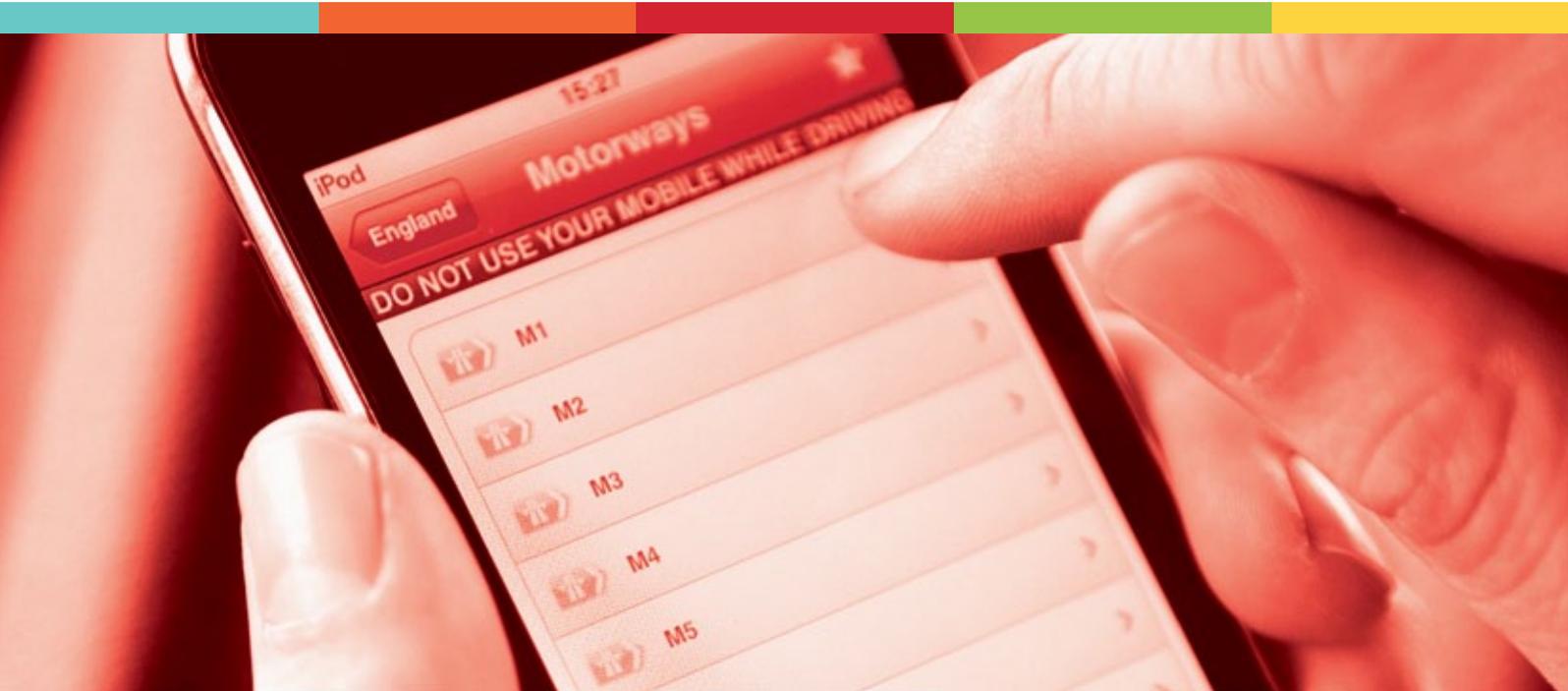




Transport
Innovation
Deployment
for Europe



GUIDELINES FOR IMPLEMENTERS

**Open access data for applications–based
traveller information**

TIDE is a Coordination Action funded by the European Commission's DG Research and Innovation under the 7th Framework Programme for Research and Development.

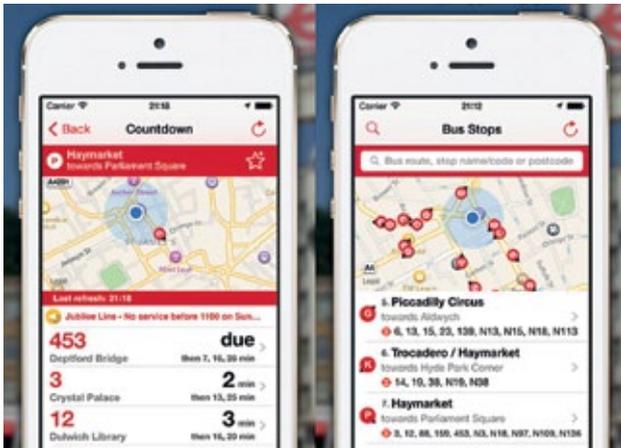


What is it about?

Characteristics

Multi-modal traveller information for road transport is generated from a wide range of data sources including those related to: congestion, car park occupancy, incidents, road works, CCTV images, variable message sign messages and real time public transport information. The provision of open access data allows any third party to freely use such data to provide traveller information services for a variety of user groups.

Open data involves management and manipulation of the various data sources in order to provide information to the open access server that is relevant to third party applications and web developers. This approach enables the private sector to deliver more and better travel information addressing the needs of different groups of people. This, in turn, allows travellers to make more informed decisions and should encourage the choice of more sustainable modes of travel.



Bus iPhone apps in London

Source: <https://itunes.apple.com/gb/app/london-bus-live-countdown/id475360935?mt=8>

Transport for London

Transport for London (TfL) have opened up their public transport data sources to the public. The aspiration is “to publish TfL data in a format which maximises its accessibility and usefulness to developer partners, wherever legally, commercially and technically possible” (TfL, 2012). This has enabled third party mobile application developers to use the data to provide a variety of real time traveller information apps for the bus, rail and underground services in London as well as information on travel modes such as walking and cycling. In 2012, there were around 41 users signed up for the continuous live stream of real time data and some 35 good quality third party apps using the data. In addition there were around 650 subscribers to the non-streaming data.

Key benefits

Open access data for traveller information:

- stimulates the private sector app developers to innovate and provide apps addressing the needs of various users;
- provides an option to disseminate multi-modal traveller information in a cost-effective way;
- allows travellers to make more informed decisions and could encourage the choice of more sustainable modes of travel.

Check list for providing Open Data

City size	No restrictions
Costs	<ul style="list-style-type: none"> • Modest capital investment needed to set up. • Support costs typical of other data management applications.
Implementation time	Planning of scheme and preparation of materials within a few months.
Stakeholders involved	<ul style="list-style-type: none"> • Local authorities. • Transport managers. • Apps developers. • General public.
Undesirable secondary effects	Possible apps contrary to local authorities policy (e.g. favouring use of the private car over public transport).
Crucial factors	<ul style="list-style-type: none"> • Commitment for open data server provision. • Clear policy about the provision and use of data. • Cost effectiveness. • Enthusiastic application developers. • Apps users.

“In Toronto, we are enthusiastic and passionate about our Open Data program. We heard early on that the Open Data process would be messy but we didn’t let that scare us. Instead, we recognized that so many things come into play we should just get started. That actually freed us to release all the data we could release quickly. In essence, we got moving and started the process. Really, continuous forward movement and networking with everyone is the best way to make sure the process happens.”

Keith McDonald,
Web Communications,
Coordinator Open Data,
City of Toronto, Canada

“Our desire in opening up our data is to empower organisations that rely on our transport network to have access to information that can be passed on (by them) to their customers, staff and business partners. By enabling individual organisations to create their own travel service by using our data, their needs will be better met and their own community and business needs served.”

Simon Beasley,
Network Manager,
Reading City Council,
UK



An example of iPhone apps in Toronto

Source: www.rocketradar.net/ and www.avisinna.com/rocketman.html

Benefits & Costs

Benefits

Open access data for traveller information:

- stimulates the private sector app developers to innovate and provide apps according to user needs;
- provides an option to disseminate multi-modal traveller information to a wider range of users in a cost-effective way;
- allows travellers to make more informed decisions and could encourage the choice of more sustainable modes of travel;
- avoids apps developers needing to apply (and pay) for data to create applications.

In addition to these direct benefits, the increased use of public transport:

- supports sustainable urban transport policies including environmental policies (with reduced emissions) and reduces congestion in urban areas;
- provides social benefits to captive public transport.

Costs

Provided the various sources of traffic information already exist, the main cost relates to the provision of a server, software for the management of data in the open access data server and some operational costs. Overall, these costs are much lower than those involved in obtaining the data in the first place.

A server is needed to store the data openly accessible to third parties. The capacity of the server depends on the amount of data provided.

Software is needed to manage the data in the server and enable its access by the third parties.

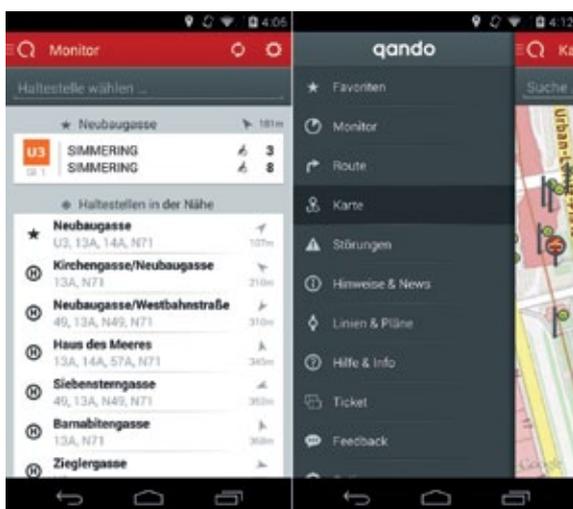
Apart from these capital costs at the beginning, open data servers also carry a regular maintenance cost to maintain the benefits achievable from the measure.

Vienna, Austria

Vienna have developed a multimodal journey planning and route guidance mobile phone application through the INTIME project (INTIME, 2013) which includes real time public transport, bike, walking and vehicular information.

With multi-modal information at one source, the user gets accurate door-to-door information on the current travel times within the city, including alternative routes and alternative modes to be used.

In addition to the real-time information, it provides ticketing possibilities as well as showing the current location of the user and all points of interest, restaurants and businesses in the immediate vicinity. In the longer run, it is expected to deliver the service according to the needs of the individual consumer (e.g. adaption for elderly and disabled people etc.).



Screenshots of Qando apps in Vienna

Source: play.google.com/store/apps/details?id=com.fluidtime.qando

Users & Stakeholders

Users and target groups

The main users and target groups for open data access and associated apps are public transport passengers, other road users and apps developers.

Public transport passengers: public transport passengers are an end-user of the system. Improved real time information of the public transport could improve their travel choice, reduce their waiting time and hence improve user satisfaction.

Apps developers: they are stakeholders as well as 'users'. They use the data in the open access server to develop apps.

Key stakeholders for implementation

The successful outcome from this measure is influenced by the active involvement of different stakeholders including: local authorities; public transport operators; technology suppliers; and apps developers.

Local authorities: the local authority is usually a main stakeholder for this measure, being often a main data provider and hence needs to consider costs and benefits of the measure.

Public transport operators: public transport operators are another key stakeholder. Their active participation in providing information is very important. The extent and importance of their involvement may depend on the way public transport is organised in the city (e.g. whether it is public/private, regulated/de-regulated).

Technology suppliers: these are the contractors providing whole or part of the system (including supply, installation and testing).

Apps developers: they play the key role in utilising the data available in the open access server and developing apps which travellers use. Without their active participation in development of apps, the measure will not be successful.

Reading, UK

The Urban Traffic Management and Control (UTMC) system applied in Reading draws on all available datasets including road detector data, Automatic Number Plate Recognition (ANPR) and bus Automatic Vehicle Location (AVL) data to present the data in a combined way to enable efficient delivery of information to their website, variable messages signs etc. As a UTMC development authority, Reading were at the forefront of using UTMC to deliver information to travellers and Reading is currently actively involved in the delivery of an open access data server.

Assessing the potential for your city

Is this something for us?

The aim of this measure is to provide useful traffic data in a city to an open access server that allows any third party to use such data freely to provide traveller information services for a variety of user groups.

For implementation, a city could take one of three different approaches:

- provide 'raw' traffic/transport data collected automatically for various purposes, so that a third party could develop apps to make better use of this data;
- provide information based on data processed and fused from different sources. This is more complex and costlier than just providing 'raw' data;
- provide the final product (e.g. the app itself). This is the most expensive approach for the city (due to the cost of the data fusion and the apps development) but enables the city to retain full control over the data and the tool/app.

The authority needs to consider how to provide data, and the cost and level of the authority's control of the data/information provided is dependent on the approach chosen.

Pre-assessing the costs and benefits

The cost of implementing open access is relatively small in comparison to the cost of the systems providing the data (e.g. Urban Traffic Control (UTC) system, Real Time Passenger Information (RTPI) system). Costs depend on the level of data processing and 'apps' development undertaken by the city.

The benefits from this measure includes: wider dissemination of traffic/travel information with potential to address specific user needs (e.g. elderly and disabled). This should lead to more informed and better travel choices, including modal change to public transport. A combination of qualitative and quantitative analysis is therefore required when assessing likely benefits.



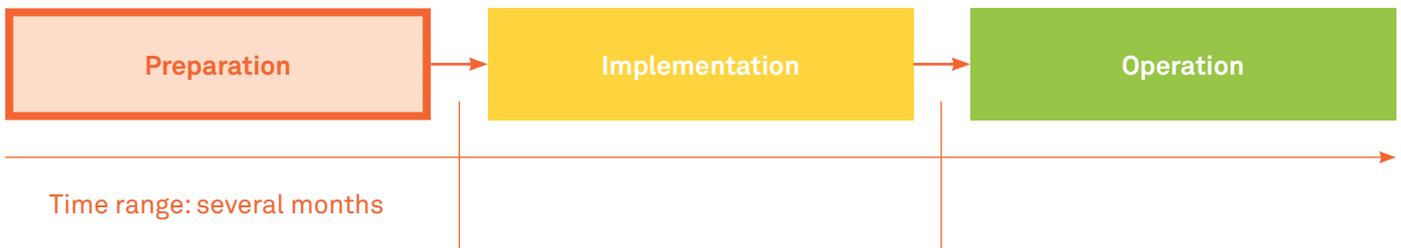
Examples of third party iPhone apps

Source: www.rocketradar.net and www.avisinna.com/rocketman.html



From plan to reality

Preparation



In the preparation phase, it is necessary to carry out activities that help to create the right pre-conditions and involve the necessary stakeholders for putting the measure successfully into practice. This ranges from the analysis of context conditions, building up stakeholder networks, integration of the measure in existing structures, creation of necessary infrastructures that the measure relies on, etc.

Key aspects at this stage

Context conditions

Context conditions of the city need to be considered, including city size, multi-modal provision, existing reliability and quality of data and services; future aspiration; identification of users and stakeholders; and identification of their needs.

Stakeholder interactions

In this phase, interaction with stakeholders is very important to identify the issues so that these could be addressed during the implementation and operation phases. The interaction will also help identify available technology to support such measures.

Identification of issues

These need to be clarified at this stage. For example, the issue of privacy should be addressed for a successful implementation of an open data project. In Toronto, the issue was discussed with the user groups and has not proved to be a barrier for implementation.

Data availability

It is necessary to identify the data available for an open access data server at this preparation stage. Consideration should be given to the usability of the data and the amount of processing as well as the format in which it could be released.

Budget needs to be considered at this stage. Even though the cost is not likely to be significant compared to the systems providing data, the budget will shape the whole implementation process.

Policy context

This measure is mostly driven by the demand for data from the private sector and open data policy of the implementing authority. The economic justification can be difficult to quantify for this measure. Hence, adoption of an open data policy at this stage can itself justify implementation.

Ready for implementation?	✓
Context conditions	
Stakeholder interactions	
Identification of issues	
Data availability	
Budget	
Policy context	

Success factors and barriers at this stage

Success factors

- Open data policy.
- Availability of robust and reliable data.
- Demand for information apps.

Barriers

- Unwillingness to give up data for free (or at all).
- Open data/apps counter to local government policy.
- Low demand.

Full open data provision depends on the willingness of the various data ‘owners’ to offer their data to the platform without charge. This could be a barrier if, for example, a public transport operator was unwilling to offer ‘his’ bus-related data for whatever reason. This needs to be considered on a situation/country-specific basis. Positive engagement with transport operators and third party operators could help address such a barrier.

If apps are developed by a third party, the possibility should be recognised that an app could be counter to local government policy (e.g. encouraging more car travel instead of buses). However, London and Toronto have not experienced such an issue.

Toronto, Canada

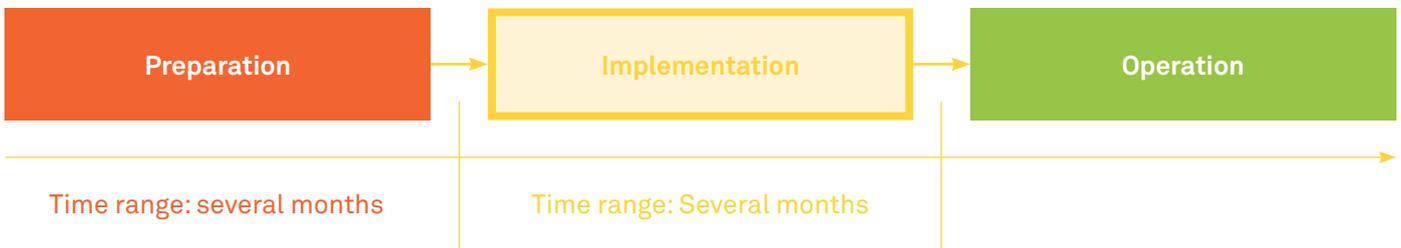
The City of Toronto is the cultural, entertainment and financial capital of Canada. Toronto was an early adopter of open data and launched an open data website in 2009. The initiative was bolstered by the city’s belief that open data is an underpinning of open government and supports accountability, accessibility, transparency and participation.

By offering unfiltered access to its information, the City anticipated that people will use the data and create their own uses and applications. The city is working towards releasing everything that is legally possible and increasing raw data with tools so citizens who may not be developers can also use the raw data — in visualizations etc. Developers are encouraged to use and re-use the datasets available under ‘Open Data Licence for City of Toronto’, freely and flexibly.

Various data (including traffic data) available to the public via www.toronto.ca open include address points, bikeways and stations, neighbourhood planning areas, Toronto’s attractions & places of interest, regional municipal boundary, Toronto Centreline (streets, waterways, rivers, railways, highways). Some of the datasets are self-updating depending on the available data but most require manual refresh. Depending on the type, the data is available in different file formats including shapefiles, csv, excel, xml.

From plan to reality

Implementation



As a measure takes shape in the field in this phase, a range of activities take place. For the success of the measure, it is necessary to involve stakeholders, ensure good quality of the data and address user needs.

Key aspects at this stage

Stakeholders involvement

It is a critical phase in which stakeholders need to be involved to make the implementation phase a success. The data content needs to match the implementing authority's aims and data format needs to match the apps developers' expectation.

Willing apps developers are critical stakeholders for effective implementation — so positive engagement with app developers to encourage them to take-up the data available is often necessary.

Integration with wider policy initiatives

Open access data could be used to provide information on different aspects of transport. For example, it could be used to provide environmental information in an area to influence the decision of the user in a positive way.

Data quality

The data available in the open access data server needs to be of good quality and needs to come from a reliable source to convince developers to spend their resources to develop apps. Without the certainty of good quality data, apps may not be developed and the data in an open server may then not be fully used.

Address user needs

The main aim of open access data is to provide traveler information to the wider community by addressing their user needs. These needs often vary according to different user categories. For example, the needs of older and disabled people will be different in terms of the content and the presentation of the information.

Supplementary data

In addition to traffic information, it is useful to provide supplementary information such as seating facilities, toilets, restaurants, tourist attractions, etc. Such information could increase the usage of the traffic data in an integrated way.

Success factors and barriers at this stage:

Success factors

- Availability of robust and reliable data.
- Positive engagement with app developers.

Barriers

- Unwillingness to give up data for free (or at all).
- Low uptake by third party app developers and users.

This measure is mostly driven by the demand for traveller information which encourages private parties to develop apps using the information in the open data server. The demand is influenced by the size of the city and its transport network as well as the quality of the data.

Low demand for apps (due to city size or small user group) may not lead private parties to develop apps. Such a barrier could be addressed with limited funding from the authority, and competition or challenge funding could be provided to ‘pump prime’ the market.

Ottawa, Canada

Ottawa launched an open data server in 2010. The city is committed to improving citizen engagement, and enhancing transparency and accountability by providing public access to its data. Now, there are several traveller information apps developed using Ottawa’s open data. To encourage private parties to develop apps using this data in a meaningful and productive way, the City has launched an ‘Open Data contest’ (www.apps4ottawa.ca). This has resulted in a number of good apps providing public transport and other information.

In addition to showing all the bus stops for a given route, it allows users to find where a bus is currently located and what time it is expected to arrive at the current stop. A trip planner integrated in the app gives route options for a combination of the start and end location chosen in the map application. It also allows users to find a bus stop close by.



BusBuddy apps in Ottawa

Source: www.apps4ottawa.ca

From plan to reality

Operation



In this phase, effort should be made to maximise the use of the data available in the open access data server. This requires maintaining the quality of the data in the server, stakeholder relations, consulting end users and publicity of the information available.

Key aspects at this stage

Maintain quality of the data

Good quality data is needed to gain users' trust to use the information provided. Hence it is essential to maintain the quality of the data for the successful outcome of the measure.

Publicity

Publicity of the data availability to app developers and available apps to users could boost use of the information available in the open access data server. Running activities such as competitions or challenges, encourages private parties to develop apps and help develop profiles. For example, the 'Open Data contest' of the City of Ottawa (www.apps4ottawa.ca) has resulted in a number of good apps providing public transport and other information. Sponsoring a competition removes the cost burden and shows involvement and approval of businesses in the process.

Maintain stakeholder relations

As the success of the measure depends on the development of useful apps to use the data, the authority needs to maintain regular engagement with the data providers and apps developers.

Consultation with end users

Apps have the potential to meet specific requirements of the users. Hence it is useful to conduct regular consultation to learn whether the requirements are being addressed, and what further developments could be needed. A discussion forum and presence in social media could be used as tools to spread the news (about developments) and get feedback.

Success factors and barriers at this stage

Success factors

- Availability of robust and reliable data.
- Availability of useful apps.

Barriers

- Low demand for the information apps.
- Development of fewer apps.

Further information & contacts

Further information

- **TfL — Transport for London (2012)**, Syndication Developer Guidelines: Transport for London Data Service. Version 2.0.
Available at: www.tfl.gov.uk/assets/downloads/businessandpartners/syndication-developer-guidelines.pdf
- **Toronto (2013)**, Open Data Licence.
Available at: www1.toronto.ca/wps/portal/contentonly?vnextoid=4a37e03bb8d1e310VgnVCM10000071d60f89RCRD
- **TSO (2012)**, Open Data White Paper: Unleashing the Potential, June 2012.
Available at: data.gov.uk/sites/default/files/Open_data_White_Paper.pdf
- **Ottawa (2013)**, Open Data — Terms of Use.
Available at: www.ottawa.ca/en/mobile-apps-and-open-data/open-data-terms-use

Further TIDE training on this measure:

Webinars and e-learning courses

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Photo on title page: Transport Research group

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About TIDE — Transport Innovation Deployment for Europe

The European TIDE project aims to foster a more favourable climate for cities and regions to integrate innovations in their urban mobility policies. This should lead to increased acceptance and take-up of new urban transport solutions and technologies. TIDE will help cities and regions to address common challenges in a collaborative and integrated way.

Why should you care about innovation?

On several occasions, European cities have indicated that innovation can help to tackle challenges resulting from the economic crisis. Innovation can save costs as well as contribute to reaching urban policy goals. Still, cities lack resources to conclude a full innovation cycle.

Innovative ideas usually start in one or just a few places before they reach wider coverage. TIDE will help cities and regions across Europe to shorten the path towards the implementation of innovative measures by showing that it is not necessary to re-invent the wheel and much more effective to exchange on innovation and transfer successful solutions from one European region to another. TIDE thus offers a cost-efficient way of spreading innovation throughout Europe

Our mission — Guided by your needs!

TIDE will enhance the broad take-up of 15 innovative urban transport and mobility measures throughout Europe and will make a visible contribution to establishing them as mainstream measures. The TIDE partnership is making a range of new and feasible solutions more easily accessible, to address key challenges of urban transport such as energy efficiency, decarbonisation, demographic change, safety, access for all, and new economic and financial conditions.

TIDE focuses on fostering awareness, advancing expertise via tried and new tools, practical work with cities, and costs and benefits. The needs of practitioners in European cities are thereby a guiding principle. TIDE is actively supporting 15 committed cities to develop implementation scenarios for innovative urban transport measures, setting the example to an even wider group of take-up candidates. These measures cover the following five TIDE themes: new pricing measures, non-motorised transport, advanced network and traffic management to support traveller information, electric mobility, and public transport organisation.

The TIDE innovative transport measures

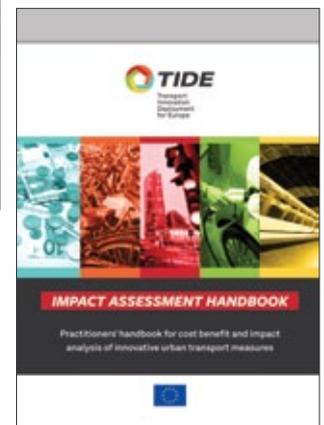
TIDE covers fifteen innovative measures across the five TIDE–themes.

<p>New pricing measures</p>	<ul style="list-style-type: none"> • Road user charging in urban areas • Parking charge policies • Efficient and convenient pricing and charging for multimodal trips
<p>Non–motorised transport</p>	<ul style="list-style-type: none"> • Bicycle parking schemes • Creating people–friendly streets and public spaces • Fast cycling lanes
<p>Advanced network and traffic management to support traveller information</p>	<ul style="list-style-type: none"> • Open data server for applications–based traveller information • User–friendly human machine interface for traveller information • Advanced priority systems for public transport
<p>Electric mobility</p>	<ul style="list-style-type: none"> • Clean city logistics • Financing schemes for charging stations • Inductive charging for public transport
<p>Public transport organisation</p>	<ul style="list-style-type: none"> • Creation of public transport management bodies for metropolitan areas • Contracting of services focused on improving passenger satisfaction and efficiency • Marketing research as optimisation tool in public transport

The **TIDE Innovation Toolbox** brochure highlights these fifteen inspiring transport measures and illustrates them with good practice examples, listing characteristics and benefits, key aspects for implementation, and useful references.

The **TIDE Practitioner Handbooks** on Transferability and Impact Assessment provide methods and examples to help understand the local potential for innovative measures in urban transport.

The **Guidelines for Implementers** are ten individual implementation guideline brochures addressing the full implementation process of ten of the fifteen TIDE innovative measures, as well as their costs and benefits, stakeholders to be involved, etc., illustrated with good practice examples.





The mission of the TIDE project

is to enhance the broad transfer and take-up of 15 innovative urban transport and mobility measures throughout Europe and to make a visible contribution to establish them as mainstream measures.

TIDE focuses on 15 innovative measures in five thematic clusters: financing models and pricing measures, non-motorised transport, network and traffic management to support traveller information, electric vehicles and public transport organisation. Sustainable Urban Mobility Plans are a horizontal topic to integrate the cluster activities.

The TIDE team

The TIDE consortium is composed of a variety of experts in the field of urban transport, bringing in the knowledge of the academic sector, the experience of cities, the expertise of consultants and the multiplier effect of European networks.



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Follow TIDE on Twitter: [@TIDE_Innovation](https://twitter.com/TIDE_Innovation)

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