



# E- bustraffic from the perspective of an operator

# Current situation

TKL operates four full electricity buses. All buses are are placed on the route number 2.

The buses have been in use since Janyary 2017

Altogether the buses have been driven for ca 600 000 km

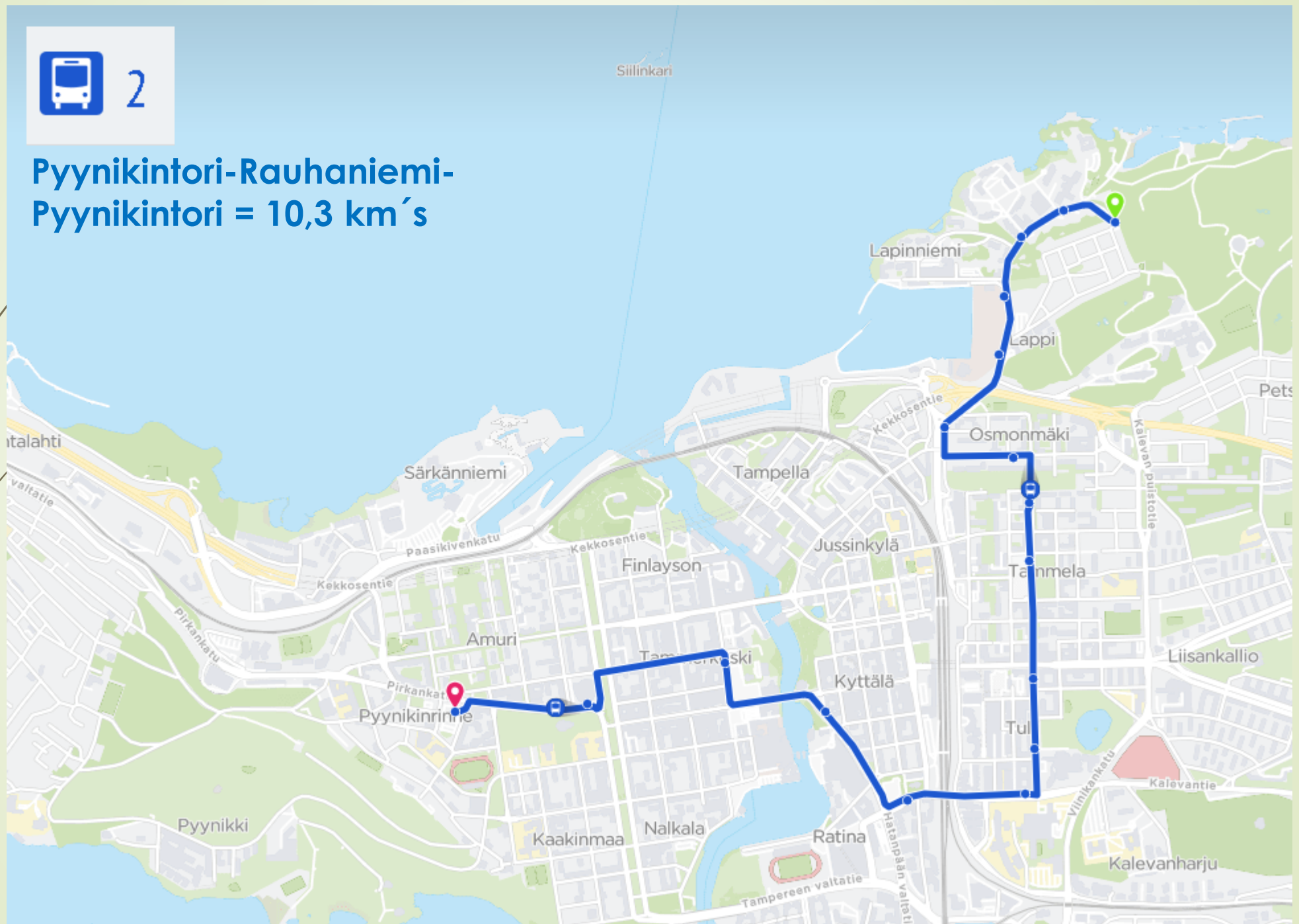
(the calculated performance in this timespan would've been roughly 800 000 km)

**The buses are a fast charging model, they are charged at Pyynikintori during the route**



2

## Pyynikintori-Rauhaniemi- Pyynikintori = 10,3 km's



# Current situation





# Technology in a nutshell

Charging power in a fast charger is max. 300 kW

Charging with a slow charger at a depot aswell (mandatory for balancing batteries), charging power 10-20 kW

The power packs in buses are 3\*25 kWh, lithium-titanate

The heating is electric with additional oil heating. The oil heating works with HVO/RME if needed

Pole motors, 2\*110 kW, energy regeneration

Drive energy consumption is 1 – 1,2 kWh/km, the usage of heating energy could be the same at worst case.

(on same route diesel-bus fuel consumption is < 0,5 ltr / km (one of hardest routes in Tampere region))

# Opportunities

Good advertisement for the operator

Very interesting according "normal bus operating"

"You learn by doing", a unique opportunity to learn about electric transportation

Electricity produced "the correct way" barely strains the environment

The cost of a performance kilometer is low

More comfortable travelling for passengers

# Challenges

Training

Vulnerability

The amount of work and having enough time

The success of an "inner conversation"

Monitoring

The buses haven't been driven enough, too many out of service-days

Are we using the right technology?

# In the Future

Electric buses will be used in the Tampere sub-region and their amount will increase

->it's clear that the law of clean vehicles will increase the number of buses, but it is probably that it will be increase even more

-> a cheap kilometer cost intrigues the operators

TO BE SOLVED:

What's the right charging model? Charging overnight to large batteries or the current model the batteries are fast charged within the bus route.

There is no simple answer, at least yet, but we will test both options

***Tampereen Kaupunkiliikenne***