TLukas: I will upload better sources for the cost estimates of tram track etc. since the one I used is referring to a report which can no longer be found (https://melbpt.wordpress.com/tram-construction-costs/). Meanwhile, some tram vehicle costs, maintenance (but not total track length, which makes the data difficult to use!) etc. can be found in

“Can bus really be the new tram?”, Hodgson, Potter et al. 2013

Nimananda:

The different type of costs to be included are

1. Infrastructure cost which includes **tram infrastructure** (track, overhead line etc.), **charging infrastructure** and **parking space**
2. Operational cost including **running cost** and **maintenance cost** of trams and vehicles
3. Equipment cost which should include **cost of tram car** and **cost of vehicles**

Cost models to be used

**Infrastructure cost**

* Tram infrastructure: **4.3 MSEK/km/year**
* Charging infrastructure: **2000 SEK/kW**
* Urban parking space:
* Suburban parking space:

**Running cost**

* Energy price**: 1 SEK/kWh**
* Maintenance cost of vehicles (yearly or per km): **0.277 SEK/km** [22000 SEK every 80000 km, *source: https://www.tesla.com/Support/maintenance-plans-ms-mx*]
* Maintenance cost of trams (yearly or per km): **1.3 SEK/km** [65000 SEK every 50000 km, *source: Analysis on Operational Cost of Modern Tram Zhao Xinmiao , Sun Quanxin, Liu Lu, Ding Yong, Shi Ruijia* OBS! maintenance includes maintenance cost of contact net and daily maintenance cost]
* Toll price for vehicles crossing to urban area: **20 SEK/pass** [*source: https://visitsweden.com/information-swedish-transport-agency-swedens-congestion-taxes-and-bridge-tolls/*]

**Equipment cost**

* Tram car cost: Approx **26 million SEK** (“Can bus really be the new tram?”, Hodgson, Potter et al. 2013)
* Base vehicle cost (without engine, clutch and transmission): **12000 SEK/vehicle** [*source: Roland Berger “Automotive metal components for car bodies and chassis”*]
* Battery pack cost: **1000 SEK/kWh**
* Electric Machine cost: **70 SEK/kW**
* Power electronics and control: **50 SEK/kW** [*source: https://www.energy.gov/sites/prod/files/2016/06/f32/edt000\_rogers\_2016\_o\_web.pdf*]
* Single speed reduction gear box: **3500 SEK** [good to double-check]
* Autonomous drive software and hardware: **48000 SEK/vehicle** [*source: https://www.wired.com/2015/04/cost-of-sensors-autonomous-cars/*]