

Test with Alternative Interiors, SL Metro

Laura Mayer
Project Manager
SL Rolling Stock Department



CX Alternative Interior Design Project

Alternative interiors for

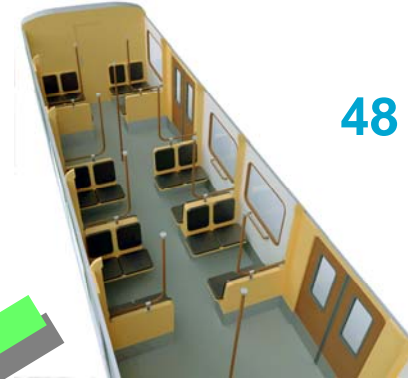
- Increased punctuality?
- Increased capacity, number of passengers?
- Satisfied passengers?

Why do tests?

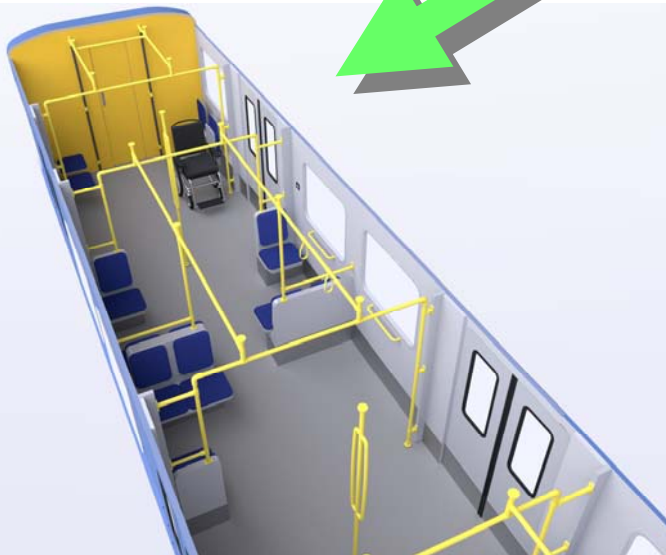
- Coming tenders of new Metro cars
- Refurbishment of older Metro cars



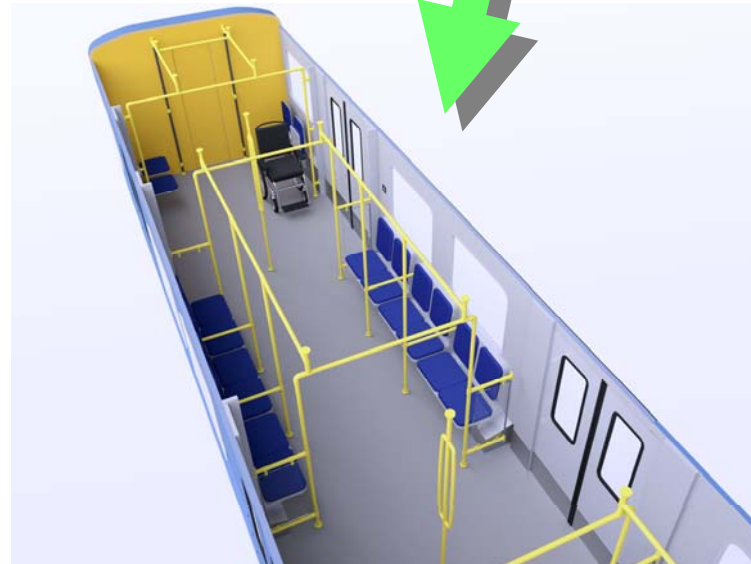
Tested Interior Layouts



48 seats



Type 1 - 26 seats



Type 2 - 32 seats

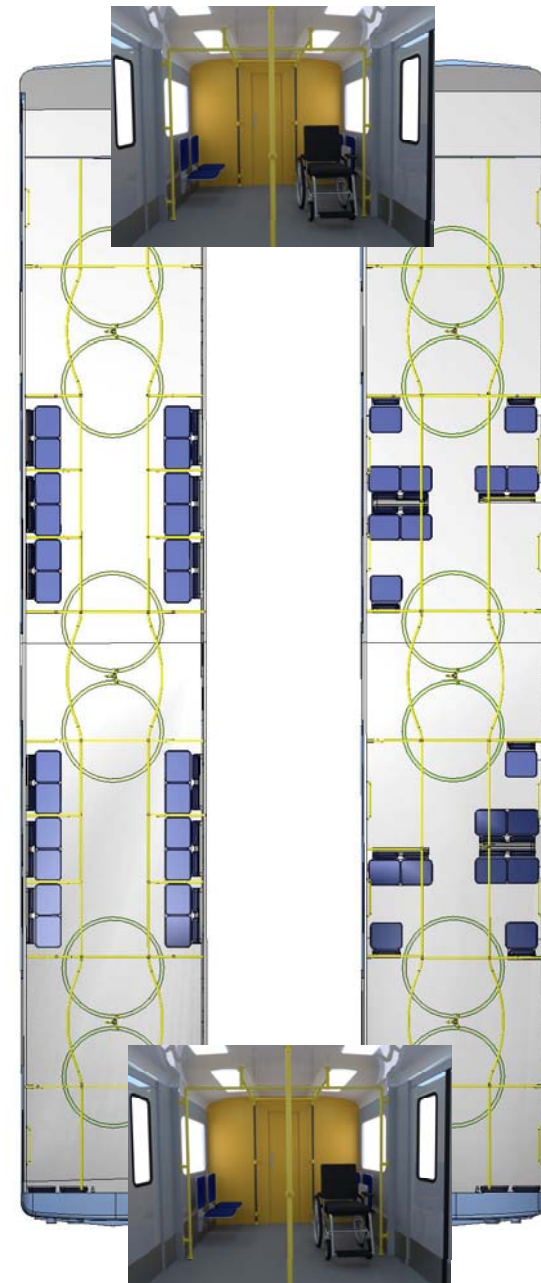


Common
Flex area



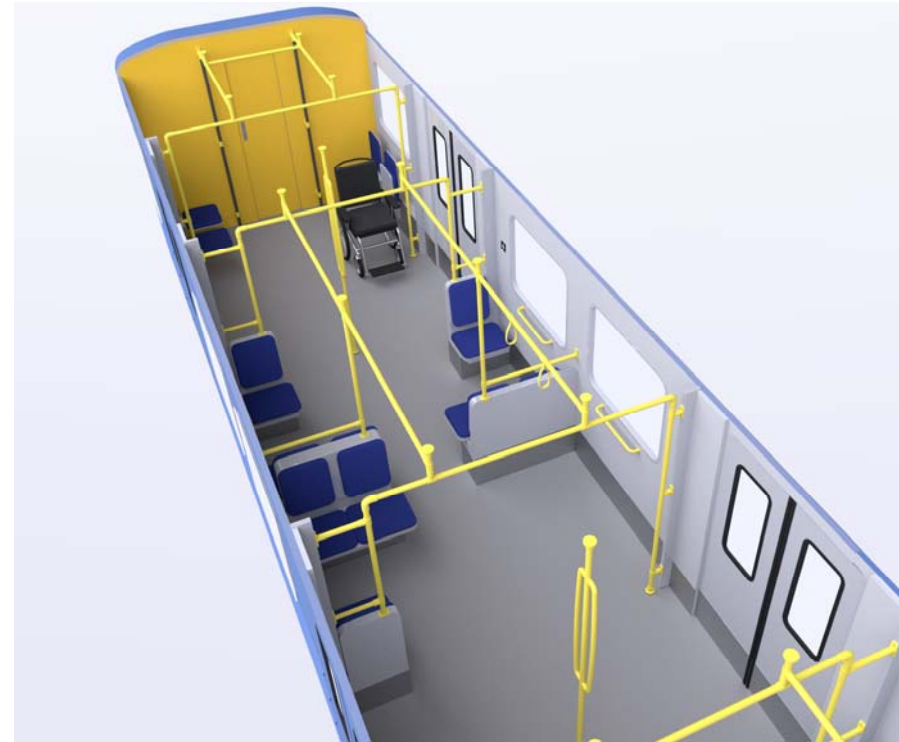
Design principles

- No changes to doors or window positions
- Refurbish interior with modern scheme
- 1.5 m turning diameter for wheelchairs and carriages
- Contrasting colors for visually impaired
- Marked seats for disabled
- Common “flex area” positioned by first door
- Stanchions floor to ceiling (+ children, - cleaning)
- Stanchions positioned with respect to passenger flow
- Few places to hold on close to doors to avoid congestion
- Wider isles
- Motivate people to move into the cars to avoid congestion by doors



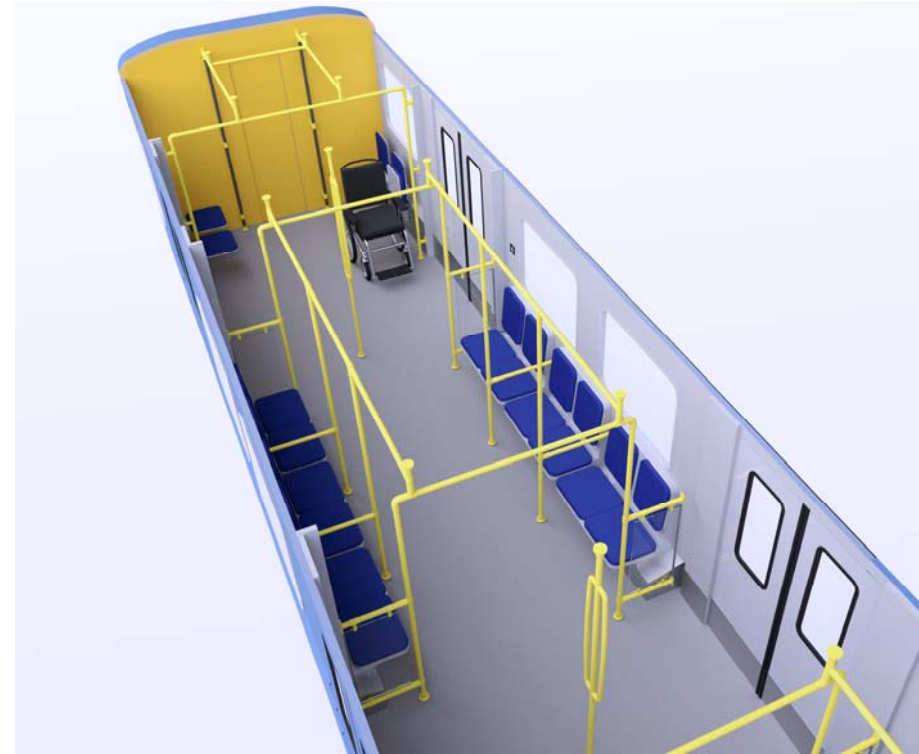
Design principles, Type 1

- Similar to original design
- Large areas for carriages, wheel chairs, Rollators, walkers
- 18 fixed seats + 8 folding seats
- A-symmetric layout
- Marked area for carriages
- Hanging straps in open areas



Design principles, Type 2

- "Asian" Seating only
- 24 fixed seats + 8 folding seats
- Double symmetric interior
- 2-seat units with armrest
- Stanchions easier access in center of each section, closer to wall by entrance

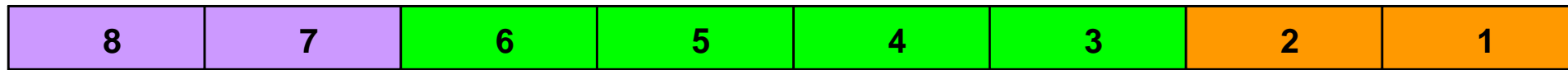


Metro train = 8 CX units




Position of test cars in train

Red line only. Test period of 8 weeks.



 Type 0, cars with original interior

 Type 1, removed seats

 Type 2, "Asian" seating

Evaluation methods – Marketing

What do the customers think?

Seating
arrangement

Comfort

Arrive
on time

Getting on
and off

Something to
hold on to

Crowds

Feeling safe



Evaluation methods – Marketing

→ Qualitative research

- Focus groups with children
- Focus groups with adults (different categories)

→ Quantitative research

- Interviews on train

Investigations with children

- SL follows the UN Convention on the Rights of the Child (the CRC).
- Earlier studies SL has done with children
 - Roslagsbanans rolling stock
- Model
 - 3 mini groups á 1.5 hours
 - On train before going in traffic
 - Target group: children 9-14 old that travel **without** an adult



Focus groups with adult passengers

- 3 focus groups with 5-6 people per group
 - Passengers that normally travel during rush hour – ages 25-40
 - Passengers that normally travel during rush hour – ages 50-65
 - Passengers that normally travel during non-rush hour – ages 25-75
- Distribution of sex, home station, short or long trip in each group
- On train in traffic with focus group. Group is taken to discussion room for focus group discussion and evaluation.
- Booked train with both Type 1 and Type 2 pick up groups at specified station.
- Focus group members are given guide lines and topics to consider during the trip. The travel first in Type 1 and then in Type 2.
- Members meet in the focus room for group discussion

Quantitative investigation

- Target group: passengers that normally travel on the Red line and have previously ridden in the test cars
- Method: Interviews on board the test cars, spread over the clock and all days of the week
- 300 interviews in Type 1 and 2 - 600 total
- Approx. 20 questions, same questions in Type 1 and 2
- To be done at end of test period

Conclusions – Marketing study

Punctuality is very important

More than 90% of passengers rate punctuality as very or quite important.

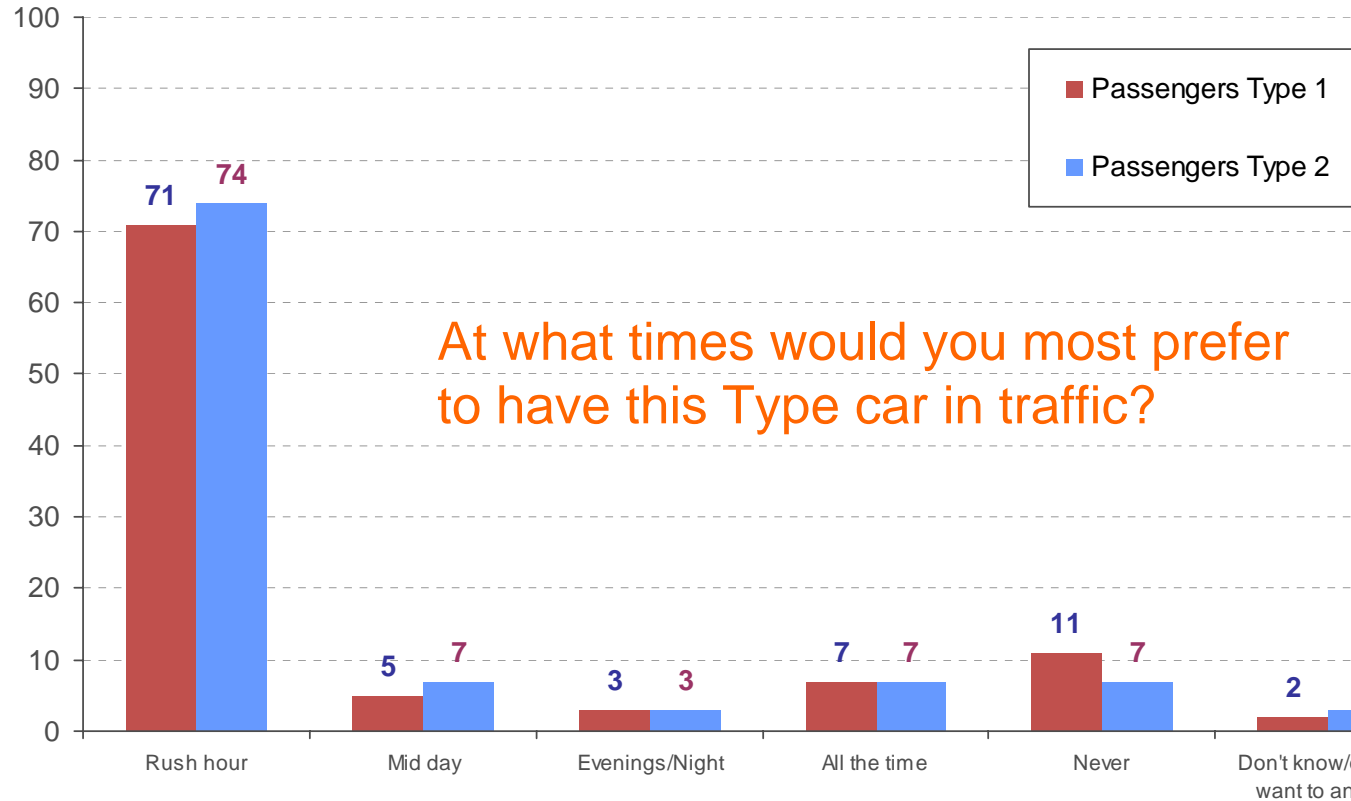
Arriving on time is most important for the greater part of passengers.

Approx 75 % set higher priority to arriving on time over having a seat, on shorter trips.

Having a seat tends to be somewhat more important than punctuality on trips longer than 20 minutes.

Rush hour

is when the cars should be used according to our customers



At what times would you most prefer to have this Type car in traffic?

*Type 2 is significantly better concerning number of seats and places to hold on when standing.
Type 1 is significantly better when travelling with baby carriage or luggage.*



Evaluation methods - Traffic

→ Quantitative

- Measure station times, compare with original car
- Times to measure, When:
 - car stops at station
 - Door opening
 - Passengers start to leave the car
 - Passengers have left the car
 - Passengers start to enter the car
 - Passengers have entered the car
 - Doors are closed
 - Train leaves station

- Measure entering and leaving passengers, at each entrance
- Count total number of passengers
- Register how the passengers are distributed in the car

Conclusions – Traffic measurements

Stop times can be reduced by 2-4 seconds with the test cars at stations

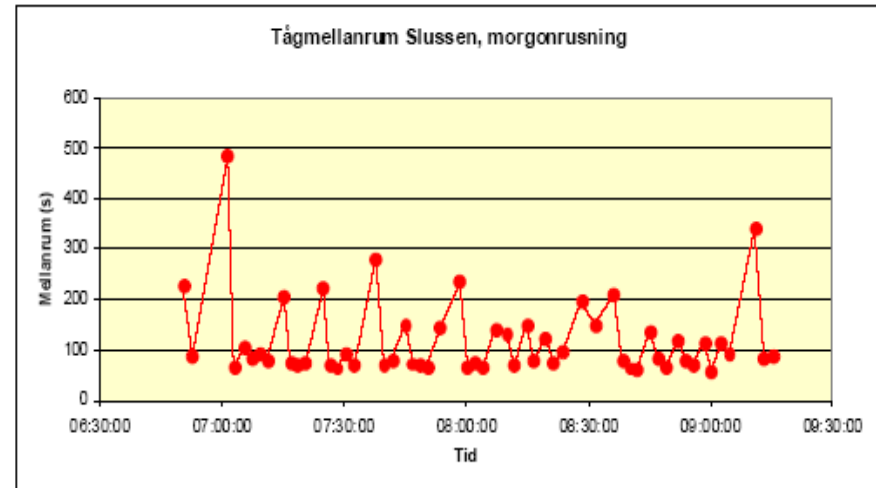
- High passenger exchange
Type 2 is slightly better than type 1

Calculated route time: Fruängen - Mörby Centrum

- Can be reduced approx. 20-45 seconds for the rush hour trips with highest passenger counts
- This time can be used to compensate for other disturbances that can affect regularity.

Problems with regularity

- affects punctuality and causes crowdedness



Target value approx. 150 seconds

Conclusions

	Positive	Neutral	Negative
→ Traffic measurements	Max 2-6 s shorter station stops	No differences in capacity	Passengers moved from test cars to Type 0.
→ Marketing study	Passengers that travel daily during rush hour. Easier to get on and off	Lower comfort is accepted IF the time schedule is followed.	Non- rush hour travelers. No external marking of the cars. Too few places to hold on.
→ Dissabled	Large areas for wheelchairs - Type 1 Easier to orientate in - Type 2		Poor contrast
Drivers			Noise from the folding chairs. Travelers moved from test cars to Type 0.

Conclusions

- Those travelling in rush hour are most satisfied with the test cars
- Advantages with Type 1 are appreciated most by disabled persons
- Those travelling during non-rush hour don't like the test cars; sitting is very important
- Position of the test car in the train is important; 1st or last car on the Red line
- The cars should be marked so they can be identified from the platform
- Small time gains from shorter station stops can contribute to better compliance with the timetable, but they doesn't solve all problems
- SL has developed a guideline document that includes requirements for functionally impaired passengers. It is used when buying new rolling stock and doing refurbishments.