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Research paper

Reforms in Metro Manila's bus transport system hastened by the Covid-19 pandemic: A policy capacity analysis of the EDSA busway

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ABSTRACT

In response to the health and mobility issues caused by the Covid-19 pandemic, the Philippine government took advantage of opportunities to expedite public transport reforms by converting a portion of Epifanio delos Santos Avenue (EDSA), Metro Manila's busiest thoroughfare, into a dedicated busway. This deserves a closer look since historically, solutions catering to EDSA have been bereft with challenges given the overlapping powers of various authorities and multitude of interests that benefit from the status-quo. Through semi-structured interviews with key actors followed by a policy capacity analysis, the authors found that the pandemic provided opportunities for the key institutions to gain political legitimacy and authority that pushed its stakeholders to cooperate. However, this new solution forced them to take on tasks that are outside their regular responsibilities so while they were able to provide measures to make EDSA Busway succeed in the short-term, much work needs to be done to sustain the gains achieved.

1. Introduction

Metro Manila is the Philippines' largest urban agglomeration and economic center that accounts for the highest Gross Domestic Product (37%) despite occupying less than 1% of the country's total land area. It is composed of 16 cities and 1 municipality with a total population of 13.5 million (PSA, 2020) that is higher during daytime, resulting to severe traffic congestion. It was found to have the highest congestion level among 278 natural cities with a population greater than 5 million (Asian Development Bank, 2019) and continues to experience low public transport quality and decreasing ridership. The Covid-19 pandemic caused shocks to mobility and economic activity in Metro Manila. During the early months of the pandemic, the government implemented strict lockdowns and completely halted public transportation save for a few services for healthcare workers. The lockdowns caused significant mobility reductions in common destinations especially transit stations (Hasselwander et al., 2021). It was during this period when the Philippine government took advantage of "windows of opportunity" (Sunio and Babiano, 2022) to expand and accelerate public transport reforms. During the lockdown period, the government restructured Metro Manila's bus routes into 31 new bus routes. One significant portion was a loop service that ran along a newly assigned exclusive busway along Epifanio Delos Santos Avenue (EDSA), Metro Manila' busiest thoroughfare and now operated by two newly-consolidated bus consortia. This was called "Route E" or EDSA Carousel.

How these massive reforms were conceptualized and implemented in record time needs a closer look since historically, solutions to the chaotic buses along EDSA have been proposed and implemented to no avail. Authority on various components of the EDSA Busway is shared between various institutions with overlapping powers (Romero et al., 2014) and multiple private interests are heavily invested in the status-quo and consequently "ill-disposed towards holistic urban transport reform" (Sidel, 2020). Solutions involving buses along EDSA have been studied and attempted by different agencies through the years. This study seeks to understand the inputs and mechanisms that enabled government to implement the EDSA busway, with particular focus on the policy capacity of the key institutions involved to derive lessons for public transport reform and sustainability in the context of the Global South.

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We aim to answer the following questions.

a. What policy capacity elements enabled the implementation of the EDSA busway?
b. How can this policy capacity be improved to ensure sustainable operations?

2. EDSA: problems and solutions

2.1. Public transport in the Philippines

The public transport sector is governed by the Department of Transportation (DOTr) which serves as the primary policy-making body for transport services in the country. In the road-based transport sector, it is supported by its attached agencies namely the Land Transportation Franchising and Regulatory Board (LTFRB) which regulates and issues public transport franchises and the Land Transportation Office (LTO) which ensures compliance to vehicle safety regulations via registration and inspection. Road-based public transport services such as buses and jeepneys are operated by the private sector through the grant of franchises or "regulated authorizations" as termed by van de Velde and Didier (1999). The government attempted to operate bus services in the 1970s but eventually failed (Santiago, 2021). From the 1980s, the LTFRB awarded franchises to applicants based on their submission of a proof of demand and financial viability for their chosen route called Route Measured Capacity (Manresa, et.al., 2013). Lack of control over franchise issuance eventually led to a widespread oversupply in public transport routes. In 2003, the LTFRB announced a nationwide moratorium on franchise issuance in order to first rationalize the routes. However, the route rationalization effort was not completed and the moratorium continued until transport demand began exceeding supply. Over the years, illegal services proliferated to meet the growing transport demand.

In 2017, the DOTr launched the Public Utility Vehicle Modernization Program with the issuance of the Omnibus Franchising Guidelines, a landmark policy that aimed to introduce wider reforms in the public transport industry via the planning and rationalization of public transport routes, transformation of route franchising procedures and promotion of industry consolidation and professionalization to improve service levels (Kaenzig et al., 2019). One key policy of the program was on route rationalization wherein a Local Public Transport Route Plan (LPTRP) was required before franchises are issued (Department of Transportation et al., 2017). This policy effectively expanded the previous route-based analysis to a network-level one wherein the LPTRP must contain an area-wide plan that enforces the hierarchy of transport modes based on passenger demand. Generally, the new guidelines required local government units to develop the LPTRPs covering public transport services within their respective boundaries. However, inter-city or inter-municipal planning for Metro Manila and the adjoining provinces of Bulacan, Laguna, Cavite, and Rizal (also called the "Greater Manila Area") shall be done by the DOTr. To this end, DOTr commissioned a route rationalization study to define the appropriate routes crossing the boundaries of the areas within the Greater Manila Area. As of 2023, the route rationalization study has not yet been completed. Overall, the program has been opposed by various transport groups and legislators (Sunio et al., 2019). Despite these, the modernization program has continued, albeit at a slower pace than planned and the status quo on routes have prevailed in Metro Manila. Stakeholders have also shown resistance due to fear of displacement and have expressed apprehension over the government's ability to effectively implement the program (Mateo-Babiano et al., 2020).

2.2. EDSA in the context of Metro Manila transport

EDSA serves as the main link between the Northern to the Southern parts of Metro Manila. Approximately 24 kilometers long, it provides access to Metro Manila's major business districts. Majority if not all of public transport routes going from North to South of Metro Manila (including those coming from outside Metro Manila) pass through EDSA. It is also a destination in itself as it is lined with various shopping malls, car dealerships, business centers, hotels, government agencies and provincial bus terminals (Bouquet, 2013). Through the years, EDSA evolved to have multiple levels and varied sections. It has portions with at-grade intersections, grade-separated junctions, and U-turns. Road widths are not uniform all throughout its alignment. In the 2000s, the Metro Rail Transit 3 (MRT-3) was built along EDSA's median lanes in a mix of at-grade, underground, and elevated sections. Given the high volume of vehicular traffic, most pedestrian crossings are elevated. EDSA has gained notoriety for its complexity, with the implication that tips for motorists are often the subject of various blogs, newspapers, and magazines.

A summary of studies on urban transport development in Metro Manila (including EDSA) have been made and extensively discussed by Napalang and Regidor (2015). A subway solution was proposed in 1973 but was dismissed for being uneconomical. In the 1990s, a BRT-type system called the Philtrack was proposed but not implemented. In 2006, a study reported an oversupply of buses along EDSA (JICA, 2006). A basic but significant challenge encountered during the study were the discrepancies in fleet size data from operator declarations, field-observed, and official data from the regulatory agency. The study recommended fundamental changes to the way fleet sizes were determined and the establishment of a sustainable public transport statistical system to minimize the need for extensive surveys and allow for performance monitoring. These findings were further echoed by the Metro Manila Public Transport Study in 2007. In 2015, an ADB-funded feasibility study on a BRT along EDSA was completed but no implementation transpired. Come 2018, a Swedish-funded study contemplating a bus system running on a dedicated lane (called "Ebus") along EDSA was completed. The bus system was supposed to augment the MRT-3's capacity as it underwent extensive rehabilitation. This was complemented by a German-funded study that proposed an operations and business model for EDSA buses which included contracted services and a system manager. Despite this, the Ebus concept was not implemented.

2.3. Bus regulations implemented in EDSA

Traffic management along EDSA is managed by the Metropolitan Manila Development Authority (MMDA). The MMDA also heads the Metro Manila Council whose members are the mayors of the 17 local governments of Metro Manila. Recognizing the overlapping mandates of local governments and various agencies on traffic management, the Inter-Agency Council for Traffic or i-ACT was formed with members encompassing all agencies with traffic management and enforcement powers.

In 2003, the Metro Manila Council approved the implementation of the EDSA Organized Bus Route (OBR) Project to "bring order to the 3151 franchised buses plying EDSA" (MMDA, 2003). The project aimed to control bus headways by giving queue cards to buses upon passing through designated terminals/entry-points on a first-on, first-off basis. Time limits were imposed on loading and unloading areas. However, among the reasons why the project did not succeed was the non-existence of a robust dispatch schedule and non-denial of entry to any bus who lines up (JICA, 2006). According to the World Bank (2009), the OBR had a good concept but the bus operators and staff managed to game the manual system using various tricks. It then went on to conclude that it is not possible to properly implement the OBR without an automated system.

In 2012, the EDSA Bus Segregation Scheme was implemented which aimed to reduce traffic congestion at loading/unloading areas (MMDA, 2012). City buses were tagged as A, B, or C wherein those tagged as A or B can only use bus stops tagged with the same letter. Meanwhile, buses tagged as C are allowed to use all bus stops. However, various bus

operators and drivers have resorted to using counterfeit stickers so they can load or unload passengers anywhere (Carcamo, 2014). In the same year, the government also made efforts to address the congestion caused by the presence of various provincial bus terminals along EDSA. One long-term solution was the construction of integrated terminals in the outskirts of Metro Manila that would serve as transfer points for buses coming from nearby provinces. Three integrated terminals in the North, South-East and South-West of Metro Manila were to be established and while waiting for these to be completed, existing terminals were designated as interim terminals. In 2016, the MMDA noted that there are 46 bus terminals operating along EDSA, most of which contributed to congestion as drivers entered the terminal with the rear end of the bus first (MMDA, 2016). A regulation prohibiting any new terminals along EDSA and asking existing owners to move to strategic areas outside the metropolis was issued, along with the institution of a "Nose In, Nose Out" policy wherein drivers should enter the terminals with the front side first. In 2018, the Paranaque Integrated Terminal Exchange (PITX), a Public Private Partnership project serving the South-west area of Metro Manila opened. In 2019, all the permits of bus terminals along EDSA were revoked and interim terminals in other areas were assigned (MMDA, 2019).

2.4. EDSA busway and EDSA carousel

In response to the increasing number of Covid-19 infections, the Philippine government through the Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID)[1] imposed mandatory lockdowns and halted all forms of public transportation from March 16-May 30, 2020 in Metro Manila with the exception of some limited services for healthcare workers. By June 1, 2020, mobility restrictions would be slightly eased for essential workers with a 1-m social distancing requirement in all public spaces including public transportation. The task force estimated an initial demand of 600,000 trips and expressed that a Light-Quick-Cheap transport solution had to be made available within 6 weeks (Martinez, 2021). Public transport trips needed to be fast and efficient to minimize passengers' exposure. In addition, social distancing on the MRT-3 would drastically reduce its capacity so a bus system that would absorb its ridership was needed. The solution would come in the form of the EDSA Busway, a dedicated bus lane along EDSA wherein buses would continuously run along a loop called the EDSA Carousel. The features of the EDSA Busway are provided in Table 1.

Table 1
Features of EDSA busway.

Component	Pre- EDSA Busway	EDSA Busway
Number of bus units	• Average of 3340 units passing through EDSA daily	• 550 units with Special Permit as of Jan 2022
Franchise	• Fragmented franchises run by several operators	• Operators consolidated into two consortia, with Special Permit to run the route
Lane utilization	• No dedicated bus lane	• Buses are running on a dedicated median lane, from Ayala to Monumento
Travel time (MOA to Monumento)	• 2–3 h	• 1 h 15 min
Travel speed	• 19 kph on average; • Stop and go and standstill traffic affects the buses	• 24–32 kph on average; • Max speed limit is 50 kph
Stations/stops	• Pick-up and drop-off points are at the curbside with no designated stops	• 16 operational stations established as of October 2021

Source: LTFRB report on EDSA Busway, 2022

3. Policy capacity: definition and applications

There are many definitions of policy capacity in literature. Some definitions pertain to the ability of governments to make good policies, policy decisions, or support decision-making (Bakvis, 2000; Parsons, 2004; Howlett & Lindquist, 2004; Painter and Pierre 2004). Some have also included the ability of governments to implement decisions (Davis, 2000) while others have considered inherent indicators of good governance such as honesty, rule-of-law, and social trust, among others (Holmberg and Rothstein (2012); Rotberg (2014)) to ensure successful policy outcomes.

Wu et al. (2015; 2017) extensively summarized the various definitions of policy capacity and provided a working definition and framework for analyzing it. We adopt their definition in this study, wherein we refer to policy capacity as the combination of skills and resources—or competencies and capabilities—necessary to perform policy functions. Skills and competences are categorized into three dimensions: analytical, operational, and political. Analytical capacities refer to knowledge and skills in policy analysis and evaluation. These aid in ensuring that policy actions are technically sound such that policy goals can be attained if carried out. Operational capacities refer to planning, staffing, budgeting, delegating, directing, and coordinating expertise which enable the alignment of resources with policy actions, facilitating their practical implementation. Political capacities refer to knowledge about policy process and skills in communication, negotiation, and consensus building. These are used in acquiring and maintaining political support for policy actions. For governments and agencies that are composed of multiple organizational layers and actors, each of the three dimensions of policy capacity also occur at the individual, organizational, and systemic levels. These are summarized into the framework in Table 2 which can be used as a tool for assessing the policy capacity of governments and agencies. Detailed descriptions of the framework are provided in Section 6.

Evaluation of policy capacities of government institutions is present in existing literature, encompassing various sectors such as foreign policy, health, environment, energy, among others. These studies investigated the current state of policy capacity of an organization (Ng. et al., 2020; Perez et al., 2022), policy outcomes and deficiencies (Woo, 2020), detect at which levels the weaknesses lie, and at which dimension possible solutions are tractable (Bajpai & Chong, 2019; Chenboonthai & Watanabe, 2018; Craft.et al., 2013). More importantly, lessons from examining policy capacity led to discussions on how policy capacity can be improved (Brenton, 2018, pp. 337–358; Gleeson et al., 2011; Hughes et al., 2015). The policy capacity perspective can apply to multi-institution actions, making it appropriate for the context of the EDSA Busway.

4. Materials and methods

4.1. Materials

The authors conducted semi-structured interviews with key actors involved in the EDSA Busway to draw its Strategic, Tactical and Operational components. For the methodology, the authors borrow from the key principles used in Interpretative Phenomenological Analysis which is an approach used in psychology that seeks to explore the individual's personal perception or account of an object or event. It requires a flexible survey instrument wherein the researcher and participant engage in a dialogue wherein initial questions are modified based on the participants' responses and the interviewer is able to probe important topics which arise (Smith et al., 2009). This approach allows the authors to identify the dynamics and motivations for decision-making within the relevant organizations which are normally not present in official policy

[1] The IATF-EID is a multi-agency body headed by the Department of Health whose task is to implement high-level quarantine guidelines related to the management of the Covid-19 pandemic.

Table 2
Policy capacity determinants at the individual, organizational, and systemic levels.

Levels of Resources & Capabilities	Skills and Competencies		
	Analytical	Operational	Political
Individual	• Knowledge and skills in policy analysis and evaluation	• Expertise in planning, staffing, budgeting, delegating, directing, and coordinating	• Knowledge about policy process and stakeholders' positions • Skills in communication, negotiation, and consensus building
Organizational	• Availability of individuals with analytical capacity • Machinery and processes for collecting and analyzing data • Organizational commitment to evidence-based policy	• Organizational commitment to achieving goals • Availability of fiscal and personnel resources • Coordination of internal processes • Performance management • Administrative accountability.	• Legitimacy of policy process • Processes for stakeholder engagement • Access to key policy makers.
Systemic	• Systems for collecting and disseminating information • Access to competitive policy advisory systems • Political support for rigorous policy analysis and evaluation.	• Inter-governmental and inter-agency coordination • Coherence of policy communities and networks • Clarity in agencies' roles and responsibilities.	• Political accountability for policies • Trust in government • Participation of non-state actors in the policy process • Presence of policy entrepreneurs

Source: Wu et al., 2017.

documents.

Purposive sampling was used to find a more closely defined group for whom the research question is significant (Smith & Shinebourne, 2012). Similar to the methodology in Chenboonthai and Watanabe (2018), the study did not focus on the quantity of respondents but instead on interviewing those who played key roles in the implementation of the EDSA Busway. A total of twelve (12) individuals were interviewed (see Appendix). Respondents from the DOTr, LTFRB, and MMDA, the three main agencies involved in EDSA Busway operations were selected. The key respondents identified are middle managers who were in charge of operationalizing EDSA Busway's tactical and operational components and those who have participated in previous EDSA-related studies. Interviews with the consultants involved in Systems Management and Bus Monitoring were also conducted. Finally, two (2) representatives playing leading roles in one of the consortiums operating along EDSA Busway were interviewed. The interviewees sought to understand the interactions, motivations, and challenges encountered during the development of the EDSA Busway. The interview results were triangulated with observed phenomena reported in the news and other sources. The authors also conducted an extensive review of policies released during the pandemic by the MMDA, DOTr, and LTFRB. Official agency press releases, public webinars, and Congressional hearings attended by high-level officers of the three target agencies were utilized.

4.2. Methods

The data collected were used to identify the various components and actors involved in the EDSA Bus operations. These components were classified according to whether they belonged to the Strategic, Tactical and Operational levels, guided by discussions made in Desaulniers & Hickman, 2007; Ibarra-Rojas et al., 2015. An assessment of the policy capacity of the key actors using the framework and definitions in Wu et al. (2017) which were presented in Table 2 was conducted, followed by a discussion of policy capacity strengths and weaknesses.

5. Strategic, tactical, and operational components of the EDSA busway

5.1. Strategic level components

Public health constraints were the main strategic considerations in the formulation of the EDSA Busway. According to DOTr planners and officials (Committee on Transportation, 2020; Martinez, 2021), the following project goals were identified.

- A public transport system that can support 600,000 passengers per day based on the IATF-EID's estimate of essential sectors that would be allowed to travel when the lockdown is eased;
- Public transport travel be kept to a minimum to avoid spread of the Covid-19 virus;
- The transport system could absorb the unserved demand of the MRT-3 due to the 1 m social distancing restriction.

In support of the above goals, the LTFRB issued Memorandum Circular (LTFRB MC 2020-019, 2020) reorganizing the bus routes in Metro Manila into 31 routes to take effect when the lockdown restrictions were downgraded from Enhanced Community Quarantine, the strictest level, to General Community Quarantine. A timeline of significant events is provided in Fig. 1. The Memorandum Circular stated that EDSA, being the corridor where all rationalized routes converged, had a special route referred to as the Route E, EDSA Loop Service or EDSA Carousel. A total of 550 units were authorized on this route, based on ideal headway computations (Interviewee 1).

5.2. Tactical level components

5.2.1. Exclusive bus lane and infrastructure

The exclusive bus lane required minimal construction as it only involved concrete barriers that were installed by the MMDA and the Department of Public Works and Highways (DPWH). Due to existing structures along EDSA's median lane, bus stops were only limited to areas with available space. In other locations, buses would mix with other modes or shift to the curbside. The barrier designs were deliberated by an inter-agency working group composed of DOTr, MMDA, and DPWH representatives. Having no existing standards for barriers, the working group adopted design elements from MMDA's previous installations as well as from the TransJakarta BRT in Indonesia (Interviewee 1). The barriers were designed to be tall enough to absorb impacts from collisions. Bus stops were located at-grade, mostly under the MRT structures (see Fig. 2) with most access points via the MRT entrances. This means that passengers need to ascend stairs to enter via the MRT gates, only to descend the stairs to reach the EDSA Carousel concourse. In other stops, existing foot bridges were utilized for access to the bus concourse. As of 2022, infrastructure upgrades and addition of missing stops are being pursued. Most stops are still not accessible for Persons with Disabilities, senior citizens, and pregnant passengers but plans for the installation of elevators are underway.

The high traffic demand along EDSA constrained the installation of bus passing lanes (Interviewee 6). Overtaking maneuvers can only be executed in the bus stops where a separate bus bay is provided for

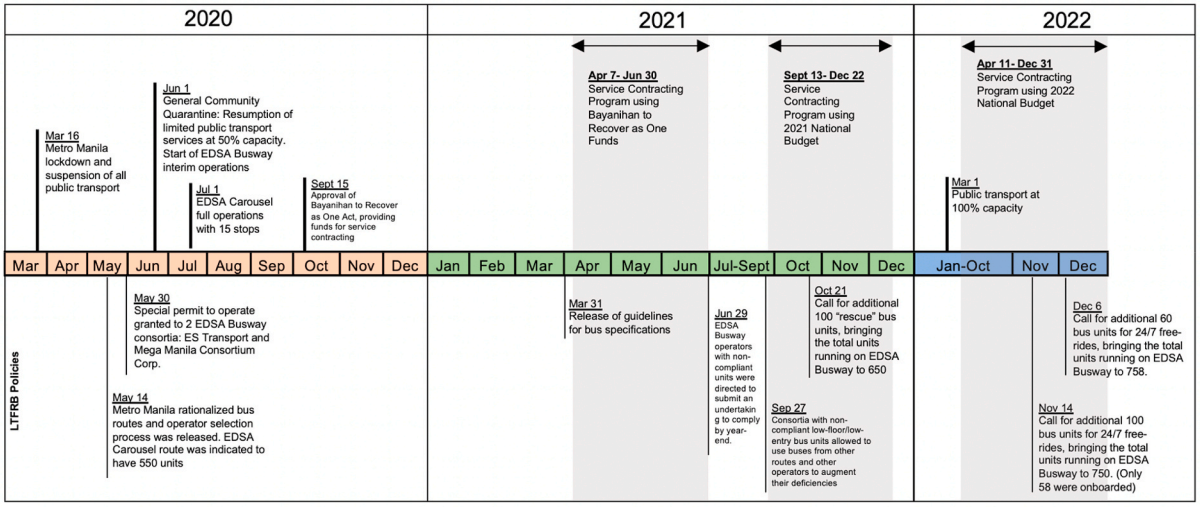

Fig. 1. Timeline of significant events and policies involving the EDSA Busway.

Fig. 2. EDSA Busway station beneath the MRT-3 Guadalupe station (Photo: S. Gaspay).

loading/unloading passengers. To maintain the car carrying capacity along EDSA while still providing space for the EDSA bus and the bicycle lane, the road widths of the remaining car lanes were reduced by the MMDA.

5.2.2. *Bus specifications*

In March 2021, the LTFRB issued guidelines (LTFRB MC 2021-015) for buses plying the EDSA Busway. These guidelines contained requirements on vehicle dimensions as well as bus accessories such as GNSS receiver, Wifi, CCTV, Speed limiter, dashboard camera, and automatic fare collection. Buses needed to be low-entry/low-floors for easier boarding and alighting of passengers. Although these guidelines merely reiterate requirements stipulated in the Omnibus Franchising Guidelines (Department of Transportation, 2017), full compliance of bus operators has not yet been achieve. In September 2021, the LTFRB Board issued Resolution No. 118, allowing EDSA busway operators to augment deficiencies in their bus units with those from other routes, be it their own or from other operators. One significant addition to the bus specifications was the requirement of doors on both the right and left sides to allow for direct passenger access from the middle lanes. Recognizing that operators needed ample time to comply with the requirement, the LTFRB on June 2021 issued Resolution No. 68 requiring operators to submit an undertaking to comply by the end of the year. Failure to comply shall cause the LTFRB to allow other operators to provide the lacking units. According to DOTr, approximately 25% of the buses have complied with the specifications as of July 2022 or more than a year after the issuance of the bus guidelines.

5.2.3. *Operator selection process and consolidation*

The LTFRB issued Memorandum Circular 2020–019 providing for an operator selection process for the EDSA Carousel route wherein the selected operator would be granted a General Community Quarantine (GCQ) Special Permit. The guidelines specified three (3) major requirements for applicant-operators (see Table 3). This has two significant implications: existing bus operators could no longer resume with business-*as*-usual and they needed to consolidate and undergo the selection process in order to continue operating.

The Special Permit was eventually awarded to two consortia, the ES Transport and Partners Consortium and the Mega Manila Consortium Corporation. However, their combined number of low-floor/low-entry units only amounted to 284 or 51.6% of the route's requirement (LTFRB Resolution No. 81 Series of 2020). The two consortia were also directed to have a common third-party Fleet Management, Automatic Fare Collection System, and to complete the remaining required units from their partner members within one month. More than a year later in September 2021, the LTFRB Board recognized the difficulties faced by

Table 3
Operator-selection requirements for EDSA route.

Requirements	Detail
Area-based operator	• Operators currently serving the EDSA route would be given priority.
Operational consolidation	• Applicants must be consolidated into a juridical entity (Corporation, Consortium, etc.); OR • Consolidated in terms of operations (i.e. single dispatching, headway, availability of units, revenue sharing, drivers/conductors fixed salary management and monitoring of the units) via a Management Agreement.
Fleet management	• With existing fleet management system; OR • Undertaking to provide the ff. Within one month from start of operations: i. Single Monitoring System ii. Single Automated Fare Collection System inter-operable with other routes iii. Formation of Corporation or Consortium.

the consortia in providing compliant bus units and therefore allowed them to augment their existing fleet with their own buses or buses from other operators (LTFRB Board Resolution No. 118, Series of 2021). The LTFRB found that the number of units were still not enough to cater to the growing passenger demand. Hence, they allowed other operators to provide 100 "Rescue" bus units from 5 to 10 a.m. and from 4 to 11 p.m. (LTFRB Board Resolution No. 133, Series of 2021). Similar efforts to provide additional units were done to provide 24/7 services under the Service Contracting program (Relativo, 2023). By December 2022, there were a total of 758 units operating on the EDSA Busway. This reverted to 550 units on January 1, 2023 when the Service Contracting program ended. The timeline of events is presented in Fig. 1.

The requirement to consolidate operations has long been a key feature of the government's PUV Modernization Program. On the government side, one benefit of consolidation was that it relieved the administrative burden of having to coordinate with many operators. A few years before the pandemic, operators already had dialogues with the DOTr and LTFRB on the formation of a bus consortium along EDSA (Interviewees 11 and 12) which eventually died down. During the pandemic, their consolidation into a consortium was expedited with some members being left with no choice but to cooperate for fear of being left with no routes (Interviewee 11). However, one of the consortia interviewed disclosed that while they are consolidated on paper, they are yet to operate as one as some consortium members are still not on board with the idea of shared operations and shared income.

5.2.4. Service contracting

Although not a permanent feature of the EDSA Busway, the Service Contracting Program aided in the continuity of EDSA Bus operations which is why it is included in this section. As part of the Philippine government's pandemic economic recovery measures, Republic Act 11494 or the "Bayanihan to Recover As One Act" was passed. For the transport sector, it included 5.58 Billion (USD 98.9 Million) in funding to provide temporary relief for adversely affected public transport workers via partially subsidized service contracting of public utility vehicles. As discussed in Sunio et al. (2022), service contracting program in the Philippines was uniquely implemented as a business model of public transport service provision during the pandemic, as opposed to implementations in other countries such as Singapore and London. The Service Contracting Program targeted land-based public transport modes nationwide. Legislators explicitly identified drivers as beneficiaries of the program. DOTr formally assigned the LTFRB to lead the implementation of the Service Contracting Program (DOTr Department Order 2020-017). The LTFRB then created a Technical Working Group (TWG) composed of LTFRB and DOTr personnel with the following tasks (LTFRB Mem. Circular No. 2020-059).

- recommend policies;
- create a Program Implementing Unit (PIU) that will implement and monitor the program's daily progress;
- monitor the procurement of a Systems Manager.

The initial phase of the Service Contracting Program adopted a net-cost contracting scheme wherein payouts to participating drivers were intended to augment their reduced income due to mobility and social-distancing restrictions. Given the positive effect of the program on drivers, operators, and commuters, the program received an additional 3 Billion pesos (60 million USD) in funds for year 2021. In an effort to give additional aid to its stakeholders, LTFRB issued Memorandum Circular 2021–054 adding an option for a gross-cost scheme where drivers would no longer charge fares and all operational expenses were shouldered by the government. Because of this, the Service Contracting program became synonymous with "Free rides". Since RA 11494 explicitly targeted PUV drivers as beneficiaries, the service contracts had to be executed by LTFRB with drivers instead of the operators/franchise owners. Payouts were distributed on a 70:30 ratio between operators and drivers. The main Key Performance Indicator used for payouts was the kilometer run. When the funds under RA 11494 (Service Contracting Program Phase 1) expired, subsequent phases (Phase 2 and 3) were funded using the national budget. In Phases 2 and 3, service contracts were executed between the LTFRB and operators instead of drivers. Payments were still based on kilometer-run, but cross referenced against a service plan developed by LTFRB with the operator. Demerits in terms of payment reductions were imposed in case of violations. Gross-cost and net-cost contracts were offered at the choice of the operators. The EDSA Bus operators participated in the program.

5.3. Operational level components

The two bus consortia managed all aspects of their operations with assistance from the government in route planning and traffic management. With the absence of CCTV cameras in most stations, monitoring is done manually. Enforcers on the field provide updates on the congestion status of passengers and at the prompt of DOTr/LTFRB, skip-buses and mini-loops are activated. According to LTFRB, bus operators initially resisted the idea of beginning their trips from the staging area in Pasay City as they had concerns over unproductive or "dead runs" from their garages to the staging area. As of the interviews conducted, there is no dedicated office that solely manages EDSA Bus affairs. The DOTr acts as the main monitor and coordinates with other agencies on matters specific to their mandates. For example, LTFRB staff are deployed to monitor the actual number of units deployed while the iACT and MMDA assist in traffic management in and out of the busway.

The Service Contracting Program necessitated the monitoring of headways and vehicle trips to ensure correct payouts. The LTFRB has a Central PUV Monitoring System (CPUVMS) that tracks the GPS feeds emitted by buses but mismatches between the CPUVMS data and operator information were often encountered. Since accuracy is important to ensure correct payments, the LTFRB still needed to deploy ground staff to submit situational reports every 30 min. Overall, the lack of real time monitoring data also posed challenges in terms of dynamically adjusting supply to meet demand. The LTFRB reported that one issue encountered was the low deployment of units by the operator. Based on a survey done on April 24–25, 2022, only 41.03% and 53.6% of the 550 authorized units have been deployed during the AM and PM peak hours, respectively. Moreover, premature ending of trips has also been observed on the ground due to mechanical problems or issues on driver behavior. The System Manager of the Service Contracting program also created a separate online monitoring platform that also included feeds for participants of the service contracting program. However, connectivity issues such as poor GPS signal or weak internet connection (Pontawe et al., 2021) became a cause of data unreliability.

The dedicated bus lanes reduced friction between buses and private cars which resulted in improved overall travel times and speeds (Table 4) despite the lane width reductions introduced to accommodate the busway and the bicycle lane on the curbside. Moreover, the improved traffic flow efficiency made the implementation of the usual 12-h number-coding scheme unnecessary (Interviewee 6). This scheme has long been implemented as a demand management measure wherein vehicles are not allowed to travel on major roads at least once a week, depending on their plate numbers.

Bus passing lanes were only placed at the bus stops below the MRT stations where additional lanes for bus bays could be accommodated. Some drivers have been observed to not use the dedicated bus bays in loading/unloading passengers, thereby clogging the busway (Interviewee 6). Interviewee 11 disclosed that since their consortium does not have an integrated fare collection system, drivers within the consortium are not paid equally which causes unnecessary competition. The requirement for Automatic Fare Collection System was also met with complaints since not all buses had AFCS readers so a hybrid system that still accepts cash was allowed. EDSA Busway is still considered to have low service quality (Hasselwander et al., 2021) and long queues are

Table 4
Travel time and speed comparison before and after EDSA Busway.

Mode	Direction	Travel Time (hh:mm:ss)			Travel Speed (kph)		
		2020	2022	% Change	2020	2022	% Change
Private Car	North Bound Roxas Blvd. – Monumento	1:08:45	1:04:30	−6%	20.14	21.47	7%
	South Bound Monumento – Roxas Blvd.	1:11:52	1:04:01	−11%	19.27	21.63	12%
Bus	North Bound Roxas Blvd. – Monumento	1:47:42	0:58:25	−46%	12.86	23.7	84%
	South Bound Monumento – Roxas Blvd.	2:31:04	0:58:29	−61%	9.17	23.68	158%

Note: Data is based on survey conducted by MMDA on the following dates.
Year 2020: Feb 24 (Private car), Jan 20 (Bus); Year 2022: May 26 (Both modes).

observed (Malasig, 2022; ABS-CBN News, 2022).

5.4. Summary

The Strategic, Tactical, and Operational components and key actors are summarized in Table 5. Despite the EDSA Busway being a multi-agency endeavor, it is the DOTr that plays a central role as it does the overall planning and policy-making for the project. Meanwhile, implementation matters are mostly executed by its attached agency, the LTFRB. The other agencies are seen to provide assistance based on their existing functions. It Is to be noted that the DOTr and LTFRB are performing new functions which are central to the EDSA Busway operations and effectively serving as de-facto Service Manager. Although the LTFRB has monitoring functions, it has not previously engaged in day-to-day service planning since this task was carried out by the operators themselves. The stakeholder interviews revealed that the DOTr and LTFRB have some knowledgeable technical staff but they are constrained by the lack of experience, data systems, and surveillance infrastructure. Moreover, experience is lacking given that previous bus management projects have been carried out by the MMDA.

Table 5
STO components of EDSA Busway and Key Actors.

Level	Institution/ Actor	Function	Did the institution perform similar functions before EDSA Bus?
Strategic	DOTr	Overall policy-making	Yes
		Future planning	Yes, with assistance from consultants
	LTFRB	Route identification and rationalization	Yes, with assistance from consultants
Tactical	DOTr	General Service Planning Guidelines	No
		Secure project financing	Yes
	LTFRB	Service Planning	No
		Vehicle specifications	Yes
		Fleet size requirement	Yes
		Operator selection	Yes
		Service Contracting	No
	DPWH/ MMDA	Infrastructure construction and additional financing	Yes
		Lane re-adjustments (Road Diet)	Yes
Operational	DOTr	Overall bus performance monitoring	No
	LTFRB	Demand/supply planning	Yes, but not day-to-day
		Violation monitoring	Yes, but via deployed enforcers
		Daily bus KPI monitoring	No
	Bus Operators	Driver schedules	Yes
		Vehicle management	Yes
		Data collection and reporting	Yes
	MMDA/i-ACT	Traffic management	Yes
		Security in Bus Stops	Yes
		Assistance in traffic monitoring	Yes

6. Policy capacity analysis of DOTr and LTFRB

In this section, the policy capacity of the implementing institutions shall be analyzed using the framework shown in Table 2. We focus on the two main institutions, DOTr and LTFRB, as they played central roles in the EDSA Busway implementation. For the following discussion, definitions of policy capacity levels, skills, and competencies are derived from Wu et al. (2017). Otherwise, the citation is provided.

6.1. Analytical capacity

6.1.1. Individual level analytical capacity

Analytical skills at the individual level typically involve tasks such as diagnosing problems and their root causes, designing and comparing solutions, formulating sensible plans/solutions, and conducting rigorous policy evaluation. For planning the operational components of the EDSA Busway, the interviews revealed a lack in technical expertise and experience in bus management and operations given that DOTr and LTFRB did not undertake these tasks in the past. However, the lack in expertise was complemented by the availability of technical consultants who were then working on the DOTr's Bus Rapid Transit projects. They consultants provided the initial service plans.

6.1.2. Organizational level analytical capacity

At the organizational level, data provided in a timely and systematic manner (Davies and Nutley 2000) within an organization in the form of an effective information system plays an important role in supporting the development of effective policies. In the planning stage of the EDSA Busway, the availability of reliable planning data was identified as a challenge by several interviewees since there was no existing system for collecting bus demand data. The planners had to rely on information from previously concluded studies which collected demand via large-scale surveys. When the EDSA Busway started operating, LTFRB tasked the two bus consortia to regularly submit demand data but due to technical and manpower limitations, the operators could only submit aggregated daily ridership which was insufficient for service planning purposes (Interviewee 1). For day-to-day monitoring and scheduling of bus supply, the LTFRB relied on a tedious manual monitoring process involving the deployment of personnel in selected stops. In 2021, LTFRB procured a Central Public Utility Vehicle Monitoring System (CPUVMS) capable of receiving GPS location data from buses. However, low

compliance to the GPS installation policy and locations with poor GPS visibility necessitate the use of a mix of manual and digital means for monitoring bus supply.

The implementation of the Service Contracting Program drew some ideas and lessons from a previous program: the DOTr's Metro Rail Transit's Bus Augmentation program wherein buses were contracted to augment the MRT's capacity when it underwent major repairs. However, the monitoring of Key Performance Indicators which would be the basis for contract payments proved challenging. The Bayanihan to Recover as One Act which was the law that provided funds for the Phase 1 of the program specifically indicated that drivers would be the beneficiaries of the program. This meant that the payments were to be given directly to the drivers. However, the LTFRB did not have an existing driver database as they only dealt with operators so significant efforts had to be done to set this up (Interviewee 7). For payouts to drivers, a mobile phone application was to be used in tracking rendered services and the purchase of mobile phones were delegated to the drivers. Issues with device and data inconsistencies were also encountered and led to an eventual reversion to manual reporting.

6.1.3. System level analytical capacity

System level analytical capacity involves system-wide data collection and a system for disseminating the information among different stakeholders involved in the policy process. There is emphasis on transparency and accountability such that policy analysis and evaluation is rigorous and involves diversity in policy advisory. For EDSA Busway, all planning activities relating to the establishment and operations of the busway are concentrated in specific offices within the LTFRB and DOTr's Road Sector. Although consultations have been conducted with various stakeholders during the planning phase, inter-agency coordination during the operational phase was conducted only when necessary such as when traffic management is concerned. Therefore, there was not much diversity in policy advisory. Within the DOTr, the interviews revealed that institutional reorganization within DOTr separated staff with planning functions from those involved in project implementation. As a result, staff with institutional memory and partipation in public transport planning exercises were not involved. Moreover, changes in leadership styles throughout different political administrations led to frequent internal restructuring (Interviewee 3 and 4) and lack of institutional stability. Transport data collection and management mechanisms for the road sector have been attempted in the past but still not been successfully institutionalized.

6.2. Operational capacity

6.2.1. Individual level operational capacity

At the individual level, operational capacity refers to the ability to perform managerial functions such as planning, staffing, budgeting, delegating, directing, and coordinating. This can be present not only during planning but also during implementation of policies. DOTr and LTFRB staff interviewed demonstrated skills in general problem solving and coordination such as ensuring the proper implementation of the plans and identifying avenues for expediting implementation. For instance, the design and implementation of busway infrastructure was accelerated by timely coordination and delegation of tasks to DPWH and MMDA who both have the equipment and manpower to carry out detailed design and construction of the busway stations. During the operational phase of the EDSA Busway, coordination with various institutions who assisted in traffic management was also regularly conducted to ensure that the service plan was followed.

6.2.2. Organizational level operational capacity

At the organizational level, operational capacity pertains to the organization's effectiveness in mobilizing and deploying the required resources, whether it be people or funding. Given the short time period allotted for developing the EDSA Busway plans, DOTr and LTFRB had to quickly reallocate personnel from other offices. At the DOTr, a four-person team of contractual staff handled overall coordination, administrative and finance matters of the EDSA Busway as of the date of the interview. Although the institutional arrangements are understandably in a state of flux for a new project, the lack of job security of existing staff coupled with lack of established information systems poses vulnerabilities that when left unaddressed, will negatively impact EDSA Busway's operations. Control mechanisms such as standard operating procedures and rules are important in maintaining quality and enforcing accountability (Wu et al., 2017). According to Interviewee 1, DOTr initiated efforts to standardize EDSA Busway's operating procedures via a draft policy document. As of the date of the interview, the document is still for review of other agencies.

At the LTFRB, the Franchise Planning and Monitoring Division (FPMD) was tasked with carrying out bus supply monitoring. The FPMD has 26 regular personnel whose scope is nationwide in scale. Its other functions include the conduct of transport development research, studies on development standards, planning development and conduct of surveys and inspections (LTFRB website). Although monitoring is within the FPMD's mandate, day-to-day monitoring of EDSA alone required a significant portion of FPMD's manpower. With regards to the implementation of the Service Contracting Program, delays were encountered in giving payouts to drivers due to the rigid bureaucratic processes entrenched in the government's financial system such as having payments be coursed through the Land Bank of the Philippines, a government bank, upon receipt of a list of payees from the LTFRB. The delays in the payments discouraged other operators from participating in the program since they relied on daily farebox revenues for capital. Moreover, the service contracting's messaging which was focused on social amelioration for drivers and eventually passengers (i.e. free rides) distracted from the conventional concept of service contracting which aims to deliver high service quality. Moreover, the legal impediment of the DOTr/LTFRB to collect fares makes Service Contracting financially unsustainable.

Another related measure for internal operational capacity is institutional effectiveness, policy consistency and forward planning, policy direction consistency, and quality of public administration as these also related to funding and staffing (Hartley and Zhang, 2017). Majority of high-level leaders within the DOTr and LTFRB are political appointees who typically stay for one six-year administration. Political appointments are advantageous in the sense that appointees enjoy the full trust and confidence of the appointing authority. However, appointees can also be quickly replaced or transferred. Within the DOTr's Road Transport and Infrastructure Office which oversees the EDSA Busway, for instance, the Undersecretary (second highest-ranking official) has changed four (4) times over the period of 2016–2021. New leaders may bring in different management styles, people and priorities which could disrupt working relations among staff and lose institutional memory if the appropriate information systems are not in place. Internal reorganizations within the DOTr through the years have also led to the discontinuation of initiatives and programs that would have contributed to a more data-driven approach to decision-making (Interviewees 3 and 4).

6.2.3. System level operational capacity

At the system level, operational capacity refers to the system or mechanism for coordination with other public sector agencies as well as partners in civil society. The roles and responsibilities of the various institutions must be clear. Hartley and Zhang (2017) used indicators for system level operational capacity such as formality of institutional rules, transparency of policymaking, communication of policy, and public debate. With regards to coordination mechanisms during the implementation of the EDSA busway, working groups were established under the DOTr, LTFRB, MMDA and DPWH with delineated tasks (Martinez, 2021). During operations, a system for gathering feedback from the concerned operators was established via weekly meetings. The DOTr's

social media page also reported on dialogues that it had with Civil Society Groups. At the level of the institutions involved, the coordination and clear definition of responsibilities helped facilitate the speedy implementation of the program.

6.3. Political capacity

6.3.1. Individual level political capacity

For individual actors, critical skills when working closely with stakeholders outside their organization involve skills in communication, negotiation, and consensus building. During the planning and operational phases of the EDSA busway, the respondents reported that there was cooperation between agencies and issues were amicably resolved. The consultative manner of communication wherein the "expertise" of government agencies was respected also played a key role in conflict resolution. For example, the MMDA's strong views on managing traffic of vehicles and pedestrians were upheld since they were the recognized authority on the matter (Interviewee 6).

6.3.2. Organizational level political capacity

At the organizational level, a key determinant for political capacity is political legitimacy. Salomonsen, et.al. (2011) also refer to "public service bargain" which refers to having a good relationship and access to key policy makers. The DOTr enjoyed political legitimacy as it was recognized by the IATF-EID as the agency in charge of providing guidelines on transport-related matters that will support public health objectives. Despite MMDA's prior experience in implementing bus management programs along EDSA, there was common acknowledgement among institutions that DOTr was in charge. The DOTr also had access to key legislators such as the Congressional Committee on Transportation which provided venues for consultation and support with other representatives and stakeholders. DOTr/LTFRB was able to gain continuous funding for its pandemic-support projects such as Service Contracting and Active transport projects through the legislative support it enjoyed.

Another key component of organizational political capacity is communication with stakeholders and the general public which significantly contributes to effective policy and governance as it enhances understanding and support for government policies. The allocation of funds or other resources to facilitate two-way exchange mechanisms such as public interest lobbying, building coalitions, and measuring and informing public opinion (Haider, et.al., 2011; Wu et al., 2017) help increase political capacity. During the conceptualization phase of the EDSA Busway, DOTr presented their plans to various transport stakeholders (Interviewee 1 and 5) but were not able to conduct it extensively due to the short planning window (Martinez, 2021). DOTr also participated in various public fora organized by the scientific community and other civil society groups. These groups have also publicly issued position papers, policy recommendations, and commendations to the policy makers. Some urban social movements have also leveraged social media to gather public support and mobilize state resources to address identified problems (Sunio et al., 2021). As observed with transportation issues in the Philippines, an active civil society and freedom of speech are present, elements that are important in enhancing political accountability (Haider, et.al., 2011) which will also contribute to achieving high public trust.

6.3.3. System level political capacity

At the system level, political capacity refers to the participation of key stakeholders in the policy process. There is also a high level of accountability wherein policy failures can be exposed and the persons responsible for making policy decisions are held accountable. High political capacity also implies high level of public trust. For EDSA Busway, the designation of DOTr as the head agency also made it accountable for any successes and failures of the program. During the planning stage, various stakeholders were consulted and mechanisms for obtaining inputs from non-state actors were used. However, non-state actors only provided feedback on crafted policies, not inputs. One example of this pertains to the involvement of operators. Although the agencies have provided direct communication channels with operators (Interviewees 1, 11, 12), one operator remarked that usually, they are consulted only after the government has made a decision, indicating displeasure with being left out of the policy formulation process. This is also manifested in the disconnect between regulations and operator compliance in terms of fleet management, vehicle specifications, and consolidation wherein the regulator imposes requirements that the operators cannot deliver. To this end, mechanisms for trust-building and collaborative governance require further exploration.

7. Summary, contributions, and recommendations

Transportation institutions and service providers faced significant difficulties and limitations during the Covid-19 pandemic. Notwithstanding these challenges, numerous governments capitalized on the chances to carry out reforms. This paper discussed the case of the EDSA Busway, an innovative, inter-agency transport project that drastically changed public transport operations along Metro Manila's busiest corridor. Through interviews with key actors, the authors were able to outline EDSA Busway's strategic, tactical, and operational components in order to clearly draw the different policies, resources, and stakeholders that came together involved in the system. It became apparent through this exercise that the central agencies, DOTr and LTFRB, performed new functions as the EDSA Busway's de-facto system manager without any significant increase in expertise and manpower while the other agencies involved provided assistance that were well within their existing skills and competencies. A policy capacity analysis of DOTr and LTFRB was then conducted in the analytical, operational, and political levels to determine the conditions that enabled the implementation of the project. Key findings are summarized in Table 6. A significant enabling factor was DOTr's strong political capacity and legitimacy as it was recognized by the IATF-EID as the main institution in charge of transport concerns during the pandemic. The halt in public transport services also brought the sense of urgency that pushed state and non-

Table 6
Salient findings of the policy capacity analysis.

Enabling conditions	Threats to sustainability of the EDSA Busway
Analytical capacity • Bus planning assistance from consultants working on DOTr's BRT projects; • Data and recommendations from previous bus studies were used; • Service contracting lessons from MRT Bus Augmentation program; • Manual bus monitoring process.	• Lack of technical expertise in bus management and operations; • Absence of organized database for planning purposes; • Frequent institutional changes that constrain implementation of long-term solutions
Operational capacity • Use of existing manpower to focus on EDSA busway; • Assistance from DPWH and MMDA on design and construction of stops; • National government funding due to Covid-19: • Establishment of inter-agency working groups.	• Temporary status of project staff; • Bureaucratic processes that delay fast delivery of Service Contracting payouts; • Frequent changes in DOTr leadership.
Political capacity • Good working relationship among involved state agencies; • DOTr enjoyed political legitimacy as designated agency of IATF-EID for transport matters; • DOTr/LTFRB's access to key legislators ensured funding; • Dialogues with operators, CSO, etc.	• Lack of involvement of non-state actors in the policy formulation; • Disconnect in regulator requirements and operators' capacity to comply reduces public trust; • Appropriate institutional structure to be established.

state actors to work together to deliver a solution after the lockdown was to be lifted. Compared to previous bus solutions that have been implemented in EDSA, bus operators also depended on special permits to resume operations and service contracts to augment income losses due to imposed capacity restrictions and thus pressured to cooperate. On the design front, DOTr and LTFRB did not possess the expertise in bus planning, operations, and management but this was supplemented by expertise from consultants who were working on other DOTr projects as well as studies from previous attempts to implement a bus solution along EDSA. Moreover, the lack of supporting data collection and monitoring systems were augmented by reallocating staff and resorting to manual monitoring measures. Had there been no pandemic pressure, this would also have taken time to arrange. Moving forward, while many of the solutions deployed for the EDSA busway program worked in the short-term, long-term success is not guaranteed. DOTr and LTFRB agencies will need to establish the appropriate data systems and establish the appropriate institutional structure to sustain and improve future plans. The threats to the sustainability of EDSA Busway operations are listed in Table 6.

The following are identified as crucial to sustainability of the EDSA Busway: a) an improved regulatory framework that allows for the appropriate institution to have the full powers of a system manager (i.e. planning, fare collection, asset management, etc.); b) institutionalizing data systems for monitoring demand and supply in order to match planning requirements and system management tasks; c) strengthening internal capacity and technical expertise in bus planning, operations and management to eventually veer from reliance on consultants, and d) harness existing relationships with stakeholders by providing mechanisms for trust-building and collaborative governance so that they can provide value to the policy formulation process. This study was able to provide a structured analysis of the strengths and weaknesses of the EDSA Busway system from the perspective of policy capacity of the implementing institutions. As opposed to most papers wherein evaluation of a policy focuses on its results or outcomes, the analysis carried out in this paper was able to pinpoint enabling conditions and threats to sustainability of the policy while it is in its early stages of implementation. While most transport solutions are focused on infrastructure and technology delivery, we highlight the strengths and weaknesses of the implementing institutions who are often unseen but are crucial to the successful execution of projects. For future work, it would be useful to expand the policy capacity analysis beyond the EDSA Busway to include the other reform programs occurring in the Philippines under the Public Utility Vehicle Modernization program. These are also being spearheaded by the DOTr and LTFRB such as the implementation of industry consolidation, electrification, expansion of service contracting program, among others.

CRediT authorship contribution statement

Sandy Mae Gaspay: Conceptualization, Data curation, Methodology, Data Collection, Writing – original draft, Writing – review & editing. **Noriel Christopher Tiglao:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Mark Angelo Tacderas:** Conceptualization, Writing – review & editing. **Niki Jon Tolentino:** Conceptualization, Resources. **Anne Clarice Ng:** Conceptualization, Resources.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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Appendix. List of Interviewees

Interviewee No.	Affiliation	Expertise
1	Department of Transportation-Road Transport and Infrastructure	EDSA Busway
2	Department of Transportation- Road Transport and Infrastructure	Service Contracting
3	Department of Transportation	Road Transport Planning
4	Department of Transportation	Road Transport Planning
5	Land Transportation Franchising and Regulatory Board	Franchise Planning and EDSA Bus Monitoring
6	Metro Manila Development Authority	Traffic Management; EDSA Busway Infrastructure
7	Private consultant	Service Contracting System Manager
8	Private consultant	Service Contracting System Manager
9	Private consultant	Service Contracting System Manager
10	Private consultant	Bus monitoring system
11	Bus operator	EDSA Bus operations
12	Bus operator	EDSA Bus operations

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