Financing Transit-Oriented Development (TOD) with Land Values
Outline

- Transit Oriented Development (TOD) as the Most Effective Measure for Sustainable Urban Development
- How to Maximize Values of TOD
- Financing TOD with Land Values – Land Value Capture
- Land Value Capture Global Good Practices: Schemes and Instruments
  - Hong Kong R(Rail)+P (Property) Model
  - Tokyo Inclusive Multiple Integration Model
  - Emerging Land Value Capture in Cities in Developing Countries
- Critical Factors for Success of LVC in Developing Countries
- Conclusion
TOD As Effective Measure for Sustainable Urban Development
TOD Promoting Urban Sustainability

Source: GIZ/World Bank

www.worldbank.org/urban
TOD & Triple Bottom Line

- Economic
  - Time Saving
  - Energy Saving
  - Space Efficiency
  - Infrastructure Cost Saving
  - Synergy & Creativity
  - Agglomeration Economy
  - Functionality

- Accessibility & Mobility
  - Access to Jobs and Services
  - Affordable Housing

- Social

- Resilience to Disaster
  - Air Pollution Reduction
  - CO2 Reduction
  - Land & Green Preservation
  - Biodiversity

- Environmental

- Aging Society
Economy of Agglomeration and Connectivity with Tradition in Global Capital (Tokyo Station Area)

Photo: HSuzuki
Green TOD (Freiburg, Germany)
Kashiwano Ha Smart City

Solar power generation
Storage battery
LaLaport KASHIWANOHA
BEMS
Private emergency transmission lines
Park City Kashiwa-no-ha
Campus Ichibangai District
HEMS
Power company transmission network
Kashiwa-no-ha Smart Center
A central control center for a smart city
Park City Kashiwa-no-ha
Campus Nibangai District
HEMS
Gate Square commercial and office building
Gate Square hotel and residences
HEMS
Electric vehicles
HEMS
Source: Mitsui Fudosan
Toyama TOD for Aging Society

Source: City of Toyama
How to Maximize Value of TOD
Value is created by combination of transit and its influenced land use

**Business As Usual**

Value Capture (VC1)

Original Value (OV)

**Vertical & Horizontal TOD**

Quantity - Density

Tools
- FAR Increase
- Transfer of Development Right
- Land Adjustment
- Urban Re-development, etc.

Quantity - Catchment

VO

Tools
- Transit Feeder
- Bus Terminal
- Bicycle Lanes, etc.
GROW HIGH: Increasing Densities
Dveloping Countries: Average Built Up Densities

Comparative average population densities in built-up areas in 48 metropolitan areas

- Beijing
- Bangalore
- Hyderabad
- Tianjin
- Shanghai
- Guangzhou
- Hong Kong

Ahmedabad
Curitiba
Articulated Density Matters; Not Average Density

Uniform Average Population Density can have totally different height and spatial form. What matters most for transit and land integration is not average population density, but articulated density.

Source: OECD Compact City Policies / Laruelle, N
Bogota: Low (<2) FAR Control
Does Not Help Create Articulated Densities

Source: The World Bank Bogota Case Study
Curitiba’s Transit Oriented Development

Source: Curitiba
TOD as Envisioned by Peter Calthorpe

A diagram of Peter Calthorpe’s vision for TOD

600 meters
Expand Catchment Area by Various Transport Modes

Source: S. Sakaki

Mode Connectivity At Station
Expand Catchment Area by Rail & Bus Connection

Toyama LRT & Bus Catchment Area

- Rail enjoys Economies of Scale
- Bus enjoys Economies of Scope

Source: Toyama City
TOD in Tokyo Metropolitan Area

- Mega-Cities in Japan = Chains of Walkable Cells connected by Railways

- A network of 800m radius walk-able areas from each railway station in Tokyo Metropolitan Area
Quality Increases Land Value of TOD Areas

Quality Urban Design Enhancing TOD

Efficient

Transit

Functional

Pleasant

Vibrant

Quantity: Vertical-Horizontal Expansion-

Transit Value

Quality

VC3

VC2

VC1

OV

Original V
Land Value Premiums of TOD in U.S.

Source: R. Cervero
The “3V Frame WORK”

- Node Value based on its location in the network
- Place Value based on its urban qualities
- Market Value, based on its economic potential
Financing TOD with Land Values

- Tax
- Fairebox Revenues
- Land Value Capture (LVC)

Scarcity & Affordability
Political Economy

Economic Rational &
Financial Viability
Transit is Capital Intensive

Tokyo Metro Construction Costs

<table>
<thead>
<tr>
<th>Cities</th>
<th>Cost</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanchang Line 2</td>
<td>$2.6</td>
<td>24Km</td>
</tr>
<tr>
<td>Hyderabad</td>
<td>$2.6</td>
<td>72 Km</td>
</tr>
<tr>
<td>Delhi</td>
<td>$11.7</td>
<td>120Km</td>
</tr>
<tr>
<td>Sao Paulo</td>
<td>$30.0</td>
<td>100Km</td>
</tr>
</tbody>
</table>

Source: World Bank LVC Case Studies

Fig. 7. Construction cost of underground railways in Tokyo (nominal values).
Source: Hitoshi Ieda
Fare-box Recovery Ratio

Fare Revenues/Operation Expenses (%) – 60 Global Cities

Source: Murakami, Jin. 2012. Transit Value Capture
Focus of the WB’s New Book

- Focusing on Development based Land Value Capture (DBLVC) practices in HKSAR and Tokyo as global best cases
- Seeing DBLVC as a strategic model of both urban finance and planning
- Discussing how to adapt DBLVC in cities of the developing world

Source: Suzuki, Murakami, Hong and Tamayose, 2014
Concept of Land Value Capture

Intrinsic land value

Increases in land value due to landowner’s investments

Increases in land value due to public investment in infrastructure and changes in land use regulations

Increases in land value due to population growth and economic development

The government, on behalf of the general public, can capture a part of this portion of the increased land value, as property tax.

Public service providers should capture this portion of the increment to cover the costs of public infrastructure and local service provision.

Private land owners should profit from this portion of the increment.

Land buyers (or lessees) pay sellers (lessors) to obtain the property rights of land.

Source: Adapted from Hong and Brubaker 2010.
Categories of LVC Instruments
“Tax or Fee based” LVC & “Development-based” LVC (DBLVC)

<table>
<thead>
<tr>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tax- &amp; Fee-Based</strong></td>
</tr>
<tr>
<td>Property and Land Tax</td>
</tr>
<tr>
<td>Betterment Levies and Special Assessments</td>
</tr>
<tr>
<td>Tax Increment Financing (TIF)</td>
</tr>
<tr>
<td><strong>Development-Based</strong></td>
</tr>
<tr>
<td>Land Sale or Land Lease</td>
</tr>
<tr>
<td>Air Right Sale</td>
</tr>
<tr>
<td>Land Readjustment</td>
</tr>
<tr>
<td>Urban Redevelopment Financing</td>
</tr>
</tbody>
</table>

Source: Suzuki, Murakami, Hong and Tamayose, 2014
Betterment Fees/Charges

Colombia

- Contribución de Valorización (1921):
  - Cost recovery through betterment charge

- Participación en Plusvalías (1997):
  - Broader value capture
Tax Incremental Financing (TIF) US
Challenges of Tax-Based Land Value Capture

• Nobody likes tax-Political Economic Problem;
• Valuation Method;
• Uncertainty
• Question of Equity: TIF District and Other Districts;
• Tax-Based Land Value Capture instruments are based on Property Tax; and Collection system such as cadastral, which is not often well developed and managed
Underlying Principle of DBLVC

開発利益還元

Development Profit  Return

VS

Land Value Capture
LVC for Finance & Planning in TOD

“Synergetic Benefits to be Shared”

- Land Value Increment
  - Accessibility
  - Density & Mixture
  - Amenity
  - Integration

“Urban Planning to Promote TOD”

Source: Jin Murakami 2013
Transit/TOD Investment-O&M Costs vs Revenues from Land Sale and Use and Others

COSTS

<table>
<thead>
<tr>
<th>Construction</th>
<th>Transit (Guided ways, Rolling Stock, Stations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit O&amp;M</td>
<td>Other TOD O&amp;M</td>
</tr>
</tbody>
</table>

| Other TOD (Station Plaza, Pedestrian Facilities, etc.) |

<table>
<thead>
<tr>
<th>Construction</th>
<th>Transit O&amp;M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other TOD O&amp;M</td>
<td></td>
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</tbody>
</table>

COSTS

<table>
<thead>
<tr>
<th>Land Sale (land, land use, air or underground use right)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tariff</th>
</tr>
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<table>
<thead>
<tr>
<th>Advertisement</th>
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</table>

<table>
<thead>
<tr>
<th>Property Mgt. &amp; Commercial Revenues</th>
</tr>
</thead>
</table>

| Tax & (Property Tax & Sales Tax) Fees (Betterment, Development) |

<table>
<thead>
<tr>
<th>REVENUES</th>
</tr>
</thead>
</table>

“Development” based LVC

“Tax or Fee” based LVC

COSTS

<table>
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<tr>
<th>+</th>
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</thead>
</table>

| - |

| + |

| = |

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| + |

| - |
Land Value Capture
Global Good Practices: Schemes and Instruments
Hong Kong

MTR is a “backbone” of Hong Kong’s urban development
Hong Kong’s “urban density” supports MTR’s ridership
HKSAR: R+P Program (1)

Sources: Based on Cervero and Murakami 2009.
Note: MTR = mass transit railway.
HKSAR: R+P Mechanism (2)

Source: Based on Hong Kong SAR, China, Mass Transit Railway (MTR) route maps and other maps.
Note: R+P = Rail Plus Property.
MTR Corporation

MTR Corporation, Revenue Sources, 2000-2010

Source: Hiroaki Suzuki et al., Financing Transit-Oriented Development with Land Value
Early Generation

Tin Hau Station (1989)
Site Area...**0.58** ha
Residential... **61,000** sqm(72.9%)
Commercial... **3,700** sqm(4.4%)
Others... **19,000** sqm(22.7%)
Parking... **650** lots
F.A.R... **14.43**
Integrated Development Package

Kowloon Station (1998-2010): 13.5 ha

Source: AL Stephan (2013)
Mass Transit Integration
How to Finance Massive Transit Investments?
Explore Possible Land Value Capture Financing

Hong Kong MTR’s Maritime Square Residential-Retail Development
Source: Hong Kong MTR
Recent Generation

Tung Chung Station (1998)

Site Area... **21.7** ha
Residential... **935,910** sqm (90.8%)
Office... **14,999** sqm (1.5%)
Commercial... **55,862** sqm (5.4%)
Hotel... **22,000** sqm (2.1%)
Others... **2,063** sqm (0.2%)
Parking..... **3,869** lots

F.A.R... **4.76**

J.Murakami
Tokyo: Multiplicity

- Population: 36.93 million
- Land Area: 13,368 sq. km
- 48 Operators (Mostly Private Agencies)
- About 3,500 km
- About 2,000 stations

Source: Based on data from National Land Information, Ministry of Infrastructure, Land, and Transport (MILT), Japan.
Example 1: Tokyu Corporation (1)

Tokyu Corporation, Revenue Sources 2004-2013

Source: Data from Tokyu Corporation’s Annual Reports 2004–13.

Source: Hiroaki Suzuki et al, Financing Transit-Oriented Development with Land Value
Example 1: Tokyu Corporation (2)

Privately Develop & Operate

Total 105 km Rail Network

Garden City

Shibuya

J. Murakami
Example 1: Tokyu Corporation (3)

Garden City Line & New Town Development 2,983 ha (1960-1980s)
Example 1: Tokyu Corporation (4)

Futagotamagawa Station Redevelopment 11.2 ha (2000-2015)
Example 1: Tokyu Corporation (5)

Corporate Ownership & Stewardship Model

High percentage of the key station areas are owned by Tokyu Corporation

Very High Ridership

Group’s Intergenerational Resource Allocation
Example 2: H-R Integration (1)

Tsukuba Express (1998-2006)

- **58 km**
- **20 Stations**
- Rail Construction Costs
  - US$ **9.4 billion**
- Integrated Housing-Rail Development Act of 1989
- Land Readjustment Projects
  - **19 Districts**
  - **Total 2,908 ha**

Source: Chiba Prefecture 2012
Example 2: H-R Integration (2)
Example 2: H-R Integration (2)

Integrated H-R Land Readjustment: Mechanism

<Local Governments, Housing Agencies, Land Owners>
Land Value Capture Instrument (2)
Urban Redevelopment Financing Instrument

Single Use
Maximum FAR: 2.0

Zoning Change

Mixed Use
Maximum FAR: 6.0

“Fragmented” Owners
A, B, C, D, E, F & G

“Consolidated” Owners
A, B, C, D, E, F & G

New Owner
X

Developer
Floor Area Rights

Government
Subsidy

New Sales

Public Facilities

Metro (Proposal)

Metro (Open)
## Joint Value Creation & Profit Sharing

### Urban Redevelopment Financing Instrument

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Contribution</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Landholders</strong> A, B, C, D, E, F &amp; G</td>
<td>Land Parcel for the New Building</td>
<td>Joint Ownership of Land for the New Building (Section A, B, C, D, E, F &amp; G) with higher access and better local infrastructure and service provision</td>
</tr>
<tr>
<td><strong>Building Owners</strong> a, b, c, d &amp; f</td>
<td>Old Buildings and Housing Units</td>
<td>Ownership of the New Building (Section a, b, c, d &amp; f) with higher access and better local infrastructure and service provision</td>
</tr>
<tr>
<td><strong>Developer</strong></td>
<td>Capital and Property Development Expertise</td>
<td>Profit from Section X &amp; from Surplus FAR</td>
</tr>
<tr>
<td><strong>Transit Company</strong></td>
<td>Construction of Transit Station</td>
<td>Transit Supportive Environment/Increased Ridership</td>
</tr>
<tr>
<td><strong>National Government</strong></td>
<td>Subsides for Land Assemblage and Road Construction</td>
<td>Save Road Construction Costs</td>
</tr>
<tr>
<td><strong>Local Government</strong></td>
<td>Change in Zoning Code (from Single Use to Mixed Use with Higher FAR)</td>
<td>Higher Property Tax Revenue Promotes Local Economic Development Builds Townships Resilient to Natural Disasters</td>
</tr>
</tbody>
</table>
Example 3: Depot Redevelopment (1)
Example 3: Depot Redevelopment (2)

JNR Yard: National Land Sales

Shinagawa Station 16.2 ha (1992-2008)

Source: JNR Settlement Corporation 2008
Example 3: Depot Redevelopment (3)

Civic Space Provision & FAR Bonus
(e.g., Case of Shinagawa Station Area)

FAR Assessment

<table>
<thead>
<tr>
<th>Before (Industrial Site)</th>
<th>After (Office Site)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base FAR</td>
<td>4.0</td>
</tr>
<tr>
<td>4.0</td>
<td>7.0</td>
</tr>
<tr>
<td>+1.9</td>
<td>+0.6</td>
</tr>
</tbody>
</table>

Green Space, Underground Access, Road & Pedestrian Network
18,167 sq.m, Civic Open Space 12,480 sq.m.

Joint Housing Provision 35,433 sq.m.
Example 4: Tokyu Shibuya Station District Redevelopment

Consecutive Urban Redevelopments Through Restructuring Station-related Infrastructure

HIKARIE Data

[Completion of construction] 2012
[Owner] Tokyu Corporation and others
[Total floor area] 144,000 m² approx.
[Number of lines] 8 lines, 6 stations
[Number of passengers] 3,000,000 persons per day approx.

Source: Nikken Sekkei Corp.
Hub stations along Railroads Network

Source: Nikken Sekkei Corp.
Adopting “FAR Transfer System” to earn restoration costs

Tokyo Station

2012: Restoration to the Original

Post War: Temporary Mended Roof

Win-Win Structure for Both Public & Private FAR Seller & Buyer

Floor Area Ratio Transfer System
Nanchang: Public Development Right Sale for New Metro Construction (1)

Suzuki, Murakami, Hong and Tamayose, 2014
Nanchang: Public Development Right Sale for New Metro Construction (2)
Hyderabad: Innovative PPP

Design-Build-Finance-Operate-Transfer (DBFOT)

Project Revenues (est.):
- Fare Box = 50%
- **Real Estate = 45%**
- Other = 5%

Gov. & Special Purpose Vehicle:
- ✓ Land Acquisition
- ✓ Statutory Clearances
- ✓ 10% Max. Gap Fund
- ✓ 300 m TOD zone

Private Concessionaire:
- ✓ Min. Gap Fund Request
- ✓ Project Period of 35 years
- ✓ Property Development Rights (25 Sites + 3 Depots)
Plan Transit & TOD Development
Identify & Design Developable Sites
Create the Rights of Way with Development Sites
Invest in Transit + Properties + TOD Infra.
Operate & Maintain Transit + Properties + TOD Infra.
Reinvest in Transit + Properties + TOD Infra.

Gov. Entities
Transit Agency
Developers
Land Owners/Tenants
Local Communities

Gov. Entities
Transit Agency
Developers
Land Owners/Tenants
Local Communities

Gov. Entities
Transit Agency
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Land Owners/Tenants
Local Communities

Gov. Entities
Transit Agency
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Gov. Entities
Transit Agency
Developers
Land Owners/Tenants
Local Communities

Key Methods & Tools
- Master Plan (Vision)
- Financing & Capital Investment Plan
- Zoning (Flexible Land Use Code & FAR)
- Site Layout Plan
- Capacity Development of Transit Agency in Urban Planning & Real Estate Business
- Public Land Leasing/Auction with Public Requirements (e.g., Social Housing, Open Space etc.)
- Land Readjustment
- Urban Redevelopment Scheme
- Public-Private Partnerships (e.g., Joint Development Contract)
- Land Auction
- Property Lease Contract
- Public-Private Partnerships (e.g., O&M Concession)
- Property Tax
- Transit Service + Extensive Businesses (e.g., Property Management, Retail, Tourism & Leisure etc.)
- Designation of Regeneration Districts
- Urban Redevelopment Scheme
- Re-zoning
- Expedite Approval
- Air Right Bonus with Public Requirements (e.g., Social Housing, Open Space etc.)
- Transferable Development Rights

User, Accessibility & Agglomeration Benefits

Source: Suzuki, Murakami, Hong and Tamayose, 2015
Critical Factors for Success of LVC in Developing Countries

• Inclusive Land Value Capture: Aim at “Win Win” for All the Stakeholders, including urban poor in the project area;
• Sound planning principle based on Visionary Long-Term Master Plan;
• Intergovernmental collaboration is must, especially at capital city.
• Macro fundamental and regional economic growth is fundamental;
• Public landownership is important, but not absolutely necessary;
• Flexible zoning should be provided by the city planning authority;
• Entrepreneurship is prompted by the transit agency (creating a real-estate development unit by bringing in private business expertise and/or develop partnership with businesses);
• Develop, clear, fair and transparent rules to prevent corruption;
• Loan or other source of financing is still needed as bridge financing till LVC can materialize; and
• LVC is not a silver bullet, explore multiple funding sources, hedging against real-estate market risks
**Conclusion**

- TOD which creates articulated densities around transit hubs by locating amenities, employment, retail, and housing in close proximity—is one of the most effective ways to achieve sustainable urban development and to increase value.
- Collaborative efforts of national government, municipalities, transit agencies, developers, landowners, and communities can maximize LVC premium. In this joint value-creating and sharing exercise, municipalities and transit agencies can contribute significantly to value creation either through zoning changes (FARs and land use) and through transit investment.
- The rapid population increase and robust economic growth in rapidly growing cities in developing countries, particularly in middle-income countries, are certainly favorable for development-based LVC.