

From Digital Investment to Value

Insights from UITP Survey on Economics of Digitalisation in Public Transport



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Introduction

The application of digital technologies has become increasingly vital for enhancing efficiency, improving user experience, and optimising resource allocation.

When considering the economics of digitalisation in public transport (PT), benchmarking serves as a crucial tool for evaluating performance and orienting investment decisions. By comparing key performance indicators (KPIs) such as technology investment over revenue, for example, public transport authorities (PTAs) can gauge their relative position and prioritise investments in digital solutions accordingly.

Return on investment (RoI) analysis plays a pivotal role in determining the economic viability of digital initiatives in PT systems. Before allocating resources to digitalisation projects, decision-makers must assess the potential benefits and costs.

Digitalisation in PT encompasses a diverse array of initiatives, as discussed in previous UITP publications:

- [Advancing Digital Transformation in Public Transport with a Digital Mindset](#) (2025)
- [Capturing Digital Value Within Public Transport](#) (2024)
- [Artificial Intelligence in Public Transport](#) (2025)
- [DATA for Public Transport](#) (2024)
- [Large Scale Bus Electrification: IT Systems Checklist](#) (2024)
- [Large Scale Bus Electrification: New Challenges for IT systems](#) (2022)
- [How technology can improve passenger flow and crowd management](#) (2024)
- [Improving Passenger Flow and Crowd Management: Through Technology and Innovation](#) (2022)
- [Ticketing in MaaS](#) (2022)

It is crucial to ensure that digital initiatives and innovations have real, tangible benefits for public transport operators (PTOs), PTAs, and, most important, the people who rely on PT services every day. This UITP Insight aims to support PTOs and PTAs in this regard by translating digital initiative results into practical guidance for investment directions and priorities in the evolution of digitalisation. Through benchmarking and structured insights, it seeks to facilitate more effective use of digital technologies to enhance the urban mobility system efficiency and sustainability, while simultaneously maximising return on investment (ROI).

This Insight has been prepared based on the UITP global survey conducted on the topic. The detailed analysis of the survey and key considerations and recommendations are provided in the following sections.

A new economic question for public transport

The economic assessment of digitalisation in PT requires a broader value lens—one that considers efficiency, quality, and equity. This multi-objective environment shapes the investment logic.

The challenge has always been determining which investments deliver measurable value, under what conditions, and how that value should be weighed against competing priorities. This question spans a wide and heterogeneous range of digitalisation measures—from passenger information systems, to operational fleet management and scheduling systems, to ticketing and analytics platforms. It covers both system modernisation and ‘greenfield’ investment.

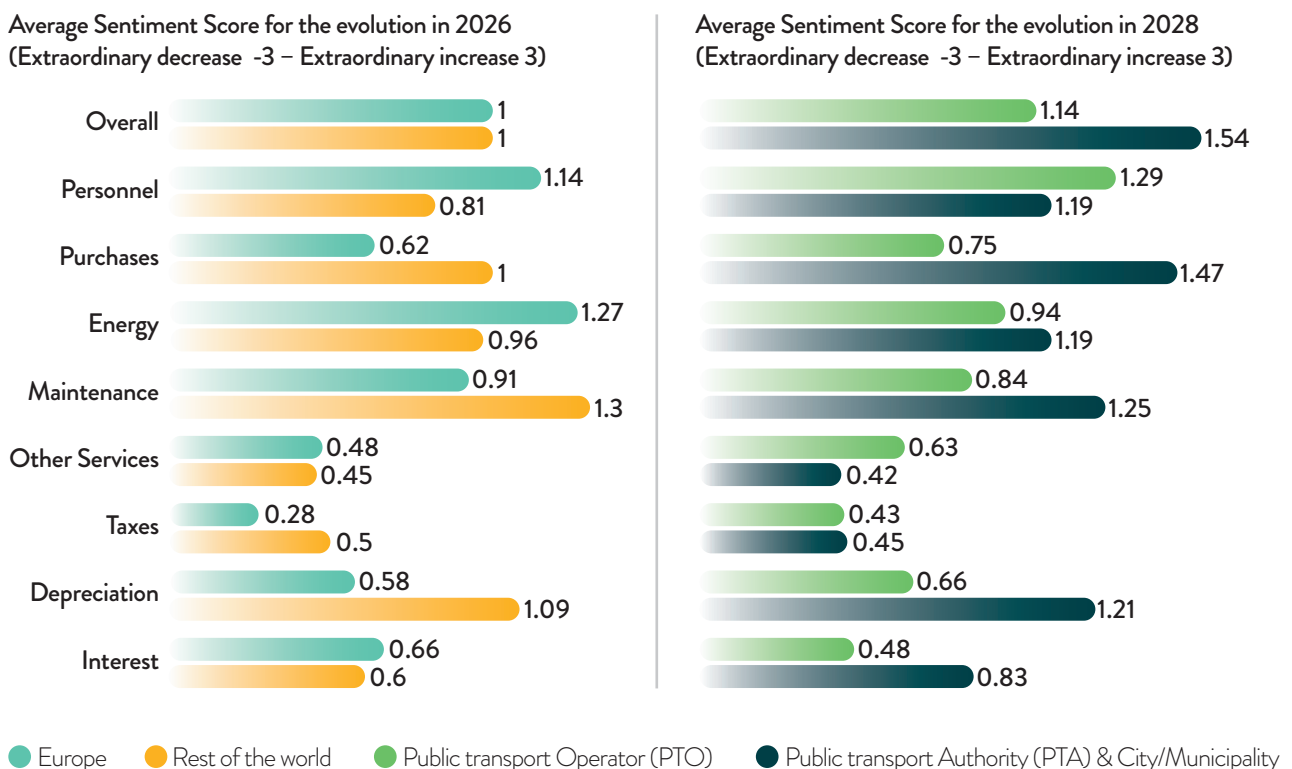
This UITP Insights covers two aspects of digitalisation initiatives in PT: the types of investments that are being made across the sector and how their economic impact is being measured and communicated.

Digitalisation context in public transport

Digitalisation in PT comes as a response to five structural pressures that define the context for PTAs and PTOs:

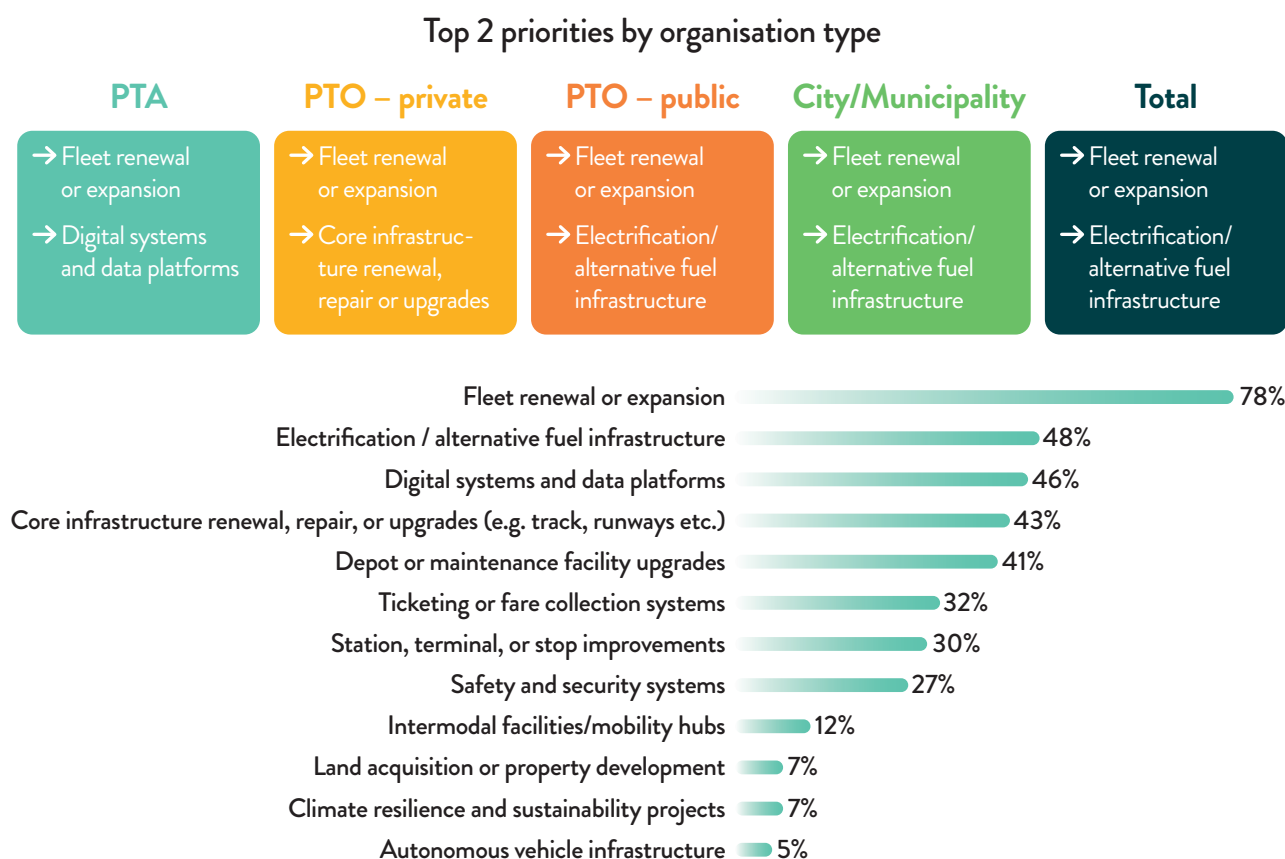
→ **Cost pressure.** Rising labour, energy, and maintenance costs (see Figure 1 and Figure 2), combined with constrained public budgets, create sustained demand for operational efficiency. Digital tools address this directly—through levers that ensure better operational resource utilisation or by replacing obsolete systems with modern, more economical ones.

Figure 1: UITP Global Economic Outlook 2026 – Expectations regarding operating cost evolution in 2026 and 2028



→ **Passenger expectations.** Consumer digital experience elevates baseline passenger expectations, calling for measures like real-time information, seamless payment, and service reliability. Falling short of these expectations erodes the ridership base and increases unit costs. According to UITP Global Economic Outlook 2026, digital systems and data platforms, as well as new ticketing systems, rank among PTOs’ top investment priorities (see Figure 3).

Figure 3: UITP Global Economic Outlook 2026 – PTOs’ investment priorities



Fleet renewal or expansion was widely chosen as a main capital expense/investment priority for 2026. There are limited differences observed between Europe and the rest of the world, whilst slightly more variation is present when comparing across organisation types.

Respondents were able to select up to four options deemed most relevant.

→ **Compliance and regulatory mandates.** Public transport is subject to strict regulatory oversight and digitalisation targets. This can include policy compliance, adhering to safety regulations, public reporting of information and outcomes, and stewardship of public funding.

→ **Change management.** Attraction of digital talent and employee capacity building are big challenges for public transport. Leveraging digitalisation, using existing data and/or implementing new digital solutions, including ones that integrate artificial intelligence (AI), can help address them.

→ **Public transport service quality.** PTAs and PTOs know they need to increase PT service quality to attract more passengers. Digital solutions can help inform decision-making and enable real-time monitoring of the city’s multimodal PT quality, facilitating implementation of real-time countermeasures in case of incidents.

How digitalisation creates economic impact

Against these pressures, digital initiatives generate economic value through two complementary mechanisms.

- **Supply-side value** comes from reducing the cost or improving the output of existing operations: process automation, optimised scheduling and resource allocation, and data and predictive systems that reduce planning error and structural inefficiency. These gains tend to be measurable in operational KPIs and cost lines, making them the more tractable dimension for investment justification.
- **Demand-side value** comes from improving the passenger experience: real-time information, account-based ticketing, multimodal journey planning, personalised services, and better planning. This dimension is harder to attribute directly to individual investments but often represents the larger system-level economic opportunity, particularly through ridership retention and modal shift.

Planning and resource allocation in PT have historically relied on periodic, siloed data. Integrated digital infrastructure enables a shift toward continuous, granular **evidence-based decision-making**—improving not only day-to-day operations but also the quality of long-term investment, contracting, and policy decisions. There is also the hidden economic benefit that digitalisation can bring to the city; improving PT service quality can facilitate better tourism management, ultimately attracting more tourists to the city in the future and generating more jobs in the city.

Challenges in assessing digitalisation's economic impact

Measuring and forecasting the actual economic impact of digital investment is not always straightforward. Impact is often **slow to materialise**, building as organisational capability develops rather than delivering a defined payback at a fixed point. Moreover, returns from digitalisation **compound**, rarely flow from a single investment, and are sensitive to a wide range of organisational and contextual factors.

As the survey points out, this variance is not random: **organisational readiness** is the primary determinant of whether returns materialise. This covers operational data's **quality** and **accessibility**, the extent to which digital tools work together rather than in isolation, and the presence of **leadership, skills, and change management** capacity to translate technology into operational improvement. The value of any given tool depends partly on what is already in place around it.

This unpredictability has a sector-level consequence. Without shared, comparable evidence on digital investment adoption and impact across organisations, business cases rest on local assessment. Benchmarking and impact measurement are therefore crucial to reducing the uncertainty around digitalisation across the sector.

Understanding the value of digital initiatives: UITP Economics of Digitalisation Survey analysis

Digitalisation has become one of the defining transformations shaping the future of public transport. Over the past decade, PTOs and PTAs have invested extensively in technologies ranging from electronic ticketing and passenger information systems to predictive maintenance, cloud platforms, and AI. These investments have often been justified by expectations of greater efficiency, improved customer experience, and better operational performance. However, despite growing levels of investment, one fundamental question remains insufficiently explored: **how should digitalisation's economic value be measured?**

Historically, PT investment decisions were relatively straightforward to evaluate. Rolling stock, signalling infrastructure, and depot modernisation generate tangible outputs that can often be translated into well-established financial indicators such as operating cost reductions, increased capacity, or lower maintenance expenditure.

This distinction has profound implications. If organisations continue to evaluate digital initiatives using the same approaches traditionally applied to physical infrastructure investments, there is a risk of underestimating the broader strategic value of digital transformation. Better data quality, improved operational visibility, faster decision-making, and enhanced organisational resilience are not quantified in financial statements, but they fundamentally improve an organisation's ability to deliver efficient, reliable, and customer-focused PT services. Furthermore, digitalisation brings value not only to PT financials but also to the city's financials. Improving PT quality improves the perception of the city, resulting in more tourists, and more money is spent not only on PT tickets but also in general in the city. This is another factor that should be taken in consideration by PTAs when supporting PTOs in investment in digitalisation.

Digital technologies, however, rarely produce value through a single measurable outcome. Instead, they create interconnected improvements across operations, maintenance, customer experience, workforce management, and strategic decision-making. Their value is cumulative, distributed across organisational functions, and frequently realised over extended periods, rather than immediately after implementation.

The **UITP Economics of Digitalisation Survey** provides one of the first international benchmarks specifically focused on how PT organisations approach the economics of digital transformation. Conducted between October and December 2025, the survey was widely shared within the UITP network and received responses from 45 organisations representing PTOs, PTAs, and integrated operating agencies across 25 countries and all UITP regions except Africa. Respondents ranged from small urban transport providers to large metropolitan networks, providing a broad view of current practices and future ambitions.

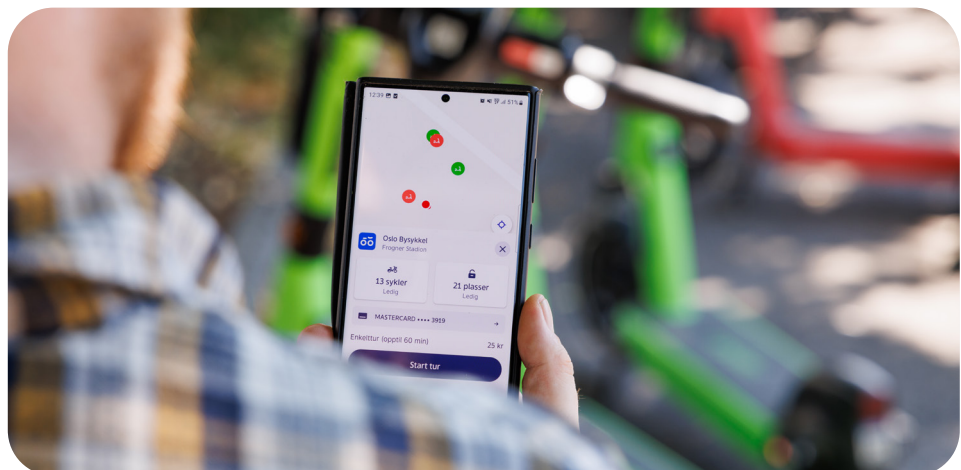
The survey comprised 33 questions across seven sections, covering the following topics: digital maturity and adoption, investment and costs, operational and economic impacts, challenges and barriers, benchmarking and best practices, and future investment planning.

The survey investigated five main digitalisation areas:

- **Operational efficiency:** Data and tools to improve operations: planning, scheduling, real-time management, multimodality, energy efficiency, revenue collection/protection.
- **Maintenance efficiency:** Data and tools to improve maintenance (from condition-based to predictive maintenance).
- **Passenger engagement:** All tools, services, and initiatives aimed at providing real-time information to passengers, improving their experience, and convincing them to opt for PT over individual transport.
- **Data and digital infrastructure:** Infrastructure and technology for data generation (edge technology), transmission (networks and communications), storage and management (data warehouses), and all related procedural and legal implications for data ownership and accessibility.
- **Organisational efficiency:** Tools and practices focused on internal process efficiency—optimisation of the ‘cost of doing business’.

The survey was designed by the ITT and IT&I Committees’ Economics of Digitalisation Working Group and captured the most relevant areas of digital technology application from the operational, user experience, and organisational points of view. The survey’s main objective was to improve PTOs’ and PTAs’ understanding of digital initiatives and ROI considerations and provide an outlook on benchmarking, best practices, and future investment planning at the global level.

→ Oslo, Norway
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Survey participation overview

Dimension	Result
Number of countries/ regions covered	25 countries globally; all UITP regions except Africa.
Regions (respondents)	Europe: 26; Latin America: 10; Asia-Pacific: 4; North America: 3; MENA: 2 ¹ .
Organisation type (respondents)	PTOs: 25 (55.6%); PTAs: 17 (37.8%); other operating agencies/authorities: 3 (6.7%). For analysis, PTAs and operating agencies/authorities were aggregated.

Across the organisations surveyed, the responses pointed to a shift from digital experimentation towards more structured and strategic digitalisation. **Digital technologies are no longer perceived as isolated innovation projects but are rather increasingly recognised as strategic capabilities that influence virtually every aspect of organisational performance. At the same time, the findings indicate that many organisations continue to face significant challenges in translating digital investments into measurable economic outcomes.**

This UITP Insight examines these findings not as isolated survey statistics but as evidence of a broader transformation taking place across the PT sector. Five key findings emerged from the survey analysis:

- Digitalisation is progressing from technology deployment towards organisational transformation.
- Investment decisions increasingly reflect institutional capability rather than financial capacity alone.
- Digitalisation's economic value extends well beyond traditional cost reduction.
- Organisations continue to face structural barriers in demonstrating and measuring ROI.
- The next generation of digital investment will increasingly focus on intelligent, predictive, and data-driven operations.

These findings suggest that public transport is entering a new phase in which the central challenge is no longer adopting digital technologies, but rather converting digital capabilities into sustainable economic and societal value.

Digital maturity: From experimentation to institutionalisation

Survey results show that digitalisation has reached a level of maturity where it is being embedded in PTOs' core businesses, rather than remaining confined to isolated innovation initiatives. The sector appears to have collectively moved beyond the question of whether digital technologies should be adopted and is increasingly focused on how these technologies can generate measurable value across operational, financial, and customer dimensions.

This shift is reflected in respondents' self-assessment of digital maturity. Nearly two-thirds of participating organisations classified themselves as being in the **developing** stage of digital maturity, while a further group had already reached the **integrated** or **optimised** stages. Only a small number described themselves as remaining at the initial stages of digital transformation (see Figure 5 and Figure 6).

Figure 5: UITP Economic of Digitalisation Survey 2026 – Organisation digital maturity self-assessment

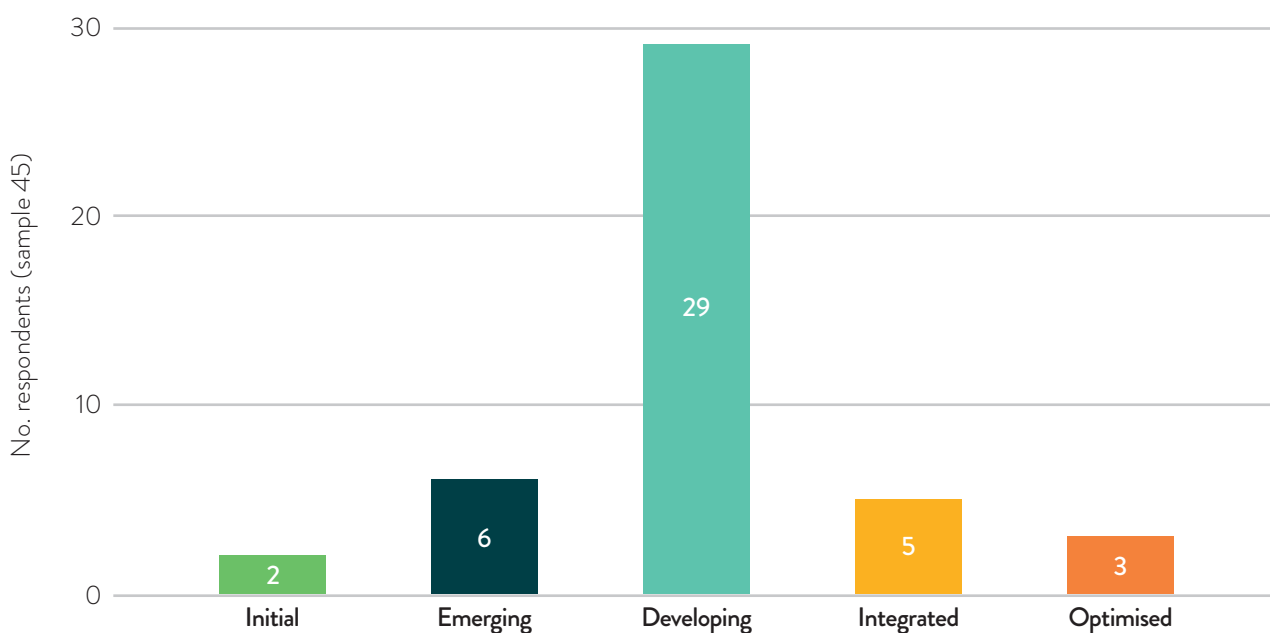
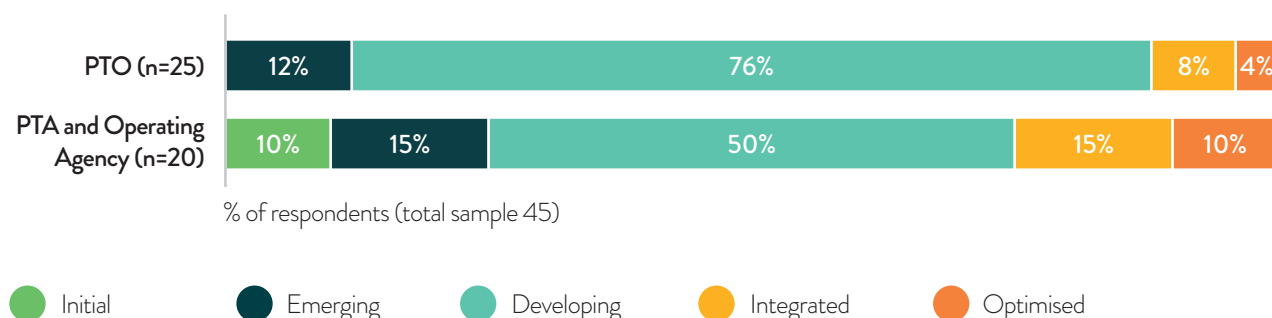


Figure 6: UITP Economics of Digital Survey 2026 – Organisation digital maturity self-assessment by organisation type



Although self-assessment inevitably reflects organisational perception, the overall distribution is significant. It suggests that digitalisation is no longer viewed primarily as a collection of pilot projects or isolated technology deployments. Instead, most organisations now recognise digital capabilities as an integral component of business strategy and operational management.

For most respondents, digitalisation appears to have moved beyond early experimentation, although full strategic integration remains limited. Digital maturity is increasingly determined more by an organisation's ability to integrate digital technologies into everyday decision-making than by the number of technologies deployed.

Customer-facing technologies have reached particularly high levels of adoption. Digital ticketing and payment systems, together with real-time passenger information platforms, have now been deployed by most respondents. Similarly, enterprise back office systems and data collection platforms have become common organisational tools, rather than differentiating innovations.

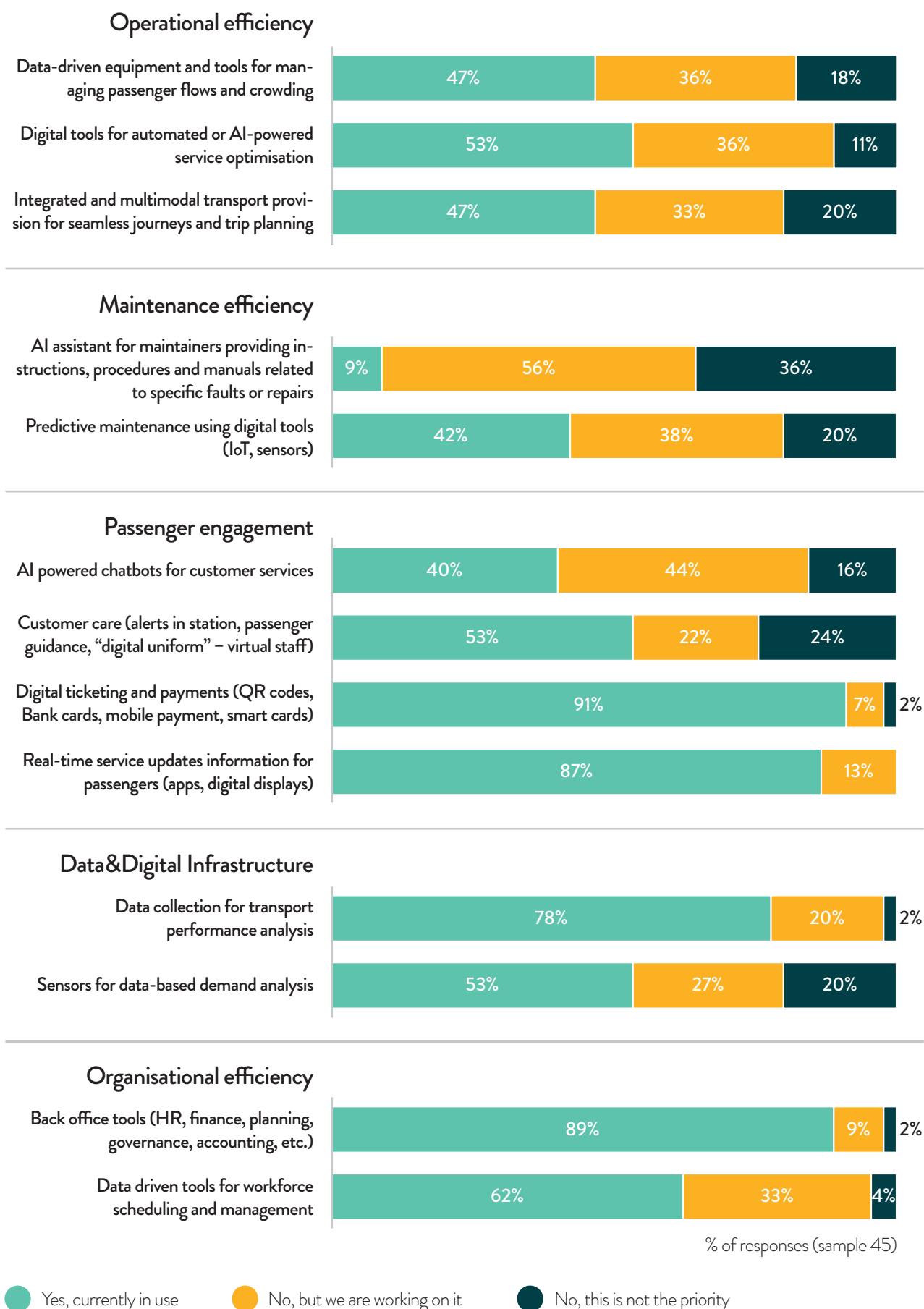
The economics behind this pattern are relatively straightforward. These technologies have largely completed the transition from innovation to infrastructure. Their value proposition is well understood, implementation risks have declined, and the operational benefits have become widely accepted across the sector. Digital ticketing reduces transaction costs while improving convenience. Passenger information systems enhance service quality and customer confidence. Enterprise management platforms streamline administrative processes and facilitate organisational coordination.

In effect, these technologies have become the digital equivalent of essential transport infrastructure. Few organisations would now regard them as optional investments.

The picture changes considerably, however, when examining more advanced applications such as AI-assisted maintenance, predictive analytics, and automated operational optimisation. Adoption remains comparatively limited, yet many organisations indicated that these technologies were currently under development, rather than outside their strategic priorities. This distinction is important. It suggests that slower adoption does not necessarily reflect scepticism about the potential value of AI or advanced analytics, but rather the greater organisational maturity required, especially in terms of organisational data strategy and data governance, to effectively deploy these technologies. These topics are currently being studied by the UITP AI Working Group.

Unlike digital ticketing or passenger information systems, AI-enabled applications depend on high-quality data, integrated information architectures, robust governance, and skilled personnel capable of interpreting algorithmic outputs. AI represents not just another technology investment but the culmination of earlier investments in digital capability.

Figure 7: UITP Economics of Digital Survey 2026 – Digital technologies adoption level by digitalisation area



From digital investment to organisational capability

If the first phase of digital transformation was characterised by the deployment of new technologies, the survey results suggest that the next phase will be defined by how effectively organisations convert those technologies into organisational capability.

This distinction is particularly important for public transport. Unlike many commercial sectors, where digital investments can often be directly linked to increased revenue or reduced labour costs, PT organisations operate within a more complex value system. Their objectives extend beyond financial performance to include service reliability, availability, accessibility, environmental sustainability, and public value. As a result, digitalisation returns frequently materialise across multiple organisational functions and over longer time horizons.

The survey reflects this evolution. While investment levels remain relatively modest compared with traditional capital expenditure (Figure 8), digitalisation is no longer treated as an isolated innovation budget. Instead, many organisations are embedding digital initiatives within broader organisational strategies, supported by dedicated governance structures and long-term investment planning. Figure 9 shows that organisations that have adopted a digital strategy plan/digitalisation guidelines or a dedicated digitalisation unit/innovation team have invested more of their total annual budget in digital initiatives.

Higher levels of digital investment were observed among organisations with more established digitalisation capabilities and governance structures. Many surveyed organisations are establishing dedicated digital teams or developing digital strategy plans, indicating that governance and organisational commitment are becoming central elements of digital transformation.

This observation points towards a shift in how digital investment should be understood. Digital technologies themselves rarely generate value in isolation. Instead, value is created when organisations develop the capabilities required to integrate technology into operational processes, decision-making, and organisational culture. The outcome of digital technology investment heavily depends on an organisation's ability to manage data, coordinate departments, develop digital skills, and adapt business processes.

The economics of digitalisation are becoming less about the amount invested and more about the ability to generate sustainable value from those investments.

Technology investment only represents the starting point of digital transformation; organisational capability ultimately determines the economic return.

Figure 8: Average share investment done in digital initiatives as of total annual budget, 2024

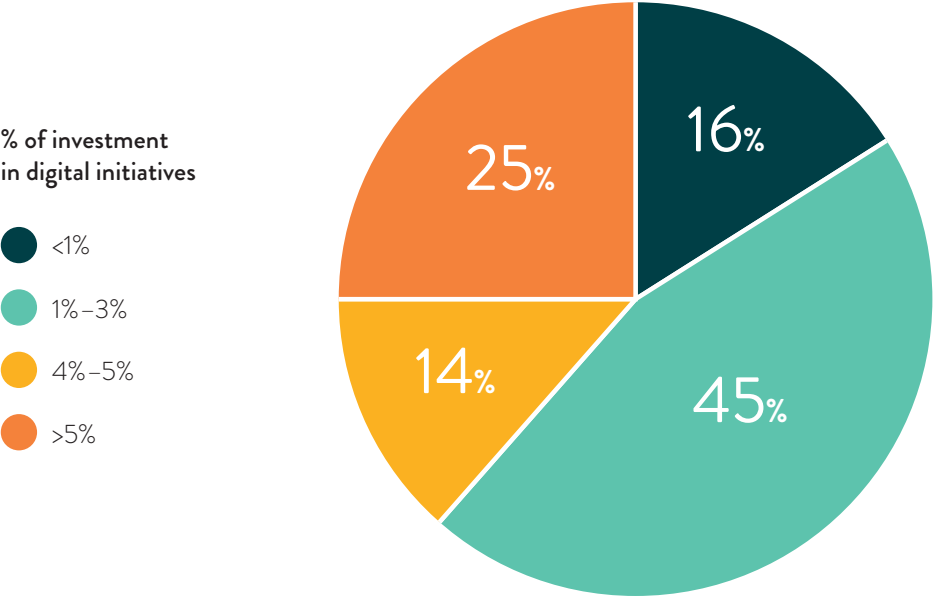
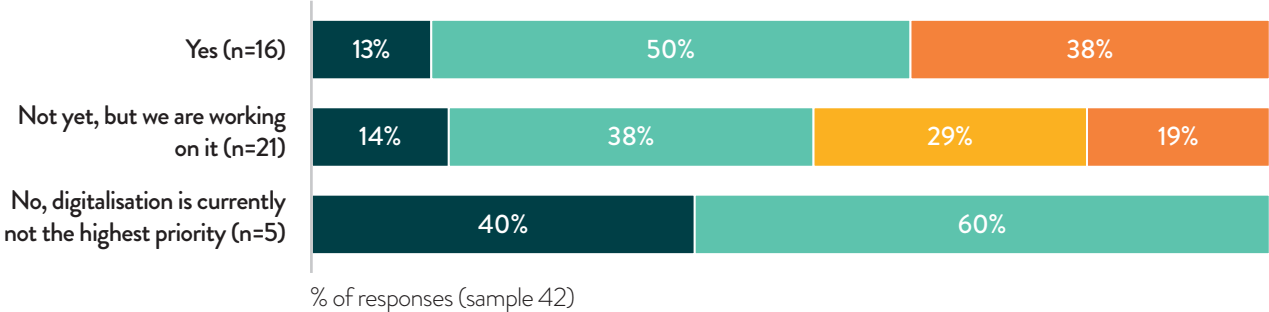
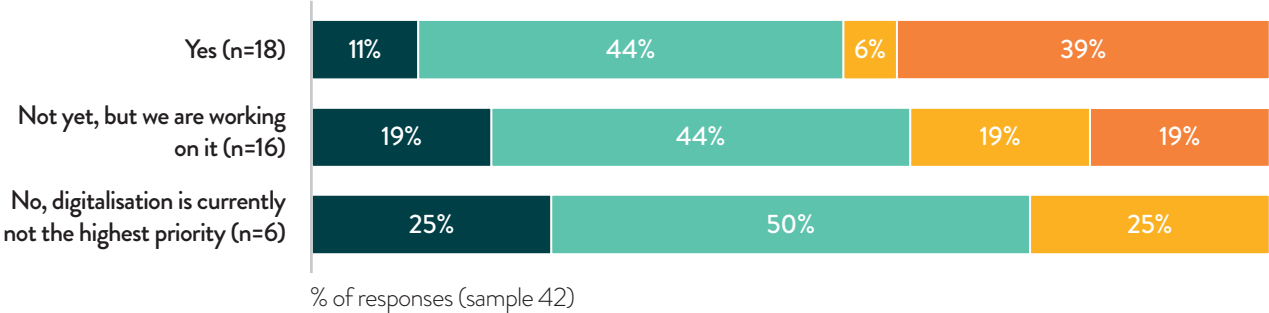


Figure 9: UITP Economics of Digital Survey 2026 – Average digitalisation investments as fraction of total annual budget

Average investment done in digital initiatives of total annual budget by adoption of a Digital Strategy Plan/Digitalisation guidelines, 2024



Average investment done in digital initiatives of total annual budget by adoption of a dedicated Digitalisation Unit/Innovation Team, 2024 (b)



% of investment in digital initiatives



The survey results provided valuable insight into how organisations prioritise digital investment across different functional areas (Figure 10). Data and digital infrastructure appears to be one of the leading areas of investment, particularly among PTAs and other operating agencies, while PTOs show a more balanced distribution across operational efficiency, passenger engagement, and digital infrastructure.

Rather than indicating differing levels of importance, this distribution reflects the sequential nature of digital transformation. Data infrastructure provides the foundation upon which more advanced applications depend. Reliable data collection, interoperability, cloud architecture, cybersecurity, and system integration enable organisations to exploit predictive analytics, automation, and AI. Without these foundations, advanced digital applications cannot operate effectively or produce reliable insights.

The survey suggests that organisations are increasingly recognising this progression. Investment is no longer directed solely towards acquiring technology; it is increasingly focused on building the capabilities that allow technology to generate value throughout the organisation.

Figure 10: UITP Economics of Digitalisation Survey 2026 – Average percentage of investment on digitalisation by digital area and organisation type compared to total investments in digital initiatives, 2024 (PTA=19; PTO=25)

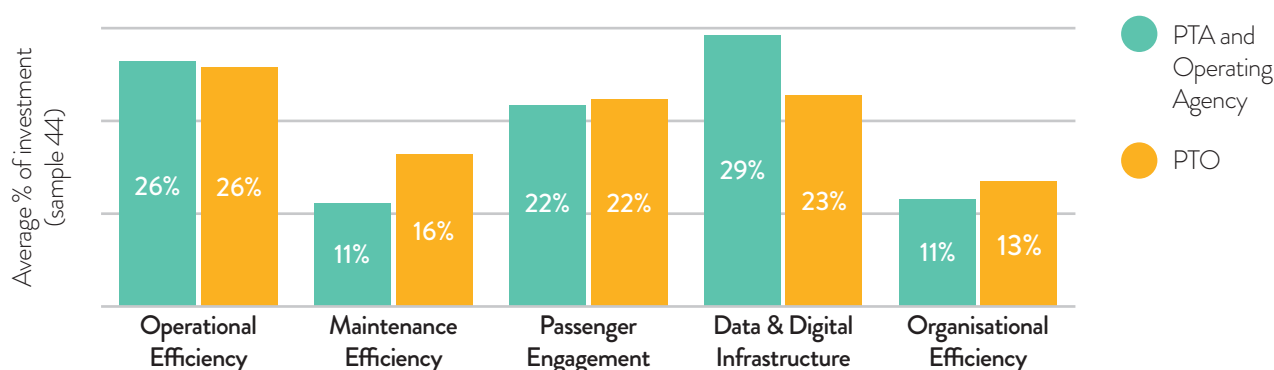
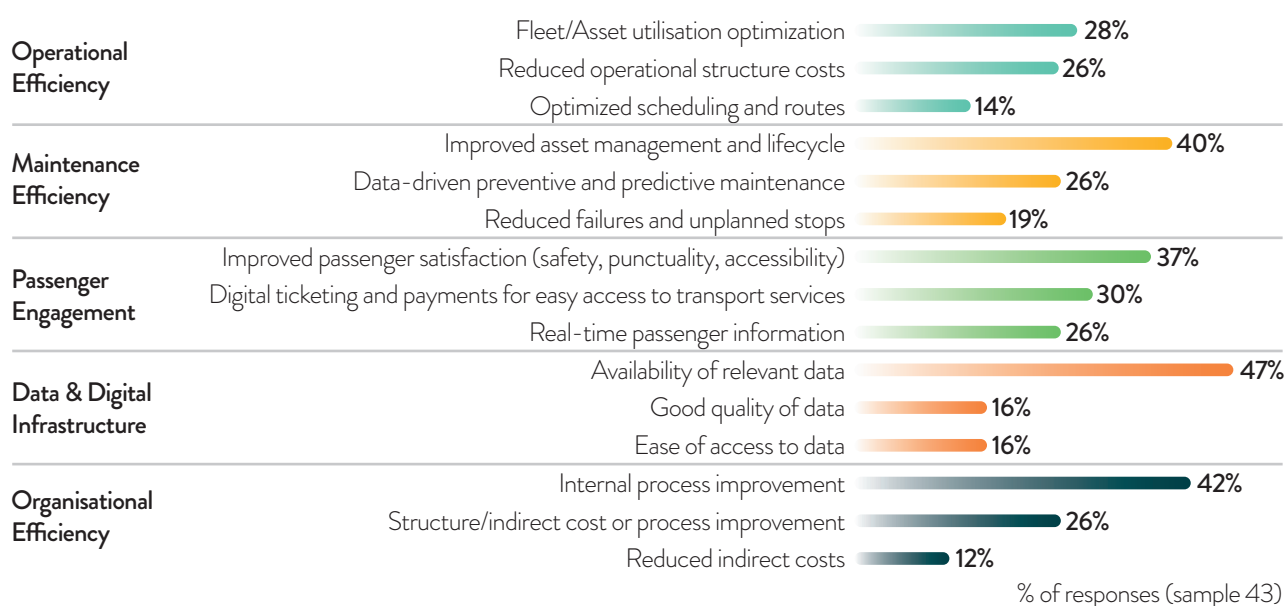


Figure 11: UITP Economics of Digitalisation 2026 – Top-three most significant benefits in measuring success by category of digitalisation



Redefining return on investment

Perhaps the most significant survey finding concerns how organisations perceive the value generated by digitalisation. Traditionally, investment decisions in PT have been evaluated through relatively straightforward financial measures such as cost reduction, increased productivity, and revenue growth. While these indicators remain important, the survey indicates that they do not capture digitalisation's full economic contribution.

Across the five digitalisation domains, respondents consistently identified improvements in operational performance, decision-making, and service quality as digital investment's most significant outcomes. Fleet optimisation, predictive maintenance, enhanced passenger experience, improved data quality, and streamlined internal processes featured more prominently than direct financial savings alone. This suggests that digitalisation's economics differ fundamentally from those of traditional infrastructure investments.

A new depot, signalling system, or vehicle fleet typically generates benefits that can be measured relatively directly through reduced maintenance costs, increased capacity, or improved energy efficiency.

Digital technologies, by contrast, often generate value indirectly through better information, faster decisions, and improved organisational coordination.

The survey results illustrate this distinction across multiple domains (see Figure 11).

In **operational efficiency**, respondents identified improved fleet utilisation, service planning, and operational visibility as major benefits of digital technologies. These improvements enable PT organisations to deploy vehicles more effectively, respond more rapidly to disruptions, and optimise operational resource allocation. While such improvements undoubtedly influence financial performance, their immediate impact is often observed in service reliability, rather than direct cost savings.

Similarly, in **maintenance efficiency**, predictive maintenance emerged as one of digitalisation's most valued applications. By monitoring real-time vehicle condition and identifying potential failures before they occur, organisations can reduce unexpected breakdowns, extend asset life, and improve fleet availability. However, the economic benefits extend beyond maintenance expenditure alone. Greater reliability reduces service disruptions, enhances passenger confidence, and improves operational resilience across the network.

The same pattern appeared in **passenger engagement**. Respondents frequently associated digital technologies with improved customer satisfaction, enhanced accessibility, and more personalised passenger services. These outcomes contribute to long-term ridership growth and public trust but are inherently more difficult to express through traditional financial metrics.

Perhaps most revealing was the prominence given to **data and digital infrastructure**. Respondents consistently identified high-quality, accessible, and integrated data as one of the most valuable outcomes of digital transformation. Data itself does not directly create financial returns. Rather, it enables organisations to make better decisions across every aspect of their operations. In economic terms, data functions as a strategic asset whose value increases as it is used across multiple business processes.



→ Guangzhou, China
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This has important implications for investment appraisal. Traditional ROI methodologies were developed primarily for physical assets, where costs and benefits could be identified relatively clearly. Digital investments rarely follow the same logic. Their benefits are cumulative, cross-functional, and often realised progressively over time.

These findings indicate that digital transformation generates value through a series of interconnected improvements, rather than isolated financial outcomes.

The survey therefore raises an important question for transport leaders:
Are existing investment evaluation frameworks sufficient for assessing digital transformation?

The evidence suggests that they may not be.

These outcomes may not immediately appear in financial statements, but they represent genuine sources of economic value that influence long-term organisational performance.

Ultimately, the survey points towards a broader understanding of return on investment—**one in which the objective is not only to reduce costs but also to strengthen the organisation's overall capability to deliver efficient, reliable, and customer-centred public transport.**

Organisations may increasingly need to complement traditional financial indicators with broader measures of organisational performance, including service reliability, customer experience, operational resilience, workforce productivity, and data quality.

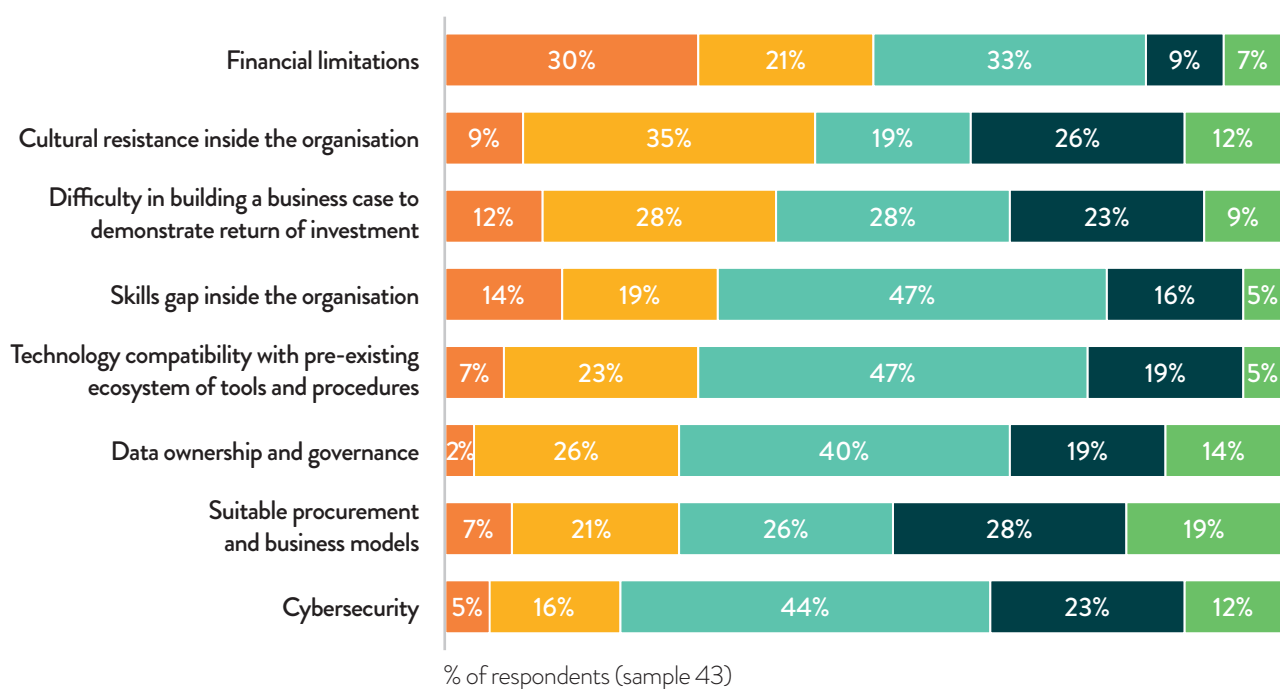
The barriers to digital value: Why transformation remains difficult

While organisations are increasingly recognising digitalisation's strategic value, converting ambition into measurable results remains challenging. Financial constraints, legacy technologies, skill shortages, and organisational complexity continue to limit the pace of transformation.

The principal obstacles are not technological, but rather organisational, financial, and institutional (see Figure 12). Understanding these barriers—and identifying how organisations intend to overcome them—can provide crucial insight into the next phase of digitalisation within public transport.

Respondents consistently cited financial constraints as one of the most significant barriers to accelerating digitalisation. Although this is hardly surprising within a sector characterised by high capital expenditure and constrained public funding, the survey suggests that the challenge extends beyond the availability of financial resources. Organisations struggle to demonstrate convincing business cases for digital investments, particularly when benefits are realised gradually and across multiple departments, rather than through immediate cost savings.

Figure 12: UITP Economics of Digitalisation 2026 – Likely challenges or barriers preventing further adoption of digital solutions



● Critical barrier
 ● Significant barrier
 ● Moderate barrier
 ● Minor barrier
 ● Not a barrier at all

This reflects a broader challenge facing PT organisations. Traditional investment decisions—such as purchasing rolling stock or upgrading signalling infrastructure—are supported by well-established appraisal methodologies that quantify costs, benefits, and payback periods. **Digital investments rarely fit this model. A new data platform may improve operational planning, maintenance scheduling, customer information, cybersecurity, and executive reporting simultaneously. The resulting value is distributed throughout the organisation and often becomes visible only over several years.**

Consequently, organisations frequently face a paradox. The strategic importance of digitalisation is widely recognised, yet its economic contribution remains difficult to quantify using conventional investment frameworks.

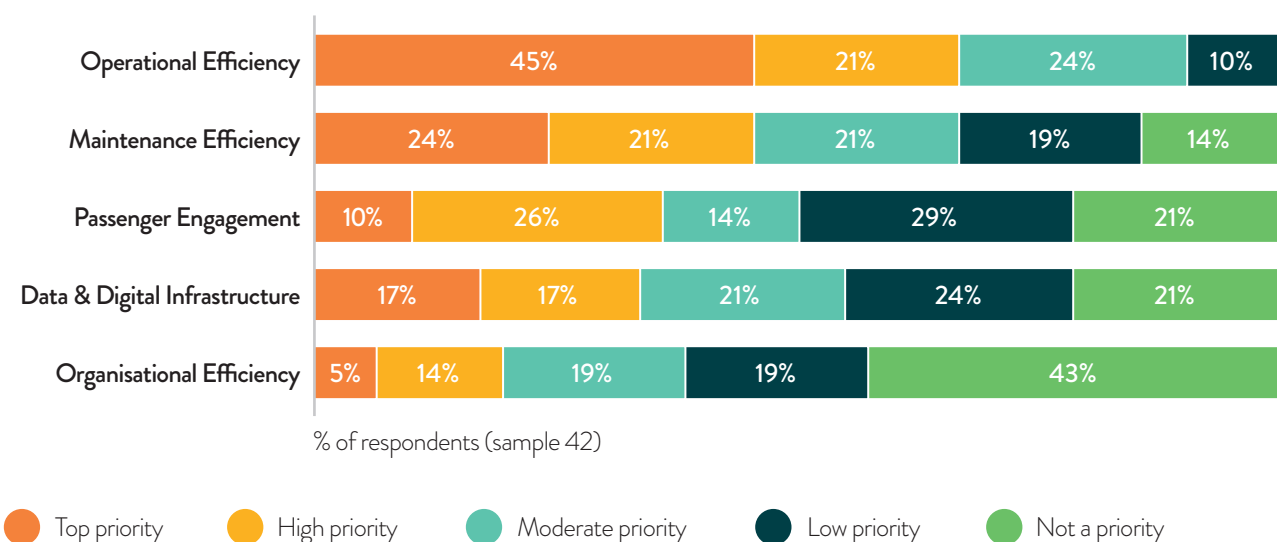
Technology compatibility with existing ecosystems is another major barrier, especially as many organisations operate complex combinations of legacy and modern systems such as ticketing platforms, fleet management systems, maintenance databases, customer information applications, and enterprise software, many of which are not designed to communicate seamlessly with one another.

This fragmentation increases implementation costs and limits the ability to exploit one of digitalisation's greatest strengths: integrated decision-making based on high-quality, real-time information.

The survey also highlights human capability as a critical determinant of digital success. Digital transformation requires skills that extend well beyond information technology. Data scientists, cybersecurity specialists, systems architects, and AI experts remain in short supply across many PT organisations. Equally important are managers capable of translating digital insights into operational decisions and organisational change. Technology alone does not transform organisations; people do.

Another recurring theme concerns governance. Successful digital transformation increasingly depends upon collaboration between operational departments, information technology teams, and executive leadership. Where digitalisation remains confined to isolated technology departments, organisations often struggle to realise enterprise-wide benefits. Respondents reporting stronger governance structures frequently demonstrated greater confidence in both investment planning and implementation.

Figure 13: UITP Economics of Digitalisation Survey 2026 – Digitalisation area by priority for future investments



The next wave of digitalisation

The most forward-looking aspect of the survey concerns organisations' future investment priorities. While earlier phases of digitalisation concentrated primarily on digitising existing processes, respondents indicated that future investment would increasingly focus on improving the intelligence of PT systems, rather than simply increasing their digitalisation.

Around 45% of respondents selected operational efficiency as a top priority over the coming three years, making it the highest future investment priority, followed by passenger engagement and data and digital infrastructure (Figure 13). This ranking implies that organisations increasingly view digital technologies not as isolated customer-facing solutions but rather as mechanisms for improving PT networks' overall performance.

This represents an important evolution.

The first wave of digital transformation focused largely on replacing analogue processes with digital alternatives. Paper tickets became smartcards and mobile tickets. Static passenger information evolved into real-time travel information. Manual reporting became digital dashboards.

The next wave is fundamentally different.

Given the strong future priority assigned to operational efficiency, the survey indicates a possible shift towards more data-driven and performance-oriented digital investment.

This evolution does not mean replacing human expertise. Instead, AI can support professional judgement by analysing large amounts of operational information, identifying potential risks, and helping professionals make faster and better-informed decisions. Human expertise remains essential to train, guide, and adapt AI tools to the organisation's specific needs, processes, and objectives.

Data therefore becomes increasingly valuable not because organisations collect more information, but because they develop greater capability to convert the information into operational knowledge.

This shift has crucial economic implications.

Historically, PT organisations created value primarily through physical assets such as vehicles, infrastructure, and depots. In the coming years, competitive advantage will increasingly depend on intangible assets, including data quality, analytical capability, digital governance, and organisational learning.

In this context, digital transformation becomes less a technology programme than an organisational capability programme.



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Netherlands
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Strategic implications for public transport leaders

The survey findings point to several strategic implications for PT executives, policymakers, and public authorities.

- **First, digitalisation should be managed as a strategic transformation rather than an information technology programme.** Organisations demonstrating higher levels of digital maturity consistently combine technology investment with governance, leadership commitment, and long-term organisational planning. Digital transformation requires executive ownership, rather than remaining solely within technology departments.
- **Second, investment should prioritise digital foundations before advanced applications.** The survey results consistently highlighted data and digital infrastructure as a prerequisite for broader transformation. AI, predictive maintenance, and automation depend fundamentally on reliable data, interoperability, and robust digital architectures. Organisations undertaking rapid AI deployment without first strengthening these foundations risk generating limited or unsustainable benefits.
- **Third, organisations should broaden their understanding of return on investment.** The survey results indicate that digitalisation frequently creates value through improved operational performance, better decision-making, and enhanced passenger outcomes, rather than immediate financial savings. Investment frameworks should combine traditional financial indicators with measures such as reliability, resilience, customer satisfaction, asset utilisation, and organisational productivity.
- **Fourth, organisational capability is becoming a strategic asset.** Digital maturity increasingly depends on leadership, skills, governance, and organisational culture. Developing these capabilities may ultimately deliver greater long-term value than individual technology projects.
- **Finally, benchmarking should become an ongoing management practice rather than an occasional exercise.** As digital transformation accelerates, organisations will benefit from systematic comparison of investment approaches, governance models, maturity levels, and operational outcomes. International benchmarking provides a key mechanism for identifying emerging practices, reducing implementation risk, and accelerating sector-wide learning.

Conclusion: From digital projects to value

The survey illustrates the picture of a sector at an important turning point.

Digitalisation is no longer an emerging trend within public transport. Across all regions represented in the survey, organisations increasingly regard digital technologies as fundamental components of service delivery, operational management, and long-term organisational strategy. **The central question is no longer whether digital transformation should occur, but rather how organisations can maximise the value created through digital investment.**

Perhaps the most significant survey insight is that digitalisation's economics cannot be understood exclusively through traditional financial measures. **While cost reduction and productivity improvements remain important, they only represent part of digital transformation's value. Better data, stronger decision-making, greater organisational resilience, improved customer experience, and enhanced operational performance all contribute to economic value, even where they cannot be easily captured through conventional return on investment calculations.**

This suggests that the sector is entering a new phase of digital maturity. Organisations that achieve the greatest success are unlikely to be those investing the most in technology alone. Rather, they will be those capable of converting digital investments into organisational capability—integrating data, technology, people, and governance to improve how public transport is planned, operated, and experienced.

Ultimately, this UITP study demonstrates that digital transformation is no longer primarily a technological challenge. It is an organisational one. Public transport's future competitiveness will primarily depend not on the technologies that organisations acquire, but rather on their ability to translate those technologies into lasting operational, economic, and societal value.

Annex

- Economics of Digitalisation Survey
- Power Point Slides Containing Survey Results

References

¹ Disclaimer: The findings should be interpreted in light of the survey's sample size and composition. While responses were received from 45 organisations across several regions, participation was uneven, with Europe accounting for 26 responses and there being limited representation from Asia-Pacific, North America, and MENA. Africa was not represented. The results reflect the experiences of participating organisations.



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