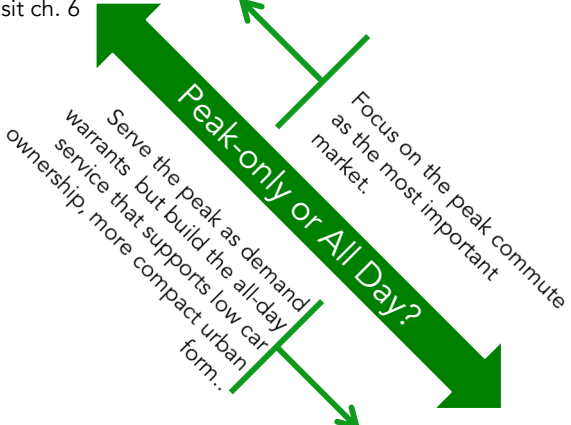


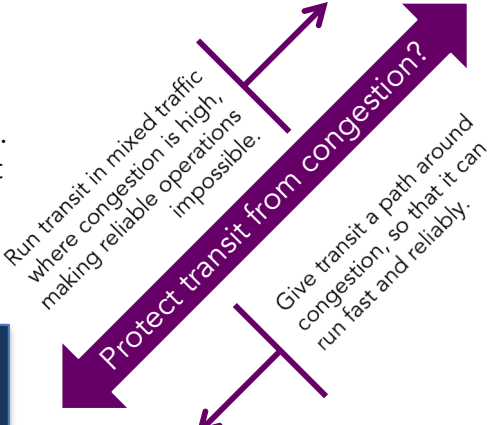
A Map of Key Transit Choices

This diagram shows how various value judgments about transit support or conflict with each other. This is not a recommendation, but an illustration of options.

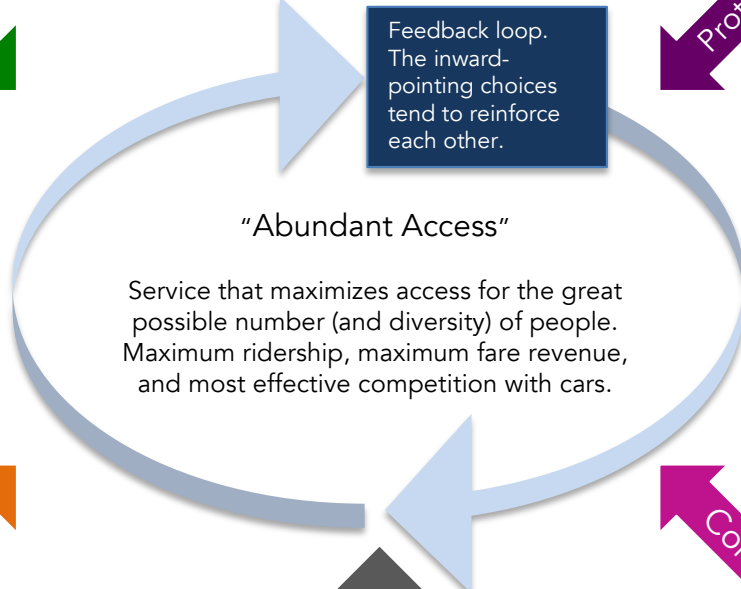
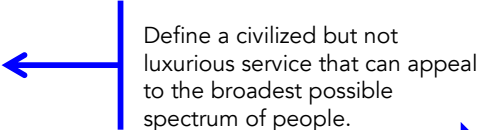
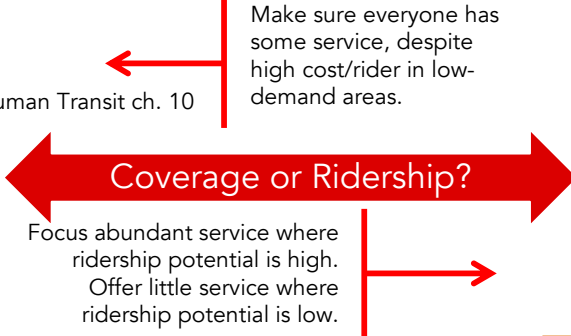
Human Transit ch. 6



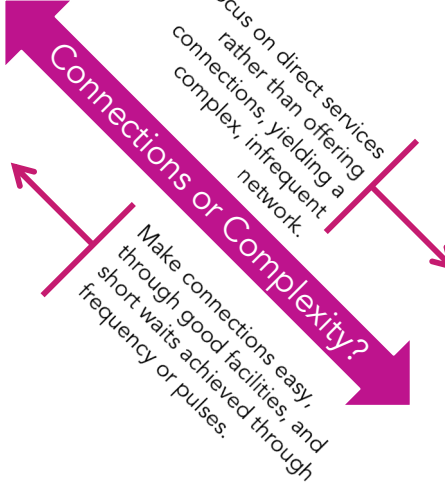
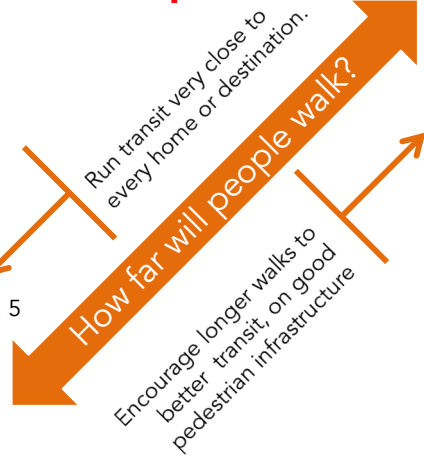
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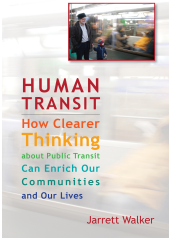
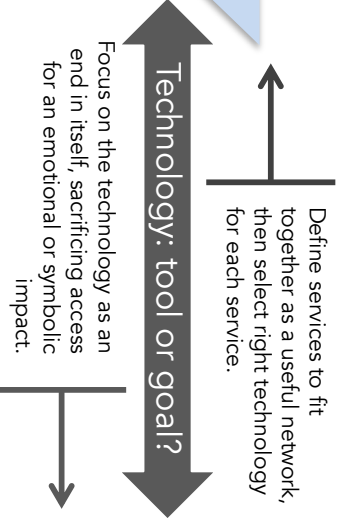
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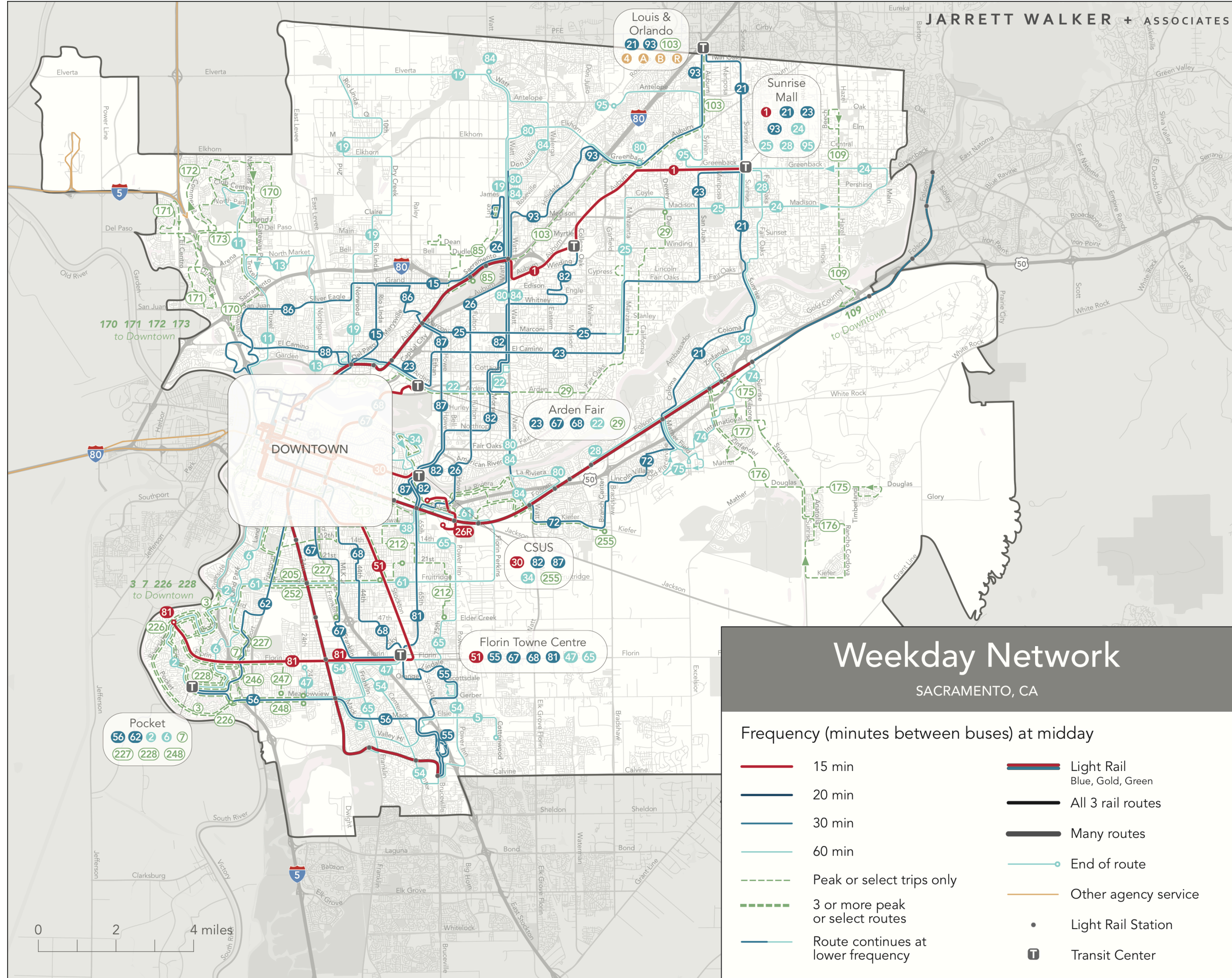
Human Transit ch. 5



Human Transit ch. 12



Human Transit, Island Press, 2011.



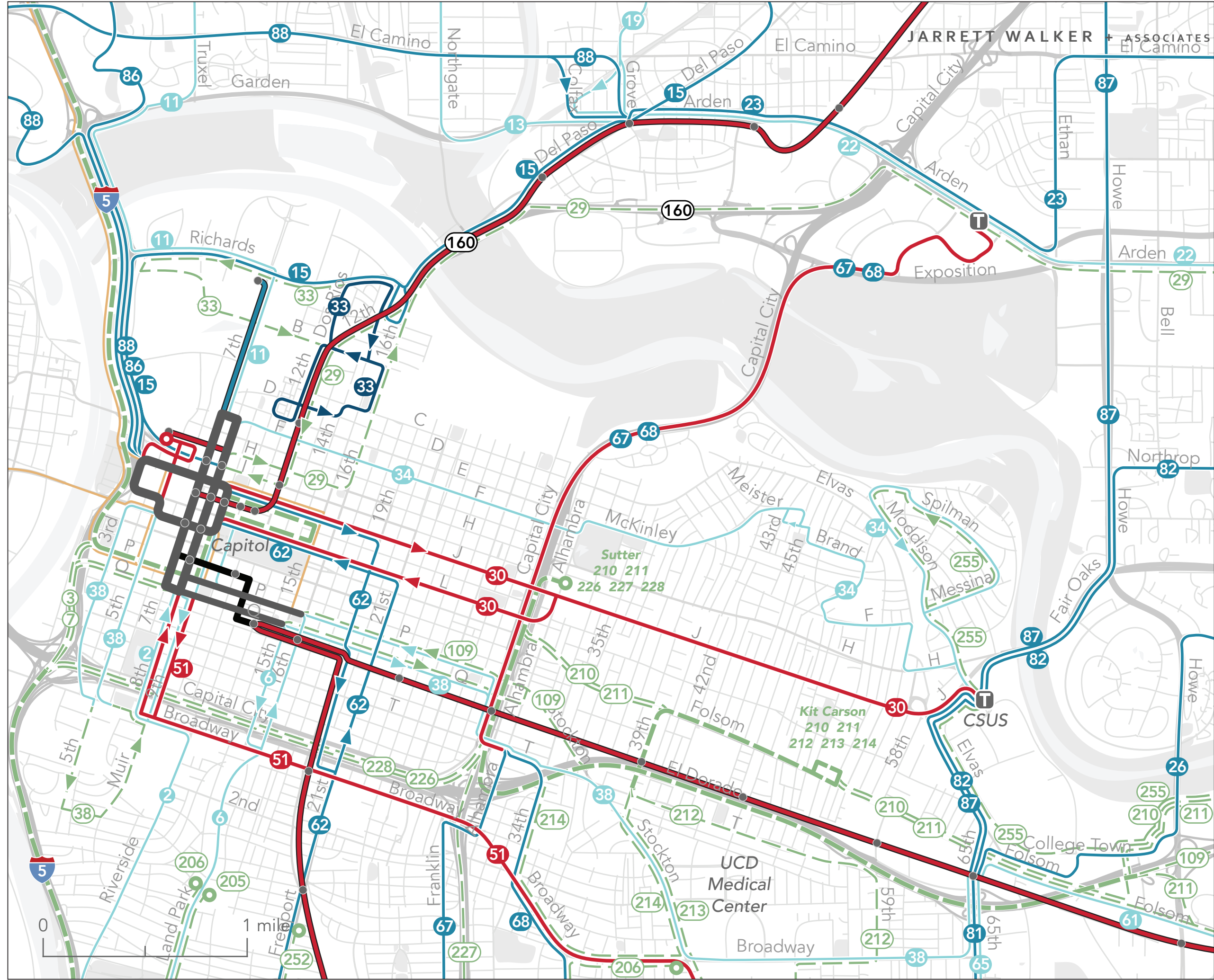
Weekday Network

SACRAMENTO, CA

Frequency (minutes between buses) at midday

- 15 min
- 20 min
- 30 min
- 60 min
- - - Peak or select trips only
- - - 3 or more peak or select routes
- Route continues at lower frequency
- Light Rail
- Blue, Gold, Green
- All 3 rail routes
- Many routes
- End of route
- Other agency service
- Light Rail Station
- T Transit Center

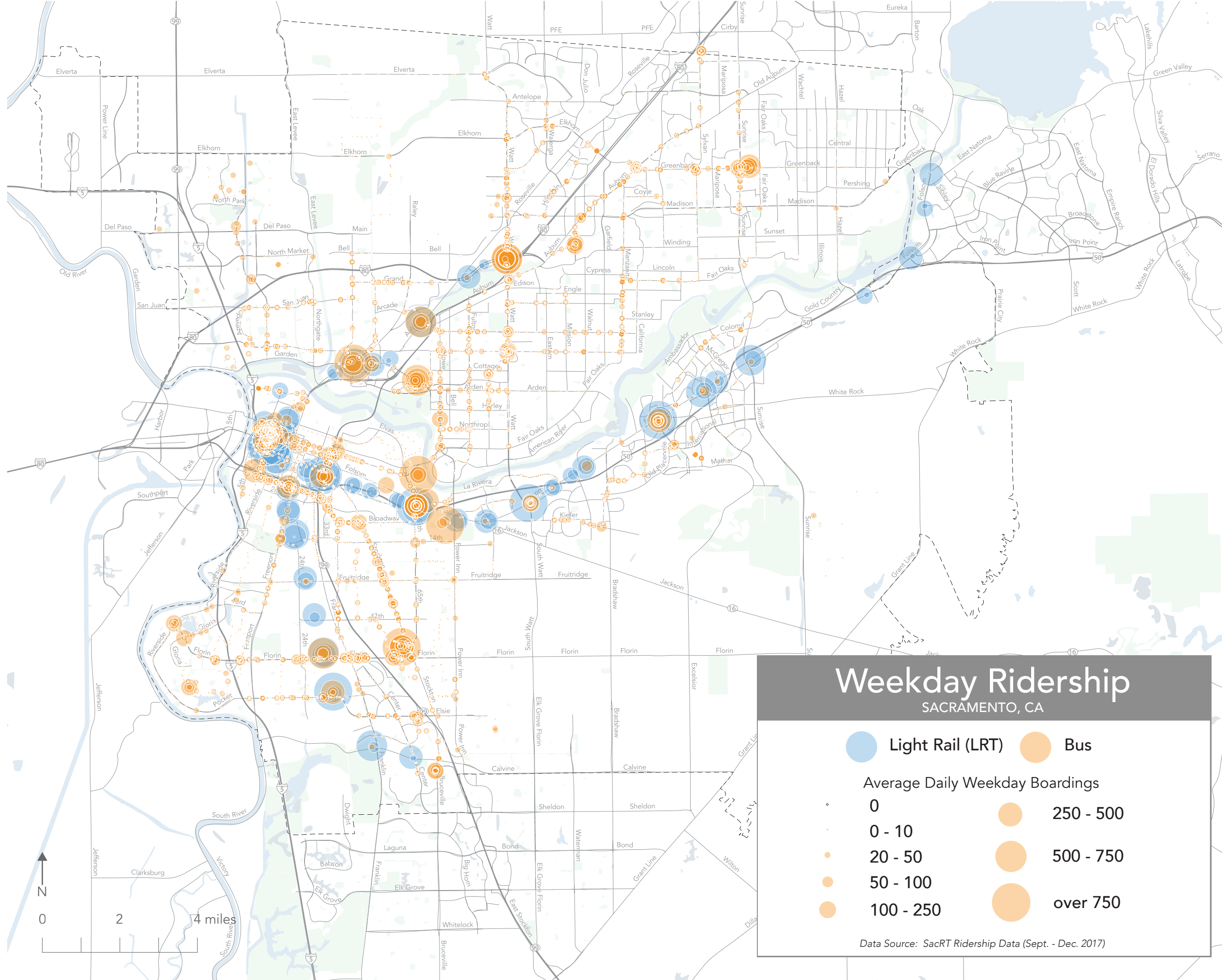




Sutter
210 211
226 227 228

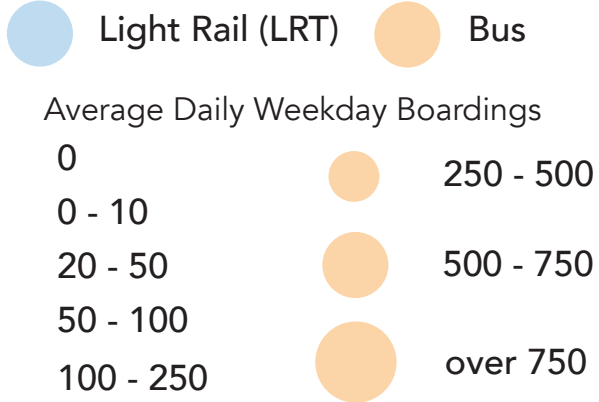
Kit Carson
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College Town
Folsom

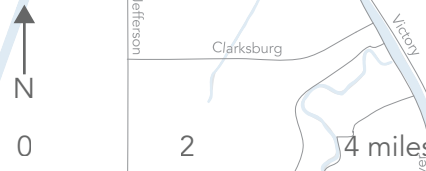


Weekday Ridership

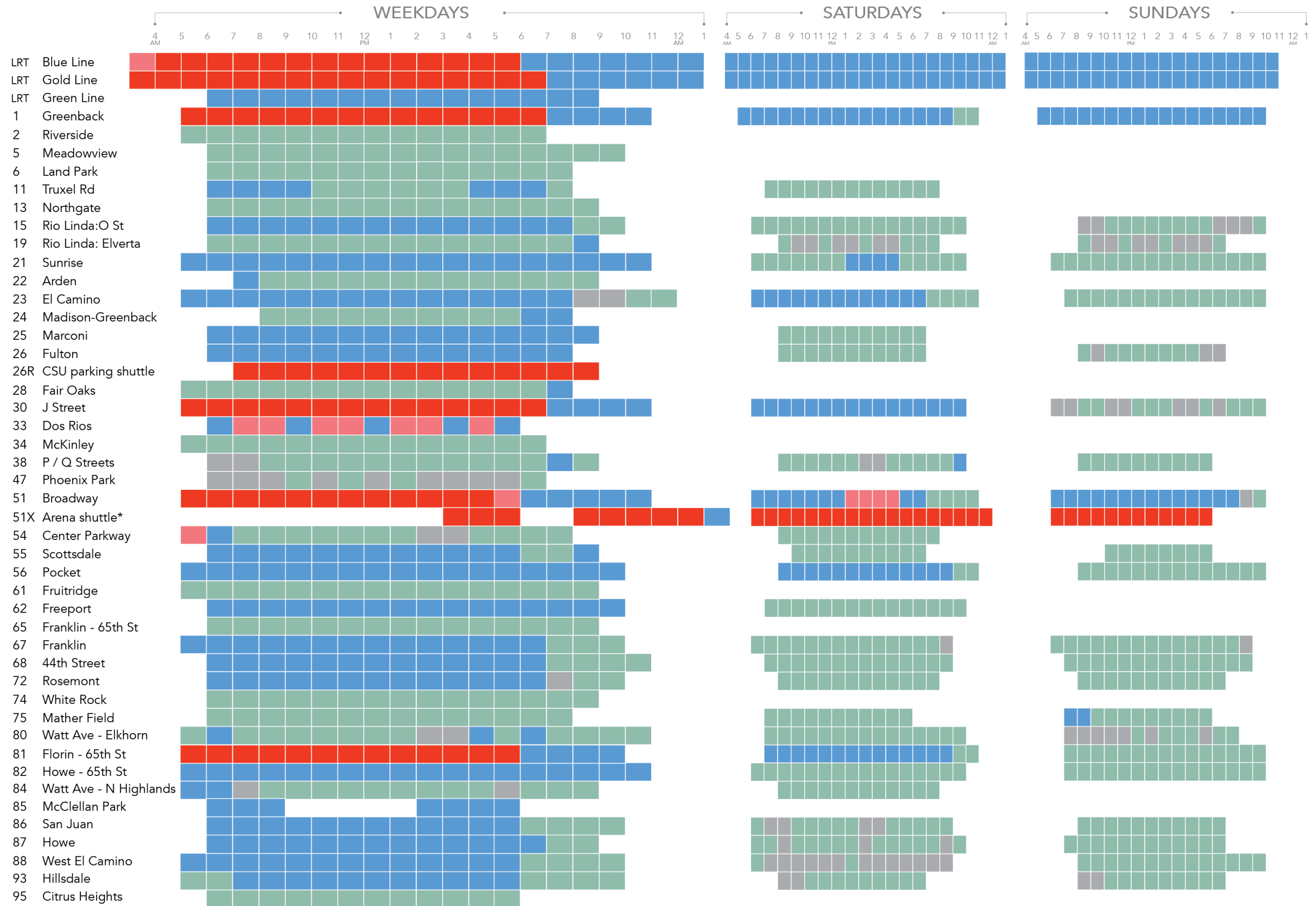
SACRAMENTO, CA



Data Source: SacRT Ridership Data (Sept. - Dec. 2017)



Sacramento RT Existing Route Frequencies



Summary

SacRT Forward Network Plan: Transit Choices Report

Existing Conditions in the Sacramento Region

APRIL 2018

For Sacramento Regional Transit

JARRETT WALKER + ASSOCIATES

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National Trends, Local Choices

This study looks at the design of the transit network in the Sacramento region and asks:

- Does it reflect the goals and values of the Sacramento region and its people?
- Are buses running in the right places and at the right times?
- What are the key choices the region will have to make about transit, and what are the benefits and downsides choosing different paths?

Sacramento is not the only region facing falling ridership and relevance

The graph at right compares transit service levels and transit ridership among Sacramento's peers, adjusted to the urban population.

National research suggests that transit ridership in many cities has been declining due to:

- *Very low costs of purchasing and driving cars*, from a combination of historically-low interest rates and low gas prices.
- *Competition by Uber and Lyft* for more affluent riders and for the most time-sensitive trips.
- *Growing distances between jobs and housing* as many regions (including Sacramento) continue to sprawl outward.
- *The suburbanization of poverty* caused by increasing desirability, property values and rents in pre-war inner city neighborhoods.

SacRT can choose to attract more ridership

Many factors that govern transit ridership are outside of the control of a transit agency, but *SacRT does have power over a few factors that govern how much ridership it can attract* within its fixed budget:

- How much of its investment is concentrated in services that get the highest ridership relative to their cost?
- How do transit fares compare to the costs of other options (e.g. parking a car, riding Uber or Lyft)?

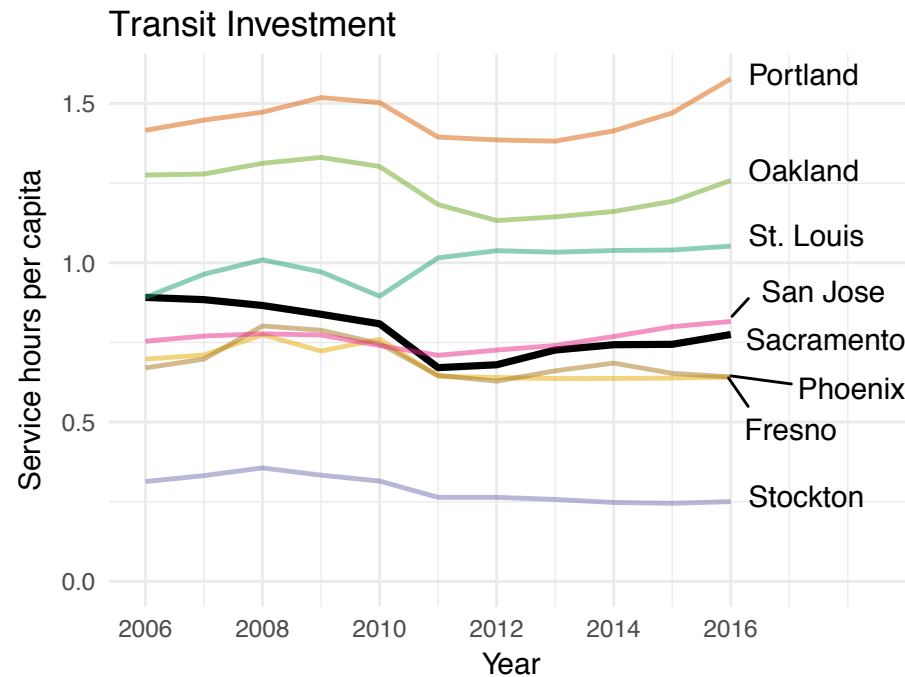


Figure 1: Transit investment (amount of service provided per capita) dropped at most agencies during the Great Recession, and has recovered to greater and lesser degrees since then.

- How well do transit fares work with the structure of the network?
- How is transit service made clear and appealing to potential riders?

It is not a given that SacRT *should* take steps to increase transit ridership, because doing so would require sacrificing other non-ridership outcomes. This trade-off, and others, are summarized here and described in detail in the full report.

This report makes no recommendation about whether SacRT should make changes that would increase ridership within its limited budget. We hope that readers of this report will form their own opinions about this difficult trade-off.

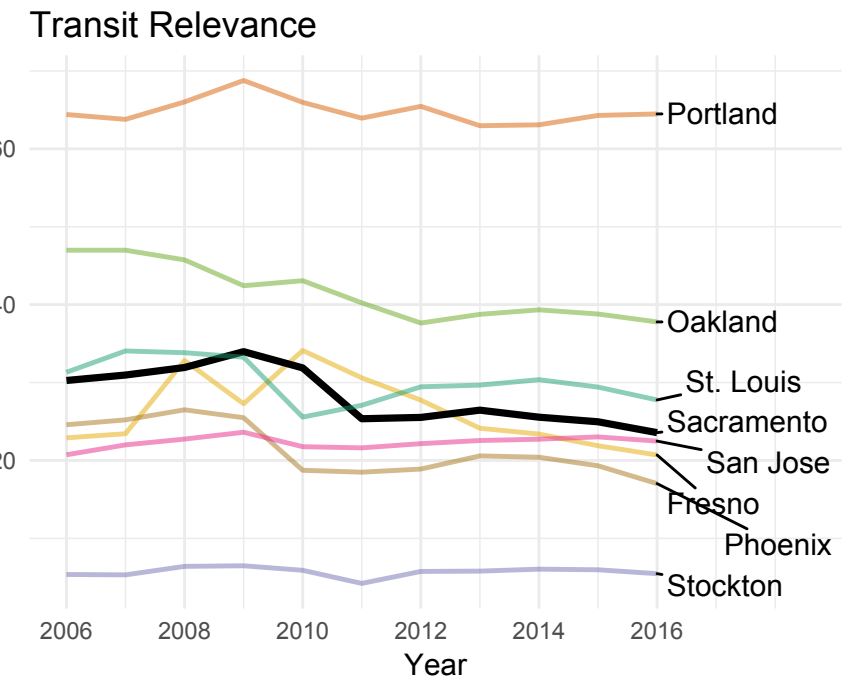


Figure 2: In Sacramento, transit relevance (ridership per capita) fell in 2010 and 2011 due to service cuts and fare increases. In many cities—including Sacramento—it has continued to fall even as service has been restored.



Figure 3: Large vehicles are able to move large numbers of people through very little space. (Photo: cyclingpromotion.org.)

Ridership and Coverage Goals Lead in Opposite Directions

Ridership and coverage goals are both laudable, but they lead us in opposite directions. *Within a fixed budget, if SacRT wants to do more of one, it must do less of the other.*

The SacRT bus network is designed for a mixture of Ridership and Coverage goals:

A **Ridership Goal** seeks maximum ridership for a given budget. This goal corresponds with outcomes such as urban redevelopment, low subsidy per passenger, and environmental and congestion benefits resulting from less car use.

A Ridership Goal is often served by running interconnected frequent service in places that are dense and walkable, and where straight, logical paths for transit are available. It is also often served by long spans of service each day and each week, so that transit is running whenever people need to travel.

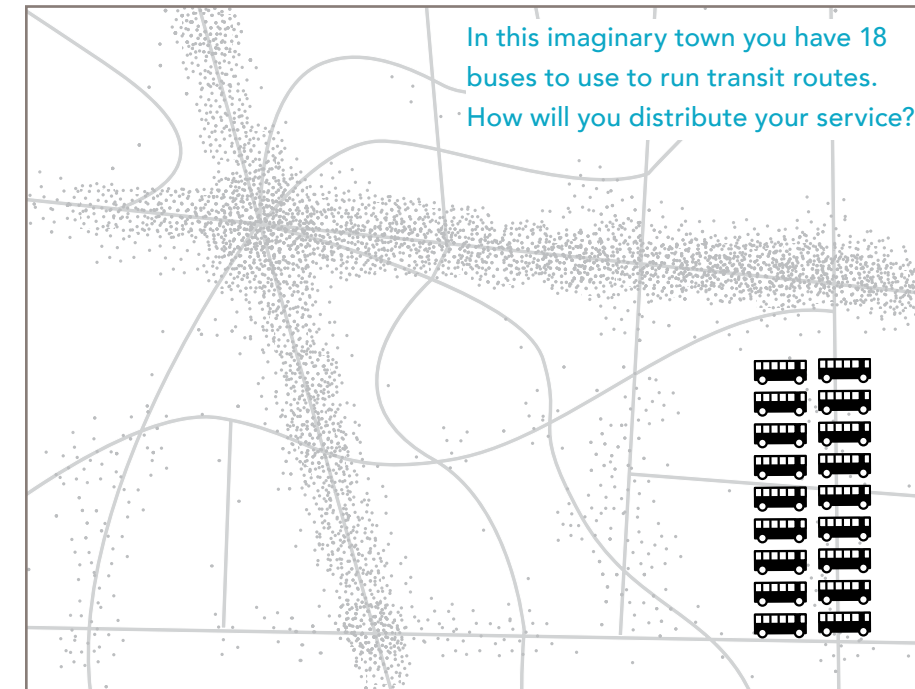
A **Coverage Goal** seeks to provide service to all parts of the region regardless of whether high ridership is a realistic expectation. This goal ensures that there is service in places where densities are low, or it is difficult or impossible to walk to and from stops, or where the road network makes it hard to draw logical routes.

A Coverage Goal corresponds to outcomes such as lifeline access for people no matter where they are, equity across cities or political districts, and access to jobs in landscapes that are not conducive to high-ridership transit, such as industrial and business park settings.

The drawings at right show the extreme ends of the Ridership-Coverage spectrum in an imaginary town.

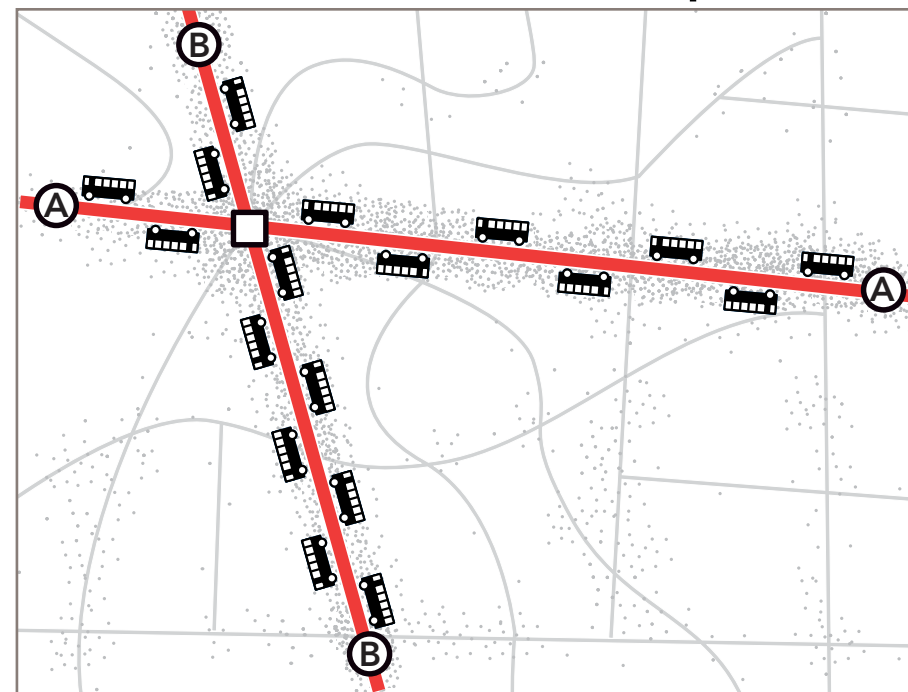
SacRT needn't choose between these extremes—the agency can choose to pursue both goals, but the goals trade-off against one another. The more SacRT pursues one the less it can pursue the other.

One outcome of this SacRT Forward process may be a policy establishing how much of SacRT's limited budget should be spent in pursuit of each goal.

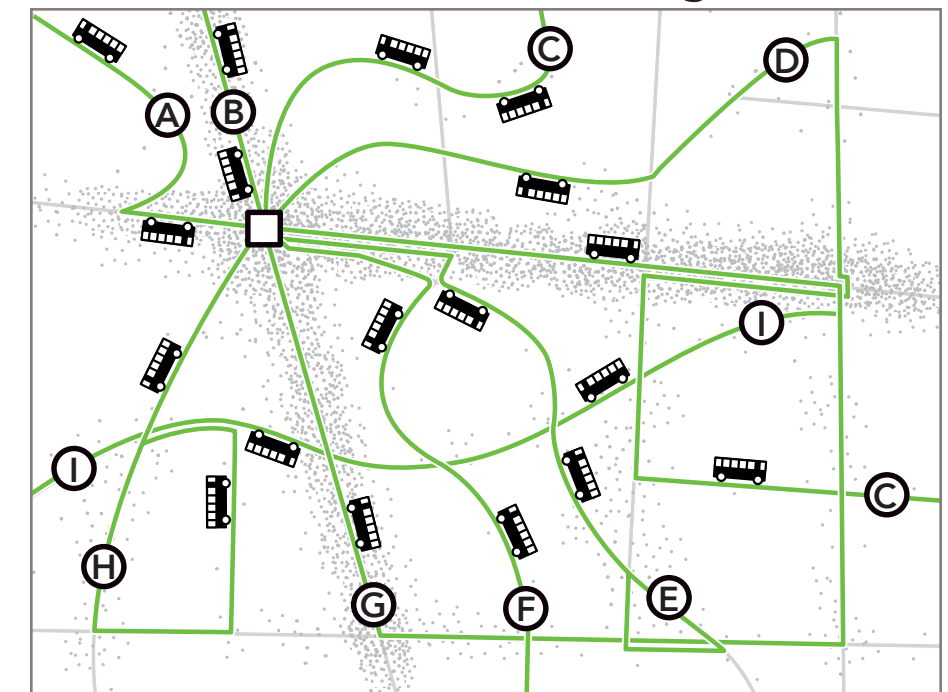


Maximum Ridership

Maximum Coverage



You can concentrate all your buses on few routes, in the densest and busiest areas. As a result, your routes are very frequent, so waits are short, and you can offer service at nights and on weekends. This results in high ridership, but some places have no service at all.



You can run buses everywhere, but each route is served by just one or two vehicles. As a result, all routes are infrequent so waits are long, and there isn't much night or weekend service. Very few people find the routes useful. Everyone has access to minimal service but total ridership is low.

A Network Designed for (Difficult) Connections

In transit conversations, there is always a great focus on *where* transit is provided, but sometimes not enough attention paid to *when* it is provided. The “when” of transit service can be described as *frequency* (how many minutes between each bus) and *span* (how many hours per day, and days per week, it runs).

Low frequencies and short spans are one of the main ways that transit fails to be useful, because it means service is simply not there when the customer needs to travel.

The map at right shows SacRT’s existing network, with every route color-coded based on its frequency during midday on a weekday. Only a few SacRT bus routes offer service every 15 minutes, and there are only a few places where a reliably quick connection can be made—where two red lines intersect on this map.

The Sacramento RT network has always been largely *radial*, since downtown is such a major and transit-friendly destination.

In the 1980s as light rail was opening, two major changes were made:

- “Grid” or “crosstown” routes were created, like Route 81 on Florin Road and 65th Street. These routes created high-frequency connections with radial services to provide travel options in many directions, not just towards downtown.
- Many radial routes into downtown were replaced by “feeders” that connect to light rail. This is a normal way to maximize returns on the investment in rail.

Both of these network design strategies depend on easy transferring. However, since they were implemented:

- Service cuts have worsened frequencies on some routes, which makes transfers more difficult.
- Connections among bus routes and light-rail lines have become harder to coordinate, so they can require very long waits.
- Fare barriers to transferring have increased. Discounted fares for a second (or third) boarding during a trip used to be offered, but were eliminated in 2009. Riders with passes can transfer for free, but for most cash purchasers a second boarding requires a whole second fare (\$2.75).

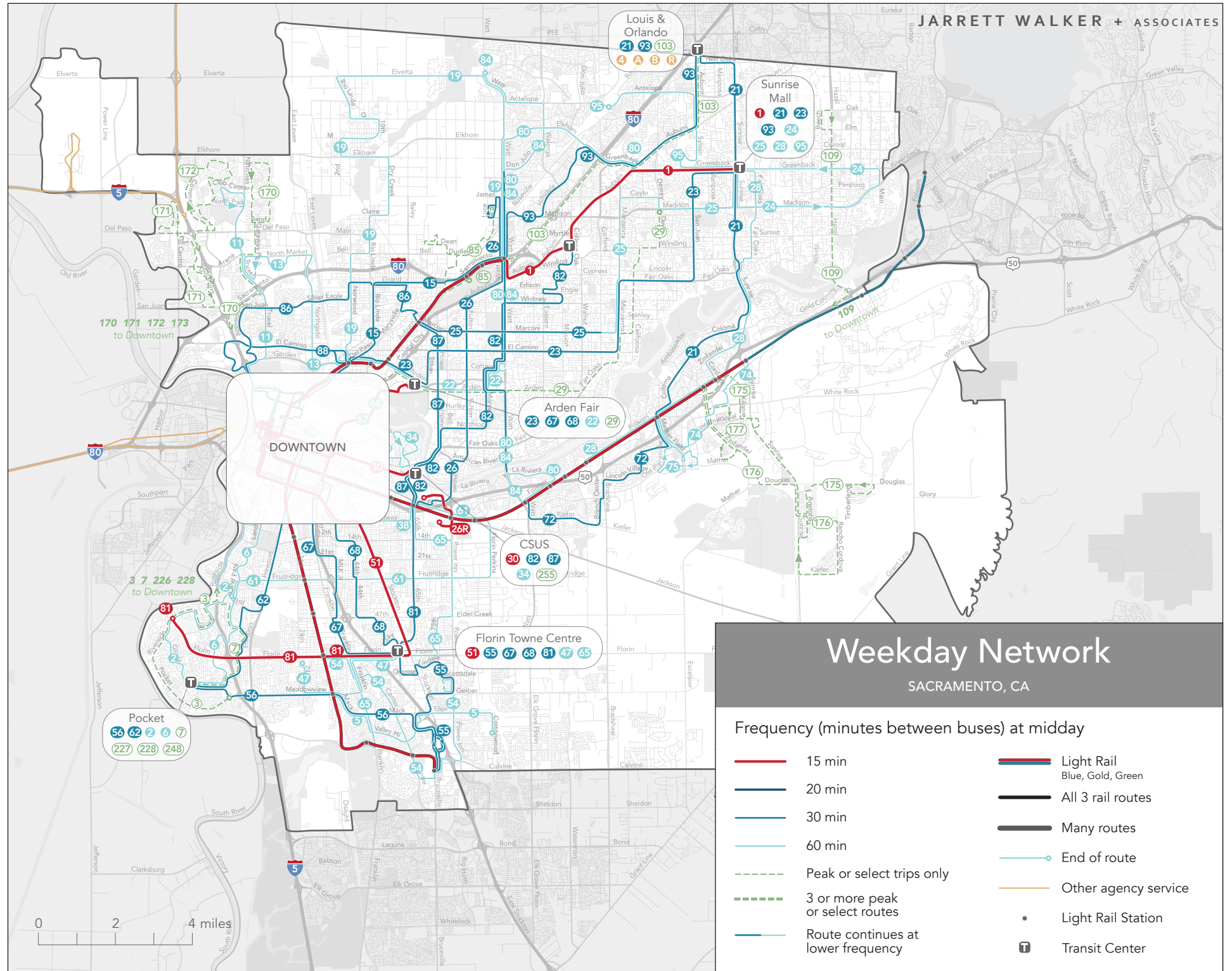


Figure 4: The existing SacRT transit network. Transit lines are color-coded based on their frequency during the midday on weekdays. Only a few routes come every 15 minutes, which is generally thought to be the level of frequency that makes catching transit, and connecting between transit lines, easy and fast.

Frequency is Freedom

Riders respond to many features of a service, including speed and reliability, but an often-overlooked factor is frequency. Frequency is the time between consecutive buses (or trains) on a line, and it determines someone's maximum waiting time.

Frequent service means public transit is coming soon, which means that it approximates the feeling of liberty you have with a private vehicle—namely that you can go anytime. Frequency has four independent benefits for the passenger:

- *Frequency reduces waiting time* (and thus overall travel time), and gives people a great deal of choice in when they travel.
- *Frequency makes connections between routes easy*, which makes it possible for a cluster of transit lines to form a network. A transit route without good connections is useful for travelling only along that line. A network massively expands the usefulness of each route.
- *Frequency improves reliability* for the customer, because if something happens to your bus, another one is always coming soon.
- *Frequency makes transit service easier to use*, by reducing the need to consult a schedule.

Real-time arrival information has made waiting for the bus or train easier. However, frequency still matters enormously, because:

- *Waiting doesn't just happen at the start of your ride*, it also happens at the end. You may not need to leave the house long before your departure, but *if your bus is infrequent, you have to choose between being very early or too late*.
- *Many of the places we go don't let us hang out until our bus's arrival is imminent*.
- *Real-time arrival information doesn't make the bus more reliable, but frequency does*. Your phone can tell you when your bus is arriving, but it cannot prevent your bus from having a problem and being severely delayed, or not showing up at all. Only frequency—which means that another bus is always coming soon—can offer this kind of reliability.

The mini-maps above show how frequencies change over the course of a weekday and the weekend in the SacRT network. *There are few places where transfers between frequent bus and rail lines are*

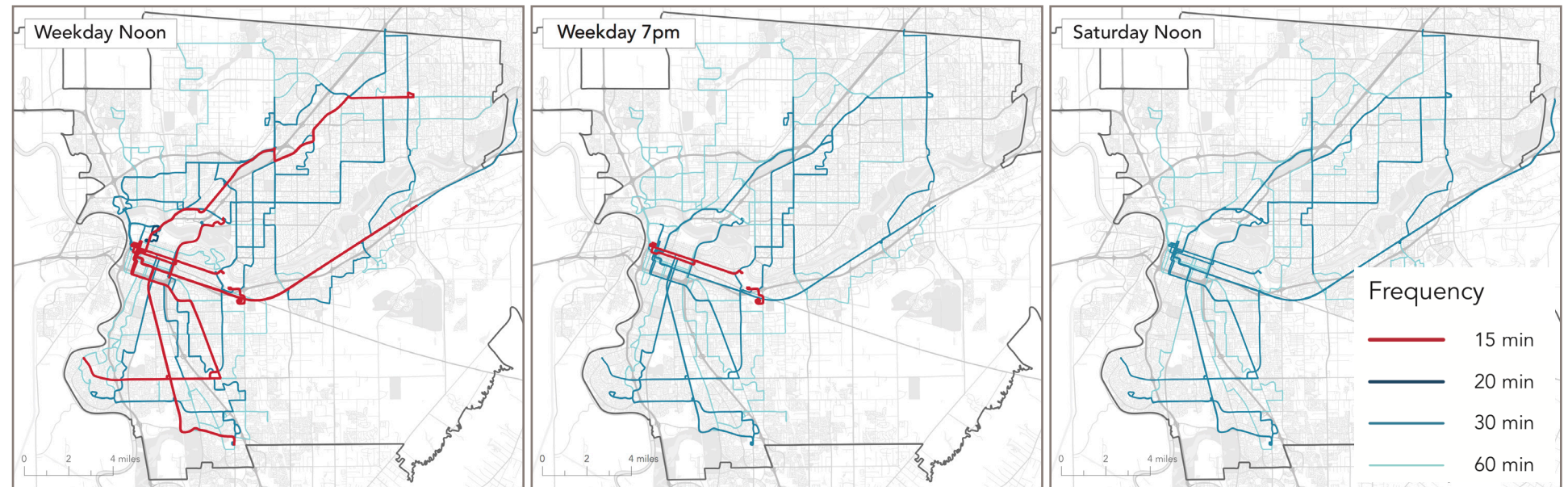


Figure 5: These mini-maps show the frequency of every route and light rail line throughout the weekday, and on Saturdays at noon. When frequencies fall low at night and on weekends, people's waits for service become long, and using the network as a network requires long waits to transfer.

possible. By the weekend, no bus route or rail line is running frequently, and only a few come every 30 minutes.

As shown at right, *more frequent services are also likely to be more productive (with higher ridership relative to cost)*. This is the case even though when SacRT provides higher frequency on a route, it increases costs. This is true not only in Sacramento but also all over the world.

The more destinations and opportunities people can access in a reasonable amount of time on a transit network, the higher its ridership potential. High-frequency networks do this particularly well, because every route is useful for reaching many other places, with one short transfer.

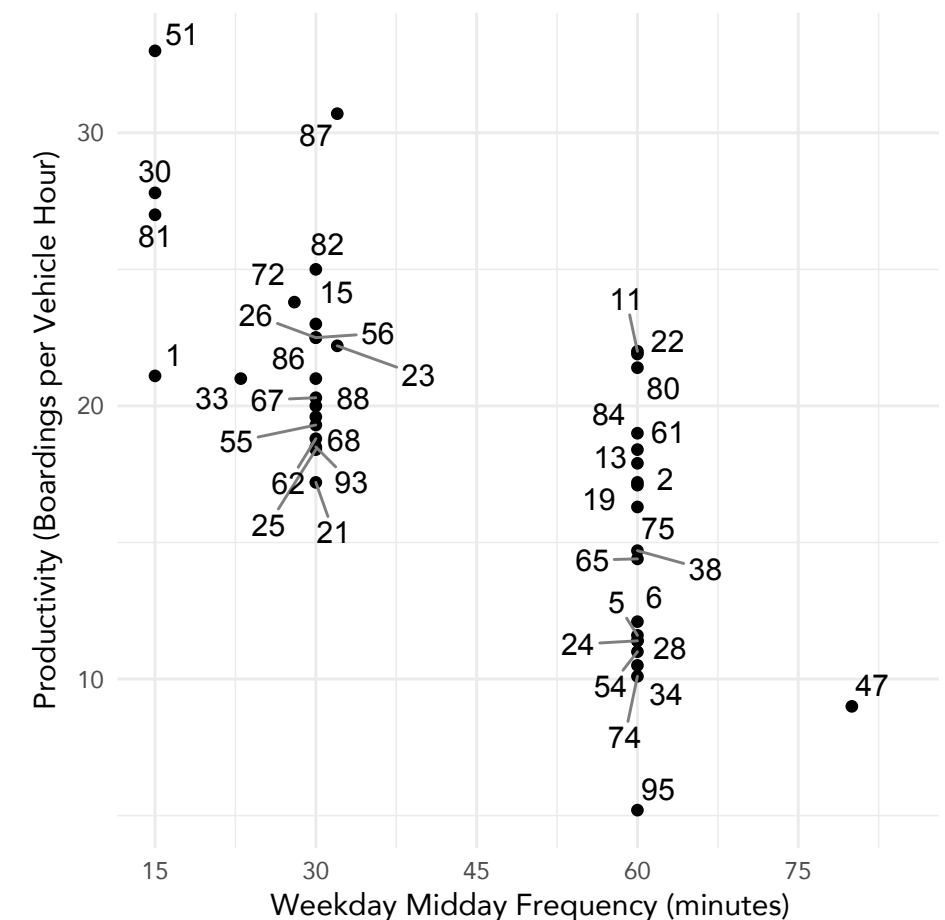


Figure 6: Frequency and productivity are correlated among SacRT routes, as among all transit routes. At right, each route is plotted based on its midday weekday frequency (on the horizontal axis) and its ridership relative to cost (on the vertical axis).

Development Patterns Affect Ridership

Achieving high ridership requires more than just good transit service. Many factors outside the control of SacRT have huge effects on transit's usefulness and therefore on potential for high ridership. This is why land-use planning by agencies like local cities, Sacramento County and SACOG is an essential part of transit's success.

The way that SacRT could attract higher ridership, within a fixed budget, is by targeting places where the "Ridership Recipe" is in effect:

- **Density:** Demand for transit is higher when there are more people, jobs and activities near each transit stop.
- **Walkability:** Transit is only useful to people who can safely and comfortably walk to a stop.
- **Linearity:** Direct paths among destinations are faster, cheaper for SacRT to operate, easier to understand and more appealing to customers.
- **Proximity:** Shorter distances between destinations are cheaper for SacRT to operate.

These are geometric facts about a region. They are not a matter of opinion or personal values.

Density and walkability tell us about the overall ridership potential: "Are there are a lot of people around, and can they get to the transit stop?"

Linearity and proximity tell us about both ridership potential and cost: "Are we going to be able to serve the market with fast, direct lines, or will we have to run indirect or long routes, which cost more to operate (and cost riders time)?"

Though it is not one of the four major factors named in the Ridership Recipe, *the mix of uses along a corridor affects how much ridership transit can achieve, relative to cost.* This is because a mix of uses tends to generate demand for transit *in both directions, at many times of day.*

Transit lines serving purely residential neighborhoods tend to be used in mostly one direction and mostly during rush hours—away from the residential neighborhood, towards jobs and services. Transit serving a mix of uses can be full in both directions, all day and all week.

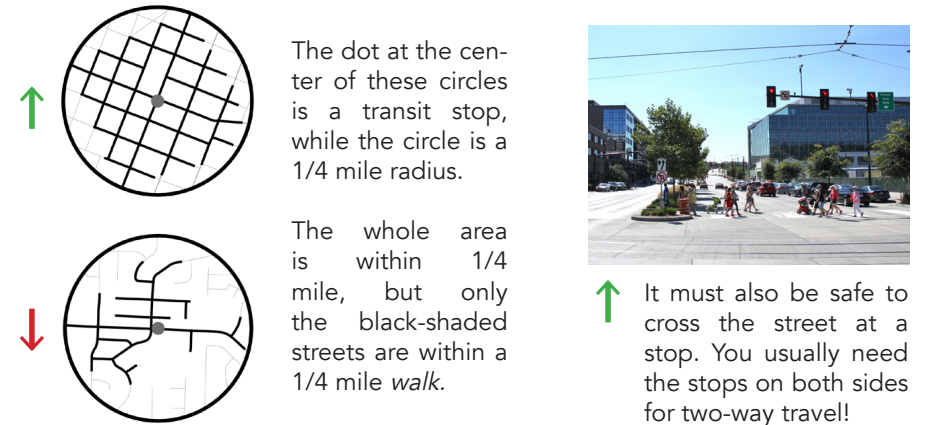
Most of SacRT's very productive services (including Routes 51, 30, 80

The Ridership Recipe: Higher Ridership, Lower Costs

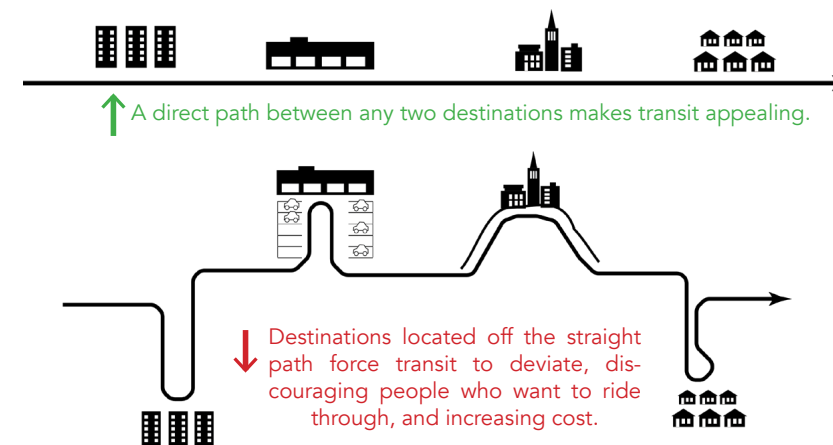
DENSITY How many people, jobs, and activities are near each transit stop?



WALKABILITY Can people walk to and from the stop?



LINEARITY Can transit run in reasonably straight lines?



PROXIMITY Does transit have to traverse long gaps?

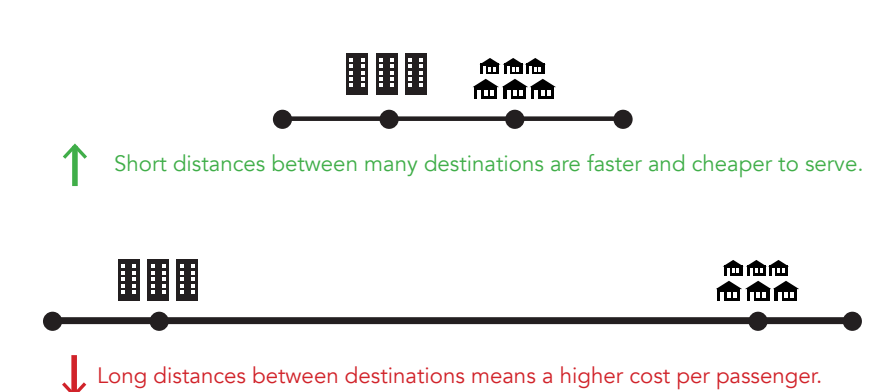


Figure 7: These four land use factors have an enormous influence over how much ridership transit can attract, and how much transit an agency can provide.

and the Blue Line light rail) run through dense mixes of housing and jobs, and as a result attract riders in both directions throughout the day.

Where is Ridership Potential High?

SacRT could attract higher ridership, within a fixed budget, by targeting places where the “Ridership Recipe” is in effect. We can visualize these places by looking for density, walkability, linearity and proximity. Residential and job densities are shown combined on a single map, at right.

Along a few corridors moderate or high density development is arranged in a continuous and linear pattern:

- J Street/Fair Oaks from downtown to Fulton Ave.
- Freeport/21st Street in Curtis Park and Midtown.
- Multiple roads in Arden-Arcade.
- Auburn/Greenback from Arden-Arcade to Citrus Heights.
- Walerga Road in North Highlands.
- Folsom Blvd., through Rancho Cordova.
- Stockton Avenue from Broadway to Elk Grove.
- Elsie and Mack Roads and Center Parkway in the Parkway/Valley-Hi neighborhoods.

The Challenge of Freeway-Oriented Development

Some of the densest development in the Sacramento area is oriented to freeways (e.g., I-5 and I-80 in South Natomas). One of the ingredients in the *Ridership Recipe* is *linearity*, but only if the line being followed is one along which buses can serve stops, and people can access those bus stops. Neither is true of freeways—*buses running down the freeway are walled off from potential riders, and must exit the freeway and loop around to serve stops*. For transit, freeways are barriers, not corridors.

Development concentrated near freeway exits and entrances requires people to walk in unsafe and unpleasant conditions to access transit service. Unsafe and unpleasant walking conditions will naturally suppress transit ridership.

SacRT and other transit agencies in this situation respond quite reasonably by making sure that neighborhoods on *both sides of the barrier* have access to transit. This means running two routes, instead of one. *Dividing a fixed quantity of service into more routes means that routes have worse frequencies* (or shorter spans of service) than they otherwise could.

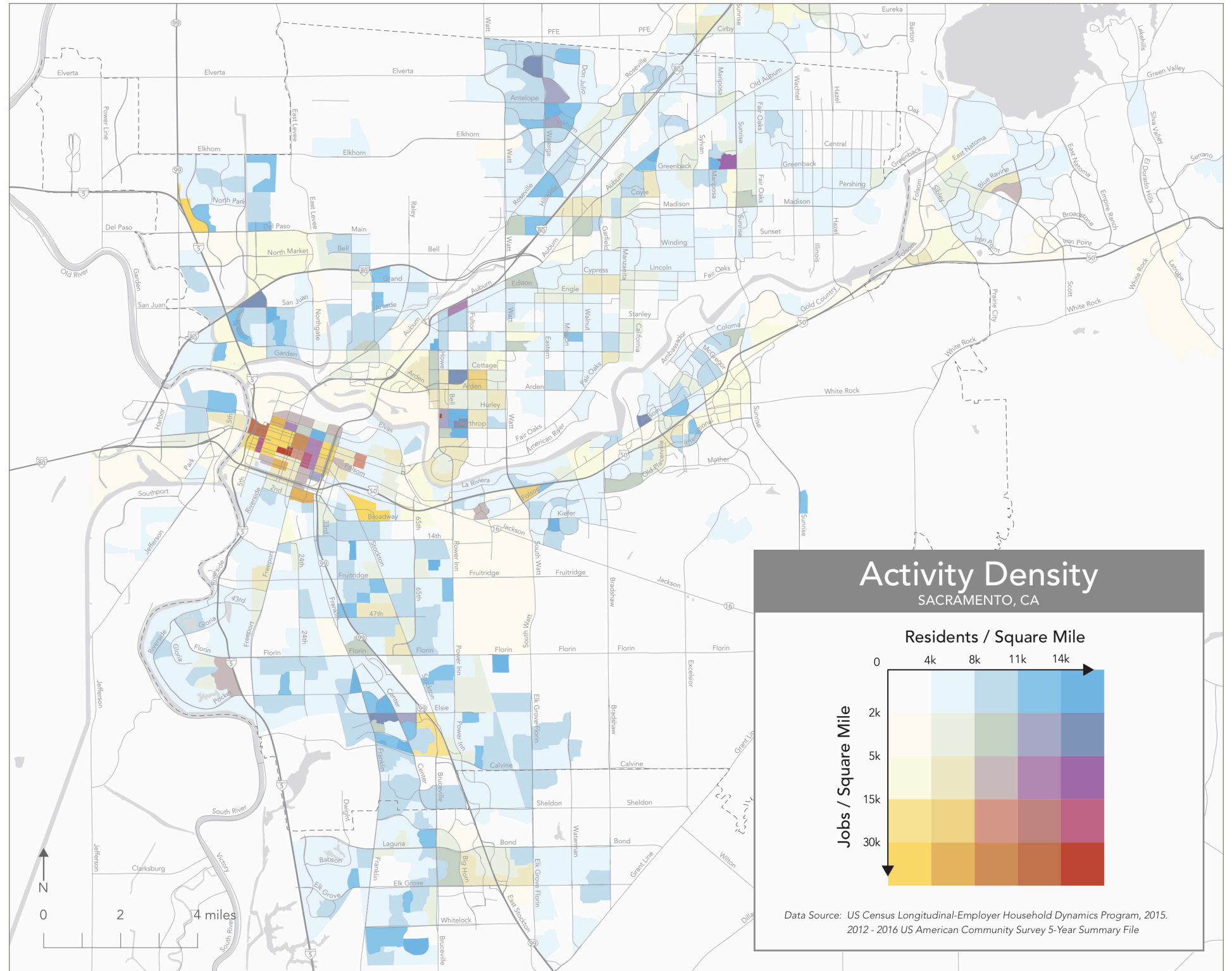


Figure 8: Areas that are dense with a mix of uses are shown in shades of red on this map. A few linear, mixed-use corridors become visible (for example, J Street, Folsom Blvd. and Stockton Blvd.), as do clusters of mixed-use density like Midtown and Arden-Arcade.

Ridership Growth Depends on Infill Development

The map at right shows changes in residential density between 1990 and 2016.

Most job and residential growth has happened at the edges of the region, in places that were previously undeveloped. These areas are not now *dense* but they have *densified the most* since 1990. (More maps illustrating growth are in the full Choices Report.)

While downtown Sacramento has attracted new investment, and more jobs, in recent years, its residential population has barely changed. Within the region, the City of Sacramento is particularly encouraging of high-density and infill development.

If growth is not close to the existing transit network, then SacRT must spend more of its budget running buses and trains longer distances, and less of its budget providing high frequencies or long hours of operation.

The lack of strong residential growth around most light rail stations (notice how many station areas, circled at right, appear mostly white or pink) has likely contributed to the decline in light rail productivity over the past 20 years, illustrated in the graph below.

If the region continues to add mostly low-density housing, away from the existing transit network, then potential for high ridership within SacRT's existing service budget will continue to fall.

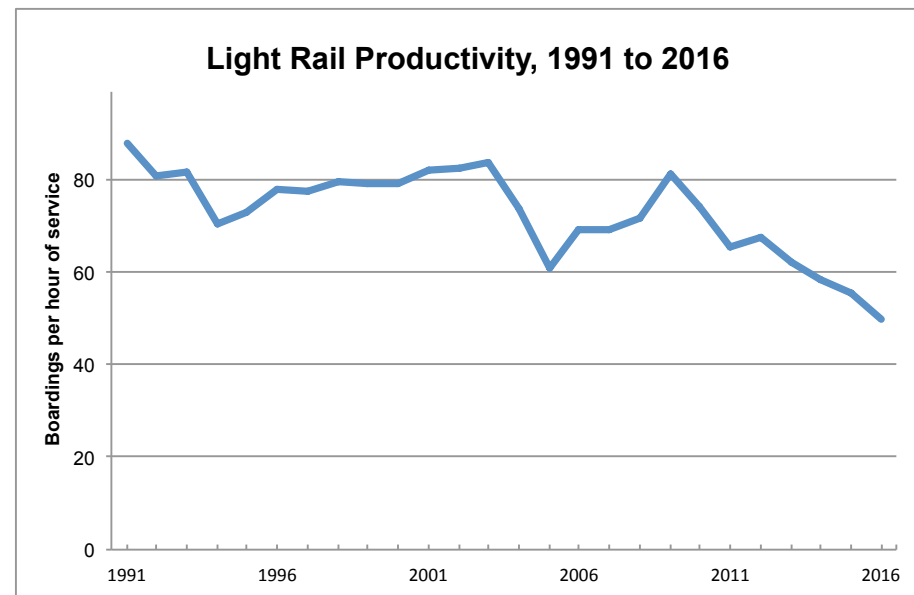


Figure 10: Light rail ridership relative to service levels has fluctuated but declined overall.

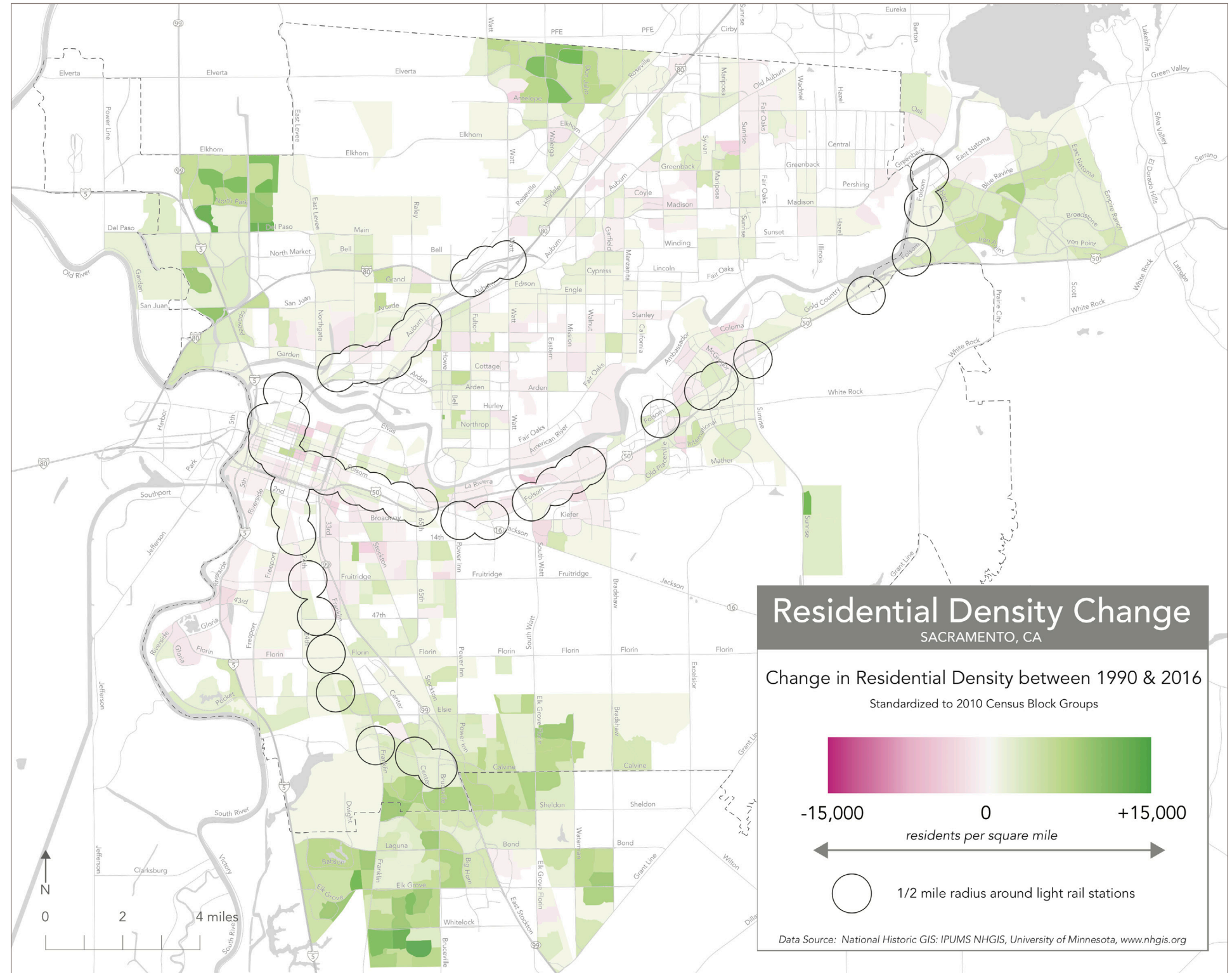


Figure 9: Mild residential growth near light-rail stations has happened along the south Blue Line and in outer Rancho Cordova and Folsom. Most other station areas have seen little increase in residents, or even a decrease in residents.

The Transit Network as an Instrument of Freedom

High transit ridership results when transit is useful to large numbers of people. A helpful way to illustrate the usefulness of a network is to visualize where a person could go using public transit and walking, from a certain location, in a certain amount of time.

Visualizing Access

The map at right shows where someone can go if they start out from the intersection of Arden & Fulton at noon on a weekday. Areas they can reach in less than 60, 45 or 30 minutes are shown in orange, red and purple, respectively. The technical term for this illustration is an *isochrone*. (Other sample isochrones are included in the full Choices Report.)

A higher-ridership transit network is one in which isochrones are large for a great number of people.

Other factors outside of the transit network (and outside of SacRT's control) influence transit ridership. For example, transit fares and the costs associated with driving have influence on ridership. But access, as illustrated by the isochrone at right, is a *necessary prerequisite* for high ridership, and is controlled by the quantity of service provided, and the design of the transit network.

Measuring access

What goes into the travel time reflected in this isochrone?

- Time spent walking to a bus or light rail stop.
- Time spent waiting for the bus or train, which is on average one-half of the frequency.
- Time spent riding the bus or train. The faster the vehicle goes, the farther someone can get.
- Time spent waiting for a second bus or train, if the trip involves making a connection, and riding that second vehicle.
- Time spent walking to the final destination.

Frequency, speed and distance govern people's travel time on transit. While speed and distance are mostly out of the control of SacRT, the frequency of different transit services is a decision made by SacRT. Long waits for low frequency services can consume a great deal of someone's travel time budget, making for smaller isochrones.

We can also measure the number of opportunities inside an isochrone, for example the number of jobs within a 45 minute trip of the starting point. This is the ultimate measure of access: not just the places you can go, but the things you can do once you get there.

Example: Access to and from Arden-Arcade

The difference in freedom offered by a low-frequency route and a medium-frequency route are visible within the purple part of this isochrone. The isochrone is centered at the intersection of Arden and Fulton, where Routes 26 and 22 cross. A person can get pretty far to the north and south along Fulton in 45 minutes, thanks to 30-minute frequency in that direction. In contrast, they can't get very far east and west along Arden Way in 45 minutes, because their east-west route comes only every 60 minutes.

Even beyond usefulness, an isochrone shows the level of personal freedom and opportunity afforded by the public transport network. For people living around Arden & Fulton, where can they apply for jobs? While jobs directly on Routes 22 or 26, within Arden-Arcade, are easily reachable, only a few jobs downtown are reachable within an hour's travel. Where can people enroll in school? Sac State is reachable within 45 minutes.

If people cannot afford to spend an hour and a half or two hours of their day traveling to and from school or work, they might not pursue a job downtown or enroll at Sac State. Or they might struggle to succeed because of the length of their commute. Or they might sacrifice some other investment, to come up with the many thousands of dollars a year required to own and maintain a car.

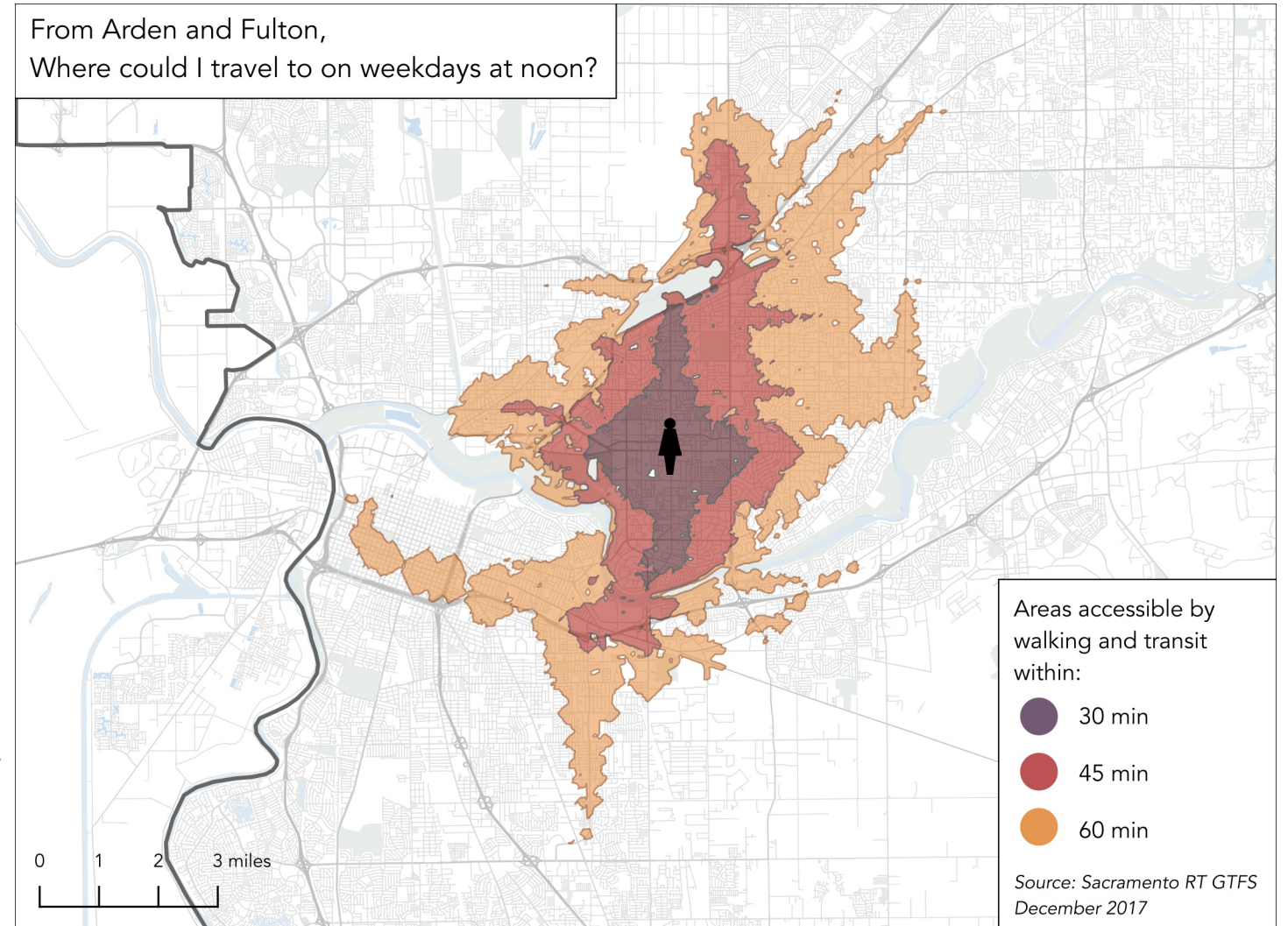


Figure 11: From the intersection of Arden & Fulton, much of Arden-Arcade is reachable within 30 minutes of travel, but Sac State is 45 minutes away, and downtown an hour or more. (More examples like this are shown in the full Choices Report.)

We can think of these shapes as the walls around someone's life. Potential for ridership grows as we move these walls outward for large numbers of people.

The biggest limits on how liberating a transit network can be are the quantity of service provided, the frequency of service, and the span of service throughout each day and week.

SacRT and its stakeholders will have an opportunity to consider changes that would make the transit network more liberating for large numbers of people. However, making such changes within the existing service budget would require major trade-offs.

Coverage Levels are Equitable

The chart at right reports how much coverage is provided by the existing SacRT network, to residents and jobs within SacRT’s very large 367 square mile service area.

This chart measures coverage by any service as well as by frequent service. The distinction is important because frequent service is most likely to attract high ridership relative to its cost. (Other service characteristics matter too, like span, speed and reliability. These are discussed in the full Choices Report.)

About 11% of residents are within 1/4 mile of frequent service, but *five times* as many people are near *some* kind of service.

It is encouraging to observe the lack of racial disparity in how the existing network covers Sacramento-area residents:

- Non-white residents are just as likely as all residents to be close to some transit service.
- Low-income residents are slightly more likely to live close to some service.

These conditions are not static and may change in coming years as the economy and city change. If increasing housing demand near transit and in urban areas is not matched by increases in the supply of housing, then people living on low incomes may move to seek lower rents and property prices. Whether or not this is a consequence of growth and the desirability of urban, walkable areas depends on land-use planning, growth-permitting and affordable housing policies in local jurisdictions.

The Sacramento area is both highly diverse and highly integrated by race and ethnicity. In fact, among major U.S. cities, it is the second-most integrated at the neighborhood scale. This means that when SacRT provides transit service to an area, it is able to cover people of different races and ethnicities.

Coverage at Midday on a Weekday (1/4 mile)

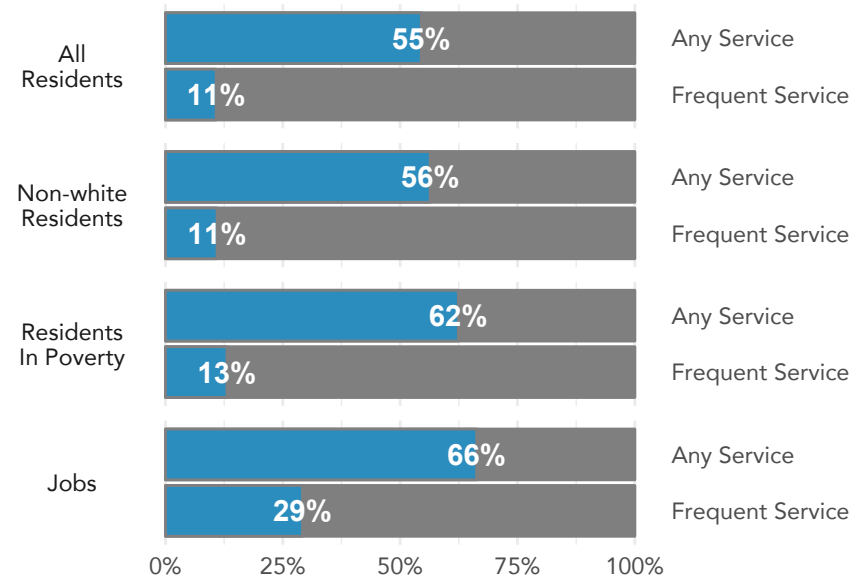


Figure 12: While a small majority (55%) of Sacramento area residents are covered with some transit service, frequent service only covers 11% of residents. Coverage of jobs by frequent service is higher, which is typical in most cities and results from jobs being concentrated downtown.

Coverage by Frequent Service is Low

Analyzing coverage for peer cities is difficult, but a few data points are available from recent JWA studies:

- In Richmond, Virginia, another state capital, *twice as many residents live near frequent service* (22%), and the same percentage of residents (55%) live near at least some kind of service. Coverage of jobs by frequent service and any service is almost identical between Richmond and Sacramento.
- In San Jose and Santa Clara County, *more than twice as many residents live near frequent service* (26%), and 66% are near any service. 37% of jobs are near frequent service, and 87% of jobs are near any service.

Coverage provided by the San Jose/Santa Clara County network is higher than that provided by SacRT, even though the two agencies are working with a similar amount of service per capita (see the graph of “Transit Investment” on page 3).

This may be partly explained by geography: Santa Clara County is “landlocked” in a way that the Sacramento region is not. Between the Bay and the mountains, most new development in Santa Clara County can’t help but be near an existing transit line. In contrast, new development in Sacramento can move away from existing transit service without hitting many natural boundaries.

The greater percentage of residents and jobs that are close to frequent service in Santa Clara County, compared to the Sacramento area, arises because the Santa Clara County transit agency has focused its service into fewer, more frequent routes.

Specialized Service is Costly

While providing specialized service is a generous gesture, most of the time it is not a path to high ridership relative to cost. High ridership transit is typically transit that is *useful* for a broad range of people, rather than *perfect* for any particular group of people.

In a high-ridership transit network, routes are designed to fit together in a way that allows people to travel in all directions. Each route is useful for reaching many different destinations because of its connections with other routes. Specialized services can almost never be integrated into the rest of the network to this degree.

Long-term ridership gains will arise as people make the choice to depend on SacRT for more and more of their trips. Highly specialized services, like routes designed for school trips or temporary parking problems, rarely have this effect.

Rush Hour Ridership Potential and Costs

The transportation profession has long been focused on the weekday peaks, because those are the times when our road capacity is most-used and congested. Yet people need to travel at all times of the day and week, especially people in lower-wage retail and service jobs. In addition, fewer than 1 in 5 trips made in the U.S. is a trip to or from work.

People sometimes assume that targeting transit service at the peak of demand, in particular at rush-hours, will be most “efficient.” In fact, *peak-only routes have a very wide range of costs per boarding* (as shown in the scatterplot at right) and are, on average, less productive than all-day routes. Even on SacRT’s all-day routes, rush-hours tend to be *less* productive than the midday!

Finally, peak-only routes and higher peak frequencies have extra costs compared to all-day and all-week routes. *They exacerbate peak vehicle and operator requirements, leading to higher costs.*

Routes Designed for School Demand

SacRT’s supplemental routes designed around schools attract fairly high ridership relative to service levels. (These routes have numbers in the 200’s, and they are not included in the chart at right.) However, like peak-only routes they impose peak fleet and labor costs.

These school-oriented routes are provided in some parts of the region but not others, due to a mix of historical factors and local advocacy.

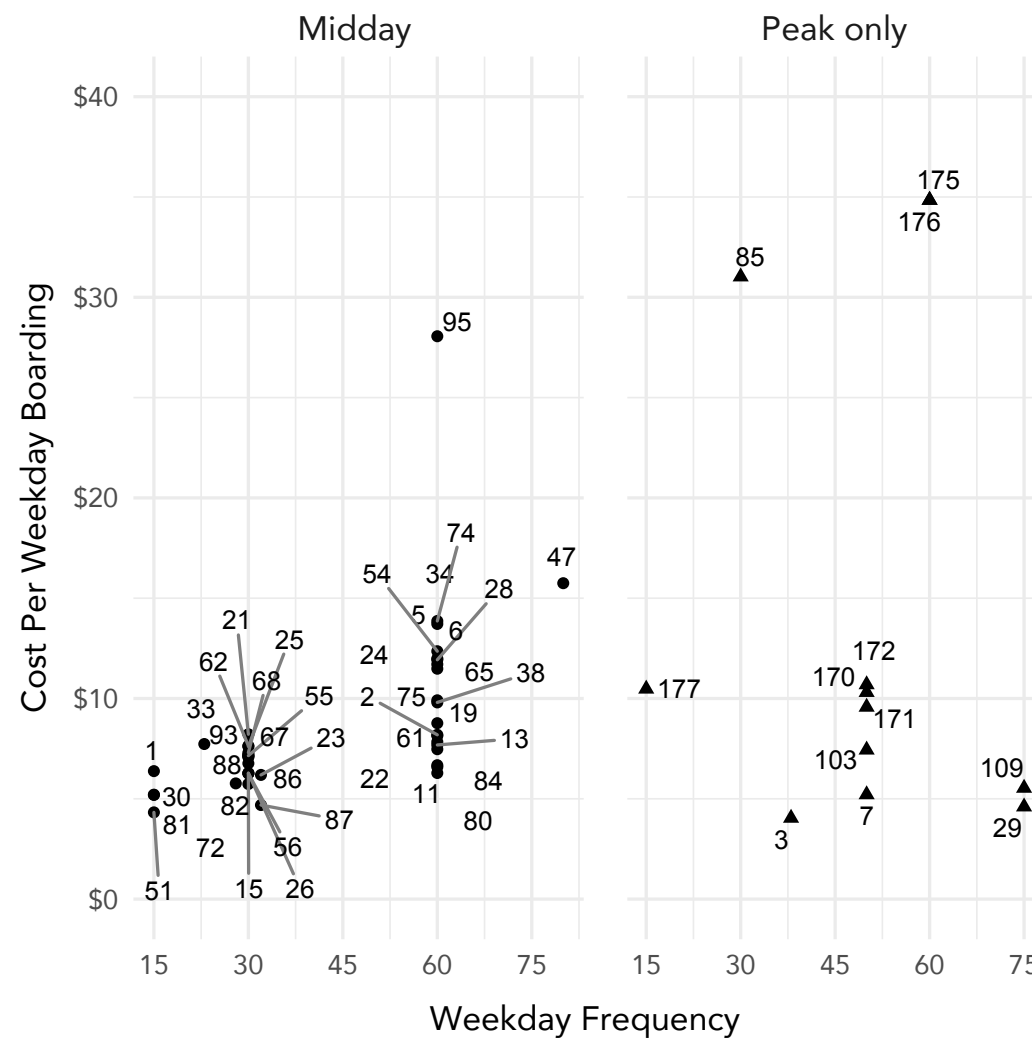


Figure 13: Routes specialized around peak commutes have a wide range of costs per boarding, but are on average less productive than all-day routes and therefore have on average higher costs per boarding. They also require extra vehicles and drivers, which raises an agency’s costs but is not captured by this particular measure.

Parking Shuttles

SacRT currently funds parking shuttles for Kings’ Arena employees and for Sac State (the latter is one of the few frequent routes that SacRT offers). While these shuttles are open to the public and charge a fare, they are designed entirely around the special needs of these organizations.

The Sac State shuttle is temporary and will soon stop operating. This makes clear that it cannot be part of a long-term ridership strategy, because no one has sold a car, or selected an apartment, or made similar life plans thanks to this temporary shuttle.

Continuation and funding of the parking shuttle for Arena employees is currently under discussion among SacRT, the Kings and the City of Sacramento.

Demand-Response Service (“Dial-a-Ride” or “Microtransit”)

SacRT provides a demand-response service in Citrus Heights. Until recently, it was operated as dial-a-ride, in which people call in advance to make a reservation, and are then picked up and dropped off at places of their choosing (within a defined zone).

More recently, SacRT started allowing people to request a ride anytime they want, without needing to make an advanced reservation. The new service is marketed as “SmaRT Ride” but also referred to as “microtransit.”

“Microtransit” provides a very high quality of service to riders, because it allows people to travel when they want, on short notice. It also allows people to get a ride without walking to or from a bus stop, which is particularly attractive in places where walking distances are long and walking conditions are not comfortable.

Demand-response service of any kind—including new “microtransit” services—cannot achieve high ridership relative to service levels, simply because driving to and from everyone’s requested places takes a lot of time. This is a physical limitation and is not altered by the size of the vehicle, or the amount of demand.

No app-enabled demand-response service has exceeded 3 boardings per hour. Recent results from SacRT’s “microtransit” pilot show a productivity and cost per boarding that are nearly identical to those of the dial-a-ride service it replaced.

The productivity of the new “SmaRT Ride” service and the old dial-a-ride are both shown in the chart at right, along with SacRT’s fixed routes. The very low productivity of these demand-response services is not due to low demand or inadequate marketing, it is simply a reflection of what is physically possible when a transit service responds to people’s demands for service where they want, when they want.

While “microtransit” may be part of SacRT’s toolkit for low-ridership coverage services, it will not contribute to a high-ridership strategy.

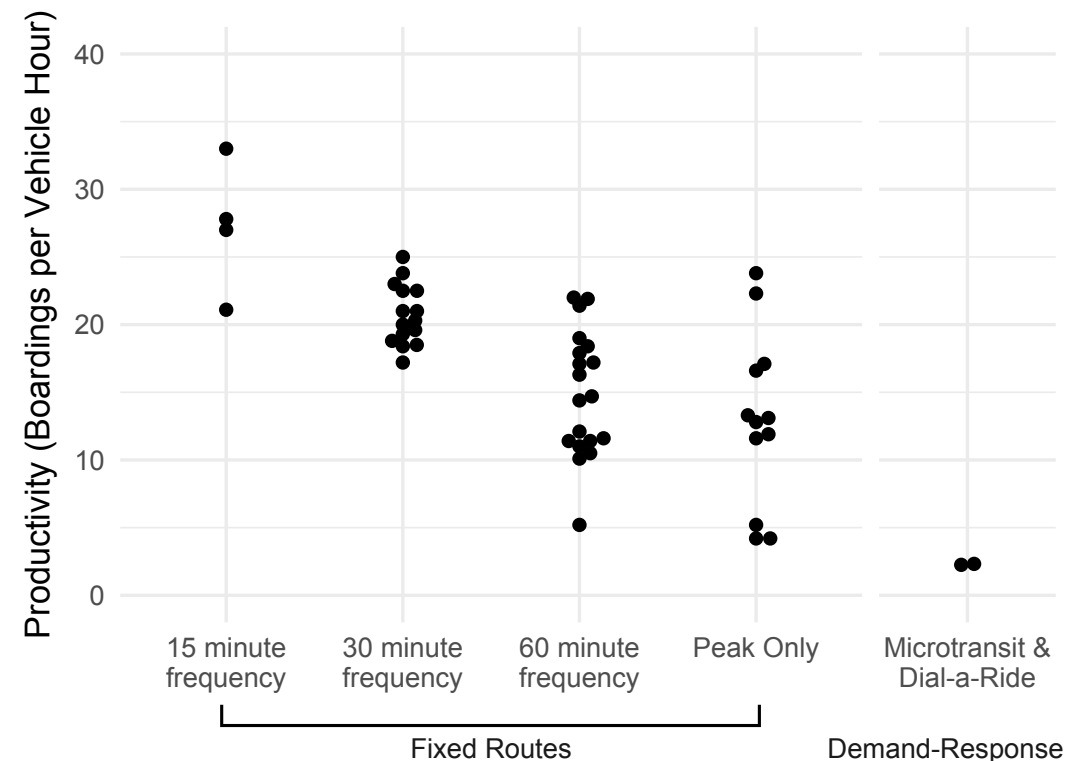


Figure 14: The productivity of SacRT services plotted by type of service. The new “SmaRT Ride” demand-response service is included at right. While “microtransit” may be a tool for providing an excellent customer experience, it cannot be scaled up to serve many people. Even with very high demand, it is not physically possible to serve more than 6 trips per hour, if you are picking people up where they want and when they want.

Thin Weekend Service

On weekends, nearly all SacRT routes run at much-reduced frequencies, if at all. Spans of service on weekends are mostly shorter than on weekdays.

Mini-maps on page 6 showed how much the frequent network dwindles and then disappears from weekdays to Saturdays. On Sundays, some routes are less frequent and some don't run at all. SacRT is one of the few transit agencies that runs light rail only every 30 minutes on weekends.

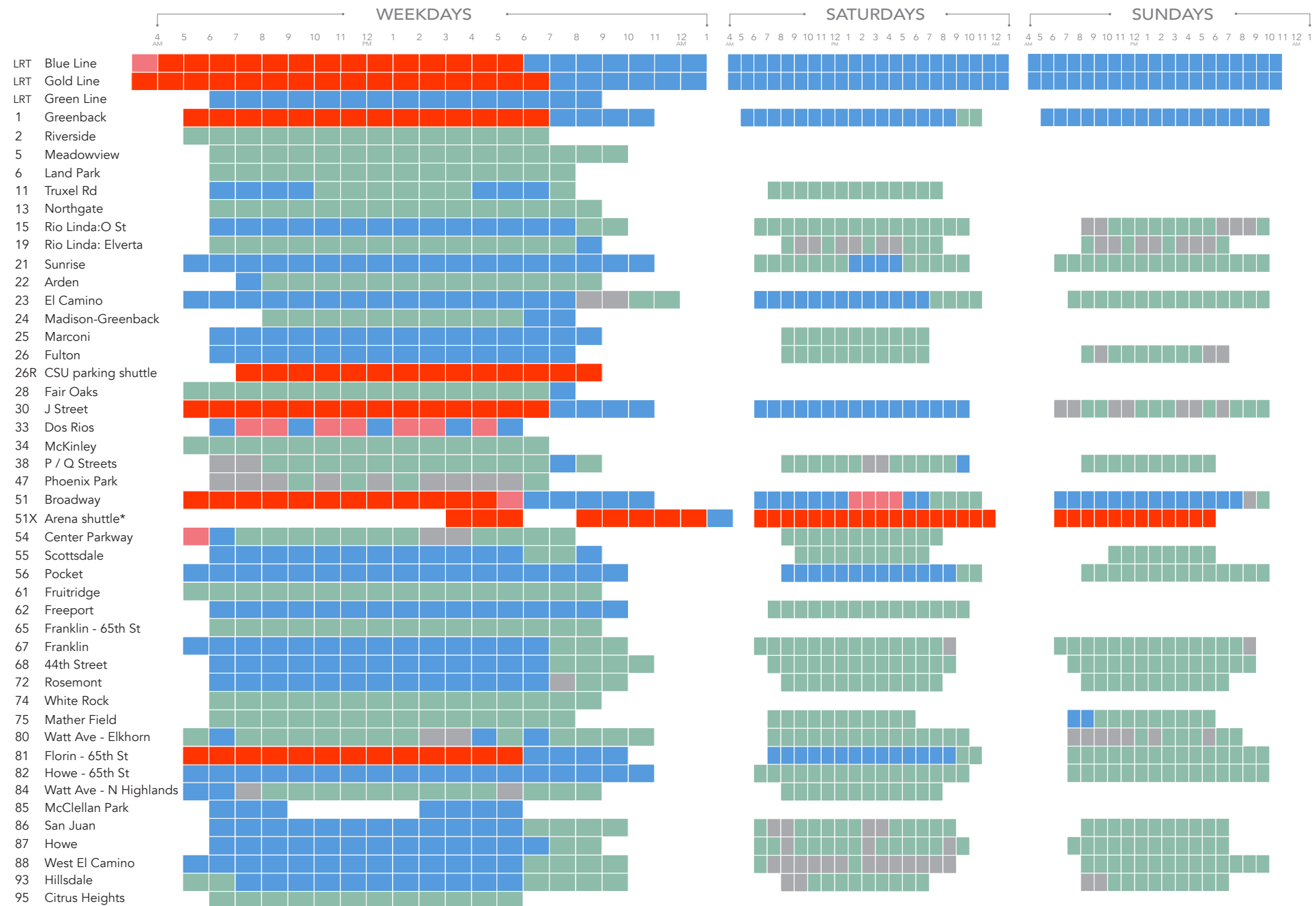
Most people need to travel at many different times of the day and week. People working in the service industry commute at all different times, and particularly on weekends when restaurants and retail are "all hands on deck."

Ridership levels on Saturdays and Sundays are not much lower than on weekdays, relative to the levels of service provided by SacRT. A few routes are even more productive on weekends than on weekdays, despite the fact that the transit network as a whole becomes much less useful.

This suggests that, at least along some routes, service is high relative to demand during the weekday, and low relative to demand on the weekends. *Some strategic shifts of service from weekdays to weekends might even result in higher total ridership relative to costs.*

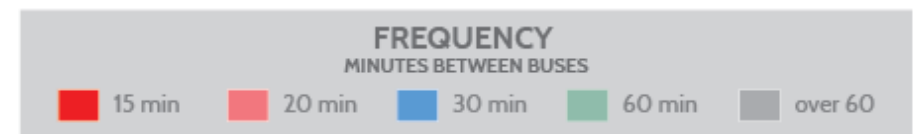
Aside from potential ridership, there are reasons to provide Saturday and Sunday service even if it does not increase ridership. People need to travel on weekends for many different reasons, including for essential trips to work, medical care and services. Giving people access to their city on the weekend is a valuable outcome for community and personal health. This is an example of a *ridership vs. coverage* trade-off that is about span of service and "temporal" coverage, rather than geographic coverage.

Sacramento RT Existing Route Frequencies



* Route 51X is an Arena-employee shuttle that runs only before and after events.

Figure 15: The frequencies and spans for each SacRT service. Light rail lines—shown at the top—are only frequent on weekdays until 7 pm. No service is frequent on weekends (except the 51X, which is an employee parking shuttle for the Arena).



Key Choices

This SacRT Forward Network Plan is a unique opportunity for the Sacramento region to rethink the purpose of the transit system.

The current transit network is a legacy of past generations, and has accrued years of good intentions, good ideas, stop-gap measures, fiscal crises, and special requests. Much of the existing network may be worth keeping as is, because it serves people's current values or because its familiarity to current riders is highly valuable.

It is also possible to start afresh. Transit networks are intricate, interwoven, living things, and adapting them incrementally over time is not always possible. SacRT staff has done a laudable job of making service cuts that were as un-damaging as possible, and restoring service in strategic ways since then. Despite their best efforts, ridership has continued to fall, and stakeholders have expressed concerns that the transit network is no longer meeting community goals.

Higher Ridership, or Wide Coverage?

The most difficult choice for the Sacramento area will be between focusing on services that attract high ridership relative to their costs; and providing wide geographic coverage.

Access is defined on page 10 as the amount of space, and the number of opportunities inside that space, that a person can reach within a given travel time.

High access for large numbers of people is a *necessary prerequisite* for high ridership, and is controlled by the design of the transit network.

Other factors also influence transit ridership. For example, transit fares and the costs associated with driving have influence on ridership. In this Network Plan, we will focus on the ways that the transit network can provide access, and can thereby create potential for high ridership.

High frequencies are a key part of a high ridership strategy. Long spans of service, in which transit runs into the night and on weekends, are also often part of a high ridership strategy.

High ridership serves several popular goals for transit, including:

- Reducing car costs, emissions and traffic.

- Achieving low public subsidy per rider.
- Allowing continued development, even at higher densities, without apocalyptic traffic congestion.
- Giving more people personal and economic freedom.

On the other hand, many popular transit goals do not require high ridership in order to be achieved. These include:

- Ensuring that everyone in the service area has access to at least *some* transit service.
- Providing lifeline access to critical civic and health services.
- Providing access for people with severe needs, no matter where they live.

No transit agency focuses solely on either of these goals. Most transit agencies have some direct, frequent, long-span routes on which ridership and productivity are high, and others which run at lower frequencies and more limited times, for specific coverage purposes.

We suggest that people think about this choice not as binary, "yes-or-no" decision, but as a sliding scale (as in the drawing above) that the community can help to set:

How much of the SacRT budget should be spent on the most useful and frequent services, in pursuit of high ridership? How much should be spent providing low-frequency coverage so that people with severe needs have access to some service?

This is not a technical question, but one that relates to the values and needs of a community.

One way to manage the trade-off between frequency and coverage is to define the percentage of the budget that should be spent in pursuit of each one. SacRT could, as a result of this study, establish that it will continue to spend a the same percentage of its budget providing high frequency services and maximizing ridership, or it could decide to spend more or less towards that purpose.

The direction of that shift—either towards higher frequencies or towards wider coverage—is a question for stakeholders to discuss as part of this Network Plan.

A transit network can be well-designed for any balance point between these two goals. The best design of the network will depend on that balance point:

- A redesigned higher-ridership network would concentrate service into fewer, more-frequent routes, possibly with longer spans of service, especially at night and on weekends.
- A redesigned high-coverage network for SacRT would not concentrate service into frequent routes. It might include some pulsed connections, so that transfers between low-frequency routes are shorter. In this way it might improve conditions for existing riders, but the potential for high ridership would not increase by much.

Broadly Useful or Specialized?

SacRT currently provides specialized services, funded mostly or entirely out of its general budget, with modest contributions from local partners in some cases. While these services add up to a small part of SacRT's operating budget, most of them add an entire bus and driver to SacRT's peak fleet and personnel requirements. They also demand agency staff's attention to plan, schedule, market and maintain them.

As individuals it is tempting to think that a transit service designed to be perfect for us, and for people like us, will attract high ridership relative to its costs. Yet high ridership transit services are rarely specialized around any particular group of people's needs. Instead of being *perfect* for a small number of people, they are *good enough* for large numbers of people.

On a high-ridership transit network, each route is designed to be broadly useful both along the route itself and through the connections it makes with other routes. Specialized services contribute much less to the usefulness of the whole network, if they are integrated into the network at all.

If SacRT wants to pursue higher ridership relative to costs, one way to do so will be to take a look at its current practices around specialization, and evaluate whether those practices should be maintained or changed in light of long-term ridership goals.

Specialized services raise a question of precedent. If the taxpayer pays for shuttles at certain employers or schools, why not at others? Where specialized services exist, agencies need an answer to this question.

SacRT may wish to define the conditions under which it will provide specialized services, and how much "local match" funding is required. This may help municipal and organizational partners understand what they can expect from SacRT and feel they are treated fairly compared to their neighbors.

Should We Focus Growth in Places Where Transit Works Best?

Parts of this report describe the current development patterns in the Sacramento area, and how those patterns have affected the usefulness of transit service and transit ridership. The immediate concern of SacRT Forward is to improve the value of the transit network in the near term.

However, this report can also inform the land-use, development and street-design policies that are made in the cities and the County, wherever people want transit to be a relevant and useful part of local life.

Through its land-use policies, partners in the Sacramento region could encourage more development that reinforces the "Ridership Recipe":

- **Density:** Demand for transportation increases as the number of people, jobs and activities around a bus stop increase.
- **Walkability:** Transit is only useful to people who can safely and comfortably walk to a stop.
- **Linearity:** Direct paths among destinations are faster, cheaper to operate, easier to understand and more appealing to customers.
- **Proximity:** Shorter distances between developed areas are cheaper for SacRT to serve.

All of these factors affect both the costs of providing transit in a particular place and how many people will find the service useful. A key choice for the public and for elected officials, in future land-use planning efforts in the region, will be: How much of the region's future development should follow the *Ridership Recipe*?

Get Involved

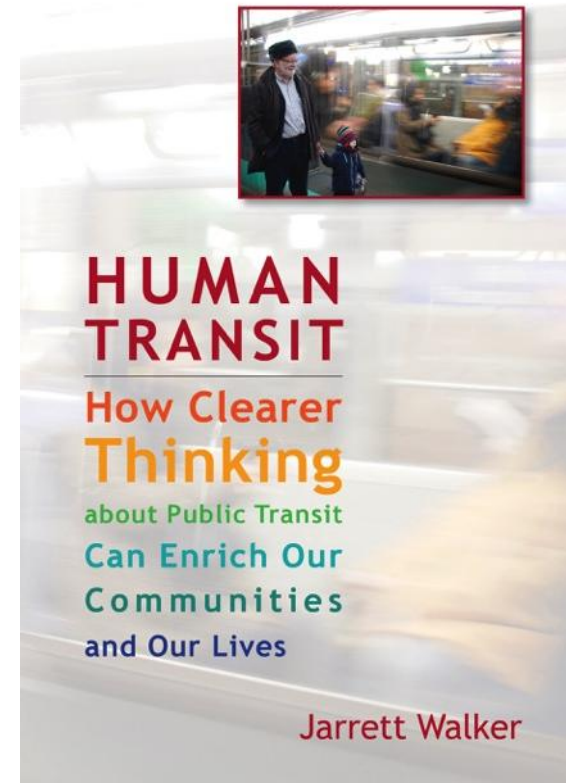
The planning process will include multiple rounds of public consultation:

- In the spring of 2018, starting with the publication of this Choices Report, the project team will request community input on key trade-offs described in this report.
- In the fall of 2018, the project team will engage the community about potential alternatives that illustrate very different ways SacRT could change its transit network.
- If SacRT decides to move ahead with any of the recommendations of this Plan, then there will be additional community engagement, first when those recommendations are incorporated into SacRT's updated Short Range Transit Plan, and again before any actual service changes are made.

You have already taken a great first step to understanding and influencing the SacRT Forward Network Plan, by reading this report. A shorter Summary report is also available on the website. We hope you will encourage other people you know to learn about this effort and get involved by:

- Visiting www.sacrt.com/apps/sacrtforward/
- Joining the email list by contacting us at sacrtforward@sacrt.com or (916) 321-2877.
- Providing input via an online survey, which will be available soon at the project website.
- Meeting the project team at a public event—places and times are listed on the project website and will be announced to the project email list as well.

Jarrett Walker, PhD
JarrettWalker.com
HumanTransit.org
Twitter: @humantransit



Executive Workshop: Sacramento RT Board of Directors

About Jarrett Walker

- Author *Human Transit* and Humantransit.org.
- 25 years experience in transit network design and policy.
- Projects in >50 metro areas in 9 countries.
- Many successful implementations.
- PhD Humanities.



HUMAN TRANSIT

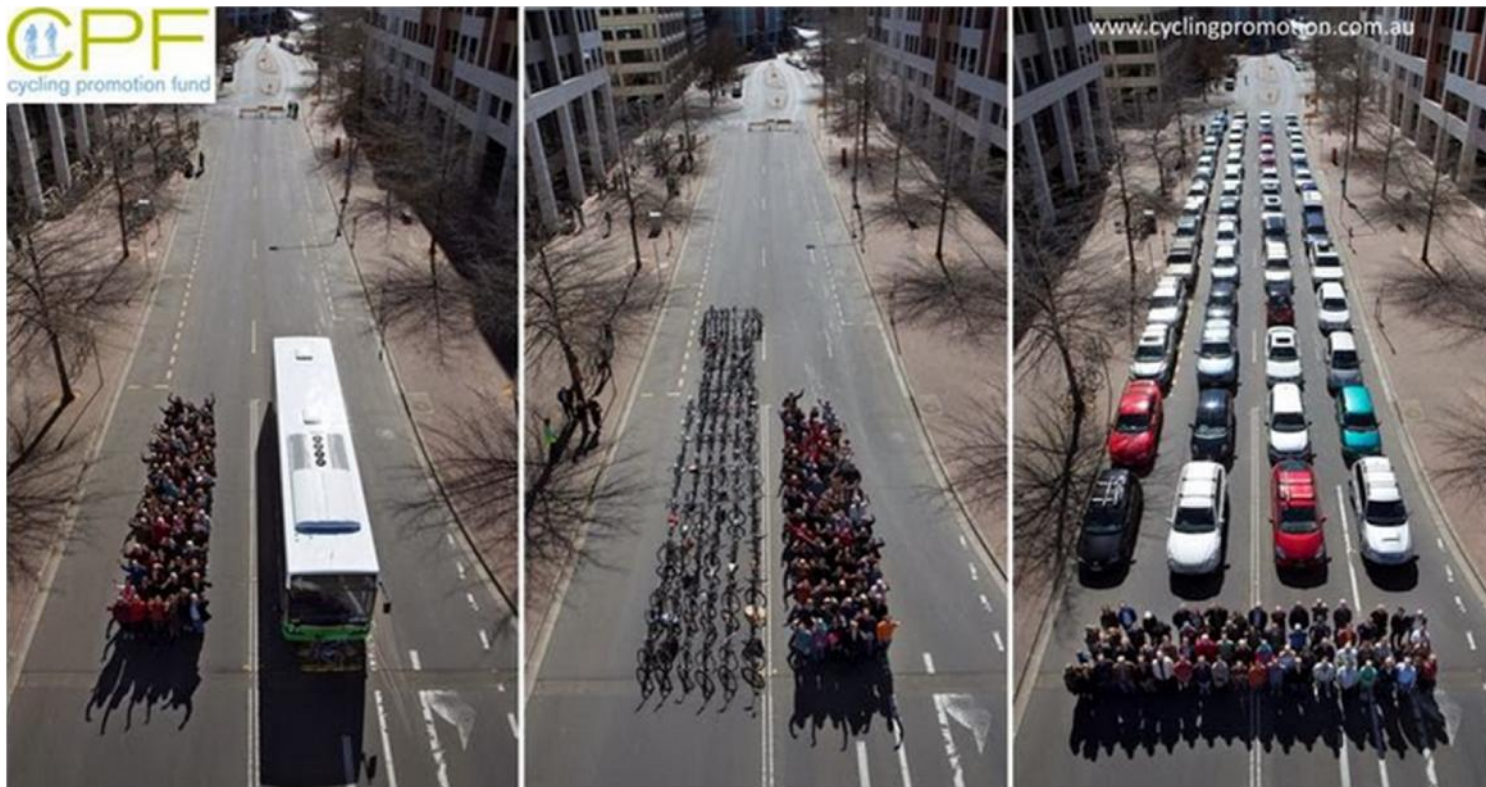
How Clearer
Thinking

about Public Transit
Can Enrich Our
Communities
and Our Lives

Jarrett Walker

Why fixed transit?

Ultimately, it's about Space

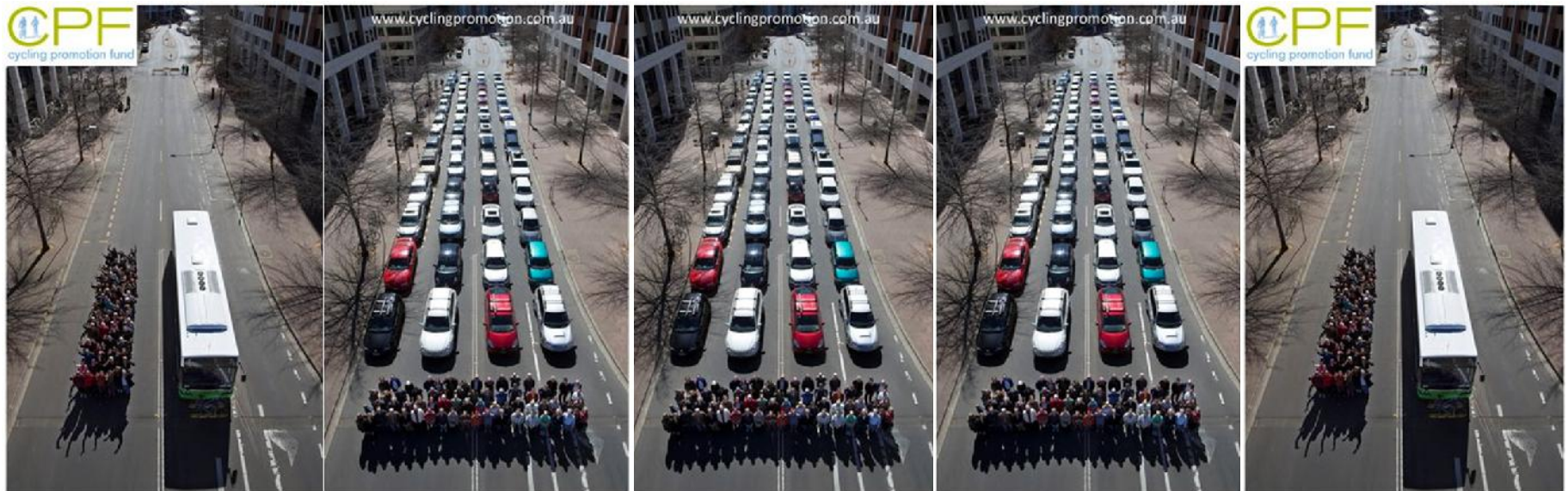


Fixed transit is existential for cities

- In dense cities, or those wanting to be dense, transit is existential. *The city is impossible without it.*
- So be careful when anyone tells you that new ideas or technologies are “disrupting” fixed route transit.

No technology will change geometry.

- Emissions and automation are technology problems.
- But space is a geometry problem.
- Technology never changes geometry.



Bus

Private Car

Uber/Lyft Car

Driverless Car

Driverless Bus?

Problem

Solution

Communications
“Info when/where needed”



Apps,
Info Tech

Emissions
Efficient Use of Energy



Electric
Vehicles

Efficient use of Labor
Safety



Autonomous
Vehicles

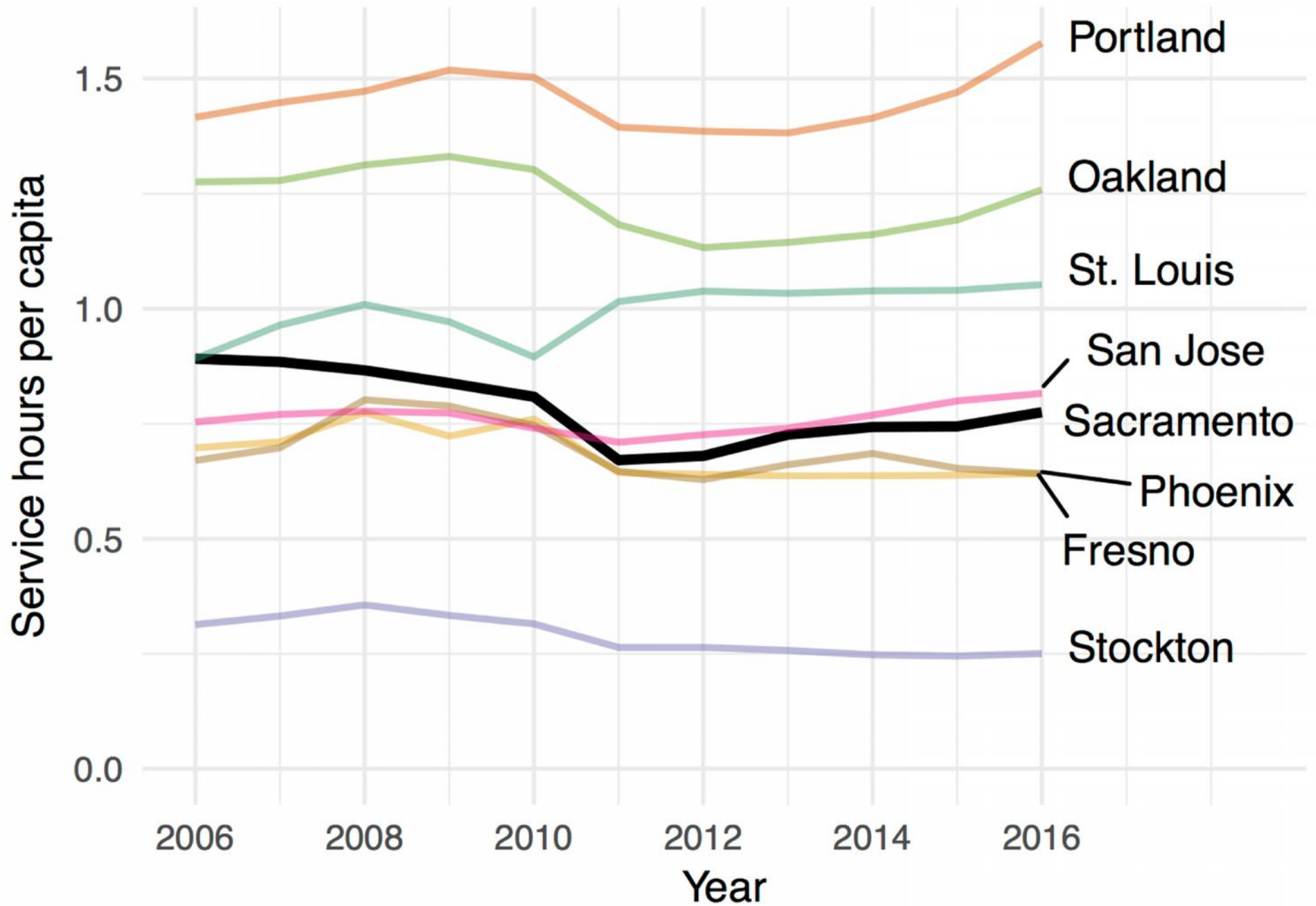
Efficient Use of Space
(in dense cities)



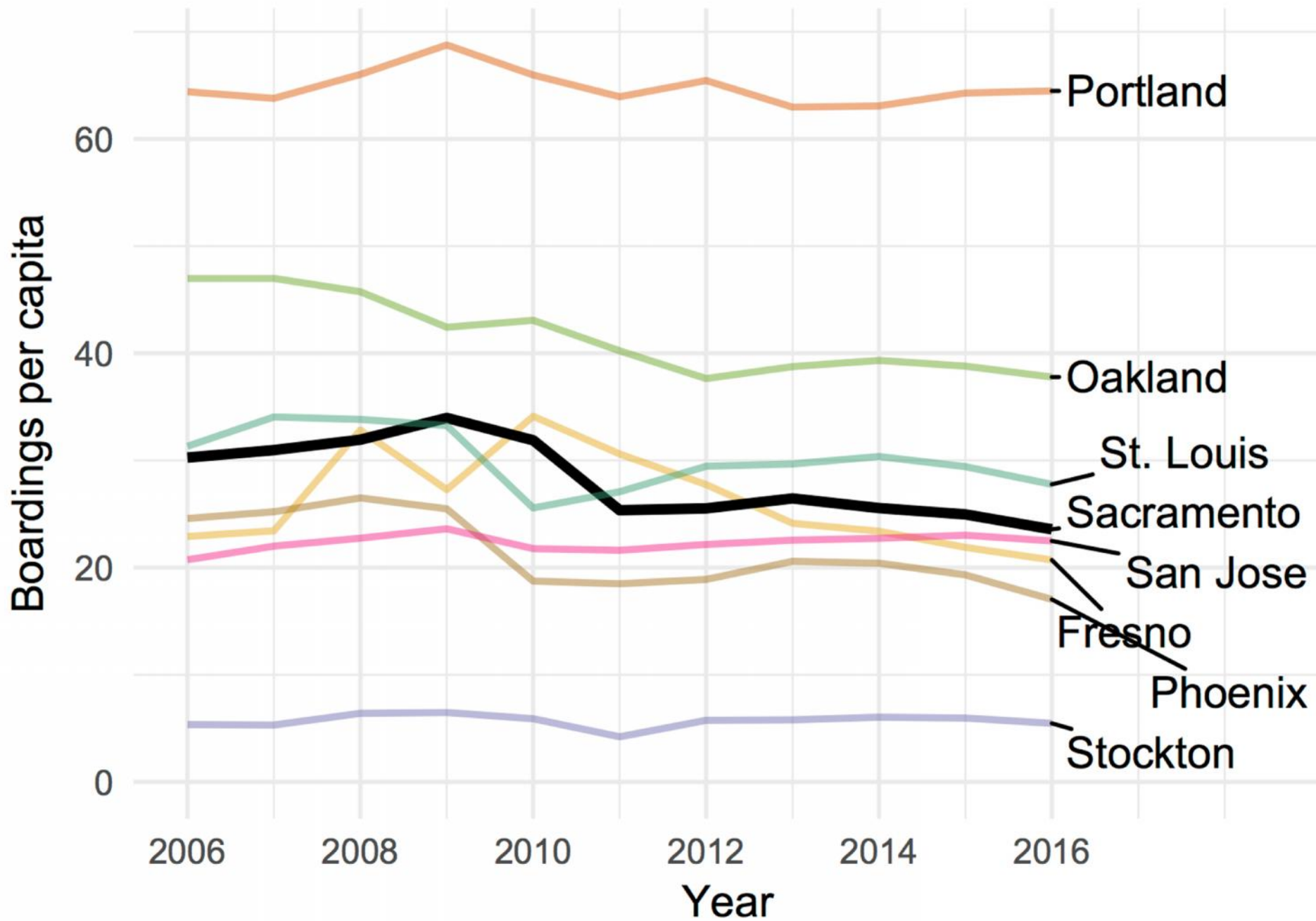
Big Vehicles
(Transit)

The Challenge

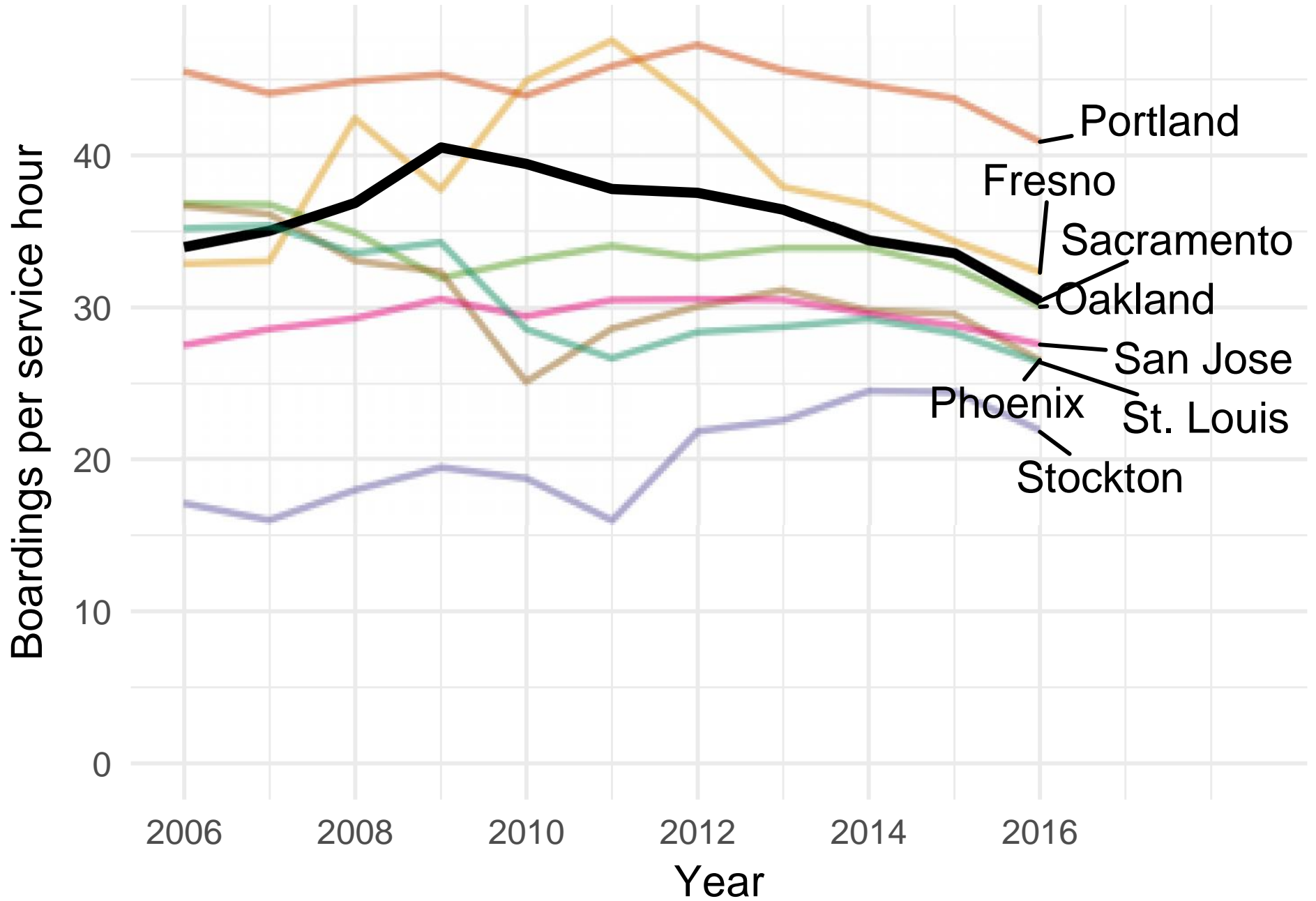
Transit Investment



Transit Relevance



Productivity



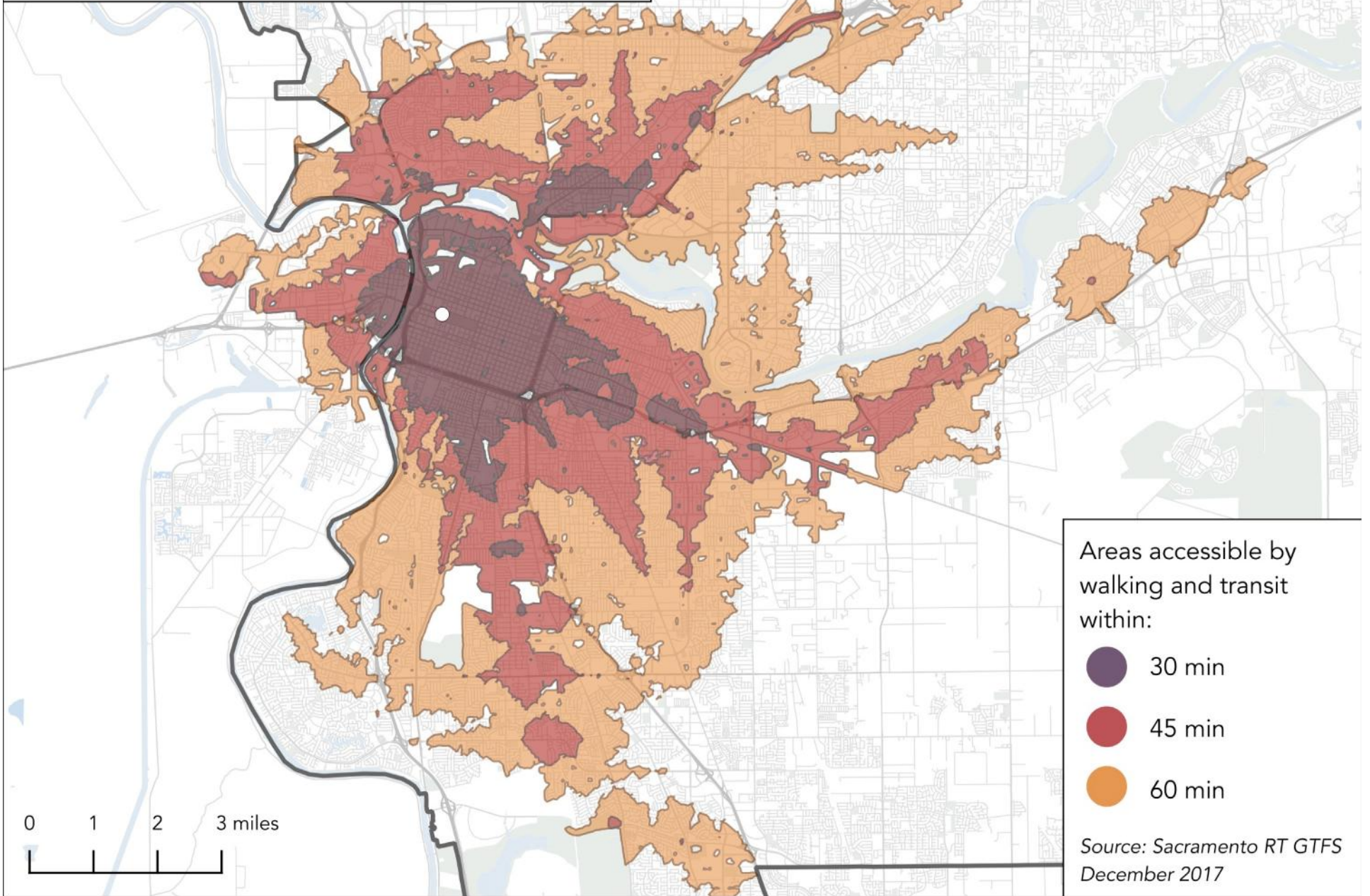
IF you want high ridership ...

What is High-Ridership Transit?

To expand ridership, expand freedom (access).

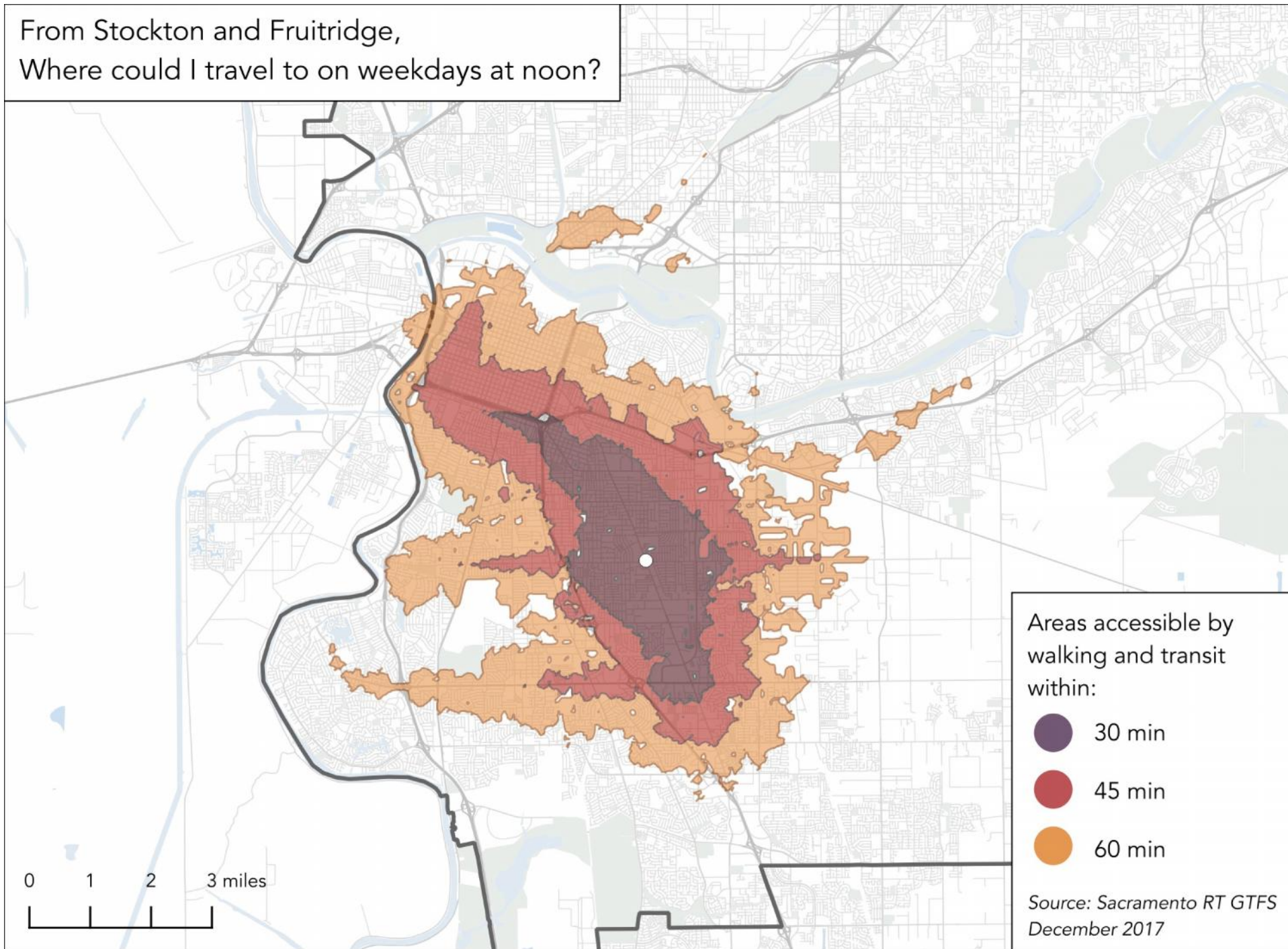
The Wall Around Your Life

From the Capitol,
Where could I travel to on weekdays at noon?

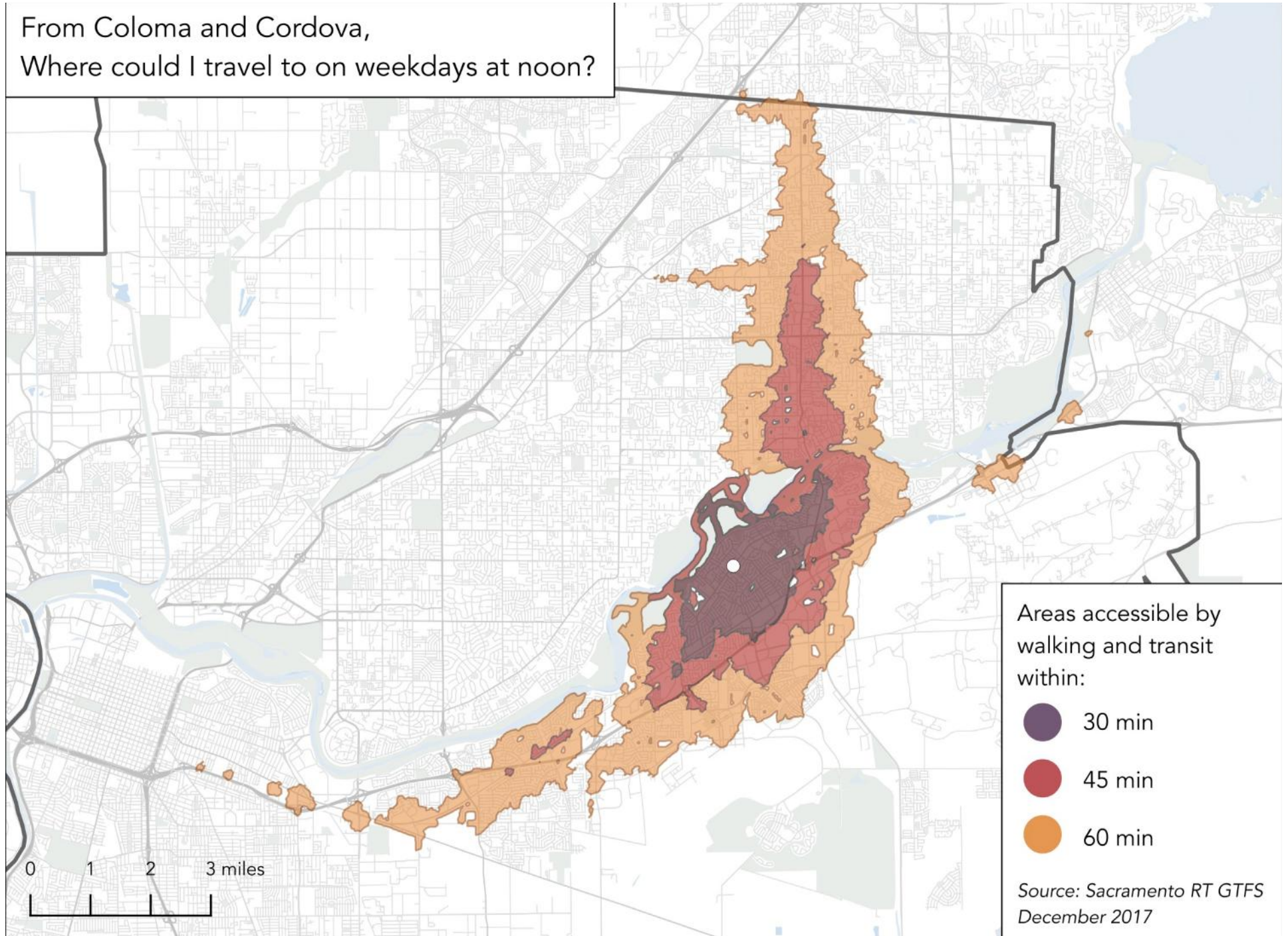


0 1 2 3 miles

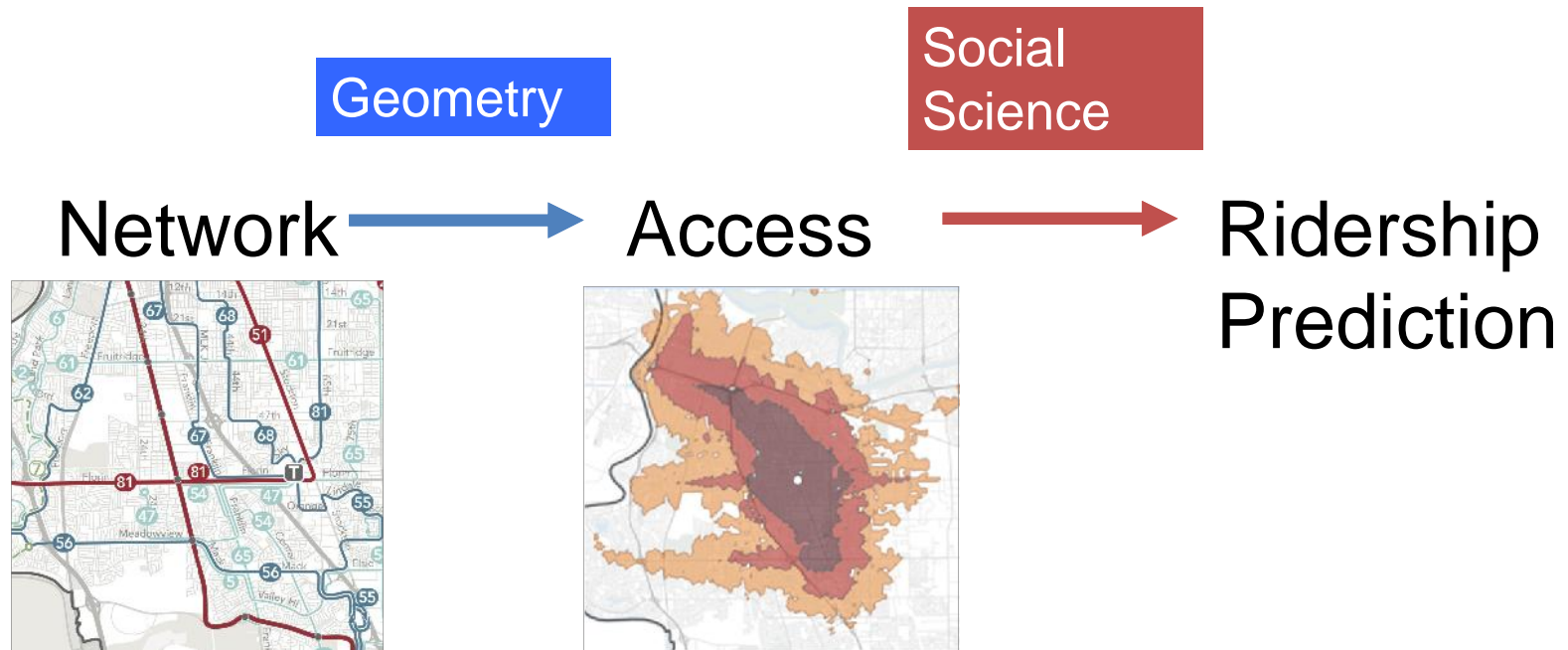
From Stockton and Fruitridge,
Where could I travel to on weekdays at noon?



From Coloma and Cordova,
Where could I travel to on weekdays at noon?

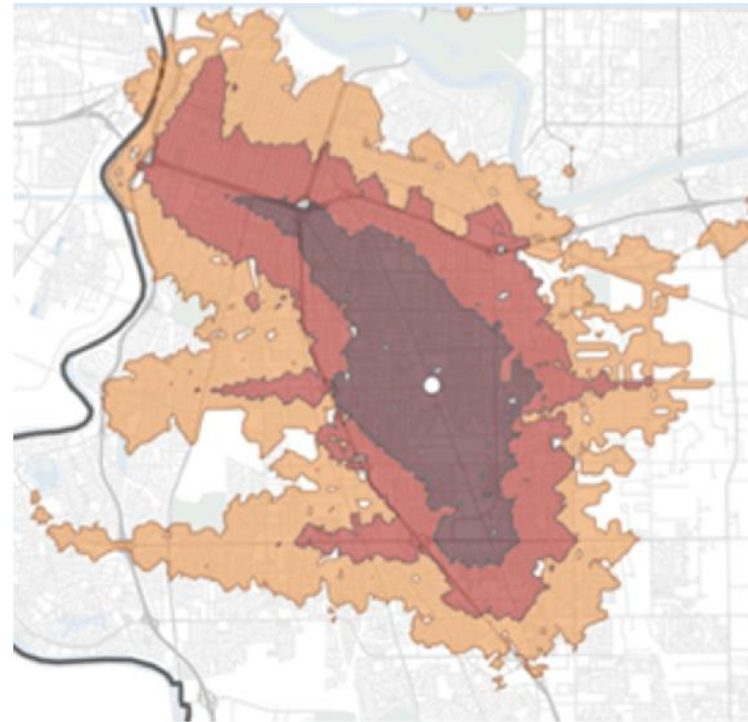


Access is a geometric fact.



What Maximizes Access?

- High Frequency Lines
- Forming a Connected Network
- Reasonably fast and reliable
- Focused on Transit Friendly Places
 - Dense
 - Walkable
 - Linear
 - Proximate

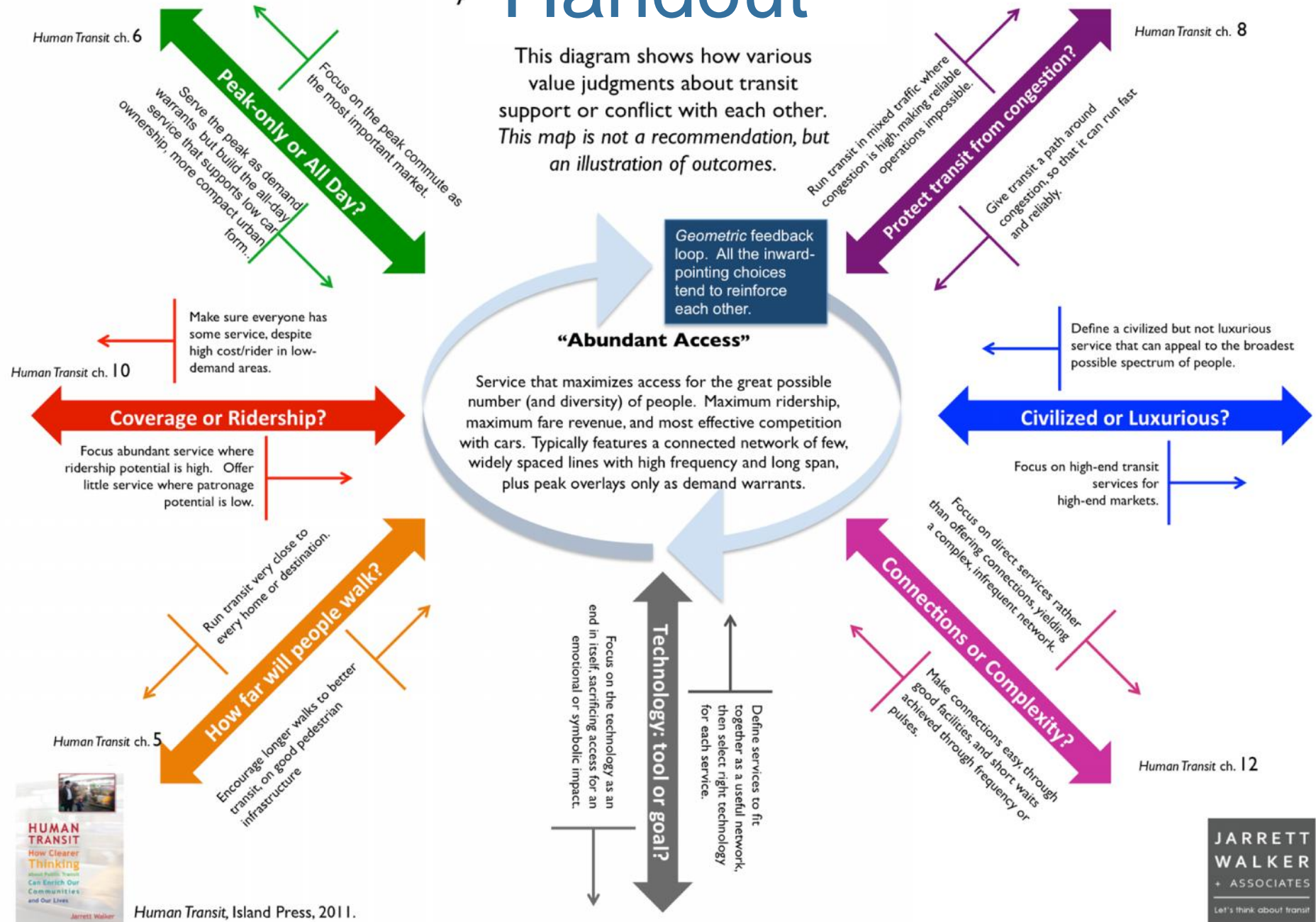


A “map” of the territory we’ll explore.

Abundant Access Handout

Handout

This diagram shows how various value judgments about transit support or conflict with each other. *This map is not a recommendation, but an illustration of outcomes.*



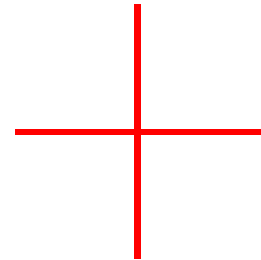
Human Transit, Island Press, 2011.

“Frequency is freedom!”

Frequency and Span

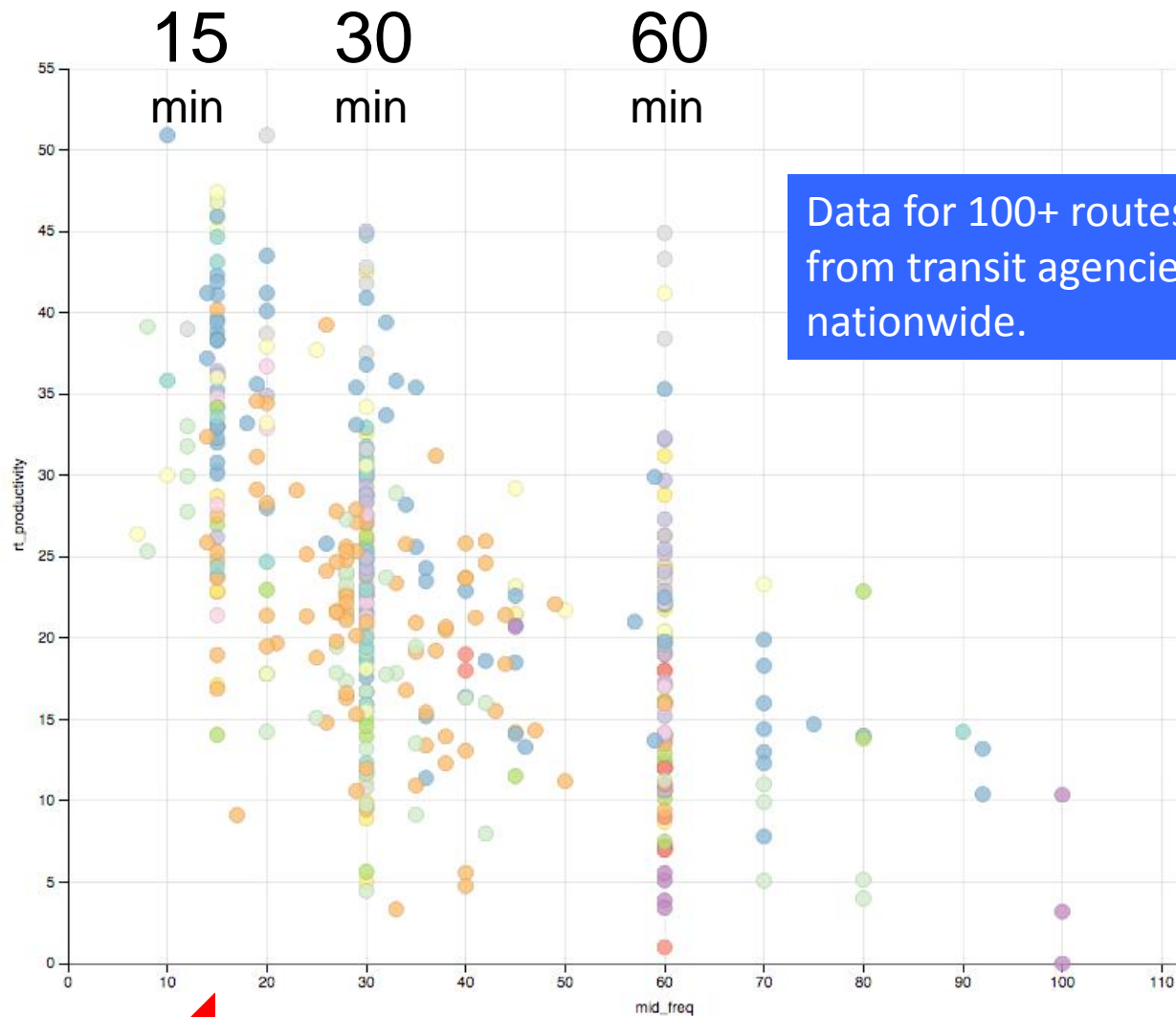
Frequency comes first

- High frequency means public transport is coming soon. This has three independent benefits:
 - **Reduced Waiting**
 - **Easier Connections**
 - **Reduced Impact of Disruptions**
- Lines with higher frequency tend to have not just higher patronage, but higher patronage per unit of service.

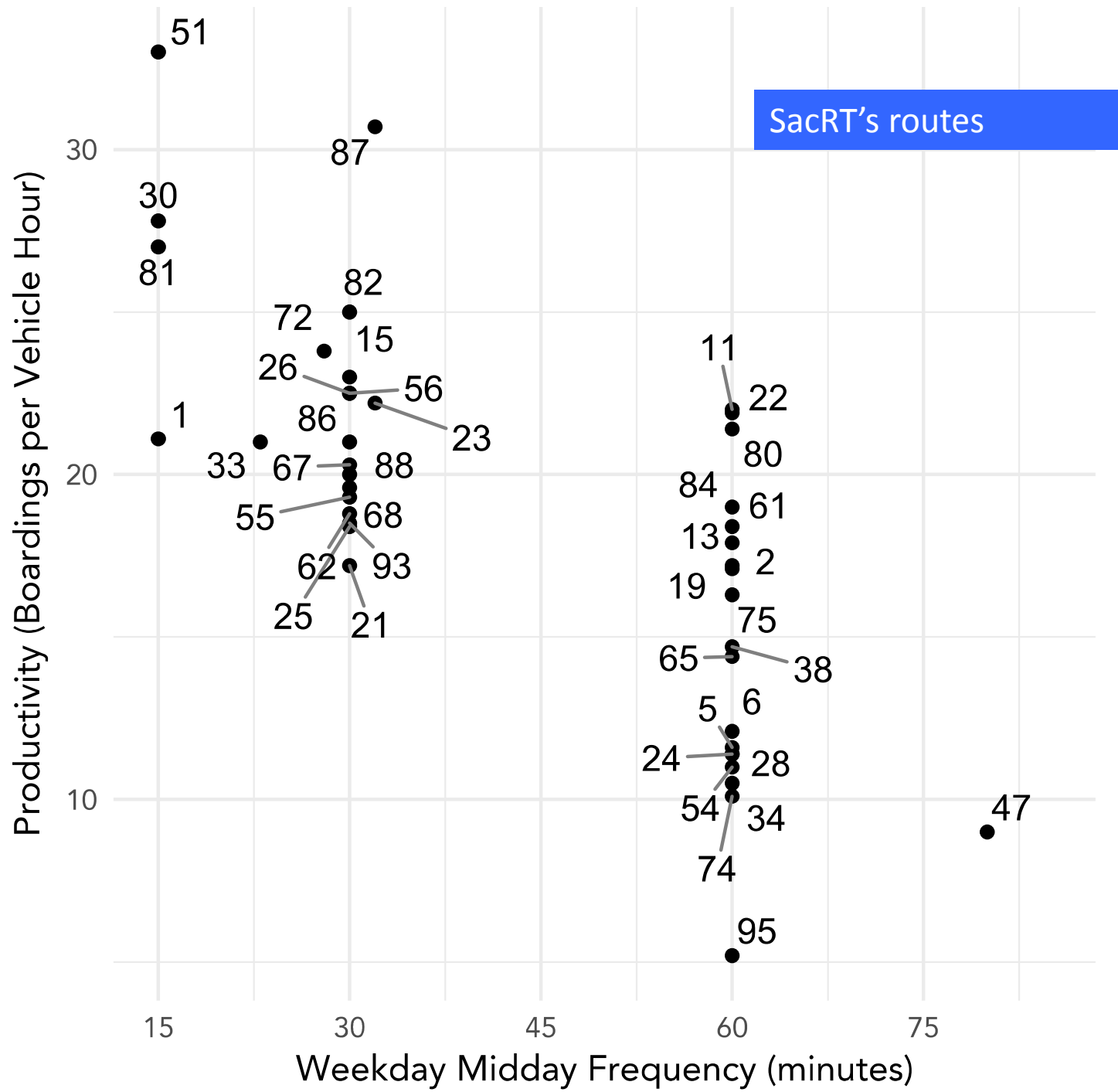


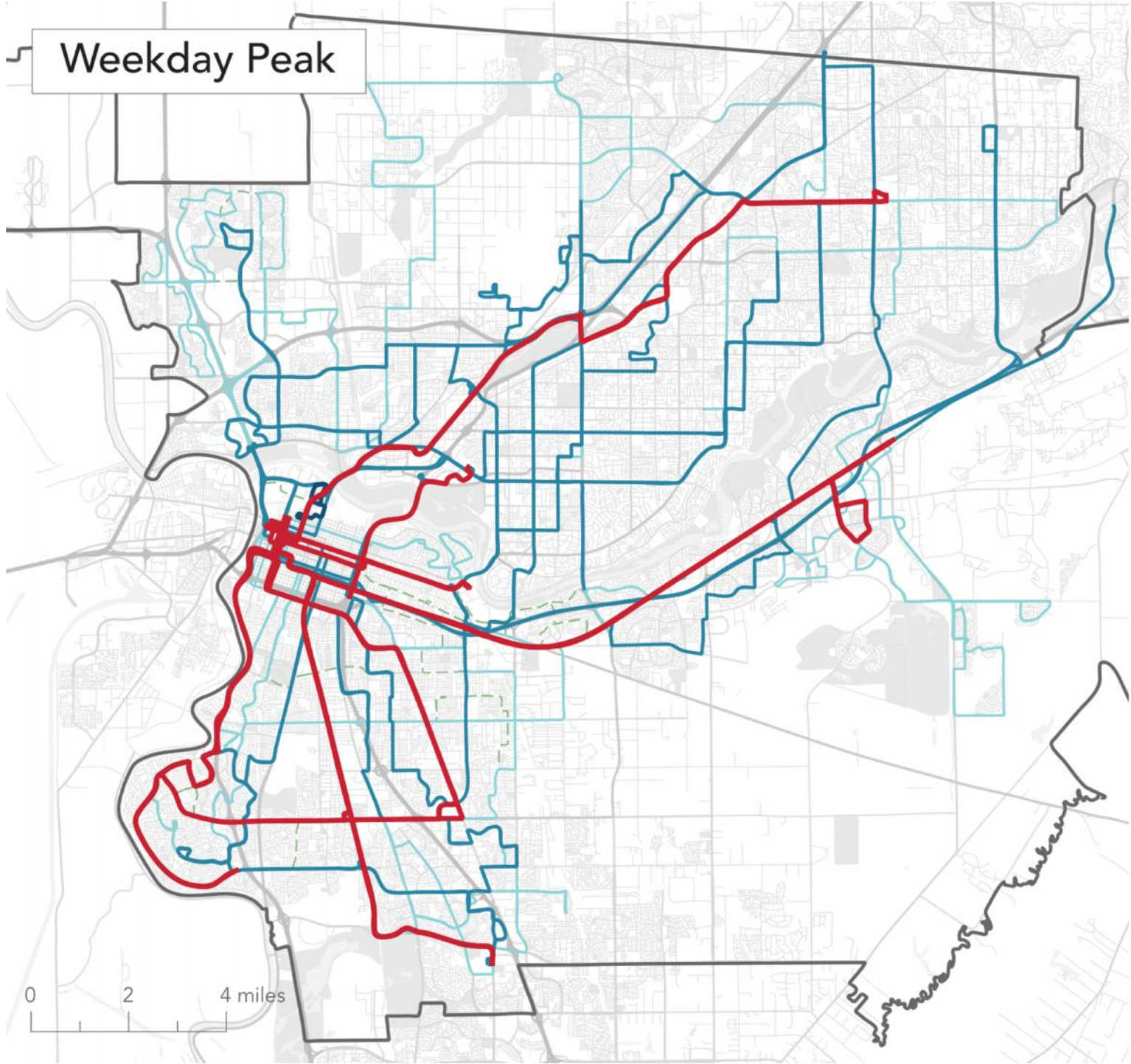
HIGH FREQUENCY AND HIGH PRODUCTIVITY

Higher Productivity (Boardings/Hour)

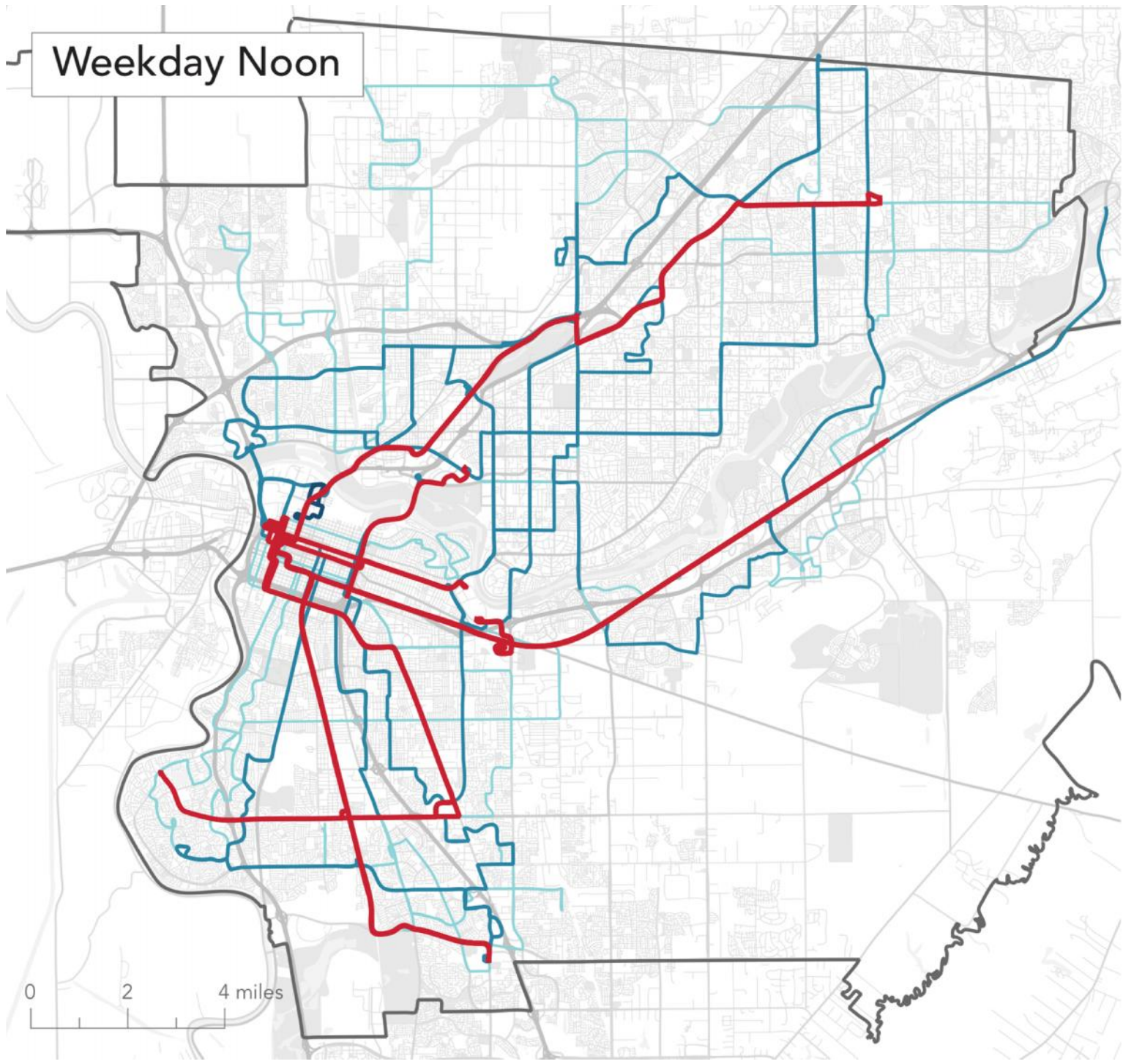


Higher Frequency

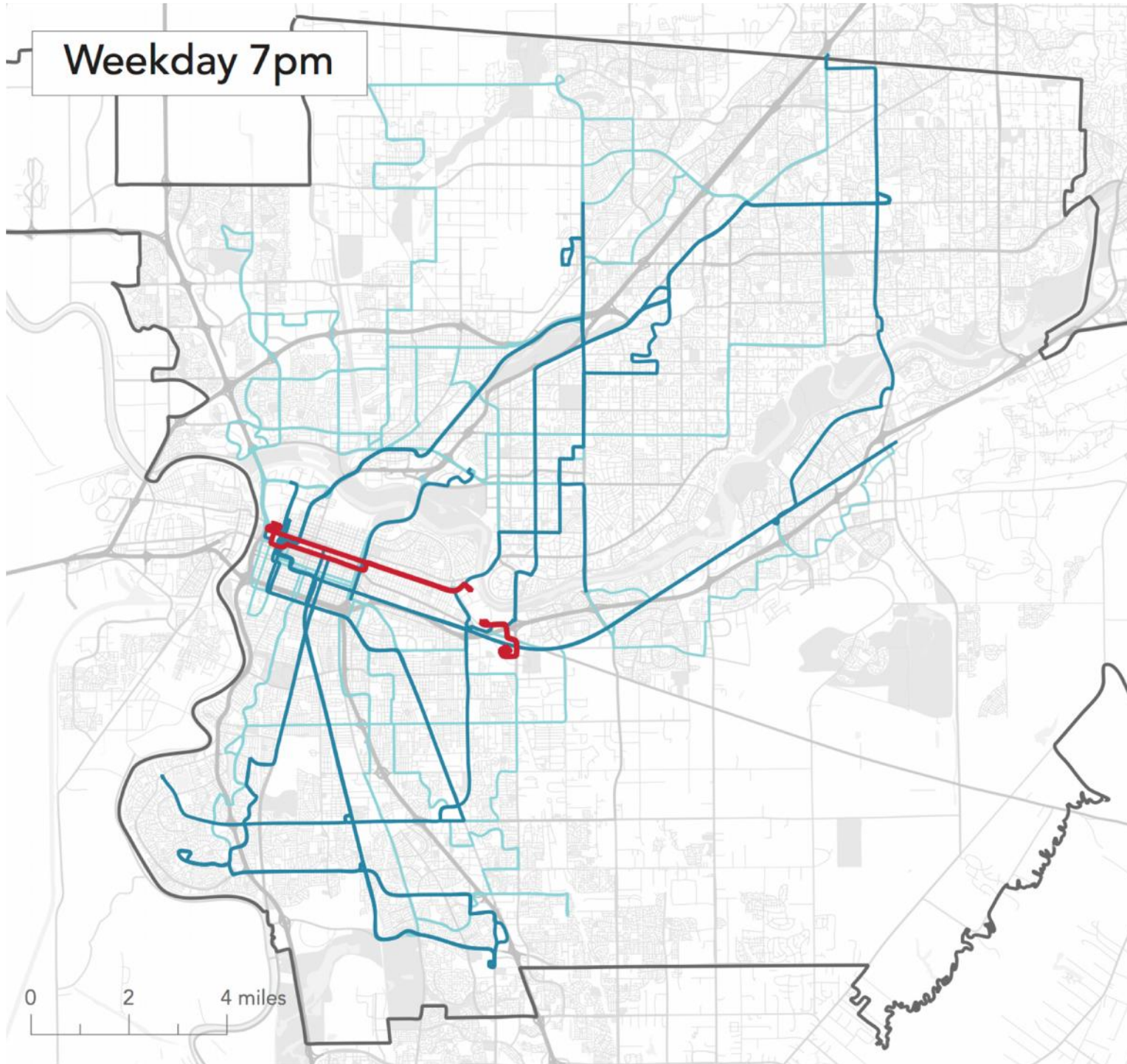




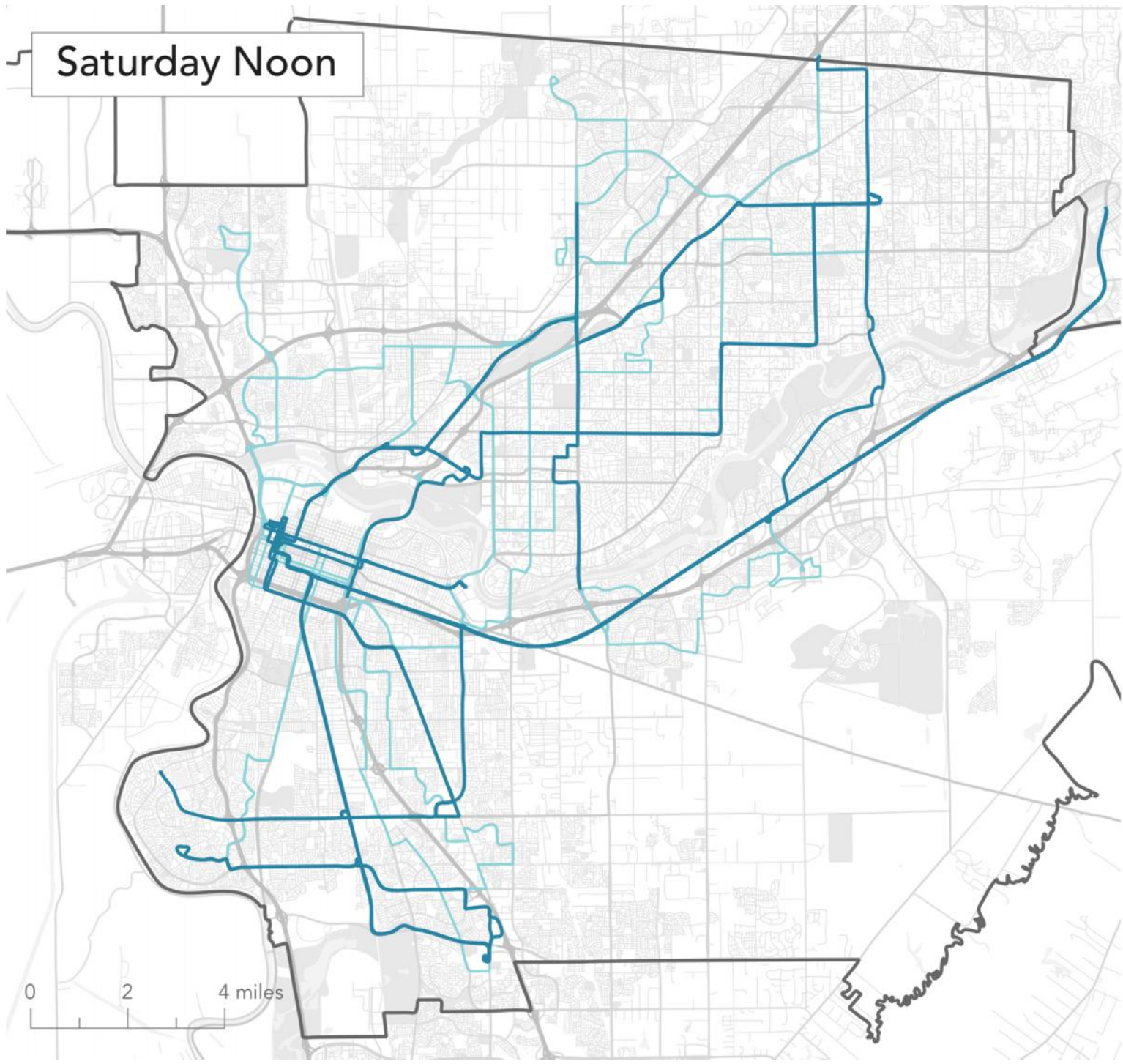
Weekday Noon



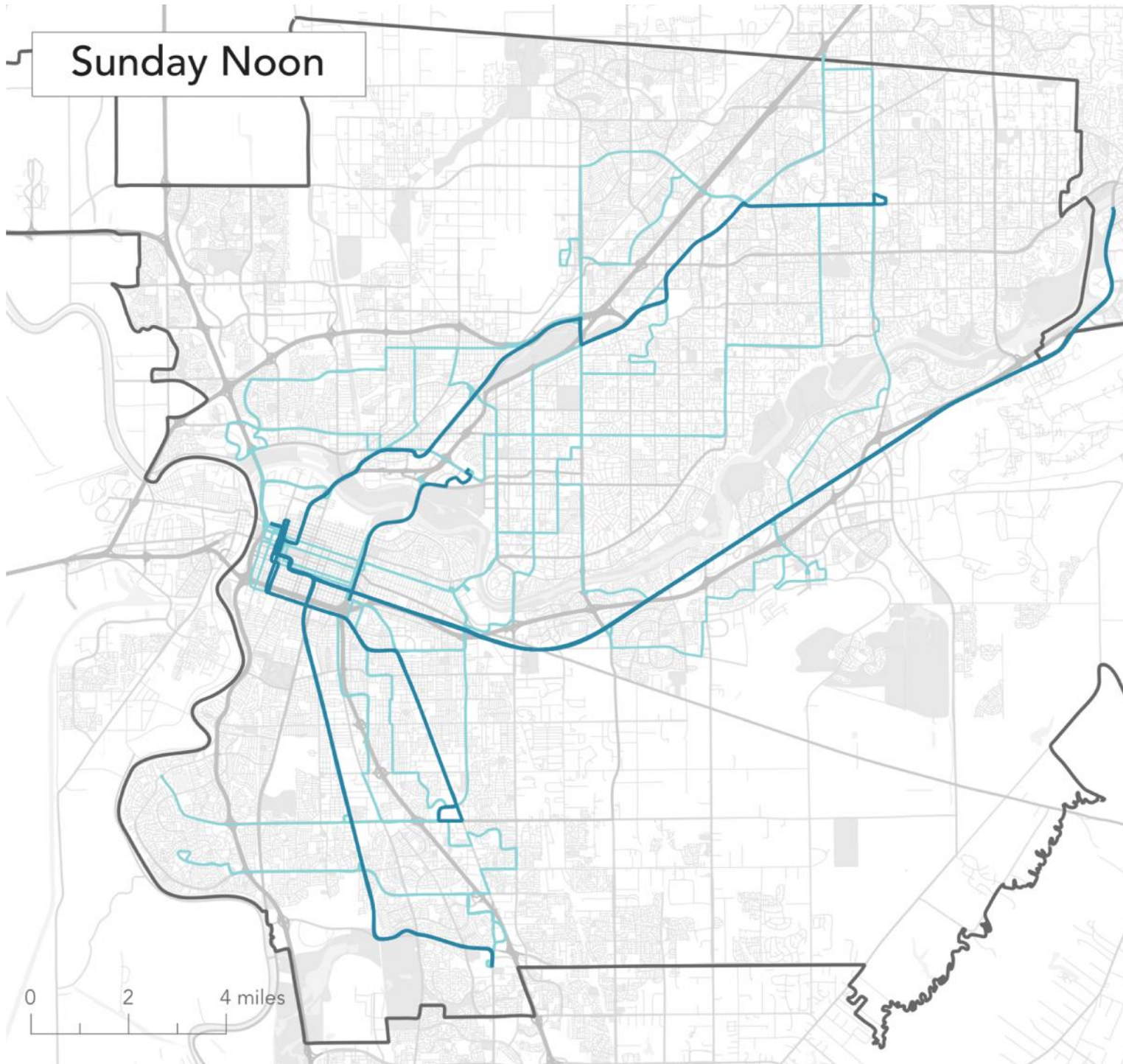
Weekday 7pm



Saturday Noon



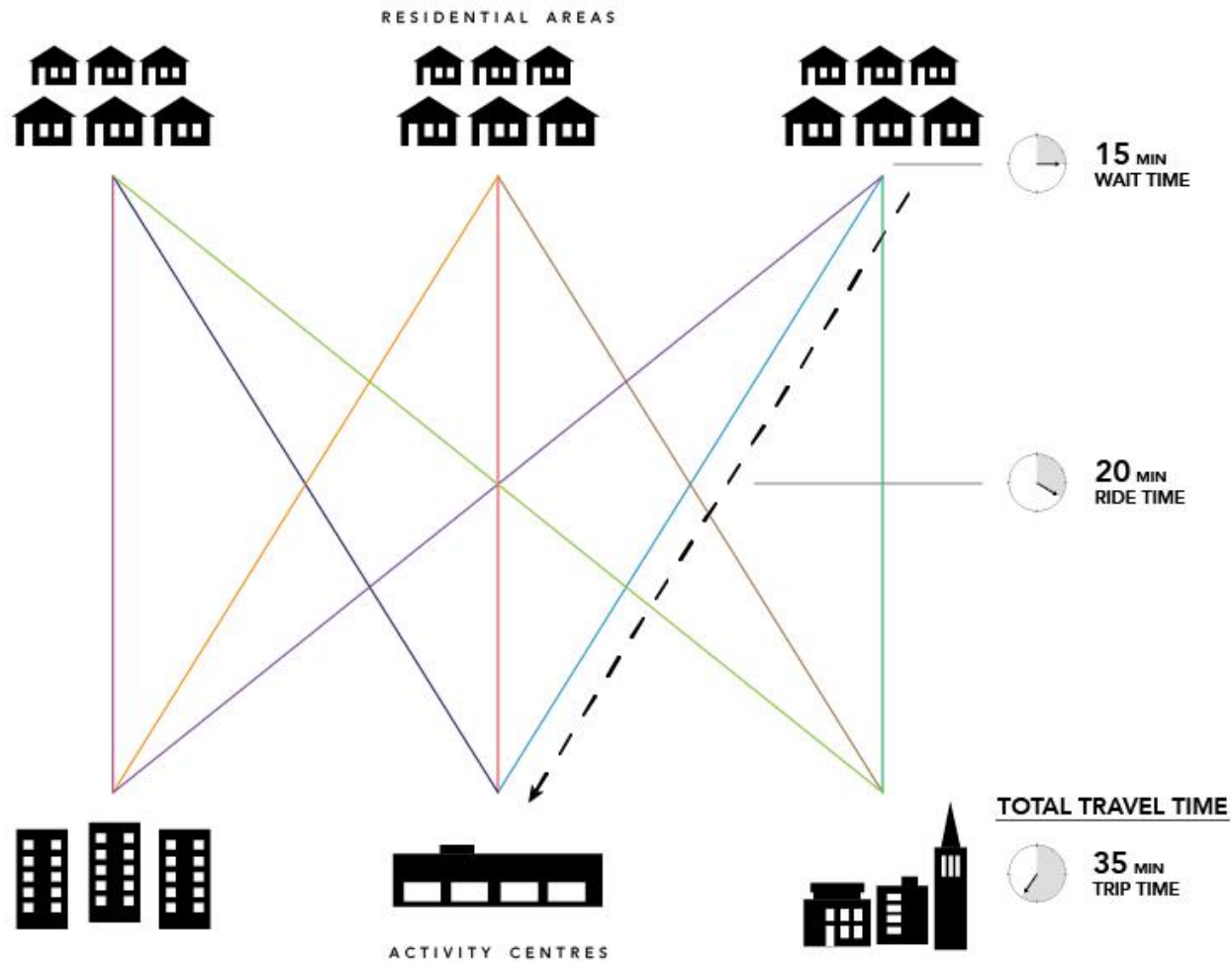
Sunday Noon



To grow freedom, make connections easy.

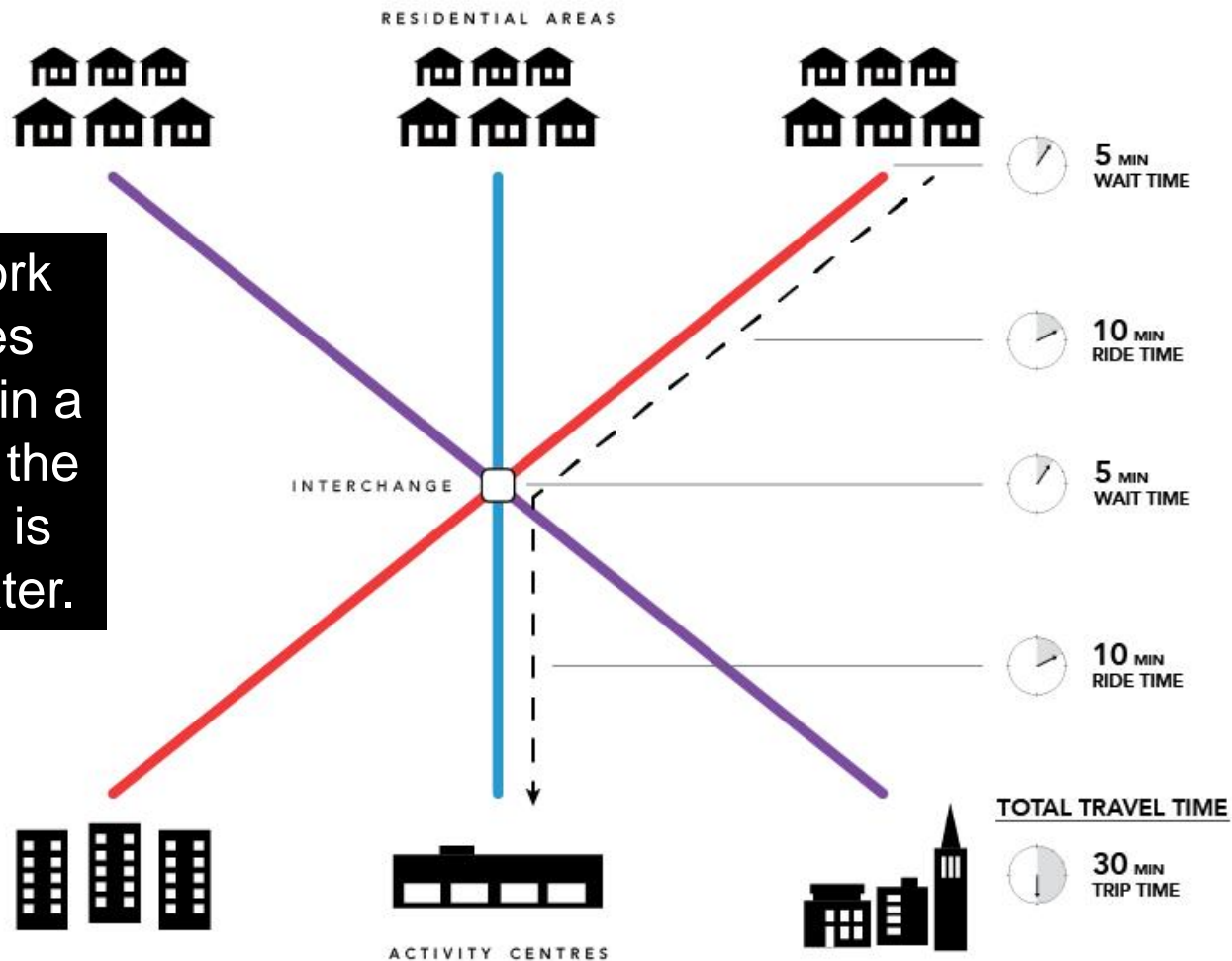
Connections

In a direct network, nobody needs to connect, but waits are long.

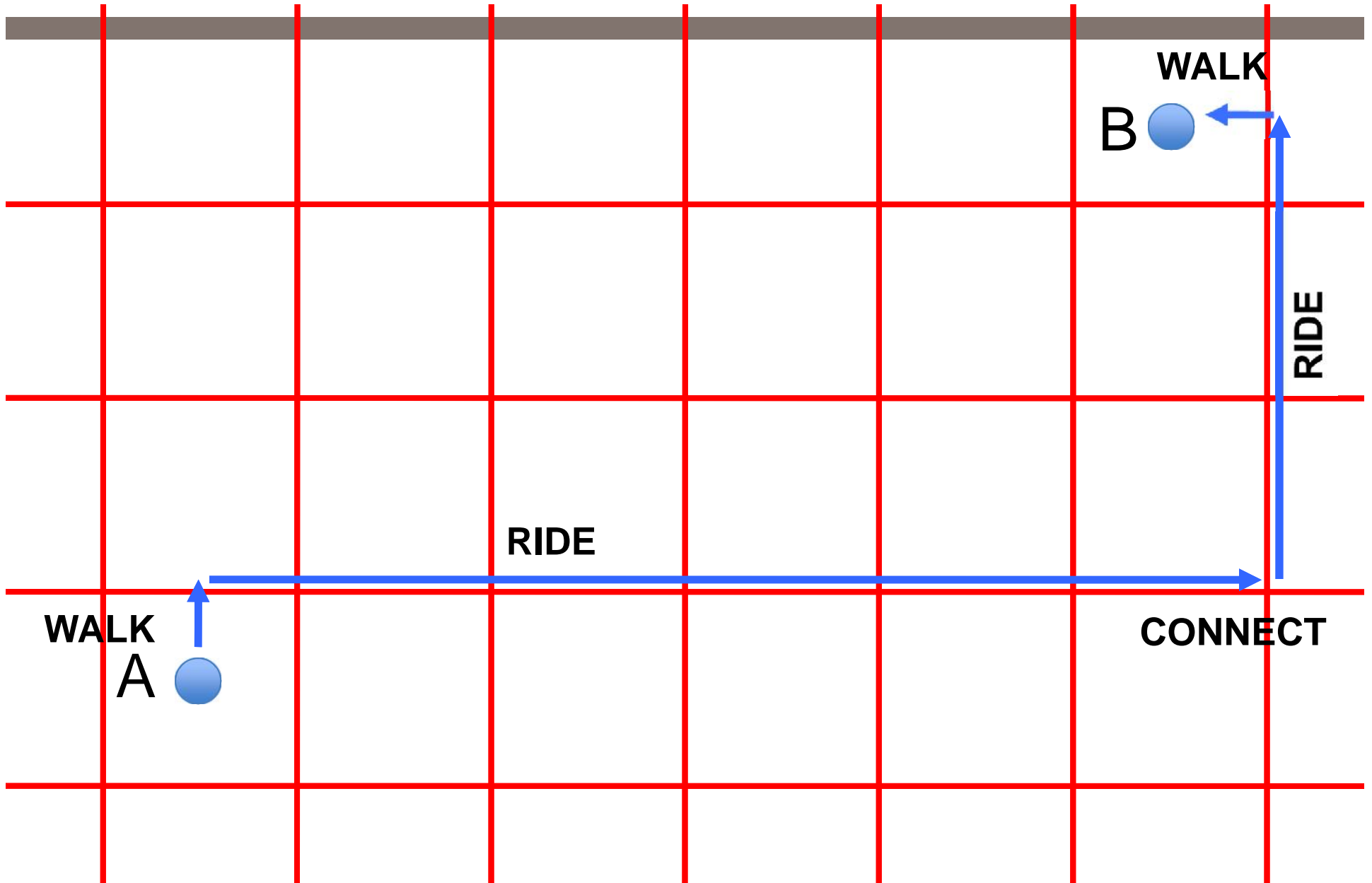


In a connected network, many passengers need to connect, but waits are short.

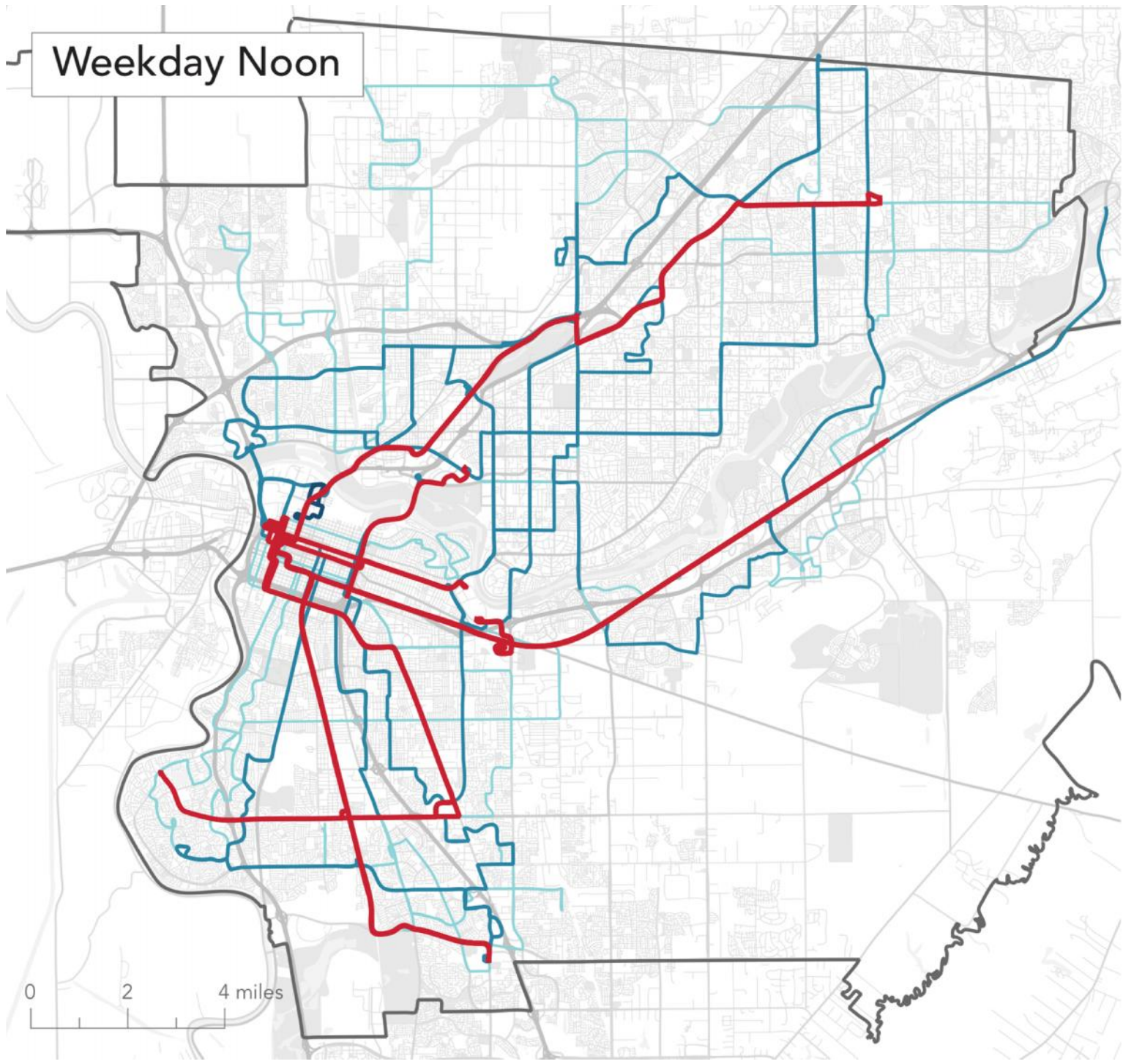
This network is 5 minutes faster, but in a larger city, the advantage is much greater.



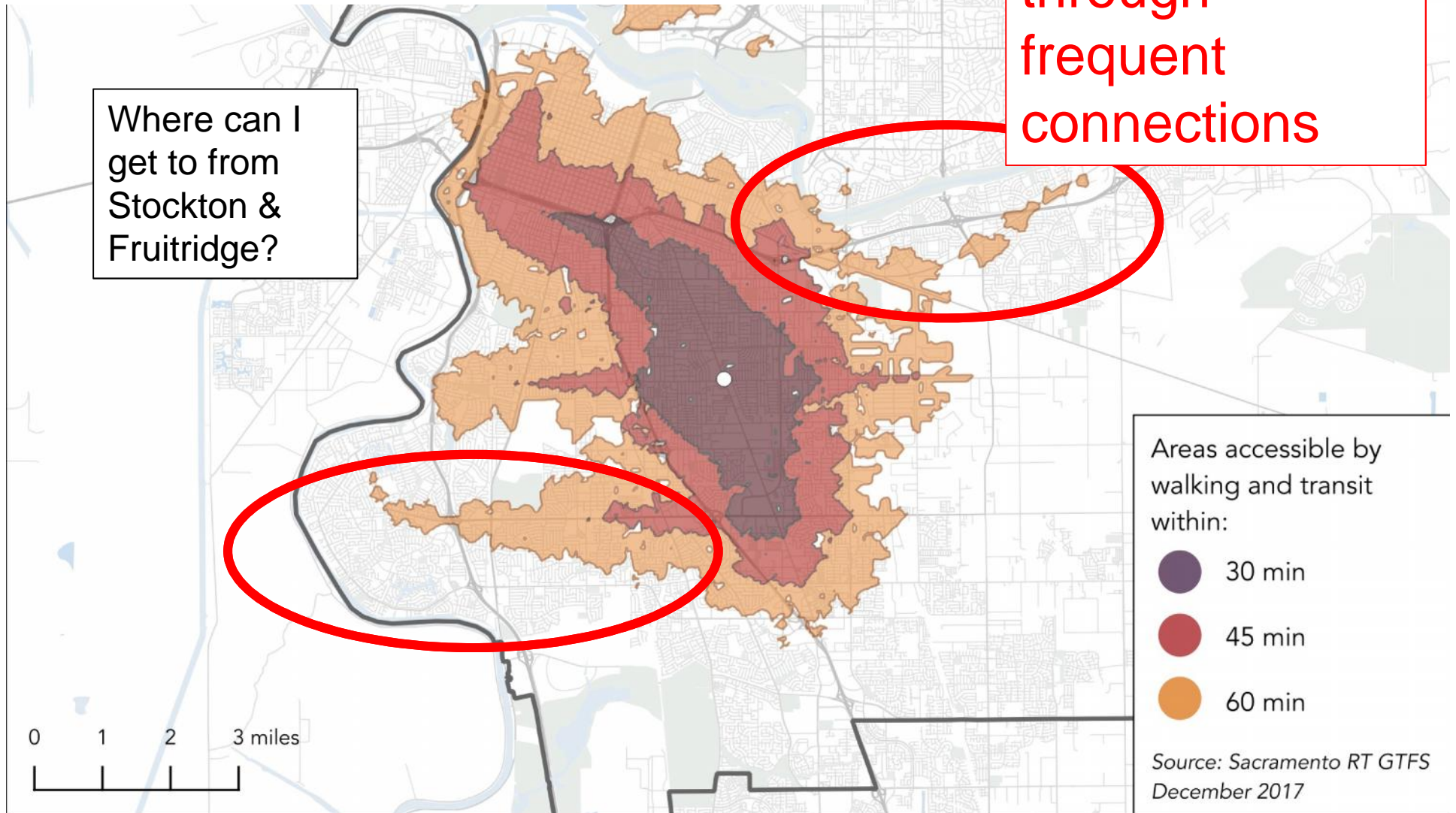
The Genius of the Frequent Grid



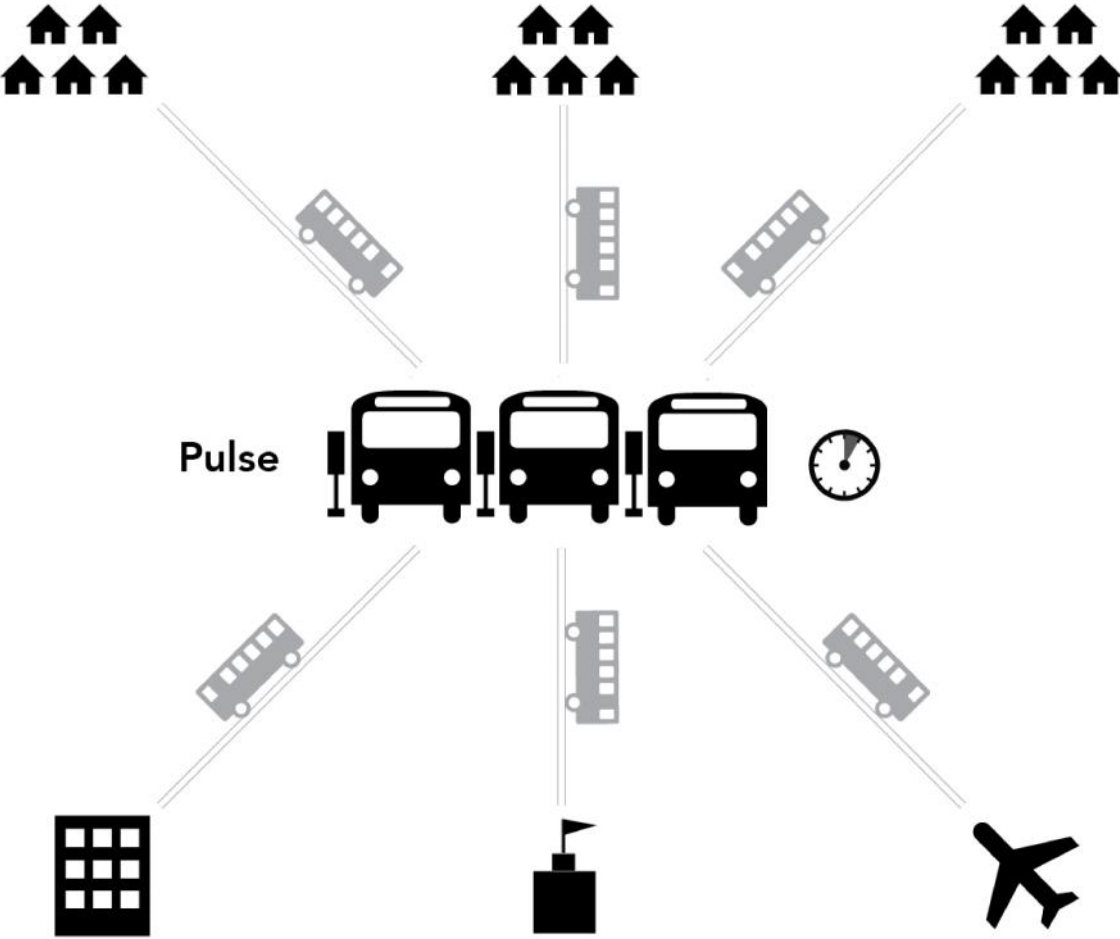
Weekday Noon



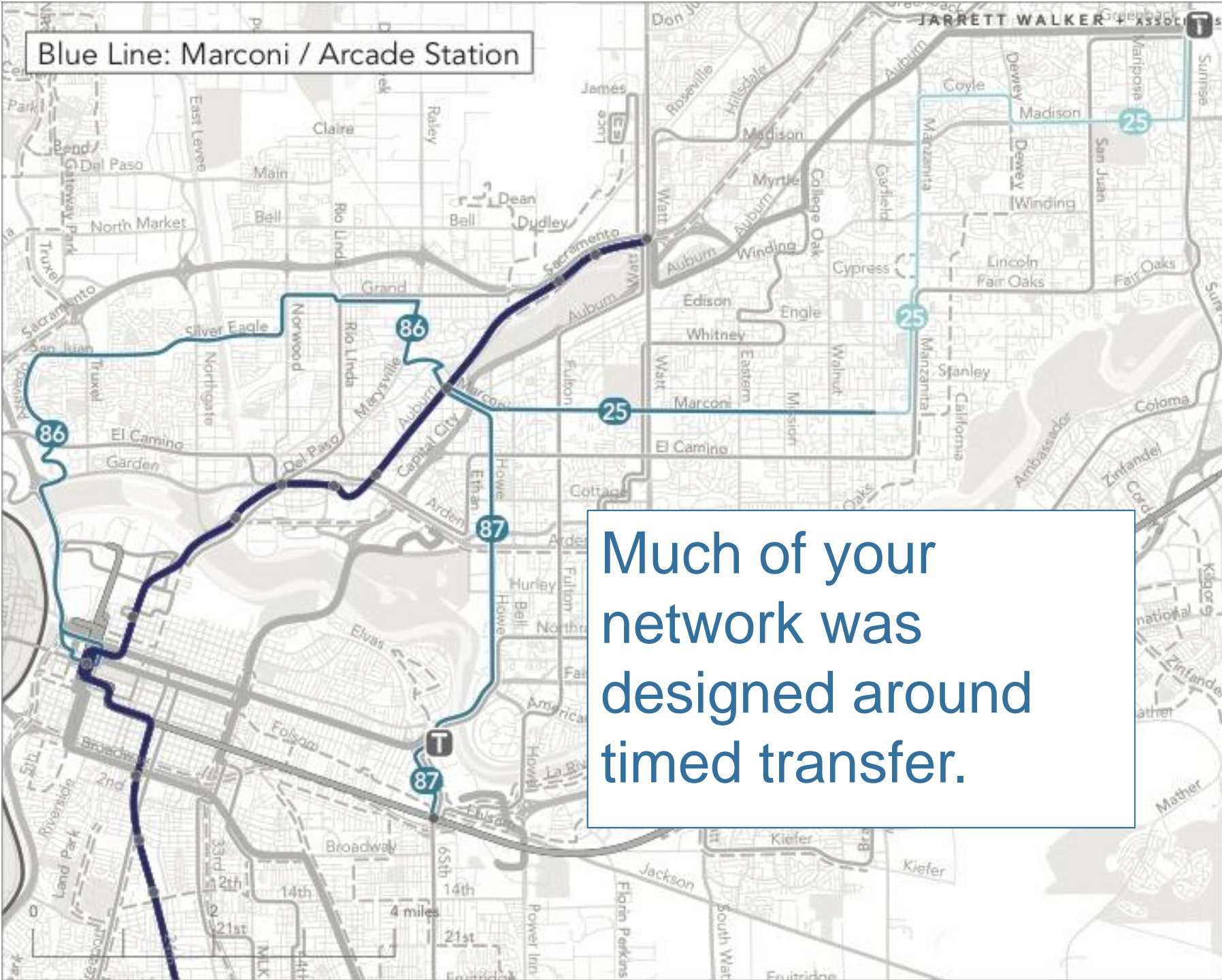
Frequent connections expand access



Timed Transfer

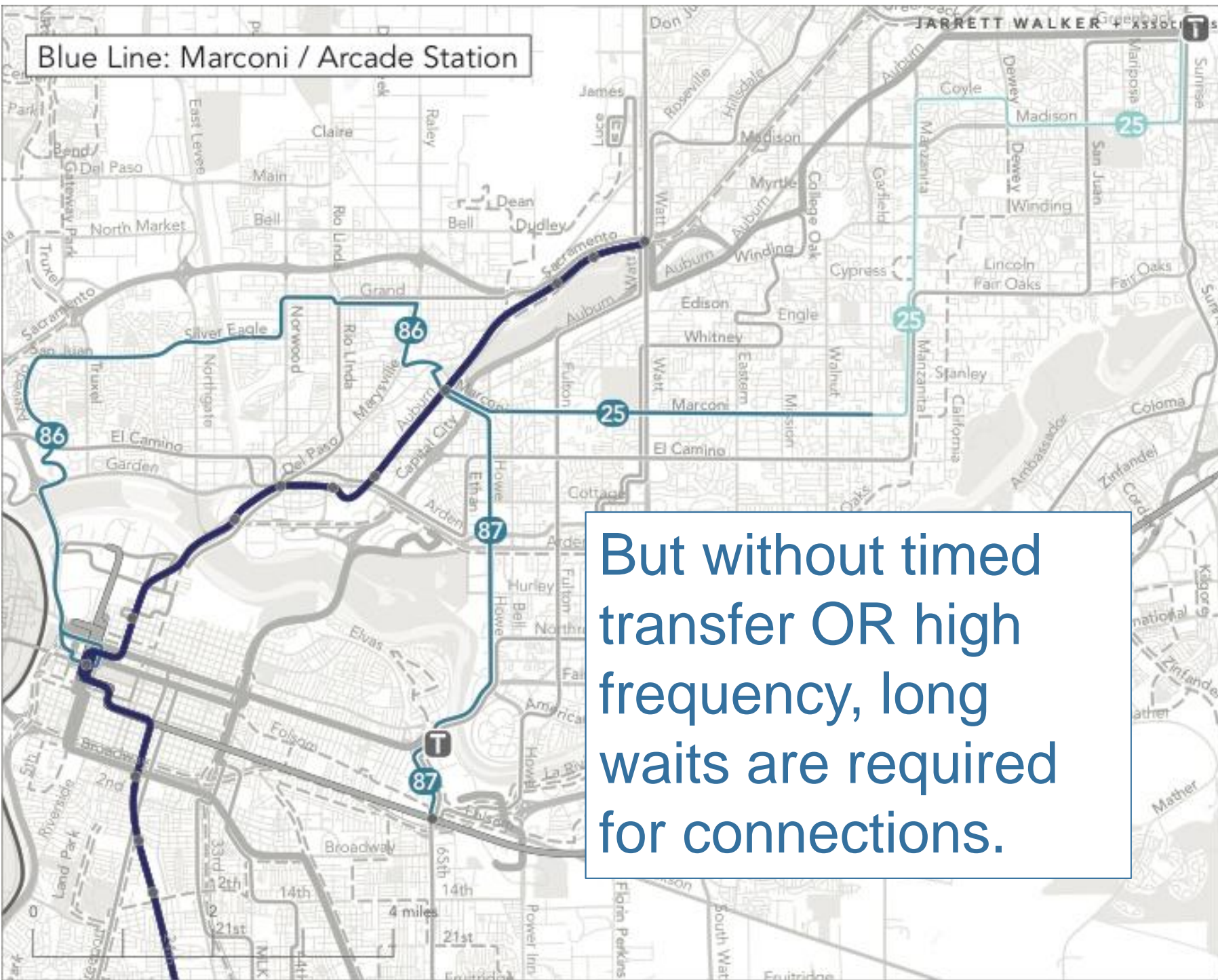


Blue Line: Marconi / Arcade Station



Much of your network was designed around timed transfer.

Blue Line: Marconi / Arcade Station



But without timed transfer OR high frequency, long waits are required for connections.

Put liberating service where it will liberate the most people.

Where do we go for ridership?

Density

How many people are near transit?

The more people are going to and from the area around each stop, the more people will ride transit.

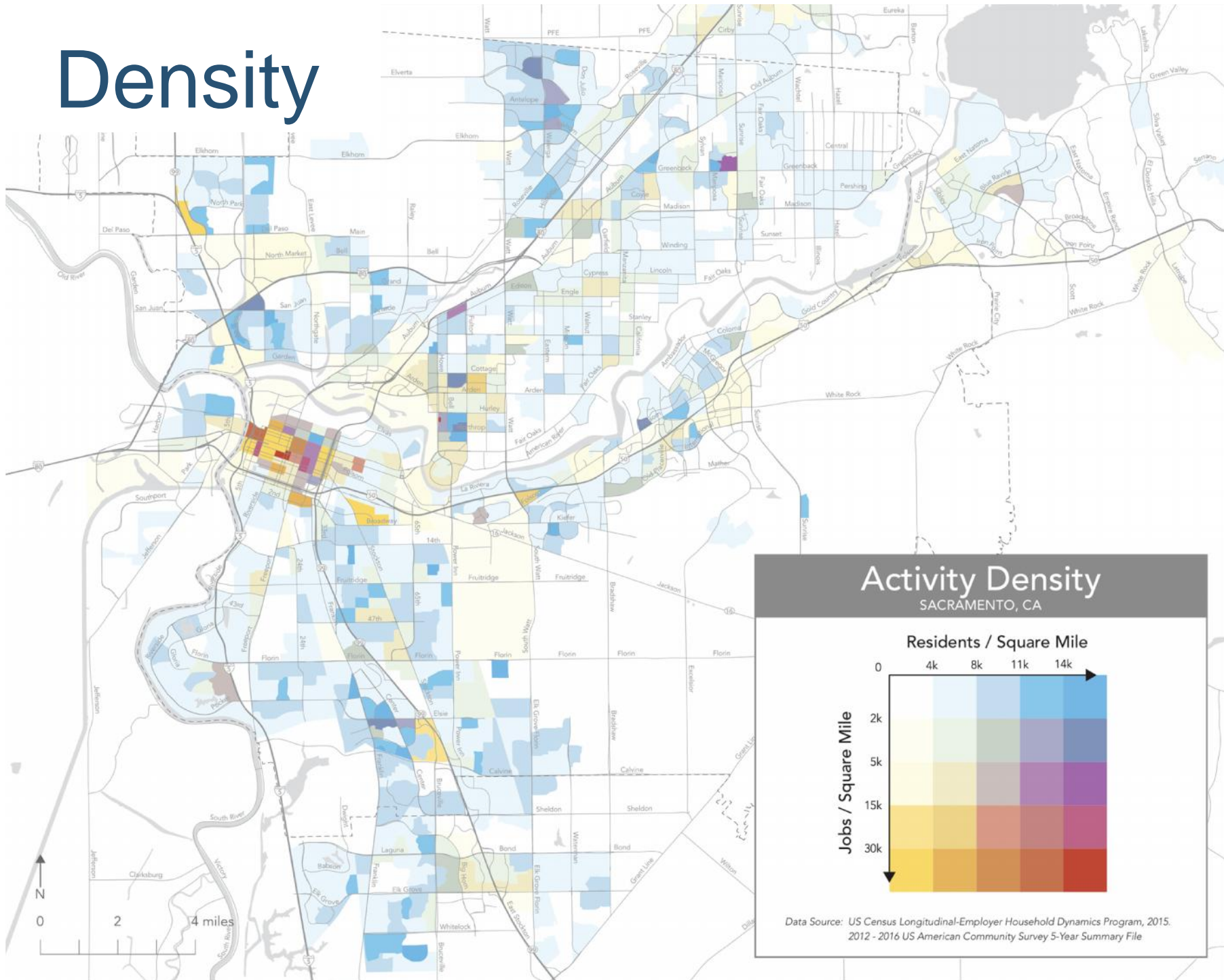
High
Ridership



Lower
Ridership

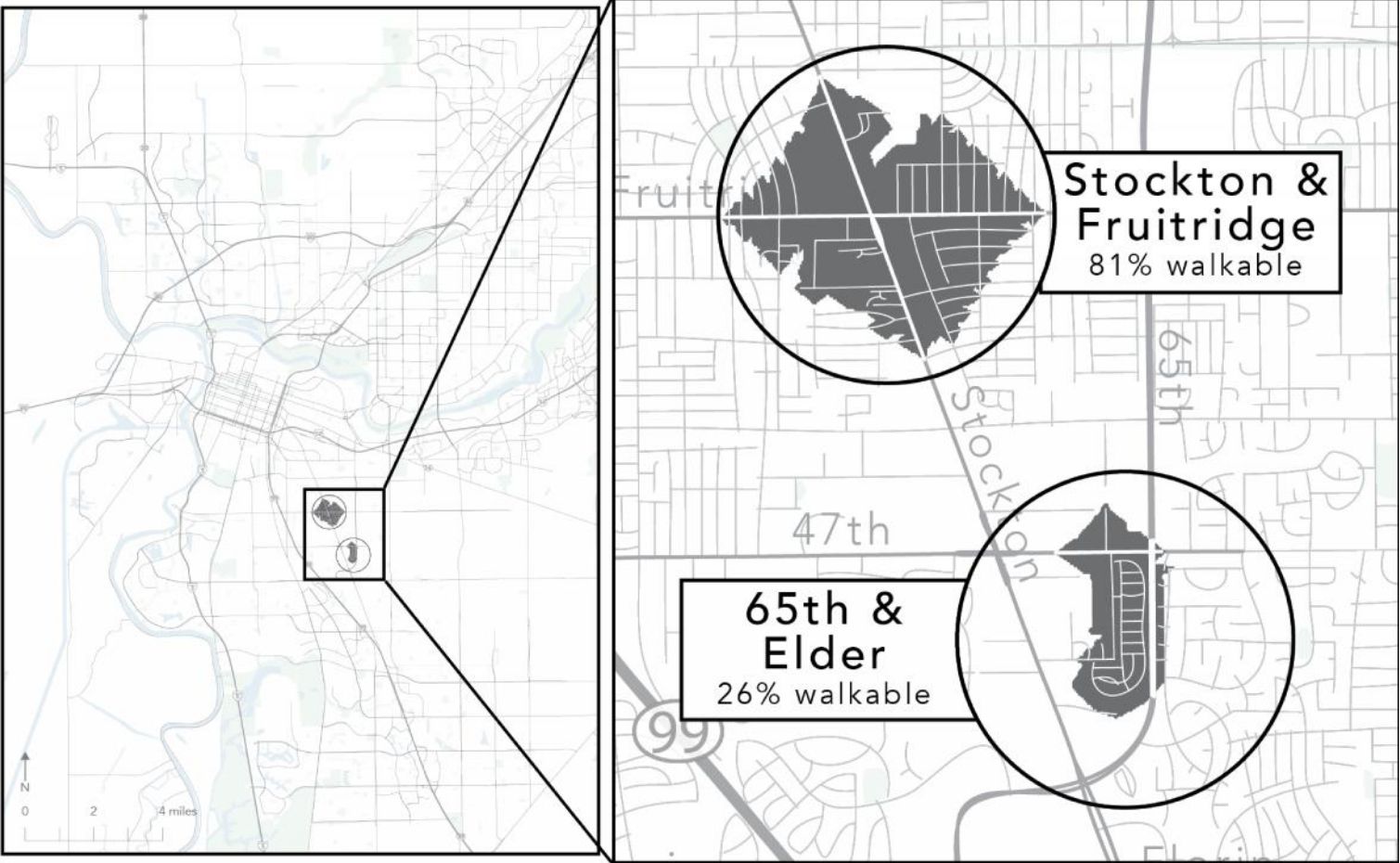


Density



Walkability

Can the people around the stop walk to the stop?



Walkability

Can you cross the street at a bus stop?



Linearity

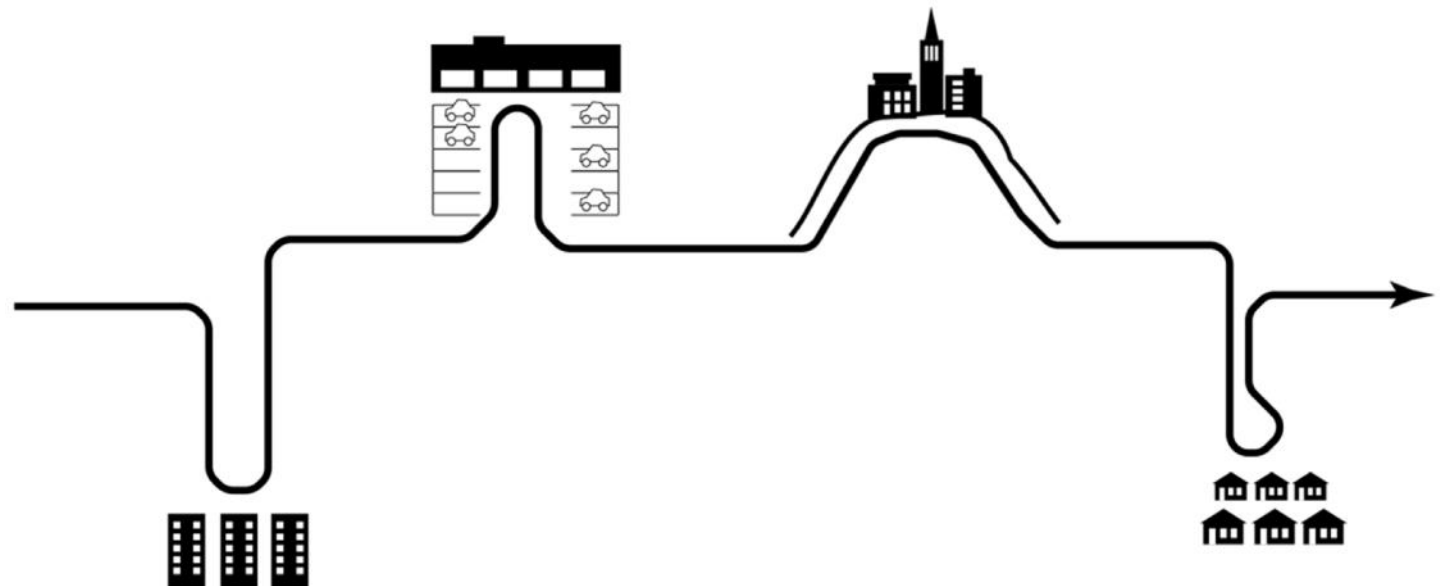
Can transit run in straight lines that are useful to through-riders?

The straighter the line, the shorter the journey, and the more people can find it useful.

High
Ridership



Lower
Ridership



Proximity

Does transit have to cross long low-ridership gaps?

Lower cost



Higher cost



The Ridership-Coverage Tradeoff

But is Ridership What You Want?

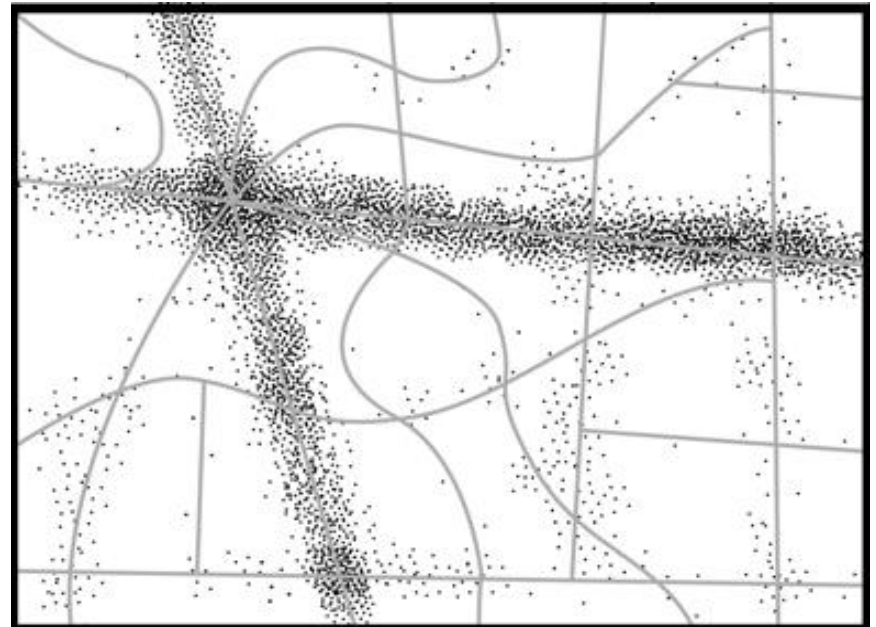


How should a transit agency allocate its resources?

Fictional Urban Area

Dots = residents and jobs

You have 18 buses



Ridership Goal

“Maximize Ridership”



Performance Measure: Productivity

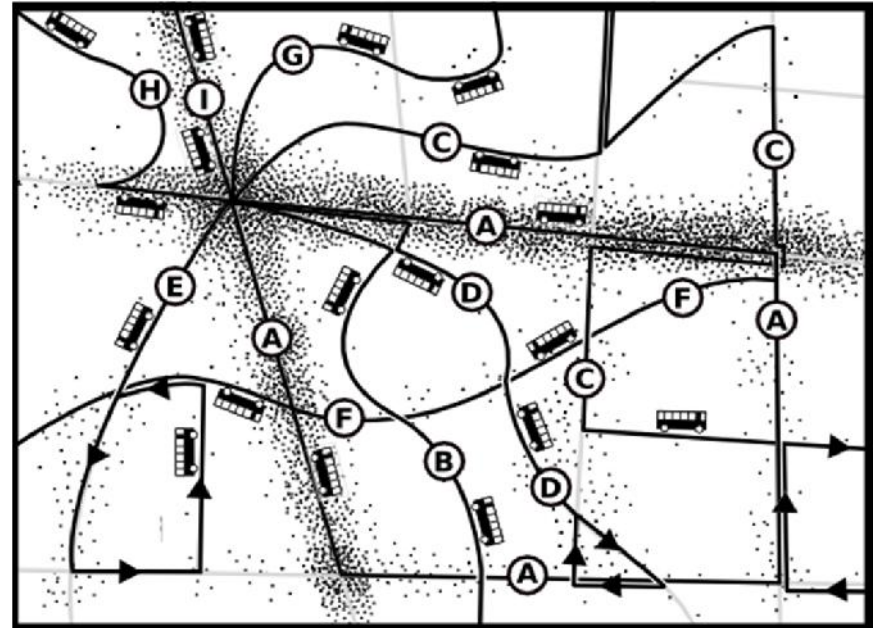
Ridership relative to costs

Coverage Goal

“Some service for everyone”

To maximize coverage, think like a government service. Try to serve everyone, *even those in expensive-to-serve places*.

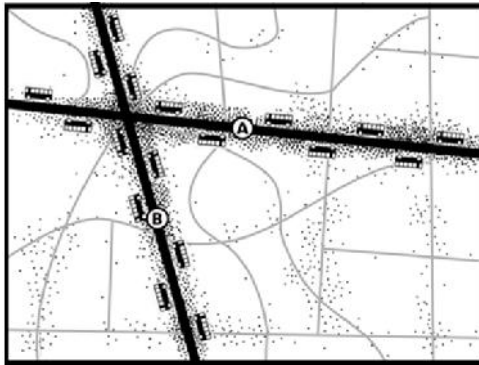
But spreading it out means spreading it thin. Low frequency → low access → low ridership.



Performance Measure: Coverage

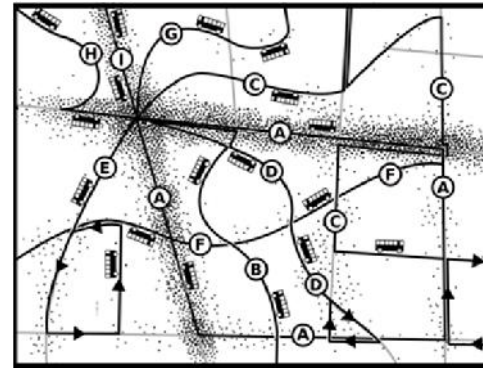
“% of people and jobs within 1/4 mile of transit”

Both goals are important,
... but they lead opposite directions!



Ridership Goal

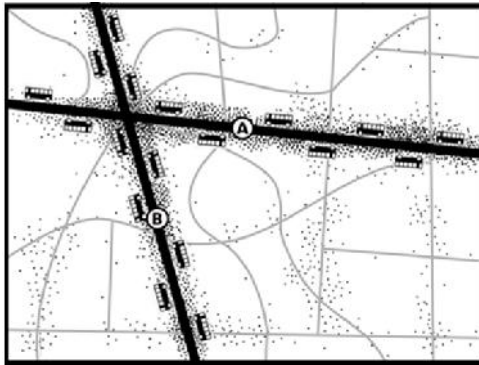
- “Think like a business.”
- Focus where ridership potential is highest.
- Support dense and walkable development.
- Max. competition with cars
- Maximum VMT reduction



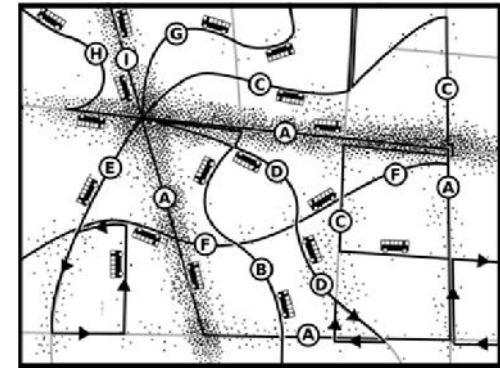
Coverage Goal

- “Think like a public service.”
- “Access for all”
- Support low-density development.
- Lifeline access for everyone.
- Service to every member city or electoral district.

So it helps to choose a point on the spectrum ...



Ridership Goal

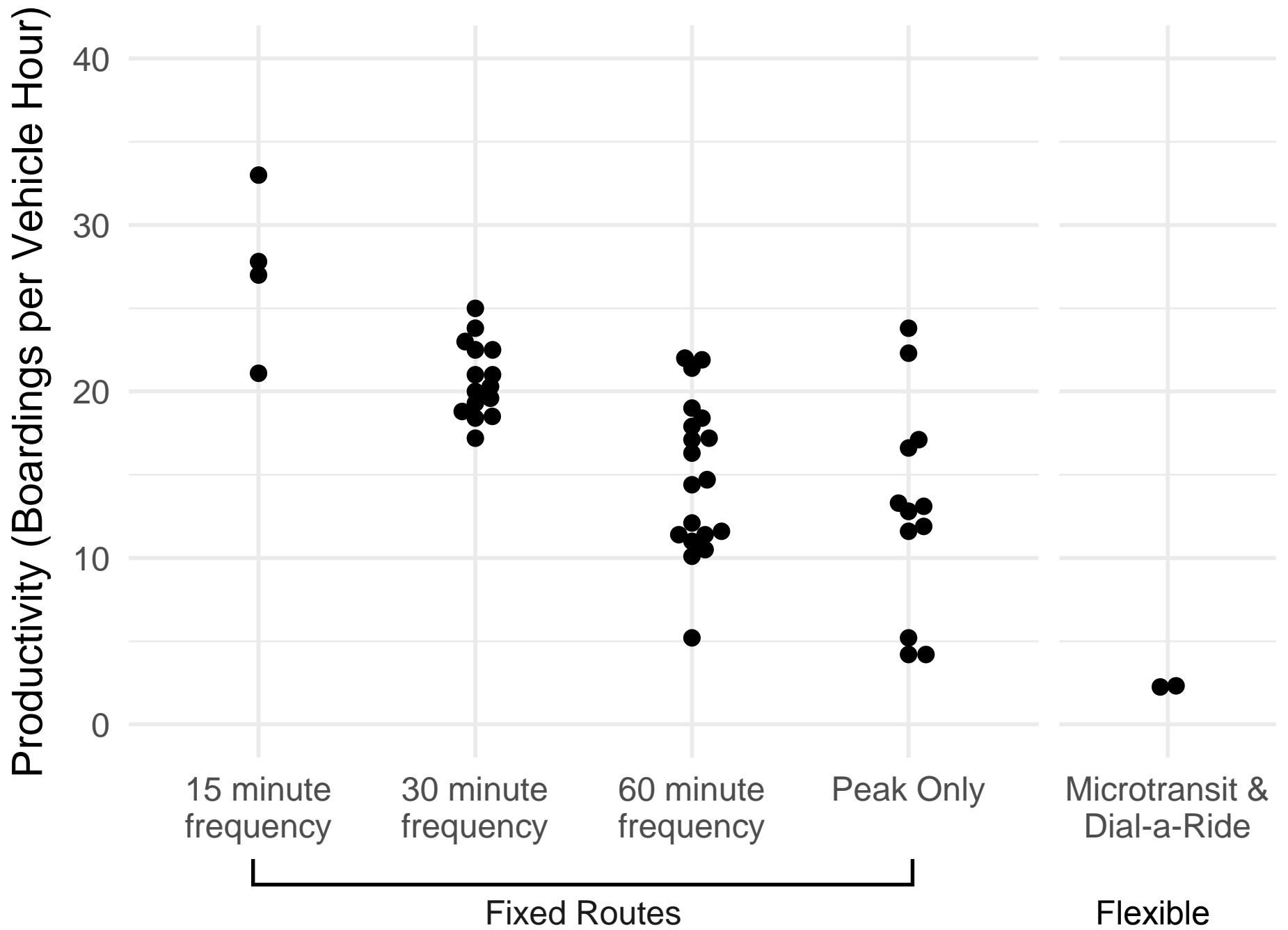


Coverage Goal



A Note on Microtransit

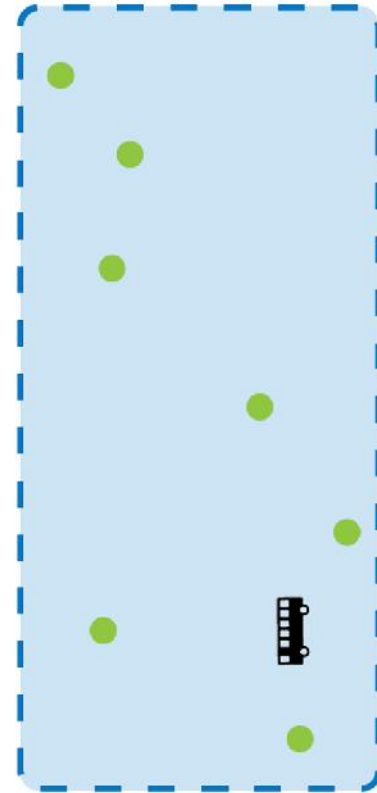
- Microtransit is a brand for flexible-route services that have existed for decades (now with same-day reservations).
- Recent microtransit pilots perform as flexible service has always done, usually <5 passengers/service hour.
- So microtransit is a coverage tool, funded from the coverage side of the ledger.



How much productivity is *physically* possible?



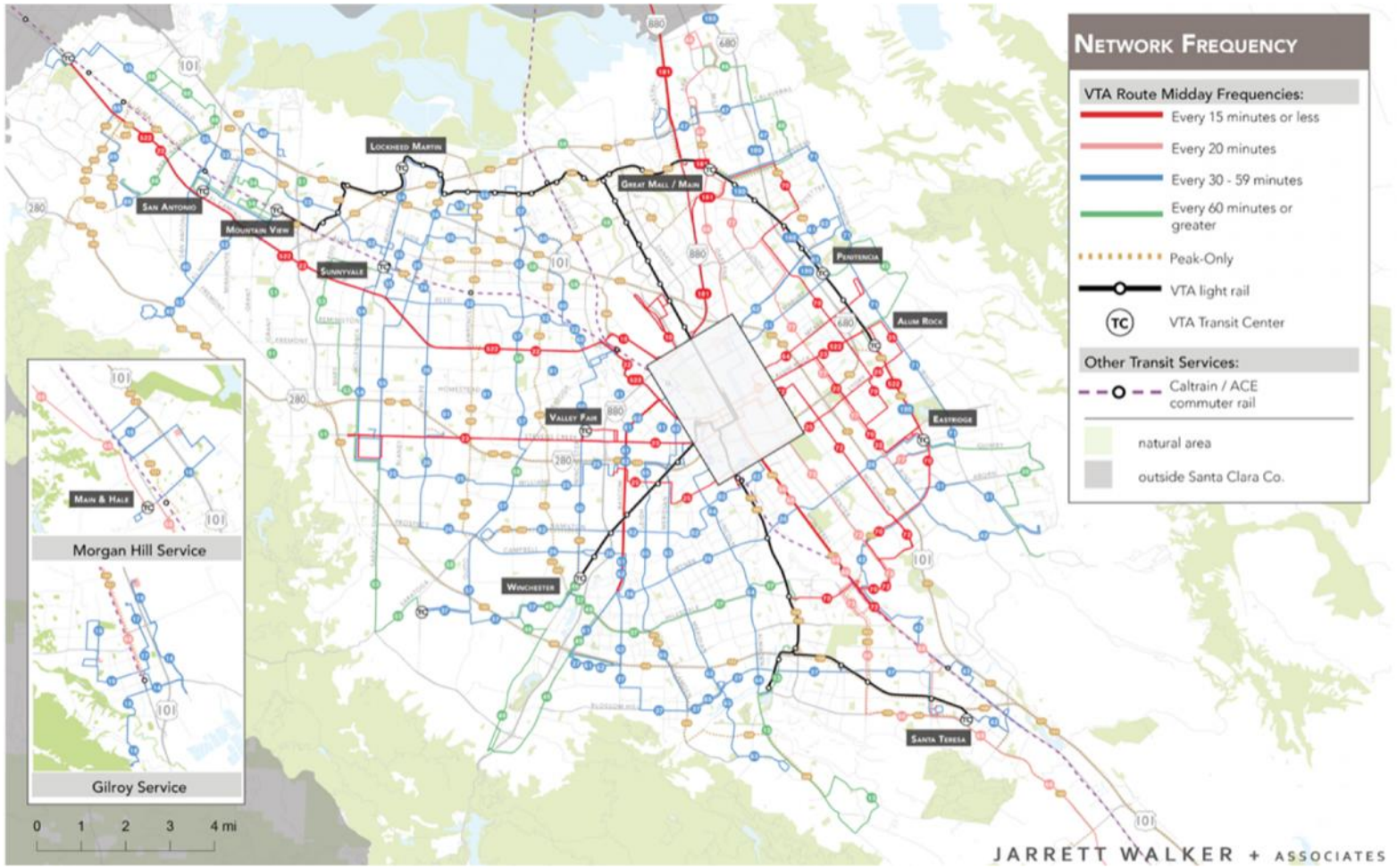
60 passengers per
service hour



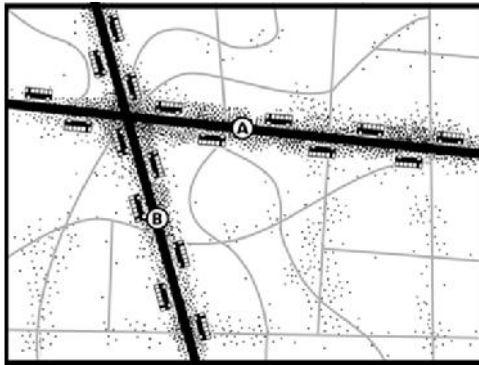
6 passengers per
service hour

Case Study of a Ridership- Coverage Conversation: VTA

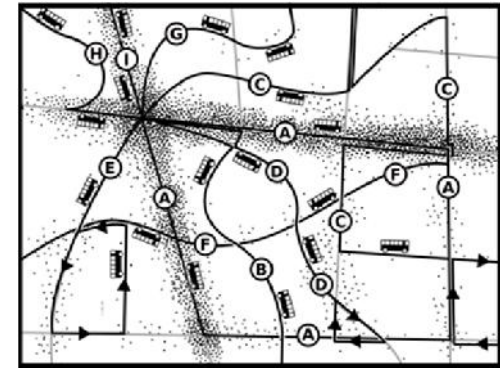
Current All-day Frequency



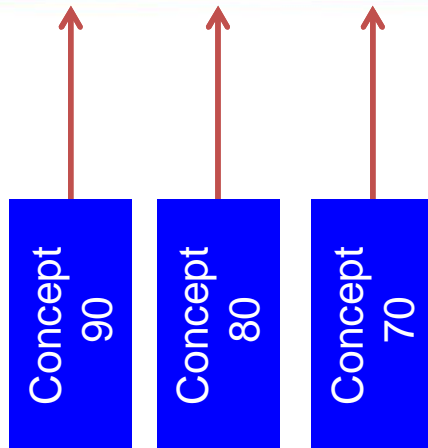
So it helps to choose a point on the spectrum ...



Ridership Goal

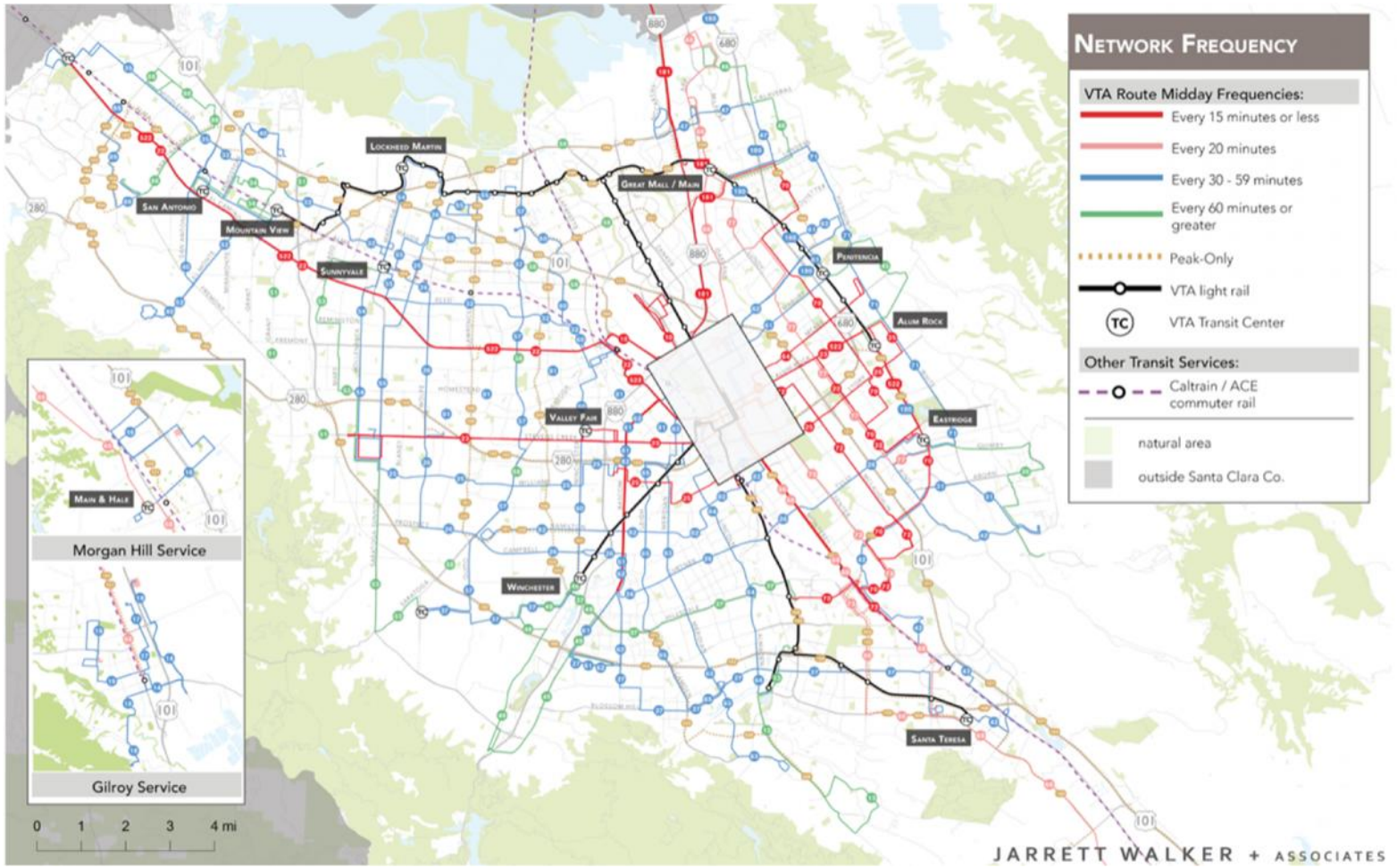


Coverage Goal

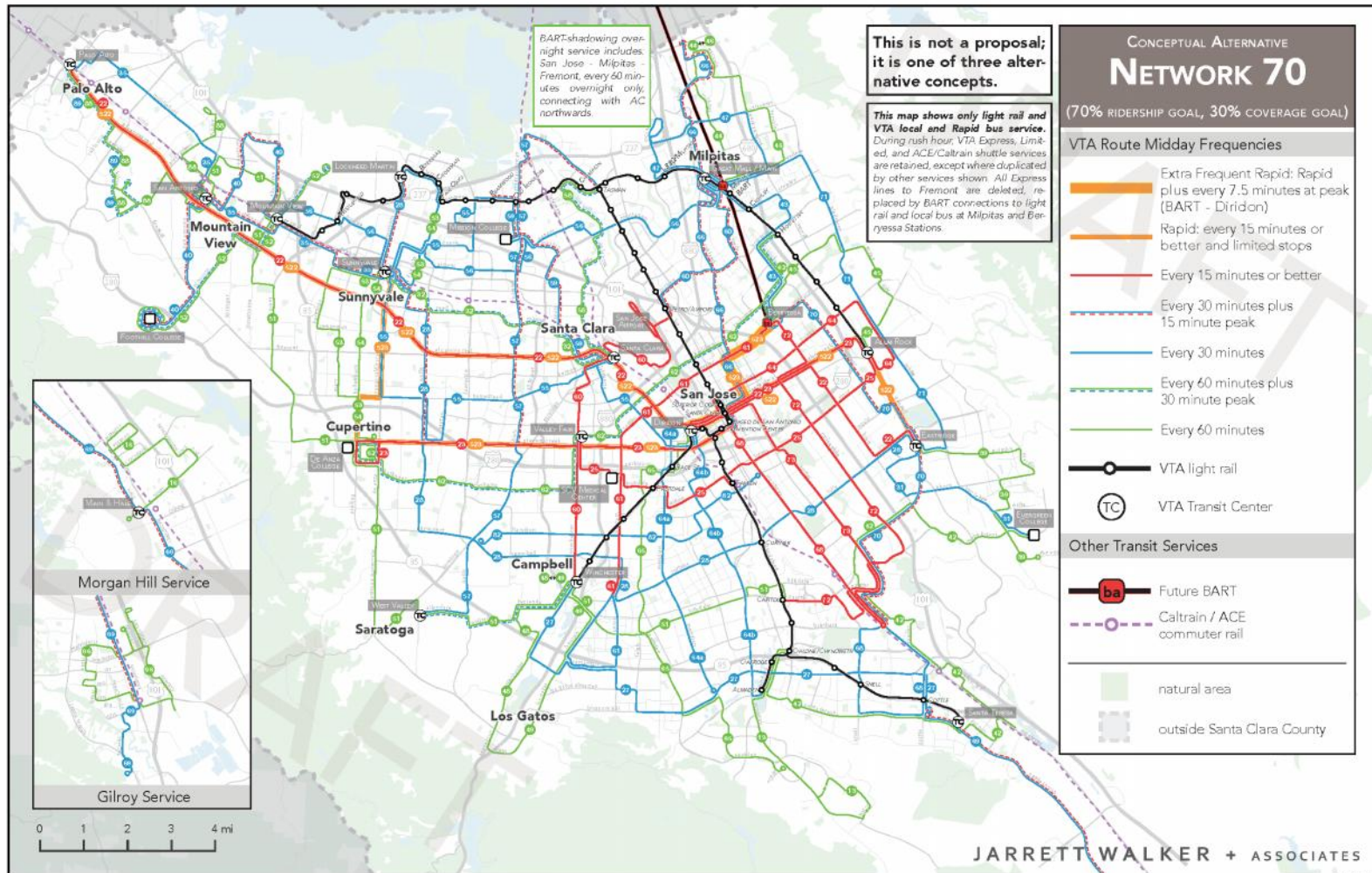


NOTE: We are scoped to do *two* alternatives here.

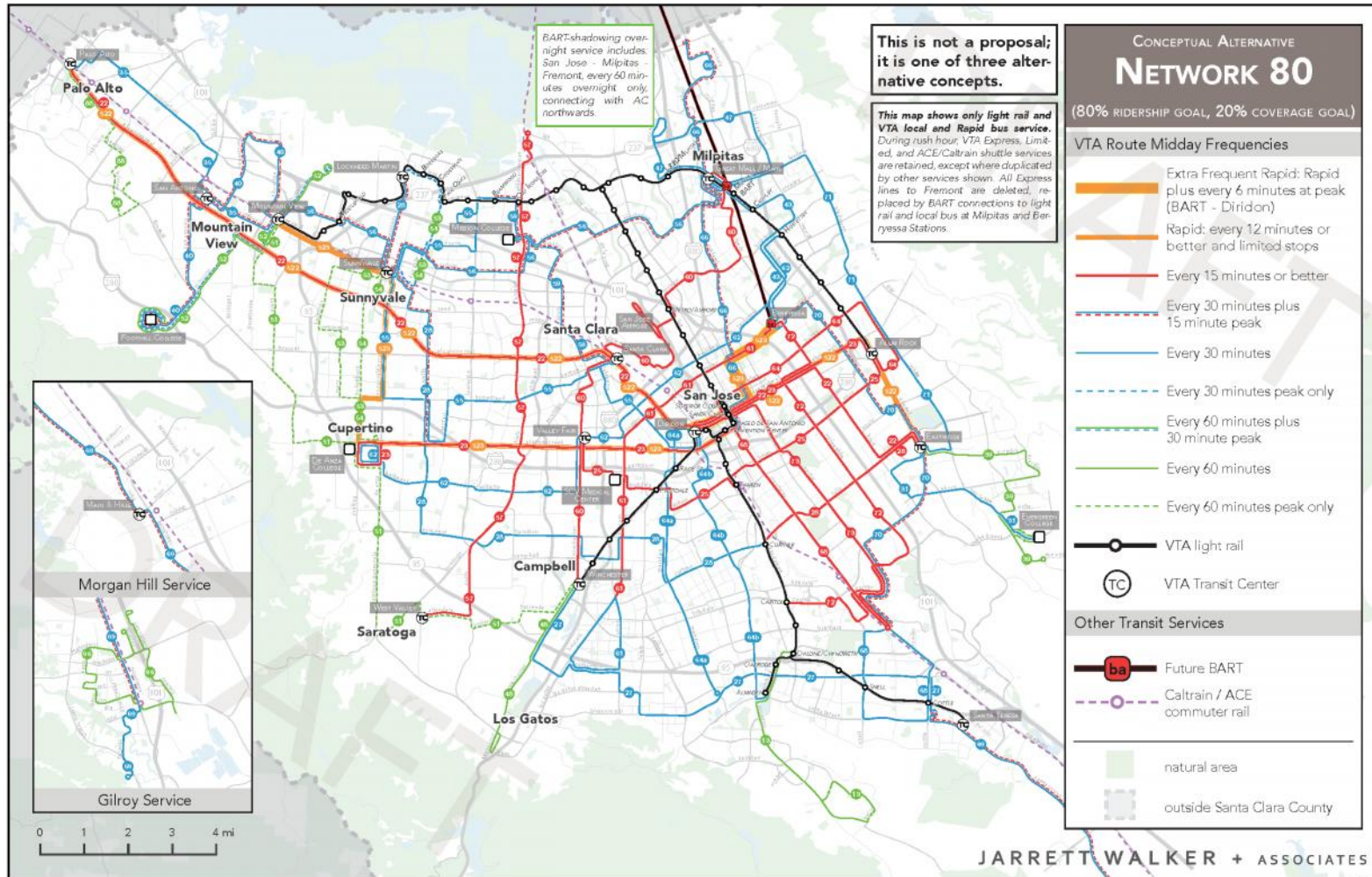
Current All-day Frequency



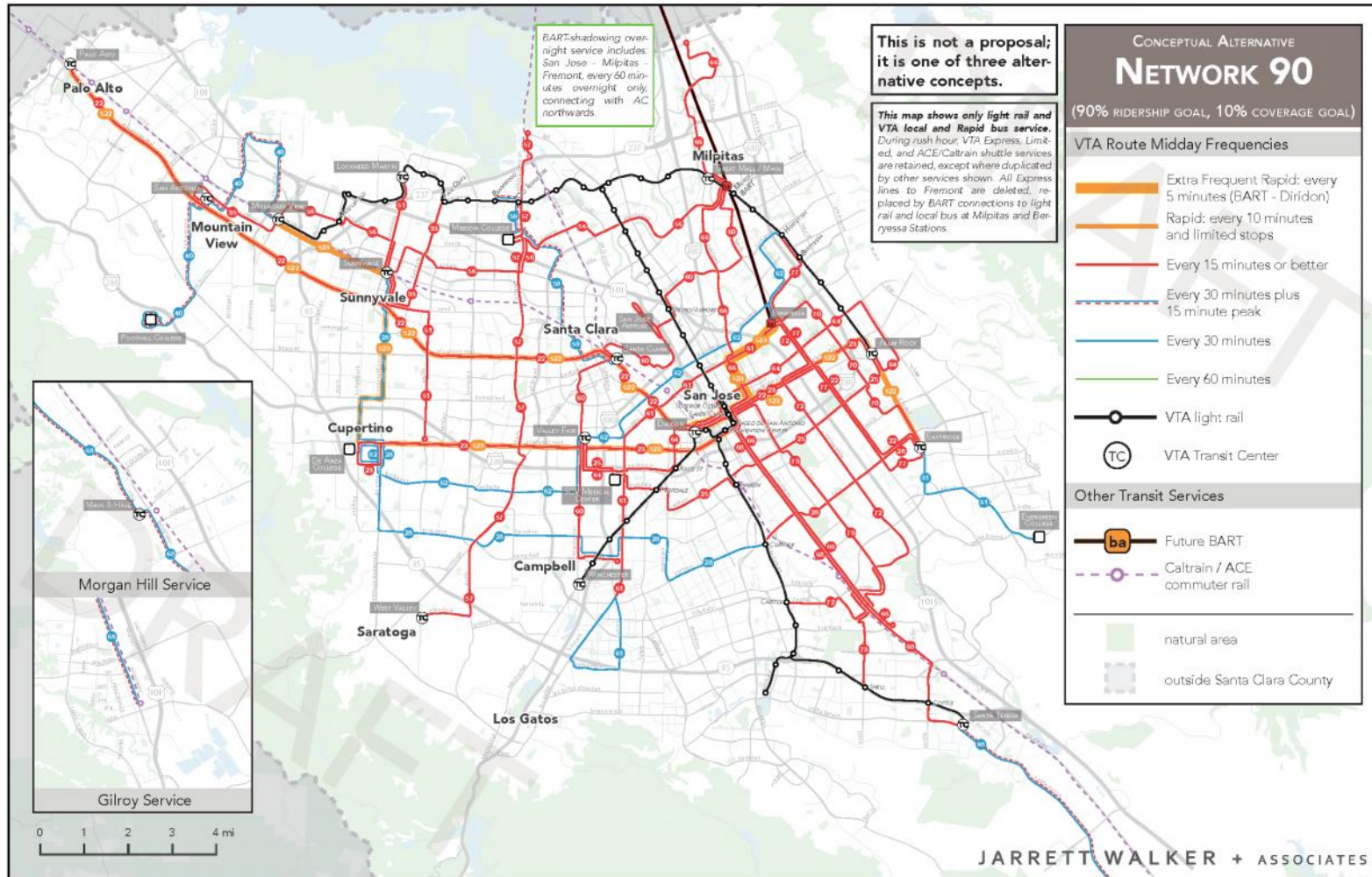
Concept 70 (70% Ridership, 30% Coverage)



Concept 80 (80% Ridership, 20% Coverage)



Concept 90 (90% Ridership, 10% Coverage)

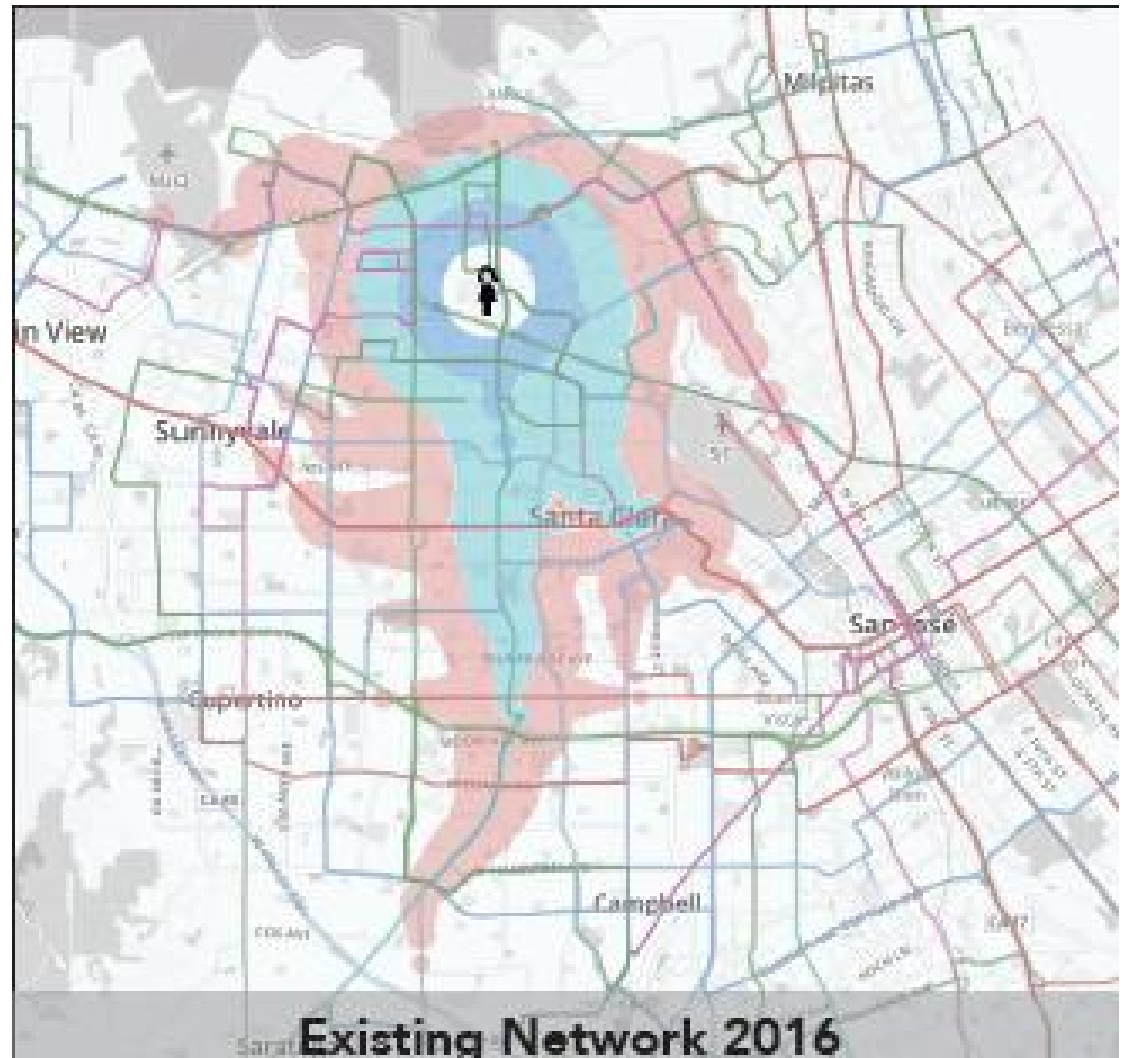


Visualizing Access

How far can Jane travel in 15 30 45 or 60 minutes?

Mission
College
12 noon

Existing
Network



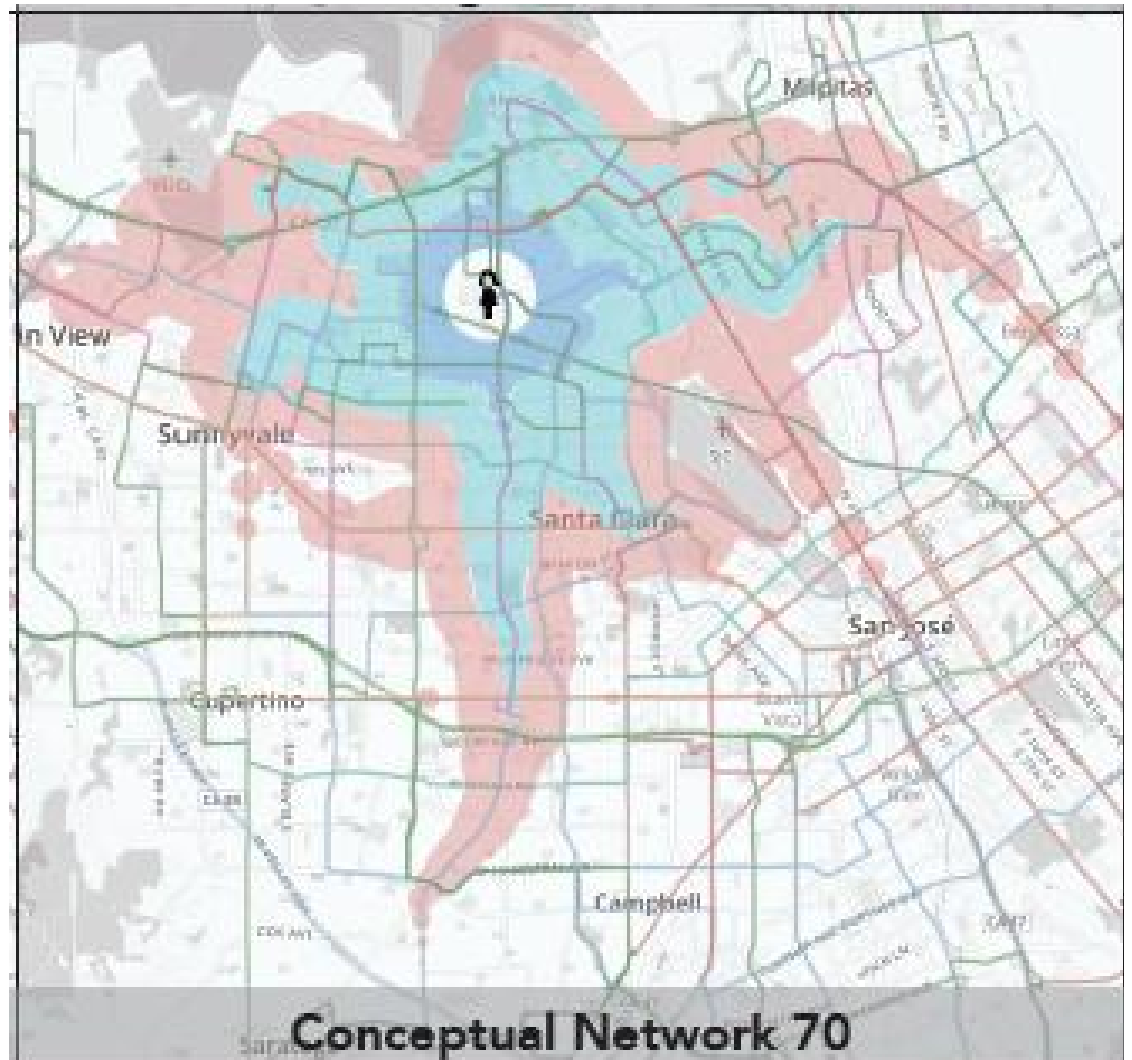
Visualizing Access

How far can Jane travel in 15 30 45 or 60 minutes?

Mission
College
12 noon

Concept 70

(70% ridership)



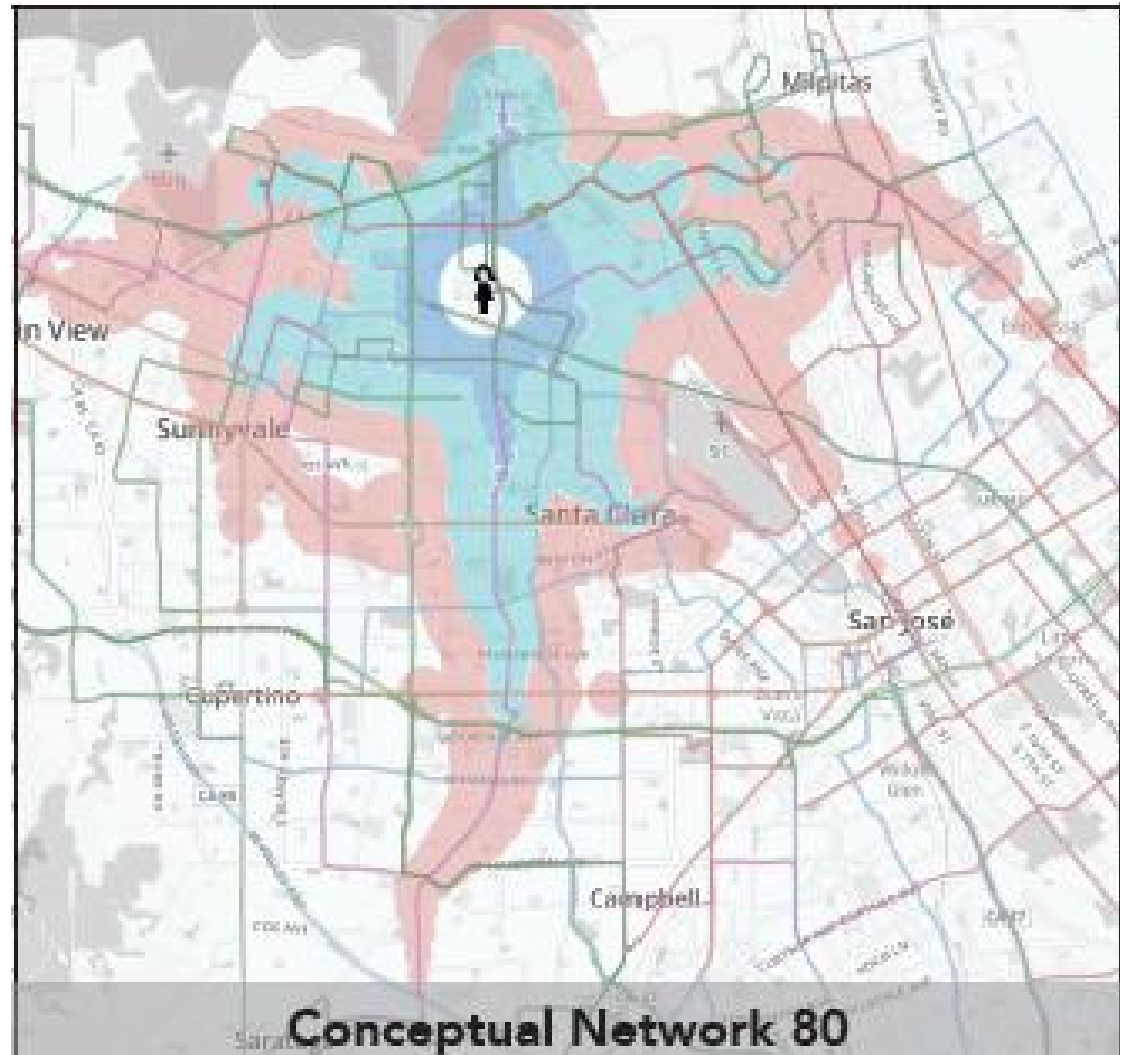
Visualizing Access

How far can Jane travel in or minutes?

Mission
College
12 noon

Concept 80

(80% ridership)



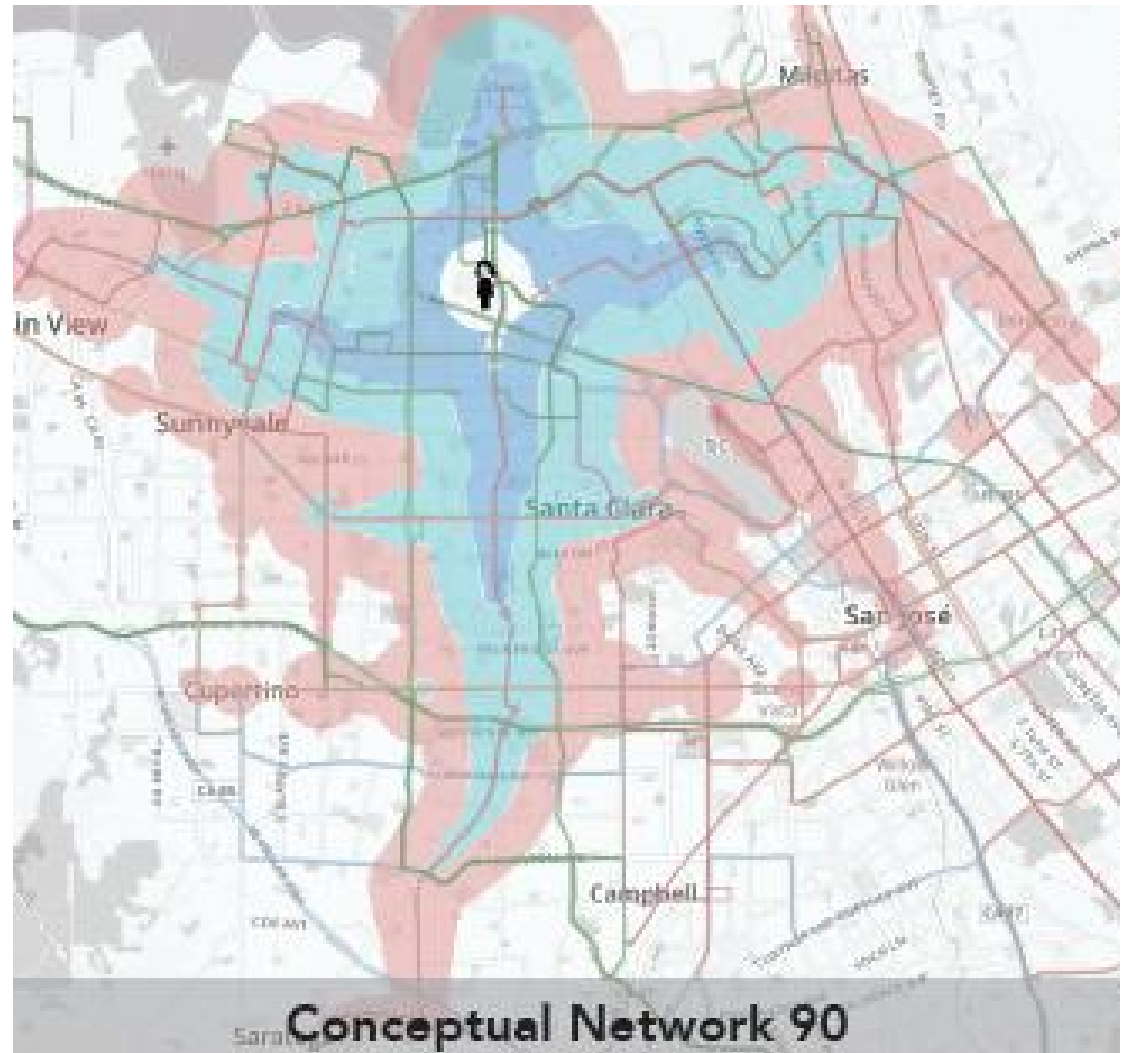
Visualizing Access

How far can Jane travel in or minutes?

Mission College
12 noon

Concept 90

(90% ridership)



So How Many People Is That?

Residents Accessible by Transit			
<i>Starting from Mission College and traveling for...</i>			
	30 min	45 min	60 min
2016 Network	13,400	94,300	295,200
<i>Increase from 2016 Network</i>			
Network 70	46%	29%	22%
Network 80	180%	96%	51%
Network 90	263%	118%	66%

Jobs Accessible by Transit			
<i>Starting from Mission College and traveling for...</i>			
	30 min	45 min	60 min
2016 Network	48,300	144,000	333,200
<i>Increase from 2016 Network</i>			
Network 70	29%	41%	22%
Network 80	72%	59%	31%
Network 90	100%	76%	43%

Diversity vs. specialization

It is tempting to specialize:

- Specific groups and organizations routinely request service *perfect for themselves*.
 - eg. Parking Shuttles
 - eg. School-oriented routes
- Some people want transit to focus on a certain “demographic.”

Beware of binarisms:

“Choice Rider”:



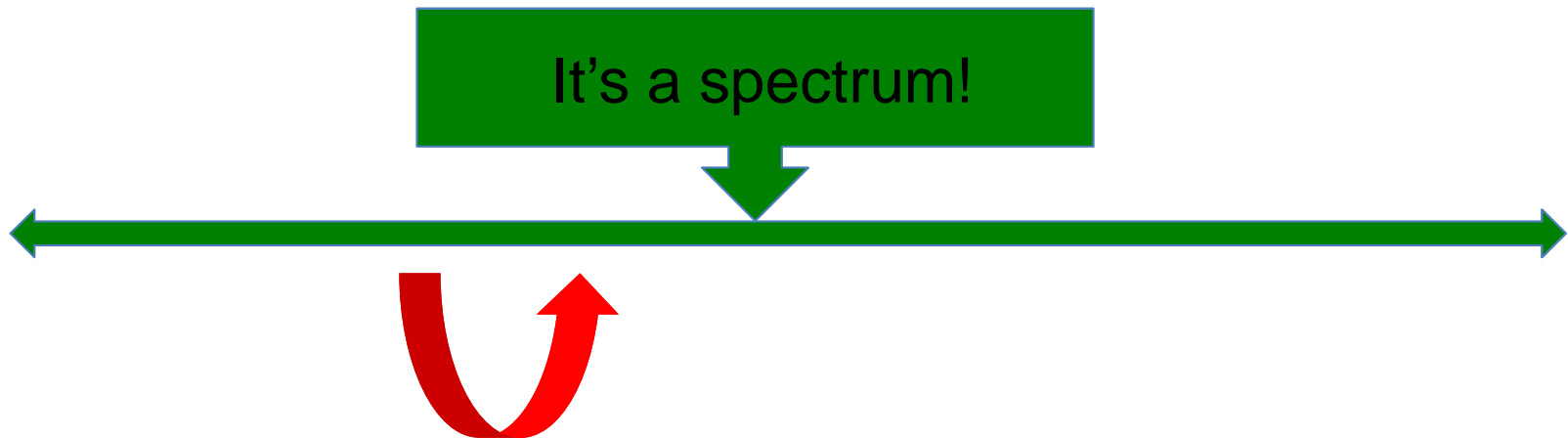
“Dependent or Captive Rider”:



Because we're all somewhere in the middle!

“Choice Rider”

“Dependent or Captive Rider”



High ridership comes from diversity...

If you want high ridership, you design for diversity and broad usefulness

The best transit for everyone isn't necessarily the ideal thing for you or people you know.

Also, be skeptical of your own transit experience as a tourist.



Concluding Observations

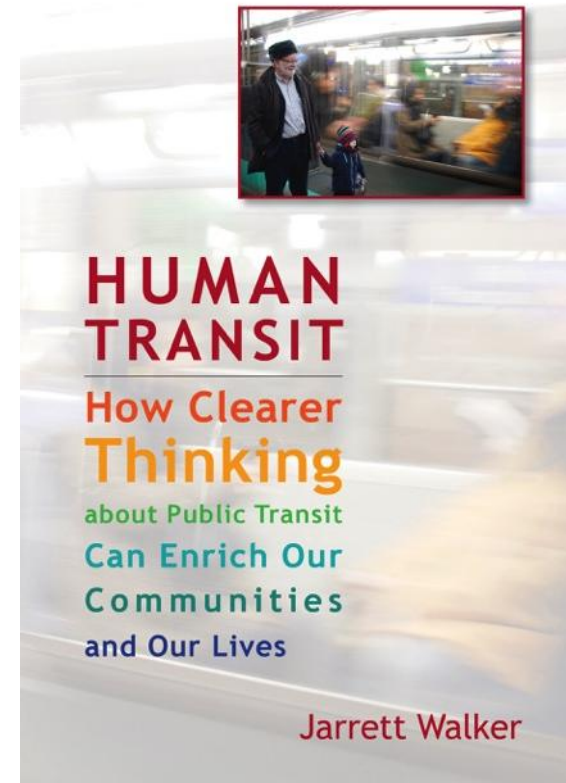
The Challenge: Plan for Everyone

- High-ridership services attract diverse ridership.
- So all impulses to specialize around certain riders (except paratransit) lead to less efficient design.
- The best network is not what any one interest group would design.
- “Market segmentation” can lead us astray if it weighs demographics too heavily.
- Be careful of elite projection.
 - Elite projection = Using your own tastes as a guide to what would make a high ridership service.

Jarrett Walker

Blog: HumanTransit.org

Twitter: [@humantransit](https://twitter.com/humantransit)



Thank you!



SacRT Board Retreat

Monday, April 23, 2018

Journey to Excellence

SacRT has made a solid, rapid and comprehensive transformation



Table of Contents

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Section 1: Historic Two Years in Review

- 1. Customers First/Clean, Safe and Convenient**
- 2. Financial Stability**
- 3. Business Optimization/Performance and Accountability**
- 4. Communications and Partnerships**
- 5. Innovations and Best Practices**

1. Customers First / Clean, Safe & Convenient



Customers First / Clean, Safe & Convenient

- 1.1** Successful Golden 1 Center service implementation – 10% of event attendees take SacRT.
- 1.2** Extended customer service and sales center hours for special events and increased train frequency during events.
- 1.3** Created a comprehensive service disruption plan to minimize customer inconveniences.
- 1.4** Instituted a 24-hour customer response policy and addressed most customer concerns within two hours.

Customers First/Clean, Safe & Convenient

- 1.5** Developed and implemented an aggressive station and vehicle cleaning policy, cleaning 52 stations, 228 buses, and 97 light rails cars, seven days a week. Increased cleaning staff by 120 percent.
- 1.6** Implemented a free 90-minute transfer to all riders who use electronic fare media.
- 1.7** Worked with community and stakeholders to re-imagine the Watt/I-80 light rail station and transit center to foster a sense of community.
- 1.8** Improved the student fare policy to make purchasing and using student monthly passes more convenient.

Customers First / Clean, Safe & Convenient

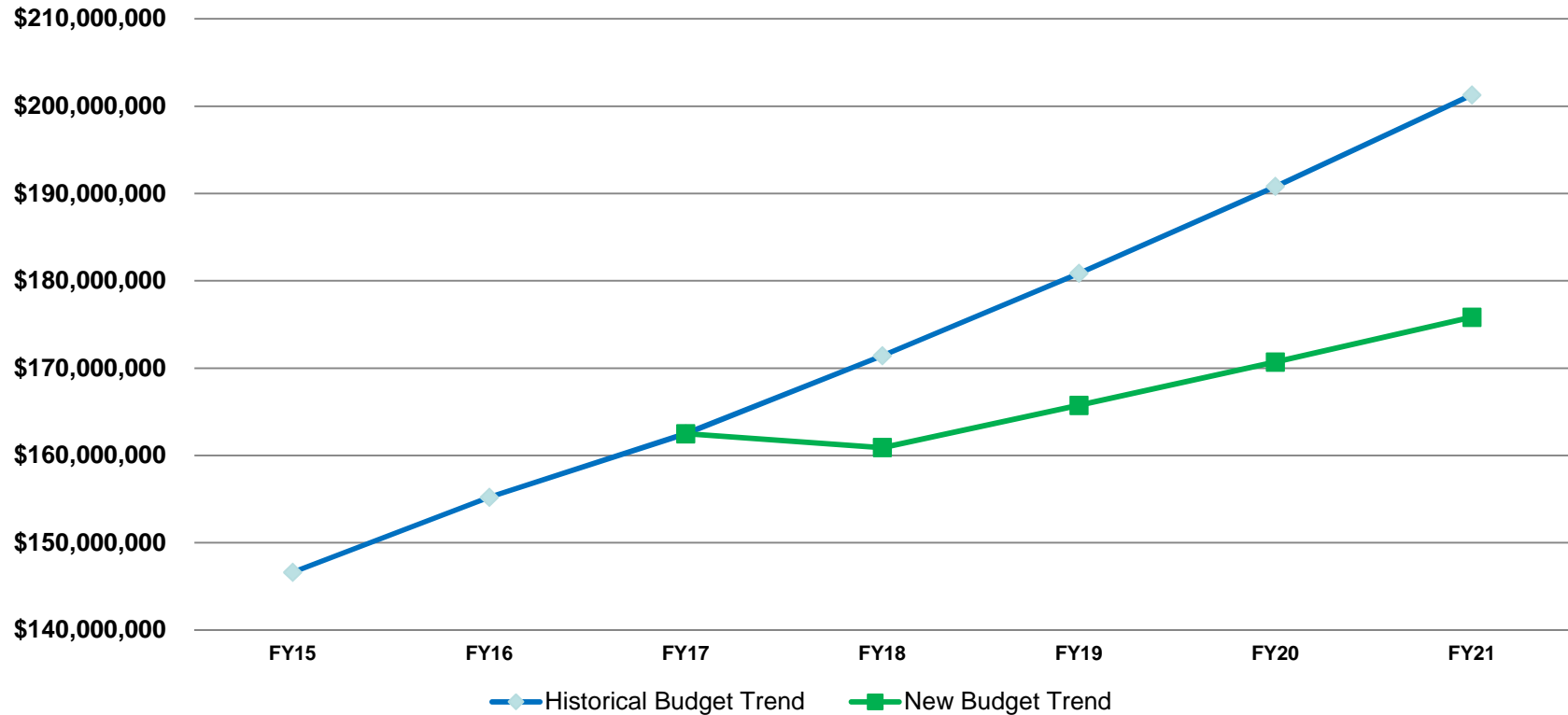


Customers First/Clean, Safe & Convenient

- 1.9** Designated Paid Fare Zones within all 52 light rail stations to allow fare inspection on station platforms to improve safety, security and fare collection.
- 1.10** Developed, integrated and expanded our safety and security workforce from 50 to over 100 team members.
- 1.11** Hired new Transit Agents to prevent fare evasion, and to provide additional customer service and security. The effort resulted in fare evasion rates dropping from 20% to 5%.
- 1.12** Installed over 800 live feed security cameras on our light rail vehicles, stations, buildings, and parking lots; remote communications using a public address system; and lighting improvements at our light rail stations

2. Financial Stability

Future Cost Avoidance Benefit



\$70 million cost avoidance/savings in five years.

Financial Stability

- 2.1** Saved \$1.75 million through a combination of staff restructuring and a reduction in administrative staff salary increases.
- 2.2** Successfully implemented a fare increase with few complaints that generated \$2 million additional fare revenue.
- 2.3** First reduction in debt service and upgraded bond rating from “negative watch” to “stable.”
- 2.4** Submitted a FY18 budget that is less than the FY17.

Financial Stability

- 2.5** Renegotiated contracts with service providers that resulted in \$3.5 million savings.
- 2.6** Implemented TODs for the first time in 30 years. Potential \$20 million in revenue and over 1,000 housing units resulting in millions of new transit trips.
- 2.7** Realized budget savings over \$2 million each in the last two years.

3. Business Optimization/ Performance & Accountability



Business Optimization/ Performance & Accountability

- 3.1** Developed a top-notch leadership team.
- 3.2** Executed a sweeping business transformation.
- 3.3** Developed a comprehensive performance management program.
- 3.4** Continuing to pursue fair and equitable union contracts: 1) Have negotiated fair and responsible wage structure in recently extended contracts; 2) Will soon implement a revised and robust Operator attendance program; 3) Have successfully introduced and implemented defined contribution retirement alternatives to the traditional defined benefit pension plans.

Business Optimization/ Performance & Accountability

- 3.5** Ongoing process improvements to the Procurement system.
- 3.6** Accelerated hiring process.
- 3.7** Expanded bus service for the first time since 2015 to reach Delta Shores.
- 3.8** Focused on building leadership capability and talent bench-strength and established the framework for how employees choose and act, producing enduring performance results.

Business Optimization/ Performance & Accountability

- 3.9** Developed a bold vision, which was used as an accelerant to inspire all stakeholders internally and externally to continue to change the culture, eliminate silos, align staff to common goals, increase collaboration, and build a bridge from actions to results.
- 3.10** Successfully settled over a dozen internal lawsuits looming for the last six years, with the least cost impact and with morale boost.
- 3.11** Timely added over 50 front line customer service positions and smoothly reduced over a dozen management and administrative positions to streamline business process and maximize efficiency without any legal challenges.



4. Communications & Partnerships

Communications & Partnerships

- 4.1** Worked diligently with the news media to tell our story, to provide transparency.
- 4.2** Implemented train wrap programs (ad sales, SacRT branding and rolling art) to improve the look of aging light rail trains.
- 4.3** Partnered with local Property and Business Improvement Districts for station cleaning.
- 4.4** Built great partnerships with NGOs, civic organizations, and other stakeholders who used to be very critical of SacRT into our strong supporters.
- 4.5** Partnered with the Sacramento Metro Chamber on the first “Transit Means Business” event that successfully raised awareness of the nexus between public transit and economic vitality.

Communications & Partnerships

- 4.6** Executed historic public private partnerships focused on station improvements and cleaning (29th Street and 16th Street).
- 4.7** Partnered with cities and communities to improve transit service.
- 4.8** Effectively worked with funding agencies such as FTA and Caltrans to generate substantial grant funding.
- 4.9** Cultivated a highly trustworthy CEO and Board partnership with timely two-way communication, effective collaboration, respect and the highest level of integrity.



Sampling of Partnerships

Sampling – SacRT Partners – Organizations

- 350 Sacramento
- 50 Corridor TMA & Point West TMA
- Alliance Chambers
- Caltrans
- Del Paso Boulevard Partnership
- Downtown Sacramento Partnership
- Environmental Council of Sacramento (ECOS)
- Eye on Sacramento
- Florin Road Partnership
- Federal Transit Administration
- Greater Broadway Partnership
- Greater Folsom Partnership
- Los Rios Community College District
- Mack Road Partnership
- Midtown Association
- North Franklin District Business Association
- North Natomas TMA
- Organize Sacramento

Sampling – SacRT Partners – Organizations

(continued)

- Power Inn Alliance
- River District
- Ridership for the Masses
- Sacramento Area Bicycling Advocates
- Sacramento Area Council of Governments
- Sacramento Housing and Redevelopment Agency
- Sacramento Metro Chamber
- Sacramento Metropolitan Air Quality Management District
- Sacramento Regional Transit Mobility Advisory Council
- Sacramento State
- Sacramento TMA
- Sacramento Transit Advocates and Riders (STAR)
- SacTRU
- South Natomas TMA
- Stockton Boulevard Partnership
- Valley Vision
- WALK Sacramento

Sampling – SacRT Partners – Individuals

- **Congresswoman Doris Matsui**
- **Mayor Darrell Steinberg (Sacramento)**
- **Supervisor Sue Frost (Sacramento)**
- **Supervisor Susan Peters (Sacramento)**
- **Norm Hom**
- **Councilmember Eric Guerra (Sacramento)**
- **Councilmember Albert Fox (Citrus Heights)**
- **Councilmember Kerri Howell (Folsom)**
- **Councilmember Darren Suen (Elk Grove)**
- **Alberto Ayala**
- **Tony Lucas**
- **Will Kempton**
- **Mike Barnbaum**
- **Pam Flohr**
- **Becky Heieck**
- **Craig Powell**
- **Rebecca Garrison**
- **Seann Rooney**
- **David Taylor**
- **Michael Ault**
- **Emily Baime Michaels**
- **Pat Fong Kushida**
- **Azizza Davis Goines**
- **Cathy Rodriguez**
- **Tina Thomas**
- **Warren Smith**
- **Russell Rawlings**
- **Tamie Dramer**
- **Barbara Stanton**
- **Glenda Marsh**
- **JoAnn Fuller**
- **Nancy Kitz**
- **Steven Bourasa**

5. Innovations & Best Practices



6360



Innovations & Best Practices

- 5.1** Successfully launched Connect Card, the region's smart card fare payment system.
- 5.2** Launched Station Link program in partnership with Uber, Lyft and Yellow Cab to address first-mile/last-mile solutions.
- 5.3** Successfully launched the Alert SacRT mobile app that enables customers to send pictures, text messages and six-second videos to police.
- 5.4** Successfully launched new ZipPass mobile fare app.
- 5.5** Implemented a new public address (P.A.) system.

Innovations & Best Practices

- 5.6** Among the first few transit agencies in the nation to implement microtransit.
- 5.7** Launched a new SacRT website that's easier for customers to navigate, offers information in any language via Google Translate, and is smartphone responsive.
- 5.8** Developed future transportation framework, including shared mobility, electric buses, and autonomous vehicles.
- 5.9** Developed an innovative and sustainable new funding source for future mobility service for a 30,000 unit new residential housing development with a national renowned firm.

12 Strategic Initiatives & Performance Measurements in FY 18

1. Operator Attendance Control: **Complete**
2. Route Optimization Study – Phase 1: **On-Time**
3. Paratransit Business Model: **Exceed**
4. IT Modernization – Phase 1: **Exceed**
5. Security Program – Phase 1: **Exceed**
6. Safety Program – Phase 1: **Exceed**

12 Strategic Initiatives & Performance Measurements in FY 18

7. Strategic Communications: **Exceed**
8. Employee & Labor Relations: **Complete**
9. Organizational Excellence & Culture Change: **Exceed**
10. Campus Master Plan: **In Progress**
11. Transit Oriented Development & Joint Development: **Exceed**
12. Sustainability & Business Process Optimization: **Well on the Way**

Section II: Peer Comparison

A. California Peer Group

1. Los Angeles County Metropolitan Transportation Authority (LACMTA)
2. Santa Clara Valley Transportation Authority (VTA)
3. San Francisco Municipal Railway (MUNI)
4. San Diego Metropolitan Transit System (MTS)

B. State Capital Peer Group Comparison

1. Massachusetts Bay Transportation Authority (MBTA)
2. Denver Regional Transportation District (RTD)
3. Utah Transit Authority (UTA)
4. MetroTransit, Minneapolis (METRO)

Key Performance Indicators

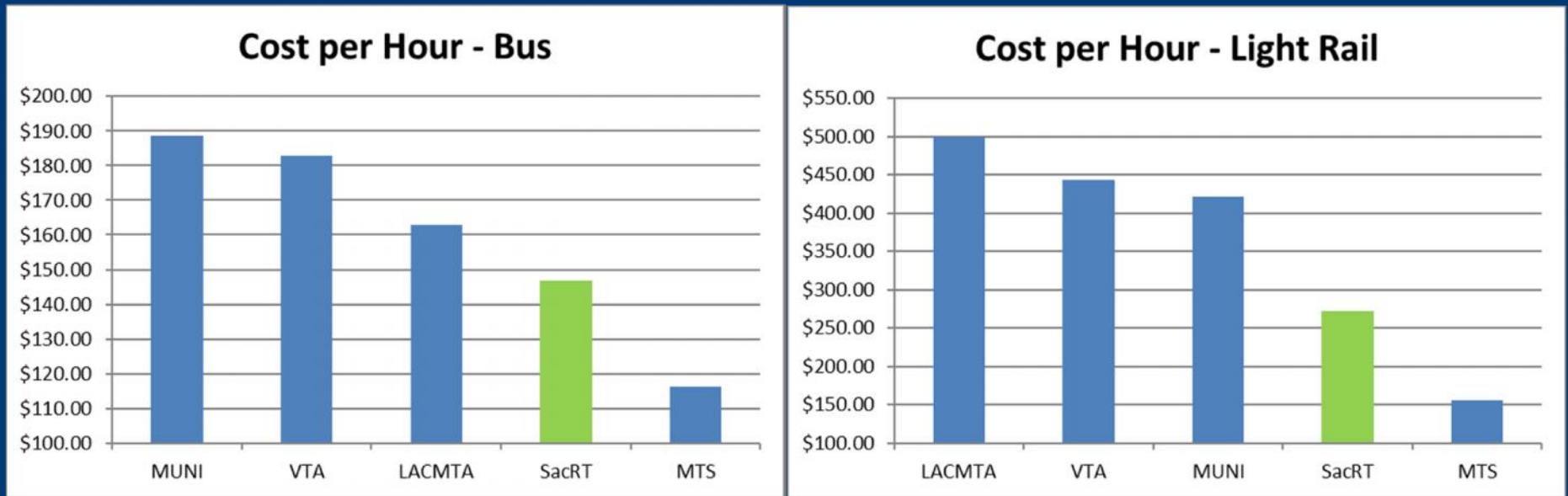
1. Cost per Hour
2. Farebox Recovery
3. Cost per Mile
4. Miles per Hour
5. Miles Between Breakdowns
6. On-Time Performance

A1. Cost per Hour FY 17 (CA)

We manage unit costs well below most California peers for both bus and light rail.

Bus

Light Rail

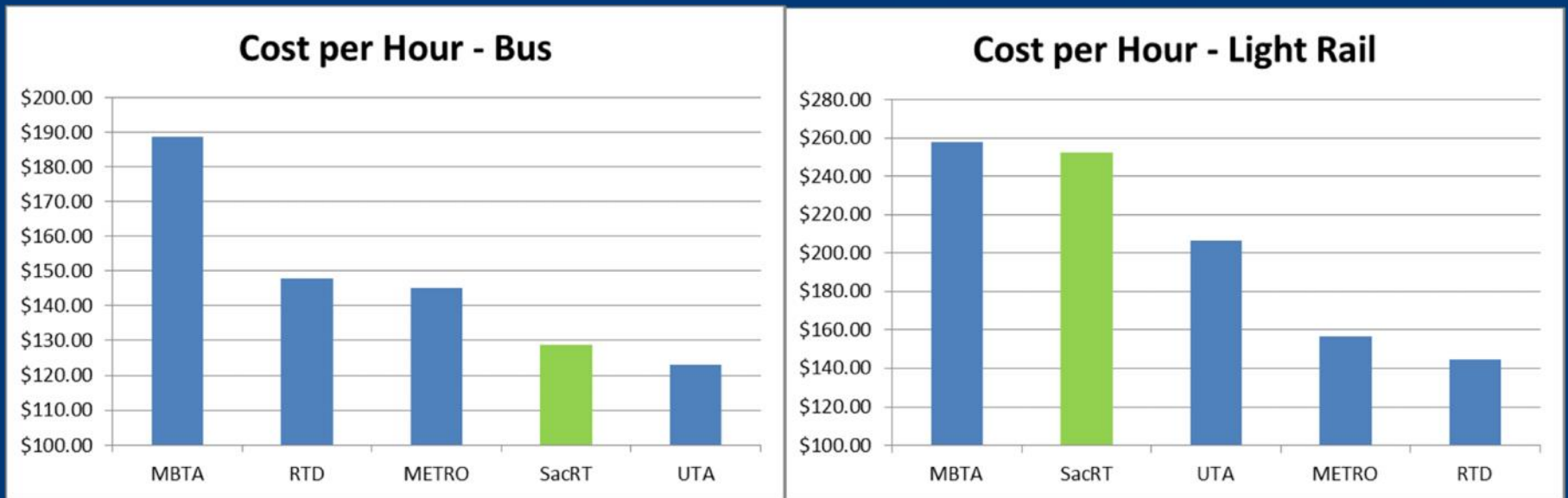


B1. Cost per Hour FY 17 (Nation)

Our cost efficiency remains intact compared to national peers, in spite of a higher California cost of living.

Bus

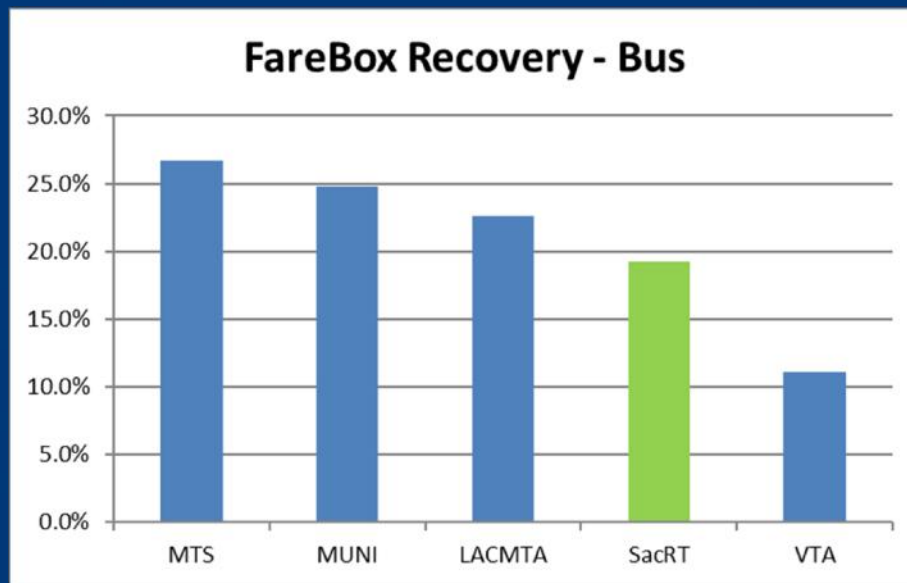
Light Rail



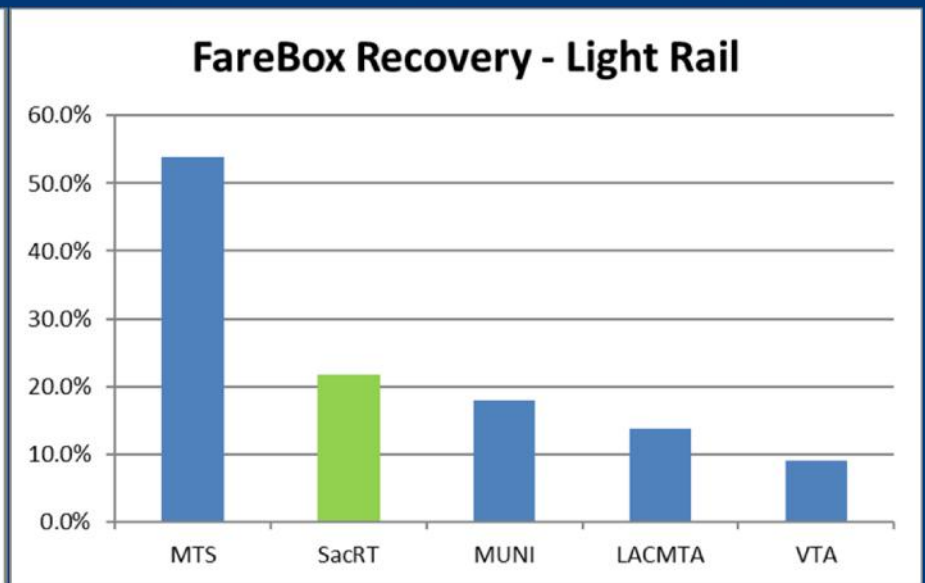
A2. Farebox Recovery FY 17 (CA)

Our customers pay for about 20% of the operating cost of their service, comparable to California peers.

Bus



Light Rail

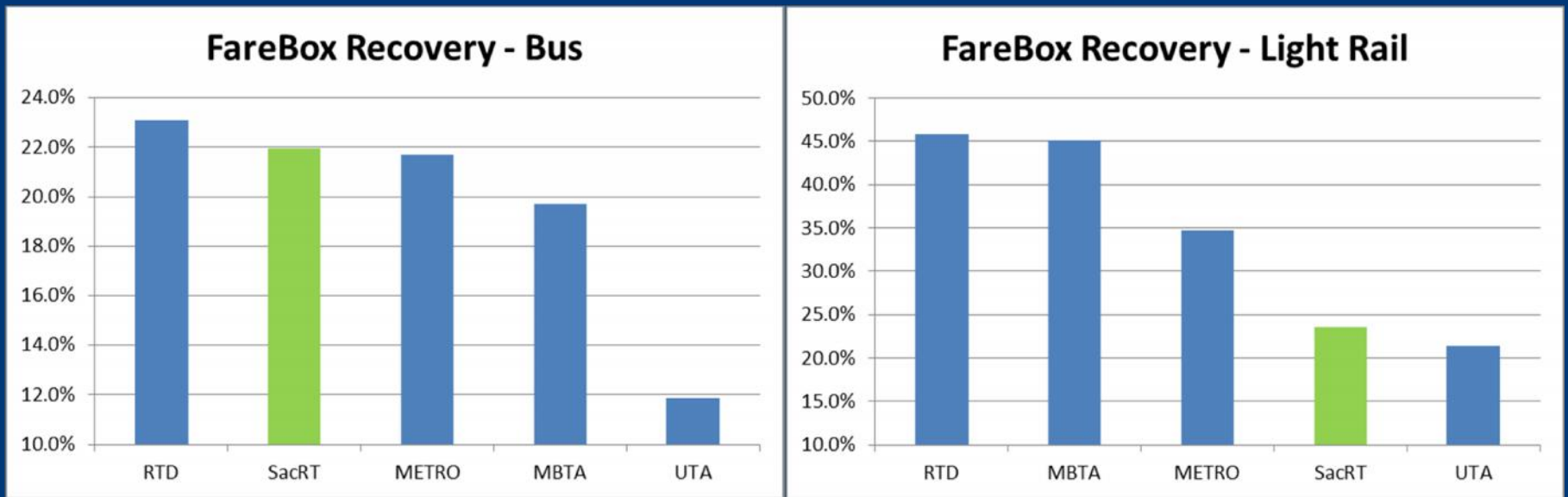


B2. Farebox Recovery FY17 (Nation)

Our bus and light rail positions flip when compared to national peers, still performing well within the norm.

Bus

Light Rail



A3. Cost per Mile FY 17 (CA)

We deliver each mile of service at a cost below most California peers.

Bus

Light Rail

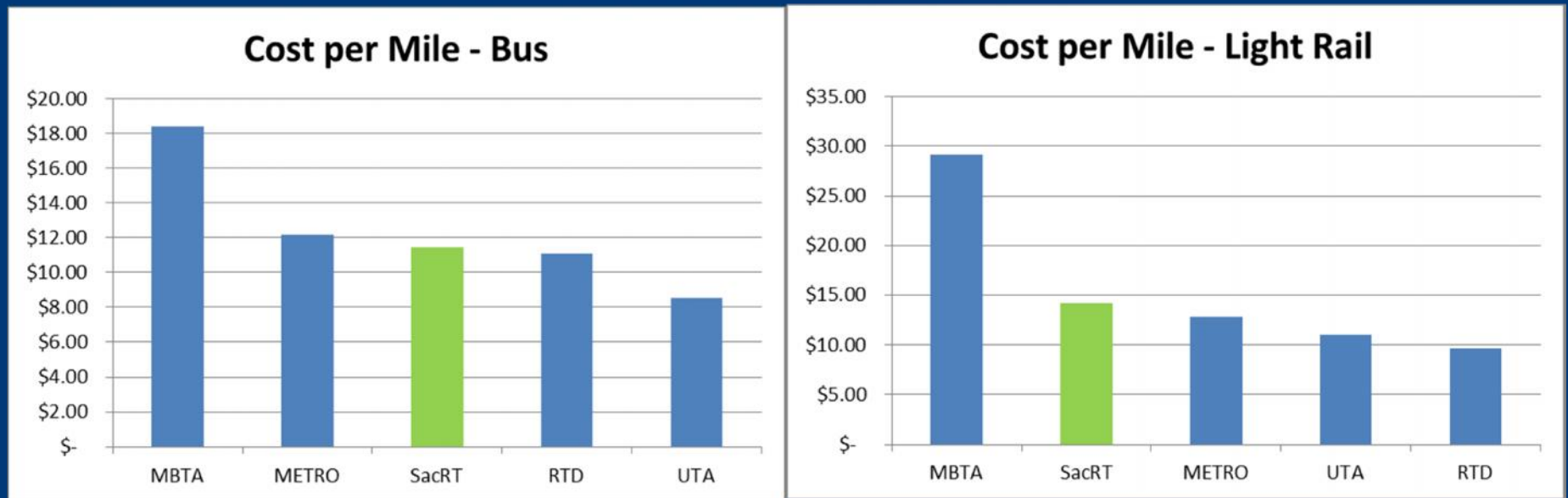


B3. Cost per Mile FY 17 (Nation)

Compared to national peers we are about average, but note that the cost of living in California is higher.

Bus

Light Rail

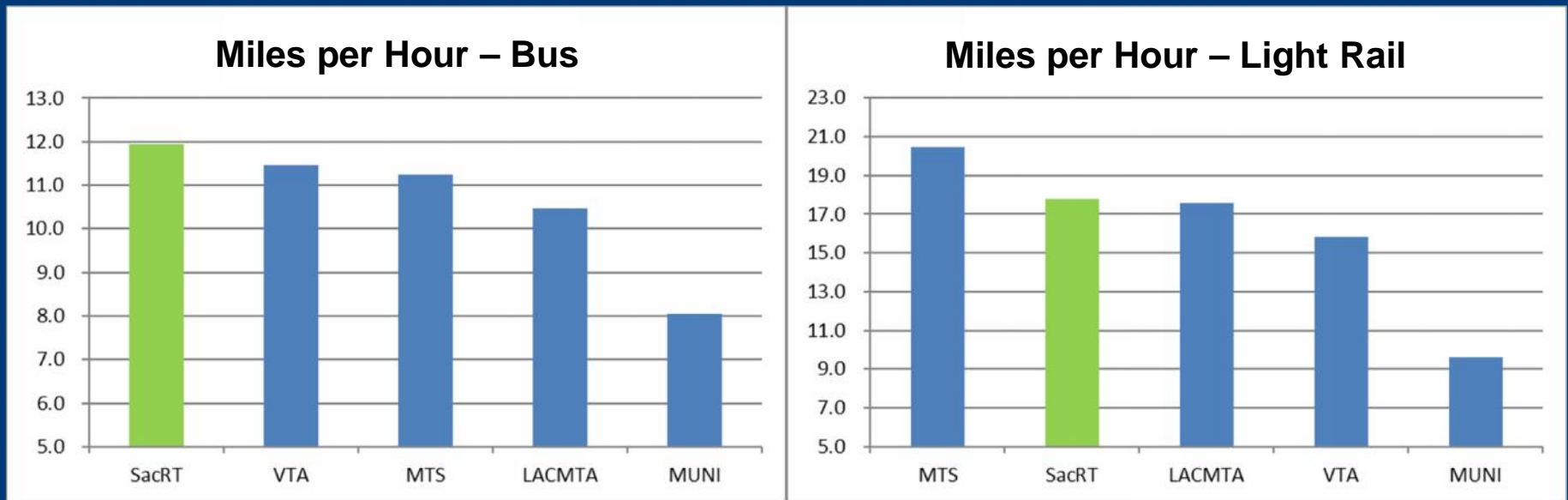


A4. Miles per Hour FY 17 (CA)

Our customers enjoy faster travel times than those provided by California peers.

Bus

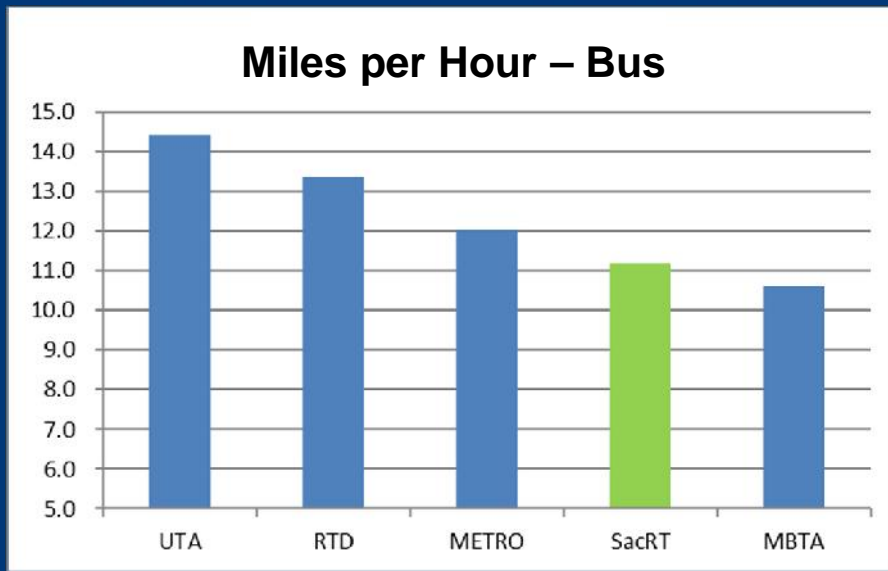
Light Rail



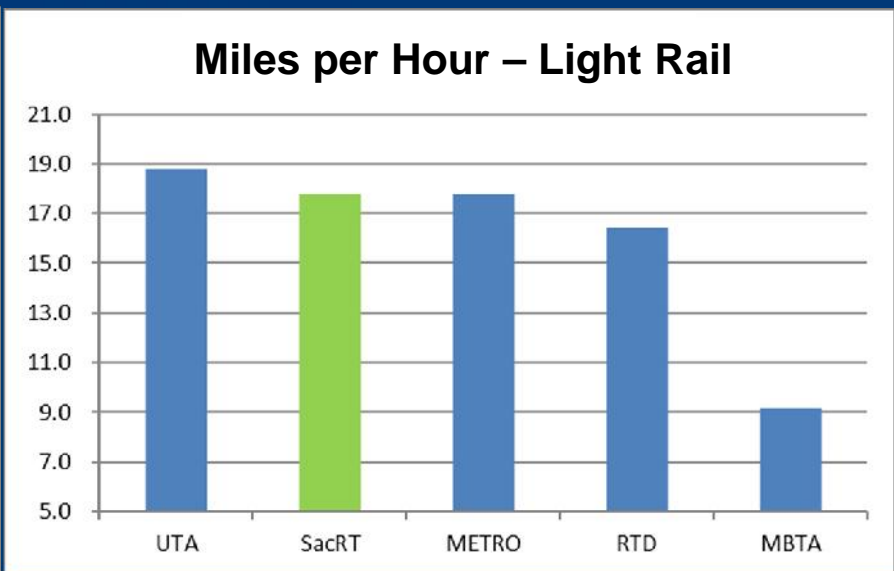
B4. Miles per Hour FY 17 (Nation)

Our speeds are about average nationally. Other cities have enjoyed more success in gaining transit priority on streets.

Bus



Light Rail

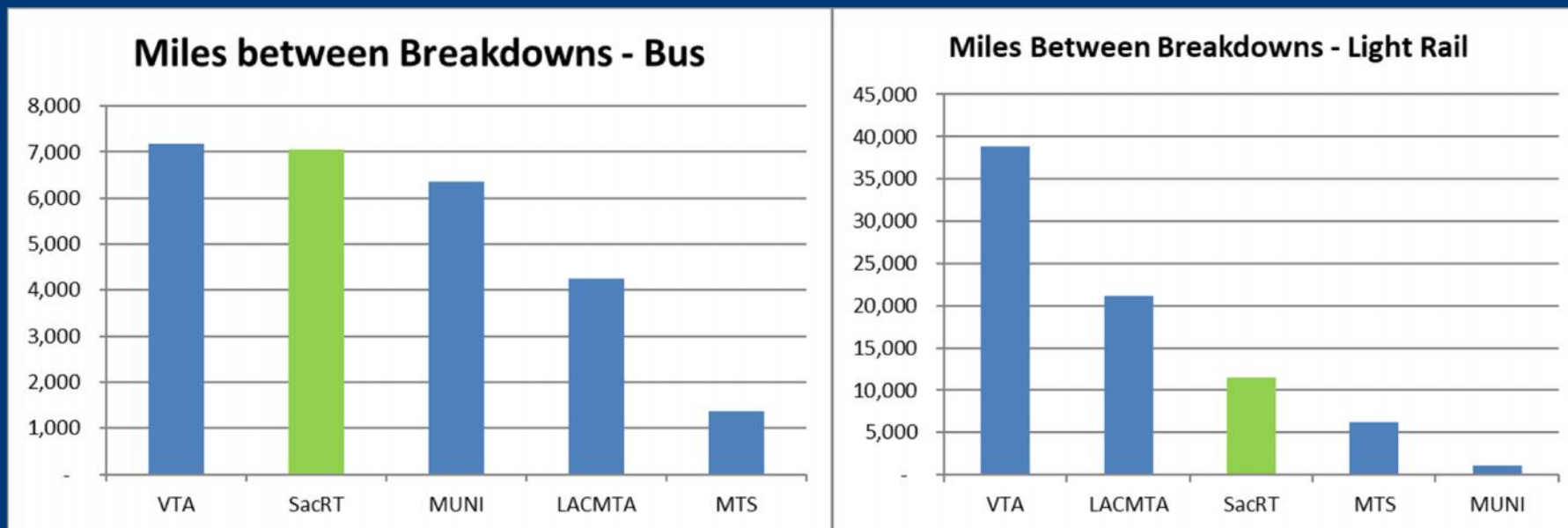


A5. Miles Between Breakdowns FY 17 (CA)

Our preventive maintenance program results in fewer service interruptions for our passengers than many California peers. Note that 1/3rd of our rail fleet is past its useful life decreasing service reliability.

Bus

Light Rail

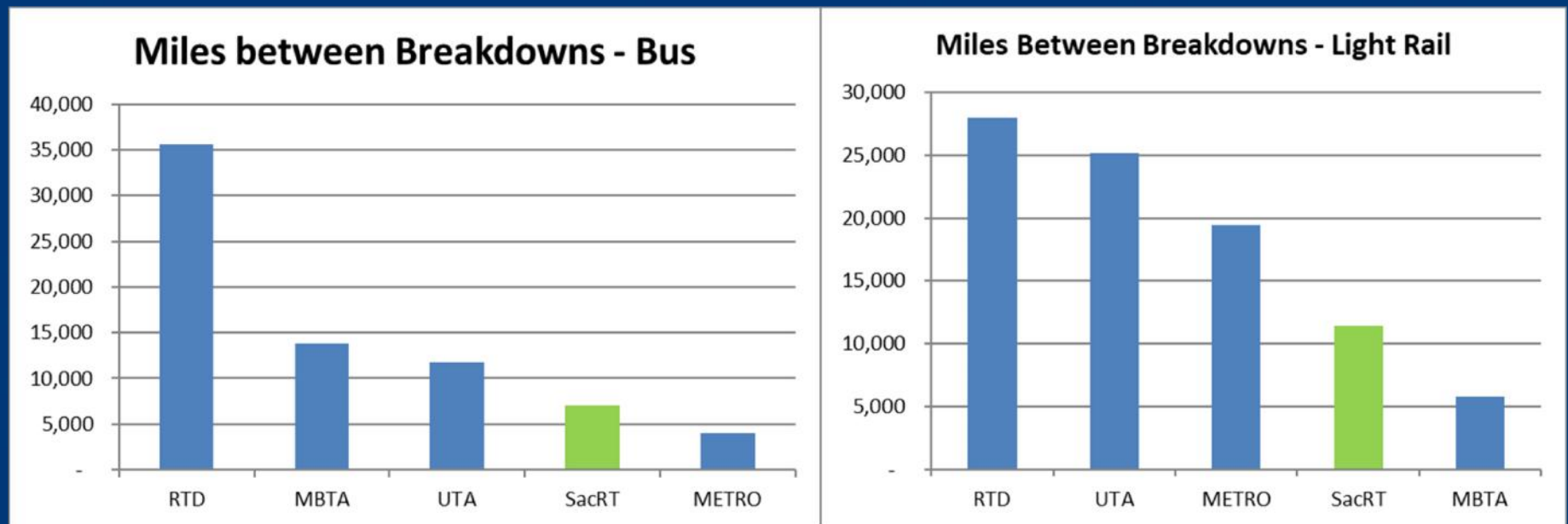


B5. Miles Between Breakdowns FY17 (Nation)

Compared to national peers our passengers experience breakdowns more often. Again, fleet age matters and our vehicles are older and many are beyond their useful life.

Bus

Light Rail

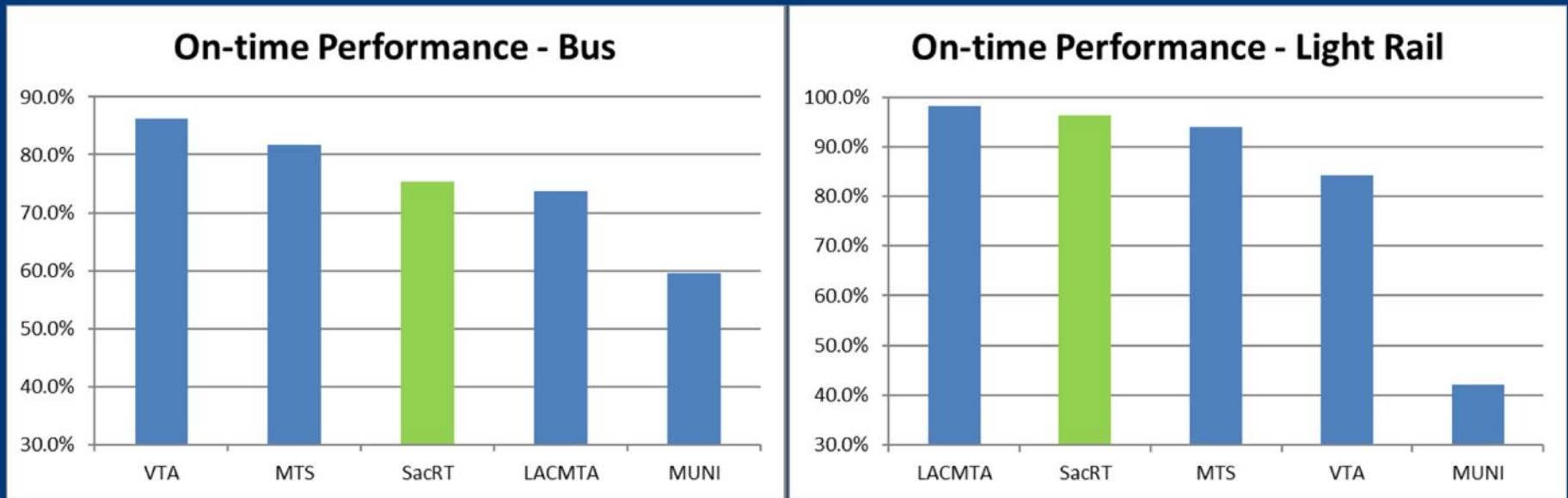


A6. On-Time Performance FY 17 (CA)

Our focus on on-time performance has paid dividends to our passengers, particularly on light rail. Addition of bus rapid transit routes with separation and traffic priority will help bus riders.

Bus

Light Rail



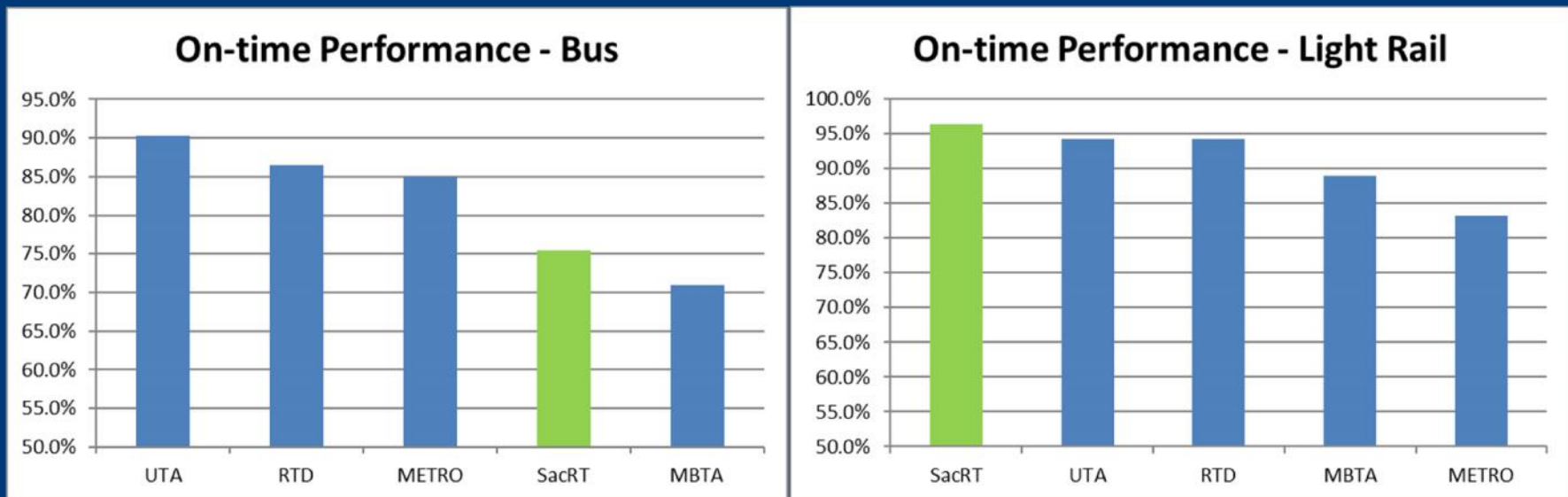
Data is not reported to NTD and methodology is not standardized across operators.

B6. On-Time Performance FY 17 (Nation)

Our passengers enjoy better on-time performance than national peers on light rail, and less predictable trip times on bus. Many of our peers enjoy bus preferential treatment on roads (including bus rapid transit or BRT).

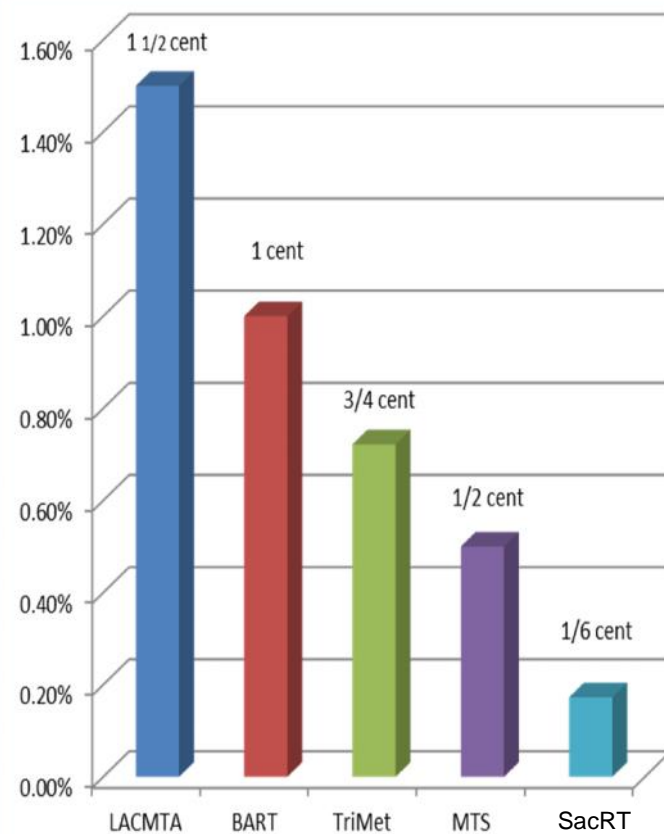
Bus

Light Rail



Data is not reported to NTD and methodology is not standardized across operators.

Peer Comparison – Local Funding



Agencies:

- (LACMTA) Los Angeles County Metropolitan Transportation Authority (greatest funding)
- (BART) San Francisco Bay Area Rapid Transit District
- (MTS) Metropolitan Transit System - San Diego
- (TriMet) Tri- County Metropolitan Transportation District of Oregon
- (RT) Sacramento Regional Transit District (least local funding)

Section III: Major Initiatives Moving Forward



Major Initiatives Moving Forward

- 1. Pursuing Grant Opportunities – TCRP, Congested Corridor, Electrify America and others**
- 2. Technology Advancements – Microtransit, Autonomous and Electric Vehicles, Customer Convenience**
- 3. SmaRT Ride Microtransit/Neighborhood Shuttle Expansion**
- 4. Downtown/Riverfront Streetcar**
- 5. 2030 Electric Conversion**

Major Initiatives Moving Forward

6. State of Good Repair
7. SacRT Forward – We are committed to re-imagining our routes to better align with current travel patterns
8. Future Major Capital Projects
9. Sales Tax and Citizen-Led Initiative – Additional funding will enable SacRT to build a reliable, safe and integrated world-class mobility network
10. Regionalism and Annexation



Stockton Blvd 1/2
Jct 80 EAST 1
Jct 99 SOUTH 1/4

1. Grant Opportunities

- Transit Intercity Rail Capital Program
- Solutions for Congested Corridors
- Federal Resources
- Others

2. Technology Advancements



3. SmaRT Ride Microtransit – Neighborhood Shuttle Expansion

DOWNLOAD THE MICROTRANSIT APP



SmaRT Ride
ON-DEMAND TRANSIT



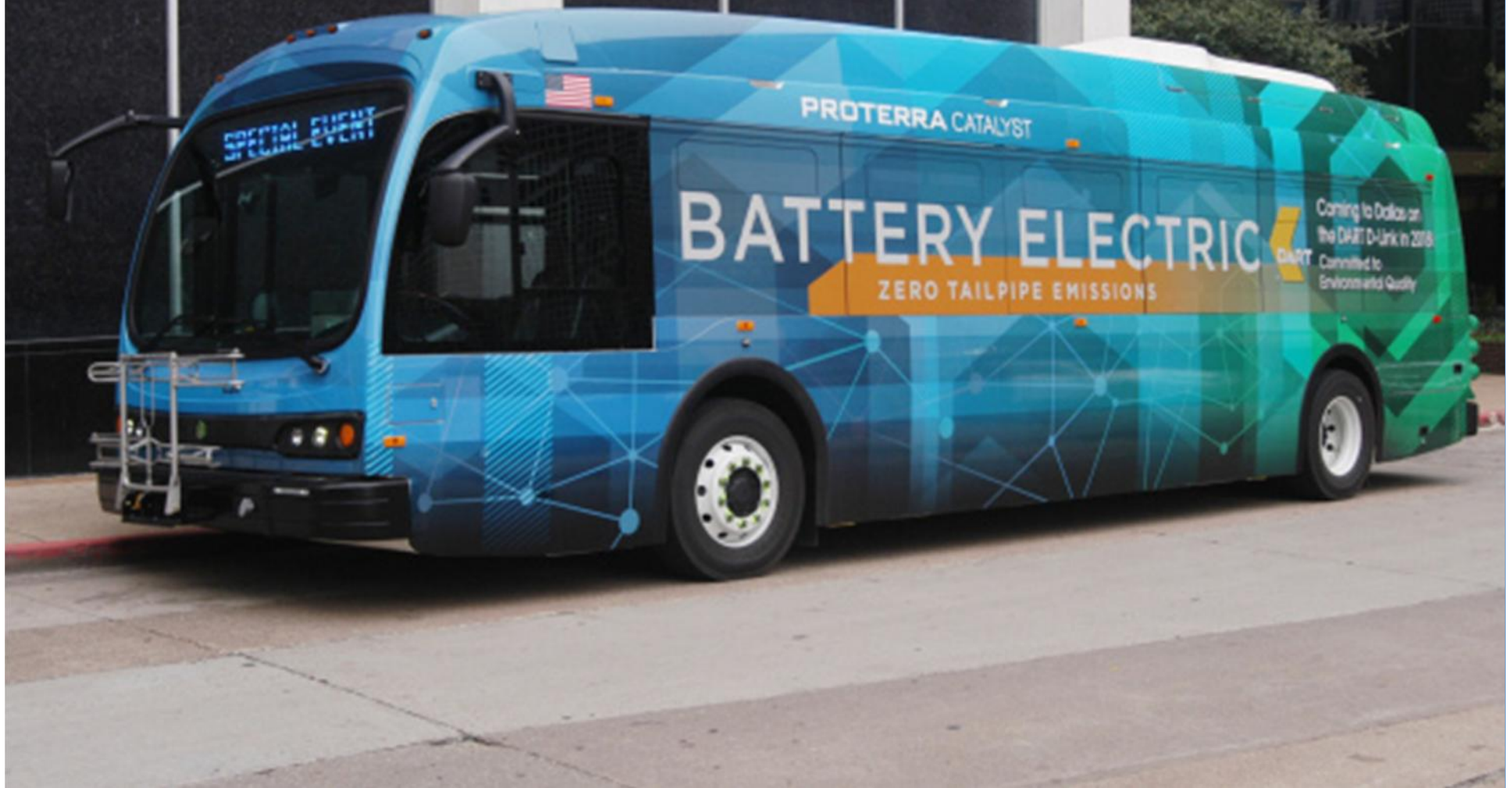
sacrt.com/smartride

4. Downtown/Riverfront Streetcar

- \$208 million Project
- 4.4 mile circulator
- 15 minute headways



5. 2030 Electric Conversion



2030 Electric Conversion



Develop a comprehensive plan to deliver a complete transition to zero emission buses by 2030.

- Help reduce the emissions of green house gases (GHG) in the Sacramento region

The transition plan is contingent on two primary factors:

1. Continuous advancements in electric bus battery technology (range)
2. The availability of funding to maintain and sustain technology & infrastructure

2030 Electric Conversion



CNG 40' Fleet – State of Good Repair

In order to maintain SacRT's bus fleet in a state of good repair and to replace aging vehicles with Zero Emission Buses (ZEB):

- 2020-2023 replace 22 to 23 buses per year (91 total buses)
- 2027-2029 replace 30 to 33 buses per year (96 total buses)

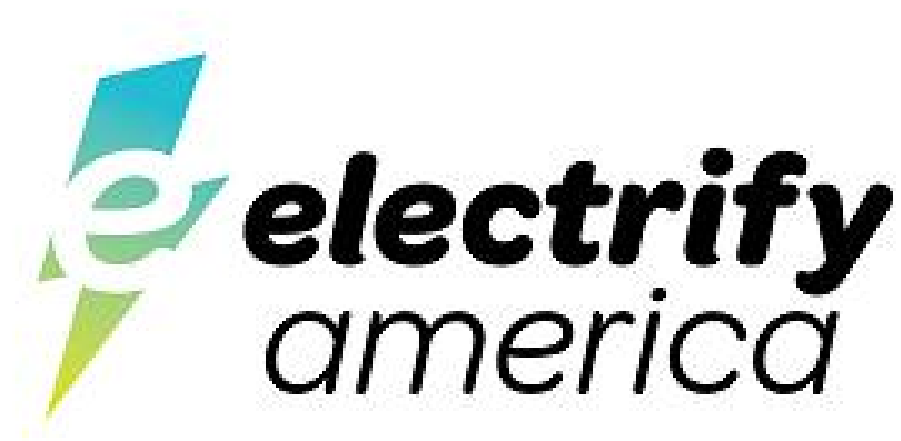
“Electric buses have shorter ranges and longer fueling times than CNG, diesel and hybrid buses, ZEB adoption may require a larger fleet.”

– Institute of Transportation Studies, UC Davis



Sustainability Commitment

Develop a formal organizational policy to identify and establish sustainability goals at SacRT.



Public Private Partnerships

- UC Davis to UC Davis Medical Center
- Sacramento International Airport to Downtown Sacramento
- Microtransit Service

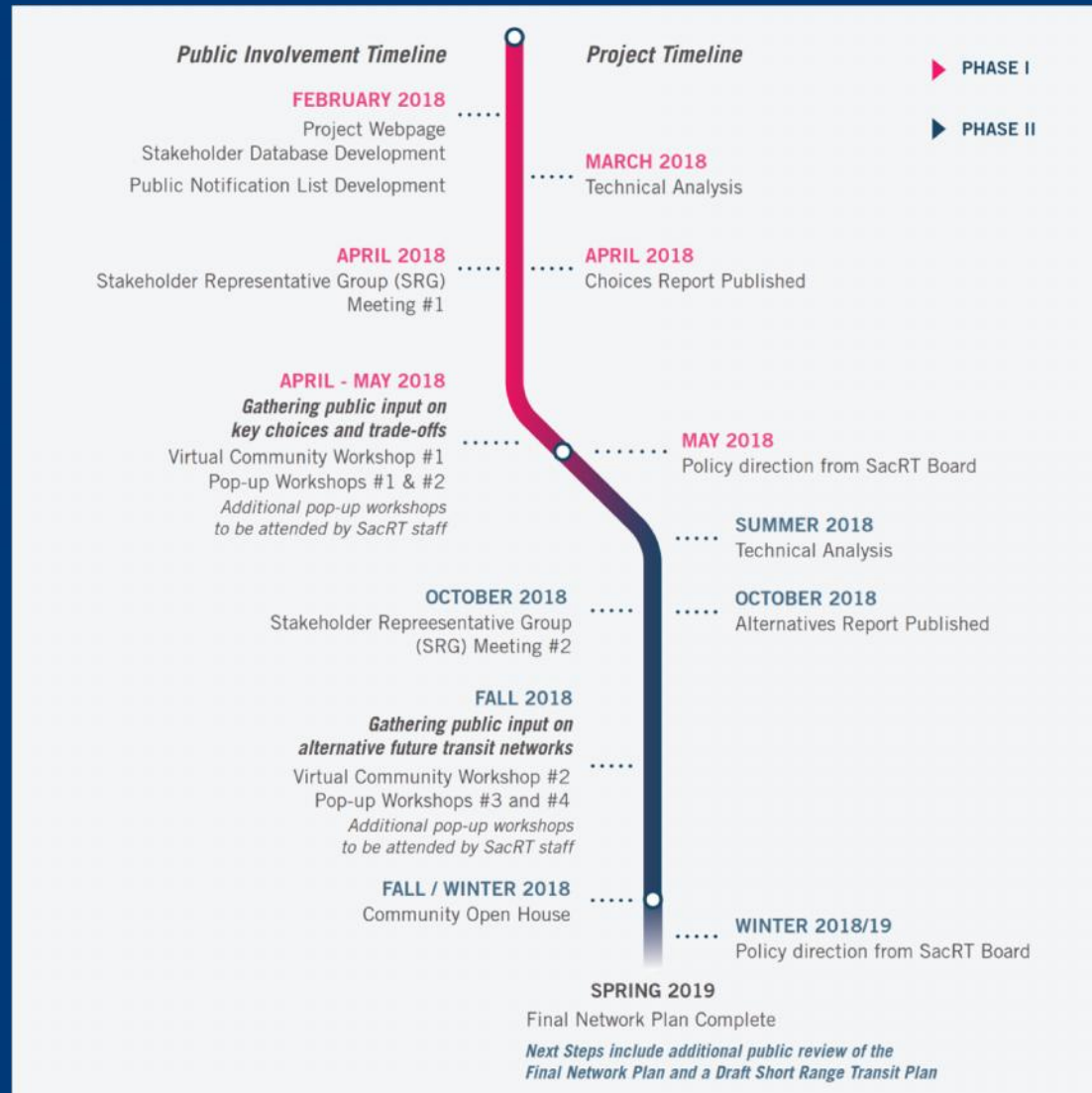
6. State of Good Repair



State of Good Repair

Name	Years	Cost
Station Modifications	2018	\$50,000,000
48 Siemens LR Vehicles	2018	\$240,000,000
91 Replacement Buses	2020	\$80,000,000
Gold Line Tracks and Rail Infrastructure	2018 - 2028	\$53,000,000
CAF Mid-Life	2018	\$40,000,000
Facilities Rehab	2017	\$13,000,000
Fare Vending Equipment	2018	\$6,000,000
IT Systems Maintenance	2017 - 2027	\$10,500,000
CBS Buses	2019-2022	\$8,000,000
Total (over next 10 years)		\$506.5M

7. SacRT Forward





8. Future Major Capital Projects

- A. Light Rail Expansion (Natomas/Airport, Elk Grove & Citrus Heights)
- B. Bus Rapid Transit
- C. Gold Line – Folsom Double Tracking and Signalization Upgrade

Future Major Capital Projects

Name	Estimated Start	Estimated Cost
SVS Loop	TBD	\$60,000,000
Green Line Extension	TBD	\$1,000,000,000
Elk Grove Extension	TBD	\$250,000,000
Folsom Double-Tracking	2020	\$50,000,000
Horn Road Station	2020	\$8,000,000
Dos Rios Station	2020	\$19,500,000
Autonomous Vehicles	TBD	TBD
Streetcar	2022	\$200,000,000

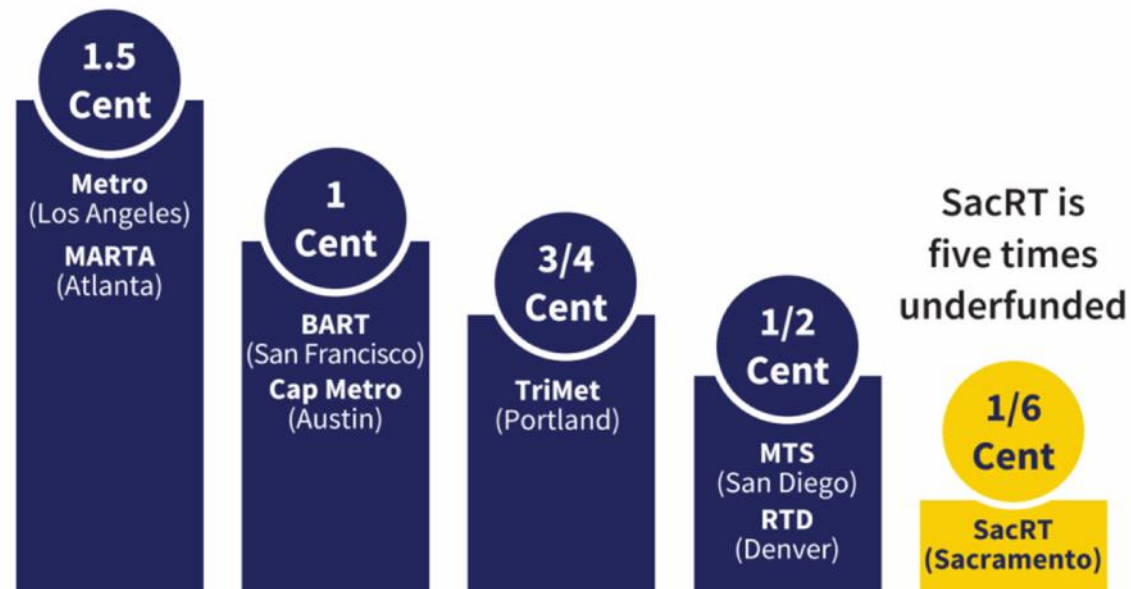
8B. Bus Rapid Transit (BRT)

1. **Watt Ave** (between Watt/Manlove Station and Fair Oaks Blvd-- existing)
2. **North Watt Ave** (between Antelope and I-80) (to connect to Placer County BRT north of county line)
3. **Sunrise Blvd** (between Sunrise Station and the river)
4. **Jackson Rd** (between Watt and Excelsior; possibly on a parallel corridor rather than Jackson Rd itself, including a Watt/Jackson interchange with BRT ramps)
5. **Cap City freeway** (bus on shoulder lane between E St ramp and Expo)

9. Future Sales Tax/Citizen Initiative

Local Funding Makes a Difference

Let's look at why public transit service is so great in Los Angeles, Portland, San Diego and San Francisco. Here's what our peer agencies receive in local funding compared to SacRT.



10. Regionalism and Annexation



Regionalism and Annexation

- 1. Allows specific terms and conditions so cities will still have a high level of control (flexibility).**
- 2. Annexation will improve efficiency and effectiveness (scale of economy).**
- 3. Easier to apply for federal and state discretionary funds for major capital projects and innovative funds.**
- 4. Over all improved customer experience through integrated and coordinated services (timed transfers, fare structure, payment methods, scheduling and reporting apps, etc.).**

Section IV: Challenges & Opportunities



Challenges & Opportunities

Keep the Momentum Going:

1. Financial Challenges
2. Ridership Building
3. Aging Infrastructure
4. Technology Disruptions

1. Financial Challenges



**Without Public Transportation, America
Does Not Move Forward!**

-American Public Transportation Association

Financial Challenges

1. Fix It First
2. Capital Costs
3. Cost for Expanded Service

Financial Challenges

- **Public transportation is a foundation for mobility solutions and economic growth. Without a robust public transportation system in the greater Sacramento region, Sacramento will not prosper and become a world-class city.**
- **Prioritizing transit is about prioritizing our economic success, our quality of life, our competitiveness, and our sustainability as a region.**

Financial Challenges

- **SacRT is doing exceptionally well given our limited funding based on industry standards. However, without proper levels of dedicated transportation funding, we will not be able to develop a world-class transit system and compete for business and attract young professionals to the region.**
- **Currently, peer transit agencies in regions similar to Sacramento receive five times more local funding on average than SacRT.**

Financial Challenges

1. Federal funds are vulnerable and are supposed to be used for capital needs; however, we use all federal funding for operating activities.
2. Reserve is at dangerously low levels.
3. In 2020, \$3.5 million debt service increase.
4. Higher costs for liability claims due to California's tough legal environment.

Financial Solutions

- **Additional funding will enable SacRT to build a robust transportation system, and better connect the Sacramento region through a reliable, safe and integrated mobility network.**
- **It's also important to note that local investment in transportation dictates the Sacramento region's ability to leverage state support. A higher level of match will bring a greater amount of state funds.**

Financial Solutions

To make SacRT's service comparable to peers, we need to optimize our network, double our service frequency and expand bus and light rail service, which means:

1. 100 more light rail vehicles - \$500 million
2. 200 more buses (electric, and/or autonomous) - \$160 million
3. 600 more drivers and associated staff- \$60 million (annual operating cost)

A half cent sales tax or sales tax equivalent, would enable SacRT to sustainably provide world-class transit services our region deserves, which in return will drive smart growth, job and business opportunities.

2. Ridership Challenges

Nationally, transit ridership is down largely as a result of low gas prices, increased car ownership, and competitive ride-share options.

Similar to other transit agencies across the nation, SacRT has been affected by this trend, as well as other major factors which include:

1. 25% service reduction in the last 10 years
2. Fares increased by 10% on July 1, 2016
3. Increased fare inspection: Non-paying riders off the system
4. Aging infrastructure

Ridership Solutions

We have an internal committee working on ridership solutions to retain and attract riders – initiatives include:

1. Reduced Student Fares 65% from \$55 a month to \$20
2. Implemented SmaRT Ride on-demand microtransit service
3. Launched SacRT Forward (route optimization study)
4. Extending Late Night Service to Folsom (June 17, 2018)
5. Continue to grow partnerships and seek innovative ways to encourage ridership

3. Aging Infrastructure Challenges

- 1. Replace aging infrastructure – 1/3 of our light rail vehicles are past their useful 30-year life.**
 - Finding replacement parts is costly and
 - Outdated technology is unsupported
- 2. Local Funding Shortfall forces SacRT to use federal capital funding for operating activities.**

3. Aging Infrastructure Solutions

Solutions

1. TIRCP
2. FTA Section 5337 (state of good repair grants program)
3. SB 1
4. Local Funding Measure

4. Technology Disruption Challenges

SacRT must expand our views, think big, and take action early to address future challenges that arise from the advancement of vehicle technologies.

1. Transportation Network Companies (TNCs)

SacRT is one of only 8 transit agencies in the nation that have partnered with TNCs (Station Link program).

SacRT is one of the first agencies in the nation to launch on-demand microtransit service (SmaRT Ride).

Technology Disruption Solutions

2. Autonomous Vehicles

Partnering with Sac State and the City of Sacramento to explore early testing of first-mile/last-mile solutions.

3. Zero Emission Vehicles

Working with Electrify America and the Sacramento Metropolitan Air Quality Management District to explore electric vehicle options.

4. Car-Sharing

This disruption does not address congestion relief associated with single-occupancy vehicles

Future Outlook

- 1. Clear and Bold Vision**
- 2. Aggressive and Well-Planned Actions**
- 3. Regional Collaboration**
- 4. Keep the Momentum Going**