

# **An Assessment of the Infrastructure Program of the Duterte Administration**

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This study assesses the performance of the “Build, Build, Build” (BBB) infrastructure program of the Duterte Administration in the Philippines. It reviews the theoretical and empirical literature on the link between infrastructure and economic growth and develops a conceptual framework to analyze the impact of the BBB program. Project-level analysis of the BBB program identifies the right-of-way acquisition problem as the major factor delaying the project implementation. Quantitative analysis of completed BBB projects reveals low correlation with regional output. The seeming lack of synergy of BBB projects is explained by the low investment efficiency index related to project appraisal and selection and by the state of the regulatory approval processes. On the other hand, the BBB program has achieved an all-time high in infrastructure spending compared to previous administrations. However, this study’s assessment of performance vs. targets reveals that it does not live up to expectations. In addition, issues on impact of small versus large projects and on short-run versus long-run impacts have to be settled in future research when relevant data are available.

*Keywords:* Assessment, infrastructure projects, implementation

## **1 Introduction**

At the beginning of its term in July 2016, the Rodrigo Duterte Administration embarked on its bold medium-term infrastructure program called, “Build, Build, Build (BBB) Program”. At that time, this program aimed to increase infrastructure spending from 5.4% of GDP in 2017 to 7.3% of GDP in 2022 (Patalinghug, 2020). Investment in infrastructure was expected to contribute to employment, productivity, and economic growth. However, the initial portfolio of BBB projects was heavily concentrated in transportation infrastructure and less on health/hospital, digital, flood-control, and water supply infrastructure. Later revisions of the BBB program’s list of projects included non-transportation sector projects. Regional disparity of identified projects was likewise evident. The International Monetary Fund (IMF) has cautioned that although public investment in infrastructure raises output both in the short-run and in the long-run, it can likewise raise the public debt-to-GDP ratio due to the inefficiency of such investments (Abiad, Almansour, Furceri, Granados, and Topalova, 2014).

Between July 1, 2017 and May 21, 2021, the Duterte Administration has approved 112 projects worth a total of PhP4.69 trillion, bulk of which was big-ticket infrastructure projects financed by official development assistance (ODA) loans and grants. As of this study, twenty-five (25) projects to be financed by the General Appropriations Act (GAA) and ODAs worth a total of PhP2.79 trillion were still awaiting approval from the National Economic and Development Authority Investment Coordination Committee (NEDA-ICC). As the BBB program approached its final month, the Duterte Administration then planned to turn over 94 projects for implementation to the next administration.

The program started with 75 “high-impact” projects in 2017. This was then revised in 2020 to cover 104 “less ambitious and more doable” projects. In 2021, a final list of 112 “more flexible and doable projects” was made. Out of these 112 BBB projects, 35 are in Luzon (31%), 30 in the NCR (27%), 29 in Mindanao (26%), and 18 in the Visayas (16%). In terms of the respective shares in the total cost, Luzon accounted for 66%, NCR for 15%, Mindanao for 12%, and Visayas for 7%. In terms of implementing agencies, Department of Public Works and Highways (DPWH) was charged of supervising 49 projects (44%), while the Department of Transportation (DOTr) had 42 projects (37%), and the rest were assigned to other agencies (19%).

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Hence, with these considerations, the primary objectives of this research are as follows:

- (1) to provide a qualitative and quantitative assessment of the impact and the performance of the BBB program,
- (2) to obtain insights on what lessons can be learned from its experience, and
- (3) to recommend ways to improve the governance of future infrastructure programs.

The paper is organized as follows. Section II reviews the theoretical and empirical literature on the relationship between infrastructure and growth. Section III gives a brief description of the relevant studies on infrastructure project assessments as well as the methods used in their assessments. This is also where the paper's conceptual framework is presented and discussed. Section IV provides a background of the infrastructure situation in the Philippines. Section V discusses the project-level monitoring and assessment of various BBB projects. Section VI presents the empirical results on the analysis of the impact of the BBB program and discusses their implications. Lastly, Section VII provides the conclusions and recommendations.

## 2 Infrastructure and Growth

The theoretical and empirical work in the economics of infrastructure, particularly on the relationship between infrastructure and economic growth, started to develop after the pioneering work of Aschauer (1989), which documented the considerable positive effect of infrastructure on growth. He estimated an elasticity of output with respect to infrastructure ranging from 0.38 to 0.56. This implied rates of return of around 100% and that the infrastructure investment would pay for itself in one year, or even less. However, later empirical studies made adjustments to address the econometric problems found in Aschauer's model. While these studies confirmed the positive and significant effect of infrastructure on growth, they generated lower output elasticities ranging from 0.15 to 0.34. These implied rates of return from 37% to 85% (Munnel and Cook, 1990; Munnel, 1990). Romp and de Haan (2005) surveyed the results of earlier literature and confirmed the positive effect of infrastructure on economic growth, but the impact was not as big as those of earlier estimates. In an attempt to reconcile the empirical findings in the infrastructure-growth nexus, Bom and Ligthart (2014) analyzed 68 studies in a meta regression analysis and estimated an average output elasticity of 0.17, which implied a rate of return of 43% for core or economic infrastructure. The latter was composed of roads, bridges, tunnels, railroads, airports, seaports, water supply, sanitation, treatment facilities, electricity generation, transmission, and distribution facilities, and telecommunications facilities.

However, debates on the proper econometric modeling have also dominated the disagreements among researchers on how much infrastructure matters to growth. In a review of the literature on the infrastructure-growth link, Straub (2011) identified two related problems: (1) the inability to lay down clearly the relevant theoretical questions to be addressed, and (2) the inability to recognize that the most relevant answers, from a policy point of view, cannot be meaningfully addressed with the type of data available. In another survey of the literature on the link between infrastructure and growth over the past decades, Valila (2020) found an inconclusive link between infrastructure and growth. This inconclusiveness was attributed to the heterogeneity of the empirical studies which measured infrastructure and growth in different ways, focused on different time periods, and used different econometric models. Hence, model inaccuracy and poor data availability posed as future challenges to be addressed in relation to the inconclusiveness of results.

Furthermore, the issue of reverse causality clouded the treatment of the empirical findings of a positive association between infrastructure and growth. This issue created two possible and contrasting interpretations: (1) output responded to infrastructure investment, and (2) growth induced higher infrastructure investment. This theoretical dilemma was addressed by Abiad, Gonzales, and Sy (2017), who employed a two-step methodology previously used by Corsetti, Meier, and Muller (2012). The first step was to estimate the fiscal policy reaction function, where infrastructure investment was a function of lagged infrastructure investment, lagged public debt, lagged output growth, and expectations about current economic activity. This equation generated the residuals that were interpreted as estimates of the infrastructure investment shocks that do not contain the response of infrastructure investment to fiscal and macroeconomic variables. The second step was to estimate

the impact of infrastructure investment on output by specifying an equation where output was a function of investment shocks, which were estimated in the first step. The findings of Abiad, et al. (2017) have shown that public investment has a positive impact on growth. ADB (2017) has estimated that a 1% increase in public infrastructure investment can lead to a 0.78% increase in physical infrastructure. On the other hand, Abiad, et al. (2017) have also estimated that a 1 percentage point increase in the infrastructure-to-GDP ratio can lead to a 0.3% increase in output. This positive relationship has also been estimated earlier by Esfahani and Ramirez, (2003), Calderon and Servén (2004), and Sahoo, Dash, and Nataraj (2010).

While there is a consensus that infrastructure positively affects growth, the magnitude of the effects varies by level of development of the country (Abiad, et al., 2014; and Abiad, et al., 2017). In particular, Abiad, et al. (2017) have discovered that infrastructure provision followed a hierarchy of needs. Countries in their early stage of development focused on basic infrastructure (e.g., roads, bridges, railways, water and sanitation, and fixed telephone lines) and prioritized advanced infrastructure (e.g., mobile cellular and internet connections) when they reach the upper-middle-income stage.

The issue of interest in this research work deals with the efficiency in the provision of infrastructure. Presbitero (2016) has argued that investment in infrastructure was less likely to be successful when they are undertaken during periods of higher-than-average public investment. This was because supply bottlenecks and poor project selection were some of the unintended consequences of scaling-up infrastructure spending. Likewise, Warner (2014) pointed out that infrastructure build-up programs tend to be financed by borrowing and have also been plagued by poor analytics at the time investment projects were chosen. ADB (2017) has shown that in the developing parts of Asia, which comprised of 45 countries, the public sector generated 92% of the total infrastructure investments. IMF added that reaping the benefits of greater investment in infrastructure required policymakers to improve investment efficiency and to sustain fiscal capacity (Abiad, et al., 2014). Furthermore, Presbitero (2016) and Abiad, et al. (2017) have also shown that countries implementing infrastructure build-up programs lack absorptive capacity, facing a smaller number of high-return projects and constraints in human, physical, and institutional capital. Public investment efficiency can also be affected by corruption, delays, cost overruns, poor project selection, and misallocation of public investment spending across sectors or categories of investment (Berg et al., 2015). In particular, poorly selected projects can lead to a reduction in the average rate of return on infrastructure investment. (Warner, 2014; Berg, et al., 2015; Presbitero, 2016; and Abiad, et al., 2017). A model simulation on the effects of improving public investment efficiency in the Philippines also showed that they are substantial (Komatsuzaki, 2019). Lastly, IMF (2019) emphasized that increasing public investment management efficiency is a key factor for attaining the Philippines' infrastructure requirements.

### 3 Assessment of Infrastructure Projects: Conceptual Framework

Berawi, et al. (2014) assessed the value contribution of two Indonesian mega projects: (1) Sunda Strait Bridge, which was supposed to connect Java and Sumatra Islands, and (2) Soekarno-Hatta International Airport Rail Link, which should provide greater connectivity for the population of Greater Jakarta area to the airport. They used quantitative (life-cycle analysis) and qualitative (questionnaire survey and focused group discussions) methods. Dunovic, Radujkovic, and Skreb (2014) analyzed the complexity of large infrastructure projects and the perception of project managers on the concept of complexity. They employed a descriptive-historical approach and used available information obtained from officials and the responses from the interviews and the questionnaire. Wiratama, et al. (2023) evaluated the impact of rural infrastructure on poverty alleviation in Kalimantan, Indonesia using the physical infrastructure index framework derived from the village survey data. Jimenez and Willis (2012) measured the correlation between infrastructure and national development, using the human development index (HDI) as a measure of national development. Correlation indicators were estimated from logarithmically transformed infrastructure per capita data.

In comparison to these past researches, in the Philippine setting, Patalinghug (2019) attempted to assess the Build, Build, Build (BBB) infrastructure program of the Duterte Administration in its initial phase, and Patalinghug (2020) pursued the assessment during the mid-term stage of the program.

Both studies employed the qualitative and descriptive approach, using information from government reports, policy research papers, newspapers, and casual observations. Guzman (2021) also pursued a brief version of this approach in assessing the mid-term performance of the BBB Program (pointing out that only 11 of the 112 BBB projects have been completed as of May 2021). Employing the same approach, a policy research paper by Cuenca (2020) found that the BBB projects are responsive to the targets of the Philippine Development Plan: 2017-2022 (PDP), but the actual contribution of the BBB program in achieving the PDP targets will depend on NEDA's tracking and monitoring of the various BBB projects.

This paper follows the same analytical approach employed by infrastructure assessment studies briefly described in this section. It differs from the previous BBB studies in terms of coverage (end-of-term) and the use of a broader analytical approach. The paper employs both qualitative-descriptive and quantitative-analytical approaches. The former is used as a way of tracking and monitoring the progress of various BBB projects, and the latter analyzes the impact and the efficiency of the BBB program using correlation analysis and investment efficiency indicators.

#### 4 The Philippine Infrastructure Situation

The Philippines' low level of infrastructure investment is indicated by the persistently low ratio of infrastructure expenditures as a proportion of its Gross Domestic Product (GDP), with an average of only 2.03% (*See Table 1: Infrastructure-to-Gross Domestic Product Ratio*). This average is lower than the ASEAN average of 3.5% (Komatsuzaki, 2019) and lower than the recommended estimate of 5.7% needed for Southeast Asian developing countries for the 2016-2030 period (ADB, 2017). Thus, in terms of infrastructure quantity, the Philippines has a lot of catching up to do relative to its neighbors. In terms of infrastructure quality, the Philippines is ranked the lowest in the efficiency of train services and in the efficiency of seaport services among eight (8) Asian countries; and second to the lowest in the quality of road infrastructure and in the efficiency of air transport services. And it has an average rating in terms of the reliability of water supply. In short, it is ranked at the bottom in terms of the quality of infrastructure (*See Table 2: Quality of Infrastructure Among Selected Asian Countries*).

**Table 1. Infrastructure-to-Gross Domestic Product Ratio**

Year	Ratio
2000	1.22%
2001	1.66%
2002	1.43%
2003	1.84%
2004	1.00%
2005	0.88%
2006	1.05%
2007	1.92%
2008	1.90%
2009	2.24%
2010	1.83%
2011	1.81%
2012	2.04%
2013	2.66%
2014	2.74%
2015	4.32%
2016	4.49%
Average	2.03%

Source: Cuenca (2020)

**Table 2. Quality of Infrastructure Among Selected Asian Countries**

Indicator	China	India	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Quality of Road Infrastructure	4.6	4.5	4.2	5.3	3.7	6.5	4.4	3.4
Efficiency of Train Services	4.5	4.4	4.7	5.1	2.4	5.8	2.8	3.6
Efficiency of Air Transport Services	4.6	4.9	4.9	5.5	4.1	6.7	5.0	4.0
Efficiency of Seaport Services	4.5	4.5	4.3	5.2	3.7	6.5	4.1	3.8
Reliability of Water Supply	4.9	4.4	4.8	5.4	4.7	6.8	5.2	4.6

Notes: The rating is based on a scale of 1 to 7, where 7 is best  
Source: WEF, The Global Competitiveness Report 2019

Having been left behind by its neighbors, the Philippines embarked on an infrastructure build-up program in 2017 called Build, Build, Build or BBB program at the beginning of the Rodrigo Duterte Administration. As earlier mentioned, the BBB program started with 75 big-ticket projects in 2017. But after encountering some implementation problems (only nine (9) of the 75 projects have been started), the composition of the BBB program was changed in 2019 to 100 less ambitious and more doable projects (Patalinghug, 2020).

In September 2020, the government approved a longer list of 104 projects worth PhP 4.13 trillion. And by May 2021, the composition of the BBB Program was changed from 104 to 112 projects with a total cost of PhP 4.69 trillion. Projects financed by ODAs comprised 48.2% of the total number of projects and 55.6% of total program cost. GAA-funded projects comprised 24.1% of total number of projects and 4.0% of total cost. Public-Private Partnership (PPP)-funded projects accounted for 27.7% of total number of projects, and 40.4% of project cost. In its most current iteration, the July 2023 list of 197 projects of the Build Better More (BBM) infrastructure program for the 2023-2028 period of the Ferdinand Marcos Jr. Administration includes 73 unfinished BBB projects.

As of October 2021, only 8 projects have been completed costing PhP 94.64 billion (*See Table 3: Status and Cost of BBB Projects (as of October 2021)*). The rest of the projects are either ongoing implementation (77 projects) or in the pipeline at various stages of government approval (27 projects). Eighteen (18) projects were targeted to be completed by end of Duterte Administration, and ninety-four (94) projects were targeted to be completed years thereafter.

**Table 3. Status and Cost of BBB Projects (as of October 2021)**

Status	Number of Projects	Cost (in billion pesos)
I. Completed	8	94.64
II. Ongoing	77	3,506.26
- Ongoing construction	47	1,215.57
- Pre-construction activities	30	2,290.69
III. Pipeline	27	1,086.26
- For government approval	25	1,080.54
- Under project preparation	2	5.72
IV. Total	112	4,687.12

Source: National Economic and Development Authority (2021b)

An examination of the list of shelved projects (Annex A) and the list of new projects included (Annex B) indicates that high-cost and game-changing flagship projects were dropped because they were slow-moving. These include the island-connecting bridge projects (e.g. Sorsogon-Samar Link Bridge, Leyte-Surigao Link Bridge, etc.) and new airport projects. Their replacements are the less-ambitious and more doable (less costly and small-scale) projects, some of which are already in process. The list

of completed projects includes the projects added in the 2020 list (*See Table 4: List of Completed BBB Projects*). The management implication from this move is simply that the government changed the list of priority projects instead of resolving the obstacles faced by the game-changing flagship projects (De Dios, 2020), or to increase the chances of completing a respectable number of projects, as asserted by Guzman (2021).

**Table 4. List of Completed BBB Projects**

Completed Projects	Financing Mode	Cost (in million PhP)	Region
1. LRT-2 East Extension	ODA	9,759	NCR
2. MRT-3 Rehabilitation	ODA	22,000	NCR
3. Clark International Airport Terminal Building	GAA/PPP	14,972	Central Luzon
4. Bicol International Airport	GAA	4,798	Bicol
5. Sangley Point Airport Rehabilitation	GAA	1,436	CALABARZON
6. Gen Santos Airport Rehabilitation	GAA	1,096	SOCCSKSARGEN
7. Bohol-Panglao International Airport	GAA	3,791	Central Visayas
8. Mactan-Cebu International Airport Terminal 2	PPP	17,234	Central Visayas
9. Metro Manila Skyway 3	PPP	65,390	NCR
10. NLEX Harbor Spur Link Road	PPP	12,000	NCR
11. Angat Water Transmission Improvement	ODA	3,290	Central Luzon
12. Tarlac-Pangasinan-La Union Expressway	PPP	24,000	Ilocos
13. Bonifacio Global City-Ortigas Center Link Road	GAA	5,724	NCR
14. Estrella-Pantaleon Bridge	ODA	1,523	NCR
15. Binondo-Intramuros Bridge	ODA	4,424	NCR
16. Boracay Circumferential Road	GAA	1,940	Western Visayas
17. Cebu-Cordova Link Expressway	PPP	33,000	Central Visayas
18. Paranaque Integrated Terminal Exchange	PPP	2,600	NCR
19. Marawi Transcendental Road	ODA	245	BARM
20. New Clark City National Government Administrative Center Phase 1A	PPP	15,000	Central Luzon

Notes: GAA refers to General Appropriations Act, ODA to Official Development Assistance, and PPP to Public-Private Partnership. BARM refers to Bangsamoro Autonomous Region for Muslim Mindanao, CALABARZON to Cavite-Laguna-Batangas-Rizal-Quezon region, NCR to National Capital Region, and SOCCSKSARGEN to South Cotabato-Cotabato-Sultan Kudarat-Sarangani-General Santos region

Source: National Economic and Development Authority (2021a); Author's compilation

## 5 Project-Level Analysis of the Build, Build, Build Program

### 5.1 Overall Program Performance

This section assesses the overall performance of the BBB program. According to DPWH (2017), the BBB program has set targets for infrastructure spending from 2017 to 2022 in aggregate peso amount as well as a percent of the Gross Domestic Product (GDP) (*See Table 5: Spending Targets of the BBB Program: 2017-2022 (in billion pesos)*). Infrastructure expenditures were targeted to progressively increase from 5.4% of GDP in 2017 to 7.3% of GDP in 2022 (Patalinghug, 2020). However, according to the Department of Budget and Management (DBM), the actual infrastructure expenditures from 2017 to 2022 both in aggregate peso value and as a percent of GDP are consistently below target, except in 2017 (*See Table 6: Actual Infrastructure Spending: 2017-2022 (in billion pesos)*). The institutional absorptive capacity of the infrastructure implementing agencies is a factor to be considered in explaining the below-target performance of the BBB program, particularly during the 2017 to 2019 period. For instance, both DPWH and DOTr, the top two agencies tasked to supervise

BBB projects, were disbursing only 43% and 39% of their budgets, respectively, during the 2016-2021 period (See Table 7: DPWH and DOTr Obligation Rates and Disbursement Rates: 2016-2021). While the ratio of obligation to allotment has improved over time, the ratio of disbursement to obligation averaged just around 50%. Other implementation issues identified by the government are the following: site condition/availability, government funding approvals, COVID-19, budget funds flow, procurement, performance of contractors/consultants, and weather conditions (NEDA, 2021b). On average, the percentage of national government disbursement over appropriations was only 75.7% during the 2017-2019 period (Patalinghug, 2020). Furthermore, COA reported that for every PhP1,000 in the budget, only PhP750 are obligated or committed, and only PhP225 are disbursed (30% ratio of disbursed to obligated amount) (Patalinghug, 2019).

**Table 5. Spending Targets of the BBB Program: 2017-2022 (in billion pesos)**

Item	2017	2018	2019	2020	2021	2022
Expenditure	858.1	1,097.3	1,295.5	1,456.6	1,584.0	1,840.2
Percent of GDP	5.4	6.3	6.8	6.9	6.9	7.3

Source: Department of Public Works and Highways (2017)

**Table 6. Actual Infrastructure Spending: 2017-2022 (in billion pesos)**

Item	2017	2018	2019	2020	2021	2022
Expenditure	991.25	990.52	1,050.0	869.9	890.7	1,180.0
Percent of GDP	5.9	5.4	5.4	4.8	4.6	5.9

Source: Department of Budget and Management, BESF (2017-2023)

**Table 7. DPWH and DOTr Obligation Rates and Disbursement Rates: 2016-2021**

Year	Obligation/Allotment		Disbursement/Obligation		Disbursement/Appropriations	
	DPWH	DOTr	DPWH	DOTr	DPWH	DOTr
2016	77.5%	67.1%	73.2%	79.2%	54.7%	52.9%
2017	92.1%	84.1%	36.3%	39.2%	32.8%	32.5%
2018	92.6%	90.0%	42.9%	40.7%	39.3%	36.6%
2019	87.8%	85.2%	56.4%	42.5%	48.1%	34.3%
2020	92.5%	96.8%	31.2%	36.9%	28.6%	35.3%
2021	93.2%	93.9%	61.0%	47.0%	53.8%	41.5%
Average	89.3%	86.2%	50.2%	47.6%	42.9%	38.9%

Source: Navarro and Latigar (2022)

## 5.2 Railway Projects

This section assesses the specific railway projects listed in the BBB program, which is one of its biggest pillars. The implementation status of fifteen (15) railway projects is shown below (See Table 8: Implementation Status of Railway Projects). The LRT-1 Cavite Extension Project (from Dr. Santos, Paranaque City to Niog, Bacoor City) started civil works construction on September 17, 2019. The progress has been slow for Phase 1, which consisted of five stations from Redemptorist Station to Dr. Santos Station. The right-of-way acquisition problem is shown to be the most significant factor delaying project completion.

**Table 8. Implementation Status of Railway Projects**

<b>Project</b>	<b>Groundbreaking</b>	<b>Construction Status</b>
1. LRT-1 Cavite Extension ○ Baclaran, Parañaque City to Niog, Bacoor City, East (11.7 kms)	May 4, 2017	Piling works for the elevated railway structure at Dr. Santos Station in Parañaque City started on September 17, 2019; Viaduct from Redemptorist to Dr. Santos stations are under construction.
2. LRT-2 East Extension ○ East Santolan, Pasig City to Masinag, Antipolo City (4 kms)	May 29, 2017	Completed on July 1, 2020
3. LRT-2 West Extension: ○ Recto Station to Pier 4, Manila (3.02 kms)	Planning stage	Ongoing preparation for procurement of Design and Build Contractor
4. LRT-1, MRT-3, and MRT-7 Common Station (13,700 sqm)	September 29, 2017	Area A hosting LRT-1 and MRT-3 is 70% complete; Area B (Atrium) is 100% complete; and Area C hosting MRT-7 has not started construction.
5. MRT-3 Rehabilitation ○ North Avenue, Quezon City to Taft Avenue, Pasay City (16.9 kms)	April 30, 2019	It started in July 2019 and was completed on March 22, 2022
6. Tutuban to Malolos Railway (38 kms)	January 5, 2018	Ongoing since February 15, 2019, 45.8% complete.
7. Malolos to Clark Railway (53 kms)	October 18, 2017	Ongoing construction, 28.8% complete
8. Tutuban to Calamba City Railway (56 kms)	Planning stage	Bidding conducted on July 22, 2021 by DOTr and PNR; ADB was evaluating the bids as of June 2022.
9. Metro Manila Subway ○ Quirino Highway, QC to NAIA 3, Pasay City (36 kms).	February 27, 2019	Delayed; ongoing depot construction; ongoing ROW acquisition; pre-construction work at North Avenue station; lowering of first TBM delayed and occurred on January 9, 2023.
10. Subic to Clark Railway (71 kms)	Planning Stage	Notice of award issued to China Harbor Engineering Company on December 29, 2020 and EPC contract signed on January 28, 2021; loan negotiation with China stopped on June 2022.
11. Tutuban to Sorsogon Railway: ○ Manila to Matnog, Sorsogon (653 kms)	Planning Stage	DOTr and joint venture of 3 Chinese companies signed a PhP142B contract on January 17, 2022 for Package 1 work; loan negotiation with China stopped on June 2022.
12. Mindanao Railway (Tagum-Davao-Digos) (102.3 kms)	Planning Stage	NEDA-ICC approved a cost increase from PhP 35.9 B to PhP 82.9 B on July 10, 2019; ROW acquisition and loan negotiation with China stopped on June 2022.
13. MRT-7 ○ North Avenue, QC to San Jose del Monte, Bulacan (24 kms)	April 20, 2016	62.1% complete; 18 of 108 train cars arrived on December 17, 2021; all train stations are still incomplete.
14. MRT 4 Monorail System ○ N. Domingo St., QC to Diversion Road, Taytay Rizal (15.56 kms)	Planning stage	Approved by the NEDA Board on January 28, 2020; contract awarded on October 2021 to a Spanish company to conduct detailed architecture and engineering design services.
15. Fort Bonifacio-Makati Skytrain: ○ Uptown BGC to EDSA Guadalupe (1.873 kms)	Planning stage	Undergoing NEDA-ICC review; awaiting proponent response on DOTr evaluation as of June 2022.

Source: Patalinghug (2020); Author's updates up to June 2022

The LRT-2 East Extension Project (Four (4) kilometers and two (2) stations from Santolan, Pasig City to Masinag, Antipolo City) was implemented in 2010 and hereafter faced a series of delays. The



previous administration divided the extension project into three separate contracts, implying that three separate and lengthy bidding and procurement processes were then done as a result. Package 1 covered civil works, Package 2 dealt with train stations, and Package 3 took care of laying the railway tracks and the installation of the electromechanical (e.g., signaling) system (Patalinghug, 2020). Under the Duterte administration, groundbreaking ceremonies were held on May 29, 2017, but Phase 3 only started on April 15, 2019. Construction was finally completed in June 2021, and its inauguration occurred on July 1, 2021. On the other hand, the LRT-2 West Extension Project is still in the procurement stage of a Design and Build contractor.

The LRT-1, MRT-3, and MRT-7 Common Station, dubbed as “Unified Grand Central Station”, had its groundbreaking ceremonies on September 29, 2017 (Patalinghug, 2020). Actual construction started on May 7, 2018. This project was originally slated to be completed in December 2020. Area A, hosting the LRT-1 and MRT-3 stations, is 70% complete. Area B, which is the designated Atrium is 100% complete. The contract for the construction of the link between LRT-1 and MRT-3 was signed on February 13, 2019. But Area C, hosting the MRT-7 station, has not even started construction. Area A and Area B were targeted to be operational by December 2022. However, the entire project remains uncompleted as of end of June 2022.

The PhP22 billion MRT-3 Rehabilitation Project was turned over to a team composed of Sumitomo Corporation, Mitsubishi Heavy Industries, and the latter’s subsidiary, TES Philippines (TESP) (Patalinghug, 2020) on April 30, 2019. The project, which was originally scheduled for 43 months, experienced a congressional delay in the approval of the 2019 budget, moving the start of the actual rehabilitation work to July 2019. The project was completed on March 22, 2022.

After its ceremonial groundbreaking on January 5, 2018, construction of the Tutuban to Malolos Railway Project (PNR Clark Phase 1) began on February 15, 2019 (Patalinghug, 2020). DOTr claims it is now 45.8% complete. The structural work of the Balagtas Station is 100% complete as of April 22, 2022. On the other hand, the Malolos to Clark Railway Project (PNR Clark Phase 2) had its ceremonial groundbreaking on October 18, 2017. But it was only on October 2020 when all contracts in five (5) separate packages to a consortium of foreign and domestic construction firms were awarded. DOTr claims that this project was 28.8% complete as of June 2022. The Tutuban to Calamba City Railway Project (PNR Clark Phase 3) has conducted the bidding for six (6) contracts on July 22, 2021, attracting 34 bids from 17 foreign and six local construction companies. These contracts cover the procurement of contracting services for civil works, rolling stocks, and electromechanical systems. The contracts were awarded under the new Marcos Jr. Administration. Right-of-way acquisition activities are ongoing, and construction has started.

The Metro Manila Subway Project, which was originally targeted for partial operation in 2022, is now delayed by at least six years. Full operations are estimated to be in 2029. The civil works contract was awarded in November 2018, while rolling stock contract was awarded in December 2020, and the electromechanical systems contract in October 2021. The lowering of the tunnel boring machine scheduled for the second quarter of 2022 finally occurred on January 9, 2023. DPWH is concerned about the structures and developments that will be hit by the subway alignment, while significant right-of-way problems are also delaying the project.

For the proposed Subic to Clark cargo railway, DOTr has issued a Notice of Award to China Harbour Engineering Company (CHEC) on December 29, 2020. Contract signing between DOTr and CHEC for engineering, procurement, construction, and commissioning (EPCC) turnkey contractor occurred on January 28, 2021. However, after a series of talks and meetings with various affected stakeholders, the Department of Finance (DOF) stopped the loan negotiation with China, which was supposed to be the ODA financier of the project, on June 2022.

Another Chinese ODA-supported project, the Tutuban to Sorsogon Railway Project (PNR South Long Haul or PNR Bicol) is a planned 653-kilometer railway from Manila to Legazpi, Albay, with possibly extending even to Matnog, Sorsogon. DOTr and a joint venture of three companies (China Railway Group Limited, China Railway No. 3 Engineering Group Company Ltd, and China Railway Engineering Consulting Group Company, Ltd.) have signed a PhP142 billion contract on January 17, 2022 for Package 1 (the 380-km segment from Banlic, Calamba, Laguna to Daraga, Albay). The contract covers the design, construction, and electromechanical works for the project. As of this research, the loan negotiation between DOF and China has yet to be finalized.

Also planned to be financed by a Chinese ODA, the Phase 1 of the Mindanao Railway Project, which will span 102 kilometers connecting Tagum City, Davao City, and Digos City, is in the right-of-way acquisition activities stage. The project management consultancy contract was signed on October 20, 2021. As of this research, the negotiation between the Philippine and Chinese governments for ODA funding has yet to be finalized as well. However, China also did not submit a short list of contractors for this design-build railway contract.

The MRT-7 project broke ground in 2015 and started construction in April 2016. While the project got off the ground after the government provided a performance undertaking, the acquisition of land to locate the train depot was mired in litigation (Patalinghug, 2020). As of May 2022, DOTr estimated that the project is 62.1% complete. The viaduct from Quezon North Avenue Station (otherwise known as the Common Station) up to Quirino Station has been completed. Beyond Quirino Station, pillars to serve as the viaduct platforms remained to be constructed. In December 17, 2021, MRT-7 unveiled the first 18 of 108 train cars manufactured by South Korea's Hyundai Rotem. However, as of May 2022, no single station has been completed from the Unified Grand Central Station in North Avenue in Quezon City up to the last station in San Jose del Monte, Bulacan.

The MRT-4 project is a 15.5-kilometer monorail system that will run from N. Domingo Street in Quezon City to Diversion Road in Taytay, Rizal. It was approved by the NEDA Board on January 28, 2020. The contract for the detailed architecture, engineering and design consultancy was awarded to Idom Consulting, Engineering, Architecture, SA, a Spanish company, on October 1, 2021. As of this research, construction has not started, and the Marcos Jr. administration has changed the nature of MRT-4 from a monorail system to a light train system.

Lastly, the Fort Bonifacio-Makati Skytrain project is an unsolicited PPP project that uses the Automated People Mover (APM) technology to connect Bonifacio Global City Station and MRT-3 EDSA-Guadalupe Station. The project is currently under NEDA-ICC review, and was awaiting the proponent's response on the evaluation made by DOTr as of June 2022.

In summary, among the fifteen (15) railway BBB projects covered in this study, only two have been completed: (1) LRT-2 East Extension Project, and (2) MRT-3 Rehabilitation Project. Thus, the BBB railway portfolio is dominated by projects under construction, projects awarded, projects still waiting for financing closure, and projects waiting for government approvals (Patalinghug, 2020).

### **5.3 Airport-Related Projects**

Airport-related projects is another significant component of the BBB project. The status of ten (10) unsolicited PPP airport-related BBB projects is shown below (*See Table 9: Implementation Status of Unsolicited PPP Airport Projects*).

Table 9. Implementation Status of Unsolicited PPP Airport Projects

Project	Proponent(s)	Cost	Duration	Date of Approval of Original Proponent Status	Status
1. New Manila International Airport	SMC	PhP 735.6 B	50 years	2017	Approved by NEDA Board on December 21, 2018, hurdled the Swiss challenge on July 31, 2019, was given a Notice of Award by DOTr on August 14, 2019, and was given the Notice to Proceed on September 18, 2019. Construction ongoing.
2. NAIA Rehabilitation	- Ayala Corporation - Aboitiz Equity Ventures - Alliance Global Group - Filinvest Dev. Corp. - Asia Emerging Dragon - JG Summit Holdings, Inc. - Metro Pacific Investments Corp.	PhP 102 B	15 years	September 10, 2018	Approved by NEDA-ICC CabCom on September 27, 2019; and by NEDA Board on November 29, 2019 subject to a maximum 80-day negotiation period to finalize terms. Negotiations failed and DOTr revoked OPS on July 8, 2020.
3. Davao Int'l Airport	Chelsea Logistics Holdings Corporation	PhP 49.4 B	40 years	September 27, 2018	Approved by NEDA-ICC CabCom on December 20, 2019
4. Laguindingan Airport	Aboitiz Infra Capital, Inc.	PhP 53.8 B	35 years	February 26, 2019	Approved by NEDA-ICC CabCom on December 20, 2019
5. Bohol-Panglao Int'l Airport	Aboitiz Infra Capital, Inc.	PhP 27 B	25 years	September 3, 2018	Approved by the NEDA Board on November 29, 2019
6. Sangley Point Int'l Airport	Cavite Provincial Gov't	PhP 506 B	25 years	December 27, 2019	China Communications Construction Corp. (CCCC) and Lucio Tan's MacroAsia Corp. won the bidding on December 17, 2019 to build, develop, and expand the airport; the Cavite Provincial Govt granted the award on February 12, 2020, and canceled the award on January 27, 2021 for failure to submit pre-award requirements.
7. Iloilo Int'l Airport	Prime Asset Ventures, Inc. (Villar Group)	PhP 6.9B	25 years	May 31, 2019	Under review by NEDA-ICC CabCom
8. Puerto Princesa Airport	Prime Asset Ventures, Inc. (Villar Group)	PhP 4.5B	25 years	May 28, 2019	Under review by NEDA-ICC CabCom
9. Bacolod-Silay International Airport	Chelsea Logistics Holdings Corporation	PhP 11.72 B	40 years	November 11, 2019	Under review by NEDA -ICC CabCom
10. Kalibo International Airport	Megawide Construction Corp.	PhP 4.46 B	35 years	September 27, 2018	Under review by NEDA-ICC CabCom

Source: Patalinghug (2020); Author's updates up to June 2022

San Miguel Corporation's (SMC) proposal to build the New Manila International Airport in Bulacan, Bulacan received the original proponent status (OPS) in 2017 (Patalinghug, 2020). It was approved by the NEDA Board on April 26, 2018, subject to the resolution of pending issues involving the joint liability statement between San Miguel Holdings, Inc. (the proponent) and its parent company, San Miguel Corporation. It received the final NEDA Board approval on December 21, 2018, and hurdled the Swiss challenge on July 31, 2019. It was given the Notice of Award (NOA) on August 14, 2019 by DOTr, and the Notice to Proceed (NTP) on September 18, 2019 after DOTr and SMC signed the concession agreement. The project will build a new international airport on a 2,500-hectare property with modern terminal buildings, four (4) runways estimated to accommodate 100 million passengers per year, and an 8.4-kilometer expressway connecting the airport to the Marilao, Bulacan exit of the North Luzon Expressway (NLEX). In addition, the proponent promised to construct a multimillion-peso flood control project to mitigate the perennial flooding in Bulacan as a result of this project (Patalinghug, 2020). In October 2020, Congress passed the SMC Aerocity Law which granted the proponent a 50-year franchise, exemption from all direct and indirect taxes and fees during the 10-year construction development, establishment, and operations of the airport city, and exemption from income and real property taxes until it has fully recovered its investment cost.

The Ninoy Aquino International Airport (NAIA) Rehabilitation Project consortium obtained the approval of its OPS on September 10, 2018 (Patalinghug, 2020). The project will rehabilitate, upgrade, expand, and maintain NAIA for fifteen (15) years. It seeks to expand and interconnect the existing terminal buildings, upgrade its airside facilities, develop commercial facilities, increase airline and airport efficiencies, and enhance passenger comfort and experience. The NAIA Rehabilitation Project proponent is a consortium of seven (7) domestic conglomerates. In October 2018, the government asked the NAIA Rehabilitation Project proponent for additional revisions of its proposal, specifically stating that: (1) material adverse government actions (MAGA) provisions in the contract should not include local government, judiciary, and legislative branches of the government, and must pertain only to actions of the executive branch, and (2) the provision in the contract that states that the proponent will only start Phase 2 once the passenger service fee is adjusted from PhP550 to PhP750 is a condition which in effect is a guarantee on the part of the government. The revised proposal was accepted by the DOTr on May 1, 2019, and was later submitted to NEDA-ICC for review. However, the proposal was returned back to the proponent on July 2019 following a new requirement imposed by the DOTr that all unsolicited airport PPP projects must pattern the provisions of their concession agreements after that of the approved hybrid PPP project, the Clark International Airport (CIA) operation and maintenance (O&M) contract. The NAIA Rehabilitation Project proponent re-submitted to the DOTr its revised proposal which followed the CIA template in the latter part of July 2019. NEDA-ICC Cabinet Committee approved the proposal on September 27, 2019, and the NEDA Board, approved the proposal on November 29, 2019, subject to a maximum of 80-day negotiation period. The proponent was later engaged in negotiating the final terms of the proposal with DOTr in the early months of 2020, particularly on the possible relief from real property taxes imposed by the LGUs (Patalinghug, 2020). Unfortunately, MPIC, one of the domestic conglomerates, withdrew from the consortium in March 2020. The NAIA project proponent then submitted a revised proposal citing the negative impact of the COVID-19 pandemic on the aviation sector in the Philippines and abroad. When talks between the government and the proponent went into a deadlock, DOTr eventually revoked the OPS of the project proponent on July 8, 2020, hereby allowing the government to entertain other bidders. On July 15, 2020, the Manila International Airport Authority (MIAA) granted the Megawide-GMR joint venture the OPS for the project. However, NEDA-ICC raised questions on the financial capability of the Megawide-GMR joint venture to undertake the project. On December 15, 2020, the MIAA Board revoked the OPS granted earlier to the Megawide-GMR joint venture, but gave no reasons for this.

The construction of the 110,000-square meters Clark International Airport Passenger Terminal Building costing PhP9.36 billion was completed on September 30, 2020. The contractor, a joint venture of Megawide Construction Corporation and Indian conglomerate GMR, officially handed over the building to DOTr and the Bases Conversion and Development Authority (BCDA) on January 22, 2021 (Abadilla, 2021). DOTr and BCDA then turned over the operations and maintenance of the terminal to Luzon International Premier Airport Development (LIPAD), the 25-year operator of the Clark

International Airport.<sup>1</sup> The new terminal building can accommodate eight million passengers per year and started operations on May 2, 2022. The terminal features touchless passenger check-in and self-bag drop system.

The Bicol International Airport project covered the construction of a new international airport in Daraga, Albay that will replace the existing Legazpi Airport in Legazpi City. It has a 2,500-meter-long runway. Construction started in 2005 on a start-and-stop basis. It was finally completed on October 6, 2021. On the other hand, the Sangley Point Airport Rehabilitation Project included the construction of the passenger terminal building, two (2) hangar units, a fresh asphalt overlay of the runway, including shoulder grade correction, the re-blocking of the concrete pavement, the construction and rehabilitation of the seawall, and the construction of the drainage system. The project was completed on January 2020.

The General Santos Airport Development project covered the expansion of the apron, the construction of drainage system, and the expansion and rehabilitation of the existing passenger terminal building to increase its capacity from 800,000 to 2,000,000 passengers per year. The project was completed on September 23, 2021. On the other hand, the Central Mindanao Airport Development (M'lang Airport) project covered the upgrading and improvement of existing airport facilities (parking area, perimeter fence, taxiway, apron expansion and rehabilitation and expansion of passenger terminal building) to enhance safety and efficiency of planned turbo propeller aircraft operations. As of this research, the construction was ongoing at the end of the Duterte Administration.

In sum, none of the ten (10) unsolicited airport PPP projects has been completed during the 2016-2022 period. Only one, SMC's New Manila International Airport, has obtained all regulatory approvals. However, the government-funded smaller scale airport projects perform much better: Four out of the five projects examined are completed (Patalinghug, 2020).

#### 5.4 Roads, Bridges, Highways, and Tollways

The implementation status of twelve (12) roads, bridges, highways and tollways projects are shown below (*Table 10: Status of Roads, Bridges, Highways and Tollways Projects*). The most prominent is the Metro Manila Skyway Phase 3 stretches from Buendia, Makati City to Balintawak, Quezon City (Patalinghug, 2020). The project was approved on December 23, 2013 but actual construction only started on April 2014 in four segments: (1) Buendia to Plaza Dilao, (2) Plaza Dilao to Aurora Boulevard, (3) Aurora Boulevard to Quezon Avenue, and (4) Quezon Avenue to Balintawak (Patalinghug, 2020). Segment 1 was opened on July 22, 2019, while the rest were completed on December 29, 2020. The project was inaugurated on January 14, 2021. As of this research, some of the entry and exit ramps were still being constructed after inauguration.

**Table 10. Status of Roads, Bridges, Highways and Tollways Projects**

Project	Status
1. Metro Manila Skyway Phase 3 (17.93 km)	Completed on December 29, 2020
2. NLEX Harbor Spur Link Road (8.4 km)	
• Karuhatan, Valenzuela City to Caloocan Interchange in C3 Road (5.8 km)	Completed on February 28, 2019
• C3 Road, Caloocan City in Rio, Navotas City (2.6 km)	Completed on June 15, 2020
3. C5 South Link Expressway (7.7 kms.)	
• Cavite R1 Interchange to Sucat Interchange	Under construction
• Sucat Interchange to E. Rodriguez	Completed August 14, 2022
• E. Rodriguez to Merville	Completed July 16, 2022
• Merville to C5 Road	Completed on July 23, 2019

<sup>1</sup> LIPAD is a consortium composed of Filinvest Development Corporation, JG Summit Holdings Inc., Philippine Airport Ground Support Solutions Inc., and Changi Airports Philippines Pte. Ltd.

Project	Status
4. Tarlac – Pangasinan – La Union Expressway (88.85 kms) <ul style="list-style-type: none"> <li>• Tarlac City to Pozorrubio, Pangasinan (77.4 kms)</li> <li>• Pozorrubio, Pangasinan to Rosario, La Union (11.45 kms)</li> </ul>	Completed in 2017 Completed on July 15, 2020
5. Southern Luzon Expressway Toll Road 4 (66.74 kms) <ul style="list-style-type: none"> <li>• Sto. Tomas, Batangas to Lucena City, Quezon</li> </ul>	Seventh groundbreaking on March 26, 2019 Ongoing construction and ROW acquisition
6. Cavite – Laguna Expressway (45 kms) <ul style="list-style-type: none"> <li>• Cavite Section</li> <li>• Laguna Section</li> </ul>	Started on March 27, 2019 Started in July 2017; the segment from SLEX Mamplasan Interchange in Biñan City, Laguna to Silang, East Interchange (14.24kms) opened for operation on August 24, 2021.
7. BGC – Ortigas Center Road Link (1.4 kms)	Completed on September 30, 2021
8. North South Connector Road (8 kms) <ul style="list-style-type: none"> <li>• Grace Park, Caloocan City to España St. Manila (5 kms)</li> <li>• España St., Manila to PUP Sta. Mesa, Manila (3 kms)</li> </ul>	Groundbreaking on March 1, 2019 Completed on March 27, 2023 Completed on October 28, 2023.
9. Southeast Metro Manila Expressway (32.7 kms) <ul style="list-style-type: none"> <li>• FTI, Taguig City to Batasan, Quezon City</li> </ul>	Construction ongoing on C5 Road; ROW acquisition ongoing
10. China Grant Bridges <ul style="list-style-type: none"> <li>• Estrella – Pantaleon Bridge (506 meters)</li> <li>• Binondo – Intramuros Bridge (680 meters)</li> </ul>	Completed on July 29, 2021 Completed on April 5, 2022
11. Panguil Bay Bridge (3.169 kms) <ul style="list-style-type: none"> <li>• To connect Tangub City, Misamis Occidental and Tubod, Lanao del Norte</li> </ul>	Groundbreaking on November 28, 2018; construction started in 2021. 69% complete as of June 2023.
12. Central Luzon Link Expressway (66.4 kms) <ul style="list-style-type: none"> <li>• Tarlac City to Cabanatuan City (Phase 1, 30.7kms)</li> <li>• Cabanatuan to San Jose City (Phase 2, 35.7 kms.)</li> </ul>	Target completion: Partially completed on July 15, 2021 the 18-km segment from Tarlac City to Aliaga, Nueva Ecija. Pipeline stage.

Source: Patalinghug (2020); Author's updates up to June 2022.

The Karuhatan, Valenzuela to Caloocan Interchange in the C3 Road segment of the NLEX Harbor Spur Link Road was completed on February 28, 2019 (Patalinghug, 2020), while the shorter segment from C3 Road in Caloocan City to R10 in Navotas City was completed on June 15, 2020. Right-of-way problems proved to be a significant challenge. On the other hand, the C5 South Link Expressway Project (otherwise known as the Manila Cavite Toll Expressway Project) is a 7.7-kilometer seven-lane expressway from R1 Expressway to SLEX/C5. The Merville to C5 Road segment was completed on July 23, 2019, the E. Rodriguez to Merville segment was completed on July 16, 2022, and the Sucat Interchange to E. Rodriguez segment was completed on August 14, 2022. As of this research, the only segment that is yet to be completed runs from Cavite R1 Interchange to the Sucat Interchange.

The Tarlac-Pangasinan-La Union Expressway (TPLEX) from Tarlac City to Rosario, La Union started construction in 2011, and opened progressively in phases in 2013, 2014, 2016, 2017, and 2020. The Pozorrubio, Pangasinan to Rosario, La Union segment was completed on July 15, 2020, while the Sison Toll Plaza was completed on October 2020. On the other hand, the Southern Luzon Expressway Toll Road 4 (TR4) project that is planned to run from Sto. Tomas, Batangas to Lucena City, Quezon has undergone seven groundbreaking ceremonies, with the last one on March 26, 2019. As of this research, both construction and right-of-way acquisition activities are ongoing.

The Cavite-Laguna Expressway (CALAX) project started the construction of the Laguna section on July 2017 and the Cavite section on March 2019. The segment from SLEX Mamplasan Interchange in Binan City, Laguna to Tagaytay City-Santa Rosa Interchange was opened for operation on December 23, 2019 (Patalinghug, 2020). The segment from Tagaytay City-Santa Rosa Interchange to Silang East Interchange was opened on August 24, 2021. So far, only 14.24 kilometers of the 45-kilometer tollway have been completed. The completion of the Silang-Aguinaldo Interchange was delayed because a

critical portion of the interchange (covering some 450 meters) was withheld by the land owner who asked for a settlement value four times the value appraised by the government. It was finally completed on February 10, 2024. As of this research, the remaining 27.2-km of the 44.6-km project remains to be completed due to right-of-way acquisition problems.

The BGC-Ortigas Center Road Link connects Lawton Avenue in Makati City and Sta. Monica Street in Pasig City. It is comprised of four-lane bridge across Pasig River connecting Makati City and Pasig City and two-lane viaduct structure traversing Lawton Avenue up to the entrance of Bonifacio Global City in Taguig. The project was completed on September 30, 2021. On the other hand, the North-South Connector Road project is an eight-kilometer elevated expressway extending NLEX from the end of Segment 10 in C3 Road, Caloocan City to PUP Sta. Mesa, Manila and connecting to the Skyway Stage 3. The five-kilometer segment from Grace Park, Caloocan City to Espana Street, Manila was completed on March 27, 2023, while the three-kilometer segment from Espana Street, Manila to PUP Sta. Mesa was completed on October 28, 2023. Furthermore, as of this research, the Southeast Metro Manila Expressway (C6) project which will cover a 32.7-kilometer toll road from Skyway FTI in Taguig City to Batasan Complex in Quezon City is still ongoing, particularly on the C5 Road (Section 1B), while right-of-way acquisition activities for the other sections are also ongoing.

The two bridges crossing Pasig River in Metro Manila funded by a grant from the People's Republic of China have been completed. The 506-meter Estrella-Pantaleon Bridge in Makati City was completed on July 29, 2021, and the 680-meter Binondo-Intramuros Bridge in the City of Manila was completed on April 5, 2022. On the other hand, the Panguil Bay Bridge is a 3.169-kilometer bridge that will connect Tangub City in Misamis Occidental to Tubod, Lanao del Norte. It is financed by South Korean ODA. The groundbreaking was held on November 28, 2018, but actual construction started in 2021. As of May 2023, construction was 63% complete. Furthermore, the Central Luzon Link Expressway (CLLEX) Phase 1 is a 30.7-kilometer expressway from Tarlac City to Cabanatuan City funded by Japanese ODA. The target completion of July 2021 was missed. As of this research, the 18-kilometer segment from Tarlac City to Aliaga, Nueva Ecija was completed on July 15, 2021.

In sum, among the twelve (12) selected BBB projects in roads, bridges, highways, and tollways that this study monitored, five (5) were completed before June 30, 2022 or 42% completion rate (Patalinghug, 2020).

## 6 Analysis of Program Impact

The previous sections have provided an overview of the literature on the effect of infrastructure on growth, identified the study's conceptual framework, described the infrastructure situation in the Philippines, and provided a qualitative analysis and monitoring of various BBB projects. To support these initial assessments, this research now turns to analyze the impact of the infrastructure program on the economy.

A quantitative analysis of the BBB program performance requires a measure to link the impact of the BBB program on the economy. The study's approach is to measure the correlation between the cost of the completed project and the Gross Regional Domestic Product (GRDP) of the region where the project is located. This method was used in the studies described earlier in the conceptual framework section. ADB (2017) has shown that there is a positive correlation between GDP per capita and indicators of infrastructure. The government is using infrastructure spending to stimulate the economy. The BBB's projected job generation is 1.2 million per year for the 2017-2022 period, but actual job generation only averaged 313,000 per year (Cuenca, 2020). The strength of the effect of infrastructure on output is also linked to the efficiency of infrastructure investment. Thus, also in line with what previous research has suggested, measures of investment efficiency are generated to supplement the correlation coefficients. This study utilizes two investment efficiency indicators: (1) incremental capital-output ratio or ICOR, and (2) investment efficiency index. ICOR indicates how much investment is required to generate one unit of output. And investment efficiency index indicates how efficiently infrastructure investments are converted into infrastructure stocks.

As earlier presented in Table 4, the list of completed BBB projects was categorized by mode of financing and by region. The list includes projects started by the previous government, but completed and inaugurated under the Duterte Administration. A correlation analysis of project cost and GRDP

among the completed BBB projects shows higher correlation coefficients for ODA-financed and GAA-financed projects compared to the correlation coefficient for all projects (*See Table 11: Correlation Between Project Cost and Gross Regional Domestic Product (GRDP)*). In the work of Jimenez and Willis (2012), they interpret the higher correlation coefficient of all projects relative to the correlation coefficients of its components as a reflection of the synergistic effect of the different infrastructure projects on the economy. The empirical findings in this present research do not indicate a synergistic effect. One possible explanation is that the completed BBB projects are dominated by more doable but low-impact projects. Another explanation is that BBB projects have greater impact on future output than on current output. Both are possible. These explanations can only be verified when complete time-series data on infrastructure capital stocks by sectors and regions are available in the future.

**Table 11. Correlation Between Project Cost and Gross Regional Domestic Product (GRDP)**

Category	Correlation Coefficient <sup>a</sup>	Correlation Coefficient <sup>b</sup>
All Projects	0.16	0.15
PPP Projects	-0.05	-0.58
ODA Projects	0.51	0.69
GAA Projects	0.25	0.46
Airport Projects	0.20	0.14
Road/Bridge Projects	0.01	0.12

<sup>a</sup> Based on absolute values of cost and GRDP;

<sup>b</sup> based on logarithmic transformations of normalized values of project cost and GRDP. GAA refers to General Appropriations Act, ODA to Official Development Assistance, and PPP to Public-Private Partnership

Source: Author's estimates

Further investigation behind this overall low correlation coefficient necessitates an estimate of the incremental capital-output ratio (ICOR). The results show the ICOR estimates for the 2016-2022 period (*Table 12: GDP Growth, Investment Ratio, and ICOR: 2016-2022*). It indicates very high ICOR values averaging approximately a value of 4.0 for the period (the negative ICOR value for 2020 is due to the negative GDP growth in 2020 caused by the pandemic). This suggests a least efficient public investment program because, as the results show, it requires an investment that is four times the value of output.

**Table 12. GDP Growth, Investment Ratio, and ICOR: 2016-2022**

Year	2016	2017	2018	2019	2020	2021	2022
GDP Growth Rate	7.6%	6.9%	6.3%	6.1%	-9.5%	5.7%	7.6%
Investment Ratio	24.84%	25.69%	27.28%	26.70%	21.46%	22.29%	22.85%
ICOR	3.27	3.72	4.33	4.38	-2.26	3.91	3.01

Notes: Author's estimates. Incremental Capital-Output Ratio (ICOR) is equal to the investment ratio divided by the GDP growth rate

Source of Basic Data: Philippine Statistics Authority

Finally, we can compare the infrastructure investment efficiency of the Philippines relative to its Asian neighbors. This is done by computing their respective investment efficiency indices (*Table 13: Infrastructure Investment Efficiency in Selected Asian Countries*). Hong Kong has an efficiency index of 1.0. This implies that in Hong Kong, a \$1 investment in infrastructure will produce \$1 worth of infrastructure stock. Hong Kong, Singapore, and South Korea have approximately the same value of the efficiency index. On the other hand, the Philippines' efficiency index of 0.37 is below the median among the countries listed. An infrastructure investment of \$1 in the Philippines will create an infrastructure stock worth at most \$0.40. This investment efficiency (or inefficiency) has not improved during the duration of the BBB program as indicated by the ICOR values for the period. The Philippine experience under the BBB program fits the experience of low-income economies which were unable to convert dollar spending into productive capital stocks. The experience of South Korea is noteworthy. In its early stage of development, its infrastructure spending program delivered a lot of infrastructure



stocks, despite investing a relatively small share of its GDP. The explanation behind South Korea's performance is that its program was targeted to support the government's goal of creating an export-oriented economy. Power projects were prioritized to supply electricity to the manufacturing sector. New expressways were built and ports were expanded to provide reliable and low-cost logistics to support export production centers and industrial complexes (Abiad, et al., 2020). In contrast, the BBB program emphasized raising infrastructure spending as a share of GDP, rather than the creation of more capital stock for a given share of GDP in the infrastructure spending. Second, the project appraisal and selection processes are less rigorous. In fact, IMF (2019) has suggested that an independent review of the feasibility studies of large projects could be considered. Third, the common obstacles in project implementation stem from various forms of incomplete project preparation that lead to delays and cost overruns. Right-of-way acquisition and resettlement issues should be addressed during pre-implementation stage, and not later on. Lastly, the Philippines is on the cusp of transitioning from a lower-middle-income to an upper-middle-income country, and it is simultaneously building both basic and advanced infrastructures. There is a need to have a sectoral balance in the portfolio of infrastructure projects, other than the transport sector projects. While the 2020 revisions to the BBB list included 10 ICT projects, the infrastructure program must include social infrastructure projects (e.g. school buildings and health facilities) and technology adoption and innovation (R&D institutes, broadband network) projects to align with the PDP targets (Cuenca, 2020).

**Table 13. Infrastructure Investment Efficiency in Selected Asian Countries**

Country	Efficiency Index
Hong Kong	1.00
Singapore	0.99
South Korea	0.95
China	0.68
India	0.60
Malaysia	0.50
Vietnam	0.40
Thailand	0.38
Philippines	0.37
Indonesia	0.37
Cambodia	0.20

Notes: Efficiency index measures how efficiently infrastructure investments are converted into infrastructure stocks. The index is a composite of transport, energy, and ICT infrastructures.

Source: Abiad, Hasan, Jiang, and Patalinghug (2020).

## 7 Conclusion and Recommendations

The scope of the BBB program has changed over time. It started with an original list of 75 big-ticket projects. It was increased to 100 "less ambitious and more doable" projects in 2019 (Patalinghug, 2020, p.33). Some of the projects contained in the original list of 75 flagship projects were shelved because they were no longer doable due to prohibitive cost or non-availability of technologies (Patalinghug, 2020). In September 2020, the BBB list of projects was increased to 104 projects, and in May 2021, it was increased to 112 projects. These changes alone present some initial indicators as to the overall performance of the BBB program.

This study likewise examines the gap between actual and targeted infrastructure expenditures, and found below-targeted performance of the BBB program that can be attributed to weak absorptive capacity of the infrastructure implementing agencies. This observation is reinforced by the low disbursement-to-appropriations ratios of the infrastructure implementing agencies. A project-level investigation of the BBB program has produced the following insights: (i) Among the fifteen (15) railway BBB projects examined by the study, only two have been completed. The railway BBB portfolio

is dominated by projects under construction, projects awarded, projects still waiting for financing closure, and projects waiting for government approval. (ii) Among the ten (10) unsolicited airport PPP projects, none has been completed and only one has obtained all regulatory approvals. However, the government-funded small-scale airport projects had an 80% completion rate. And (iii) among the twelve (12) selected BBB projects in roads, bridges, highways, and tollways, five were completed, for a completion rate of 42%. These figures present a second set of indicators that provides complementary and corroborative means to make an assessment of the BBB program.

Our quantitative analysis of the impact of the BBB program points to the following conclusion: (1) the correlation between BBB projects and regional output is low, implying lack of synergistic effects. However, the available data is not able to verify whether this is due to substitution of high-impact projects with low-impact projects, whether BBB projects have greater long-run output effects than short-run output effects, or both; (2) a look at the public investment efficiency indicator reveals a relatively high ICOR value of 4.0 during the BBB period, implying a high investment is needed to generate one unit of output; and (3) the Philippines' investment efficiency index is far below the indices of Asia's top performing countries. The BBB program is implemented under this environment. However, there is definitely room for improvement in the efficiency of Philippine infrastructure investment, as pointed out by Komatsuzaki (2019).

On the other hand, "the BBB program can be considered incredibly successful in terms of achieving an all-time high public spending on infrastructure" (Patalinghug, 2020, p.36). While it can be said that the Duterte Administration is a better implementer of infrastructure projects compared to past administrations, its impact on long-run output and employment remains to be verified by future researchers, especially when relevant data become available. Moreover, if evaluated in terms of performance versus its target, the BBB program fails expectations. A comparison of the budget versus actual disbursements of the infrastructure implementing agencies shows that actual expenditures are far below programmed expenditures due to a plethora of institutional weaknesses, as documented in each of these infrastructure projects.

The lessons that can be learned from the experiences of countries which embarked on "big push" infrastructure programs are : (1) the expected gains from coordinated infrastructure programs can be smoothly attained if absorptive capacity exists, (2) reaping the benefits of greater investments in infrastructure requires an improvement in investment efficiency, and (3) private participation in infrastructure can increase efficiency and bring expertise but possible risks that can occur must be understood in order to determine the appropriate regulatory framework (Presbitero, 2016 and Patalinghug, 2017). Moreover, World Bank (2009) has stressed that the credibility of the national planning processes with regard to transport infrastructure can be improved. Since the capacity to assess investment projects from the line agencies is limited, there is a need to improve the quality of project proposals and the undertaking of proper cost-benefit and technical analysis of projects on a routine basis.

The recommendations of the paper are as follows: (1) Streamline the approval process for major infrastructure projects, (2) Improve project appraisal and selection process by requiring an independent review of the feasibility studies of large infrastructure projects, (3) Improve infrastructure project management by settling right-of-way acquisition and resettlement issues during the pre-implementation stage, and (4) broaden the sectoral composition of priority infrastructure projects.

**Annex A**  
**List of Shelved Projects From 2020 BBB List**

1. Sangley Point International Airport
2. New Dumaguete Airport
3. New Zamboanga International Airport
4. Bataan-Cavite Interlink Bridge
5. Dalton Pass East Alignment Alternative Road Project
6. Panay River Basin Integrated Development Program
7. Kabulnan-2 Multipurpose Irrigation and Power Project
8. Kanan Dam Project
9. Cebu-Bohol Link Bridge
10. Leyte-Surigao Link Bridge
11. Sorsogon-Samar Link Bridge
12. Bohol-Leyte Link Bridge
13. Negros-Cebu Link Bridge

Source: NEDA (2021a)

**Annex B**  
**List of New Projects Included in the Revised BBB List**

1. General Santos Airport
2. NLEX Harbor Link Extension to Anda Circle
3. National Irrigation Sector Rehabilitation and Improvement Project
4. Balog-Balog Multipurpose Project Phase II (Tarlac)
5. Jalaur River Multipurpose Project – Stage II (Iloilo)
6. Lower Angat River Irrigation System Improvement Project (Pangasinan)
7. Water District Development Sector Projects
8. National Broadband Program
9. ICT Capability Development and Management Program
10. LTO Central Command Center
11. Motor Vehicle Recognition and Enhancement System
12. Virology Science and Technology Institute of the Philippines
13. New Manila Logistics Network: Pasig River and Manggahan Floodway Bridges Projects
  - a. J.P. Rizal-Lopez Jaena Bridge (Marikina River)
  - b. J.P. Rizal-St. Mary Bridge (Marikina River)
  - c. Marikina-Vista Real Bridge (Marikina River)

Source: NEDA (2021a)

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