# Station Parking and Transit-Oriented Design

## Transit Perspective

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**A simple analysis framework is presented to assist transit agencies and station-area communities in making informed planning decisions regarding the highest and best use of parking areas at suburban transit stations. The framework provides the flexibility to tailor values to local settings. The success of high-capacity transit systems depends on well-located and -designed stations. Outside regional commercial business districts, the most favored means of access to transit stations often is a park-and-ride facility. Many suburban station locations have reached full use of limited parking resources, and parking capacity has begun to limit opportunities to increase rail transit ridership. Thus, these major cost transit investments are not fulfilling their full potential as a result of constrained access capacity. Also, many station communities increasingly have been pressuring transit agencies to convert some station patron parking to transit-oriented development (TOD) uses, and some nearby private parking lots have been lost to TOD. Thus, station parking is not only limited but also under pressure for reduction. Little information exists to help transit agencies and local communities understand the highest and best use of limited station site resources. A simple spreadsheet analysis framework is presented to help transit agencies and local communities make informed decisions regarding parking and TOD. This suggested analysis framework focuses on the rail transit ridership implications of parking versus TOD and on the cost of station parking.**

Stations are critically important to the success of high-capacity transit systems. Each represents the front door or gateway to the system; conversely, stations represent major gateways into individual station communities. At most suburban stations, parking is the dominant use on the site and the preferred means of access for most patrons. As surface parking lots reach capacity, transit agencies have built parking structures, expanded lots, and implemented parking management programs. The latter programs have included paid parking for formerly free parking lots. Most transit patrons favor free parking, and the preference for surface lots versus structured parking depends on individual station features. Most station-area communities oppose increased traffic associated with parking expansion but also favor measures that minimize the effects of spillover from station parking. Surface and structured parking tend to be visually unattractive and can create barriers to pedestrian movement around stations. In this paper, the term "line-haul transit" is used to describe high-capacity transit services, primarily rail transit modes.

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Most stations are located as close as possible to the heart of a suburban town center and therefore occupy valuable sites for competing uses. The movement toward livable communities has increased pressure to locate transit-oriented development (TOD) near and over station sites. By locating high-density development near transit stations, more people should choose transit, walking, and bicycling alternatives to automobile travel for both commute and noncommute trips. Therefore, this strategy somewhat offsets the line-haul transit patronage losses resulting from the conversion of parking to TOD. Important peripheral issues relate to the amount of parking needed to support TOD uses.

Discussion of the need to create more station parking versus the need to convert station surface parking to TOD is common; unfortunately, it has not always been an informed one. A simple spreadsheet analysis framework is presented in this paper to facilitate informed discussions. Unlike numerous half-mile station-shed analyses, the spreadsheet framework is intended for decisions about station site parcels rather than a larger half-mile catchment area. Specifically, the analysis framework addresses ridership and cost questions such as the following:

1. What might be the line-haul transit ridership for a 3-acre parcel developed for surface parking, multilevel parking, residential TOD use, office TOD use, and retail TOD use?
2. How intensive would TOD need to be to provide the line-haul transit ridership equivalent to surface parking?
3. What is the full cost of surface and multilevel parking?
4. At what land value does surface parking become uneconomical and suggest the conversion to structured parking, TOD use, or both?

The two ridership issues are discussed first, followed by the two cost issues. These discussions are intended to provide background to allow the ridership and parking cost spreadsheets to be tailored to local conditions, substituting local values where available.

The authors recognize that line-haul ridership is not the only factor that must be considered in determining the best use for a station site, but this factor is an important one. In this context, line-haul ridership refers to patrons who ride high-capacity rail services as opposed to those who ride local buses.

## STATION ACCESS PROFILES

Parking tends to be the primary mode of access at many suburban stations. In the San Francisco, California, area, Bay Area Rapid Transit (BART) surveyed its patrons to determine their origin- or home-based access mode; results for some of the suburban stations are presented in Table 1 (*1*). An estimated 50% to 80% of the patrons

**TABLE 1 BART Station Access Modes (*1*)**

| | Patrons Not Parking | | | | Patrons Parking | | |
|---|---|---|---|---|---|---|---|
| Station | Walking (%) | Biking (%) | By Bus (%) | Dropped Off (%) | Driving Alone (%) | Carpooling (%) | Total Parking (%) |
| Castro Valley | 14 | 2 | 1 | 11 | 65 | 5 | 70 |
| Dublin | 4 | 1 | 9 | 15 | 60 | 10 | 70 |
| Lafayette | 12 | 2 | 1 | 9 | 68 | 7 | 75 |
| North Concord | 4 | 1 | 2 | 10 | 72 | 11 | 83 |
| Orinda | 3 | 2 | 1 | 13 | 64 | 11 | 75 |
| Pleasant Hill | 19 | 3 | 5 | 11 | 56 | 5 | 61 |
| Union City | 17 | 2 | 8 | 15 | 53 | 6 | 59 |
| Walnut Creek | 12 | 2 | 7 | 13 | 55 | 10 | 65 |
| Fremont | 17 | 1 | 8 | 15 | 50 | 8 | 58 |
| Concord | 11 | 3 | 7 | 13 | 56 | 9 | 65 |
| Hayward | 22 | 1 | 8 | 12 | 49 | 7 | 56 |

at these stations rely on parking for access. Most of these suburban stations have reasonable suburban-level bus services, and pedestrian and bicycle access is encouraged. Other stations in the BART system depend less on parking for access; however, many commuter rail systems and rail transit systems with less robust bus, pedestrian, and bicycle access means rely even more on parking for station access.

## USAGE EFFICIENCY OF STATION SITES

Parking stalls average about 300 square feet, including a proportional share of circulation and access aisles. To simplify the math for discussion purposes in this paper, the base unit is defined as a 10,000-square-foot station site parcel. For the base 10,000-square-foot parcel, about 33 spaces typically are achievable. Needs at a residential TOD site vary but might include 1,500 gross square feet (gsf) for the housing and another 300 gsf for associated parking (one space per unit). Together, these values would translate to an average of 1,800 feet per dwelling unit, which would yield 5.6 dwelling units per level for the base 10,000-square-foot parcel.

Office TOD site needs vary widely. However, if 2.0 parking spaces are considered to be equivalent to 1,000 gsf of office development, the 10,000-square-foot base parcel would yield about 6,300 gsf of office use (assuming no setbacks and full use of the parcel). Retail TOD site needs vary similarly, but if 3.5 parking spaces are considered to be equivalent to 1,000 gsf of retail space, the same base parcel would yield 4,900 square feet of retail. Non-TOD off-street parking ratios in the United States typically are 1.5 to 2.0 spaces per dwelling unit for residential, 4.0 spaces per 1,000 gsf for office, and 5.0 spaces per 1,000 gsf for retail. Thus, the parking allowances at TOD spaces listed here are substantially less than for typical developments.

## TOD RIDERSHIP

The amount of line-haul transit ridership that might be captured by TOD is influenced by many factors. Such factors include the competitive strength of the line-haul transit service, the type of TOD, parking policies for TOD, and the overall travel market around the station. Restrictive parking policies at TOD sites would further encourage the self-selection of residents and employees who are predisposed to ride transit. One common problem at stations is that some carpoolers use station parking, thereby preventing transit riders from using the parking. Similarly, people might choose to reside in a TOD because they like the walkable station area setting but have little interest in using the line-haul transit service. The more focused the TOD is on line-haul use, the greater the potential transit capture. Commute-oriented TOD and regional-attraction TOD tend to have higher line-haul transit usage than housing for seniors, unemployed low income housing, and retail that is oriented to local communities.

According to the Institute of Transportation Engineers (*2*), TOD might be expected to generate the following trips daily:

- 6 vehicle trips and 7.2 person trips per dwelling unit for residential,
- 10 vehicle trips and 11 person trips per 1,000 gsf of office use for office, and
- 40 vehicle trips and 52 person trips per 1,000 gsf of retail use for retail.

These daily vehicle trip rates were converted to daily person trip rates assuming 1.2 persons per vehicle for residential, 1.1 persons per vehicle for office, and 1.3 persons per vehicle for retail. Park-and-ride spaces should generate about 1.1 roundtrip person trips or 2.2 one-way person trips per space each day.

If the ranges of line-haul transit capture rates of 15% to 30% for residential, 5% to 10% for office, and 2% to 10% for retail were to be considered, the following line-haul transit ridership might be expected per 10,000 feet of total development (including parking):

- 72.6 line-haul trips for park-and-ride,
- 6.0 to 12.1 line-haul trips for residential TOD,
- 3.5 to 6.9 line-haul trips for office TOD, and
- 5.1 to 25.5 line-haul trips for retail TOD.

The use of local transit services would be in addition to these line-haul transit patronage figures. Values will vary by community, and each community should discuss these assumption inputs to reflect local conditions.

These relationships indicate that the conversion of a 3-acre parcel currently used for station parking would require 6 to 12 floors of residential TOD, 10 to 21 stories of office use, or 3 to 14 stories of retail use to generate the same amount of line-haul transit trips as the surface parking (949 combined total of daily boardings and alightings). At stations for which parking structures are not envisioned, the air rights above surface parking represent a development opportunity. Air rights from TOD could in fact add to line-haul transit ridership as long as its parking is self-contained in the air rights and does not use the surface-level patron parking below the TOD. Some potential might exist for commute-oriented TOD to allow less than one-for-one replacement of line-haul parking (perhaps 8 or 9 spaces for every 10 lost). TOD that achieves higher capture rates or that has tighter parking policies could improve on these estimates.

This discussion relates to parking in the immediate station area. Lower-density development adjacent to or a short distance away from the station would be a good complementary development practice. The higher the TOD density and the lower the TOD parking provision, the better the likely line-haul ridership. Air rights from TOD over surface parking could provide some line-haul patrons for free—that is, any line-haul trips generated by TOD would be added at no cost to the transit agency, as long as the trips did not displace or severely constrain line-haul patron parking. TOD parking should be constrained and not bundled into lease or other costs to maximize line-haul ridership. This TOD parking policy probably should be complemented by a parking management plan for the station and the station area to prevent line-haul patrons from abusing community parking resources as a result of spillover demand.

Another low-cost means of increasing station parking would be to implement a version of Shoup's benefit district concept, whereby parking permits might be sold for on-street parking around the station and the revenue used to fund local neighborhood improvements (*3*).

## LINE-HAUL RIDERSHIP SPREADSHEET

Table 2 describes how line-haul ridership can be estimated for surface parking, residential TOD, office TOD, and retail TOD for a station site parcel of 10,000 square feet. Row 1 is the parcel size in square feet. Row 2 is the unit square footage for each use: for parking, 300 square feet per space; for residential, 1,500 gsf (including hallways and so on). Row 3 is the amount of area required for 10,000 gsf of TOD parking (300 feet per space). Row 4 is any adjustment to developable site space (setbacks). Row 5 is the net adjusted number of parking spaces, dwelling units, and gross square feet of office and retail space: for residential, 10,000 gsf divided by 1,800 square feet per unit or 5.6 dwelling units; for office, 10,000 gsf adjusted for the 600 square feet for off-street parking. Row 6 is the daily person trip rate per parking space, per dwelling unit, or per 1,000 gsf of office or retail development. Row 7 is the daily person trip rate for the land use. Rows 8 and 9 are the high and low likely line-haul transit capture percentages (excluding local transit capture). Rows 10 and 11 are the resulting estimates of daily ridership using line-haul transit trip for the low- and high-use scenarios.

## STATION PARKING COSTS

Many motorists are accustomed to free parking and seem to assume that parking costs little or nothing to provide. Whereas many of the older rail transit systems have had a history of paid station parking, many of the newer systems began with free surface parking and began to charge for parking as the original lots reached capacity. Many transit operators do not fully understand the full cost of parking, which includes annual operating and maintenance costs as well as the capital cost for development. Capital costs tend not to be as onerous as annual operating costs because the federal government often funds 50% to 80% of the capital costs for station parking. After a parking lot is constructed, some transit agencies consider it free and worry about only annual operating and maintenance costs.

The capital cost to develop parking varies by locale and by the degree of design plushness. The typical cost to construct an average surface parking space is about $3,500. The cost to construct a one-level deck parking facility averages about $10,000 per space; for multilevel parking structures, the cost per parking space is about $15,000 for up to four stories and $20,000 for more than four stories. Costs of underground spaces average about $25,000 for one level and $35,000 for more than one level. Notably, water tables and soil geology can substantially increase the costs of underground parking structures. With a useful life of 40 years for

**TABLE 2 Line-Haul Ridership for 10,000-ft$^2$ Station Parcel**

| Row No. | Patronage Determinant | Parking | Residential | Office | Retail |
|---|---|---|---|---|---|
| 1 | Site area (ft$^2$) | 10,000 | 10,000 | 10,000 | 10,000 |
| 2 | Unit area (ft$^2$) | 300 | 1,500 | na | na |
| 3 | Adjustment for parking (ft$^2$) | 0 | 300 | 600 | 1,050 |
| 4 | Site use adjustment (ft$^2$) | 0 | 0 | 0 | 0 |
| 5 | Number of units | 33 | 5.6 | 6,300 | 4,900 |
| 6 | Person trips per unit | 2.2 | 7.2 | 11 | 52 |
| 7 | Daily number of person trips | 72.6 | 40.3 | 69.3 | 254.8 |
| Line-haul transit capture (%) | | | | | |
| 8 | Low | 100 | 15 | 5 | 2 |
| 9 | High | 100 | 30 | 10 | 10 |
| Daily No. of line-haul patrons | | | | | |
| 10 | Low | 72.6 | 6.0 | 3.5 | 5.1 |
| 11 | High | 72.6 | 12.1 | 6.9 | 25.5 |

NOTE: na = not applicable.

the parking and 4% interest, these costs translate into annualized costs of

- $177 for a surface space,
- $505 for a one-level deck space,
- $758 for a two- to four-story multilevel space,
- $1,010 for a five- to eight-story space,
- $1,263 for a one-level underground space, and
- $1,768 for a multilevel underground space.

Even though the land would have an endless useful life (full salvage value), it also would have a lost opportunity cost to lease for commercial purposes, so the annual commercial value of land and tax revenues lost would add to the per-space costs listed above. These values would vary substantially by location; therefore, no attempt is made to account for them in this paper. These considerations can be substantial, and local planners should include them in their discussions.

Annual operating costs for parking vary widely. They can include lighting, irrigation and landscaping, trash removal, security, insurance, basic maintenance, and fee collection and management. Suggested typical annual costs are $300, $400, and $500 per space for surface, structured, and underground spaces, respectively.

The total costs and the typical weekday cost recovery revenue per space for various forms of parking would be

- $477 annually and $2.01 daily for a surface space,
- $905 annually and $4.65 daily for a one-level deck space,
- $1,158 annually and $4.88 daily for a two- to four-story structure space,
- $1,410 annually and $5.93 daily for a five- to eight-story structure space,
- $1,763 annually and $7.42 daily for a one-level underground space, and
- $2,268 annually and $9.55 daily for a multilevel underground space.

Weekday cost recovery refers to the amount of revenue that would be needed each weekday to cover the full cost per parking space of constructing and operating the parking. The revenue estimates are based on 95% occupancy of the total number of spaces (effective capacity) and assume that off-peak weekend parking would be free.

The cost per surface parking space is higher than that for an above-ground structured parking garage space when land costs (about $2,500,000 per acre) also are considered, as illustrated in Figure 1 (*4*). Although transit agencies already own the land used for surface parking, they can recoup lost opportunity revenue by converting surface spaces to structured spaces after land values exceed $2,500,000 per acre. If construction costs are discounted to reflect only local costs, then structured parking becomes attractive when land values exceed $500,000 with 80% federal funding and exceed $1,200,000 with 50% federal funding. For suburban stations with high parking demand and limited space, these numbers suggest that land valued at up to $1 million per acre should be considered for purchase, with perhaps near-term use for surface parking, long-term use for TOD, and replacement parking provided in structures.

Tables 3 and 4 illustrate the parking cost spreadsheet tool. Table 3 describes total parking space costs, and Table 4 shows net new space costs for projects that develop on existing surface parking lots. In Table 3, Column 1 is the parking type. Column 2 is the number of spaces that can be provided on a 1-acre parcel (43,560 square feet) for each of the parking development concepts. Column 3 is the estimated construction cost per space. Column 4 is the estimated construction cost for each parking development concept. Columns 5 through 11 are the total parking development costs for land values of $250,000, $500,000, $1,000,000, $2,000,000, $2,500,000, $5,000,000, and $10,000,000, respectively. These total costs per space can easily be adjusted to reflect local costs by discounting the capital construction cost to recognize 20%, 50%, or some other level of federal funding. Shaded cells indicate per-space costs that are less than those for surface parking. Table 4 provides the same information as in Table 3 except that it is for the net new spaces added

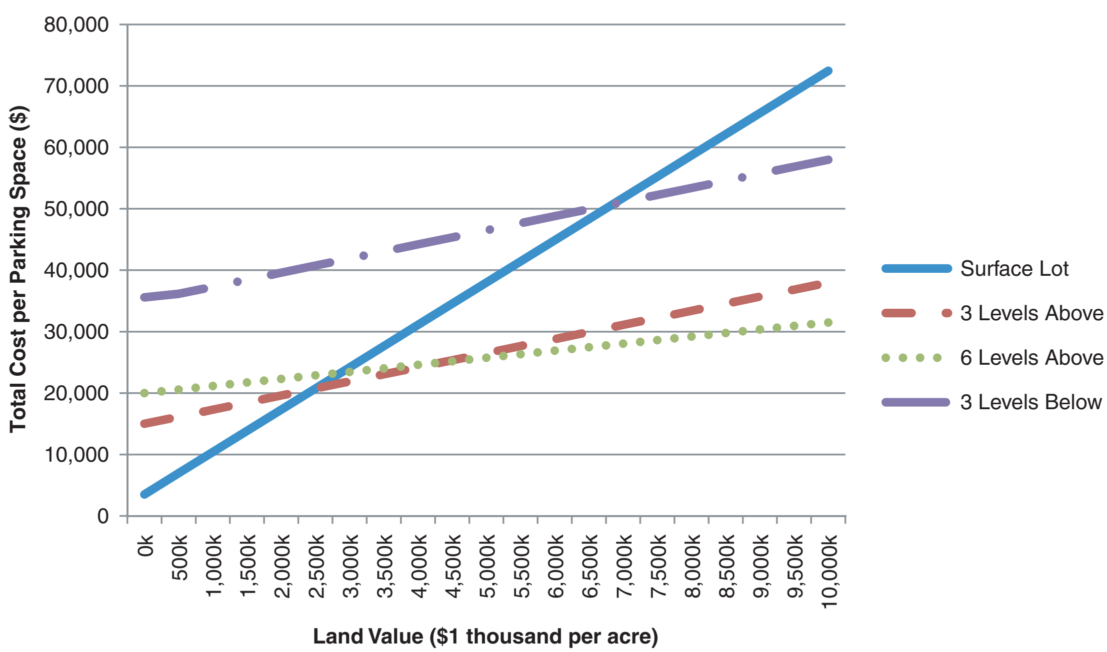


FIGURE 1 Effects of land value on cost of parking.

TABLE 3 Cost per Space for New Construction, by Cost per Acre

| Parking Type (1) | No. of Spaces (2) | Per Space Construction $ (3) | Total Construction $ (4) | Land Cost per Acre: $250,000 Per Space Total $ (5) | $500,000 Per Space Total $ (6) | $1 million Per Space Total $ (7) | $2 million Per Space Total $ (8) | $2.5 million Per Space Total $ (9) | $5 million Per Space Total $ (10) | $10 million Per Space Total $ (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| Surface | 145 | 3,500 | 507,500 | 5,224 | 6,948 | 10,397 | 17,293 | 20,741 | 37,983 | 72,466 |
| Above Ground | | | | | | | | | | |
| Deck | 290 | 10,000 | 2,900,000 | 10,862 | 11,724 | 13,448 | 16,897 | 18,621 | 27,241 | 44,483 |
| 3 levels | 435 | 15,000 | 6,525,000 | 15,575 | 16,149 | 17,299 | 19,598 | 20,747 | 26,494 | 37,989 |
| 4 levels | 580 | 15,000 | 8,700,000 | 15,431 | 15,862 | 16,724 | 18,448 | 19,310 | 23,621 | 32,241 |
| 5 levels | 725 | 20,000 | 14,500,000 | 20,345 | 20,690 | 21,379 | 22,759 | 23,448 | 26,897 | 33,793 |
| 6 levels | 870 | 20,000 | 17,400,000 | 20,287 | 20,575 | 21,149 | 22,299 | 22,874 | 25,747 | 31,494 |
| 7 levels | 1,015 | 20,000 | 20,300,000 | 20,246 | 20,493 | 20,985 | 21,970 | 22,463 | 24,926 | 29,852 |
| 8 levels | 1,160 | 20,000 | 23,200,000 | 20,216 | 20,431 | 20,862 | 21,724 | 22,155 | 24,310 | 28,621 |
| Underground | | | | | | | | | | |
| 1 level | 145 | 25,000 | 3,625,000 | 26,724 | 28,448 | 31,897 | 38,793 | 42,241 | 59,483 | 93,966 |
| 2 levels | 290 | 35,000 | 10,150,000 | 35,862 | 36,724 | 38,448 | 41,897 | 43,621 | 52,241 | 69,483 |
| 3 levels | 435 | 35,000 | 15,225,000 | 35,575 | 36,149 | 37,299 | 39,598 | 40,747 | 46,494 | 57,989 |
| 4 levels | 580 | 35,000 | 20,300,000 | 35,431 | 35,862 | 36,724 | 38,448 | 39,310 | 43,621 | 52,241 |

NOTE: Shaded cells indicate per-space costs less than those for surface parking.

for projects built on existing surface parking lots. About 145 spaces per acre would be lost, and the resulting cost per net new space added is shown.

The preceding discussion suggests that for TOD to provide the equivalent line-haul ridership return of surface parking (79 rides daily per 10,000 square feet of site area), about 7 to 16 stories of residential development would be required, with no allowances for setbacks or open yard area. Three- and four-story residential development would produce substantially less line-haul patronage than surface parking. About 10 to 21 stories of office and about 6 to 10 stories of retail would be required to provide the same level of line-haul ridership as surface parking. If multilevel parking is considered, then the amount of TOD would need to be even greater.

TABLE 4 Cost per Space on Existing Surface Lot, by Cost per Acre

| Parking Type (1) | Net Spaces (2) | Per Space Construction $ (3) | Total Construction $ (4) | Land Cost per Acre: $250,000 Per Net Space Total $ (5) | $500,000 Per Net Space Total $ (6) | $1 million Per Net Space Total $ (7) | $2 million Per Net Space Total $ (8) | $2.5 million Per Net Space Total $ (9) | $5 million Per Net Space Total $ (10) | $10 million Per Net Space Total $ (11) |
|---|---|---|---|---|---|---|---|---|---|---|
| Above Ground | | | | | | | | | | |
| Deck | 145 | 10,000 | 2,900,000 | 21,724 | 23,448 | 26,897 | 33,793 | 37,241 | 54,483 | 88,966 |
| 3 levels | 290 | 15,000 | 6,525,000 | 23,362 | 24,224 | 25,948 | 29,397 | 31,121 | 39,741 | 56,983 |
| 4 levels | 435 | 15,000 | 8,700,000 | 20,575 | 21,149 | 22,299 | 24,598 | 25,747 | 31,494 | 42,989 |
| 5 levels | 580 | 20,000 | 14,500,000 | 25,431 | 25,862 | 26,724 | 28,448 | 29,310 | 33,621 | 42,241 |
| 6 levels | 725 | 20,000 | 17,400,000 | 24,345 | 24,690 | 25,379 | 26,759 | 27,448 | 30,897 | 37,793 |
| 7 levels | 870 | 20,000 | 20,300,000 | 23,621 | 23,908 | 24,483 | 25,632 | 26,207 | 29,080 | 34,828 |
| 8 levels | 1,015 | 20,000 | 23,200,000 | 23,103 | 23,350 | 23,842 | 24,828 | 25,320 | 27,783 | 32,709 |
| Underground (assumes TOD surface use) | | | | | | | | | | |
| 1 level | 0 | 25,000 | 3,625,000 | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| 2 levels | 145 | 35,000 | 10,150,000 | 71,724 | 73,448 | 76,897 | 83,793 | 87,241 | 104,483 | 138,966 |
| 3 levels | 290 | 35,000 | 15,225,000 | 53,362 | 54,224 | 55,948 | 59,397 | 61,121 | 69,741 | 86,983 |
| 4 levels | 435 | 35,000 | 20,300,000 | 47,241 | 47,816 | 48,966 | 51,264 | 52,414 | 58,161 | 69,655 |

NOTE: ∞ (infinity) = division by zero.

This discussion relates to parking in the immediate station area. Increasing TOD adjacent to or a short distance away from the station would be a good complementary practice for increasing line-haul patronage. For ridership, the greater the TOD density and the lesser the TOD parking provision, the better the likely line-haul ridership. Also, air rights from TOD over surface parking could increase the number of line-haul patrons at no cost to the transit agency, as long as they did not displace or severely constrain line-haul patron parking.

TOD parking should be very constrained and not bundled into lease or other costs to maximize line-haul ridership. This TOD parking policy probably should be complemented by a parking management plan for the station and the station area to prevent line-haul patrons from abusing community parking resources as a result of spillover demand. Another low-cost means of increasing station parking would be to implement a version of Shoup's benefit district concept, whereby parking permits might be sold for on-street parking around the station and the revenue used to fund local neighborhood improvements (*4*).

Even though parking provides the greatest line-haul transit ridership benefit, parking is the most costly station-area use. TOD potentially could provide revenue. In some instances, transit agencies have helped subsidize TOD, and no revenue was gained. Arguments have arisen between local communities and transit operators over which party benefits financially from the TOD. What seems clear is that when surface parking at stations reaches capacity, users should begin paying the costs of parking provision. One or two dollars per weekday would cover at least the annual operating and maintenance costs. Parking demand is elastic, and demand generally dampens somewhat from charging for parking use.

## SUMMARY

The simple spreadsheet analysis framework presented in this paper is intended to help transit agencies and station-area communities understand the line-haul patronage implications that are associated with the conversion of station parking into TOD use. The framework also helps parties understand the real estate economics of when surface parking becomes an uneconomical use of valuable station land and structured parking should be considered.

Findings of this generic analysis include the following:

- Parking provides the greatest line-haul transit ridership potential, with surface parking ridership dwarfing even high-rise TOD. If TOD replaces surface parking, then it must be very high-rise and must complement policies to minimize TOD parking and encourage TOD line-haul transit use. This conclusion applies primarily to the development of station parcel TOD but also holds true for adjacent parcels and TOD in the catchment area of the station.
- Station parking provision is expensive, and users can reasonably be expected to pay for the convenience.
- Even if local transit use is added to the line-haul transit use, TOD is likely to generate more vehicle trips than station parking is.
- At land values of less than $2 million dollars per acre, surface parking is more cost-effective than structured parking.
- Convenient station access is critical to the success of high-cost line-haul transit investments, and after a station is located, little flexibility exists to replace that station's system access.
- Besides line-haul patronage, some factors that are important to consider in determining the highest and best use for a station site parcel include livability, economic revitalization, and environmental objectives.

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*The Intermodal Transfer Facilities Committee peer-reviewed this paper.*