AB Storstockholms Lokaltrafik (SL) /Stockholm PTA

General presentation

”SL is responsible for public transport on rail and road in the County of Stockholm”

County of Stockholm

- Population 2 million
- 26 municipalities
- Land area 6,500 km^2
- 160 km from north to south

- Every fifth Swede lives here
- Cars per thousand inhabitants

County of Stockholm: 393

Sweden: 459

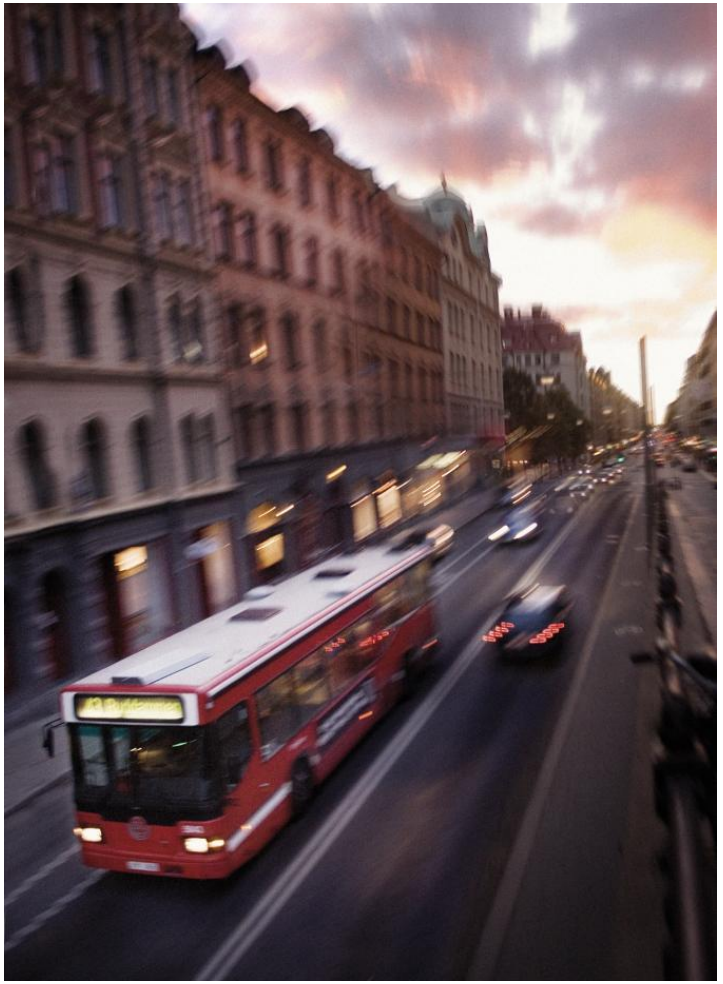
AB Storstockholms Lokaltrafik / Stockholm Public Transport

- Is a limited company owned by Stockholm County Council

Owner
Stockholm County Council
(SLL)

AB Storstockholms Lokaltrafik
Stockholm PTA
(SL)

Contractors
-Operations
- Stations Services
-Infrastructure maintenance



County Council = regional level

- Own parliament – County Council Assembly
- Independent power of taxation and decision
- Responsible for healthcare, dental care, public transport

There is a PTA in every county responsible for local and regional passenger transport, in Stockholm this is called SL.

18 County Councils

SL in short

- Biggest public transport company (more than 50 %) in Sweden
- 725,000 passengers / weekday
- 42% overall market share in the Stockholm region
- 80% during morning peak
- 75% customer satisfaction

- Zone-based prices
- Funding: 50% taxes and 50% fares
- Costs: 1,400 M Euro / year
- Investments: 500 M Euro / year
- 14,000 employees: 500 at SL, 13,500 at contractors

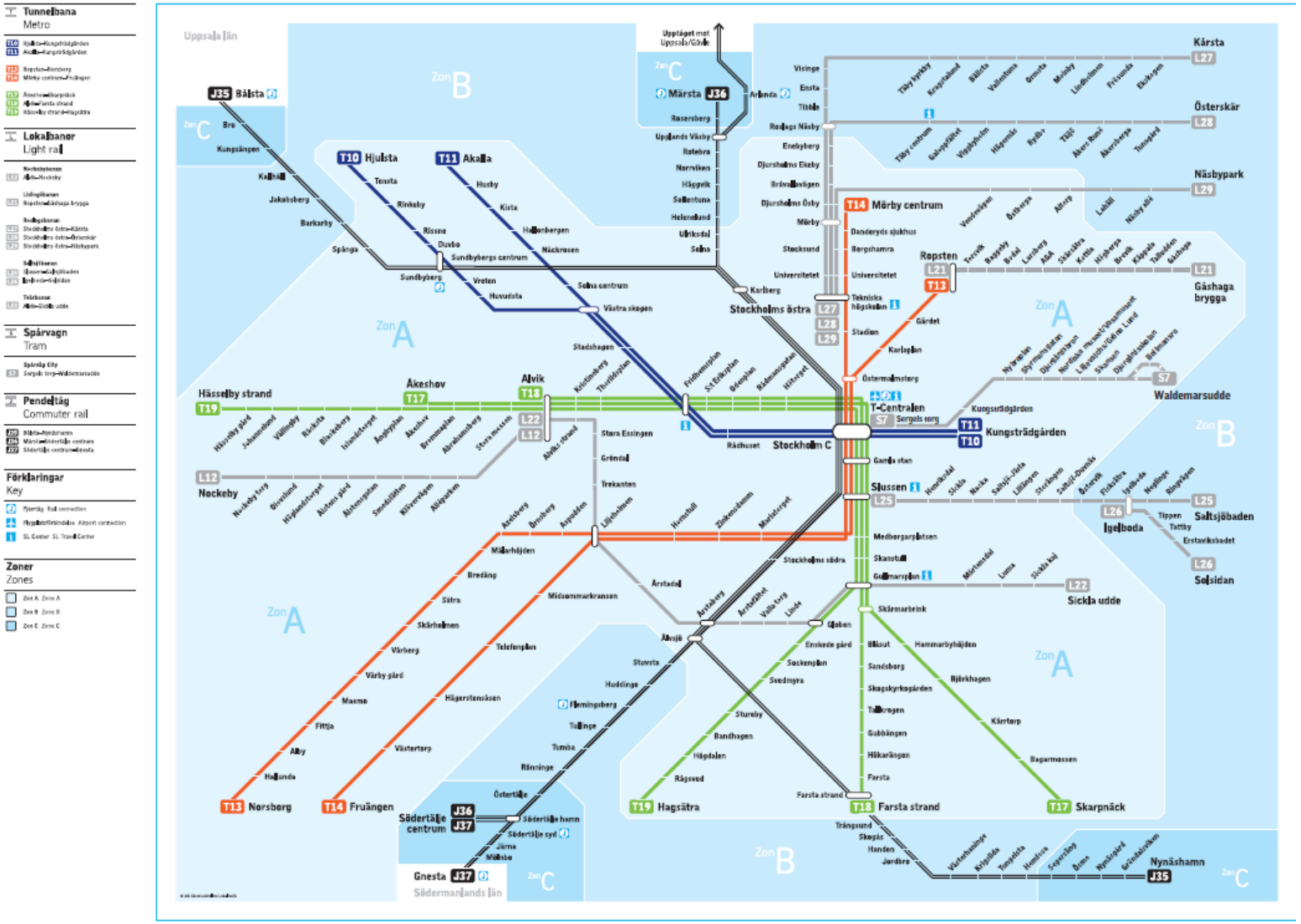
Infrastructure managed by SL

The management of engineering and equipment represents a large part of SL's expenses:

- ➔1,000 track vehicles
- ➔244 stations
- ➔900,000 m^2 property area
- ➔233 km track
- ➔167 bridges
- ➔32 depots

The value of the infrastructure managed by SL corresponds at present to SEK 100 billion.

Stockholm rail system



Responsibility distribution for SL contracts

SL

- Long term planning
- Integration and co-ordination of the SL-system (fares, quality levels etc)
- Infrastructure development incl. rolling stock and stations
- Procurement

Operators

- Daily planning and operations
- Ticketing
- Local information
- Maintenance

Major part of SL vehicles run on renewable energy

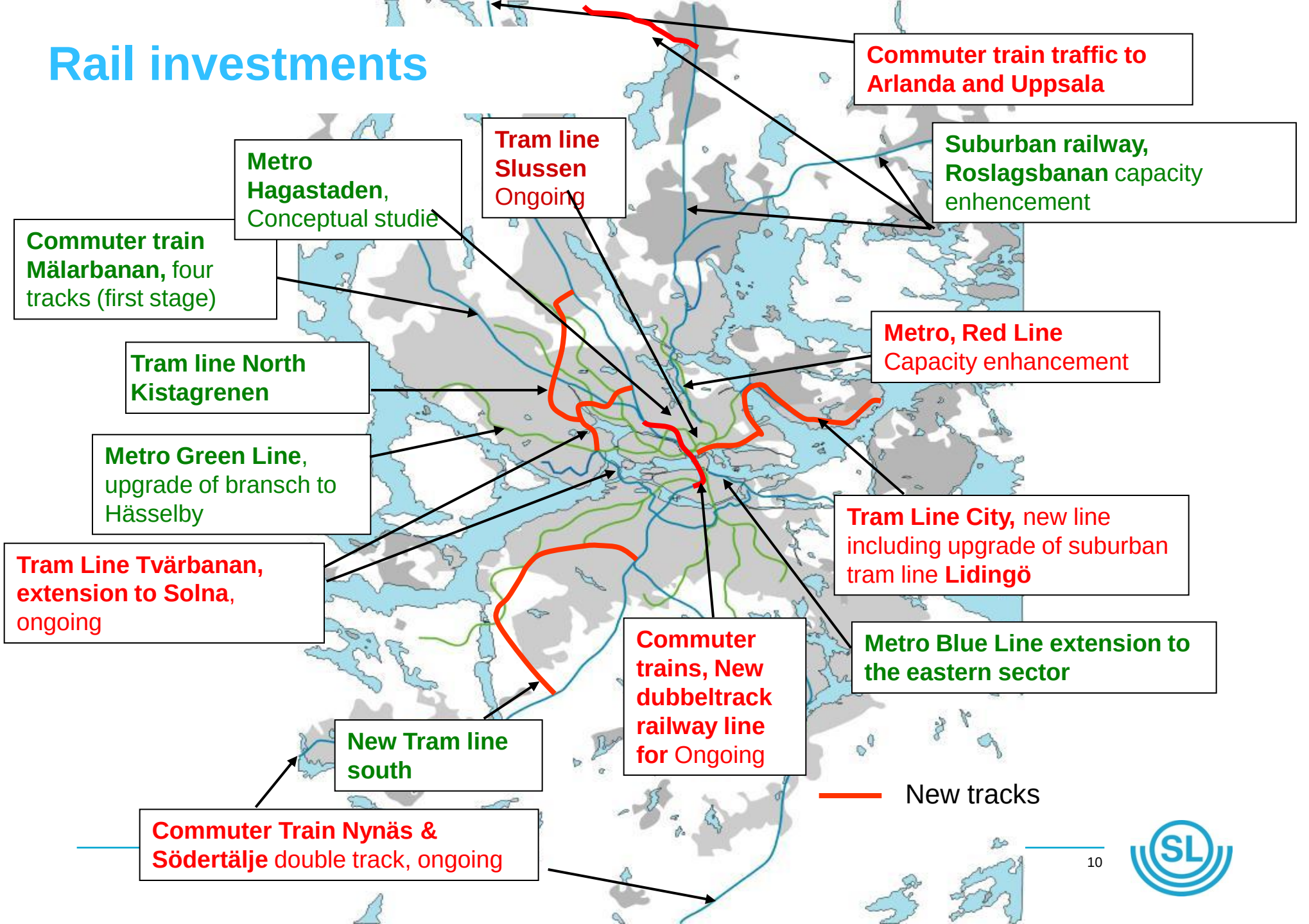
All track vehicles run on energy from wind- or hydropower

- Next step is lower energy consumption

Today > 50% of the buses run on renewable energy

- Target 2011 50%
- Target 2016 75%
- Target 2025 100%

Rail investments



Red line

First section opened, year 1964

Number of stations	36
Double track (km)	41
- tunnels (km)	
-viaducts and bridge	
Trains per hour and d	
- planned	
Trains in traffic (140 r	
- planned	
Train Type	C
Depots	
- planned	

Blue line

First section opened, year 1975

Number of stations	20
	25
	23
ges (km)	2
d direction	20
0 metres)	18
CX and C20	
	1

Number of stations	
Double track (km)	
- tunnels (km)	
-viaducts and bridge	
Trains per hour and	
- planned	
Trains in traffic (140 metres)	51
Train Type	C20
Depots	2

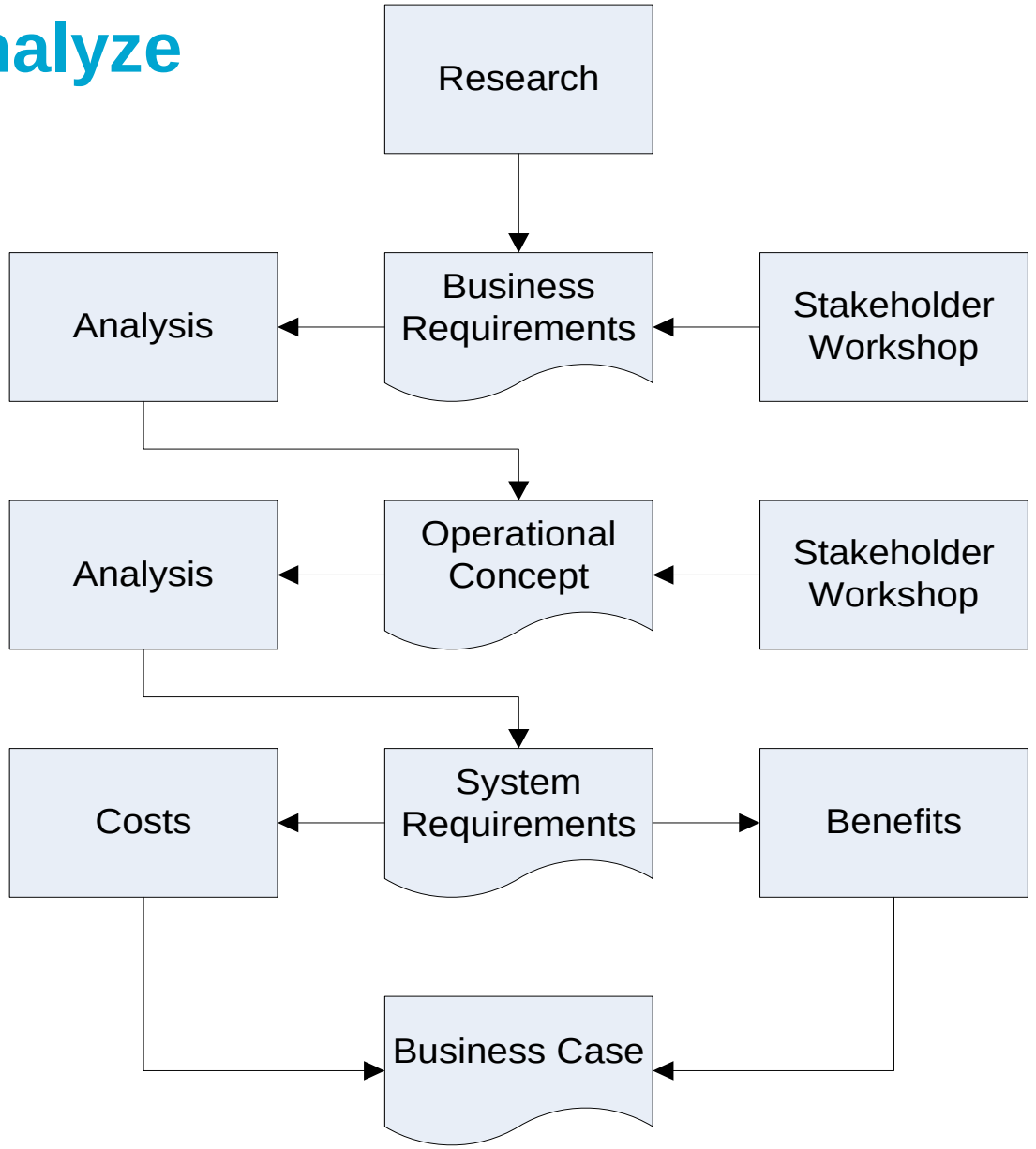
The Programme Red line upgrade - RLU

- Programme objective:
  - The existing signalling system has to be excanged due to age
  - The oldest trains needs to be exchanged (type CX)
  - The Capacity on the Red Line need to be increaed
- And the challenge:
  - The exchange of signalling system and trains must not affect ongoing traffic

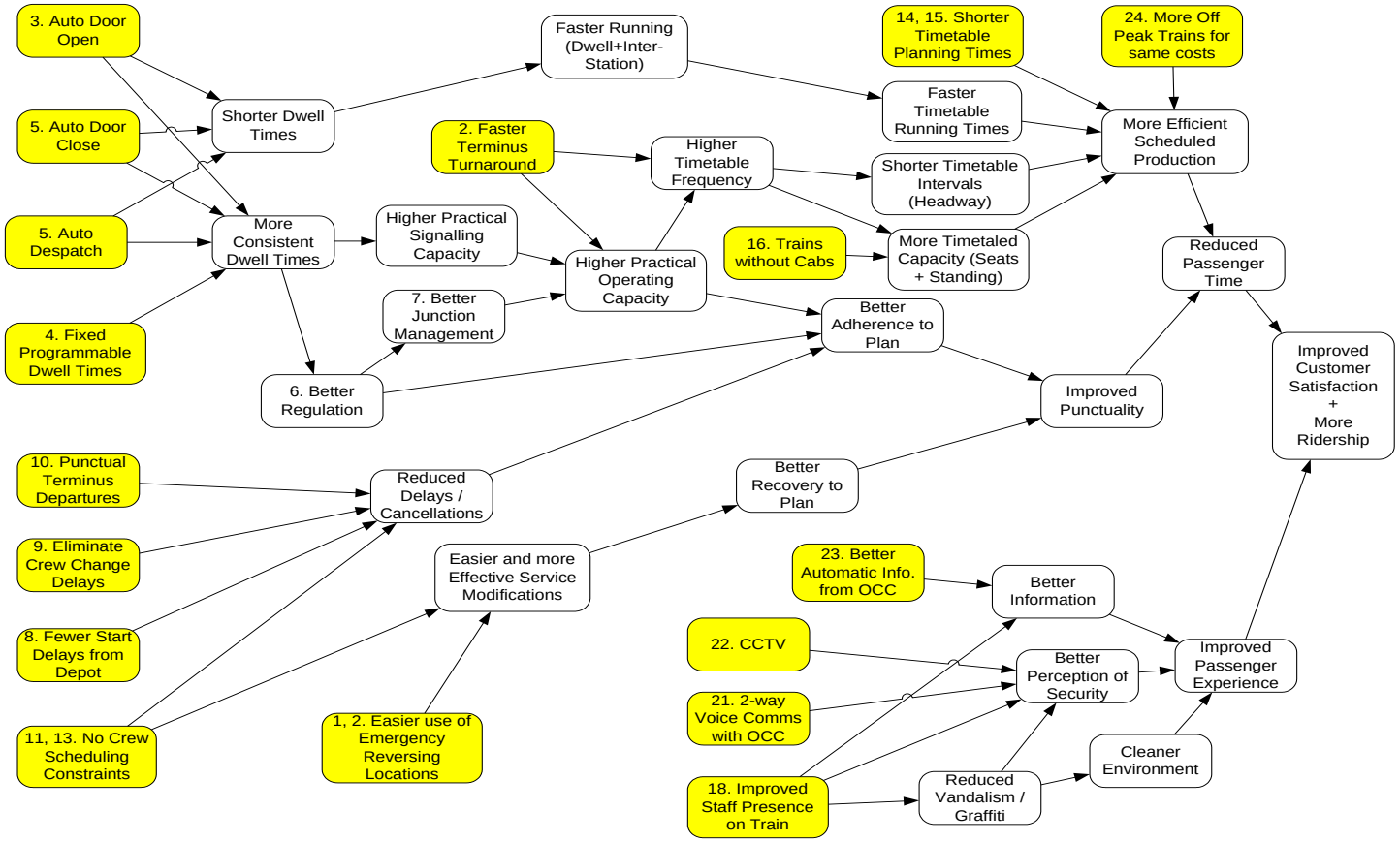
Starting with the Signalling project, why CBTC?

- A System Study started and the outcome was that SL should aim for a modern, robust system
- A change in technology would make it possible to have an owerlay system and by that avoid the problems that arose at the change of signaling system on Green Line Metro
- An increase in capacity from 24 trains/h to 30 trains/h was needed
- New technology opened for the possibility to go for fully atomization of the Metro.
- The choise was to go for CBTC! But what grade of automation?

Method of Analyze



FAO Benefits Map



Benefits of UTO

- Improved Operational Flexibility
- Faster Terminus Reversing
- More Consistent Dwell Times
- Increased Train Capacity
- Improved Customer Service and Staff Presence (Roaming Staff)
- Reduced Staffing Costs

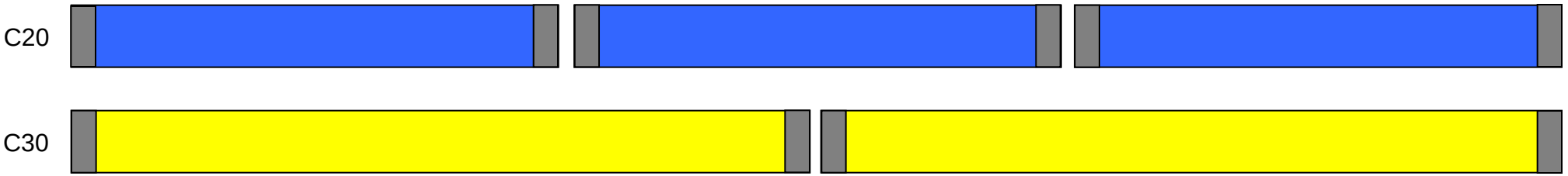
Planned Migration Strategy

- Rolling Stock
  - Cx Trains should be phased-out and will not have any modifications
  - C20 Stock should be fitted with ATO,FAO and communications systems modifications during a single out-of-service period
  - New Stock should be delivered with all the FAO supporting systems

- The number of C20 trains is not enough to fill up the red line when the traffic is increased

C30 Ny New Metro Trian

- A process for purchasing 26 new trains started
- The public tender process had to be stopped due to lack of budget
- New knowledge was taken into account:
  - Many possible options are expensive
  - Uppgrade of old vehicles are difficult and expensive
  - Plattform screen doors sets restrictions

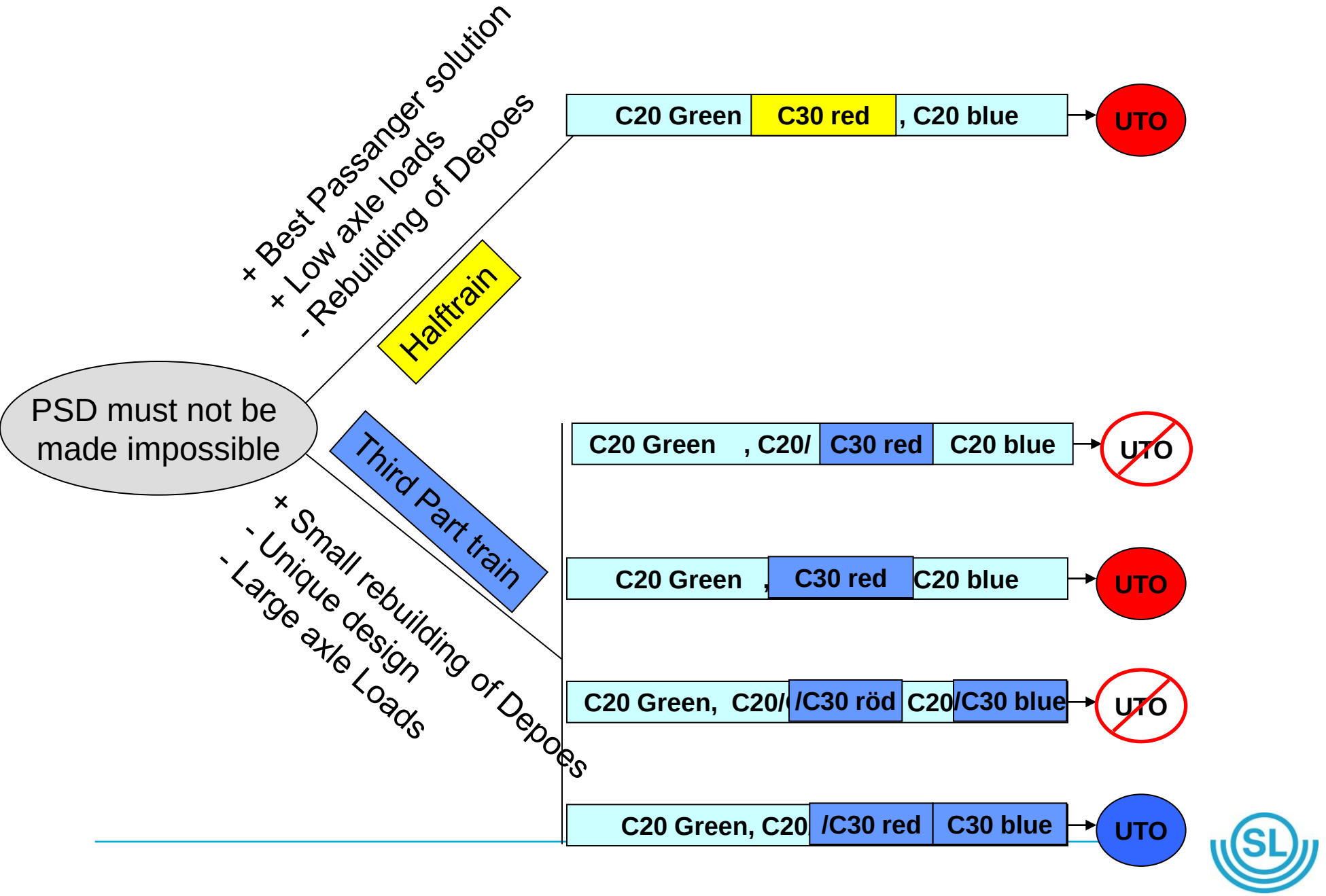


C20 Concept

Train Doors / Platform screen doors

1/3-vehicle

1/2-vehicle


+ Best Passanger solution
+ Low axle loads
- Rebuilding of Depoes
Halftrain
PSD must not be made impossible
Third Part train
+ Small rebuilding of Depoes
- Unique design
- Large axle Loads
C20 Green
C30 red
, C20 blue
UTO
C20 Green , C20/
C30 red
C20 blue
UTO
C20 Green ,
C30 red
C20 blue
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C20
/C30 blue
UTO
C20 Green, C20
/C30 red
C30 blue
UTO

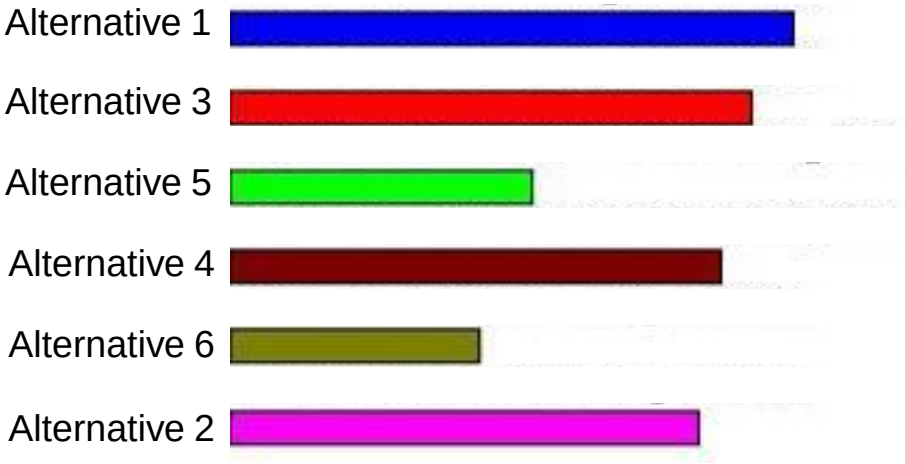
Traffic alternatives

	Type of vehicle per track	Vehicle concept	Mode of operation	Number of C30 trains needed (final delivery)
1	C20 Green C30 Red C20 Blue	1/2-tåg	UTO	**48 C30 trains** (year 2020-2023)
2	C20 Green C20/30 Red C20 Blue		UTO	**39 C30 trains** (year 2022)
3	C20 Green C30 Red C20 Blue	1/3-delståg	UTO	**48 C30 trains** (year 2023)
5	C20 Green C20/C30 Red C30 Blue		UTO	**37 C30 trains** (year 2021)

Investigation – Result

Evaluation of traffic alternatives with FOI - Swedish Defense Research Agency

- Eight traffic alternatives were developed from the basic requirements
  - Enabling increase of traffic
  - Platform Screen Doors must be possible
- Six alternatives were evaluated in ”Expert Choice”
- Different criterias identified and measured against each other
- All six alternatives where then evaluated against each other



- Four alternatives where relatively equal
- Sensitivity analysis show that the result is stable

Status right now

- Ongoing development and installation of the CBTC system
- Ongoing procurement of 48 new C30 trains prepared for UTO
- Ongoing procurement of design and construction of the new depot in Norsborg
- Ongoing redesign of workshops in old depoes

- Ongoing investigations of actual solutions in how UTO can be implemented in Stockholm Metro

Thank You !