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Report No: ICR00004011

IMPLEMENTATION COMPLETION AND RESULTS REPORT
IDA-43470 / TF-58293

ON A

CREDIT

IN THE AMOUNT OF SDR 101.8 MILLION
(US\$ 155.21 MILLION EQUIVALENT)

AND A

GRANT

IN THE AMOUNT OF US\$9.8 MILLION

TO THE

SOCIALIST REPUBLIC OF VIETNAM

FOR THE

HANOI URBAN TRANSPORT DEVELOPMENT PROJECT (P083581)

January 18, 2018

Transport and ICT Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS AT ICR
(Exchange Rate Effective September 27, 2017)

Currency Unit = Vietnamese Dong (VnD)

VnD22,730 = US\$1

US\$ 1.41076 = SDR 1

CURRENCY EQUIVALENTS AT APPRAISAL
(Exchange Rate Effective April 30, 2007)

Currency Unit = Vietnamese Dong (VnD)

VnD16,000 = US\$1

US\$ 1.52493 = SDR 1

FISCAL YEAR
January 1–December 31

ABBREVIATIONS AND ACRONYMS

BRT	Bus Rapid Transit
CMU	Country Management Unit
CPS	Country Partnership Strategy
DAPM	Department of Architecture and Planning Management
DOT	Department of Transport
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMP	Environment Management Plan
FM	Financial Management
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GOV	Government of Vietnam
HCMC	Ho Chi Minh City
HPC	Hanoi People's Committee
ICR	Implementation Completion and Results Report
IEMC	Independent Environmental Monitoring Consultant
IRR	Internal Rate of Return
ISR	Implementation Status and Results Report
ITS	Intelligent Transport Systems
LRT	Light Rail Transit
M&E	Monitoring and Evaluation
MMPTC	Multimodal Public Transport Committee
MTR	Midterm Review

NMT	Non-motorized Transport
NPV	Net Present Value
O&M	Operation and Maintenance
PAD	Project Appraisal Document
PAH	Project Affected Household
PDO	Project Development Objective
PMU	Project Management Unit
PPIAF	Public-Private Infrastructure Advisory Facility
PTA	Public Transport Authority
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RR2	Second Ring Road
TA	Technical Assistance
TRAMOC	Hanoi Urban Transport Management and Operation Center
TRANSERCO	Hanoi Transport and Services Corporation
UTIP	Urban Transport Improvement Project
VOC	Vehicle Operating Cost
VOT	Value of Time

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P083581	HANOI URBAN TRANSPORT DEVELOPMENT PROJECT (P083581)
Country	Financing Instrument
Vietnam	Specific Investment Loan
Original EA Category	Revised EA Category

Related Projects

Relationship	Project	Approval	Product Line
Supplement	P085393-Hanoi Urban Transport Development Project GEF component	11-Sep-2007	Global Environment Project

Organizations

Borrower	Implementing Agency
Hanoi People Committee	Hanoi Urban Transport Development Project Management Unit

Project Development Objective (PDO)

Original PDO

The development objective of the IDA Credit is to increase urban mobility in targeted areas in Hanoi by (i) increasing the use of public transport in two existing and one new corridors; and (ii) reducing travel times by all modes between the city center and the west and northwest sections of the city (west of West Lake).



PDO as stated in the legal agreement

The objectives of the Project are to: (i) increase urban mobility in targeted areas of the City of Hanoi through increased use of public transport in selected traffic corridors and reduced travel time between the center and the west and northwest sections of Hanoi; and (ii) promote more environmentally sustainable transport modes and urban development plans for Hanoi.

FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
World Bank Financing			
P083581 IDA-43470	155,210,000	115,901,593	107,388,341
P085393 TF-58293	9,800,000	6,422,455	6,422,455
Total	165,010,000	122,324,048	113,810,796
Non-World Bank Financing			
Borrower	139,680,000	329,300,000	181,409,261
Total	139,680,000	329,300,000	181,409,261
Total Project Cost	304,690,000	451,624,048	295,220,057

KEY DATES

Project	Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
P083581	03-Jul-2007	22-Apr-2008	07-Jun-2012	31-Dec-2013	31-Dec-2016
P085393	11-Sep-2007	22-Nov-2007		31-Dec-2013	31-Dec-2016



RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
06-Nov-2013	44.82	Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Change in Financing Plan Reallocation between Disbursement Categories Change in Implementation Schedule
11-Jun-2015	70.14	Change in Loan Closing Date(s) Change in Implementation Schedule
29-Dec-2016	94.47	Reallocation between Disbursement Categories

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Moderately Satisfactory	Moderately Satisfactory	Modest

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	02-Jun-2008	Moderately Satisfactory	Moderately Satisfactory	3.48
02	22-Jun-2009	Moderately Unsatisfactory	Moderately Unsatisfactory	7.12
03	14-Jan-2010	Moderately Unsatisfactory	Moderately Unsatisfactory	8.08
04	12-Nov-2010	Moderately Unsatisfactory	Moderately Unsatisfactory	12.59
05	27-Jun-2011	Moderately Unsatisfactory	Moderately Unsatisfactory	14.82
06	23-Dec-2011	Moderately Unsatisfactory	Moderately Unsatisfactory	18.54
07	27-May-2012	Moderately Unsatisfactory	Moderately Unsatisfactory	21.82
08	27-Oct-2012	Unsatisfactory	Moderately Unsatisfactory	25.93
09	25-Jun-2013	Unsatisfactory	Moderately Unsatisfactory	36.98



10	25-Feb-2014	Moderately Unsatisfactory	Moderately Unsatisfactory	48.68
11	28-Oct-2014	Moderately Unsatisfactory	Moderately Unsatisfactory	60.04
12	24-Feb-2015	Moderately Unsatisfactory	Moderately Unsatisfactory	65.55
13	17-Jun-2015	Satisfactory	Moderately Satisfactory	70.14
14	11-Dec-2015	Moderately Satisfactory	Moderately Satisfactory	77.06
15	28-Jun-2016	Moderately Satisfactory	Moderately Satisfactory	86.25
16	28-Dec-2016	Moderately Satisfactory	Moderately Satisfactory	107.39

SECTORS AND THEMES

Sectors

Major Sector/Sector (%)

Public Administration 4

Sub-National Government 4

Social Protection 12

Social Protection 12

Transportation 84

Urban Transport 84

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)

Private Sector Development 10

Public Private Partnerships 10

Public Sector Management 20

Public Administration 20

Administrative and Civil Service Reform 6

Municipal Institution Building 14



Social Development and Protection	20
Social Inclusion	18
Other Excluded Groups	18
Fragility, Conflict and Violence	2
Forced Displacement	2
Urban and Rural Development	40
Urban Development	40
Urban Infrastructure and Service Delivery	40
Environment and Natural Resource Management	21
Environmental Health and Pollution Management	21
Air quality management	7
Water Pollution	7
Soil Pollution	7

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. At the time of project preparation around 2005, Hanoi, Vietnam's capital and key economic center of the country's north, was a booming city of over 5 million people. It was also one of the most densely populated urban areas in the world. With population and income expected to continue rising, motorization levels were expected to accelerate.
2. Hanoi's motorization is characterized by the dominance of motorcycles, a symbol of high personal mobility amid rapidly rising incomes. Almost 2 million motorcycles were making 60 percent of all trips in the city. The city's efforts to curb motorization either failed (for example, restriction on motor vehicle ownership) or were not in place (for example, parking was cheap and plentiful, gasoline price was among the world's lowest). On the other hand, the supply of mobility services was poor. Occupying less than 7 percent of the land area, the road network of Hanoi was exceptionally sparse. Road infrastructure was lacking to provide access especially to the less developed areas, for example, in the north and northwest of the city, where the city envisioned to accommodate future urban growth. The public transport system was underdeveloped with only buses, transporting less than 10 percent of the total trips in the city. Furthermore, traffic management was still nascent. Most intersections were not signalized. Although some progress was made in part through the support of the World Bank-financed Urban Transport Improvement Project (UTIP) (P004833) completed shortly before, residents in Hanoi had been slow to accept basic traffic rules. Congestion was already becoming a critical problem in the city. Traffic was in general unorderedly and sometimes chaotic at intersections, posing safety concerns especially for vulnerable groups such as women, children, elderly, and long-distance motorists.
3. As Hanoi was transforming itself into a major metropolis, the city saw the need to build capacity for all the institutions engaged in managing the urban environment. In the public transport sector, the city was in the process of a major reform in bus operations and management. Partly as a result of a study financed by the Public-Private Infrastructure Advisory Facility (PPIAF), Hanoi franchised six new bus routes to two private operators chosen by competitive tender, ending the monopoly of Hanoi Transport and Services Corporation (TRANSERCO), a state-owned enterprise. As the concession process was extended to other routes, and with proposals of new public transport modes including urban rail, Hanoi saw the need for setting up a strong regulatory and planning authority to manage all public transport issues. The city also recognized the need to enhance its institutions and infrastructure for air quality monitoring and management.
4. Given its international experiences and good working relationship with Hanoi in the urban transport sector since the early 1990s (especially the UTIP that supported traffic management investments and institutions in Hanoi and Ho Chi Minh City [HCMC] and the PPIAF-financed bus sector reform), the World Bank was well positioned to support Hanoi at this critical juncture of rapid motorization. With the ambition to transform its urban transport sector, the City of Hanoi and the World Bank proposed this project with comprehensive interventions in public transport, road infrastructure, and institutions. The project aimed to introduce the first mass rapid transit system, a Bus Rapid Transit (BRT)

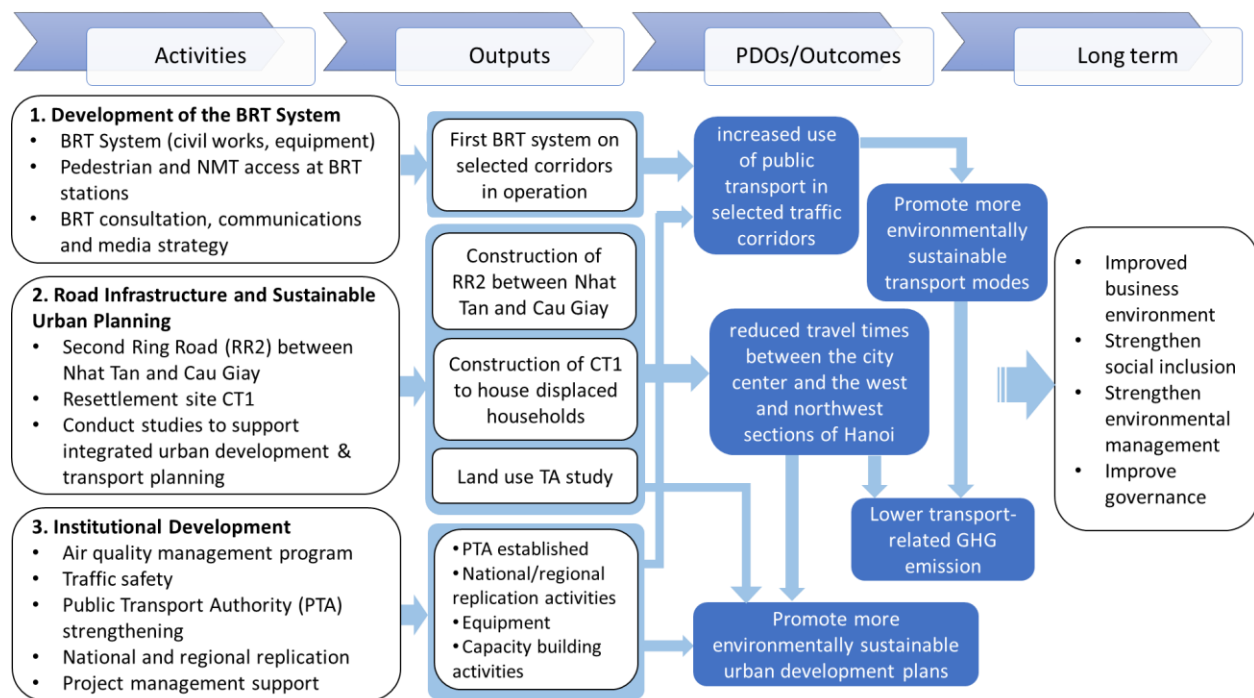


system to Hanoi, to demonstrate meeting increasing demand with high capacity and quality public transport services. The project also proposed to construct a critical section of road infrastructure to improve access to the less developed areas and to facilitate environmentally sustainable urbanization of Hanoi. The institution component included capacity building in transport and planning/implementation institutions for air quality, traffic safety, and public transport authority (PTA). The design was consistent with the World Bank’s global urban transport strategy and Vietnam’s infrastructure strategy.

5. This project was designed as a Specific Investment Loan with a Global Environmental Facility (GEF) co-financing a set of initiatives that either would reduce barriers to implementation of the project or maximize its global environmental benefits. The project was consistent with the GEF Operational Program 11’s objective ‘Promoting Environmentally Sustainable Transport’ and the GEF climate change strategic priority related to sustainable transport. The BRT system proposed in this project would be the first such system financed by the World Bank in Asia and would have the potential to be a high-profile demonstration for bus-based mass rapid transit in the region.

Theory of Change (Results Chain)

Figure 1. Theory of Change (Results Chain)



6. Figure 1 lays out how outputs from the project activities would lead to the project outcomes and long-term impacts. To realize this results chain, at project appraisal a number of assumptions were made, including: (a) continuous political commitment to implement the BRT; proper traffic management measures; enforcement of BRT restriction by traffic police; coordination with other transport modes including planned urban light rail, non-motorized transport (NMT), feeder services, and other bus services, and so on for the results chain of the BRT component; (b) no delay in resettlement and no delay or abandonment of the planned urbanization in the west and northwest of the city for the road infrastructure



and sustainable urban planning results chain; and (c) good coordination and political will to reform throughout project implementation for the results chain of institutional development. All components also assumed sufficient counterpart funding and solid financial management (FM) for project implementation. Overall risk at appraisal was rated Substantial.

Project Development Objectives (PDOs)

7. The objectives of the project as stated in the Legal Agreements were to: (a) increase urban mobility in targeted areas of the City of Hanoi through increased use of public transport in selected traffic corridors and reduced travel time between the center and the west and northwest sections of Hanoi and (b) promote more environmentally sustainable transport modes and urban development plans for Hanoi. This PDO statement is used for this report.

8. In the Project Appraisal Document (PAD), these objectives were broken into two parts. The development objective of the IDA credit was to increase urban mobility in targeted areas in Hanoi by (a) increasing the use of public transport in two existing corridors and one new corridor and (b) reducing travel times by all modes between the city center and the west and northwest sections of the city (west of West Lake). GEF strategic objectives were to promote a shift to more environmentally sustainable transport modes and urban development plans and to promote the replication of these approaches in the country and region. Its Global Environment Objective was to lower Hanoi's transport-related greenhouse gas (GHG) emissions relative to a business-as-usual scenario.

Key Expected Outcomes and Outcome Indicators

9. According to the PDO statement in the Legal Agreements, the key expected outcomes of this project were the following:

- (i) Increase urban mobility in targeted areas of the City of Hanoi, specifically (a) increased use of public transport in selected traffic corridors and (b) reduced travel time between the center and the west and northwest sections of Hanoi.
- (ii) Promote (a) more environmentally sustainable transport modes and (b) urban development plans for Hanoi.

10. According to the Results Framework in the original PAD, these outcomes would be measured by the following indicators: number of daily BRT/bus boardings and travel time by bus on the project corridors, modal shift to BRT, travel time by bus and motorcycles from Nhat Tan to Cau Giay (RR2), GHG emission reduction, and several other indicators to measure institutional development including land use planning and coordinated public transport plan, air quality management, and number of replication activities (see table 2 for details).

Components

11. The project, as designed at appraisal stage, had three major components: Development of the BRT System (BRT component), Road Infrastructure and Sustainable Urban Planning (RR2 component), and the Institutional Development component (see table 1). The estimated costs at appraisal as well as



the actual costs (including resettlement costs) at project closing are also listed with main reasons of cost variation by component.

Table 1. Estimated and Actual Costs by Component

Component	Activities	Estimated Costs (US\$, millions)	Actual Costs (US\$, millions)	Main Factors for Cost Variation
1. Development of the BRT System	BRT System (busway, stations, terminals, depots, BRT vehicles, ticketing system)	99.88	32.78	Two BRT routes reduced to one route due to overlapping Light Rail Transit (LRT) and metro line; electronic ticketing system contract was cancelled.
	Pedestrian and NMT access at BRT stations			
	BRT consultation, communications and media strategy			
2. Road Infrastructure and Sustainable Urban Planning	RR2 between Cau Giay and Nhat Tan	194.33	258.14	Resettlement cost increased significantly; three civil works items were added: i) widening of a bridge to increase intersection capacity; ii) widening a road section; iii) two more pedestrian overpasses.
	Resettlement site CT1			
	Integrated sustainable urban land development & transport planning			
3. Institutional Development	Air quality management program	10.49	4.3	Air quality management and traffic management component was cancelled as government implemented on their own.
	Traffic safety interventions			
	Public Transport Authority (PTA)			
	National and regional replication			
	Project management			
Total Project Costs		304.7	295.2	

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

12. The PDOs have remained unchanged throughout the project implementation.

13. The outcome targets for the BRT component, however, were changed during the first restructuring of the project in November 2013. Due to changes of Hanoi’s public transport strategy, a metro line and a LRT were planned along the original project BRT corridors, so the original project BRT alignment was changed and the scope and impact of the BRT system was reduced. BRT Line 1 was realigned and extended from Hadong to Yen Nghia Bus Terminal while BRT Line 2 (Giai Phong corridor) was cancelled. The targets for daily BRT/bus boardings (PDO indicator 1) were therefore reduced from 100,000 (Line 2), 80,000 (Line 1), 30,000 (Dong Anh and west of West Lake districts) to 37,162 (first section of the realigned and extended Line 1), 61,050 (second section of the realigned and extended Line 1), and 28,623 (Dong Anh and west of West Lake districts), respectively. The target for percentage of BRT riders who would switch from private motorized modes (PDO indicator 2) was also adjusted from 15 percent to 10 percent during this restructuring.



Revised PDO Indicators

Table 2. Indicators to Measure Project Outcomes after First Restructuring

Outcomes		Original Indicators (PAD)	Revised Indicators
(i) increase urban mobility in targeted areas of the City of Hanoi	(a) increased use of public transport in selected traffic corridors	PDO Indicator 1: number of daily BRT/bus boardings 1a. Le Duan – Giai Pong 1b. Giang Vo – Lang Ha 1c. Dong Anh and West of West Lake districts	PDO Indicator 1: number of daily BRT/bus boardings 1a. Kim Ma – Khat Duy Tien 1b. Khat Duy Tien – Yen Nghia 1c. Dong Anh and West of West Lake districts
		Indicator 4. financial performance of Hanoi's bus system (income, subsidy, expenditure) for monitoring purpose only	PDO Indicator 5. User satisfaction on BRT system (all persons)
		Indicator 6. Estimated financial performance of BRT lines	PDO Indicator 6. User satisfaction on BRT system for women
	(b) reduced travel time between the center and the west and northwest sections of Hanoi	Indicator 5: travel time by bus 5a. Le Duan – Giai Pong Corridor 5b. Giang Vo – Lang Ha Corridor	Indicator 7: travel time by bus 7a. Kim Ma – Khat Duy Tien 7b. Khat Duy Tien – Yen Nghia
		Indicator 7a. travel time by bus Cau Giay to Dyke Road at Nhat Tran (<i>should be Nhat Tan *</i>)	Indicator 9a. travel time by bus Cau Giay to Dyke Road at Nhat Tran (<i>should be Nhat Tan *</i>)
		Indicator 7b. travel time by motorcycle Nhat Tan to Cau Giay (PM peak, Wednesday)	Indicator 9b. travel time by motorcycle Nhat Tan to Cau Giay (PM peak, Wednesday)
(ii) promote more environmentally sustainable transport modes and urban development plans for Hanoi	(a) promote more environmentally sustainable transport modes	PDO Indicator 2: number (percentage *) of BRT riders whose alternate (alternative *) mode would have been a private motorized vehicle/taxi 2a. Le Duan – Giai Pong 2b. Giang Vo – Lang Ha 2c. Dong Anh and West of West Lake districts	PDO Indicator 2: number (percentage*) of BRT riders whose alternate (alternative*) mode would have been a private motorized vehicle/taxi 2a. Kim Ma – Khat Duy Tien 2b. Khat Duy Tien – Yen Nghia
		PDO Indicator 3: Hanoi GHG emission (transport-related *) saved	PDO Indicator 3: Hanoi GHG emission (transport-related *) saved
		Indicator 8A. adoption of land-use TA leading to implementation of pilots, or policy change in land-use planning or controls	Indicator 10. adoption of land-use TA a) draft final report developed b) Final report approved
	(b) promote more environmentally sustainable urban development plans for Hanoi	Indicator 8B. number of DAPM staff trained	Indicator 11. Number of DAPM staff trained
		Indicator 10. Coordinated institutional system to manage and coordinate public transport planning and operations Step 1. multiple strong bus operators Step 2. integrated fares and schedules between bus-based and rail-based systems Step 3. independent agency established	Indicator 12. Strengthen capacity for planning multi-modal public transport system a) Decision for establishment of Multi-Modal Public Transport Committee issued b) Draft final report on establishment of PTA developed c) Final report establishment of PTA approved
		Indicator 11. Coordinated institutional system for AQM policy making in place based on monitoring system and emission data	Indicator 13. Coordinated institutional system for AQM policy making in place based on monitoring system and emission data
	Indicator 13. Number of replication activities (workshop, studies in other Vietnam cities, study tours)	Indicator 15. Number of replication activities (workshop, studies in other Vietnam cities, study tours)	

Note: PDO indicators are in bold, typos are corrected in red with asterisk, and changes are marked as shaded text.

14. The first restructuring in November 2013 resulted in several changes to the Results Framework including the PDO indicators. PDO indicators 1 and 2 and intermediate indicator 7 were revised in response to the new alignment of the BRT. PDO indicators 5 and 6 on user satisfaction of the BRT system were added. Two indicators (intermediate indicator 4 and 6) on financial performance of the bus system and BRT were dropped as they were for monitoring purpose only and not directly linked to the PDO or project activities. Two intermediate outcome indicators, 10 and 12, to measure institutional and capacity improvement were revised to be less ambitious.

Revised Components

15. The BRT component was modified during implementation. Due to overlapping alignment of urban rail lines under implementation (as mentioned above), the City of Hanoi and the World Bank agreed to change the scope and alignment of the BRT system in 2011 and this change was later formally approved



in the first restructuring in November 2013. This change included the following: the original BRT Line 1 west section (Khuat Duy Tien-Nguyen Trai-Ba La) was realigned so that it would not overlap with LRT Line 2a. The BRT Line 1 route was also extended from Hadong to Yen Nghia bus station, from the original 9.1 km to 14.7 km. The planned depot at Vinh Quynh was relocated to Yen Nghia, where a BRT terminal was also added. Concerning that limited road space in the city center would affect BRT operability in mixed traffic from Kim Ma to Hai Ba Trung and surrounding streets of Hoan Kiem Lake, the city requested that the BRT Line 1 end at Kim Ma terminal (3.8 km of BRT routes cancelled). The BRT Line 2 (10.1 km long Giai Phong corridor) along with a terminal and interchange at Quang Lai was cancelled because its alignment overlapped with Metro Line 1. Annex 7 shows these changes on a map. This alignment and scope change of the BRT system had a fundamental impact on the baselines and targets of relevant indicators as set out in the PAD, thus necessitating the revision of the framework as mentioned earlier.

16. Two more changes were made to the BRT component but not through formal restructurings. One was additional civil works to strengthen a flyover at Lang Ha-Thai Ha intersection to allow for use by BRT vehicles and the other was the cancellation of an equipment contract for BRT electronic ticketing and communications system due to bid evaluation delay, the debarment of the recommended bidder, and the city's plan for implementing a citywide integrated smart card system at a later stage.

17. The Institutional Development component was also revised during the first restructuring in November 2013. Two activities were cancelled: (a) air quality monitoring equipment and (b) technical assistance (TA) for traffic and demand management, which were financed and implemented directly by city authorities.

Other Changes

18. The project closing date was extended twice, by 36 months in total. The first restructuring in November 2013 extended the credit closing date from the original December 31, 2013, to June 30, 2015. The second restructuring in June 2015 extended the closing date for 18 more months to December 31, 2016. Implementation schedule and disbursement estimates were changed accordingly. Besides the project design and scope change discussed earlier as well as the modified Results Framework, the first restructuring in 2013 also made a reallocation of credit and grant proceeds to reflect changes in project design and changes in the loan covenant to allow the public bus company TRANSERCO to operate BRT for an initial period of 5 years.

19. Finally, due to the cancellation of the BRT electronic ticketing system contract mentioned earlier, the project had unused funds. The cancellation of SDR 9,675,000 from the credit was approved as a third restructuring right before credit closing in December 2016. This allowed the reutilization of the cancelled IDA resources to be recommitted to other Vietnam project(s) before the end of the IDA17 cycle.

Rationale for Changes and Their Implication on the Original Theory of Change

20. While the City of Hanoi had plans for urban rails even before this project was prepared, its public transport plan was made without budget constraints or coordination. The city's public transport strategy and priorities changed in 2010 due to factors of financing opportunities and implementation schedules. The team decided to adjust the scope and design of the BRT system in response to the city's overall public transport plan change and different priorities. Per the original theory of change (Figure 1), the BRT system



design and scope change reduced the impact on increasing BRT/bus ridership but, on the other hand, complemented other mass public transport modes in the city such as the metro and LRT.

21. The reason for the two closing date extensions totaling 36 months was the complexities of the components, compounded with extremely lengthy administrative approval procedure in Vietnam, especially in Hanoi. Since the loan became effective, the project implementation had suffered substantial delays caused by the large-scale resettlement under the RR2 component (with more than 1,500 households affected), as well as the technically complex nature of the BRT component (for example, introduction of the first BRT system in Vietnam that featured BRT lanes in the median lanes, special BRT vehicles with doors on both sides, priority signal system, smart card ticketing system, and integration with regular buses and other modes). This implementation delay, according to the theory of change, reduced the efficiency of achieving the original expected outcome.

II. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

22. The relevance of the PDOs is High.

23. As Vietnam reached middle-income status (in 2009) and graduated from IDA, its demographic and economic evolutions put new demands on service delivery to which urban mobility and environmentally sustainable transport were critical. As the population further urbanized, urban mobility issues needed to be addressed for the country and the city to achieve the aspiration of better quality of life. The PDOs supported all four objectives of the Vietnam 2007–2011 Country Partnership Strategy (CPS) (Report No. 65200-VN) at project preparation. In the subsequent 2012–2016 CPS, the PDOs stayed highly relevant as they supported all three pillars: competitiveness, sustainability, and opportunity. The PDOs are also fully aligned with the GOV's Socioeconomic Development Strategies and the Socioeconomic Development Plans. Looking forward, the project PDOs also support two of the three focal areas of the new Country Partnership Framework for Vietnam 2018–2022 (Report No. 111771-VN): (a) Enable Inclusive Growth and Private Sector Participation by improving planning, management, and delivery of infrastructure and land in cities and enhancing the complementary roles of public and private sectors in infrastructure and (b) Ensure Environmental Sustainability and Resilience by promoting more environmentally sustainable transport modes that will lower the GHG emission in the transport sector.

24. The need to improve urban mobility by promoting public transport and integrated urban growth has become even more relevant in Hanoi throughout the project implementation period, which underlies the project's relevance of design. From 2005 to 2016, the population of Hanoi grew from 5.9 million to 7.3 million. The income growth is even more drastic: the nominal income more than doubled just in 6 years (2010 to 2016). As predicted in project preparation, the motorization in Hanoi has accelerated dramatically during this decade, with the number of motor vehicles reaching 5.7 million in 2016 compared to 2 million in 2005. Notably, the number of cars in the city grew almost sixfold, from 56,000 in 2005 to 328,000 in 2016. Motorcycles still dominate the streets today while bus ridership remains stagnated with a declining trend, carrying less than 10 percent of all trips the residents make. The target areas of the



project were located either with current or anticipated large-scale development with high mobility demand. Booming Hanoi needed and continues to need a sustainable transport solution to meet the rapidly increasing mobility demand and to accommodate and guide urban growth.

25. Finally, the project has demonstrated its relevance by adapting to the changing circumstances and priorities of the government, notably the government's decision to reconfigure its public transport, to which the project adapted.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

26. As described in the previous section, key expected outcomes of this project were to (i) increase urban mobility in targeted areas of the City of Hanoi through (a) increased use of public transport in selected traffic corridors and (b) reduced travel time between the center and the west and northwest sections of Hanoi and (ii) promote (a) more environmentally sustainable transport modes and (b) urban development plans for Hanoi. These four aspects are evaluated and discussed separately in the following paragraphs. It is important to note that indicators in the M&E framework are not sufficient to fully assess the project outcomes, especially those related to the BRT whose design and scope was adjusted in response to the client's overall public transport strategy change.

PDO (i)(a): Increase urban mobility in targeted areas of the City of Hanoi through increased use of public transport in selected traffic corridors

Rating: Substantial

27. This part of the PDO captures the impact of the introduction of BRT to Hanoi. In the original project design, this outcome was measured by number of daily bus/BRT boardings (PDO indicator 1) and travel time by bus (intermediate indicator 7) in the corridor. The first restructuring in 2013 added indicators for user satisfaction of the BRT system (PDO indicators 5 and 6) to the results framework. Given the context of trying to transform the urban transport sector with dramatic motorization, the pioneering aspect of the first BRT line in Hanoi is also taken into consideration to evaluate this outcome, that is, whether the introduction of BRT has increased urban mobility by its impact on the overall increased use of public transport in Hanoi.

28. Because the PDO statement did not change and the values of corridor-specific indicators (especially ridership) for original design and actual implementation were not comparable because of the corridor selection/alignment change, this ICR does not use a split evaluation but instead assesses the efficacy based on the overall achievement of the stated outcome considering ridership, travel time, user satisfaction, and its transformational impact as the first mass public transport mode in the city.

29. The project built the first BRT line in Vietnam. The output was one BRT route, including a 14.7 km long BRT busway (one bus lane per direction) from Kim Ma to Yen Nghia, 21 BRT stations, 2 BRT terminals (Kim Ma and Yen Nghia), one depot at Yen Nghia, 10 pedestrian overpasses, 35 BRT vehicles, and BRT traffic signals. The BRT line began operation on January 1, 2017. In the first month, passengers could ride the BRT free of charge. After one month, a one-way BRT ticket costs VND 7,000 (about US\$0.3). BRT has



been operating a service frequency of one bus every 5 minutes (each direction) in the peak hours, 7 minutes in the daytime off-peak hours, and every 10 minutes in the evening.

30. **Ridership.** The selection of ‘ridership’ or number of boardings as a PDO indicator is problematic. Firstly, as discussed earlier, the scope and design of BRT was changed due to the client’s strategy and priority change, leading to the first project restructuring when the targets for daily BRT/bus boardings (PDO indicator 1) were reduced from 100,000 (Line 2), 80,000 (Line 1), 30,000 (Dong Anh and west of West Lake districts) to 37,162 (first section of the realigned and extended Line 1), 61,050 (second section of the realigned and extended Line 1), and 28,623 (Dong Anh and west of West Lake districts) after the realignment of Line 1 and the cancellation of Line 2. This significant reduction of ridership target was reasonable not only because one line was cancelled and the other line shifted partly to a route with less demand, but also because the original integrated BRT system became only one line, which significantly limited its ability to attract riders. Secondly, the total number of daily bus/BRT ridership on the corridor could be a good indicator if it was monitored after a considerable period of BRT operation with a stabilized service plan for all routes. However, in this case, while the monitored ridership on the corridors almost achieved all revised targets in November 2016, at that time BRT had not started operation, therefore it was not attributable to BRT. As reported by Hanoi Urban Transport Management and Operation Center (TRAMOC), after 10 months of operation, BRT ridership has been quite stable at 13,000 to 14,000 trips per day. However, the forecast was 36,500 trips per day at the first restructuring. While the ridership on the corridor had not yet met its expectation at the time of this writing, it is also not a good indicator to use as TRAMOC and the Department of Transport (DOT) are still deciding and adjusting the service plan and route reorganization of other buses on the corridor. The lower-than-expected ridership is due to several factors: the most important being the lack of integration with regular bus services. TRAMOC has taken all regular bus routes off the BRT corridor and reorganized five bus routes to connect to BRT, but more efforts are needed to achieve service integration and attract riders, including much wider scale route rationalization and service planning, relocating some bus stations closer to BRT stations, and solving transfer and ticketing issues. Furthermore, the current BRT line is the first in the city and is still operating on a pilot basis with limited or compromised features such as manual ticketing, soft barriers for designating the dedicated lane, loose traffic management and enforcement, and inadequate accessibility facilities to stations. These important features were planned but some have not yet been fully implemented with necessary compromises made in order to get Hanoi’s first BRT system up and running. Also, the access to BRT stations needs improvement, as on average people need to walk longer distance to cross the street either at intersections or by pedestrian overpasses to get to the BRT stations, which deters ridership or causes safety risks. There is also lack of wheelchair access to the BRT stations. DOT and TRAMOC are actively looking into these issues and have started to take actions. It is expected that these issues will gradually be addressed over time, and the system is likely to attract more passengers. For example, more hard barriers (lane dividers) are being installed at some locations (for example, Giang Vo and Hoang Dao Thuy intersections) to prevent other traffic from invading the BRT lane; traffic police started imposing fines on BRT lane violation from February 15, 2017; and signage and a speaker system were added to remind road users to respect the BRT lane. Also, much higher ridership is expected when more BRT routes are introduced and regular bus services and stations are more integrated. Furthermore, according to TRAMOC’s 8-month BRT operation report, ridership will have significant growth in the near future when the high-density development with high-rise apartments along the corridor from Ring Road 3 to Yen Nghia is completed.



31. **User satisfaction.** User satisfaction and user experiences on the BRT systems are measured through BRT passenger surveys. The World Bank ICR team designed and conducted two rounds of BRT passenger satisfaction survey as part of this report. One round of BRT passenger survey with 723 respondents was carried out in February 2017 ('2nd month BRT survey') and another round with 707 respondents in September 2017 ('9th month BRT survey'). TRAMOC is also responsible for conducting passenger satisfaction surveys regularly. The 2nd month BRT survey showed that 96 percent of all sampled passengers are either satisfied or extremely satisfied with the BRT services. Specifically, about 95 percent of all female passengers are either satisfied or extremely satisfied with the BRT services. Another survey of a larger scale (2,050 respondents) conducted by TRAMOC in March 2017 ('3rd month TRAMOC survey') showed similar results with 97 percent of passengers responding that the BRT services are good. The 9th month BRT survey also offered consistent numbers: 97 percent of passengers are satisfied with the BRT services. These high satisfaction levels of BRT passengers well exceeded the target values for the BRT user satisfaction indicator (PDO indicator 5 aimed for 55 percent satisfaction of all users and PDO indicator 6 targeted 60 percent satisfaction for female users). According to the BRT user surveys, riders are mostly satisfied with the punctuality, high speed, comfort, ease of getting on and off, and the fare level. However, passengers are not satisfied (that is, less than 80 percent agree to the statement) with (a) the access to the station locations, (b) accessibility facilities for the disabled, and (c) the integration with other bus routes. These accessibility and integration issues are also the most mentioned comments in the survey.

32. **Travel time.** According to the TRAMOC BRT 3-month operation report, the average operating speed of the BRT buses is 20 km per hour, 20 percent faster than regular buses. The travel time on bus for Kim Ma-Khuat Duy Tien and Khuat Duy Tien-Yen Nghia is therefore calculated using the lengths of these two sections: 24 minutes and 22 minutes, respectively. Adding 3 minutes of average waiting time (half of average headway weighted by ridership during peak and non-peak hours), the travel time by bus on these two sections are 27 minutes and 25 minutes, respectively, well achieving the target values (35 minutes and 30 minutes) for intermediate indicator 7. BRT riders also reported in the surveys the travel time using BRT versus their 'alternative mode' (the transport mode they would have used if there was no BRT). On average, BRT riders save 14 percent (or 3.1 minutes in the 9th month BRT survey) of their travel time (including walking time to the station and waiting time at the station) per trip. For those who shifted from regular buses to BRT, their travel time savings is much higher: 37–87 percent according to the BRT surveys, as the higher frequency and reliability of BRT buses further saves waiting time for riders. The saved travel time is important evidence of improved mobility, which has particularly more significance for highly congested areas like this corridor.

33. In summary, significant compromises in design and implementation have been made to get the first BRT into operation, which affected the ridership not achieving the target. However, high user satisfaction and considerable time savings of riders show the achievement of improved mobility by providing high-quality public transport services. BRT has also improved the safety in the corridor—no fatalities/injuries have been reported so far after almost a year's operation. While Hanoi is working hard to solve numerous issues including enforcement, accessibility, and integration, the introduction of BRT in Hanoi is the first difficult step toward a transformation from chaotic motorization to a modern urban transport system with mass public transport system as its backbone (see before and after image comparison in figure 2). The efficacy of this outcome is therefore rated Substantial considering all the factors mentioned above and the pioneering impact of introducing public transport priority in the context of dramatic motorization in Hanoi.



Figure 2. BRT Corridor Before (above) and After (below)



Source: BRT survey report (above) and vnexpress.net (below left) and dtnews.vn (below right).

PDO (i)(b): Increase urban mobility in targeted areas of the City of Hanoi through reduced travel time between the center and the west and northwest sections of Hanoi

Rating: High

34. This part of the PDO captures the impact of the RR2 component. The RR2 component has constructed the key northwest quarter of the RR2, including 6.1 km roadway; major interchanges (Buoi, Dao Tan, and Cau Giay); overpasses; lighting; greening; and traffic signal system. RR2 has been open to traffic since January 18, 2016. This segment of RR2 connects the city center to the less developed west and northwest sections of Hanoi and to the newly completed rainbow bridge financed by Japan International Cooperation Agency, saving significant time between the city and the airport too. The construction of the RR2 section also enabled five more bus routes connecting the city center to the north and west of the city as well as to the airport. The travel time by bus from Cau Giay to Dyke Road at Nhat Tan with the RR2 is 21 minutes, 7 minutes less than the baseline, almost meeting the target value (20 minutes) for intermediate indicator 9a. The average travel time by motorcycle from Nhat Tan to Cau Giay at PM peak hours is only 11 minutes by the new RR2, well achieving the target value (18 minutes) for the intermediate indicator 9b. A roadside survey as well as traffic count was conducted along RR2 in October 2017 as part of this ICR for updating the economic analysis. According to the traffic count, on a typical weekday from 7 a.m. to 7 p.m., there are 77,000 to 93,000 vehicles (50–75 percent are motorcycles)



running in two directions along RR2. According to the roadside survey, road users save on average 20 minutes (or 30 percent) of their travel time. The significant time saving due to the construction of RR2 has exceeded the mobility increase objective and therefore the efficacy for this part of the PDO is rated High.

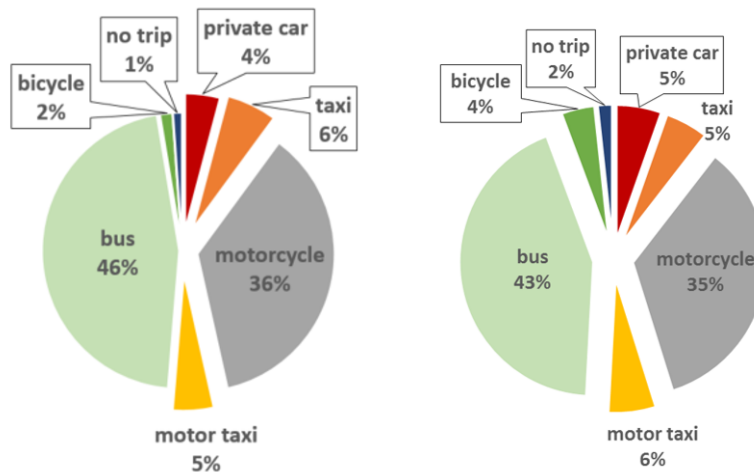
PDO (ii)(a): Promote more environmentally sustainable transport modes

Rating: Substantial

35. One important indicator to measure the extent to which the introduction of BRT has promoted more environmentally sustainable transport modes (public transport in this case) is to see how many of the new BRT passengers are switching from private transport mode (PDO indicator 2) or ‘modal shift’. In the 2nd month and 9th month BRT surveys, one question was focusing on modal shift and asked the BRT rider what transport mode he/she would use for that specific trip if BRT was not built (the counterfactual ‘alternative mode’). Interestingly, over half of the BRT riders would have used a personal motorized vehicle (including private car, taxi, motorcycle, or motorcycle taxi; see figure 3). The modal shift is 51 percent, far exceeding the target value of PDO indicator 2 (15 percent in original PAD or 10 percent at the first restructuring). This result therefore provides strong evidence that with better quality of service, mass public transport modes such as BRT can attract a significant portion of personal motorized vehicle users, in the context of Vietnam and Hanoi, where motorcycles dominate the streets.

36. However, because the BRT ridership is moderate, the absolute number (number of passengers who switched modes) or scale of the modal shift impact is not large. Considering both the impressive modal shift percentage and relatively small scale of the impact, the achievement of this part of the PDO is rated Substantial.

Figure 3. Modal Shift of BRT Passengers



Source: Left: 2nd month BRT survey; Right: 9th month BRT survey.

37. As part of this ICR, GHG emission reduction is estimated using the actual BRT ridership, traffic counts along RR2, and modal shift and speed change estimations from the surveys. Annual growth of public transport demand is conservatively assumed to be 1 percent while the annual growth of traffic demand on RR2 is assumed to be 6 percent. The major GHG emission reduction comes from the avoided car and motorcycle trips due to modal shift to BRT, as well as the travel distance and speed change



because of the construction of RR2. Given that BRT started operation in 2017 and RR2 in 2016, till 2025, the total GHG emission reduction is 122,177 tons CO₂e (see annex 4 for details). This estimation has achieved the target for PDO indicator 3 after the first restructuring (100,000 tons).

PDO (ii)(b): Promote more environmentally sustainable urban development plans for Hanoi

Rating: Moderate

38. This outcome is also part of the GEF objectives. The rationale was that the GEF-financed TA would help Hanoi to learn and pilot sustainable urban planning that integrates land use and transport planning and to improve the coordination among city agencies for integrated, multimodal transport planning, management, and operation. Disseminating experiences and promoting the replication of Hanoi BRT in Vietnam and other regions was also mentioned in the GEF objective in the PAD.

39. This outcome was originally measured by the indicator ‘adoption of land use TA leading to implementation of pilots, or policy change in land use planning or controls’, ‘coordinated institutional system to manage and coordinate public transport planning and operations’, and ‘the number of Department of Architecture and Planning Management (DAPM) staff trained.’ After the first restructuring, the descriptions for the former two indicators were relaxed. The ‘adoption of land use TA’ was relaxed to mean the development and approval of the land use TA final report, without pilots or policy changes. The ‘coordinated institutional system’ that included substantial institutional reforms (such as control of public transport planning, fare, and schedule integration between bus-based and rail-based systems and establishment of an independent agency) was revised at the first restructuring to ‘strengthen capacity for planning multimodal public transport system’, which includes the following three steps: (1) decision for establishment of Multimodal Public Transport Committee (MMPTC) issued; (2) draft final report on establishment of PTA developed; and (3) final report on establishment of PTA approved (‘approved’ was further relaxed to ‘developed’ in the second restructuring in 2015). Targets were achieved for most indicators with less ambitious definitions after the first restructuring but not the original definitions.

40. Policy changes and institutional reforms in Hanoi, as originally envisioned, proved to be difficult and the results were hard earned but still incremental. The project has supported DAPM (later changed to Department of Planning and Architecture, or DPA) on urban planning and integrated land use and transport model. Using the TransCAD-based integrated land use and transport model and others, trainings are provided to staff in the Project Management Unit (PMU) and DAPM. In March 2016, the prime minister approved the ‘Transportation Plan for Hanoi by 2030, with a Vision to 2050’. This new transport master plan for Hanoi prioritizes mass public transport. The proposed transport system including eight new BRT corridors is planned in coordination with the economic, social, and land use planning to accommodate the city’s future growth in a sustainable way. The Hanoi DOT and PMU proposed to use World Bank financing for two of these planned BRT corridors.

41. The project also provided technical support to the establishment of the MMPTC and the preparation for establishing a PTA by strengthening the capacity of TRAMOC. To ensure integration of all public transport modes and to avoid duplication/overlapping, Hanoi People’s Committee (HPC) established the MMPTC on July 11, 2013, with participation of key agencies such as Metropolitan Railway Management Board, TRAMOC, DOT, DPA, Department of Construction, TRANSERCO, and Department of Planning and Investment. In September 2013, HPC approved a general fare collection policy framework, supporting one common ticket for all modes and an open ticketing system. Although a PTA has not yet



been established (Hanoi DOT and TRAMOC are still making efforts), relevant agencies in Hanoi better understand the importance and methods of coordination and multimodal integration for public transport.

42. The project has made efforts and completed several replication activities by conducting workshops, study tours, and other knowledge exchange events in Vietnam and the region. The lessons from Hanoi BRT have been very helpful for Da Nang and HCMC. For example, Da Nang BRT improved its bidding document of the electronic ticketing package by incorporating the lessons learned in this project; HCMC has recently completed a yearlong review of its feasibility study design, in close consultation with Hanoi DOT, TRAMOC, and TRANSERCO, incorporating some design modifications that would allow them to avoid some of the difficulties Hanoi BRT experienced.

43. The overall achievement of this outcome is thus rated Moderate.

Justification of Overall Efficacy Rating

44. Summarizing the discussions and ratings for the four parts of the PDOs above (Substantial, High, Substantial, Moderate), the overall efficacy of this project is rated Substantial. Going back to the theory of change, the RR2 component exceeded expected outcomes; moderate results were achieved in institutional development; and the first BRT in Hanoi has made transformational impact in the urban transport sector despite of its significant scope reduction and compromises to adapt to the government's strategy and priority change.

C. EFFICIENCY

Assessment of Efficiency and Rating

45. The prolonged project implementation and reduced scope of work for the BRT component has affected the efficiency of the project. The implementation period was extended for 3 years (in total 8.5 years of implementation from loan effectiveness) and the completion of all project activities was delayed. The scope of work for the BRT component reduced from two corridors to one (but extended) corridor and without the electronic ticketing system. The cost-benefit analyses done at appraisal stage and completion stage showed that the economic internal rate of return (EIRR) and the net present value (NPV) for the BRT component were much lower than originally estimated, even with emission reduction benefits added. The EIRR and NPV for the RR2 component, on the other hand, were higher at completion stage, showing good efficiency given the good traffic volume and higher-than-expected time savings (based on the roadside survey). The higher EIRR at completion is also due to the higher value of time (VOT) estimation using the roadside survey conducted in 2017. See annex 4 for details of the ex post economic analyses.

Table 3. Results of Economic Analysis at Different Stages

		PAD (2007)	Restructuring (2013)	Completion (2017)
BRT	NPV (US\$, millions) ^a	41.3	3.4	-5.2
	EIRR (%)	21.0	13.1	6.0
RR2	NPV (US\$, millions) ^a	34.0	—	165.0
	EIRR (%)	14.5	—	18.5

Note: a. Discount rate of 12 percent was used for calculation at all stages.



46. Considering all factors above, the overall efficiency rating for the project is Modest.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

47. The project objectives are highly relevant to the country’s priorities and the World Bank’s country strategies at the design stage and remained relevant at the completion stage also. The project almost fully achieved its objectives. The project suffered efficiency loss due to prolonged project implementation and reduced scope of work for the BRT component. Considering the High relevance, Substantial efficacy, and Modest efficiency, the overall outcome rating is Moderately Satisfactory.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

48. International research findings show that women generally rely on public transport more than men and use less motorized vehicles. Results from the 2nd month and 9th month BRT surveys confirmed that Hanoi BRT has more female passengers than male, and women also use BRT more frequently. Therefore, the introduction of BRT system in Hanoi benefits women more. Based on the 9th month BRT survey, female passengers spend longer time making a trip (including walking and waiting time) and the BRT saves them 4.5 minutes per trip on average versus only 1.4 minutes for male passengers. Averaging the Likert scale of the satisfaction questions, female passengers tend to be more satisfied with the BRT services and more likely to recommend others to use BRT (table 4).

Table 4. Benefit Comparison for Female and Male Passengers on Hanoi BRT (9th Month BRT Survey)

	Alternative Travel Time (minutes)	Travel Time with BRT (minutes)	Average Time Saved (minutes)	Are You Satisfied with BRT Services?	Will You Recommend Others to Use BRT?
Female	40.0	35.4	4.5	4.51	4.41
Male	34.3	33.0	1.4	4.44	4.33

49. The most unsatisfactory aspects of the system are the same for both women and men: station access, disabled accessibility, and integration with other buses. One notable difference is that women are more satisfied with the safety feature of the BRT system, which is always an important consideration for female public transport users.

Institutional Strengthening

50. As discussed earlier, although institutional reform proved to be difficult, incremental improvements have been made by the project. For example, the capacity of the planning agency for Hanoi has been strengthened to integrate land use urban plan with transport plans. Results are reflected by the newly approved transport master plan, which prioritizes mass public transport. The capacity of relevant agencies in Hanoi, especially TRAMOC, has also been strengthened.



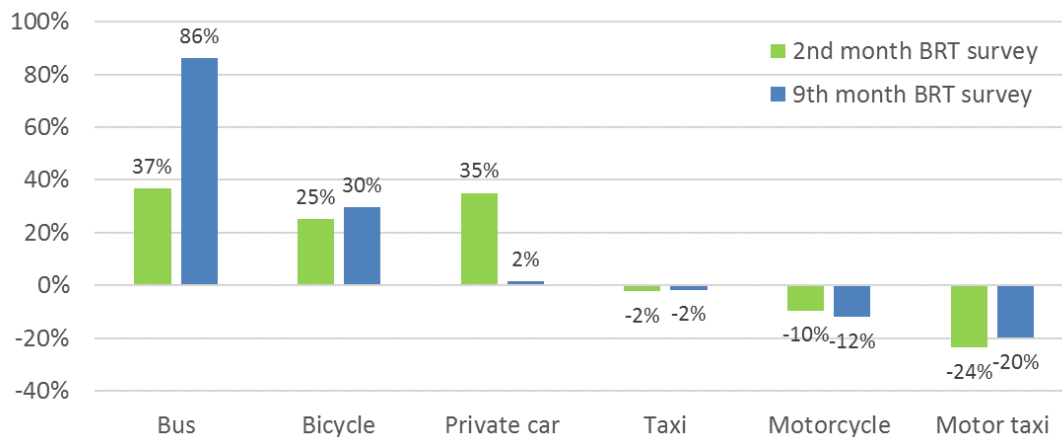
Mobilizing Private Sector Financing

51. As mentioned earlier, the PPIAF-funded study in 2004 helped the city franchise the operation of some bus routes to private operators in 2005, ending the monopoly of the state-owned TRANSERCO. This project aimed to build on that effort and to mobilize private sector financing in the BRT operation. The project design hence incorporated legal covenants that the operation of the BRT had to go through competitive tendering and award concessions for private operators. Although this requirement was amended later, at project restructuring, to allow TRANSERCO to operate the BRT during the start-up period due to lack of competent operators in the untested market, the implementation of the first BRT system and all the supporting TAs in the project has set up the mechanism to mobilize private sector financing for the operation of the bus routes.

Poverty Reduction and Shared Prosperity

52. The BRT component of this project benefits the low-income households more as low-income people without personal motorized vehicles tend to depend on public transport modes. Furthermore, the BRT saves more travel time for those who used to take buses (who tend to be poorer), while those who would have used motor vehicles (who tend to have higher income) save much less time or even spend more time riding BRT. Therefore, in terms of time-saving benefits, the BRT is progressive. Figure 4 indicates that those who ‘switched’ from buses save 37–86 percent of their travel time (including walking and waiting time), and those who switched from bicycles save 25–30 percent. The riders who would have ridden motorcycles spend 10–12 percent more time on BRT and those who would have taken a motor taxi lose the most time.

Figure 4. Time Savings of BRT Riders Shifted from Different Modes



III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

53. **Ambitious objectives.** As discussed earlier, the project PDOs are highly relevant, aiming to solve pressing urban transport issues in Hanoi. However, these objectives proved to be too ambitious, especially



those related to the BRT component and institutional reform. Introducing BRT to a city is not easy—it is a reform of the public transport sector and its planning and implementation need to be considered as part of the whole urban transport system including all other modes. Furthermore, it is the first mass public transport system in the city and the first BRT system in the country. A lot of institutional changes are needed—which is extremely difficult in Vietnam and even more so in its capital Hanoi. Taking one lane from each direction in an already congested corridor was not accepted by many residents who were using private vehicles, causing negative public pressure. Technically, route reorganization, traffic management plan, pedestrian accessibility, operational plan, service plan, financing plan, fare setting, subsidy, concession contract, and risk allocation all need to be considered before the design of the infrastructure, and many of these technical considerations required policy and regulation changes. For example, passenger boarding and alighting in the median lane was not compliant with Hanoi’s traffic regulation. Not only TRAMOC, most related agencies in Hanoi agreed with the concept but did not understand what a BRT really meant and were overwhelmed when they needed to face the details. The objectives of the project also included the competitive tendering of BRT operation. Due to lack of competent operators in an untested market and risk of further delaying project implementation, later amendment had to be made to assign TRANSERCO to operate the BRT for an initial period of 5 years. As discussed earlier, the institutional component was also very ambitious, targeting policy reforms and institutional changes in multiple sectors: urban development, land use and transport planning, air quality, traffic management and safety, and public transport, all facing challenges that required significant resources to address.

54. **Complex project design.** The project wanted to accomplish too many objectives in several complex fields that are very difficult to implement: BRT and pedestrian accessibility, urban ring road construction with large resettlement, resettlement housing, integrated urban planning, institutional reform, air quality monitoring, and traffic management and safety. In the context of Vietnam, by design it is not likely that all these activities can be completed within a reasonable implementation period. Also, the detailed sequencing of project activities was not emphasized at the project preparation stage, for example, several TA tasks in the institutional component should have been carried out earlier to prepare for the implementation of other components.

55. **Adequately identified risk and mitigation measures.** The project preparation has adequately identified that this is a project with substantial risk even with mitigation measures. Specifically, the risk of ineffective traffic management and lack of coordination with other transport modes (including urban rail, NMT, and other buses) jeopardizing the BRT benefits materialized. The mitigation measures were reasonably identified in the PAD but some (for example, establishing the PTA) were difficult to implement. The team also correctly identified the high risk of implementation delay caused by slow domestic decision and approval procedures, which also materialized even with mitigation measures. The substantial risks of losing political will in the BRT and resettlement delays happened and the preparation team was correctly identified.

56. In summary, this project was prepared aiming to solve pressing issues in Hanoi with high ambition given the context. The technical complexity and institutional challenges of project design posed substantial risks to project outcomes, as adequately identified by the World Bank team.



B. KEY FACTORS DURING IMPLEMENTATION

57. The project fell into ‘problem project’ status shortly after effectiveness, from May 2009 to May 2015, due to considerable delays in implementation, which were due to a number of factors, as outlined in the following paragraphs.

Factors Subject to Government and/or Implementing Entities’ Control

58. **Lack of coordination and integration.** As integrated transport master planning and a coordinating authority for public transport did not exist in Hanoi, there was no coordination mechanism for public transport projects planned and implemented by different levels of government agencies. Institutionally, the PMU for Hanoi Urban Transport Development Project (as well as TRAMOC) was housed under Transport and Urban Public Works Service (TUPWS, later DOT), while the PMU for the metro was housed directly under HPC and the PMU for the LRT was housed under the Ministry of Transport at the national level. While the BRT was at design stage, government’s strategy changed and top national priority was given to the urban rail. The alignment of one BRT corridor had to be changed due to the overlapping alignment of the planned LRT and metro and the Gai Phong BRT corridor was cancelled. This lack of coordination mechanism makes intermodal integration (planning, infrastructure, ticketing, operation) extremely difficult: uncoordinated route and service planning, station location and design, electronic ticketing, passenger information system, and so on lead to further inefficiency.

59. **Varying levels of government confidence in BRT.** Despite strong commitment by HPC, especially during the two restructurings in 2013 and 2015, Hanoi leadership showed lack of confidence in the BRT system over the course of its implementation. The study tour to international examples (Curitiba and Bogota) helped Hanoi leaders witness high-quality BRT services and, at the same time, the political risks associated with its implementation. The unique characteristics of Hanoi and the corridor (motorcycle dominance, narrow streets, small blocks, and dense population distribution, which make traffic management difficult) made Hanoi city leadership, which was risk adverse, hesitate in making several key decisions. For example, in mid-2012 and early 2013, Hanoi constructed a ‘light structure’ flyover along the proposed BRT realignment to ease congestion. The contract of strengthening the flyover to allow for its use by BRT vehicles was awarded on October 2, 2014, but the construction started only in October 2016. In 2016, HPC and DOT had a hard time approving the traffic management plan on the BRT corridor, again showing lack of confidence even when the infrastructure was completed. Because of the delay in getting official sign-off for the basic attributes (for example, dedicated lane with soft or hard barrier), DOT and TRAMOC were also late in preparing the traffic management plan, operational and service plan, and bus reorganization, which affected project outcomes.

60. **Delayed and difficult execution of resettlement and land acquisition for RR2.** The RR2 component has affected many households (1,541 Project-Affected Households [PAHs], including 714 relocated). Compensating these households was extremely difficult and caused significant delays. Affected households demanded higher level of compensation and determining the market price was difficult due to highly volatile land markets in Hanoi. All compensation and resettlement activities were put on hold waiting for the approval of new land compensation prices by HPC that would reflect the results of an independent land appraisal. After more than one year, HPC approved land compensation prices (K-factors) for all four districts with resettlement in September 2013 and provided a methodology to establish land price in 2014. More time and resources were needed to restore livelihood of PAHs who had



suffered economic loss, for example, to assist the business PAHs in finding new sites to restart business or to provide cash payment or job training. Also, initiated by residents' complaints, the design of the Dao Tan interchange was changed after extensive consultation and discussions to reduce the amount of resettlement.

61. **Lengthy approval procedures.** Like all other World Bank operations, project implementation had to comply with both the World Bank system and the domestic system. With the BRT being the first one in the country, and technically complicated, the project had to go through careful evaluation, scrutiny, and lengthy approval procedures at different institutional levels of Hanoi. It was identified in the first Implementation Status and Results Report (ISR) that the delays caused by administrative procedures would make it difficult to complete the project before closing date. Every implementation step needed reappraisal and clearances, often sequentially by multiple Hanoi agencies, adding additional processing time to every decision. For example, as mentioned in the Aide Memoire of the April 2011 mission, the time it took to move to the next implementation step even when preparatory work was completed, for example, bid evaluations and procurement following design and cost estimate approval, was unacceptably long (each step took several months). The World Bank team and the PMU agreed during that mission to streamline the review/clearance process between the World Bank and DOT by setting up a parallel work flow.

62. **Cancellation of the BRT electronic ticketing and communication contract.** There had been serious delays in bid evaluation of the contract for the BRT electronic ticketing and communications system. The PMU and the World Bank team could not reach consensus on bid evaluation on whether the recommended bidder met the post-qualification criteria. After the questioned bidder was debarred for different reasons on May 12, 2015, the DOT PMU and the World Bank team disagreed on the post-qualification evaluation of the second responsive bid. In the end in 2016, Hanoi decided to cancel the package and proposed that the BRT use paper tickets and manual ticketing. The delay and cancellation of this contract further affected other BRT contracts and image of the BRT system, for example, some communication hardware needed to go with another contract (for example, causing BRT vehicle design change) and the station handover was delayed, causing security as well as maintenance issues.

63. **Delay and quality issue of the designs and TA.** For example, the TA 'institutional strengthening of TRAMOC and creation of PTA' contract was signed on June 6, 2012. The consulting firm was not able to deliver quality recommendations to address the pressing issue of integration with BRT and Metro Line 2A and was requested to revise team composition in September 2013. By the time the contract amendment ended without extension due to the debarment of the firm, the consulting firm completed 8 technical notes out of the total 18, and the PMU had to hire individual consultants to carry out the remaining tasks. As Hanoi had no experience in BRT, the delay and quality issues of the technical support significantly affected project implementation and outcomes.

64. **Underwhelming media and public communication strategy.** Partly due to lack of confidence of the city leadership in the BRT system and other issues mentioned earlier, the media and public communication strategy could not fully achieve its potential. Introducing a new system to Hanoi is challenging and calls for more proactive, creative, and collaborative communication strategy to manage public expectations and opinions.



Factors Subject to World Bank Control

65. **Lengthy internal procedures.** The internal procedures of the World Bank also took a long time. For example, the Integrity Vice Presidency's investigation of the BRT fare collection and communication contract was extremely slow, took more than one year, and the further delay in deciding on this package caused more troubles (Intelligent Transport Systems [ITS] in stations, change of vehicle design, and so on), as discussed earlier, and affected project implementation and outcomes.

Factors Outside the Control of Government and/or Implementing Entities

66. **Rapid urban growth and rising land prices.** During project implementation, Hanoi experienced rapid urban growth and rising land prices. This not only dramatically increased the counterpart funds needed for resettlement but also made negotiations with PAHs on compensation standards difficult as people had high expectations and had a lot of complaints. The implementation delay itself further adversely affected the project. Conditions in Hanoi changed quickly as time passed, for example, the exchange rate, inflation, land prices, approvals procedures, Government agenda and commitment, traffic conditions, media, and public opinion. Many of these changing factors went against the project implementation and caused further delay.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

67. The operation's theory of change in the PAD was clear, but the indicators were not well selected. For example, the total bus and BRT ridership on the corridor is not attributable to project activity but rather more associated with bus operational and service plan. The indicators were not well defined, with inconsistency in the description and baseline and target values. For example, for PDO indicator 'number of BRT riders whose alternate mode would have been a private motorized vehicle/taxi', 'number' should be 'percentage', and alternate should be 'alternative'. GHG emission in Hanoi should be limited to 'transport sector'. The methodology of how to estimate each indicator was unclear. For example, the estimation results for modal shift as well as transport-related GHG emission reduction could be very different using different methods. At the first restructuring, several issues were fixed, some indicators were dropped, and some were made clearer, but clarity in indicator description and methodology was still lacking. The M&E design is therefore rated Modest.

M&E Implementation

68. An M&E consultancy was contracted by the PMU to carry out the M&E as well as completion evaluation. However, due to the lack of description on methodologies for many of the indicators, the M&E data were collected regularly but not analyzed in a methodologically sound manner. The M&E consultant has made efforts to clarify the methodology and implemented monitoring after the first restructuring. Overall, M&E implementation is also rated Modest.



M&E Utilization

69. Although the M&E consultant carried out M&E regularly, some of the data and results were not used to inform project management and decision making because these indicators do not measure project progress or outcomes. For example, the total bus and BRT ridership on the BRT corridor was monitored regularly before the BRT started operation and mostly achieved the target, but that had nothing to do with the project activity and therefore could not inform project management and decision making. Therefore, the M&E utilization is rated Modest.

Justification of Overall Rating of Quality of M&E

70. As discussed, there were significant weaknesses in the design and implementation of the M&E system, making it somewhat difficult to assess the achievement of the stated objectives and test the links in the results chain, and there were also some weaknesses in the use and impact of the M&E system. Therefore, the overall rating of quality of M&E is Modest.

B. ENVIRONMENTAL SAFEGUARD, SOCIAL SAFEGUARD, AND FIDUCIARY COMPLIANCE

Environmental Safeguards

71. The project was classified as a Category A project under OP 4.01 - Environmental Assessment due to the disruption to be caused by the construction of a new road, BRT lanes, and stations and a resettlement site in an urban setting. The only environmental safeguard policy triggered was Environmental Assessment (OP/BP 4.01). The project Environmental Impact Assessment (EIA) identified potential negative environmental impacts associated with construction-related disruption, noise, and the possibility of increased air pollution and treatment of wastewater. The EIA and Environment Management Plan (EMP) were satisfactorily prepared in line with the Government and the World Bank safeguard policies and disclosed at the InfoShop in English and at the project sites in Vietnamese. The EMP included detailed practical mitigation measures and estimated budgets for their implementation, institutional responsibilities, monitoring plans, and building capacity for environmental management and a budget for implementation.

72. During implementation, specific requirements of the EMP were included in the bidding documents to ensure effective execution of the mitigation measures during construction. Training on environmental management and monitoring of EMP implementation was provided to the staff of the PMUs and contractors. Monitoring of the implementation of EMPs was carried out by the technical supervision staff of the PMU and Construction Supervision Consultant. An Independent Environmental Monitoring Consultant (IEMC), hired by the Hanoi PMU, also conducted quarterly environmental monitoring and provided reports on the implementation of the EMPs, including results of consultation with local communities regarding environmental concerns and complaints. The EMP was implemented satisfactorily as confirmed by the Hanoi PMU and the IEMC in project progress reports.

73. The project demonstrated good practices in management of physical cultural resources. A 300-year-old banyan tree is located within the originally planned right-of-way of RR2. As a result of consultation and design examination, it was proposed that the tree would be kept in the median of the road. The ancient Buoi dyke surrounding inner Hanoi is located along the RR2 alignment; consultation



with the flood prevention and dyke management authority resulted in the selection of an engineering design which maintains the dyke's flood protection function as well as its cultural and historical value.

74. The World Bank missions consistently rated environmental performance of the project as satisfactory and moderately satisfactory during the project implementation. The final World Bank supervision mission concluded that the current environmental safeguards management is satisfactory for the BRT corridor and along RR2. There were no outstanding environmental safeguard issues.

Social Safeguards

75. The project triggered the Involuntary Resettlement (OP/BP 4.12) social safeguard policy. The Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP) were satisfactorily prepared in line with local laws, regulations, and the World Bank's policy and disclosed at project preparation. The RAP was updated to reflect the changes in the first restructuring and disclosed. A multilevel organization was established for the management and implementation of the resettlement program at the Hanoi municipal, district, and ward levels. The PMU was responsible for implementing the RAP on behalf of HPC. An external agency was engaged to carry out independent M&E of the RAP's implementation. The reporting frequency of external resettlement monitoring was increased from every 6 months originally to every 3 months after the first restructuring.

76. After the first restructuring, RR2 was the only activity causing involuntary resettlement. The RR2 component has affected many households (1,541 PAHs, including 714 relocated ones). During the project implementation, the World Bank missions rated social safeguard performance of the project as moderately satisfactory and moderately unsatisfactory when noncompliance was found. For example, the midterm review (MTR) found that the PMU and local (mainly district) authorities had been following the HPC regulation but not the RFP and RAP, including not assisting for illegal residential land, replacement cost not replacing PAHs' losses, earlier cut-off date per the Land Law, eligibility for compensation/assistance of illegal land occupation, and not providing assistance for unregistered businesses. The World Bank team had worked intensively with the PMU and HPC to make them comply with the approved RPF/RAP.

77. The final World Bank supervision mission concluded that the social safeguards are moderately satisfactory by project closing. According to the PMU report, the compensation and resettlement activities for the whole project had been completed, except for two outstanding cases. The PMU continues to work with local authorities to supplement compensation packages for all relocated households to help them stabilize their living conditions. However, compensation and assistance activities for the income loss as well as for assisting business PAHs to restore income sources remain very slow. HPC was requested to instruct all project districts to (a) speed up the process of payment for the income losses in Tay Ho, Cau Giay, and Dong Da districts as per the RPF/RAP and (b) assist the business PAHs in finding new sites for them to restart their business either at the resettlement site or any markets available in the city. Otherwise, cash payment or new job training should be provided to the PAHs to help them in restoring the income sources as per RPF/RAP requirements.



Procurement

78. Although there was significant delay in implementing the procurement activities under the project, it was noted that the PMU had made considerable efforts to move the project ahead. The overall procurement performance of the PMU is considered moderately satisfactory. There were several critical issues that caused procurement and project implementation delays: (a) lengthy internal approval process within the PMU and Hanoi DOT, (b) difficulty in resettlement and site clearance, (c) cases of complaints during the procurement process resulting in several adverse influences on the project implementation including cancellation of the procurement process, and (d) delay in making payments to consultants and contractors causing delay in contract implementation and sometimes leading to disputes.

Financial Management

79. The project FM reviews in regular supervision missions identified that an adequate FM system was in place that could provide, with reasonable assurance, accurate and timely information that World Bank loan proceeds were being used for the intended purposes. The project FM rating was consistently rated Moderately Satisfactory since late 2010. The reviews also recognized adequacy of FM staffing, accounting, and internal control systems; maintenance of supporting documents in the project; and implementation of auditor recommendations for annual audit. Quarterly financial reports with acceptable quality have been submitted on time. Annual audited financial reports have mostly been submitted on time to the World Bank with unqualified (clean) audit opinions. The project accounting systems were observed to be in order and payments were well controlled. The verifying and payment for contracts were timely and accurate, consistent with the provisions of the Vietnamese Government and the World Bank. The FM arrangement of the project GEF component continues to be Moderately Satisfactorily, as maintained throughout project implementation.

80. A regular fund flow arrangement was applied and the fund sources of project were allocated promptly. By October 31, 2017, a total of US\$102.8 million or 80 percent of US\$129.2 million project funds were disbursed.

C. BANK PERFORMANCE

Quality at Entry

81. As discussed earlier, the project objectives are of high strategic relevance but too ambitious, aiming to solve many pressing issues Hanoi was facing. The project design was comprehensive but too complex, with activities covering many difficult fields. Technical, financial, and economic appraisal was done properly except for substantially overoptimistic estimation of BRT ridership. Poverty, gender, and social development aspects were considered. Risks and mitigation measures were adequately identified. Environmental and social safeguards were prepared properly, with extensive due diligence and consultation done in the process of preparing the Environmental Assessment, EMP, RFP, and RAP. However, the preparation failed to identify the challenges of different local law and regulation for land and resettlement compensation to comply with World Bank resettlement policy. The fiduciary team properly assessed the procurement and FM aspects of the implementation entities. The World Bank team also engaged with the correct stakeholders, especially HPC, whose relationship proved to be critical in project implementation. Project preparation also placed enough emphasis on institutional aspects and



capacity building to gain political commitment to the BRT, which turned out to be very difficult. The M&E framework was designed with significant weaknesses, including lack of attribution and lack of methodology description.

Quality of Supervision

82. **Intensive supervision and technical support.** The World Bank team has been providing Hanoi with intensive technical support and supervision throughout the implementation process. Besides regular missions, the team conducted additional technical visits; study tours; workshops; review meetings; consultations; and numerous discussions with experts, consultants, and the client. For example, the MTR was conducted during June 7–12, 2012. A quality enhancement review, chaired by the Sector Director was carried out during August 20–28, 2012, to share experience from other countries and provide advice to the team on how to address these difficult issues. After the MTR, World Bank management recommended that HPC could consider cancelling the project. High-level management, especially the Country Management Unit (CMU), had been engaging and working closely with HPC. Given the progress and commitment from HPC, the World Bank team decided to continue with project extension during the mission in April 2013. The project was restructured for the first time, with the important realignment of BRT and extension of closing date, as well as an updated and improved M&E framework. In 2015, the World Bank processed a second restructuring with another 18-month extension to allow for the remaining PAHs by the RR2 to be resettled and BRT to be completed. Another example was in October 2016 before the launch of the BRT, a conference on urban public transport under the GEF component, focusing on BRT, was organized by the Ministry of Construction. The conference discussed the lessons learned from ongoing BRT projects financed by the World Bank in Vietnam (Hanoi, HCMC and Da Nang) and other countries (China, Republic of Korea, and India).

83. **Proactivity and flexibility.** Facing the unique urban transport characteristic and institutional challenges in Hanoi, the World Bank team tried to adapt to the context and seek flexible solutions by sometimes making compromises. For example, in 2016 when the city was having a hard time approving the traffic management plan for the BRT corridor, especially the dedicated busway with hard barriers, the World Bank team agreed to compromise on the traffic management plan as a pilot and to use markings and only fencing off key areas such as stations and intersections. The ‘pilot’ traffic management plan finally got signed in time for BRT to start operation. With BRT operating, the drivers, traffic police, and passengers began to see the need for better protection of the dedicated bus lane, and hard barriers have been installed gradually. Public opinion and perception of BRT improved.

84. In summary, the World Bank team has been providing intensive technical support and supervision to the project. The World Bank team focused on development impact and made great efforts in communicating with clients. The World Bank management, especially the CMU, played a crucial role in engaging and working closely with HPC to solve difficult issues and turned the project around. The supervision of fiduciary and safeguard aspects was done adequately. Adequate number of international and local experts were part of the missions, technical visits, review meetings, and workshops. ISRs and AMs showed candor and quality in performance reporting. The World Bank team proactively supported three project restructurings including two extensions. The client showed appreciation to the World Bank team and requested future projects for World Bank financing. After credit closing, the team continued the good relationship with relevant agencies and continued providing support. For example, the team mobilized a trust fund to support the city in operating and expanding of the BRT system, including



assessing the overall public transport network for accessibility and connectivity improvement. TRAMOC is managing the new BRT system with confidence and producing quality monthly operation reports.

Justification of Overall Rating of Bank Performance

85. In summary, the overall World Bank performance is Moderately Satisfactory, with moderate shortcomings in Quality at Entry.

D. RISK TO DEVELOPMENT OUTCOME

86. For the BRT component, the biggest risk is the failure to attract ridership. Once the BRT loses passengers, mobility is reduced, and keeping the dedicated lane will be an inefficient use of the infrastructure. This risk can only be mitigated by continuing to enhance the quality of service and solving the accessibility and integration issues discussed in the 'Efficacy' section. Maintaining speed and reliability is key to maintain and attract more passengers. There is a risk that traffic is not well managed and BRT buses lose their advantages in speed and reliability. TRAMOC and DOT will probably need to keep installing hard barriers at least at key sections to protect the dedicated lane from intrusion of other traffic. Traffic police needs to put more resources to monitor the traffic or think of innovative measures to enforce the dedicated lane for BRT buses. For example, there is a risk that violations by motorcycles are too many to enforce (for example, on flyovers, intersections) and the busway could 'collapse' when massive motorcycles invade the BRT lane and BRT buses get stuck in traffic congestion. There is also a risk that the station access issues are not solved and people still need to walk a long distance to be able to safely get to the BRT station. That lack of access will cause the loss of passengers too or even worse, cause accidents when people try to cross in the middle of the street. More importantly, the improved mobility objective through increased public transport use will only be maintained if the BRT is integrated with other modes such as the metro, LRT, other future BRT lines, regular buses, and NMT. There is a substantial risk that when LRT Line 2a starts operation, this BRT line will lose ridership as they overlap in a significant portion and the BRT line is not designed to feed the metro. The integration should be done at different levels through route reorganization, infrastructure (interchange station or bicycle or motorcycle parking facilities), integrated fare collection, operational and service plan, and passenger information system. There is a risk that due to lack of a coordinating authority for all modes and difficult institutional reform, integration is not implemented. Careful integration with the metro, LRT, regular buses, NMT, and other modes is also important as the current BRT station design offers limited capacity for boarding and alighting. Lastly, a maintenance budget needs to be ensured to keep the infrastructure and vehicles in good condition so that services are not disrupted.

87. The main benefits of the RR2 component are the accrual of travel time and vehicle operating cost (VOC) savings by road users and spurring the growth in the less developed west and northwest parts of Hanoi. There is a risk that roads are not sufficiently maintained, so users do not save much time and costs or even cause accidents.



V. LESSONS AND RECOMMENDATIONS

The Overall Project Design

88. **A more focused project design with appropriate instrument and combination of components.** This project was designed with too many activities and ambitious goals. Given the limited capacity of both the World Bank team and the client, it may have been better to focus resources in a smaller, high-impact area so that both sides can make decisions and solve problems more quickly. The financial instrument most appropriate to implement this focus should be selected. For example, Development Policy Loan might be more effective in bringing critical policy and institutional changes. Depending on the sector context of the client city and Government strategy, whether to have a combination of road infrastructure, ITS, and public transport components or just focusing on public transport improvement needs to be carefully examined.

The Design and Deployment of a 'Pioneer' BRT

89. **Deploying mass transport projects requires both political leadership and technical expertise.** Introducing a new system such as BRT involves many stakeholders with diverging interests. The city leadership needs to make tough decisions with political implications. Maintaining a high-level political 'champion' and dedicated technical focal points who are responsible to implement the decisions is key. Continuous political 'buy-in' or commitment needs to be built on a full understanding of the political and technical risks in the local context. Sometimes compromises had to be made. 'Getting the buses running' on a pilot/trial basis was a good decision. Painting a 'soft' barrier, while not being fully effective, makes the installation of hard barrier face less opposition. Relying on an established and experienced operator to commence services reduced the start-up difficulties and spread out the launch risk.

90. **BRT operation plan before finalizing designs.** One of the important lessons was to complete a sufficiently detailed operational and service plan before building infrastructure. A detailed operational and service plan should be part of the project feasibility studies and include a business plan and financial model. These plans should guide the design and implementation of infrastructure and be updated as necessary to ensure system accessibility and intermodal integration.

91. **Hiring long-term technical adviser on the client side.** When there is weak technical capacity of government agencies, hiring external consultants can help support timely decision making and the project management skills of the PMU. Appointing independent technical advisers on longer-term contracts, who can be embedded within the PMU, can help align incentives to deliver longer-term objectives. Such an adviser was needed to develop the BRT operations and service plan and guide the design and implementation of these components. Similarly, a stakeholder strategy and public media campaign is important and requires experienced professionals to support the project from the earliest stages.

Necessary Institutional Changes

92. **Anticipating necessary institutional changes.** As is often the case with infrastructure projects, the larger 'hard' components such as the Ring Road tend to dominate management attention and overshadow the 'softer' institutional components. However, institutional changes are often the key to sector reform. For example, introducing a new system opens a window of opportunity to transform the bus operating



industry by allowing incumbent operators to reassemble themselves into creditworthy, asset-owning, highly performing operators. On the other hand, it is usually the institutional obstacles that delay project implementation and affect outcomes. It is important to anticipate and evaluate these obstacles, for example, lack of legal framework, no coordination mechanism, lack of transparency, monopoly of the market, and large difference in safeguard policies such as land and resettlement compensation or environmental regulations, so that correct expectation can be set and incorporated into project design with sufficient resources allocated to make necessary changes happen.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: PDO (i) (a): increase urban mobility in targeted areas through increased use of public transport in selected traffic corridors.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increase in the use of public transport in two existing and one new corridor: Number of daily BRT/bus boardings.	Text	Kim Ma - Khat Duy Tien: 30,000; Khat Duy Tien - Yen Nghia: 50,000; Dong Anh - West of West Lake: 25,000 22-Oct-2013	1a. Le Duan - Giai Pong: 100,000; 1b. Giang Vo - Lang Ha: 80,000; 1c. Dong Anh - West of West Lake: 30,000 20-Jul-2010	Kim Ma - Khat Duy Tien: 37,000; Khat Duy Tien - Yen Nghia: 61,000; Dong Anh - West of West Lake: 28,000 13-Nov-2013	Kim Ma - Khat Duy Tien: 32,038; Khat Duy Tien - Yen Nghia: 63,598; Dong Anh - West of West Lake: 27,518 02-Nov-2016

Comments (achievements against targets): The revised targets were almost achieved as monitored in November 2016, but not attributable to BRT because it was monitored before the opening of the BRT. The original targets were based on old alignment therefore not applicable. After the BRT operation, regular buses were taken off the corridor, and the BRT ridership does not achieve the target. However, DOT and TRAMOC are still adjusting the routes and service plan on the corridor.

Objective/Outcome: PDO (i) (b): increase urban mobility in targeted areas through reduced travel time between the center and the west and northwest



sections of Hanoi

Objective/Outcome: PDO (ii)(a): promote more environmentally sustainable transport modes

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Hanoi GHG emissions saved through 2025 (project corridor)	Text	0	1.5m tons	100,000 tons	122,177 tons CO2e
		01-May-2008	17-Jul-2013	13-Nov-2013	30-Dec-2016

Comments (achievements against targets): Revised target was achieved. The original target value was estimated based on old alignment and two BRT routes with much higher ridership forecast.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of BRT riders whose alternate mode would have been a private motorized vehicle/taxi	Text	0	15% and 10%	10%	51%
		22-Oct-2013	31-Dec-2010	13-Nov-2013	29-Sep-2017
User satisfaction on BRT system (all persons)	Percentage	0.00	0.00	55.00	97.00
		22-Oct-2013			29-Sep-2017
User satisfaction on BRT System for women	Percentage	0.00	0.00	60.00	95.00
		22-Oct-2013			29-Sep-2017

Comments (achievements against targets): Both the original and revised targets for modal shift were well achieved. Two user satisfaction indicators also well achieved their targets. Note that the two user satisfaction indicators below should be individual PDO indicators instead of sub-indicators--this should



be a typo/bug of the project portal.

Objective/Outcome: PDO (ii)(b): promote more environmentally sustainable urban development plans for Hanoi

A.2 Intermediate Results Indicators

Component: Bus Rapid Transit Component (BRT)

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Travel time by bus from Kim Ma to Khuat Duy Tien	Text	50 min	40 min (20% reduction of travel time)	30 min	27 min
		22-Oct-2013	31-Dec-2010	13-Nov-2013	03-Apr-2017

Comments (achievements against targets): Revised target was well achieved. The original indicator target is not applicable as the BRT changed alignment and the indicator is measuring different corridor.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Travel time by bus from Khuat Duy Tien to Yen nghia	Text	45 min	36 min (20% reduction of travel time)	35 min	25 min
		22-Oct-2013	31-Dec-2010	13-Nov-2013	03-Apr-2017

Comments (achievements against targets): The revised target value was well achieved. The original indicator target is not applicable as the BRT changed alignment and the indicator is measuring different corridor.

**Component: Road Infrastructure and Sustainable Urban Planning Component**

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Travel time by bus Cau Giay to Dyke Road at Nhat Tran	Minutes	28.00	22.00	22.00	21.00
		22-Oct-2013	31-Dec-2013	13-Nov-2013	02-Nov-2016

Comments (achievements against targets): The target value was achieved.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Travel time by motor cycle Nhat tan to Cau Giay (PM peak)	Minutes	21.00	15.00	15.00	11.00
		22-Oct-2013	31-Dec-2013	13-Nov-2013	02-Nov-2016

Comments (achievements against targets): The target value was well achieved.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Adoption of land use TA- Draft Final Report developed - Final Report approved	Number	0.00	1.00	1.00	1.00
		22-Oct-2013	31-Dec-2013	13-Nov-2013	30-Jun-2016

Comments (achievements against targets): The revised less ambitious target was achieved.



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of DAPM staff trained	Number	0.00	20.00	60.00	61.00
		22-Oct-2013	31-Dec-2013	13-Nov-2013	02-Nov-2016
Comments (achievements against targets): Both original and revised targets were achieved.					

Component: Institutional Development Component

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Strengthened capacity for planning multi-modal public transport system	Number	0.00	1.00	1.00	1.00
		22-Nov-2007	31-Dec-2013	13-Nov-2013	02-Nov-2016
Step 1: establishment of Multi-Modal Public Transport Committee	Number	0.00	1.00	1.00	1.00
		22-Oct-2013	31-Dec-2010	13-Nov-2013	31-Dec-2013
Step 2: Draft final report on establishment of PTA developed.	Number	0.00	1.00	1.00	1.00
		22-Oct-2013	30-Dec-2011	13-Nov-2013	30-Jun-2015
Comments (achievements against targets): The revised less ambitious target was achieved.					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
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Coordinated institutional system for AQM policy making in place based on monitoring system and emission data	Number	0.00 22-Nov-2007	1.00 31-Dec-2013	1.00 13-Nov-2013	1.00 02-Nov-2016
Number of staff trained, skills assessment	Number	0.00 22-Nov-2007	25.00 31-Dec-2013	85.00 13-Nov-2013	128.00 02-Nov-2016
Number of replication activities (workshop, studies in other Vietnam cities, study tours)	Number	0.00 22-Nov-2007	5.00 31-Dec-2013	6.00 13-Nov-2013	6.00 21-Oct-2016

Comments (achievements against targets): The target was achieved.



B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Increase urban mobility in targeted areas of the City of Hanoi through increased use of public transport in selected traffic corridors	
Outcome indicators	<ol style="list-style-type: none"> 1. PDO indicator 1: Number of daily BRT/bus boardings 2. PDO indicator 5: User satisfaction on BRT system (all persons) 3. PDO indicator 6: User satisfaction on BRT system for women
Intermediate results indicators	<ol style="list-style-type: none"> 1. Travel time by bus on the BRT corridors
Key outputs by component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> 1. Construction of BRT Line 1, including a 14.7 km long BRT busway from Kim Ma to Yen Nghia, 21 BRT stations, 2 BRT terminals, one depot at Yen Nghia, 35 BRT vehicles, and BRT traffic signals 2. Improvement of pedestrian and NMT access at BRT stations, including construction of 10 pedestrian overpasses 3. Implementation of public consultation, communications, and media strategy
Objective/Outcome 2: Increase urban mobility in targeted areas of the City of Hanoi through reduced travel time between the center and the west and northwest sections of Hanoi	
Outcome indicators	—
Intermediate results indicators	<ol style="list-style-type: none"> 1. Travel time by bus from Cau Giay to Dyke Road at Nhat Tan 2. Travel time by motorcycle from Nhat Tan to Cau Giay
Key outputs by component (linked to the achievement of the Objective/Outcome 2)	<ol style="list-style-type: none"> 1. Construction of Ring Road 2, including 6.1 km roadway; major interchanges (Buoi, Dao Tan, and Cau Giay); overpasses; lighting; greening; and traffic signal system 2. Construction of the resettlement site CT1 to house the displaced households
Objective/Outcome 3: Promote more environmentally sustainable transport modes	
Outcome indicators	<ol style="list-style-type: none"> 1. PDO indicator 2: Number (percentage*) of BRT riders whose alternate (alternative*) mode would have been a private motorized vehicle/taxi 2. PDO indicator 3: Hanoi GHG emission (transport-related*) saved
Intermediate results indicators	—
Key outputs by component (linked to the achievement of the Objective/Outcome 3)	<ol style="list-style-type: none"> 1. Construction of BRT Line 1 2. Construction of Ring Road 2 3. Implementation of public consultation, communications, and media strategy



Objective/Outcome 4: Promote more environmentally sustainable urban development plans for Hanoi	
Outcome indicators	—
Intermediate results indicators	<ol style="list-style-type: none">1. Adoption of land use TA2. Number of DAPM staff trained3. Strengthened capacity for planning multimodal public transport system4. Coordinated institutional system for AQM policy making in place based on monitoring system and emission data5. Number of replication activities (workshop, study tours in other Vietnam cities)
Key outputs by component (linked to the achievement of the Objective/Outcome 4)	<ol style="list-style-type: none">1. Land use TA final report2. Establishment of the MMPTC3. Final report on strengthening TRAMOC and the establishment of PTA4. Replication activities including workshop and study tours in other Vietnam cities5. Relevant staff in DAPM trained for integrated land use and transport planning6. Procurement of equipment for traffic management and safety



ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Shomik Raj Mehndiratta	Task Team Leader
Cuong Duc Dang	Co-TTL
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B. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
Preparation		
FY05	35.895	91,058.04
FY06	56.605	149,267.39
FY07	53.537	126,542.73



FY08	0	- 212.90
Total	146.04	366,655.26
Supervision/ICR		
FY08	28.632	93,066.95
FY09	28.904	92,658.80
FY10	29.883	135,702.71
FY11	23.320	93,585.72
FY12	32.970	107,555.22
FY13	44.123	177,976.26
FY14	28.938	126,008.12
FY15	23.820	108,895.83
FY16	25.245	73,393.68
FY17	32.330	121,263.12
FY18	6.100	27,029.59
Total	304.27	1,157,136.00



ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US\$, millions)	Actual at Project Closing (US\$, millions)	Percentage of Approval
Development of the BRT System	99.88	32.78	33
Road Infrastructure and Sustainable Urban Planning	194.33	258.14	133
Institutional Development	10.49	4.30	41
Total	304.70	295.20	91



ANNEX 4. EFFICIENCY ANALYSIS

Overview

1. In 2007, the project was originally approved with two key components that together constituted over 95 percent of the project cost.
 - **BRT component.** Development of a BRT system along the Giang Vo-Lang Ha (9.1 km) and Giai Phong corridor (10.1 km)
 - **RR2 component.** Construction of approximately 6.1 km road section as part of the RR2 between Nhat Tan Bridge and Cau Giay
2. In 2013, the project was restructured. The BRT component was realigned in the western section from Le Van Luong extended road to Le Trong Tan street to maximize the design capacity of the public transport system. The route was also extended to Yen Nghia bus station. The BRT Line 2 Giai Phong corridor was cancelled to avoid the overlap of the LRT project along the same corridor.
3. The economic analysis was conducted for both BRT and RR2 components at the completion of the project to provide a comparison of the economic efficiency of the project from the estimation at project appraisal with the changes over project implementation. The updated economic analysis used similar methodology as in the PAD and the first restructuring, adding the benefits of GHG emission reduction. Costs and benefits of the 'with project' scenario were compared with those of the 'without project' scenario (counterfactual or baseline scenario). Economic viability was assessed using two indicators of NPV and EIRR.
4. Annual costs and benefits were calculated for the life cycle of 12 years for BRT and 25 years for RR2. To be consistent with the appraisal stage NPV, the same discount rate of 12 percent was used.
5. Unit prices of the updated project costs and benefits are based on prices in Vietnam in 2017. The evaluation was conducted using U.S. dollar with exchange rate of VND 22,730:US\$1, which was close to the market rate and so no shadow foreign exchange rate was considered necessary.

Ex Post Economic Analysis of the BRT Component

6. **Project costs.** The analysis used the project life cycle costs, which included capital costs and operation and maintenance (O&M) costs throughout the evaluation period.
7. **Capital costs.** The capital cost for this BRT component included costs for civil works, equipment, consulting services, and resettlement. Civil works included concrete pavement of the BRT lanes, depots, stations and terminals for BRT, footbridges, parking lots at stations, office, and control center. Equipment costs included costs for buses, communication system, ticketing and control, traffic signals, and control system. The capital costs were reduced significantly at first restructuring due to the cancellation of one corridor and fewer vehicles (130 buses to 35 buses). The final costs were even lower mainly because of the cancellation of the electronic ticketing package.



Table 4.1. Updated BRT Component Costs (US\$, millions)

	PAD (2007)	Restructuring (2013)	ICR (2017)
Financial cost	92.8	52.0	32.78

Table 4.2. Annual Disbursement for the BRT Component (US\$, millions)

Capital Cost (US\$, millions)	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Financial Cost	32.8	0.01	1.03	1.35	0.27	0.48	0.86	2.87	3.86	7.09	13.23	1.74
Economic Cost	26.6	0.01	0.83	1.10	0.22	0.39	0.69	2.32	3.12	5.74	10.72	1.41

8. **Operating and maintenance costs.** The method in the PAD was used with 2017 prices.

Table 4.3. Updated O&M Cost (US\$, millions per year)

	2017	2020	2025
O&M cost	3.337	3.989	4.112

9. **Economic benefits.** The study quantified three major sources of benefits: VOC savings, travel time savings, and the GHG emission reduction. The economic benefits of reducing fatalities/injuries were not calculated due to lack of baseline data.

10. **VOC savings.** VOC savings result from modal shifts from private vehicles or/and normal buses to BRT services. The VOCs of BRT and other vehicles in the ‘with project’ and ‘without project’ cases were updated using the same methodology as in the PAD and restructuring with 2017 unit prices.

Table 4.4. Vehicle Operating Costs (US\$ per vehicle-km)

Sl. No.	Type of Vehicle	Restructuring (2013)	ICR (2017)
1	BRT	1.269	1.523
2	Motorbike	0.092	0.046
3	Car	0.362	0.329
4	Standard bus (60 seats)	0.740	0.630

11. **VOT savings.** VOT savings were estimated based on reduction of travel times, income of travelers, and traffic pattern. At the Implementation Completion and Results Report (ICR) stage, a roadside survey on traffic pattern and income level was conducted to update the time saving and VOT of passengers.

Table 4.5. Value of Time (US\$ per passenger per hour)

	Restructuring (2013)	ICR (2017)
Average VOT/passenger/hour	1.55	1.89

12. **Travel demand forecast.** In the PAD and the 2013 restructuring, travel demand forecasts were done with the STRADA model. At the ICR stage, travel demand was adjusted with actual BRT ridership for the first year of operation and other traffic along the corridor.



Table 4.6. Modal Composition of BRT Ridership (modal shift)

No.	Type of Vehicle	Restructuring (2013)	ICR (2017)
1	Motorbike	48%	35%
2	Car	1%	11%
3	Bus	51%	44%

13. **GHG emission reduction.** In the PAD and 2013 restructuring, GHG emission reduction benefits were not calculated. With the BRT ridership data collected every month and modal shift data estimated using the 2nd month and 9th month BRT survey, GHG emission reduction due to the BRT component is estimated.

Table 4.7. GHG Emission Reduction by Year due to the BRT Component (tCO₂e)

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
tCO ₂ e	2,278	2,300	2,323	2,347	2,370	2,394	2,418	2,442	2,466	2,491	2,516	2,541	2,566

14. Based on the Guidance Note on shadow price of carbon in economic analysis in September 2017,¹ US\$50 per tCO₂e was used for 2017, and an annual increase of 2.25 percent is assumed to calculate the shadow price of carbon, that is, US\$50 per tCO₂e in 2017, US\$60 in 2025, and US\$65 in 2029.

15. **Updated economic evaluation results.** The updated evaluation shows that at ICR, the investment efficiency of the BRT component is only modest, with an EIRR of 6 percent. This is mainly due to the lower ridership and therefore smaller scale of benefits.

Table 4.8. Updated Economic Analysis of the BRT Component

	PAD (2007)	Restructuring (2013)	ICR (2017)
NPV (US\$, millions)	41.3	3.44	-5.16
EIRR (%)	21.0	13.1	6.0

Updated Economic Analysis of the RR2 Component

16. **Capital costs.** Similarly, capital costs of the component included civil work costs, consulting and resettlement costs, and so on. Actual investment costs were higher than cost estimate at appraisal due to significant increase in land acquisition costs and some civil works variations.

Table 4.9. Financial Investment Costs of the RR2 (US\$, millions)

Items	PAD (2007)	ICR (2017)
Civil works	42.54	51.81
Resettlement	104.32	174.69
Others	23.89	7.61
Total	170.75	234.12

¹ In line with the high-level commission on carbon prices led by Joseph Stiglitz and Nicholas Stern, the estimation method is based on marginal abatement cost of reducing GHG emission to meet the Paris Agreement target of keeping temperature rise below 2 degrees by 2100.

**Table 4.10. Actual Disbursement of the RR2 (US\$, millions)**

Items	Total	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Civils Works	51.81	0.00	0.00	0.00	0.00	0.00	0.00	14.89	14.06	10.21	9.88	2.77
Resettlement	174.69	0.00	0.39	0.34	11.52	6.88	8.39	26.53	96.84	13.46	5.86	4.49
Other costs	7.61	0.00	0.00	0.94	0.52	0.60	0.69	1.38	1.31	1.10	0.76	0.31
Total	234.12	0.00	0.39	1.27	12.04	7.48	9.08	42.80	112.20	24.77	16.51	7.57

17. **O&M costs.** The method in the PAD was used with 2017 prices.

Table 4.11. Updated O&M Cost

	2017	2020	2025	2030	2035	2040
O&M cost	1.950	9.755	1.950	1.950	1.950	58.529

18. **Traffic forecast.** A traffic count was carried out along the RR2 in October 2017, more than one year after the road inauguration. The results are given in table 4.12.

Table 4.12. Traffic Count on the RR2 in 2017 (vehicles per day)

Section	Motorbike	Car	Bus	Truck
Cau Giay - Buoi	84,253	24,700	1,338	917
Buoi - Nhat Tan	47,460	39,640	3,324	2,076

19. The 2017 traffic survey shows that traffic grew faster than expected. At the ICR stage, the actual traffic on the Cau Giay-Buoi section was 12 percent higher than forecasted in the PAD whereas traffic on the Buoi-Nhat Tan section was 50 percent higher than projected in the PAD. With reference to other recent relevant studies in Hanoi, the traffic forecast was updated as shown in table 4.13.

Table 4.13. Updated Traffic Forecast on the RR2 (vehicles per day)

Section	2020	2025	2030	2035	2040
Cau Giay-Buoi section					
Motorbike	70,063	89,420	114,126	145,656	185,898
Car	2,909	3,820	5,016	6,586	8,649
Bus	158	207	272	357	469
Truck	108	142	186	245	321
Buoi-Nhat Tan section					
Motorbike	27,470	35,060	44,746	57,109	72,887
Car	20,736	27,749	37,134	49,694	66,502
Bus	2,525	3,379	4,521	6,051	8,097
Truck	1,490	1,993	2,668	3,570	4,777
Cau Giay-Nhat Tan section					
Motorbike	27,470	35,060	44,746	57,109	72,887
Car	26,476	35,431	47,415	63,452	84,913
Bus	1,434	1,919	2,568	3,437	4,600
Truck	983	1,315	1,760	2,356	3,152



20. **Project benefits.** Economic benefits quantified for the analysis consist of (a) VOC savings, (b) travel time savings, and (c) GHG emission reduction due to the average speed increase on the RR2. These three benefits were estimated annually by comparing total VOCs, total time values, and GHG emissions ‘with’ and ‘without’ the RR2 scenarios.

21. **VOC savings.** The unit VOCs in the ‘with project’ and ‘without project’ cases were calculated using the HDM4-VOC model with inputs from recent relevant studies and similar projects, updated with changes in gasoline and lubricants costs, vehicle prices, and vehicle characteristics and usages in Hanoi City in 2017. Given this updated traffic forecast, the VOC savings from the investment in the RR2 were as shown in table 4.14.

Table 4.14. Updated VOC Savings Benefits (US\$, millions)

VOC Savings	2017	2020	2025	2030	2035	2040
Motorbike	0.855	0.990	1.264	1.613	2.058	2.627
Car	17.714	21.095	28.226	37.767	50.532	67.614
Bus	1.482	1.765	2.361	3.160	4.228	5.658
Truck	0.906	1.078	1.443	1.931	2.584	3.457
Total	20.957	24.930	33.295	44.472	59.405	79.359

22. **Travel time savings.** Travel time savings were due to shorter trips at faster speed because of the construction of the RR2. VOTs used in the analysis were also updated using recent survey results. Given this updated traffic forecast, the VOT savings from the investment in the RR2 are as shown in table 4.15.

Table 4.15. Updated VOT Savings Benefits (US\$, millions)

VOT Savings	2017	2020	2025	2030	2035	2040
Motorbike	4.726	6.334	10.317	16.805	27.374	44.589
Car	5.290	7.292	12.452	21.263	36.308	61.999
Bus	4.243	5.849	9.989	17.057	29.129	49.744
Truck	0.171	0.236	0.403	0.689	1.176	2.009
Total	14.459	19.750	33.225	55.918	94.156	158.616

23. **GHG emission reduction.** In the PAD and the 2013 restructuring, GHG emission reduction benefits were not calculated. With the traffic count and road ride survey conducted, GHG emission reduction due to the RR2 component is estimated as shown in table 4.16.

Table 4.16. GHG Emission Reduction by Year due to RR2 Component

Year	2016	2020	2025	2030	2035	2040
tCO ₂ e	7,651	9,659	12,925	17,297	23,147	30,977

24. Similarly, the shadow price of carbon is US\$50 per tCO₂e for 2017, with 2.25 percent annual growth.



25. **Updated economic evaluation results.** Although the capital costs increased about 20 percent, higher traffic volume on the road as well as higher VOT of passengers resulted in better return on investment. Both the internal rate of return (IRR) and NPV at the ICR stage are higher than those estimated at the appraisal stage.

Table 4.17. Economic Evaluation Results for the RR2

	PAD (2007)	ICR (2017)
NPV (US\$, millions)	34.0	165.0
IRR (%)	14.5	18.5



ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

	Comments/Edits	Revisions	Explanation
1 ^a	Discount rate is too high; Suggest using cost-benefit ratio instead of NPV.	Discount rate kept at 12%	The ICR used the same discount rate of 12% so that the comparison can be made between project appraisal and project closing. NPV is not used for deciding project feasibility but to assess the efficiency decrease. Using cost-benefit ratio would be the same as NPV for this purpose.
2 ^a	Higher BRT ridership is expected.	BRT ridership forecast is adjusted in the ex post economic analysis	Given the future development along the corridor and ongoing improvements to the BRT features and connectivity issues, BRT ridership growth rate is adjusted upward. However, the adjustment is minor as the forecasted ridership is also constrained by station and fleet capacity.
3	Edit in para. 29: 9 10 pedestrian overpasses (two newly constructed ones and two were added with stairs on the existing ones)	Number of pedestrian overpasses revised to 10	
4	<u>Rating for PDO (ii)(b): promote more environmentally sustainable urban development plans for Hanoi</u> <i>Moderate Substantial</i>	Proposed change not accepted	Two major indicators related to this outcome were relaxed during first restructuring and it is difficult to justify Substantial achievement because the land use policy reform did not materialize and the PTA has not been established.
5	Edit in para. 48 and para. 50 for efficiency	Minor edits were made in wording	Same as #1. Revised text: The prolonged project implementation and reduced scope of work for the BRT component has affected the efficiency of the project.
6	Efficiency rating: <i>Modest Moderately Satisfactory</i>	Proposed change not accepted	World Bank ICRs rate efficiency by the scale of 'High', 'Substantial', 'Modest', and 'Negligible'.
7	Overall outcome rating: <i>Moderately Satisfactory</i>	Proposed change not accepted	The overall outcome rating is derived according to the latest ICR guideline: the project is Moderately Satisfactory with High relevance, Substantial efficacy,



	Comments/Edits	Revisions	Explanation
			and Modest efficiency.
8	<p>Edit in para. 62. On flyover. A “light structure” flyovers were-was constructed along the proposed BRT realignment that were-was not suitable for BRT to run over. The development of light flyover with aim of preventing traffic congestion. At that time, the construction of flyover was a matter of urgency, which needed to be implemented quickly to overcome the traffic jams. Initially, the city planned BRT vehicle running under the flyover so as not to have to strengthen the flyover load, not affecting the construction progress. However, in the course of implementation, on the basis of the comments from WB, the City agreed to upgrade the flyover load for BRT vehicle running on the flyover.</p>	Text in para. 62 was revised accordingly with shorter explanation than the suggested edits due to word limit.	Revised text: In mid-2012 and early 2013, Hanoi constructed a “light structure” flyover along the proposed BRT realignment to ease congestion.
9	<p>Edit in para. 64. Slow approval procedures and weak capacity.The approval process also took long time, since BRT with many complicated items was the first time applied in Vietnam, getting comments from related agencies and being careful in appraisal and approval process is indispensable. Hanoi managed to concentrate on resolving the issues as quickly as possible. Implementation of this project must comply with a dual system: WB system and the local system. The system of Vietnam, especially Hanoi must comply with the Laws of Vietnam before making approval, so it must report to competent authorities to decide contents beyond their competence. It was identified in the first ISR that delays due to administrative procedures would make it difficult to complete the project before closing date. Like all other WB operations, project implementation had to follow a dual system: the WB system and the domestic system. The Vietnam system, especially Hanoi was extremely conservative and slow. It was identified in the first ISR that the delays due to administrative procedures would make it difficult to complete the project before closing date.</p>	Wording in para. 64 was revised.	Revised text: <i>Lengthy approval procedures.</i> Like all other WB operations, project implementation had to comply with both the WB system and the domestic system. With the BRT being the first one in the country, and technically complicated, the project had to go through careful evaluation, scrutiny, and lengthy approval procedures at different institutional levels of Hanoi.
10	Edit in para. 65. After the questioned bidder was debarred due to separate reason on May 12, 2015, DOT and PMU and the Bank	Edits accepted	Revised text: DOT and PMU and the bank team disagreed on the post-



	Comments/Edits	Revisions	Explanation
	team could not also reach consensus further delayed on the post-qualification evaluation of the second responsive bid.		qualification evaluation of the second responsive bid.
11	Edit in para. 81. complaints, especially those related to fraud/corruption during the procurement process resulted in several adverse influences on the project implementation including cancelation of the procurement process; and 4) delay in making payments to consultants and contractors caused delay in contract implementation and sometimes lead to disputes.	Edit to point 3) accepted; deletion of point 4) not accepted	Point 4) is a factual statement backed by complaints.
12	Edit in Annex 4. 7 6.1 km (Km 6+537-KO+419) road section as part of the Second Ring Road between Nhat Tan Bridge and Cau Giay.	Road length is revised to 6.1 km.	

Note: a. The first two comments in the table are summaries of the written comments that the client sent by e-mail. Full comments are included in the end after this table.

1. The discount rate for the financial evaluation of the project was determined to be 12% per annum. This was a very high number compared to the condition in Vietnam, especially in the case of BRT evaluation. This led to a low Net Present Value (NPV) of BRT (-7.46 million) – Table 3 Results of Economic Analysis at different stages. It is recommended that the discount rate should be equal to the interest rate of ODA loans of the project (1% / year).
2. The assessment of investment project through NPV only is applied for business projects (i.e, projects are invested to seek higher returns than input costs).
3. BRT should be considered as a public project (is an investment project that seeks total benefits of the investment higher than input costs). Hanoi has been trying to encourage the development of public transport, even Hanoi is spending a budget to subsidize for bus routes annually. Therefore, economic efficiency assessment of BRT as a business project will not reflect the nature as well as investment objectives of the project. It is recommended to use “Cost-Benefit” (B / C) to evaluate the efficiency of BRT (not using NPV).
4. **For the ridership of BRT:** under current traffic conditions, BRT cannot fully function as BRT in the world. As a result, BRT ridership has not reached the initial forecast but is already the busiest route (higher than all regular buses). The city is planning step by step to complete installation of electronic ticket system, to finalize the traffic management plan ... to speed up the BRT operation and to attract passengers. Moreover, many high-rise buildings on both sides of the route are being completed and when these buildings are put into operation, the BRT ridership will get higher.



ANNEX 6. SUPPORTING DOCUMENTS

1. TRAMOC, 1-month, 2-month, 3-month, 8-month, and 10-month Hanoi BRT Operation Report, 2017
2. World Bank, 2nd Month and 9th Month BRT Survey for Hanoi BRT Line 1, 2017
3. World Bank, Country Partnership Strategy for Vietnam 2007–2011 (Report No. 65200-VN)
4. World Bank, Country Partnership Framework for Vietnam 2018–2022 (Report No. 111771-VN)
5. World Bank, Project Appraisal Document on a Proposed Credit in the amount of SDR101.8 Million to the Socialist Republic of Vietnam for a Hanoi Urban Transport Development Project, Report No. 39434–VN, May 17, 2007
6. World Bank, Project Document on a Proposed Global Environment Facility Trust Fund Grant in the amount of USD 9.8 Million to the Socialist Republic of Vietnam for a Hanoi Urban Transport Development Project, Report No. 40565–VN, August 10, 2007
7. World Bank, Restructuring Papers, 2013, 2015, and 2016
8. World Bank, Mission Aide-Memoires, 2008-2016
9. World Bank, Implementation Status and Results Reports, 2008-2016



ANNEX 7. MAP

