

Open Arctic MaaS

**Digital mobility services for
rural areas**

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Vihreät matkaketjut,
Turku, 8.11.2019

Open Arctic MaaS (#ArcticMaaS)

- **Enabling rural MaaS** and sustainable growth of tourism in Lapland
 - Area of ~100 000 km²
- **Joint effort to make mobility as easy as possible**
 - **11 remote travel destinations** joining their resources to improve internal accessibility and digital transport service level
- Up-scale deployment towards **open and shared mobility platform**
 - by utilizing and further developing common open source public transport information systems
- Continuation for VAMOS! (Value Added Mobility Services!)
 - Proof of concept in Ylläs



Starting point

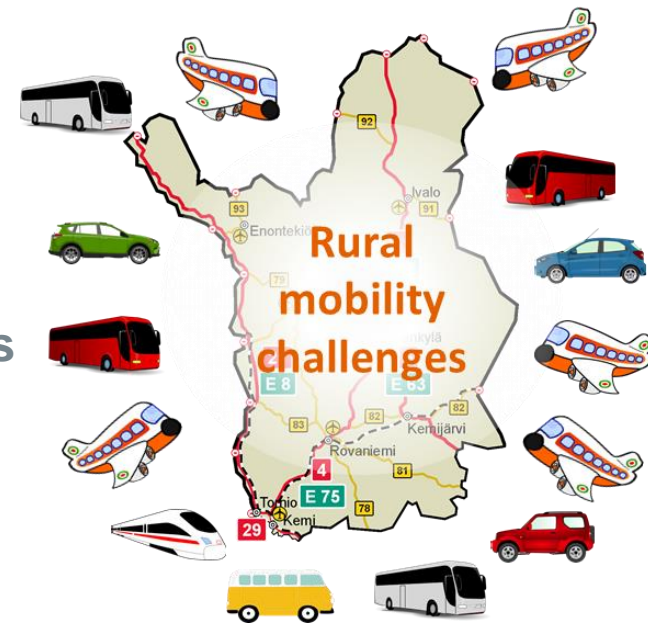
Rural tourism facing mobility challenges

- Tourist **destinations** and attractions are **distributed sparsely** in large areas
- **Reaching destinations** sometimes **challenging**
- Supply and **demand vary strongly** depending on seasons and local destination popularity
- Local transport **services** mainly **available** on **high seasons** between **main destinations**
- **Taxis rarely** available or economic **alternative**
- Tourists come with **varying needs and interests**
- Services by **small businesses**
- **Information** about mobility service offering **difficult to find**



**LAPLAND IS DRIVER
FOR GROWTH IN TOURISM.**

Source: Lapin materiaalipankki



Variety of mobility services in the areas

	Ylläs	Kemijärvi	Pyhä- Luosto	Salla	Kittilä / Levi	Enontekiö	Koillismaa	Muonio
Taxi	6	12	5-9	15-25	18	15	83	10
Rental cars	-	X	X	X	X	-	X	X
Bus transportation, normal routes	X	X	X	X	X	X	X	X
Feeder transportation	X	X	X	X	X	X	X	X
On-demand transit	X	X	X	X	X	X	X	X
Flexible routes	X	X	X	-	-	X	X	-
Mobility services by tourist service providers	X	X	X	X	X	-	X	-
Shared rides	X	-	-	-	-	X	X	-
School etc. subsidized transport	X	X	?	X	X	X	X	X
Other mobility services & means	X	-	X	X	X	X	X	-

State of the digitalization in the areas

	Ylläs	Kemijärvi	Pyhä- Luosto	Salla	Kittilä / Levi	Enontekiö	Koillismaa	Muonio
GTFS-tool usage skills	X	(X)	-	-	-	-	-	-
Stops in Digiroad	X	X	X	?	X	X	X	?
Other than official stops	X	X	X	X	X	X	X	?
Digitized timetables and routes	X	-	-	-	-	-	-	-

Why to digitize mobility services?

Why to digitize mobility services? (1)

■ Better customer experience

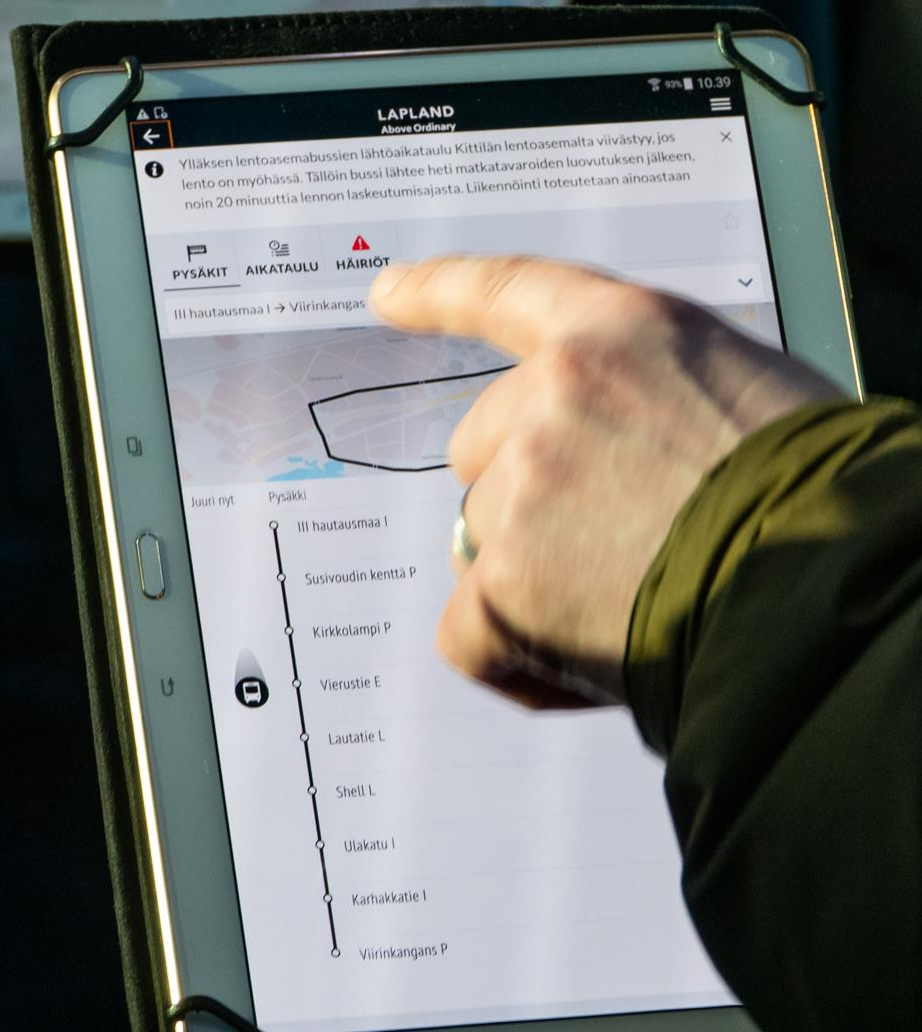
- All mobility as **harmonized service offering** and available from one **preferred place**
- Powerful **search & routing tools** for door-to-door travelling
- Allows **online ticketing** and **MaaS solutions** combined to trip planning
- Provides **navigation** and **on-trip guidance** including walking directions to/from stops
- Provides **better information** on pricing, accessibility, etc.
- **Real-time information** for optimizing travelling and informing about disruptions
- Dynamic and flexible mobility services providing **more mobility alternatives**
- **Combination of mobility and other services** serving needs better
- **Better accessibility** to mobility services for those having special needs

Why to digitize mobility services? (2)

- **More business to mobility service provider**
 - Own service offering **accessible for more people**
 - **Integration to travel chains** through digital routing and MaaS solutions
 - Allows **planning tools for optimizing** mobility service offering
 - **Managing fleets and operation** (in real-time) becomes easier
 - Real-time info to passengers takes **decreases load in customer service**
 - **Interactive online services provide Information about peoples' needs**
 - Digitalization enables **new kinds of mobility services**
 - **Optimization of resource use** through online services, intelligent routing, etc.

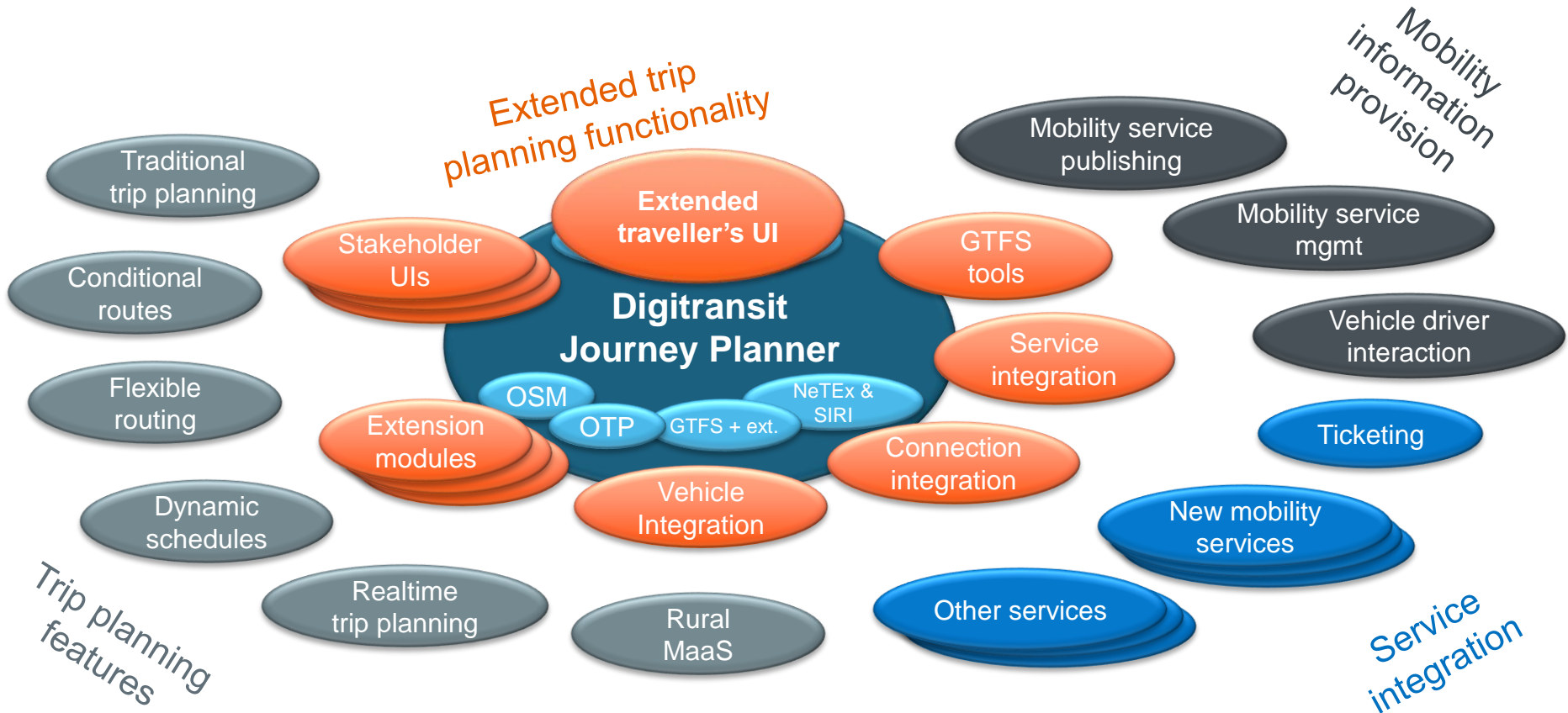
Why to digitize mobility services? (3)

- **More appealing service offering for other service providers**
 - Combining and packaging **mobility services** easily with other services
 - Holistic view for **destination management and development**
- **Holistic view for authorities organizing transport**
 - Find gaps in service offering and **guarantee services for all**
- **Finland as a more attractive destination**
 - Easy to **plan a visit**
 - Easy to **find and use services**



Examples of work in Open Arctic MaaS

Rural trip planning vision



Trip planning features

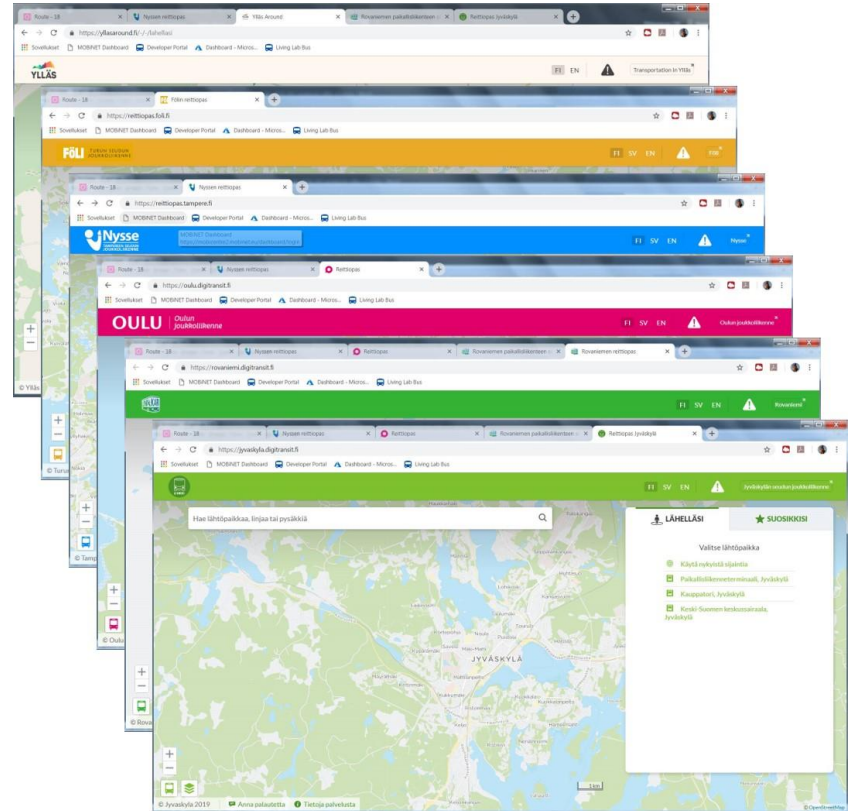
Extended trip planning functionality

Mobility information provision

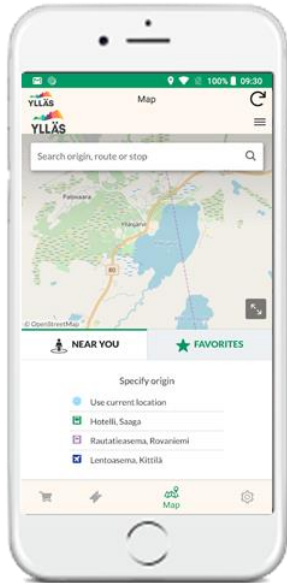
Service integration

Digitransit as a basis for lapinreittiopas.fi

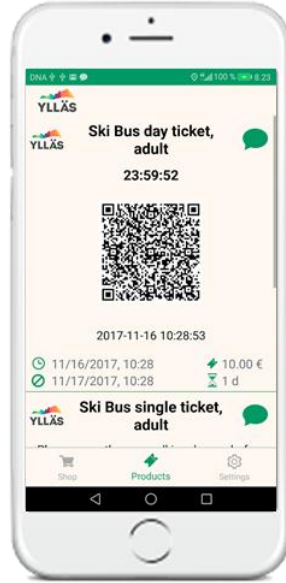
- *Digitransit* is a **open source** collaboration project providing a service platform for a **public transport journey planner**.
- The service is based on *OpenTripPlanner*
- Development by Helsinki Region Transport (HSL), the Finnish Transport Infrastructure Agency (Väylä) and TVV LMJ Oy (so far).
- Used in ~15 cities, towns or areas in Finland
- Norwegian national journey planner started from the same foundations
- **Our starting point for development of rural area trip planner**



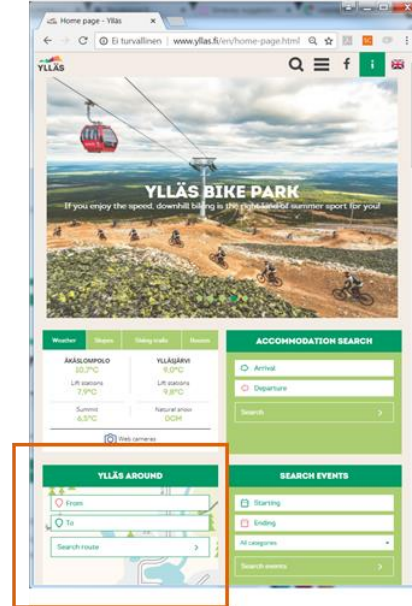
Flashback: Ylläs Around pilot (2017-2018)



Ylläs Around
Journey Planner



Ylläs Tiketti
Integration to
ticketing & payment
application



Ylläs web portal
integration

Lapland trip planner – lapinreittiopas.fi (2018-)

The image displays two screenshots of the Lapland trip planner interface. The left screenshot shows the main search results page, and the right screenshot shows a detailed view of a selected route.

Left Screenshot: Search Results

Header: LAPLAND Above Ordinary, FI EN, Open Arctic MaaS[®]

Search Criteria: Rautatieasema, Kolarí; Lapland Hotel Äkäshotelli, Kolarí; Kulkumuoto: Bus, Walking, Bicycle, Car; 08:55, Sa 23.3, Lähtöaika, Asetukset, Perusasetukset.

Start Time	End Time	Duration	Walking Distance
09:04	09:45	41 min	60 m
09:04	10:00	56 min	60 m
11:14	11:55	41 min	60 m
11:14	12:10	56 min	60 m

Right Screenshot: Detailed Route View

Header: LAPLAND Above Ordinary, FI EN, Open Arctic MaaS[®]

Search Criteria: Rautatieasema, Kolarí; Lapland Hotel Äkäshotelli, Kolarí; Kulkumuoto: Bus, Walking, Bicycle, Car; 08:55, Sa 23.3, Lähtöaika, Asetukset, Perusasetukset.

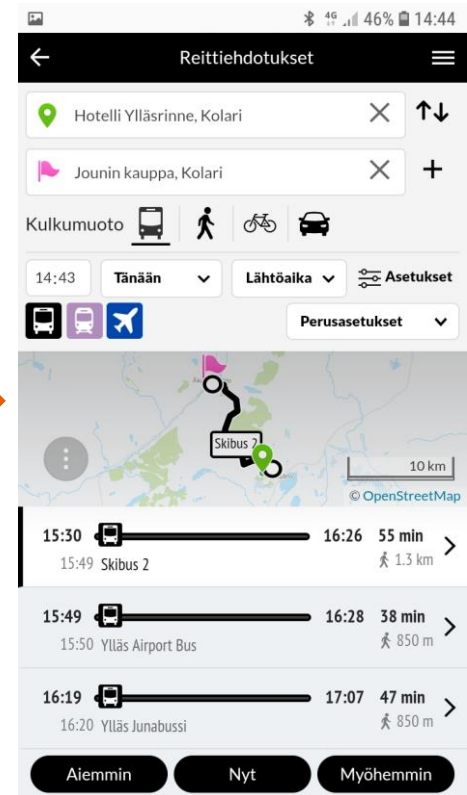
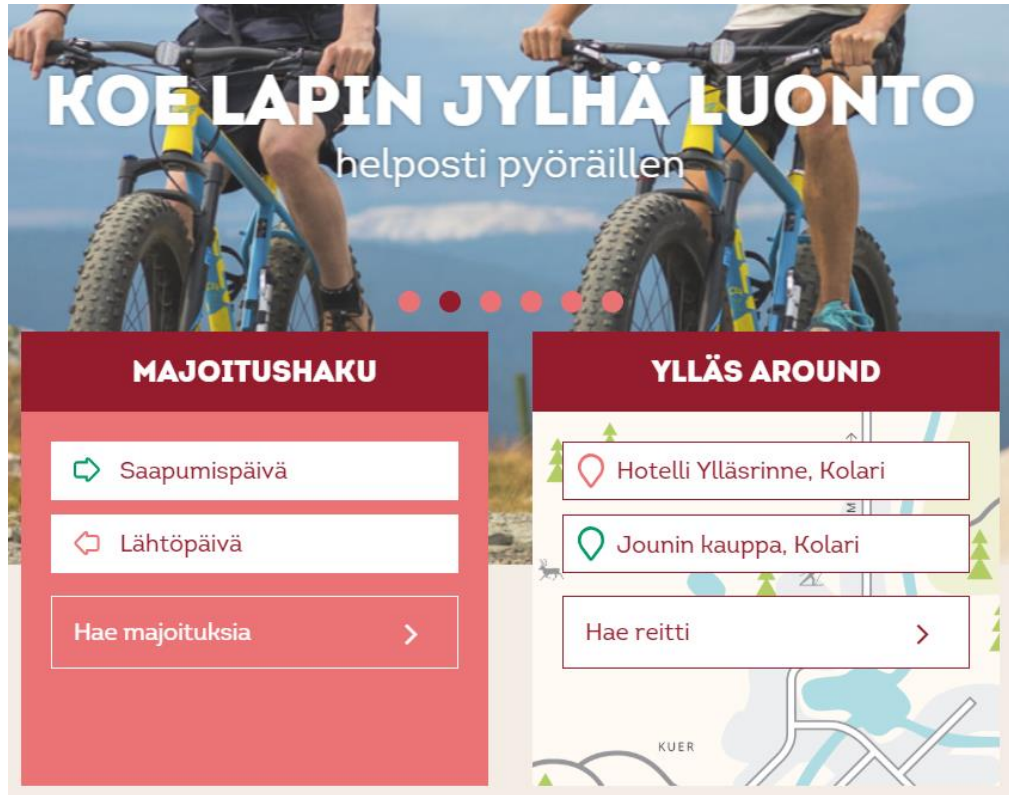
Reittiohje:

- 09:04 Rautatieasema, Kolarí
- Kävele 60 m (1 min)
- 09:05 Kolarí rautatieasema
- Bussi Ylläs Junabussi Karila th
- 1 pysäkki (40 min)
- 09:45 Lapland Hotel Äkäshotelli

Matkan pituus: 32 km

Tulosta

Integration to the tourist resort portal



Real-time features emphasized in the tech work

- **Service alerts**
 - Inform customers with exceptions in operation
- **Trip updates**
 - Inform customers with real-time changes in timetables
- **Vehicle positions**
 - Show customer the real-time progress of the public transportation vehicles

- **Why?**
 - Cancellation, disruptions, vehicle breaks down, changes on route
 - Real-time timetables dependent on weather, roadworks, other trips (e.g., feeder line from flights or trains)
 - Real-time information is important for customers, e.g. when:
 - there is -30 C outside
 - it is an imperative to catch the flight or train
 - transportation has some restrictions for passengers
 - there is a need to choose another stop because of route change
 -

Real-time features – vehicle location

LAPLAND
Above Ordinary

Route

STOPS TIMETABLE DISRUPTIONS

ÄKÄSHOTELLIKIERROS

Lapland Hotel Äkäshotelli → Äkäshotelli

Right now	Stop	Leaves	Next
	Lapland Hotel Äkäshotelli Drop-off only	19:40	20:00
	Äkäskentien th	20:04	08:04
	Lapland Hotel Yläskaitio	20:09	08:09
	Sivulantien th	4 min	20:23
	Äkäskentien th	5 min	20:24
	Takamettäntie	6 min	20:25
	Kellinkas	9 min	20:28

<https://lapinreittiopas.fi/linjat/MATKA2800/pysakit/MATKA2800-01#close>

11.36 82%

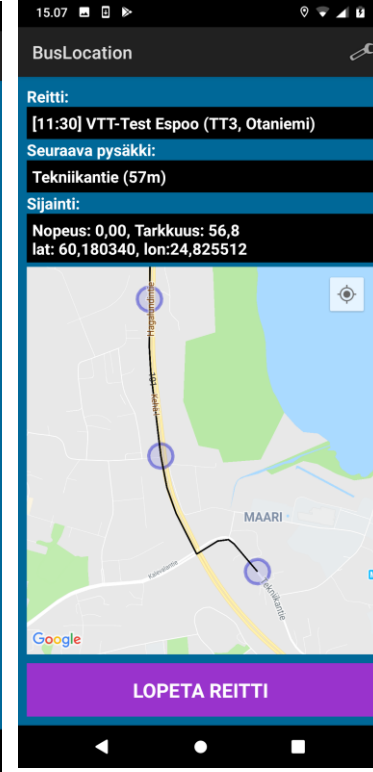
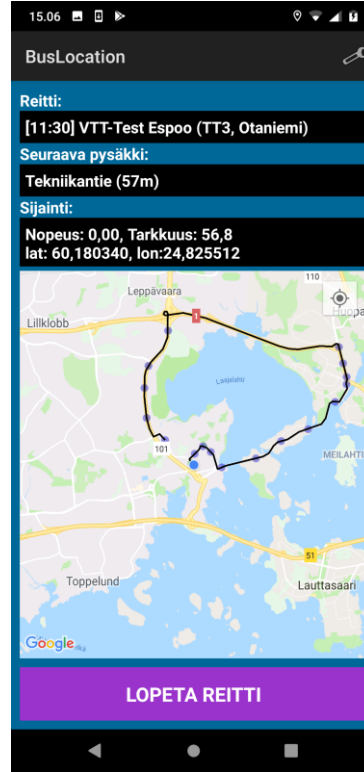
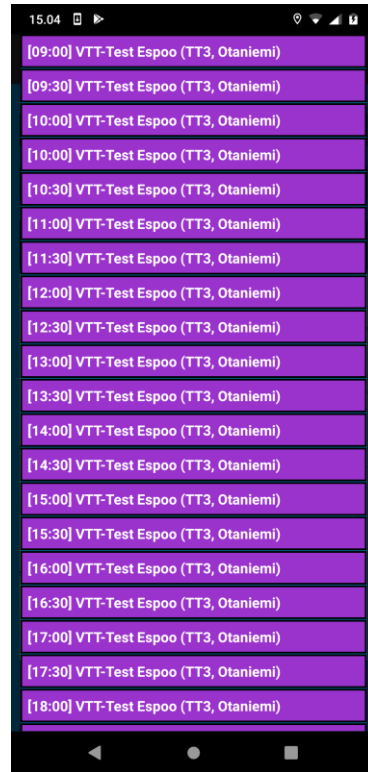
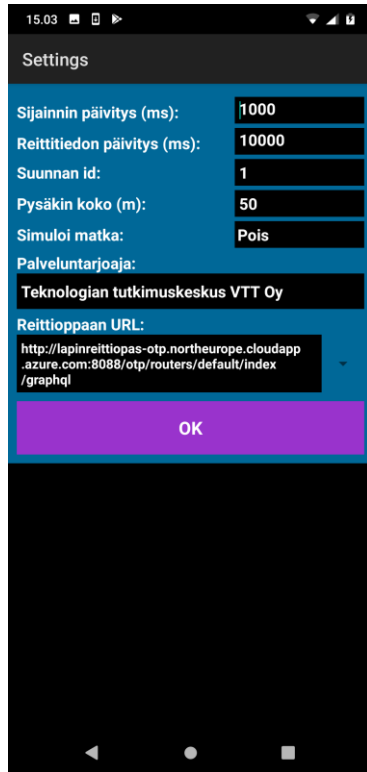
LAPLAND
Above Ordinary

PYSÄKIT AIKATAULU HÄIRIÖT


Tekniikantie → TT3, Otaniemi

Juuri nyt	Pysäkki	Lähtee	Seuraava
	Tekniikantie E2210	12:00	12:30
	Vuorimies E2212	12:01	12:31
	Aalto-yliopisto (M) E2226	12:02	12:32
	Otaranta E2204		12:03
	Otaniemensilta E2202	1 min	12:04
	Lehtisaarentie H1414	2 min	12:05
	Kuusisaarenuja	4 min	12:07

Real-time features – Driver's application



Real-time features – service alerts

 **GTFS-RT** Kirjautunut nimellä oli

[KIRJAUDU ULOS](#)

Muokkaa poikkeustietoa:

Liikennöitsijä (agency):
Teknologian tutkimuskeskus VTT Oy (F1)

Reitti (route):
Äkäshotelli-Ylläskallio-Ylläs Ski Resort-Äkäshotelli (MATKA:2800)

Vuoro (trip):
16:00 Äkäshotelli (MATKA:9567)

Pysäkki (stop):
ALL

Liikennemuoto:
ALL

Otsikko: **PAKOLLINEN**

Vuoro myöhässä

Kuvaus: **PAKOLLINEN**
Kello 16 lähtevä Äkäshotellikerroksen vuoro myöhässä runsaan lumentulon vuoksi.

Englanninkielinen otsikko (header):
Trip late

Englanninkielinen kuvaus (description):
Trip starting 16.00 is late due to extensive snow fall.

Real-time features – service alerts

LAPLAND
Above Ordinary

Reittihdotukset

Perusasetukset

14:29 15:04 12 min 2.5 km

15:28 15:52 12 min 300 m

16:28 16:52 12 min 300 m

17:28 17:52 12 min 300 m

18:28 18:52 12 min 300 m

Aiemmin Nyt Myöhemmin

Kellokas

16:28

16:32 Äkäshotellikierros

LAPLAND
Above Ordinary

Linja

PYSÄKIT AIKATAULU HÄIRIÖT

ÄKÄSHOTELLIKIERROS

Lapland Hotel Äkäshotelli → Äkäshotelli

Vuoro myöhässä
Äkäshotellikierros Kello 16 lähtävä Äkäshotellikierroksen vuoro myöhässä runsaan lumentulon vuoksi.

Vuoro myöhässä
Äkäshotellikierros Kello 16 lähtävä Äkäshotellikierroksen vuoro myöhässä runsaan lumentulon vuoksi.

Real-time features – stop updates

GTFS-RT

lappi-rt.northeurope.cloudapp.azure.com:8080/tripupdates/edit/10/

Muokkaa pysäkkiennustetta:

Liikennöitsijä (agency):
Teknologian tutkimuskeskus VTT Oy (MATKA:1)

Reitti (route):
VTT-Test Espoo (MATKA:3021)

Vuoro (trip):
TT3, Otaniemi (MATKA:10576)

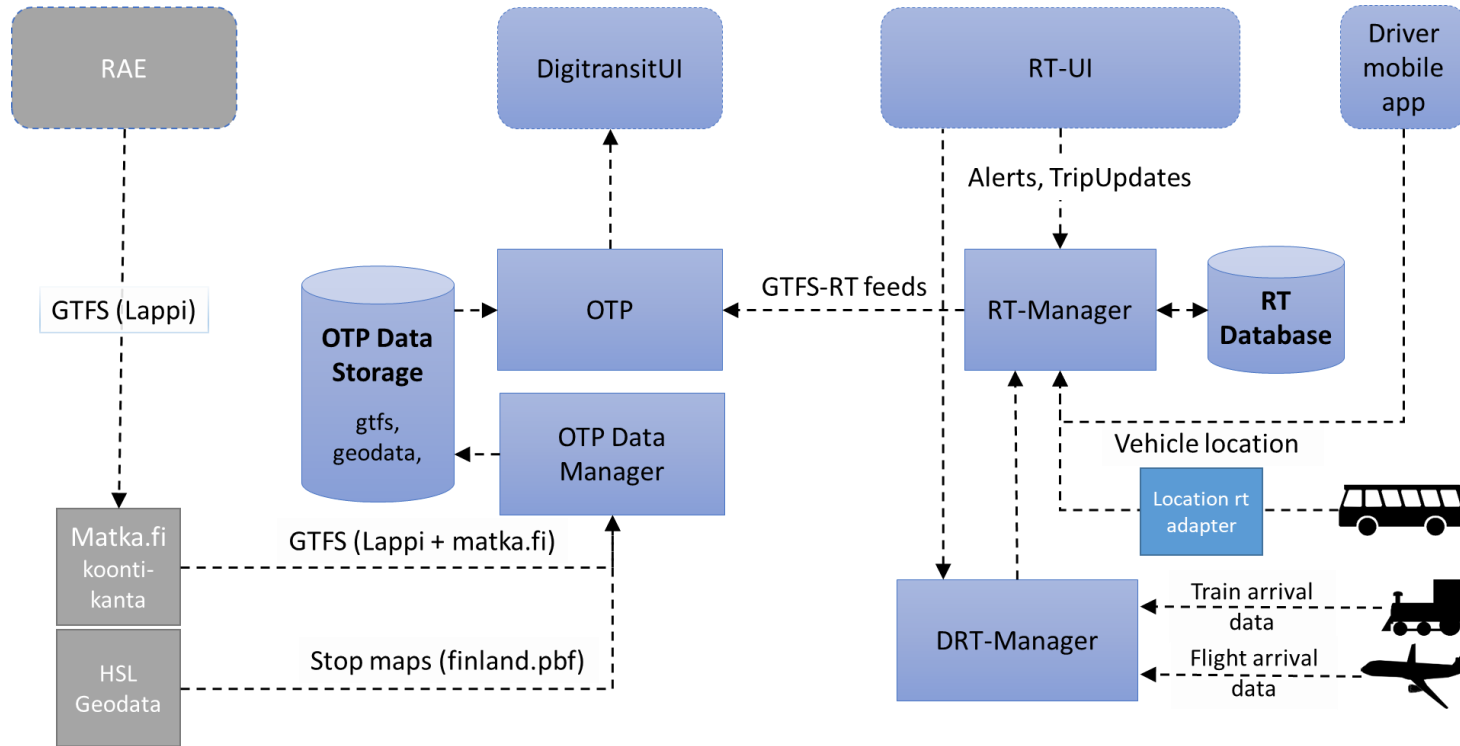
Vuoron tila:
Ajetaan normaalisti

Viive:
600

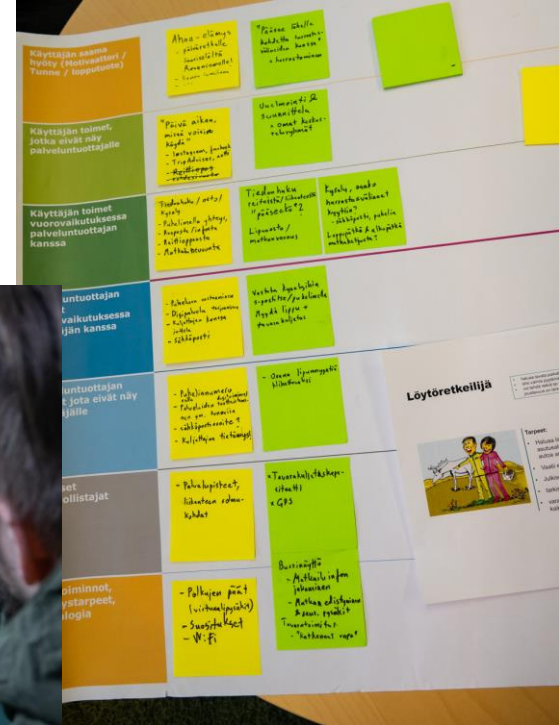
Päivämäärä:
08.03.2019

Pysäkin nimi	Pysäkin id	Viive	Lähtöaika	Vuoron tila
Tekniikantie	MATKA:168253	600	08.03.2019 10.40.00	Aikataulun mukaisesti
Vuorimies	MATKA:168450	600	08.03.2019 10.41.00	Aikataulun mukaisesti
Aalto-yliopisto (M)	MATKA:168122	600	08.03.2019 10.42.00	Aikataulun mukaisesti

Simplified architecture of lapinreittiopas.fi



Co-creation and awareness building



Concrete digitizing workshops

OpenStreetMap Edit History Export

GPS Traces User Dates Copyright Help

Edit feature

Hotel

All fields

Name: Sirkantahti

Brand: Unknown

Address: Levintie 1630, 99130 Levi

Rooms: Unknown

Internet Access: Yes, No, Wi-Fi...

Sources: Add...

Telephone: +358 16 323 35

All tags (11)

- addr:city: Levi
- addr:country: FI
- addr:house: 1630
- addr:postcode: 99130
- addr:street: Levintie
- name: Sirkantahti
- phone: +358 16 323 5522
- source: survey
- tourism: hotel
- website: www.laplandhotels...
- alt_name: Lapland Hotel Sirk...

All fields

Name: Lapland Hotels Sirkantahti

Brand: Unknown

Address: Levintie 1630, 99130 Levi

website: www.laplandhotels...

alt_name: Lapland Hotel Sirk...

short_name: Sirkantahti

All relations (0)

VÄYLÄ
Pöytäkirja - fi English

MAKU
KARTTILUOKAT
VALTUUTUSKORTIT
KARTTILUOKAT
KÄYTTÖOHJE
LAHTAUSOHJE
DIGIROAD

Kohdetiedot
Joukkoliikenteen pysäkit (Osoite)

Vuoron id	Lahtoaika	Voimassaoloaika	Ajopäiväkalenteri	Aikataulu
19829	09:45	15.11.2019 - 21.12.2019	Yläs Skibus Marraskuu 2018	Näytä kalenteri Näytä
19830	11:45	15.11.2019 - 21.12.2019	Yläs Skibus Marraskuu 2018	Näytä kalenteri Näytä
19831	13:45	15.11.2019 - 21.12.2019	Yläs Skibus Marraskuu 2018	Näytä kalenteri Näytä
19832	15:45	15.11.2019 - 21.12.2019	Yläs Skibus Marraskuu 2018	Näytä kalenteri Näytä
19833	17:45	15.11.2019 - 21.12.2019	Yläs Skibus Marraskuu 2018	Näytä kalenteri Näytä
19834	18:45	15.11.2019 - 21.12.2019	Yläs Skibus Marraskuu 2018	Näytä kalenteri Näytä

Route & timetable digitizers experimented

The image shows three overlapping screenshots of route digitization software. The top screenshot is Conveyal, showing a map with a route and a sidebar with 'Line De Gaulle - Bonaval'. The middle screenshot is Chouette, showing a map with a route and a sidebar with 'Hollin pysäkkiä'. The bottom screenshot is RAE, showing a map of Ylläsjärvi with a route and a sidebar with 'Hävittä välypysäkkejä'. Each screenshot has an orange label with the software name: 'Conveyal', 'Chouette', and 'RAE'.

Conclusion on editors

■ RAE editor (Traficom)

- Targeted at small operators (GTFS)
- Only freely usable editor in Finland if you do not choose to use **Google GTFS tools**
- Old design, not very usable works for basic GTFS
- Not open, not further developed currently

■ Conveyal and Chouette are open source editors requiring major work in order to apply them in them Finland

- Entur in Norway has chosen to develop Chouette (NeTEx support)

■ No editors available supporting anything above basic routes and timetables for road traffic

Conclusions

- **Mobility services in rural areas fragmented and poorly digitized** → traveller cannot find easily the services
- **Digital mobility services on the move** after national policy change and commercial stakeholders are taking roles where they see business – currently mainly in cities
- **Open Arctic MaaS created strategic network** for developing digital mobility services in Lapland – **operating models still to be developed and not only in Lapland**
- Piloting DigiTransit succesful – **enhanced access to mobility service offering and better customer experience**
- Major **deficiency in the digitizing tools** for small actors and special mobility needs
- **Work is really only beginning** – both technically and ecosystem-wise.
- **Digitalization is the key to attract and reach customers, to provide winning customer experience, to optimize service provision, and to co-operate with other players**



Thank you!

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