MOVING MAKASSAR FORWARD

INNOVATION FOR A USER-ORIENTED PUBLIC TRANSPORTATION NETWORK

Lany Harijanti • Maurice Shawndefar

United Nations Development Programme

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EXECUTIVE SUMMARY

Makassar City has approached UNDP, through the City-I-Leaps initiative in request for support of improving its public transportation network and reduce traffic congestion. The main challenges facing the city's transport network include:

(1) mismatch between demand and supply in the city's transportation network;
(2) lack of collaboration between provincial and city administrations on transportation policies;
(3) travel time unreliability, especially for public transport users;
(4) lack of understanding of user needs; and
(5) lack of understanding of service providers' challenges.

UNDP collaborated with several key stakeholders including the Mayor's Office, DISHUB Makassar, UN Pulse Lab Jakarta, and BaKTI to build a platform for creativity and innovation. A three-day innovation workshop was held on 16-18 November 2016 that gathered 37 participants from various sectors and backgrounds.

Three prototypes were designed, and they are outlined as follows:

(1) Service: the first prototype would introduce:
   a. a Pete-Pete route that circles around the city;
   b. a feeder route to reduce overlapping routes and idle Pete-Pete vehicles stopping illegally on streets;
   c. an integrated fare system and All-Day Tickets; and
   d. designated Pete-Pete stops every 400m (based on international standards) to reduce coverage gaps across the city's network.

(2) Behavior: the second prototype would introduce:
   a. a Pete-Pete school network serving elementary and junior high schools;
   b. an integrated smart student card that can be used for payment;
   c. ethics training for Pete-Pete 'Pasikola' drivers to ensure professionalism; and
   d. a campaign to raise awareness and collaborate with relevant stakeholders.

(3) Information: the third prototype would introduce:
   a. a GPS tracker to increase data collection and oversee vehicle movement;
   b. an integrated database that can provide BRT and Pete-Pete schedules, locations of stops, and estimated time of arrival to reduce travel time unreliability; and
   c. a campaign to raise awareness on Makassar's transit network to increase demand for the system.

During the testing phase, BaKTI has been selected to support the incubation period. BaKTI is expected to:

(1) provide high-quality mentoring and technical support to the groups;
(2) closely assess the prototypes to evaluate their efficacy and feasibility;
(3) liaise with relevant stakeholders to ensure coherent communications throughout this process; and
(4) manage the day-to-day project operations including logistics.

Following the incubation period, BaKTI is expected to present findings to UNDP, and generate a report that highlights the results from the testing phase. If the results are satisfactory, UNDP will support the city and DISHUB Makassar to test the final prototypes and scale-up once a decision has been made by the government.

BACKGROUND

Cities across Indonesia are already taking measures to improve urban infrastructures and public services to meet the demands of rapid urbanization in the country. Currently, 54 percent of Indonesians reside in urban areas, and this figure increases by 2.7 percent, annually.[1] UNFPA forecasts the proportion of the Indonesian population living in urban areas to reach 66 percent by 2035.[2] South Sulawesi is currently home to 8.5 million people, and the population is projected to increase by 14 percent by 2035.[3] As GDP per capita has been on the rise, there has also been an increase in vehicle ownership in the region.[4] Table 1 demonstrates this growth in automobile ownership in South Sulawesi (JRISS, 2015).

	2009	2010	2011	2012	2013
Growth Rate					
Cars					
Motorcycles					

Makassar City, the capital of South Sulawesi, has branded itself as a "Kind-Hearted and Smart City". According to a BPS 2015 census, the city is home to roughly 1.5 million residents. The Mayor of Makassar, Mr. Danny Pomanto, became the first mayor to launch a Smart City plan in Indonesia, and has since received a lot of public attention in leading Makassar in this transition. The city government has already adopted several innovative approaches in improving public services across the city. The government has introduced measures to collect and use real-time data to improve decision-making processes and day-to-day administration. This includes the issuing of a smart card that contains civil registry data, tax ID numbers, and social security numbers for Makassar residents.[5] It has also introduced smart-cards in schools for parents to track their student's activities and progress.[6] In addition, the Makassar Operation Room, was established in late 2015 with the goal of connecting the entire data network in Eastern Indonesia. The Operation Room is capable of monitoring a number of different areas including social media, weather conditions, road conditions, and the tracking of all public service vehicles belonging to the city government. Since its inauguration, the city has been working to expand the Operation Room's capacity and capabilities by installing hundreds of new CCTVs across the city as well as free WIFI networks in several locations.[7]

The city government is also keen on revitalizing its public transportation. The government has developed a masterplan to create an integrated system to mitigate traffic congestion and increase demand for public transportation. However, several challenges persist in developing a transit-oriented system. These include: (1) mismatch between demand and supply in the city's transportation network, (2) lack of collaboration between provincial and city administrations on transportation policies, (3) travel time unreliability, especially for public transport users, (4) lack of understanding of user needs, and (5) lack of information on service providers' challenges.

Moreover, the city government is currently in the planning phase of developing *Pete-Pete Smart*, an upgraded version of a currently informal public transport, but has yet to test a prototype. Given the city's ongoing efforts to transform public services, the Mayor's office and the city's Transportation Agency (DISHUB Makassar) are in search of potential approaches that can improve the city's transportation network. Consequently, Makassar City, through the City-I-Leaps initiative, has sought UNDP's support and assistance in developing innovative solutions.

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[1] CIA World Factbook
[2] The 2010 – 2035 Indonesian Population Projection
[3] Central Bureau of Statistics
[4] South Sulawesi Central Bureau of Statistics
[5] Jakarta Post - Smart City Index Coming to Indonesia
[6] Gov Insider - Makassar's Data Revolution
[7] Pojok Sulawesi Selatan - Makassar Operation Room Jadi Pusat Data Indonesia Timur

UNDP'S SUPPORT

The City-I-LEAPS initiative is a partnership between UNDP and Seoul Metropolitan Government with the intention to support cities and local governments in Asia and Pacific to address the challenges of rapid urbanization through innovative solutions. The initiative was introduced at the International Forum on Urban Policy in June 2016, and it "facilitates city innovation through learning, exchanging, adapting, prototyping and scaling" that goes beyond traditional knowledge sharing approaches. Moreover, the initiative primarily focuses on design thinking as the core concept in promoting creative and innovative solutions. However, other concepts such as reverse engineering to design, adapt, and prototype can be effective in complementing the main approach.[8]

In developing more creative solutions to improve the city's transportation network, UNDP collaborated with several key stakeholders including the Mayor's Office, DISHUB Makassar, UN Pulse Lab Jakarta, and BaKTI - an active non-governmental organization (NGO) in eastern Indonesia, in building a platform for creativity and innovation. To this end, UNDP convened a three-day innovation workshop on 16-18 November 2016 that gathered 37 participants from various sectors and backgrounds including government officials, transport operators and users, academics, transport engineering students, and design experts. The following is a list of organizations that were represented during the workshop:

	Transportation Sector	Non-Transportation Sector
Government		
Private / Non-Government		
Academia		

UN Pulse Lab Jakarta (PLJ) is an innovation lab that brings together experts from UN agencies, the Government of Indonesia, NGOs, and the private sector to collaborate in facilitating new solutions and approaches to social development across Indonesia. In September 2016, PLJ conducted a field study on Makassar's transportation network, and identified three critical areas of opportunity for UNDP and partners to address. They include (1) service provision and user-based routes, (2) driving behavior, and (3) the supply of information to users and operators. Given PLJ's extensive experience in coordinating innovation workshops, the organization was asked to assist in setting the workshop agenda.[9]

In addition, BaKTI became a key partner in the coordination of the workshop. Initially, the organization was established as a knowledge center for social and economic development in Eastern Indonesia. Since, BaKTI has developed a platform for donor agencies, local governments, and the public to "store and access information, to meet and discuss development issues, and to determine priorities necessary for better influencing decision-making and to better support

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[8] UNDP, City of Seoul Announce New Innovation Partnership to Tackle Challenges of Asia's Rapidly Growing Cities
[9] UN Pulse Lab Jakarta

knowledge-based development". To this end, BaKTI used its resources and knowledge management to support UNDP with facilitating the innovation workshop.[10]

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[10] BaKTI

INNOVATION WORKSHOP

The innovation workshop, convened by UNDP and partners, sought to develop creative solutions for the city's transportation network. The workshop was developed on two core concepts: (1) strategic urban planning, and (2) design thinking. Strategic urban planning (SUP) is an urban management tool that "encourages citizen participation in local policy decisions. The partnerships which emerge from SUP are especially created for designing and managing sustainable projects for the city."[11] Design thinking, on the other hand, is a human-centered designing method in which participants go through the five stages – (1) empathize, (2) define, (3) ideate, (4) prototype, and (5) test.[12] Figure 1 visualizes this relationship. The combination of these two approaches enabled a diverse and collaborative spirit to merge expertise and perspectives in identifying windows of opportunity for potential solutions.

Participants were divided into six groups, and were asked to select one out of the three identified areas to address. The three areas of opportunity include (1) service, (2) behavior, and (3) information. Please, refer to figure 2 below for further information. By addressing these three areas, DISHUB is working to mitigate traffic congestion through supply-side management measures that look to improve public transport and traffic operations.

Moreover, the participants relied on field research in testing their assumptions, and synthesized their findings to design and develop their prototypes. On the final day of the workshop, the prototypes were presented to government officials including the Head of DISHUB Makassar, as the prototypes enter the testing phase to be reviewed and revised if necessary.
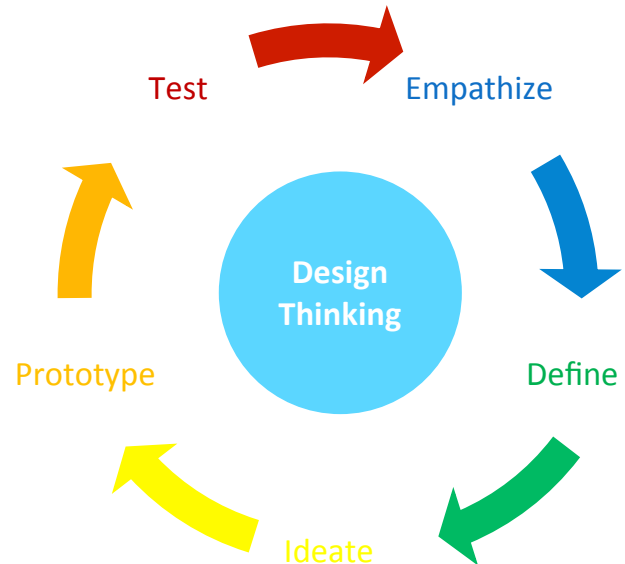

Figure 1: Design Thinking Cycle

Service: improving user-based routes through better collaboration to meet user demand, while discouraging the overlapping of different modes of public transport

Behavior: using nudge theory to change the behavior of users and operators to abide by traffic laws

Information: improving the supply of traffic information to users and service providers to reduce travel time unreliability

Figure 2: Three areas of opportunity

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[11] United Cities and Local Governments - Policy Paper on Strategic Urban Development
[12] An Introduction to Design Thinking Process Guide

PROTOTYPES

Following the development of the six prototypes, the designs were collated into three broad areas, in which all three are eligible for incubation. UNDP will be supporting the financing and testing phase of the prototypes in the coming months. The three final prototypes are outlined below:

(4) The first looks to address the overlapping of routes by rerouting existing routes to ensure more efficiency. In addition, the Pete-Pete network would expand across areas lacking access to public transport, and use Pete-Pete as a feeder mode to complement alternative modes of public transportation. Moreover, the design proposes to build Pete-Pete stops to prevent drivers from stopping in the middle of roads in search of passengers. This prototype introduces:

   a. a Pete-Pete route that circles around the city;
   b. a feeder route to reduce overlapping routes and idle Pete-Pete vehicles stopping illegally on streets;
   c. an integrated fare system and All-Day Tickets; and
   d. designated Pete-Pete stops every 400m (based on international standards) to reduce coverage gaps across the city's network.

(5) In changing behavior and removing the stigma associated with Pete-Pete, this prototype looks to address reckless driving, Pete-Pete comfort, convenience, and safety. The design proposes the establishment of a Pete-Pete network, Pasikola, specific for students across Makassar. Currently, many schools do not offer bus services for students, and this design would address this need while improving the quality of service and rerouting the current network. This prototype introduces:

   a. a Pete-Pete school network serving elementary and junior high schools;
   b. an integrated smart student card that can be used for payment;
   c. ethics training for Pete-Pete Pasikola drivers to ensure professionalism; and
   d. a campaign to raise awareness and collaborate with relevant stakeholders.

(6) The third design is a smart phone application that would provide real-time traffic information. This will be done by placing GPS tracking systems on the vehicles. This prototype introduces:

   a. a GPS tracker to increase data collection and oversee vehicle movement;
   b. an integrated database that can provide BRT and Pete-Pete schedules, locations of stops, and estimated time of arrival to reduce travel time unreliability; and
   c. a campaign to raise awareness on Makassar's transit network to increase demand for the system.

WAY FORWARD

UNDP has selected BaKTI to assist with supporting the incubation process. Given the organization's large network and expertise, BaKTI is uniquely qualified to take a support role throughout the testing phase of the prototypes. The organization has become an information center for development programs, and has facilitated collaborations between organizations and government officials, international development partners, universities, community-based organizations, and the media. This includes close partnerships with DFAT Australia, USAID-MCC, GIZ, and UNICEF.

BaKTI has a proven record along with the expertise that makes the organization uniquely positioned for supporting the incubation process. During this period, the participants will collaborate with BaKTI in better shaping their prototypes in piloting the designs. BaKTI will provide high-quality mentoring and technical support to the groups, and closely assess the prototypes to evaluate their efficacy and feasibility. In addition, BaKTI is expected to liaise with relevant stakeholders to ensure coherent communications throughout this process, and will manage the day-to-day project operations including logistics. Following the incubation period, BaKTI is expected to present findings to UNDP, and generate a

report that highlights the results from the testing phase. If the results are satisfactory, UNDP will support the city and DISHUB Makassar to test the final prototypes and scale-up once a decision has been finalized by the city government.

ANNEX I – WORKSHOP AGENDA

Location:

Grand Clarion Convention Hotel Makassar
Jalan A. P. Pettarani No. 3
Gn. Sari, Rappocini
Makassar, Sulawesi Selatan 90221

Facilitators:

- PLJ: Dalia Kuwatly • Kautsar Anggakara • Mellyana Frederika
- BaKTI: Ashry Sallatu • Luna Matulessy • Rahman Ramlan • Sumarni Arianto

Time	Description
Day 0	**Tuesday, 15 November 2016**
Day 1	**Wednesday, 16 November 2016**
Day 2	**Thursday, 17 November 2016**
Day 3	**Friday, 18 November 2016**

No.	Name	Organization
1	Ahmad Faisal	BAPPEDA Makassar
2	Akbar Zukakia	Revius Web
3	Amalia Malik	DISHUB
4	Amri Achmad	DISHUB Makassar
5	Andi Cendrawati	DISHUB Makassar
6	Andi Faizal Majid	DISHUB Makassar
7	Andi Lukmana K.	UNHAS
8	Andi Santana	DISHUB Makassar
9	Andi Zuhaerini	Start-up Komunitas
10	Diangahyadi	UNM
11	Dimas Suharto	Komunitas Makassar
12	Fiqhi Triansha	Komunitas Makassar Berkebun
13	H. Basoddini	ORGANDA
14	Hamzah	PPDI SulSel
15	Ichsan	BAPPEDA Makassar
16	Idham Aulia M. Basir	T. Kelautan ITS
17	Ilham S.	DISHUB Makassar
18	Irawadi	UNHAS
19	Iskandar M.S.	ORGANDA
20	Isran Ramli	UNHAS Professor (observer)
21	Jaka Santosa	POLRI
22	Jasman Launtu	DISHUB Makassar
23	Kasman Suherman	Start-up Komunitas
24	Lambang Basri Said	UMI Professor (observer)
25	Mansyur Rahim	Flock Indonesia
26	Monalisa Bumbungan	UNHAS
27	Nurabdiansyah	UNM
28	Nurul Azizah	UNHAS
29	Panci Yocing	UNHAS
30	Purba Arief Sanjaya	UNHAS
31	Qodriansyah Agam	Aji Makassar
32	Reski Maulana Putra	UNHAS
33	Reza Alamsyah	Digital Nusantara Studio
34	S. Ariyani	DILO Makassar
35	Sainal Abidin	ORGANDA
36	Suriani Mappong	LKBN ANTARA
37	Takashi Sakamoto	JICA (observer)
38	Tristania Indah W.	INCOMIC
39	Yulianti Tanyadji	Architect
40	Yusmira	UNM Professor