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[Road Infrastructure]

Road Infrastructure Project Implementation Cases



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Outreach and Business Engagement Seminar

THEMATIC SESSION 1 | Trends in Korea-CAREC Cooperation in Transport

ROAD INFRASTRUCTURE PROJECT IMPLEMENTATION CASES

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CAREC ROAD INFRASTRUCTURE PROJECT TRENDS

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01 CAREC ROAD INFRASTRUCTURE PROJECTS

CAREC Road Infrastructure
Project Trends

CAREC Investment Status (As of Dec 2023)

CAREC, Strategic Transport Link

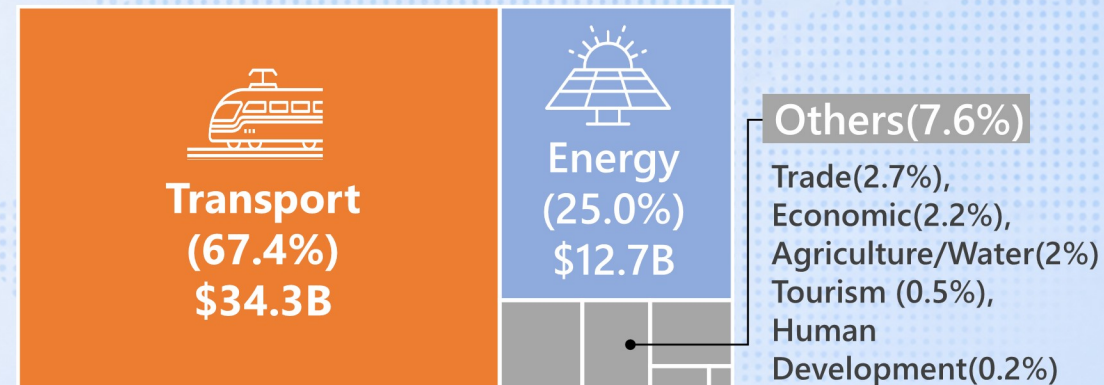


■ Cumulative Investment
: **USD 51 billion**

■ Funding Sources
: **ADB (34.5%)** / Govts. (19.5%) / Others (46%)

Source: CAREC Program / CAREC Project Portfolio

Road Infrastructure Projects in CAREC



183 Road Projects (71%)
Among 257 Transport Projects

■ Largest Subsector
in CAREC Program

■ Supports trade, mobility,
and corridor integration



02 ROAD INFRASTRUCTURE TRENDS

Conventional Objectives



Connectivity

Connecting countries, markets, and corridors



Mobility

Moving people and goods more efficiently



Trade & Logistics Efficiency

Reducing time, cost, and border delays

*From Connectivity and Mobility
to Sustainable, Resilient,
and Safe Transport Systems*

Emerging Objectives



Sustainable Development

Green, resilient, inclusive, and digitalized transport



Climate Resilience

Roads prepared for climate risks and disruptions



Road Asset Management

Life-cycle management and sustainable maintenance



Road Safety

Safer roads through system-based and digital solutions

II

ROAD INFRASTRUCTURE PROJECT IMPLEMENTATION CASES

- 01 Projects Implemented by DOHWA
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- 04 Conclusion

01 PROJECTS IMPLEMENTED BY DOHWA (1)

II Road Infrastructure Project Implementation Cases

I DOHWA's Project Footprint in CAREC Countries



 **9**
CAREC Countries

 **73**
Projects Implemented



Funding Partners

Asian Development Bank / WB / EBRD / EIB / KFAED / SFD / OFID / EDCF / KOICA / KOTRA

01 PROJECTS IMPLEMENTED BY DOHWA (2)

II Road Infrastructure Project Implementation Cases

Road Projects Implemented in CAREC Countries

Azerbaijan (1 Project)

- (PD/DD/BA) **WB** Baku-Shamakhi Road

Kazakhstan (5 Project)

- (CS) **IBRD** Western Europe-Western China Transit Corridor
- (CS) **IBRD** Mangystau Oblast Aktau-Manasha Road
- (CS) **EBRD** Kyzlorda-Zhezkazgan Road Lot 1
- (CS) **EBRD** Kyzlorda-Zhezkazgan Road Lot 2
- (CS) **EBRD** Kyzlorda-Zhezkazgan Road Lot 3

Tajikistan (5 Project)

- (CS) **KfAED** Kulyab-Kalaykhumb Road, Section "A" and "F"
- (CS) **WB** 9 Bridges with Road Approaches
- (CS) **EBRD** Obigarm-Norobod Road Project
- (CS) **WB** Kanibadam-Patar Road
- (CS) **WB** Central Asia Road Links Program – Sugd Oblast

Uzbekistan (2 Project)

- (CS) **ADB** A380 Highway Guzar-Bukhara-Nukus-Beyneu Section
- (CS) **ADB** A380 Highway Bukhara-Gazli Section

Georgia (7 Project)

- (CS) **IBRD** E-60 Highway Chumateleti-Khevi Section
- (DD/CS) **ADB** Tbilisi-Rustavi Section of the Tbilisi-Red Bridge
- (DD/BA) **ADB** Marshal Gelovani Intersection
- (DD/BA) **WB** Rehabilitation of Local Roads (SLRP III)
- (DD/CS) **ADB** Gorgasali Street Tunnel and Access Roads
- (CS) **EIB** Samtredia-Grigoleti Road Sections
- (CS) **ADB** Poti-Batumi Road

Pakistan (7 Project)

- (DD/CS) **EDCF** Widening of National Highway N-45, Section 1
- (PD) **SFD** Kohri/Kamsar & Challpani Road Tunnel
- (FS) **GOV.** Shounter-Rattu Road Tunnel
- (DD) **GOV.** Lahore-Sialkot Motorway
- (CS) **ADB** Hasanabdal-Havelian Section of E-35
- (FS) **GOV.** Lamnian Reshian-Leepa and Dhulli-Kahuta Tunnel
- (DD) **GOV.** Lahore Ferozepur Road

 **6**
CAREC
Countries

 **27**
Road Projects
Implemented

Services Performed

3 (FS)



Feasibility
Study

2 (PD)



Preliminary
Design

9 (DD)



Detailed
Design

3 (BA)



Bidding
Assistance

18 (CS)



Construction
Supervision



DOHWA's CAREC road project experience covers the full project cycle of road infrastructure development.

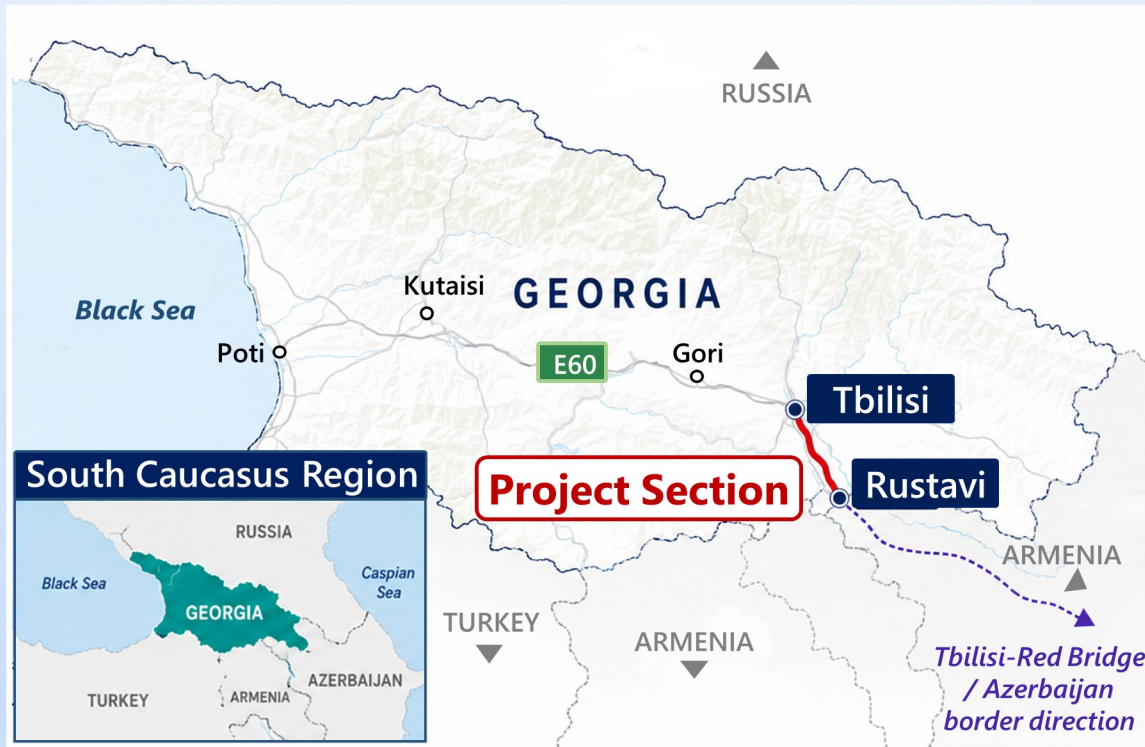
02 CASE STUDY I: Georgia Tbilisi–Rustavi (1)

II Road Infrastructure Project
Implementation Cases

I Project Brief



DOHWA delivered integrated design, bidding assistance, and construction supervision services for the full Tbilisi-Rustavi corridor over nearly nine years.

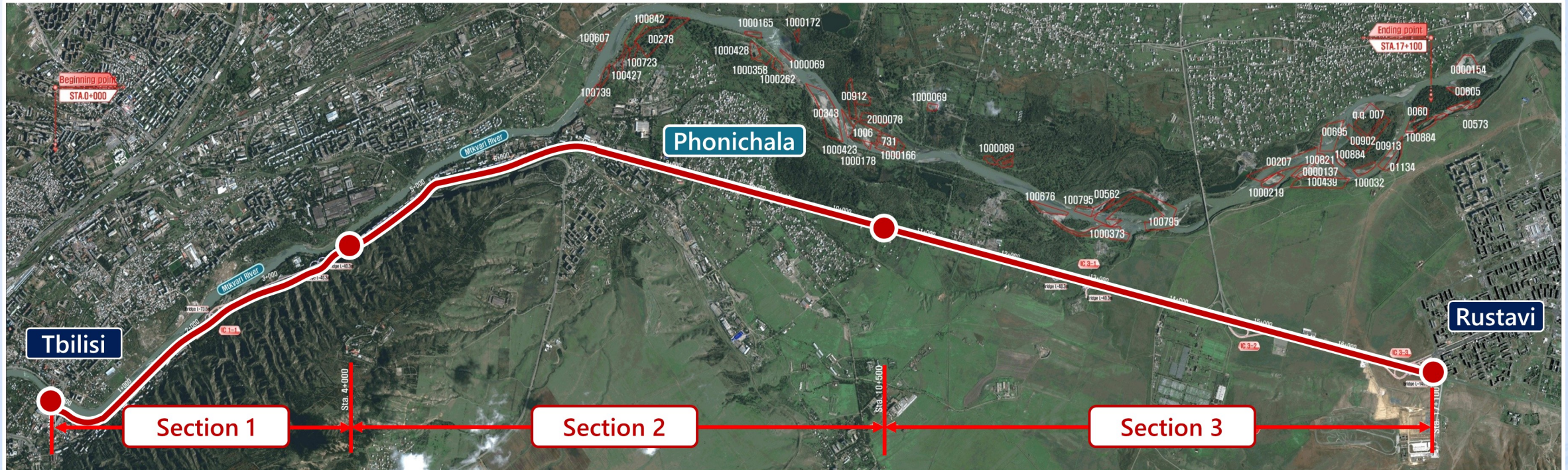


■ Project	Engineering, Procurement, Construction Management and Supervision of the Modernization of Tbilisi-Rustavi Section of the Tbilisi-Red Bridge
■ Country	Georgia
■ Location	Tbilisi-Rustavi Section 1, 2 ,3
■ Client	Municipal Development Fund (MDF) of Georgia
■ Fund	Asian Development Bank (ADB)
■ Service	Stage I : Detailed Design / Bidding Assistance Stage II: Construction Management and Supervision

02 CASE STUDY I: Georgia Tbilisi–Rustavi (2)

II Road Infrastructure Project Implementation Cases

Salient Features



Length

L = 33.37km, 4~6 lanes

Design Speed

V = 120km/h (main road)

Intersection

6 Grade-separated Intersection

Structures

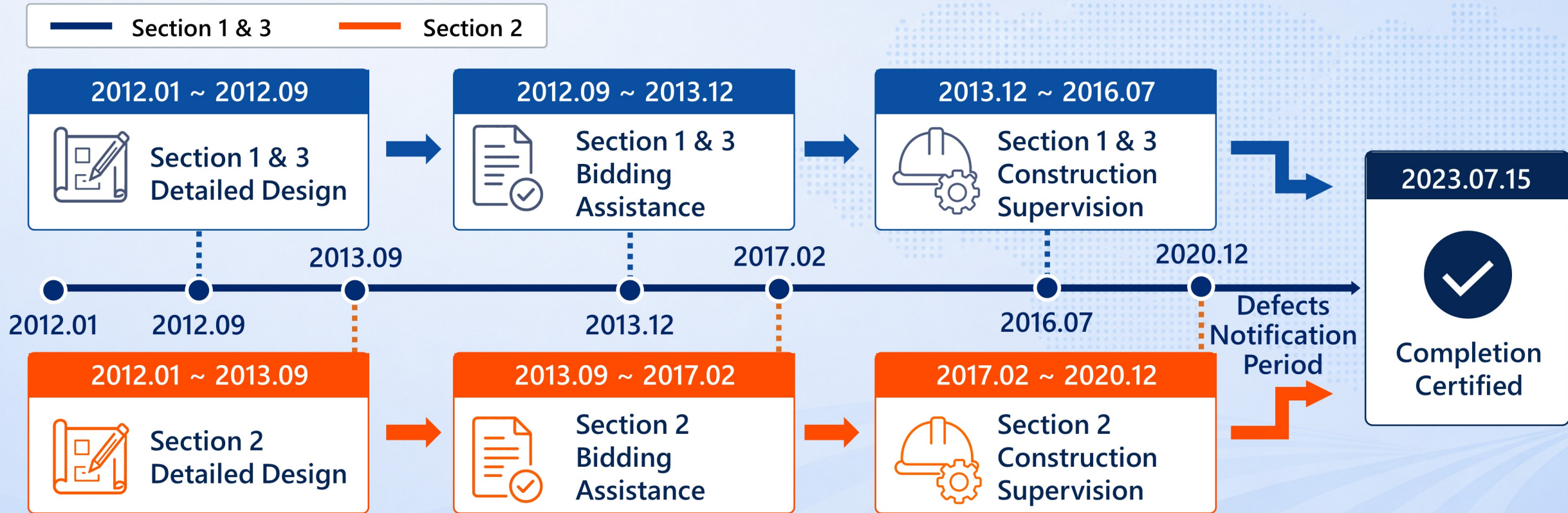
8 Bridges (L=228m), 2 Underpass (L=430m)

Other Works

Relocation of utility (Gas, water supply, sewage, telecommunication, fiber optical, etc.)

02 CASE STUDY I: Georgia Tbilisi–Rustavi (3)

Contract and Implementation Timeline



The project progressed from detailed design to bidding assistance and construction supervision over nearly nine years, covering all three sections of the Tbilisi-Rustavi corridor.

02 CASE STUDY I: Georgia Tbilisi–Rustavi (4)

Implementation Risks and Lessons Learned

01 Safeguards, LARP, and Public Grievance

RISK

- **Alignment change**
Original widening plan in urban area changed to bypass plan
→ Cost increase and schedule delay
- **Grievance from affected properties**
Apartments, businesses, and private properties were affected
→ Compensation, noise, and access issues were prolonged

LESSONS LEARNED

- ✓ Safeguard, LARP, EIA/IEE, and public grievance risks shall be reviewed from the feasibility stage
- ✓ Route alternatives should be assessed together with safeguard requirements (LARP, community acceptance)

02 Utility Relocation and Data Accuracy

RISK

- **Extensive Utility Networks**
Gas, sewage, and optical fiber utilities along the corridor
→ Complex coordination with multiple utility owners
- **Gaps in Design-Stage Utility Data**
Limited utility information received during design stage
→ design changes and construction delays

LESSONS LEARNED

- ✓ Utility agency coordination should be completed and major utility should be identified during design stage
- ✓ Formal support from the client is essential to secure data and coordinate with utility agencies.

02 CASE STUDY I: Georgia Tbilisi–Rustavi (5)

I Implementation Risks and Lessons Learned

03 Budget and Cost Management

⚠ RISK

- **Cost Increase from Bypass**

The Section 2 bypass alignment required additional structures
→ Section divided and schedule delay

- **Inflation and Price Adjustment**

Exchange rate, material price, and fuel cost increases
→ Additional budget pressure occurred during implementation

💡 LESSONS LEARNED

- ✓ Alternative routes should be reviewed in terms of construction cost and funding readiness.
- ✓ Contingency and price adjustment risks shall be reflected in budget plan

04 Project Alignment and Integrated Delivery

⚠ KEY ACHIEVEMENTS

- **Alignment with ADB–CAREC Corridor Objectives**

Strengthened the Tbilisi–Rustavi corridor toward the Azerbaijan border
→ Improved connectivity and logistics efficiency.

- **Integrated Project Delivery**

Delivered design, procurement support and construction supervision
→ Linked project preparation with implementation

💡 LESSONS LEARNED

- ✓ Project preparation issues should be managed through construction
- ✓ Good design means a procurable and buildable package
- ✓ Integrated engineering improves MDB road project outcomes

03 CASE STUDY II: Georgia Marshal Gelovani (1) II Road Infrastructure Project Implementation Cases

I Project Brief



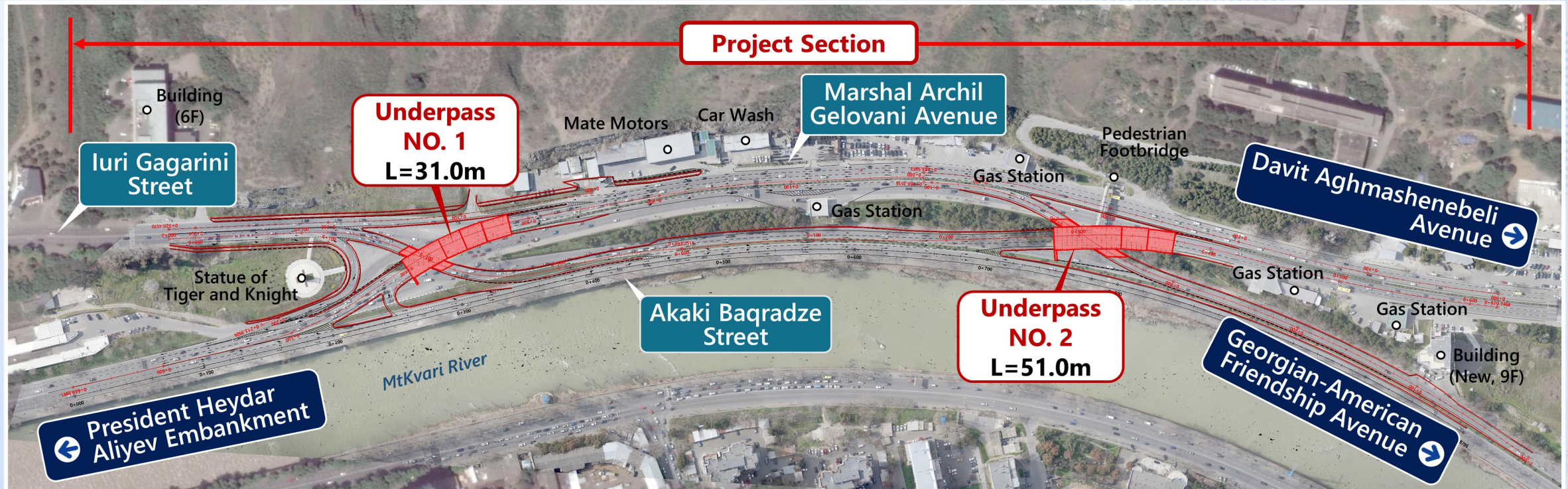
This project was urgently implemented to address chronic traffic congestion at Marshal Gelovani Intersection, one of the busiest intersections in Tbilisi.



■ Project	Consulting Services for Detailed Design and Bidding Documents for Marshal Gelovani Avenue Intersection
■ Country	Georgia
■ Location	Tbilisi, Marshal Gelovani Avenue and Mtkvari River Right Bank Intersection
■ Client	Municipal Development Fund (MDF) of Georgia
■ Fund	Asian Development Bank (ADB)
■ Duration	9 Months
■ Service	Detailed Engineering Design and Bidding Assistance

03 CASE STUDY II: Georgia Marshal Gelovani (2) II Road Infrastructure Project Implementation Cases

Salient Features



Length

L = 4.5km

Design Speed

V = 60km/h

Intersection

Grade-separated Intersection

Structures

2 Underpass (L=176m), Retaining Walls (L=757m)

Other Works

Protection Work for existing drainage culverts, Relocation of telecommunication utility lines

03 CASE STUDY II: Georgia Marshal Gelovani (3)

II Road Infrastructure Project Implementation Cases

Implementation Risks and Lessons Learned

01 Establishment of Long-term Development Plans



💡 LESSONS LEARNED

- ✓ All development projects shall be prioritized base on the long-term development plans to avoid diluted impacts and inefficient resource use

02 Local Conditions and Stakeholder Coordination

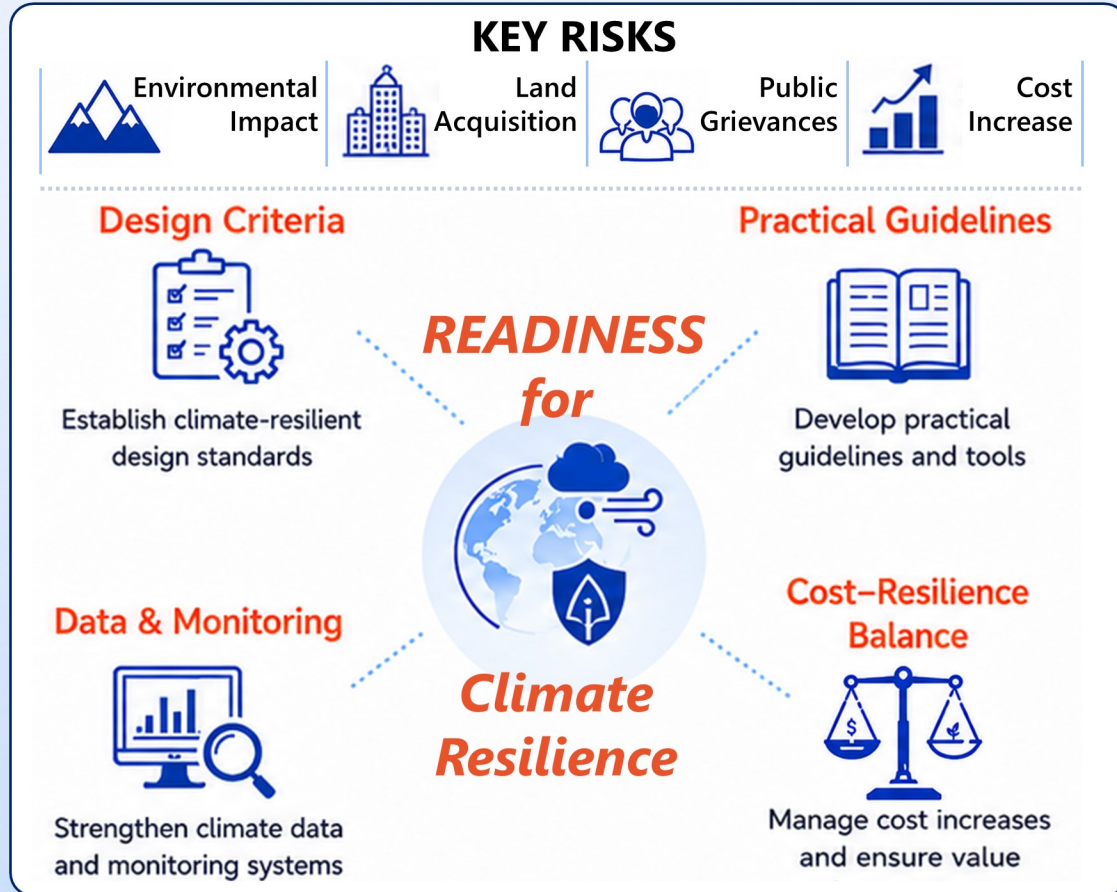
⚠️ RISK

- **Different local standards and approval practices**
International standards had to be aligned with local requirements
→ Additional technical review and coordination with local experts
- **Site constraints and multiple authority interfaces**
Coordination required with local authorities and relevant agencies
→ Delays in design finalization and project schedule

💡 LESSONS LEARNED

- ✓ Local standards, approval practices, and site constraints shall be reviewed early
- ✓ The client's proactive coordination support is essential to prevent delays

04 CHALLENGES



Maximizing the Impact of Road Infrastructure Cooperation and Investment