



NAXÇIVAN DÖVLƏT
UNİVERSİTETİ

Annual Transportation Report 2024

NAKHCHIVAN STATE UNIVERSITY ANNUAL TRANSPORTATION REPORT

Planning, Implementation, Monitoring, and Evaluation of Transportation
Programs through ICT

1.Introduction

In alignment with the sustainability and environmental responsibility strategy of Nakhchivan State University (NSU), the institution has developed and implemented a comprehensive and integrated Transportation Management Policy that fully supports the objectives of the UI GreenMetric World University Rankings. This policy represents NSU's long-term vision to create a low-emission, pedestrian-oriented, and intelligent mobility system within the university campus, contributing directly to global goals on sustainable development and climate action.

The central purpose of this policy is to minimize the environmental impact of transportation activities, ensure a safe and accessible campus for all members of the university community, and promote the adoption of eco-friendly and innovative mobility solutions. Within this framework, NSU aims to integrate modern Information and Communication Technology (ICT) systems into all stages of transportation management — including planning, implementation, monitoring, and evaluation — to improve efficiency, transparency, and sustainability outcomes.

The university campus is designed as a compact and green educational environment, where all academic buildings, research centers, dormitories, administrative offices, and social spaces are located within short walking distances. This physical structure naturally supports sustainable transport behaviors by reducing dependency on private vehicles. To further strengthen this system, NSU has enforced a strict prohibition on the entry of private fuel-based vehicles into the campus. Only electric scooters, bicycles, and authorized university-managed service cars are allowed to operate within campus boundaries. This regulation not only reduces carbon emissions and air pollution but also enhances the quality of life, safety, and comfort of students, faculty, and visitors.

As part of its sustainability roadmap, NSU has adopted an ICT-driven management approach for all transportation-related programs. Advanced digital tools and monitoring systems are utilized to collect, analyze, and visualize transportation data in real time. The integration of technology ensures that every movement of vehicles, bicycles, and e-scooters within the campus can be observed and evaluated through an interconnected system involving the ICT Department, Campus Security Service, and the Sustainable Development Office.

Moreover, the university collaborates with technology partners such as WingZ, enabling the digital tracking and analysis of electric scooter activity. These systems help optimize route planning, ensure safety compliance, and generate valuable insights for sustainability reporting. The use of digital dashboards, CCTV monitoring networks, and automated data collection tools provides a strong foundation for evidence-based transportation governance and continuous performance improvement.

Through the implementation of this holistic transportation management model, Nakhchivan State University demonstrates its commitment to achieving Sustainable Development Goals (SDGs) — particularly SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action). By combining policy innovation with ICT-based monitoring and stakeholder engagement, NSU sets a benchmark for green campus transportation systems in the region.

This annual report therefore presents a detailed overview of the university's activities related to the planning, implementation, monitoring, and evaluation of transportation programs during the reporting year. It outlines how ICT integration enhances decision-making, operational efficiency, environmental responsibility, and user satisfaction, serving as a vital component of NSU's overall sustainability performance under the UI GreenMetric framework.

2. Sustainable Transportation Policy

2.1 Objective

The Sustainable Transportation Policy of Nakhchivan State University (NSU) aims to establish a transportation system that minimizes environmental impact, supports zero-emission mobility, and ensures safe, inclusive, and accessible movement across the campus. The policy is a core component of NSU's broader sustainability framework and directly contributes to reducing carbon footprint and improving the well-being of students and staff.

2.2 Scope

This policy applies to:

- All university-owned and operated vehicles,
- Private vehicles of students, staff, and visitors,
- Bicycles and electric scooters operating within the campus,
- Campus entry and exit control systems,
- Transportation data monitoring and reporting activities.

The policy covers the entire NSU campus area, including academic buildings, administrative blocks, dormitories, and service zones.

2.3 Policy Principles

The university's transportation system is guided by the following sustainability principles:

Restriction of Fuel-Based Vehicles

Entry of all petrol- and diesel-powered vehicles into the university campus is strictly prohibited. Only university-managed cars and service vehicles with special authorization are allowed under controlled access.

Promotion of Non-Motorized Mobility

NSU encourages walking, cycling, and electric scooter usage as the main modes of internal transport. All campus buildings are located within walking distance, reducing the need for motorized transport.

Integration of ICT Tools

Transportation monitoring and decision-making are supported by ICT systems — including digital access controls, vehicle tracking dashboards, CCTV monitoring, and data analytics tools.

Safety and Accessibility

Clear pedestrian pathways, accessible routes for individuals with disabilities, and dedicated micro-mobility zones ensure that campus transportation remains safe, inclusive, and barrier-free.

Environmental Commitment

The policy directly supports the university's objectives under SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action) by reducing emissions, promoting green mobility, and improving air quality.

2.4 Implementation Measures

To operationalize this policy, the university has taken the following actions:

No.	Implementation Measure	Responsible Unit	Status
1	Installation of digital entry control points for vehicles and pedestrians	ICT Department, Security Service	Completed
2	Designation of pedestrian-only and micro-mobility zones across the campus	Sustainable Development Office	Ongoing
3	Partnership with WingZ to monitor and track electric scooter usage	ICT Department	Active
4	Deployment of surveillance cameras for transportation and safety monitoring	Security Service	Completed
5	Periodic review of transportation data and sustainability indicators	Sustainability Committee	Annual
6	Organization of awareness campaigns on green mobility	Student Affairs Office	Annual

2.5 ICT Integration

ICT is embedded at every level of transportation management:

- Digital Access System: Records vehicle entries and prevents unauthorized access.
- CCTV Network: Provides visual monitoring of movement across pedestrian and vehicle zones.
- WingZ E-Scooter Tracking Platform: Allows the university to track scooter usage patterns and manage data securely.
- Online Transportation Dashboard: Centralized interface that collects and analyzes transportation metrics for decision-making.

Automated Data Reports: Monthly summaries generated by ICT systems support evidence-based policy evaluation.

2.6 Key Performance Indicators (KPIs)

Indicator	Target	2024 Result	Status
Ratio of vehicles per population	≤ 0.005	0.0025	Achieved
Share of zero-emission mobility	$\geq 95\%$	98%	Achieved
Percentage of areas with pedestrian-only access	$\geq 90\%$	100%	Achieved
ICT system uptime for monitoring	$\geq 95\%$	99%	Achieved

3. ICT Integration and Monitoring

3.1 Purpose

The integration of Information and Communication Technology (ICT) into transportation management at Nakhchivan State University (NSU) aims to ensure efficient planning, real-time monitoring, transparent reporting, and continuous improvement of mobility systems within the campus.

By relying on digital data rather than manual observations, NSU enhances decision-making accuracy, reduces administrative workload, and strengthens evidence-based sustainability governance.

3.2 ICT Systems Utilized

To maintain full control over transportation activities, NSU has established a comprehensive ICT-based monitoring infrastructure that connects security, mobility, and sustainability units. The following systems are currently in operation:

No.	ICT System / Tool	Functionality	Responsible Unit
1	Digital Campus Access System	Registers all vehicle entries and exits;	ICT Department & Security Service
2	CCTV Surveillance	Provides real-time visual monitoring across	Security Service
3	WingZ E-Scooter Tracking	Enables real-time tracking of electric	ICT Department
4	Online Transportation	Centralized data platform displaying live	ICT Department & Sustainable Development
5	Data Analytics and Reporting	Automatically compile monthly and annual	Sustainability Committee

3.3 Data Collection and Analysis Process

1. Daily Data Capture

- Each vehicle entering the university is registered through the digital access control system.
- E-scooter movement data is transmitted automatically from the WingZ platform to the central server.
- CCTV systems record time-stamped footage to ensure security and transparency.

2. Data Verification

- The Security Service verifies the daily entry data and cross-checks it with access logs.
- Irregular or unauthorized entries are flagged automatically for review.

Data Analysis and Visualization

- The Online Transportation Dashboard converts raw data into visual analytics (graphs, charts, and ratios).
- Trends are reviewed monthly to identify patterns in transportation usage and optimize mobility zones.

Annual Review and Reporting

- The Sustainability Committee and ICT Department jointly evaluate the effectiveness of ICT integration using key performance indicators (KPIs).
- Annual reports are submitted to the university administration and included in UI GreenMetric submissions.

3.4 Monitoring Results

The ICT-based system enables precise quantification of campus transportation activity. Based on 2024 data:

Indicator	Measurement	Result	Interpretation
Daily average number of	27	Very low	Indicates restricted entry
Total university population	10,856	—	—
Vehicle-to-population ratio	$27 / 10,856 = 0.0025$	Excellent	Below GreenMetric
Share of ICT-controlled entries	100%	Achieved	All entries digitally
Incidents of unauthorized	0	Excellent	System integrity maintained

3.5 Evaluation and Continuous Improvement

The monitoring process is not limited to data collection; it serves as an ongoing feedback mechanism. Each semester, the Sustainability Office evaluates ICT efficiency using the following criteria:

- System reliability and uptime (target $\geq 95\%$)
- Accuracy of vehicle entry data (target $\geq 98\%$)
- Integration between WingZ tracking and university servers (target = full synchronization)
- User feedback through online surveys on accessibility and safety

Based on these evaluations, the ICT team updates software configurations, expands CCTV coverage, and improves data visualization modules. Annual reviews ensure the system remains adaptive and aligned with sustainability goals.

3.6 Key Achievements

- 100% of transportation monitoring now conducted digitally via ICT systems.
- Real-time mobility data integrated with campus security operations.
- Partnership with WingZ established for continuous e-scooter tracking and performance analytics.
- Annual transportation reports automatically generated using the dashboard data.
- Zero cases of unauthorized vehicle entry recorded in 2024.

3.7 Summary

Through the effective utilization of ICT, Nakhchivan State University has achieved full transparency and control over its transportation system.

Digital access monitoring, e-scooter tracking, and automated data reporting have collectively improved efficiency, safety, and sustainability outcomes.

This approach represents a model of best practice under UI GreenMetric TR.9, showcasing how technology can drive measurable improvements in campus mobility and environmental performance.

4. Monitoring and Evaluation

The transportation system at Nakhchivan State University (NSU) is continuously monitored and evaluated to ensure its alignment with sustainability goals and operational efficiency standards. The monitoring process primarily focuses on vehicle entry rates, energy efficiency, carbon footprint analysis, and compliance with campus traffic regulations. This systematic evaluation helps to maintain an environmentally responsible and well-organized transport network within the university premises.

Data collection is conducted through a combination of digital surveillance systems and manual registration logs maintained by the transportation security department. Surveillance cameras installed across the campus gates capture all vehicle entries, and these records are cross-checked with manual logs to ensure accuracy and reliability of data. The monitoring team compiles monthly summaries that are then reviewed by the university's Sustainability Committee and the Administrative Department.

During the 2024–2025 academic year, the total number of vehicle entries recorded was 27 per day, corresponding to a daily mobility rate of 0.25% relative to the total university population of 10,856 individuals (students, academic, and administrative staff). This low ratio indicates a significant reliance on walking, cycling, and shared transport options, demonstrating the university's effective control over private car usage on campus.

In addition to numerical data, qualitative indicators are also monitored—such as user satisfaction, traffic safety incidents, and parking efficiency. Feedback is collected from students and staff through online surveys conducted twice a year. The findings are used to identify potential bottlenecks or areas needing improvement, such as optimizing pedestrian crossings, adjusting shuttle schedules, or enhancing accessibility for individuals with disabilities.

Evaluation results are presented annually to the University Council as part of the Sustainability Performance Report. Corrective measures and new initiatives are proposed based on the outcomes, ensuring a continuous improvement loop. The combination of digital monitoring, transparent reporting, and community participation strengthens NSU's transportation governance and contributes positively to the UI GreenMetric indicators on sustainable mobility.

5. Key Findings and Future Improvements

The evaluation of transportation management at Nakhchivan State University (NSU) for the 2024–2025 academic year highlights a number of key findings that reflect the institution's strong commitment to sustainable mobility and operational efficiency. The monitoring results demonstrate significant progress in reducing vehicle dependency, improving pedestrian safety, and integrating smart monitoring systems for better management.

Key Findings

Low Daily Vehicle Entry Rate:

The calculated daily average of 27 vehicle entries, representing just 0.25% of the total university population (10,856 individuals), indicates a very low level of private vehicle use. This metric is consistent with best practices outlined in the UI GreenMetric framework, where lower ratios reflect stronger sustainability performance in transportation management.

High Pedestrian and Bicycle Mobility:

The low rate of car entry suggests that a large proportion of students and staff rely on walking or cycling within the campus. This aligns with NSU's strategic goal of promoting non-motorized mobility and maintaining a healthy, emission-free learning environment.

Efficient Use of ICT in Monitoring:

The university's transportation department utilizes a hybrid system combining digital surveillance cameras and manual security logs for comprehensive monitoring. This approach ensures real-time oversight, transparency, and reliable data for reporting and analysis.

Environmental and Safety Impact:

Reduced vehicular movement has directly contributed to lower CO₂ emissions, decreased noise pollution, and improved overall campus safety. No major traffic-related incidents were reported during the academic year, highlighting the effectiveness of NSU's regulatory measures.

Integration with Sustainability Governance:

The transportation data is systematically incorporated into the annual sustainability report, allowing decision-makers to evaluate performance trends and make informed policy adjustments. This strengthens the institutional framework for evidence-based environmental management.

Future Improvements

While current performance indicates strong compliance with sustainability standards, NSU continues to identify areas for further enhancement:

Expansion of Smart Mobility Infrastructure:

The university plans to introduce an automated vehicle entry monitoring system linked with digital dashboards to allow real-time analytics on traffic flow and carbon impact.

Encouragement of Green Transport Options:

Future initiatives include developing electric shuttle services and bicycle-sharing programs to further reduce private car dependency among staff and students.

Enhanced Accessibility and Inclusion:

NSU aims to improve the infrastructure for individuals with disabilities, including wheelchair-friendly crossings, tactile ground surfaces, and clearly marked pedestrian paths.

Periodic Awareness Campaigns:

Educational programs and awareness campaigns on sustainable commuting practices will be organized to strengthen behavioral change and community engagement.

Regular Benchmarking and Reporting:

NSU will continue to benchmark its transport indicators against UI GreenMetric global standards, ensuring transparency and continuous improvement through annual reporting.