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June 5, 2018

Closing Date: Friday, June 22, 2018 at 6 p.m.

FROM: Vice President and Corporate Secretary

Vietnam - Dynamic City Integrated Development Project - Thai Nguyen

Project Appraisal Document

Attached is the Project Appraisal Document regarding a proposed credit to Vietnam for Dynamic City Integrated Development Project - Thai Nguyen (IDA/R2018-0185), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

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Report No: PAD2627

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF US$80 MILLION

TO THE

SOCIALIST REPUBLIC OF VIETNAM

FOR A

DYNAMIC CITIES INTEGRATED DEVELOPMENT PROJECT - THAI NGUYEN

June 1, 2018

Social, Urban, Rural And Resilience Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 30, 2018)

Currency Unit =	Vietnam Dong (VND)
US$1 =	VND22,736

FISCAL YEAR
January 1 - December 31

Regional Vice President:	Victoria Kwakwa
Country Director:	Ousmane Dione
Senior Global Practice Director:	Ede Jorge Ijjasz-Vasquez
Practice Manager:	Abhas Kumar Jha
Task Team Leader:	Huyen Thi Phuong Phan

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AFD	Agence Française de Développement *(French Development Agency)*
CCS	City Classification System
CD	Country Director
CESMP	Contractor's Environment and Social Management Plan
CF	Counterpart Funds
CPC	City People's Committee
CPF	Country Partnership Framework
CQS	Consultant Qualifications Selection
CSC	Construction Supervision Consultant
CUDRP	Can Tho Urban Development and Resilience Project
DA	Designated Account
DMS	Detailed Measurement Survey
DCIDP	Dynamic City Integrated Development Project
DDMP	Dredging and Dredged Material Management Plan
DSCDP	Da Nang Sustainable Development Project
EAP	East Asia and Pacific Region
ECOP	Environmental Codes of Practice
EOCC	Economic Opportunity Cost of Capital
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FA	Financing Agreement
FDI	Foreign Direct Investment
FM	Financial Management
FMM	Financial Management Manual
FS	Feasibility Study
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GoV	Government of Vietnam
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GSO	General Statistics Office
HCMC	Ho Chi Minh City
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
IBRD	International Bank for Reconstruction and Development
IC	Individual Consultant
IDA	International Development Association
IEMC	Independent Environmental Monitoring Consultant
IRI	International Roughness Index

IRR	Internal Rate of Return
ISDS	Integrated Safeguards Data Sheet
JICA	Japan International Cooperation Agency
KEXIM	Export-Import Bank of Korea
MFD	Maximizing Finance for Development
M&E	Monitoring and Evaluation
MCDP	Medium Cities Development Project
MOC	Ministry of Construction
MOET	Ministry of Education and Training
MOF	Ministry of Finance
MONRE	Ministry of Natural Resources and Environment
MPI	Ministry of Planning and Investment
MTPIP	Medium Term Public Investment Plan
NPF	New Procurement Framework
NPV	Net Present Value
O&M	Operations and Maintenance
O-D Survey	Origin-Destination Survey
ODA	Official Development Assistance
OP/BP	Operations Policy / Bank Policy
PAD	Project Appraisal Document
PCRA	Procurement Capacity and Risk Assessment
PCU	Passenger Car Units
PDO	Project Development Objective
PforR	Program-for-Results Financing
PIM	Project Implementation Manual
PM	Prime Minister
PMU	Project Management Unit
PPC	Provincial People's Committee
PPSD	Project Procurement Strategy Document
PPU	Project Preparation Unit
PSC	Project Steering Committee
QCBS	Quality and Cost-based Selection
RAP	Resettlement Action Plan
RF	Results Framework
RFB	Request for Bidding
RFP	Request for Proposal
RFQ	Request for Quotation
RPF	Resettlement Policy Framework
RR	Retained Revenue
RVP	Regional Vice President
SECO	Swiss State Secretariat for Economic Affairs

SORT	Systematic Operations Risk-Rating Tool
STEP	Systematic Tracking of Exchanges in Procurement
STRADA	System for Traffic Demand Analysis
SUTI	Sustainable Urban Transport Index
TA	Technical Assistance
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
VAT	Value Added Tax
VOC	Vehicle Operating Cost
VOT	Vehicle Operating Time
VUUP	Vietnam Urban Upgrading Project
WWTP	Wastewater Treatment Plant

BASIC INFORMATION

Country(ies)	Project Name	
Vietnam	Dynamic City Integrated Development Project - Thai Nguyen	
Project ID	**Financing Instrument**	**Environmental Assessment Category**
P160162	Investment Project Financing	B-Partial Assessment

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
22-Jun-2018	31-Dec-2023

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To improve access to urban infrastructure and to improve integrated urban planning and management in the project city.

Components

Component Name	Cost (US$, millions)
Component 1: Structural Investments - Rehabilitation and Construction of Urban Infrastructure	87.52

Component 2: Non-Structural Investments - Technical Assistance and Implementation Support	6.56

Organizations

Borrower:	Socialist Republic of Vietnam
Implementing Agency:	Thai Nguyen City People's Committee

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	100.00
Total Financing	100.00
of which IBRD/IDA	80.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	80.00
IDA Credit	80.00

Non-World Bank Group Financing

Counterpart Funding	20.00
Borrower	20.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Total Amount
Transitional Support	80.00	0.00	80.00
Total	**80.00**	**0.00**	**80.00**

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2018	2019	2020	2021	2022	2023	2024

Annual	0.00	3.42	5.60	8.81	16.12	22.57	23.49
Cumulative	0.00	3.42	9.02	17.82	33.94	56.51	80.00

INSTITUTIONAL DATA

Practice Area (Lead)

Social, Urban, Rural and Resilience Global Practice

Contributing Practice Areas

Governance, Transport & Digital Development, Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?	
a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF	Yes
b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment	Yes
c. Include Indicators in results framework to monitor outcomes from actions identified in (b)	Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	High
7. Environment and Social	Substantial

8. Stakeholders	Moderate
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36	✓	
Pest Management OP 4.09		✓
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50		✓
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Institutional Arrangements

Financing Agreement: Schedule 2, Section I.A

Recurrent, Continuous

Obligation of the Recipient, through the Project Province, to maintain, and cause to be maintained a Project

Management Unit, with composition, powers, functions, staffing, facilities and other resources satisfactory to the Association.

Sections and Description
Subsidiary Agreement
Financing Agreement: Schedule 2, Section I.B
Recurrent, Continuous
Obligation of the Recipient to make the proceeds of the Credit available to the Project Province under a subsidiary agreement between the Recipient and the Project Province, under terms and conditions acceptable by the Association; exercise its rights under the Subsidiary Agreement in such manner as to protect the interests of the Recipient and the Association and to accomplish the purposes of the Credit. Except as the Association shall otherwise agree, the Recipient shall not assign, amend, abrogate or waive the Subsidiary Agreement or any of its provisions.

Sections and Description
Project Implementation Manual
Financing Agreement: Schedule 2, Section I.C
Recurrent, Continuous
Obligation of the Recipient, through the Project Province, to carry out the Project in accordance with the Project Implementation Manual; and not amend, suspend, or waive the Project Implementation Manual or any provision or schedule thereof unless the Association otherwise agrees in writing.

Sections and Description
Safeguards
Financing Agreement: Schedule 2, Section I.D
Recurrent, Continuous
Obligation of the Recipient, through the Project Province, to ensure that the Project is carried out in accordance with the Safeguards Instruments; and not amend, revise or waive, nor allow to be amended, revised or waived, any of the provisions of the Safeguards Instruments unless the Association agrees otherwise in writing; and regularly collect, compile, and furnish to the Association as part of the Progress Reports information on the status of compliance with the Safeguards Instruments; and maintain policies and procedures adequate to enable it to so monitor and evaluate implementation.

Sections and Description
Midterm Review
Financing Agreement: Schedule 2, Section II.A.2
Due Date: 36 months after the Effective Date
Obligation of the Recipient, through the Project Province, to carry out jointly with the Association a midterm review to assess the status of Project implementation, as measures against the performance indicators set forth in the

Project Implementation Manual.

Conditions

Vietnam
Dynamic Cities Integrated Development Project - Thai Nguyen

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I. STRATEGIC CONTEXT

A. Country Context

1. Vietnam has sustained rapid economic growth rates since the introduction of the Doi Moi reforms in the late 1980s, allowing the country to transform from a low-income economy to a middle-income economy in one generation. With GDP growth averaging 5.3 percent annually, real GDP per capita more than tripled between 1990 and 2014. Economic growth, coupled with the Government's strong focus on inclusive social development has enabled Vietnam to drastically reduce the incidence of extreme poverty and to broaden prosperity. By the World Bank's measure of shared prosperity (i.e., the income growth of the bottom 40 percent of the population), Vietnam is one of the most noteworthy cases of long-term shared prosperity globally. The pace of economic growth is expected to continue, with the country's recently approved Socio-Economic Development Plan (SEDP) for 2016-2020 setting out an annual growth target of 6.5-7 percent.

2. As is common among developing and industrializing economies, urban growth has accompanied Vietnam's rapid economic expansion, with the fastest urban population growth concentrated in and around Hanoi and Ho Chi Minh City (HCMC). The urban population has grown by 3.1 percent annually, with half the country's population expected to live in urban areas by 2040.[1] However, the expansion of urban areas in Vietnam has been low-density and fragmented in nature. In addition, while peri-urban areas around the two major cities have benefitted from their proximity to key economic drivers, regions elsewhere in the country are at risk of falling behind. The World Bank's Vietnam Urbanization Review (2011) highlighted that access to basic services, such as sanitation, drainage and quality of water, remains low in secondary cities as compared to large cities. For example, while Hanoi has access to sanitation with connection rates above 80 percent, smaller cities have access rates as low as 15 percent. An additional challenge is the increased vulnerability of poor urban areas to climate change variations. Increased incidences of flooding and rising sea levels can have potentially dramatic effects on economies and populations; industries such as shipping, agriculture, and tourism, for example, may face significant pressure in vulnerable low-lying areas.

3. In recognition of the strategic role of urbanization in achieving Vietnam's goals of industrialization and modernization, the GoV developed the Framework Master Plan for Urban Development in Viet Nam to 2025 and Vision to 2050 (hereby referred to as the National Master Plan) in 2009. Under the National Master Plan, the urban population is expected to increase by 5.3 percent annually, reaching 52 million by 2025. While Vietnam has made overall improvements in reducing poverty and regional inequality, the growing pace of urbanization and the demands of an ever-evolving growth model indicate that well-planned and well-managed urban growth is critical for the country to continue its transformation into a high-income economy.

B. Sectoral and Institutional Context

4. Current Urbanization Trends. Urban areas currently account for 34 percent of Vietnam's population and contribute to more than half of national GDP.[2] Global evidence suggests that the benefits from urban growth come from encouraging economic densification, which allows cities to harness the agglomeration economies that enhance productivity, spur innovation and economic diversification, and facilitate more efficient service delivery. However, a

[1] Vietnam Urbanization Review (World Bank 2011); World Data Bank World Development Indicators http://databank.worldbank.org/data/reports.aspx?source=2&country=VNM&series=&period=
[2] World Urban Population data (World Bank 2015).

notable characteristic of urban development in Vietnam has been low and stagnant levels of urban density. Between 2000 and 2015, urban density remained at 18.9 urban residents per hectare even as urban land expanded by over 650,000 hectares.[3] Increasingly fragmented urbanization is driven in part by Vietnam's current City Classification System (CCS), which provides fiscal incentives for rapid land conversion and physical expansion of cities, with little emphasis placed on urban density.[4] In an analysis of seven cities that attained Class I status between 2009 and 2011, all but one city failed to meet the minimum standards for urban density, implying that other factors, such as the non-agricultural labor population and development of infrastructure, were relied on to qualify for upgrading.

5. Low and stagnant urban densities with limited infrastructure impede agglomeration economies.[5] Vietnam's fragmented pattern of urbanization, wherein development commonly takes place beyond the "official" urban core, means that expanding metropolitan areas are limited in their ability to develop infrastructure efficiently. This in turn gives rise to a host of other urban management issues, including growing traffic congestion, worsening air pollution, poor environmental management, and emerging informal settlements. In contrast to Vietnam's low-density, fragmented urbanization, it is generally recognized that compact cities—with tightly-knit development patterns, strong public transport linkages, and good accessibility to services and jobs—are better able to respond to the growing needs of urban areas. By reducing travel distances within the city and lessening dependency on cars, compact cities are more efficient in their utility of infrastructure. Environmental impacts, such as pollution and greenhouse gas emissions, are also lessened if automobile dependency is reduced in favor of public transport or other forms of non-motorized transport. A focus on physical expansion is unlikely to be sufficient to efficiently guide Vietnam's rapid urban growth. Instead, emerging cities should re-consider existing urban development patterns and harness opportunities to develop more integrated multi-modal transport systems, which can improve accessibility to jobs and services, promote more compact urban forms and mitigate environmental externalities. Furthermore, services that promote opportunities for both men and women to benefit from and contribute to local economies are important for cities in stimulating economic growth. However, women's household and care responsibilities constrain their ability to work on equal terms as men. There is a gender gap in the share of urban women engaging in paid work compared to men. In 2014, the proportion of female workers without an employment contract was 47.8 percent, while this ratio among male laborers was 37.5 percent in urban areas.

6. Role of Secondary Cities. The National Master Plan focuses on achieving balanced and strategic growth through a national urban system, consisting of urban centers of various grades and types distributed throughout the country. Specifically, it envisages the development of secondary and tertiary cities as hubs to drive development within larger urban areas and provinces. This is consistent with international experience, where there is growing recognition of the role of secondary cities[6] as catalysts in facilitating localization economies and the efficient transfer of goods, people, services, and information within a system of cities at different levels (i.e., metropolitan, regional, national, and global). Balanced regional development and appropriate definitions of functions among different hierarchies of urban areas are of great importance. For example, large cities should provide a diverse range of services and connect to external areas, thus promoting international competitiveness, while secondary cities should focus on specialized manufacturing activities. Many countries have been successful with this development pattern.[7]

[3] Vietnam 2035 Report (World Bank 2016).
[4] The CCS was developed in 1990 by the Ministry of Construction and amended in 2001 and 2009. Its original goal was to spur the development of cities using indicators set by the GoV to determine budget transfer allocations, thus influencing local choices and investment allocations. The classification of cities under this system falls into four categories: special, first class (I), second class (II), and third class (III); while the status of townships falls into two categories: (IV) fourth class and (V) fifth class.
[5] Vietnam 2035 Report (World Bank 2016).
[6] Globally, secondary cities range in size from 150,000 people to 5 million people.
[7] Vietnam 2035 Report (World Bank 2016).

7. As Vietnam seeks to sustain an ambitious growth trajectory, nurturing secondary cities that have demonstrated the economic potential to play a greater role in enhancing productivity and growth will be essential. However, it remains a challenge for many secondary cities to raise capital and attract the investment required to build infrastructure and support communities that are critical to create dynamic economies, improved livelihoods, and jobs.[8] Demand for basic infrastructure remains high in smaller cities in Vietnam – many still lack wastewater treatment facilities while public transport networks often do not exist. Poor provision of infrastructure has implications both for the quality of life for existing residents, as well as on the attractiveness of the city for further investment and growth. Compounding the need for improved infrastructure is vulnerability to climate change. Vietnam is ranked among the world's most climate-vulnerable countries, with cities particularly at risk of damage from weather disruptions and rising sea levels given their natural concentration of people, industry, and goods.

8. The World Bank's flagship Vietnam 2035: Towards Prosperity, Creativity, Equity and Democracy report, a recent study jointly developed by the GoV and the World Bank, emphasized the need to strengthen institutions for integrated urban planning—both functionally (i.e., within and across sectors) and spatially (i.e., across contiguous urban areas and encompassing provincial and metropolitan/city-level plans)—to encourage scale economies at corridor, metropolitan area/conurbation, and regional levels. The report cautions cities in Vietnam against becoming locked into a "large scale" development mindset, in which the accelerated conversion of rural to urban land encourages sprawl and oversized infrastructure. Large infrastructure and a lack of medium- and small-scale street networks will eventually limit the connectivity options available for the city (e.g., public transport and non-motorized transport systems), further increasing private motorization. The key lessons from this study are directly relevant to the challenges faced by the secondary cities.

9. The World Bank's urban sector engagement strategy in Vietnam recognizes the growing role of secondary cities and the critical need for stronger, more integrated urban planning. The urban portfolio currently focuses on cities at different scales: (i) integrated stand-alone operations in large cities (including Ho Chi Minh City, Hanoi, Da Nang, Hai Phong, and Can Tho); (ii) multi-city approaches targeting infrastructure development and strengthening urban management and planning in secondary cities; and (iii) piloting new approaches, such as PforR, for supporting small cities and towns in lagging regions. The five cities of Ky Anh, Tinh Gia, Hai Duong, Yen Bai, and Thai Nguyen were proposed by the Government of Vietnam (GoV) to receive the Bank's support on the basis of their economic growth potential. Serving as key regional centers and economic engines that are undergoing rapid urbanization, they urgently need improved urban infrastructure services. Aligned with the Bank's approach, and on request by the GoV, a multi-city approach was originally designed for this operation. However, based on the current pace of the project preparation, there are varying levels of operational readiness for each city and only Thai Nguyen city is eligible to receive the Association's credit at this stage. An adaptive option is proposed to proceed with a single-city project for Thai Nguyen city. As a large Class I city that serves as the capital of the Thai Nguyen province as well as the regional hub of the Northern Mountainous Region, the proposed Dynamic City Integrated Development Project (DCIDP) for Thai Nguyen is consistent with the Bank's integrated stand-alone approach for large cities. Successful implementation of DCIDP Thai Nguyen may be replicated to the remaining cities in an appropriate support of the World Bank to the GoV's urban development agenda.

[8] Brian Roberts and Rene Peter Hohmann, The Systems of Secondary Cities: The neglected drivers of urbanizing economies, CIVIS Nov. 2014.

C. Relevance to Higher Level Objectives

10. Consistent with the World Bank Group's Country Partnership Framework (CPF) for Vietnam 2018-2022 (Report 111771-VN), DCIDP Thai Nguyen will support two important higher-level objectives. Firstly, the proposed project will contribute to strengthening urban planning and management, and to boosting capacity to deliver high-priority infrastructure in the project city. This will directly contribute to Objective 5 of the CPF to "Improve planning, management, and delivery of infrastructure and land in cities" under the first focus area to "Enable inclusive growth and private sector participation." Secondly, DCIDP will support the project city in Objective 10 of the CPF to "increase climate resilience and strengthen disaster risk management" under the third focus area to "Enhance environmental sustainability and resilience" (CPF Objective 10). The proposed project will support resilient urban infrastructure investments and provide technical assistance to improve the disaster risk management of the project city for better preparedness, including financial planning and protection and post-disaster recovery. Further, DCIDP will support the recommendations made under the Vietnam 2035 report by promoting the development of a secondary city, as well as equity and social inclusion in urban areas. The proposed project is fully aligned with the World Bank Group's Twin Goals of eliminating extreme poverty and boosting shared prosperity by supporting the project city in increasing access to improved basic services for the bottom 40 percent of the population, enhancing productivity, removing infrastructure constraints, improving connectivity, enabling exports, and providing jobs for both male and female members of local communities.

II. PROJECT DESCRIPTION

A. Project Development Objectives

11. The project development objectives are to improve access to urban infrastructure and to improve integrated urban planning and management in the project city.

12. The project will improve the quality of transport connectivity; urban environmental sanitation; and education services. Thai Nguyen has demonstrated both current significance and future growth potential as a province- and region-level urban economic center. Nevertheless, the city suffers from uneven access to basic services, including lack of 24-hour water supply, wastewater treatment, childcare services, and road networks. Consistent with approved city master plans, the project will provide financing for strategic municipal infrastructure that will help the project city: (i) improve access to, and reliability of, urban services for the bottom 40 percent of the population; (ii) promote the development of neighborhoods with access to high quality public spaces and public transport; (iii) support continued socio-economic growth (e.g., by enhancing productivity and localization economies, removing infrastructure constraints, improving connectivity, facilitating local job creation, etc.); and (iv) promote women's opportunity to access paid work. The proposed operation will also support Thai Nguyen in addressing fundamental urban development challenges through TA for improved urban planning and management that will promote more compact, sustainable urban development, and the development of higher quality neighborhoods.

13. Thai Nguyen has a poverty rate of 3.6 percent, with 22.8 percent of its population falling below the national low-income classification level.[9] A lack of financing sources and poor investment prioritization has resulted in increasing traffic congestion, flooding, and uneven spatial development, as well as the deterioration (or lack of

[9] *General Statistical Office (GSO) –World Bank 2015*

provision) of public spaces. In addition, a survey carried out in preparation of this project finds that there is an unmet demand for preschool services in the City. Road network development has also tended to encourage motorization, with little attention paid to the development of appropriate public transportation systems. Thai Nguyen city, located in the more mountainous North-East region of Vietnam, is also vulnerable to the impacts of climate change, with a Climate & Disaster Risk Screening indicating a "Moderate" risk to climate change and disasters, specifically related to increased rainfall and landslides.

14. Economic Profile. Thai Nguyen has experienced strong local and regional economic growth in recent years. While Vietnam's GDP grew by an annual rate of 5.9 percent over 2011-15, the city-level GDP of Thai Nguyen grew by over 15 percent annually over the same period. Located strategically in the Hanoi Capital Region, newly constructed highway connections facilitate access to the capital, which is just 80 kilometers away. Thai Nguyen's local economy is driven by the Industry/Construction sector, which accounts for over 75 percent of economic output. The Trade/Services/Commercial sector comprises approximately 20 percent of local economic output while Agricultural/Forestry Production accounts for the balance of 5 percent. The city is located in an area that has historically served as a center for heavy industry focused on steel and iron. However, the manufacturing sector is transitioning to clean and high technology industries that are located in new industrial zones that have sprouted in neighboring districts of Thai Nguyen.

15. Constraints in Urban Planning. Both the spatial and economic planning capacities of the city remain weak, with tenuous inter-linkages between spatial, economic, and investment planning at both the city- and provincial-level. To capitalize on its competitive advantages and enable further growth, Thai Nguyen city requires not just improvements to basic urban infrastructure but also more comprehensive and integrated urban planning that links physical development to overall socio-economic strategies as well as climate change adaptation and disaster risk management plans. Currently, the master plan of the city through 2030 suggests conversion of agricultural to urban land and urban expansion with minimal restrictions, without clear market demand analysis or an indication of phasing plans. The five-year socio-economic development plan of the city (through 2020) is very broadly defined and does not fully account for how the city strategically plans to leverage its economic endowments to accelerate local economic development.

16. At the neighborhood level, plans do not adequately consider the provision of greenery or public space. The proposed expansion of road networks is not consistently supported by adequate traffic demand analysis. Plans also do not currently account for the need for public transport, which is a key element in reducing motorization and avoiding large-scale, inefficient transport infrastructure. Importantly, road networks do not provide a suitable environment for pedestrians or cyclists, and do not necessarily facilitate residential and commercial accessibility for existing communities. Further studies are necessary to assess street patterns and the potential for developing appropriate public transport systems based on Thai Nguyen city's anticipated growth pattern and projected population.

B. Project Components

17. A combination of structural and non-structural components is proposed to support the achievement of the PDO to improve access to urban infrastructure services and to improve integrated urban planning and management in the project city.

18. Component 1: Structural Investments - Rehabilitation and Construction of Urban Infrastructure: A series of

municipal investments will be financed to improve the access to and quality of critical urban infrastructure services, including those in urban environmental sanitation, urban transport, and urban amenities. The selection of infrastructure sub-projects will be aligned with the updated city master plan. However, given that the sub-projects will be identified based on plans developed before project implementation, the proposals will be rigorously prioritized to ensure that these are no-regret investments that: (i) improve access to, and reliability of, urban services for the bottom 40 percent of the population; (ii) promote more compact and denser urbanization; (iii) promote the development of neighborhoods with access to high-quality public spaces and public transport; (iv) support long-term socio-economic growth objectives; (v) meet demands for climate change adaptation; and (vi) meet accepted standards for technical and economic soundness, including resilience measures to limit the potential losses from disasters. A range of municipal infrastructure investments across several sectors is consolidated under a single project component to ensure that DCIDP provides sufficient flexibility to support a menu of municipal infrastructure solutions to address the specific demands of the project city, both at the project appraisal stage and, potentially, during project implementation to address emerging needs.

19. The design and implementation of sub-projects will factor in access to services for women and men (e.g. differentiated travel patterns and safety) and universal design considerations (i.e., ensuring accessibility to older people and people with disabilities). Ownership of the proposed sub-projects will be assumed by the project city, which will be required to establish adequate institutional arrangements and operations and maintenance (O&M) plans to ensure future sustainability. The proposed sub-components are:

i. *Sub-component 1.1 – Urban drainage*: The overall improvement of the local drainage system (including construction of new drains, dredging and embankment of ditches, streams and channels) has been proposed to address the need for improved flood management, particularly in light of both current and projected susceptibility to climate change. To address the potential impacts of climate change, the designs of drainage and flood control infrastructure will take into account scenarios produced by MONRE and reflect them through improved hydraulic modeling works and flexible use of structural and non-structural approaches.

ii. *Sub-component 1.2 – Urban environmental sanitation*: This includes the rehabilitation and construction of sewer collection networks, and the expansion of the existing wastewater collection system. Technical designs for urban environmental sanitation investments will explore low impact designs and water-sensitive urban design interventions.

iii. *Sub-component 1.3 – Urban transport*: This includes investments in strategic urban roads and bridges for better connectivity. Proposed road and bridge sub-projects have been vetted at the preparation stage to ensure that they are aligned with existing master plans, and based on sound analyses of travel and traffic demand and street design patterns. The provision of the proposed roads and bridges in the project city is expected to provide better accessibility for residents to jobs, education, and other services, as well as to improve traffic safety, which are critical for sustaining rapid local economic development. In addition, the sub-projects will promote more compact urban development, allow for mixed land uses and densification, promote non-motorized transport options as well as safeguard flexibility for the introduction of a public transport system. As such, technical designs will provide flexibility for the introduction of public transport systems and/or adoption as potential public transport routes. Furthermore, traffic safety facilities have been included in all preliminary technical designs. Traffic issues will be thoroughly reviewed and mitigated, especially at intersections with major roads and transit roads of national highways/bypasses. To address the potential impacts of climate change, climate change adaptation measures will be included in the road designs (both at basic and detailed stages) to correspond to MONRE climate change scenarios. Road drainage

structures will be designed based on hydrologic analyses that adopt climate change scenarios while the elevation of roads and bridges will take into account projected increases in seawater levels. Other issues such as road slope protection will be required for sub-projects in mountainous areas.

iv. *Sub-component 1.4 – Urban amenities and public spaces*: The improvement of ditches, streams and channels proposed under the other sub-components strengthens urban resilience and also provides potential opportunities to introduce new, accessible public spaces around the improved infrastructure. These may include public green spaces and promenades with lanes for both cyclists and pedestrians. The project will also support the construction and upgrading of two kindergartens to address issues of under-capacity and poor and deteriorating quality of existing preschool facilities.

20. Component 2: Non-Structural Investments - Technical Assistance and Implementation Support: A comprehensive package of TA and project implementation support will be provided to Thai Nguyen PPC to strengthen its capacities for integrated economic and spatial planning as well as climate change and disaster risk informed planning. The TA will ensure the strategic relevance and efficiency of the municipal infrastructure investments to be financed under the structural component of the project. The technical assistance and implementation support activities are critical to support the structural investments to be undertaken under Component 1 by: (i) linking financing/budgets to the investment programs of the city in order to ensure financial sustainability for long-term O&M and asset management; (ii) consolidating various spatial and sectoral plans into integrated strategic development plans; and (iii) ensuring community participation throughout the planning and sub-project implementation process.

21. The TA activities are expected to cover the following areas.

a) *Integrated planning*. This activity will facilitate the development/updating of comprehensive, context-specific strategic urban development plans that: (i) are based on the specific needs, economic endowments, and key development issues of the project city (including a reassessment of economic and demographic assumptions and growth projections); (ii) are functionally and spatially aligned with the updated provincial-level and regional-level strategic plans; (iii) reinforce Thai Nguyen's role as a secondary city within the National Master Plan; and (iv) adopt tools for disaster and climate risk-informed urban planning. For expediency and consistency in management and delivery of the TA, the city and province will work closely with the Ministry of Construction (MOC), the national technical body for urban planning. The integrated urban development plans will enable the project city to manage urbanization in a more comprehensive manner that will promote more compact urban development as well as urban densification. Decision-makers at the city level will rely on these integrated plans to make decisions on infrastructure prioritization and financing.

b) *Public transport planning*. TA will be provided for the development of a public transport development strategy and plan that is aligned with the updated city master plans and promote the expansion of local public transport systems. The TA will identify and safeguard provisions for introducing forms of public transport as found to be suitable in Thai Nguyen. Further, the plans will be expected to provide a framework for decision-making, including a clear set of sustainable urban mobility indicators (e.g., sustainable urban transport index [SUTI] by UNESCAP), to help the city define specific targets, such as higher network coverage and modal share by public transport, accessibility, affordability, safety, etc.

c) *Asset management*. TA will be provided to enhance the sustainability of urban assets through the development of asset management plans, which will include corresponding financial sources for O&M of the project investments. A robust analysis of the financing needs and corresponding own-source revenue mobilization forecasts and challenges will be a key part of the development and

implementation of asset management plans for the project city. With these plans, it is expected that Thai Nguyen will be better-equipped to manage urban assets in an efficient and sustainable manner.

d) *Project implementation support*. TA will be provided for: (i) the preparation of technical designs for sub-projects; (ii) construction supervision and contracts management; (iii) independent monitoring of environmental and social safeguards; (iv) independent financial audits. This TA is also expected to strengthen project implementation capacity for project management, environmental and social safeguards, financial management, procurement, and monitoring and evaluation.

22. Project Implementation Manual (PIM). The PIM will be the primary document guiding the implementation of the project. The PIM will set forth: (i) the Vietnamese laws and regulations that will govern the various aspects of the project, and (ii) the applicable Bank policies and guidelines governing the project. Throughout project implementation, the project city will implement project activities under Components 1 and 2 in accordance with the PIM in a timely and efficient manner satisfactory to the Bank. Especially, the PIM will specify milestones and outputs for each TA activity under Component 2 as well as the roles and responsibilities of the Project Management Unit (PMU) and relevant departments. The PIM will be the basis for monitoring the underlying commitment of the city government to utilize the outputs of the technical assistance for improving integrated urban planning and asset management. This will facilitate the effective implementation monitoring of the various activities. The PIM was cleared by the Bank and approved by the PPC and cannot be amended without the prior written agreement of the Bank. The project city will be required to implement the PIM as a legal obligation under the project's Financing Agreement (FA).

23. Summary of Project Costs: The total project costs are estimated at US$100 million, of which US$80 million will be financed by the Transitional Support Window of IDA and US$20 million will be counterpart funding from the provincial governments. Of the total counterpart fund requirement, US$11.83 million will be expended for site clearance, compensation costs and taxes while US$2.25 million will support various technical assistance activities under Component 2. Implementation support activities under Component 2, which primarily consists of the preparation of technical designs, construction supervision and contracts management, fiduciary, and safeguards monitoring, and project management, will be financed out of IDA funds.

Table 1: Project Costs per Component (US$ millions)

Project Components	Project cost	IDA Financing	Counterpart Funding
Component 1 – Structural Investments – Rehabilitation and Construction of Urban Infrastructure	87.52	75.69	11.83
Component 2 – Non-Structural Investments – Technical Assistance and Implementation Support	6.56	4.31	2.25
Front End Fee, Commitment Fee, Interest and other Fees	5.92		5.92
Total Project Costs	100.00	80.00	20.00
Total Financing Required			

C. Project Beneficiaries

24. The proposed project's key beneficiaries will be the residents of Thai Nguyen city in Thai Nguyen Province, who will benefit from improved urban infrastructure that will reduce the risk of flooding and expand access to improved sanitation, reduce vehicle travel times on new and improved roads, increase access to child care services, and high quality public spaces. The project will also improve connectivity to industrial parks, commercial establishments, and tourist attractions in the project city, which will benefit workers and merchants commuting to and from the project city as well as tourists visiting the project city. The Provincial People's Committee (PPC) and City People's Committee (CPC) of Thai Nguyen will also directly benefit from the project's non-structural investments, which will provide targeted technical assistance (TA) and capacity development for improved strategic socio-economic spatial planning, public transport planning, asset management, and specialized development planning.

D. Results Chains

The proposed theory of change, which links the sector-specific outputs and outcomes to the project's long-term development objectives, is illustrated in the table below.

Table 2: Theory of change

Activities	Outputs	Outcomes/ PDO	Long-Term Outcomes
Drainage	• Length of drains improved or constructed	• Reduction in areas prone to floods in the area covered by the project interventions • Number of people benefiting from improved drainage in the area covered by the project interventions	• Reduced economic losses due to flooding • Increased land values
Sanitation	• Length of wastewater pipeline laid • Additional wastewater treatment capacity provided • Households connected to new or improved wastewater treatment systems	• People provided with access to improved sanitation provided by the project	• Improved urban environment • Improved health outcomes (reduced illnesses) • Increased productivity • Increase in public-private partnerships with the city government to provide operations and maintenance (O&M) services
Roads	• Length of roads and bridges constructed or improved (non-rural)	• People who have access to new and improved roads under the project • Users satisfied with the new or improved roads under the project	• Reduction in vehicle operating costs and vehicle operating time • Increased productivity • Increased access of beneficiaries to jobs and public services • Increased land values • Increased opportunities for private sector investment in

Activities	Outputs	Outcomes/ PDO	Long-Term Outcomes
			ancillary infrastructure alongside project investments
Public Space	• Area of new or improved walkable public space • Beneficiaries views sought on ideal placement and form of public space	• People provided with access to new or improved public spaces under the project • Users satisfied with new or improved public spaces under the project	• Increased land values • Improved health and physical fitness • Improved urban environment
Childcare	• Changed in time used by mothers of children aged 3-72 months on unpaid childcare work • Achievement of Government standard for teacher to student ratio in childcare facilities of 2: 25-35	• Beneficiaries have access to and utilize child care services • Users satisfied with childcare services under the project	• Reduced time of sick leave for children • Increased productivity of parents
Technical Assistance (TA) for integrated urban planning and management	• Stakeholder consultation sessions and training activities conducted in integrated urban development planning • Urban asset management plans approved with approved annual budgets for O&M	• Integrated urban development plans developed that are used by the project city to prioritize investments • Mandatory inclusion and funding of asset management plans in annual city budgets	• Improved technical capacity in urban planning • Improved prioritization of infrastructure investments • Improved efficiency and sustainability in asset management • Increase in private sector investments and Public-Private Partnerships

E. Role of Partners

25. The World Bank coordinates extensively with development partners engaged in urban development projects in Vietnam e.g., Swiss State Secretariat for Economic Affairs (SECO); Asian Development Bank (ADB), Japanese International Cooperation Agency (JICA), Korean Export-Import Bank (KEXIM), French Development Agency (AFD), European Union (EU). Partnerships will be explored with development partners to leverage additional development financing to supplement the non-structural investments under Component 2. In particular, discussions are on-going with the Swiss State Secretariat for Economic Affairs (SECO) and Global Facility for Disaster Reduction and Recovery (GFDRR) to mobilize trust funds to support the project city in: (i) developing integrated master plans; (ii) strengthening technical and regulatory capacity for integrated urban planning and development; (iii) integrating disaster risk management into the master plan; and (iv) enhancing local authorities' capacity in resilience and disaster risk management.

F. Lessons Learned and Reflected in the Project Design

26. The operational design of DCIDP Thai Nguyen integrates lessons learned from other urban operations in the country, such as the Medium Cities Development Project (MCDP), Da Nang Sustainable Development Project

(DSCDP), Vietnam Urban Upgrading Projects (VUUPs), and Can Tho Urban Development and Resilience Project (CUDRP), as well as similar operations in EAP and other regions (including China, Indonesia, Sri Lanka, Tanzania, and Uganda).

a) *Need for strong, sustained political commitment*: In recognition of the critical need for urban infrastructure financing, as well as capacity building for developing integrated and evidence-based master plans that are linked to the budget process, the project has received strong support from the central, provincial, and city governments. However, the sustained commitment of the provincial authority and its technical departments will be essential for the effective preparation and implementation of the project.

b) *Verification of fiscal capacities of provinces of the project city to borrow on-lent concessional loan and provide counterpart funds*: Thai Nguyen PPC has been assessed to have sufficient fiscal capacity to: (i) cover debt service payments on the proposed sub-loans for DCIDP Thai Nguyen; and (ii) provide the minimum required counterpart fund contributions. This is critical in light of the transition from IDA to IBRD funding in Vietnam, and the accompanying changes in the GoV's policies for on-lending and on-granting of ODA funds to provinces according to their fiscal capacities.

c) *Need for strong operations planning and high quality project preparation*: To avoid start-up delays in early years of implementation, particularly given the multi-sectoral nature of the project, substantial implementation support and capacity building (technical, fiduciary, safeguards) will be provided during preparation and implementation of the project.

d) *Adoption of in-situ resettlement and early preparation of resettlement sites for smooth land acquisition and compensation processes:* In-situ resettlement is likely to be feasible given Thai Nguyen city's relatively low population density as compared to larger primary cities. The availability of open spaces increases the chances of successful in-situ upgrading without major resettlement. In cases where resettlement sites are needed, these will be developed by the city in nearby communities and constructed in the early stages of project implementation.

e) *Adoption of integrated urban development strategies with a clear vision for future growth and sustainability:* Sprawling, unchecked urban development has led to increasingly fragmented cities in Vietnam, resulting in inefficiencies in infrastructure and service provision. To adequately cater to population growth and ensure that housing, jobs, basic services, and infrastructure are provided effectively and efficiently, DCIDP will support the project city in adopting integrated urban planning and sustainable development models. Importantly, the city will first establish a strategic, evidence-based vision for future development that can build broad-based support for the integration of traditionally separated planning spheres. Land use, infrastructure, and public transport strategies, for example, must be considered together so that infrastructure investments are appropriately defined and phased, and promote more compact, sustainable urban development with full consideration of climate change and disaster risks.

f) *Adoption of community participation and consultation throughout planning, design and implementation process:* When developing community-level infrastructure, experience has shown that involving the community in the planning, design, and implementation process can help to improve the sustainability of infrastructure components, given that they have been designed to better suit local needs and priorities. Accordingly, the project will ensure community participation and consultation throughout project preparation and implementation, and help to instill a sense of ownership over the infrastructure amongst the community, which is expected to contribute to better long-term maintenance and management. Capacity building for local government staff will also include communication strategy training to improve capacity for citizen engagement.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

27. Following the lessons and best practices from the Bank's recent urban development projects in Vietnam (e.g., MCDP, DSCDP, and VUUPs), Thai Nguyen DCIDP will be implemented in a decentralized manner, with the city as the Project Owner under the supervision of provincial level administration. Thai Nguyen PPC organized a Project Preparation Unit (PPU) within an existing PMU that has been implementing ODA-funded and GoV-funded urban infrastructure investments. A PMU for DCIDP was subsequently formally established from the PPU following the approval of the Investment Policy Report (pre-feasibility study) by the GoV. Given the crucial role of provincial leadership in facilitating project implementation, the PPC will provide overall guidance and may establish a Project Steering Committee (PSC) comprised of multi-sector departments to guide, support, and supervise the PMU.

28. In terms of implementing the non-structural investments under Component 2, Thai Nguyen will work closely with MOC, the national technical body overseeing urban planning, in supporting the TA and capacity building activities.

B. Results Monitoring and Evaluation

29. The Monitoring and Evaluation (M&E) system, including a Results Framework (RF), is designed to assess whether the project is being implemented in line with the proposed objectives and its achievement of expected results. Measurement of the project's progress in the carrying out of the activities within the identified components that feed the M&E system will be documented in regular project Progress Reports. The PMU will be responsible for the preparation of these reports. The PMU will be fully accountable for collecting all relevant information and data required for monitoring project implementation based on the RF. The reports will be prepared on a semi-annual basis and submitted to the Association for review. In addition to reporting on the project results indicators, the reports will include information on disbursements, compliance with financial management, procurement, social and environmental policies and guidelines, and an updated annual plan of works and activities. Beneficiary surveys will be carried out by the project city at the end of the project, with results for low-income segments of the population and female beneficiaries disaggregated from the overall results. The detailed methodology and frequency for the conduct of the various M&E tools, including beneficiary surveys, are specified in the PIM. Thai Nguyen PPC will be required to implement the PIM and report semi-annually on project progress as a legal obligation under the project's FA, which provides strong assurance that project monitoring will be strictly implemented based on the DCIDP RF.

C. Sustainability

30. At the project design stage, sustainability is enhanced by ensuring that technical designs are based on thorough studies of past patterns and trends, as well as future projections relevant to the infrastructure being developed. For example, in terms of drainage interventions, designs must consider hydro-hydraulic modeling and long-term projections for flooding and climate change vulnerability. Similarly, road and bridge designs should be based on thorough Origin-Destination (O-D) surveys, and projections for traffic in line with master plan developments. Consultations with communities, as required by Vietnamese law, will also ensure that designs best meet local needs.

31. To promote sustainable urban development beyond the project, non-structural TA components have been designed to build capacity in several areas. These include an integrated urban planning strategy, which aims to address existing weaknesses in urban planning processes by bringing sectoral plans together (e.g. land use planning, transport and other basic service infrastructure) and linking them to socio-economic development plans, budgeting and phasing. Thai Nguyen will also receive TA to develop a public transport strategy, which will feed into the integrated urban plans and further promote more compact and sustainable city development. Involving MOC as a technical partner in implementing TA activities will also promote capacity-building at the central level.

32. In addition, to ensure sustainability of the assets built under the project, the project city will receive TA to build its asset management capacity. This will include the development of O&M strategy and action plans, institutional arrangements for asset ownership and management and cost-recovery mechanisms, as appropriate.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

(i) Technical Analysis

33. Drainage and Wastewater Systems. The proposed investments for improving drainage and wastewater services in the project city were well studied. The improved canals/drains can improve flow conditions and contribute to reduce floods caused by storm water in critical areas of the city. Computerized hydraulic models were used to analyze the status of floods and flow conditions of the invested infrastructure. The selected technical options are consistent with the city's long-term development master plans and are feasible for implementation. The improved wastewater systems employ the construction of wastewater collection and treatment infrastructure that can collect wastewater generated from households then transport and treat it to meet the discharge standards regulated by the GoV prior to discharging to the environment. The wastewater collection and transportation networks are combined sewers in old urban setups and separated ones for new urban areas that are consistent with the GoV's guidance and the city's master plans. The treatment plant uses well-proven simple technologies that employ low level of O&M skills and costs. The improved drainage and wastewater services will help the city in improving environmental and sanitation conditions that can reduce the risks of health-related diseases, attract tourism, and leverage economic development.

34. Transport. The proposed investments in strategic urban roads and bridges were assessed to improve connectivity and reduce vehicle travel times within the project city. The proposed roads and bridge were well studied and based on traffic forecast analyses utilizing Origin-Destination (O-D) surveys for their function and priority, as well as scope of work. They are consistent with road network development plans and visions of the city to 2030 and have been approved by the CPC. The proposals are also aligned with the provincial transport development plans of the province. The proposed items were reviewed to avoid overlap with investment projects funded by state budget and other funds and to ensure consistent application of social and environment policies. Technical issues and construction technologies covered in proposed road and bridge investments are not complex and complicated, and are within the capacity of local technical management agencies, consulting designers, and contractors. The designs are supported by current national standards and specifications as well as enhanced by the integration of public transport and non-motorized vehicles.

35. The project institutional arrangement was assessed as generally sound and follows the current national

system for project management. At the provincial government level, while the Departments of Investment and Planning and Departments of Finance cover issues relating to investment procedures, the Department of Transportation is responsible for the technical management of transport items for urban road network, and the Department of Construction is responsible for the technical management of urban drainage system development and improvement and rainwater and wastewater drainage construction. At the sub-project level, consultants will assume responsibility of technical monitoring and management. The local quality management system is sound at both government and project levels.

36. Maximizing Finance for Development (MFD). DCIDP Thai Nguyen can be considered as MFD-enabling in two ways. First, through its structural infrastructure investments—particularly, in roads and wastewater treatment—there is potential for private sector involvement to provide ancillary infrastructure alongside the main investments and to enter into public-private partnerships with the city government to provide O&M services. Second, as illustrated in the project's theory of change (Table 2), the longer-term impacts of TA activities can provide the institutional framework for encouraging future private sector investment. The various strategies developed under the project's TA activities will also actively identify opportunities for the city to bring in sustainable private sector financing.

37. For example, the development of an integrated urban development strategy, which will provide a clear link between socio-economic development, infrastructure, and land use development and financing, will provide investors with a sound, transparent basis on which to make investment decisions. The strategy also provides a framework for the city government to identify projects for which private sector funding and/or potential Public-Private Partnerships (PPPs) can be considered. Further, DCIDP will provide Thai Nguyen city with a public transport development strategy, which will assess and propose opportunities for crowding in private financing, e.g., through the provision of public transport infrastructure and services in the future.

(ii) Economic Analysis

38. The economic analysis confirmed the economic viability of all the proposed sub-projects of Thai Nguyen utilizing the conventional economic appraisal methodology for infrastructure improvement schemes. The analysis compared annual discounted costs and benefits of the project to society as a whole over the project life cycle in "with" and "without" cases using the Net Present Value (NPV) and the Internal Rate of Return (IRR) indicators to justify the economic viability. Overall, the proposed sub-projects were found to generate IRR in the range of 10.6 percent - 24.6 percent, which is higher than the economic opportunity cost of capital (EOCC) of 10 percent.

39. Sensitivity analysis combined impacts of a 10 percent increase in the economic investment cost and a 10 percent decrease in the quantifiable economic benefits. As shown in Table 3, the IRRs of most sub-projects remain above the EOCC hurdle rate of 10 percent. The exceptions are investments Dong Bam residential road, which had a worse case IRR of 8.5 percent that was slightly below the 10 percent hurdle rate.

Table 3: Summary of Economic Cost-Benefit Analysis

No.	Case	Base Case		Worse Case	
		NPV (US$ million)	**IRR (%)**	**NPV** (US$ million)	**IRR (%)**
1	North - South Road and Huong Thuong Bridge	37.45	18.0	27.54	15.7
2	Huong Thuong - Chua Hang Road	19.62	20.1	15.14	17.6

No.	Case	Base Case		Worse Case	
		NPV (US$ million)	**IRR (%)**	**NPV** (US$ million)	**IRR (%)**
3	Dong Bam Residential Road	0.69	10.6	-1.65	8.5
4	Dan Bridge	2.36	18.0	2.10	15.2
5	Le Huu Trac Road	5.02	18.2	3.70	16.0
6	Xuong Rong Drainage	1.41	18.5	0.90	15.2
7	Mo Bach Drainage	1.11	14.1	0.43	11.6
8	Huong Son Kindergarten	5.13	24.6	4.30	22.1
9	Phan Dinh Phung Kindergarten	1.74	20.4	1.38	18.1

a) ***Assumptions***. Annual project costs and benefits were evaluated for a 25-year period of benefit, allowing for a two to five year construction period starting in 2019. A discount rate of 10 percent was employed to convert annual cost and benefit streams into present value in the year 2017 according to the recent guidelines of the World Bank in 2016. The unit prices use for estimation of project costs and benefits were based on prices in Vietnam in 2017. The evaluation was conducted using VND as the unit of currency. The exchange rate of VND 22,500: US$ 1 for converting the VND to US$ was close to the market rate and so no shadow foreign exchange rate was considered necessary.

Costs and benefits were calculated from economic prices rather than market, or financial, prices. Each category of capital costs and operation and maintenance costs were broken down into categories such as traded material, non-traded material, skilled labor, unskilled labor, transfer cost (taxes, subsidies, levies), and others. These financial costs were converted from VND to US$ and were multiplied with respective conversion factors, to arrive at economic prices. The economic costs were converted from the financial cost using conversion factor of 0.9 for investment costs and 0.95 for operation and maintenance costs, which are based on international border prices.

b) ***Project Costs***. The analysis took into account costs incurred over a project cycle, including capital investments and O&M costs, which are converted into economic prices. Capital investments include construction costs and other costs during preparation and implementation of construction, such as design, supervision consulting, resettlement, environment management, etc. Annual O&M costs were expressed as a percentage of the economic investment cost. For urban transport infrastructure sub-projects, the percentages were estimated as 1 percent for routine maintenance, 5 percent for periodic maintenance, and 30 percent for major repairs. For water drainage and sanitation sub-projects and kindergarten sub-projects, the annual O&M cost was estimated as 2 percent of the economic investment cost.

c) ***Project Benefits for Urban Transport Sub-projects***. The evaluation quantified two main conventional economic benefits: savings in vehicle operating cost (VOC) and savings in passenger travel time (VOT).[10] Traffic demand was estimated using the System for Traffic Demand Analysis (STRADA), which is a package for transport forecasting that is widely used in Vietnam. The system was used to calibrate current and projected passenger traffic of the city road networks and to assign traffic to each of the project roads in

[10] VOC savings are derived from shorter and faster journeys in case the project is implemented comparing to the case without interventions from the project. VOT savings are obtained when road improvements lead to increases in vehicle speeds, hence reducing the travel time of passengers and goods.

"with project" and "without project" networks. Traffic demand was computed from existing and projected population statistics, passenger occupancies, trip rates, and modal shares. The networks comprise project road catchment zones as well as non-project road catchment zones, which are typically outside but adjacent to the road catchment zones. Traffic counts were conducted in sub-project areas in June 2017. Household surveys were also conducted to collect data on trip rates, modal shares, length of trips, and trip purposes for model calculation.

VOC units were estimated using the HDM4-VOC model with inputs collected in project areas for gasoline, lubricants costs, and vehicle prices in 2017. Vehicle fleet characteristics were drawn from recent relevant studies and similar projects, adjusted using survey data in project areas. VOC units were calculated for the project city based on topographic characteristics (flat, hilly or mountainous), climate features (number of rainy days per year), and road conditions (surface type, carriageway width, speed limit). The estimate of VOT follows standard methodology employed in the other World Bank projects. VOT units were calculated for the city based on average personal incomes, number of residents per household, number of income earners, and percentages of work and business trips. The average number of passengers on various categories of vehicles was collected through surveys in project areas in order to calculate VOT per vehicle.

d) ***Project Benefits for Drainage and Sanitation Sub-projects***. The evaluation quantified economic benefits derived from reduced damage due to flooding, health benefits, and increased productivity due to time savings and increased land values. The number of beneficiaries taken into the analysis was based on the population projections of the identified catchment areas and in line with population growth in the city.

e) ***Project Benefits for Kindergarten Sub-projects***. The evaluation quantified economic benefits from the construction and upgrading of two kindergarten schools that have suffered from physical deterioration and severe overcapacity. Expected economic benefits include resource cost savings, improved student health (leading to less sick leave), and productive time savings for parents (who will have to spend less time attending to sick children).

(iii) Financial Analysis

40. The financial analysis confirmed that Thai Nguyen PPC has: (i) sufficient borrowing capacity to access its on-lending share of the Association credit based on GoV policies with respect to sub-national debt limits;[11] and (ii) sufficient fiscal capacity to provide the counterpart fund contributions committed to the project. The analysis was undertaken based on the prescribed on-lending vs. on-granting schemes outlined in the latest MOF decree, as detailed in Table 4.

Table 4: Proposed Project Cost and Financing Plan (US$ million)

PPC (Project City)	Association Credit			Borrower	TOTAL
	On-Lending	On-Granting	Subtotal		
Thai Nguyen (Thai Nguyen)	56.00	24.00	80.00	20.00	100.00

41. The first dimension of the financial analysis assessed the compliance of the PPC with statutory limits on on-

[11] As per decree 52/2017/ND-CP, on-grants 30 percent of Association credit from central GoV to PPC while on-lending the remaining 70 percent.

lending of ODA and less-concessional loans,[12] which specifies two constraints to the amount of foreign-funded debt of a PPC: (i) repayment limit, where the total debt service on a foreign-financed loan to a PPC must not exceed 10 percent of the annual budget revenue of that PPC in any given year during the credit repayment period; and (ii) overall debt limit, where the total outstanding debt must not exceed 20 percent of the total retained revenue for PPCs where retained revenues are less than recurrent expenditures, or 30 percent of total retained revenue for PPCs where retained revenues exceed recurrent expenditures.

42. Based on the medium-term fiscal forecasts and debt profiles of the PPC, Thai Nguyen has sufficient borrowing capacity to access their respective on-lending shares under the proposed Association credit. The highest projected share of debt service as a percentage of retained revenue is just 1.2 percent in 2024, which is well below the 10 percent statutory limit. Similarly, the highest projected share of overall stock of debt as a percentage of retained revenue is 13.2 percent in 2022, which is well below the 20 percent statutory limit.

43. The second dimension of the financial analysis assessed the capacity of the PPC to provide the required counterpart funding for the project, including approximately US$ 1.5-3 million for financing project preparation (e.g., sub-project feasibility studies and detailed designs), land acquisition and compensation, and the funding required to finance a substantial portion of the non-structural component of DCIDP (given GoV's restrictions on the use of ODA loans to finance TA activities). The counterpart funding requirement is equivalent to approximately 25 percent of the Association credit for the project city. The financial analysis conservatively assumed that 100 percent of the counterpart funding requirements would be borne by the PPC in light of recent guidance from MOF that specified that PPCs would be expected to provide for all counterpart fund requirements from provincial budgets. Further, the analysis was extended to cover additional expenditures related to the structural investments of the project that the PPC is expected to finance with their own resources, specifically: (i) incremental O&M expenditure on project-financed assets, and (ii) debt service charges on sub-loans for project-financed assets.

44. While there are no statutory requirements nor formally prescribed methodologies for assessing the ability of a sub-national government to provide counterpart contributions, development partners (including ADB) normally adopt a standard where the counterpart funding requirements for a project must not exceed 5 percent of the total budget of the entity that provides the contributions. This threshold is accepted by MOF and is applied throughout the entire implementation period of the project. Based on the medium-term fiscal forecasts, debt profiles, and O&M plans of Thai Nguyen PPC, it was confirmed that the PPC has extensive fiscal capacity to absorb the financial commitments under DCIDP, with the counterpart fund requirements not expected to reach 1 percent of total PPC revenue at any point during the project implementation period.

45. The Association will regularly review the financial performance and forecasts of the PPC throughout project implementation to ensure the fiscal sustainability for the provision of counterpart funds and O&M costs.

B. Fiduciary

(i) Financial Management

46. DCICP will be implemented in a decentralized manner. Key financial management functions to be performed

[12] The applicable provisions governing the borrowing limits of provinces are based on MOF decree 52/2017/ND-CP and the State Budget Law of 2015.

by the PMU include the preparation of project annual financial statements and external audits, management of designated accounts, expenditures approval, contract management and payments, maintenance of accounting records, and working with auditors/ inspectors. The financial management function of the proposed project meets the Bank's minimum financial management requirements.

47. The main actions required to strengthen the PMU includes: (i) appointing accounting staff with qualifications and experiences acceptable to the Bank to be in charge of the project's finance and accounting works; (ii) developing and adopting a Financial Management Manual (FMM) for the project by the implementing agencies, (iii) adopting upgraded accounting software (based on software currently being used in similar on-going Bank projects) to fit with the project's accounting and reporting requirements; and (iv) conducting training for the Financial Management (FM) staff of the PMU on the Bank's FM and disbursement requirements and procedures.

48. Funds flow will be channeled through a segregated Designated Account (DA) to be opened at a commercial bank or financial institution acceptable to the Bank for the PMU of the project city. The ceiling of the designated account will be variable and based on the forecast of one quarter of the approved annual financing plan of the project city. The primary disbursement method will be advances and replenishment. Supporting documentation required for documenting eligible expenditures paid from the DA includes Statements of Expenditures. The frequency for reporting eligible expenditures paid from the DA will be quarterly or more frequent, if needed. The Reimbursement, Special Commitment, and Direct Payment disbursement methods will also be available. Reimbursements will also be documented by Statements of Expenditures. Direct Payments will be documented by Records. The Minimum Application Size for Reimbursement, Special Commitment and Direct Payments will be set at US$ 100,000 equivalent. Detailed requirements for financial management capacity and arrangements, financial reporting, external auditing, and disbursement are specified in the FMM and PIM.

49. The project will be financed with US$80 million by IDA at 100 percent, exclusive of taxes, for: i) the expenditures of goods, works, non-consulting services, and consulting services under Component 1; ii) project implementation support under Component 2, including technical design, construction supervision and management, independent monitoring of environmental and social safeguards, independent financial audits. Counterpart funds of US$20 million will cover expenditure items, such as land acquisition and compensation, taxes, technical assistance activities under Component 2, project management, applicable credit's fees and interest of the five years during the project implementation period and other costs.

(ii) Procurement

50. Procedures. For contracts financed in whole or in part by the transitional IDA Credit, procurement would be carried out in accordance with the World Bank's "Procurement Regulations for IPF Borrowers: Procurement in Investment Project Financing" (hereinafter referred to as "Procurement Regulations") dated July 1, 2016, and revised in November 2017; and the provisions stipulated in the FA and the Procurement Plan. The World Bank's planning and tracking system, Systematic Tracking of Exchanges in Procurement (STEP), will be used to prepare, clear and update Procurement Plans and conduct all procurement transactions for the Project. Accordingly, all the procurement activities under the proposed project will be entered into, tracked and monitored online through the system.

51. Procurement Capacity and Risk Assessment (PCRA). The PCRA for the PMU was conducted during various project preparation missions. It found that the PMU has some experience in conducting procurement in accordance with the Vietnam public procurement law and regulations and in implementing several publicly funded projects, but

the experience is relatively limited for ODA-funded projects. The PMU has just established its organizational structure for procurement and staffing is considered adequate to implement the project. A number of risks could adversely influence the project implementation if not mitigated, including: (i) despite having some experience with project management, there are still gaps concerning knowledge and experience in carrying out procurement activities in accordance with the Bank's procurement regulations, rules, and procedures; (ii) lack of practical guidance on the steps of procurement process, in particular, the PMU does not have a manual to guide staff in carrying out the Bank procurement procedures step by step; (iii) potential preference to try and use national procurement rules and procedures when there is difference with the Bank's procurement regulations; (iv) potential fraud/corruption and collusive practices; and (v) inadequate contract management capacity causing implementation delays and/or leading to contractual disputes.

52. In order to mitigate the above identified risks and strengthen the procurement capacity of the PMU, the following measures have been established and agreed with the PMU to be implemented during project implementation: (i) providing regular procurement training for PMU staff, including initial training during project preparation and in-depth procurement trainings during project implementation; (ii) preparing and adopting a PIM, including a detailed chapter on procurement and contract management; (iii) signing and executing a Transparency and Ethics Statement by all members of the bid/proposal evaluation committee when carrying out their duties; (iv) providing appropriate training on contract management and hands-on support to PMU staff during contract execution; and (v) carrying out regular implementation support missions and conduct annual procurement post review.

53. Procurement Strategy. Based on the project requirements, operational context, economic aspects, technical solutions, and market analysis, a Project Procurement Strategy Document (PPSD) has been developed for the project by the PMU with the support from the Bank. The PPSD identified the following types of activities: (i) works contracts for the construction of road and bridges, sewage pipe, kindergartens, etc. (approx. US$ 71.02 million), and (ii) consultancy service for detailed design of works and preparation of bidding documents, construction supervision, environmental impacts monitoring, auditing, etc. (approx. US$ 3.06 million). For the procurement of civil works, the estimated cost per package ranges from US$ 1 million to US$ 18 million. The analysis in the PPSD showed that there are a lot of potential contractors in the country for these types of works (nature and size) and there is little evidence that international firms have shown interest in contracts estimated to cost less than US$ 20 million, therefore, open competition approaching national market was found to be the most appropriate choice. Nevertheless, foreign contractors are still allowed to participate if they wish to do so. For contracts with an estimated cost above US$ 20 million, there would be open competition, which approaches international market. For the consulting services including civil works design, construction supervision, auditing, etc., the estimated cost per package ranges from US$ 0.2 to US$ 3.6 million with major assignments being the detailed design and construction supervision (estimated at US$ 3.6 million).

54. Although the market research demonstrates that there are a significant number of potential consultants in the country for these types of services given the nature of civil works that needs to take into account the factors of safety and climate resilience, participation of reputable and qualified international consultants will be beneficial to project implementation; therefore, the project will be approaching international market. For civil works contracts, which approach national market, the harmonized model bidding documents agreed with the Bank will be used. For all other procurements, the Bank's Standard Procurement Documents shall be used. The PPSD also indicates a number of potential risks that may affect the success of the procurement process, including: (i) frequent changes and overlap in policy regime of Vietnam which may cause delay in project implementation as the PMU has to fulfill

accountability to satisfy both the Bank and GoV procedures; (ii) inflation leading to increase of the investment cost; (iii) weak financial capacity of many bidders; and (iv) desire of bidders to win contracts at any cost that may negatively affect the quality of works and implementation progress. A number of risk mitigation measures as well as allocation of risks to the party that is in best position to take the risks are also proposed in the PPSD, including: (i) PMU staff should be trained and updated regularly and timely in any changes in Vietnam legislations relating to procurement procedures; (ii) use of price adjustment or apply advanced construction methods to reduce the construction period as well as closely supervising construction activities to complete the contract as planned; (iii) preparation of clear requirements on qualifications/experience in Requests for Proposals (RFPs) and Requests for Bids (RFBs) to have strong basis during evaluating capacity and experience of the contractor or consultant; and (iv) verification of qualifications and experience through other sources of other information during bidding evaluation process in due diligence.

55. Procurement Plan. Based on the PPSD, the initial 18-month procurement plan for the project city, dated May 25, 2018 was prepared by the PMU and agreed by the Bank. For civil works contracts, RFB is the method to be used. Regarding goods procurement, there is a small goods contract under the project that will be procured using RFB method, the details of which are in the procurement plan. For efficiency, goods contracts with a cost estimate of less than US$100,000 will be procured using Request for Quotations (RFQ). For consulting services, Quality and Cost-based Selection (QCBS), Consultant Qualifications Selection (CQS), and Individual Consultant (IC) with the most appropriate market approach will be used. The Procurement Plans will be updated at least annually or more often, if this is required, by the PMU via STEP to (i) reflect project implementation; (ii) accommodate changes that should be made; and (iii) add new packages as needed for the project. For all procurement plans, their updates or modifications shall be subject to the Bank's prior review and no-objection. Details for the procurement arrangements are provided in the PIM. The project Procurement Plan identifies the risk and review level for each activity. The latter of these activities is set based on: the value, the procurement performance of the PMU, and risk rating. Contracts that are not subject to prior review will be subject to post review. The Bank will carry out procurement post reviews on an annual basis with an initial sampling rate of 20 percent, which will be adjusted periodically during project implementation based on the procurement performance of the project.

C. Safeguards

(i) Social Safeguards

56. ***Involuntary Resettlement (OP/BP4.12).*** In terms of social impacts, the structural component was estimated to potentially affect about 49.2 hectares of land of 1,347 households will be acquired, including 20.1 hectares of agricultural land, 8.3 hectares of residential land, and 1.6 hectares of production forestland. A total of 133 households would have to relocate and 936 households would have their livelihoods affected due to the partial loss of agricultural land and affected shops. Therefore, OP/BP4.12 was triggered for the project. All potential negative impacts and risks could be predicted design alternatives assessed and, where unavoidable, mitigated. Agreed mitigation measures include the compensation at replacement cost, provision of land plots in resettlement sites that will be constructed by the city within sub-project wards/communes for relocated households, and provision of livelihood restoration packages. All the potential social impacts and associated mitigation measures were identified and included in the RAP of the project for implementation.

57. While it was not required by the Bank because all sub-projects and their boundaries had been identified during project preparation, a Resettlement Policy Framework (RPF) was prepared for DCIDP Thai Nguyen as required by the

Land Law 2013 of Vietnam. The RPF provides principles for involuntary resettlement policy and guidance for the preparation of RAPs and the RAP for the project city was prepared following the RPF. The RPF and RAP were concurred by the World Bank and approved by the Prime Minister (PM) and the PPC, respectively.

58. Public consultations were carried out during preparation of RPF/RAP and will be continued throughout the project cycle. The final draft RPF and RAP were disclosed locally at project communes/wards and PMU in November and December 2017 and on the Bank's external website in December 2017 and January 2018. The final RPF and RAP were disclosed again locally and on the Bank's external website on January 11, 2018 and March 29, 2018 respectively. The RAP will be updated during project implementation, if there are significant changes in scope of work based on the detailed technical design and results of detailed measurement surveys (DMS), replacement cost surveys, and consultations with affected households.

59. Inventory of losses shows that there are no ethnic minority communities living in and/or having collective attachment to the sub-project areas that meet the criteria of OP 4.10 on Indigenous Peoples. Therefore, the policy was not triggered.

60. Gender. A survey was conducted in two residential quarters in Thai Nguyen city to identify potential impact on income opportunities and access to paid work for men and women of the construction/upgrading of kindergarten facilities in Huong Son and Phan Dinh Phung wards. The analysis reflected a considerable gap between local women and men in their time spent on unpaid childcare work due to a lack of affordable and quality childcare facilities, and their absenteeism from work due to childcare responsibilities.[13] To promote an urban environment that facilitates equal opportunities for men and women to access paid work, the project will build/upgrade two kindergartens in Thai Nguyen, which will be able to accommodate up to 1,000 children aged 3-72 months. These investments are expected to lead to a reduction in unpaid work and the rate of absenteeism from work for local women and men in the city who access the kindergarten facilities. The investments are also expected to reduce the teacher to student ratio per class from the current 2:45 (for children aged 25-72 months) to a government standard of 2:25-35 (for children in the same age group), which will improve the quality of the local childcare facilities.

61. During project preparation, consultations were undertaken with a minimum participation requirement of 60 percent of residents and an equal representation between genders. Negative livelihood impacts resulting from project implementation and resettlement will be carefully assessed to determine the potential disproportional effects on women who are constrained to running home-based businesses due to household management and childcare responsibilities. Options for possible mitigation measures (such as cash assistance during transition periods to resettlement sites or preferred business locations within resettlement sites) were explored with city administrators and included in the RAP. Possible infrastructure investments in urban sanitation and transport are expected to contribute to improving access to services and networks for women. During project implementation, implementing agencies will develop appropriate monitoring and evaluation tools to monitor a gender-disaggregated database of project beneficiaries (PDO indicators) and intended beneficiaries who are aware of project information and project investment (intermediate results indicators).

[13] The survey was conducted among mothers and fathers from 100 households with children aged 3-72 months who do not go to a kindergarten. The results revealed that mothers spend two hours during their most productive time of the day on childcare, as compared to 0.45 hours for fathers and 1.1 hours for mothers who send their children to kindergartens (public and private). As many as 25% of mothers who do not send children to a kindergarten have an average rate of 1.6 days of absenteeism from work per month to support their home-based child minders, compared to a zero rate for male partners. Parents leave children at home because seats are unavailable and the quality of care is considered low in the existing public kindergartens while they may not be able to afford private care, whose costs may triple those of a public care facility.

62. Temporary Project Induced Labor Influx. During the construction of the various infrastructure sub-projects, contractors may mobilize a number of workers from outside the project areas. This may generate potential social risks for communities living in the project area, such as violence among local youths, gambling, drug proliferation, and the risk of disease transmission (e.g., sexually-transmitted diseases such as HIV, syphilis, etc.), particularly among local women. In addition, environmental pollution (e.g., dust, noise, and construction waste) can affect local people living around the vicinity of construction sites during the construction period. However, these impacts will be mitigated through mitigation measures proposed in the project ESMP and RAP, such as training for workers and construction supervision teams on required lawful conduct in the host community and on HIV/AIDs awareness, strict enforcement of drug abuse and traffic, and ensuring payment of adequate salaries for workers to reduce incentives for theft and gambling. The PMU and external monitoring agency will be responsible for closely monitoring and mitigating potential risks caused by labor influx to communities surrounding project areas. The mitigation measures for potential labor influx will be contractually enforced through the inclusion of codes of conduct in the bidding documents and the inclusion of necessary requirements in the Contractor's Environment and Social Management Plan (CESMP), the guidelines of which are detailed in the ESIA/ESMP.

63. Citizen Engagement. All projects in Vietnam are legally required to engage citizens throughout the preparation and implementation processes. As discussed, extensive consultations were undertaken in the design phase. Community consultations will continue throughout implementation, especially in the development of the city's integrated urban plan to ensure a closed feedback loop. Following lessons from similar urban development projects in Vietnam (detailed in sub-section C of the Project Description), community participation will be ensured in the project city through the PMU and relevant departments. Community consultations will be conducted during the preparation of technical designs for each investment and will be continued throughout project implementation. As part of project monitoring and evaluation, the number of beneficiaries consulted will be captured in the DCIDP RF.

(ii) Environment Safeguards

64. Applicable Environmental and Social Safeguard Policies. *Environmental Assessment (OP 4.01):* This policy is triggered due to the potential adverse impacts associated with construction activities under Component 1. The project is environmental Category B due to the moderate environmental and social impacts associated with the construction, rehabilitation, and operation of the proposed facilities provided by the Project. The ESIA/ESMP were prepared and are deemed acceptable to the Association. The following additional environmental safeguard policies are triggered:

a) *Natural Habitats (OP/BP 4.04)*: The proposed works (bridge construction, dredging and embankment lining) in the Xuong Rong and Mo Bach ditches, the Huong Thuong river may affect the growth of or damage some existing aquatic flora and fauna at these locations. The ESMP proposed to build coffer dams before construction is started and carrying out dredging at intervals to mitigate these potential impacts on aquatic species.

b) *Forests (OP/BP 4.36):* The project will acquire approximately 1.45 ha of production forest which has economical but no biological values. In addition, the presence of workers in the forest area may cause increased fire risk or clearance of trees in the existing forest near construction sites. Forest owners will be compensated under RAP. Workers' code of conduct includes regulations to prevent behaviors that may cause harm to the forest.

c) *Physical Cultural Resources (OP/BP 4.11):* The project will require the relocation of 58 graves. Compensation and support for the relocation of these graves were included in the RAP and ESMP. The potential impacts on other PCRs, such as monuments, pagodas, temples, churches, etc., include noise, dust, reduced accessibility. The

ESMP includes measures such as watering, loading materials and wastes away from these PCRs, and scheduling of construction to avoid most sensitive time/days etc. As the project involves significant earth works, there are chances that some artifacts may be exposed during excavation. Chance finds procedure has been prepared and included in the ESMP.

65. The key findings and recommendations of the ESIA/ESMPs. The ESIA/ESMP assessed the potential social and environmental impacts and risks of the project. It is expected that the project will mainly bring about positive environmental and social impacts during the operation phase, particularly on improving drainage capacity, environmental sanitation conditions and urban landscape and connectivity, and environmental sanitation conditions in the sub-project areas.

66. The project area is also at safety risk due to some unexploded objects that may be left from the past war. Common construction impacts and risks include: (i) dust, noise, and vibration; (ii) generation of solid waste and wastewater; (iii) surface water quality reduction and negative impacts on aquatic lives; (iv) traffic disturbance and increased traffic safety risks; (v) disturbance or damaging existing infrastructures; (vi) social impacts related to mobilization of the workers to the project areas; (vii) localized flooding; (viii) landslides and erosion; (ix) social impacts; and (x) health and safety of the workers and communities. Specific construction impacts were also assessed in areas having sensitive receptors (schools, commune houses, churches, cemeteries, health care facilities, etc.), dredging areas with regards to sedimentation quality, and construction sites near production forests. The main issues during the operation phase would be disturbance to drainage that may lead to localized flooding after the new roads are built, changes in land use and landscape, changes in topography and flow in the Xuong Rong and Mo Bach ditches, and safety for the children at the kindergartens. Most of these impacts are localized, short-term, temporary, reversible at moderate levels, and manageable through the readily known mitigation measures.

67. The ESMP includes adequate mitigation measures to address the assessed impacts and mechanism of implementation of these measures together with monitoring, supervision, and reporting. The Thai Nguyen PMU, through its Social/ Environmental Officers, will be responsible for oversight to ensure compliance with the ESMP. The detailed design engineers will incorporate environmentally-friendly/greening solutions into engineering design and cost estimation, as appropriate. Relevant mitigation measures, plans and other relevant parts of the ESMP, such as Environmental Codes of Practice (ECOP), site-specific mitigation measures, Dredging and Dredged Material Management Plan (DDMP), will be incorporated into the construction contractual and bidding documents for implementation by the Contractors. The construction supervision consultants (CSCs) will be responsible for day-to-day monitoring and periodical reporting on the contractor's environmental performance. In addition, the CSCs will also arrange for: (i) environmental quality monitoring in accordance with the ESMP; and (ii) training on HIV/AIDs awareness raising for the contractor's workers, CSC team members, and PMU staff. The costs of environmental quality monitoring and HIV/AIDs trainings should be included in the CSC contract values. Safeguard management capacities of the PMU will be enhanced during project implementation through the services provided by the Independent Environmental Monitoring Consultant (IEMC) contracted by the PMU. The IEMC will also carry out periodical monitoring to verify that sub-projects are environmentally compliant and recommend corrective actions if/when necessary.

68. Public Consultation and Information Disclosure. Consultations were conducted during August to November 2017 as part of ESIA/ESMP preparation. The representatives of the affected households and other relevant stakeholders were consulted on the ESIA/ESMP. The draft ESIA/ESMP were disclosed both locally, at the PMU and sub-project areas, and at World Bank's external website on November 28, 2017. The final ESIA/ESMP were disclosed

again locally and at the World Bank's external website on March 29, 2018 for public access.

(iii) Other Safeguard Policies

69. No other safeguards policies were triggered.

(iv) World Bank Grievance Redress

70. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms (GRMs), which were established in the RPF and RAPs, or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed and redressed satisfactorily. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate GRS, please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.* For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

V. KEY RISKS

71. The overall risk to the project is rated as **Substantial**, given the Substantial ratings for several categories, including Institutional and Implementation Capacity, Fiduciary, and Environmental and Social Safeguards (see the SORT in the data sheet for detailed ratings).

72. Technical design: **Moderate**. Overall, the technical approach and portfolio of civil works is not expected to be complex, although the investments will be multi-sectoral in nature. Thai Nguyen has experience implementing similar investments financed by other sources, including an on-going Program-for-Results (PforR) operation with the Bank. Based upon previous experiences, the proposed investments were assessed to be within the capacity of the local authority and contractors. The key risks that the project city needs to manage include: (i) ensuring the alignment of the technical designs of the structural investments with the integrated urban master plan of the city; (ii) ensuring that technical designs are responsive to climate change risks; (iii) strengthening the capacity of the PMU to supervise construction and ensure technical quality of the investments; and (iv) developing and implementing comprehensive O&M plans to effectively manage the structural investments. The extensive program of non-structural investments under Component 2 of the project was specifically designed to provide the project city with the needed TA to mitigate the risks in technical design.

73. Sector Strategies and Policies: **Substantial**. Given recent experiences of delays in the GoV's approval and ratification procedure, there is a risk of delays in signing of the FA and project effectiveness, and subsequently lead to delays in project implementation. In addition, there may be further delay in project implementation as a result of the lengthy process of adjustment to the GoV's Medium Term Public Investment Plan (MTPIP). The Bank will maintain a high-level engagement with the GoV both at the technical and country management levels to ensure that project approval, effectiveness and implementation proceed as scheduled.

74. Further, while the project seeks to engage MOC in project implementation, particularly in the delivery of TA activities under the non-structural component, recent experiences in urban development operations (e.g., VUUP and Northern Mountains PforR) indicate that MOC has considerable capacity constraints in project implementation and coordination. In mitigation, relevant ministries will be engaged closely during project implementation (at both a technical and management levels) and appropriate TA will be provided to facilitate timely and efficient project implementation.

75. Institutional Capacity for Implementation and Sustainability Risks: **Substantial**. The rating was cautiously based on the relatively limited experience of the project city to prepare and implement World Bank IPF projects. The project city has familiarity with the Bank's policies and procedures for result-based operations through the on-going implementation of a PforR project, which largely uses the country policies, regulations, and procedures. Regarding project preparation, project documents were prepared using counterpart funds (CF), which was not adequate to attract qualified international consultants. Subsequently, if project documents are not comprehensively well reviewed, the quality of design and construction may be severely impacted. In implementation, start-up delays are common in the Vietnam portfolio for reasons that generally include: (i) low procurement readiness requiring multiple reviews at document preparation stages, (ii) weak contract management and complicated and lengthy appraisal/approval procedures, (iii) lack of counterpart funds for land acquisition, and (iv) difficulties in land acquisition and site compensation processes; and (v) inadequate and/or untimely availability of IDA funds for project implementation due to adjustments to the MTPIP, which can lead to delays in disbursements. To address these risks, a number of measures will be pursued that are consistent with lessons learned from past projects:

a) The full staffing of the PMU prior to Project Effectiveness with officials that meet qualification requirements acceptable to the Bank will be prioritized.
b) Capacity building and TA on technical design, procurement, and contract management will be provided to the PMU throughout implementation.
c) Pre-procurement activities will be accelerated prior to Project Effectiveness to facilitate timely procurement of key packages in the first year of implementation. These efforts will include prioritizing the preparation of procurement packages not requiring land acquisition in Year 1, early preparation of bidding documents, and the early drafting of TORs (particularly for the TA activities).
d) The land acquisition process and consultation with the stakeholders will be undertaken with the close support of the Bank's specialists.
e) The fiscal capacity of the project city was comprehensively assessed and confirmed at project appraisal and annual budgets have been allocated accordingly in medium-term public investment plans to ensure availability of project IDA and CF. Potential risks relating to the city's ability to manage sub-loans will be duly flagged, with particular attention paid to the local economic structure.
f) Strong commitments from the PPC and CPC will be confirmed at the early stage of project preparation to ensure project management support and monitoring of construction during implementation.

76. There are also expected to be challenges in the Bank's supervision of the project given the decentralized design that assigns ownership and responsibilities for project implementation to the project city. The decentralized project management strictly follows the GoV's regulations and this approach has been applied for several similar on-going projects in Da Nang and Can Tho. Hence, lessons from the project management of these projects will be adopted, particularly regarding maintaining a regular schedule of bi-annual project implementation support missions, conducting monthly project monitoring meetings with the project city, and providing extensive technical support to the PMU, especially in the initial stages of project implementation.

77. Fiduciary Risks: **High**. The financial management (FM) capacity assessment revealed that: (i) the PMU has experience with the Bank's IPF FM procedures through its on-going implementation of a PforR project; and (ii) the project will demand greater capacity and accountability of the PPC in monitoring of the fund flows and in meeting the financial reporting requirements given the decentralized project design, which provides extensive flexibility and autonomy to the Project Owner. Therefore, the FM risk rating was assessed as **Moderate**. The following mitigation measures were identified and will be implemented:

a) Appointing accounting staff with qualifications and experience acceptable to the Bank at the PMU to be in charge of the project's finance and accounting works.
b) Developing and adopting a Financial Management Manual (FMM) for the project by the PMU.
c) Adopting upgraded accounting software (based on software currently being used in similar on-going Bank projects) to fit with the project's accounting and reporting requirements.
d) Conducting training for the FM staff of the PMU on the Bank's FM and disbursement requirements and procedures.
e) Substantial monitoring by the provincial authority on the project financial reporting and expenditures. The PMU's annual financial statements and the final reports for each investment are to be approved by the Department of Finance and PPC within three months after report submission.

78. The procurement capacity assessment showed that the procurement risk for the proposed project was **High** due to: (i) the lack of practical guidance on the steps of procurement process; (ii) the potential preference to try and use national procurement rules and procedures when there is a difference with the Bank's procurement regulations; (iii) the potential for fraud/corruption and collusive practices; and (iv) inadequate contract management capacity causing implementation delays and/or leading to contractual disputes. The risks are further detailed above in sub-section B (ii) of the Appraisal Summary. There are three major mitigation actions identified: (i) providing regularly procurement training for PMU staff; (ii) preparing and adopting a PIM, including a detailed chapter on procurement and contract management; and (iii) providing appropriate training on contract management and hands-on support to PMU staff during contract execution, as well as specific recommendations detailed above in the sub-section B (ii) of the Appraisal Summary.

79. Environmental and Social Safeguards: **Substantial**. The project is expected to bring improvements in city drainage and flood control capacity, transportation, and sanitation, which will contribute to improved public health, reduced traffic congestion, better inner and external city connectivity, and reduced losses due to flooding. Potential negative environmental impacts and risks, such as dust, noise, erosion/soil subsidence risks, nuisance from ditch dredging, road and waterway traffic disturbance, impacts on businesses and agricultural production, safety risks for the workers and communities, etc., would occur mainly during the construction phase. The main issues during operation are traffic safety risks on newly built roads. However, most of the potential environmental impacts are expected to be moderate, temporary, site-specific, and mostly reversible, with mitigation measures that can be readily designed in most cases (as detailed in sub-section C (i) of the Appraisal Summary, paragraph 67).

80. Social adverse impacts of the project will be caused by unavoidable land acquisition leading to physical and economic displacement of local people. The structural component was estimated to potentially affect about 1,347 households, of which 133 households would have to relocate or resettle. The land acquisition process in Vietnam is generally complex and the same may happen in Thai Nguyen city. The capacity assessment of Thai Nguyen PMU and resettlement implementation agencies showed that, while the PMU has some prior experience in a PforR project financed by the Association, their experience with the Bank's IPF environment and social safeguards management is limited. This may cause substantial risk to the resettlement implementation, such as non-compliance with the Bank's

safeguards policy leading to complaints of affected people. A capacity building plan was developed in the RAP with provisions for training courses on the Bank's involuntary resettlement policy for staff of the PMU and the resettlement implementation agency. During project implementation, the PMU will hire qualified resettlement consultants to support the implementation of resettlement activities for the project so that potential risks could be reduced. During project implementation, a large number of workers of contractors will come and live temporarily in the project area. Potential risks may be caused by this labor influx such as violence among local youths, HIV/AIDs, drug use. The potential environmental and social impacts and mitigation measures were detailed in the sub-project environmental and social impact assessment (ESIA) and management plan (ESMP), and resettlement action plan (RAP).

81. Climate Change Screening. A Climate & Disaster Risk Screening was conducted and the project was found to have **Moderate** risk to climate change and disasters overall. Given that a high proportion of the country's population and economic assets are located in coastal lowlands and deltas, Vietnam has been ranked by the World Bank as among the five countries likely to be most affected by climate change. Thai Nguyen, which is situated in the more mountainous North-East region, faces risks related to increased rainfall and landslides. Projected increases in summer and winter rainfall, runoff, rainfall variability, and the proportion of rain falling in heavy events will have profound implications for flooding.

82. Increased urbanization, population growth, and the increase in infrastructure assets mean that the damage potential from climate change and disasters will likely rise with time. Mitigation measures incorporated into design will include: (i) increasing the drainage capacity of canal systems; and (ii) preserving green spaces for water retention within city limits. Engineering designs of all sub-projects will incorporate climate and disaster risks factors. Importantly, the project design includes non-structural components that are aimed at ensuring more strategic, climate change-informed urban planning, as well as improved management of assets to withstand shocks from extreme weather events or natural hazards.

VI. RESULTS FRAMEWORK AND MONITORING

Results Framework

Project Development Objective(s)

To improve access to urban infrastructure and to improve integrated urban planning and management in the project city.

PDO Indicators by Objectives / Outcomes	DLI	CRI	Unit of Measure	Baseline	Intermediate Targets					End Target
					1	2	3	4	5	
Improve access to urban infrastructure services and integrated urban planning and management										
Area prone to floods in the area coverred by the project interventions			Hectare(Ha)	643.00	643.00	643.00	643.00	643.00	631.00	631.00
Number of people benefiting from improved drainage in the area covered by the project interventions			Number	0.00	0.00	0.00	0.00	0.00	1,207.00	1,207.00
Of which female beneficiaries			Percentage	0.00	0.00	0.00	0.00	0.00	51.00	51.00
Of which bottom 40% beneficiaries			Percentage	0.00	0.00	0.00	0.00	0.00	54.00	54.00
People provided with access to improved sanitation provided by the project			Number	0.00	0.00	0.00	0.00	0.00	3,178.00	3,178.00
Of which female beneficiaries			Percentage	0.00	0.00	0.00	0.00	0.00	51.00	51.00
Of which bottom 40% beneficiaries			Percentage	0.00	0.00	0.00	0.00	0.00	58.00	58.00
People who have access to new and improved roads under the project			Number	0.00	0.00	0.00	9,161.00	32,551.00	38,133.00	38,133.00
Of which female beneficiaries			Percentage	0.00	0.00	0.00	49.60	49.60	49.60	51.00
Of which bottom 40% beneficiaries			Percentage	0.00						49.60

PDO Indicators by Objectives / Outcomes	DLI	CRI	Unit of Measure	Baseline	Intermediate Targets					End Target
					1	2	3	4	5	
Users satisfied with the new or improved roads under the project			Percentage	0.00	0.00	0.00	80.00	80.00	80.00	80.00
Female users satisfaction			Percentage	0.00	0.00	0.00	0.00	80.00	80.00	80.00
Bottom 40% users satisfaction			Percentage	0.00	0.00	0.00	85.00	85.00	85.00	85.00
People provided with access to new or improved public spaces			Number	0.00	0.00	0.00	17,677.00	17,677.00	42,611.00	42,611.00
Of which female beneficiaries			Percentage	0.00	0.00	0.00	51.00	51.00	51.00	51.00
Of which bottom 40% beneficiaries			Percentage	0.00	0.00	0.00	56.00	56.00	56.00	56.00
Users satisfied with the new or improved public spaces			Percentage	0.00	0.00	0.00	80.00	80.00	80.00	80.00
Female users satisfaction			Percentage	0.00	0.00	0.00	80.00	80.00	80.00	80.00
Bottom 40% users satisfaction			Percentage	0.00	0.00	0.00	85.00	85.00	85.00	85.00
Direct project beneficiaries			Number	0.00	0.00	0.00	26,838.00	51,012.00	81,951.00	81,951.00
Female beneficiaries			Percentage	0.00	0.00	0.00	51.00	51.00	51.00	51.00
Bottom 40% beneficiaries			Percentage	0.00	0.00	0.00	52.00	52.00	53.00	53.00
Integrated urban development plans developed			Number	0.00	0.00	0.00	1.00	1.00	1.00	1.00

Intermediate Results Indicators by Components	DLI	CRI	Unit of Measure	Baseline	Intermediate Targets					End Target
					1	2	3	4	5	
Component 1-Structural Investments: Rehabilitation and Construction of Urban Infrastructure										
Length of drains improved or constructed			Kilometers	0.00	0.00	0.00	0.00	0.00	2.19	2.19
Length of wastewater pipeline laid			Kilometers	0.00	0.00	0.00	0.00	0.00	2.80	2.80
Additional wastewater treatment capacity provided			Cubic Meter(m3)	0.00	0.00	0.00	0.00	0.00	1,100.00	1,100.00
Households connected to new or improved wastewater treatment systems			Number	0.00	0.00	0.00	0.00	840.00	840.00	840.00
Length of roads and bridges constructed or improved			Kilometers	0.00	0.00	0.00	3.70	12.66	14.45	14.45
Area of new or improved walkable public space			Square Meter(m2)	0.00	0.00	0.00	36,870.00	136,710.00	151,925.00	151,925.00
Change in time used by mothers of children aged 3-72 months on unpaid childcare work			Percentage	0.00	0.00	0.00	-50.00	-50.00	-50.00	-50.00
Achievement of Government standard for teacher to student ratio in child care facilities of 2:30 for children aged 25-36 months			Text	2:45	2:45	2:45	2:30	2:30	2:30	2:30
Achievement of Government standard for teacher to student ratio in child care facilities of 2:35 for children aged 37-60 months			Text	2:40	2:40	2:40	2:35	2:35	2:35	2:35
Achievement of Government standard for teacher to student ratio in child care facilities of 2:35 for children aged 61-72 months			Text	2:50	2:50	2:50	2;35	2:35	2:35	2:35
Users satisfied with childcare services provided under the project			Percentage	0.00	0.00	0.00	0.00	80.00	80.00	80.00

Female users satisfaction			Percentage	0.00	0.00	0.00	80.00	80.00	80.00	80.00
Bottom 40% users satisfaction			Percentage	0.00	0.00	0.00	85.00	85.00	85.00	85.00
Component 2: Non-Structural Investments - Technical Assistance and Implementation Support										
Integrated urban development plans developed			Number	0.00	0.00	0.00	1.00	1.00	1.00	1.00
Urban asset management plans approved with approved annual budgets for O&M			Number	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Stakeholder consultation sessions and training activities conducted in integrated urban development planning			Number	0.00	3.00	7.00	7.00	7.00	7.00	7.00
Beneficiaries involved in consultations for project planning/ implementation/ evaluation			Number	0.00	300.00	500.00	550.00	600.00	700.00	700.00
Of which female beneficiaries			Percentage	0.00	44.00	44.00	44.00	44.00	44.00	44.00
Of which bottom 40% beneficiaries			Percentage	0.00	42.00	42.00	42.00	42.00	42.00	42.00

Monitoring & Evaluation Plan: PDO Indicators	
Indicator Name	Area prone to floods in the area coverred by the project interventions
Definition/Description	Area (ha) at risk of flood inundation within the areas covered by the scope of project investments over a 10-year return period as regulated by Government's design standards
Frequency	Annually
Data Source	PMU/consultant reports
Methodology for Data Collection	This indicator will be calculated using the hydraulic modeling and map overlay at the design and completions of the project interventions.
Responsibility for Data Collection	PMU

Indicator Name	Number of people benefiting from improved drainage in the area covered by the project interventions
Definition/Description	Number of people protected from flood inundation within the areas covered by the scope of project investments over a 10-year return period as regulated by Government's design standards
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be calculated using the hydraulic modeling and map overlay at the design and completions of interventions. A survey also be conducted for the population in the project area. Survey must ask the respondent's gender and income.
Responsibility for Data Collection	PMU

Indicator Name	Of which female beneficiaries
Definition/Description	Percentage of female beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the survey on the people access to the improved drainages. It will report female respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Of which bottom 40% beneficiaries
Definition/Description	Percentage of bottom 40% beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the survey on the people access to the improved drainages. It will report bottom 40% respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	People provided with access to improved sanitation provided by the project
Definition/Description	Number of people benefiting from improved sanitation from project investments (including connections to new or improved wastewater treatment plants)
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be calculated the population whose wastewater is collected and/or treated by wastewater collection and treatment facilities financed under the project. The data will come from the project progress and M&E report. The M&E reports should provide the gender ratio and income of the group.
Responsibility for Data Collection	PMU

Indicator Name	Of which female beneficiaries
Definition/Description	Percentage of female beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be extracted from the progress and M&E report. It will report female ratio.
Responsibility for Data Collection	PMU

Indicator Name	Of which bottom 40% beneficiaries
Definition/Description	Percentage of bottom 40% beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be extracted from the progress and M&E report. It will report the bottom 40% ratio.
Responsibility for Data Collection	PMU

Indicator Name	People who have access to new and improved roads under the project
Definition/Description	Number of people, including both motorized and non-motorized users, provided with access to new or improved roads within a 500 meter range from project investments
Frequency	Initial: when road enters service; Annually thereafter for 5 years
Data Source	PMU/Consultant surveys when roads enter service, annually thereafter
Methodology for Data Collection	Surveys when roads enter service, annually thereafter. Survey must ask the respondent's gender and income.
Responsibility for Data Collection	PMU

Indicator Name	Of which female beneficiaries
Definition/Description	Percentage of female beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the survey on the people access to the improved roads. It will report female respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Of which bottom 40% beneficiaries
Definition/Description	Percentage of bottom 40% beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the survey on the people access to the improved roads. It will report bottom 40% respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Users satisfied with the new or improved roads under the project
Definition/Description	Percentage of users expressing satisfaction with the new or improved roads under the project based on beneficiary surveys
Frequency	PMU/Consultant surveys when roads enter service, annually thereafter
Data Source	Initial: when road enters service; Annually thereafter for 5 years
Methodology for Data Collection	Surveys when roads enter service, annually thereafter. Survey must ask the respondent’s gender and income. User satisfaction could be measured using a 5-point Likert scale (1: unsatisfied; 2: moderately unsatisfied; 3: neutral; 4: moderately satisfied; 5: satisfied).
Responsibility for Data Collection	PMU

Indicator Name	Female users satisfaction
Definition/Description	Percentage of female users
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	This sub-indicator will be built from the user survey. It will report female respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Bottom 40% users satisfaction
Definition/Description	Percentage of bottom 40% users
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the survey on the people access to the improved roads. It will report bottom 40% respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	People provided with access to new or improved public spaces
Definition/Description	Number of people provided with access to new or improved urban spaces within a 500 meter range from project investments
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be calculated the population within a 500 meter range from the completed project investments. The data will come from the project progress and M&E report. The M&E report should provide the gender and income of the group.
Responsibility for Data Collection	PMU

Indicator Name	Of which female beneficiaries
Definition/Description	Percentage of female beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be extracted from the progress and M&E report. It will report female ratio.
Responsibility for Data Collection	PMU

Indicator Name	Of which bottom 40% beneficiaries
Definition/Description	Percentage of bottom 40% beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be extracted from the progress and M&E report. It will report the bottom 40% ratio.
Responsibility for Data Collection	PMU

Indicator Name	Users satisfied with the new or improved public spaces
Definition/Description	Percentage of users expressing satisfaction with the new or improved public spaces under the project based on beneficiary surveys
Frequency	Initial: when public spaces enter service; Annually thereafter for 5 years
Data Source	PMU/Consultant reports
Methodology for Data Collection	Surveys when public spaces enter service, annually thereafter. Survey must ask the respondent's gender and income. User satisfaction could be measured using a 5-point Likert scale (1: unsatisfied; 2: moderately unsatisfied; 3: neutral; 4: moderately satisfied; 5: satisfied).
Responsibility for Data Collection	PMU

Indicator Name	Female users satisfaction
Definition/Description	Percentage of female users
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the user survey. It will report female respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Bottom 40% users satisfaction
Definition/Description	Percentage of bottom 40% users
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the user survey. It will report bottom 40% respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Direct project beneficiaries
Definition/Description	Number of direct beneficiaries from project investments
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	The data will come from the project progress and M&E report. The M&E report should provide the gender and income of the group.
Responsibility for Data Collection	PMU

Indicator Name	Female beneficiaries
Definition/Description	Percentage of female beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be extracted from the progress and M&E report. It will report female ratio.
Responsibility for Data Collection	PMU

Indicator Name	Bottom 40% beneficiaries
Definition/Description	Percentage of bottom 40% beneficiaries
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be extracted from the progress and M&E report. It will report the bottom 40% ratio.
Responsibility for Data Collection	PMU

Indicator Name	Integrated urban development plans developed
Definition/Description	Number of integrated urban development strategies developed
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator is calculated when the integrated urban development strategies is developed.
Responsibility for Data Collection	PMU

Monitoring & Evaluation Plan: Intermediate Results Indicators	
Indicator Name	Length of drains improved or constructed
Definition/Description	Km completed and put into service through project investments
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	This indicator will be measured from PMU's progress report and reports produced by the contractor and verified by the supervisor.
Responsibility for Data Collection	PMU
Indicator Name	Length of wastewater pipeline laid
Definition/Description	Km completed and put into service through project investments
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	This indicator will be measured from PMU's progress report and reports produced by the contractor and verified by the supervisor.
Responsibility for Data Collection	PMU

Indicator Name	Additional wastewater treatment capacity provided
Definition/Description	Additional m3/day of wastewater collected or treated through project investments
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	This indicator will be measured from PMU's progress report and reports produced by the contractor and verified by the supervisor.
Responsibility for Data Collection	PMU

Indicator Name	Households connected to new or improved wastewater treatment systems
Definition/Description	Number of households connected to new or improved wastewater treatment systems constructed by project investments
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	This indicator will be measured from PMU's progress report and reports produced by the contractor and verified by the supervisor.
Responsibility for Data Collection	PMU

Indicator Name	Length of roads and bridges constructed or improved
Definition/Description	Length of roads constructed or improved and put into service through project investments
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be measured from PMU's progress report and reports produced by the contractor and verified by the supervisor.
Responsibility for Data Collection	PMU

Indicator Name	Area of new or improved walkable public space
Definition/Description	Square meters of new or improved properly designed public space constructed by project investments (including designated footpaths along roads, bridges, canals, and waterways)
Frequency	Annually
Data Source	PMU/Consultant Reports
Methodology for Data Collection	This indicator will be measured from PMU's progress report and reports produced by the contractor and verified by the supervisor.
Responsibility for Data Collection	PMU

Indicator Name	Change in time used by mothers of children aged 3-72 months on unpaid childcare work
Definition/Description	Percentage change vs. baseline in hours spent on unpaid childcare work measured for mothers of children aged 3-72 months who use the childcare facilities developed by the project. The time between 5 AM and 6 PM is considered the most productive period of the day. Baseline survey indicates mothers spent 2 hours on unpaid child care work, whereas mothers using care facilities spend only 1.1 hour.
Frequency	Annually
Data Source	PMU/Consultant report
Methodology for Data Collection	Surveys when childcare services become available, annually thereafter.
Responsibility for Data Collection	PMU

Indicator Name	Achievement of Government standard for teacher to student ratio in child care facilities of 2:30 for children aged 25-36 months
Definition/Description	Achievement of the government standard for teacher to student ratio in childcare facilities of 2:25-35 (for children in different age groups) among kindergartens built using the project's investments. The standard is based on MoET's Charter on Kindergartens (issued on Dec 24, 2015) and the inter-ministerial (MoET-Ministry for Home Affairs) circular on staffing positions and quotas in child care facilities (issued on March 16, 2015).
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	Surveys when childcare services become available, annually thereafter.
Responsibility for Data Collection	PMU

Indicator Name	Achievement of Government standard for teacher to student ratio in child care facilities of 2:35 for children aged 37-60 months
Definition/Description	Achievement of the government standard for teacher to student ratio in childcare facilities of 2:25-35 (for children in different age groups) among kindergartens built using the project's investments. The standard is based on MoET's Charter on Kindergartens (issued on Dec 24, 2015) and the inter-ministerial (MoET-Ministry for Home Affairs) circular on staffing positions and quotas in child care facilities (issued on March 16, 2015).
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	Surveys when childcare services become available, annually thereafter.
Responsibility for Data Collection	PMU

Indicator Name	Achievement of Government standard for teacher to student ratio in child care facilities of 2:35 for children aged 61-72 months
Definition/Description	Achievement of the government standard for teacher to student ratio in childcare facilities of 2:25-35 (for children in different age groups) among kindergartens built using the project's investments. The standard is based on MoET's Charter on Kindergartens (issued on Dec 24, 2015) and the inter-ministerial (MoET-Ministry for Home Affairs) circular on staffing positions and quotas in child care facilities (issued on March 16, 2015).
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	Surveys when childcare services become available, annually thereafter.
Responsibility for Data Collection	PMU

Indicator Name	Users satisfied with childcare services provided under the project
Definition/Description	Percentage of users expressing satisfaction with the childcare services under the project based on beneficiary surveys
Frequency	Initial: when childcare services become available; Annually
Data Source	PMU/Consultant surveys when childcare services become available, annually thereafter
Methodology for Data Collection	Surveys when childcare services become available, annually thereafter. Survey must ask the respondent's gender and income. User satisfaction could be measured using a 5-point Likert scale (1: unsatisfied; 2: moderately unsatisfied; 3: neutral; 4: moderately satisfied; 5: satisfied).
Responsibility for Data Collection	PMU

Indicator Name	Female users satisfaction
Definition/Description	Percentage of female users
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the user survey. It will report female respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Bottom 40% users satisfaction
Definition/Description	Percentage of bottom 40% users
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from the survey on the people access to the improved public spaces. It will report bottom 40% respondents' answers.
Responsibility for Data Collection	PMU

Indicator Name	Integrated urban development plans developed
Definition/Description	Number of integrated urban development strategies developed
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be measured from PMU's progress report.
Responsibility for Data Collection	PMU

Indicator Name	Urban asset management plans approved with approved annual budgets for O&M
Definition/Description	Number of comprehensive and sustainable operations and management plans developed, adopted, and implemented by the city with approved budgets
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be measured from PMU's progress report.
Responsibility for Data Collection	PMU
Indicator Name	Stakeholder consultation sessions and training activities conducted in integrated urban development planning
Definition/Description	Number of stakeholder consultation sessions and training activities conducted by the city in the course of integrated urban development planning (including urban planning and public transport strategy development)
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be measured from PMU's progress report.
Responsibility for Data Collection	PMU

Indicator Name	Beneficiaries involved in consultations for project planning/ implementation/ evaluation
Definition/Description	Number of beneficiaries participating in consultation activities conducted in the planning, implementation, or evaluation of project investments
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This indicator will be measured from PMU's progress report, and minutes of the consultation meetings.
Responsibility for Data Collection	PMU

Indicator Name	Of which female beneficiaries
Definition/Description	Percentage of female beneficiaries involved
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from progress report and minutes of the meetings. It will report female participants.
Responsibility for Data Collection	PMU

Indicator Name	Of which bottom 40% beneficiaries
Definition/Description	Percentage of bottom 40% beneficiaries involved
Frequency	Annually
Data Source	PMU/Consultant reports
Methodology for Data Collection	This sub-indicator will be built from progress report and minutes of the meetings. It will report bottom 40% participants.
Responsibility for Data Collection	PMU

ANNEX 1 – ECONOMIC ANALYSIS

1. Methodology

1. The evaluation followed the conventional economic appraisal methodology for infrastructure improvement schemes. It compared annual discounted costs and benefits of the project to society as a whole over the project life cycle in "with" and "without" cases using the Net Present Value (NPV) and the Internal Rate of Return (IRR) indicators to justify the economic viability.[14] Annual project costs and benefits were evaluated for a 25-year period of benefit, allowing for a two to five-year construction period starting in 2019. A discount rate of 10 percent was employed to convert annual cost and benefit streams into present value in the year 2017 according to the recent guidelines of the World Bank in 2016.

2. The unit prices use for estimation of project costs and benefits were based on prices in Vietnam in 2017. The evaluation was conducted using VND as the unit of currency. The exchange rate of VND 22,500: US$ 1 for converting the VND to US$ was close to the market rate and so no shadow foreign exchange rate was considered necessary. The economic analysis was conducted on the basis of constant prices without taking the impact of inflation on prices into account.

3. For the economic evaluation, costs and benefits were calculated from economic prices rather than market, or financial, prices. Economic prices reflect the resource cost or value of an item to the country. Economic costs are the actual parts of the results of financial cost conversion in which market factors are eliminated. Each category of capital costs and operation and maintenance costs were broken down into categories such as traded material, non-traded material, skilled labor, unskilled labor, transfer cost (taxes, subsidies, levies), and others. These financial costs were converted from VND to US$ and were multiplied with respective conversion factors, to arrive at economic prices. The economic costs were converted from the financial cost using a conversion factor of 0.9 for investment costs and 0.95 for operation and maintenance costs, which are based on international border prices.

Table 1: Conversion factors from Financial Costs to Economic Costs

Cost Item	Capital Cost		Maintenance Cost	
	Percentage (%)	Adjustment	Percentage (%)	Adjustment
Traded goods	30	1	10	1
Non-traded goods	20	0.93	25	0.93
Skilled labors	5	0.97	20	0.97
Unskilled labors	30	0.7	20	0.7
Energy	5	1.25	15	1.25
Taxes	10	0	10	0
Total	100		100	
Conversion factor (VAT	**0.90**		**0.95**	

[14] NPV is a principle measure of economic viability, representing the difference between the present value of economic costs and the present value of economic benefits. If the NPV is greater than zero the project is considered to be viable. On the other hand, IRR is the discount rate at which the present value of economic benefits equals the present value of economic costs. If IRR exceeds the discount rate then the project is considered viable.

excluded)

2. Project Costs

2.1. Capital Costs

4. The project costs include construction costs and other costs during preparation and implementation of construction, such as design, supervision consulting, resettlement, environment management, etc.

Table 2: Economic Costs of Investments (US$ million)

Sub-Project	Total	2018	2019	2020	2021	2022	2023
1. North - South Road and Huong Thuong Bridge	31.79	0.58	17.63	9.25	4.34		
2. Huong Thuong - Chua Hang Road	13.17		6.58	3.95	2.63		
3. Dong Bam Residential Road	11.22	1.80	5.85	3.57			
4. Dan Bridge	2.62	0.40	1.69	0.52			
5. Le Huu Trac Road	5.01	0.25	0.76	0.25	0.93	1.49	1.31
6. Xuong Rong Drainage	2.41	0.15	0.44	0.15	0.42	0.67	0.58
7. Mo Bach Drainage	3.43	0.34	1.03	0.34	0.43	0.69	0.60
8. Huong Son Kindergarten	1.63	0.33	0.98	0.33			
9. Phan Dinh Phung Kindergarten	0.97	0.19	0.58	0.19			

2.2. Maintenance costs

5. At this stage, the annual economic O&M cost was expressed as a percentage of the economic investment cost. For urban transport infrastructure subprojects, the percentages were estimated as 1 percent for routine maintenance, 5 percent for periodic maintenance, and 30 percent for major repairs.

Table 3: Maintenance Mechanism - Urban Transport Infrastructure

Activity	Frequency (Year)	Cost (% of Capital Cost)
Routine maintenance	1	1%
Periodic maintenance	4	5%
Major repair	12	30%

6. For water drainage and sanitation projects and kindergarten projects, the O&M cost was estimated as 2 percent of the economic investment cost.

3. Project Benefits

3.1. Urban Transport Infrastructure Component

7. Thai Nguyen has five sub-projects under the urban transport infrastructure component. The evaluation for the component quantified two main conventional economic benefits: savings in vehicle operating

cost (VOC) and savings in passenger travel time (VOT).[15]

8. Traffic Demand Forecast: Traffic demand was estimated using the System for Traffic Demand Analysis (STRADA), a package for transport forecasting that is widely used in Vietnam. The system was used to calibrate current and projected passenger traffic of the city road networks and to assign traffic to each of the project roads in "with project" and "without project" networks. Traffic demand was computed from existing and projected population statistics, passenger occupancies, trip rates and modal shares. The networks comprise project road catchment zones as well as non-project road catchment zones, which are typically outside but adjacent to the road catchment zones.

9. Traffic counts were conducted in sub-project areas in June 2017. Household surveys were also conducted to collect data on trip rates, modal shares, length of trips, and trip purposes for model calculation. Other inputs were taken from other city projects and other models that are widely used in Vietnam for traffic modeling. Traffic demand forecasts based on the STRADA model for the project roads are summarized in Table 4 in passenger car equivalent units (PCU).

Table 4: Traffic Forecast on Project Roads (PCUs per day)

Project Road	2025	2030	2035	2040	2045
1. North - South Road and Huong Thuong bridge	17,404	22,512	36,269	59,078	97,401
2. Huong Thuong - Chua Hang road	18,124	29,170	41,556	59,413	85,273
3. Dong Bam Residential Road	7,910	12,294	14,065	16,101	18,444
4. Dan bridge	17,552	20,977	26,153	32,691	40,968
5. Le Huu Trac Road	20,610	26,253	38,346	56,621	84,523

10. Description of sub-projects: The sub-project descriptions with and without project are detailed in Table 5 below. The alternative roads were defined based on network distribution in case of without project.

Table 5: Description of Road and Bridge Sub-Projects

Road Section	With Project	Without Project		
	Length (km)	Alternative Route	Length (km)	Condition
1. North - South Road and Huong Thuong bridge	3.2	Ben Oanh	6	Fair
2. Huong Thuong - Chua Hang road	5.65	QL37	7	Good
3. Dong Bam Residential Road	3.2	Dong Bam	3.2	Poor
		QL1B	4.5	Fair
4. Dan bridge	0.24	Dan bridge	0.24	Poor
			2.5	Good
5. Le Huu Trac Road	1.7	Tan Thinh	2.07	Good

[15] VOC savings is derived from shorter and faster journeys in case the project is implemented comparing to the case without interventions from the project. VOT savings is obtained when road improvements lead to increases in vehicle speeds, hence reducing the travel time of passengers and goods.

11. Vehicle Operating Cost Savings: Vehicle operating costs were estimated using the HDM4-VOC model with inputs collected in project areas for gasoline, lubricants costs, and vehicle prices in 2017. Vehicle fleet characteristics were drawn from recent relevant studies and similar projects, adjusted using survey data in project areas.

Table 6: Vehicle Fleet Characteristics

	Motorcycle	Car	Bus	Truck
Economic Unit Costs				
New Vehicle Cost ($/vehicle)	844	28,300	49,000	39,500
Fuel Cost ($/liter)	0.59	0.59	0.59	0.51
Lubricant Cost ($/liter)	3.46	5.84	5.84	5.84
New Tire Cost ($/tire)	26.4	52.3	125	156
Maintenance Labor Cost ($/hour)	2.00	2.55	2.55	2.55
Crew Cost ($/hour)	0.00	3.50	3.77	3.86
Interest Rate (%)	10.0	10.0	10.0	10.0
Utilization and Loading				
Kilometers Driven per Year (km)	4,800	15,000	40,000	40,000
Hours Driven per Year (hr)	4,500	550	1,500	1,600
Service Life (years)	10	10	10	10
Percent of Time for Private Use (%)	70	0.0	0.0	0.0
Gross Vehicle Weight (tons)	0.01	1.20	4.50	4.50

12. VOC units were calculated based on topographic characteristics (flat, hilly or mountainous), climate features (number of rainy days per year), and road conditions (surface type, carriageway width, speed limit).

Table 7: Vehicle Operating Costs (US$)

	IRI (m/km)					
	2	4	6	8	10	12
Motorbike	0.0415	0.0428	0.0460	0.0493	0.0506	0.0511
Car	0.3651	0.3718	0.3868	0.4060	0.4307	0.4619
Bus	0.3431	0.3566	0.3891	0.4277	0.4674	0.5082
Truck	0.3588	0.3734	0.4055	0.4415	0.4784	0.5169

Given the above traffic forecasts, the annual VOC savings are summarized in the Table 8 below.

Table 8: VOC Savings (US$ million)

Project Road	2025	2030	2035	2040	2045
1. North - South Road and Huong Thuong bridge	4.27	5.56	8.93	14.48	23.71
2. Huong Thuong - Chua Hang road	2.06	3.34	4.75	6.77	9.68
3. Dong Bam Residential Road	0.89	1.35	1.54	1.77	2.02
4. Dan bridge	0.45	0.57	0.70	0.87	1.08

5. Le Huu Trac Road	0.66	0.85	1.26	1.86	2.77

13. Value of Time Savings: Value of passenger time follows standard methodology employed in World Bank projects. VOT units were calculated based on the city's average personal incomes, number of residents per household, number of income earners, and percentages of work and business trips. The average number of passengers on various categories of vehicles was collected through surveys in project areas in order to calculate VOT per vehicle.

Table 9: Value of Passenger Time (US$)

VOT/ passenger	VOT/vehicle			
	Motorcycle	Car	Buses	Truck
1.07	1.44	2.01	12.19	1.77

14. Incomes are likely to increase in real terms and therefore faster than the general price level. As a result, the evaluation allows for growth of real income annually 5 percent in 2020 - 2030 and 3 percent after 2030.

Table 10: Average Value of Passenger Time (US$/vehicle/hour)

	2025	2030	2035	2040	2045
Motorbike	3.36	4.29	5.48	6.99	8.93
Car	4.69	5.99	7.65	9.76	12.46
Bus	28.50	36.37	46.42	59.24	75.61
Truck	4.14	5.29	6.75	8.61	10.99

Given the above traffic forecasts, the VOT savings during the evaluation period is presented in Table 11 below:

Table 11: VOT Savings (US$ million)

Project Road	2025	2030	2035	2040	2045
1. North - South Road and Huong Thuong bridge	2.05	3.45	7.26	15.55	33.93
2. Huong Thuong - Chua Hang road	1.09	2.17	3.99	7.39	13.77
3. Dong Bam Residential Road	0.32	0.61	0.91	1.35	2.00
4. Dan bridge	0.09	0.15	0.23	0.37	0.58
5. Le Huu Trac Road	0.31	0.50	0.93	1.74	3.31

3.2. Drainage and Sanitation Component

15. For this component, quantified benefits include reduced damage due to flooding, health benefits, and increased productivity due to time savings and increased land values.

- **Savings in health care costs:** These were estimated at US$ 38.6 per beneficiary per year.

- **Savings in productive time:** It was assumed that beneficiaries would save three working days per year because of investment by the project. Savings in productive time were estimated at US$ 24.4 per beneficiary per year.
- **Savings in flood control damage:** The proposed investments would reduce flood damage by an estimated US$ 6.6 per affected person per year.
- **Increase in land prices:** The value of project-induced increases in land prices was conservatively estimated for residential land only, and assumed that the value such land would be 5 - 10 percent higher in the "with project" scenario than without the proposed investments.

Table 12: Unit Benefits of Drainage and Sanitation Component (US$ per person per year, US$ per m^2)

Type of Benefit	Thai Nguyen
Health benefit	38.6
Productive time saving	24.4
Flood reduction	6.6
Land appreciation	13.3

16. The number of beneficiaries taken into the analysis was based on the population projections of the identified catchment areas and in line with population growth.

Table 13: Number of Beneficiaries

Sub-Project	Number of Beneficiaries			Land Appreciation (m^2)
	Health Benefit	Productive time savings	Flood reduction	
1. Xuong Rong Drainage	6,860	6,860	2,181	81,600
2. Mo Bach Drainage	9,215	9,215	1,718	38,470

3.3. Kindergarten Component

17. Thai Nguyen has included the construction and upgrading of kindergartens among their proposed sub-projects. Huong Son Kindergarten currently has an area of 1,981m2 with eight rooms and a total of 390 children. However, the current classrooms are overloaded and have deteriorated over time. Phan Dinh Phung Kindergarten has been used for 19 years so the quality and safety of its classrooms are seriously downgraded, posing many risks to the safety of children. Investments in the construction and upgrading of Huong Son and Phan Dinh Phung kindergartens will improve the quality of preschool education for the two wards where population densities are high, which is expected to help children who had not attended school or are studying in private kindergartens to go to standard kindergartens with better education conditions.

18. Children that are well educated are expected to be more successful in the future with better income. According to the General Statistics Office of Vietnam, average incomes of the high-income group are 20 - 40 percent higher compared to the middle-income group in urban areas. Huong Son and Phan Dinh Phung kindergartens will also help children to learn in a better environment that significantly reduces infectious diseases in children. According to a survey, a better school environment will reduce

the time of sick leave of children for 1-2 days per month. At the same time, it will increase the productivity of their parents by reducing time to take care of their sick children.

Table 14: Unit Benefits of Kindergarten

Type of Benefit	Unit	Value
Resource Cost Savings	%	20%
Health Care saving	US$/yr	64.4
Productive time saving	US$/yr	97.5

4. Cost Benefit Analysis Results

19. The economic analysis confirms that all the proposed sub-projects of the project city are economically viable with the IRR of investments in the range of 10.5 - 24.6 percent, which is higher than the economic opportunity cost of capital (EOCC) of 10%. Sensitivity analysis combined impacts of a 10 percent increase in the economic investment cost and a 10 percent decrease in the quantifiable economic benefits. As shown in Table 15, the IRRs of most sub-projects remain above the EOCC hurdle rate of 10 percent. The exceptions is the investment in Dong Bam residential road in Thai Nguyen, which had a worse case IRRs of 8.3 percent that was only slightly below the 10 percent hurdle rate.

Table 15: Cost Benefit Analysis Result

No.	Case	Base Case		Worse Case	
		NPV (US$ million)	IRR (%)	NPV (US$ million)	IRR (%)
1	North - South Road and Huong Thuong bridge	37.45	18.0	27.54	15.7
2	Huong Thuong - Chua Hang road	19.62	20.1	15.14	17.6
3	Dong Bam Residential Road	0.69	10.6	-1.65	8.5
4	Dan bridge	2.36	18.0	2.10	15.2
5	Le Huu Trac Road	5.02	18.2	3.70	16.0
6	Xuong Rong Drainage	1.41	18.5	0.90	15.2
7	Mo Bach Drainage	1.11	14.1	0.43	11.6
8	Huong Son Kindergarten	5.13	24.6	4.30	22.1
9	Phan Dinh Phung Kindergarten	1.74	20.4	1.38	18.1

ANNEX 2 – PROJECT MAP