

Korea's Leap Forward in Green Transport

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Megacities in developing countries suffer from serious traffic congestion, high levels of greenhouse gas (GHG) emissions, and heavy air pollution. These urban areas face a stark dilemma: economic expansion attracts more people and vehicles; but the resulting traffic and pollution hinder further growth while reducing the quality of life for their citizens. Not long ago, Seoul faced a similar conundrum. Choked with pollution and traffic jams, it changed course and helped Korea make a historic transition to green urban transport. It shifted from supply-side policies focused on expanding roadways and metro lines to green demand-side policies focused on creating transit-oriented cities. Today, Seoul boasts a passenger-trip share for metro and bus of more than 60%. Energy consumption in Korea's road sector is lower than in other countries with similar GDP. Congestion costs have been decreasing, and CO2 emissions in the transport sector have been kept under control. This pathbreaking transition was founded on multimodal solutions integrated by information and communication technology (ICT) in a context of strong political leadership and public financing.



From 1980 to 2010, the total length of all roads in Korea more than doubled, and the length of paved roads increased 540%. By 2000, the road density in Seoul (12.9 km/km²) was three to four times greater than in Beijing or Shanghai. From 1980 to 1997, estimated congestion costs in Korea quadrupled, to 18.5 trillion won, or 3.6% of GDP, with Seoul accounting for one-fourth of the costs. Air pollution from road traffic cost an estimated \$13.3 billion in 2006.

The reliance on supply-oriented transportation policies began to lose its appeal, but the path to better transit and less congested roads was not straightforward.

Seoul had been expanding its metro transit network throughout the 1990s and early 2000s, but most of the rise in metro ridership came from former bus riders rather than passenger car drivers. In those years, almost half of the city's 103 bus companies shut down. After a 2002 expansion of the metro network, automobile passenger trips and metro ridership were both higher than in 1996, while bus ridership was lower.

A comprehensive reform in 2004 began a dramatic reversal in the trend. The new strategy drew people out of their cars and into public transport by modernizing and expanding the bus system and integrating it with both metro and a new system of feeder buses.

Multimodal Transport Solutions

The reform in Seoul introduced distance-based fares and free transfers between buses and between bus and metro. The city rearranged bus routes to broaden passenger access, built bus rapid transit (BRT) lanes and transit centers for faster and more reliable service, and introduced shuttle buses connecting remote locations to the main system.

The new multimodal system was supported by innovative ICT that enabled rechargeable transport cards to work with distance-based fares and provided real-time route and schedule information to travelers.

Transfers became more convenient; the speed and reliability of bus service improved; and bus-related accidents and injuries declined by about 25% just one year after the reform. Seoul saw a continuous increase in the number of subway, surface rail, and bus passengers and a drop in the use of cars. The rechargeable transport card has now become a virtually nationwide fare system, and cities continue to make innovative strides in their transit networks.

Key Policies

Seoul's shift to green transport had four fundamental characteristics: (1) multimodalism, (2) use of ICT to integrate the modes, (3) vision and political will, and (4) financial support. These elements also defined green transport policies that spread to other parts of the country.

Multimodalism and ICT

Key elements of multimodalism are land development centered around new or existing transit stations that also become commercial and cultural hubs; a distance-based, free transfer fare system; and a community shuttle-bus system. The system of free transfers and distance-based fares was a pivotal achievement, making each transport mode a branch of the overall integrated system. The community shuttle bus system connects the more remote neighborhoods with metro stations or major bus stations under the same fare and transfer system; it is a major element of Korea's green trans-

port model and currently accounts for about 10% of the country's public transit ridership.

The role of ICT was crucial for the transportation smart card (T-card), which had a catalytic role in the success of the reform. By allowing a distance-based fare system employing free transfers, it brought passengers to buses. Each major city now operates a transportation information system that includes GPS tracking of its buses. Travelers use the information to guide their trips, government uses it to evaluate its transport operations, and bus associations and the smart card company use it to distribute revenue according to distance traveled.

Vision, Political Will, and Financial Support

The reform was the type of high-risk, high-return project that brings immediate opposition. In Seoul, green reform of the public transport system was one of the major pledges of the then-mayor, who was able to get political support from both the government and citizens. Overall, the initial construction and preparation costs for Seoul's revamped bus network probably amounted to about \$100 million. Seoul's government spends about \$200 million per year to cover the operating losses of the bus system, which translates to about \$20 per person.

Lessons and New Challenges

By the early 2000s, Korean transport policy had reached a dead end, unable to stop the rise of highway congestion. The solution began in Seoul, which upgraded and revived the bus system with BRT and neighborhood feeder routes and linked it to rail with ICT. The result was an integrated urban, and ultimately national, mass transit system that could stem the rise of automobile use.

Korea succeeded so well that it has stabilized energy consumption per capita in the road sector. In 2010, Korea took aim at a new 10-year goal with its green transport master plan: reduce GHG emissions by one-third while maintaining its competitiveness.

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Korea Green Growth Partnership:
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