

Automation functions on ElectriCity buses



City of
Gothenburg



2019-11-27

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POLIS | ANNUAL
CITIES AND REGIONS FOR TRANSPORT INNOVATION | CONFERENCE
2019

27-28 November 2019, Brussels

ElectriCity in Gothenburg

- ElectriCity was formed in 2013
- A partnership between industry, the public sector and academia
- Started with the electrification of city bus line 55
- Now the scope has broadened: sustainable electrified urban travel and transport that can be scaled up outside the demo arena



VOLVO

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ERICSSON

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City bus automation

- The project is founded by the Strategic vehicle research and innovation programme (FFI)
- There are three functions developed and tested within the ElectriCity project:
 - Autonomous drive in bus depots
 - City bus train
 - Autonomous bus stop docking
- Initial tests in confined areas
 - We plan for tests on public roads



FFI Fordonsstrategisk
Forskning och
Innovation



City bus automation

- These systems are a step in the way of fully autonomous vehicles
- The city buses are operating in the worst traffic environment and it may take a long time until the driver can be removed.
- By partial automating we can
 - make the journey much more comfortable
 - reduce damages
 - increase capacity
 - cutting cost



Autonomous drive in bus depots

- The bus will autonomously drive between the different stations of a bus depot
- There is no need for drivers to walk to and from busses, thus eliminating risk of injuries
- The busses will not be damaged in the depot
- This functionality is not affecting the bus line planning or the city infrastructure



City bus train

- This is also called platooning
 - Two or more busses are electronically connected
- Several functions can be performed
 - One line can have variable capacity along its route
 - Increased throughput in tight spots, intersections or bus stops
 - Increased capacity over a distance, a bridge or a tunnel
- This can be done with or without a driver in the trailing busses



- This functionality is more complex as well as the implementation in traffic, but the gains are also great

Autonomous bus stop docking

- This is a driver support system
- This will comfortably and safe take the bus to the bus stop and then leave the bus stop
- This will keep the bus from driving on the curb, thus eliminating damages
- It will also be safe for the passengers, inside and outside of the bus
- This functionality will make the bus travel much more comfortably for the passengers, especially for elderly and disabled



Main advantages for the city



- Automation functions will work together with safety features
 - pedestrian and cyclist warning systems and autobrake
 - speed geofencing
- There are many advantages, but for the city focus on these
 - Damages
 - Safety
 - Capacity
 - Passenger comfort
- This will increase public transport attraction and economy

Future

- From these functions we see new applications
 - To assist the driver at difficult spots along the line, for example turns
 - Passing speed bumps
 - To have the bus autonomously turn around at end stops
 - To autonomously move to and from charging stations



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