



Data Governance for Road Traffic Management

Policy brief for Trafikanalys





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Executive summary

Road traffic management is increasingly dependent on digital infrastructure: shared data, common interfaces, connected systems and services delivered across organisational boundaries. Operational traffic management in Sweden functions well, but responsibility for the digital infrastructure that supports it is distributed across different parts of Trafikverket and, in some cases, other actors. This creates challenges for ownership, long-term development, funding and coordination across systems.

This report looks at how Finland, the Netherlands and Norway have adapted their institutional arrangements as traffic management has become increasingly dependent on shared digital infrastructure and data. In Finland, Fintraffic was created to bring together traffic operations, transport data management and ecosystem coordination, while ownership of roads and other physical infrastructure remains with separate infrastructure authorities. In the Netherlands, NDW was established as a shared national organisation for collecting, standardising, quality-assuring and distributing road traffic data across national, regional and local road authorities, which continue to manage traffic on their own networks. In Norway, Entur was created as a neutral provider of shared digital infrastructure for public transport, including journey planning, ticketing and common data services, while transport operators remain responsible for running services. Wider coordination across the transport sector is now being developed through TDS (Tverrsektorielt datasamarbeid).

The main finding is that, unlike in Sweden, all three countries have created shared digital functions and a distinct organisational home for traffic management. Common platforms, standards, interfaces, data quality and data-sharing responsibilities are united in a common organisational home, rather than as supporting tasks embedded within individual systems or projects. This creates a clearer basis for mandate, resources, skills and long-term responsibility.

The cases also show that digital infrastructure management comes hand in hand with specific working methods. Standards, data sources, interfaces and user needs can change quickly, and services need to adapt with them. This calls for shorter development cycles (than physical infrastructure management), testing changes on a limited scale, learning from pilots and moving successful solutions into regular operations. Finland provides the clearest example of this approach, with structured processes for testing new data sources, standards and services before wider implementation. The same underlying need for continuous adaptation is visible in the Dutch and Norwegian cases.

Managing digital infrastructure also means managing the wider ecosystem around it. Shared digital services depend on municipalities, transport operators, navigation providers, technology companies, researchers and other actors. Managing these relationships is part of the infrastructure function itself. It includes coordination of standards, data quality, access arrangements, responsibilities and incentives. Finland makes this most explicit through a dedicated ecosystem coordination function, while the Dutch and Norwegian cases also show the growing importance of cross-actor coordination and ecosystem management.



For Sweden, the three implications are to establish a clearly mandated and sustainably funded function for shared digital infrastructure, make ecosystem coordination an explicit governance responsibility, and assess success based on the value and outcomes enabled by the infrastructure rather than the infrastructure itself.

The organisational form should be shaped by Swedish conditions, including Trafikverket's existing responsibilities, legacy systems, competences and relationships with other actors. The international cases are reference points rather than templates. The key task is to establish an arrangement that gives shared digital infrastructure clear ownership, authority and continuity while keeping it closely connected to operational traffic management.



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1 Introduction

1.1 Background and aim

Transport Analysis (Trafikanalys) is examining the digitalisation of Sweden's transport system and how its digital transport infrastructure should be governed. In 2025, Transport Analysis and VTI conducted a Delphi study of Swedish experts' views on digitalisation needs in the transport sector (Trafikanalys, 2025). The study identified the data and IT architecture underpinning road traffic management as an area requiring further attention. Later that year, Transport Analysis commissioned Trivector to undertake an interview-based study mapping Sweden's road traffic management systems and data flows.

The interview study identified a decentralised and, in several respects, fragmented system landscape. Responsibilities for data, system development and operations are distributed across different parts of the Swedish Transport Administration (Trafikverket) and, in some cases, other actors (Trivector, 2026). These findings raise questions about how policy and governance measures can best support a more data-driven and digitalised transport system.

To inform its continuing policy work, Transport Analysis commissioned Trivector to complement the Swedish study with an overview of arrangements in Finland, Norway and the Netherlands. This report examines selected approaches to transport data management and governance in Finland, Norway and the Netherlands, with the aim of identifying lessons relevant to road traffic management in Sweden.

Finland, and Fintraffic in particular, is examined as an example of a more centralised and data-oriented approach. Norway and the Netherlands broaden the basis for comparison. Rather than treating these cases as models for direct transfer to Sweden, the report uses them to explore alternative ways of allocating responsibilities and organising data governance.

1.2 Previous study

The previous study (Trivector, 2026) examined the systems and data flows supporting national road traffic management in Sweden. It drew mainly on interviews with Trafikverket employees and consultants familiar with the systems' architecture, operation and development, given the lack of existing documentation for desk research. Seven in-depth interviews were conducted and supplemented by shorter conversations with additional contacts.

Interviewees described road traffic management as functioning well operationally, supported by a system landscape that has evolved in response to changing needs and technology. A combination of procured and in-house systems and databases supports traffic management, facility monitoring, traffic data collection and traffic information. Although often described as a single system, the national traffic management system (NTS) comprises several subsystems,



rules and user interfaces. It also depends on underlying systems for data collection, quality assurance and storage, such as TDIS (TrafikDataInsamlingsSystem).

The study also examined the extent to which traffic management is data-driven. Interviewees described extensive use of data for situational awareness, incident management and follow-up, but also differences in data availability across the country. Sensor coverage was described as dense in Stockholm and Gothenburg, but more limited across much of the rest of Sweden. In areas with limited coverage, incident reports, including information from emergency services, play a more prominent role. Human involvement remains important in reporting information and acting on it. The study identified scope for greater automation, particularly in urban areas with extensive sensor coverage.

The study also examined how responsibility for digital transport infrastructure is organised within Trafikverket and in relation to municipalities, other public authorities and commercial actors. Trafikverket is the principal actor managing data for road traffic management. However, responsibilities for data, system development and operational use are distributed across different parts of the organisation and, in some cases, other actors.

The study described this decentralised arrangement as supporting flexibility, but also raised questions about standardisation, long-term planning and coordinated development across the system. A further question concerned Trafikverket's mandate to manage digital transport infrastructure, given the organisation's primary focus on physical infrastructure.

1.3 Method

This report draws on two primary methods. First, a review of existing documentation (reports, websites, presentations) from relevant national authorities, EU institutions and academic sources. Second, qualitative interviews conducted with senior practitioners in traffic management and mobility data governance. Interviews were semi-structured and focused on institutional design, data governance practices, public–private collaboration models and lessons for the Swedish context. Interview findings are integrated into the case study sections and are not cited individually in the text.

Analysis of what the findings mean for the Swedish policy context was done by Trivector.

The text has been written with support from Claude Sonnet 5 and Chat GPT 5.6 Sol models, both through team accounts. The models were used both in drafting text from interview notes and other sources as well as finding relevant written sources. Personal details were never shared with the model. All text has been edited and reviewed, and all sources have been reviewed by the author. All conclusions and recommendations are the author's own, and do not reflect the position of Trafikanalys.

2 Three approaches to transport data governance

The cases illustrate different ways of organising shared transport data functions. The comparison focuses on who is responsible for managing data, how this responsibility relates to operational activities, and how organisations work together to share and use data.

The cases differ in scope. Finland's Fintraffic combines traffic management and associated data functions across transport modes. The Dutch case focuses on shared road traffic data through NDW, while the Norwegian case examines public transport data and digital services through Entur. The three organisations' main organisational features are described in the table below.

Table 1 Main organisational features of the three cases

Dimension	Finland: Fintraffic	Netherlands: NDW	Norway: Entur
Background and organisational approach	Previously separate traffic management functions were brought together in a state-owned company covering road, rail, maritime and aviation.	Public authorities established a jointly governed shared-service organisation to coordinate road traffic data across national, regional and local government.	Railway reform separated digital infrastructure from the incumbent operator, creating a state-owned company intended to provide neutral services across competing operators.
Relationship to operations	Traffic management and data functions sit within the same company, separate from physical infrastructure ownership.	Road authorities retain operational traffic management. NDW collects, standardises and redistributes data from their systems.	Transport operators continue to run services. Entur manages shared data and digital services supporting journey planning and ticketing.
Data ecosystem & collaboration	A dedicated coordination function and common participation rules bring together public and private organisations. Fintraffic also supports the joint development of data-based applications.	Participating authorities contribute data and gain access to shared processing, quality assurance and distribution services. Data is also made available to commercial and other users.	Shared services connect operators, public transport authorities and data users. Entur also provides the secretariat for TDS, a cross-sector transport data initiative intended to support wider data sharing and reuse.

These arrangements provide different starting points for examining data governance: combining traffic operations and data functions, coordinating data across independent road authorities, and providing shared digital services outside transport operators. The following case profiles explain the background and practical workings of each approach. Chapter 3 considers their implications for road traffic management and data governance in Sweden.

2.1 Finland: combining traffic operations and data ecosystem coordination

2.1.1 Background and responsibilities

Fintraffic was established in 2019 as a state-owned company bringing together traffic management functions for road, rail, maritime and aviation. These functions had previously developed separate systems, sensors and reporting arrangements, with little shared digital infrastructure. Bringing them together provided a basis for developing common approaches to data management across transport modes. The account provided for this study describes this as a shift towards treating data as a strategic asset, rather than primarily as a by-product of traffic operations.

Fintraffic combines three functions: traffic operations, data stewardship and coordination of the wider traffic data ecosystem. These responsibilities are separate from physical transport infrastructure ownership. For the national road network, the Finnish Transport Infrastructure Agency (Väylävirasto) owns and maintains infrastructure and procures traffic management services from Fintraffic. Municipalities manage urban streets and have more limited involvement in Fintraffic's operations, although include cooperation in areas such as tunnel management. An overview of the interconnections between different actors is given in the figure below.

The company is wholly owned by the Finnish state and operates under ownership steering from the Ministry of Transport and Communications. Its objectives cover traffic safety, smooth traffic flow, environmental sustainability and economic value for Finnish society and businesses. Although Fintraffic is expected to generate a profit, financial performance is considered alongside these wider public objectives. The organisational model therefore combines a corporate structure with a public-policy remit.

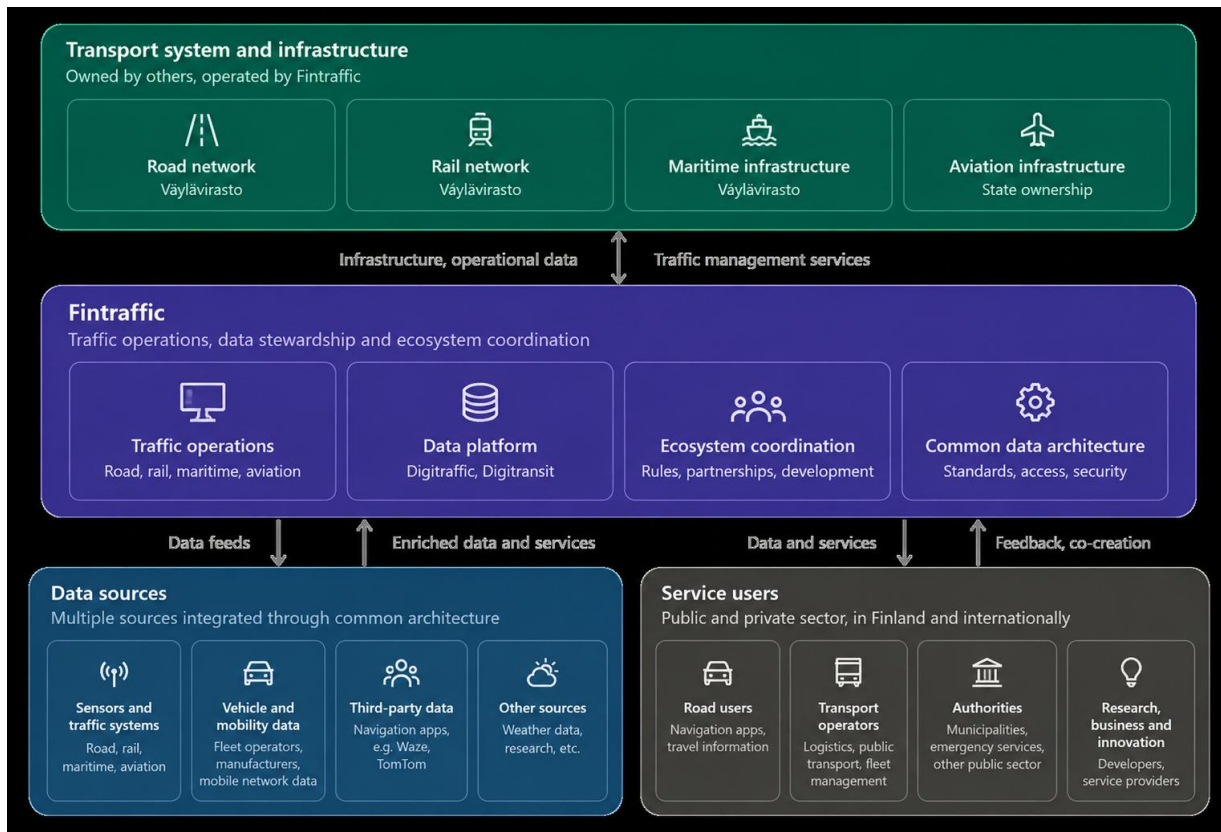


Figure 1 Overview of Fintraffic's central role in road traffic management.

2.1.2 Data platform and open ecosystem

Fintraffic functions both as a traffic operator and as a national transport data platform. Its architecture can be understood in several layers: a data layer covering sensors, connected devices, operational feeds and external data sources; a platform layer including Digitraffic, the National Access Point and traffic management systems; an interoperability layer based on common standards and APIs; an access and security layer; and a development and application layer covering developer services, testing environments, analytics tools and digital twin applications. This final layer supports the testing and introduction of new data sources, standards and services rather than constituting a separate “innovation” function, and is called the “innovation layer”.

The two principal user-facing platforms are Digitraffic and Digitransit. Digitraffic provides APIs for road conditions, weather, traffic flows and other transport information, while Digitransit supports multimodal journey planning. Fintraffic also has a wider role in establishing common rules for data architecture, access and exchange across transport modes.

A separate Digital Ecosystem Services function coordinates collaboration between public authorities, operators, technology companies, logistics firms and research organisations. This includes common participation arrangements through the Traffic Data Ecosystem Rulebook, as well as working groups addressing issues such as data quality, standards, business models and new applications.

An important part of this role is providing a structured route from an identified need or proposed change to operational implementation. New requirements may arise from changes in technical standards, the availability of new data sources, new participating actors or identified service needs. These can be scoped and tested through pilots, often in relatively short iterative cycles, before successful solutions are transferred into wider implementation or regular operations. This gives a repeatable route from idea to service: idea generation, scoping, pilot design, short implementation cycles and either scale-up or documented learning.

Examples include work on winter road safety, where weather, road-sensor and vehicle data were combined to develop predictive warnings that subsequently became continuing data flows used by navigation and fleet-service providers. The significance of such examples is less that they represent “innovation” in themselves than that Fintraffic has an organisational mechanism for testing changes and, where useful, moving them into normal service provision.

2.1.3 Data flows and practical applications

Fintraffic brings together data from its own monitoring infrastructure and external sources. Road sensors, cameras, weather stations and tunnel systems supply operational information. Commercial and third-party sources supplement this with vehicle data, mobile network positioning data and crowdsourced incident reports. Its relationship with Waze, for example, involves both supplying traffic information and receiving incident reports. Common data architecture rules provide a basis for integrating information across transport modes.

Data is made available for wider use through platforms including Digitraffic and Digitransit. Digitraffic provides interfaces to road conditions, weather, traffic flows and other transport information. Digitransit supports multimodal journey planning using public transport schedules, real-time vehicle positions, and walking and cycling routes. These services connect data provision to applications used outside Fintraffic’s own traffic management operations.

Winter road safety illustrates how this can work in practice. An application combines weather information, road sensor data and vehicle data to generate predictive safety warnings. This developed into continuing data flows used by navigation and fleet companies. The example shows how data collected for different purposes can be combined to support a service beyond the organisations that originally produced it.

2.1.4 Traffic operations and working methods

Fintraffic’s road traffic management division operates around the clock on the national road network. Its responsibilities include variable speed limits, traffic signals, tunnel and open-road control systems, road weather services, traffic measurement and incident coordination. These activities both use and generate data: weather observations support warnings and speed-limit decisions, while traffic measurements and incident reports contribute to information distributed to other users.

There is substantial automation of reporting and traffic information production. Information from the field enters ticketing systems and can be processed, classified and disseminated without manual intervention at every stage. Operational decision-making still relies on people: AI supports decisions and drafts announcements, while final operational decisions remain under human oversight. Applications described for the study include weather-related incident prediction and analysis of roadside camera images.

The interview account also emphasises recruitment of staff with IT and digital innovation backgrounds, including private-sector experience. This provides an example of the capabilities associated with Fintraffic's digital remit. It does not, by itself, establish that the corporate structure is necessary for developing those capabilities elsewhere.

2.1.5 Contribution to the comparison

The Finnish case combines two distinct choices: traffic operations and associated data functions in one corporate structure, separate from physical infrastructure ownership, and an explicit coordination function supporting a wider data ecosystem. For Sweden, it raises questions about the organisational home of data responsibilities and the resources needed for collaboration and practical use; common architecture, access arrangements and ecosystem coordination matter in their own right, not simply as by-products of creating a state-owned company.

Sources and further detail: *The case draws on an online interview with Fintraffic representatives, its corporate presentation (2025), its website and further reading provided for the study. It primarily reflects the perspectives of Fintraffic and its representatives, rather than an independent assessment of effectiveness. A fuller account of the organisational arrangements, platforms, ecosystem governance and operational activities is provided in the separate supporting document, Finland: In-depth case study of Fintraffic.*

2.2 The Netherlands: shared data services across road authorities

2.2.1 Background and responsibilities

Responsibility for road traffic management in the Netherlands is distributed between Rijkswaterstaat, provincial authorities and municipalities. In a dense and heavily used road network, traffic information needs to work across these administrative boundaries. National Database for Road Traffic Data (Nationale Databank Wegverkeersgegevens, NDW) provides a common data function while operational responsibility remains with the individual road authorities.

NDW developed as a public-sector collaboration to collect, process, validate, store and redistribute road traffic data. Its governance brings together national, provincial and municipal interests. NDW provides shared services through which authorities contribute data

and access information covering a wider network than the roads they manage themselves, while road infrastructure and traffic management centres stay with the individual authorities.

Rijkswaterstaat remains responsible for traffic management on the national motorway network, including through its national traffic centre, Verkeerscentrum Nederland (VCNL). It also operates a substantial part of the sensing infrastructure that supplies traffic data. Provincial and municipal authorities manage their own networks and traffic systems. NDW therefore coordinates data from organisations that retain both their operational responsibilities and much of the underlying technical infrastructure. Overview of the system is given in the figure below.

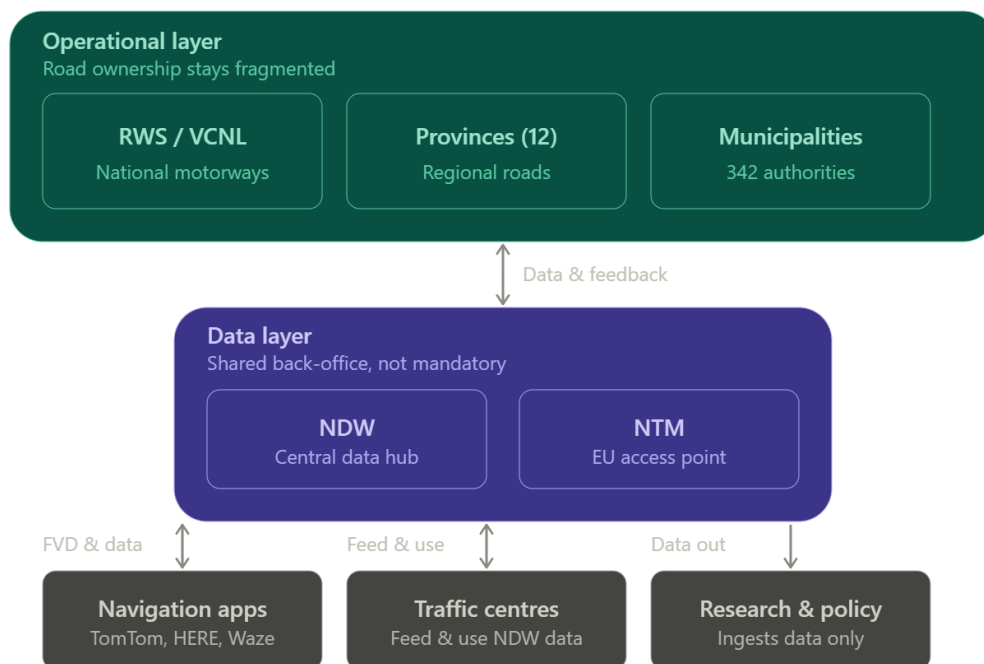


Figure 2 Schematic overview of how road traffic data is managed in the Netherlands.

2.2.2 Data ecosystem and collaboration

Participation is organised through agreements with road authorities. Authorities contribute data from their networks and gain access to a national dataset, together with shared processing, quality assurance and distribution services. Cost sharing gives smaller authorities access to services that would be difficult to fund individually. Larger contributors benefit from wider geographical coverage and consistent formats across neighbouring networks.

The ecosystem also includes commercial data suppliers and users. Vehicle-based data from navigation and fleet providers supplements roadside measurements. Navigation companies, logistics operators and other service providers use the resulting information, alongside traffic management centres, planners and researchers. Public-private collaboration therefore involves both contributions to the data supply and the development of services using that data.

This arrangement connects public-sector data management to wider use without transferring traffic control to the data organisation. Its practical value depends on participating authorities continuing to supply usable data and being able to use the shared services in their own work.

2.2.3 Data flows and practical applications

NDW brings together measurements from sources such as loop detectors, radar, roadside cameras and vehicle-based data. Incoming data undergoes automated quality checks, combination of information from different sources and conversion into standardised formats.

Outputs include speeds, traffic flows, travel times, incidents and roadworks, as well as historical datasets for planning and research. Data is distributed through interfaces including DATEX II, the European standard for traffic data exchange.

However, not all data is first processed by NDW. VCNL checks and supplements traffic data and publishes traffic information through Rijkswaterstaat's own channels before sharing it with NDW. Production of the static national road network dataset, NWB, also remains with Rijkswaterstaat. Shared data governance here means common standards and distribution across authorities, with data production still spread across several organisations and platforms.

Roadworks information provides a practical example. Road authorities register planned works, and NDW distributes the information to navigation services, logistics operators and traffic centres. Bringing these records together makes it possible to view planned disruptions across authority boundaries. The authority responsible for the works remains the source of the information, while a common distribution service makes it available for wider use.

The arrangements also include NTM (Nationaal Toegangspunt Mobiliteitsdata), the national registration and access-point function for mobility data associated with NDW. This connects the management of road traffic data with the arrangements for making regulated mobility data accessible.

2.2.4 Data quality and continuing coordination

Data quality needs continuous attention even with a common platform in place. Sensor coverage is denser on motorways than on much of the provincial and municipal network. Differences in equipment age, maintenance and technical systems also affect the information available.

NDW checks completeness, plausibility and timeliness, detects possible equipment faults and reports these back to the responsible authorities. Quality indicators and availability information help users identify limitations and gaps. This links central quality assurance to follow-up by the organisations responsible for producing the data. A shared service can identify and communicate problems, but the condition of the underlying equipment and the quality of contributions remain important dependencies.

2.2.5 Contribution to the comparison

The Dutch case shows coordination of road traffic data without consolidating operational traffic management: a shared organisation provides common data services across several levels of government while road authorities keep running their own networks and systems. For Sweden, it raises how shared data functions can serve both national and municipal needs, how contributing authorities take part in governance, how data-quality responsibilities hold across boundaries, and the difference between shared access to data and shared production of it.

Sources and further detail: *The case draws primarily on NDW's annual report and platform documentation (2024), the NDW and Rijkswaterstaat websites, and supporting material from TISA and CROW. No in-depth interviews were conducted. Further detail on organisational responsibilities, data flows, quality assurance and services is provided in the separate supporting document, The Netherlands: In-depth case study of NDW.*

2.3 Norway: neutral digital infrastructure for public transport

2.3.1 Background and responsibilities

Entur is a state-owned company providing shared digital infrastructure for public transport in Norway. Its services cover journey planning, ticketing and the data needed to connect bus, rail, ferry, metro and tram services. Entur's remit is limited to these shared digital functions; transport services and road traffic management sit with other organisations. The Norwegian case therefore concerns the organisation of shared data functions rather than operational road traffic management.

Entur emerged from railway reform, when digital infrastructure and ticketing functions were separated from the incumbent operator, NSB. The intention was to provide services on neutral terms across competing operators. Placing these functions in a separate company gave them a sector-wide remit rather than leaving them within one operator.

The Ministry of Transport exercises ownership steering, while Jernbanedirektoratet, the Norwegian Railway Directorate, coordinates rail-sector planning and purchases services from Entur. Transport operators and public transport authorities retain responsibility for service delivery. This distinguishes policy and sector coordination from shared digital services and day-to-day transport operations.

2.3.2 Data ecosystem and collaboration

Operators and public transport authorities supply information about stops, routes, timetables, vehicle positions and ticket products. Entur collects, structures, quality-assures and distributes data for use in journey planners, ticketing systems and other digital services. Contributors can also use the common services in their own applications, so the shared infrastructure supports more than Entur's own app.

The ecosystem connects a public-purpose digital service provider with organisations that retain their own systems, commercial interests and customer relationships. Entur's neutrality is therefore both an organisational requirement and a practical coordination issue. Its ability to provide comprehensive services depends on contributors supplying usable information and making relevant ticket products available.

2.3.3 Data flows and practical applications

Static data provides the foundation: the National Stop Place Registry and route database describe stops, interchanges, routes and timetables. Dynamic information adds vehicle positions, delays and disruptions. Real-time coverage varies between operators and regions. These layers are interdependent: a delay needs to be linked to the correct service and stop before a journey planner can use it.

Route data submission and ticketing participation are distinct arrangements. The Auditor General's 2024 review described mandatory route-data reporting, while access to ticket products depended on the obligations and agreements applying to different operators. Having timetable information therefore did not necessarily mean that Entur could show a fare or sell a ticket for every journey (Riksrevisjonen, 2024).

Journey planning illustrates the practical purpose of the shared data. A search combining a train and a connecting bus can bring together information from separate operators. Updates can then be associated with the planned journey. The operators continue to run their services, while the common data infrastructure makes information usable across organisational boundaries.

2.3.4 Wider coordination through TDS

Entur also provides the secretariat for Tverrsektorielt datasamarbeid (TDS), a cross-sector transport data collaboration involving national organisations responsible for roads, rail, aviation and coastal transport. TDS aims to reduce barriers to sharing and reusing data for analysis, planning, traffic management and traveller information, without merging the participating organisations.

The Ministry's instruction letter for 2026 calls for closer integration of TDS and Entur's data and analytics environment (Samferdselsdepartementet, 2025). This sets a direction of travel: today TDS and Entur's data environment remain separate, and Entur's established public transport services have a different scope from the wider coordination role.

2.3.5 Participation, neutrality and data quality

The 2024 audit found weaknesses in Entur's national app, including low awareness and use, missing ticket and price information, and search results that favoured rail over bus. Operators also sought greater transparency over expenditure. At the same time, the audit recognised the value of Entur's collection and sharing of travel data (Riksrevisjonen, 2024).

These findings concerned the period 2016-2023 and should not be read as a current assessment of every Entur service. They illustrate why a neutrality requirement and a



common platform are not sufficient on their own: data completeness, incentives, transparent working relationships and the treatment of competing travel options also matter.

2.3.6 Contribution to the comparison

The Norwegian case shows a dedicated digital infrastructure function outside transport operators, supported by shared data and services, with TDS adding wider coordination without moving operational responsibility to Entur. For Sweden, it raises the organisational home of common data services (and on what level), how neutrality is maintained, how responsibilities and incentives sustain participation, and the difference between mandatory data reporting and the arrangements needed for usable services.

Sources and further detail: *The case draws on desk research, principally Entur's service documentation, the Ministry of Transport's instruction letter for 2026, dated 19 December 2025, and Riksrevisjonen's 2024 review. No in-depth interviews were conducted. Further detail on governance, data flows, participation, performance assessment and TDS is provided in the separate supporting document, Norway: In-depth case study of Entur and TDS.*

3 Analysis and implications for Sweden

A common pattern can be identified across the cases studies, despite their differing institutional origins and organisational forms. In all three cases, shared data and digital functions have been given an organisational home, differentiated from the management of physical infrastructure or individual operational services. The boundary is drawn differently, but functions such as shared data platforms, common standards, data quality, interfaces and wider data sharing are clearly delineated as functions in their own right within a dedicated organisational entity, rather than as supporting elements within individual operational systems.

A second common feature is that these arrangements create room for working methods suited to digital infrastructure. Although this is perhaps an obvious point, the needs and working methods for managing digital infrastructure are considerably different to those for managing physical infrastructure. For example, digital systems need to adapt continuously as standards, data sources, interfaces and user needs change. For digital infrastructure management, this requires collaboration with other public authorities, technology providers, operators, researchers and service users. It also usually requires any changes to be tested on a limited scale before being incorporated into regular services. The role therefore goes beyond maintaining technical platforms. It also means managing their continued development and adaptation, which depends on having the right people and skills and being able to respond to change quickly.

Table 2 Overview of the different structure seen in case studies

Aspect	Finland – Fintraffic	Netherlands – NDW	Norway – Entur / TDS
What is separated?	Physical infrastructure ownership is separated from traffic operations and associated digital/data functions.	Shared road-data functions are separated from road ownership and operational traffic management.	Shared digital infrastructure is separated from transport operators and operational service delivery.
Organisational home of the digital/data function	State-owned company combining traffic operations, data stewardship and ecosystem coordination.	Public shared-service organisation jointly governed by road authorities.	State-owned company providing neutral digital infrastructure; TDS adds wider cross-sector coordination.
Relationship to operations	Closely linked: Fintraffic also performs traffic operations.	Separate: road authorities retain all operational responsibility.	Separate: Entur does not operate transport services.
Core shared functions	Data platforms, shared architecture, access, data services and ecosystem coordination.	Collection, standardisation, quality assurance and distribution of road traffic data.	Shared public transport data, journey planning, ticketing and common digital services.
Relationship to the wider ecosystem	Active ecosystem coordination and co-development with public and private actors.	Primarily organised around collaboration between public road authorities, with data distributed to wider users.	Neutral services across operators; wider coordination being developed through TDS.
Managing development and change	Structured development with ecosystem participants, including pilots and transfer of successful solutions into regular services.	Shared development around common data needs, standards and quality across road authorities.	Common digital services developed across operators; TDS provides a forum for wider cross-sector coordination and reuse.

For the purposes of this report, these common functions can be described as the data layer: the platforms, architecture, standards, quality processes, interfaces and coordination arrangements that enable data to move between operational systems, organisations and

external users. By data layer the report means the functions that need to be managed across individual systems and applications, whether or not the data itself sits in one platform.

This distinction is relevant to Sweden. The previous Swedish study found that national road traffic management works well operationally, while also identifying questions concerning the long-term management of digital infrastructure, responsibility for shared data functions and the scope of Trafikverket's mandate as road traffic management becomes increasingly digital and data-dependent. The international cases therefore provide reference points for issues already being raised in Sweden.

3.1 A distinct organisational home for digital infrastructure

The clearest common finding from the international comparison is the organisational differentiation of the digital function for road traffic management.

In Finland, Fintraffic brings together traffic operations, data stewardship and ecosystem coordination across transport modes. Ownership of the physical infrastructure remains outside the company, principally with the Finnish Transport Infrastructure Agency and other infrastructure owners.

The Dutch model draws the boundary differently. Road ownership and operational traffic management remain distributed across national, provincial and municipal authorities. NDW does not assume these responsibilities. Instead, it provides a shared national function for collecting, standardising, quality-assuring and distributing road traffic data across those authorities.

Norway represents a third variant. Entur was established outside individual transport operators to provide shared digital services on neutral terms across the sector. It manages data, journey planning, ticketing infrastructure and related services, while transport operators remain responsible for service delivery. Through TDS, Norway is also exploring broader coordination across transport-sector organisations.

Despite institutional differences, the underlying principle is similar: digital functions are given a sufficiently distinct organisational home to support a clear mandate and sustained responsibility. This serves several purposes. It makes responsibilities easier to identify, provides a stronger mandate for common functions that cut across individual systems, and creates a basis for assigning appropriate skills and resources. It can also allow digital infrastructure to be developed and managed through working methods better suited to its characteristics than those traditionally used for physical infrastructure. At the same time, the digital function remains closely connected to the management of physical infrastructure and, in this case, to road traffic management.

Importantly, none of the cases suggests that a legally separate entity is necessary in itself. What matters is that the organisational boundary is sufficiently clear to support an explicit mandate, defined responsibilities and continuity over time.

The examples also reflect a broader institutional challenge. Transport organisations have historically been structured around physical infrastructure and service delivery, and are now

adapting as digital infrastructure becomes a larger and more consequential part of their remit. This challenge is visible across the international cases and was also evident in the Swedish study. The central question is how to make the digital function explicit within an institutional landscape originally organised around other responsibilities.

In Sweden, Trafikverket has developed primarily around the planning, construction, operation and maintenance of physical infrastructure. The interview study raised questions about where responsibility for digital transport infrastructure sits within this structure and what mandate accompanies it. Greater organisational differentiation could provide a way to clarify responsibility, mandate, resources and development processes, and thereby strengthen continuity between the development of digital services and their long-term management as infrastructure. It can be more difficult to change or adapt existing organisations, especially large (public sector) organisations – so a new organisational home might be the best way forward, provided that this is done through a transparent decision-making process.

3.2 The wider data ecosystem

Shared digital infrastructure for road traffic management depends on a wider ecosystem of organisations that produce, manage, exchange and use data. Floating car data illustrates this clearly: private navigation companies can be both consumers of public traffic data and providers of data to traffic management authorities. The relationship therefore goes beyond a conventional buyer–supplier contract. It requires coordination of data sharing, standards, quality, access and the value created for participating organisations.

This is most explicit in Finland, where Fintraffic has made ecosystem coordination a distinct organisational function. Public authorities, transport operators, technology companies, logistics firms and research organisations are brought together through common rules, working groups and joint development activities. This gives Fintraffic a role not only as an operator or purchaser of services, but also as an orchestrator of the relationships on which shared digital infrastructure depends.

The same relationships are present in the other cases, although they are organised less explicitly around an ecosystem function. NDW coordinates national, provincial and municipal road authorities around common data standards and services, while also interacting with navigation providers, researchers and other data users. In Norway, Entur depends on continuing cooperation with transport authorities and operators that provide and maintain data, while TDS seeks to strengthen coordination and reuse across a broader group of transport-sector organisations.

Across the cases, the implication is that shared digital infrastructure requires active management of relationships between actors with different responsibilities and incentives. Participation must also create practical value, whether through access to better data, common standards, shared services, reduced duplication or improved interfaces. This role differs from the well-established function of procuring and managing contractors: it involves maintaining an ecosystem in which several organisations both contribute to and depend on the shared infrastructure.

For Sweden, the implication is to consider what structure is needed to manage the ecosystem around shared digital infrastructure, how responsibility for maintaining and developing that ecosystem should be allocated over time, and how participation can continue to provide practical value for the actors involved.

3.3 How success is assessed

A basic problem arises in the shift from physical to digital infrastructure. Physical infrastructure investments can be weighed using established appraisal methods, whereas there is no equivalent framework for digital infrastructure within the transport context. This makes digital infrastructure hard to compare with other investment needs and weakens its position in prioritisation and resource allocation. The Swedish study reflects this same tension, leaving open where responsibility for digital infrastructure should sit and how its value should be weighed against other needs.

The international cases suggest that this problem could be framed differently. They do not primarily evaluate whether the underlying digital infrastructure should exist. Rather, it is treated as a necessary enabling function, much as certain elements of physical infrastructure are regarded as prerequisites for the transport system to operate. Evaluation is instead directed towards how well that infrastructure is used and what benefits the services built on it generate.

This is reflected in the measures used in the case studies. Fintraffic combines measures of platform performance, such as availability, data quality and use, with broader measures linked to safety, traffic flow, sustainability and economic value. NDW focuses on whether the shared data environment is sufficiently complete, timely and reliable to support operational and downstream services. Entur places greater emphasis on service performance, including reliability, usage, customer satisfaction and ticketing outcomes. In each case, the focus is less on demonstrating the value of the digital infrastructure as an asset in itself and more on whether the services it enables perform well and create value.

For Sweden, this implies two things. First, digital infrastructure should be recognised as a necessary part of the transport system and given a clear basis for long-term resource allocation, rather than being repeatedly justified as an investment in itself. Second, the use of those resources should be assessed through the performance, uptake and wider benefits of the services the infrastructure enables. The international cases also provide practical starting points for this. Measures of availability, data quality, reliability, use, user satisfaction and broader service outcomes could be adapted to the Swedish context.

3.4 Governance options for Sweden

Taken together, the international case studies and the previous Swedish study point to a broader governance question: how should road traffic management adapt as digital infrastructure, shared data and new stakeholder relationships become a larger part of an organisation historically developed around physical infrastructure?

Operational traffic management in Sweden functions well, and the issue is therefore not one of replacing the existing model. Rather, the findings suggest that some elements of governance need to evolve as digital functions become more important. Any change should be rooted in Swedish conditions, including Trafikverket's existing responsibilities, legacy systems, organisational structures and relationships with other public and private actors.

The international cases do not provide a single model that can simply be transferred to Sweden. Each arrangement has emerged from its own institutional context. Finland and Norway provide relevant reference points in terms of public-sector culture and institutional traditions, while the Netherlands may in some respects offer a closer organisational comparison, with shared digital and data functions operating alongside existing road authorities and traffic-management responsibilities.

The cases point to a consistent underlying principle. Shared digital infrastructure benefits from having a distinct organisational home with a clear mandate, dedicated resources and long-term responsibility, although the precise form can vary.

For Sweden, this suggests that some form of distinct organisational entity or function should be considered for shared digital infrastructure in road traffic management. Such a function would need a defined scope, a clear mandate to work across organisational boundaries, and a sufficiently stable budget to support both operation and continued development. Its purpose would not be to separate digital infrastructure from traffic management, but to ensure that common digital capabilities receive the continuity, competence and management attention required over time.

A second implication concerns the wider ecosystem. The international cases show that shared digital infrastructure increasingly depends on relationships with municipalities, transport operators, navigation providers, technology companies, research organisations and other actors. These relationships cannot be managed only through conventional procurement and contracting. They require active coordination of standards, data quality, interfaces, access arrangements, responsibilities and incentives. Finland demonstrates this most explicitly through a dedicated ecosystem coordination function, while similar coordination needs are visible in the Dutch and Norwegian cases. For Sweden, ecosystem management should therefore be treated as a defined governance responsibility rather than as an informal or project-based activity.

A third implication concerns how success is assessed. The Swedish study highlighted the lack of established appraisal methods for digital infrastructure, which makes prioritisation and resource allocation more difficult. The international cases suggest a different approach from that used for physical infrastructure. The digital infrastructure itself is generally treated as a necessary enabling capability, while evaluation focuses on how effectively it is used and what value the services built on it generate.

The international cases suggest that the main issue is not which model Sweden should copy, but whether shared digital infrastructure has sufficiently clear responsibility, authority and continuity. The next step is therefore to define an arrangement that gives these functions a stable organisational basis within Swedish conditions.





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