Key success factors for a tram system in developing countries

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#1

The urban environment

The urban environment

- Integration within the built environment and urban environment
  - Urban environment generally chaotic : how to turn chaos into a well-structured urban environment and provide evidence/convince people the tram will not bring more congestion
  - a maximum of segregation is required as well as high level of traffic signal priority) : segregation and priority provide reliable journey times
  - safety considerations (collision risk with pedestrians or road vehicles drastically reduced if environment segregated)

- articulation and integration with other elements of the transport system (last mile link buses, or existing local small transport businesses
  - how to make the tram the backbone of the transport system
  - how to use the tram system to leverage global transport offer and increase ridership
  - opportunity to develop a multimodal network

#2

Local leadership and political commitment

Local leadership and political commitment

- a necessity as the tram is the opportunity to contribute to a deep restructuring / transformation of the city for the benefits of the population

- a necessity to promote a cultural shift in countries with little public transport culture or when the ultimate dream of individuals is to get their own car

- need to have an urban development strategy and a vision for the future, for the city and its population : what does the government want the city to look like in 10-year time and how the tram contributes to deliver the vision

#3

The demand and the capacity requirement

The demand and the capacity requirement

- tram : 5000 PPHPD max or 5000 pax/km of line per day in practice
- how to cope with increasing demand (fast growing cities and ridership increase)
- think the system with potential capacity enhancement (at design stage it is always less expensive than once in operations)

#4

Attractiveness of the network

Attractiveness of the network

- commercial speed
- frequency
- ticket price and tramway as a social integration contributor (to be kept affordable to enable access to mobility)
- security
- comparison with other transport modes available
- tram network as a system : need P&R for instance close to terminus stations

#5

The economic equation

The economic equation

- project funding and financing arrangements
- ticket price – key affordability issues for the population
- operating costs (potential extra costs : operating conditions which me be tough in operating countries, security
- revenue management (see below also fare evasion)

#6

Environmental considerations

Environmental considerations

- air pollution reduced with a tram (even if not obvious especially if tram system not fully thought through and create more congestion)

- noise reduction

#7

The service quality challenge

The service quality challenge

- what KPIs
- what performance regime

#8

BRT vs LRT is a key question

BRT vs LRT is a key question

- List level the economic equation :
  - CAPEX : tram is 4 to 10 times as expensive as BRT system
  - OPEX : tram is 2 to 3 times as expensive as BRT

- the timing issue : BRT has also been acknowledged as one of the best solutions in the developing countries with growing demand and limited financial resources especially in the cases requiring immediate transport network improvements. Tram network development takes longer in general

- the revenue risk : fare evasion is more difficult to manage on a tram than on a BRT

- environmental considerations (BRT less environment friendly than tram usually except if electric BRT)

BRT vs LRT is a key question

Système	Bus à Haut Niveau de Service (BHNS)	Tramway	Métro léger (de type Val)	Métro lourd
Coût d'investissements 1re ligne	2 à 10 M€/km de site propre	13 à 22 M€/km	60 à 80 M€/km	90 à 120M€/km
Durée de vie des matériels	10-15 ans	30-40 ans	30-40 ans	30-40 ans
Coût d'un véhicule	300 k€ à 900 k€	1,8 à 3 M€/rame	3 à 4 M€/rame	5 à 9 M€/rame
Coût d'exploitation d'une 1re ligne	3,5 à 5 €/km	6 à 10 €/km	8 à 10 €/km	10 à 16 €/km

Source : Certu - unité : € 2010 HT

Other issues

- Operator financial risks and contractual arrangements
- Security
- Fare evasion issue

Thank you for your attention

Questions/answers