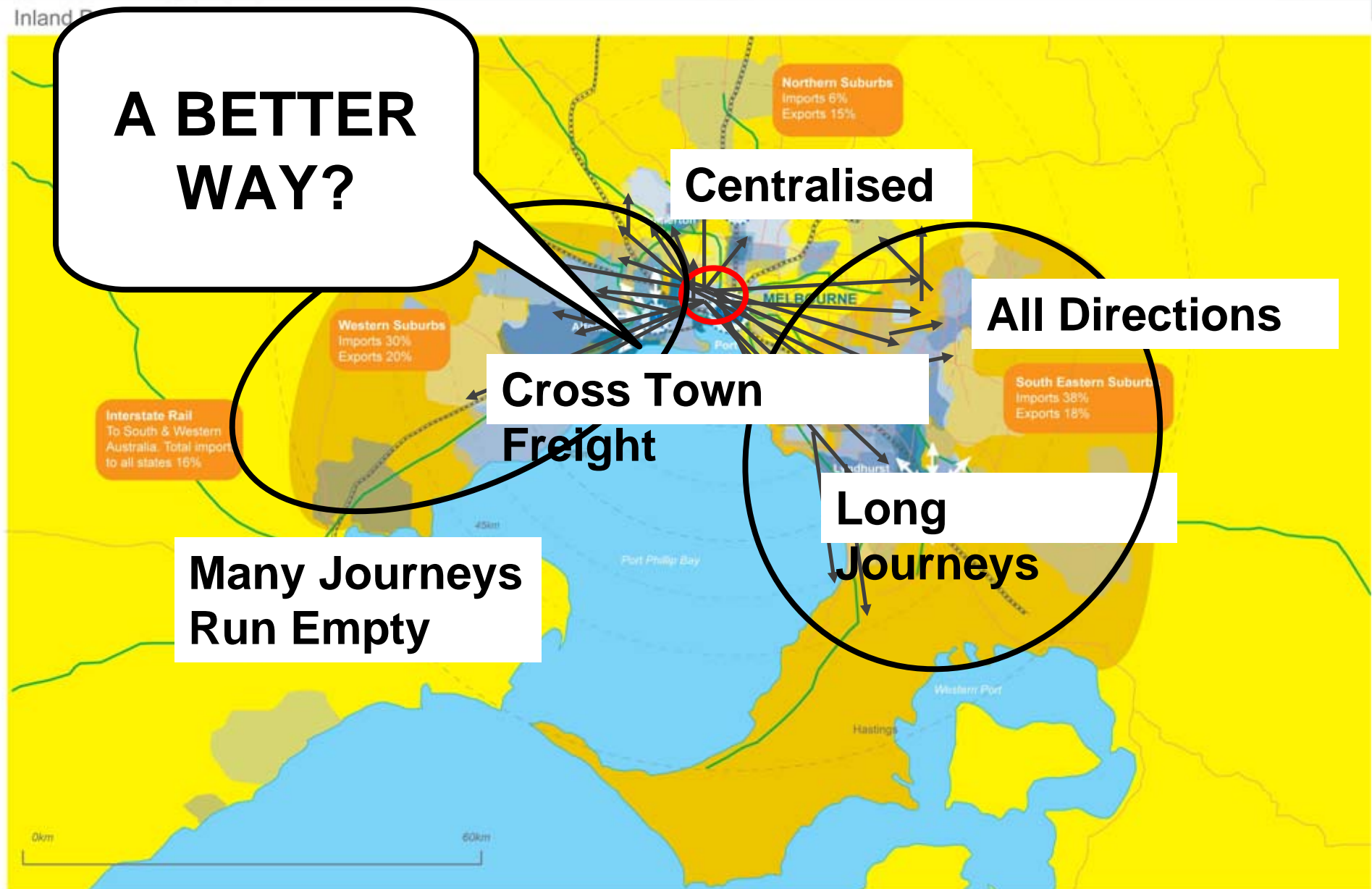
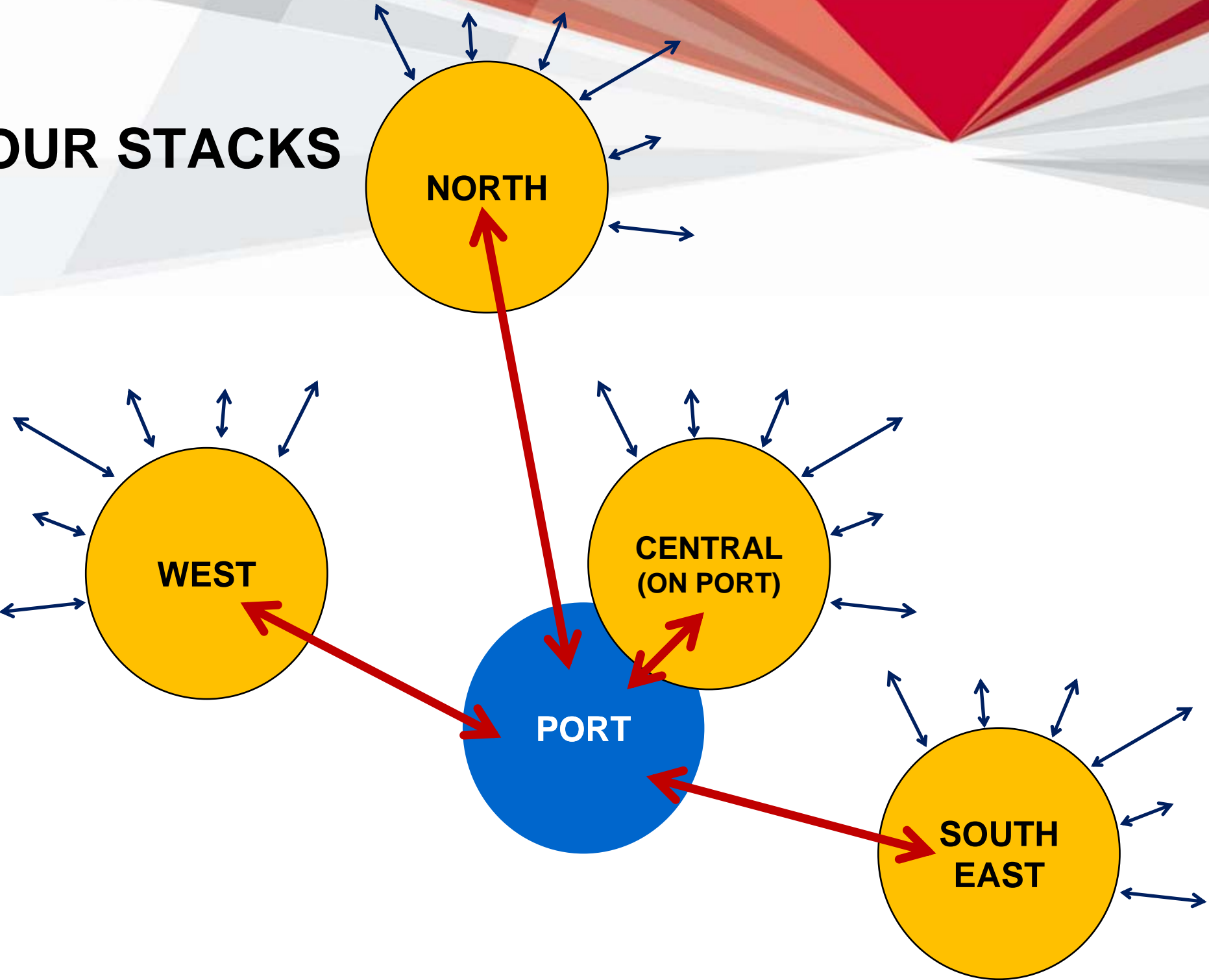


Port of Melbourne Distribution - Current Situation



FOUR STACKS



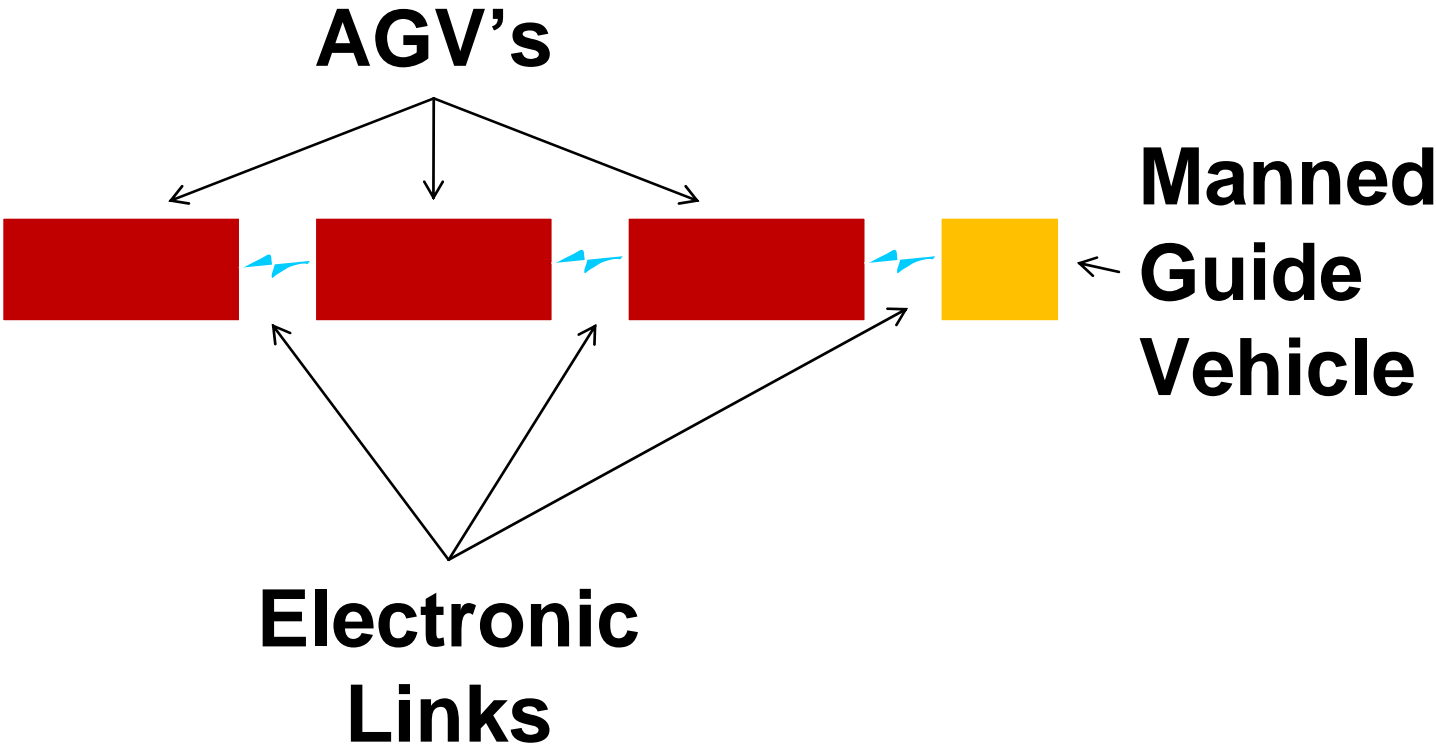
Gottwald 'Lift AGV'



Steel Frame

Intelligent Transport Systems

VEHICLE 'PLATOONING'





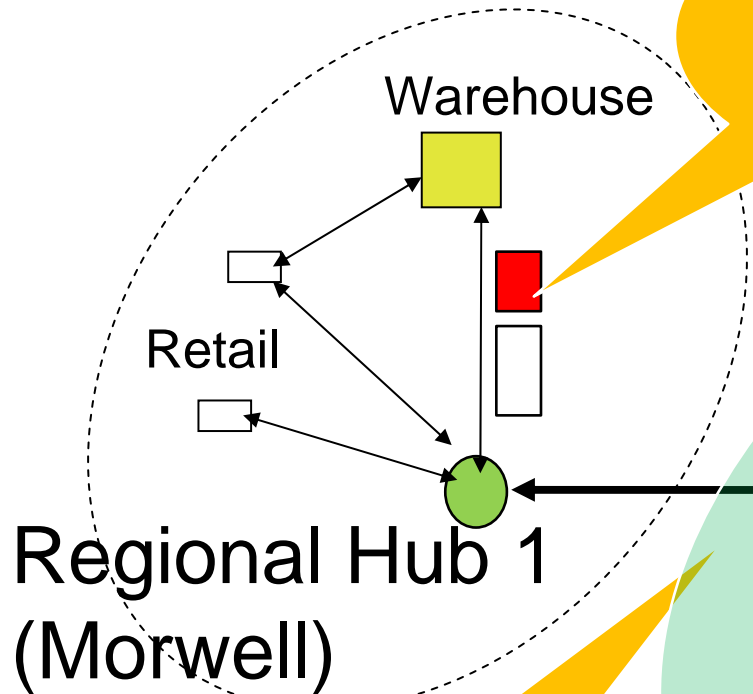
SMOOTH PHYSICAL FLOW CANNOT BE ACHIEVED WITHOUT THE SMOOTH FLOW OF INFORMATION

Right Data, at the Right Place, at the Right Time:

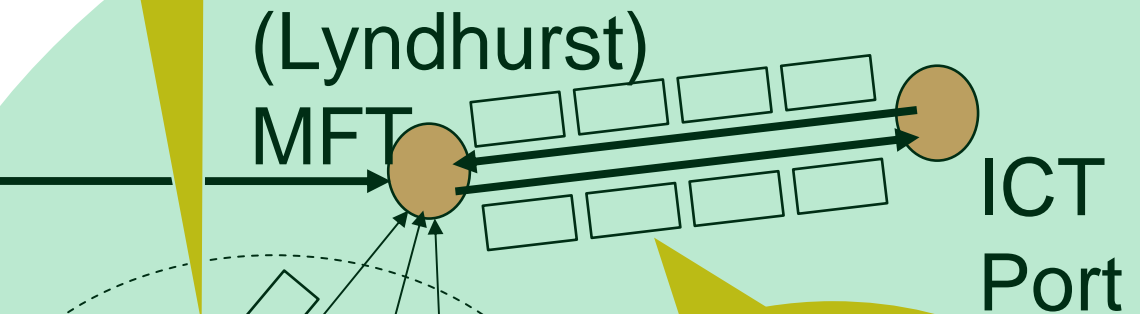
- Freight
- Packaging
- Vehicles
- Network
- People

Fully Integrated System: AGV + Manual Guide Vehicle

ULTIMATELY... The Network should carry ALL CROSS TOWN FREIGHT



LIKE A TRAIN



LIKE A CONVEYOR

Warehouse

Retail

ROAD + RAIL vs Intelligent AGV

ROAD + RAIL		AGV
Ship		Ship
Crane + Driver + TWO Twist Lock	Lift	Crane
*Straddle + Driver	Lift	Twist Lock Removal
#Port Stack (Wait time)		AGV to MFT
*Straddle + Driver	Lift	
Truck + Driver		
*Reach Stacker + Driver	Lift	
# Rail Stack (Wait time)		
*Reach Stacker + Driver + Yard Staff	Lift	
Train + TWO Drivers		
*Reach Stacker + Driver + Yard Staff	Lift	
# MFT Stack (Wait time)		
*Reach Stacker + Driver	Lift	OR for Local Delivery:
Truck + Driver		@ MFT Manned Guide + Driver
Forklift + Driver	Lift	Warehouse Rack

* Reposition Time

Wait Time

Benefits

▪ Port

- Distributed Land Use at Lower Cost
- Faster Throughput at Lower Cost

▪ Social

- Less congestion & improved amenity
- Less noise & air pollution

▪ Environmental

- Less carbon emissions

▪ Economic

- Less energy/fuel
- Less labour (vs impending shortage)
- Greater use of infrastructure
- Overcomes 7 of 23 Key Blockages in Distribution Network (per ALC)

▪ Business

- Greater efficiency, lower costs & better service... And better Safety

FUTURE PROOF AND LOW RISK

- Guarantee 100% Usage: Most Efficient
- On-going Need: based on 'Physics'
- Increasing Value: as Volume Increases

Allows Long Amortisation of Capital Costs

Project Co-ordination, Simulation and Visualisation

- Web 2.0 Collaboration Tools
- Virtual Reality Simulation and Visualisation

THE FREIGHT NETWORK IS FUTURE PROOF

1. Freight must go where People Live and Work
2. Physical things must be moved Physically
3. Freight moves in 'Container' and 'Truck' loads that cannot move under their own power.
4. Reliability is more important than Speed
5. The most efficient way to move large volumes of 'things' is as a 'conveyor'... timed to unload and load at each end.

OTHER REASONS FOR SEPARATING MASS TRANSIT OF PASSENGERS AND FREIGHT

1. Passengers want to move at ad hoc times between 'arbitrary' points.
2. For Passengers, Speed is important.
3. Passengers move in 'peaks'.
4. Passengers are independently mobile (ie they can walk/ride/drive themselves)
5. Avoiding Collisions between Passengers and Freight In-transit... but especially at Terminals