Engaging in TOD Globally for Better Cities

Highlights from the World Bank

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OUTLINE OF PRESENTATION

1. How TOD Projects Work / How WB Engages
2. Summary of Key Projects
3. Transforming cities through TOD: 3V Approach
4. Emerging Lessons & Next Steps
| WHY TOD? | More Competitive | Access and Mobility  
         | Lower Transport and Housing cost | Resilient to Natural Hazards | Partly self financing by capturing value created |
|----------|------------------|----------------------------------|-----------------------------|----------------------------------------------|
|          | High quality neighborhoods with lower infrastructure costs and lower CO2 |                                  |                              |                                              |
1. Align Human/Economic Densities, Mass Transit Capacity and Network Characteristics for Greater Accessibility

2. Create Compact Regions with Short Commutes

3. Ensure Resilience of Areas Connected by Mass Transit

4. Plan and Zone for Mixed Use and Mixed Income Neighborhoods at Corridor Level

5. Create Vibrant, People-Centric Public Spaces Around Stations

6. Develop Neighborhoods that Promote Walking and Biking

7. Develop Good Quality, Accessible and Integrated Public Transit

8. Manage Private Vehicle Demand

Source: World Bank TOD COP
### Design Elements of TOD at Various Scales

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>CITY</th>
<th>INTER-NEIGHBORHOOD</th>
<th>NEIGHBORHOOD</th>
<th>STREET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality Public Transit</strong></td>
<td>Proximity to urban centers</td>
<td>Financial viability of public transit</td>
<td>Access to public transit</td>
<td>Public transit infrastructure</td>
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<tr>
<td><strong>Non-Motorized Mobility</strong></td>
<td>Continuous street network</td>
<td>Pedestrian and cycling networks</td>
<td>Internal connectivity</td>
<td>Sidewalks and bike paths</td>
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<tr>
<td><strong>Vehicle Demand Management</strong></td>
<td>Optimization of daily commutes</td>
<td>Safe and orderly roads</td>
<td>Parking management</td>
<td>Road safety for all users</td>
</tr>
<tr>
<td><strong>Mixed-Use and Efficient Buildings</strong></td>
<td>Regional facilities</td>
<td>Public amenities and marketplaces</td>
<td>Efficient buildings</td>
<td>Live streets</td>
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## DESIGN ELEMENTS OF TOD AT VARIOUS SCALES

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<tr>
<td><strong>NEIGHBORHOOD CENTERS AND ACTIVE GROUND FLOORS</strong></td>
<td>Local economy</td>
<td>Neighborhood centers</td>
<td>Active ground floors</td>
<td>Public-private transition</td>
</tr>
<tr>
<td><strong>PUBLIC SPACES AND NATURAL RESOURCES</strong></td>
<td>Green area networks</td>
<td>Energy, water and waste efficiency</td>
<td>Green and public space networks</td>
<td>Public life</td>
</tr>
<tr>
<td><strong>COMMUNITY INVOLVEMENT AND IDENTITY</strong></td>
<td>Inclusive stakeholder engagement</td>
<td>Place identity</td>
<td>Community management</td>
<td>Sharing the street</td>
</tr>
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Access the full content of dots CIDADES in Portuguese: [bit.ly/DOTSCidades](bit.ly/DOTSCidades)

A product of WRI Ross Center for Sustainable Cities
TOD TOOLS

Enabling Factors

Physical and Technical Aspect
- PL: Political Leadership & Vision
- L: Land
- IS: Institutional Structure
- RE: Regulatory Environment
- SE: Stakeholder Engagement
- D: Design
- F: Financing
- H: Affordable Housing

Institutional Categories
- Infrastructure Categories
- Social Aspect

Tools for Land Assembly

Voluntary
- Tool 1: Land Readjustment
- Tool 2: Urban Redevelopment
- Tool 3: Land Sharing

Involuntary
- Tool 1: Eminent Domain
- Tool 2: The Right of Preemption

Funding sources

- Investment revenues
  - Service charges
  - Land value capture
- Investment incentives
  - Grants
  - Fiscal incentives

Own source revenue
Revenues, and other non-reimbursable monetary support, that can be used to repay the costs of the investment components.
1. How TOD Projects Work / Engagement Process
World Bank has provided $23.5 billion in lending to urban transport projects over the past decade.

Effective coordination of transport and land use (TOD) fills the gap here:

- TOD allows large-scale public investments funded by World Bank to be more efficient and more effective in producing desired outcomes.
HOW TOD COP INTERACTS WITH CLIENTS

Leverage ongoing engagement

• Provide TOD CoP members with easy access to wealth of reference material and information
• Increased coordination and collaboration across 30+ TOD-related World Bank projects

Support operationalization of TOD/LVC concepts by WB teams and clients

• Broaden and deepen engagement to projects and provide just-in-time support to give targeted advice and recommendations of other expertise

Expand the knowledge base

• Develop new tools in partnership with NGOs and other experts
• Set up global learning network with TDLC, Singapore Hub, and Washington HQ

Facilitating sharing of good practices internationally

• Engaged with multiple cities as part of the Global Platform for Sustainable Cities (GPSC)
• Worked with WRI and ITDP to review and improve new materials
• Speaking engagements by CoP members
EMERGING THEMES IN OUR GLOBAL TOD WORK

➢ Context matters, both geographic and institutional
➢ Upfront coordination is necessary for good infrastructure design and effective linkages with surrounding land uses
➢ Finance options should be discussed early
➢ Land tenure & land readjustment are difficult in built-up areas
➢ Partnership with private-sector developers is essential for timely implementation
➢ Working to provide focused resources in urban design, land value capture, among other areas
2. Key Projects & Insights
OVERVIEW OF ALL TOD PROJECTS

<table>
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<tr>
<th>City Scale</th>
<th>Corridor Scale</th>
<th>Station Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use Policy and Strategy</td>
<td>Understanding Transformation Potential</td>
<td>Feasibility Study for PPP and TOD/structuring</td>
</tr>
<tr>
<td>Legal and Regulatory Framework</td>
<td>Integrated urban/transport development</td>
<td>Conceptual Design</td>
</tr>
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<td>Integrated Land Use and Transport</td>
<td>Legal and Regulatory Framework</td>
<td>Accessibility planning</td>
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<tr>
<td>Modeling of TOD</td>
<td>Design and Planning Guidelines</td>
<td>Case Studies</td>
</tr>
<tr>
<td>Leveraging Private Sector</td>
<td>Feasibility Study</td>
<td>Public space at local scale</td>
</tr>
<tr>
<td>Improving Accessibility around Stations</td>
<td>Operational guide</td>
<td>Social housing</td>
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<td>Capacity Building</td>
<td>Accessibility Plan and Integrated Transport</td>
<td>Financing Scheme/LVC</td>
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<td></td>
<td>Operational guide</td>
<td>Citizen Engagement</td>
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<td>Evaluation</td>
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<td>Social housing</td>
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</table>

- no funding but interest
- funding identified, but not contracted
- contracted but not done
- report available

Project locations include:
- Addis Ababa
- Beijing
- Belgrade
- Bogota
- Cape Town
- Chiang Mai
- Da Nang
- Dakar
- Dar es Salaam
- Dubai
- Ho Chi Minh City
- India
- Jakarta
- Kigali
- Lima
- Moscow
- Mexico City
- Mumbai
- Nairobi
- Naples
- Nanning
- Nanchang
- Nathan
- Paris
- Prague
- Quito
- Recife
- Rio de Janeiro
- Seoul
- Shanghai
- Shenzhen
- Srinagar
- Sousse
- Tehran
- Tianjin
- Zhengzhou
INTERACTION WITH CITIES ON TOD AROUND THE WORLD

Cities in China
Beijing    Ningbo
Tianjin    Nanchang
Shijiazhuang Shenzhen
Qingyang    Guiyang
Zhengzhou    Kunming

*national-level engagement in Pakistan
KEY PROJECTS DEMONSTRATE BROAD TYPES OF PARTNERSHIP

GEF Integrated Cities Pilot in China

Beijing  Nanchang
Tianjin  Shenzhen
Shijiazhuang  Guiyang
Ningbo

Lima  Dar es Salaam  Raipur  Surabaya  Da Nang
FROM SMALL-SCALE DESIGN TO CITY-WIDE STRATEGY

Station-level:
fine-grained urban design and specific parcel-level phasing and feasibility

Corridor-level:
comprehensive examination of land use strategy along a specific transit corridor

City-level:
policy and strategy for metropolitan implementation of TOD concepts
Surabaya / Urban Corridor Development Project

**Context:**

*In anticipation of a potential metro transit line, city is working on a strategy to revitalize a major corridor along a new tramway and tie into the traditional/historic urban fabric*

**Project Objective:**

A feasibility study to support the development of a metro system in Surabaya, aiming to facilitate improvements in accessibility and mobility, and to strengthen the capacity for integrated urban transport planning and management in Indonesia

**Key Insights:**

- Improved information and data is key to successful planning of the corridor
- Regulatory planning tools such as policies and guidelines are central for land value capture
- Practical capital works projects and urban design/public space improvements in corridor have a considerable impact on the image, identity and usage of the MRT
Detailed parcel-level analysis, with expected building areas and real estate value generated.

Detailed urban design, including integration of new development with existing kampong (village) fabric.
Lima / Metro Line 2 Study

**Context:**

In a fast-growing and congested region, Lima is expanding its metro system. Line 2 connects the coastal port with a river valley between mountains on the urban fringe, a primarily residential area.

**Project Objective:**

Comprehensive engagement for integrated planning along the new metro corridor, to identify specific parcels for development, recommend urban design and public space changes, and financing arrangements/options.
**LIMA: RECOMMENDATIONS FOR LAND USE & PUBLIC SPACE**

**Key Insights:**

- Integrated transit connections can assist in multi-modal transit operations and urban planning, and can help more cohesive urban districts around future stations.

- Vertical spaces should also be leveraged to provide access and public space, and can be created during initial metro excavation work.

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Small transit nodes & centralities can be created with good infrastructure design.

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Need to combine proposed land uses with investment in road network and public space network.
EXPLORING VERTICAL SPACES ALONG LIMA METRO LINE 2

**Vertical commercial and residential development**

**Connected network of public spaces**

**Underground expressway, bus interchange & parking**

**Metro Line 2**
Dar es Salaam / BRT & Corridor Development

Context:

Fast-growing Tanzanian capital city is building a network of bus rapid transit (BRT) corridors within existing urban fabric along three major corridors.

Project Objective:

Create a Corridor Development Strategy (CDS) to develop an integrated land use and transport plan and guidelines to guide the detailed development and appropriate densification along the BRT corridor. Provide TOD guidelines and pedestrian oriented development solutions for future BRT corridors.
INITIAL RECOMMENDATIONS & FEEDBACK FOR DAR BRT CORRIDORS

Workshop Insight:

Specific real estate mgmt. decisions (such as parking design and retail tenancy) play a key role in how people perceive the corridor.
Context: To connect with upcoming relocated rail station along mainline, a targeted BRT corridor development to extend from existing city center to major new commercial node to be developed at new station

Project Objective: As part of a large urban infrastructure project, aim to develop a BRT corridor in Da Nang, provide new urban connecting roads, and provide technical assistance and capacity building.
Key Insights:

- Need for a formal coordination structure between central government, city government, and investors, given large amounts of investment
- Need to formalize land value capture (LVC) arrangements
- Need a platform for sharing information and getting feedback from project stakeholder

Design typology recommendations for stations along BRT corridor
Raipur / TOD Strategy for Naya Raipur District

Context:

Naya Raipur is a master-planned greenfield district being developed about 10km east of the current city, with new transit and road infrastructure, with the vision of “mobility of all, affordable, equitable, and safe” (including BRT/LRT/railway/NMT infra).

Examples of Naya Raipur land use planning concepts.
INSIGHTS FOR GREENFIELD TOD PLANNING IN INDIA

Project Objective:

Refine the plan for Naya Raipur with a baseline study and evaluation with international planners through a charrette and workshop. Establish the TOD policy and provide capacity building for implementation, and carry out needed modification in the statutory development and road plans.

Key Insight:

TOD planning should be done by buffer distances from rapid transit stations, and not by city sector, which is the traditional approach for city planning in India.
China-GEF Integrated Cities Pilot Project

Context:

*Customizing recently released TOD urban design guidelines by Ministry of Housing and Urban-Rural Development (MoHURD) for application in city planning processes, for application in China’s fast-growing cities*

Project Objectives:

- In Beijing, Tianjin, Shijiazhuang, Ningbo, Nanchang, Guiyang, and Shenzhen, to incorporate transit-oriented development principles in their policies and into future urban and transit plans
- Create national-level TOD platform for sharing data and best practices
TOD WITH CHINESE CHARACTERISTICS: INITIAL INSIGHTS

• Adopt, adapt, or abandon international TOD guidelines
• Localizing TOD for each city’s context is the rule rather than the exception

What urban design makes sense for each Chinese city based on history and context?

(not blindly accepting USA TOD norms)

How do ubiquitous shared bikes extend the transit station area and affect accessibility planning? What assumptions change?
Emerging Trends and Tools to Plan TOD

- New forms of big data on movement patterns allow finer-grained planning of station area and accessibility
- Evolving research on land value can help build case for land value capture

Beijing: Information from stationless bicycle sharing helps to understand station usage and movement patterns
3. Transforming Cities through TOD: 3V Approach
London’s Jobs hierarchy exponent minus 1, (minus 0.7 for population like in systems of cities in economic geography); one third of jobs, 1.5 million jobs, in 16 km² in London

<table>
<thead>
<tr>
<th>Share</th>
<th>Pop</th>
<th>Area pop</th>
<th>Job</th>
<th>area jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>33%</td>
<td>2,724,646</td>
<td>145</td>
<td>1,500,160</td>
<td>16</td>
</tr>
<tr>
<td>33-66%</td>
<td>2,724,646</td>
<td>285</td>
<td>1,500,160</td>
<td>150</td>
</tr>
<tr>
<td>66-100%</td>
<td>2,724,646</td>
<td>1144</td>
<td>1,500,160</td>
<td>1408</td>
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Source: Urban Morphology Institute.
SUBWAY NETWORKS CONVERGE TOWARDS A CHARACTERISTIC STRUCTURE WITH A DENSE AND INTERCONNECTED CORE WITH BRANCHES

Degree centrality describes how connective a station is, that-is how many lines it connects (major interchanges have high degree centrality values)

Closeness centrality describes how close a station is from all the other stations in the network (closeness centrality is a measure of accessibility to a station within the network)

Betweenness centrality describes how many routes go through a given station (the more routes through the network pass through a station, the more “in between” this station is)

Source: QuantUrb, CASA
NODE/PLACE/MARKET POTENTIAL VALUES FOR A CORRIDOR?

**Example:** Crossrail in London
The stations along Crossrail route where property prices have outperformed compared to the market are the ones located in Central London where both jobs and connectivity are highly concentrated © JLL
Transforming the Urban Space through Transit-Oriented Development
The 3V Approach

Serge Salat and Gerald Ollivier

Available at http://hdl.handle.net/10986/26405
4. Key Lessons & Next Steps for WB TOD
➢ TOD in existing built-up area or greenfield land?

➢ Which agency sponsors project? How do they relate to other government agencies?

➢ Current status of real estate market demand? New transit corridor in a growing or stagnating area of city?

➢ Are incentives aligned to encourage cooperation between public and private sector?

➢ Funding sources for infrastructure?
A NETWORK FOR JOB ACCESSIBILITY

Zhengzhou
- Population: 6.4 million
- GDP per capita: US$11k
- Peak hour accessibility

Percent of jobs accessible within 45 minutes by public transit

- Scenario a plus bus: **28%**
- Scenario b plus TOD: **39%**
- Scenario c plus bicycle: **46%**

Source: The 3V Framework (World Bank)
LAND READJUSTMENT OFTEN DIFFICULT IN BUILT-UP AREAS

- In developing countries, land tenure is often not well-established, limiting possibility for redevelopment

- Formalization of title and adjustments of parcel configuration often necessary, as well as reform of property taxation system
UPFRONT INFRASTRUCTURE DESIGN COORDINATION ALLOWS FOR BETTER INTEGRATION WITH TOD PROJECTS

Examples of integrated design from Lima
TOD PROJECTS INVOLVE COMPLEX MIX OF PUBLIC, PRIVATE SECTORS

Pre-consultation & strategy development

- Economic development officials
  - Inventory potential redevelopment sites
  - Assess economy & potential growth areas
  - Developers assess potential real estate projects in corridor

- Real-estate developers
  - Finalize route and stations
    - Urban planners
      - Operations plan for transport integration
      - Refine station designs for transfers & NMT
      - Confirm street infra to be changed
      - Create branding strategy & market corridor

- Transport planners
  - Refine station area plans with stakeholders
  - Operations plan for transport integration
  - Refine station designs for transfers & NMT
  - Confirm street infra to be changed
  - Create branding strategy & market corridor

Implementation of TOD corridor

- Economic development officials
  - Finalize cost estimates for transit infra
  - Estimate financing gap & propose funding mechanism
  - Discuss high-potential redev sites at stations

- Real-estate developers
  - Finalize transit service changes for integration
  - Discuss phasing of dev & contribution to infrastructure/incentives needed

- Urban planners
  - Finalize transit service changes for integration
  - Discuss phasing of dev & contribution to infrastructure/incentives needed
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PARTNERSHIP WITH PRIVATE-SECTOR DEVELOPERS IS LIKELY NECESSARY FOR TIMELY IMPLEMENTATION

• Need to gauge interest in development opportunities, to determine level of public involvement for infrastructure development

• Developers need to understand new design standards, to ensure that standard practices are phased out (e.g. barrier walls, super-blocks, etc.)
INFRASTRUCTURE FINANCE OPTIONS & LAND VALUE CAPTURE MUST BE EVALUATED EARLY

Transit feasibility phase
- Need to gauge what level of infrastructure investment is necessary:
  - For transit capital investment & operations
  - For supporting infrastructure to enable densification

Corridor development/TOD analysis phase
- What value is likely to be generated?
- What are the tools and enabling policies in place to capture value?

(changing tools may require legislation, which takes time)
NEXT STEPS & CUSTOM ASSISTANCE

• Moving from national-level policies and design guidelines to actionable steps and tools customized to local city contexts
• Sharing the best local projects with the wider community
Any questions?