

THE URBAN NETWORK: A NEW FRAMEWORK FOR GROWTH

By Peter Calthorpe

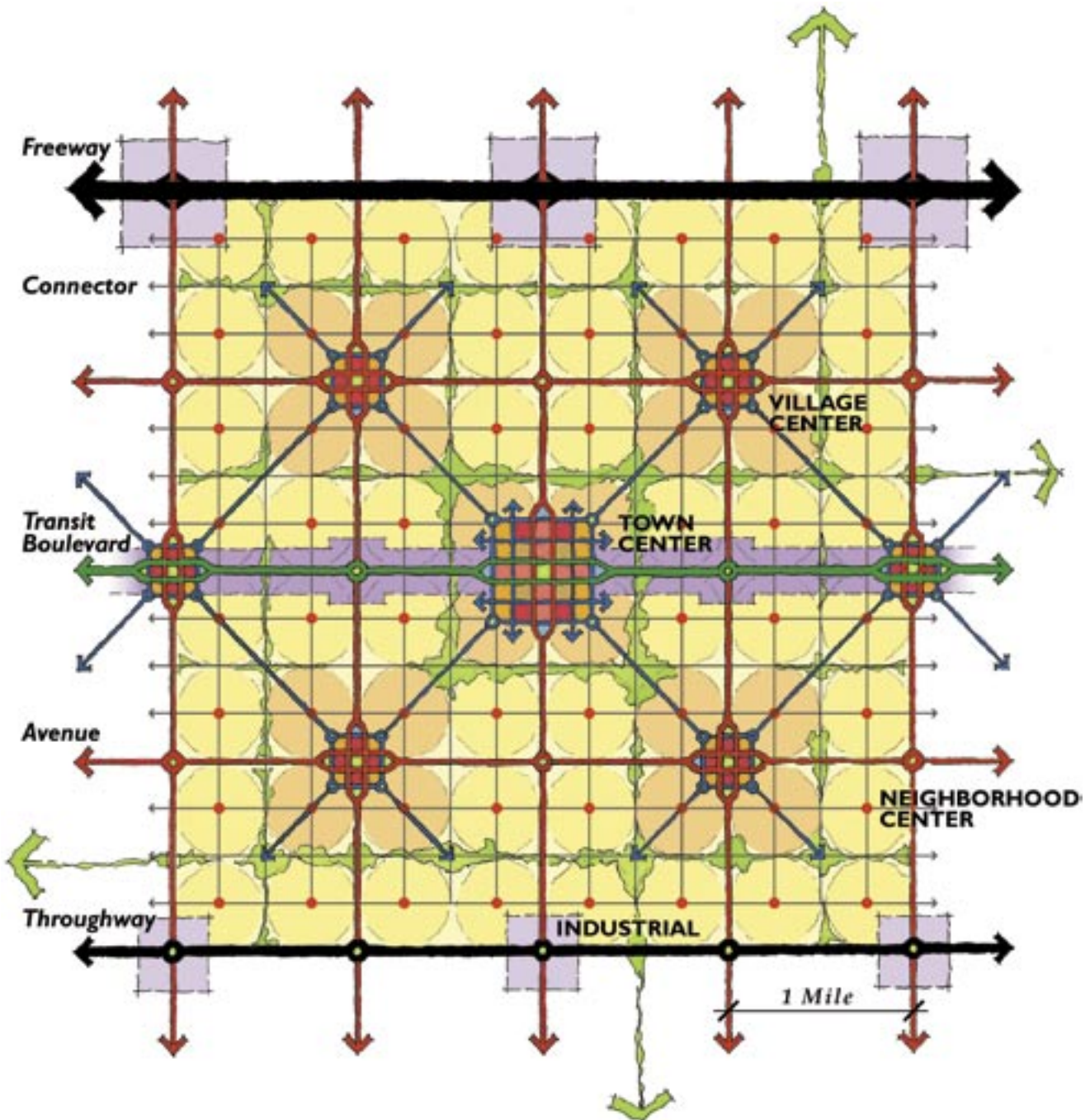


Illustration 1: The Urban Network

California is projected to grow by 12 million people in the next twenty years. Many other metropolitan areas, while not growing as fast, are experiencing major migrations to suburban areas. As much as we may like development to focus on infill and

redevelopment, such efforts will only solve part of the growth problem. Even Portland, with its Urban Growth Boundary and strong urban design policies, only satisfies 30% of its growth with infill and redevelopment.

There is a critical need for a new paradigm of growth in undeveloped sites that complements urban infill and revitalization -- a design that matches a new circulation system with the new forms of land use now emerging through New Urbanism and Smart Growth.

Our transportation network is still a suburban grid of arterials punctuated with freeways. On occasion a transit line may overlay this auto-oriented framework supporting Transit Oriented Development and the revitalization of some historic towns and cities. But short of that, New Urbanism and Smart Growth is forced to grow within a network designed for sprawl.

The Old Way

The old paradigm is simple [ill. 2]. A grid of arterials spaced at one-mile increments with major retail centers located at the intersections and strip commercial lining its inhospitable but very visible edges. Overlaying the grid in rings and radials is the freeway system. The intersection of the grid and freeway becomes fertile ground for malls and office parks. This system is rational, coherent and true to itself, even if increasingly dysfunctional. Its land use matches the transportation system in a way that New Urbanism, when dropped into this network, cannot.

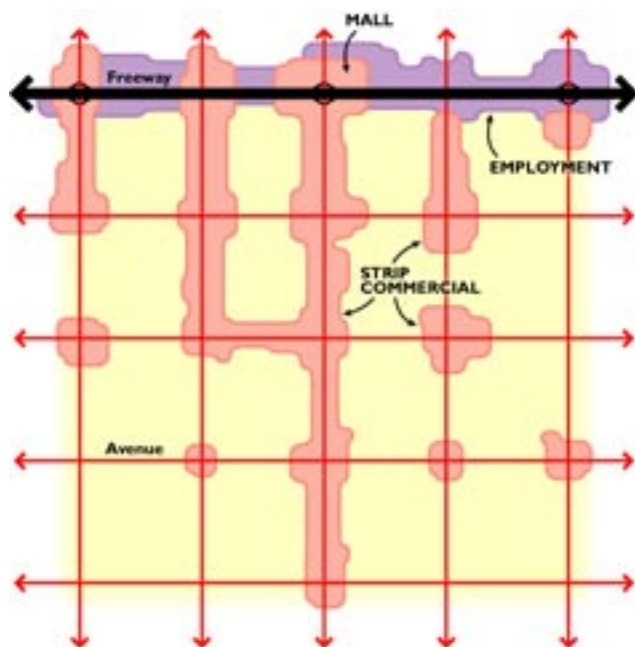


Illustration 2: Modern Suburbia

Unfortunately, to assert that we must build transit rather than freeways is simplistic, just as calling for infill development to the exclusion of new growth is unrealistic. This is not to say that transit and infill are trivial pursuits, but that they are not and never will be the whole story.

We must develop a new circulation pattern to match the new land-uses -- one that accommodates the car as well as transit and that reinforces, rather than isolates, walkable places. Bringing daily destinations closer to home is a fundamental aspect of urbanism, but is not the complete solution to our access needs.

More than ever, regions define our lives. Our job opportunities, cultural interests and social networks are bigger than any neighborhood or town. Even if we double the percent of walkable trips in a neighborhood and triple transit ridership, there still will be massive growth in auto trips -- not to mention an exploding quantity of truck miles. We need a system that accommodates all modes efficiently at the same time that it supports urbanism throughout the region.

A New Transportation Network

The alternative transportation network proposed here is diverse and complex, mixing differing types of auto uses with transit, biking and walking. It sets up a new hierarchy of arterials and boulevards that allow for through traffic without always bypassing commercial centers -- a road network that in fact reinforces access to walkable neighborhoods, urban town centers, and transit without cutting them off from local pedestrian movement. This new network incorporates transit in a way that is affordable, appropriately placed, and inherent to the system. And finally it reserves freeway capacity for long trips while providing alternate means for daily work commutes and shopping trips.

Our firm developed the 'Urban Network' (see Ill. 1) for Chicago Metropolis 2020, a private regional planning effort of the historic Commercial Club. The plan for new growth areas around Chicago proposes four types of major roads to replace the standard arterial grid: Transit Boulevards, Throughways, Avenues, and Connectors. The Transit Boulevards combine semi-local auto trips with transit right-of-ways, the Throughways are limited access roads for longer trips, the Avenues lead to commercial destinations and the Connectors provide for local circulation within and between neighborhoods.

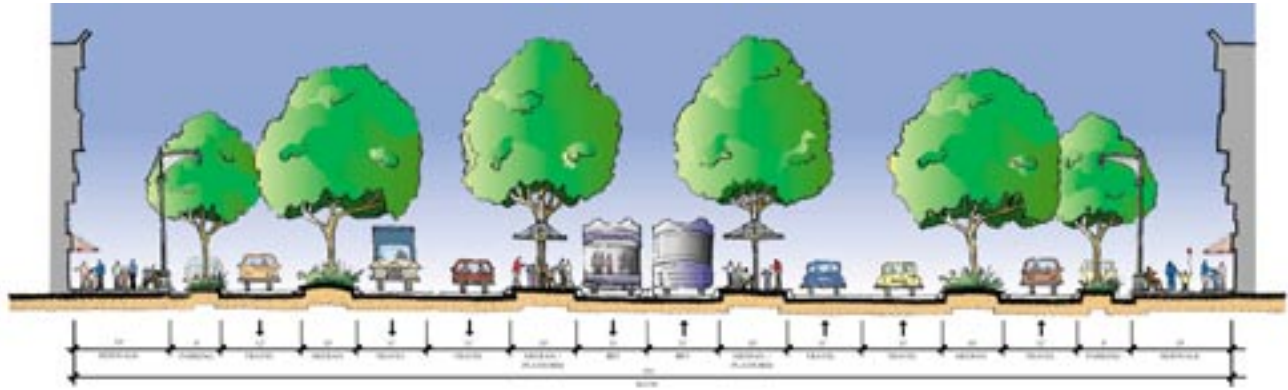


Illustration 3: Transit Boulevard

These alternate street types breed a different set of intersections -- roundabouts and couplets of one-way streets. These replace the slow, over-scaled intersections of our standard signalized arterials. The roundabouts are placed to expedite traffic on through streets and the couplets are placed to allow urban development adjacent to and actually within a major intersection.

The Transit Boulevards are at the heart of this new network. They are multi-functional arterials designed to match the mixed-use urban development that they support. Like traditional Boulevards they would have a central area for through traffic and transit, along with small-scale access roads at the sides to support local activities and pedestrian environment. It is a place where cafes, small businesses, apartments, transit, parking, and through traffic all mingle in a simple and time-tested hierarchy.

These Transit Boulevards [ill. 3] would be lined with higher density development and would run through a 'Town Center' approximately every four miles. In the commercial center only, the Boulevard would split into two one-way streets set a block apart, creating an urban grid of pedestrian scaled streets

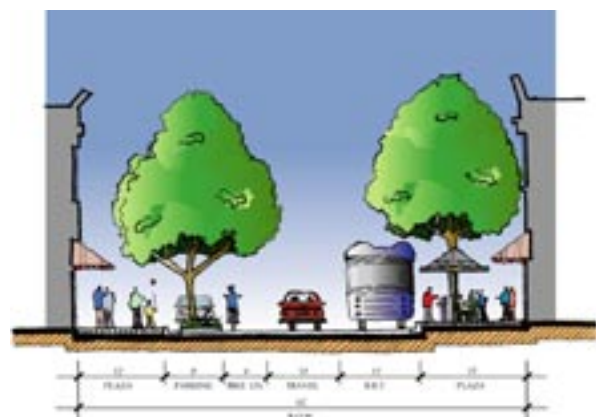


Illustration 4: Town Center Couplet

[ill 4]. No street in such a town would contain more than two travel lanes, allowing pedestrian continuity without diverting auto capacity. In addition, this one-way system eliminates left turn delays, actually decreasing travel time through the area.

The transit system running along the Boulevards and through the towns could be Light Rail, Streetcars, or Bus Rapid Transit (BRT). Because of its frequency, it is important that the transit system be, to put it bluntly, cheap. When Light Rail is not possible, the capital and operational costs of BRT or streetcars are the most affordable and make it financially viable for widespread use. New, super-efficient natural gas engines and advanced bus design would make such buses reasonable companions to the urban environment of the Boulevard.

In contrast to the Boulevards, the Throughways are single use roads that provide for truck and longer distance auto trips, much like our older highways do today. They provide a viable alternate to congested freeways or stop-and-go arterials. Roundabouts would be placed at one-mile intervals, supplemented by infrequent right-in, right-out curb cuts. The roundabout is particularly important to this system, as its average intersection delay is half that of a typical signalized arterial intersection.

The Throughway would support truck and auto-oriented land-uses, such as low density manufacturing, warehousing, and light industrial development. In some areas these roads could run through regional open space areas and greenbelts. The tendency for strip development along such roads would be offset by the availability of development opportunities on the Boulevards, Avenues, and in village and town centers, and by limiting curb cuts.

Avenues would intersect both the Throughways and Boulevards at one-mile centers. The Avenues would allow more frequent intersections, just as our

existing suburban system does. However, at major intersections it could support a Village Center with an urban couplet, similar to the Town Centers. Between centers, these Avenues could have a parkway treatment lined by alley loaded large lot homes -- as in the historic neighborhoods of many American cities.

Finally a system of Connector streets forms a finer grid of approximately 1/8 mile spacing within and between neighborhoods. These connections provide routes for direct access to local village and town centers, as well as neighborhood centers. These streets are more frequent than the standard collector and therefore serve to disperse the traffic in such a way as to create livable environments along them. This system also functions to relieve the Avenues of local trips thereby allowing a smaller street section at their one-mile increments.

Urban Places in the Urban Network

The Urban Network would replace the old system of 'functional' street types in which streets serve a single function in a linear hierarchy of capacities. The new street types combine uses, capacities, and scales. The Transit Boulevards combine the capacity of a major arterial with the intimacy of its local frontage roads, and the pedestrian orientation that comes with its transit system. The Avenues are multi-lane facilities that transition into a couplet of 'main streets' at the village centers. Streets, like land-use, can no longer afford to be single purpose.

The Urban Network integrates new and old forms of urban development in appropriate and accessible locations (ill. 1). Walkable town and village centers are placed at the crossroads of the Transit Boulevards and Avenues. Residential neighborhoods are directly accessible to these centers by local Connector streets as well as the Avenues. The industrial, warehouse and other auto-oriented uses are close to the Throughways.

Each urban land use type has the appropriate scale and type of access. The town center is pedestrian friendly as well as accessible to the Boulevard's through traffic and transit line. The villages are directly accessible by foot, bus, car, or bike from their surrounding neighborhoods while their couplet streets bring the auto traffic needed by its retail. Auto and truck oriented uses can locate at the intersections of the Throughways away from the transit and mixed-use centers.



Illustration 5: San Elijo Village street couplet construction



Illustration 6: San Elijo Village plan

Making Retail Work

Retail within the village and town centers need adequate access, visibility, and an appropriate market area. For example, it takes a minimum of 10,000 population or just under two square miles of mixed-density housing to support a full-service grocery store.

In the Urban Network, a Village Center, anchored by such a grocery store, is located at major Avenue intersections without being cut off from the surrounding development. Connector streets provide direct access for pedestrians, bikers, and cars from the adjacent neighborhoods while the couplet allows comfortable pedestrian movement through the center. Surrounding the village are four 'neighborhoods' each defined by a quarter-mile walking radius and a mix of uses enhanced by access to the Village Center.

An example of a Village Center organized this way is the San Elijo Town Center, located about 40 miles north of San Diego (ill 5, 6). This site, originally planned around a standard intersection of two arterials was redesigned to place a village green at the intersection of four one-way streets. In one quadrant the grocery store anchors the primary retail, in others housing and civic buildings line the streets. Two 'main streets' lead up to the green and mixed-use buildings will surround it. In two of the quadrants, a school and community park complete the center.

A Town Center contains a much larger quantity of retail along with higher density housing, major office development and a more extensive street system. Issaquah Highlands, 30 miles east of Seattle, is an example (ill. 7, 8). This center is placed at the intersection of a major new arterial (projected to carry about 50,000 ADT to a new freeway interchange) and the entry to a new community of approximately 3,500 units of housing. Some 500 more units are planned in the Town Center along with 900,000 sf of retail and commercial space. The Microsoft Corporation has also acquired part of the town center for a second major campus of approximately three million square feet.

Splitting the arterials into one-way couplets allowed an urban grid to organize the site and provided for a pedestrian scaled environment. The standard configuration had a primary intersection with a 166 ft pedestrian crossing, while the couplets had two streets, one 40' and the other just 28'. These one way streets also provided on-street parking and bulb-outs



Illustration 7: Issaquah Highlands without and with a couplet in the town center



Illustration 8: Issaquah Highlands aerial perspective

at the intersections for traffic calming. In addition, the traffic engineers found that the auto travel time through the center was actually reduced by 11% when compared to the conventional intersection pattern. The town is now planned to contain about 500 units of housing, and 900,000 square feet of retail and commercial space in addition to the new Microsoft campus.

Another example of a large-scale application of the Urban Network is the preliminary plan for the 20,000-acre St. Andrews expansion area north of Perth. This plan shows a hierarchy of neighborhoods, villages, and towns set into an Urban Network with open space systems buffering the coast and weaving through the community (ill. 9).

As with any circulation system, the spacing and configuration of the Urban Network would bend to environmental constraints and existing development. In retrofitting areas, certain existing suburban arterials could be converted into Transit Boulevards. Some intersections could be reconfigured into paired one-way couplets where retail redevelopment was appropriate. The Network would work with existing freeways but may represent an opportunity to replace freeway extensions with a combination of Transit Boulevards and Throughways.

Beyond the Neighborhood Scale

The Urban Network is a framework of transit and circulation corridors that supports walkable neighborhoods and urban centers. It posits a new hierarchy of streets, new intersection configurations, and a new set of land-use types. However, it employs much of the same technology and many

of the same institutions that build our current suburban infrastructure. Road builders would still lay down asphalt, automakers could build buses, and developers could still build communities.

All the advantages of New Urbanism -- its compact land saving density, its walkable mix of uses, and its integrated range of housing opportunities -- would be supported and amplified by a circulation system that offers fundamentally different choices in mobility and access.

Smart Growth and New Urbanism have begun the work of redefining America's twenty-first century development paradigms. Now it is time to redefine the circulation armature that supports them. It is short sighted to think that significant changes in land-use and regional structure can be realized without fundamentally reordering our circulation system. Only an integrated network of urban places and multi-use street systems can support the change we need for the next century of growth.



Illustration 9: The Urban Network de cts to existing development and environmental constraints