

New Interior concepts for commuter rail operations.

*Jim Ryan, FIDSA
Director of Transportation Design*

*ECCO Design Inc.
New York, USA*

In the New York area today, passenger accommodations in commuter rail fall between the very Spartan interiors of the Metro NYC-subway cars and the more comfortable accommodations in modern intercity railcar interiors.

The subways now have indirect lighting and electronic information signs but little else in the way of amenities. The Acela intercity railcars in contrast have subdued lighting, enclosed luggage bins, Individual passenger reading lights, window curtains, carpeted floors and comfortable fabric upholstered seating in a 2x2 configuration.

**Photo of NYC subway interior.*

**Photo of Acela interior*

.

If we want to convince commuters to ride the trains and leave their automobiles at home it will require an enhanced riding experience.

Why can't some of the features and amenities that we come to expect as basic in commuter air travel be provided in commuter rail cars?

** Title: Bi-Level Cars for Increased Capacity*

These recent bi-level cars for New Jersey Transit with 2x2 seating are replacing older single level cars at an increasing rate. To accommodate a growing number of riders on trains where the number of cars is limited by the station's platform length, bi-levels offer a solution.

Seating capacity can be increased by 20% to 30% over single level cars with 2x3 seating. An added benefit is that commuters greatly prefer the comfortable wider seats and aisles resulting from the 2x2 seating arrangement.

These cars are a step in the right direction, however, they still do not provide the electronic communications, information and entertainment features that are possible today. Incorporating these features would greatly improve the passenger's riding experience.

**Show NJT multilevel car shots*

**Title: Enhanced Riding Experience*

We see the possibility of a greatly enhanced commuter riding experience. The advances that are being made in communications and materials technologies will permit extending these conveniences to commuter rail travel.

Many products and services once thought to be too costly, too complex or just extravagant are now regarded as basic daily necessities that we can't live without.

**Photos of cell phone, i-Pod, PDA and laptop computer.*

** Title: Passenger Communications, Information, Entertainment*

**Cell phone access*

**Wireless connectivity*

**Power access*

**Seat back displays*

Passenger communications and entertainment will be the most notable change for the new commuter rail. We already have cell phone access and we also have wireless connectivity to our PDA's and laptop computers on some intercity rail. But this feature is not widely available on commuter rail systems as yet. WiFi or WiMax will certainly be considered for internet access in any new railcar procurement. Providing passenger access to power receptacles for recharging their phone and laptop batteries will be a standard feature. Small auxiliary table surfaces on sidewalls or on seat backs will be provided to assist.

**Photo or sketch of a laptop plugged into a receptacle on the side wall.*

**Title: Operations Information*

**Basic information displays*

**Graphic displays for special information*

**Security CCTV cameras*

Operations communication in the form basic digital displays will keep passengers informed of “destination”/”next stop”/”time of day”. Full color graphic displays will inform of special events, schedule changes and emergency announcements.

Security precautions will be less apparent to the passenger but equally important.

Central control stations will monitor the condition of the systems in all cars and the position of all trains. Several security cameras (CCTV) will be placed in each car and will be addressable in central control. This will reduce the time needed for train personnel to identify the site of an incident and take corrective action.

**Photo of a graphic display*

**Photo of CCTV mounted on ceiling*

**Photo of a control room with many monitors*

It is becoming more likely that seatbacks will be equipped with displays capable of delivering short summaries of local, sports and world news as well as some entertainment selections. This could be offered in an all text format not requiring audio, so as not to disturb one’s seat mate. The content offered on these displays would be limited to short segments to suit the duration of an average commute. Though some riders may travel an hour and a half or even longer, the average commuter’s ride in this area runs approximately 30 to 60 minutes.

**Title: Materials technology*

**Lighting*

**Interior materials*

**Seating*

**Title: Lighting*

The sight of overhead fluorescent lighting glaring down from the ceiling will become a thing of the past. Ceilings will be indirectly lit by LED wash lighting providing a softer more attractive ambiance, possibly with color variability between entrance areas seating areas. Individual reading lights will supplement the light level. Individual lights were once shunned in commuter rail because of cost and maintenance issues, but they are now practical due to the extremely long life of LED systems. Changing bulbs is no longer a consideration. Another emerging technology, electroluminescent film, could permit entire areas ceilings or other surfaces to be luminous.

**Photos of LED reading lights, LED wash lighting, electroluminescent ceiling*

Advances in materials technology are helping designers develop lighter and more visually open interiors. Composite sandwich panel construction is not only lighter in weight but more durable and decay resistant. Mar resistant surface treatments are permitting the increased use of transparent panels for better light distribution and openness in luggage racks as well as windscreens. Window shades can be sandwiched between the panes of the car windows.

**Cabin rendering showing open/transparent luggage rack, doors and wind screens. Also shows indirect lighting and reading lights*

**Title: Seating*

Ergonomically designed seating goes without saying. No vehicular program today would be undertaken without requiring an ergonomic analysis of the seating design. It is simply the price of admission. However, configurations and new materials can be utilized to maximize seating comfort.

Increased seat width and aisle width are gained by using the 2x2 configuration.

Visco-elastic cushioning conforms to the shape of ones body distributing the pressure more evenly for better comfort. This cushioning is much thinner than conventional foam permitting a slimmer overall seat dimension. A woven mesh supporting membrane provides breathability and is likewise very space conserving. These materials in combination result in a seat design that provides greater usable passenger space at a reduced seat pitch. In some cases an additional seat row may be gained

**Sketch of seating concept*

**Title: Automating Fare Collection*

Fare collection can be automated by radio frequency scanning of the rider's card on entry and exit. Frequent riders would advance a monthly amount for the card and then receive a monthly statement debiting their account. The account would be replenished automatically at a pre-set threshold. Occasional riders would purchase their cards prior to boarding. Sensors located on the luggage rack or on the seat would indicate to the conductor if the passenger's fare had not been collected. A conductor's display panel would show the status and passenger density in all cars.

Similar systems already exist: such as "Fastrack" or "EZ-pass" for automobile travel or metrocard for city transit systems. They have proven to reduce personnel requirements and speed processing.

**Sketch of indicators on the luggage rack*

**Title: The End Result: Rider satisfaction*

**Reduced automobile use*

**Reduced fossil fuel consumption*

**Reduced air pollution*

n

**Reduced greenhouse gasses*

**Lower carbon footprint*

**Help inhibit global warming*

While the cost of providing these features may seem daunting at present, the benefits of rider satisfaction results in increased use of mass transit. The costs of new technologies always trend downwards as their use proliferates. Witness the dramatic price reductions in personal computers and flatscreen HDTV's in just a very few years. And there are many more examples.

The more we can get commuters to leave their cars home in favor of rail travel the better our environment will be. Many cities, soon to include New York, are instituting congestion pricing to keep automobile traffic from strangling our inner cities. Enhancing the riding experience for commuters will be critical in winning them over to mass transit.

THANK YOU