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SUSTAINABLE INTEGRATED URBAN AND TRANSPORTATION PLANNING

Public Transportation oriented urban development should aim at polycentric dense, mixed building environments with high quality public street space around stops, connected by close meshed networks. Thus urban bus systems rarely need maximum capacity lines, continuous dedicated lanes, flyovers, left side exits, elevated platforms, or central interchange stations. And they do not have to follow the trunk/feeder logic.

Instead, BRT and Conventional Busses should be integrated and enhanced to area wide ABN - Advanced Bus Networks. They form multi-directed flexible networks with priority at all junctions, limited dedicated lanes, low floor busses with right side exits, multiple (exchange) bus stops at 18 cm sidewalk curbs at caps with straight bus approach. They are integrated in urban design and development and can be installed gradually.

BRT - efficient through absolute priority
Bus Rapid Transit Systems are very efficient for most requirements. BRT usually is designed as one or few separated dedicated lanes and stations for highest possible capacity per lane. In future even more flexibilities of the rubber tyre system may be used, for extending it to area wide networks, for better integration into pedestrian and bicycle networks, into urban structure, design and environment, and without giving up the main BRT advantages.

Urban density, mix of functions, and public space crucial for passenger demand and PT success
Only high density around stations can provide passengers, only mix of urban functions can provide all directions 24 hrs demand, only well designed public street networks provide attractive access for passengers. Functional requirements can be integrated into urban public street design. Monofunctional separated technical space (bus lanes, platforms, etc.) should be reduced. PT in general is fostered better by more buildings than by more dedicated operating space.

Development from lines to urban networks
Advanced Urban structures follow a model of many different, specialized and equivalent points of urbanity rather than a center and periphery hierarchy. This leads to quasi endless networks with polyvalent nodes and directions. Trunk /feeder systems do not really reflect these objectives and network geometry.

Level junctions, pervious for all kinds of traffic, bus capacity limits, mixed traffic/PT priority
The many junctions of a close meshed network should be on ground level (no flyovers) in favour of cost, urban design, and access. Bus and also pedestrian and bicycle network mobility need intermittent green light for all directions. So maximum BRT lane capacity (pers. x km) is not possible. The maximum (driving in groups of two) will be about 25 busses per lane per hour. This can be given priority at junctions, but does not justify a complete dedicated bus lane. Instead, part of the way busses may as well lead a queue of private motor vehicles mixed on the same lane (including bus stop!) without being disturbed or delayed. Dedicated lanes must be provided only at less sensitive sections where PMC congestion is to be located. This will save driveway space and helps for boulevard design, not only in small historical streets or in streets with less traffic.

Right doors, low platforms, no central stations
Mixed lane private and public traffic allows bus caps along general sidewalk, integrating bus waiting with window shopping and strolling. This is better than on dedicated platforms unavoidable for PT lanes in the middle of the street. As interchange to the opposite direction is very unusual also within middle platforms, even in middle lane sections right side platforms are suitable. So left side bus doors are expendable. This makes busses cheaper and more flexible for different places, situations and purposes. Network models also do not really need big central exchange stations with their left turn exit capacity problems. Interchange may take place at any junction from one sidewalk to the next, all being places of intensive urbanisation and pedestrian nodes.

Curb stops at caps, low floor technology
18cm tyre protecting curbs at caps in straight bus approach position together with low floor busses offer overwhelming advantages in comfort, speed and long term economy. All other solutions should only be intermediate. Elevated platforms of 40-60cm should not be installed at all: they cause severe urban functional and design problems, car damage, and dangerous gaps for em- and disembarking, and prevent gradual low floor equipping.