

# Impacts Of Rail Transit On Property Values

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## ABSTRACT

Introducing rail transit into a region often creates expectations about the impact of the rail project on property values. Information on the impact of rail on property values is often incomplete and limited to anecdotal evidence, leaving regions planning for rail investments without a firm basis to judge the future impact of such an investment. In addition, this lack of complete information limits the extent to which transit agencies can develop strategies to maximize positive property value impacts. This paper summarizes a comprehensive survey of recent research on the impact of rail transit and property values. The impact of twelve rail projects (including both heavy rail and light rail) throughout North America is compared to develop general conclusions about the impact of rail on property values. In general, proximity to rail is shown to have positive impacts on property values. This conclusion is based on several measures of property value such as sales prices of single-family homes, apartment rents, and median home value. This survey of recent experience also reveals that the relative impact of rail transit is affected by a number of factors. The relative increase in accessibility provided by the new transit investment is the primary factor in increasing property values. In addition, some studies show that such factors as proximity to industrial uses or to highway facilities may limit the extent to which property values are increased. These conclusions suggest a number of strategies that transit agencies can undertake to ensure maximum property value benefit for land along future rail alignments.

## INTRODUCTION

The introduction of a rail transit investment brings benefits to the transportation system and to the accessibility of the population to employment, retail, and recreation activities. Rail transit investments also introduce a variety of impacts to the area around the rail alignment. One of the most significant impacts of a rail transit project is the

impact on property values. Numerous accounts of recent experiences with the impact of rail transit on property values have surfaced within the past two decades with varied results and general conclusions based on the local conditions of the rail transit systems studied. These numerous accounts often appear as isolated anecdotes in documenting the impact of rail transit on property values.

This paper presents a summary of the recent studies that examine the impact of rail transit on property values. It synthesizes the research in order to draw general conclusions and to place the various experiences in the context of one another. The summary begins with an enumeration of impacts of rail on single family homes. It continues with a discussion of additional studies that suggest that there are disparate property value effects based upon other factors. This discussion identifies various variables associated with a rail transit investment that contribute to positive and negative changes in property values. Finally, the summary ends with a suggestion that the primary positive impact of rail on property values is the impact due to accessibility.

The latter half of the paper speaks generally about another way that rail transit can affect property values, through new development. Because the documentation on the actual value increase is not as well documented as the value difference due to accessibility differences, the discussion focuses on general principles associated with the increased ability to develop land and the factors that contribute to intensification and changes in use. The paper concludes with a general discussion of strategies transit agencies can take to ensure maximum property value benefit.

## IMPACTS ON PROPERTY VALUES

### Positive Impacts of Rail on Residential Property

One of the more prominent ways that people understand the value of property is through the price or value of a home that they own or in the rent that they pay. Generally, individuals working in an office building or

purchasing goods in a retail store do not readily know the rents charged for office space or retail space. In addition, the amount of space devoted to residential property is generally greater than that devoted to other uses. Given that the number of residential property owners or of residential renters is greater than the number of consumers of other types of real estate, the effects of rail transit on rail transit are most acutely felt in the residential sector. For these reasons, much of the research performed on the impact of rail transit on property values focuses on the impact on residential property values.

The analysis of residential property impacts begins with a study on apartment rentals around stations on the Bay Area Rapid Transit (BART) system. The Bay Area Rapid Transit system in the San Francisco Bay Area is a transit system with the most well-documented impacts in the United States. Recent studies associated with the twentieth anniversary of the regional heavy rail system have detailed the impact of BART on property values. In a study to examine the potential for housing near transit, comparisons were made between the property values of new housing developments around several transit stations (many of them newly constructed) and developments well outside of BART station areas. Rental housing units near BART were found to enjoy higher rents over those away from the BART system. For example, one bedroom apartment units within a quarter-mile of the Pleasant Hill BART station in suburban Contra Costa County, east of San Francisco, rented for approximately 10% more per square foot than one bedroom units away from BART. Following a similar pattern, two bedroom units near the station rented at approximately 16% more per square foot than comparable units in the same general area but farther from BART. Another suburban area encompassing the cities of Union City and Fremont experienced a similar pattern of higher rents for transit-proximal locations.

This pattern was not widely felt, however, throughout the BART service area. For example, in northern Alameda County area encompassing the communities of Albany, El Cerrito, and Richmond, apartment unit rents exhibited no significant difference based on the distance from the BART station. This helps to highlight that different communities experience property value benefits differently. In some communities, transit options and transit accessibility play a larger role in housing prices than in others. Examining the difference even further with tests that hold other variables constant, such as the number of bedrooms, the age of the unit, and the presence of amenities such as playgrounds or weight rooms on the site of the housing complex, the rent premium for being within one quarter-mile of BART was found to be \$34 more per month. (1)

A separate study of the impacts of the BART system examined the impact on home values. Statistical models developed to analyze the impact of proximity to rail on property values showed that for every meter a house in Alameda County was located closer to the nearest BART station, its sales price in 1990 increased by \$2.29. For every meter a house was closer to the nearest BART station in Contra Costa County, the sales price increased \$1.96. According to the models, a house immediately adjacent to BART would sell for close to 38% more than an identical house not near any BART service (35 kilometers away). (2) Effectively, this comparison may represent the difference between the sales price of the home near a station of a mature rail system and the sales price of a home in a region without a mature rail system.

Another heavy rail system experienced mixed results with respect to the impact on property values. An analysis of single family home prices near the 21-mile heavy rail Metrorail system in Miami-Dade County, Florida revealed mixed results. In an analysis of comparing home price sales from 1971 (13 years before the 1984 opening of the heavy rail line) to 1990 (6 years after opening), property values near Metrorail stations experienced at most a 5% higher rate of appreciation in sales value compared to the rest of the City of Miami. The Miami study also found varying effects of proximity to rail. Housing prices in some neighborhoods also varied. Interestingly, the study attributed these variations to neighborhood type. For example, the introduction of Metrorail weakly increased the value of existing properties near transit stations in higher priced neighborhoods experiencing growth. Properties in neighborhoods experiencing decline showed almost no relative benefit to property values.(3)

An examination of areas near commuter rail systems in suburban Philadelphia confirms that there is a similar effect associated with commuter rail service. For two separate commuter rail systems, there are proven premiums for being near commuter rail. In suburban New Jersey, for example, the median home price for census tracts immediately served by the rail line operated by PATCO was generally 10% higher than the median home price in census tracts located away from the rail line. This differential was evident in the same direction for the Philadelphia suburbs within Pennsylvania. The average median home price for census tracts served by SEPTA commuter rail enjoy a 3.8% premium over the average median home price for census tracts not directly served by commuter rail.(4)

### The Potential for Negative Impacts

Given the positive nature of the correlation between rail transit service and property values, is there any potential for negative effects caused by new transit infrastructure? Can factors such as noise, traffic, safety, or aesthetics negatively affect property values? Two recent experiences – one with light rail and one with heavy rail – place the potentially negative effects in perspective.

A 1993 study of the Eastside Metropolitan Area Express (MAX) light rail transit line reviewed the impacts of rail transit to property values in suburban Portland. In general, Portland's experience is generally consistent with the results of the studies in other areas. Within the 2 years after the 1986 beginning of operation of the rail line, residential properties in the East Burnside area within 500 meters of the transit were, on average, 10.6% greater in value than homes outside of 500 meters. Properties within the 500 meter walking distance generally experienced higher property values the closer a property was to the station. Within the immediate station area, however, nuisance effects such as noise and increased traffic reduce the potential property value impacts of those properties closest to the station area. Nevertheless, that there is a net benefit shows that, at least in the case of this particular area within metropolitan Portland, the benefit of rail transit overshadows the nuisance effects.(5)

In Atlanta, the impacts of rail transit were tested in an area of DeKalb County along the East Line of the Metropolitan Atlanta Rapid Transit Authority. This study area was chosen because the neighborhood types served by the line to the north and south of the line are dramatically different enough to demonstrate if there are relative differences due to neighborhood types. The east line follows the right of way of freight railroad tracks stretching to the east from downtown Atlanta. As such, industrial uses lie on both sides of the rail transit line, generally adjacent to the right-of-way. These industrial uses, the railroads, and the MARTA East Line form a buffer between the neighborhoods to the north and south of the right-of-way. The areas to the north of the line comprised predominantly middle class neighborhoods with some prominent affluent sections. The areas to the south of the line are predominantly lower income, lower middle class neighborhoods. In 1980, the average value of housing on the north side of the tracks were more than twice the value on the south side of the tracks. At the same time, the mean

family income on the north was close to twice that on the south side. The fact that these two dramatically different neighborhood types were served by the same transit line presented the opportunity to examine if the impacts of rail transit on property values depend upon the characteristics of the neighborhood.

Examination of the effects of proximity to rail transit for these two neighborhoods showed that proximity to rail showed a positive effect on property values on the south side, but a negative effect in the neighborhood on the north side. In the neighborhood on the south side, property values increased close to \$1045 for every 100 feet a property was closer to the East Line. The opposite occurred on the north side. For every 100 feet a property was closer to the East Line, property values dropped by \$965. This negative effect may be due to such factors as noise, perceptions of crime, and visual intrusion. The pattern of rising property values as one travels to the north of rail tracks may also have to do with the general pattern of rising incomes as one travels to the north. In addition, proximity to the industrial uses and the freight railroad right-of-way were may also be deterrents to high property values. In the case of the south side, the value of accessibility provided by the rail line more than compensated for these nuisance effects. On the north side, the value accessibility was not enough to compensate for the nuisance effects. (6)

While the Atlanta experience appears to demonstrate the opposite effect of that shown in Miami, these differences can be explained by the assertion that rail transit imparts value to residential property in districts where the population values the access provided by that transit service the most, regardless of the income of the district. In Miami, higher growth, higher priced neighborhoods experienced a greater positive effect than stagnant, lower priced neighborhoods. In Atlanta, it appears that the opposite may be the case. The higher income neighborhoods did not appear to show value associated with being near rail while lower income neighborhoods did show positive value with that association. While this may appear to be a contradiction, these facts highlight one of the primary reasons why rail transit imparts value to properties. Rail transit shows positive correlation to property values to areas where the access provided by the transit service is valued. This is the case for both the high growth, higher valued districts in Miami and the lower income groups in suburban Atlanta.

## Factors Affecting The Magnitude Of Property Value

### Impact

#### *Access to Employment*

These studies all suggest that there are generally positive impacts of proximity to rail transit on property values, although some experience more pronounced increases than others. This leads to the following question. What is it about a rail transit system increases the value of property? And why do property values increase more in some cases than in others? The comparison of the Atlanta experience and the Miami experience highlight that the value of accessibility provided by rail transit accounts for a significant part of the impact on property values. The experience around the Philadelphia to Lindenwold High Speed Line supports this notion. In studying the impacts around this heavy rail connection between Philadelphia and suburbs in Southern New Jersey, it was found that there was an increase in value of \$149 (in 1971 dollars) in the price of a single family home for each dollar value of time savings to the Philadelphia central business district.<sup>(7)</sup> A similar effect was felt in the Toronto area. The average premium for the average home served by the new Spadina heavy rail line was found to be C\$2,237. Commute time savings contributed most to these premiums.<sup>(8)</sup> Effectively, individuals are capitalizing the time savings they receive by a lower priced commute into a higher priced home purchase.

Another study conducted in the Philadelphia area, examined the impact of commuter rail service on property values. Regional census tracts with commuter rail services averaged 12% more of their residents working in downtown Philadelphia than surrounding census tracts. Census tracts in suburban Philadelphia near Southeastern Pennsylvania Transportation Authority commuter rail lines generally had a median home price 3.8% above the median home price of census tracts not near commuter rail. Census tracts in Philadelphia suburbs in New Jersey near commuter rail lines operated by the Port Authority Transit Corporation (PATCO) demonstrated a median home price of 10% above those not near commuter rail.<sup>(4)</sup>

This experience suggests that the primary advantage of properties near rail over those not near rail transit is the additional accessibility that the rail transit line brings to those properties near transit. The added convenience of

accessibility manifests itself to different types of properties. Residential properties become more attractive because residents near rail more convenient access to regional employment, retail, and cultural opportunities. Properties holding employment uses such as offices and industrial sites experience higher property values because such properties have increased access to a larger labor market. In fact, office properties demonstrate a larger property value increase compared to industrial sites because office buildings tend to cluster in more dense concentrations, allowing for the benefit of rail to be more acutely felt. Finally, retail properties often benefit from the fact that rail transit contributes to the concentration of activity and increases in pedestrian traffic in transit-accessible, pedestrian-oriented districts.

#### *Pedestrian Accessibility*

Most of the tests of the impact of rail on property values showed that the positive effects of rail transit on property values were most prominently felt within a very limited distance from transit stations. This distance is determined by the distance of a reasonable walk from the station, generally one quarter mile to one-half mile. Beyond this zone, the effect of the proximity to rail on property values is negligible. Easier automobile access to stations, therefore, has limited appreciable effects on property values. This highlights the importance of creating more the pedestrian connections to rail transit stations and the enhancing the pedestrian environment around stations.

#### *Market Penetration*

The extent of property value increase appears to be affected by the market penetration of transit in the respective area. A comparison of various California rail systems confirms this. Statistical analyses compared 5 rail systems in California – the CalTrain commuter rail line connecting San Mateo County to San Francisco and San Jose, BART in the San Francisco Bay Area, the light rail systems Sacramento, San Jose, and San Diego. The study confirmed that the that those systems with the highest rates of ridership and that reached more locations within their respective regions, such as BART and the San Diego Trolley experienced the most significant association between distance from transit stations and property values. Property values in the regions these systems serve increased more than \$2 per meter the closer the property was to the transit alignment. This effect was stronger and more significant

in some portions of these regions than in others. Proximity to the CalTrain commuter rail service, and the Sacramento light rail system and the San Jose light rail transit system exhibited a negative relationship between proximity to the line and property values. The study suggested, however, that this negative effect may have been due to proximity to heavy industry and freeways near the light rail tracks. (9) This comparison suggests that rail systems that enjoy the highest rates of usage enjoy the greatest property value increases. This reinforces the notion that rail transit accessibility is one of the strongest determinants of property value increases.

### ***Development Impacts***

As the summary of studies shows, research on the impact of rail on property values has focused primarily on comparing the effect of distance from the rail system on property values. As just mentioned, this comparison suggests that the primary influence on property values is the improvement in regional accessibility that a rail transit investment brings. However, measuring the effect of proximity to rail at one point in time fails to capture the second major effect of rail on property values. Rail transit may make locations near transit more valuable as sites for potential development, thus increasing the value of property at those locations.

Second, rail transit can make a property a more attractive site for a higher level of development. Often, property owners decide they can develop their vacant parcels in order to capitalize on the proximity to transit. In other cases, an existing low density use can be converted to a higher density use or another type of use altogether. The conversion of properties from previously vacant sites to developed sites imparts additional value to the property. An informal survey of properties in Hillsborough County in Florida suggested that the average appraised value of developed parcels within the urbanized core was approximately \$19,000 greater per acre than that of undeveloped parcels in the same urbanized core. A review of the BART system 20 years after the beginning of revenue operation revealed that there were more significant changes in land use and density around the rail transit stations than near nearby highway intersections. Such change, however, has depended on the willingness of local jurisdictions to accommodate such development growth. (Cervero and Landis 1995, unpublished)

### **Policies to Maximize Positive Impacts of Rail on Property Values**

Given that there are proven positive impacts of rail on property values because of new accessibility and the because of the ability to attract new and more intense development, how best can transit agency maximize the potential for a property value increase? This section presents several strategies that transit agencies can undertake to maximize the positive impact on property values of a rail transit investment. As discussed earlier, there are two primary ways that property values can increase due to a rail transit investment. This section, therefore, groups the strategies into ways to improve accessibility and ways to improve the possibility of new development. In addition, this section briefly mentions strategies to minimize the potential negative impacts of a rail transit system.

#### **Improving Accessibility**

##### ***Plan for Regional Accessibility***

Improving accessibility provided by rail requires that the rail line or rail system be planned to reach regional accessibility centers quickly. When planning rail transit alignments, it is important, therefore, to place the rail line within a reasonable walking distance of current and planned regional employment centers, cultural centers, and retail opportunities. In fact, locations with high levels of employment accessibility, either through highways or through transit, generally have higher housing prices and rents than locations with less employment accessibility. (10) Any factor that increases the length of travel time to other locations near the rail system will unnecessarily reduce the accessibility provided by the rail transit investment. This reduction in the value of rail transit will result in lower than potential property value increases. Placing a rail transit station at locations far from strong centers of development will limit the accessibility provided by rail transit and therefore limit the impact on property values.

Maximizing the accessibility provided by the rail is also impacted by the plan for operations. Strategies to increase speed such as providing separate right-of-way to improve running speeds can reduce travel time to locations along the line. Increasing frequencies also increases the level of service provided by a rail line. In addition, providing some limited service by skipping stops at times of the day or by building fewer stops can improve accessibility in the region.

**Table 1: SUMMARY OF THE IMPACT OF RAIL TRANSIT FACILITIES ON PROPERTY VALUES**

AUTHORS	RAIL MODE	LOCATION (TRANSIT FACILITY)	EXTENT OF PROPERTY VALUE IMPACT	MAJOR CONCLUSIONS
Boyce, David et al. (1972)	Heavy Rail	Southern New Jersey (Philadelphia – Lindenwold High Speed Line)	positive increase of \$149 (1971 \$) in the price of a home for each dollar of value in time savings	<ul style="list-style-type: none"> <li>Property values incorporate travel time to major employment centers.</li> </ul>
Bajic, Vladimir (1983)	Heavy Rail	Toronto (Spadina Line)	\$2,237 premium for the average home	<ul style="list-style-type: none"> <li>Commute time savings contributes most to home value premiums</li> </ul>
Voith (1991)	Commuter Rail	Southern New Jersey (PATCO) Suburban Philadelphia (SEPTA)	+10% premium for median home price in census tracts served by rail line +3.8% premium for median home price in census tracts served by rail line	<ul style="list-style-type: none"> <li>Proximity to commuter rail service has some minor positive median home values</li> </ul>
Nelson, Arthur (1992)	Heavy Rail	Atlanta, Georgia (MARTA East Line)	+\$1,000 on home prices for each 100 feet a house is closer to a rail station in low-income transit adjacent census tracts; a slight negative effect in high income tracts (although this may be due to proximity to industrial uses or to low income neighborhoods)	<ul style="list-style-type: none"> <li>For lower income neighborhoods, the benefit effects of accessibility more than offset any nuisance effects.</li> <li>Higher value homes may be more sensitive to nuisance effects than by improvements in accessibility.</li> </ul>
Al-Mosaind, Musaad, et al. (1993)	Light Rail	Portland, Oregon (MAX Eastside line)	+10.6% for homes within 500 meters	<ul style="list-style-type: none"> <li>Where transit plays a minor role, transit's impact on property values is minimal.</li> <li>Positive effects of accessibility are stronger than the negative nuisance effects.</li> </ul>
Gatzlaff, Dean and Smith Marc (1993)	Heavy Rail	Dade County, Florida (Miami Metrorail)	at most a 5% higher rate of appreciation in real estate sales value compared to the rest of the City of Miami	<ul style="list-style-type: none"> <li>Residential values were, at most, only weakly impacted by the announcement of the new rail system</li> <li>Higher priced neighborhoods have experienced greater increases in property values near Metrorail stations while declining ones have not</li> </ul>
Landis, John et al. (1994)	Heavy Rail, Light Rail, and Commuter Rail	San Mateo County (CalTrain) San Francisco Bay Area (BART) Sacramento (Light Rail) San Jose (Light Rail) San Diego (The Trolley)	negative effect on proximity to Caltrain +\$2.29 per meter closer to BART in Alameda Co.; +\$1.96 per meter in Contra Costa Co. no discernable positive or negative impact -\$1.97 per meter closer to light rail (but negative effect may be due to proximity to industrial and commercial uses) +\$2.72 per meter closer to the Trolley	<ul style="list-style-type: none"> <li>The extent to which a rail system captures ridership from its market area affects the extent to which property values are increased</li> <li>Frequency of service and regional accessibility affect the amenity of a rail system</li> </ul>
Cervero, Robert (1996)	Heavy Rail	San Francisco Bay Area (Bay Area Rapid Transit)	+10-15% in rent for rental units within 1/4 mile of BART	<ul style="list-style-type: none"> <li>Units within a quarter-mile of the Pleasant Hill BART station rented for around \$34 more per month than comparable units farther away.</li> </ul>

### ***Improve Pedestrian Station Accessibility***

Positive property value impacts are primarily felt within a limited zone around transit stations, generally a reasonable walking distance of up to one-quarter or one-half mile. Enhancing pedestrian accessibility from the station to the surrounding area can thus increase the likelihood that properties will fall within a reasonable walking distance of the station and therefore experience a benefit to their value. Improvements to station area accessibility can take the form of increasing the density of streets and pedestrian paths, improving safety, lighting, and other pedestrian amenities, and by providing additional station entrances and portals to allow direct access to the station from more locations.

### ***Minimize Negative Impacts of the Rail Investment***

Although the exact impact of nuisance variables such as noise, and visual obstruction caused by at-grade and elevated rail guideways has not been extensively reviewed, several studies at least suggest that such nuisances do lessen the amount of property value benefit that properties near the rail alignment and rail stations experience (6). Rail investment planning thus should seek to mitigate these types of effects through effective design and engineering.

The examination of the impact of proximity to the MARTA east line in Atlanta may have also suggested that proximity to industrial uses often has a negative effect on property values. Because the most available railroad rights-of-way for developing rail transit investments often occur in industrial districts, it is important to plan for a conversion of uses to more transit-compatible uses. Transit agencies can help local municipalities and jurisdictions plan for appropriate buffer uses between the remaining industrial land and the transit station area. In the longer term, plans can potentially incorporate the eventual conversion of uses to more transit-compatible ones such as housing or commercial space. Recent experiences with joint development indicates that industrial sites often provide for attractive opportunities for redevelopment.

### **Improving Potential for New Development**

#### ***Assemble Development Sites***

Transit agencies are often left with surplus sites after completion of a rail transit investment. Often, these sites are no longer necessary for the operation of the transit system. Surplus sites, however, are often characterized by irregular shapes and small size. These constraints limit the

attractiveness of these properties as locations for development. Partnerships with adjacent property owners and with local jurisdictions can, however, enable the assembly of these sites into larger, more flexible sites that allow for a broader range of development options. The federal government has historically allowed lease of property to private developers as long as revenues were used for transit purposes. Recently, the federal legislation has permitted the sale of property for limited purposes.

### **Introduce Incentives and Reduce Regulation for Development Near Stations**

Often, developers are hesitant to be the first to enter a particular market niche. Development to capitalize on rail transit is often a new phenomenon to real estate developers in a given region because rail is often new to certain regions. Therefore, assorted incentives, both with increased financial incentives and decreased regulation may provide the jump start necessary to attract more developers to take advantage of transit-adjacent sites. Such incentives may include low-cost financing, mortgage guarantees, waivers or reductions in impact fees, and incentives to promote mixed uses.(11)

### **Support Joint Development**

Developers in cities with new rail transit systems often have little experience with developing around transit stations. Transit agencies can perform a role as a catalyst by partnering with private developers to jointly develop property adjacent to transit stations. Activities that support joint development can include providing information on available sites for development, by establishing a process to receive, evaluate, and approve development proposals, and by providing assistance in the public outreach during the development review process. Joint development also has the additional benefit of increasing the attractiveness of the station area. Coordinated planning around stations for property around station

## **CONCLUSIONS**

Rail transit investments have proven positive effects on property values. In fact, the effect of a new fixed guideway transit investment is two-fold. First, transit investments improve the convenience of accessing other parts of a region from station locations. Second, rail transit accessibility enhances the attractiveness of property, increasing the likelihood that the property can be developed

or redeveloped to a more valuable and more intense use. Documentation of the impact of rail transit on property values primarily focuses on the first effect. Property value premiums due to increases in accessibility range between 3% and 40%. Property value premiums due to increases in the ability to develop or redevelop property depend on the land use and amount of development allowed on the property. Slight negative impacts of rail on property values are generally attributed to noise, visual intrusion, and the association of the rail right-of-way with industrial uses.

Transit agencies can undertake a number of strategies to increase the potential to increase property values with fixed guideway investments. To increase the effect of improved accessibility, transit agencies can plan rail lines to be serve the most prominent existing and planned development clusters. It can also orient the operating plan to provide for the maximum accessibility benefit by limiting the number of stops and planning for higher speed services. In addition, a transit agency can work with local jurisdictions to enhance pedestrian accessibility in station areas. Enhancements such as increased density of streets and walkways and safety improvements, and can make the positive impacts of rail transit on adjacent properties more apparent. To increase the positive impact of rail transit through new development, transit agencies can work to assemble development sites and undertake joint development activities. It can also work to enable development and redevelopment of station sites through support of development incentives and enhanced zoning.

## ENDNOTES

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