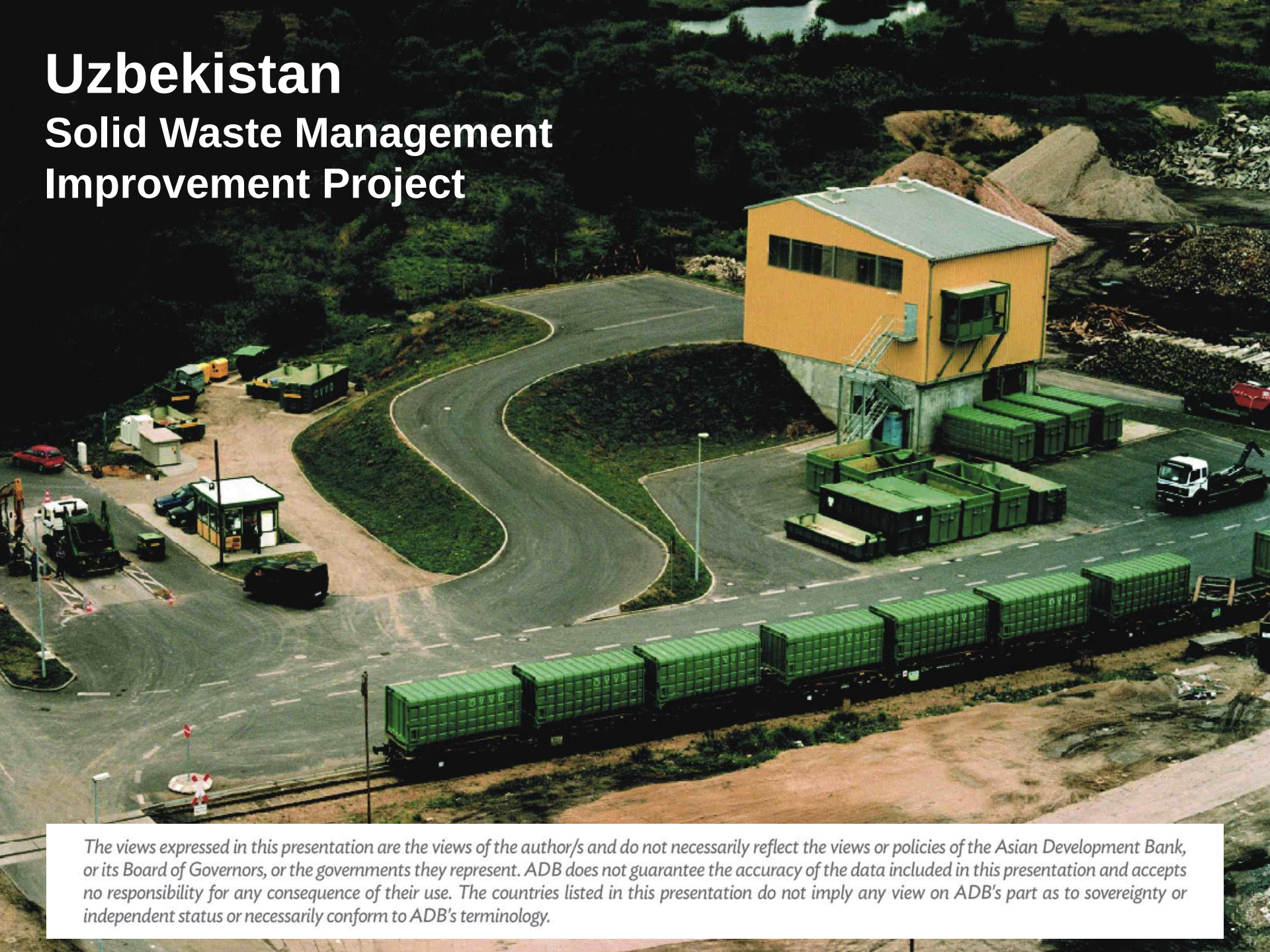
# Uzbekistan
## Solid Waste Management Improvement Project



# Key Development Drivers

**Strengths**

1. Growing, highly efficient, clean, modern international city
2. Well organized and disciplined municipal structure
3. Strong technical knowledge
4. Resilient, durable SWM operations
5. Functional tariff collection
6. Foundations for a world class SWM system are in place: Tashkent system should be the catalyst for national SWM sector development and full SWM sector strategy

**Challenges**

1. Collection/transfer system highly inefficient because it is outdated
2. Waste recycling potential underdeveloped but informally functioning
3. Significant disposal defects



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# Regions/Oblasts
# Key Development Drivers

**Strengths**

1. Cities are relatively clean
2. Rudimentary 'truck and dump' operations in place
3. Basic tariffs are in place and tariff collection rate typical in comparison
4. Selective recycling informally practiced

**Challenges**

1. Serious collection deficiencies – the smaller the city, the bigger the challenge
2. Inadequate waste disposal with dangerous consequences for public health and environment
3. Completely under resourced organizational and logistical structure, cost recovery and financial sustainability;
4. Relatively low volume of waste unless agglomerated on a provincial level



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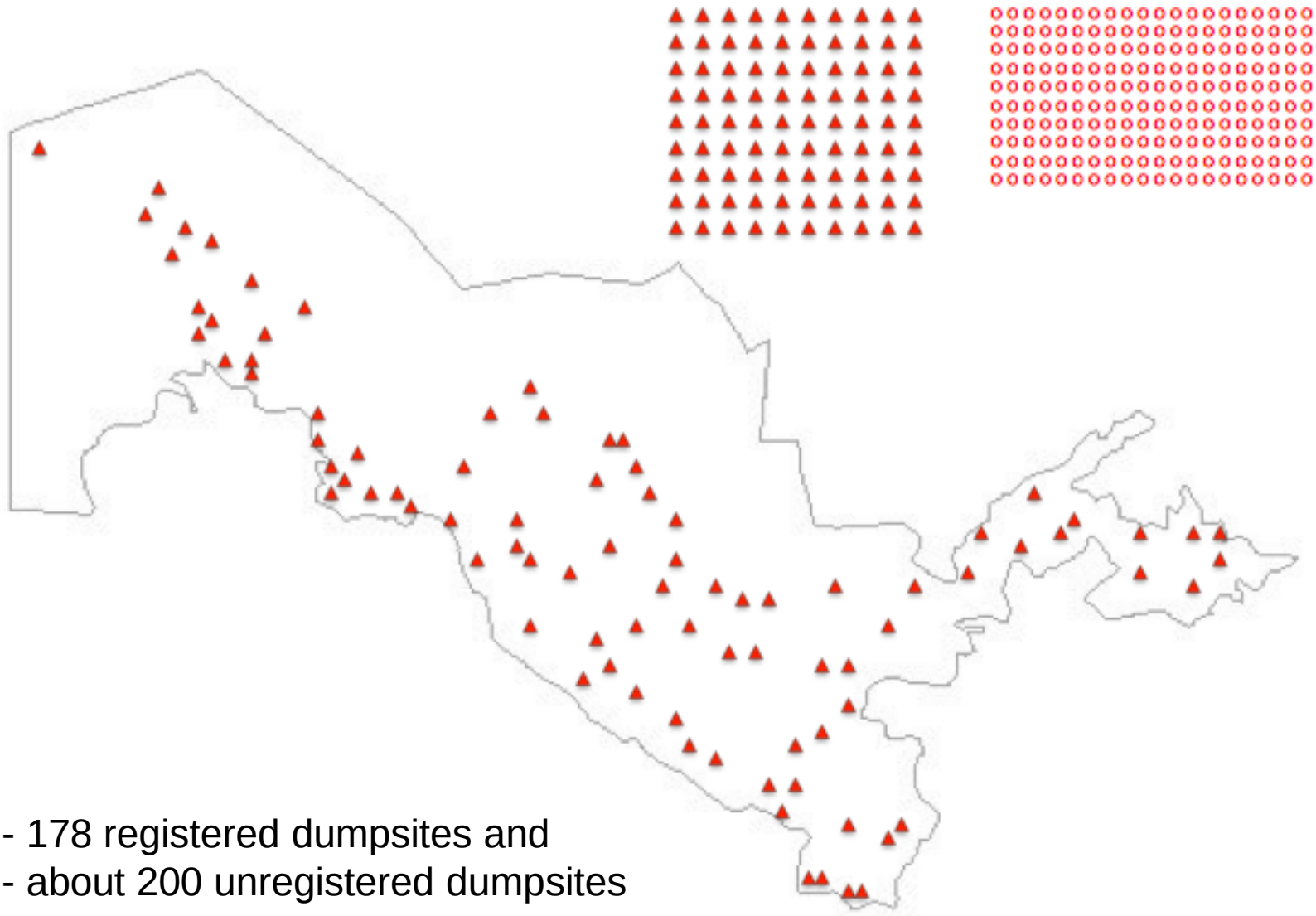
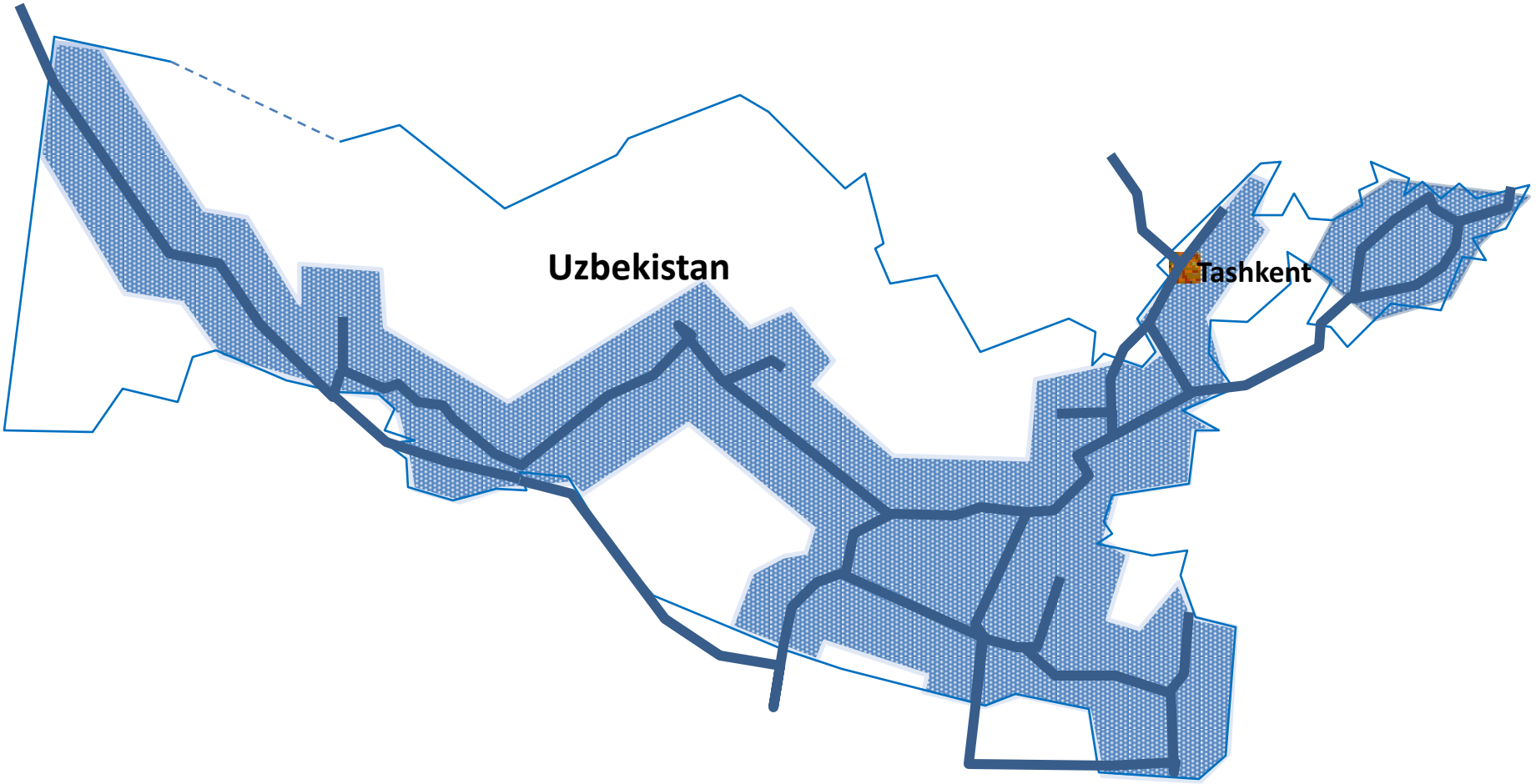


- 178 registered dumpsites and
- about 200 unregistered dumpsites




**Uzbekistan main Railway network**

| Selected Area Population served | Capital Expenditure Needs Assessment | Capital Expenditure Initial estimate |
|---|---|---|
| **Tashkent City – only: 2.2 million people** | Waste collection point improvement; collection fleet; transfer stations upgrade; waste container; special rail wagons; locomotive engines; waste management center with sanitary landfill as main facility; administrative support infrastructure | **USD 130 million** |
| **Tashkent –Samarkand Corridor: 4.7 million additional people** | Waste collection point improvement; collection fleet; transfer stations; waste container; special rail wagons; administrative support infrastructure | **(additional) USD 250 million** |
| **Ferghana Valley: 7.0 million people** | Waste collection point improvement; collection fleet; transfer stations; waste container; waste management center with sanitary landfill as main facility; administrative support infrastructure | **USD 400 million** |
| **Bukhara – Qarzih – Termiz Area: 5.9 million people** | Waste collection points; collection fleet; transfer stations; waste container; special rail wagons; locomotive engines; waste management center with sanitary landfill as main facility; administrative support infrastructure | **USD 320 million** |
| **Nukus – Urgench Region: 2 million people** | Waste collection point; collection fleet; transfer stations; waste container; special rail wagons; locomotive engines; waste management center with sanitary landfill as main facility; administrative support infrastructure | **USD 100 million** |
| | **TOTAL** | **USD 1.200 billion** |

# PPTA Activities

## Technical
- Community collection point survey
- International fact finding mission (Germany)
- Waste characterization assessment
- Recycling sector analysis
- Waste collection and transfer system analysis
- Disposal facility siting assessment
- Concept designs and cost estimates
- Cost benefit analysis (disposal options)

## Economic/Financial
- Financial management assessment
- Socioeconomic survey
- Financial analysis
- Economic analysis

## Institutional
- National and provincial agency reviews
- Tashkent City institutional assessment
- Maxsustrans operations review

## Environmental
- Regulatory framework review
- Rapid environmental assessment
- Landfill siting assessment
- IEE

## Social and Resettlement
- Poverty, social and gender assessments
- Resettlement Policy Framework review
- LARP
- Detailed assessment of preferred site
- Specific gender measures

## Procurement
- Initial procurement assessment
- Procurement package preparation



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# Capital Expenditure of Options (US$'000)
# Cost Benefit Analysis

| Capital Expenditures | Akhangaran Sanitary Landfill | Remote, Inter-Regional Landfill |
|---|---|---|
| Transfer station rehabilitation | 1,750 | 1,750 |
| Landfill machinery | 2,990 | 2,990 |
| **Subtotal** (same for both options) | **4,740** | **4,740** |
| Landfill facility | 25,966 | 24,082 |
| Railway sidings Tashkent | - | 4,450 |
| Railway spur-line & siding Hovos | - | 11,650 |
| Transfer vehicles & containers | 7,600 | 4,200 |
| Gantry crane Hovos | - | 1,500 |
| Railway wagons | - | 6,300 |
| **Subtotal** (different across options) | **33,566** | **52,182** |
| **Total** | **38,306** | **56,922** |

# Operating Costs of Options (US$/ton)
# Cost Benefit Analysis

| Operating Costs | Akhangaran Sanitary Landfill | Remote, Inter-Regional Landfill |
|---|---|---|
| Fixed OPEX1 | 0.97 | 1.42 |
| Variable OPEX2 | 6.02 | 12.17 |
| **Total OPEX** | **6.99** | **13.59** |
| **Transport Costs** | | |
| Mode | Truck and trailer | Rail |
| Distance km (round trip) | 80 | 350 |
| Transport cost (US$ per ton) | 4.47 | 9.54 |

Notes:
1. Average fixed OPEX made up of O&M costs for civil works and staff over 25 years.
2. Average variable OPEX includes landfill machinery and transport costs.
3. Rail transport cost based on Uzbekistan Railways indicative rate.



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# Comparison of Options
# Cost Benefit Analysis

| Criteria | Akhangaran Sanitary Landfill | Remote, Inter-Regional Landfill |
|---|---|---|
| **Financial** | | |
| Capital cost (Initial) Waste transfer system and landfill | US$ 38.31 million | US$ 56.92 million |
| Operating cost (Initial) Waste transfer system only | US$ 4.47 per ton | US$ 9.54 per ton |
| **Legal** | | |
| Land acquisition | Irrigated land | Undeveloped land |
| Technical and planning restrictions | Site already restricted | Restrictions unlikely |
| **Strategic Potential** | | |
| Potential population served | Possibly 3 million | Possibly 7 million |
| Facility life | 50 years | Possibly exceed 100 years |

# Comparison of Options
# Cost Benefit Analysis

| Criteria | Akhangaran Sanitary Landfill | Remote, Inter-Regional Landfill |
|---|---|---|
| **Environmental** | | |
| **Waste Transfer:** | | |
| Vehicle emissions | - | Lowest |
| Road safety | - | Safest |
| Road deterioration and congestion | - | Lowest |
| **Waste Disposal:** | | |
| Conversion of irrigated land | Confirmed | Unlikely |
| Operational beyond 2060 | Unlikely | High potential |
| **Social** | | |
| Involuntary resettlement | Confirmed | Unlikely |
| Disposal site social impacts | Low | Negligible |
| Job creation potential | High | High |

# Structuring modalities

**Immediate stand alone project**

System 1 (Phase A):

- Tashkent City upgrade of equipment and logistics
- Implementation of intl. standard sanitary landfill

**MFF (now or future)**

- System 1 (Phase B) : Tashkent – Samarkand corridor
- System 2: Fergana Valley
- System 3: Bukhara – Quarzih – Termiz
- System 4: Nukus - Urgench



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# Tashkent's Municipal Waste Problem

While recognizing SWM needs nationwide, government prioritized rehabilitation of Tashkent's SWM system

SWM demands in Tashkent are growing rapidly,

- city's population of 2.3 million currently generates over 0.5 M tons annually,
- expected to increase to over 0.7 M tons annually by 2030,
- cumulative generation from 2013 to 2030 reaching more than 10 million tons.

The current system has served the city since 2006 and needs immediate and complete rehabilitation to avert potentially serious service disruptions.



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# Tashkent SWM System

Collection Points

Collection System

Transfer Stations

Transfer System

Disposal

# UZB Solid Waste Management Improvement Project

| | |
|---|---|
| Project: | The project will develop a sanitary landfill that meets international standards, rehabilitate transfer stations, and modernize the waste collection and transfer fleet. It will build capacity in waste management and help formulate a national strategy on solid waste management. |
| EA: | Tashkent Municipality (core project)<br>State Committee for Nature Protection (natl. strategy) |
| IA: | Maxsustrans |
| Capital Cost: | US$ 76 million |
| Proposed Financing: | Asian Development Bank: US$ 69 million<br>Government of Uzbekistan: US$ 7 million |
| Implementation Period: | January 2014 to December 2018<br>*(For Board Approval on 21 October 2013)* |
| Procurement: | International competitive bidding: 5 contracts<br>National competitive bidding: 13 contracts<br>Consultant procurement: 6 contracts |



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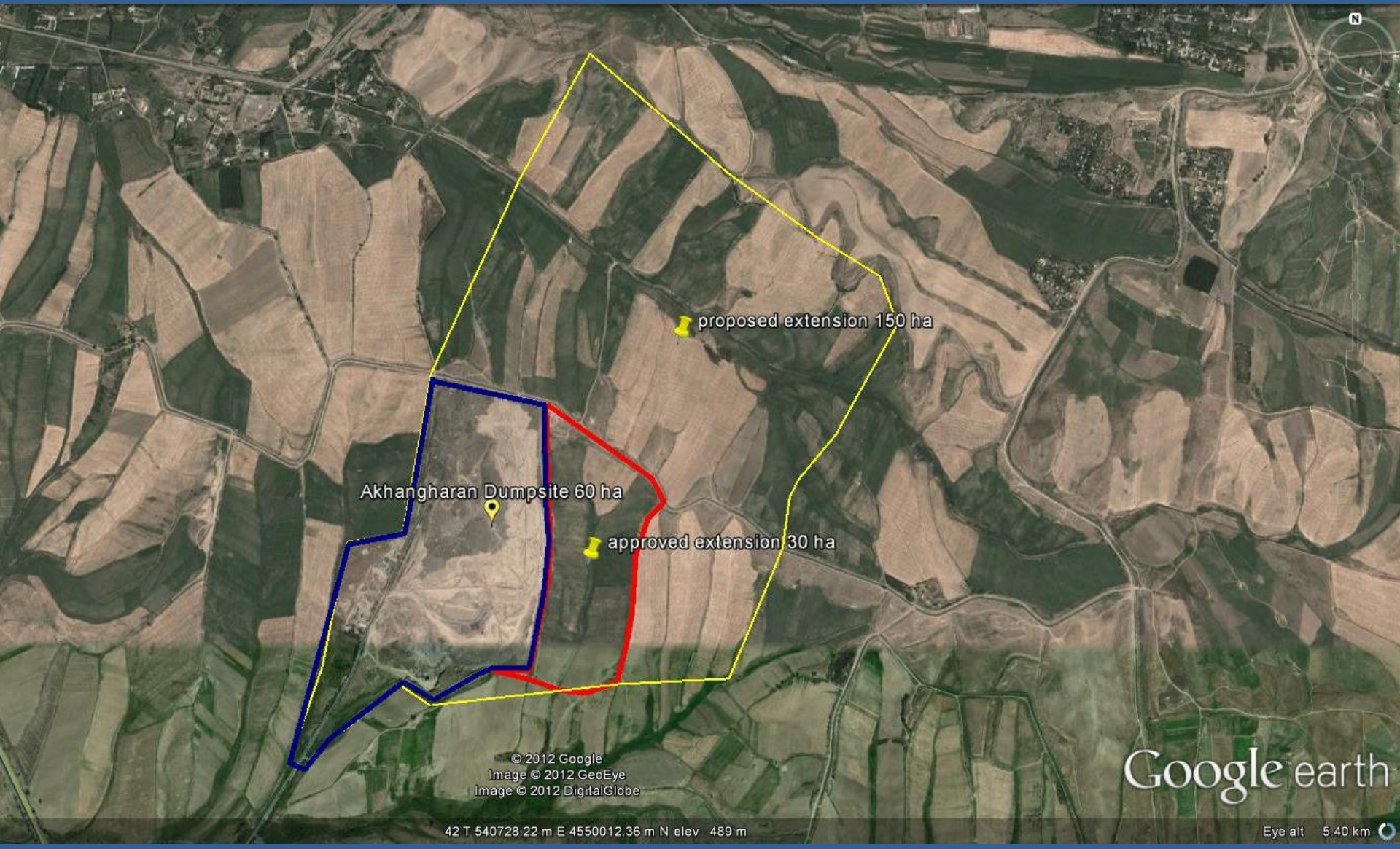
# UZB SWM Improvement Project
# (For Board Approval on 21 October 2013)

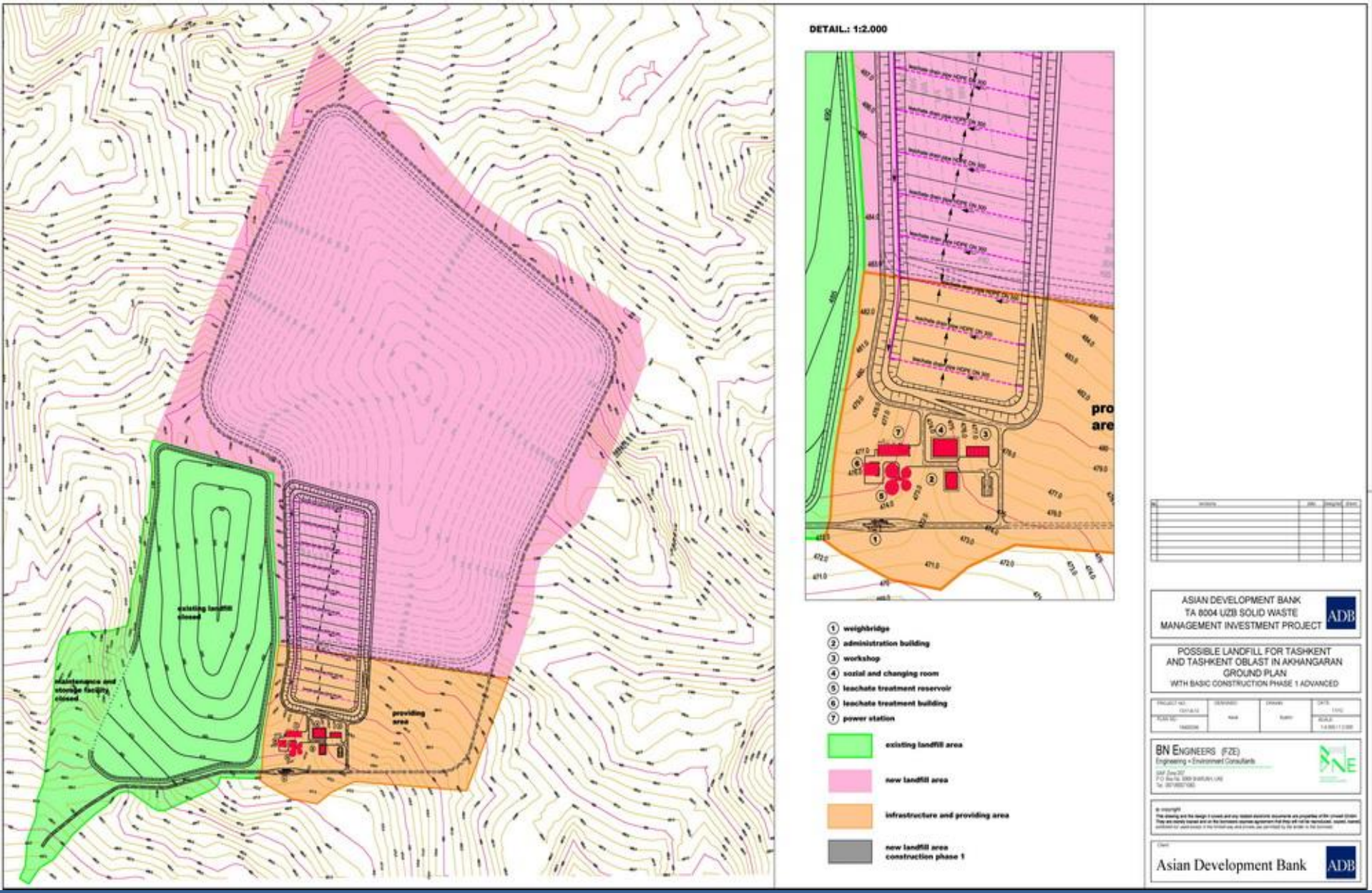
**Technical Components:**

- Rehabilitation and construction of 700 waste collection point facilities
- Provision of 13,500 waste collection bins
- Provision of 177 additional waste collection vehicles (155 WC vehicles replaced in 2013 by Municipality)
- Rehabilitation of two transfer stations (possible closure of a third transfer station)
- Provision of a new waste transfer fleet, 17 vehicles
- Development of a 30-hectare intl. standard sanitary landfill
- Closure of existing dumpsite
- Project design and supervision
- Program coordination and monitoring

**Capacity Development Component:**

- Transport and logistics study
- Waste minimization and recycling strategy
- Media and public awareness program
- SWM systems technical operations support
- National SWM strategy


proposed extension 150 ha
Akhangharan Dumpsite 60 ha
approved extension 30 ha
© 2012 Google
Image © 2012 GeoEye
Image © 2012 DigitalGlobe
Google earth
42 T 540728.22 m E 4550012.36 m N elev 489 m
Eye alt 5.40 km


existing landfill closed
providing area
DETAIL.: 1:2.000
1 weighbridge
2 administration building
3 workshop
4 sozial and changing room
5 leachate treatment reservoir
6 leachate treatment building
7 power station
existing landfill area
new landfill area
infrastructure and providing area
new landfill area construction phase 1
ASIAN DEVELOPMENT BANK
TA 8004 UZB SOLID WASTE MANAGEMENT INVESTMENT PROJECT
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POSSIBLE LANDFILL FOR TASHKENT AND TASHKENT OBLAST IN AKHANGARAN
GROUND PLAN
WITH BASIC CONSTRUCTION PHASE 1 ADVANCED
BN ENGINEERS (FZE)
Engineering + Environment Consultants
Asian Development Bank
ADB

# UZB SWM Improvement Project

| Category | | | ADB Financing | | |
|---|---|---|---|---|---|
| | | Total Amount Allocated for ADB OCR Financing ($) | | | |
| No | Item | Category | Subcategory | Percentage and Basis for Withdrawal from the Loan Account | |
| **1** | **Civil Works** | 31,477,000 | | | |
| a | Landfill construction | | 17,831,000 | 100% of total expenditure claimed* | |
| b | Dumpsite closure | | 5,700,000 | 100% of total expenditure claimed* | |
| c | Transfer station, garages & collection points | | 5,400,000 | 100% of total expenditure claimed* | |
| d | Design & Supervision | | 2,546,000 | 100% of total expenditure claimed* | |
| **2** | **Plant & Equipment** | 23,455,500 | | | |
| a | Landfill Equipment & Machinery | | 1,858,500 | 100% of total expenditure claimed* | |
| b | Waste Collection & Transfer Trucks | | 13,642,000 | 100% of total expenditure claimed* | |
| c | Bins & Other Equipment | | 7,955,000 | 100% of total expenditure claimed* | |
| **3** | **PMU, Capacity Development & Studies** | 4,407,200 | | | |
| a | Project Management Personnel & Support | | 2,236,700 | 100% of total expenditure claimed* | |
| b | Consultants, Capacity Support and Audit | | 2,170,500 | 100% of total expenditure claimed* | |
| **4** | **Interest and Commitment Charges** | 1,501,000 | | 100% of amounts due | |
| **5** | **Unallocated** | 8,159,300 | | | |
| | **Total** | **69,000,000** | | | |

*Exclusive of taxes and duties in the territory of the borrower.



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# SAFEGUARDS SUMMARY

| | |
|---|---|
| Environmental: | Sanitary landfill<br>Classified as Category B project<br>IEE; environmental impacts not significant<br>Project results in improved environmental conditions |
| Resettlement: | 1 affected household (AH), cultivated fields<br>9 workers (seasonal workers)<br>Classified as Category B project<br>Community irrigation association (basic infrastructure)<br>80-100 informal (illegal) waste pickers |
| IP/Social : | Indigenous people not identified<br>Classified as Category C project<br>Social impacts on surrounding communities expected to be negligible due to expected improvement of existing facilities |
| Gender: | Important role of women at the household in source recycling<br>Women operating waste collection points<br>Female waste pickers |



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# SWM System Financial Sustainability

Maxsustrans has relatively good O&M capacity and has been the operator of the SWM system since inception 2000.

Area of concern has been financial sustainability.

Historically, tariffs have been low and revenues marginal, resulting in inability to set-aside funding for asset replacement.

# SWM System Financial Sustainability

Implementation of Key Features to address financial sustainability

- Government last year raised tariffs significantly; current tariffs and collections rates are sufficient to ensure sustainability
- Government's success in raising tariffs in the last three years demonstrates that tariff-setting mechanisms are in place and working
- The investment program provides for reserves to fund future systems investment needs – both asset replacement and expansion of landfill
- Capacity development component provides four key individual consultants to assist EA and Maxsustrans with financial and sustainability issues
- Also, technical support and O&M assistance for Maxsustrans



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# SWM System Financial Sustainability

Implementation of Key Features to address financial sustainability

Project covenants:

- Operating ratio - expenditure over revenue (O&M, debt servicing, taxes, and reasonable return on equity)
- Borrower will provide temporary funding if ratios not met
- Tariffs reviewed at least annually, and adjusted accordingly
- Maxsustrans to prepare an annual business plan, for approval by EA

# Other CWUW SWM Projects

The following are the ongoing and planned projects:

Armenia:
- PPTA ongoing; interim report prepared
- Consultations with Government on proposed options – regional vs centralized
- Project processing of $20M-30M in 2014

Azerbajian:
- PPTA processing initiated
- Approval of PPTA in 2014
- Project processing in 2015

Georgia:
- PPTA processing in 2015
- Project processing in 2016



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