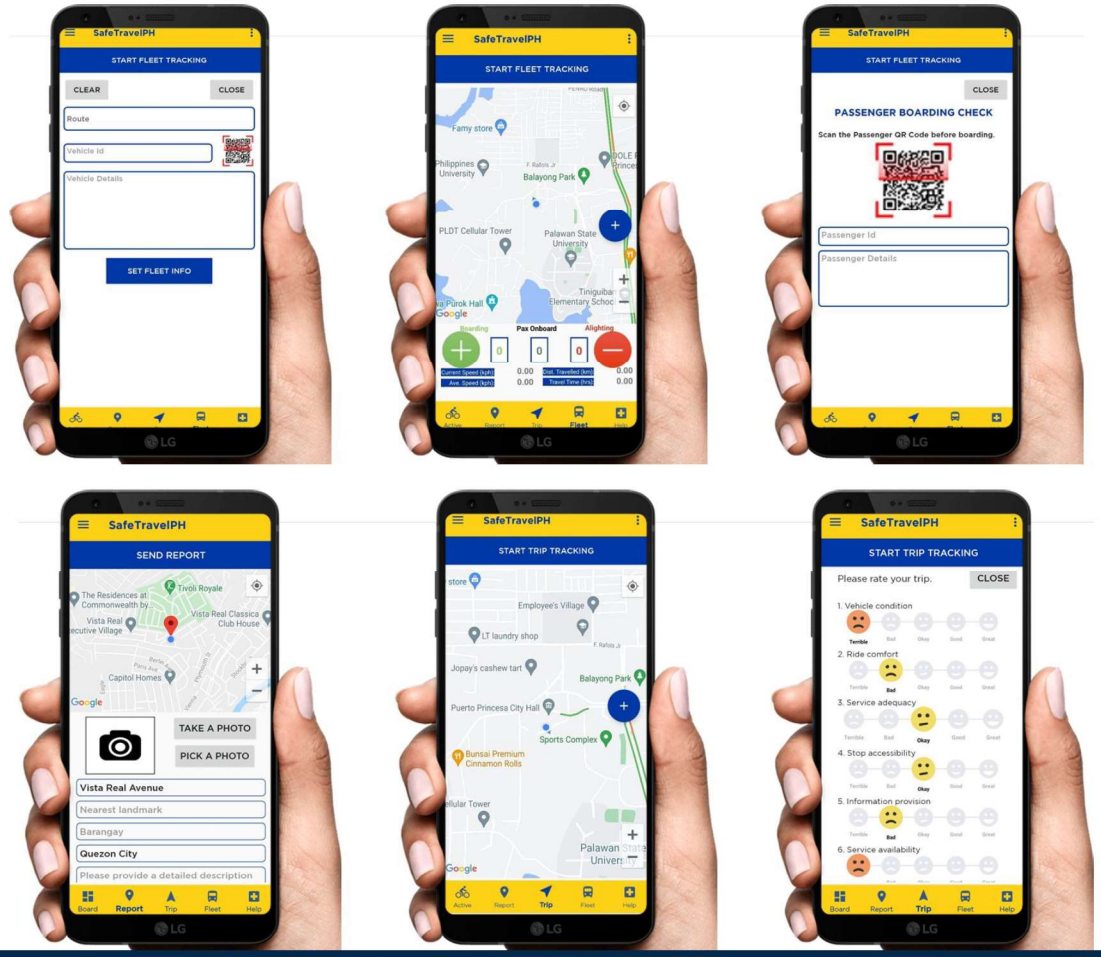
Technology

User Feedback

Data Analytics

Partnerships

SafeTravelPH App Features



Use Case: EDSA Busway

SafeTravelPH has partnered up with the following organizations for the pilot implementation on the EDSA Carousel

University of the Philippines - Diliman (UPD)
As SafeTravelPH was developed under a research project, the University owns SafeTravelPH. Hence, the implementation and usage of SafeTravelPH must be coursed through the University.

Land Transportation Franchising and Regulation Board (LTFRB)
A co-ownership agreement of the SafeTravelPH between UPD and LTFRB under the Department of Transportation (DOTr) is undertaken to ensure the continuous usability of the SafeTravelPH even beyond the current administration.

HM Transport Inc.
A research collaboration on the use of SafeTravelPH has been executed between UPD and HM Transport Inc., one of the innovative bus transport operators in the EDSA-Carousel route.

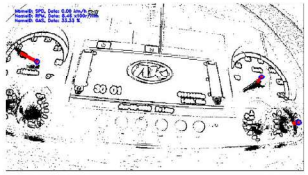
*"Sa paggamit po ng **SafeTravelPH**, namo-monitor ko po ang bilang ng sumasakay at bumababa na pasahero. Nakikita ko agad ilan ang bakante bago pa mag-istasyon. Nalalaman ko din kung saang lugar ang trapik."*

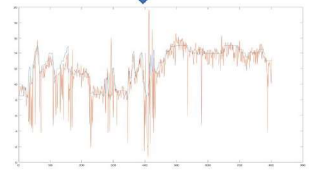
*"Ang aking obserbasyon sa paggamit ko ng **SafeTravelPH** ay nakakatulong sa aming mga drayber sa pagmo-monitor sa pasahero na sumasakay at bumababa, at nakikita rin namin ang time travel papunta at pabalik sa aming rota; pati kung ilang kms ang nagawa naming biyahe sa maghapon; pati kung ilan ang naisakay namin at advance na malalaman namin kung saang area sa EDSA ang matraffic dahil sa map na gamit ng **SafeTravelPH**. Sa kabuuan, maganda at malaking tulong ito sa aming mga drayber, pati na rin sa mga operator dahil namo-monitor din nila ang aming biyahe."*

*"Napakalaki pong tulong sa akin ng **SafeTravelPH** dahil sa fleet tracking kasi nahuhuli ko ang conductor ko na kung nagko-collect siya ng pansarili niya. Ang kagandahan po kasi, bawat bus stop, nabibilang ko 'yung sakay kaya wala po talagang lusot ang mga conductor."*

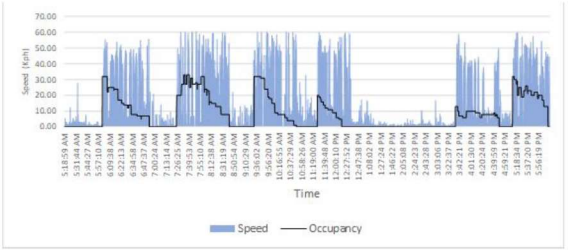
Mobile app

Dashboard image





Vision AI



Use Case: GenSan LPTRP

SafeTravelPH R&D
- Development of data warehouse and data capture algorithms
- Development of STPH features
- UI/UX Research
- Exploration of cost-efficient and effective IoT (e.g. cameras, mobile applications, etc.

Collaboration with LGU
- Formalize a collaborative research agreement with GenSan
- Formulate research and collaboration objectives (e.g. revision of LPTRP)

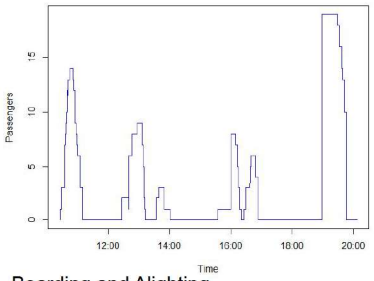
Operator Engagement & Participation
- Bring public transport sector players onboard
- Orientation on SafeTravelPH system and approach
- Orientation on use and benefits of system

Deployment of IoT
- Installation and testing of SafeTravelPH system in mobile devices and prepare data warehouse

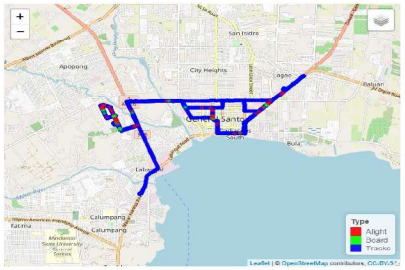
Monitoring, Evaluation and Feedback
- Daily analysis and reporting of monitoring results
- Gather feedback with LGU and operators

Survey and Interview
- Conduct of operator's survey to capture costs, practices, etc.
- Conduct of one-to-one interviews

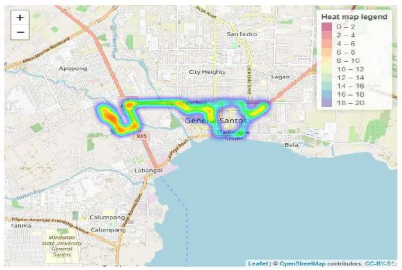
Passenger Profile



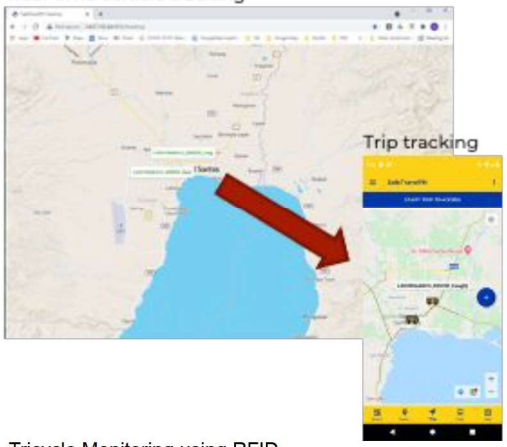
Boarding and Alighting



Occupancy/Speed Heatmap



Real-time vehicle tracking



Tricycle Monitoring using RFID

Use Case: Promoting Sustainable Mobility In Puerto Princesa

Project SUSI

Sustainable, Safe, and Integrated Public Transport Planning

Promoting Sustainable Mobility In Puerto Princesa Through Public Transport Crowdsourcing And Collaborative Governance

BASELINING
- Data Gathering
- Preliminary Interviews
- Preliminary Transport Network Mapping
- **Household Profiling Survey**
- **Policy Capacity**
- **Technology Requirements Workshop**

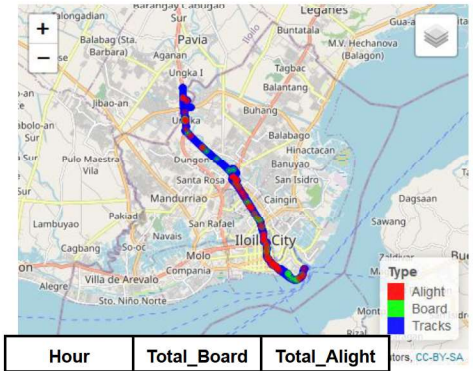
DEPLOYMENT
- SafeTravelPH
- TEAMS

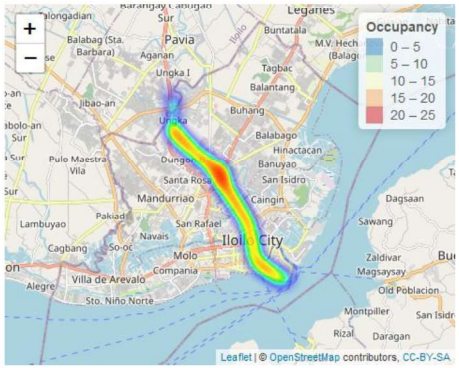
COLLABORATIVE PLANNING
- Key Informant Interviews
- Focus Group Discussion
- Design Thinking and Collaborative Governance Workshop

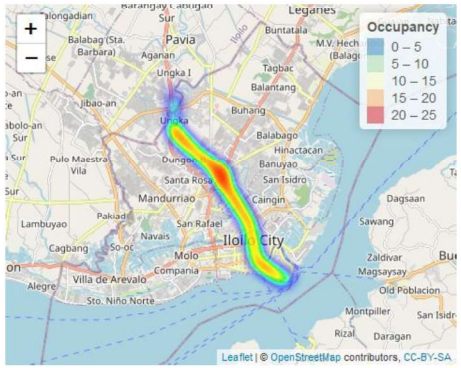
INSTITUTIONAL DEVELOPMENT
- Capacity Building Training/ Workshop
- Policy Roundtable Discussion
- Draft Sustainability Plan

Use Case: Low Carbon Transport (LCT) Route Characterization

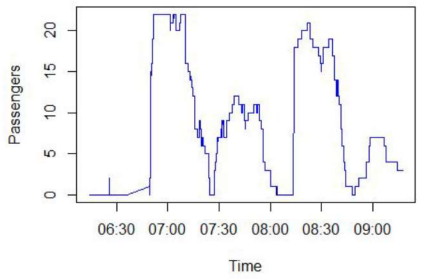
ROUTE 3: Ungka to Iloilo C/P via CPU





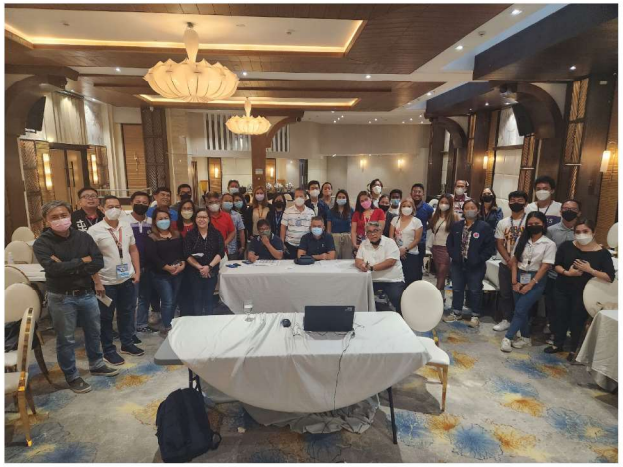


Hour	Total_Board	Total_Alight
6	22	2
7	26	39
8	29	31
9	0	4



Key Statistics

Time Start: 06:14:01
Time End: 09:17:34
Route Length: 22.97 kms
Vehicle KM Travelled: 40.94 kms
Round Trips: 1.78
Total Time (Hours): 3.06 Hours
Average Speed: 15.29 kph
Total Seating Capacity: 27
Total Passengers: 77
Average Occupancy: 21.63



Use Case: Low Carbon Transport (LCT) Route Characterization

Baguio City

Transport System:

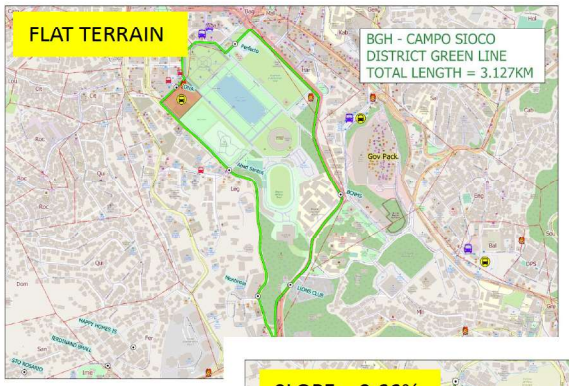
- Measure performance of route: Road Grade, Total Travel Time, Dwelling Time, Ave and Max Speed, Total Distance, Distances of Stops and Clustering

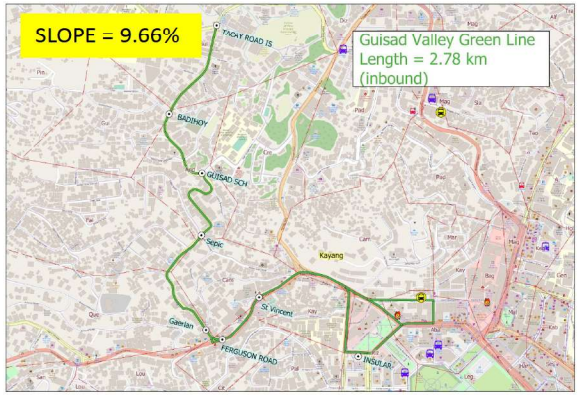
Energy:

- Get factors for estimating energy consumption during uphill driving

Vehicle:

- Design considerations to serve Baguio routes and energy demand for PT





Key Findings

- Collaborative Governance Approach enables public transport policy innovations
  - Research partnerships
  - Living Lab
- Crowdsourcing supports the capture and use of big data/ machine learning
- Co-Production supports transition of informal transport to more modernized operations (consolidation, fleet management, EV operations)

Key Findings

- Several promising areas for co-production work
  - Improving Quality of Service of Public Transport
  - Evaluation of Local Public Transport Route Plan (LPTRP)
  - Policy Capacity Analysis
  - Characterization of EV Jeepneys
- Need to conduct Participatory Action Research and mentoring programs with other local governments
  - Organize SafeTravelPH as a Scientific NGO

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