Measuring TOD Impact on Emissions

An Approach Adopted by Seven Chinese Cities for Global Environment Facility Reporting

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GEF funded a sustainable city integrate approach pilot supporting transit-oriented development (TOD) in China

Seven cities were selected to represent the diversity of large cities

	Population	
	2010 (million)	Growth (%)
Beijing	20.19	0.5%
Tianjin	12.94	1.5%
Shijiazhuang	10.27	1.5%
Shenzhen	10.37	1.5%
Ningbo	7.61	2.0%
Nanchang	5.02	2.0%
Guiyang	4.32	2.0%

TOD can potentially save carbon emissions embedded in energy consumption by the transport sector, buildings and industrial production

- Cities will be able to reduce per capita carbon emissions if they follow the trajectory of urbanization guided by transit-oriented development principles

- TOD can potentially save carbon emissions embedded in energy consumption by transport sector, buildings and industrial production

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Methodology and assumptions for estimating the indirect carbon emissions reduction

Carbon emissions reduction, denoted by ΔV , is calculated using the following equation where ***CI*** denotes the carbon intensity of a city

$$\Delta V = \sum_{i=1}^{10} \sum_{j=1}^{7} (CI_{ij}^{BAU} - CI_{ij}^{TOD}) * Pop_{ij}$$

Carbon intensity assumptions

	BAU	TOD
2010-20	0.5-1.5%	Same as BAU (without intervention)
2021-30	Reaching peak in the period: Beijing (2020), Shenzhen (2022), Guiyang (2025) and others (2030)	0.3% decrease each year

An estimated 62 million tons of CO_2 emissions will be avoided in the period of 2021-30 from implementing TOD in the seven Chinese cities