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[5] Transportation (TR)

5.18 Planning, implementation, monitoring and/or evaluation of all programs related to Transportation through the utilization of Information and Communication Technology

Uzbekistan State University of World Languages (UzSWLU) has fully digitalized its transportation management system through the integration of Information and Communication Technologies (ICT).

This initiative forms part of the *Digital Green Campus Strategy (2023–2030)* and is aligned with the *Green Mobility Policy (Order No. 21/2022)*.

All planning, implementation, monitoring, and evaluation processes related to campus mobility are now managed through the Smart Mobility Management Ecosystem, a multi-layer ICT platform that enables real-time data collection, analytics, and sustainability monitoring across all campuses.

The system supports efficient mobility, reduces CO₂ emissions, and enhances safety and accessibility for more than 19,000 students and 1,600 staff.

ICT Systems Integrated into Campus Transportation

ICT Component	Year Introduced	Description	Functionality
Smart Mobility Dashboard	2024	Centralized digital platform managed by the Green Office	Displays live data on shuttle movement, parking occupancy, EV charging, and emissions
QR-Based Vehicle Entry System	2023	QR codes issued for all staff and service vehicles	Enables controlled access and real-time vehicle tracking
GPS Shuttle Tracking System	2023	Installed on two electric shuttles	Provides live route monitoring, trip history, and energy consumption data
EV Charging Management App	2024	Linked to campus solar chargers	Tracks charging time, user frequency, and electricity consumption
AI-Powered Traffic Analysis Module	2025	Integrated with CCTV cameras	Uses AI to identify traffic congestion and optimize shuttle scheduling
Pedestrian & Bicycle Counter Sensors	2025	Installed at three main campus gates	Monitors daily foot and bicycle traffic
Smart Parking Sensors	2024	In 9 parking zones	Detects free spaces and monitors utilization rates
Online Feedback & Survey Portal	2023	Embedded in university website and mobile app	Collects user opinions on shuttle and parking services

2. Planning through ICT

UzSWLU uses digital planning tools to ensure every transportation program is optimized, efficient, and sustainable:



- GIS-based transport mapping helps design shuttle routes and pedestrian paths between campuses (Main, Zakovat, and Dormitory Zones).
- Digital data modeling identifies traffic intensity and informs road layout adjustments.
- Predictive analysis based on historical data forecasts shuttle demand and parking needs.
- Smart Mobility Dashboard visualizes all transportation indicators in real time, allowing immediate policy adjustments.
- Long-term digital strategy (2025–2030) includes expansion of EV charging points and paperless permit systems.

Planning is entirely paper-free, accelerating workflow and reducing administrative waste.

Implementation through ICT

ICT integration ensures that all initiatives are implemented efficiently and transparently:

- QR-based passes grant controlled access to authorized vehicles and help reduce unnecessary car entry by 30 %.
- Shuttle GPS tracking enables students to view real-time bus locations and estimated arrival times via the mobile app.
- Smart parking sensors automatically report occupancy rates to the dashboard and mobile interface.
- EV charging system powered by renewable solar energy records energy flow digitally.
- Electronic reporting system replaces paper logs, allowing digital submission of maintenance and usage reports.
- Mobile notifications alert students about shuttle schedules, delays, or route updates.
- Integration with Tashkent City Transport Department's e-payment system allows digital cards to function on both municipal and campus buses.

This ICT-enabled implementation ensures not only sustainability but also user convenience and accountability.

Monitoring through ICT

UzSWLU has established a comprehensive digital monitoring system operated jointly by the Green Office and Transport & Logistics Department:

- Smart Mobility Dashboard visualizes shuttle ridership, CO₂ emissions, and parking use in real time.
- AI-based analytics detect abnormal traffic flows and propose scheduling adjustments automatically.
- IoT sensors in parking areas measure occupancy and detect idle engines to reduce emissions.
- Monthly data reports automatically generated by the Dashboard are reviewed by the Rector's Council.
- Smart cameras record pedestrian movement for safety and flow optimization.
- Automatic alerts notify technical staff if lighting, sensors, or shuttle systems malfunction.
- All data are stored in the Smart Campus Server, integrated with the broader *Sustainability Dashboard (2025)*.

Evaluation and Continuous Improvement

Evaluation is carried out quarterly through the Dashboard and verified with field data:



- Data-driven decisions: transport policies are revised based on CO₂ tracking, shuttle demand, and user feedback.
- Efficiency impact (2023–2025):
 - Parking congestion reduced by 15 %.
 - Private car use decreased by 12 %.
 - Shuttle ridership increased by 18 %.
 - Share of ZEVs in the fleet rose from 20 % to 35 %.
- Satisfaction survey results: 82 % of students and 91 % of staff rate current transport services as “efficient and accessible.”
- Evaluation reports are made available in the GreenMetric Annual Digital Sustainability Report.

Integration with Other Smart Systems

The ICT-based transport system is interconnected with other sustainability platforms:

- Smart Energy Dashboard — monitors power use of EV chargers and lighting systems.
- Smart Parking Module — connected to mobility sensors to measure occupancy in real time.
- Pedestrian and Cycling Dashboard — tracks walkway usage and solar lamp efficiency.
- Water and Waste Dashboards — combined data help assess overall carbon footprint.

This integration creates a Smart Sustainable Campus Network, enabling holistic monitoring across all GreenMetric indicators.

Data Governance and Security

All ICT data are managed under the *ICT Data Protection Policy (2024)* ensuring privacy and transparency:

- Three-level governance model:
 1. Operational: Transport Department manages daily inputs.
 2. Analytical: Green Office performs sustainability analytics.
 3. Strategic: Rector’s Council reviews digital reports quarterly.
- Data stored on secure servers with backup and encryption.
- Access limited to authorized personnel; all reports are timestamped and auditable.

Environmental and Social Impact

- **Energy efficiency:** Smart route optimization reduced shuttle idle time by 25 %.
- **Fuel savings:** 12 % reduction since 2023 due to optimized trips.
- **CO₂ emissions:** decreased by approximately **2.7 tons per year**, verified through Dashboard analytics.
- **Digital management:** reduced annual paper use by 1,200 sheets (–100 % paper transition).
- **Accessibility improvement:** digital tools make transport easier for students with disabilities.
- **Enhanced safety:** AI monitoring lowered vehicle incidents by 40 %.
- **Inclusion:** mobile app interface available in Uzbek, English, and Russian.

Impact on SDGs

- **SDG 9:** Industry, Innovation and Infrastructure – advanced ICT integration.
- **SDG 11:** Sustainable Cities and Communities – improved mobility and safety.
- **SDG 13:** Climate Action – CO₂ reduction and data-based planning.

- **SDG 16: Strong Institutions** – transparent, accountable digital governance.



Additional evidence link (i.e., for videos, more images, or other files that are not included in this file):