Sustainability *and the*

Downtown Redwood City Precise Plan

Good urban planning offers some of the most effective solutions available as we seek a more sustainable future

By Dan Zack and Blake Lyon

What is Sustainability?

Picture, if you will a vibrant, lively, old-fashioned downtown. Bright lights, packed sidewalks, busy traffic, amplified live music, and outdoor cafes fill the scene. What words pop into your mind? *Fun? Exciting? Beautiful?*

How about *sustainable?*

When people think of sustainability, traditional urban neighborhoods aren't the first association they make. For many, in fact, these places represent the opposite of sustainability.

Source: Dan Zack

More often, the term *sustainability* stirs up images of thrilling technological advancements. Indeed, high-tech innovations can help us achieve sustainability, but they don't define the concept.

Simply put, *sustainability* means that y**ou can keep something going for a very long period of time.** High tech and low tech systems can both be sustainable, but they can both be unsustainable, too.

The design of cities plays a much larger role in sustainability than most people realize. Sadly, American land use patterns and transportation systems have become very *un*sustainable—they cannot be kept running indefinitely without major changes. The carbon dioxide emitted from electrical generation and transportation networks are contributing to changes in the Earth's climate which may be seriously detrimental to civilization, and fossil fuels are becoming more expensive and scarce—relying on huge amounts of them will not be an option forever.

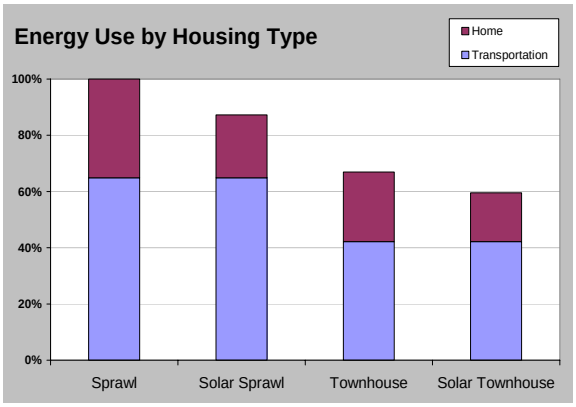
Gizmo Green

Many people who are concerned with sustainability focus on "Gizmo Green." This term was coined by architect Steve Mouzon to describe the fascination with gadgetry as the solution to our ecological problems. While the invention of more efficient mechanisms can certainly help us achieve sustainability, it will only be part of a truly effective sustainability strategy.

Source: Blake Lyon

Gizmo Green focuses on things such as solar panels, energy-efficient glass, wind turbines, and compact fluorescent lighting. These advances certainly help make buildings more sustainable, but if they are the only focus of our efforts their gains can be minimized or erased by inefficiencies elsewhere. For example, the report *Growing Cooler* points out that if vehicle miles travelled (VMT) continues to grow three times faster than population growth, any improvements in fuel mileage will quickly be negated.

This is also illustrated by research conducted by urban planner Peter Calthorpe which demonstrates how building type and location, as well as technological tools, combine in an overall measure of efficiency. He points out that it is true that a "solar" single-family home in suburbia uses less energy than its non-solar neighbor, and this is often



Source: Peter Calthorpe

celebrated. However, a townhouse in an urban context, without any Gizmo Green accoutrements, outperforms them both, with little fanfare.

True Sustainability

True sustainability lies in a combination of strategies: taking advantage of efficient building types, efficient locations, *and* efficient technologies. What is really important is lower per capita resource consumption, not necessarily employing flashy new machines. Tools don't count; results do.

To be sustainable, we must lower our environmental impact in many ways, including:

- Lower building energy use per capita
- Lower transportation energy use per capita
- Lower water use per capita
- Retention of "embedded" energy (the energy used to manufacture, transport, and assemble building materials)
- Reduced land consumption per capita

This paper will attempt to make the case that creating dense, walkable, transit-connected urbanism is one of the most effective ways to achieve sustainability that our society can undertake. Urban planning alone won't solve our environmental problems—but any sustainability strategy that doesn't include land-use and transportation reforms is woefully incomplete. In fact, leaving a competent urban strategy out of our sustainability plans may actually cause gains from technological improvements to be overwhelmed by suburban inefficiencies, leaving us less sustainable in the future than we are now.

The award-winning Downtown Redwood City Precise Plan is a document that represents how that critical urban planning component of sustainability can be achieved.

How the Downtown Precise Plan Promotes Sustainability

Redwood City's Downtown Precise Plan (DTPP) is a document which seeks to achieve many things. Most importantly, the citizens and leaders of the community wanted to create a dynamic district in the heart of their community that would be a source of pride for all of Redwood City's residents.

The best planning and design practices

Why use a "Precise Plan" to regulate Downtown development?

Precise plans are very flexible documents used by some California cities—such as Mountain View, Cathedral City, and Redwood City—who want to use innovative or unconventional urban planning techniques. Precise plans are often very similar to specific plans, but are preferred by some charter cities (who unlike general law cities can use any planning tool not prohibited by the State) due to the lack of State-mandated constraints. A precise plan can be practically anything that its city wants it to be, as long as State law doesn't forbid it. Redwood City's Downtown Precise Plan features a unique combination of characteristics:

Interactive Public Process - The creation of the Downtown Precise Plan (DTPP) was used to engage the community in the process of establishing a vision, creating goals and guiding principles, and determining revitalization strategies. Derived from a strong community outreach effort, the vision for the DTPP places critical importance on the need to embrace "placemaking." An emphasis is placed on developing a downtown neighborhood, rather than simply building projects.

Innovative Document Structure and Regulations - The DTPP was structured to regulate development within Downtown in a way that would stimulate the revival of the heart of the city. **Book I** describes the vision. Conceptual illustrations and renderings are presented to foster images of what Downtown Redwood City may become, with the intention of inspiring the public, City leaders, and developers to make that vision happen. **Book II** serves as the zoning for Downtown Redwood City and is a "form-based" code. This is an innovative zoning technique which emphasizes the physical form of a building—how that building relates to its context, and how the building contributes to the quality of public spaces surrounding the building—rather than focusing primarily on land use. Additionally, Book II utilizes strategies such as reduced parking ratios, parking in-lieu payment options, and no per parcel residential density limits to help promote profitable private development free of City subsidies. Finally, **Book III** lays out City actions and capital improvement projects which demonstrate the City's commitment to the growth and revitalization of Downtown.

Streamlined Approval Process - In addition to an emphasis on placemaking and more understandable regulations, the DTPP uses two specific strategies to establish a streamlined process. First, the City developed the DTPP in conjunction with a Programmatic EIR. As a result, in most cases if the project conforms to the DTPP the CEQA process is complete (with the exception that some additional review may be necessary if a project affects a historical resource). Secondly, the development regulations are formatted into a series of standards (the "must do's") and guidelines (the "should do's"). If a project meets both the standards and guidelines, the entitlement process is expedited. If the project meets the standards, but not the guidelines, then additional design review is necessary. Projects that do not meet the standards or the guidelines are returned to the applicant for a redesign.

A Unique Marketing Tool - The document itself is presented in such a way that it can be used as a marketing tool to attract high-quality private development and new businesses. The DTPP utilizes a series of maps, charts, graphics, and text to communicate the development regulations rather than relying only on "plannerese" text traditionally found in Zoning Ordinances or Municipal Codes. Beautiful renderings convey the vision of the plan to developers and inspire them to meet it. Clear but strict regulations provide the assurance that subsequent projects will meet the same high standards and reduce the uncertainty that can come with a more ambiguous design review process. The DTPP makes it clear that our Downtown is a great place to invest in.

Through the establishment of a beautiful vision, tough but clear development regulations, and an improved approval process, the community (both developers and residents) can be assured that new Downtown projects will be held to a very high standard. The award-winning DTPP helps to remove political uncertainty, establish a greater return on investment, and ensure that the community gets a vibrant, loveable, and sustainable Downtown. *The DTPP can be viewed online at www.redwoodcity.org/downtown.*

were employed in the plan to revitalize the Downtown area. Fortunately, good urban planning is sustainable—thus a remarkable tool of environmental sustainability came out of a process in which sustainability was not the foremost goal.

The DTPP promotes sustainability in a number of ways. The following are the most important.

The Right Location

First of all, we must focus our efforts for sustainable development at the right locations. Downtown Redwood City is an ideal location for intensification for the following reasons:

It is already developed. No new land will be consumed by future Downtown residents and employees. Also, while some infrastructure will need to be upgraded to accommodate future growth, the area is already served with streets, plazas, water and sewer lines, electrical service, and other infrastructure that will serve new residents without the need for as much new infrastructure as new "greenfield" development. Also, by pumping economic vitality back into a declining area, many older buildings will be adaptively re-used, preserving their embedded energy and saving the energy that would have been expended in new construction.

Regional transit connection. The Caltrain commuter system—which connects San Francisco to San Jose—has a busy station in Downtown Redwood City. It is much more sustainable to locate new growth in an area that already has such service than to build it in areas which will need new tracks or which will not be served by transit at all.

Major employment cluster. As the site of the San Mateo County seat and a major regional hospital, Downtown Redwood City already has a substantial concentration of jobs. This creates opportunities for future residents to walk to work, potentially reducing VMT.

Services already present. New Downtown residents will have the opportunity to walk to the doctor, the salon, or the grocery store the minute they move in to the neighborhood, providing instant trip and VMT reduction opportunities that don't exist in areas that need to develop these services from scratch or which will always lack them.

Walkability

No matter how great the location, without a high degree of walkability any development is ultimately unsustainable. Why is walkability so important? In the absence of walkability people depend on automobiles for nearly every single activity that they engage in. As VMT rises orders of magnitude quicker than population growth, it overwhelms the advances of made by improved technologies (such as improved fuel efficiency or ethanol fuels).

Source: Dan Zack

In many parts of the country the design of neighborhoods allows people to make some of their trips on foot. A study by L. Frank, B. Saelens, and KE Powell, which is discussed in the *Growing Cooler* report, demonstrated that people who live in walkable neighborhoods drive nearly half as much as those who live in auto-oriented areas. This is a key to reducing VMT and the associated carbon dioxide emissions.

The DTPP aggressively promotes walking in several ways:

Street grid. First, it maintains and restores Downtown's walkable street grid (Pages 52-54). In order for walking to be a viable mode of transportation, a street network needs two characteristics: short blocks and connectivity. Long blocks prevent walkers from making direct routes between their origins and destinations, unnecessarily extending the walk. Connectivity means that the streets form a network and do not block pedestrians with cul-de-sacs. The DTPP prohibits the abandonment of streets and requires that new development create new streets in areas where the blocks are too long.

Comfortable sidewalks. The DTPP sets high standards for sidewalk widths, street trees, and lighting (Pages 42-45). It requires new development along substandard sidewalks to upgrade them to an adequate condition. Adequate sidewalk width is important for a variety of reasons. People must be able to stroll comfortably without being too terribly crowded, and the sidewalks must be able to handle the volumes of pedestrians that will ultimately be present in Downtown Redwood City. Adequate width also allows for things such as retail displays, outdoor dining, benches, and other activities which make the sidewalks safe, comfortable, and inviting. Street trees provide shade in the summer, a touch of green, and a sense of protection from passing automobiles. The need for lighting is obvious, and the DTPP ensures that spacing is close enough to keep sidewalks lit and the lamps are low enough to be scaled for people more so than for cars.

Active building frontages. People aren't typically fond of walking past blank walls. It can be boring, and for many people it feels dangerous, because no one can see you if something bad were to happen. We also know that life attracts life—so without frequent entrances lining a sidewalk it will have little coming-and-going activity, which will repel other people from walking there. The DTPP requires that all buildings place their entrances in front, facing the street, and that streets also be lined with windows, awnings, signage, stoops, and other sources of visibility, activity, and interest (Pages 46-49).

Calm traffic. Speeding cars are hardly welcoming to pedestrians. While automobiles are a fact of life—and important to the success of Downtown businesses—they cannot be allowed to behave antagonistically in a pedestrian-oriented environment. Specifically, they must slow down. Downtown Redwood City has no level-of-service (LOS) standard, which means that actions will **not** be taken to widen streets as development occurs. All streets within the interior of the Downtown area will be two lanes in width (Pages 108-109). Overly

wide streets are a primary cause of speeding. Also, street trees, on-street parking, and frequent intersections all serve to slow traffic further. In addition to pedestrian comfort, slower traffic also has the benefits of increased safety for motorists and decreased carbon dioxide emissions.

"Wrapped" parking lots and garages. Exposed parking garages and lots will not be allowed adjacent to sidewalks in Downtown. Exposed garages and parking lots are known to repel pedestrians, so the DTPP requires developers to wrap parking facilities with shops, offices, and apartments, concealing parking into the center of the block or underground (Pages 58-61).

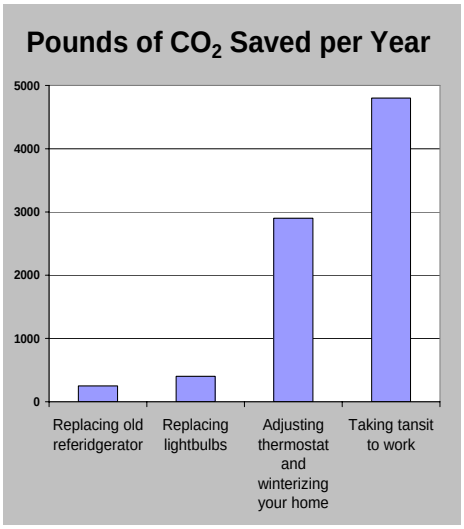
Mixed-uses. The entire DTPP area allows for the mixing of residential and commercial uses (Pages 28-29). This brings trip origins and destinations close together and is one of the single most important factors in walkability. In combination with the other factors listed above, it represents a potent walkability strategy that is certain to lower the VMT of people living and working in Downtown Redwood City.

Transit Orientation

While true sustainability is not possible without walkability, people often need to get to places that are beyond walking distance. Transit is much more fuel efficient per passenger mile than driving for these longer journeys. In addition, it is much less land-intensive than driving due to reduced need for wide roads and parking facilities. If the United States is to attain sustainability, a determined strategy to convert as many auto trips into transit trips as possible must be a part of our approach. This cannot be done through mandates—we must convince large numbers of people to voluntarily and happily take transit. To do this, transit service must be of a high quality, and large numbers of people must live and work in convenient proximity to this transit. Proximity isn't enough, though. The urban fabric must be seamlessly connected to the transit station so that those living or working nearby can easily access it.

The DTPP enhances the transit orientation of Downtown in the following ways:

Focusing growth on an existing regional transit facility. The DTPP area has one of the busiest stations in the Caltrain system. This is due to Redwood City's central location, high employment concentration, and "Baby Bullet" express service, among other factors. Transit access will be improved in coming years by the future Dumbarton rail line (which will terminate in the DTPP area and will open up the East Bay to Downtown). A state High-Speed Rail station may even be located in Downtown Redwood City, bringing easy car-free access to every major California metropolitan area to Downtown Redwood City. By focusing future growth near this facility, the number of people who have access to the regional transit network will grow over time, lowering growth in per capita VMT.



Source: The American Public Transit Association

Easy access to the station. The DTPP integrates transit into the urban fabric of Downtown by proposing to raise it into a viaduct structure through the area, with active retail uses built in underneath (Page 110). Raising the station will allow it to stay in the central core of Downtown, which due to space constraints would otherwise be likely to move to the northern edge of the district. Also, elevating the tracks will allow the Downtown street grid to be restored under the system, providing short, direct walking trips to the station. Finally, by raising the tracks, Downtown can develop right up against the corridor, maximizing the number of people that are close to the station.


Source: Dan Zack

Density

Density is a key component of sustainability. Comfortably placing more people on less land is the only real way to preserve natural habitats, and high densities are a key to making walking and transit viable modes of transportation. Due to the high densities promoted in the DTPP, future Downtown workers and residents will be consuming less land per capita than nearly anywhere else in San Mateo County. They will also require less pavement, and will need less infrastructure than the typical Bay Area resident. Sustainability cannot be achieved without pockets of high densities.

The DTPP increases densities in the following ways:

Mid-rise buildings. While much of the Peninsula struggles to breach three stories, the DTPP allows most of Downtown Redwood City to build up to 8 stories, and the central core can rise to up to 12 stories (Pages 34-35). This will create one of the densest nodes of development in the county, and thus one of its most sustainable areas.

Minimum height requirements. New buildings in Downtown Redwood City are required to be at least 3 stories tall (Pages 34-35). This will ensure that prime land is not underutilized and that future growth is urbane, compact, and sustainable.

No arbitrary density limits. Unlike most plans, the DTPP has no restriction on the number of dwelling units per acre. Over time, this will allow Downtown Redwood City to develop a critical mass of residents which will make retail more viable, boost the number of people living near transit, and make walking more convenient (and thus more likely).

Less parking required. Ask any developer what places the greatest limit on the density of a site, and you are likely to get this answer: *the parking requirement*. By requiring large amounts of parking, the amount of building space available for *people* is severely restricted. The DTPP lowered the old Downtown parking requirements, created a shared parking incentive (for greater efficiencies) and also created an in-lieu parking program to allow developers to

buy their way out of the parking requirement for difficult sites. This money will then be used to create efficient, centralized public parking elsewhere (Page 62).

Inherently Efficient Building Types

Certain kinds of buildings are inherently more efficient than typical buildings, even without the addition of high-tech green strategies. Truly sustainable places will not only have the benefit of improved technologies, but will take advantage of low-tech efficiencies which make them very sustainable in the long run without the provision of technical expertise, large expense, or great effort.

The DTPP encourages inherently sustainable and resource-efficient buildings in many ways, including:

Durability. Due to the heights allowed in the DTPP, a majority of new buildings will be constructed of reinforced concrete. These heavy-duty urban structures will last a long time, preserving their embedded energy (the energy used to produce the materials, transport them to the site, and assemble them) by reducing the need to replace the structure at a later date.

Flexibility. Mixed-use urban structures can accommodate a variety of activities over time, as needs and tastes change. Suburban single-use structures ("big boxes," detached houses, regional malls, office parks, etc.) aren't as flexible and must usually be demolished and replaced (or abandoned) in order to respond to changes in the market.

Multifamily housing. Multifamily structures will dominate the build-out of the plan, and these structures are proven to be much more energy efficient by nature than detached single-family homes or townhouses. This is due primarily to fewer portions of the building being exposed to the elements and shared heating among the units.

Smaller units. Dwelling units located in dense, walkable, convenient urban settings with a high-quality public realm tend to be smaller than suburban dwelling units. Smaller units use significantly less energy.

Fewer lawns. Water use in Downtown Redwood City will be lower than elsewhere in the Peninsula due to restriction of front setbacks (Pages 42-43). Front setbacks are usually occupied by lawns, which according to the New York Times account for up to 60% of water use in the western US. In addition to saving water, fewer lawns also means less land consumed per person and fewer harmful pesticides released into the environment. According to Diana Balmori of Yale University, the lawn "is the major crop of the United States -- 20 million acres of lawn using more fertilizer than is used in all of India."

No curtain walls allowed. Sealed glass curtain wall buildings lose more heat and cooling to the outside than masonry buildings with operable windows. The DTPP relegates curtain walls to an occasional aesthetic accent treatment rather than a primary cladding material (Page 76).

Incremental, Organic Growth

Source: Dan Zack

Redwood City is an old city with a very fragmented and "fine grained" pattern of ownership. Big-footprint projects can be great, and there will probably be some in Downtown Redwood City. However, most Downtown development will occur gradually through the participation of dozens of small developers. While challenging in some respects, this pattern is ultimately more sustainable for several reasons, including:

Economic resilience. Over time, Downtown Redwood City ought to be more resistant to market fluctuations and recessions than conventional suburban development, because we won't have "all of our eggs in one basket." We will have diverse land uses, diverse types of buildings, and a large numbers of owners and operators with a diversity of financial resources. With the current housing bust and the dot-com crash of the recent past (and the subsequent "see-through" office market phenomenon) we have seen how individual sectors can flounder from time to time. Such episodes are much less traumatic for a diverse district than for a homogeneous district.

Easier financing. It is often easier to get financing for small projects than it is for a massive project. We are seeing the effects of this during the current downturn. Large developers are struggling to get the hundreds of millions (or billions) of dollars that they need for mega projects, whereas smaller financing can still be found. The ability to grow in smaller increments will prevent growth and improvements from grinding to a halt every 5 years or so. Steady growth is more sustainable than fits and starts.

More potential developers. The fine grain of Downtown Redwood City opens development opportunities to many more players, making the chances for growth and improvement more numerous.

Ease of growth and adaption. In a fine-grained environment change, intensification, and adaption over time are easier. To add new buildings, or expand certain uses doesn't require massive areas to be demolished and rebuilt. Smaller building can simply be replaced by bigger ones where opportunities exist, without always relying on big disruptions (and the resulting loss in embedded energy).

Lovability

How sustainable is a place if it is abandoned or neglected within a generation due to lack of affection for it? Architect Steve Mouzon makes the unique observation that places that are loved by their residents through the ages are ultimately far more sustainable than places that fall out of favor within a generation.

Source: Dan Zack

The DTPP will create a lovable place in the following ways:

Beautiful buildings. The consultants and staff involved in the creation of the DTPP underwent an aggressive program of community outreach in order to learn about the aesthetic tastes of the people of Redwood City. Architectural standards and guidelines in the DTPP will ensure that new buildings are beautiful, timeless, and meet expressed desires of the community (Pages 73-89).

Well designed public spaces. Well-designed public spaces ensure community building and long-term emotional attachment to the district by providing places to gather, exchange ideas, get to know each other, and celebrate. The DTPP includes a program for the creation high-quality public spaces (Pages 103-108).

Historic preservation. Historic preservation provides architectural beauty, connections to the past, and a unique community character that will ensure a commitment to the area. The DTPP includes a proactive strategy for the retention and enhancement of historic resources (Pages 38-40).

"Restorative infill." The DTPP was written in part to encourage "restorative infill" projects, which will remove unattractive and inefficient suburban buildings over time and replace them with denser, more attractive urban buildings. This will increase resource efficiency and make Downtown as a whole more lovable and thus more sustainable.

Next Steps

As the climate changes and fuel prices rise, it is becoming clear that we must build more sustainable communities. Clearly, we must use old-fashioned techniques *and* modern technologies to make our buildings as energy efficient as possible. We must also change the way that we design our neighborhoods and downtowns so that we can lower per capita VMT and home energy consumption.

However, we cannot simply improve one downtown here and there. According to *Growing Cooler*, 89 million new homes and 190 billion square feet of new commercial space will need to be constructed between now and 2050 in the United States to accommodate population growth.

Thankfully, according to real estate expert Christopher Leinberger, the bulk of these new residents will prefer sustainable, walkable urbanism. But do we have the will and the creativity to reform our codes to the extent necessary to satisfy this demand?

Also, beyond the scale of the building and the neighborhood, we must strive to create sustainability at the regional and national scales. Cleaner electrical generation, a national passenger rail system, preservation of prime farmland—all of these issues and more must be addressed quickly if we a re to become truly sustainable as a nation.

Redwood City has attempted to uphold its responsibilities to its citizens, and hopes that its model can inspire other communities figure out how to address sustainability—while enhancing livability—as well.

For more information the authors can be reached at the following email addresses:

Dan Zack, AICP, Downtown Development Coordinator: dzack@redwoodcity.org

Blake Lyon, Senior Planner: blyon@redwoodcity.org

View the DTPP online at www.redwoodcity.org/downtown

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