

Transit-Commerce Integration in Seoul:
Examining Its Impacts on Ridership, User Experience, and Transport System Finances

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Abstract

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Transit-commerce integration (TCI), meaning retail that is architecturally unified with transit stations and usually owned by the transit agency, is among the most visible features of Seoul's subway system and an increasingly discussed model for North American transit agencies seeking to improve system performance and generate non-fare revenue. This study examines how Seoul's TCI model shapes ridership, user experience, and system finances through a mixed-methods case study of four Seoul Metro stations: Jamsil, Seongsu, Myeongdong, and Banpo. This study draws on Seoul Metro's open-source ridership dataset covering all 365 days of 2024, seven years of Seoul Metro financial statements, expert interviews with two Seoul-based senior urban planning researchers, and a primary survey of 21 transit users with direct experience on Seoul Metro.

This study finds that commercially integrated stations consistently outperform comparable non-integrated stations on ridership metrics, retaining between 84 and 107 percent of

weekday ridership on weekends compared to 54 to 66 percent at low-integration stations on the same lines. User experience findings, grounded in Gehl's quality criteria and Alfonzo's hierarchy of walking needs and corroborated by survey testimony, identify safety through passive surveillance, trip-chaining convenience, and urban vibrancy as TCI's primary experiential contributions. Financial findings reveal that commercial revenue covered only 18 to 23 percent of Seoul Metro's operating loss from 2022 to 2024, a ratio that remained essentially unchanged as the operating deficit grew 77 percent between 2019 and 2024. The study concludes with regulatory, infrastructure, lease structure, and station-specific design recommendations for Sound Transit's ST3 expansion plans, grounded in both the Seoul evidence and documented barriers to TCI in the Seattle context.

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List of Acronyms & Agencies

CBE	College of Built Environments, University of Washington
JKPA	Journal of Korea Planners Association
JR East	East Japan Railway Company (東日本旅客鉄道株式会社)
MOLIT	Korean Ministry of Land, Infrastructure, and Transport (국토교통부)
MTR	Mass Transit Railway, Hong Kong (港鐵)
MTRC	MTR Corporation Limited
RIC	Rail Integrated Community
SMG	Seoul Metropolitan Government (서울특별시)
ST	Sound Transit (Central Puget Sound Regional Transit Authority)
ST3	Sound Transit 3 (2016 voter-approved expansion program)
TCI	Transit–Commerce Integration
TOD	Transit-Oriented Development
TOSMD	Transit-Oriented Shopping Mall Development
UW	University of Washington
WMATA	Washington Metropolitan Area Transit Authority
Seoul Metro (Seoul Transportation Corporation)	서울교통공사 (Seoul Gytong Gongsa)
Seoul Facilities Corporation	서울시설공단 (Seoul Shiseol Gongdan)
Seoul Metropolitan Government Urban Transportation Bureau	서울시 도시교통본부 (Seoulshi Doshi Gytong Bongu)

Glossary

Provided below are a list of Korean terms utilized throughout the study and their closest English equivalents.

English	Korean	Romanization
Alighting	하차	Hacha
Ancillary business revenue / non-fare commercial revenue	부대사업수익	Budae Saeop Suik
Boarding	승차	Seungcha
Fare revenue / transport service revenue	운수사업수익	Unsu Saeop Suik
Financial statements	재무제표	Jaemu Jepyo
Merchant association	상인회	Sanginhoe
Ministry of Land, Infrastructure, and Transport (MOLIT)	국토교통부	Gukto Gytongbu
Net loss for the current period	당기순손실	Danggi Sunson-sil
Operating loss	영업손실	Yeongeop Son-sil

Railway site (as a land classification category)	철도용지	Cheoldo Yongji
Road (as a land classification category)	도로	Doro
Seoul Facilities Corporation	서울시설공단	Seoul Sisul Gongdan
Seoul Metro / Seoul Transportation Corporation	서울교통공사	Seoul Gytong Gongsang
Seoul Open Data Portal (Open Data Plaza)	서울열린데이터광장	Seoul Yeollin Deiteo Gwangjang
Small-business-oriented traditional market	소상인 중심의 전통상가	Sosangin Jungsim-ui Jeontong Sangga
Station influence area / station catchment area	역세권	Yeoksegwon
Station-internal retail	지하철 상가	Jihacheol Sangga
Subway station commercial area / station-internal retail	지하철 상가	Jihacheol Sangga
Transit mall / transit-priority zone	대중교통전용지구	Daejung Gytong Jeonyong Jigu
Underground (corridor) commercial area	지하도 상가	Jihado Sangga

Underground road-adjacent commercial
areas / underground shopping center

지하 쇼핑 센터

Jiha Syoping Senteo

1. INTRODUCTION

The success of our public spaces, including transit stations, is dependent on its vibrancy and its ability to make its users feel that the space is an extension of their life. Nowhere is this connection more apparent than in a transit station with a high level of integration with retail and their commercial uses. This research is largely inspired by my visit to Seoul in the autumn of 2025, where, while riding the subway, I could not help but notice the disparity of experience between the subway stations in Korea and what I was used to back home. In Seattle, our most significant attempts at transit-commerce integration include Westlake Station, which connects only to a mostly shuttered mall (Westlake Center itself). There is also the permanently blocked entrance to an active department store, and the erstwhile entrance to a long-gone department store. Looking elsewhere, the Seattle area's rail transit only directly connects with a now-demolished mall (Northgate); the area's most successful mall (Bellevue Square) is accessible through rail, but shoppers must walk four blocks between the mall and the station, an arrangement that exists for political reasons.

More than wanting to understand just why that difference exists, this study seeks to investigate how that difference affects transit users and how that difference impacts the viability of transit agencies. To my eyes, transit integrated retail creates a clear connection with improved vibrancy, enjoyment, safety, comfort, and convenience, but I wanted to see what the empirical evidence found. Indeed, the gap in experience between the commercially integrated stations of Seoul and what is seen at home reflects a specific urban planning phenomenon that is worth systematic and empirical study.

1.1 Research Question

For this investigation, the researcher sought to not just understand the vibrant and integrated transit of Seoul better, but also to understand the entire framework of transit-commerce integration in a unified and holistic way. The author has created the term “transit-commerce integration” [TCI] which refers to a distinctive model of urban development in which transit infrastructure and commercial activity are co-located, co-managed, and symbiotically support each other. In this model, the commercial uses are architecturally unified with the transit station, not simply adjacent to it. The author has drawn from the standard Transit-Oriented Development [TOD] framework as well as Calimente’s Rail-Integrated Communities framework, which will be discussed further in the Literature Review.

Therefore, the investigation rested on the primary research question: “How does Seoul’s model of commercial integration within subway station areas shape user experience, ridership, and system finances?”

A secondary research question also guides the Discussion, and implicitly supports the methods: “How can Seoul’s model inform and shape transit-commerce integration efforts in North American models?”

1.2 Research Context & Methods

The underlying framework for this study is “Transit–Commerce Integration,” referenced through this study by its acronym “TCI.” The author has designed this term to refer to a distinctive model of urban development in which transit infrastructure and commercial activity are co-located, co-managed, and symbiotically support each other. While this model is most fully realized in major East Asian cities (Seoul, Tokyo, and Hong Kong as the foremost examples) it is

increasingly relevant to global planning discourse about station-area development, transit finance, and the design of next-generation transit systems. It is distinct from “transit-oriented development,” which is a common framework for planning in the Seattle metropolitan area, in that it specifically refers to commercial uses that are directly integrated with transit stations in that they are architecturally unified and can be accessed directly from train platforms without having to step outside. This integration is often subterranean or otherwise vertically designed.

For this study, Seoul was chosen as the primary case study because it is one of the most fully developed examples of TCI in the world. The city’s subway system boasts eight million daily trips and has been in operation for over fifty years. There are also a large range of commercial typologies, ranging from small-scale station retail to large-scale underground shopping complexes. This offers a direct contrast with many American transit agencies, like the Seattle-area’s Sound Transit, whose commercial integration is non-existent or simply nascent. More so, Seoul is more similar to American transit systems than other highly mature examples of TCI (like Hong Kong and Tokyo) in that the Seoul Metro lacks property development rights and functions more as a public service without the ability or desire to turn a profit through real estate development. For the most part, all of Seoul’s station retail exists within the public right-of-way (either directly under surface roads or directly adjacent to the rail lines), and not on private, developable land.

Within the city of Seoul, the study focuses on four case study stations: Seongsu, Myeongdong, Jamsil, and the Banpo Express Bus Terminal. These stations have been chosen as they are the most significantly commercially integrated stations in the city, but each represents a different expression of TCI. Seongsu is an anchor to a growing neighborhood of local designers and major international brands, Myeongdong hosts a vast network of underground shopping

arcades, Jamsil is integrated with Lotte World (containing a major entertainment complex, department store, hotel, and the Seoul Tower attraction), and Banpo connects various modes of transit with a vast shopping complex. I have also identified two secondary case study stations: Yongdap and Sindap, which have plenty of residential development around them but little commercial integration, to serve as direct comparisons, as they are also on Line 2 like Seongsu and Jamsil. Stations that serve suburban cities like Goyang, Daehwa, and Jeongbalsan are also occasionally compared for suburban cases.

Throughout the study, the methods and findings have been organized into three analytical lenses: ridership, user experience, and transit system finances. These three benchmarks are the best way to gauge TCI's impact on the success of transit systems, as together they create a complete picture of the transit environment. The ridership and transit system finance lenses rely mostly on quantitative research methods, while the user experience findings rely chiefly on qualitative methods. The primary methods for this study include a survey of transit riders, interviews with experts, and analysis of ridership counts and financial reports from Seoul Metro. More detailed information on methods may be found in Chapter 3 of this study.

1.3 Summary of Findings

Going into this study, the researcher expected to discover that TCI has a positive effect on all three identified lenses. However, throughout this study it was discovered that while Seoul Metro's TCI has a positive impact on ridership numbers and on transit user experience, it does not have a meaningful impact on the agency's finances and is not an impactful strategy that is sufficient on solving its operating deficit.

In terms of ridership, this study found that TCI is associated with substantially higher daily ridership, strong weekend demand retention, and elevated surrounding land values at all four case study stations. The evidence (particularly the weekend/weekday ratio data) suggests a direct impact on transit user behavior through TCI, and the generation of destination and leisure-based transit trip demand. This anchors transit usage in ways beyond being simply a vehicle for commuters.

As for the transit user experience, the data indicates that Seoul's integrated stations succeed at the foundational levels of public space quality criteria (including Gehl and Alfonzo's frameworks) through the provision of weather protection, trip-chaining convenience, and improved wayfinding. Indeed, major themes from the survey conducted include improved safety and cleanliness, convenience, and a heightened sense of urban vibrancy. This improved user experience likely drives the ridership gains seen above.

Finally, looking towards transit agency finances, the study found that TCI does generate real revenue but in a way that is structurally limited. In Seoul's case, commercial revenue has remained essentially flat since 2019 while the system's operating deficit has grown 77%. The governance structure (being split between Seoul Metro and Seoul Facilities Corporation, being oriented towards small business, and operating without a formal policy mandate) explains why this revenue ceiling exists and that it is not a flaw of the model, but more of a feature. This result is likely transferable to American transit agencies, as elaborated on in the Discussion. This comparison is particularly important for an agency like Sound Transit, which is currently in the process of exploring deeper retail integration in future stations as part of upcoming line extensions, as well as increasing retail presence within already existing stations.

1.4 Expected Contributions

There is currently no English-language literature that examines Seoul's TCI model through a holistic and complete review across multiple dimensions in a way that is both quantitative and qualitative. More so, there is little empirical examination of the financial dimension, creating a significant gap worthy of filling. Therefore, the expected contributions of this study to the field of urban design and planning are as follows: this study offers a systematic multi-dimensional analysis of Seoul's transit-commerce integration examining its effects on ridership, user experience, and finances looked at together.

This study also offers a financial analysis of Seoul Metro's revenue trends over the past four years (as well as a pre-COVID comparison) including its deficit record and that establishes empirically that TCI does not inherently address structural financial imbalances. This study also documents how Seoul governs its station area retail and how its governance connects to the ceiling seen in its commercial revenue, which provides a more accurate account of how Seoul's transit model actually works institutionally than currently exists in English-language planning literature. This study also suggests how American transit agencies, with an emphasis on the Seattle metropolitan area's Sound Transit, should and should not apply Seoul's model to their own station retail planning. There are ridership and user experience findings that are more clearly transferable, and financial findings that should be transferred more cautiously. Finally, this study aims to be a part of the literature that more broadly shows that frameworks like transit-commerce integration and transit-oriented development creates a better transit user experience and overall higher quality of life in cities.

1.5 Study Outline

The rest of the study will be structured as follows. The Literature Review (Chapter 2) will guide us through varying frameworks that guide the development of station area commerce, including American TOD as well as commercial integration in Tokyo and Hong Kong, and identify the definition of transit-commerce integration that this study relies on. The Review will also work through frameworks for judging the quality of public spaces, which the user experience methods and findings rely on, and will further review existing research (both Seoul-based and not) regarding transit station performance, ridership, and finances. The Methods (Chapter 3) will go in detail regarding the study's mixed methods approach, including a survey, interviews, and data analysis, justifying the methods, and further justifying the case study rationale. The Findings (Chapter 4) will detail the major discoveries of the study, across all three identified research dimensions: ridership, user experience, and transit agency finances. The Discussion (Chapter 5) will apply these findings critically to the local case of the Seattle metropolitan area and develop a series of recommendations for Sound Transit and other similar agencies to follow. It will also identify the study's primary conclusions.

The study is structured to flow from station area planning foundational and key international cases, to the methods and strategy of this study, to the specific findings discovered, and finally to how the study's findings should be applied to the local context. The gaps in the literature establish what methods are appropriate and which lenses should be utilized. From there, the methods are established, the research can be conducted and the Findings shown and organized appropriately. The Discussion then follows from there.

2. LITERATURE REVIEW

The term “Transit-Commerce Integration,” known through this study by its acronym “TCI”, refers to a distinctive model of urban development in which transit infrastructure and commercial activity are co-located, co-managed, and symbiotically support each other. While this model is predominantly realized in major East Asian cities (Seoul, Tokyo, and Hong Kong are significant examples) it is increasingly relevant to global planning discourse about station-area development, transit finance, and the design of next-generation transit systems. This chapter reviews the key theoretical frameworks and empirical findings that inform this study, examines precedents from global contexts, and identifies the knowledge gaps that motivate this study's mixed-methods approach and frames its anticipated contributions. This literature review is organized around four thematic areas: the first, establishing the conceptual frameworks and global precedents that this study rests on; and the other three corresponding to the study's analytical dimensions: ridership and station-area performance, user experience and public space, and finally transit system finance and governance.

2.1 Conceptual Frameworks: TCI and TOD

The dominant conceptual framework for Transit-Adjacent Development in planning scholarship is Transit-Oriented Development (TOD), introduced by Calthorpe and codified in subsequent decades of American planning practice. Cervero et al.'s (2004) comprehensive synthesis of TOD in the United States defines the model as the creation of compact, mixed-use, walkable communities centered on transit stations, with residential, commercial, and civic uses clustered within a quarter to half-mile radius. This framework emphasizes density, diversity of use, and pedestrian-friendly design as the primary factors for connecting transit investment to the

vitality of cities. TOD has become the foundational reference for North American transit agencies pursuing station-area development, and its principles inform the Seattle metropolitan area's current planning frameworks.

The standard TOD framework, however, is insufficient for studying what effect Seoul's subway system has on the city and the proper ways to measure those effects. Sung, Oh, and Jeong's (2011) analysis of transit ridership in Seoul demonstrates that in an already highly dense metropolitan context, increasing development density around stations yields diminishing returns. Their study goes on to assert that what matters more is the complexity of land use, the quality of street networks, and the pedestrian-friendliness of station areas. It is under those conditions that the integration of retail and transit becomes especially relevant. This insight helps us see a critical gap in the traditional TOD literature: because most North American TOD involves clustering housing and ground-floor retail near stations in low or medium-density contexts, the framework does not account for the vertically layered, subterranean, or architecturally integrated commercial environments that characterize Seoul's most developed stations.

Calimente (2012) provides the closest existing scholarly parallel to the concept that this study investigates. Examining Tokyo's private railway station areas, Calimente introduces the term Rail Integrated Community (RIC) to describe high-density, safe, mixed-use, pedestrian-friendly developments built around railway stations that act as community hubs, served by frequent all-day rail and accessed primarily on foot or by transit. Calimente distinguishes RICs from TOD by their relationship to transit operators: where TOD is a planning concept typically executed by municipalities or developers adjacent to transit infrastructure, RICs in Tokyo are actively developed and managed by private railway operators who diversify into real estate,

retail, and numerous other commercial businesses as a primary strategy for financial sustainability without government subsidy. The Tokyu Corporation case study demonstrates how this model is operated through the physical integration of station design with adjacent retail and residential development.

This study adopts the term “Transit–Commerce Integration” (TCI) to describe the phenomenon under investigation in Seoul, distinguishing it from both TOD and RIC. TCI is defined here as the deliberate co-location and operational integration of transit infrastructure and commercial activity, including station-internal retail concourses, underground shopping streets, and direct physical connections between transit fare gates and commercial anchors. In TCI, the transit station and the commercial environment are experienced by users as a unified system rather than as adjacent but separate systems. TCI further differs from TOD in its focus on vertical and subterranean integration rather than horizontal clustering, and from Calimente's RIC in that it emerged in Seoul through market forces and municipal management decisions rather than through private railway operator development. It differs from both in that the commercial integration in Seoul's case was not designed primarily to generate large-scale financial returns, as the Findings of this study reveal.

Abutaleb et al.'s (2019) systematic review of transit-oriented shopping malls (TOSMDs) offers a useful bridge between the TOD literature and the TCI concept examined in this study. In that study, the authors synthesized research on rail-based shopping malls and identified that the development of shopping mall facilities can contribute to making station areas more attractive and expanding the potential customer base, while also noting that poorly planned integration can produce marketplace congestion. Their TOSMD framework, integrating TOD design dimensions

with looser market-driven concepts, frames integrated transit-commercial hubs as hybrid systems shaped by both urban design and retail dynamics, a perspective directly applicable to Seoul's station environments.

2.2 TCI Models in Practice: Tokyo and Hong Kong

Before examining Seoul's TCI model, it is necessary to survey the East Asian precedents that have directly shaped it. The two most developed and most studied models are Tokyo's private railway station communities and Hong Kong's Rail + Property development framework. These are also the precedents that most inspired the Seoul government during the subway's planning.

2.2.1 Tokyo

Tokyo's railway station areas represent the most fully realized example of transit-commerce integration in the world, and the model that Seoul's planners drew on most directly. Calimente's (2012) analysis of the Tokyu Corporation demonstrates how Japanese private railways achieved financial sustainability without government operating subsidy by diversifying into real estate, retail, and other for-profit businesses built around and above their station areas. Ten performance indicators (including ridership, population density, and transit mode share) demonstrate how Tokyu's two analyzed stations function as self-reinforcing commercial and transit communities.

Pojani and Stead (2011) examine the redevelopment of Tokyo Station as an urban commercial and civic hub under a project explicitly branded "Tokyo Station City" by JR East. Their analysis traces how the 1987 privatization of Japan National Railways was a critical

regulatory turning point: newly private railway companies were permitted to accumulate profits through commercial activities beyond transportation, while also becoming financially responsible for their own capital investment through non-fare revenue streams. The resulting redevelopment combined historic station restoration with a reconfiguration of the surrounding walking network, prestige retail, and entertainment venues, establishing the transit station as a destination in its own right.

Cao's (2022) study of JR East's station-area development strategy traces how this model evolved across historical phases of the Tokyo network's expansion. The study finds that the 1987 privatization enabled a systematic transformation of underutilized or industrial station-adjacent land into high-density commercial districts, with stations comprehensively redesigned for place identity and commercial vitality. The coordination between transit network function and station-area commercial development (matching network nodes with appropriate land use intensity) represents a planning logic that Seoul adopted in modified form.

Miki's (2020) analysis of Japanese private passenger railways documents the financial outcomes of this model: non-fare real estate and retail segments contribute between 20 and 50 percent of total income, enabling commercial activities to subsidize transit operations and support new infrastructure investment. This financial model contrasts sharply with Seoul's, as the Findings chapter of this study establish.

2.2.2 Hong Kong

Hong Kong's MTR has attracted the most sustained scholarly attention of any transit system for its approach to integrating commercial and property development with transit

operations. Tang et al.'s (2004) foundational study of the MTR's Rail + Property (R+P) model documents its core mechanism: the Hong Kong government grants the MTRC exclusive property development rights over station areas at pre-rail land prices, enabling the MTRC to develop or partner with developers to build residential and commercial property above and around stations, capturing the resulting land value uplift to cross-subsidize railway construction and operations.

Cervero and Murakami (2009) extend Tang et al.'s analysis in a peer-reviewed update, examining how the R+P model functions as a form of value capture and assessing its transferability to other institutional contexts. The great success of the Hong Kong MTR and its ability to survive and expand on its own through fares and revenue from commercial development alone is inspiring, however transit advocates in the United States shouldn't look to it as a model. The MTR's financial success depends on specific institutional conditions: particularly the government's willingness to grant exclusive development rights at below-market land prices. This condition is difficult or impossible to replicate in most other cities, but especially in American cities. The governance structure that enables Hong Kong's commercial revenue performance is totally unique to itself.

Xue et al.'s study of MTR station-related complexes examines the physical dimension of Hong Kong's integration model, analyzing how station atrium spaces function as vital semi-public urban environments. Their findings show that transparent, wayfinding-oriented designs attract more shoppers and increase foot traffic in associated retail, while also serving diverse community functions. The study notes that Hong Kong's extreme development density (with plot ratios frequently exceeding 1:10) necessitates the vertical integration of transit, public space, and commercial activity that characterizes MTR developments. These design principles are relevant

to Seoul's station environments, where similar vertical integration exists but operates at a different scale and under a different ownership model.

2.3 Ridership, Mobility, and Station-Area Performance

A growing body of literature examines how transit station environments shape ridership patterns and the commercial vitality of surrounding areas, and as such these studies provide the empirical and analytical foundation for the ridership analysis in this study's Findings chapter. Shin et al.'s (2022) activity-based TOD typology analysis using Seoul smart-card data is the most directly relevant empirical study for this thesis. Using detailed origin-destination data from Seoul's transit card system, the authors identified station typologies based on mix-based and time-based distribution of trip purposes. Their analysis reveals that station areas with strong commercial presence exhibit more diverse and temporally stable ridership patterns than primarily residential or commuter-oriented areas. Stations that attract not only commute trips but also shopping, dining, and leisure trips (exactly the types of trips that TCI enables) show stronger ridership across all hours and days of the week. This finding provides the scholarly foundation for the weekend ridership retention analysis in the Findings chapter.

Rao and Pafka's (2021) comparative study of central city station catchment areas in Toronto, San Francisco, and Melbourne documents how shopfront density declines as one moves away from station cores, demonstrating that the immediate station vicinity is critical for retail viability. Their study establishes that retail density and station proximity are closely linked across different Western urban contexts, supporting the broader principle that transit access concentrates commercial activity. While their study contexts involve street-level retail rather than the integrated underground commercial environments of Seoul, the underlying logic (that

transit foot traffic enables retail viability) applies to TCI environments, where the rail station itself and retail floorplates are architecturally unified rather than simply close together.

Ganning and Miller (2020) contribute a critical analytical lens for understanding why TOD retail performance varies so widely across North American contexts. Examining 474 light rail station areas across eleven metropolitan areas, they find that density, land use diversity, and walkable block structure significantly predict station-area retail employment. However, they also find that many implementations of TOD fail to achieve sufficient levels of these characteristics to substantially activate retail markets. Their study reveals a systematic gap between what TOD theory predicts and what North American practice actually delivers. This is a finding directly relevant to understanding why Seattle's current station-area retail environments are underperforming relative to what Seoul's TCI model achieves. The study suggests that retail integration requires not just proximity to transit but a sufficient density and mix of complementary uses, which are conditions that Seoul's most integrated stations satisfy through subterranean commercial networks and conditions that American stations do not or cannot replicate.

Kim and Zhang's (2005) spatial econometric analysis of 731 commercial land parcels in Seoul documents the relationship between rail transit proximity and commercial land values, finding that transit's effect on commercial land value is strongest in central business districts and dense subcenters and weakest in peripheral areas. This finding contextualizes the elevated commercial rents observed at integrated stations such as Myeongdong and Jamsil, where transit access and commercial concentration reinforce each other. Some recent commercial real estate data from Korean market sources corroborate this pattern: Choi (2025) documents that

apartments with direct underground access to Seoul Metro stations appreciated 48 percent between 2020 and 2025, compared to 37 percent citywide, consistent with the land-value uplift mechanism Kim and Zhang identify.

2.4 User Experience and Public Space

Evaluating how transit users experience commercially integrated environments requires a framework for what constitutes quality in pedestrian and public space design. To that end, this study will be utilizing two complementary bodies of literature in order to establish the evaluative criteria that this study applies. First, Gehl's (2011) foundational framework for human-centered public space design organizes the determinants of quality public space around twelve criteria, grouped into three categories: “Protection” (from traffic, crime, and unpleasant sensory experiences including bad weather), “Comfort” (ease of movement, opportunities to stand, sit, and engage), and “Enjoyment” (human-scale design, aesthetic quality, and sensory stimulation). Gehl argues that outdoor spaces (and by extension, interior civic spaces) achieve their social potential only when they satisfy the lower-order protection and comfort criteria that allow social activities to flourish. His weather protection criterion is particularly relevant to Seoul's underground station environments, which shield millions of daily users from the extreme seasonal conditions of the Korean peninsula.

Protection	Comfort		Enjoyment
Protection against traffic and accidents.	Options for mobility.	Options for seeing.	Scale.
Protection against harm by others.	Options to stand and linger.	Options for talking and listening/hearing.	Opportunities to enjoy positive aspects of climate.
Protection against unpleasant sensory experiences.	Options for sitting.	Options for play, exercise, and activities.	Experience of aesthetic qualities and positive sensory experiences.

Figure 1: Jan Gehl's 12 Quality Criteria.

Source: The Gehl Institute, Copenhagen.

Alfonzo (2005) extends this framework into a decision model for planning, proposing a five-level hierarchy of pedestrian needs (feasibility, accessibility, safety, comfort, and pleasurability) adapted from Maslow's hierarchy of human needs. The model argues that lower-order needs must be satisfied before higher-order ones become motivationally relevant: for example, an environment that fails on safety or accessibility will not generate walking behavior regardless of its pleasurability. For transit environments specifically, this hierarchy suggests that stations succeeding at the foundational levels (e.g. providing safe, weatherproof, accessible paths with minimal friction) create the preconditions for the richer commercial and social activity associated with TCI. Mehta (2008) extends both Gehl and Alfonzo by adding two dimensions that both frameworks underweight: the usefulness of the environment in serving practical needs, and a sense of belonging generated by community-oriented places. Mehta's belonging dimension

is particularly applicable to Seoul's station retail, where small-business tenants serve regular commuters in ways that build habitual attachment to station environments.

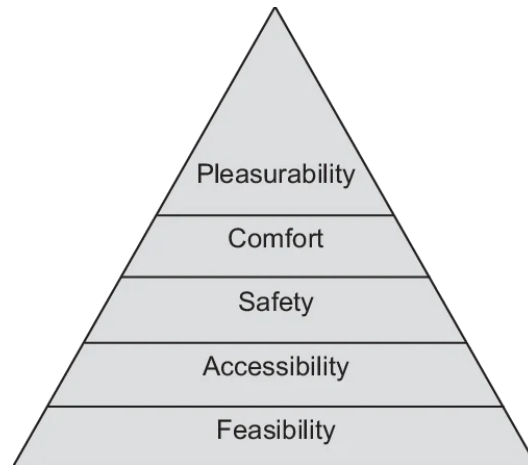


Figure 2: Alfonzo's Hierarchy of Walking Needs.

Graphic by Marieta Alfonzo.

The behavioral evidence for why trip-chaining matters to transit ridership is established by McGuckin and Murakami (1999), whose analysis of National Personal Transportation Survey data demonstrates that the ability to combine multiple errands (like shopping, childcare, personal services, etc.) with commute trips is the primary driver of mode choice. The automobile's dominance in American commuting is partly attributable to how well it accommodates complex trip chains compared to transit. Seoul's commercially integrated stations address this structural disadvantage directly by bringing destinations inside the transit infrastructure, enabling riders to accomplish multiple trip purposes within the station environment without returning to the street or using a vehicle.

Sung, Oh, and Jeong's (2011) study examines Seoul's underground commercial spaces specifically, analyzing how the city's extensive network of subterranean shopping corridors functions as a public space. Their study documents how these underground environments serve as weather-protected pedestrian networks that extend the functional reach of the transit system into surrounding commercial districts and explores the complex social dynamics (including questions of publicness, accessibility, and control) that characterize privately managed but publicly used underground spaces. Their analysis provides Seoul-specific context for the abstract frameworks of Gehl and Alfonzo, grounding them in the particular built environment that this study examines.

Zhao et al (2025) examines sustainable comfort design in underground shopping malls, arguing that subterranean commercial environments can optimize land-use efficiency, alleviate surface-level pedestrian congestion, and provide year-round climate-controlled environments that generate significant user satisfaction. The authors of that study also note that comfort design, thermal management, and spatial orientation pose specific challenges not encountered in above-ground retail environments. An and Oh (2015) of the University of Seoul provide the most directly applicable Seoul-specific empirical evidence for user experience outcomes, demonstrating through GIS-based pedestrian network analysis that the Sinchon transit mall intervention (which expanded pedestrian paths around Sinchon Station and reduced car traffic) increased the number of buildings accessible within a ten-minute walk from 1,065 to 1,221, and expanded accessible total floor area by 37 percent. Their finding that improvements in pedestrian environment quality measurably expand station commercial catchment areas establishes a quantifiable link between pedestrian design investments and commercial vitality outcomes.

2.5 Transit System Finance & Operations

The financial and institutional dimensions of transit–commerce integration have received scholarly attention primarily through studies of Hong Kong and Tokyo, where the financial outcomes of integration are most dramatic. Seoul's model has received considerably less attention, which is a gap that this study addresses directly.

Jauregui-Fung documents the financial logic of Hong Kong's MTR, demonstrating that property development revenues have historically covered substantial portions of the system's capital expansion costs, enabling the MTR to operate without government operating subsidies. This financial profile has made it the global reference point for transit commercial integration. Their analysis shows that the MTR's property-related income is not a supplement to transit operations but a structural enabler of the system's financial independence.

Cervero and Murakami (2009) place this outcome in the context of governance, showing that the MTR's financial success depends specifically on the government's grant of exclusive development rights at pre-rail land prices. This is a form of institutional value capture that provides the MTR with access to land value uplifts that other transit agencies do not capture. Their finding that this governance structure is difficult to replicate elsewhere is critical for understanding why Seoul's commercial revenue performance falls short of Hong Kong's, despite Seoul's comparably dense station environments: Seoul Metro does not hold property development rights and was never designed to generate Hong Kong-scale commercial returns.

Miki's (2020) analysis of Japanese private railways establishes the Tokyo comparator on the financial dimension, documenting that non-fare income like real estate, retail, and ancillary

businesses, accounts for between 20 and 50 percent of total profits at major Japanese operators. Like Hong Kong's model, this outcome is enabled by a specific governance structure: the 1987 privatization that permitted JR operators to diversify commercially while bearing full responsibility for their own financial sustainability.

Bae, Jun, and Park's (2003) study of residential property values along Seoul's Line 5 offers a useful cautionary note for interpreting value capture expectations in the Seoul context. Their analysis finds that residential price effects were substantially priced in before the line opened, with post-opening effects modest relative to other price determinants. This finding suggests that transit investment does not automatically generate the sustained value uplift that could support a Hong Kong-style subsidy model, and that the relationship between transit access and commercial value in Seoul is more complex than transit simply raising property values when being located near commercial activity.

The Concessions Study (Jones Lang LaSalle, 2014) conducted by the Los Angeles Metro provides the primary comparative governance benchmark for North American transit retail. The study benchmarks concession program practices at the CTA, MBTA, and WMATA, documenting best practices for lease structures, tenant evaluation criteria, third-party management, and revenue sharing arrangements. Its North American frame of reference contextualizes what Sound Transit and similar agencies are working toward and highlights how distant current North American station retail practices are from Seoul's organically developed model.

Korean-language policy reporting documents that Seoul Metro's own internal framing of its commercial activities positions TCI as a necessary response to structural fiscal pressure:

Seoul Metro officials describe station retail leases, station naming rights, and advertising as components of a strategy to offset structural deficits driven by limited farebox elasticity, rising pension obligations, and the costs of an elderly free-fare policy (Seoul Metro, 2024). Sound Transit's 2021 retail integration planning report reveals how the Seattle Metropolitan area is actively grappling with precisely the questions this study addresses and is indeed looking towards transit-commerce integration as a potential solution to the financial pressure put on rail transit there. However, the report explored ideas without the benefit of systematic analysis of what Seoul's model actually delivers financially, a gap that this study's Findings directly address.

2.6 Literature Gaps and Expected Contributions

The literature reviewed in this chapter provides a valuable empirical and conceptual foundation, but several important gaps remain. First, there is a persistent underrepresentation of vertically integrated and subterranean commercial environments in TOD scholarship. While TOD theory and empirical research [namely Sung et al (2011) and Ganning and Miller (2020)] address land use mix, density, and walkability, the standard TOD framework does not account for the type of transit-commerce integration that Seoul embodies: architecturally unified, usually subterranean, and operationally integrated with transit infrastructure. The TOSMD framework offered by Abutaleb et al. (2019) partially bridges this gap but remains limited in scope and does not address Seoul's specific institutional context.

Second, user experience in commercially integrated interior transit environments is understudied. The existing user experience literature (Gehl, Alfonzo, and Mehta) establishes powerful frameworks for evaluating outdoor pedestrian environments and underground commercial spaces, but does not systematically or specifically examine how TCI specifically

shapes transit user behavior and satisfaction. An and Oh (2015) provide Seoul-specific quantitative evidence on pedestrian accessibility, but the relationship between commercial integration and user experience outcomes in Seoul's station environments has not been directly investigated through primary data collection. The researcher has conducted a survey to help bridge that gap, but the small sample size and biased sample give it limited relevance outside of this study (see Methods Chapter and Appendix B).

Third, the financial dimensions of Seoul's TCI model have received no systematic scholarly analysis. Comparative studies of Hong Kong's MTR and Tokyo's private railways establish the financial potential of transit–property integration, but Seoul's model, which is institutionally distinct from both, operating without property development rights and with deliberately below-market rents, has not been examined as a financial case in its own right. The assumption, implicit in much North American planning interest in Seoul's model, that commercial integration can meaningfully offset transit operating deficits, has not been empirically tested.

Fourth, no existing study examines all three dimensions (ridership, user experience, and system finances) together in the Seoul context, or connects Seoul's empirical experience to the specific planning decisions facing North American agencies. This study addresses all four gaps through a mixed-methods approach combining four-year financial statement analysis, station-level ridership data, expert interviews, and a primary survey of transit users. This will generate a more complete and analytically integrated account of what Seoul's TCI model actually delivers than currently exists in the literature.

3. METHODS

3.1 Research Design

This study utilizes a mixed-methods approach to examine how Transit-Commerce Integration (TCI) in Seoul shapes ridership, user experience, and system finances. Neither quantitative nor qualitative methods alone are sufficient to investigate that properly. The study has utilized a quantitative analysis of station-level ridership data and financial records to identify patterns and trends, which has helped the study to establish that commercially integrated stations outperform on ridership metrics, and that commercial revenue only covers a small fraction of Seoul Metro's operating losses. However, this quantitative analysis cannot fully explain why those patterns exist, how they are institutionally produced, or how users actually experience these commercially integrated transit environments. This study has therefore utilized qualitative methods like interviews with subject matter experts, an analysis of policy documents and Korean-language news sources and blogs, and survey-based testimony from transit users in order to provide the interpretive depth that quantitative methods cannot. The methods connect to the three analytical dimensions as follows: ridership is examined primarily through quantitative station-level data; user experience is examined through a combination of survey data and evaluative frameworks drawn from the literature; and system finances are examined through a combination of financial statements analysis, interview data, and primary source documents on governance and leasing practices.

This study adopts a case study approach, using Seoul's subway system as the primary case and four individual stations as sub-cases within it. Case study methodology is appropriate here because transit-commerce integration as a model of urban design and transportation

planning is best understood in its real-world context rather than through abstract variables and disparate data. The case selection rationale is discussed in the following section.

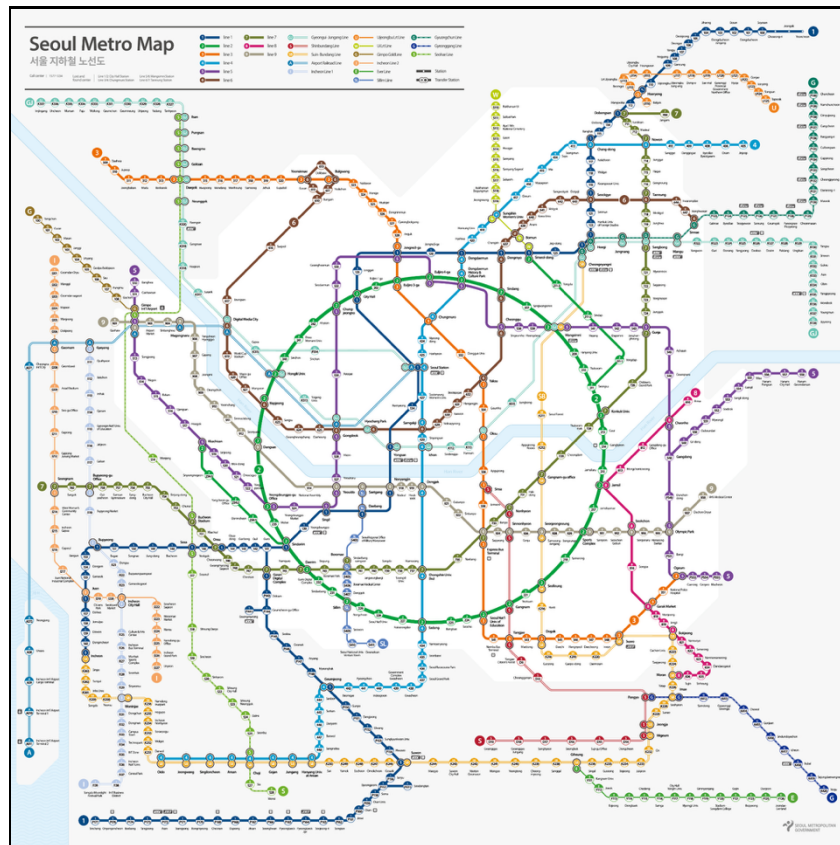


Figure 3: Map of the Seoul Subway System.

Source: Seoul Metro.

3.2 Case Study Selection

Seoul was chosen as the case study as its subway system represents one of the most fully developed examples of transit-commerce integration in the world. Its network serves over eight million daily trips, has been operating for over fifty years, and has developed a system of commercially integrated station environments that span from small-scale station-internal retail to large-scale underground shopping complexes that connect multiple subway lines. It is also

important to note here that Seoul's model developed organically through a mixture of design choices and market forces rather than through a formally mandated policy. This makes it a useful case for understanding what TCI produces when it operates at scale and is allowed to be developed organically over time. Seoul was also chosen because it is actually more similar to American transit agencies in that Seoul Metro lacks property development rights and does not partake in for-profit real estate development ventures around its stations. This makes it a more useful example than others as American transit agencies will never be able to replicate the land ownership model of the Hong Kong MTR. Seoul provides another contrast though with transit models in the United States, where commercial integration in transit stations is nascent at best.

The four case study stations (Seongsu, Jamsil, Myeongdong, and the Banpo Express Bus terminal) were selected to represent the range of urban contexts in which TCI operates within the Seoul Metro system, and to allow for intentional comparisons across different station typologies.

Jamsil Station (serving Lines 2 and 8) is the system's busiest station, averaging nearly 200,000 riders across both lines. It is directly integrated with the Lotte Department Store, Lotte World Mall, and the Lotte World amusement park, making it the clearest example of large-scale retail integration in the system. It is a significant example of TCI in its most intense form.

Seongsu Station (serving Line 2) is located at the center of a rapidly commercializing design and dining district, with station-area retail oriented towards the neighborhood's small-brand identity. Seongsu is increasingly known as the trendiest neighborhood of the city and has in recent years become a hot spot of both tourist and local recreation. It is known for its eclectic mix of thrift stores, small stores featuring the work of local designers, and the flagship stores of numerous multinational luxury brands, and has become synonymous with local Korean fashion and art. Averaging 90,735 daily passengers in 2024, it

represents TCI in an emerging commercial neighborhood where station-retail and neighborhood character exist symbiotically.

Myeongdong Station (serving Line 4) is located at the entrance to one of Asia's most recognized and important retail streets, with extensive underground commercial corridors extending below the street network. Averaging 72,726 daily passengers, it represents TCI in a high-street retail context where the transit station functions as the primary pedestrian access point for a major commercial district.

The Banpo Express Bus Terminal (serving Lines 3 and 7; as well as numerous express buses) connects directly to Goto Mall (one of the largest shopping centers in Korea) and to the Shinsegae Department store. Averaging 133,921 combined subway passengers, it represents TCI in a major intermodal hub, where commerce serves transit passengers arriving from many directions and modes.

These four stations allow for analysis across different commercial typologies, network positions, and surrounding land uses, enabling this study to assess whether TCI's effects are consistent across contexts or simply specific to one particular station environment.

3.3 Data Sources

3.3.1 Primary Data

Station-level ridership data was obtained from the Seoul Metropolitan Government's Open Data Portal and Seoul Metro's published datasets. The ridership data used for the primary analysis covers all 366 days of 2024, aggregated by hour, direction, and station across the entire Seoul Metro network. This dataset is publicly available and accessed in late 2025.

Price and rent indicators were drawn from commercial real estate reporting published through Korean news outlets and online blogs, covering station-adjacent commercial rents and residential property values in the case study station areas. These sources are identified individually in the bibliography.

Financial data was obtained directly from Seoul Metro's published financial statements, which are freely available for download from the Seoul Metro website. Data from 2019 and 2022-2024 was analyzed: 2019 utilized the compare current trends to pre-COVID trends, and 2020 and 2021 were excluded due the distorting effects of the COVID-19 pandemic on ridership.

Interviews with two subject matter experts (Dr. Heo Ja-Yeon of the Seoul Institute and Dr. Joo-il Lee) provided primarily qualitative data on governance structures, policy frameworks, leasing practices, and the financial dimensions of Seoul's TCI model. The interview process is described in detail below in subchapter 3.4.

A survey of transit users who have experience using Seoul's subway system provided primarily qualitative research on the user experience dimensions of TCI. The survey procedure is described in detail in subchapter 3.5 below.

3.3.2 Secondary Sources

Korean-language news outlets and blog posts provided documentation of commercial rent levels, the station retail bidding process, lease structures, and Seoul Metro's financial challenges. Key sources include reporting from Maeil Business Newspaper, the Korea Times, Chosun Biz, and Edaily. Information was also taken from two Korean-language blogs documenting the

OnBod auction listing and land use classification practices. Where Korean-language sources were used, the researcher utilized translation tools such as Google Translate.

Policy documents and Seoul government publications, including Seoul Metropolitan Government reports, Seoul Metro press releases, and Korean Ministry of Land, Infrastructure, and Transport (MOLIT) data provided institutional and regulatory context for findings regarding governance.

Evaluation frameworks from scholarly literature informed both the design of the survey and the interpretation criteria applied to user experience findings. Specifically, Gehl's (2011) quality criteria and Alonzo's (2005) hierarchy of walking needs provided the analytical framework for evaluating what constitutes a high-quality pedestrian environment and structured the user experience dimensions that the survey sought to capture.

3.4 Interviews

Two subject-matter expert interviews were conducted as primary qualitative data sources for the governance and finance dimensions of the study.

Dr. Heo Ja-Yeon, a researcher at the Seoul Institute with expertise in urban planning and transit-area development in Seoul, was interviewed on March 13th, 2026, at a conference room at the Seoul Institute. Dr. Heo's expertise is in Seoul's station-area planning, land use, institutions, and urban transit development. Her responses addressed governance structure, the absence of formal integration policy, leasing and bidding practices, zoning and land use, as well as the financial relationship between TCI and Seoul Metro's operating budget.

Dr. Joo-il Lee, a subject-matter expert in Korean urban planning and transit policy as Director of Center for Capital Region Policies, responded to the interview questions in writing.

Dr. Lee's responses addressed institutional and regulatory dimensions of TCI, including the governance split between Seoul Metro and the Seoul Facilities Corporation, the role of the "Special Act on Railway Undergrounding," and the legal land use classification framework the governance structure is based on.

The interview process was supervised by the researcher's thesis advisor and committee chair, Dr. Christine Bae. The researcher developed a set of interview questions which covered eight topic areas: passenger satisfaction/feedback data, formal policy and legislation that shapes Korean TCI, decision-making processes for station-area retail, Korean zoning and land use rules, public controversies regarding TCI, station-area lease structures, commercial revenue implications for subway expansions, and advice for American cities. Dr. Bae sent the questions to both interviewees alongside the researcher's introduction. Dr. Lee wrote back directly with his responses. Dr. Heo responded verbally in a live conversation with Dr. Bae. Dr. Bae transmitted both sets of responses to the researcher.

This interview process departs from the more typical and expected model of the researcher conducting interviews directly. This is acknowledged as a limitation of the methodology of this study due to the added layer of interpretation as a result of the responses being translated and the researcher not having the ability to ask follow-up questions in real time. Nevertheless, the depth and institutional expertise of both respondents, and the specificity of information they provided on the topic areas, especially governance, lease, and policy information that is not well documented in English-language sources, justify their inclusion as primary sources. In a similar vein, Dr. Bae provided ongoing advisory input throughout the research process as an additional expert in Korean planning and transportation issues.

3.5 Transit-User Survey

A survey of transit users with direct experience of Seoul's subway system was conducted as a primary qualitative data source for the user experience dimension of the study. The survey received approval from the University of Washington's Institutional Review Board (IRB) prior to administration. The survey had a response rate of 58.3%, with 21 responses received out of the 36 solicited.

Participants were recruited from two groups: past participants of the University of Washington College of Built Environments (CBE) Seoul field trip participants; and current/former UW students with substantive experience in Seoul as identified through Dr. Bae's network. Inclusion criteria required that participants had visited or lived in Seoul for a minimum of five days and were current or former UW students. These groups were selected because all participants have direct experience with both transit use in Seoul as well as Seattle, allowing for comparative questions about the two cities.

Participants were contacted via email and directed to a Google Forms survey. The survey consisted of eight open-ended questions addressing the respondent's experiences using Seoul's subway infrastructure, their perceptions of commercial integration within station areas, and their comparative assessments of Seoul and Seattle's transit environments (see Appendix B). It is estimated that the survey required ten to fifteen minutes to complete. More so, no compensation was provided. Thirty-six respondents were contacted, comprising twenty-nine former field trip participants and seven additional students with experience in Seoul.

The survey was designed to elicit qualitative testimony on user experience dimensions corresponding to the evaluative frameworks established in the literature review. Specifically, the

researcher was interested in the respondent's perceptions of weather protection, trip-chaining convenience, safety, wayfinding, and overall satisfaction with station environments. Survey respondents are analyzed and presented alongside the literature and quantitative based findings in the user experience section of the Findings chapter.

Survey data, including the respondent's names and email addresses, was stored electronically and accessible only to the researcher and to the advisory committee. Data will not be shared with other researchers or used for any purposes other than this study.

3.6 Limitations

The first limitation is that the interviews were conducted with only a small sample. Two subject-matter experts provide significant depth and specific information, but they do not represent the perspectives of other practitioners like Seoul Metro operators, Seoul Facilities Corporation administrators, station retail tenants, or Seoul Metropolitan Government planners. Different interviewees might have offered alternative interpretations of Seoul's TCI or revealed different details of how it is governed. The mediated interview process, in which responses were transmitted through the thesis advisor rather than collected directly by the researcher, introduces an additional layer of interpretation, especially for Dr. Heo's verbal responses.

The survey is also limited by the fact that it is a convenience sample with a likely selection bias. Participants were collected from a population with an existing interest in urban planning, especially transit-oriented planning. More so, most of the participants were ones who chose to participate in the Seoul field trip. This population likely holds more favorable prior views about transit, transit-oriented development, and commercial integration within that development than a representative sample of Seattle-area transit users might. Therefore, survey

responses should be read as indicative of perceptions among a transit-enthusiast, Seoul-familiar population rather than being a representation of broader public opinion. However, the benefits outweigh the limitations of this sample. Those who are engaged in planning topics and enthusiastic about transit are more likely to notice important details about the environment, and have a more complete idea of what a good transit environment is, than the general public and thus their responses and opinions are of a greater value to this study.

Language limitations additionally affected the collection and analysis of Korean-language sources. While translation tools and consultation with Dr. Bae (who speaks Korean natively) were used to verify key documents and information points, nuance may have been lost in translation, especially for policy documents and news articles that use technical or legal language.

This study does not include any architectural analysis of station design quality, and selected stations are not evaluated based on the design of the structures themselves. Any variation in materials, lighting, public art, or layout across the four case study stations may affect user experience in ways that are not captured by the ridership data, financial analysis, or survey responses. Whether architectural quality independently explains some portion of the ridership or user experience differences observed is a question that this study cannot answer.

Finally, as a case study of four stations in a single large city, the findings of this study should not be generalized for all contexts. The patterns identified here may inform planning practices in other contexts, and the Discussion argues that they should, but they cannot be assumed to apply universally across transit systems with different institutional, cultural, or financial structures.

4. FINDINGS

Seoul's subway system began construction in 1971 and opened its first line in August 1974, drawing heavily on Japanese technology and operation models. The network expanded significantly through the 1980s and 1990s, with Lines 2 through 8 adding coverage across the city and its surrounding suburbs. Most recently Line 9 opened in 2009, with numerous expansion projects continuing until the present day and more planned for well into the 2030s. See Figure 3 for more information on the number of lines and stations. Commercial activity became embedded in the system organically as it continued to expand. This was guided through both loose formal policy, but primarily through the accumulation of market-driven decisions made by Seoul Metro and the Seoul Facilities Corporation, the two bodies responsible for managing station-internal retail and underground corridor commercial areas respectively.

Early on, low rents and small-business eligibility rules shaped the commercial character of these spaces and established an early onset of transit-integrated retail oriented toward the needs of everyday commuters rather than large-scale commercial stores with prestige tenants. However, that commercial infrastructure now operates against a backdrop of deepening financial strain while maintaining station area commercial vitality: Seoul Metro's accumulated deficit has reached nearly 19 trillion won (12 billion USD), with an operating loss of 945 billion won (629 million USD) in 2024 alone, driven by rising operational costs, chronically below-cost fares, and mounting losses from the elderly free-fare policy that cost the system 448.8 billion won (298 million USD) in its most recent reporting period (Jung 2025).

This study has sought to understand Seoul's transit-commerce integration model through the lenses of ridership impacts, transit user experiences, and agency finances. This chapter will

turn its attention to each lens in turn before looking at the overall findings and moving into the fifth chapter, the Discussion.



Figure 4: Primary Case Study Stations. Graphic by the author.

4.1 Effects on Ridership

First, this study turns its attention to the impact of TCI on ridership numbers. Ridership (meaning the volume of passengers using a station on a daily basis) is among the most direct and legible measures of a transit station's performance and its integration with surrounding urban activity. For the purposes of this study, the author assumes that ridership serves as a primary indicator of TCI's impact on transit system utility. If commercially integrated stations attract

more riders, retain them across a broader range of trip types, and generate stronger surrounding land-value dynamics than comparable non-integrated stations, this constitutes meaningful evidence that TCI shapes how people engage with the transit system beyond the commute trip alone.

The analysis in this section draws on open-source station-level ridership data published by the Seoul Metropolitan Government and Seoul Metro, covering all 366 days of 2024 and disaggregated by hour, direction, and station across the full Seoul Metro network. This dataset allows for both aggregate daily ridership comparisons and weekday-to-weekend breakdowns that provide an idea of the demand at each station. The findings show a consistent pattern: the four Seoul stations selected for this study (Jamsil, Seongsu, Myeongdong, and the Banpo Express Bus Terminal) report substantially higher average daily ridership than comparable stations with lower levels of commercial integration, including stations on the same lines serving similar residential catchment areas. This gap persists on weekends, where highly integrated stations retain a significantly greater share of their weekday ridership, suggesting that commercial integration into station areas generates trip demand that is not explained by commuting trips alone. Elevated commercial rents and land values in the immediate vicinity of these stations further corroborate the pattern, pointing to a mutually reinforcing relationship between transit activity and commercial vitality.

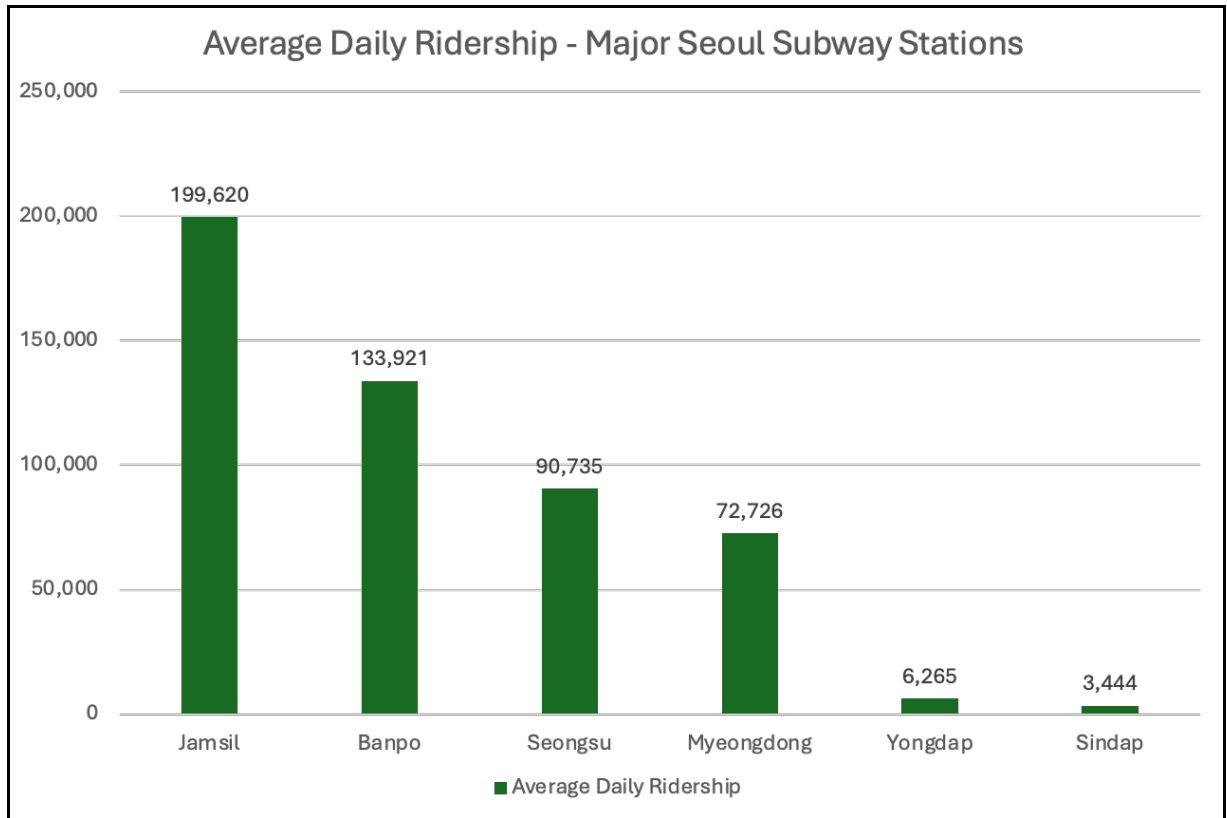


Figure 5: Average Daily Ridership across major Seoul Subway Stations. Data: Seoul Metro. Graphic by the author.

The analysis of Seoul Metro’s station-level ridership patterns shows a consistent and meaningful relationship between TCI and high ridership counts, particularly in stations surrounded by significant commercial land use. Jamsil Station, which is directly integrated with Lotte World, Lotte Department Store, Lotte World Tower, and Lotte World Mall, currently reports approximately 199,620 daily passengers (Lines 2 & 8 combined), making it the busiest station in Seoul in 2024. This exceeds even the passenger volumes of more traditional business-district stations such as Gangnam or Hongdae. Similarly, Seongsu Station (located at the center

of a rapidly commercializing and “trendy” district) has recorded extraordinary ridership growth, increasing from 58,499 daily passengers in 2021 to 90,735 in 2024. Myeongdong Station, positioned within one of Asia’s most recognized retail streets, recorded 72,726 daily passengers. The Banpo Express Bus Terminal Station (Subway Lines 3,7, and 9), directly integrated with Goto Mall and multiple commercial anchors (e.g. Shinsegae Department Store Gangnam branch), is consistently identified as one of the most crowded stations in the country with 133,921 daily passengers. Banpo also boasts the world’s largest underground shopping center.

Station	Line(s)	Avg Daily Ridership	TCI Level
Jamsil (잠실)	Lines 2, 8	199,620	High
Express Bus Terminal (고속터미널)	Lines 3, 7, 9	133,921	High
Seongsu (성수)	Line 2	90,735	High
Myeongdong (명동)	Line 4	72,726	High
Sindap (신답)	Line 2	3,444	Low
Yongdap (용답)	Line 2	6,265	Low

Table 1: 2024 Ridership at Selected Stations. Data Source: Seoul Metro,
<https://www.data.go.kr/en/data/15048032/fileData.do>

To analyze ridership trends as related to TCI, this study has selected six stations in the Seoul subway system, with an emphasis on stations serving Line 2, with a mixture of high and low TCI presence. As noted above, this includes the highest ridership stations (Seongsu, Myeondong, Jamsil, Banpo) but also Sindap and Yongdap, two stations with plenty of residential land use surrounding them but little commercial integration. Seongsu averages 90,735 daily passengers. Sindap, on the same Line 2 loop with similar residential surroundings but minimal commercial integration, averages 3,444 while Yongdap averages 6,265. That is a 26-to-1 and 14-to-1 ratio respectively. It should be noted that Seongsu's typology is quite different from Jamsil or Myeongdong's, with the anchor being private retail accessible from the station. However, considering the higher ridership at the other, more traditional TCI, stations, we can see Seongsu as an example of how commerce can drive ridership and trip activity more broadly.

The consistency of this pattern across four stations spanning different urban contexts (a suburban-adjacent mall hub, a high-street retail district, an emerging commercial neighborhood, and a transit interchange) suggests the relationship between commercial integration and ridership is not specific to any single station typology but reflects a broader dynamic. These ridership patterns suggest that stations with the most integrated transit-commerce connections will have the highest ridership, as stations with direct retail integration or adjacency to high-street retail show not only strong weekday commuter flows but also elevated weekend ridership. This shows a strong connection with these stations and non-commute use, consistent with Sung, Oh, and Jeong who, in their own study, note that higher commercial integration correlates with higher ridership at train stations (Sung, Oh and Jung, 2011).

Station	Average Weekday Ridership	Average Weekend Ridership	Weekend % of Weekday
Banpo Express Bus Terminal	131,343	140,416	106.9%
Myeongdong	74,809	67,480	90.2%
Jamsil	209,102	175,732	84.0%
Seongsu	99,756	68,007	68.2%
Yongdap	6,941	4,563	65.7%
Sindap	3,957	2,150	54.3%

Table 2: 2024 Weekend v Weekday Ridership at Selected Stations. Data Source: Seoul Metro.

As we can see in the ridership data, highly integrated stations retain significantly more weekend versus weekday ridership than stations with lower integration. The most striking example of this is the Banpo Express Bus Terminal, which is actually busier on weekends than weekdays. This makes sense given the Goto Mall and the Shinsegae department store serve as anchors that draw leisure shoppers. Myeongdong retains 90% of weekday ridership on weekends due to it being Korea's center of commerce, tourism, arts, and culture. Jamsil retains 84% due to both its strong commercial integration as well as its proximity to an upper-middle class residential area. By contrast, Sindap drops to 54% on weekends, which makes sense considering that it is a pure commuter station surrounded by established middle-class residential communities, with minimal commercial draw, and Yongdap drops to 66% for similar reasons.

These are stations that exist almost entirely to serve the commute trip, with little to attract riders on non-workdays. This supports the supposition that TCI generates non-commute ridership.

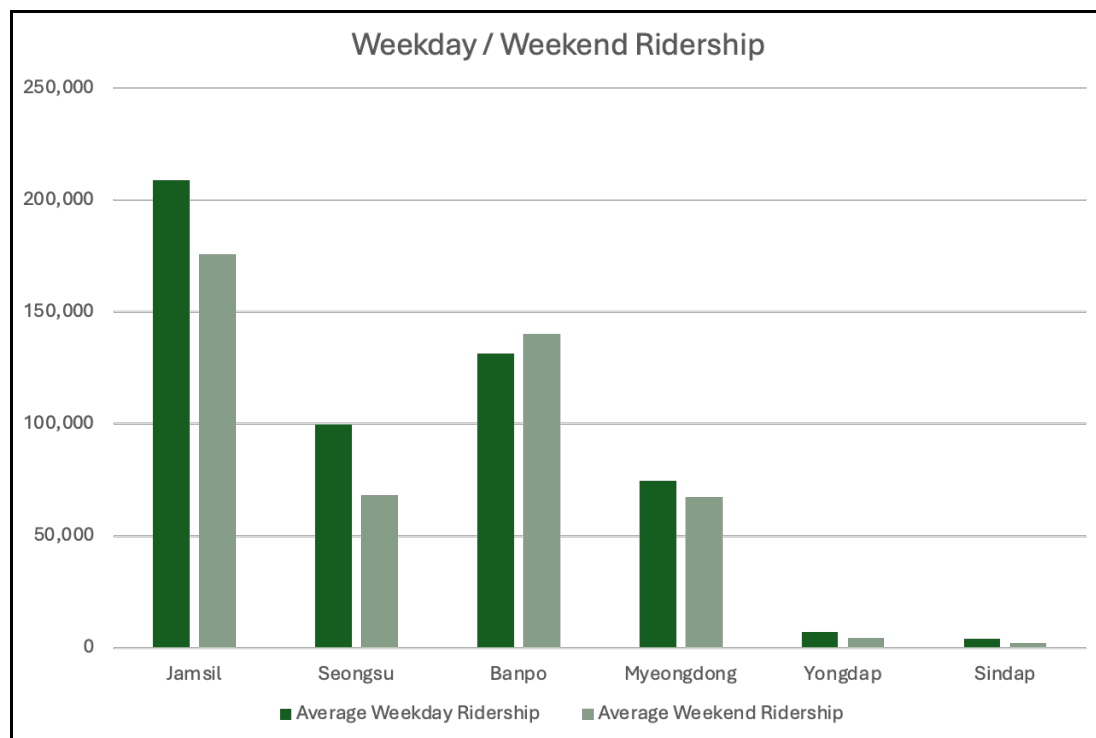


Figure 6: Weekend and Weekday Ridership at Major Seoul Subway Stations. Data

Source: Seoul Metro. Graphic by the author.

To support these findings, commercial rents and land values have also been considered. This metric has been used as a supportive metric as increased ridership should translate into higher values of both metrics due to increased retail foot traffic. It is important because it suggests a larger public good associated with TCI. This data has been gathered through Korean

real estate news channels, like Chosun Biz, the Korea Times, and Maeil Business Newspaper. Commercial rents and land values around the selected high ridership stations tend to exceed citywide averages (Choi 2025 and Jeong 2025). Myeongdong is ranked among the Top 10 most expensive retail environments in the world, with high-street rents around ₩10.3 million/m² (approximately 6,800 USD/m²) annually and declining vacancy rates (from 6.8% in 2024 to 4.9% in 2025), signaling exceptionally strong retail demand. Jamsil's property market exhibits unusually rapid appreciation among "direct access" station developments: residential units directly connected to Jamsil Station increased 48% in value between 2020 and 2025, outpacing Seoul's overall 37% rise (Choi 2025). Seongsu's commercial rents have nearly doubled in 10 years, indicating strong alignment between retail expansion and rising transit use (Kim 2024). Although this may seem like common-sense, there is still a stigma in North America that transit and retail, especially malls, are incompatible; which is a concept that we will re-visit in the Discussion chapter.

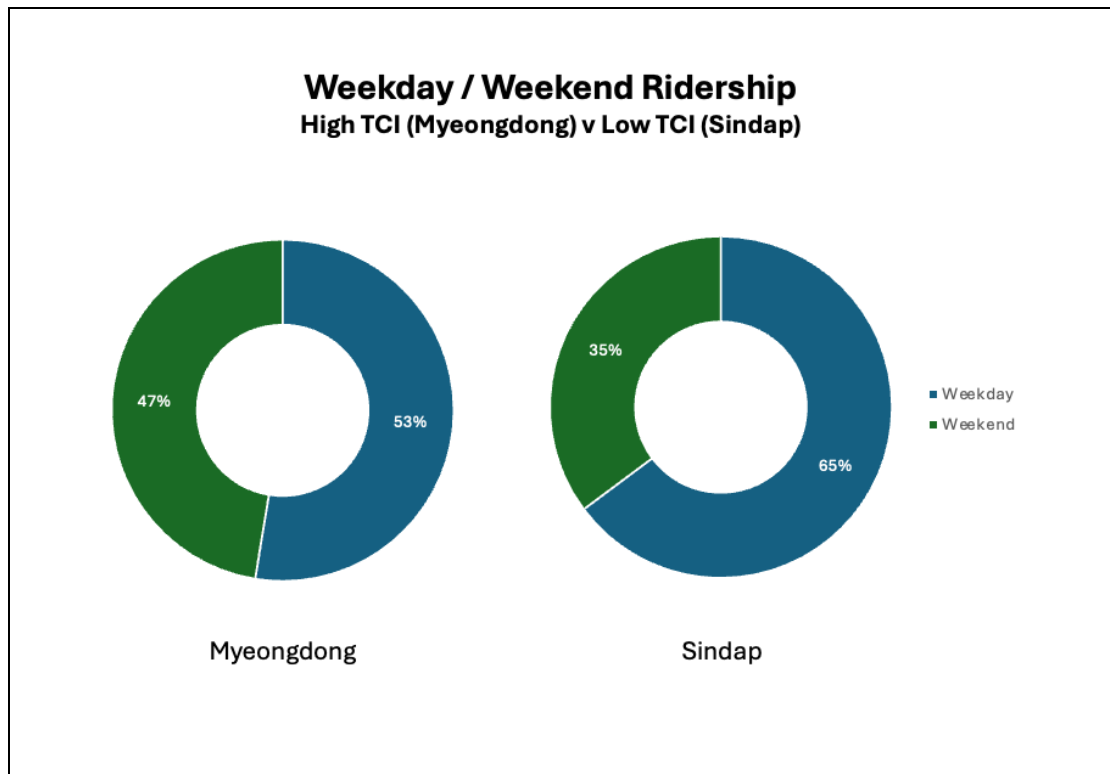


Figure 7: Weekend / Weekday Ridership - High TCI v Low TCI. Data Source: Seoul Metro. Graphic by the author.

The ridership data points consistently in one direction: commercial integration is associated with higher station-level ridership, more diverse temporal demand, and stronger surrounding land-value dynamics across all four case study stations. The scale of the contrast between high-TCI and low-TCI stations on the same Line 2 corridor, where Seongsu averages 90,735 daily passengers against Sindap's 3,444 and Yongdap's 6,265, points toward commercial integration as a meaningful driver of station-level demand. The weekend ridership retention data reinforces this conclusion: stations where transit and commerce are most tightly integrated retain between 84 and 107 percent of their weekday ridership on weekends, compared to 54 to 66

percent at low-integration stations, providing behavioral evidence that TCI generates trip demand that extends beyond the daily commute. Land value and commercial rent data around Jamsil, Myeongdong, and Seongsu further suggest that this relationship is self-reinforcing as higher ridership supports stronger retail markets, which in turn attract more riders and elevate surrounding property values. Whether this elevated ridership translates into a meaningfully better experience for the people using these stations, and whether users actively value the commercial integration that appears to drive it, is the question the following section addresses.

4.2 User Experience

The next finding of interest is related to transit-commerce integration's effect on the user experience. Evaluating how transit users experience commercially integrated stations requires a framework for what constitutes a high-quality pedestrian environment. Two complementary frameworks from the literature provide this study's evaluative criteria. Gehl's (2011) twelve quality criteria, organized around Protection, Comfort, and Enjoyment, identify the features of built environments that support diverse human activity, with weather protection, perceived safety, and ease of movement among the most critical. Alfonzo's (2005) hierarchy of walking needs refines this further, proposing that pedestrians must first satisfy lower-order needs, feasibility, accessibility, and safety, before higher-order needs such as comfort and pleasurability become relevant.

Together, these frameworks suggest that transit environments succeeding at the lower levels of this hierarchy, providing safe, weatherproof, accessible paths, create the preconditions for the richer social and commercial activity that characterizes Seoul's most integrated stations. The findings in this section are interpreted through these criteria. According to Dr. Heo of the

Seoul Institute, Seoul Metro has not systematically studied user experience in relation to TCI. Thus, the author surveyed a group of UW urban planning students who are familiar with Seoul's subway system. Testimonials were gathered through a survey of open-ended questions relating to individual experiences of subway stations.

4.2.1 User Access

This research on Seoul's underground commercial networks suggests that TCI substantially shapes how users perceive and navigate station environments. A central theme across the literature is the convenience and time-efficiency offered to users by integrated transit-commercial spaces. An & Oh's (2015) study of the Sinchon transit mall provides quantitative evidence of how pedestrian environment improvements in Seoul's station areas expand effective access and commercial catchment. Using GIS-based network analysis, An & Oh measured pedestrian accessibility before and after the conversion of Yonsei-ro and Myeongmul-gil into a transit mall prioritizing pedestrian movement. Their results show that the number of buildings accessible within a ten-minute walk from Sinchon Station increased from 1,065 to 1,221 following the intervention (a 15% gain) while the total accessible floor area increased by 37%, from 584,441 to 803,286 square meters. Gains were particularly concentrated in the four-to-six-minute walking range, suggesting that pedestrian-priority improvements most dramatically expand the middle-distance catchment where transit-adjacent retail is concentrated. For TCI, this finding is significant: it suggests that improving the pedestrian environment around station entrances does not simply make existing access easier, it materially expands the commercial catchment area served by the station, generating more foot traffic for integrated retail and

increasing the number of daily errands that can feasibly be conducted on foot from the transit network.

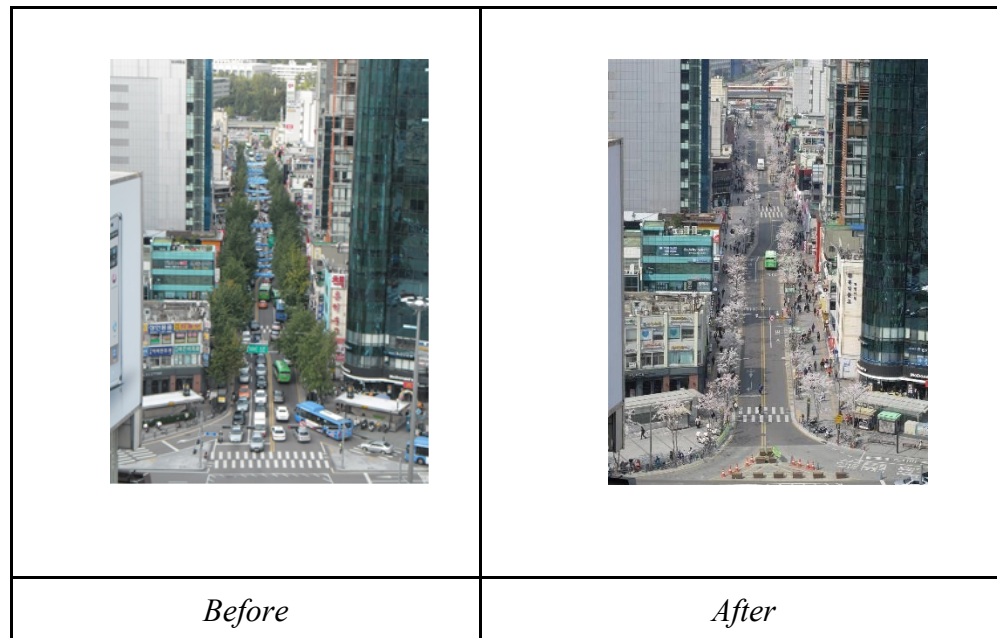


Figure 8: Before and After the Sinchon Transit Mall.

4.2.2 Safety

Safety, or the perception of safety, also plays a large role in the success of retail-integrated transit environments. This finding was expected as it is strongly rooted in the literature. Specifically, both Gehl's (2011) observation that commercial activity in public spaces generates a sense of protection through the passive surveillance of the numerous other people that are using the space. This is also anchored in Jane Jacob's (1961) observation in her seminal work *The Death and Life of Great American Cities*, that busy, vibrant, public spaces are safer than non-vibrant spaces due to additional "eyes on the street." Alfozno (2005) further echoes this in her hierarchy, noting that safety is a foundational need for pedestrians.

In the author's transit user survey, numerous respondents remarked that a high level of safety was one of the most successful features of the Seoul Subway system. More so, many attributed this sense of safety to the visibility and activity generated by retail. Specifically Respondent 12 noted that stations felt much more safe, especially at night, due to the presence of merchants and other transit staff, and Respondent 11 remarked that they were less worried about something going wrong due to the presence of shopkeepers as a source of help. Respondent 18 also had an interesting observation that one was never really alone in a Seoul subway station, which felt protective. More so, several respondents (12, 3, and 4) noted that the lack of this protective commercial activity contributed to feeling less safe in Seattle area stations (Appendix B).



Figure 9: A typical concourse at Banpo Station. Photograph by the author.



Figure 10: A typical snack shop at Banpo Station. Photograph by the author.

4.2.3 Trip-chaining

McGuckin and Murakami (1999) establish in the foundational trip-chaining literature that the ability to combine errands with a commute trip is a primary driver of mode choice, and that transit's historic disadvantage relative to the automobile is partly explained by how poorly it accommodates complex trip chains. Seoul's commercially integrated stations address this disadvantage directly by bringing the destinations inside the transit infrastructure itself. At Jamsil, riders exiting the subway have immediate access to Lotte Department Store, Lotte World Mall, and a dense food and beverage concourse without leaving the station complex. At the Express Bus Terminal, Goto Mall (one of the largest underground shopping centers in Korea) connects directly to the fare gates of Lines 3, 7 and 9, with Shinsegae Department Store accessible above ground. Myeong-dong Station opens onto one of Asia's highest-density retail streets as well as an extensive underground commercial concourse extending toward the neighborhood, its high street, and beyond. Seongsu's station retail reflects the neighborhood's newly found identity as a hip destination for design and food, with curated small-brand shops

and cafes concentrated within a short walking distance of the station exits. In each case, the commercial environment at and around the station substantially reduces the marginal travel cost, in time and effort, of combining transit use with errands, shopping, or leisure, which is precisely the behavioral mechanism McGuckin and Murakami identify as central to transit ridership retention.

As expected, the results from the transit user survey confirms this. Respondent 2 noted the benefit of trip-chaining that the TCI found within Seoul subway stations, specifically noting that “you can stop by a drug store by the train on the way home, [and] you don’t need to drive somewhere else.” In a similar vein, Respondent 7 commented that TCI in the Seoul Subway made “travel very easy because if you know you need something, you can just grab it on your route.”

4.2.4 User Comfort

In a similar vein, Zhao’s (2025) analysis of user comfort in East Asian underground malls highlights Seoul’s integrated stations as exemplary cases where safety from inclement weather, continuous pedestrian flow, and proximity to commerce and amenities enhance travel quality. Zhao’s findings suggest that transit users select routes through underground malls because they offer safe paths and access to a wide array of services that would otherwise require additional trips or transfers. This aligns well with the frameworks established by Gehl and Alfonzo. This supports the idea that integrated station environments provide *efficiency* highly valued by commuters, students, and service workers with limited free time (Zhao, 2025).

Accessibility and legibility also emerge as recurring and important themes of user experience. Studies of pedestrian networks and station-area access show that integrated underground paths shorten effective walking distances, simplify transfers, and improve wayfinding. These are qualities that are associated with higher trip satisfaction and perceived accessibility (Shin et al., 2022). These benefits are especially pronounced in multi-line transfer hubs such as Jamsil Station or the Banpo Express Bus Terminal, where commercial concourses link multiple transport modes. Users report that these integrated environments feel more intuitive and less physically demanding than surface-level alternatives, particularly during extreme weather or peak-hour congestion.

4.2.5 Equity

The equity dimension of TCI deserves a brief acknowledgment. The literature reviewed does not systematically address whether TCI's user experience benefits are distributed equally across demographic groups. Seoul Metro's deliberate orientation toward small businesses and below-market rents, documented in the governance findings (Chapter 4.3.1), suggests that station retail is intended to serve everyday functional needs rather than high-end consumption, which may support broader accessibility across income levels. However, the extent to which elderly riders, lower-income users, or mobility-impaired passengers benefit from or are excluded by integrated station environments is not captured in the data available to this study. This gap is noted here as a limitation and could be a direction for future research.

User Experience Conclusion

The evidence from the transit user survey, supported by the literature, the Sinchon case study, and the station-level ridership patterns examined in the preceding section, point to a consistent picture: Seoul's commercially integrated stations are experienced by users as more useful, more comfortable, and more navigable than their non-integrated counterparts. The behavioral evidence for this, most clearly visible in the weekend ridership retention data, suggests these are not merely perceived improvements but functional ones that shape how and when people choose to use the transit system. This is supported by favorable survey responses highlighting benefits with trip-chaining, comfort, and safety in the TCI found in the Seoul Subway system. Whether these user experience benefits translate into meaningful financial gains for Seoul Metro is the question the following section addresses.

4.3 Impacts on Transit System Finances

Seoul Metro's commercial integration strategy is commonly framed (by the agency itself, by planners, and by outside observers) as a fundamentally financial strategy. The logic for this is intuitive: a system with millions of daily passengers generates enormous captive foot traffic, and converting that foot traffic into retail revenue should meaningfully offset operating costs. This section examines whether that logic holds up under scrutiny. This section draws on Seoul Metro's published financial statements from 2019 and 2022 through 2024, interviews with two subject-matter experts: Dr. Heo and Dr. Lee, and primary source documentation of governance and leasing practices. The analysis here addresses three interrelated questions: who owns and operates the commercial spaces embedded in Seoul's transit system, how those spaces are governed and allocated, and what their actual contribution to system finances has been. The

findings reveal a governance structure that is more fragmented than it appears, a commercial revenue stream that is real but structurally limited, and a financial picture in which TCI plays a stabilizing but ultimately insufficient role in addressing Seoul Metro's deepening structural deficit.

4.3.1 Station Retail Governance in Seoul

Before addressing the findings from the financial analysis of Seoul Metro's commercial revenue, it is important to establish a strong idea of how the integrated retail is governed. The interviews with Dr. Lee and Dr. Heo showed that there is a split governance structure that is more fragmented than most outsiders would assume. There are two distinct types of commercial space in Seoul's transit system, managed by two different bodies. Station-internal retail (the shops physically inside station fare gates and concourses) is managed by Seoul Metro through its 'Strategic Business Headquarters, Commercial & Advertising Division.' Underground corridor and road-adjacent commercial areas (the longer underground shopping streets that connect stations to surrounding blocks) are managed by the Seoul Facilities Corporation, which was entrusted with this role by merchant associations (상인회) under a specific city ordinance ("Seoul Underground Shopping Center Management Ordinance"). Above-ground station-area development falls under a third body, the Seoul Metropolitan Government's 'Urban Space Division,' through a policy called "Station Area Mixed-Use Development." Dr. Heo confirmed that the typical revenue from station retail flows back through these management bodies, and the financial data shows it landing in Seoul Metro's books as "ancillary business revenue."

According to a blog post by a Navar user named Han Chae (한채), who has rented commercial spaces within transit stations themselves, the station area retail is structured like this: tenants rent in five-year terms from the start date of use with the first-year rent determined by the

winning bid. From year two onward, rent is recalculated annually using a formula tied to property value changes under the “Public Property and Commodity Management Act,” (공유재산 및 물품 관리법) meaning rents are not locked in at the bid price but adjust with assessed values. The lease deposit is set at 50% of annual rent, payable in cash or through a payment guarantee insurance policy.

This testimony aligns with what Dr. Heo confirmed in her interview. The general process for leasing is that commercial spaces are awarded through bidding procedures, and when business owners transfer or deal among themselves, they need to obtain approvals from the managing authority. Han Chae further revealed that the bidding for station area retail is conducted entirely electronically through OnBid, the Korea Asset Management Corporation's (한국자산관리공사) public asset disposal platform. The bid deposit is 5% of the bid amount and the bid winner is simply the highest bidder, with ties resolved through a random lottery. Each bidder may only bid on one unit at a time, submitting multiple bids simultaneously invalidates all of them.

Han Chae, in their blog, notes a few more interesting pieces of information on how station-area retail is governed. They note that Gangnam Station units have minimum annual rents between 16 million - 30 million KRW (translating to roughly 1.3 to 2.5 million KRW per month). This likely shows the higher end of what station area retail goes for. The author explicitly notes that first-floor commercial rents in Gangnam typically run around 10 million KRW per month (6,500 USD). Underground station rents are therefore running at roughly one-quarter to one-eighth of surface market rates.

This confirms Dr. Heo's observation that rents are kept deliberately low in underground station units, and it connects to the financial data analyzed: if Seoul Metro and the Seoul Facilities Corporation are charging below-market rents as a matter of policy orientation toward small businesses, this structurally limits how much revenue TCI can realistically generate. It is important to also discuss the eligibility requirements for renting station-area units. Anyone already leasing a shop in Seoul city-owned underground arcades is ineligible to bid on another. This is a formal mechanism preventing commercial consolidation and explicitly protecting the small-business character of station retail that Dr. Heo described. It is also probably why one doesn't see large chains dominating Seoul's underground commercial spaces the way one might expect given the high foot traffic.

In terms of uses and what sort of commercial activity is allowed for station-area retail, Dr. Heo confirmed there are no categorical use restrictions, only infrastructure-based constraints: food businesses must be located where plumbing is available, for example. This means the commercial mix is largely market-determined, which is consistent with the broader finding that TCI in Seoul operates without a formal planning policy framework. Han Chae mentioned that food and beverage businesses are generally prohibited unless the unit has gas supply, plumbing, drainage, and exhaust infrastructure in place, which is consistent with Dr. Heo's testimony. Han Chae's blog gives a concrete example: they discuss a unit under bid that is an exception to that rule precisely because it has those facilities. This makes it much more desirable than units that do not have those facilities. The main prohibitions for tenants are illegal subleasing, placing goods outside the shop frontage, and installing unauthorized promotional materials. Violating any of these can result in lease termination. This suggests the commercial environment is more tightly

managed aesthetically and operationally than may be assumed at first glance, even without a formal guiding policy.

4.3.2 Zoning and Land Use Interactions

Both Dr. Heo and Dr. Lee independently confirmed that there is no formal policy from either the mayor's office or the national government requiring or encouraging commercial integration in Seoul's subway stations. Dr. Heo was explicit: "it has been run by market forces" and that there is no legislation mandating TCI. The one national law Dr. Lee mentions, the “Special Act on Railway Undergrounding and Integrated Development of Railway Sites,” ([철도지하화 및 철도부지 통합개발에 관한 특별법](#)) applies only to national railways operated by the state, not to Seoul Metro, which is a municipal operation.

This directly supports why the North American context matters: Sound Transit and other U.S. agencies looking at Seoul's model often assume there is a formal policy architecture behind it that they could replicate, however that does not appear to be the case. Seoul's TCI emerged organically from market dynamics and municipal management decisions, not from a replicable legislative or policy framework.

An article by a user named “Office Raccoon” ([관리실너구리](#)) discussed Seoul's land use classifications. The classification that seems to relate most to TCI in Seoul is the distinction between railway site ([철도용지](#)) and roads ([도로](#)). Station-internal retail is located on railway site land, managed by Seoul Metro. Underground corridor shopping streets (the longer arcades connecting stations to surrounding blocks) often sit on land classified as roads, which is why they fall under Seoul Facilities Corporation ([서울시설공단](#)) rather than Seoul Metro. This explains the split governance structure the interviews documented: the different types of retail

are not governed due to arbitrary bureaucratic decisions, but rather the governance structure reflects genuinely different land classifications under Korean cadastral law.

This connects directly to Dr. Heo's comment in her interview that "subway stores could be regarded as roads." The land use blog answers what she meant, that the underground corridor retail that pedestrians experience as part of the transit system is legally classified as road infrastructure, not transit infrastructure, which is why a different agency manages it. As we will discuss more in the Discussion (Chapter 5), this further complicates the idea that North American cities could easily replicate the model.

4.3.3 Financial Analysis of Commercial Revenue

Transit-commerce integration also has significant implications for system resiliency, which is defined in this study as the financial, operational, and developmental capacity of a transit network to withstand external shocks and sustain long-term expansion. The findings demonstrate that Seoul's commercial integration strategy contributes to the resiliency of Seoul's transit systems through the diversification of operating revenue beyond fares and government subsidies. However, despite this it is not enough to solve the current financial struggles that the Seoul Metro has found itself in. Overall, TCI's benefits for ridership gain (and this indirect financial gain) as well as improved user experience are more concrete.

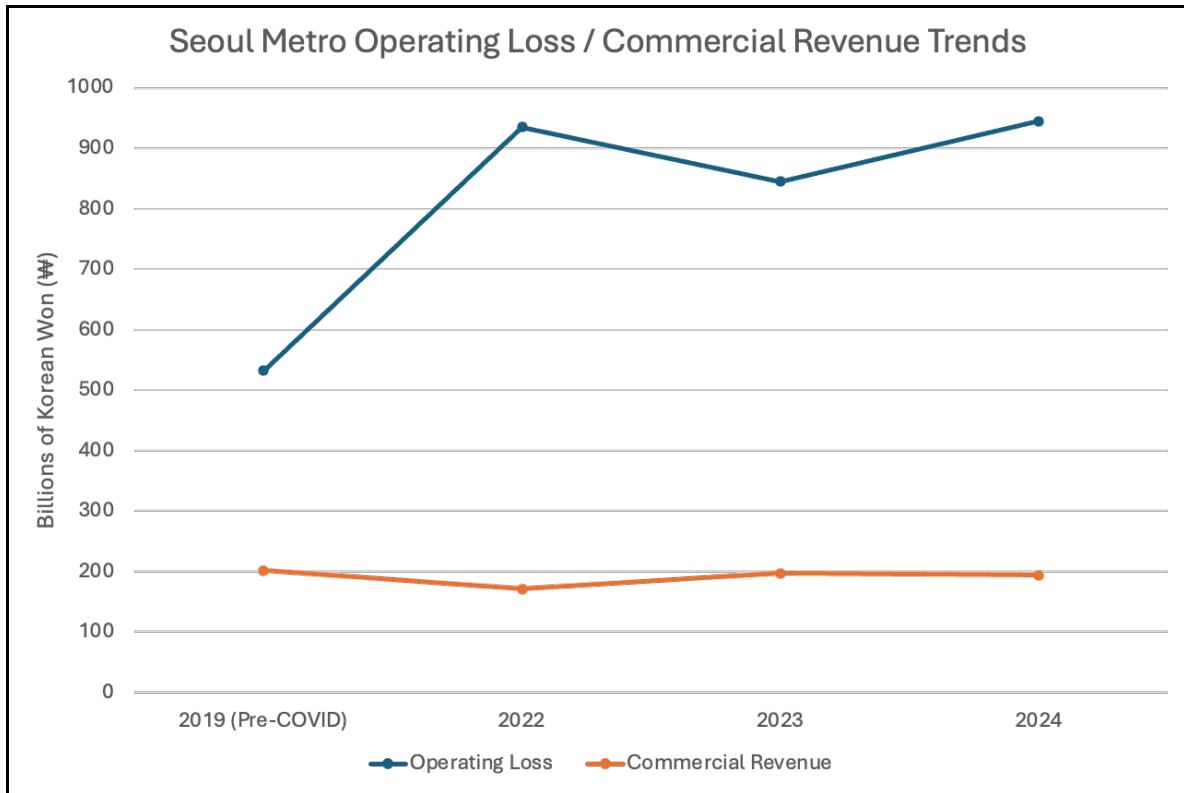


Figure 11: Seoul Metro Financial Trends. Data Source: Seoul Metro. Graphic by the author.

Seoul Metro’s historically heavy reliance on fare income has made the agency’s bottom line vulnerable to economic and demographic fluctuations. Its increasing commercial integration mitigates this vulnerability by cultivating non-fare revenue streams that help to stabilize the agency’s finances. Some of the revenue streams that come from commercial integration include station naming rights, which generated ₩14.97 billion (~\$11.4M in USD) over four years and are explicitly described by the agency as a strategy to offset structural deficits and in-station retail leases which convert station real estate into recurring income (Lee 2024). A major example of this is at Seongsu Station, where naming rights were sold to Olive Young (a major cosmetic

store chain) for 1 billion won (\$740,000). At the station, Olive Young branding can be found on pole signs, LED panels, and voice announcements (Hwang 2024).

These non-fare streams do not eliminate operational losses, but they meaningfully reduce Seoul Metro's dependence on fare increases. The contrast with Hong Kong's MTR and Tokyo's private railways is interesting, though the comparison is not exact due to different governing models as discussed in the Literature Review. Jauregui-Fung documents that MTR's property development revenues effectively cover its capital expansion costs, enabling the system to operate without government operating subsidies, a financial profile that has made it the reference point for transit commercial integration globally. This is also a trend documented in Hong Kong's MTR and Japanese private railways, where commercial revenue accounts for 20–50% of profits (McKinsey 2020 and Miki 2020). Cervero and Murakami (2009) attribute this performance not primarily to retail leasing but to the Rail + Property model's property development rights, through which the MTRC acquires land at pre-rail prices, develops residential and commercial property above and around stations, and captures the resulting value uplift directly. Japanese private railways achieve similarly strong non-fare revenues, Miki (2020) documents non-fare income accounting for 20 to 50 percent of total profits at major operators, again through diversified real estate and retail holdings that extend well beyond station concourse leasing.

As discussed earlier, Seoul Metro's commercial model resembles neither of these. It does not hold property development rights, does not profit from land value uplift, and deliberately charges below-market rents as a matter of policy to support small businesses. The revenue ceiling visible in Seoul's four-year financial record is therefore not a failure of execution but a

structural feature of a model that was never designed to generate Hong Kong or Tokyo scale commercial returns. In and of itself, the commercial revenue plateau is interesting. Ancillary revenue went from 171 billion to 197 billion won between 2022 and 2023, a significant increase, likely reflecting post-COVID recovery of station foot traffic and retail activity. This then essentially flatlined at 194 billion in 2024. This plateau pattern suggests TCI revenue has a natural ceiling well below what would be needed to make a structural difference.

	2019 (pre-COVID)	2022	2023	2024
Revenue				
Fare revenue (운수사업수익)	1,637	1,426	1,473	1,578
Commercial revenue (부대사업수익)	202	171	197	194
Losses				
Operating loss (영업손실)	-532	-935	-845	-945
Net loss (당기순손실)	-586	-642	-517	-724
Commercial revenue as % of operating loss	38%	18%	23%	21%

Table 3: Seoul Metro Selected Financial Indicators, 2019 and 2022-2024 (in billions of Korean won). Source: Seoul Metro. All numbers in billions of Korean Won (₩).

The ratio stays consistent over the studied years; commercial revenue covers roughly 18-23% of the operating loss across all three years (2022-2024). It is worth noting commercial revenue nearly covered 40% of the operating loss in 2019, however the lower rates of commercial revenue coverage in recent years is due to the explosion of Seoul Metro's deficit: 2024 commercial revenues being nearly identical to 2019's, 202 billion and 194 billion, respectively. The denominator fluctuates (2023 was a better year, 2024 got worse again), but the commercial revenue line barely moves in comparison. Also note that operating loss grew 77% (2019–2024) and commercial revenue declined in real terms. 2023's improvement does not appear to be TCI-driven. The operating loss dropped from 935 billion to 845 billion in 2023 despite commercial revenue only rising modestly. The improvement came almost entirely from fare revenue growth, ridership recovery post-COVID. The financial improvements Seoul Metro has seen are ridership-driven, not TCI-driven. Although gains in ridership seem to be connected to TCI, as we saw in the ridership findings section, that does not translate to higher commercial rents.

2024 got significantly worse despite stable commercial revenue. The net loss jumped from 517 billion to 724 billion, and the operating loss hit a three-year high of 945 billion. This happened while fare revenue was actually at its highest point of the three years. Rising operational costs (labor, energy, infrastructure maintenance) are outpacing both fare revenue growth and commercial revenue. Profits related to TCI are not keeping pace with those structural cost pressures. Fare revenue grew 10.7% from 2022 to 2024, from 1.426 to 1.578 trillion won. Commercial revenue grew only 13.5% over the same period, a similar rate but from a much smaller base, so the absolute contribution remains modest. Commercial revenue has been essentially flat for six years. In 2019 it was 202 billion won. In 2024 it was 194 billion won.

Accounting for inflation, this is a significant decline. Whatever growth TCI has generated, it has not translated into meaningful revenue expansion over the medium term.

The operating deficit has nearly doubled while commercial revenue stood still. The operating loss went from 532 billion in 2019 to 945 billion in 2024 (a 77% increase) while commercial revenue declined slightly. This suggests that the structural problem is growing far faster than TCI can address it, and that the gap between what TCI generates and what the system needs is widening, not narrowing. Fare revenue in 2024 (1.578 trillion) still hasn't recovered to 2019 levels (1.637 trillion) in nominal terms, and certainly not in real terms. So, the system is running larger deficits than pre-pandemic despite TCI being fully operational, and despite fare revenue not having fully recovered. Dr. Heo's comment that "the amount of the profit is not big enough to affect the feasibility of new projects" is a direct expert confirmation of this financial finding.

Overall, Seoul Metro's commercial revenue is real, growing, and operationally meaningful, but it is structurally incapable of closing a deficit that runs six to nine times its size. This is not to suggest that TCI has no benefit to transport system finances, but it seems to be the case that the scale of Seoul Metro's structural cost burden, driven by aging infrastructure, labor obligations, and the free elderly fare policy, is categorically larger than what station retail and advertising can offset. We will look into this more in the Discussion.

Finally, evidence for TCI's impact on system resiliency emerges from user behavior itself, the stable weekend ridership at integrated stations suggests that commercial nodes smooth demand (and thus fare) fluctuations by attracting both commuters and leisure travelers. By

offering elevated system usage during weekends and holidays, the commercial integration of stations also helps to protect the system by offering consistent fare-based revenue year-round.

Taken together, the financial and governance findings present a picture that is more complicated than either TCI's advocates or its skeptics tend to acknowledge. Seoul Metro's commercial revenue is genuine, operationally meaningful, and as the governance structure reveals, deliberately shaped to serve small-business operators and everyday commuters rather than to maximize yield. But the four-year financial record is unambiguous: commercial revenue has remained essentially flat in real terms since 2019, covering between 18 and 23 percent of an operating deficit that has grown 77 percent over the same period. Dr. Heo's assessment that commercial revenues are not large enough to affect the feasibility of new transit projects is borne out by the numbers. The structural forces driving Seoul Metro's deficit, including chronically below-cost fares, aging infrastructure, rising labor and energy costs, and the mounting burden of the elderly free-fare policy, are categorically larger than what station retail and advertising can offset. This finding does not diminish TCI's genuine contributions to ridership and user experience, which the preceding sections document. It does, however, complicate the assumption implicit in much of the North American planning interest in Seoul's model that commercial integration offers a viable pathway to transit financial self-sufficiency. What TCI appears to offer financially is stabilization at the margins, not structural solvency. The implications of this finding for how Sound Transit and other North American agencies should frame their own retail integration strategies are taken up in the Discussion.

4.4 Overall Findings

The findings of this study demonstrate that transit–commerce integration in Seoul produces meaningful and consistent benefits for system ridership, user experience, and the vitality of adjacent commercial areas, while revealing a more complicated and limited picture on the financial side. Quantitatively, integrated stations such as Jamsil, Seongsu, Myeongdong, and the Banpo Express Bus Terminal exhibit consistently higher ridership, stronger weekend activity, and elevated commercial rents relative to non-integrated stations on the same lines. The weekend ridership retention data is particularly telling: highly integrated stations retain 84 to 107 percent of their weekday ridership on weekends, compared to 54 to 66 percent at low-integration stations, providing behavioral evidence that commercial integration generates non-commute trip demand rather than simply serving existing riders more conveniently. This is supported by favorable survey responses that compliment Seoul’s level of safety and convenience. These patterns suggest that commercial intensity, in the form of underground shopping concourses, retail anchors, and high-street linkages, plays a meaningful role in driving pedestrian volumes and shaping dynamics around station areas.

Qualitatively, users perceive integrated station environments as efficient, climate-controlled, and time-saving spaces where daily routines can be folded into travel. Drawing on Gehl's protection criteria and Alfonzo's hierarchy of walking needs, the analysis shows that Seoul's commercially integrated stations succeed at the foundational levels of pedestrian experience, providing weather protection, perceived safety, and reduced effective walking distances, in ways that generate the conditions for richer social and commercial activity. An & Oh's (2015) quantitative analysis of the Sinchon transit mall demonstrates that even targeted

pedestrian environment improvements expand station catchment areas measurably, reinforcing the connection between station-area design and commercial viability.

Institutionally, the governance findings reveal a structure more fragmented and market-driven than outside observers typically assume. Station-internal retail and underground corridor commercial areas are managed by two separate bodies, Seoul Metro and the Seoul Facilities Corporation, under a land classification system that reflects genuinely different legal categories rather than administrative convenience. No formal policy at the mayoral or national level mandates or systematically encourages commercial integration; the model emerged organically through market forces shaped by deliberately below-market rents and small-business eligibility rules. These governance characteristics directly constrain the financial contribution TCI can make to system revenues, since they were never designed to maximize yield.

The financial findings complicate a common assumption in transit planning discourse, that commercial integration offers a pathway toward reduced fiscal dependence on fares and subsidies. Seoul Metro's four-year financial record shows commercial revenue covering between 18 and 23 percent of an operating deficit that grew 77 percent between 2019 and 2024, a ratio that remained stubbornly consistent despite the agency's active pursuit of non-fare revenue strategies. The structural forces driving that deficit, aging infrastructure, rising energy and labor costs, and an elderly free-fare policy that cost the system 448.8 billion won in its most recent reporting period, are categorically larger than what station retail and advertising can offset. The contrast with Hong Kong's MTR and Tokyo's private railways is instructive: those systems achieve significantly stronger commercial revenue performance, but through property development rights and land value capture mechanisms that Seoul Metro does not hold. Seoul's commercial revenue ceiling is therefore a structural feature of its model, not a failure of

execution. This finding does not diminish TCI's genuine contributions to ridership and user experience. It does, however, clarify what TCI can and cannot do, stabilizing revenues at the margins while leaving the system's deeper fiscal challenges unresolved.

Together, these findings underscore that TCI is not simply an amenity or urban design choice but a structural component of the transit ecosystem, one that shapes how stations are used, how surrounding areas develop, and how the system's operating budget is partially supplemented. The reinforcing cycle visible in Seoul's most integrated stations, higher pedestrian counts enabling stronger retail markets, retail intensity elevating land values, and elevated station activity generating fare and non-fare revenue, illustrates the degree to which Seoul's transit system is shaped by its commercial interfaces. What this cycle does not do, at least in Seoul's model, is generate the scale of commercial return needed to address structural financial imbalances. The Discussion examines what these findings mean for agencies such as Sound Transit that are actively developing station retail strategies, and considers how Seoul's model, with its particular governance structure, organic commercial development, and constrained financial outcomes, should and should not inform planning practice in the North American context.

5. DISCUSSION

5.1 Primary Conclusions

The findings show that the planning practice of TCI demonstrably improves user experience and ridership in meaningful ways. This is measurable and consistent across different station typologies. However, TCI does not function as a financial solution, and North American planners who are looking at Seoul's model should not replicate it for revenue potential. Despite that, there are numerous takeaways from Seoul's model that can be incorporated elsewhere in order to increase transit ridership, transit user experience, and the vibrancy of American cities.

From the ridership data, there is a clear trend that stations which are highly integrated with commercial activity outperform stations that are not well integrated significantly. This overperformance can be seen in raw ridership (like at Jamsil, with nearly 200,000 daily riders) as well as weekend ridership retention and user experience metrics like the favorable survey responses as collected by this study. This insight can be utilized by planners, architects, and urban designers on how to properly design transit stations and systems. One aspect of this insight is that we see a direct reflection of the principles laid out by thinkers like Jan Gehl and Mariela Alfonzo as to what creates good and successful public spaces applied to transit stations. Seoul's integrated stations succeed at creating pedestrian spaces by doing the foundations very well: offering protection from the weather, safety, reduced walking distance, and convenient services in ways that add to a richer urban life. This is not accidental, but rather an intentional strategy by the designers of the Seoul transportation system.

Building upon the principles of good pedestrian-forward design, lessons on how to maximize trip-chaining for the benefit of the user is key here. This is supported by the data that

shows the stability, and in some cases even uptick, of activity on the weekends. In the United States, people often have to pay a steep price for not having a car in terms of wasting their time through complex trip chains. Even in American cities that have better than average transit, utilizing transit for commute, errands, and leisure all in the same day takes significantly longer than using a car for those same trips. In contrast, in a system like Seoul, with transit and commercial uses integrated, one can access desired goods and services without having to go on long journeys as they are mere steps from the train platform.

The success of Seoul's model is not limited to the city's dense urban core; however, it is also present in suburban typologies similar to what we see near Seattle in Federal Way or Lynnwood, albeit at different scales. Within the Seoul Subway system, stations like Goyang Station, Daehwa Station and Jeongbalsan Station illustrate comparable examples of suburban TCI. These stations serve residential areas with lower densities than central Seoul but still support significant retail activity. At Jeongbalsan Station, for example, the station is integrated with the Lafesta and Western Dom mixed-use districts, where retail streets, entertainment venues, and public spaces cluster around transit access. Although quite different to how TCI appears in Seoul's core, the functional integration remains largely the same: transit riders flow directly into commercial environments that provide both essential activities as well as leisure. As many of Sound Transit and other North American transit agencies' expansions open up new stations in suburban areas, this finding seems especially relevant.

Overall, it can be seen through the findings that transit environments which are purely designed for throughput, simply moving people efficiently from A to B, miss the benefit to user

experience that comes with designing stations as destinations themselves. Seoul’s model shows that these two goals are not at all in tension.

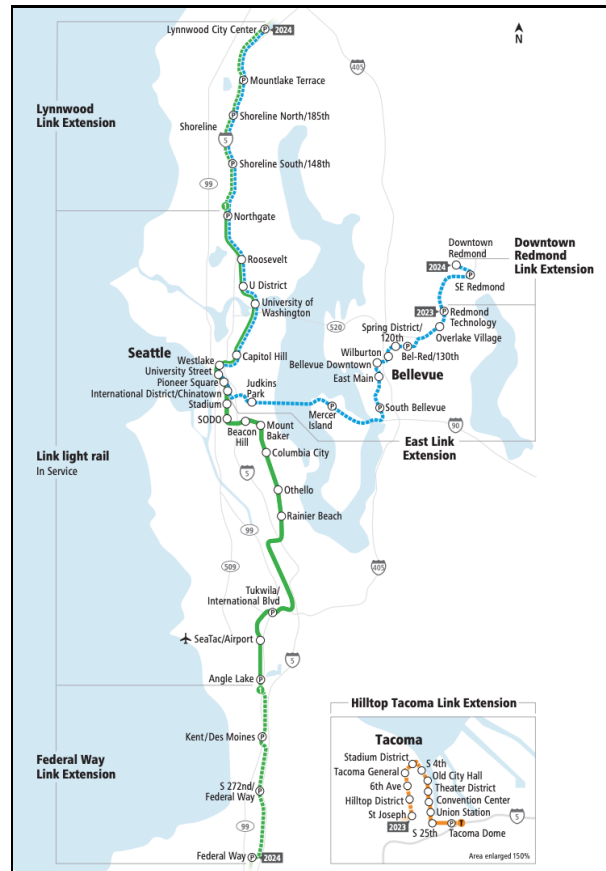


Figure 12: The Link Light Rail System as of 2026. Graphic by Sound Transit.

5.2 Existing Conditions in Seattle

Before applying the findings directly to Seattle-area planning, a discussion on the current TCI infrastructure is warranted. Rapid Transit in the Seattle-area is still relatively new, although buses and before that streetcars have served the area since its inception, the concept of Seattle having a rapid transit system similar to other major medium-sized American cities, like San

San Francisco or Boston, has long been imagined but has faced numerous barriers to creation. However, now the area has the Link Light Rail system, which opened in 2009 as a rail connection between downtown Seattle and the airport, has grown through numerous expansions into a regional rail system that connects most of Seattle’s densest neighborhoods and important institutions (The University of Washington, museums, other schools, etc) with its most significant suburbs east, north, and south. It currently comprises 62.5 miles and 50 stations, with 117,200 average daily ridership that has increased significantly with each new expansion. As of April 2026, this makes Link the highest ridership light rail system in the entire country as well as one of the strongest post-COVID ridership recovery cases (American Public Transit Association).

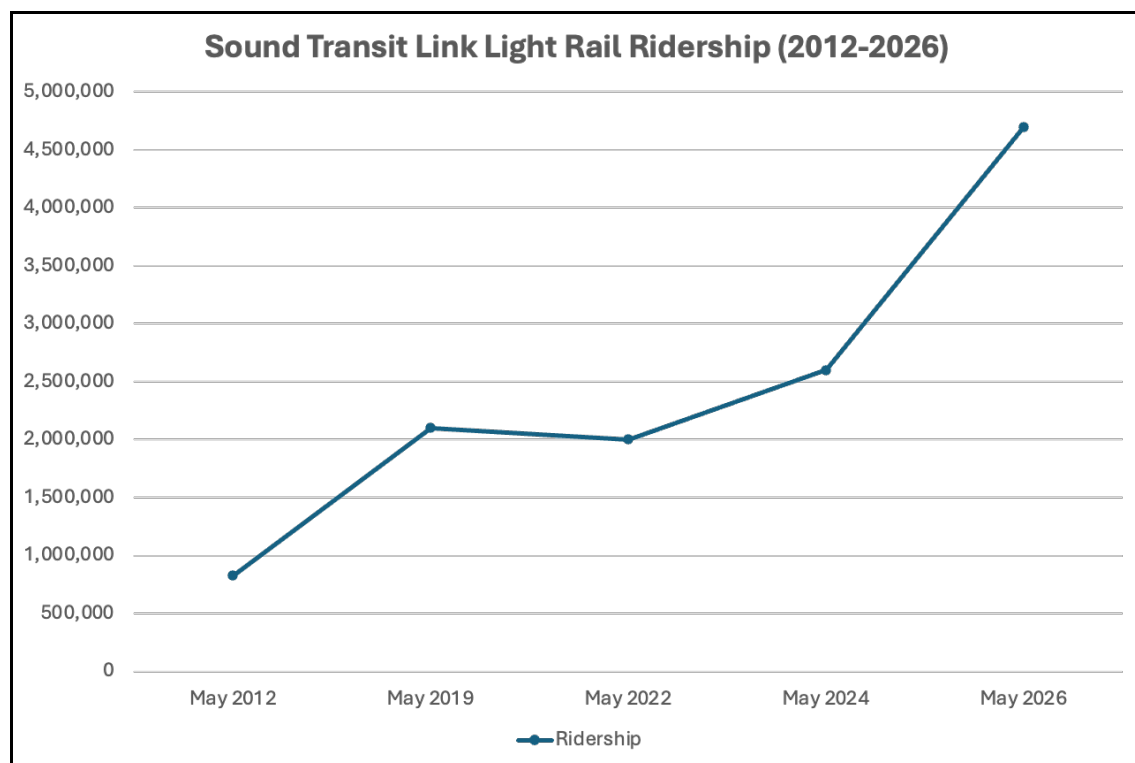


Figure 13: Sound Transit Link Light Rail Ridership, 2012-2016. Sources: Federal Transit Administration & Sound Transit. Graphic by the author.

However, the main glaring difference between the Link system and other rapid transit systems in the United States and beyond is its lack of connectivity to major retail areas and shopping centers, as well as the lack of retail integration to the system itself. Retail activity within Link stations is almost completely non-existent, outside of a cafe at Lynnwood Station, a failed coffee cart pilot (will be discussed later), and underutilized department store connections at Westlake Station. As Respondent 14 of the Transit User Survey noted, "Seoul stations are world-class, Seattle stations simply serve one purpose."

The system is poised to continue expansion with numerous projects approved as part of the Sound Transit 3 voter initiative, although the agency has faced financial challenges recently , these projects are all still poised to move forward and expand to system to two of Seattle's largest neighboring cities, Everett and Tacoma, as well as the the neighborhood of West Seattle, and major neighborhoods of the city including South Lake Union and Seattle Center. This has been held in a precarious situation lately, with the agency having a 35 billion dollar deficit ([KIRO 7](#)) relating to construction of future projects, but has been largely resolved with the agency identifying a plan that drops costs for most projects to a manageable level. Despite the failure to integrate properly with other Seattle commercial areas, these upcoming projects represent a major opportunity for both integration with up and coming commercial areas in Seattle as well as retail integration in new stations.



Figure 14: Rail Transit Expansion in Seattle. Graphic by the Seattle Department of Transportation.

This is something that Sound Transit itself has been considering, with a 2023 report published which detailed the agency's ideas for future vending and pop-ups in existing stations, as well as the possibility for architecturally integrated retail spaces in future stations. The 2023 report framed this as largely a financial strategy that may assist the agency with financial difficulties. However, even with the context of financial difficulties, any future retail integration in the Sound Transit system should be seen as a public benefit, improving ridership and user experience as well as giving opportunities to small businesses. Although the commercial revenue as a result of TCI is significant, it is not enough to finance new expansions or cover the entirety of an operating deficit.

For the purpose of comparison, this study will turn its attention to four case study stations in the Seattle area: Westlake, Capitol Hill, Northgate, and Downtown Bellevue. Like the case study stations selected for Seoul, each of these four stations represents a different typology typical for the Seattle area. Westlake Station is a significant case study for TCI as it is one of the few transit stations in the West Coast built with it in mind, although the collapse of the Downtown Seattle retail market has not allowed Sound Transit to benefit from that. It is architecturally integrated to Westlake Center, the erstwhile major mall of the city, as well as a Nordstrom department store, although they have had the connection blocked since 2020. It was also directly integrated with the Macy's department store before it closed. In many ways it is similar to the Banpo case in Seoul, except that Westlake's connection to a major department store was intentionally severed. Of course, the scale of these two examples are vastly different, but the underlying logic of the connection is much the same. This is a dramatic departure from the logic that businesses have towards transit in major world cities, especially in Seoul. In a different world, and perhaps it could again be in the future, Westlake could have been an enviable example where transit infrastructure and vibrant retail activity co-exist, similarly to Banpo and Jamsil stations.

The Downtown Bellevue station represents both another significant departure from normal TCI logic, as well as a unique Seattle-area typology. Although originally intended to be constructed adjacent to, and directly integrated with, the Downtown Bellevue mall, the station was forced to be moved several blocks away from the station due to political disagreements. Although the municipal government of Bellevue has taken steps to assuage this and have created a high quality pedestrian path connecting the mall and the station, the opportunity for the positive benefits associated with direct integration as seen in Seoul have long passed. This should serve

as a strong warning to both Sound Transit and other local decision makers about design decisions that should be made differently in future transit expansions.

Northgate Station also provides an interesting example. Although originally the first auto-oriented mall in the nation, Northgate mall is currently in the process of a mass transformation to a walkable, mixed use (residential and commercial) district directly connected to the Link system. However, that development has lagged significantly behind the opening of Northgate station so the use of the station is mostly limited to North Seattle commuters heading into Downtown. It remains to be seen in the future if the station will be able to anchor a mixed use district in the way that Seongsu was anchored and nurtured by its subway connection. Finally, Capitol Hill station is situated in one of Seattle's densest, most walkable, and most commercially active neighborhoods. As Respondent 15 pointed out in the Transit User Survey, the vibrancy and high ridership of the station is attributed to the commercial character of the area that predates the station. This offers a great opportunity to expand that commercial vibrancy into the station itself, which is something that Sound Transit itself has tried to pilot.

5.3 The Capitol Hill Station Case

Earlier this year, Sound Transit piloted its first attempt at retail integration in its stations, largely informed by the previously mentioned 2023 report. At Capitol Hill, one of the highest ridership stations in the system, ST allowed a coffee cart vendor to operate in the main mezzanine of the station. This vendor, a small business named "Common Cart" served coffee, pastries, and packaged food. The merchant is named Zaiquiri and specializes in serving Yaupon, a type of holly tea. This business was rather profitable, with the merchant reporting approximately 14 sales per hour during off-peak hours. Sound Transit only charged Zaiquiri

\$250 per month to vend there. However, after only a few weeks it was shut down by the county government due to health code temperature control regulations that could not be met by the station environment (Capitol Hill Seattle Blog). Normally, a food and beverage business is not allowed under King County regulations to operate without a commissary kitchen and bathrooms, however by limiting the amount of items sold and by not selling cooked food, Zaiquiri was able to receive an exemption from that. However, that greatly limits their profit margins. This reveals a barrier to TCI within the Seattle-area. Without architecturally-integrated retail units, the only way forward (beyond significant station retrofitting) for TCI is the presence of these vendor carts. However, our regulatory environment is not ready for that. The way that regulations governing food and beverage sale was designed for permanent fixed-location establishments and is not favorable to small businesses that can only sell out of a cart. So the failure of TCI in this case is not one of demand, but rather a failure of regulations and infrastructure as it impacts TCI.



Figure 15: The Capitol Hill coffee cart pilot. Photo courtesy of Zaiquiri.

There are further regulatory issues that this case reveals which blocks the adoption of TCI in the Seattle area. First is the lack of bathrooms in Link stations, with only a small number of

exceptions. This is a baseline requirement for food and beverage establishments, and one that is baked into both health code regulations as well as practical needs for both merchants and customers. As is the case with Ziquiri, a merchant is able to receive an exemption but the requirements for the exemption greatly interfere with their ability to turn a profit. Second, is the lack of electrical outlets at stations. Any merchant that may require refrigeration, charging point-of-sale systems, or needed any powered equipment would be totally unable to be a vendor at any Link station as they have no infrastructure to draw on currently.

This draws an interesting comparison to the Seoul case. In Seoul, station-area retail and underground corridor retail are managed under clear, albeit separate, frameworks. There are clear areas where merchants can exist, and these areas are governed under a clear framework provided by either Seoul Metro itself or the Seoul Metropolitan Facilities Company. In the Seattle-area, Sound Transit has no impact on retail regulations or governance, and any vendors or future integrated retail units will be subject to a governance structure split over several jurisdictions, King, Snohomish, Pierce counties, as well as numerous different cities within those counties. This also connects to something that Dr. Heo said in her interview that the use restrictions in Seoul's stations are essentially infrastructure-based. Food and beverage merchants can exist so long as they rent a unit that has plumbing and gas connections. Of course, these are requirements that no Seattle-area station would meet, but it does suggest that the correct path forward for retail integration is to build the infrastructure needed for it during station construction, instead of trying to dance around regulations or performing expensive retrofitting after the fact.

Nevertheless, there is significant physical opportunity available in Link stations. Many stations have significant unused mezzanine spaces, vast and cavernous areas between the ORCA

card readers and the train platforms. Although currently existing simply as a throughput for passengers, these areas could be activated and utilized in a positive way through future retail integration. Overall, the Capitol Hill coffee cart case represents that the barrier to increased TCI in the Seattle-area is not simply political, cultural, or financial, but is primarily regulatory and infrastructural. This is actually encouraging though, as infrastructure can always be built and regulations can always be changed as long as there is a desire to do so. The case also suggests that demand exists, and its failure was not due to a lack of demand but a failure to supply.

5.4 Implications for Planning Thought

Across the United States, there is a significant demand for transit expansion, especially for rapid transit rail systems, however, that supply is being complicated by increasingly high costs of construction for these transit projects. There is no greater example of this phenomenon than in Seattle, Washington, where Sound Transit's Link light rail system has consistently broken ridership estimates and has catapulted the city to transit utilization percentages on par with other medium-sized cities with century old rail systems, like San Francisco and Boston. However, the city's eagerness to expand rail service to more neighborhoods and realize the vision of Sound Transit 3 (approved over a decade ago) that promises rail connections not just to Tacoma and Everett, but throughout the city to South Lake Union, Lower Queen Anne, West Seattle, and Ballard, is threatened by a 35 billion dollar shortfall. So, naturally, Sound Transit and similar agencies undergoing similar projects have begun to eye new sources of revenue to help finance expansion projects.

To that end, Sound Transit put together a report in 2023 showing the agency's thinking regarding future retail integration in their stations (Sound Transit, 2023). The report looked at

numerous examples of TCI throughout the world, including Seoul, and put together a list of recommendations for the agency going forward including concessions stands, vending machines, and full retail spaces within existing and future stations. The report details TCI's positive impacts on user experience and ridership gains, in line with this study's findings, however much of the report focuses on TCI as a strategy for revenue gaining. The findings of this study complicate that goal. As we saw in the previous chapter through the financial data as well as testimony from the experts, even with its extensive retail integration, the profit from Seoul Metro's commercial activity makes only enough to do a small impact on maintenance and has no bearing on its expansion plans.

Something that transit agencies should understand then is that Seoul's TCI model is not a financial solution. The financial data reviewed shows a ceiling to how much profit can actually be obtained from TCI. This does not appear to be a policy shortfall, or a lack of optimization on Seoul Metro's part, but rather it is simply that the commercial integration that we see in systems like Seoul's was not meant to be integrated into transit system financing. This does not mean that TCI is useless, however, as there are still positive effects as to how it improves user experience and drives ridership gain. There are also additional social benefits, as Dr. Heo pointed out: the small-scale retail floorplates and low rents provide work and income opportunities for people who may otherwise not have the opportunity to own a store. It is possible that if Seoul charged market-rate or higher rents for its commercial spaces, there could be a much more significant gap. However, the cost of subway construction projects is so great that it is unlikely to cause a great enough difference, and indeed would belie both the social benefits of this integration as well as the 'authentic' of the spaces mentioned by numerous addressed by the Transit Survey Respondents in this study. Dr. Heo confirmed that commercial revenue is not a consideration in

the planning of subway expansions as the cost of these projects is far too great for that revenue to cover. It should be noted that, according to the financial data, fares, station naming rights, and ad campaigns are all much larger funding sources for the Seoul Metro, and indeed if North American transit agencies are looking for new sources of income, they should be eyeing those instead.

However, all that being said, we do have to consider that in the cases of Tokyo and Hong Kong, their TCI is much more profitable and in their cases TCI does play a large part in their expansion plans. Indeed, in the case of Hong Kong, the entirety of the budget is covered through fares and commercial revenue, making it entirely self-sustaining. What makes Seoul distinct from these systems, despite being influenced from them, is that the Seoul Metro does not develop property and deliberately charges below-market rents for the spaces that it does own. An in-depth discussion and review of Tokyo and Hong Kong's TCI strategies are outside the scope of this study, however it is important to note the differences here. Sound Transit and other North American transit agencies do not have the ability to copy Tokyo and Hong Kong's models as they are governed in a manner more similar to Seoul. Hong Kong and Tokyo are able to turn a profit through TCI mainly through their ability to own and develop land around their stations for for-profit ventures. Both Sound Transit and the Seoul Metro do not possess property development rights. Indeed, Sound Transit gives the excess land around their stations to non-profits for free to build low-income housing. This is not a policy failure, rather a deliberate choice reflecting the idea of transit agencies as forces for public good. Observers that are impressed by Seoul's revenue numbers should understand the context both historical and structurally before they understand what retail integration can really offer.

In the same vein, there are additional cultural differences that may be too vast for North American agencies to overcome. Even looking at the cases of the Seoul Metro, we see a city full of entrepreneurs and developers that are eager to connect their projects with the subway. The greatest example of that lies in the case of Jamsil station, which is directly integrated with the Lotte World amusement park and the Lotte World department store. This was done very purposefully, with Lotte lobbying and indeed paying for their direct transit connection. In contrast, in the Seattle area we have the case of Bellevue Square, which is perhaps the most significant commercial area in the state next to Seattle's University Village mall. As Sound Transit planned to bring rail over to the suburb of Bellevue, its planners wanted a direct and legible connection with the mall. However, the mall's owner fought bitterly to prevent the station from being near his mall, or even to exist at all. Eventually, the station was built but several blocks away from Bellevue Square. Although cultural attitudes may change as time goes on, the opportunity for the system to properly integrate with major commercial areas may have already passed.

Nevertheless, the case of Seoul shows us that transit-commerce integration presents a strong opportunity for the long-term stability of a transit system. TCI stabilizes revenue at the margins, smooths demand/ridership fluctuations in weekend ridership and provides a modest but real non-fare revenue stream. Even without large-scale financial returns and even taking user experience benefits aside, there are genuine contributions that justify investment in TCI. It is clear from the findings that increased ridership and greater user experience is the main argument for transit-commerce integration.

5.5 Recommendations for Seattle-Area Planning

So, what should Sound Transit and other similar agencies take from the findings? First, that if stations are designed as destinations (not just throughways), ridership will increase significantly. To design a station as a destination, activation through commercial activity and cultural opportunities is essential. Going forward, many stations planned for Sound Transit 3, especially Ballard Station, Denny Station, and Alaska Junction Station, have significant potential for TCI if they are designed with commercial integration in mind from the outset instead of being retrofitted for it after opening. These stations should be designed with retail spaces built-in and directly accessible from the station's mezzanine.

Designing stations as destinations with commercial integration also reaps benefits in terms of user experience. Stations designed with weather protection, trip-chaining enablement (through commercial integration as well as easy access to desirable areas), and good wayfinding activate the behavior benefits that Seoul Metro demonstrates. Seattle's climate makes the weather protection aspect quite desirable, underground or covered commercial spaces connecting transit to surrounding retail areas would address one of the most significant deterrents to transit-mode choice in the Pacific Northwest. This is something that we already see in Seattle's Westlake Station, and although that case has not been as successful as it could be, does not mean that similar arrangements should not be designed in future Link stations.

Building on the previous section, Sound Transit should not expect commercial integration to offset capital costs or meaningfully reduce dependency on fares. The agency's retail integration report's revenue projections should be treated as a marginal supplement to system finances, not as a structural source of revenue. If an agency designs station-area retail for

primarily revenue optimization through high-yield tenants and market-rate rents, there is a significant risk of undermining the user experience benefits that create TCI's most significant contribution.

The importance of Sound Transit to integrate these lessons into future station designs cannot be underscored. As seen in the cases of Westlake Station and Downtown Bellevue Station, the system as it exists right now is littered with examples of wasted potential. Although a physical connection between transit and retail exists in Westlake Station's design (the train platform connects directly with both the Westlake Center mall as well as Nordstrom and formerly with Macy's when it existed) it is currently underutilized due to Nordstrom closing off their underground entrance as well as the failure of the Center and of Macy's. Bellevue Square in contrast has been incredibly successful as a commercial area, but the train station serving it was forced to be located four large blocks away due to political opposition. Although the municipal government has created a very pleasant pedestrian path from the station to the mall, the benefits seen in the Seoul model cannot be fully unlocked in this configuration as the Seoul model rests on direct integration as we see in Jamsil or Banpo stations. For example, the safety benefits of additional "eyes on the street" are not fully realized due to merchants existing but behind walls and doors. In the cases of those two stations, we see intentional integration at its best with subway stations connected directly with two of the most significant commercial areas in the city. Allowing for maximum convenience and comfort for transit users.

This study also recommends that the King County Department of Public Health work closely with Sound Transit to develop a new retail code specific to Link stations that allows for flexible vendors to operate in the stations with more generous allowances for nearby bathrooms,

temperature control, and food handling. It is important for the County to create a new permit category for transit station retail, so that this new (for Seattle) try of commerce is not held to the same requirements as fixed-location establishments. The County should look towards Seoul as an example there, allowing for specific rules that accommodate station-area retail.

In the same vein, Sound Transit should investigate the cost of retrofitting existing stations with restroom facilities and electrical infrastructure for vendor use. Of course, this is a financially significant action, so this study recommends a cautious approach that concentrates this at stations with the highest-level ridership and commercial potential like Capitol Hill and Westlake stations. This study further recommends that ST3 station design guidelines require restrooms, electrical infrastructure, and dedicated retail space in all new stations as building it in during construction is much less expensive than retrofitting down the line.

Something else to note is that Seoul's model emerged without formal policy mandating integration. North American agencies cannot then simply legislate their way into Seoul-style TCI, but the deliberate design choices for station planning can create the conditions for organic transit-commerce integration to develop. These design choices can include station layouts that lead users through commercial areas, favorable exit placement to already-busy pedestrian areas, ground-level retail requirements in adjacent developments, small-floorplate retail within stations themselves, and lease structures oriented towards everyday tenants and small businesses over prestige retail. Keeping rents low is essential to developing a dynamic and vibrant retail environment. The tenant mix recommendations found in Sound Transit's planning document gesture at this but do not fully develop it, or fully account for how it may affect the system. In future retail integration, Sound Transit should make sure to keep rents low to give opportunities

to small businesses that may not otherwise be able to afford a Seattle-area commercial lease. It should also prioritize leases to businesses that provide every-day necessities over high-end retail or national chains. Businesses like pharmacies, food and beverage, merchants, and bodegas. Sound Transit should also institute a single-operator limit similar to Seoul's to prevent commercial consolidation and preserve the small-business character of station retail. Moreover, the agency should offer flexible lease terms, specifically shorter initial leases with renewal options to lower the barrier to entry further for small vendors and allow the tenant mix to evolve with the neighborhood character. The upcoming new stations in Downtown Seattle, South Lake Union, and Seattle Center represent the highest architectural opportunity for the future of transit-commerce integration in the Seattle area. ST should begin with a vending pilot program at all underground stations (once a dedicated retail code has been established), and then gradually build the retail integration up from there.

Collated Findings and Recommendations		
<i>Finding Type</i>	<i>Finding from Seoul</i>	<i>Planning Implication and Recommendation</i>
Ridership	Integrated stations retain 84-107% of weekday ridership vs 54-66% at non-integrated stations on the same lines. Stations designed only for commuter throughput leave	Design stations as destinations, not throughways. Stations designed for ST3 (especially in the Ballard Link project) have the opportunity to capture weekend and leisure trips if commercial integration is built

	substantial non-peak ridership potential unrealized.	in from the onset, not retrofitted after opening.
Ridership	TCI effects hold across both urban and suburban typologies. The Jeongbalsan and Goyang precedents in Seoul show that TCI is viable in suburban contexts.	Suburban Link stations (Lynnwood, Federal Way, Redmond, etc) should not be dismissed as unsuitable for TCI. Lower density does not mean commercial integration should not be included, only that the scale and character should be different.
User experience	Weather protection and trip-chaining convenience are the primary behavioral drivers of TCI's user experience benefits	Seattle's climate makes the weather protection aspect especially beneficial. Underground or covered commercial connections between transit and surrounding areas directly address the most significant deterrent for transit-mode choice in the Pacific Northwest. Station design should prioritize exit placement and concourse design that enables access to areas with the most pedestrian and commercial activity.

User Experience	Small-business orientation within Seoul’s model for station area retail creates attachment to place and a sense of belonging amongst regular riders. It also creates opportunities for small businesses and entrepreneurs that may otherwise not exist within the city’s real estate market.	Optimizing station-area retail for high-yield tenants (national chains, and/or airport-style retail) may maximize profits but undermines the authentic usefulness that drives rider attachment and commuter convenience.
System finance	Revenue from commercial sources covered only 18-23% of Seoul Metro’s operating loss across 2022-2024, with the gap widening as deficits grew 77% since 2019 while commercial revenue stayed flat.	Agencies that invest in TCI primarily for revenue gain will likely be disappointed. Investment in TCI will mostly garner gains in ridership and user satisfaction. Agencies should not think of TCI as a financial solution. The commercial revenue from integration is real but only functions as a supplement to fares, taxes, and other revenue (e.g. station naming rights).

System finance	Hong Kong's MTR and Tokyo's railways achieve far stronger commercial revenue, but they do so through property development rights.	If Sound Transit, or other American agencies would like significant non-fare revenue, the policy conversation should be about development rights, not retail leases or station concession stands.
Governance	Seoul's TCI model emerged without a formal policy mandate. Rather, it evolved naturally through market forced, cultural norms, public-private partnerships, and deliberately below market rate rents.	American transit agencies cannot legislate their way into Seoul-style TCI. However, deliberate design choices can allow for their integration to develop naturally. Overall, station design is more important than policy alone. The physical integration of transit and commerce must be built into the station's architecture from the onset.
Governance	Integration must be designed in from the start and must be planned for early. Seoul's commercial network around subway stations took decades to develop organically.	If Seattle has any chance of developing significant transit-commerce integration, the city should act now. The design phase for Sound Transit 3 project will be key as many of the planned stations (in Ballard, South Lake Union, Downtown, and in West Seattle) are directly in existing dense, commercial cores.

		This is the highest leverage moment for commercial integration with the Link. Retrofitting stations later on is significantly more expensive and difficult than designing and including it during initial construction. This is a decision that cannot be deferred.
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5.6 Caveats and Final Thoughts

Although it is important to use other models as a guide, it is important to note that each transit system's model of transit-commerce integration is unique and responds to a special blend of cultural, demographic, and governance factors. It is not possible, or even desirable, to directly replicate and implement Seoul's model. Rather the appropriate lesson to take from the case of Seoul's TCI should be to extract its underlying logic. The lesson to be learned is that transit stations function better and are more successful when they serve more of daily life and are deliberately designed to contribute to the vibrancy of a city. How that specifically translates to local institutional and cultural constraints should be allowed to develop organically.

This is directly reflected in the Capitol Hill coffee cart case. This reveals several specific and tangible barriers to additional retail integration in Link stations, but at the same time, it revealed that the demand was present and it was more of an issue of a lack of supply that held back TCI efforts. It is important to realize that the success of future vending and station area

retail efforts lies in partnership towards specific TCI governance and regulations, as well as architectural retrofitting and future station guidelines that make TCI more viable. The benefits to ridership and user experience are more than worth this investment.

Compared to Seoul, Sound Transit's current approach remains limited in scale and constrained by policy priorities, particularly the emphasis on affordable housing within transit-oriented development. While these priorities are critical, Seoul's model suggests that integrating retail alongside housing could create more vibrant, station environments. Rather than viewing retail as secondary or optional, it should be considered one of the core components of station design and development. Now is Seattle's time to decide what a transit station should be and what it should offer its users. As we see in Seoul's case, retail integration allows a path forward to a more safe, vibrant, convenient, and viable transit system.

6. CONCLUSION

This study has sought to understand how Seoul's model of commercial integration within its subway system affects its ridership numbers, user experience, and system finances. To that end, this study has found that Seoul's model of TCI produces demonstrable, meaningful, and consistent benefits for ridership numbers and positive user experience. However, it falls short as a financial solution to any deficit issues or expansion plans. This study has further discovered that Seoul's TCI model emerged without a formal policy mandate and instead has been shaped and driven more by market forces. Seoul Metro has guided these forces, however, with values that seek to give opportunities to small businesses and provide everyday necessities for commuters. These findings have meaning both to planning thought as a meaningful contribution to the understanding of how TCI operates, but also to practical efforts as American transportation agencies, like Seattle's Sound Transit, increasingly try to implement retail integration in their own systems.

6.1 Summary of Findings

As for ridership, this study found that TCI is associated with substantially higher average daily ridership across all four case study stations (Gangnam, Jamsil, Seongsu, Banpo Express Terminal) relative to comparable non-integrated stations (Shindap, Yongdap). The weekend retention data is especially significant here, as high-TCI stations (Banpo Express Terminal and Gangnam) retain between 84 to 107 percent of their weekday ridership on the weekends, compared to 54 to 66 percent at low-TCI stations. This suggests that TCI generates demand, possibly as destination places, beyond simple commuting patterns and offers greater accessibility for transit riders. This is further supported by the increased land values around the case study stations, which suggests that the city's real estate market sees transit as a boon and opportunity,

and not a liability. Overall, the increased ridership seen in the findings suggests that TCI is not simply an amenity but is a significant effect on how people utilize transit systems and offers a broader range of trip types than stations designed as simple throughways can provide.

As for user experience, the Survey of Transit Users consistently identified safety through passive surveillance (“eyes on the street”), trip-chaining convenience, and increased urban vibrancy as the primary benefits of TCI. This seems to help explain the increased ridership at high-TCI stations qualitatively. It also supports Jan Gehl’s public space criteria as applied to transit stations and further emphasizes that transit stations can be important public stations in and of themselves. However, the responses regarding wayfinding were more mixed. Some respondents praised TCI as different shops and landmarks helped anchor paths and specific exits in their minds, while others felt that it made the process of moving through the space more confusing. Many respondents praised the small business character of the station retail and its value to everyday commuters. This directly corroborates Mehta’s findings that things like familiar vendors, convenient services, and habitual routines help to generate a sense of belonging in transit environments. These findings are perhaps most important for American transit agencies to draw from, as the effects are functional, and rooted in design and thus can be replicated at scale.

As for TCI’s effects on system finances, this study found that Seoul Metro’s commercial revenue covered 18-23 percent of its operating loss across 2022 to 2024 and is a ratio that remained essentially the same as the operating deficit grew 77 percent between 2019 to 2024. This is largely because Seoul Metro has never intended for it to be a financial solution. Also, free ridership to Seoul’s ever increasing aging population could contribute the deficit, which was not discussed in the research. Unlike other high-TCI transit systems (like

Tokyo and Hong Kong), Seoul Metro does not hold property development rights. Instead, it seeks to use its station retail to give opportunities to small businesses and provide commuters with everyday essentials. To that end, it deliberately charges below-market rents, avoids prestige tenants, and limits unit ownership to one per person. Although there has been some interest from American transit agencies to use TCI as a financial strategy, without property development rights and the ability to buy land below market-rate (as we see in Hong Kong), TCI is unlikely to cover much of a structural deficit.

6.2 Summary of Recommendations for Seattle-Area Planning

This study has prepared several recommendations borne out of the findings for any transit agency interested in TCI in the Seattle-area to use, especially Sound Transit. First, Sound Transit should work with King, Pierce, and Snohomish counties to develop a transit station specific retail code that accommodates flexible vendor formats (carts, kiosks, pop-ups, etc) with modified requirements appropriate to a station environment. The case of ‘Common Cart’ in Capitol Hill station demonstrates that the barrier to TCI is not one of a lack of demand, rather the lack of regulatory and physical infrastructure to meet that demand. As for infrastructure, the design guidelines for ST3 projects should require public restrooms, electrical outlets for vendors, dedicated space for vendors in the mezzanine, and small-scale retail units built into the station itself at all new stations. This is especially important for the new stations in downtown, South Lake Union, and Seattle Center. Moreover, once a dedicated transit retail code has been developed, the agency should run a broader program with vendor activations in stations with significant underused mezzanine space.

Looking towards the future, once a more matured retail integration program has been developed with a mix of station vendors and dedicated retail units owned by the agency, Sound

Transit's leasing program should prioritize necessities for everyday commuters over prestige tenants. It should also borrow Seoul's tenants of offering below-market rents and flexible lease terms to lower the barrier to entry. Retail unit and vending spaces should also be limited to one per person. The findings support that the small business character of Seoul's transit retail drove the behavioral benefits that TCI produces.

6.3 Contributions of This Study

This study has sought to provide the following contributions to the study and practice of planning. First, it provides a systematic and multi-dimension analysis of Seoul's transit-commerce integration model, examining ridership, user experience, and system finances together rather than in isolation. The author believes that this is the only work of its sort that exists in English-language planning literature. Second, this study provides an original financial analysis of Seoul Metro's revenue and deficits post-COVID, empirically establishing that TCI does not substantially address financial imbalances. Third, this study provides documentation of Seoul's split governance structure for its transit retail, its land use classifications (zoning), and its connection to how its commercial revenues have reached its ceiling. Finally, it provides a framework for how American agencies, specifically Sound Transit, should and should not apply Seoul's TCI model to their own station area planning. This is grounded in empirical analysis rather than aspirational comparisons, including specific regulatory, infrastructure, and design recommendations.

6.4 Study Limitations

There are a few limitations to the study's methods that should be addressed again briefly. The interview sample is small due to time and geographic constraints, and the mediated

interview process (Dr. Bae speaking to the experts on my behalf using my interview questions) introduced an additional layer of interpretation. Different and/or more interviewees could have emphasized different dimensions or see certain policies through a different perspective. They could have additionally offered alternative readings of the ridership and financial data. The survey sample is additionally a convenience sample with a likely positive bias towards subway stations and transit use in general, as all respondents were current or former UW College of Built Environments students. As such, the results are indicative but not statistically representative. Additionally, a case study of four stations in one city do not provide findings that are statistically generalizable. However, they are still analytically transferable and identify patterns that inform planning practice but cannot be assumed to apply universally. Finally, the financial analysis only covered the years since 2019. Starting earlier, perhaps looking from now to decades past and other sociodemographic, especially aging population and their free ridership, changes, would provide a more complete picture of how TCI interacts with the system's finances.

6.5 Directions for Future Research

The author has prepared a few directions for future research. The first idea is a study that focuses on the equity dimension. Specifically, how TCI affects the user experiences of different demographics: disabled people, elderly, young, low-income, high-income, etc. This would add a rich dimension in how we understand TCI's effects on user experience. Another direction would be for a more detailed, architectural set of recommendations for how station-area retail and vending spaces should be properly designed to bring out the most significant benefits of TCI. Finally, another direction could be an analysis of how differing cultural practices inform and affect TCI. Building from this study, research could be done as to how Korean culture and the

transition to market economy during the rapid urbanization and subway transit system has specifically informed Seoul's model of station area retail.

6.6 Final Thoughts

The success of our public spaces, including transit stations, is dependent on its vibrancy and its ability to make its users feel that the space is an extension of their life. Transit stations serve as essential elements for a good city form that provide vitality, accessibility, sense of place, memorability, etc. (Lynch, 1960 and 1981) Our transit stations are better when they serve more of daily life and make that daily life easier for everyday people. Seoul's model of TCI demonstrably improves the experience of transit riders, reflected by both the increased ridership numbers and survey testimonials. What we can learn from this is not a blueprint for how cities, like Seattle, can become Seoul, but rather we can learn how to extract the underlying logic of how to make transit systems work better through offering more of daily life by integrating different activities than focusing on commuting alone. Now, looking towards the future, as we are planning the design of stations that will be used for a hundred years to come, the evidence collected from this study suggests that decisions that support the success of retail integration should be made now.

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DETERMINATION OF EXEMPT STATUS

April 17, 2026

Dear Erik Wolfgang Byron:

On 4/17/2026, the University of Washington Human Subjects Division (HSD) reviewed the following application:

Type of Review:	Initial Study
Title of Study:	Transit, Commerce, and Land Use Experiences in Seoul
Investigator:	Erik Wolfgang Byron
IRB ID:	STUDY00025118
Funding:	None

Exempt Status

HSD determined that your proposed activity is human subjects research that qualifies for exempt status (Category 2). This determination may or may not be based on the Limited IRB Review process.

- This determination is valid for the duration of your research.
- This means that your research is exempt from the federal human subjects regulations, including the requirement for IRB approval and continuing review.
- Depending on the nature of your study, you may need to obtain other approvals or permissions to conduct your research. For example, you might need to apply for access to data or specimens (e.g., to obtain UW student data). Or you might need to obtain permission from facilities managers to approach possible subjects or conduct research procedures in the facilities (e.g., Seattle School District; the Harborview Emergency Department).
- HSD does not make determinations on behalf of other institutions. If other institutions are involved in the research, they may need to make their own determination or they may decide to be guided by our determination.

Only certain types of changes to exempt research require that you submit a modification in Zipline. For information about what changes

require a Modification, refer to the guidance on [Exempt Research](#). If you are unsure if your proposed changes require a modification, contact your [HSD team](#) before preparing the modification.

HSD does not review or approve consent plans and consent materials for exempt research. Researchers are still responsible for providing subjects with information about the research prior to their agreement to participate. Refer to the guidance on [Exempt Research](#) for details about what information should be provided. You may wish to use the optional [Exempt Consent Template](#) as a guide.

Thank you for your commitment to ethical and responsible research.

We wish you great success! Sincerely,

Greg Wallace, CIP
IRB Administrator -
Committee D
206.221.7973 –
gkw@uw.edu

APPENDIX B: Survey of Transit Users information

Sample email sent to survey participants:

Hello,

My name is Erik Byron, a Master of Urban Planning student at the University of Washington conducting research under Dr. Christine Bae.

I am writing my thesis about the integration of transit systems with commercial uses in station areas, with an emphasis on how it affects user experience. My main case study is the Seoul subway system as it is a world-class example of this integration. To that end, I would like to gather some comments and testimony from people that have used it and are able to compare it to Seattle's transit.

Christine has identified you as someone who could provide invaluable insight as someone knowledgeable in planning topics but also possessing experience with both Seoul and Seattle's transit systems.

I've prepared a short survey for you, which I've attached below. I would really appreciate your participation.

<https://docs.google.com/forms/d/e/1FAIpQLSe-Rhwf10BlqF8CPsVqy-aS8W-oVEvYz5IRKbQuSaMNcqkyUw/viewform?usp=publish-editor>

The survey should take 10 or fewer minutes to complete. Please complete it by EOD Tuesday, May 12th, 2026.

Thank you so much,

Erik Byron
University of Washington

Survey Questions

Thank you for your time and contribution to my research! Please complete the survey and reply by EOD Tuesday, May 12th, 2026.

Section 1: Seoul

For the next few questions, please recall a specific trip where you used a Seoul subway station that contains shops or services.

1. Are you familiar with Seoul Subway stations? If yes, which ones? (E.g. Seongsu, Myeongdong, Jamsil, Banpo)
2. What did you do inside the station besides boarding the train? E.g. shopping, food, art/entertainment, wandering.
3. How does the retail integration of Seoul's subway stations contribute to the vibrancy of the city? Which elements stand out to you the most? (Level of comfort? Safety? Number of shops? Differing types of shops/services? Bike ridership? Art and entertainment options? Something else?)

Section 2: Seattle Comparison

For the next few questions, please compare your experiences in Seoul with your normal experiences living in Seattle.

1. Are you familiar with Link stations in Seattle? If yes, which do you use regularly?
2. Do you think that transit-oriented development (shops and houses built near Link stations) in Seattle contributes to the vibrancy of the city? Which station area do you think is the most vibrant?
3. What stands out in your experience in Seoul's transit stations that makes it more/less vibrant than Seattle's transit stations (cleanliness, safety, retail, other)?
4. How easy was it to navigate through Seoul's stations and station retail? What elements made it easier or harder to navigate through compared to Seattle?
5. Are there any other comments that you would like to add?