GEF
China Sustainable Cities
Integrated Approach Pilot

June 2017
Project Development Objective

Participating cities incorporate Transit-Oriented Development (TOD) principles into their policies and into future urban and transit plans.
Why TOD in China?

Current urbanization pattern of sprawl, superblocks, and single-use districts not sustainable

Chinese government recognize a new paradigm for urban development and energy is needed and has set ambitious goals to change urban form and peak greenhouse gas emissions

*China’s urban population is projected to reach 1 billion by 2030*
Why TOD in China?

Policy requires mass transit planning to be informed by land use plans, but huge gaps exist between high-level mandates and on-the-ground technical guidance.

National Guidelines on Urban Development and Management (2016)
Ministry of Transport’s 13th Five-Year Plan on Transit calls for transit-land use integration (2016)
New Urbanization Plan also calls for improved planning of cities (2014 – 2020)
State Council Notice Cities to prepare dedicated land administration plans during transit planning (2003)

Ministry of Housing Urban-Rural Development’s National TOD Technical Guidelines (2015) and policies above meant to address this gap
Why TOD in China?

Planning with TOD can create high-quality and livable neighborhoods

- Increase accessibility and mobility with more transportation choices
- Increase connectivity to jobs, housing and retail
- Increase inclusiveness and competitiveness
- Increase resilience to natural hazards
- Lower infrastructure costs
- Lower CO₂ emissions
Key Project Players

MINISTRY OF HOUSING AND URBAN-RURAL DEVELOPMENT

7 CITIES
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<tr>
<th>City</th>
<th>Built-up Area (km²)</th>
<th>Urban population per km² of built-up area</th>
<th>Total Municipal Population including migrants</th>
<th>Total population of urban districts including migrants*</th>
<th>Municipal GDP per capita (RMB)</th>
<th>GDP per Capita of urban districts (RMB)</th>
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Project Framework

GLOBAL ENVIRONMENT FACILITY SUSTAINABLE CITIES INTEGRATED APPROACH PILOTS

Global Platform

Country Child Pilots

China Child Pilot
Led by the World Bank

7 Cities

City TOD Strategy

District
Corridor
Station

MOHURD
National TOD Platform

Technical Support
Data and best practices

Data and tools
Lessons learned

Application of TOD strategy at various levels
Component 1: National TOD Platform, Toolkit, and Policy Support ($1.928 million)

- Establish a National TOD Platform and Toolkit
  - National and city level coordination
  - International good practices collection and technical training development
  - Comprehensive toolkit development with modules to help cities conduct analysis and monitor impacts

- Capacity Building
- Project Management
  - Operation of MOHURD project management office and monitoring and evaluation
National TOD Platform Modules:

**TOD Digital Repository** - resources, existing tools, guidelines, manuals, best practices including institutional, policy, technical, financial data, and TOD Indicators

**TOD Dashboard** - inventory of ongoing TOD initiatives across China

**TOD Diagnosis** - GIS-based data analytics to allow complete and quick assessment of a city’s current level of sprawl and auto-centricity

**TOD Planning** - development scenarios with projections based on different transit-oriented and compact city development scenarios

**TOD Impact Evaluation** - existing context and future interventions

**TOD Monitoring** – short and long-term, existing and developing TOD, environmental, social, and economic costs and benefits of various interventions
Component 2: City TOD Technical Support and TOD Application ($30.8 million USD).  
- City-level TOD Strategy  
- District-level application of TOD strategy  
- Corridor-level application of TOD strategy  
- Station-level application of TOD strategy  
- Project management

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Project Phasing

- National TOD Platform
- City TOD strategy
- District-level application of TOD strategy
- Corridor-level application of TOD strategy
- Station-level application of TOD strategy

Years: 2017, 2018, 2019, 2020, 2021
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GEF Grant Allocations by Cities and by Project Components

- MOHURD
- Beijing
- Tianjin
- Shijiazhuang
- Ningbo
- Nanchang
- Guiyang
- Shenzhen

Legend:
- TOD strategy/platform
- TOD application
- Capacity building
- Project management
Project Indicators

(a) Number of cities incorporating TOD strategies in urban and transit plans

(b) Number of cities endorsing city-level TOD strategy or policy

(c) Number of cities using the National TOD diagnostic tool
Project Intermediate Indicators

- Development of a National TOD Platform
- # of **training modules** under TOD Platform used by cities
- # of **person/days** in **training** on TOD training modules
- # of cities with **TOD strategies** and related guidelines
- # of cities using **project TOD databases**
- # of **citizen engagement sessions** on TOD at the city level
- # of districts introducing TOD **approaches** into their **plans**
- # of **corridor** level policy guidebooks or **manuals** produced
- # of cities that adopt TOD-friendly **station area planning**
- # of **citizen engagement sessions** part of station design
Further Project Details

Stakeholder Engagement Approach
City TOD Strategy Outline
TOD Diagnostic and Impact Indicators
Private Sector Framework Approach
Project Details

Stakeholder Engagement Approach

- Each City has set up a Steering Committee chaired by the Vice Mayor
  The project will support public consultation and stakeholder engagement to understand actual on-the-ground demand-side issues
- Key local stakeholders include the government departments - Transport, Planning, etc., and state-owned enterprise groups who have been involved in transit construction
- Private sector voice and engagement
- Consultations with the public-at-large
## Project Details

### City TOD Strategy Outline – Major Sections

1. Context
2. Diagnostic Analysis of Existing Conditions and TOD Priority Area Identification
3. TOD Typology Identification
4. Monitoring and Evaluation
5. TOD Action Plans
I. Context
   A. Provide an overview of the city’s historical expansion as it relates to the evolution of land use and public transit development (Review relevant plans, i.e. city master plan, urban rail system plan, etc.)
   B. Articulate a TOD vision for the city
II. Diagnostic Analysis of Existing Conditions and TOD Priority Area Identification

A. Conduct comprehensive quantitative and qualitative analysis on current development of integrated transit network and land use

B. Identify and rank promising areas or corridors for further TOD improvement or new investment based on diagnostic analysis

C. Outline current TOD investment needs and financing gaps

D. Provide thematic analysis of city-specific issues such as parking management, housing, jobs, private sector engagement, or low-carbon development
## City TOD Strategy Outline Section II – TOD Diagnostic Indicators: Macro-level (City and Network)

### 7 Cities

### Project Details

<table>
<thead>
<tr>
<th>Macro-Level (Network) Indicators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Transit Line density (km/km²)</td>
<td>the kilometer of mass transit lines over the size of the covered area</td>
</tr>
<tr>
<td>Mass Transit Station Density (unit/km²)</td>
<td>the number of mass transit stations over the size of the covered area</td>
</tr>
<tr>
<td>Urban Land Coverage Ratio (%)</td>
<td>the percentage of land within the 800m radius of all stations</td>
</tr>
<tr>
<td>Urban Population Coverage Ratio (%)</td>
<td>the percentage of population over the 800m radius of all stations</td>
</tr>
<tr>
<td>Job Coverage Ratio (%)</td>
<td>the percentage of jobs over the 800m radius of all stations</td>
</tr>
</tbody>
</table>
## City TOD Strategy Outline Section II – TOD Diagnostic Indicators: Macro and Micro-Level (Station)

### Node value
- **Degree centrality:** describes the number of links connects to one specific station.
- **Closeness centrality:** ranks the stations based on their distance to all the other stations in the network.
- **Intensity of station activity:** describes the traffic flow volume in a station, which could be reflected by the frequency of departures of public transit system and/or by the ridership of the station.

### Place value
- **Density of Street Intersections:** measures the number of street intersections within an 800 m radius from each station.
- **Diversity of land uses:** measures the number of different type of land use around a station (800 m radius).
- **Density of amenities:** measures the number of cultural, education and health services and more generally social infrastructure, within 800 m of a station.

### Potential market value
- **Density of people and jobs:** measures the number of people and jobs per km² around a transit station within a catchment area of 800 m.
- **Activity mix:** is the job to housing ratio, which measures the mix of residents and jobs in an area.
- **Floor Area Ratio (FAR):** the total floor size over the area size, which measures the land intensity potential.

### Project Details

<table>
<thead>
<tr>
<th>Node value</th>
<th>Place value</th>
<th>Potential market value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Degree centrality:</strong></td>
<td>Density of Street Intersections: measures the number of street intersections within an 800 m radius from each station.</td>
<td>Density of people and jobs: measures the number of people and jobs per km² around a transit station within a catchment area of 800 m.</td>
</tr>
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</tr>
<tr>
<td><strong>Intensity of station activity:</strong></td>
<td>Density of amenities: measures the number of cultural, education and health services and more generally social infrastructure, within 800 m of a station.</td>
<td>Floor Area Ratio (FAR): the total floor size over the area size, which measures the land intensity potential.</td>
</tr>
</tbody>
</table>

### Diagnostic Indicators
- **Diversity of connectivity:** is the number of different transportation modes (regular buses, BRTs, metros, etc.) that a station connects.
- **Pedestrian accessibility:** measures the proportion of the area around a station (800 m) actually reachable through a 10-minute walk.
- **Forecasted rate of growth in human density:** forecasted density of people plus jobs around stations, based on the urban mobility plans or mass transit development plans.
- **The number of accessible jobs:** measures the number of jobs accessible through transit and walking within a given timeframe (such as: 30 minutes to 1 hour).

*From the 3V Approach*
City TOD Strategy Outline Section II – TOD Impact Indicators: Macro-Level (Network)

<table>
<thead>
<tr>
<th>Macro-Level (Network) Indicators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport greenhouse Gas (GHG) emissions (ton/yr)</td>
<td>The annual amount of CO₂e produced by travel activities (e.g., passenger car, bus, truck, etc.) for the entire city</td>
</tr>
<tr>
<td>Mode Share in Peak Hour</td>
<td>Percentage of journeys in peak hour undertaken on public transport and non-motorized transport (NMT)</td>
</tr>
<tr>
<td>Travel Time (min)</td>
<td>The average travel time needed to finish one working trip by mode (passenger car, public transit, etc.) with either origin or destination in the traffic analysis zone (TAZ) covering all TOD stations.</td>
</tr>
<tr>
<td>Accessibility (%/#)</td>
<td>The percentage/number of jobs that is accessible through transit and walking within certain timeframe</td>
</tr>
</tbody>
</table>
## City TOD Strategy Outline Section II – TOD Impact Indicators: Micro-Level (Station)

<table>
<thead>
<tr>
<th>Property value</th>
<th>Residential property price (RMB/m²) &amp; Commercial property price (RMB/m²) within a catchment area of 800 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments</td>
<td>Investment activity within the TOD design area (RMB/yr)</td>
</tr>
<tr>
<td>Construction</td>
<td>Commercial and residential floor space constructed within TOD design area (800m catchment area) (m²/yr)</td>
</tr>
<tr>
<td>Social Inclusiveness Measure</td>
<td>The number of affordable housing units within the 800m catchment area of the station.</td>
</tr>
</tbody>
</table>
III. TOD Typology Identification

A. Develop TOD typologies based on the indicators
   - TOD typologies differentiate transit station areas based on their suitability for accommodating growth. They link regional and local public policy recommendations to support the type of development that is best suited for a specific site and community.
   - TOD typology aims at creating an aspirational vision of future land uses, prioritizing stations for investment, providing guidelines and actions for implementation, and measuring performance on a range of metrics.

B. Categorize corridor, station, and/or district areas that are under review in study and map by type
IV. Monitoring and Evaluation
   A. Develop clear KPIs for the strategy based on the indicators
V. TOD Action Plans

A. Typology-Specific Implementation Plans
   – Develop typology-specific implementable plans of 3 to 5 years
   – Include projected GHG emissions reductions for each plan.

B. District, Corridor, and/or Station-level Approaches
   – Develop broad approaches as a guide for the district, corridor, and/or station-level applications to follow
V. TOD Action Plans

C. TOD Regulatory Framework Plan

- Articulate how TOD principles can be effectively channeled and incorporated in existing city policies and legal plans, including specific actions to be taken by relevant city departments and bureaus.

- Include a list of existing supporting TOD policies and technical guidelines and any recommendations for policy improvements or reforms, and recommended new policies would support a healthy TOD regulatory environment.

- Include institutional management coordination mechanism and restructuring recommendations.
V. TOD Action Plans
   D. Financing Plan
   – Identify financing and investment strategies, with a specific focus to involve the private sector at different stages in order to lessen the reliance on land financing to support TOD; clear coordination mechanisms between the private and public should be articulated and carried out
   – The framework can be explored at two levels, a broad and specific framework. More details and a hypothetical Analytical Framework for Private Sector Participation on next slide
Project Details

Private Sector Framework Approach – Potential Use for Financing Plan under TOD Action Plans from the City TOD Strategy

7 Cities

City TOD Strategy

Framework sets out options for involving private sector at different levels and stages of TOD (Developed with TOD Community of Practice, IFC and peer reviewers)

A. Broad Framework
B. Specific Framework

Table 6.1 Analytical Framework for Private Sector Participation in TOD in China

<table>
<thead>
<tr>
<th>Components</th>
<th>Policy</th>
<th>Laws &amp; Regulations</th>
<th>Institutional Setting</th>
<th>Financing instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Level &lt;--------------&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Level C: Current R: Recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CORRIDOR</td>
<td>C  R</td>
<td>C  R</td>
<td>C  R</td>
<td>C  R</td>
</tr>
<tr>
<td>Transit Infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guided wats (rail and BRT line)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trains and Buses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit Stations (platform, concourse, ticket office, waiting room)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample from Analytical Framework for Private Sector Participation
THANK YOU!

Joanna Masic
Senior Urban Specialist
World Bank Group

jmasic@worldbank.org
TOD Finance and M&E
TOD: Types of Capital Investment

When considering financing strategies for TOD corridor development, what needs to be financed?

- **Investment Size: Large**
  - Capital costs for BRT, LRT, or metro systems
  - Often paid by public sector, but funding can be raised through capturing land value uplift and real estate improvements

- **Investment Size: Small-Medium**
  - Local street improvements & sidewalk/NMT infrastructure
  - Can be paid by developers in strong markets or by local government

- **Investment Size: Varies**
  - Consists of construction costs of residential/commercial buildings
  - Most costs to be paid by developer, but public subsidy sometimes required if weak market or affordable housing is required
A business model is a framework that includes all of the elements that make it possible for an investment to generate a return. A TOD business model is a framework that includes all the elements that allow a TOD investment to generate [social, economic, environmental and financial] return.
The various assets and processes that generate cost and revenues over the course of a TOD investment
Corridor scale Investment components

**Tangible assets**
- Land
- Transit Track (Bus Lanes, Railways etc) and Transit stations
- Roads, street networks, pedestrians, bike lanes,
- Other TOD related investments (station plaza, bus terminal, public amenities, etc)
- Public and private buildings
- Public utilities

**Intangible assets**
- Articulated Density
- Public safety
- Walkability
- Mixed land use
- Cohesive Community
- High Quality Public places and Cultural heritage

**Processes**
- Feasibility studies
- Detailed engineering and investment cost estimate
- Financing arrangement
- Securing lands and site preparation
- Procurement and construction
- Monitoring and evaluation
- Operation and Maintenance
- Community engagement (all through critical stage from planning to implementation)
Funding Sources

- Funding sources
  - Investment revenues
    - Service charges
    - Land value capture
    - Air right sales
    - Own source revenue
  - Investment incentives
    - Grants
    - Fiscal incentives

Revenues, and other non-reimbursable monetary support, that can be used to repay the costs of the investment components
Financial products: de-risking products

De-risking products: products designed to lower the costs of finance by reducing the likelihood that an investor will not receive a return on investment.

TOD products can access guarantees and insurance for de-risking purposes, which include:

- Credit guarantees
- Revenue guarantees
- Political risk insurance
A Review of TOD Benefits

**Mobility Benefits**
- Increase access to jobs and amenities city wide
- Improve access to a low cost transport solution (public transit/walkable urban space/bicycle infrastructure)
- Reduce automobile-dependency

**Social Benefits**
- Revitalize neighborhoods
- Promote social equity through creation of mixed-income housing near transit
- Increase accessibility for less mobile.
- Improve health and increase physical activity through creation of walkable neighborhoods

**Environmental Benefits**
- Lower air pollution and GHG emissions by reducing automobile-dependency and urban sprawl
- Reduce energy consumption
- Conservation of green and natural spaces

**Economic Benefits**
- Increase agglomeration and access to employees
- Encourage economic resilience through diversity
- Energize local economy
- Increase property values along corridors to help fund needed infrastructure
- Reduce infrastructure costs
- Reduce transport cost

Image Source: WRI.
Thoughts on M&E Systems

• When creating a M&E system for a TOD project, the project owner must:
  o Establish project goals, in collaboration with other project stakeholders
  o Set output and outcome performance indicators
  o Collect data on outputs and outcomes at regular intervals
  o Integrate feedback into project implementation
Performance Indicators
Measuring for Mobility Outputs and Outcomes

TRAVEL BEHAVIOR
Output Performance Indicators:
• Changed parking rules (such as limits, pricing, and location)
Outcome Performance Indicators:
• Automobile usage, measured in VKT
• Mode share
• Auto ownership
• Transit use

ROAD SAFETY
Output Performance Indicators:
• Number of redesigned street intersections and crossings
• Km of bicycle lanes
Outcome Performance Indicators:
• Vehicular speeds on roads
• Public perception of pedestrian and bicycle safety
• Number of vehicular accidents and fatalities

TRANSIT SERVICE & QUALITY
Output Performance Indicators:
• Number of transit options
• Integration of multi-modal options within transit stations
• Frequency of transit service
Outcome Performance Indicators:
• Total area accessible in 45/60 mins
• Percentage of jobs accessible in 45 mins by public transport+NMT
• Satisfaction levels
• Changes in travel time

ACCESSIBILITY & WALKABILITY
Output Performance Indicators:
• Number of high-density developments located within a station-area
• Change in length and width of unobstructed sidewalks/footpaths
Outcome Performance Indicators:
• Walkability Score
• Number of pedestrian and bicyclist accidents

Image Source: WRI.
Performance Indicators
Measuring for Social Outputs and Outcomes

NEIGHBORHOOD REVITALIZATION
Output Performance Indicators:
• Number of community facilities, amenities, and educational services within a project area
• Redesigned streetscapes, public spaces, and building facades throughout a project area
• Number of mixed-use developments within a project area

Outcome Performance Indicators:
• Improved access to transit and services for all socioeconomic groups
• Diversity within a project area, including racial, ethnic, gender, religious, & socioeconomic diversity of local residents, business-owners, and workers
• Increase accessibility for less mobile

SOCIAL EQUITY
Output Performance Indicators:
• Number of affordable housing units
• Interconnection designed for the less mobile

Outcome Performance Indicators:
• Residents’ involvement in community projects and initiatives

SOCIAL CAPITAL & CITIZEN PARTICIPATION
Output Performance Indicators:
• Number of community outreach programs

Outcome Performance Indicators:
• Residents’ involvement in community projects and initiatives

Image Source: WRI.
Performance Indicators
Measuring for Environmental Outputs and Outcomes

**REDUCED EMISSIONS**
Output Performance Indicator:
- Transport system and land use prioritizing transit and NMT
- Establishment and implementation of low emission zones around metro stations

Outcome Performance Indicator:
- Number of days of good air quality
- Overall GHG intensity of transport
- Overall energy intensity of transport

**CONSERVATION OF GREEN AND NATURAL SPACES**
Output Performance Indicator:
- Creation/maintenance of park and/green space as a result compact urban development in TOD areas
- Infill and brownfield reclamation

Outcome Performance Indicator:
- Habitat conservation through preservation of ecological areas
- Increased tree cover and reduced heat island effect

Image Source: WRI.
Sustainable Urban Transport Financing from the Sidewalk to the Subway
CAPITAL, OPERATIONS, AND MAINTENANCE FINANCING

Arturo Ardila Gomez and Adriana Ortegon-Sanchez

FINANCING TRANSIT-ORIENTED DEVELOPMENT WITH LAND VALUES
Adapting Land Value Capture in Developing Countries
Hiroyuki Suzuki, Jin Munakami, Yu-Hung Hong, and Beth Tymoshke

WORLD BANK GROUP
List

- https://www.nap.edu/download/23682
- https://www.epa.gov/smartgrowth/infrastructure-financing-options-transit-oriented-development
- https://openknowledge.worldbank.org/handle/10986/23521
- http://hdl.handle.net/10986/21286

Quick Wins

1) Long term impact are major, but start with manageable size projects
2) There is a role for the national government
3) Review the vision of the city, key objectives and real estate demand
4) Develop indicator targets to stimulate development around transit
   a) Percentage of new permitted development around station
   b) Target percentage of jobs and housing around stations
   c) Additional rule and cost for development outside mass transit
5) Classify stations in three categories based on node, place and market potential values, discuss among agencies, developer and citizens
6) Identify stations with available land for the different types and start developing
7) Adopt design guidelines for streetscape
Link to the TOD COP Group
Asato1@worldbank.org
gollivier@worldbank.org
jgood@worldbank.org

https://collaboration.worldbank.org/groups/tod-cop

Also connect on Linkedin for regular news: “Gerald Ollivier”
Quick win (Serbia)
INTEGRATING SUSTAINABILITY INTO URBAN PLANNING AND STRATEGY - JOHANNESBURG SPATIAL DEVELOPMENT FRAMEWORK AND CORRIDORS OF FREEDOM
- Session 1 – How do we understand the city
- Session 2 – Theoretical underbuilt and International Benchmarking – Developing an approach for Johannesburg
- Session 3 – Testing development options and models
- Session 4 – Strategy for future development
Johannesburg in the 80s
Johannesburg today
The polycentric city is the traditional pattern of city growth, with a dense and large urban core surrounded by dense sub-centers. This structures supports agglomeration economies.
Johannesburg
Inverted polycentricity

Johannesburg metropolitan structure is unique and inherited from its complex history. It displays inverted polycentricity, with satellites urban areas much larger than the core of the city.
DEPRIVATION, INEQUALITY & THE GEOGRAPHY OF POVERTY

... the areas with the highest population concentrations are the most deprived areas in the City

BASED ON 5 INDICATORS:
- Income
- Employment
- Health
- Education
- Living Environment
A strong socio-spatial divide

Figure 7: The socio-spatial inequality in South African Cities: Deprivation areas are concentrated in high density residential areas. High income areas are concentrated in low density northern suburbs.
Figure 8: The socio-spatial inequality in South African Cities: High density of unemployed people are concentrated in high density residential areas. High unemployment rates are concentrated in high density residential areas.
Both private investment and informal settlements further fragment the city.
This results in 100-fold variations in residential densities.
Mapping formal jobs concentrations

Figure 19: Formal job density is highly concentrated in Norther areas
Strong imbalances in job people ratio

Figure 21: Demographic density (left) and job density (right) in the City of Johannesburg

3%
Of the urban area with more than 10 jobs per inhabitant

50%
Of the urban area with less than 1 job for 3 inhabitants
Strong imbalances in street network per capita. 

Figure 27: Street networks per km² are evenly distributed, but street networks per capita display high spatial inequality.
Disconnected Street patterns in 93% of the land

Figure 31: The number of intersections per km² in the north or Johannesburg is much lower than international best practice.
LAND USE DIVERSITY (ENTROPY)

- Limited diversity and inefficient land use patterns
- The lack of land use diversity is even more critical in deprived areas where we find mostly residential land uses
Strong imbalances in mixed use

Figure 38: The inner shows high levels of land use diversity, indicated by high entropy cells

Figure 39: Soweto shows first signs of land use diversification with seldom high entropy cells

Figure 40: Northern suburbs (Bryanston) show very low levels of land use mix (low entropy)
Distribution of Spatial Economy

- 62% of City Economy (37% pop)
- 75% of City Economy (14% pop red only)
- 12% of city economy (14% pop)
- 9% of city economy (27% pop)
- 4% of city economy (14% pop)
DEVELOPMENT STRATEGY
- Position the political debate as a central component of the entire planning process
- Integrate planning process with political expectations and mandate
- Regular sessions with the Mayor and senior politicians at every step of the process (Provide information and testing the concepts)
- Mayoral and Council approval of Draft SDF for publication and further public input. (November 2015)
• Evidence based planning creates common understanding of development issues
• International guidelines and principles for sustainable development creates universal acceptance of the vision
• Participative processes and continued civic engagement ensures legitimacy of the plan
• Flexibility allows for shifts in focus and emphasis on specific elements of the plan – ie economic development and job creation
The inverted polycentricy and the polycentric scenario

Figure 10: Johannesburg metropolitan structure is unique and inherited from its complex history. It displays inverted polycentricity, with satellites urban areas much larger than the core of the city.
How to build on the Corridors of Freedom opportunity to reshape the spatial structure of the metropolis?
Business as Usual scenario
Residential density increases are scattered within the entire CoJ area
Linear densification scenario
Urban sprawl is contained and residential density is concentrated along transit corridors (zones 0, 1 and 2)
Compact scenario
Urban sprawl is contained and residential density is concentrated in priority development areas (zones 0 and 1)
Building spatial growth scenarios: Towards polycentricity
Transect analysis along the BRT backbone (Empire Perth and Louis Botha Avenues)
Residential and job densities remain low
Transect analysis along the BRT backbone (Empire Perth and Louis Botha Avenues)

Job Housing Ratios show a job housing mismatch, but a great economic potential in close transit catchments
Transect analysis along the BRT backbone (Empire Perth and Louis Botha Avenues)

Low FAR and building footprints provide densification opportunities
Transect analysis along the BRT backbone
(Empire Perth and Louis Botha Avenues)
Land use diversity
Transect analysis along the BRT backbone (Empire Perth and Louis Botha Avenues)
Income per household
INTEGRATION ZONES (TRANSFORMATION ZONES)
26% of the people living less than 1km from transit, compared to only 11% today.
64% living less than 2km from transit, compared to only 18% today.
33% of the jobs located less than 1km from transit, compared to 10% today.
80% of the jobs less than 2km from transit, compared to 17% today.

- **Joburg now**
  - Less than 500m: 5%
  - 500m-1km: 5%
  - 1km-2km: 5%
  - More than 2km: 7%

- **Joburg 2040**
  - Less than 500m: 14%
  - 500m-1km: 19%
  - 1km-2km: 47%
How do we implement the plan?
1. Capital investment
2. Special Development Zone
3. Indicators
4. Inclusionary housing
TOTAL CAPEX DEMAND vs STRATEGICALLY TARGETED INVESTMENT
ORANGE GROVE – CURRENT FORM

Existing units - 7133
ORANGE GROVE – FUTURE FORM

Special Development Zone
• Providing market certainty
• Up front package of rights
• Service contributions
• Design requirements

Additional units - 13447
Investment Projects (R350m – MTEF)
- 1500 new res units (pot 12000)
- 3000 m² Commercial Library
- Indoor and Outdoor Sport facilities
- Rec Centre
- 9,2 Ha Park
- NMT Connectivity
- Storm water infrastructure
- 2 BRT Stations
- Power and water network upgrades

Sustainable and Resource Efficient Social Housing

Eco District – Standards Indicator Development
Implementation Mechanisms

Evidence based planning and Indicators
Access to Train Stations and Nodes

500m Service areas representing road networks and different walkability around different train stations.
Access to Commercial Jobs

Commercial buildings in 2km

Representing access to commercial jobs
Access to Community Facilities