

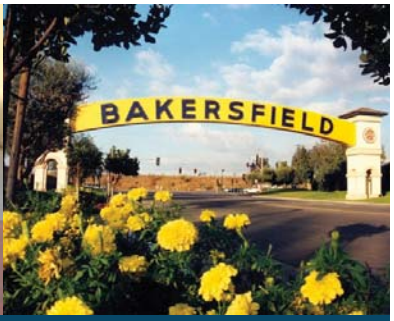

METROPOLITAN BAKERSFIELD TRANSIT CENTER STUDY

Market Assessment Study

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For
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May 2015

Kern Council of Governments

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Executive Summary

This Market Study summarizes the efforts of Task 5 for the Kern Council of Governments' Metropolitan Bakersfield Transit Center Study. The purpose of this study is to assess the Transit-Oriented Development (TOD) potential of each of the 9 station site alternatives considered by the Project Team for the proposed Transit Centers. HDR has recently performed similar market feasibility studies for several other cities throughout the State of California, including San Francisco, Los Angeles, Upland, and Santa Ana. These studies have coincided with a growing interest by municipalities to evaluate, capture and leverage the economic benefits and real estate value that are generated from public investments in new transit facilities. Key insights from each of the three main sections of the Market Study are summarized below.

Station Site Development Potential. The Market Study provided an assessment of the potential for the future Transit Center to accommodate new retail uses on site. Many new transit centers in other cities have been designed to capitalize upon the significant levels of foot traffic and retail spending potential that the confluence of multiple transit services generate. Demand for retail space at the future Transit Centers will be strongly correlated with the number of daily boardings/alightings and hence level of foot traffic that the combined bus and/or rail services co-located at the Transit Center attract. The site alternatives encompass a broad range of existing and projected ridership levels, from approximately 76,000 boardings/alightings at the CSU-Bakersfield location (Site 4) to nearly 2 million projected annual boardings at the future California high-speed rail station (Site 5b).

This TOD assessment is comprised of three main elements:

1) a phased estimate of future demand for residential, retail, and office uses through 2040 within a half-mile radius of each of the station site alternatives;

2) a zoning analysis of the quarter-mile and half-mile areas around station sites to determine the types of new development that are currently permitted and to assess the compatibility of those permitted uses with TOD; and

3) a market feasibility study for different types of TOD-compatible building typologies, based on existing rents, vacancy rates, and other market related factors typically used by private-sector developers to assess feasibility.

The annual spending by transit riders will support less than 1,000 square feet of transit center retail at the vast majority of the site alternatives. For these sites, successful retail formats may include carts and kiosks offering food and beverage items. The Amtrak Station and California High-Speed Rail Stations have sufficiently robust ridership levels to support more conventional retail space, such as food service establishments and convenience shops. A modest version of "destination" retail might even be appropriate for the future Transit Center co-located with HSR service at Site 5b.

Projected Future Demand for Residential, Retail, and Office Uses. Demand forecasts for new development within a half-mile radius of each station site alternative (the "TOD Market Area") were developed using TAZ-level population and employment projections.

The TAZ-level projections do not take into account the potential growth inducement impacts of the planned California High Speed Rail (HSR) system, so those impacts were incorporated into the demand forecasts. The HSR system is projected to add about 1,000 more people and 5,800 more jobs within Kern County compared to the No Project Alternative, and at least 15 percent of that additional residential and employment growth is projected to occur within the half-mile TOD Market Area around the planned HSR station.The inducement analysis further indicates that the employment growth associated with new HSR service will be led by the professional services and Financial, Insurance, and Real Estate (FIRE) job sectors, which may support denser station-area development for office-style facilities.

Residential Uses. The long-term population forecast for Kern County estimates growth of 501,377 between 2015 and 2040, equivalent to 107,311 new households, an average annual growth rate of 1.2 percent. The half-mile TOD Market Areas are projected to capture only a tiny fraction of the countywide growth over this period, ranging from a low of 0.2% at the CSU-Bakersfield site (projected demand of 230 new residential units) to a high of 1.8% at the Downtown Transit Center (projected demand of 1,960 new residential units).

Retail Uses. In the near term (2015-2020), only one of the site alternatives, the Downtown Transit Center (Site 2), appears to have sufficient retail demand to support a major new shopping center in excess of 100,000 square feet, approximately the size of a large supermarket or an urban Big Box store, such as City Target. Over the long term (2021-2040), five of the nine site alternatives (Sites 2, 3, 5a, 5b, and 7) could potentially absorb a retail center of this scale. Because this type of "anchor" tenant attracts consumer spending from a radius beyond the half-mile Market Area, it helps to support a critical mass of new retail businesses and reduces the phenomenon of sales "leakage," whereby residents spend more on retail products than local businesses capture. In the absence of a sufficient demand for an anchor, most of the new retail development at other site alternatives will likely be incremental, consisting of neighborhood-serving establishments.

Office Uses. Demand for office space is driven fundamentally by employment growth in four key sectors: FIRE, Government, Business and Professional Services, and Communications. While these four sectors are projected to account for an increased share of new job growth in the Bakersfield region, the average amount of office space utilized per worker has been on the decline for the past decade, with a broad range of industries moving towards more efficient office floor plans. Ten years ago, the average space occupied per worker was approximately 250 square feet. Today, the average space per worker is less than 200 square feet. Given uncertainties over traditional forecasting methodologies for new office demand, a conservative assumption of 170 square feet per new office worker was used in this analysis. The projections show the most robust office demand at station site alternatives located in Downtown Bakersfield, with a range of 840,000 to 1.3 million square feet of office space to be absorbed over the analysis period (2015-2040).

Zoning-Based Assessment of TOD Potential. An analysis of the quarter-mile and half-mile areas around station sites was performed to determine the types of new development that are currently permitted by the City and to assess the compatibility of those permitted uses with TOD. The nine station site alternatives were ranked for TOD potential from "high" to "very low" based on the opportunities and

constraints observed in the distribution and types of zoned uses, the implied allowable development densities associated with each zoning classification, existing street block characteristics/level of walkability, other relevant physical site conditions, and projected levels of future growth assessed in the previous section of this report. Table 11 in the report provides a summary of this assessment. The TOD potential rankings are reproduced in Table ES-1 below.

Table ES-1. Summary Ranking of Site TOD Potential

TOD Potential	Site(s)
High	2-Downtown Transit Center
Medium-High	5a-Amtrak Station 5b-CAHSR Station
Medium	3-Southwest Transit Center 4-CSU-Bakersfield
Medium-Low	1-Bakersfield College 6-Niles/Vernon Avenue
Low	8-Mt Vernon Ave/Highway 178
Very Low	7-Panama Lane/Highway 99 9-California Ave/Highway 99

The analysis found the following:

- Few of the 9 candidate station areas are currently zoned for high-density residential buildings (R-4 zoning classification), and most are located in built-out neighborhoods with a lack of land availability for new "greenfield" construction (absent the conversion that would be required of land zoned "Agricultural" at Bakersfield College and CSU-Bakersfield). Most of the additional housing units will therefore have to be accommodated through the redevelopment and densification of existing properties.
- Based on current zoning, most of the station site alternatives currently permit only low-density commercial (C-1, C-2) and residential uses (R-1) that do not, in isolation or in combination, meet the threshold of 25 persons and jobs per acre typically required to encourage transit ridership and reduce auto dependence.
- Central Business (C-B) and Civic Center (C-C) are the only zoning classifications to allow high-density, mixed-use development "by right"—that is, without a conditional use permit; these zoning classifications exist only in the downtown Bakersfield area.

Market Feasibility Analysis. Imputed per-square foot sale prices and development costs were compared for different types of TOD-compatible building typologies, based on existing rents, vacancy rates, and other market related factors typically used by private-sector developers to assess market feasibility.

For each station site alternative, the analysis assessed whether the following TOD-compatible building typologies are feasible based on prevailing real estate market conditions:

- Townhomes (3 stories)
- Mid-rise apartments (4-7 stories)
- Low-rise office (3 stories)

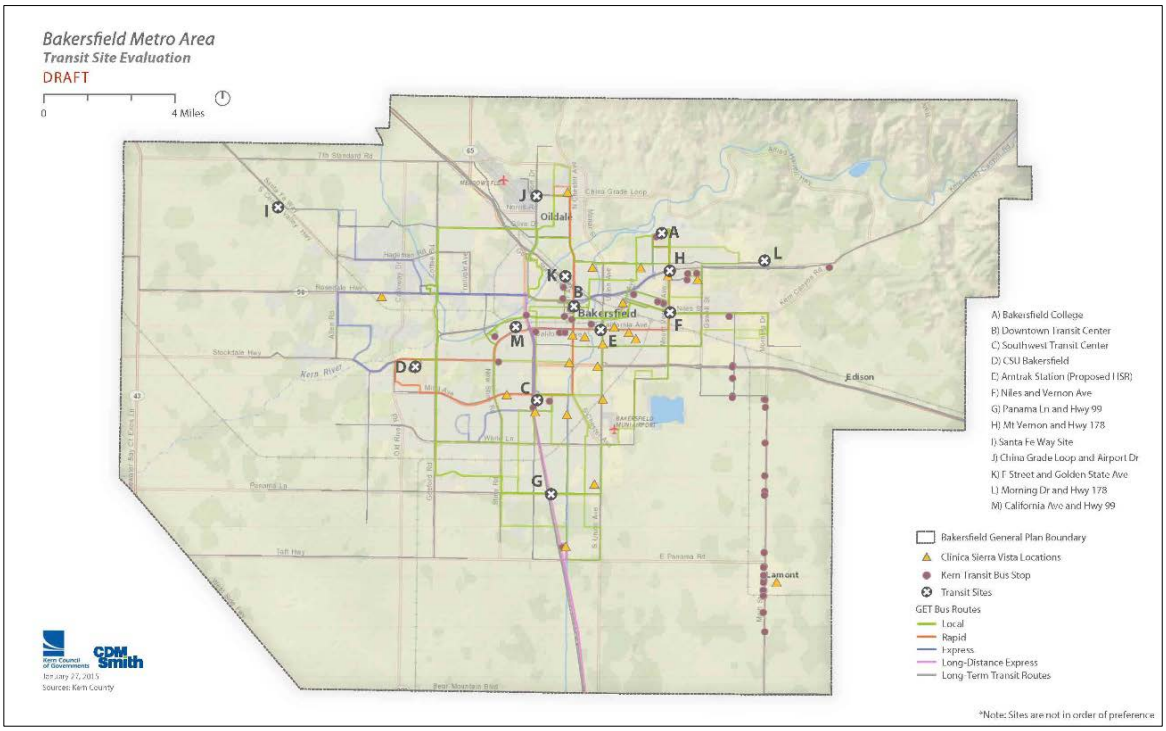
- Mid-rise office (4-7 stories)
- Medical office (1 story) – as a groundfloor use of a multistory mixed-use building
- Retail (1 story) – as a groundfloor use of a multistory mixed-use building

Overall, the market feasibility assessment shows limited near-term opportunities for these types of new development in the nine TOD Market Areas, as available inventory continues to suppress rent levels in many cases.

- CSU-Bakersfield (Site 4) appears to offer one of the more buoyant local real estate markets, driven by the ongoing expansion of the university, with a low vacancy rate (3.8 percent) and correspondingly higher property values. At that location, market conditions may be sufficiently favorable to support the construction of new townhomes and mid-rise office, despite low projected demand for these uses in the near term (which, as noted earlier, may not accurately capture future university expansion plans).
- Some new housing and retail development may be supportable in the near-term at the Southwest Transit Center (Site 3).
- Finally, Panama Lane/Highway 99 (Site 7) appears to be a strong market for new retail development; over the long term, office-based employment growth at this location is projected to generate sufficient retail demand for a major new shopping center in excess of 100,000 square feet.

Figure E-1 (below) displays the Transit Center site locations. Please note, while all sites are shown in the figure, secondary sites are not included in this Market Study.

Figure E-1. Transit Center Sites



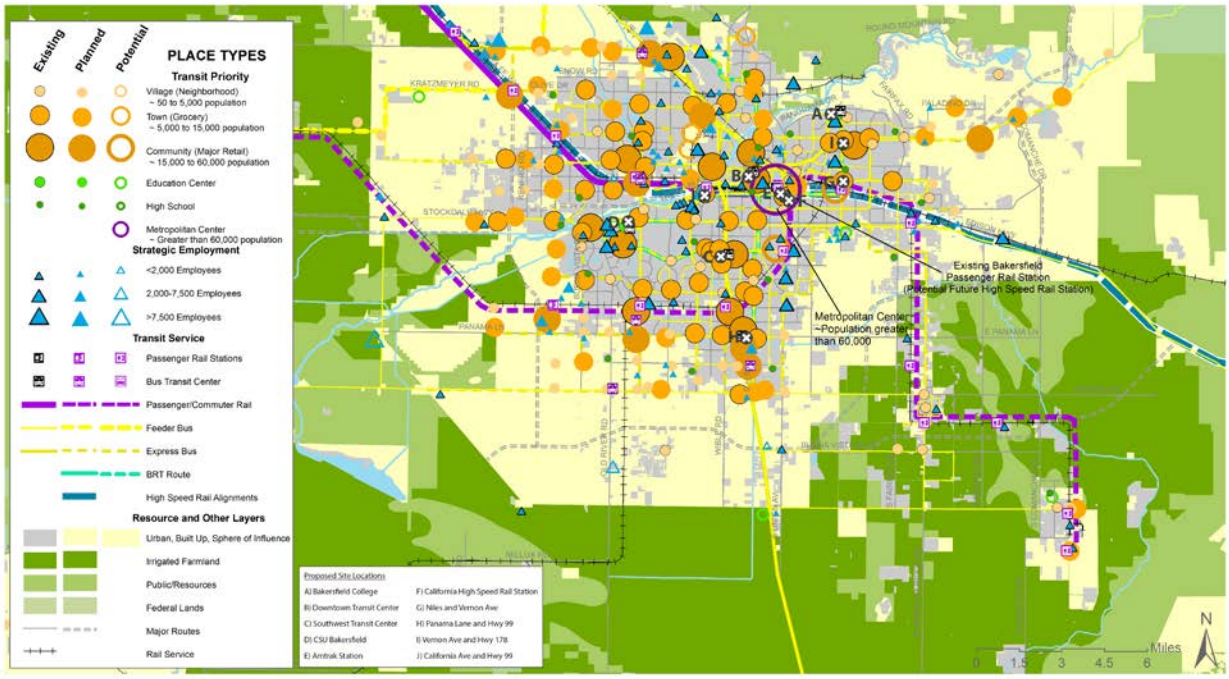
Introduction

HDR was retained by the Kern Council of Governments (Kern COG) as part of a multi-disciplinary team led by CDM Smith to assess the transit-oriented development (TOD) market potential for each of the Transit Center site alternatives. HDR has recently performed similar market feasibility studies for several other cities throughout the State of California, including San Francisco, Los Angeles, Upland, and Santa Ana. These studies have coincided with a growing interest by municipalities to evaluate, capture and leverage the economic benefits and real estate value that are generated from public investments in new transit facilities. In the locations where it is called upon to perform these feasibility studies, HDR brings an unique perspective to the quantitative and qualitative assessment of TOD potential, combining an expertise in multimodal transportation planning with an understanding of land use economics.

Depending on its location, the proposed Transit Center in Bakersfield has the potential to integrate a range of intra-city, regional, and intercity bus and rail services, including intermodal transit interfaces with the existing Downtown Bakersfield Amtrak Station and proposed Bakersfield High-Speed Rail station. One of the primary objectives of the TOD market assessment is to optimize the future location of the Transit Center by identifying areas within Kern County whose land use and demographic characteristics will be supportive of transit ridership.

Each of the nine sites are located in Transit Priority Areas, identified in the Sustainable Communities Strategy (SCS), shown in Figure 1. Transit Priority Areas are locations within ½ mile of transit stations where urban uses exist or may be planned. Not all of these areas have been identified, as station planning is in the early stages for some routes.

Figure 1. Sustainable Communities Strategy Transit Priority Areas



Source: Draft 2014 RTP, Chapter 4 Sustainable Communities Strategy. http://www.kerncog.org/regional-transportation-plan

Table 1 provides a list of the nine station site alternatives that were considered. The Amtrak Station (Site 5a) and California High Speed Rail (HSR) Station (Site 5b) were grouped as variations on one alternative due to their geographic proximity and overlapping Market Areas.

Table 1. Transit Center Site Alternatives Considered

Site	
1	Bakersfield College
2	Downtown Transit Center
3	Southwest Transit Center
4	California State University Bakersfield
5a	Amtrak Station
5b	California High Speed Rail Station
6	Niles and Vernon Avenue
7	Panama Lane and Highway 99
8	Mt. Vernon Ave and Hwy 178
9	California Avenue and Highway 99

This TOD assessment is comprised of three main elements:

1) a phased estimate of future demand for residential, retail, and office uses through 2040 within a half-mile radius of each of the station site alternatives, based on TAZ-level population and employment projections;

2) a zoning analysis of the quarter-mile and half-mile areas around station sites to determine the types of new development that are currently permitted by the City and to assess the compatibility of those permitted uses with TOD; and

3) a market feasibility study for different types of TOD-compatible building typologies, based on existing rents, vacancy rates, and other market related factors typically used by private-sector developers to assess feasibility.

Projected Market Demand

This component of the TOD market assessment consists of two components: 1) a calculation of the potential for new development located on the Transit Center site itself, supported by the retail purchases of waiting or transferring transit riders; and 2) projected market demand for new residential, retail, and office uses through 2040 in the half-mile radius around station sites (the "Market Area").

Station Site Development Potential

Many new transit centers in other cities have been designed to capitalize upon the significant levels of foot traffic and retail spending potential that the confluence of multiple transit services generate, with some broadening their target markets to include not only transit riders who patronize the station as part of their commute, but local residents and visitors who live in the surrounding neighborhood. This type of

"destination" retail configuration is becoming increasingly common particularly as transit agencies seek new forms of revenue generation and creative partnerships with the private sector to operate and maintain station areas.

While many of the existing intercity and commuter rail stations in California have incorporated retail into their stations, at least two California cities with planned high-speed rail stations have also integrated a significant retail component into their station development plans. The new Transbay Transit Center in San Francisco is envisioned as a thriving transportation depot for eating, drinking, and shopping, with plans in the first phase for 100,000 square feet of leasable space divided over three levels.[1] The newly-constructed Anaheim Regional Transportation Intermodal Center (ARTIC) in Southern California, as a multimodal hub for Amtrak intercity rail, Metrolink commuter rail, and OCTA bus service, offers 12,000 square feet of retail and is expected to serve nearly 52,000 daily passengers at full buildout.[2] Whichever firm leases the retail space will also be responsible for cleaning and maintaining it.

Demand for retail space at the future Transit Centers will be strongly correlated with the number of daily boardings/alightings and hence level of foot traffic that the combined bus and/or rail services co-located at the Transit Center attract. Both San Francisco's Transbay Transit Center and the ARTIC are, perhaps not coincidentally, terminus stations for Phase I of the California HSR alignment, with a larger proportion of origin or destination HSR trips than "pass-through" stations such as Bakersfield. The wait/transfer times associated with origin and destination trips offer a prime opportunity to capture retail spending by passengers. This factor bodes well for leveraging potential retail demand at the Amtrak station (Site 5a), which is the current terminus of San Joaquin Corridor service and a major transfer point for connections to Southern California via Amtrak Thruway Bus Service.

To calculate the retail potential of each site, HDR compiled 2013 boarding/alighting statistics associated with existing local and regional Golden Empire Transit (GET) and Kern Transit (KT) bus routes, Amtrak intercity rail and thruway bus service, and future California HSR.

[1] J.K. Dineen, "Transbay Transit Center grand vision includes thriving retail hub," *San Francisco Chronicle*, December 10, 2014, accessed on March 3, 2015 at http://www.sfgate.com/bayarea/article/Transbay-Transit-Center-grand-vision-includes-5948997.php

[2] N. Deshmukh (2010), "Anaheim Regional Transportation Intermodal Center: Case Study," http://www.slideshare.net/nainadesh/literature-case-study-artic

Table 2. Annual Passenger 2013 Boardings/Alightings by Site Alternative

	Site								
	1	**2**	**3**	**4**	**5a**	**5b**	**6**	**7**	**8**
Service	Bakersfield College	Downtown Ctr	SW Transit Ctr	CSU-Bakersfield	Amtrak	CAHSR	Niles/Vernon	Panama/99	Mt Vernon/178
Amtrak San Joaquin	-	-	-	-	546,439	-	-	-	-
Amtrak Thruway	-	-	-	-	338,792	-	-	-	-
CAHSR	-	-	-	-	-	1,975,000*	-	-	-
GET Route 21	26,229	81,524	-	24,812	-	-	24,103	-	17,014
GET Route 22	-	-	68,220	39,795	-	-	-	-	-
GET Route 41	19,358	-	31,392	-	-	-	17,789	14,650	-
GET Route 42	13,131	40,814	21,294	-	-	-	-	9,937	-
GET Route 43	-	46,431	-	-	-	-	-	-	9,690
GET Route 44	22,120	-	35,871	-	-	-	-	-	14,348
GET Route 45	-	67,505	-	-	7,044	-	19,958	-	-
GET Route 47	-	-	-	-	-	-	-	-	-
GET Route 61	8,680	-	-	8,211	-	-	-	6,569	-
GET Route 62	-	-	9,303	-	-	-	-	4,341	-
GET Route 81	8,318	25,852	13,488	-	-	-	-	-	-
GET Route 82	-	9,246	-	2,814	-	-	-	-	-
GET Route 83	-	-	4,452	-	-	-	-	-	-
GET Route 84	-	7,648	-	-	-	-	-	-	-
GET Route 92	-	-	-	-	-	-	-	-	-
KT Route 100	21,000	21,850	-	-	1,300	-	-	-	-
KT Route 115	-	4,150	-	-	-	-	-	-	-
KT Route 130	-	3,050	3,100	-	250	-	-	-	-
KT Route 140	21,850	27,500	850	-	-	-	9,900	-	-

	Site								
	1	**2**	**3**	**4**	**5a**	**5b**	**6**	**7**	**8**
Service	Bakersfield College	Downtown Ctr	SW Transit Ctr	CSU-Bakersfield	Amtrak	CAHSR	Niles/Vernon	Panama/99	Mt Vernon/178
KT Route 150	1,000	13,150	-	-	-	-	1,750	-	-
Total	**141,687**	**348,719**	**187,970**	**75,632**	**893,825**	**1,975,000**	**73,499**	**35,497**	**41,052**

* projected boardings only for 2025; CAHSR ridership projections do not specifically estimate the number of alightings by station.

Note that this compilation of ridership data in Table 2 reflects *existing service only* (with the exception of the planned HSR service) and does not attempt to forecast the impact of future service changes or route modifications. For example, the extension of HSR from Bakersfield to the Los Angeles Basin will likely reduce demand for Amtrak Thruway bus connections, as some passengers who currently transfer from rail to bus at the Amtrak station will prefer to take a "one-seat" ride on HSR to their destination in Southern California. This may in turn reduce the level of retail space that the Amtrak station can support, but the potential impacts are difficult to estimate or quantify given the many unknowns surrounding HSR implementation.

As Table 2 shows, the site alternatives encompass a broad range of existing and projected ridership levels, from approximately 76,000 boardings/alightings at the CSU-Bakersfield location (Site 4) to nearly 2 million projected annual boardings at the future California high-speed rail station (Site 5b). These ridership statistics can be used to estimate the annual level of on-site passenger spending, that is, the amount that passengers spend while waiting or transferring at a transit center. The average on-site spending per trip will vary based on the demographic profile of the riders and trip purpose. Based on onboard survey data, the *GET Short-Range Transit Plan* identifies the "profile" GET rider as between 25 and 44 years of age with a household income of less than $20,000 per year. Intercity rail passengers on Amtrak California routes have a substantially higher median income estimated at $76,000, based on a 2013 survey[3], and accordingly, are likely to spend more than a local bus rider. This analysis used an average expenditure of $4.05 per rail boarding and $0.70 per bus boarding based on retail spending patterns at comparable transportation facilities. Applying these per-trip spending levels to the ridership statistics above, and using the Urban Land Institute's *Dollars and Cents of Shopping Centers* handbook on median sales per square foot[4] required to operate convenience retail profitably, it is possible to calculate the amount of retail space that each site could support.

[3] Amtrak California Summer 2013 Pacific Surfliner Ridership Profile Survey Results, http://www.octa.net/pdf/lossanagenda1-15-14.pdf

[4] See Table 1-8 in the *ULI Dollars & Cents of Shopping Centers* (2004). The median sales per square foot at neighborhood retail centers, which offer food service and convenience store items, was $276.94 in 2004, or $342.63 adjusted for inflation.

Table 3. Supportable Level of On-Site Transit Center Retail

	Site Alternative								
	1	2	3	4	5a	5b	6	7	8
	Bakersfield College	Downtown Ctr	SW Transit Ctr	CSU-Bakersfield	Amtrak	CAHSR	Niles/Vernon	Panama/99	Mt Vernon/178
Annual Boardings/Alightings	141,687	348,719	187,970	75,632	893,825	1,975,000	73,499	35,497	41,052
Annual Spending (in thousands)	$99	$244	$132	$53	$2,456	$7,999	$51	$25	$29
Target Annual Sales PSF	$343								
Supportable Retail SF	290	710	390	150	7,170	23,350	150	70	80

As shown in Table 3, the annual spending by transit riders will support less than 1,000 square feet of transit center retail at the vast majority of the site alternatives. For these sites, successful retail formats may include carts and kiosks offering food and beverage items. This is not only convenient for passengers in a hurry, but creates opportunities for small, local businesses to try out new concepts without the higher fixed costs of brick-and-mortar retail. The Amtrak Station and California High-Speed Rail Stations have sufficiently robust ridership levels to support more conventional retail space, such as food service establishments and convenience shops. A modest version of "destination" retail might even be appropriate for the future Transit Center if co-located with HSR service at Site 5b, given the proximity of the Bakersfield HSR station to downtown.

TOD Market Area Assessment

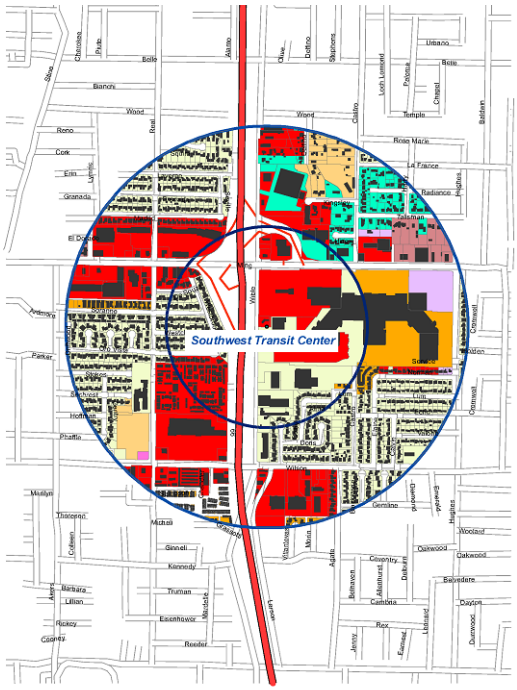
This assessment focuses on the one-half-mile buffer around the Transit Center site as the potential Market Area where TOD is likely to occur. One half-mile is generally considered the maximum distance that residents are willing to walk in order to access transit nodes for home-based trips, and conversely, the maximum distance that commuters are willing to walk in order to access places of employment in conjunction with a transit trip. Within this half-mile buffer, HDR analyzed population and employment projections provided at the Traffic Analysis Zone (TAZ) level to estimate future demand for residential, retail, and office uses through 2040.

Figure 2 provides a regional overview of the location of the 9 site alternatives, with Figure 3 providing a more detailed mapping of zoned uses within the one-mile radius around each site. Note that there is overlap between several of the TOD Market Areas, primarily in downtown Bakersfield. In order to be consistent, the Market Area analysis does not make adjustments for the overlaps. However, any market area overlaps are taken into consideration in estimating market demand and potential capture in the station areas.

Figure 2. Regional Overview Map of Site Alternatives

Figure 3. Potential Station Areas with Existing Half-Mile Zoning

Site 1



Site 3

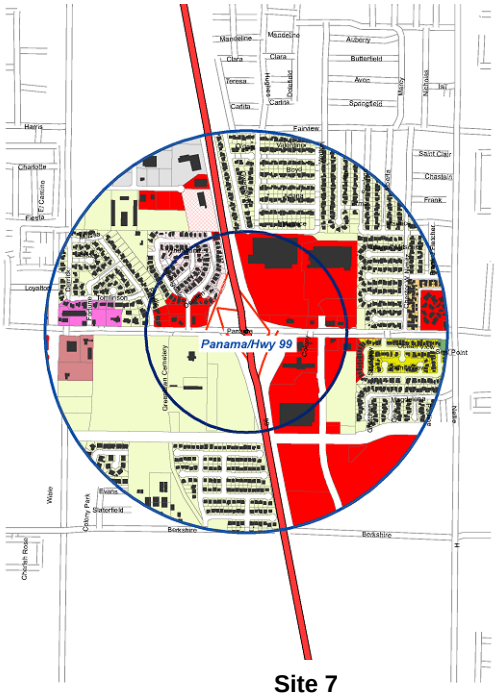
Site 4

Zoning Legend

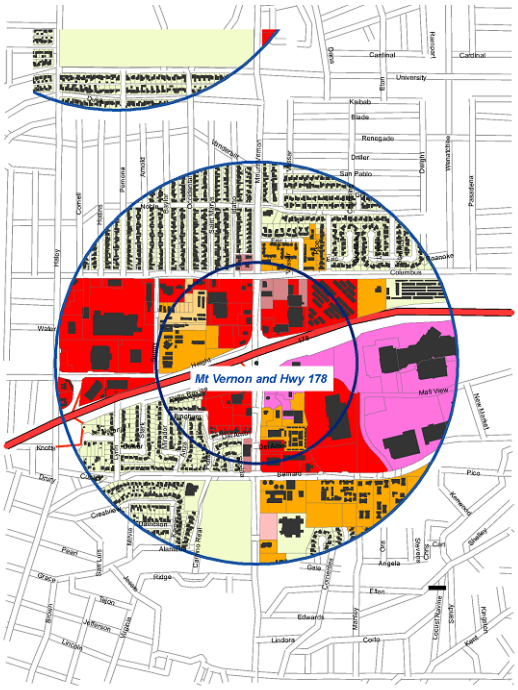
- A Agricultural;
- C-1 Limited Commercial
- C-2 Commercial
- C-B Central Business
- C-C Civic Center
- C-O Commercial and Professional Office
- MH Mobile Home
- OS Open Space - Flood Plain
- P Parking
- P.C.D. Planned Commercial Development
- P.U.D. Planned Unit Development
- R-1 One Family Dwelling
- R-2 Limited Multiple Family Dwelling Zone - 1 unit/2,500 sq. ft
- R-3 Limited Multiple Family Dwelling Zone - 1 unit/1,250 sq. ft.
- R-4 Limited Multiple Family Dwelling Zone - 1 unit/600 sq. ft.
- R-S Residential Suburban
- R-S-10A Residential Suburban - 10 acre minimum;
- RE Recreation
- Parks
- Lakes

Figure 3. Potential Station Areas with Existing Half-Mile Zoning

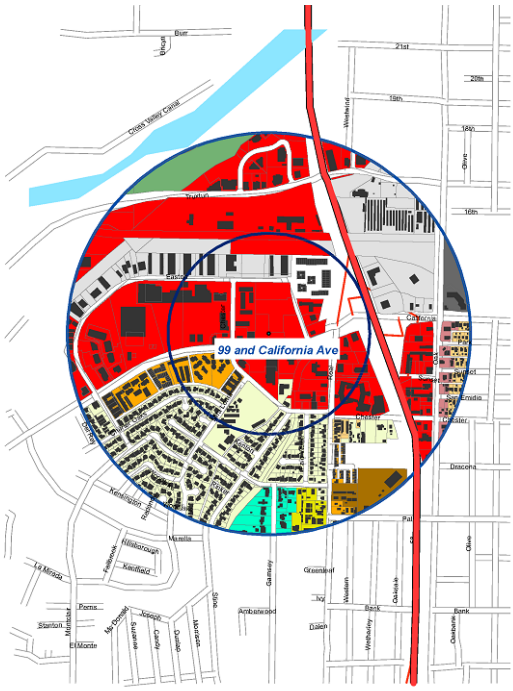
Site 6



Site 7

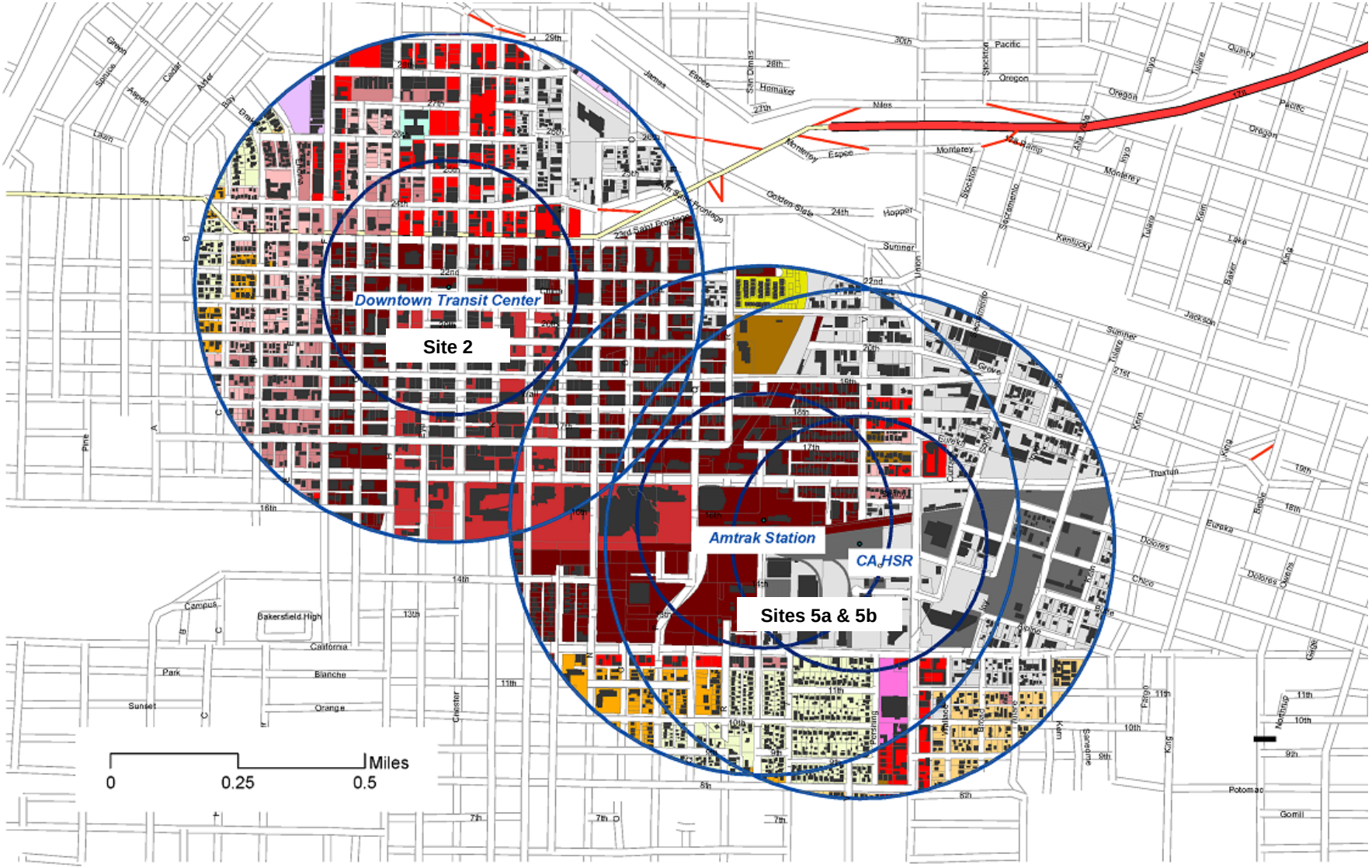


Site 8



Site 9

Figure 3. Potential Station Areas with Existing Half-Mile Zoning



The TAZ population and employment projections provide a baseline demand for new development potentials around each station site. These projections have *not* been adjusted to account for potential induced growth impacts attributable to the new Transit Center. Indeed, this analysis assumes that such impacts in the surrounding half-mile TOD Market Area are likely to be limited. This is a conservative approach, as academic research on the ability of conventional bus (as opposed to bus rapid transit) service to attract TOD is inconclusive at best. Most of the site alternatives considered in this study will feature only conventional bus service or, in the case of the Amtrak station, intercity rail service operating at >90 minute headways.

The preponderance of academic research on TODs concludes that fixed guideway projects, and specifically rail projects offering "high-quality transit service," typically defined as peak hour headways of 15 minutes or less, are the most likely to stimulate additional demand for development around station areas.

The private sector views these types of infrastructure investments as long term and stable, whereas most bus services are perceived as more vulnerable to route modifications and service reductions, making them less attractive as a basis for capital-intensive real estate investment. The more limited city-shaping potential of bus transit also derives in part from the perception that it delivers fewer regional accessibility benefits than rail.

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There is, by contrast, supportive analysis to suggest that the Bakersfield HSR Station (Site 5b) will be transformative for the greater metropolitan area, inducing regional population and employment growth that would not have otherwise occurred under a "No Project" alternative. As part of its program-level Environmental Impact Report, the California High Speed Rail (CAHSR) Authority quantified the induced growth impacts associated with the introduction of HSR service in the Central Valley as a result of increased statewide connectivity. The growth-inducement analysis was conducted for the forecast year of

[5] Robert Cervero, *BRT TOD: Leveraging transit oriented development with bus rapid transit investments*, Volume 36, November 2014, Pages 127–138. Accessed at http://www.sciencedirect.com/science/article/pii/S0967070X14001802 on March 3, 2015.

2035, in which the HSR system is projected to add about 1,000 more people and 5,800 more jobs within Kern County compared to the No Project Alternative.[6]

There is the potential for the future Transit Centers, if co-located with the HSR Station at Site 5b, to capture a portion of this additional growth within its half-mile Market Area. Indeed, by improving accessibility to labor and customer markets, the HSR system is projected to enhance the operational efficiency of businesses located in close proximity to an HSR station. The inducement analysis indicates that the employment growth associated with new HSR service will be led by the professional services and Financial, Insurance, and Real Estate (FIRE) job sectors, which support denser station-area development for office-style facilities. Similarly, at 54 minutes, the anticipated HSR trip length between Bakersfield and downtown Los Angeles will also make long-range commuting a viable option, with the potential to attract residential growth in proximity to the Bakersfield HSR station. The projected demand for new residential, office, and retail uses, summarized in Tables 4 through 6 below, assume that the half-mile Market Area surrounding the Bakersfield HSR Station will conservatively capture 15 percent of the total countywide induced population and employment growth associated with the initiation of HSR service. The CAHSR EIR estimates that "the potential impacts of the induced growth, to the degree that they can be detected, would be most apparent around urban HST stations and airports, where the additional traffic generated by induced growth is expected to be concentrated."

Residential Demand

The population forecast for Kern County estimates population growth of 501,377 between 2015 and 2040, equivalent to 107,311 new households, an average annual growth rate of 1.2 percent. The half-mile TOD Market Areas are projected to capture only a tiny fraction of this countywide growth, ranging from a low of 0.2% at the CSU-Bakersfield site to a high of 1.8% at the Downtown Transit Center.

Table 4. Half-Mile Market Area Residential Demand Summary

		2015-2020	2021-2040	Total
		units		
1	Bakersfield College	10	440	450
2	Downtown Transit Center	1,550	410	1,960
3	Southwest Transit Center	0	1,100	1,100
4	California State University Bakersfield	10	220	230
5a	Amtrak Station	1,040	650	1,690
5b	California High Speed Rail Station	440	620	1,060
6	Niles and Vernon Avenue	10	330	340
7	Panama Lane and Hwy 99	130	730	860
8	Mt. Vernon Ave and Hwy 178	240	520	760
9	California Avenue and Hwy 99	0	430	430

This growth forecast assumes no changes to existing land use policies. Indeed, few of the 9 candidate station areas are currently zoned for high-density residential buildings (see Zoning Analysis), and most are located in built-out neighborhoods with a lack of land availability for new "greenfield" construction

[6] See Table 5.3-5, *California High-Speed Train Final Program EIR/EIS, Chapter 5: Economic and Growth Impacts.* Accessed at http://www.hsr.ca.gov/docs/programs/eir-eis/statewide_final_EIR_vol1ch5.pdf on March 11, 2015.

(absent the conversion that would be required of land zoned "Agricultural" at Bakersfield College and CSU-Bakersfield). Most of the additional housing units will therefore have to be accommodated through the redevelopment and densification of existing properties.

This forecast does take into account the potential induced growth impacts of future California High Speed Rail service, which would likely be more focused on sites with proximity to downtown, if appropriately zoned.

Retail Demand

The retail demand summary is comprised of two components: 1) residential-driven demand and 2) office-driven demand. New households generate additional retail space demand of approximately 30 square feet per capita (excluding automobile sales), based on their annual per capita retail spending in all categories divided into the median sales per square foot required to support a particular retail category, as illustrated in Table 5.

Table 5. Per Capita Retail Demand Factors (in Square Feet)

Retail Use	Per Capita Demand
Local Serving	
Supermarket	4.8
Convenience	1.7
Strip Retail/Miscellaneous	1.2
Service Stations	1.5
Subtotal	9.2
Sub-Regional	
Discount Stores	2.3
Super Drugstores	1.1
Home Improvement/Building Materials, Home Furnishings	4.5
Restaurant	4.0
Cinemas	0.8
Subtotal	12.7
Regional	
Department Stores	2.3
Apparel/Specialty Category/Other	2.8
Automotive, Boats, Vehicular Sales	4.3
Entertainment/Specialty Centers	2.2
Subtotal	11.6
Total	33.5
Total (without automobile)	**30.0**

Source: Economic Research Associates

Household-driven retail uses delineated in Table 5 are classified into three categories: 1) local serving, 2) subregional uses, and 3) regional uses. This distinction is important because each type of retail assumes a certain catchment area from which potential customers are drawn and requires a certain customer base in order to be financially viable. A local cafe needs about 2,000 residents; local shops generally need 5,000. Further up the scale, a small multiplex cinema needs 80,000. At the top end, big retailers often need to be within reach of 1 million people.

The TOD Market Areas are most likely to attract local-serving uses that are accessible via a short walking or biking trip and economically viable based on patronage by local residents alone, rather than dependent upon a larger customer base drawn from outside of the TOD Market Area. For subregional and regional retail, the catchment area is larger, so residents within the half-mile TOD Market Area are more likely to be served by existing retail establishments located outside of the TOD Market Area.

For other reasons as well, not all types of retail uses listed in Table 5 may be viable within the half-mile TOD Market Area of each site alternative. Physical constraints, such as lot size dimensions, may not be compatible with the larger footprint of department stores or entertainment uses, such as multiplex cinemas. Nor may some of the retail uses, such as service stations or auto dealerships, be desirable from an urban planning point of view, since they do not promote walkability or support transit use. Second, the demographics of a given Market Area may not be suitable, as certain regional-serving uses require population densities and median household incomes to be at or above a certain threshold for those uses to be sustainable and profitable, as noted above. Third, the advent of internet shopping has made local retail increasingly hard to sustain in many places.

Given all of these factors, the total retail space supportable by household spending is likely to be less than 30 square feet per capita. This analysis assumes that 30 percent of new household retail spending will be captured within a given TOD Market Area.

In addition to residential-driven retail demand, office developments also generate significant demand for new retail space. According to the International Council of Shopping Centers (ICSC), office workers spend about $195 per week on all expenses associated with going to and returning from work and typical purchases around the office building during the workweek. The average-weekly spend on all goods and services by office workers in close vicinity of the worker's office building is $102. Among the expenditures on goods and services, grocery stores capture the largest spend, followed by discount stores.[7] Using ICSC's figures, a back-of-the-envelope calculation shows that for every 100 sq. ft. of office space, another +/-9 sq. ft. of retail can be supported.

To avoid double-counting retail demand from office workers who may also reside within the half-mile Market Area, this analysis discounts the estimate of +/-9 sq. ft. of retail per new office worker by 30 percent, in recognition of the well-documented lifestyle preference of Millenials to "live, work, and play" within the same neighborhood, especially in walkable downtown locations well-served by transit connections. Table 6 shows the combined office- and residential-driven demand for retail space for the Market Area surrounding each site alternative. Note that this retail demand is distinct from the on-site transit center retail demand estimated above in Table 3.

Table 6. Half-Mile Market Area Retail Demand Summary

		2015-2020	2021-2040	Total
		sf		
1	Bakersfield College	600	35,900	36,500
2	Downtown Transit Center	108,000	80,000	188,000

[7] *Office-Worker Retail Spending in a Digital Age*, International Council of Shopping Centers, 2012.

3	Southwest Transit Center	0	140,900	140,900
4	California State University Bakersfield	700	15,500	16,200
5a	Amtrak Station	82,500	76,200	158,700
5b	California High Speed Rail Station	43,600	88,300	131,900
6	Niles and Vernon Avenue	200	37,800	38,000
7	Panama Lane and Hwy 99	15,500	88,900	104,400
8	Mt. Vernon Ave and Hwy 178	19,600	42,800	62,400
9	California Avenue and Hwy 99	0	62,500	62,500

The total level of projected retail demand through 2040 ranges from a low of 16,200 square feet within the CSU-Bakersfield Market Area (Site 4) to a high of 188,000 square feet at the Downtown Transit Center Market Area (Site 2). The retail demand projection for the CSU-Bakersfield Market Area may reflect uncertainty over the timing of the University's expansion plans rather than a lack of future growth. Indeed, the CSU-Bakersfield 2007 Master Plan Update calls for the construction of significant new teaching and research facilities that will drive additional demand for retail and residential uses within the half-mile Market Area.[8] The high estimate for the Downtown Transit Center is, on the other hand, indicative of strong demographic trends favoring redevelopment of the urban core.

To translate these quantitative retail demand projections into the physical form of the built environment, Table 7 provides an indicative overview of the gross leasable area associated with various types of TOD-compatible retail configurations. Compatibility with TOD in this context means neighborhood- or community-serving retail that can be accommodated on the ground floor of a mixed-use office/residential building or appropriately scaled to fit within a typical city block of 500 to 1,000 feet without detracting from the walkability of the streetscape.

Table 7. Overview of TOD-Compatible Retail Typologies

Type of Retail	Gross Leasable Area (SF)
Food Service Establishment	300-1,100
Coffee Shop/Cafe	500-1,500
Minimart	10,000-15,000
Pharmacy	15,000
Supermarket	30,000-100,000
Urban Big Box	80,000-125,000

In the near term (2015-2020), only one of the site alternatives, the Downtown Transit Center (Site 2), appears to have sufficient retail demand to support a major new shopping center in excess of 100,000 square feet, approximately the size of a large supermarket or an urban Big Box store, such as City Target. Over the long term (2021-2040), five of the nine site alternatives (Sites 2, 3, 5a, 5b, and 7) could

[8] The CSU-Bakersfield 2007 master plan update envisioned the near-term addition of twin 32-story residential and mixed-use buildings to the campus, but these projects did not move forward as a result of the real estate downturn. Over the long term, the campus is capable of accommodating up to 18,000 students at full buildout, an increase from its current enrollment of 6,000 students. The University's near-total site control means that any future development within the half-mile vicinity of the proposed Transit Center location will be contingent upon University expansion plans. See *Final Environmental Impact Report, California State University Bakersfield, Campus Master Plan Update*, August 2007, accessed on March 4, 2015 at http://www.csub.edu/documents/FEIR.pdf

potentially absorb a retail center of this scale. This type of "anchor" tenant attracts consumer spending from a radius beyond the half-mile Market Area and thereby supports a critical mass of new retail businesses. By drawing customers from a broader catchment area, an anchor tenant helps to reduce the phenomenon of sales "leakage," whereby residents spend more on retail products than local businesses capture. In the absence of a sufficient demand for an anchor, most of the new retail development at other site alternatives will likely be incremental, consisting of neighborhood-serving establishments.

Office Demand

Demand for office space is driven fundamentally by employment growth. Of the eight major employment categories identified by the Bureau of Labor Statistics, four generate demand for office space:

- TCU (Transportation, Communications, Utilities) – 20% of TCU employment generates demand for office space
- FIRE (Finance, Insurance, Real Estate)
- SVCS (Business and Professional Services)
- GOV (Government, including Education)

In 2014, these four categories accounted for 42.5% of all non-farm payroll jobs in the Bakersfield-Delano Metropolitan Statistical Area (MSA). The overall share of regional employment in these four sectors is projected to increase regardless of new transit facilities or services; however, areas served by high-quality transit service, and particularly rail service, may have a higher potential to attract office jobs, based on the experience of other commuter-friendly rail services in California. Approximately 60% of trips on the Amtrak Capitol Corridor are work-or business-related; 30% of fares are purchased via a monthly pass, and likely reflect regular commute trips to office-based employment centers.[9] Just over half (51%) of systemwide ridership consists of commuters who work in the Government (14%), FIRE (finance/insurance/real estate, 11%), Business and Professional Services (9%), and Communications (7%) sectors based on Metrolink, the regional rail system in Southern California. The half-mile Market Area around the future Transit Centers are likely to exhibit a similar tendency to attract a higher proportion of jobs in these sectors, ie. those most compatible with locations in higher-density corporate office settings.

Accordingly, the office demand projection assumes that 80% of the future employment growth occurring within the half-mile Market Area around the 9 site alternatives will occur in these four sectors, with an average space of 170 square feet per new office worker. This is a decrease from the historical norm. Over the last decade, there have been shifts in office space usage and in the types of industries driving leasing activity. A broad range of industries are moving towards more efficient office floor plans. Ten years ago, the average space occupied per worker was approximately 250 square feet. Today, the average space per worker ranges from approximately 135 to 240 square feet; the midpoint of this range has been used in these demand projections. There are multiple explanations for this trend including: economic uncertainty; advances in technology that have reduced tenants' need for on-site storage and server

[9] Amtrak Capitol Corridor 2010 Performance Report, p. 7, accessed at http://www.capitolcorridor.org/included/docs/performance_reports/10_Performance_Report.pdf on April 19, 2015.

rooms; increased opportunities for employees to work remotely; and the growing practice of office space "hoteling" in which employees use workspaces on an as-needed basis.

Table 8. Half-Mile Market Area Office Demand Summary

		2015-2020	2021-2040	Total
		sf		
1	Bakersfield College	2,400	9,600	12,000
2	Downtown Transit Center	4,900	1,308,800	1,313,700
3	Southwest Transit Center	0	866,600	866,600
4	California State University Bakersfield	1,600	0	1,600
5a	Amtrak Station	140,900	699,600	840,500
5b	California High Speed Rail Station	138,200	875,900	1,014,100
6	Niles and Vernon Avenue	900	20,500	21,400
7	Panama Lane and Hwy 99	10,000	45,900	55,900
8	Mt. Vernon Ave and Hwy 178	0	0	0
9	California Avenue and Hwy 99	0	0	0

Zoning Analysis

This analysis focuses on two key questions: Do existing land use plans around station sites support transit center investment and TOD? Are they able to accommodate future demand for residential, office, and retail uses? To investigate these questions, a zoning analysis was performed to identify the existing zoning around station areas and to evaluate the capacity of station areas to accommodate new types of development based on existing zoning regulations. This type of analysis is useful because, when paired with market demand projections, it can inform policymakers on whether existing zoning is adequately flexible to accommodate future demand for new residential, office, and retail uses identified in the TOD Market assessment. An analysis of General Plan Land Use is also included to show where planned mixed-use may occur.

This analysis identified a total of 18 distinct zoning classifications in the half-mile Market Area of the 9 site alternatives. The City of Bakersfield has, for example, five basic zoning classifications for residential uses, ranging from single-family homes on large lots (Residential Suburban) to multi-family dwelling units (R-4). Five of the 18 zoning classifications were for commercial uses at a range of scales, from neighborhood commercial (C-1) to Central Business (CB) district zoning, which also allows for high-density residential (ie mixed) uses. Other zoning classifications found in the half-mile Market Areas included agricultural uses (A), hospital uses (HOSP), light and general manufacturing (M-1, M-2), Mobile Homes (MH), Open Space (OS), parking (P), and Planned Commercial Development/Planned Unit Development (PCD/PUD), which are typically governed by more flexible zoning regulations negotiated by a masterplan developer for a large area. The amount of land zoned for each use within the one-quarter and one-half mile area around each site alternative is summarized below in Tables 9 and 10.

Table 9. Distribution of Zoned Uses within a Quarter-Mile Radius of Station Site Alternatives (in acres)

		Zoning Classification																	
	Site	**A**	**C-1**	**C-2**	**C-B***	**C-C***	**C-O**	**HO SP**	**M-1**	**M-2**	**MH**	**OS**	**P**	**PCD/ PUD**	**R-1**	**R-2**	**R-3**	**R-4**	**R-S**
1	Bakersfield College	47.4	-	-	-	-	-	-	-	-	-	-	-	-	62.0	-	-	-	-
2	Downtown Transit Center	-	4.7	12.3	19.9	28.9	0.0	-	1.0	-	-	-	-	-	-	-	-	-	-
3	Southwest Transit Center	-	-	33.8	-	-	-	-	-	-	-	-	-	-	27.7	-	14.9	-	0.4
4	California State University Bakersfield	6.7	-	56.6	-	-	8.5	-	-	-	-	-	-	-	-	-	-	-	-
5 a	Amtrak Station	-	0.8	0.5	8.7	58.3	0.9	-	30.7	8.1	-	-	-	-	-	-	-	1.3	-
5 b	California High Speed Rail Station	-	1.2	3.9	-	23.3	1.5	-	42.5	18.3	-	-	-	-	1.5	-	-	2.0	-
6	Niles and Vernon Avenue	-	24.6	4.9	-	-	1.2	-	-	-	-	-	-	-	31.8	16.8	14.3	-	-
7	Panama Lane and Highway 99	-	-	48.9	-	-	-	-	-	-	8.0	-	-	-	32.8	-	-	-	-
8	Mt. Vernon Ave and Hwy 178	-	5.3	50.3	-	-	-	-	-	-	-	-	-	-	7.3	3.7	13.9	-	-
9	California Avenue and Highway 99	-	-	55.9	-	-	-	-	16.8	-	-	-	-	-	13.9	-	7.4	-	-

*Zoning Classifications C-B and C-C include Mixed-Use

Table 10. Distribution of Zoned Uses within a Half-Mile Radius of Station Site Alternatives (in acres)

		Zoning Classification																
	Site	**A**	**C-1**	**C-2**	**C-B***	**C-C***	**C-O**	**HO SP**	**M-1**	**M-2**	**MH**	**OS**	**P**	**PCD/ PUD**	**R-1**	**R-2**	**R-3**	**R-4**	**R-S**
1	Bakersfield College	158.6	-	3.0	-	-	2.2	-	-	-	-	-	-	-	211.1	-	71.0	-	-
2	Downtown Transit Center	-	53.2	41.5	63.7	80.6	22.8	2.3	25.9	-	-	-	5.1	-	7.8	0.2	5.0	-	-
3	Southwest Transit Center	-	11.0	132.9	-	-	-	-	-	-	-	-	8.5	-	136.3	18.7	50.2	-	26.6
4	California State University Bakersfield	10.0	-	237.5	-	-	90.5	-	-	0.6	-	4.3	-	-	1.9	-	-	-	-
5 a	Amtrak Station	-	2.5	11.6	33.2	123.0	1.5	-	82.6	20.6	-	8.1	-	6.7	32.4	0.2	13.0	2.2	-
5 b	California High Speed Rail Station	-	2.9	32.1	8.8	85.3	1.5	-	116.1	38.4	-	8.1	-	1.3	62.4	15.2	5.6	2.4	-
6	Niles and Vernon Avenue	-	44.3	32.3	-	-	1.3	-	1.4	41.7	-	-	-	3.7	130.7	63.8	62.6	-	-
7	Panama Lane and Highway 99	0.6	6.4	100.8	-	-	-	-	10.6	-	16.5	-	-	10.0	231.5	3.1	-	-	-
8	Mt. Vernon Ave and Hwy 178	-	6.3	111.1	-	-	1.8	-	-	-	-	-	-	-	145.9	4.6	52.5	-	-
9	California Avenue and Highway 99	-	4.2	164.2	-	-	-	-	79.0	4.9	-	8.4	-	4.9	76.2	5.6	17.3	-	8.6

*Zoning Classifications C-B and C-C include Mixed-Use

Distribution of Zoned Uses Within TOD Market Areas

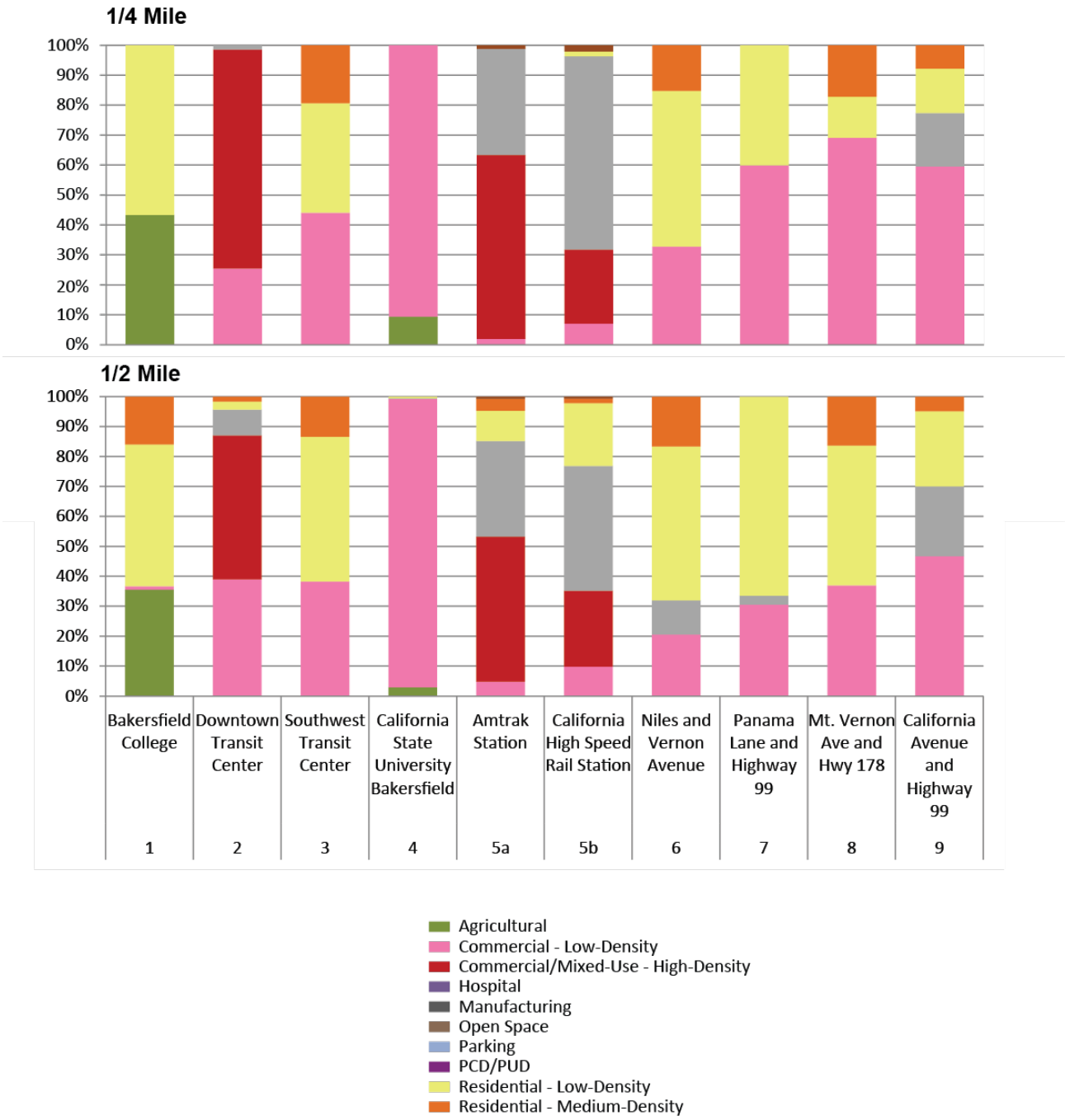
Figure 4 shows each zoned use as a percentage of the total developable land area within both a one-quarter and half-mile radius around the station sites. Any land assigned a parcel number by the Kern County Assessor was generally considered "developable" for the purposes of this analysis. Public rights-of-way (sidewalks, streets, highways), natural features (bodies of water), and floodplains were excluded from the calculation of "developable" land. These non-developable elements typically comprised around 30 percent of the total land area within a one-quarter and one-half mile radius of station areas, with the variation among station site alternatives attributable to local infrastructure patterns.

The distribution of zoned uses in each TOD Market Area indicates the presence of two important ingredients in TOD placemaking: 1) allowable development densities; and 2) diversity of land uses. First, there is a strong (though not guaranteed) correlation between density of development and transit ridership; long-term data from cities around the world appear to show that there is a fundamental density threshold of around 25 residents and jobs per acre where automobile dependence is significantly reduced.[10] Second, TOD tends to thrive in areas where a diversity of land uses in close proximity to one another allows residents, workers, and visitors to access a range of services efficiently via walking or biking.

Both development densities and the diversity of land uses are directly determined and enabled by zoning—and can be achieved either by permitting multiple, high-intensity uses on a single site (mixed use development) or by clustering different types of uses together within a given district.

[10] Peter Newman and Jeffrey Kenworthy (2006) "Urban Design to Reduce Automobile Dependence", *Opolis: An International Journal of Suburban and Metropolitan Studies*: Vol. 2: No. 1, Article 3.
Accessed at http://repositories.cdlib.org/cssd/opolis/vol2/iss1/art3 on March 16, 2015.

Figure 4. Zoned Uses as a Percentage of Total Developable Land Area Within One-Quarter and One-Half Mile Radius of Station Site



Zoning-Based Assessment of Station Site TOD Potential

The nine station site alternatives were ranked for TOD potential from "very low" to "high" based on the opportunities and constraints observed in the distribution and types of zoned uses, the implied allowable development densities associated with each zoning classification, existing street block characteristics/level of walkability, other relevant physical site conditions, and projected levels of future growth assessed in the previous section of this report.

Table 11. Zoning-Based Assessment of Station Site TOD Opportunities and Constraints

Site		TOD Potential	Opportunities	Constraints
1	Bakersfield College	MEDIUM-LOW	• Diversity of land uses on campus • Student population a key transit ridership market	• Low projected future growth • Low density zoning • Potential development pressures on adjacent agricultural land
2	Downtown Transit Center	HIGH	• Flexible C-B zoning for high-density mixed use • Transit-supportive 50% reduction in minimum parking requirements available "by right" in C-B and C-C zones (73 percent of developable land area) • High employment densities and projected future growth • Walkable street block configuration • Market Area overlap with future Bakersfield HSR Station • Mixed use general plan land use	
3	Southwest Transit Center	MEDIUM	• High projected residential and office growth • Sizable portion of developable land area (19 percent) currently zoned for medium-density residential zoning	• Irregular parcelization and street grid • Half-mile TOD Market Area bisected by Highway 99 with intrusive off-ramps
4	California State University Bakersfield	MEDIUM	• Student population a key transit ridership market • Consolidated land ownership/site control	• Potential development pressures on adjacent agricultural land
5a	Amtrak Station	MEDIUM-HIGH	• Flexible C-B zoning for high-density mixed use • High employment densities and projected future growth • Mixed use general plan land use	• High percentage of adjacent manufacturing uses
5b	California High Speed Rail Station			
6	Niles and Vernon Avenue	MEDIUM-LOW	• Diversity of zoned uses within half-mile TOD Market Area • Walkable street block configuration	• Low projected future growth
7	Panama Lane and Highway 99	VERY LOW		• Predominantly low-density zoning • Low projected future growth • Half-mile TOD Market Area bisected by Highway 99 • Irregular parcelization within commercial and PCD areas
8	Mt. Vernon Ave and Hwy 178	LOW	• Some vacant/underutilized medium-density commercial and residential zoned uses in close proximity to proposed station site	• Low projected future growth • Half-mile TOD Market Area bisected by Highway 178

Site		TOD Potential	Opportunities	Constraints
9	California Avenue and Highway 99	VERY LOW		• Low density zoning • Low projected future growth • Half-mile TOD Market Area bisected by Highway 99 • High percentage of manufacturing uses

Panama Lane/Highway 99 (Site 7), Mount Vernon Ave/Highway 178 (Site 8), and California Avenue/Highway 99 (Site 9) score very low on both allowable densities, diversity of land uses, and projected future demand for new uses; in addition, their half-mile TOD Market Areas are bisected by a major highway, which lessens the desirability of these locations for walking and biking activity to and from the station.

Bakersfield College (Site 1) and CSU-Bakersfield (Site 4) both have low-density zoning, but contain a diverse mix of uses on their respective campuses; their student population constitutes a key target market for transit ridership; and both the college/universities retain site control over a large portion of the TOD Market Area, enabling more coordinated planning for future TOD and thereby justifying a "Medium-Low" to "Medium" ranking for TOD potential.

Similarly, Niles/Vernon Ave (Site 6) is ranked "Medium-Low," as it has a sizable area zoned for medium-density housing and professional office space within the one-quarter mile TOD Market Area, both of which are transit-supportive. This site also has a coherent, walkable street block configuration that might lend itself to increased levels of future pedestrian activity with the appropriate investment in streetscape amenities and drafting of new development standards to encourage TOD, such as an transit overlay zone. Despite these advantages, the Niles/Vernon Ave location has low projected future growth, meaning that market demand may not be adequate to create the "critical mass" of new uses associated with a TOD district.

In the "Medium" category for TOD potential is the Southwest Transit Center (Site 3), largely based on its significant capture rate of future residential and employment growth. It has a significant amount of land already zoned for medium-density residential within a one-half mile radius to accommodate the forecast demand for 1,100 additional housing units over the next 25 years. The scale of forecast development may be significant enough to create a vibrant TOD district at this location, but substantial challenges remain with physical constraints on pedestrian circulation caused by the location of Highway 99 and associated off-ramps.

The sites in the Medium-High and High category for TOD potential - Sites 2, 5a, and 5b – are characterized by flexible zoning for high-density mixed use, high employment densities and projected future growth, and their Market Areas overlap with the future Bakersfield HSR station, with the potential to benefit from the "halo" effect of new station area development associated with HSR. Site 2, the highest ranking site, also has a walkable street block configuration that could lend itself to increased levels of pedestrian activity.

Additional Observations

The zoning analysis generated these additional observations on existing land use plans around station sites:

- Based on current zoning, most of the station site alternatives currently permit only low-density commercial (C-1, C-2) and residential uses (R-1) that do not, in isolation or in combination, meet the threshold of 25 persons and jobs per acre typically required to encourage transit ridership and reduce auto dependence.
- Light and general manufacturing (M-1, M-2) comprise a large percentage of zoned uses within one-half mile of the California High-Speed Rail Station (40.6 percent), Amtrak Station (30.6 percent), and California Avenue/Highway 99 (22.5 percent); the transit ridership and TOD potential associated with these uses is generally suboptimal due to low employment densities (workers per square foot) and lack of compatibility with adjacent residential and office uses.
- Central Business (C-B) is the only zoning classification to allow high-density, mixed-use development "by right"—that is, without a conditional use permit; this zoning classification exists only in the downtown Bakersfield area.
- R-4, the highest-density residential zone available under Bakersfield's municipal ordinance, comprises less than one percent of the zoned uses at Amtrak Station and the California High Speed Rail Station (Sites 5a and 5b); none of the other sites has R-4 zoning.

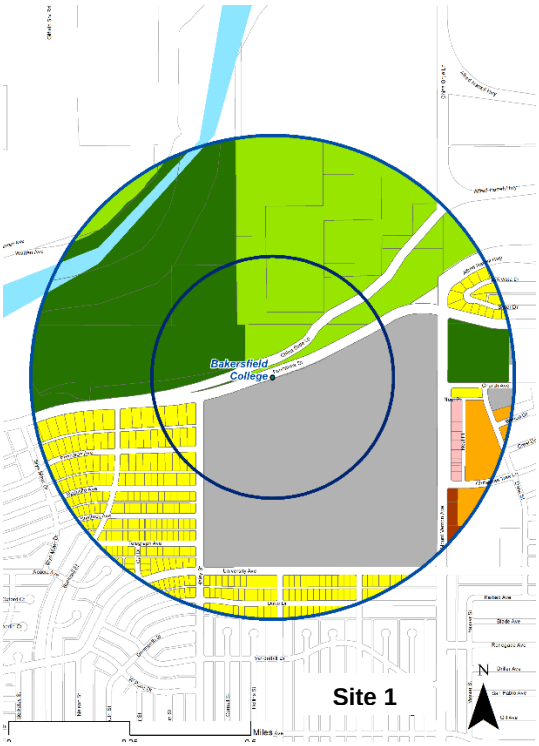
This zoning analysis indicates that many of the "by right" zoned and permitted uses within the one-quarter to one-half mile radius of stations areas are adequate to accommodate future growth, but not necessarily compatible with accommodating the denser development patterns typically associated with TOD.

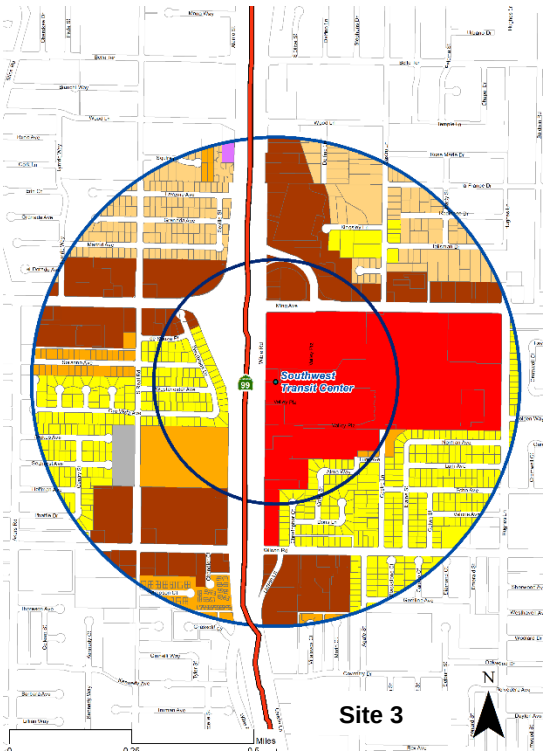
General Plan Land Use

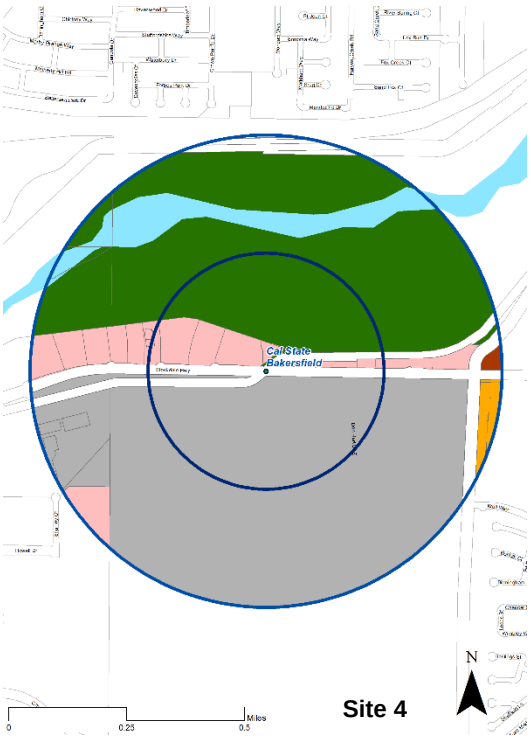
Included as part of the zoning analysis is an additional evaluation of the general plan land uses within the half-mile Market Area of the 9 site alternatives. The Metropolitan Bakersfield General Plan includes a series of sub category land uses within six general land use classifications – Residential, Commercial, Industrial, Resource, Public Facilities, and Open Space.

This evaluation identified a total of 12 land uses within the half-mile Market Area of the 9 site alternatives. Residential uses ranged from low-density single-family detached housing (LR and SR) to multi-family high-density housing (HMR, LMR, HR) such as apartments. Commercial uses included all five of the general commercial land use classification including highway (HC), general (GC), major (MC), office (OC), and mixed use (MUC). Other land uses found within the half-mile Market Areas include agricultural uses (R-IA, R-EA, R-MP), industrial uses (LI, SI, HI), open space uses (OS, OS-P, OS-S), and public facility uses (P, PS, PT, P-SW). Among the identified land uses, mixed use land use is identified at the three site alternatives within the downtown area: Downtown Transit Center, Amtrak Station, and the California High Speed Rail Station. Figure 5 provides detailed mapping of general plan land uses within a half-mile radius around each site. Tables 12 and 13 provide acreages by General Plan Land Use categories within a quarter-mile and half-mile of station sites.

Figure 5. Potential Station Areas with Half-Mile General Plan Land Uses



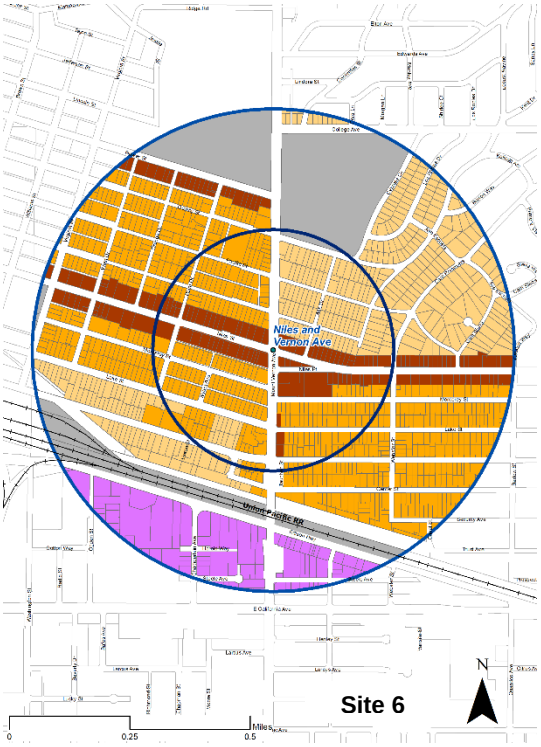


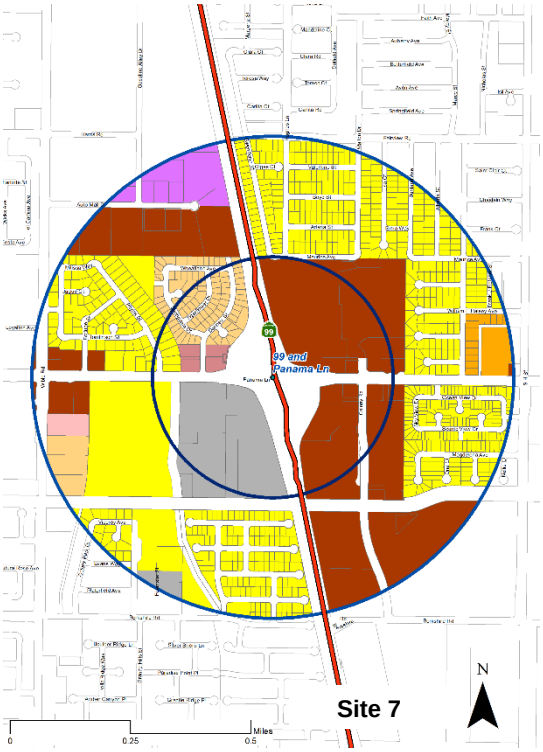


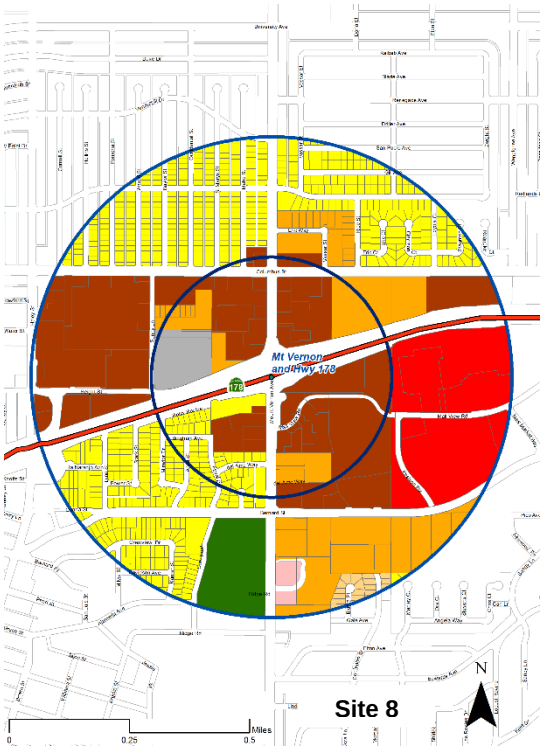
Land Use Legend

- Agriculture (R-IA, R-EA, R-MP)
- Major Commercial (MC)
- General Commercial (GC)
- Highway Commercial (HC)
- Office Commercial (OC)
- Mixed Use (MUC)
- Low Density Residential (LR, SR/LR, SR)
- Medium Density Residential (LMR, LMR/LR)
- High Density Residential (HMR/LMR, HMR, HR)
- Industrial (LI, SI, HI)
- Open Space (OS, OS-P, OS-S)
- Public Sector (P, PS, PT, P-SW)

Figure 5. Potential Station Areas with Half-Mile General Plan Land Uses







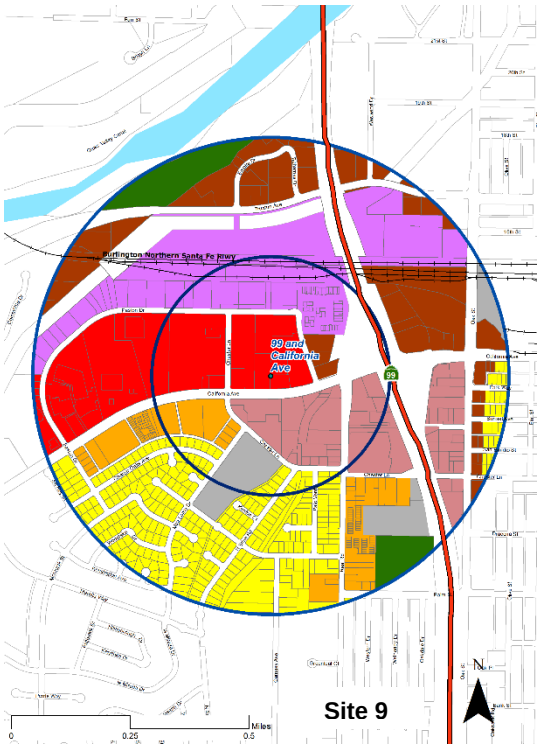


Figure 5. Potential Station Areas with Half-Mile General Plan Land Uses

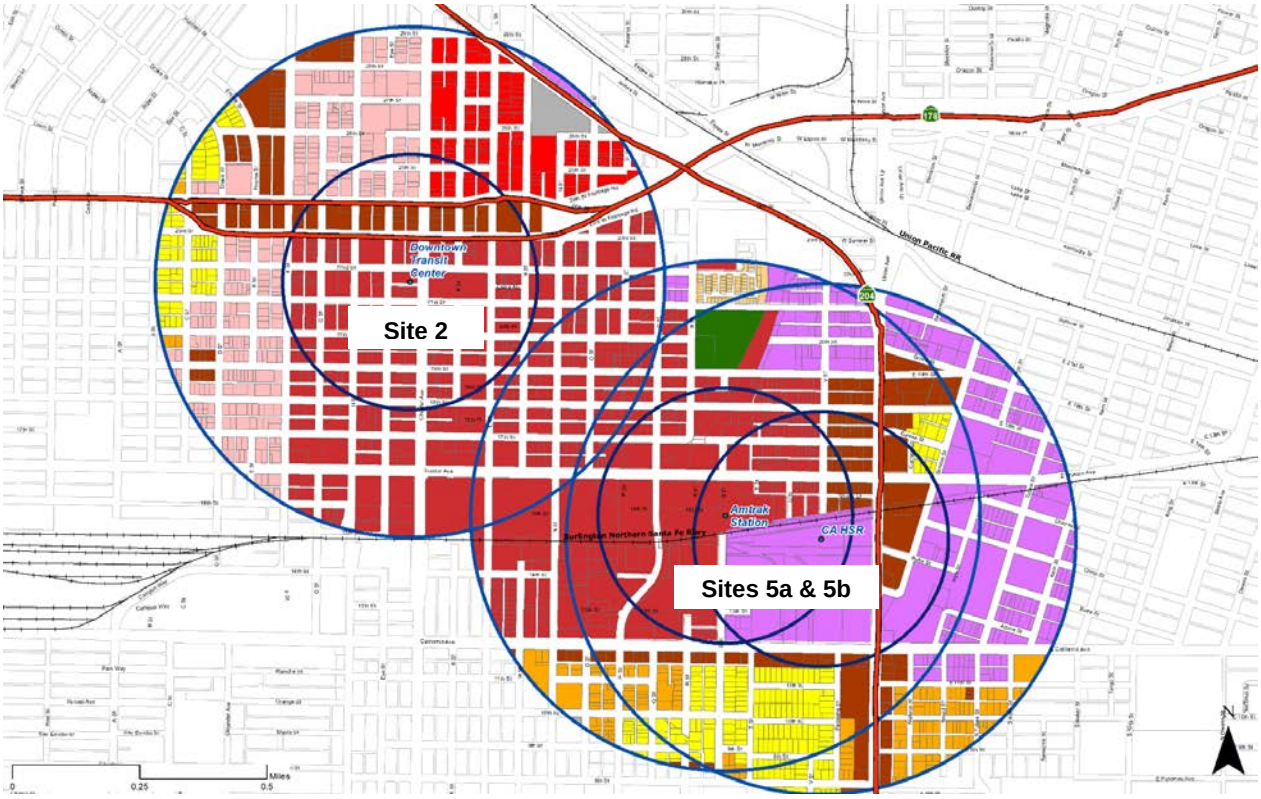


Table 12. Distribution of Zoned Uses within a Quarter-Mile Radius of Station Site Alternatives (in acres)

General Plan Land Use													
Site		**Agriculture**	**Major Commercial**	**General Commercial**	**Highway Commercial**	**Office Commercial**	**Mixed Use**	**Low Density Residential**	**Medium Density Residential**	**High Density Residential**	**Industrial**	**Open Space**	**Public Sector**
1	Bakersfield College	98.76	-	-	-	-	-	11.73	-	-	-	107.96	134.14
2	Downtown Transit Center	-	6	11.19	-	14.08	59.67	-	-	-	-	-	-
3	Southwest Transit Center	-	88.63	46.02	-	-	-	45.7	-	-	-	-	-
4	California State University Bakersfield	-	-	-	-	32.05	-	-	-	-	-	198.97	204.83
5a	Amtrak Station	-	-	2.11	-	-	68.23	-	-	-	29.22	-	-
5b	California High Speed Rail Station	-	-	19.4	-	-	23.01	0.47	-	-	52.07	-	-
6	Niles and Vernon Avenue	-	-	23.6	-	-	-	-	53.71	77.37	-	-	32.04
7	Panama Lane and Highway 99	-	-	67.81	3.1	-	-	45.2	12.95	-	-	-	29.12
8	Mt. Vernon Ave and Hwy 178	-	29.09	71.81	-	-	-	21.93	-	20.17	-	-	8.62
9	California Avenue and Highway 99	-	58.33	2.88	29.68	-	-	34.13	-	9.73	59.15	-	9.68

Table 13. Distribution of Zoned Uses within a Half-Mile Radius of Station Site Alternatives (in acres)

General Plan Land Use													
Site		**Agriculture**	**Major Commercial**	**General Commercial**	**Highway Commercial**	**Office Commercial**	**Mixed Use**	**Low Density Residential**	**Medium Density Residential**	**High Density Residential**	**Industrial**	**Open Space**	**Public Sector**
1	Bakersfield College	102.57	-	1.53	-	2.45	-	66.06	-	9.14	-	117.61	135.82
2	Downtown Transit Center	-	30.86	30.66	-	60.21	138.9	12.62	-	0.93	1.52	-	5.24
3	Southwest Transit Center	-	88.63	103.36	-	-	-	91.82	54.18	30.19	0.68	-	3.69
4	California State University Bakersfield	-	-	1.05	-	36.84	-	-	-	4.25	-	199.33	223.93
5a	Amtrak Station	-	-	42.1	-	-	158.36	32.2	3.97	14.73	86.41	8.22	0.15
5b	California High Speed Rail Station	-	-	45.68	-	-	102.65	33.75	0.53	23.63	136.82	8.09	-
6	Niles and Vernon Avenue	-	-	41	-	-	-	-	93.19	142.25	36.83	-	69.46
7	Panama Lane and Highway 99	-	-	122.71	3.1	2.54	-	172.02	21.08	6.96	11.75	-	31.42
8	Mt. Vernon Ave and Hwy 178	-	49.21	118.26	-	2.37	-	117.71	3.28	63.86	-	16.11	8.62
9	California Avenue and Highway 99	-	60.66	59.16	42.6	-	-	77.06	-	28.49	77.9	17.47	18.88

Market Feasibility Analysis for TOD Typologies

The final component of this study investigates the financial feasibility of different TOD-compatible building typologies, based on existing rents, vacancy rates, and other market metrics typically used by private-sector developers to assess the favorability of real estate market conditions for particular uses. This analysis indicates whether new construction is financially viable based on a comparison of total development costs and the total market value of a particular building typology.

There is no "one size fits all" definition of building typologies considered "TOD-compatible." That being said, cities looking to incentivize TOD at specific locations generally allow a higher level of density (defined as units per acre or floor area ratio) than otherwise permitted in surrounding areas, reduce mandatory minimum parking requirements, encourage a diverse mix of uses within a given TOD district (or even within a single building) via flexible zoning codes, and mandate building design features that are intended to activate the public realm and encourage pedestrian activity (such as curb cut limitations, display windows on groundfloor buildings, awnings that provide shade coverage, landscaping, and/or entrances oriented toward the street).

Examples of TOD-compatible building typologies include townhomes, mid- and high-rise office and residential buildings, multi-story mixed-use buildings comprised of groundfloor retail and upper-floor apartments. Single-family homes, "strip" malls, industrial office space, and manufacturing facilities, by contrast, are not generally considered TOD-compatible due to their auto-oriented building form and lack of vertical density.

For each station site alternative, this analysis assessed whether the following TOD-compatible building typologies are feasible based on prevailing real estate market conditions:

- Townhomes (3 stories)
- Mid-rise apartments (4-7 stories)
- Low-rise office (3 stories)
- Mid-rise office (4-7 stories)
- Medical office (1 story) – as a groundfloor use of a multistory mixed-use building
- Retail (1 story) – as a groundfloor use of a multistory mixed-use building

Capitalized Value Methodology

For each of these building typologies, the average sale price per square foot for each type of use was imputed from existing rents using the capitalization valuation method. This method uses the amount of net operating income (NOI) generated annually by a property (gross rent paid by the tenant(s) net of owner operating expenses) to derive an indication of market value. This calculation can be summarized by the following formula:

$$\frac{\text{NOI (gross rent less operating expenses)}}{\text{k (capitalization rate)}} = \text{Capitalized market value}$$

NOI is divided by the capitalization rate (k), or cap rate, which is itself a reflection of the average ratio between the NOI and recorded sale price for comparable properties in the same asset class. This valuation method is generally considered most appropriate for income-producing properties such as apartments, offices, and retail stores. The average imputed sale price per square foot was calculated for each station site alternative based on prevailing market rents for different property types observed in Q4 2014.

The average imputed sale price per square foot was then compared against the total development cost per square foot (PSF) for each building typology, inclusive of both "hard" and "soft" construction costs, land acquisition, and parking costs. PSF costs were derived from RSMeans, the industry standard for estimating building costs, and adjusted to reflect the local cost of labor and materials in the Bakersfield-Delano MSA. Parking costs were based on the minimum parking requirements per square feet of building use specified in Section 17.58.110 of the Bakersfield Municipal Code. For Sites 2, 5a, and 5b, a 50 percent reduction in parking requirements applicable to Zones C-B and C-C was assumed, consistent with Section 17.58.120 of the Bakersfield Municipal Code. For all other sites, a 10 percent reduction in parking requirements associated with the "Transit Credit" provision of Section 17.58.055, applicable to areas located within 1,000 feet of the front or main customer door of a transit facility, was assumed. Even with the reduction in parking minimums, it should be noted that this requirement added on average 43 percent to the total PSF development cost, a finding consistent with a recent UCLA study of cost impacts associated with minimum parking requirements.[11] This added cost greatly impacts the feasibility of new construction.

Results of Market Feasibility Assessment

The results of the market feasibility analysis are summarized below in Table 14. Six different TOD typologies were assessed for financial viability at each of the 9 station sites using available market data, including existing rent levels per square foot, vacancy rates, and capitalization rates. Total development costs per square foot (PSF), including construction, land, and other "soft" costs, were compared against the imputed sale price PSF. There were 3 possible scores for each of the 48 building type/location combinations tested (6 building typologies multiplied by 8 Market Areas, with Sites 5a and 5b considered a single Market Area).

Table 14. Definitions of Market Feasibility

Score		Definition		
F	Feasible	total PSF development costs	<	imputed sale price PSF
M	Marginal Feasibility	total PSF development costs	<	120 percent of the imputed sale price PSF
NF	Not Feasible	total PSF development costs	>	imputed sale price PSF

[11] See Table 2, Donald Shoup, "The High Cost of Minimum Parking Requirements," *Parking: Issues and Policies Transport and Sustainability*, Volume 5, 87-113, accessed at http://shoup.bol.ucla.edu/HighCost.pdf on March 18, 2015

The “marginal feasibility” (M) score takes into account the fact that there is typically a PSF rent premium of up to 20 percent for new construction compared to older properties on which the imputed sales price PSF is based. Assuming this rent premium is supported by the market, new construction may be feasible.

Overall, the market feasibility assessment shows limited *near-term* opportunities for new construction in the eight TOD Market Areas, as available inventory continues to suppress rent levels in many cases. The market demand projections tell a somewhat different story, as they are focused on the aggregate potential of new development over the next 20 years. Some of the areas with the highest *long-term* potential for growth in Bakersfield, such as the Downtown Transit Center, do not appear ripe for new development at this time. The apparent disconnect between the near-term market feasibility assessment and the long-term projected market demand may be explained simply by the fact that an additional growth cycle is needed to absorb excess capacity in certain Market Areas and drive rents upward to the point of sustaining new construction.

At this time, CSU-Bakersfield (Site 4) appears to offer one of the more buoyant local real estate markets, driven by the ongoing expansion of the university, with a low vacancy rate (3.8 percent) and correspondingly higher property values. At that location, market conditions may be sufficiently favorable to support the construction of new townhomes and mid-rise office, despite low projected demand for these uses in the near term (which, as noted earlier, may not accurately capture future university expansion plans). Some new housing and retail development may be supportable in the near-term at the Southwest Transit Center (Site 3). Finally, Panama Lane/Highway 99 (Site 7) appears to be a strong market for new retail development; over the long term, office-based employment growth at this location is projected to generate sufficient retail demand for a major new shopping center in excess of 100,000 square feet.