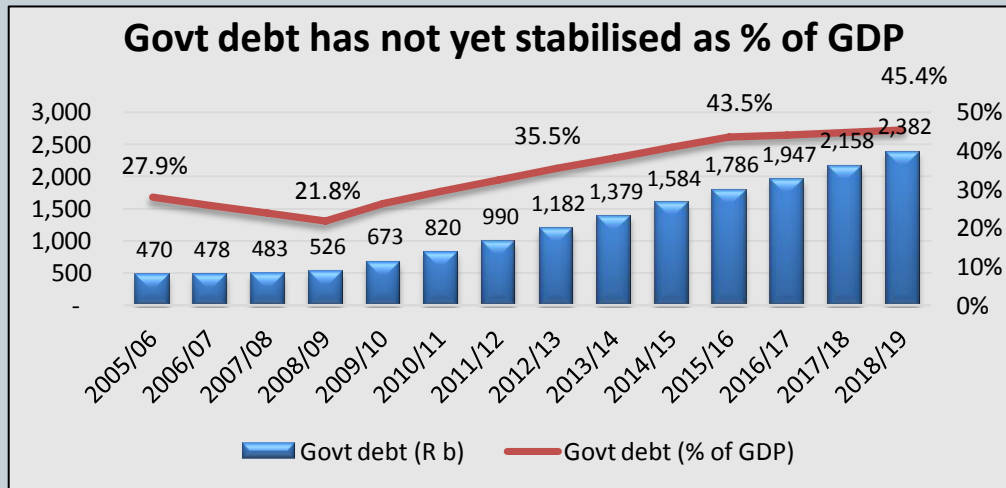
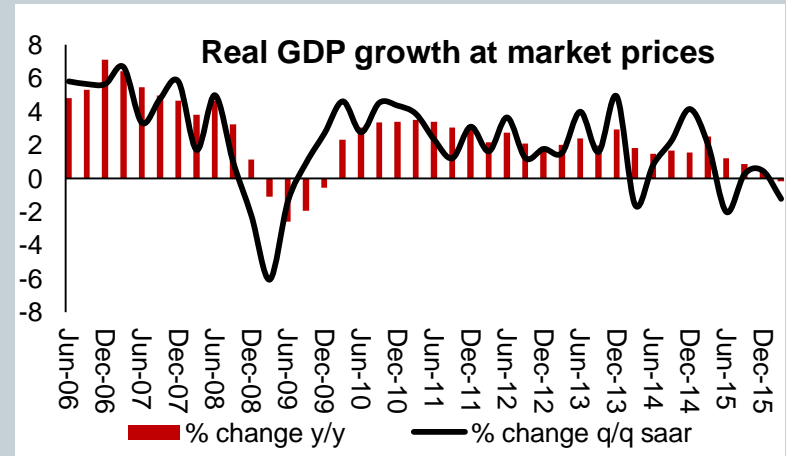


# PUBLIC TRANSPORT IN SOUTH AFRICAN CITIES: A SPATIAL CONUNDRUM

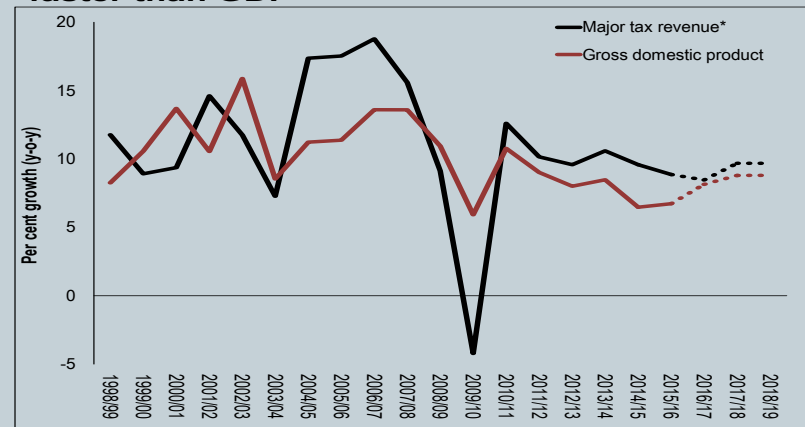
Michael Kihato  
08 November 2016

# South Africa is in a very difficult economic and fiscal environment

- Weak (declining) economic growth
- Underlying structural constraints are well understood, but require tangible progress
- Fiscal impact requires a programme of fiscal consolidation
  - Revenue impact
  - Credit rating and public sector debt concerns
- Deep and practical partnerships across government and with the private sector are essential



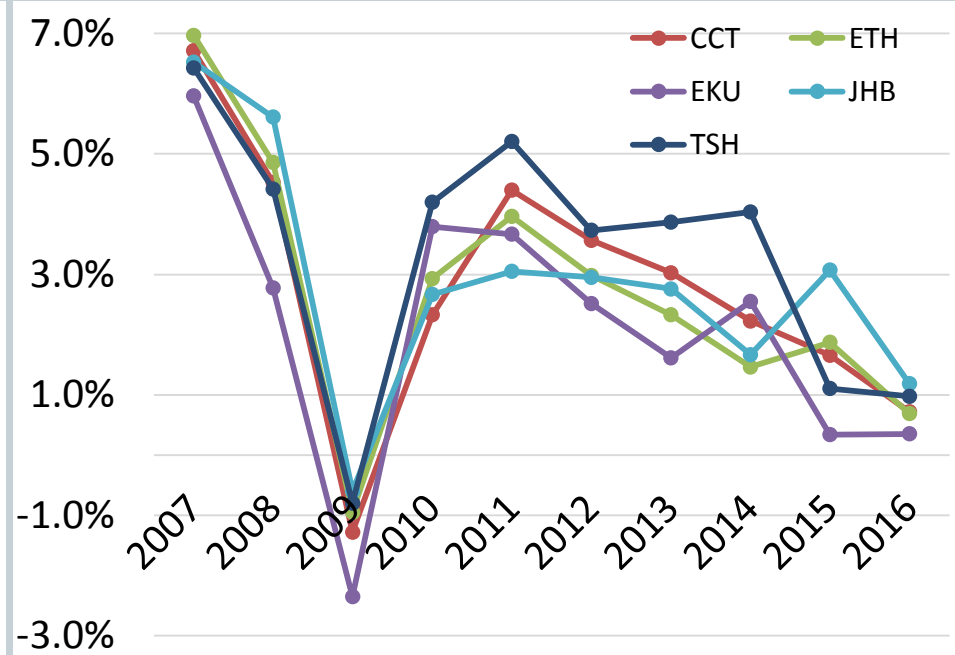
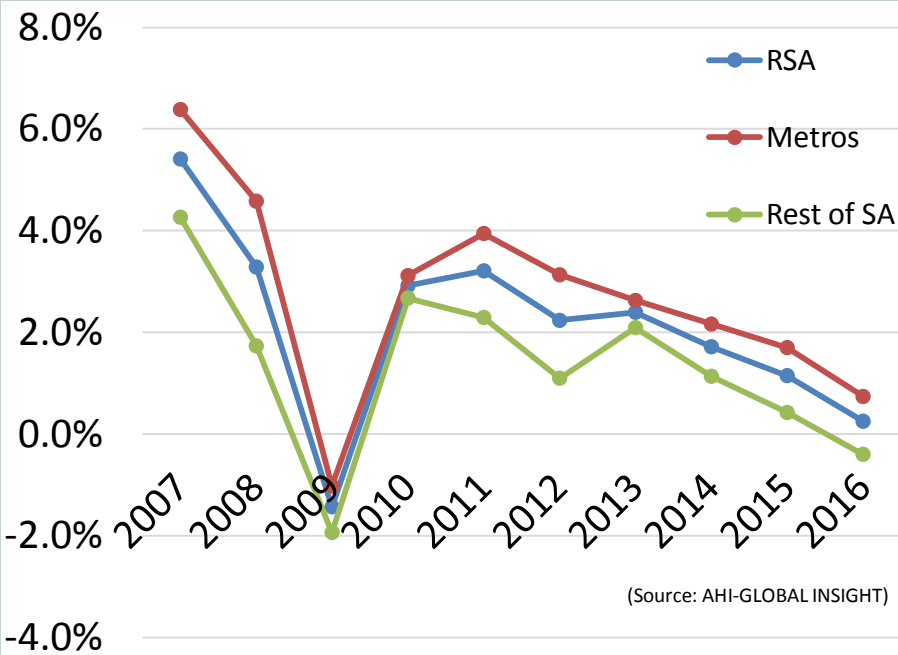
**It will be hard to keep tax revenues growing faster than GDP**



# The cities are the engines of the SA economy ... but the engines are slowing down (GVA annual % growth)

- Metro economic growth rates are faster than RSA
- The rest of South Africa is growing even more slowly

- TSH has grown the fastest (37% over 10 years), followed by CCT and JHB (29% each), then ETH (27%) and ECU (25%)
- Slowing economic growth in all cities



# SA's urban powerhouses should be able to drive growth and create jobs

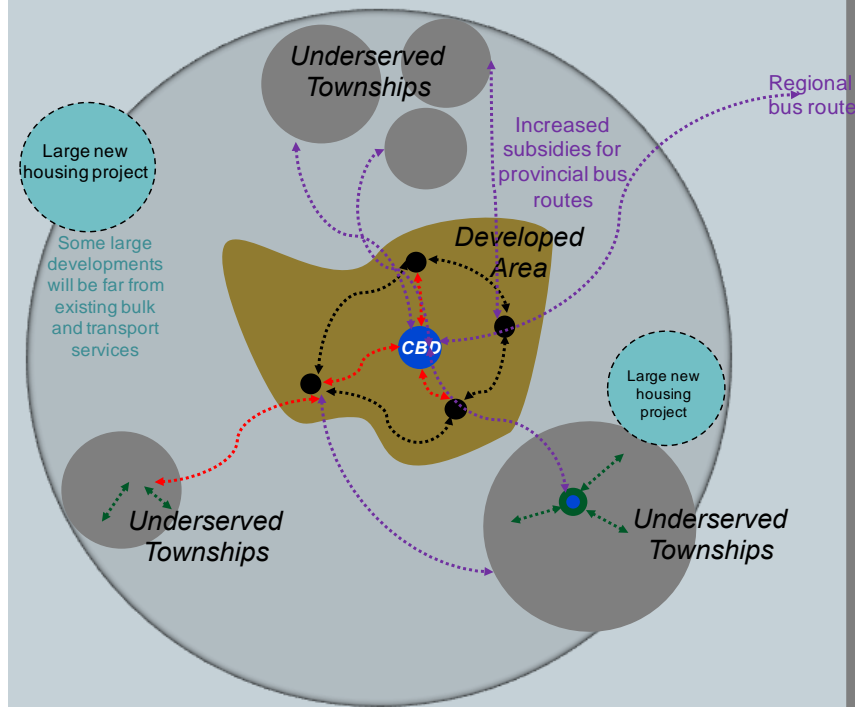
**Largest cities are the best economic performers and create the most jobs**

**But urban economies face structural constraints**

- High levels of inequality
  - Driven by urbanisation patterns:
  - Spatial dislocation of people and jobs
  - Jobless population growth
- **Driven by fragmented, inefficient and inequitable urban spatial form**
  - Transfers costs to poor households, the state and ultimately the real economy, dampening growth and deepening inequality
  - Creates inefficient and rising local expenditure pressures

**Current national and city programmes deepen the fiscal challenge**

- By addressing symptoms rather than causes
- Low density, segregated cities are a reflection of the infrastructure investment and land use development choices we make



# Background to Public Transport Funding in South Africa

Over last 10 years over R 167 billion in infrastructure and operations subsidies with average annual growth 18%

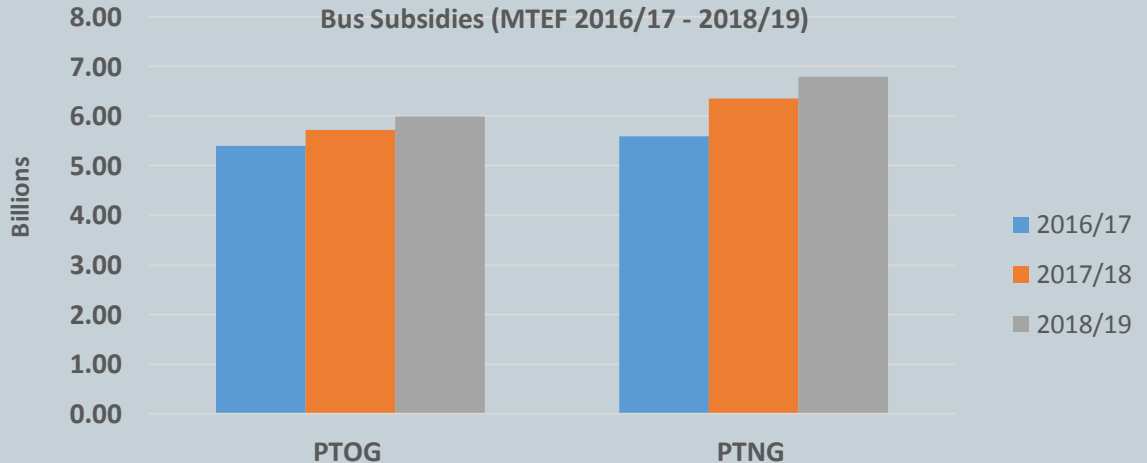
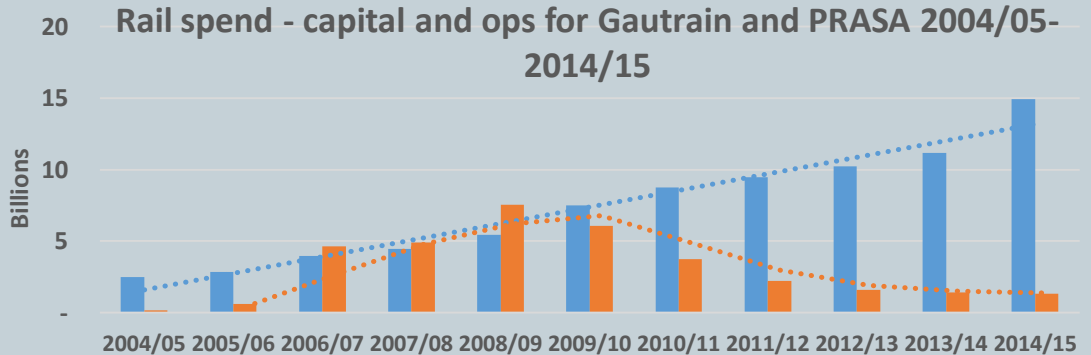
Key subsidies:

- Provincial bus subsidies (PTOG)
- City and large towns (PTNG)
- PRASA
- Taxi recapitalisation
- Gautrain

We acknowledge the key role of public transport to economic growth, social inclusion and spatial transformation

# Some particulars of spend

- Rail spend upward trend – PRASA main driver (almost 40% growth 2013/14-2015/16) mostly CAPEX
- 2012/13-2016/17 rail to absorb more than 60%
- Gautrain steady state after CAPEX build
- Allocations for bus more modest growth



# Operational subsidies for public transport

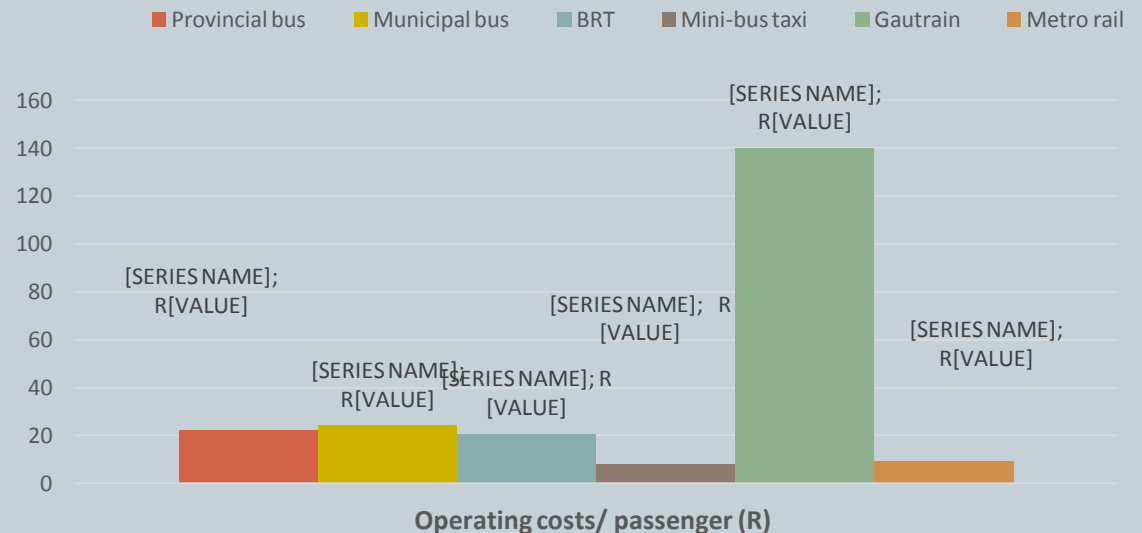
Operating public transport systems require subsidies

Gautrain most expensive per passenger per trip

Mini bus taxis receive no subsidy on ops.

Metro rail second cheapest service per passenger; absorbs most subsidies into quantum.

Mode	Operating subsidy per passenger per trip	Fare Box Recovery rates
Municipal Bus	R 16.75- R 24.36	13%-31%
Conventional Bus	R 11.40 - 16.89	31%-44%
Bus Rapid Transit	R 11.76 - 15.12	28%-44%
Mini bus taxis	0	0
Gautrain	R60.30	57%
PRASA Metrorail	R3.73	R 39%



# Some efficiency pointers

- Provincial bus: Apartheid service for black townships to places of work
  - Very costly because of distances and extreme peaking
- Municipal bus: Metro Bus, Brakpan Bus, Tshwane Bus etc
  - High operating costs, although shorter trips
- Bus Rapid Transit
  - 4 cities operating the model; developed in Latin America but now quite widespread especially in developing countries
  - Heralded shift in thinking; attention to spatial transformation
  - Has relatively good user satisfaction where it operates
  - Has however resulted in very high deficits
- Gautrain
  - High user satisfaction
  - costly (between 2005/6-2013/14 represents 20% of total PT spend though has steadied over time)

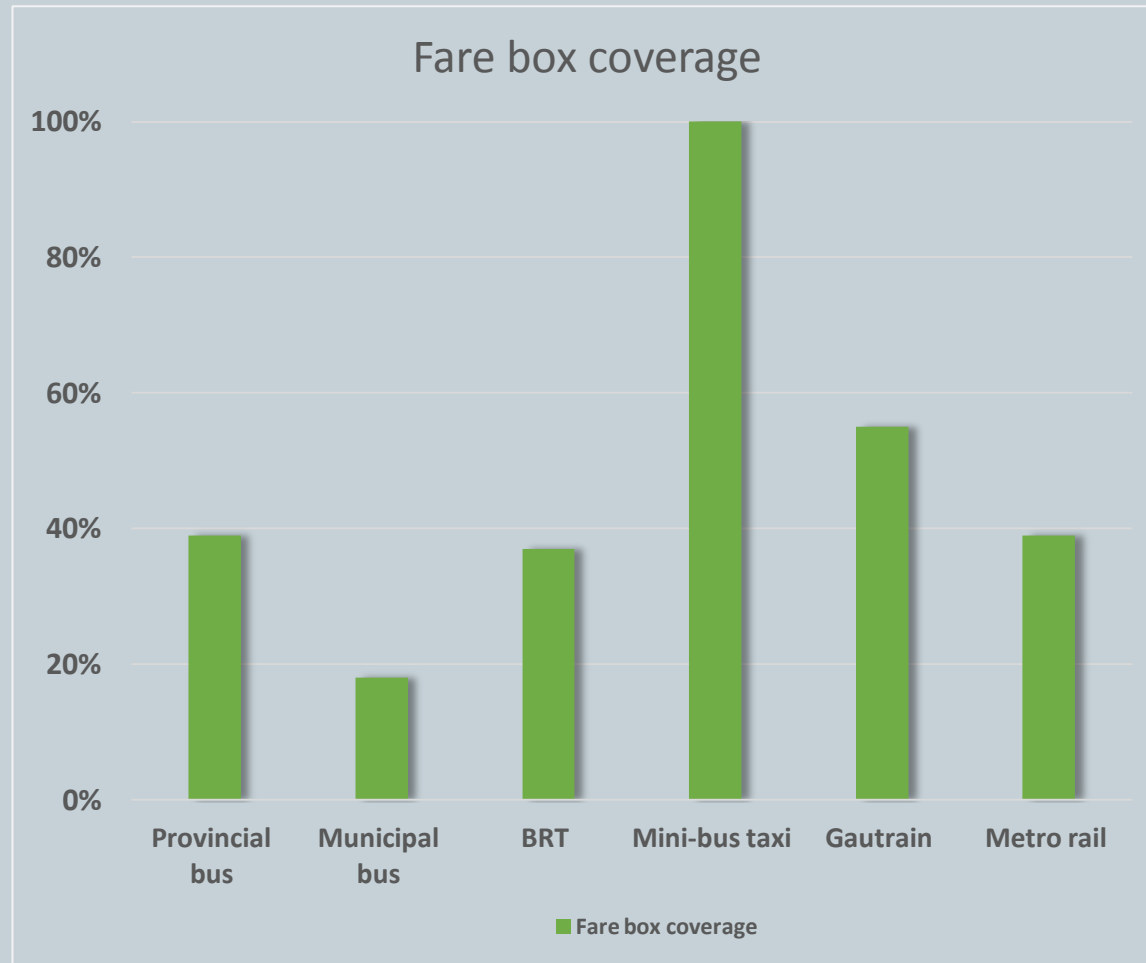


# Some efficiency pointers

Fare box recovery rates in the systems are very modest

This apart from privately run minibus taxis

Globally, there are better recovery rates



# Some efficiency pointers

- Mini bus taxis: carry more than 2/3 of people in metro areas and
  - efficient carrier esp. over shorter routes
  - have no operational subsidies
  - rely on informality, mass vehicle technology and flexibility
  - particularly good at servicing off peak demand and have coped well with spatial inefficiencies in SA
  - high societal costs linked to service
- Metro rail (PRASA):
  - Provided through 4 regional operators that is Western Cape (Cape Town); Gauteng (Joburg, Ekurhuleni, Tshwane) Kwa Zulu Natal (Ethekewini) Eastern Cape (Buffalo City and Nelson Mandela Bay)
  - Very low prices for passengers
  - Significant capital infusion over the next couple of years including recapitalisation and line extensions

# Some BRT operational stats

Comparison of different BRT system stats (DRAFT)

08-Nov-16

No.	Stats	City A (April 16)	City B (April 16)	City C (April 2016)	City D (April 16)
1	No. of routes	37	21	14	5
2	No. of Peak Buses (excl spares)	250	247	67	18
3	No of Drivers	549	396	206	103
4	No of Average Weekday Boarding Pax	67 778	60 312	13 065	5 054
5	No. of monthly Boarding Pax	1 644 503	1 355 184	346 800	123 872
6	Monthly operational kms	1 441 944	969 965	306 247	77 286
7	Monthly Fare Income	R 15 892 152	R 11 081 413	R 2 855 360	R 1 098 601
8	Direct Monthly Operating Cost (Excl Station Man. etc)	R 37 988 222	R 32 233 551	R 9 106 557	R 8 427 213
9	Monthly Operating Profit / (-Deficit)	<b>-R 22 096 070</b>	<b>-R 21 152 138</b>	<b>-R 6 251 197</b>	<b>-R 7 328 612</b>

No.	Ratios	City A (April 16)	City B (April 16)	City C (April 2016)	City D (April 16)
10	Revenue to cost ratio	42%	34%	31%	13%
11	Monthly Pax boardings per operational km	1,14	1,40	1,13	1,60
12	Operating Cost per pax	R 23,10	R 23,79	R 26,26	R 68,03
12	Revenue per pax	R 9,66	R 8,18	R 8,23	R 8,87
13	Operating deficit per pax	-R 13,44	-R 15,61	-R 18,03	-R 59,16
14	Operating cost per km	R 26,35	R 33,23	R 29,74	R 109,04
15	Monthly operational kms per peak bus (excl spares)	5 768	3 927	4 571	4 294
16	Driver ratio	2,20	1,60	3,07	5,72
17	Operational kilometres per driver	2 626	2 449	1 487	750

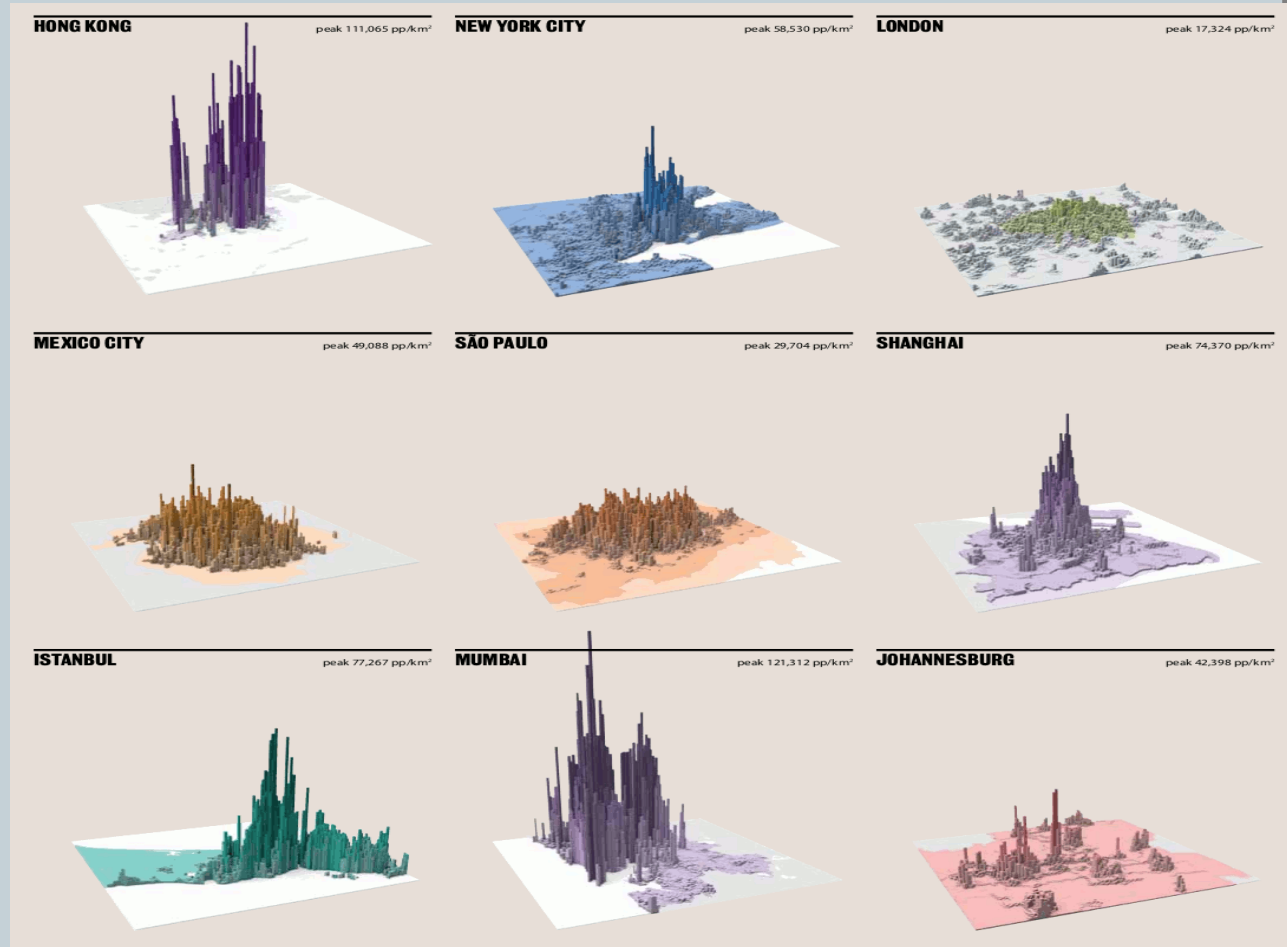
	12m bus rate per km (Phase 1A)	R26,68	R39.87*	R29,74	
	18m bus rate per km (Phase 1A)	R29,27	R39.89*		
	12m bus rate per km (Phase 1B)	R26,68	R32,51	R29,74	TBC
	18m bus rate per km (Phase 1B)	R29,27	R35,48		

# Some observations

- Greater efficiency among the various modes.
  - Part of the challenge is creating greater efficiencies within the modes themselves
- Need to deal with the high fragmentation of institutions and funding flows
  - Investment in the modes needs to be driven by enhancing efficiencies
  - Better funding allocation
  - Synergising of funding

# The spatial conundrum.....

- Our greatest challenge of efficiency lies in our space a legacy of our past
- A key way of creating institutional and funding synergy is targeting spatial patterns in cities



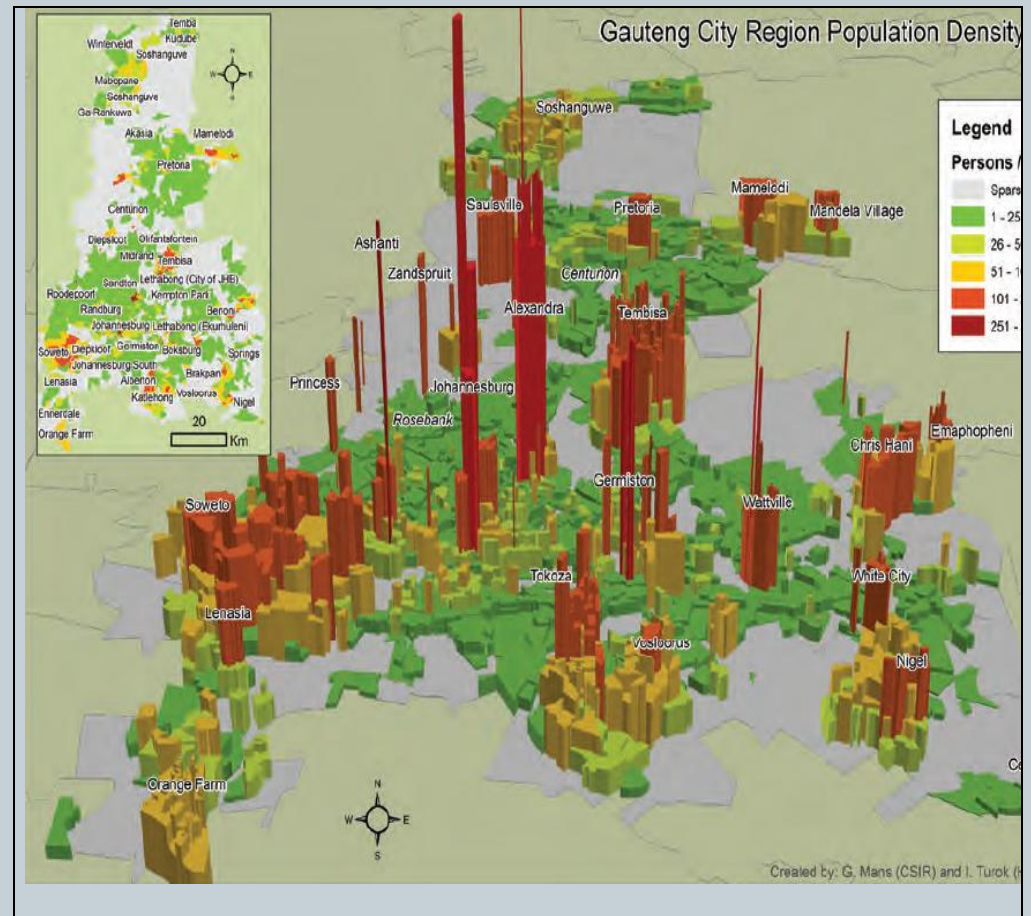
# City metrics are sprawling low density urban areas... with distant pockets of poverty

Urban densities nowhere near the situation in India

Comparisons: per sq km		Population density (people per sq. km)	Economic density (GVA per sq. km) (R m)	City employees per sq. km.	City spending per sq. km. (R m)	Employee-related spending per sq. km (R m)	
Johannesburg		2 698	266	14,8	17,2	4,2	
Cape Town		1 520	119	8,6	9,3	2,7	
eThekweni		1 503	123	8,1	9,7	2,3	
Tshwane		1 518	136	7,1	9,4	2,4	
Ekurhuleni		1 462	78	8,2	9,6	2,2	
Nelson Mandela Bay		588	44	3,4	4,3	1,1	
Buffalo City		299	19	1,8	1,5	0,4	
Mangaung		119	7	0,6	0,3	0,1	
Msunduzi		977	36	4,5	4,9	1,1	
KEY CITY METRICS IN 2011		Service area (sq km)	Population (m)	Gross value added (GVA ) (R b)	City employees	Total city spending (R m)	Employee-related spending (R m)
Johannesburg		1 644	4 434 827	437	24 254	28 356	6 907
Cape Town		2 460	3 740 026	292	21 199	22 962	6 616
eThekweni		2 291	3 442 361	283	18 581	22 236	5 265
Tshwane		1 924	2 921 488	262	13 729	18 139	4 534
Ekurhuleni		2 174	3 178 471	170	17 934	20 954	4 815
Nelson Mandela Bay		1 958	1 152 115	87	6 561	8 357	2 064
Buffalo City		2 527	755 201	49	4 588	3 839	908
Mangaung		6 283	747 431	43	3 633	2 017	812
Msunduzi		633	618 536	23	2 855	3 098	701

# Variations in the low densities ...

high density low income “townships”, low density suburbs and single family detached low income housing, and great parcels of land in between with low density or scattered development

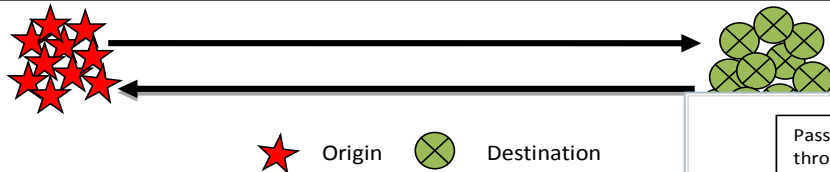


# Some typical route KPIs: BRTs

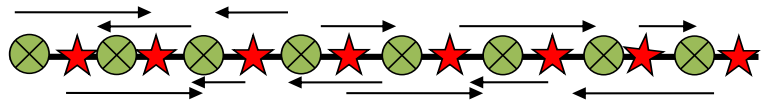
## Route KPIs

	Period	No. of buses	Peak Headway	Peak Utilisation	Pax ph	Peak Hour Factor	Speed	Seat Turnover	PH Reverse Flow %
T1	AM Peak	55	1.9	77%	2 528	47%	31	1.0	7%
	Midday	14	12.0	85%	488	59%	32	0.2	45%
	PM Peak	60	2.6	73%	2 133	35%	28	1.0	8%
	Sat	14	10.0	39%	191	47%	31	0.5	45%
T2	AM Peak	10	6.7	97%	719	82%	28	1.1	12%
	Midday	4	20.0	20%	65	60%	32	0.2	34%
	PM Peak	7	12.0	67%	274	54%	26	0.8	40%
	Sat	-	-	-	-	-	-	-	-
T3	AM Peak	40	2.1	79%	2 401	55%	26	0.6	10%
	Midday	12	10.0	74%	454	60%	28	1.9	8%
	PM Peak	31	4.6	100%	1 399	38%	32	1.7	14%
	Sat	12	15.0	72%	600	42%	29	0.5	35%

All passengers travel long distances, in the morning peak, from residential areas to centres of employment and return in the evening; densification on this basis is not efficient



Passengers make short trips – some in the forward direction and others the reverse – along a corridor throughout the day





# Some international comparisons: BRTs

Very extreme passenger demand patterns (Joburg seen against some cities across the world)

(Source: Scorcia & Munoz Raskin)

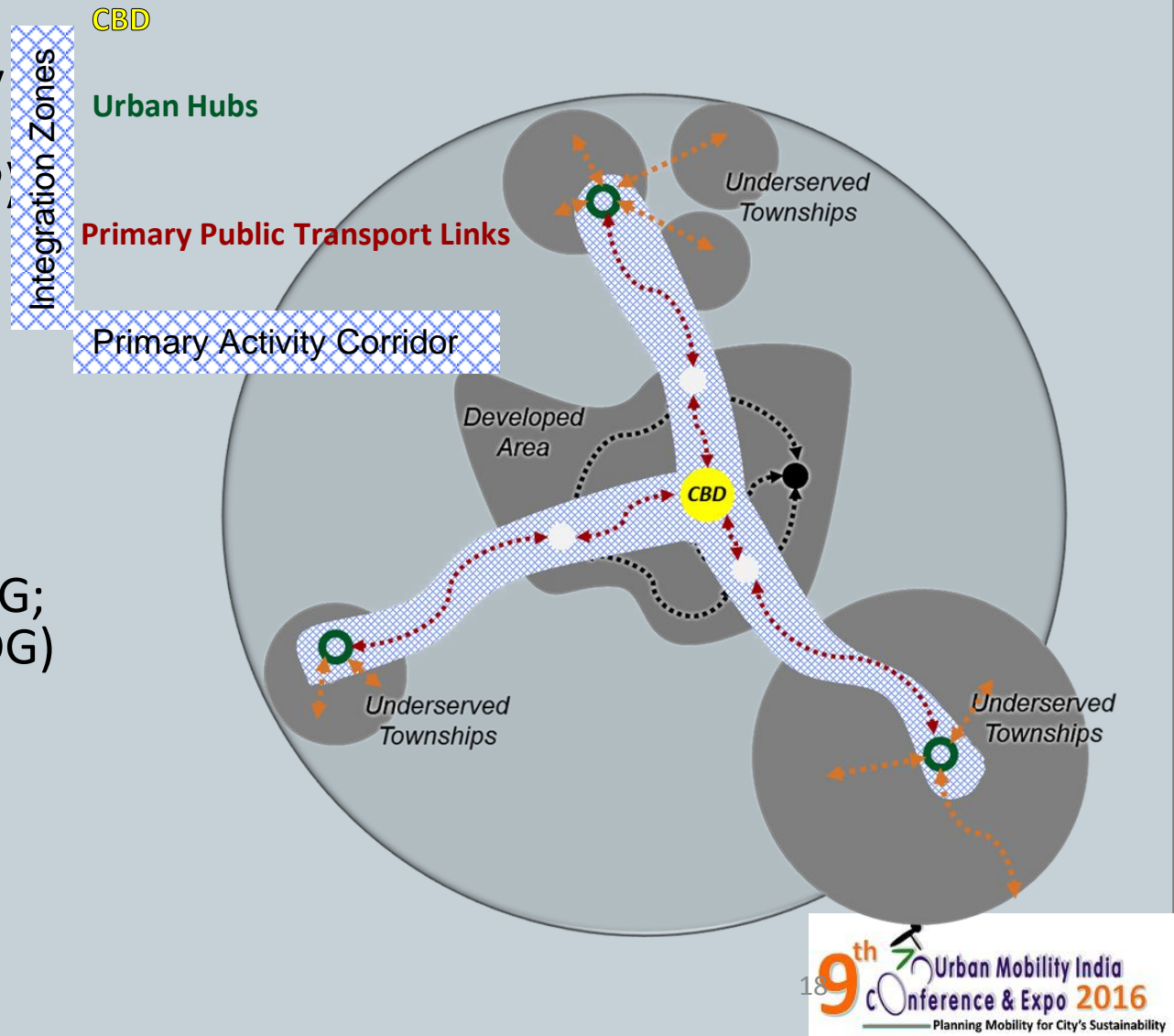


# Some programmatic reforms...

Urban Network Strategy and Built Environment Performance Plan (BEPP)

Use of financial instruments to shape spatial change

Levers of PT (PTNG) and other grants (ICDG; PTNG; NDPG; INEP; USDG; HSDG) to spatially target and drive change



# Going forward ....

Acknowledgement and provision power to the local level for built environment functions where appropriate

From national level, rethink our funding for public transport

- Car centric focus in funding transport?
- Should we continue to use PT subsidies when they sometimes exacerbate sprawl?
- Key role of focussing spending on changing spatial forms to incentivise greater mixture of uses at municipal level

Need to take advantage of sub national city agglomerations

- Such as in Gauteng to create better alignment eg Gauteng Transport Authority

9<sup>th</sup> Urban  
Mobility India  
2016

**MICHAEL KIHATO**

[Michael.Kihato@treasury.gov.za](mailto:Michael.Kihato@treasury.gov.za)