



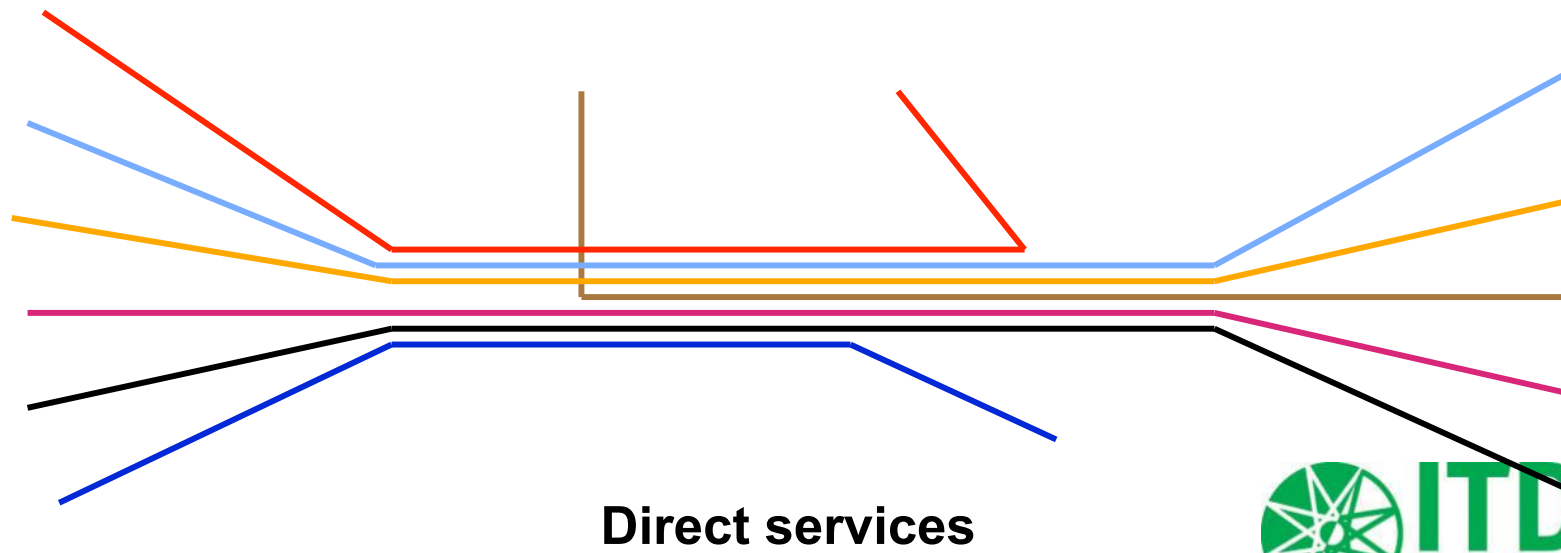
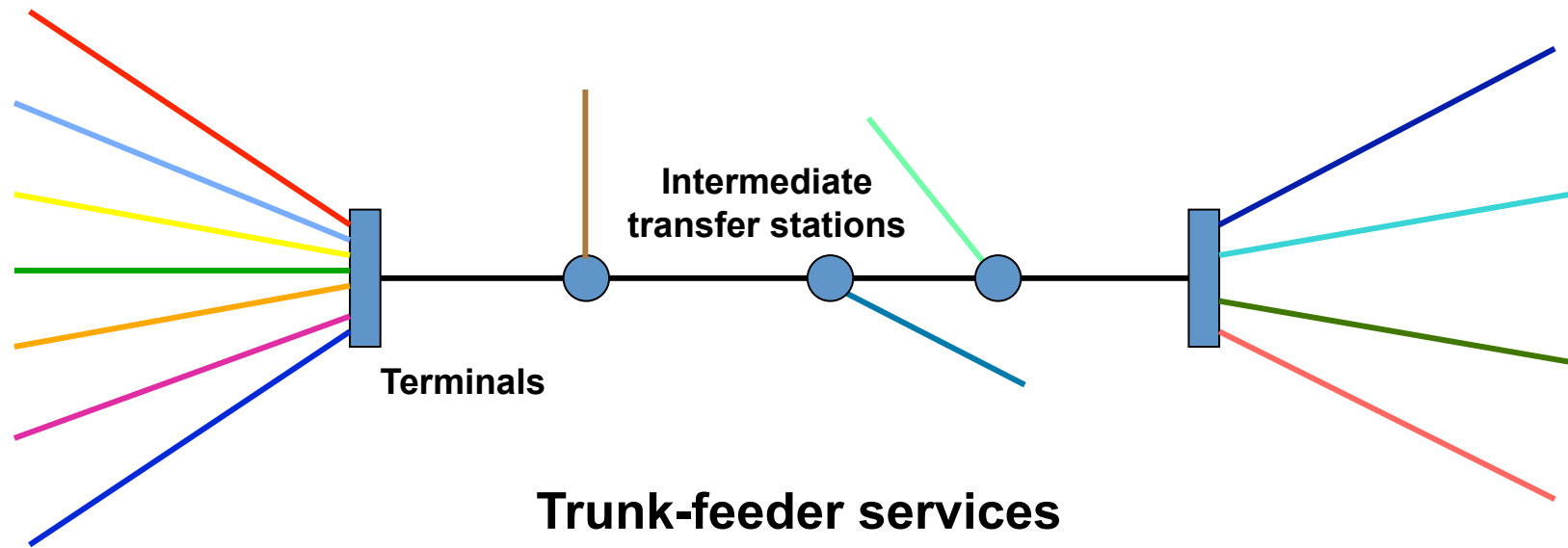
USA: Recapturing Global Leadership in Bus Rapid Transit

BRT SYSTEMS GLOBALLY AND THEIR CHARACTERISTICS												
CITY	2-way dedicated lanes, central verge	Local & Express	Off-board fare collection	BRT network	Platform-level boarding	High service frequency	Turn restrictions at junctions	Unique branding	Private/Quality of service contracting	Safe, wide, weather-protected stations	Station spacing	On highest-demand corridors
Bogotá	H	H	H	H	H	H	H	H	H	H	H	H
Guangzhou	H	H	H	H	H	H	H	H	H	H	H	H
Cali	H	M	H	M	H	H	L	H	H	H	H	H
Pereira	H	L	H	H	H	H	L	H	H	H	H	H
Guayaquil	H	L	H	M	H	H	L	H	H	H	H	H
Ahmedabad	H	L	H	M	H	M	M	H	H	H	H	M
Mexico City	H	L	H	M	H	H	H	M	M	H	H	H
León	H	L	H	H	H	H	H	H	M	H	H	H
Johannesburg	H	M	H	H	H	H	H	H	H	H	H	H
Guadalajara	H	M	H	M	H	H	H	H	H	H	H	H
Cleveland	M	L	H	L	H	M	M	H	L	M	L	H
Eugene	M	L	H	M	H	L	M	H	L	M	H	H
Las Vegas	M	L	H	M	M	L	M	H	M	L	H	H
Los Angeles	H	L	H	L	L	M	H	H	L	M	H	L
Boston	L	L	H	L	L	M	L	M	L	L	M	H
New York City	L	L	H	M	L	H	L	M	L	L	M	H
Nantes	M	L	H	L	H	M	L	H	M	M	M	L
Amsterdam	H	L	L	L	M	M	M	M	H	M	M	L

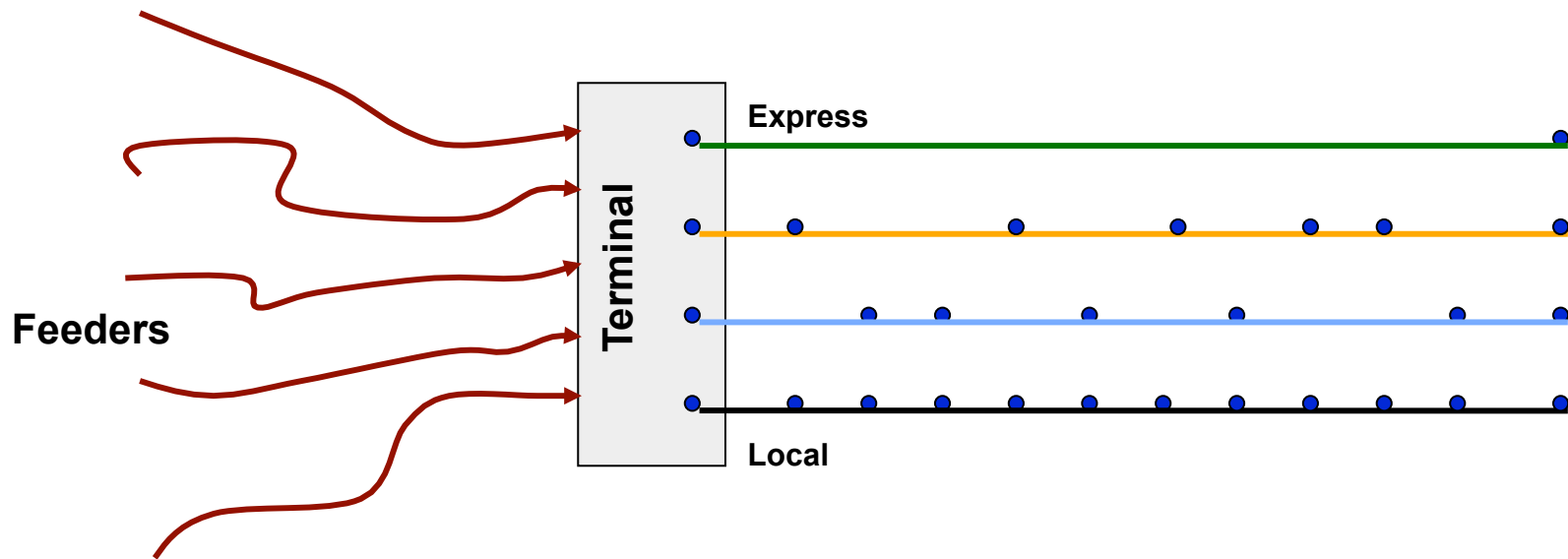
The USA already has good BRT systems,
but not the *best*

BRT Starts with Great Operations

- Infrastructure should optimize performance.
- BRT design should play to the operational advantages of buses (they can pass one another, they can go anywhere there is a road)
- Ridership is attracted mainly by great operations more than by fancy vehicles, rail or bus
- US has BRT 'corridors' but so far no BRT 'networks'. We need to be designing integrated networks with multiple service options.



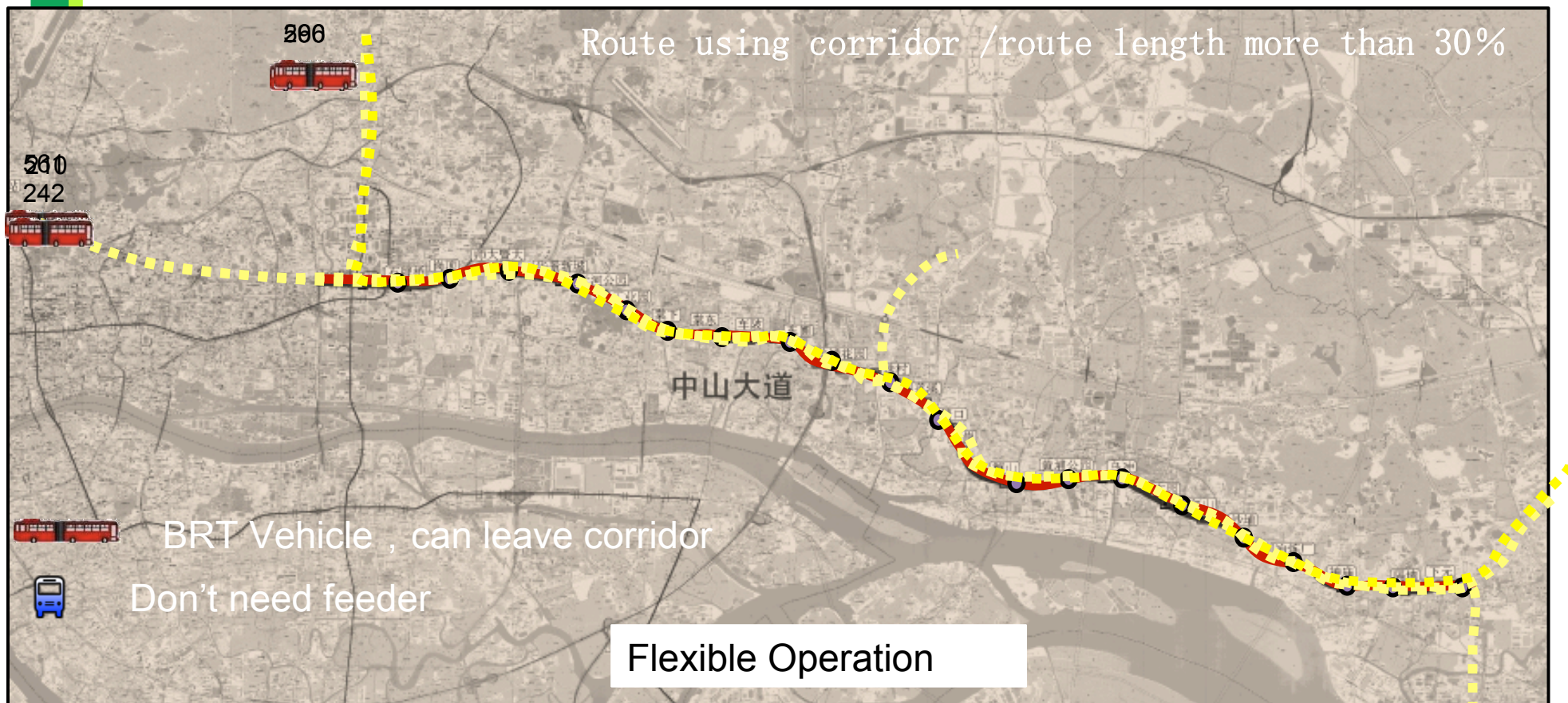
State of the art BRT incorporates multiple service options inside the BRT infrastructure



Trunk and feeder in Bogota was a response to bus saturation on busway slowing avg speeds to 7.6 mph



TransMilenio today is about 18mph avg speed.



优点：专用走廊，走廊内Guangzhou and Cali, Colombia, are the first BRT systems to combine full BRT features with 'direct' routes

Metro capacities can be reached with multiple service options, sub-stops, and passing lanes at stops.

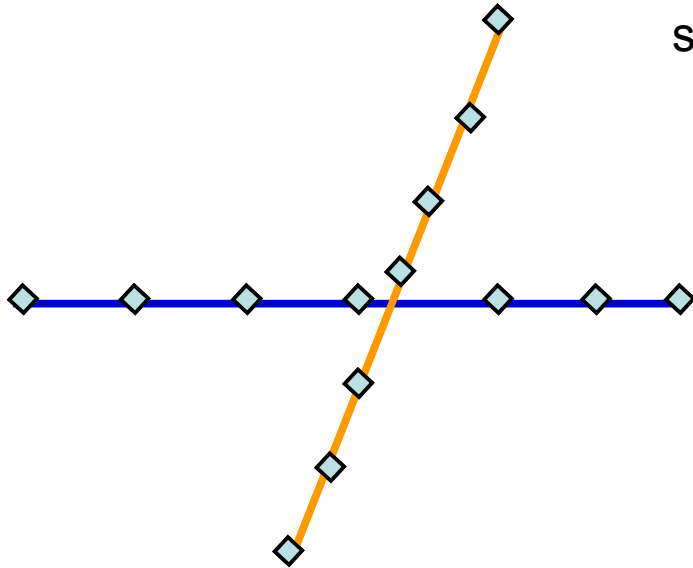


Guangzhou BRT is
20,000 PPHPD,

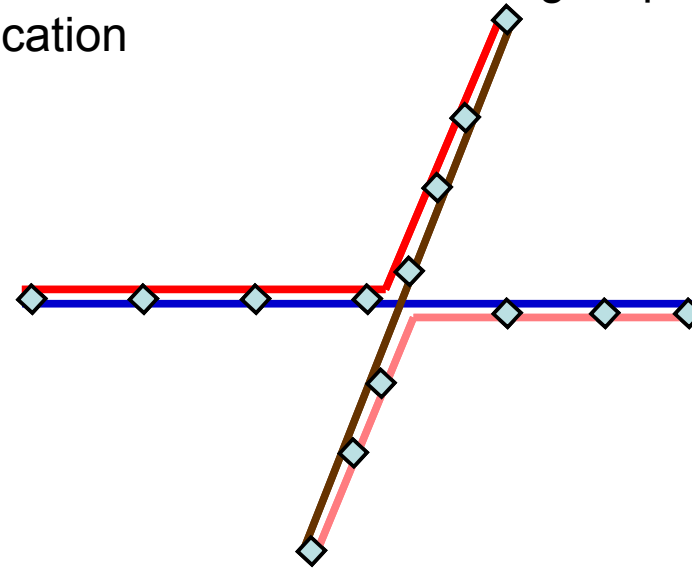
US BRT Networks

- BRT generally function as limited stop service.
- Few incorporate local services.
- few systems have multiple routes on one BRT corridor.
- No systems accommodate express buses

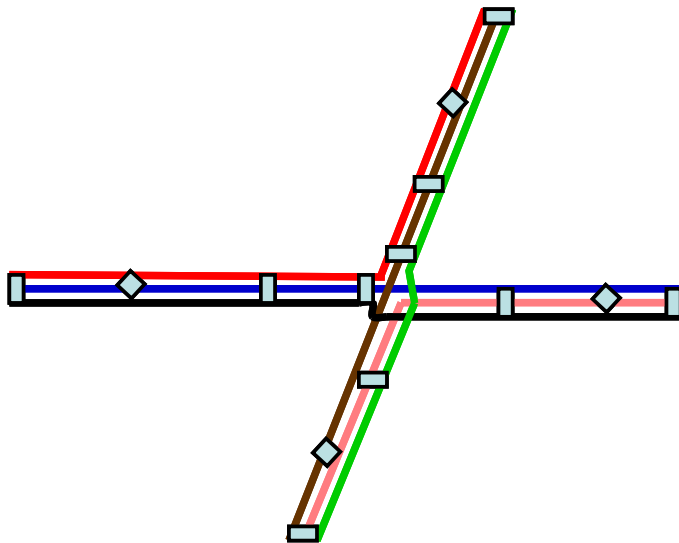
Balance between network and signal phase simplification



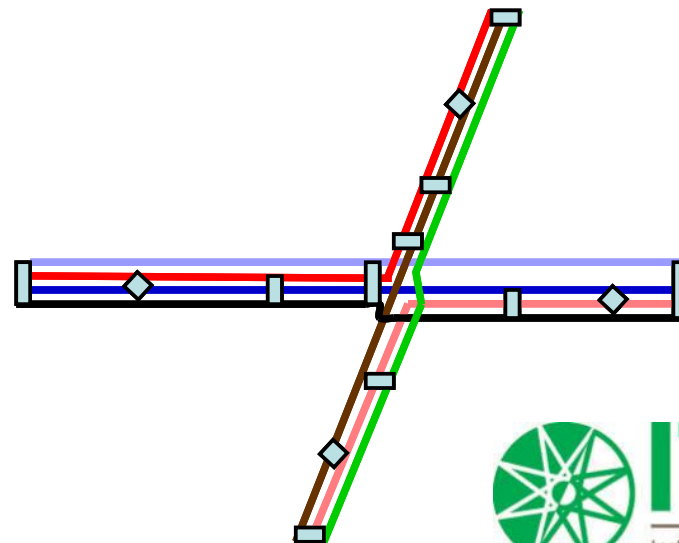
Local service only



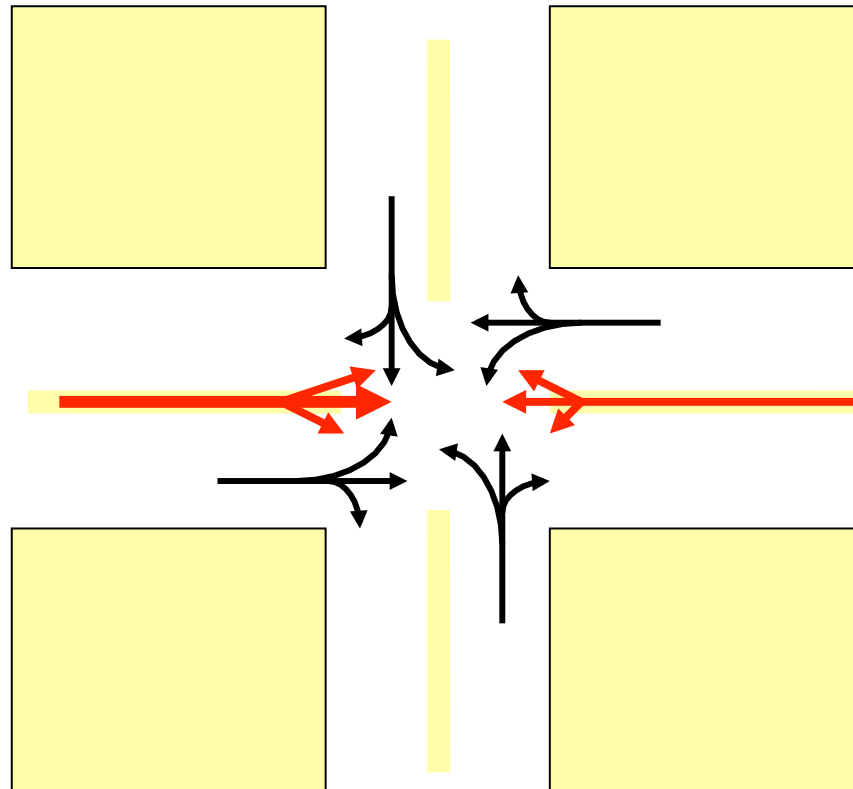
Add routes to simply transfers



Add limited-stop services



Add express services

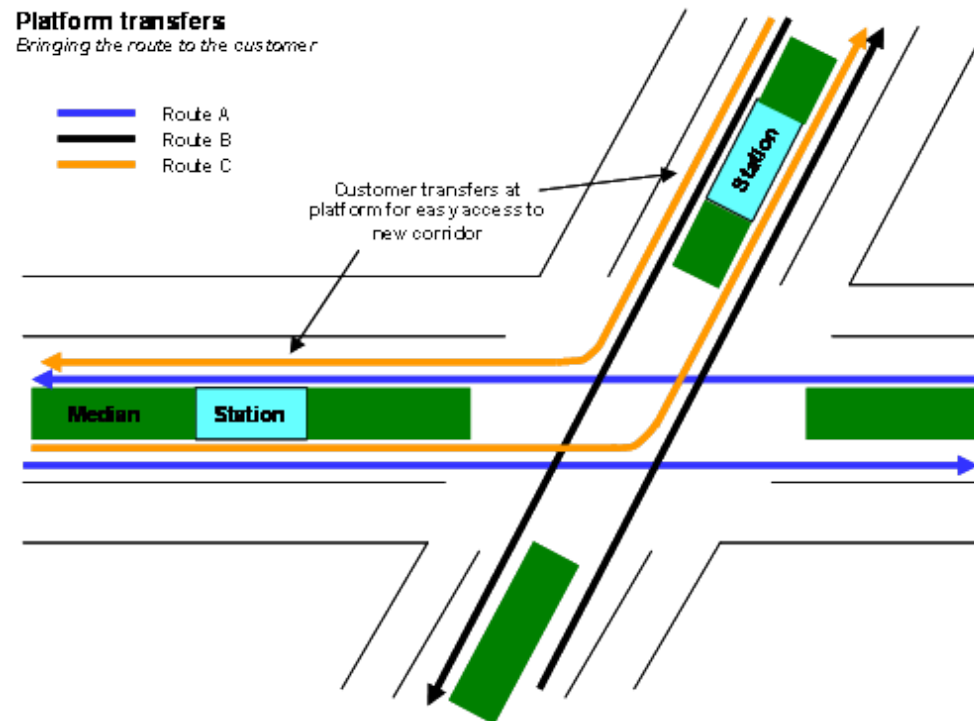


Delhi has six phase junctions, TransMilenio has 2 or 3 phases



ITDP
Institute for Transportation
& Development Policy

Some turns allowed: a compromise between directness of routing and intersection simplicity



One station in the middle has some advantages as system expands



Difficult to transfer

Stations are Narrow

Impossible to reconstruct for higher volume

Have to build 2 stations rather than 1



Requires special buses with doors on the left or on both sides

(Eugene and Cleveland

Many key BRT features are found in at least some US systems

Cleveland has classic central median aligned configuration

Others say:
How will pedestrians reach the median?
How to accommodate left turns?



Stations feel like metro systems: station floor level with the bus floor

Eugene and Cleveland have station platforms level with the bus floor



Reasons cities site for not having a level platform: cost, administrative, drivers fear of hitting the platform

Many have unique branding and special articulated buses with a modern look. Many have 'proof of payment' off board fare collection.



No US System has 'gate controlled' off board fare collection.
Primary reason identified was capital cost.



Off board fare collection means passengers can enter through all doors at once. Multiple wide doors then become important.



Las Vegas, Eugene, Los Angeles, and Pittsburgh have physically separated right of way for part of the route



All cities face many of the same issues and can learn from each other. US lacks precedents and needs to get them where-ever it can.

But there are a few differences

- Lower transit demand
- Not much experience on one-way downtown streets
- Not much experience with bicycle integration
- Higher labor costs change the cost benefit results

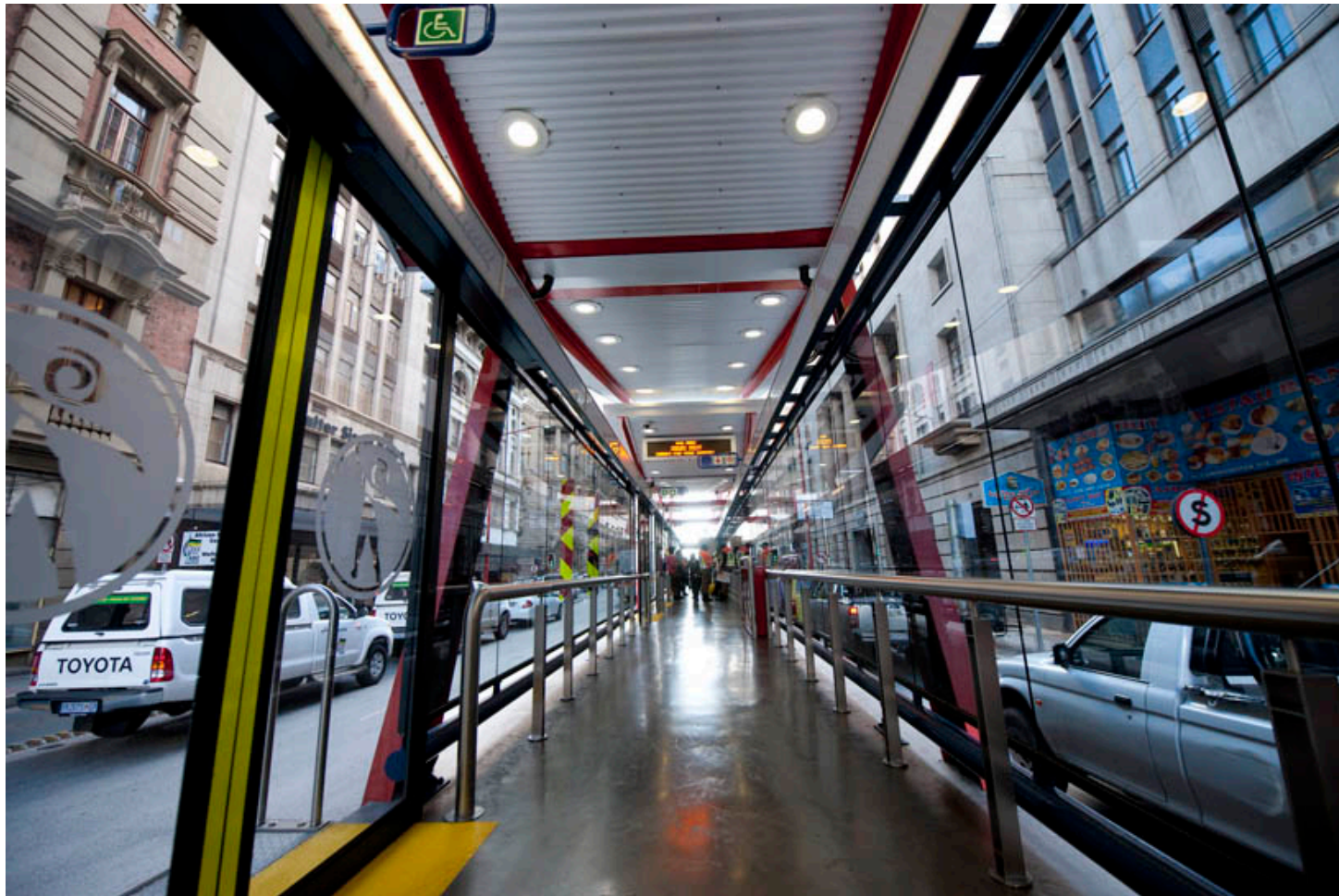
Difficulties in implementing physical separation of the right of way



Lower bus ridership and frequency makes dedicating a lane without lowering mixed traffic LOS harder



Buslanes improve mixed traffic LOS if buses are *causing* the congestion problem



Central verge configuration on narrow
downtown one way street

Mexico City 2 way BRT in middle of a one way street. (problematic)





What is wrong with this configuration?

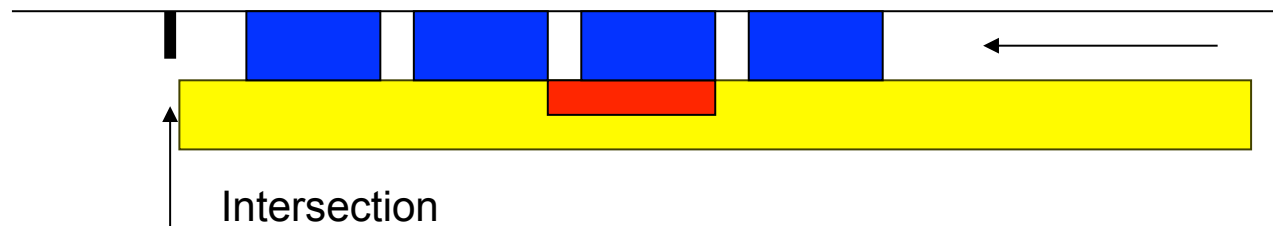


Mid block station location increases the level of service for both buses and mixed traffic at minimal pedestrian inconvenience

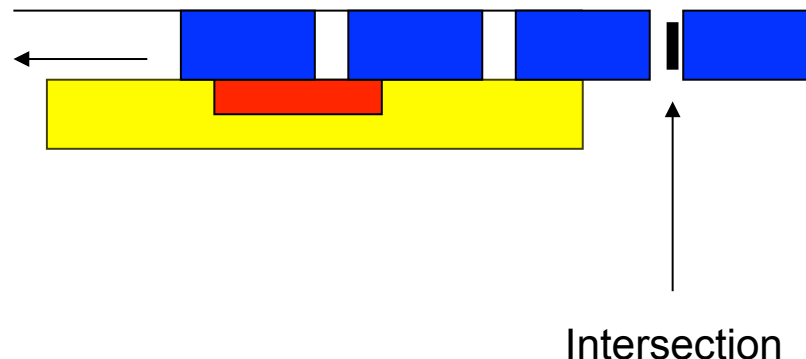


Bus stop – Intersection interference: Easier to avoid if blocks are longer

Bus stop before intersection, buses waiting at light can disrupt functioning of the bus stop



Bus stop after intersection, buses queuing at stop disrupt intersection



No technical agreement on how to best integrate with bikes. Having bike and bus on opposite sides means both sides have turning conflicts



Paris BRT system shares bus lanes with bicycles



luc nadal (cc)

Another configuration under consideration...



Political Obstacles

- Lack of political champion
- Majority of voters are motorists
- Urban transport not under the Mayor's control
- Lack of familiarity with high quality BRT
- Tarnishing of BRT brand with BRT – lite
- Lack of organized BRT lobby
- NIMBY groups relatively powerful
- Rail bias among transit advocates

Administrative Obstacles

- Transit and roads controlled by different agencies
- Lack of US precedent for many BRT designs
- Fear of lawsuits make engineers nervous
- LOS requirements focus on vehicles not people.

Concluding thoughts

The US lacks a BRT network that is of high enough quality to prove to the US public that BRT is at least as good an option as light rail and in some ways is better.

Gold standard requires a powerful political champion willing to sell an exciting vision of a high quality network, and willing to use their political capital to implement it.

Gold standard BRT in the US will share most characteristics with other BRT systems internationally but will need to be a full featured direct service BRT that incorporates express buses to far flung suburbs.

Some examples of gold standard US BRT could convince the public that BRT is not a second best solution.