# Norway, Entur reuse

## European data availability and NAP added value scenarios

**Collaboration globally**

**regardless of standards**

Brede Dammen

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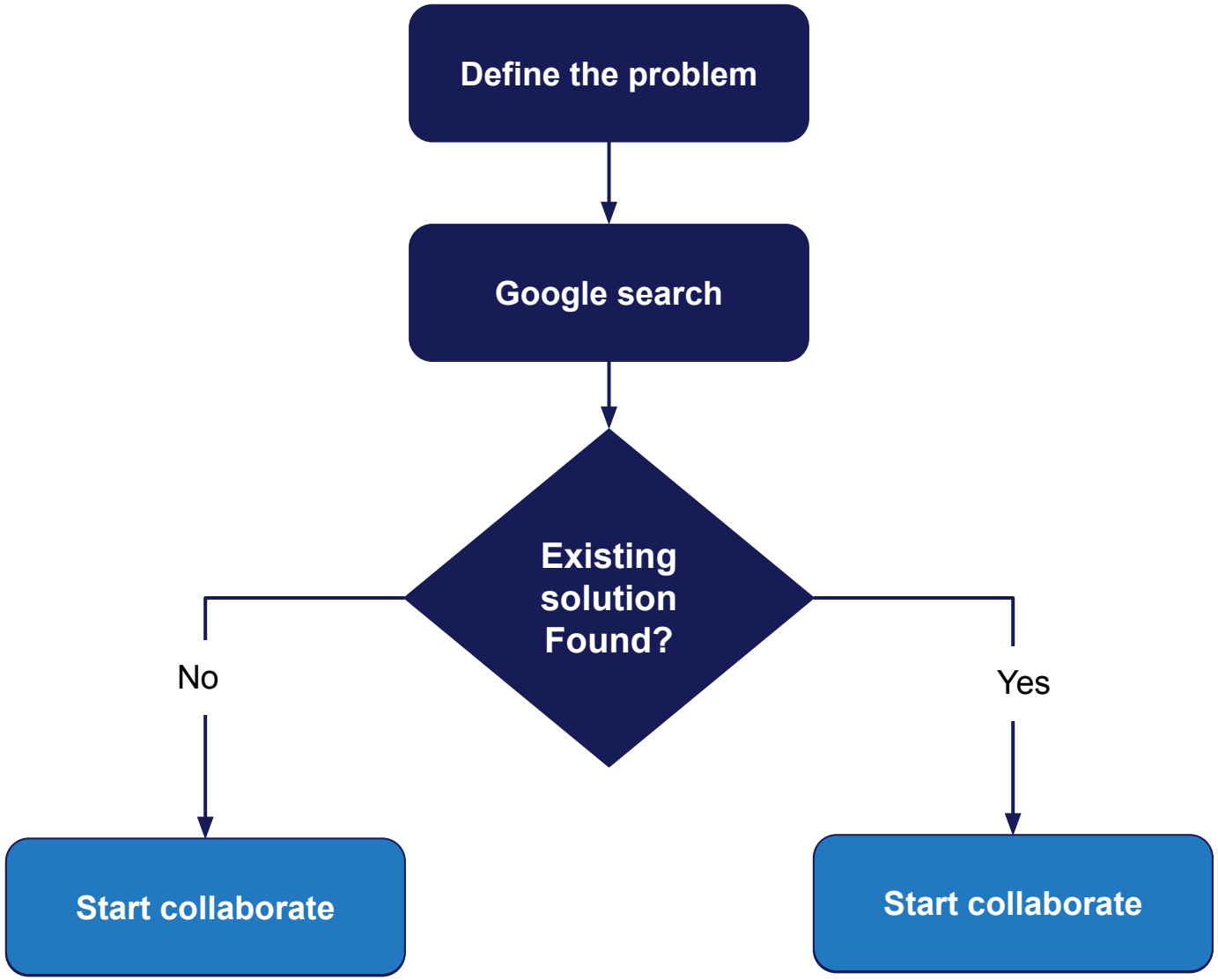
# ENTUR

- Established 2016
- Owned by the Norwegian Ministry of Transport
- Responsible for:
  - Collection of all Public Transport data
  - National services for Journey Planning
  - National services for ticketing for the whole PT sector
    - Mandatory for the rail sector
    - Optional for the rest of the PT sector
  - Data analytics

# Human Problem Solving

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Our services are used by a long list of mobility platforms and digital channels (app & web)


Partner portal, APIs and files

APIs for trip plan and fares

APIs for ticket sales

Timetables and real time data

Prices and fare products

Orders and QR-tickets

Inventory

Payment

Customer GDPR

Agreements

Settlement

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## 2015

Assignment from the Norwegian government:

- Create a national journey planning platform for Norway

## 2016

Analysis - How to complete the assignment

- Open Standards (Transmodel/NeTEx)
- In-house development (using available open source components)
- Open data (digital Infrastructure for Norway)

## 2017

- Norwegian NeTEx Profile published
- Started developing data pipelines and a national journey planning platform

## 2018

- Half of all PTAs in Norway produce valid NeTEx data

- Norwegian SIRI Profile published

- Entur national journey planning app goes live

## 2019

All PTAs produce valid NeTEx data with roughly half producing SIRI real time information.

The nordic countries adopt the Nordic NeTEx profile

## 2020/21

A majority of Norwegian journey planning APP/WEBs use the Entur API platform.

- Integrated SIRI data from most of PTA/PTOs in Norway
- The Nordic countries adopt the Nordic SIRI profile
- National Accesspoint (NAP) goes online
- New OpenTripPlanner 2.x in production
- Added operational data
- Increased validation for better data

# Team national trip planning

| | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| Brede Dammen<br>Produkteier | Andreas Tryti<br>Team Lead | Lasse Tyrihjell<br>Tech-lead | Johan Wiklund<br>Dataforvalter | Thomas Gran<br>Utvikler |
|  |  |  |  |  |
| Mansoor Sajjad<br>Utvikler | Vincent Paturet<br>Utvikler | Assad Riaz<br>Utvikler | Tom Erik Støwer<br>Utvikler | Eivind Morris<br>Bakke |

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# We have to handle ...

**Many dependencies/obligations to 3rd parties**

- Data sources from ~150 parties
- Many consumers ~ a few hundred???
- International cooperation on open source components

**A portfolio of services to maintain**

- ~ 80 components

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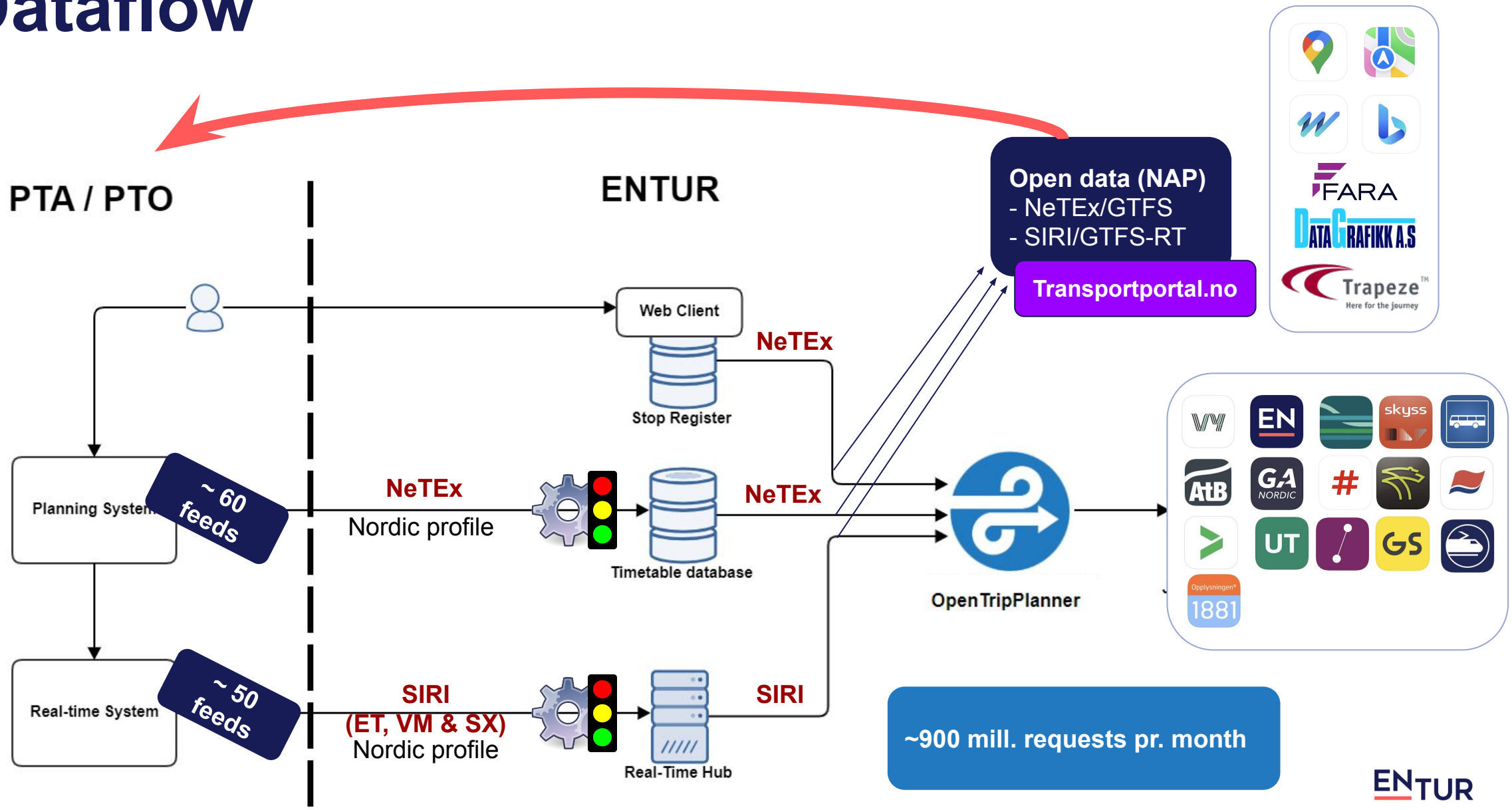
# Dataflow


PTA / PTO
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Open data (NAP)
- NeTEx/GTFS
- SIRI/GTFS-RT
Transportportal.no
Web Client
Stop Register
NeTEx
Planning System
~ 60 feeds
NeTEx
Nordic profile
Timetable database
NeTEx
OpenTripPlanner
Real-time System
~ 50 feeds
SIRI
(ET, VM & SX)
Nordic profile
Real-Time Hub
SIRI
~900 mill. requests pr. month
FARA
DataGrafikk A.S
Trapeze
Here for the journey
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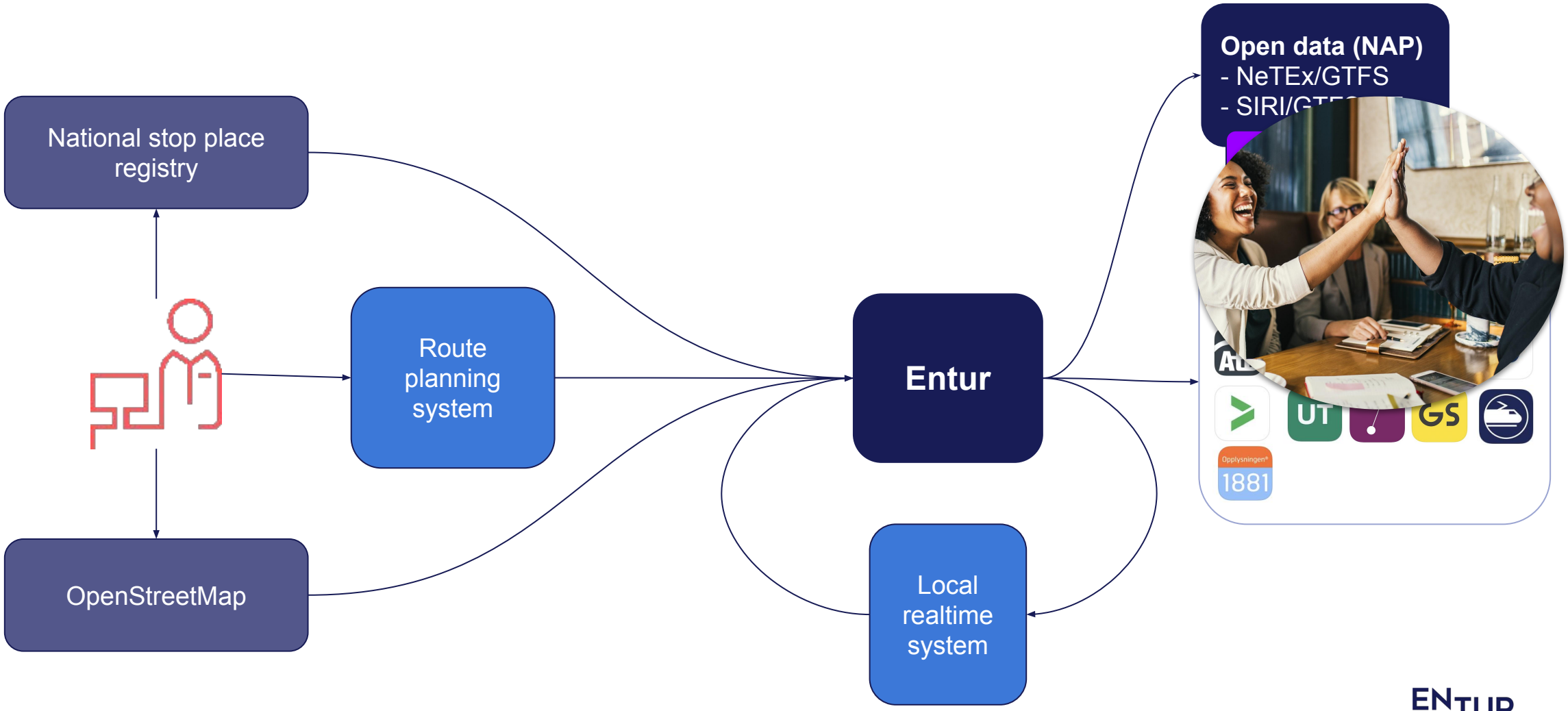
# From a route planner perspective



# Open source supporting tools

- Stop place register
- OpenTripPlanner
- Editor for flexible transportation
- Editor for small operators
- Validation tools NeTEx and SIRI
- MobilityHub, aggregate many sources
- Deviation messages
- Visualization of data
- Usage of data
- ++++

Let's start collaborating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# Links

National stop place registry
Handbooks
Nordic NeTEx profile
Nordic SIRI profile

Open data APIs and data
Open source software Github.com/entur
NAP (transportportal.no)

# Demo

otp2debug.entur.org
Mobility map
Vehicle map




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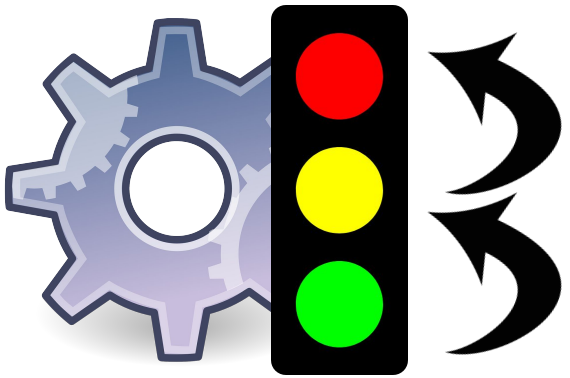
# End-user centric quality validation

- against the standard (CEN XSD)
- against the profile
- logical validation

We want the traveller to find the same correct information regardless of which end user app they use. For that reason we need to have strict control measures on the data input.

- Errors halt the import process.
- Warnings are accepted but we encourage data providers to resolve the issue.
- The info level may reveal further issues.
- The rules are continuously tightened at a pace where the data providers are able to keep up compliance.



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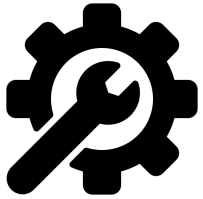
# What does the journey planner team do?



**Maintenance of standards/profiles for PT data collection**
- Nordic NeTEx profile
- Nordic SIRI profile

**Collection of data**
- Stop place information (NeTEx)
- Timetable data (NeTEx)
- Real time (SIRI)
- Flex and on-demand (NeTEx)
- Micro-mobility (GBFS)
- OpenStreetMap
- Address, Points of Interest, elevation data

**Harmonizing/structuring of collected data**
- Open national PT data
  (NeTEx, SIRI, GTFS, GTFS-RT, GBFS)

**National services for journey planning**
- Geocoding
- Trip planning / departureboard etc.
- Stop places
- Citybikes
- E-scooters
- Shared cars

**Other services**
- Position of vehicles
- Push messages
- Editor for stop places
- Editor for deviation messages
- Editor for on-demand services
- Editor for small operators

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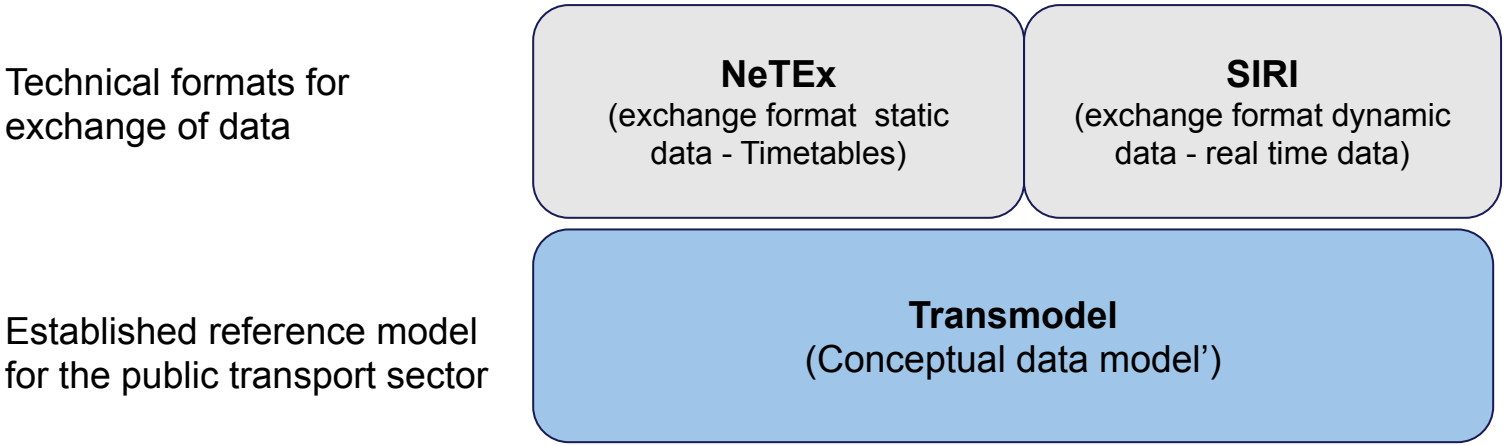
# Open standard - Why?

*How do you describe a StopPlace?*

*How do you describe a rail service?*

How do you update with real time forecast for a specific journey?

- The need to establish common terminology and concepts → **speak the same "language"**
- Many parties need to exchange their data → **Common exchange format**
- "Everyone" tries to solve the same problem → **Avoid national or sector specific formats**

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# Principles

- Follow defined standards end-to-end

  **Conversion of data “always” mean degradation of quality**

- All data should be visible/available throughout the whole platform

  **no “black box”**

- Self-service and automation

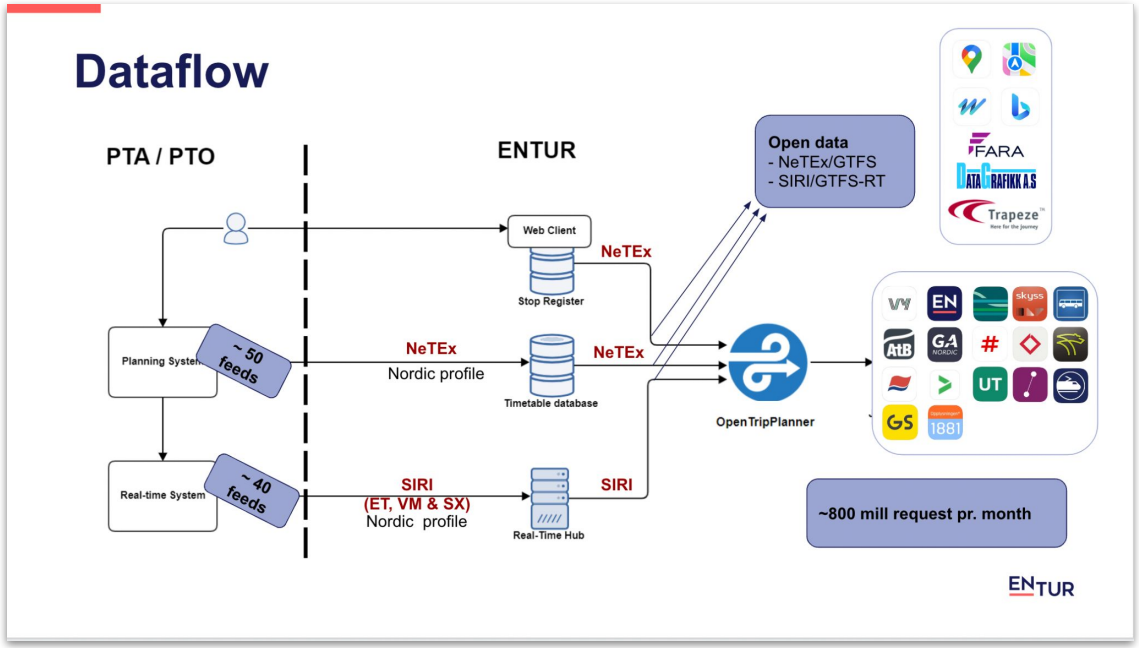
  **Feedback loops and no manual steps**

- No compensation for missing data quality

  **Focus to correct errors/quality aspects at the data source**

- All data and all services shall be openly available

  **The threshold for using data and services should be as low as possible**

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# *Why did we choose* open source?

- Supplier marked
  - Limited knowledge of new exchange formats
  - Many proprietary formats/systems → “black box”
  - Outdated development process → waterfall based

- “All” countries/regions try to solve “standardized PT data” and regional/national/international journey planning

- The public transport sector is driven by public money → More sharing is a obvious benefit

open source

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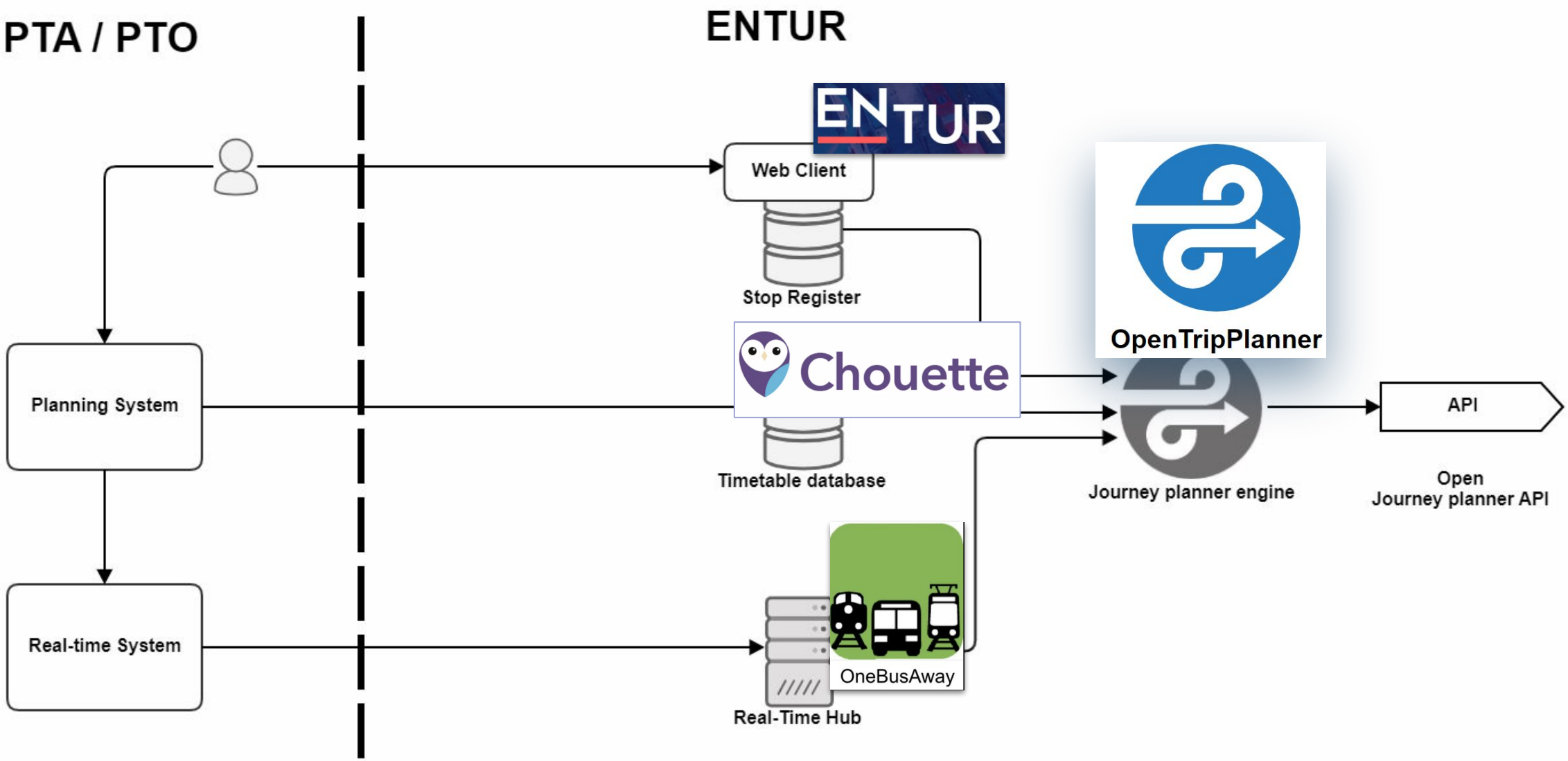
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