Technical Assistance Report

PUBLIC

Project Number: 59163-001
November 2025

Nepal: Kathmandu Valley Urban Transportation System Project (Ropeway)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 17 October 2025)

Currency unit	–	Nepalese rupee/s (NRe/NRs)
NRe1.00	=	$0.007
$1.00	=	NRs140.522

ABBREVIATIONS

ADB	–	Asian Development Bank
GHG	–	greenhouse gas
TA	–	technical assistance

NOTE

In this report, “$” refers to United States dollars.

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CONTENTS

TECHNICAL ASSISTANCE AT A GLANCE

Project Data			
Project number	59163-001	**Project name**	Kathmandu Valley Urban Transportation System Project (Ropeway)
Nature of Activity	✓Capacity Development Research and Development	**Modality**	Stand-alone
Country	Nepal	**Executing or implementing agency**	Ministry of Physical Infrastructure and Transport
Department/Office	SD1/SD1-TRA	**Geographical location**	Country
Sector(s)	✓ Transport	**Subsector(s)**	Urban public transport
Strategic Focus Area	✓ Climate action	**Sustainable Development Goals**	SDG 9.1 SDG 11.2, 11.6 SDG 13.2, 13.a

Financing

ADB Financing	**Amount** ($ million)
Technical Assistance Special Fund	1.50
Cofinancing	**Amount** ($ million)
Smart Energy Innovation Fund	0.75
Counterpart	**Amount** ($ million)
None	0.00
Total	**2.25**
ADB Climate Financing	
ADB	
Adaptation	0.00
Mitigation	1.00
Cofinancing (ADB-administered)	
Adaptation	0.00
Mitigation	0.00
Total	**1.00**

Currency of ADB Financing: US Dollar

Climate Action	
Disaster Risk Management, Environment and Nature	Disaster risk reduction (DRR)

Safeguards		
Category	Environment: Involuntary resettlement: Indigenous peoples:	☐ A ☐ B ☐ C ☐ FI ☑ Not Applicable ☐ A ☐ B ☐ C ☐ FI ☑ Not Applicable ☐ A ☐ B ☐ C ☐ FI ☑ Not Applicable

Gender Equality		
Category	☐ Gender equality objective (GEN) ☑ Some gender elements (SGE)	☐ Effective gender mainstreaming (EGM) ☐ Indirect gender benefits (IGB)

Poverty Reduction and Inclusion	
Category	☐ Poverty reduction and inclusion focus (PIF) ☐ Poverty reduction and inclusion elements (PIE) ☑ Indirect poverty reduction and inclusion (IPI)

Regional Cooperation and Public Goods	
Category	☐ Pillar 1 ☐ Pillar 2 ☐ Pillar 3 ☑ Not applicable

Source: Asian Development Bank

I. INTRODUCTION

1. The technical assistance (TA) will support the Government of Nepal in preparing for future investment in ropeway systems as part of an inclusive, low-emission urban mobility strategy. The TA activities will focus on (i) conducting a detailed diagnostic study for the Bishnumati River corridor in Kathmandu Valley, covering technical, economic, environmental, and social aspects; (ii) assessing clean energy technology options for cable-propelled transit systems; and (iii) defining institutional, policy, and financing arrangements to support the implementation. The TA will also provide capacity building and institutional strengthening to enable Nepal's transition to sustainable and climate-resilient urban transport.

2. The TA is closely aligned with the Asian Development Bank (ADB) country partnership strategy, 2025–2029 for Nepal, particularly its strategic priorities 1 (green transportation modes) and 3 (environmental sustainability and climate resilience).[1] It responds to the government's request to explore space-efficient, low-emission mobility solutions in Kathmandu Valley, where narrow streets, unplanned urban sprawl, and heritage preservation constraints limit the feasibility of conventional mass transit. By leveraging lessons and insights from similar ropeway transit initiatives, the TA will inform the design of an implementable, socially accepted, and financially viable ropeway system that provides a pathway for future investment and potential replication in other urban and rural contexts in Nepal.[2]

II. ISSUES

3. **Urban context and challenges.** Kathmandu Valley faces critical transport challenges that affect livability, productivity, and resilience. Rapid urban growth, a radial road network, and fragmented public transport have resulted in chronic congestion, and peak-hour speeds are often below 10 kilometers per hour. Services are dominated by aging minibuses and microbuses operated by informal providers, offering limited reliability, safety, and accessibility, particularly for women and vulnerable groups.[3] In addition, large diesel buses remain major contributors to particulate emissions, while smaller private microbuses are gradually being replaced by electric vehicles. Narrow streets, unplanned sprawl, and terrain constraints, combined with dense settlements and heritage zones, limit the feasibility of surface-based mass transit. Past studies of bus rapid transit and light rail options have not progressed because of land acquisition, geological, and institutional barriers, while high vehicular emissions continue to degrade air quality.[4]

4. In addition, weak traffic management and inadequate pedestrian infrastructure constrain the efficiency and safety of the network. Poorly maintained sidewalks blocked by obstacles, unregulated roadside parking, and uncontrolled junctions force reliance on motorcycles and small private vehicles, increasing congestion and worsening pollution.[5] Terminal and depot space are insufficient for larger and cleaner fleets, while climate-related disruptions such as flooding along riverbanks regularly impede mobility. At the same time, a rapid shift to electric vehicles is underway in Nepal, including in the Kathmandu Valley. These combined factors highlight the need to explore alternative mobility solutions with low space requirements such as ropeway systems.

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[1] ADB. 2025. *Country Partnership Strategy: Nepal, 2025–2029—A Partnership for Private Sector-Led Growth, Youth Employment, and Resilience*.
[2] The TA first appeared in the business opportunities section of ADB's website on 29 July 2025.
[3] P. Bhatta. 2025. Overcrowded and Overlooked: The State of Public Transport in Kathmandu. *NepalConnect*. 8 July.
[4] S. Awale. 2025. The Public in public transport. *Nepali Times*. 29 March.
[5] ADB. Nepal: Kathmandu Sustainable Urban Transport Project.

5. **Climate actions and investment needs.** Nepal's enhanced nationally determined contribution targets carbon neutrality by 2045, with transport decarbonization as a key pillar.[6] Ropeway systems powered by clean energy offer a low-emission, space-efficient, and climate-resilient alternative in constrained urban settings. The Bishnumati River corridor—identified as the most viable alignment under ADB-funded regional TA (Accelerating Innovation in Transport: E-Mobility Support and Investment Platform for Asia and the Pacific)—shows strong potential in passenger demand and requires minimal resettlement needs. [7]

6. **Corridor selection and lessons**. In 2024, ADB's preliminary scoping under regional TA (footnote 7) reviewed four potential ropeway alignments: Dhobi Khola River, Ratna Park to Patan, Bagmati River, and Bishnumati River. Among these, the Bishnumati corridor emerged as the most functionally and socially viable option because of its potential passenger demand, limited resettlement needs, and the relative suitability of ropeway technology compared with traditional modes. The assessment also considered socio-cultural sensitivities, given the proximity to heritage and religious sites. The planned study will need to factor in experience from ADB-financed urban projects in the area, including scope reductions and incomplete sections of the Bishnumati Link Road, where cultural site sensitivities, overlapping institutional mandates, and community concerns contributed to delays.[8] These lessons are important for shaping both the alignment approach and the stakeholder engagement strategy to reduce risks and build acceptance. A full diagnostic is required to assess engineering, environmental, social, climate, and financial aspects, and to identify enabling policies, institutional capacity, and financing models.

7. Kathmandu Valley's dense urban form and worsening air quality make it a priority site for investments in climate-friendly and pollution-reducing mobility. Shifting demand from motorcycles and diesel minibuses to clean ropeway systems would generate significant reductions in particulate matter and greenhouse gas emissions (GHG) and contribute to the government's objective of increasing internal demand for electric power. However, upfront capital costs, the need for reliable electricity supply, and integration with other modes of transport are critical factors that must be carefully analyzed to ensure that climate and air quality gains are both achievable and sustainable.

8. **Key inclusion challenges**. Kathmandu's transport system remains difficult to access for women, children, the elderly, and people with disabilities. Overcrowded vehicles, unsafe walkways, and poor connectivity amplify everyday risks such as harassment and accidents. Steep slopes, narrow alleys, and informal settlements make even reaching a bus stop a challenge for many. Without inclusive design, new mobility investments risk deepening these barriers instead of breaking them. Thoughtful, universal access features can turn this gap into an opportunity for safer, more inclusive mobility.

9. **Strategic alignment.** The TA aligns with Nepal's enhanced nationally determined contribution, national mobility strategies, and ADB's operational priority 3 by accelerating low-GHG transport development and strengthening climate and disaster resilience. It supports ADB's Climate Change Action Plan, 2023–2030,[9] and the Paris Agreement. The TA also complements ongoing ADB transport and urban projects in Nepal and draws on international experience, particularly France's cable-propelled transit initiatives, to ensure that the Bishnumati system is technically sound, socially accepted, and financially viable. For Kathmandu Valley, this strategic

[6] NDC Partnership. Nepal (accessed on 19 August 2025).
[7] ADB. 2021. *Accelerating Innovation in Transport* (TA 6763-REG).
[8] Independent Evaluation Department. 2020. *Validation Report: Kathmandu Sustainable Urban Transport Project in Nepal.* ADB.
[9] ADB. 2023. *Climate Change Action Plan, 2023-2030.*

alignment ensures that the proposed ropeway system is not treated as a stand-alone pilot, but rather as part of a coordinated program of climate-resilient urban development.

10. **Evolving travel demand in peri-urban expansion**. Kathmandu Valley's rapid peri-urban growth is marked by informal settlements spreading along hillsides and riverbanks. This has generated longer and more dispersed travel patterns that road-bound systems fail to serve efficiently. Studies show that longer distances from the central business district significantly elevate travel energy and time in the valley, underscoring inefficiencies for longer commutes from emerging suburbs.[10] Ropeway systems, which can traverse challenging terrain and bypass congested radial roads, offer a highly space-efficient alternative that better aligns with these evolving mobility needs.

11. The TA provides diagnostics and feasibility assessments to generate the technical, environmental, social, and financial evidence needed for future investments that reduce urban pollution, cut GHG emissions, and enhance climate resilience. It integrates gender-responsive and socially inclusive measures to ensure benefits for women and vulnerable communities.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

12. The impact of the TA will be public transportation accessibility and sustainability in both urban and rural areas strengthened. The outcome will be a comprehensive framework for ropeway systems for public transportation established.[11] The TA will help the government improve urban mobility in Kathmandu Valley, fostering climate resilience and reducing urban pollution and GHG.

B. Outputs, Methods, and Activities

13. **Output 1: Diagnostic study for Bishnumati corridor developed.** A corridor-specific assessment will examine the potential for a ropeway along the Bishnumati River. The study will include (i) an engineering assessment of route alignment, station locations, and integration with existing transport; (ii) environmental, social, and heritage scoping, including resettlement risks; (iii) climate and geotechnical screening for resilience; (iv) demand modeling, ridership forecasts, and preliminary financial and economic analysis; (v) structural and safety simulations through finite element analysis; (vi) comparisons with conventional and sustainable transport for cost, space efficiency, and social acceptance; and (vii) a gender analysis with consultations to assess and meet women's safety, accessibility, and travel needs (ensuring consultations with women on site locations, and safety and accessibility concerns).

14. **Output 2: Institutional framework and knowledge resources established.** The TA team will create an enabling framework to strengthen institutional capacity for and knowledge of ropeway development. Activities include (i) establishing regulatory guidelines, operational protocols, and safety standards; (ii) preparing a toolkit to manage climate, geotechnical, and social risks, including gender-based violence prevention; (iii) delivering capacity-building programs that emphasize women's safety, mobility, and employment; (iv) producing knowledge products to support replication in other corridors; (v) identifying financing and delivery models,

[10] A. Bajracharya, S. Shrestha, and H. Skotte. 2020. Linking Travel Behavior and Urban Form with Travel Energy Consumption for Kathmandu Valley, Nepal. *Journal of Urban Planning and Development*. 146 (3).

[11] The design and monitoring framework is in the Appendix.

including public–private partnerships; and (vi) engaging municipalities, communities, women's groups, and heritage stakeholders in the Bishnumati corridor to ensure awareness, inclusivity, and ownership.

15. The TA, designed as a diagnostic and feasibility study, supports the country partnership strategy for 2025–2029 (footnote 1) and is linked to other transport and urban projects and TA in Nepal, such as the Rural Connectivity Improvement Project and sustainable transport and tourism initiatives.[12] Its scope may extend to additional corridors through government consultations. Risks such as interagency coordination gaps and high terrain costs will be managed through early engagement, technical support, and phased implementation. The study will lay a solid foundation for integrating ropeways into Nepal's resilient, inclusive, and sustainable infrastructure

16. **ADB's value addition.** This TA builds on ADB's experience with clean energy ropeways and digital modeling to assess routes, stations, and performance. It will provide the government with an integrated framework combining technical analysis, institutional options, and policy guidance. Knowledge sharing will draw on European and other ADB member country practices where ropeways are part of urban transport. It will also build national capacity through inclusive, gender-responsive training to help planners and decision-makers integrate ropeways into broader mobility and climate strategies.

C. Cost and Financing

17. The TA financing amount is $2.25 million, of which (i) $1.50 million will be financed on a grant basis from ADB's Technical Assistance Special Fund (TASF 8), and (ii) $0.75 million will be financed on a grant basis by the Smart Energy Innovation Fund under the Clean Energy Financing Partnership Facility and administered by ADB.[13] The government will provide counterpart staff, administrative support, and other in-kind contributions valued at $110,500 (about 5% of the total TA cost). This support will facilitate coordination, access to data and reports, and smooth implementation of TA activities. The total TA amount is detailed in Table 1.

Table 1: Cost Breakdown per Output

Output	Indicative Cost ($)	Percentage of TA Amount (%)
1. Diagnostic Study for Bishnumati Corridor Developed	1,500,000	66.7
2. Institutional Framework and Knowledge Resources Established	750,000	33.3
Total	**2,250,000**	**100.0**

TA = technical assistance.
Source: Asian Development Bank estimates.

D. Implementation Arrangements

18. ADB will administer the TA. The Transport Sector Office of ADB's Sectors Department 1 will lead the administration, including selecting, supervising, and evaluating consultants throughout the TA implementation, in close coordination with the Nepal Resident Mission and other operations departments using the One ADB approach. The implementation arrangements are summarized in Table 2.

[12] ADB. 2023. *Nepal: Rural Connectivity Improvement Project (Additional Financing);* and ADB. 2023. *Regional: Integrated and Innovative Solutions for More Livable Cities – Pokhara Sustainable Tourism Action Plan.* Consultant's report.

[13] Financing partner: the Government of the United Kingdom. The fund was originally named "Artificial Intelligence and Digitalization Innovation Fund" in the 2021 establishment paper.

Table 2: Implementation Arrangements

Aspects	Arrangements		
Indicative implementation period	December 2025–June 2029		
Executing agency	Ministry of Physical infrastructure and Transport		
Implementing agencies	Ministry of Physical Infrastructure and Transport		
Consultants	To be selected and engaged by the Asian Development Bank (ADB)		
	Firm: quality- and cost-based selection (90:10), simplified technical proposal	Diagnostic studies for engineering; financial, social, and climate change assessments; knowledge products; and capacity development. Safety assessments, finite element analysis modeling, and establishment of institutional framework and knowledge resources (54 person-months); national (40 person-months)	$1,250,000
	Individual: individual selection	Institutional capacity building and project coordination: international (20 person-months); national (6 person-months)	$495,000
Advance contracting	Advance contracting will be applied in the selection of consultants. Negotiation and signing of the contracts will occur after the technical assistance (TA) becomes effective.		
Disbursement	Disbursement of TA resources will follow ADB's *Technical Assistance Disbursement Handbook* (2020, as amended from time to time).		
Asset turnover or disposal arrangement upon TA completion	Fixed assets will be turned-over to the implementing agencies.		

Source: Asian Development Bank.

19. **Consulting services.** ADB will engage consultants following the ADB Procurement Policy (2017, as amended from time to time).[14] One consulting firm will be recruited using quality- and cost-based selection, with a 90:10 quality–cost ratio. The quality–cost ratio reflects greater priority for quality. Individual international and national consultants will be recruited to support the diagnostics under outputs 1 and 2.

20. **Cofinancier requirements.** Progress reports prepared by the consultants will be submitted to ADB semiannually. The ADB team will provide a progress monitoring report to the Smart Energy Innovation Fund under the Clean Energy Financing Partnership Facility, which is administered by ADB on a semiannual basis.

IV. THE PRESIDENT'S DECISION

21. The President, acting under the authority delegated by the Board, has approved (i) the Asian Development Bank (ADB) administering a portion of technical assistance not exceeding the equivalent of $750,000 to be financed on a grant basis by the Smart Energy Innovation Fund under the Clean Energy Financing Partnership Facility and (ii) ADB providing the balance not exceeding the equivalent of $1,500,000 to the Government of Nepal for the Kathmandu Valley Urban Transportation System Project (Ropeway) and hereby reports this action to the Board.

[14] Terms of Reference for Consultants (Annex 2).

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with Public transportation accessibility and sustainability in both urban and rural areas strengthened.			
Results Chain	**Performance Indicators**	**Data Sources and Reporting Mechanisms**	**Risks and Critical Assumptions**
Outcome Comprehensive framework for ropeway systems for public transportation established	By 2030 a. National policy guidelines for adoption of CPT developed. b. Comprehensive CPT operational and safety standards formulated and disseminated. (2025 baseline: TBD) c. CPT design guidelines and feasibility studies incorporate at least three clean energy technologies, validated through technical studies. (2025 baseline: 0) (DR5)	a.–c. Policy documents and records from MOPIT and Ministry of Urban Development	R: Government shifts its priority away from CPT. A: Adequate technical support and funding are available to develop policies and safety standards.
Outputs 1. Diagnostic study for Bishnumati Corridor developed	By 2028 1a. Detailed diagnostic report, including gender-related and other social considerations, completed and accepted by MOPIT. (2025 baseline: 0) (DR3) 1b. At least three climate-resilient and energy-efficient technologies, such as solar power, battery storage, and regenerative braking, integrated into the Bishnumati Corridor CPT system. (2025 baseline: not applicable) (DR5) 1c. A framework using FEA and digital twin technologies for optimizing energy consumption and renewable energy integration in CPT systems is developed. (2025 baseline: 0) (DR3, DR5)	1a.–1c. Detailed feasibility report published on MOPIT website	R. Inaccurate or insufficient data could undermine the effectiveness of the technology integration recommendations. A. Reliable data on climate conditions and energy demands will be available to support the feasibility study. R. Difficulty in integrating renewable energy or optimizing energy use because of modeling or design constraints A. Access to advanced tools (FEA, digital twin) and expertise to optimize energy efficiency and integrate renewable energy are available.
2. Institutional framework and knowledge	2a. At least three training programs developed and delivered on CPT, including integrating gender-	2a.–2c. Capacity development progress report	

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
resources established	inclusive features and women's participation in CPT operations for stakeholders, by 2028. (2025 baseline: 0) (DR3) 2b. At least two policy requirements identified and documented for the implementation of CPT in urban contexts by 2028. (2025 baseline: 0) 2c. At least three capacity-building activities on clean energy integration in CPT are conducted. (2025 baseline: 0) (DR3, DR5)		

Key Activities with Milestones

1. Diagnostic Study for Bishnumati Corridor developed

1.1 Comprehensive demand analysis for public transport needs conducted (Q1 2026).
1.2 Geotechnical surveys and environmental assessments completed for the corridor (Q2 2026–Q3 2026).
1.3 Stakeholder consultations, including separate consultations with women or women's organizations and community engagement sessions, conducted (Q4 2026–Q1 2027).
1.4 Innovative technology solutions for cable car system identified and evaluated (Q2 2027–Q1 2028).
1.5 Evaluation of clean energy integration (solar, hydro, regenerative braking, electric propulsion) into the CPT completed (Q3 2028).
1.6 Energy efficiency optimization framework using FEA and digital twin technologies developed (Q4 2028–Q1 2029).
1.5 Final feasibility report, including risk mitigation and financial models, prepared and disseminated (Q4 2028–Q2 2029).

2. Institutional Framework and Knowledge Resources established

2.1 Key stakeholders identified and a capacity building framework for CPT developed (Q1 2026).
2.2 Development and delivery of at least three training programs on CPT for stakeholders, including gender-sensitive modules, designed and delivered to stakeholders (Q2 2026–Q3 2028).
2.3 Documentation of at least five policy requirements necessary for implementing CPT in urban contexts documented (Q3 2026–Q4 2028).
2.4 Stakeholder consultations and knowledge-sharing workshops conducted to align training programs and policy recommendations with local needs (Q3 2026–Q1 2029).
2.5 At least three clean energy-focused training programs (on electric propulsion, renewable energy integration, and energy efficiency) designed and delivered to stakeholders and government officials (Q4 2026–Q2 2029).

TA Management Activities

Recruitment and management of consultants.

Inputs

ADB (TASF 8): $1,500,000
Government: $110,500
Smart Energy Innovation Fund under the Clean Energy Financing Partnership Facility: $750,000

A = assumption, ADB = Asian Development Bank, CPT = cable-propelled transport, DR= development result, FEA = finite element analysis, MOPIT = Ministry of Physical Infrastructure and Transport, Q = quarter, R = risk, TA = technical assistance, TASF = Technical Assistance Special Fund, TBD = to be determined.
Note: The government will provide counterpart support in the form of counterpart staff, provision of internal reports and/or information, tax waivers for ADB loan contracts, and other in-kind contributions.
Source: Asian Development Bank.