

From Smart Growth to Sustainability: The Challenge of Multiple Paradigm Change

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Sherman L. Lewis III, Professor of Political Science
California State University, East Bay
Hayward CA 94542 USA
sherman@csuhayward.us

Abstract

Metropolitan regions like the San Francisco Bay Area succeed in some ways, yet fail at sustainability. There are ways to achieve sustainability and social equity without losing prosperity. The paper discusses Smart Growth, fighting freeways, aggregate vs. per capita growth and human capital, social equity and jobs, the status of women, job location externalities and housing responsibility, fiscal reform and affordable housing, global warming, carism, and indicators. Each of these ten topics reveals a conflict between a dominant, hyper-growth paradigm and an emerging sustainability paradigm. Better measurement, economic analysis and market choice are major additions to the usual governmental policies for managing growth. Given the political infeasibility of promising ideas at this time, education is needed to develop support for sustainability.

Keywords

affordable housing, aggregate growth/per capita growth, alternative growth, carism/auto dependency, capacity model/congestion model/pricing model, cost-effective transit, elasticity, externalities, fiscal reform, freeway tipping point, gentrification/inequitable dislocation, global warming, growth projections, housing responsibility, human capital, indicators, job location externalities, job-housing balances/regional job location management, market price, migration, moving rate, paradigms, Pedestrian Neighborhood, Smart Growth, status of women, suburbia/urbia, sustainability.

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Introduction

"Sustainability" requires that the environmental impacts of this generation not rob future generations of opportunities equal to ours. For some people, it primarily means making industrial technologies more productive, more energy and resource conserving, and less polluting. For others, it means recognizing that consumerism, especially American-style, cannot be sustained and is even now degrading the environment, exploiting third world workers, and causing catastrophic global warming. For many it means going beyond a narrowly defined sustainability to include goals of social equity, economic prosperity, and environmental quality.

"Sustainable community" and "sustainable growth" apply the concept of sustainability to two major urban planning and development issues, land use and transportation. In each, a dominant paradigm has supported unsustainable, unending growth and has failed to distinguish between the kinds of growth that can be sustained and those that cannot. In each issue area, a sustainability paradigm is emerging to challenge the conventional wisdom and established interests.

"Smart Growth" is the new paradigm in land use. Smart Growth involves builders, planners, and environmentalists in an uneasy alliance promoting higher urban development densities, transit orientation, and open space protection. Builders see a way to provide more housing, but are uncertain about neighborhood vetoes, buyer resistance, and just how much housing can really be built. Planners see a way to get greater efficiency in land use and marginal transit gains while still accommodating the automobile. Environmentalists see a way to gain credibility in open space fights, form new alliances with affordable housing advocates, and revive the walking-transit city. In transportation, the new paradigm is fighting freeways, supporting cost-effective transit, de-emphasizing the dominance of the automobile, serving low income people, and promoting walking and bicycling.

These land use and transportation reforms, though still part of the solution, are unlikely to achieve sustainability alone. The campaign for sustainable growth would become much more effective if it were construct a larger framework by including new paradigms emerging in other policy areas. These ideas also help explain why **1) Smart Growth** and **2) Fighting freeways and supporting cost-effective transit** have failed to stop sprawl and auto dependency. The larger framework would add eight emerging paradigms related to **3) aggregate vs. per capita growth and human capital, 4) social equity and jobs, 5) the status of women 6) job location**

externalities and housing responsibility, 7) fiscal reform and affordable housing, 8) global warming, 9) carism, and 10) indicators.

Each stream of thought has a community of scholars and activists focusing almost exclusively on it, usually only vaguely aware of the related ideas. Such focus is well-justified, because each area has tremendous complexity and challenges in its own right. Each area has a dominant paradigm of conventional policy wisdom supporting hyper-growth that reformers are intent on overthrowing.

In addition to substantive content, each policy area tends to emphasize certain modalities of action. Land use planning has traditionally emphasized design, planning, and regulation reflecting the interests of urban planners and architects. Transportation policy has emphasized central planning, political pork barrel, and tax-and-spend bureaucracies reflecting the interests of public works engineers and development interests. The policies new to urban growth management bring in additional modalities: deregulation, social services, indicator reform, externalities and Pigovian taxes, fiscal policy, tax swaps and elasticities, and market based pricing reforms that consider aggregate demand. These policies balance government and market, and regulation and choice. A deepened economic analysis informs policy and adds pervasive incentives to the usual "growth management" focus of traditional land use and transportation policies.

SUMMARY OF TEN MAJOR POLICIES FOR SUSTAINABILITY

1. Smart Growth.

Sustainability requires protecting the greenbelt and rebuilding a post-suburban "urbia" based on land development efficiency, proximity, walking, transit, and amenities.

2. Fighting freeways; supporting cost effective transit

More highway capacity induces its own demand due to underpricing; European-quality transit works in denser corridors but cannot be cost-effective in dispersed suburbia.

3. Aggregate vs. per capita growth and human capital.

A sustainable region requires that the basis of the economy shift from aggregate growth to per capita growth based on investing in human capital.

4. Social equity and jobs.

Jobs which provide opportunity for disadvantaged people are better than jobs which drain the rest of the world of the talent it needs for economic growth.

5. The status of women.

Improving the status of women gives disadvantaged women and girls more opportunity for education and paid work, increases productivity, and lowers population growth.

6. Job location externalities and housing responsibility.

Cities with severe job surpluses have the primary responsibility to increase housing, not cities with housing surpluses.

7. Fiscal reform and affordable housing

Perverse local tax incentives encourage one city to get taxes from people who live in other cities, and penalize cities for providing affordable housing.

8. Global warming.

People, especially Americans, have already substantially and irreversibly changed the global climate, requiring a dramatic reduction in carbon emissions.

9. Carism.

Auto dependency has unacceptable economic, social, and environmental costs. Car use should generally be a market good (drivers pay), not a social good (public pays).

10. Indicators.

Sustainability requires a radical change in accounting systems to include social and environmental values in income statements, balance sheets, and regional accounts.

DISCUSSION OF EACH AREA

1. Smart Growth

Sustainability requires protecting the greenbelt and rebuilding a post-suburban "urbia" based on land development efficiency, proximity, walking, transit, and amenities.

Smart Growth is a new paradigm opposed to the dominant paradigm of high growth and sprawl. Smart Growth would stop development in the greenbelt and foster higher, transit oriented densities within urbanized areas. It would end the destruction of natural and rural values by dispersed auto-oriented development using freeways and parking lots. It would redevelop urbanized land with mixed uses and higher densities near transit. Smart Growth supports more transit, bicycling, and walking, and less auto use through such means as reduced parking, traffic calming, and other disincentives. Demand for transit would increase, supporting greater frequency and lowering transit subsidies. Typically, a five minute walk down a tree-lined walkway would lead to nearby shops and frequent transit. Tight urban limit lines and density are essential to meet housing needs in a way consistent with sustainability. While neo-traditionalism, the Ahwahnee principles, and the New Urbanism may sometimes allow dispersed development, their design concepts are otherwise part of Smart Growth. The design of Smart Growth has been best articulated by the Congress for the New Urbanism, an organization of the nation's leading architects, designers, and town planners. A catch phrase or acronym that defines Smart Growth is "COMUTO": Compact, Mixed Use, and Transit-Oriented.

Synergy for system change. Smart Growth is not just buildings and density, but system change. It is not just cramming more people, cars, and pavement into less space, which can be called "smashed suburbia." Systemic change also requires better neighborhood design, transit, and transportation pricing reforms to reduce auto use, so that higher densities have less traffic and better street life with no loss of access.

System change is not accomplished by land use reform alone, in isolation from other policies. Transportation reforms, discussed next, and transportation pricing reforms (discussed under carism below), encourage system change by creating modal choices and market forces that reinforce Smart Growth land use. None alone works very well. Traditional land use planning, of course, remains important. Urban systems result, rightfully, from a combination of public policy on land use, transportation infrastructure, and market forces.

How dense is dense? Density figures are notoriously difficult to deal with because of variations on what kind of land is being looked at and whether the figure is for population or households. Smart Growth projects should be in a range of densities from about 40 to 100 people per gross neighborhood acre. Gross neighborhood acre includes properties used for housing, local streets and parking, local business, primary schools, churches and smaller parks. It excludes central business district uses, industrial areas, major institutions, larger open spaces, bigger parking areas, and major utility and transportation rights of way. It includes neighborhood shopping centers but excludes regional shopping centers. Sometimes mixed or ambiguous uses make delineation difficult. A neighborhood has from about 2,500 to 20,000 people.

Sometimes density is given on a net basis, which is just property for housing and not the other uses. Net density needs to be about doubled to estimate the gross neighborhood density. Thus, 100 people per net acre becomes about 50 per gross acre, or about 17 to 25 units per acre. Typically suburban housing has about 36 percent of its area in streets, and downtowns have about 60 percent in pavement.

Generally, as densities rise, auto use falls, and then, at even higher densities, transit use also falls as walk trips become dominant.¹ The central city of Toronto has densities of about 40 to 60 people per gross neighborhood acre that work well with street trolleys and subways.²

The Pedestrian Neighborhood is much denser than most Smart Growth.³ At gross densities of about 100 per acre, walking predominates, followed by transit. Such a neighborhood would have convenient car rental when needed, but generally the rules for cars have to be different from what we are used to. The tables would be turned, so that cars are disadvantaged the way walking and transit are now. Walking and transit would have travel times comparable to suburbia, e.g., an average of about 27 minutes to get to work and about 8 minutes to get to the grocery store.

The Pedestrian Neighborhood would be a big investment. It takes a large number of people in one place to make it work. Many people in the Bay Area are probably ready to pay top dollar for a high quality, mostly car-free life style, but the banks don't know that the demand is there. The market research has not been done. Existing areas of high density, all in San Francisco, have low household auto ownership but also excessive street area and parking which reduce street function and amenity. Nevertheless, they have extremely high housing prices, suggesting feasibility.

The Pedestrian Neighborhood requires several steps of research. The research should be based on a real site of one hundred acres or more next to High Quality Transit, such as Bay Fair BART. High Quality Transit provides headways of 15 minutes or less during the main part of the day and 20 minutes or less in early morning and evening. The Pedestrian Neighborhood should be based on a "beyond transit" density of about 100 residents per acre, which requires 3 to 5 story construction. "Beyond transit" means that transit mode share declines because at this density, walk-bike becomes the dominant mode, followed by transit, then cars. The phases of the study would be:

- Sketch design of a neighborhood for 10,000 people, including an area land use plan, interior floor plans, and building and street perspectives. The plan includes local-serving businesses, including car rental or shared ownership service, a par course, small local parks with two primary schools, non-profits, community buildings, and a main street with transit. Parking would be limited and costly to users. Police on foot or bicycles would serve round the clock. Emergency telephones would be scattered around the area. Energy and materials efficiencies would be designed in.
- Costing of land, site preparation, structures, design, environmental review, and permitting.
- Financing pro formas to establish rent and sale prices.

¹ John Holtzclaw, *Using Residential Patterns and Transit to Decrease Auto Dependence and Costs*. Natural Resources Defense Council, San Francisco CA 94105, June 1994; Holtzclaw, "Designing Cities to Reduce Driving and Pollution: New Studies in Chicago, LA and San Francisco," Paper for Air & Waste Management Assn. Meeting, Toronto, June 1997; Holtzclaw, "Traffic Mitigation Measures: Density and Affordable Housing; Technical Note," Transportation Planning and Technology, forthcoming May 2000. See also www.sierraclub.org/sprawl/transportation/modal.asp.

² Sherman Lewis, "Toronto's Neighborhoods; Quantifying Walkable Densities, draft for review, July 8, 1997.

³ Sherman Lewis, "The Pedestrian Neighborhood; A Possibility for Select Older Areas," *Urban Land*, May 1984, pp. 16-19.

- Marketing materials to show to prospects, including a detailed description and graphics on how their personal accessibility changes, and what the rent or sale price would be.
- Market research and interviews with prospects with the demographic profile likely to be interested in order to establish demand for planning purposes.

I think many people will get excited about this. The market research firm may get more than answers; some people may be willing to put money down or join an organization promoting the development. It does not have to appeal to the mainstream suburbanite; it would appeal to a niche market; with enough people and money, it could work. If banks (and it may take a consortium) are willing to sign off on construction loans, a pedestrian neighborhood could happen.

The phrase "Smart Growth" is being appropriated and misused by powerful old paradigm forces to include parking structures, "free" parking, and a lack of support for more car-free life styles. Smart Growth has problems on four fronts.

1) Environmentalists are being asked to support unsustainable "Smart Growth" as a way to save the greenbelt while meeting the "housing need." The Bay Area, for example, has seven million people. The Association of Bay Area Governments (ABAG), a Council of Governments, makes official projections and projects growth of a million more people by 2020. The region might be able to accommodate a total of ten million people with Smart Growth, actually more than if it had sprawl. Smart Growth is better than sprawl, but without limits it is just one more hyper-growth housing program.

There is room for much Smart Growth within urbanized areas in American cities, but not necessarily enough to meet official growth projections at current densities or even at somewhat higher densities. Here are the results of one study: Based on ABAG Projections for the Bay Area, about 722,000 new housing units from 2000 to 2020 are needed for a regional balance of jobs and housing. ABAG projects the density of the new development based on current trends at 5.1 units per acre. An extra effort could increase the density by 50 percent to 7.65 units per net acre. The study assumed 3 persons per household, so 7.65 units would have 23 people per net acre, which would have only about 12 people per gross neighborhood acre, well below the low end of real Smart Growth densities. A density of 7.65 units per acre would require 94,347 net acres. The study expanded from net to gross acres, adding in land for roads, parks, and schools at 50 percent of the net area, resulting in a need of 141,521 gross acres. The use of 50 percent seems too low, and the other estimates of the study mostly use the 1:1 ratio to expand from net to gross. The low ratio is feasible from a design point of view, and gets easier as densities increase, but 23 people per acre are going to be mostly using cars, requiring a lot of streets and parking.⁴

The study found 37,680 acres of vacant land and 101,305 acres of redevelopable land inside the urban footprint, for a total of 139,000 acres of available land. Redevelopable land was defined as vacant and minimally improved parcels, further screened to eliminate flood plain, wetland, steep sloped, superfund sites, public institutions, condominiums, and heavy industry uses. If 141,521 gross acres are needed and only 139,000 are available, about 2,500 acres of open space would need to be urbanized. The study also found that, at the current trend density of 5.1 units per acre, and the usual 1:1 ratio to estimate gross acres, the region would need to develop

⁴ John Landis, "Conclusions, Initial Data Sets for Jobs-Housing Footprint Component, Regional Livability Footprint Project," Technical Advisory Team Meeting, Sept. 8, 2000 at ABAG.

283,000 acres, leaving a need to urbanize about 144,000 acres of open space. This need would substantially expand the existing urbanized area of 539,000 acres.⁵

In short, some increase in density can help, but only at higher densities are road needs reduced, transit made attractive and feasible, and open space saved. How much densification is politically feasible is, of course, very controversial.

The Smart Growth ecological footprint on land directly occupied is much smaller than sprawl, but the ecological footprint is otherwise similar to sprawl simply because of the size of the population, its consumption, and its technology. More density is a good idea, but more and more and more density, ultimately, does not work. Environmentalists should be tempted to fight every housing project and every highway in sight until there are some policies in place to restrain population. Long, congested commutes and sky-high housing prices at least dampen aggregate growth.

2) Most "Smart Growth" is too automobile-oriented, bringing auto dependency into the city where it destroys the urban values we are trying to save. For example, the Fruitvale "Transit Village" in Oakland California is not actually transit-oriented. At the end of the redevelopment around the Fruitvale BART station, there will be more "free" parking, and thus more traffic, than at the beginning.

So-called "transit-oriented" developments, such as at Hayward (Atherton Place) and Castro Valley (Strobridge Court), are based on platforms, with parking underneath and residential structure above. Everyone has subsidized and easy access to cars; increased traffic displaces pedestrians; the street level cannot be used for homes and businesses; and the street dies. The result is as much, or more, traffic and auto-dependency than when "transit-oriented" development started. Especially in a dense setting, cars can quickly create congestion that reduces mobility. "Free" parking is the problem, not the solution. Sustainability requires blowing the whistle on "transit-oriented" fraud and opposing parking that does not completely pay its own way.

3) The Smart Growth concept is also being corrupted by those who support sprawl. Some developers and even planners claim that development in the greenbelt qualifies. The Alameda County Planning Dept. claims that sprawl on North Livermore ranch land is Smart Growth. Lower density projects are often called Smart just for the buzz word, especially by groups like the National Association of Home Builders. It is not Smart Growth to have huge "free" parking lots around mass transit stations accessed by drive-alones from low density subdivisions. Ten units per net acre is not "high density" despite such suburban misconceptions about real urbanism. Well-designed density is a solution, not a problem.

4) A fourth problem, neighborhood objections to dense developments, is a complex issue. Neighborhoods sometimes object to new Smart Growth proposals and block them politically fearing they would create even more traffic and parking problems, or would attract "undesirable" kinds of people, based on race, class, and fear of crime. Some high density projects succeed, for example, in the Bay Area: Atherton Place in Hayward, and Strobridge Court in Castro Valley. While not as good as they could be, they are still more sustainable than sprawl.

Planners and neighborhoods usually have very different frames of reference. The planners want to save open space and to meet housing needs, and think Smart Growth is the best way to do it. Neighborhoods do not see any need to increase housing; everybody there already has a house. In the Bay Area, for example, planners are telling neighbors there is a legal "housing

⁵ John Landis and Ness Sandoval, table given to the Technical Advisory Team, Regional Livability Footprint Project, Bay Area Alliance, Sept. 8, 2000 at ABAG.

needs determination" by ABAG. From the neighborhood perspective, this comes from another planet.

Planners need to focus on a more common-sense set of ethics and responsibility. The folks who create the housing need-the businesses and cities that increase jobs ahead of housing-should have the responsibility to meet the need, or forgo more job increases. (See part 6 below.) Negative attitudes about "selfish" NIMBYs and support for overriding local wishes are usually misguided; the approach should be persuasion and dealing with specific reasonable grievances.⁶

Usually the neighborhood problem is parking and traffic. An apartment development proposal with no parking foundered in "liberal" Berkeley in 2000 because of these problems. Greater effort needs to be made to alleviate problems using parking charges, neighborhood parking permit programs, and traffic calming. Other problems may need to be worked through with the people who know the most, care the most, and will have to live with the project longer than the developers or the city. Dealing effectively with real neighborhood problems creates a better basis for getting support for a car-free development. Then neighbors can see a benefit and do not have to be told they are no-good NIMBYs because they object to housing to meet a crisis they did not create.

Regions like Portland, Oregon, have defined these trade-offs carefully and fully involved the public in making informed and reasonable decisions. People choose the densest alternative to reduce car use, increase transit use, and save open space. In neighborhoods the planning process should hold neighborhood design charrettes supported by various visualization techniques developed in recent years. One of the more important is the Visual Preference Survey, which gives choices based on pictures of various development options. People usually choose well-designed, low-rise dense housing. Neighbors should support well-designed Smart Growth because, done right, it will improve their neighborhood, bringing in more local business they often want.

Even though the negotiating process is difficult, it should not be impossible, bringing us to the issue of defining who the neighbors are. Sometimes an approval process becomes dominated by a few activists with deeply held but not widely shared views, and City Councils may have to decide that most neighbors are happy enough with a negotiated project to proceed.

At the risk of contradicting the above, some special developments may have so many virtues that NIMBY vetoes should be overridden. Such projects should meet quantified criteria of density, closeness to transit, less parking and car use, affordability, and identifiable open space saved by avoiding sprawl. We should then allow intervention by the State Office of Planning and Research to approve a project if a city does not act within a reasonable time. Further, we should empower and fund the State Housing Agency to make a few criteria-meeting project proposals to cities and to support the environmental review, so that developers can reduce risk and bid for approved site plans and building permits. Some modest experiment in Smart Growth and sustainability, bringing environmentalists and builders together, should be politically possible.

The sustainability paradigm promises a new Smart Growth "urbia." The evidence is that urbia at densities of about 30 to 100 persons per gross neighborhood acre can be more livable, more economical, and more sustainable than suburbia. Denser, mostly car-free growth may initially occur in only a few key places close to transit, but it will develop and demonstrate a way

⁶ Not in My Back Yard, objecting to LULUs (Locally Unwanted Land Uses).

of life better than suburbia. We can have the same spacious housing interiors, the same travel times, a more attractive streetscape, and we can achieve all of this with more health and safety, less pollution, resources and energy use, and at a great economic savings.

2. Fighting freeways and supporting cost-effective transit

More highway capacity induces its own demand due to underpricing; European-quality transit works in denser corridors but cannot be cost-effective in dispersed suburbia.

The paradigm change for transportation proceeds on two fronts, one, fighting freeways and promoting transit because of their comparative social and environmental impacts, and two, carism (discussed more below) which emphasizes market economics. Concerning the first front, there is an increasing aesthetic, social, and environmental rebellion against more pavement. One component is the depaving movement, part of a broader, deep ecology utopianism compelling some people toward profound changes in personal and community life styles. Another component is the social equity movement to rescue and improve urban bus service for the inner city poor, paratransit service for the disabled, and transit for TANF recipients, welfare-to-work participants, and low-wage labor. Another component is the defense of existing neighborhoods and open spaces against destruction and degradation by new freeway capacity.

The split between land use and transportation affects both paradigms. It is in some ways artificial, but in other ways, practical. Land use assumes transportation and transportation is a land use. Transportation as a land use varies enormously, from freeways to local streets with slow speeds and social functions. The amount of land needed for transportation is decided politically by the dominant paradigm rather than economically by a sustainability paradigm. Land use assumes transportation: in the dominant paradigm by expecting, planning for, and requiring space for cars; and in the sustainability paradigm, the reverse. Land use planning for structures always includes planning for most walking, while transportation planning almost never plans for pedestrian trips.

The split is also practical. In the dominant paradigm, land use planning de jure precedes transportation planning. The idea is that transportation serves land use. However, de facto, transportation facilities create the incentives for the location and kind of land use. Different bureaucracies do the planning and the decisions reach Councils and Boards separately, the General Plan revision arriving at one time, the Circulation Element many months later-or before. Even for the reformers of the sustainability paradigm, much specialization takes place just because of the great complexity of land use planning and transportation planning, the need to gain expertise, and the need to lobby governments that segregate the decisions. The land use/transportation split is, however, mostly on the surface, because each side shares a common ideology assuring coordination. The real conflict is between the paradigms.

The Metropolitan Transportation Commission (MTC), which plans transportation for the Bay Area and controls most of the funds, emphasizes that most of its funds go to maintain the current highway, street, and transit systems. MTC rarely mentions that it still supports old paradigm projects like the Hayward Foothill Freeway which wipes out the homes of a thousand people, destroys open space, degrades neighborhoods, crosses the face of the hills, and competes directly with a parallel BART line. MTC also supports expanding the tunnel between Oakland and Orinda to carry more traffic, and widening I-880 at the Sunol grade, again resulting in more traffic.

In the Bay Area as in many other regions, transportation planning is heavily politicized by pet projects of elected officials. These projects become the priorities of cities, counties, and

transit agencies, are patched together by Congestion Management Agencies (CMAs) for each county, all stapled together by MTC, and called the Regional Transportation Plan.

The problem with pavement does not, however, mean that all transit is good. Much American transit is economically wasteful, obscuring the debate on the value of transit in general. When transit serves a dense corridor, provides good service, and has a high fare box recovery, it is performing well against subsidized car travel. Cost-effectiveness has to be judged against car competition.

While Americans admire European transit, few understand that its success depends on much more than the transit itself. In Europe, four other factors are at work: high auto ownership costs, high auto operating costs, high levels of auto congestion, and dense land use. People are pulled into transit because it is good, but they are also pushed out of their cars. The congestion is deceptive, based on "inadequate" roads which prevent more traffic just because they are so congested. By policy, most of these roads will not be widened. Traffic, even though congested, on a small capacity network produces less air pollution than less congested traffic on a large network that encourages car travel.

In the U.S. bus transit mostly serves lower income people, who must often tolerate slow and infrequent service on zig-zag routes or over-crowded peak service crawling along behind solo drivers. Many problems exist: infrequent service, reliability and safety problems, poor equipment, few timed transfers, car traffic interference, slow ticket collection, low sidewalks, high bus floors, narrow doors, and poor pavements. As a result, buses are much slower than they could be. Improved bus service needs barrier-free ticketing, wider doors, lower floors, raised sidewalk stops, signal preferences, intersection lane innovations, more powerful motors, frequent direct service on main corridors, special bus and HOV lanes, and transit-oriented land development.

It is uneconomic to try to blanket suburbia with frequent bus service. Bus transit should be tied to Smart Growth land use; pricing reforms, transit, and density need to reinforce each other. Transit, in fact, does nothing on its own; it works as part of a larger system. Once the elements of the rest of the system are in place, transit become both necessary and cost-effective.

At the other end of the spectrum from cheap buses for the poor, we find expensive urban rail projects for the middle class and affluent. Several cities have invested in costly projects justified by politics and naive public support for wonderful trains that are just not cost-effective. MTC emphasizes its support for transit, but it really puts its money into BART even when the cost per new rider is extremely high, several times higher than more cost-effective but less glamorous projects. Often lost in the debate are high quality, cost-effective bus and rail services with large riderships.

In 1996 in the Bay Area, the Regional Alliance for Transit (RAFT), a group of analysts and advocates, put together its own plan. Besides Smart Growth land use and employee parking cash out, the RAFT plan included improved frequency of transit service, improved bus pavements, some lower transit fares, high quality bus shuttle access to transit stations, CalTrain and Fremont-to-San Jose commuter rail upgraded to urban rail, electrification of CalTrain and its extension downtown to the Transbay Terminal, rebuilding the Transbay Terminal, and so on. MTC modeling of this RAFT plan showed that from 2000 to 2010, drive-alone mode share

declines and non-drive alone mode share increases significantly, with many other benefits in cleaner air and shorter commutes.⁷

The old paradigm slams transit for its heavy subsidy and low ridership. Such criticisms overlook how much cars are subsidized and how many transit systems in denser areas have much better fare box recovery. Cost-effective transit is not cheap, and is worthy of some subsidy to compete with cars. However, transit would need less subsidy if cars were less subsidized and if land use improves. Fares could then rise to recover more and more operating costs. Walking and bicycling are even more cost-effective and sustainable than transit. The new paradigm clearly opposes more pavement, and supports traffic calming and non-car modes, but is cautious about expensive transit, because it is not transit as such that works, but its functioning as part of a larger land use and pricing system.

3. Aggregate vs. per capita growth and human capital

A sustainable region requires that the basis of the economy shift from aggregate growth to per capita growth based on investing in human capital.

The dominant paradigm does not distinguish between "aggregate growth" and "per capita growth," but the difference is central to using the sustainability paradigm as a way of understanding prosperity. "Aggregate growth" refers to that part of economic growth due to population increase. "Per capita growth" refers to that part of economic growth due to per capita productivity gains.

"Aggregate growth" That part of economic growth attributable to population

"Per capita growth" That part of economic growth attributable to per capita productivity

The dominant hyper-growth paradigm inextricably mixes aggregate growth with per capita growth. It cannot distinguish between urban cancer and sustainable development. It cannot separate population growth from economic growth.

As a result, the dominant paradigm 1) celebrates its success, 2) laments about crises that are about to undermine the economy, 3) overlooks the fact that its success is unaffected by its crises, and 4) ignores its externalities. The celebration of success is very comparative, so regions like the Bay Area are especially proud of their accomplishments.

Perception of crisis. The dominant paradigm also perceives the Bay Area as competing with other regions, so anything that slows regional growth—such as high housing prices, long commutes, high living costs, a labor "shortage," or, most recently, an electrical supply crisis—is seen as potentially disastrous.

Sustainability concepts don't appear in the media and political rhetoric. The dominant paradigm controls media perceptions of the problems it creates. "Objective" news stories editorialize for hypergrowth without the slightest awareness of their advocacy. The media and business often claim that the Bay Area is losing its competitive edge. For example, in the Bay Area, a recent news story quotes the leading advocate for Silicon Valley manufacturers: "This is

⁷ Sherman Lewis, "Land use and transportation: Envisioning regional sustainability," *Transport Policy* 5:3, July 1998, pp. 147-161

the biggest crisis our valley has faced in the last two decades.⁸ The "crisis" is a pending short term increase in the cost of electricity combined with some uncertainties about how to manage supply in the future, whether by increasing production or becoming more efficient. Electrical power problems have led many companies to develop, and a few to implement, "exit strategies" to move their production facilities elsewhere to get cheap, secure power.

Similar observations could be made about the housing "crisis," the commuting "crisis," the skills shortage "crisis," and the air pollution "crisis." Alleged crises are used to justify more unsustainable growth. Building more fossil fuel power plants, for example, will further exacerbating unbalanced hyper-growth in Silicon Valley. The dominant paradigm has enough political power to exacerbate the long-term crisis of sustainability. Using sustainability principles, these crises are not solved by even more growth.

Success is unaffected by its crises. The dominant paradigm ignores the fact of continuing economic success despite continuing problems. The perceived crises do not get solved, yet the success continues.

Ignoring externalities. The dominant paradigm creates the problems it complains about, primarily by emphasizing aggregate growth, mis-measuring success, and externalizing costs. The dominant paradigm has no way of knowing how much is enough. It understands free enterprise and supply and demand, but does not apply these concepts to larger market issues, and, thus, is so far constrained only by forces beyond its control. Succeeding sections of this paper cover aspects of this problem topic by topic; this section discusses how the dominant paradigm affects the less affluent and the real source of per capita wealth, which is productivity.

Has the dominant paradigm benefitted the less affluent? The hyper-growth paradigm assumes that aggregate growth benefits the disadvantaged, but assessing the performance of the economy over the last few years from a social equity perspective is difficult. On the positive side, in the Bay Area since the 1980s private industrial developments and military base conversions have restructured the economy, increasing wealth for the competitive. Recently, unemployment in California is low and most workers are getting pay raises and job advancement.⁹ (Even more recently, the economy is slowing and the Fed has lowered interest rates.) From an individual perspective, America is the land of opportunity, and the Bay Area is opportunity squared. There are too many individual success stories to ignore.

Other analyses, using different parameters and time periods, show that many people of all races, especially the less educated, stagnate and slip in income. The Region reflects national trends; the United States has the greatest poverty and greatest inequality of income distribution of the 17 leading industrial nations.¹⁰ The inequality is getting worse as the affluent go higher

⁸ Mark Simon, "Silent Exodus in Silicon Valley," *S.F. Chronicle*, Jan. 13, 2001, quoting Carl Guardino, CEO, Silicon Valley Manufacturers Group. See also John Markoff, "Job Growth Slowing in Peninsula; Traffic, housing issues threaten middle class," *S.F. Chronicle*, Jan. 15, 2001, from the *New York Times*. His story is based on a report by Joint Venture, a regional planning group. He says economists such as Steven Levy, the state's leading hypergrowth economist, are worried about the inability of the region to provide sufficient transportation and housing. The focus is on the supply of transportation and housing while ignoring the demand created by jobs. Sustainability is ignored.

⁹ Janet Wells, "Racial divide in boom time, study reports," *S.F. Chronicle*, Sept. 5, 2000 p. A1.

¹⁰ Poverty: Human Poverty Index based on survival to age 60, functional illiteracy, population below poverty line, and long-term unemployment. "World Poverty." *S.F. Examiner*, Sept. 9, 1998, p. C-18. Income distribution: Kevin Danaher, *Globalization and the Down Sizing of the American Dream*, S.F.: Global Exchange, 1996. Both sources are cited in Nikhil Anand and Henry Holmes, *Failed Promises...*, SAGE, Earth Island Institute, San Francisco, April 2000. See also OECD, *Income Distribution in OECD Counties*, Social Policy Studies No. 18, Oct. 1995.

and the middle class spreads out across a wider range of income. The income distribution curve once had a high peak near a median on the left, with a long slope to the right towards fewer numbers of higher income people. Now the peak is lower and the slope to the right longer. In this sense, the U.S. is not an advanced country. The gains from the booming economy in the U.S., in California, and in the Bay Area have mostly gone to the already affluent; the bottom 60 percent by income lost ground. Two-thirds of poverty level workers lack health insurance and 84 percent have no pension plan.¹¹ Current hypergrowth policy uses the poor as a permanent excuse for aggregate growth that does not actually benefit them. Wealthy regions have large low to moderate income populations, often minorities with educational disadvantages that persist in poverty.

There is a paradox of expanding employment without effective economic improvement. The job gains of low to moderate income people are overbalanced by income stagnation and an increasing cost of living, especially for health care and for housing. They lose jobs to better qualified and less well paid migrants coming into the region. Their incomes are also kept in check by globalization, which has resulted in the larger scale loss of blue collar manufacturing jobs abroad.

Lower income working families are increasingly squeezed between low pay and higher rents. They see housing prices go up due to pressures from the affluent native and migrant population. They can't find affordable housing, are being gentrified out onto the streets, leave the region, or crowd up. The result is the same-the income/housing cost crunch leaves them worse off. African-Americans and Latinos in California are more likely to have low income, low education, fewer college graduates, and fair to poor health, as shown in the table below. They are more likely to be unemployed and lose jobs. In the Bay Area, Latinos are under-represented in high tech employment (23 percent of population, 7 percent of high tech employment).¹²

Race, Income, Education, Health

2000 California	Household Income below \$20,000	Education High School or less	Education college graduate	Health fair or poor
Anglos	8%	14%	46%	8%
Black	15%	28%	36%	14%
Latinos	26%	56%	15%	20%
Asian (English speaking)	7%	11%	64%	8%

¹¹ U.S.: Ronald Dugger, "Real Populists Please Stand Up," in *Globalization*, cited above. CA: Deborah Reed, *California's Rising Income Inequality*, S.F.: Public Policy Institute of California, 1999, p. xxv. Silicon Valley: Chris Benner, *Growing Together or Drifting Apart? Working Families and Business in the New Economy*, San Jose: Working Partnerships and the Economic Policy Institute, 1988, p. 22, all from Anand and Holmes. Jennifer Coleman, "Study: California leads nation in dead-end jobs," *S.F. Examiner*, date missing, based on California Budget Project: more earn poverty wages than ten years ago, and median California four person family income declined. Cost of living goes up faster than compensation. Markoff, "Job Growth..." cited above, using the Joint Venture report, says "the gap widened between the region's richest and poorest households."

¹² "Latinos in Silicon Valley: The Digital Divide," *The Economist*, Apr. 17, 1999 p. 33.

Source: Janet Wells, "Racial divide in boom time, study reports," *S.F. Chronicle*, Sept. 5, 2000 p. A1, quoting from a survey by the University of California San Francisco, Institute for Health Policy Studies and the Field Institute.

Typically, the dominant paradigm sees labor shortages as too few workers. During a growth period a local labor force at a given pay level becomes fully employed, and more jobs at that level attract migration from lower pay areas. However, shortages of labor met by more labor at the same skill level do only a little to increase incomes. More workers per se do not necessarily increase per capita wealth or help productivity and investment. They simply allow the economy to grow based on existing pay levels using existing technology; that is, they support aggregate growth without per capita growth.

The sustainability paradigm see labor shortages a result of too low pay. Higher pay stimulates innovation, capital investment in more productive technologies, investment in human capital, higher productivity, and higher compensation. Such investment dislocates old-technology workers in the short run; in the long run more people become better off. These factors propel per capita growth, and are consistent with sustainability because they allow economic growth with lower population growth. For the last two centuries economies have grown mostly because of increasing productivity per worker. Nations lacking improvements in productivity show little per capita growth no matter how much their populations grow. The new paradigm requires ideas that, in a region, reduce migration and help the resident population, and, outside the region, promote jobs the region does not need.

Sustainability, economy, equity. If sustainability is helped by, and possibly requires, a stabilizing of population growth, and if therefore migration is to play a smaller role for competitiveness, and if the more affluent are already pretty productive, then the greatest potential source for more productivity will be less affluent workers. The less affluent spectrum of workers broadly divides between educated middle class being left behind by those more successful, and the more disadvantaged, less educated strata with low to moderate incomes. Improving their earning ability improves their incomes and the regional economy in a way consistent with sustainability. Education and training could help them move up to something more productive. Income would rise in a context of stable population.

Education, health care, and enforcement against racial discrimination are needed. These three policies help current residents qualify for and get employment that employers might otherwise give to residents outside the region. Thus, the policies could reduce would-be migration while helping the disadvantaged, including migrants already here.

Education including training is highly correlated with income, and is the major expensive policy needed to improve earnings of the disadvantaged of all races. Lack of health insurance is also correlated with low income and also likely to be costly. While not as expensive as education and health, policies fighting racial discrimination deserve support. Investing in this human capital would use, to the extent possible, resources now going to support aggregate growth. Research is needed to identify more specifically those resources and how they might be shifted.

The importance of the educated middle class has been under-emphasized. California has almost 3.5 million unemployed people whose skills are clearly above entry level work, yet below the requirements of certain high tech jobs which are going begging.¹³ About one fifth of these

¹³ Janet Wells, "California's workers in a crunch," *S.F. Chronicle*, Sept. 4, 2000, p. 1, quoting from a survey by the University of California Institute for Health Policy Studies San Francisco and the Field Institute.

unemployed have a college degree and more than half have attended college. Most have been employed within the last three years and they average more than 15 years' work experience. While predominantly minority, the single biggest group is Anglo, 42 percent. Investing in this human capital promotes per capita productivity and a more sustainable growth than importing workers for those jobs.

Next, we need to invest in those who are more disadvantaged, relating social justice to sustainable economic growth. They are the less educated and less skilled, and disproportionately minority.

The sustainability paradigm of per capita growth is based on investing in human capital to support sustainable economic growth, avoiding the cancerous "more is better" ideology of aggregate growth. Per capita growth focuses on social justice and individual productivity. Labor shortages are seen as opportunities for investment in research, new technologies and in people, not as reasons to import more workers. The thrust of the next two sections is to reduce an expansion of jobs that is unsustainable. The thrust of this section is to improve the ability of the resident population to compete for the jobs that will be created even with a reduction in the rate of job growth.

4. Social equity and jobs

Jobs which provide opportunity for disadvantaged people are better than jobs which drain the rest of the world of the talent it needs for economic growth.

The theme of this section overlaps with and flows from the preceding section on growth and human capital. The focus shifts from macro-economic issues to paradigms about jobs, their location among regions, and regional competition over jobs. Just as the preceding section attacked the notion that aggregate growth is always good, this section criticizes the idea that all jobs are good. Section 6 focuses on another aspect, job location within a region.

The dominant paradigm considers all jobs to be good. Regions assume they should promote job growth, or assume that jobs, like natural increase, are inevitable and have to be planned for. Planning for the inevitable has helped the inevitability along. The sustainability paradigm distinguishes among jobs and finds that some jobs cost more than they are worth. Unending job growth is ultimately unsustainable.

Alternative growth. The multiple "crises" of housing, commuting, skills, and electrical power have dampened aggregate growth in the Bay Area and particularly Silicon Valley, yet aggregate growth continues unabated. The Bay Area loses growth due to incredible housing costs and impossible commutes. Growth is "lost" unintentionally and unconsciously as a result of the dominant paradigm leading to more growth than the region can handle. The sustainability of the region is helped by the sheer inability of the dominant paradigm to keep up with itself.

This dampening or holding down of a growth rate that would otherwise be higher contains the germ of a new paradigm: If a region can endure long crises that cost us growth and still get rich, maybe it could slow job growth intentionally and still get rich. Instead of slowing jobs with high external costs inadvertently, the region could do it on purpose and reduce the externalities. An irrational, costly, unintentional, partially if accidentally successful "policy" could be replaced with one that could reduce regional problems. The new paradigm supports cooperation among metropolitan regions for sustainability, not just competition for more money. It supports giving some of the growth away. Lost growth may compete with our exporters, but it also creates more income, some of which comes back to the region and benefits its economy, with net gains all around. This is the concept of alternative growth.

The issue, then, is not the feasibility of alternative growth, but whether we are willing to discuss a policy of supporting it in some way. The sustainability paradigm reverses the perception from one of crisis and competition to one of opportunity and cooperation. It holds that we could have less aggregate growth but not less per capita growth. We just have not thought about its importance or how to do it. The challenge to policy is to find a way to do it.

Social justice and migration. Section 6 below discusses in detail how to manage job growth and location, and argues in favor of doing so to allow housing to catch up with jobs and to trend toward sustainability. It argues for policies to restrain job growth with moratoriums on certain land use decisions in a few cities and on linking housing creation to job creation.

Alternative growth policy indirectly but necessarily affects migration by reducing job growth in a region, and migration is controversial. Migrants are favored variously for their entrepreneurship and investment, technical skills, low wage labor, tax payments, and for their contribution to diversity. We want to help people; limiting migration limits opportunity and we need to allow for family reunification and political asylum. Limits may be racially and economically discriminatory. Migrants are variously opposed for their ethnic and racial differences from the native population, labor competition, underpayment of taxes, use of public services, and anti-social or criminal behavior. Rarely, however, is migration discussed in terms of sustainability, of interregional cooperation, and of social justice for both contributing and receiving regions.

Compelling but not conclusive arguments of the dominant paradigm support economic growth based on free movement of labor, and migrants generally do contribute to aggregate growth. What are the equally compelling, contrary sustainability considerations? Most obviously, excessive migration is regionally unsustainable. We also need to consider arguments about: a) costs created by migration that are not currently measured in regional accounts, b) alternative growth that avoids the costs, c) the equity impacts on the receiving regions, and d) the equity impacts on the giving regions.

a) Concerning the costs of migration which are not in regional accounts, the problem is created not by migration as such, but by people. It would be equally productive to get current residents, especially the affluent, to leave the region, but I have not yet been able to think of a good public policy for doing so. Alternative growth seems more feasible. Generally, the more that migrants contribute to regional economic growth, the greater their environmental impacts. The Bay Area, in the process of becoming enormously wealthy with great contributions by migrants, has also suffered costs caused by people: the air is polluted, commutes are terrible, housing prices are astronomical, and open space and agriculture are being lost. The assumption of public benefit from growth is made by the media and self-interested beneficiaries, not rational measurement. The sustainability paradigm is developing better measurements, as discussed below under 10. Indicators.

b) Alternative growth could avoid the costs. Generally, the more migrants contribute economically, the greater the contribution they could have made in their region of origin. Economic growth around the world shows that the vast majority of those becoming prosperous have not migrated out of their regions. There are, obviously, places of violence, abuse, corruption, and governmental incompetence that mitigate against alternative growth, but the much larger story has been the broad expansion of the world's economy over the long run and many success stories.

c) Migration has equity impacts on the receiving regions. Benefits provided by migrants may be achieved by those already in a region. Relevant policies are discussed above in section 3

on growth and human capital and below in section 5 on the status of women. Education and training can improve the productivity of current residents and qualify them for jobs now going to migrants, thus reducing migration in a way that advances social equity within the region.

d) Migration has equity impacts on the giving regions. Totally overlooked in the context of regional planning is the potential social injustice of attracting large numbers of migrants from other regions. Migrants are not only enterprising but also educated. Growth in a receiving region is partly built on depriving the giving region of the investments it has made in the education of its citizens. The taking region can even under-fund its own local education because it can use migrants for economic growth, and they are cheaper to employ.

Brain drain, then, hides a social inequity behind policies which draw workers to a region, especially when disadvantaged workers already living there struggle to get ahead. The inequity is both to the contributing region, which loses its investment in human capital, and to people in the receiving region, who are denied adequate education and training and better jobs. Alternative growth is not only feasible, it's fair.

Alternative growth avoids impacts in a would-be receiving region, but does not guarantee reduction of impacts in a would-be giving region. Reduction of impacts can still occur, for example, if the would-be migrant can, instead of migrating, live in an existing house and not require a new subdivision, can get to work by not driving alone, and is engaged in a sustainable business. However, these outcomes are not guaranteed and it is primarily up to each region to advance its own sustainability.

Because of the dominance of the hyper-growth paradigm, employers have the power to make political claims about labor "shortages," get special exemptions in immigration laws which are already generous by international standards, and import workers at lower wages. The impact falls on local educated middle class workers, with trickle down effects limiting mobility from below. Employers also have the power to expand operations almost at will, getting fast track permitting and even subsidies from local governments, without a housing or transit responsibility. Employers have the power to provide too little training for employees and to avoid taxes through investment incentive loopholes. They even have media credibility when they complain about the lack of education and skills of the local work force. Their power is based on the popular belief in aggregate growth, and in the value of all jobs, when more careful analysis would reveal a range of costs and benefits.

Wealthier regions should not, as a rule, drain brains and muscle from elsewhere to meet the needs of a regional labor market. (Some labor markets are justifiably more international, such as top executives and top researchers.) Regions should invest more in their own brains, especially in educating the disadvantaged. Sustainability requires that regions should not import people but rather export sustainability. To achieve sustainability, we should promote some jobs and prevent others.

What is a good job?

- A good job is sustainable; it should be consistent with opportunity for future generations at least equal to that of this generation.
- A good job may help the environment, educate or train the disadvantaged, employ the disadvantaged, help regional global competitiveness, or help meet social needs of many kinds.
- A good job employs local residents.

- A good job does not use excessive resources or cause excessive pollution.
- A good job does not destroy wilderness, open space, habitat, ranches, farms, or wetlands.
- A good job is not accessed by driving alone and does not aggravate congestion, air pollution, and housing costs.
- A good job pays at least a living wage and living compensation.
- A good job does not pay non-equity compensation more than about 20 times the income paid to the average worker in a company; everyone in an enterprise should share in its success.
- A good job does not use special tax breaks and low taxes denying support for education, children, and the disadvantaged or shifting the tax burden to others.
- A good job does not have excessive risks to worker health and safety.
- A good job allows time for family and community life; overtime should be voluntary; job sharing can be helpful.
- A good job inspires others to seek and create good jobs.

How many jobs in our economy are good jobs? Actually, quite a few. We need more research.

Preventing jobs in a region is definitely a new paradigm idea. Regions have always competed for investment and jobs. The old paradigm reacts with the accusation that crazy people are attacking jobs. Not true; the new paradigm primarily influences the location of jobs. Jobs are not lost, but move around. If one region grows a little less because of too little housing, another with housing may grow a little more. The new paradigm includes regional cooperation as well as competition because the focus is on per capita competitiveness, not more jobs. A region tries to improve its competitiveness, and also to avoid unsustainable aggregate growth.

5. The status of women

Improving the status of women gives disadvantaged women and girls more opportunity for education and paid work, increases productivity, and lowers population growth.

This topic is a special part of social equity and jobs. Improved choice over family size allows women to provide more support for fewer children, helps them to be more productive in the paid work force, and lowers the rate of natural increase of population, benefitting at once social justice, economic prosperity, and environmental sustainability. Sustainability is helped when education and productivity, not family size and low wages, are the keys to success.

The debate on population is sometimes emotionally charged by racial and class issues. The fertility factors that explain most births per woman are: education of the mother, income of the household, and education of the father. Next most important are the mother's years in the United States and her ability to speak English. Least important are her race and ethnicity. Less easily measured factors-tradition and culture, health and family programs-are also very important.

The policy should not be maligned as middle class birth control for the lower classes, nor as pressuring a particular racial or ethnic group to have fewer children. The Cairo Conference in 1994 on world population and the status of women made manifest a paradigm change at the international level. The evidence supports the conclusion that giving women legal respect and educational and economic opportunity lowers fertility, regardless of income, education, ethnicity, race, place of origin, or other factors. Improvements in the status of women universally move birth rates to sustainability. Similarly, improved status contributes to the economy and social

justice. In the last two decades remarkable reductions in birth rates have occurred in Singapore, Mexico, Thailand, Kenya, and Bangladesh.

One of the many aspects of improving status of women is health care, and, within that, family planning and reproductive health services. Government at all levels should support culturally sensitive general health care, including comprehensive family services, family planning and teen health services. Government should help the disadvantaged get the same support that has allowed affluent women to improve their education and training, to get jobs, and to invest more in raising a smaller number of children. This policy will not have a major impact on population growth in affluent regions but is still important because of social justice and economic benefits.

The paradigm change manifest at the Cairo Conference needs to carry into the debate on national and urban sustainability. The challenge is to apply the international paradigm about family and health services to the American and regional context. In 1996 the President's Commission on Sustainable Development said one of the "two most important steps the US must take toward sustainability [is] to stabilize the US population promptly."

Consideration of such women's issues by American urban planners is approximately zero. The dominant paradigm takes "natural increase" as projected by demographic models and state agencies as a given, as "inevitable" and therefore to be planned for. There is no quantitative information or even estimates for specific cities of how a given investment in services such as Planned Parenthood leads to how much increased productivity and reduction in family size. Disadvantaged women do not have much choice and are not part of the sustainability debate. They are sometimes not even mentioned as part of environmental justice, which focuses on industrial pollution, education, transit, employment opportunity, small business, and stopping gentrification.

The United States continues to have the most rapid population increase of all developed countries, partly out of failure to reach effectively its disadvantaged women and teens. Disadvantaged women even in the Bay Area get inadequate support, especially low education, non-English speakers. The purpose of policy is to empower the most disadvantaged, the under-served population those with low education and low income, those who do not speak English, and teens.

In the Bay Area, Planned Parenthood Golden Gate provides family planning services, funded at about \$16 million per year. Services include: client services (clinics, schools, teen clinics in health centers), trained educators who do workshop/seminars for classes, clubs and groups on many issues including Sexually Transmitted Infections, sexual decision making, and domestic violence, support for age-appropriate sex education in schools (9,694 students in 179 schools in 6 counties '99-00) without race or gender bias, and advocacy (fund raising, protecting the right to choose and privacy).

Social service agencies, particularly family planning services, are painfully aware of how even today under-funding denies opportunity to many women in otherwise affluent urban areas. Planned Parenthood Golden Gate (PPGG) states (bolding added):

"The average cost of a visit to Planned Parenthood Golden Gate is \$74.48. This means that with one million dollars, our organization could provide approximately 13,346 additional medical visits to our clients, provided our existing health centers have the capacity to handle this increase. ... This substantial increase would be incredibly significant to PPGG's client population who face multiple barriers in accessing needed health care services. ... It could give immigrants, who are often very reluctant to seek health care due to their immigration status, an opportunity to

access culturally sensitive medical services. It would also allow us to educate more teenagers about postponing pregnancy, strengthening sexual decision making, and reducing sexually transmitted infections."¹⁴

The benefits of Planned Parenthood Golden Gate services are less teen pregnancy (9% down in 1998), more healthy (full term, full weight) babies, delay and spacing of births for better nurturance, smaller families, births to infertile couples, protection of the right to choose, less HIV and related diseases, and fewer abortions.

Sustainability requires that over-looked issues concerning the status of women need to be considered as an integral part of urban planning. Investment in under-served women affects economic and demographic projections.

6. Job location externalities and housing responsibility

Cities with severe job surpluses have the primary responsibility to increase housing, not cities with housing surpluses.

Job location externality costs. The old hyper-growth paradigm does not consider externality costs created by the location of a job and would never impose controls on increases in jobs in order to prevent a worsening of those externalities. We need to consider three issues: the costs and benefits of jobs considering locational externalities, how to quantify the amount of housing needed for a solution, and policies that would prevent externalities from getting worse.

1) Estimating job location costs and benefits. Jobs can have high externality costs because of their location. More jobs in an area already having a severe job surplus will cause increases in housing prices, commuting time, and air pollution. These costs increase geometrically as local housing supply and road capacity are more and more burdened over their designed capacities. Such jobs may have higher regional costs than benefits because of their location. Commonly recognized benefits of a job in a severe job surplus area need to be judged against usually unmeasured costs, and compared with the costs and benefits of the same growth in an area with surplus workers.

We need to quantify the benefits of a job and the costs of its externalities, but there is no established methodology for the analysis. The benefit estimate could be the annual total compensation for the job and profit expected by the employer, ignoring multiplier effects. Measuring the three costs is more complicated but could also ignore multiplier effects.

1. The cost estimate requires an estimate of the **increase in housing costs** within a reasonable commuting area of the job surplus area. For example, home prices in Silicon Valley can be compared with prices in an average metro region for a similar house and similar average commute time to a similar job. The higher housing price in (and near) the job surplus city would be attributed to the failure of that city (and its near neighbors) to build enough housing.

2. The cost estimate also requires gauging the annual value of **time lost by commuters** compared to a median commute time. Commute time value is difficult to analyze because workers do not accept jobs with an unacceptable commute, and once a worker has made a locational decision considering commute duration, the time is valued essentially at zero. The major grievance is felt by those who, after their locational decision, find a once acceptable duration degraded by more traffic. A reasonable estimate, then, can be based on societal median commute durations compared to those for similar jobs in the job surplus area.

¹⁴ Dian Harrison, President and CEO of Planned Parenthood Golden Gate, and Kim Meredith (415-441-7858), email, Oct. 3, 2000.

3. Finally, the cost estimate requires quantification of **air pollution** and other commute-related externalized pollution costs created by the job surplus area, both from length of commute and from congestion. Silicon Valley, for example, has longer, more congested drive-alone commutes than San Francisco, so each job is associated with more air pollution.

A benefit cost ratio can then be estimated.

We can look at a hypothetical illustration. If the annual costs per new job were something like \$10,000 in pollution, \$10,000 in wasted time, and \$70,000 in housing costs, the externalized costs per job could total \$90,000, probably more than the benefit of the job.

Policy makers today, following the dominant paradigm, do not consider these three costs, or any other regional externalities. The company creating the job in the severe surplus area has no responsibility for the problems it creates. The company benefits, because it externalizes the costs.

The city approving the land use where the job exists has no responsibility either. The city reaps sales tax and real estate tax revenue while avoiding the expenditure of serving worker housing. The regional agencies are run by locally elected officials who know little about economic analysis and are more committed to local power than to local responsibility. They are elected by developer and business contributions from an affluent class committed to the myths of unsustainable growth. The media and the economists also show no interest in these questions. The problem at this point is not so much the lack of an answer as the lack of asking the question. The sustainability paradigm is too weak to get the question on the table.

2) Quantifying housing need. How to quantify the amount of housing needed to eliminate the externalities? The estimates below look at local balances of employed residents and jobs and at the capacity of transportation infrastructure to deliver workers. How can we distinguish between productive agglomeration economies and a severe job surplus with high external costs?

A simple count of jobs and employed residents in a given area, the "land use balance," is too simplistic. A large area tends to have a better job-housing land use balance but can easily include overly long commutes. A small area is likely to be very imbalanced without causing systemic problems. Economic productivity is increased by concentrations of related jobs, i.e., agglomeration economies. Therefore, the job housing balance should consider the ability to commute without undue costs.

The freeway tipping point. Probably the best criterion is the capacity of transportation infrastructure to deliver workers to the jobs without excessive commute distance, congestion, or duration. This criterion can be operationalized as the freeway capacity "tipping point" at which an increase in traffic of just a few cars causes speed instabilities and big slowdowns. The impacts are disproportionate to the number of cars because the slowdown does not affect just the added cars, but everyone using the freeway. A small number of commutes above the tipping point inflicts high and geometrically increasing systemic costs in lower vehicle throughput, delay and pollution.

The tipping point can be quantified; it occurs when speeds drop below about 35 miles per hour and when flow reaches volumes of about 1800 to 2000 vehicles per freeway lane per hour. At this speed and volume so close to carrying capacity, very small increments of traffic cause temporary slowdowns and speedups, experienced by most drivers as the yo-yo or slinky effect of bunching up and stringing out without apparent cause. As travel demand increases even more, average speeds go down and stay down.

Bay Area Alliance for Sustainable Development recognizes the relationship among job surpluses, housing shortages, and freeway capacity. Its *Draft Compact . . .* of July 2000, uses, as

an indicator of regional progress, "Housing units needed in job surplus areas to alleviate severe congestion."

An analysis of job-housing imbalance should focus on housing supply but could also focus on increasing the capacity of transportation infrastructure. For reasons discussed elsewhere, expanding freeways is uneconomic and unsustainable. We have been expanding freeways for decades, resulting in longer and faster commutes and no reduction in commute congestion or duration. Expanding public transit has more intuitive appeal, and may apply in some cases where densities along corridors support it, but long distance transit can also be uneconomic compared with simply reducing commute distances, which results from increasing local housing supply. More local housing also helps short distance transit with higher housing densities, shorter distances to work, and improved access to transit. Transit usually moves more slowly than a car, but, if it does not have as far to go, its duration can be competitive with driving alone.

Focusing on housing, we need to relate housing supply to the freeway tipping point. There are two tools for doing this, computer models and a rougher kind of estimate using a spreadsheet.

1. First, we will discuss **computer models of land use and transportation**. These models can be used to estimate job surpluses/housing shortfalls. The Metropolitan Transportation Commission (MTC) does advanced quantitative analysis of travel in the Bay Area. The MTC model (MTC BAYCAST-90) and private models (like EMME/2, TP+/Viper, and MINUTP) show travel volumes and times in huge trip tables based on small geographic areas called travel analysis zones. The MTC table has 1,099 zones, forming a 1099x1099 matrix for the nine county region. The zones are all connected to each other by a network of roads and transit lines, also in the model.

The models consider land uses, auto ownership, certain costs of travel, mode choice, highway and transit networks, trip volumes, and speeds. The models estimate traffic on all of the thousands of links of the network. In the "base year" the models simulate and replicate actual land uses, networks, and travel counts. Assumptions can be changed to estimate alternative scenarios.

The capacity tipping points for bottleneck freeways serving the severe job surplus centers are well known. The trip table or a "screenline" at freeway bottlenecks can report the geographic location of "productions" and "attractions." A screenline is an imaginary line across a link that identifies it for reporting trips, speeds, and level of service. Modelers define a "production" as the location where a round trip typically originates. For example, the home is the production location for a "home-based work trip" whether the trip goes from home to work *or* from work to home. The trip table shows the home as the production zone for both trips. Similarly, the "attraction" is the work place for both trips.

The models can report the number of trips in peak direction during peak hour and how many are above the tipping point, which then indicates the putative number of houses that would need to be closer to work to replace the excess freeway trips. The longer the trip, the greater the externalities, so the longest trips are of greatest interest. We can identify fairly precisely the job and housing locations connected by long commutes that cause an exponential increase in external costs to the region. The greatest gain in sustainability would be to somehow move the most distant housing to the job center. In modeling lingo, the most distant productions would be moved to the attraction zone, creating an intra-zonal trip probably not using a freeway. Eliminating the longer commutes would have the greatest benefit for the whole system, taking cars off many links of the freeway system before they reach the screenline.

Thus, we can quantify job and house locations and the number of related long commutes that cause an exponential increase in external costs to the region. The modeling of pricing changes, land use changes, transit improvements, and mode choice also allow a fairly precise definition of a solution for both land use and mode.

No one has yet done this kind of research in the region and perhaps the world. The models have always been used to determine how much more pavement is needed to meet land use imbalances. These powerful tools have not been used to reason backwards from highway capacity to land use problems and to quantify housing responsibilities.

2. Second, we will discuss a rough **estimate of housing need/job surplus using a spreadsheet** and MTC superdistricts. The Bay Area has nine counties, which are too big, and 101 cities, which are too many and too diverse to study easily. MTC also divides the Region into 34 superdistricts of roughly comparable size. Each superdistrict usually has a roughly reasonable commute shed consisting of itself and its adjacent superdistricts. The basic data are available on line at ABAG's FTP site where MTC data can be downloaded.

Our estimate is based on very approximate commute distances and lacks the precision of a model-based analysis. The estimate is not based on freeway capacity, but on distance, looking for job surpluses that cannot be covered by "reasonable" commutes. For example, the distance from San Rafael to downtown San Francisco is 20 miles, which I considered reasonable. From Novato to downtown San Francisco is 28 miles, which I accepted but considered to be on the outside edge of reasonable. The methodology could be applied to any region and for different ways of defining "reasonable."

An estimate of these numbers based on superdistrict-defined commute sheds is in Table 1 for 2000 and Table 2 for 2020. Table 1, "Job Surpluses by MTC 34 Superdistrict 2000," uses ABAG's Projections 2000, the latest available. The Table lists the superdistricts, their employed residents, employment (jobs), worker surplus, adjustments of worker surpluses based on allocations from adjacent superdistricts, adjusted surplus as a percent of workers, and a description of the adjustments. Superdistricts with job surpluses after adjustment are bolded.

Some adjustment to the roughly reasonable commute shed is needed because it underestimates the number of workers who can get to work in a reasonable distance. The adjustment estimates "cascade flows." A cascade flow allows workers from a job surplus city to commute to an even bigger job surplus nearby and have its jobs covered by employees from employee surplus cities further away. For example, Daly City/San Bruno has a job surplus which can be considered more than covered by the employee surplus from San Mateo/Burlingame, allowing Daly City/San Bruno employed residents to be allocated to the big job surplus in San Francisco. Similarly, workers can flow from St. Helena to Napa to Vallejo to Richmond to Oakland to San Francisco, all with reasonable commutes. The cascade adjustments do not describe what actually happens; they are a "what if" approximation of how short commutes might work, with the jobs not reachable by reasonable commutes being the excess causing problems.

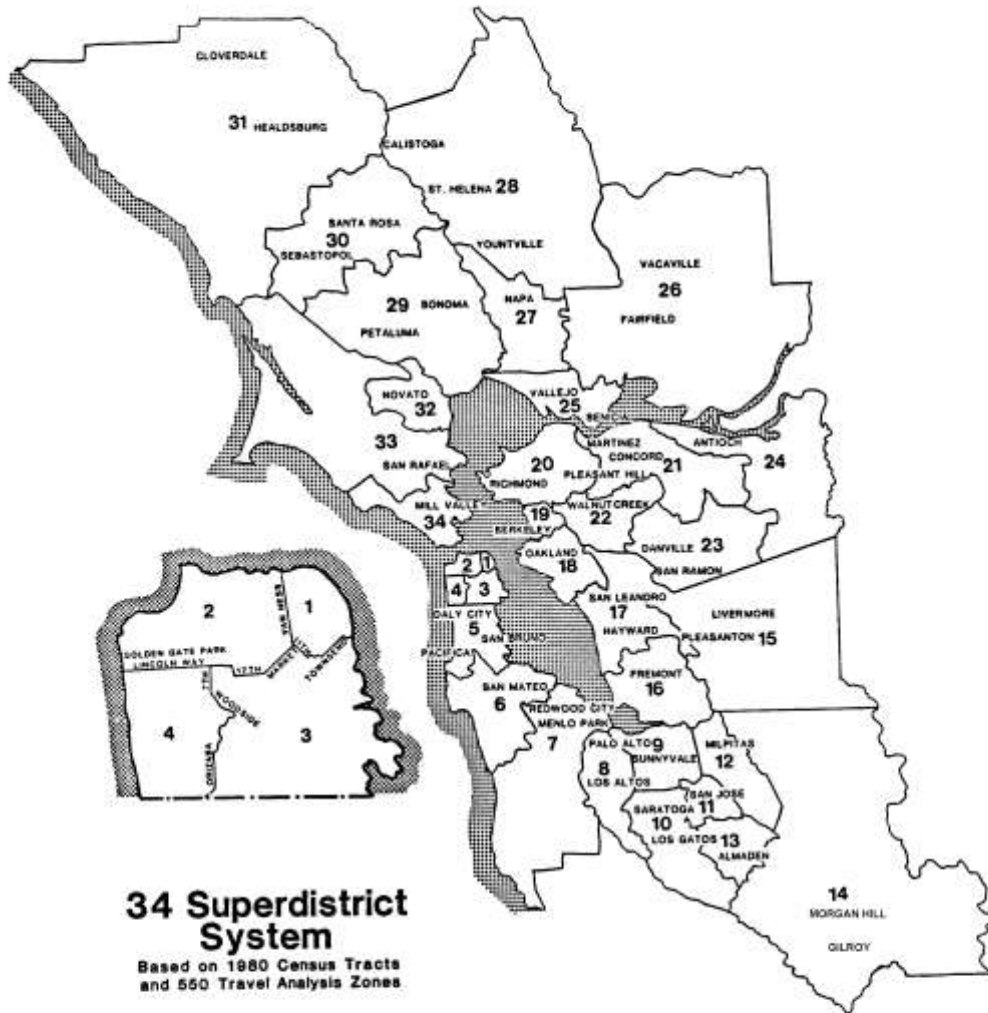
Twelve of 34 superdistricts have land use job surpluses, that is, a surplus of total employment over employed residents within the superdistrict. Nine of these, however, including Superdistrict 15, disappear when adjusted for short commutes from adjacent superdistricts. The surplus of 10,000 jobs in Superdistrict 15 Livermore/Pleasanton is misleading. Data on nearby Tracy, if treated as an adjacent superdistrict, would show the Livermore/Pleasanton surplus is covered by employed residents from Tracy.

The three superdistricts remaining have severe job surpluses beyond reach by reasonable commutes. Two of them constitute Silicon Valley: Superdistrict 8 with Palo Alto and Superdistrict 9 with Sunnyvale, Mountain View, and Santa Clara. These four cities, out of the 101 in the region, stick out like sore thumbs in regional statistics. The third superdistrict is downtown San Francisco. In 2000 "The City" had an adjusted surplus of 66,000 jobs, while Silicon Valley had an adjusted surplus of 108,000 jobs. Silicon Valley and San Francisco have imbalances many orders of magnitude bigger than any others and should be the focus of any serious discussion. Not surprisingly, they have colossal housing prices and horrible commutes. Silicon Valley is the bigger problem because of its larger size, predominance of drive-alone commutes, dispersion of destinations, and lack of transit infrastructure. San Francisco has lower environmental and commuting externalities, making it easier for The City to meet housing supply or transit access goals.

ABAG Projections 2000 estimates that current trends will make matters worse. See Table 2. The City job surplus goes from 66,000 to 145,000 jobs. Silicon Valley goes from 108,000 to 133,000 jobs. Converting the job figures to households would give us the number of houses needed.

While a computer estimate would be more precise, the spreadsheet estimate gives an idea of the magnitude of the problem.

Superdistrict Map



34 Superdistrict System

Based on 1980 Census Tracts and 550 Travel Analysis Zones

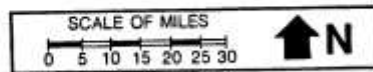


Table 1

Table 1. Job Surpluses by MTC 34 Superdistrict 2000

SD# SUPERDISTRICT	Employed Residents			Adjusted 2000	Percent 2000
	2000	2000	2000		
1 Downtown San Francisco	65,255	380,367	(315,112)	(65,969)	17%
2 Richmond District	127,244	81,706	45,538		
3 Mission District	161,572	139,371	22,201		
4 Sunset District	68,029	27,416	40,613		
5 Daly City/San Bruno	157,267	163,342	(6,075)	adjacent	
6 San Mateo/Burlingame	121,402	104,309	17,093	split to 1 and 8	
7 Redwood City/Menlo Park	115,034	112,718	2,316		
8 Palo Alto/Los Altos	99,656	166,624	(66,968)	(40,401)	24%
9 Sunnyvale/Mountain View	139,169	395,541	(256,372)	(67,167)	17%
10 Saratoga/Cupertino	181,853	150,443	31,410	split to 8 and 9	
11 Central San Jose	150,846	153,003	(2,157)	adjacent	
12 Milpitas/East San Jose	185,381	98,418	86,963		
13 South San Jose/Almaden	122,850	65,962	56,888		
14 Gilroy/Morgan Hill	48,944	47,236	1,708		
15 Livermore/Pleasanton	93,988	117,602	(23,614)	Tracy	
16 Fremont/Union City	167,213	131,152	36,061	split to 9 and 17	
17 Hayward/San Leandro	154,970	160,933	(5,963)	adjacent	
18 Oakland/Alameda	196,116	209,560	(13,444)	adjacent	
19 Berkeley/Albany/Emeryv.	82,315	106,542	(24,227)	adjacent	

20	Richmond/El Cerrito	108,620	74,731	33,889	
21	Concord/Martinez	121,660	108,784	12,876	
22	Walnut Creek/Lamorinda	72,897	75,143	(2,246)	adjacent
23	Danville/San Ramon	68,166	52,481	15,685	split to 15 and 22
24	Antioch/Pittsburg	104,545	48,951	55,594	
25	Vallejo/Benicia	69,060	46,077	22,983	
26	Fairfield/Vacaville	116,546	83,433	33,113	
27	Napa	42,003	37,268	4,735	split to 28 and 19
28	St. Helena/Calistoga	19,595	22,442	(2,847)	adjacent
29	Petaluma/Sonoma	85,506	60,586	24,920	
30	Santa Rosa/Sebastopol	111,127	123,841	(12,714)	adjacent
31	Healdsburg/Cloverdale	38,767	19,103	19,664	
32	Novato	33,032	25,988	7,044	
33	San Rafael	59,797	55,384	4,413	
34	Mill Valley/Sausalito	47,572	42,138	5,434	
	Bay Area	3,537,997	3,688,595	(150,598)	
	San Francisco	422,100	628,860	(206,760)	
	San Mateo	393,703	380,369	13,334	
	Santa Clara	928,699	1,077,227	(148,528)	
	Alameda	694,602	725,789	(31,187)	
	Contra Costa	475,888	360,090	115,798	
	Solano	185,606	129,510	56,096	
	Napa	61,598	59,710	1,888	
	Sonoma	235,400	203,530	31,870	
	Marin	140,401	123,510	16,891	

"Worker surplus" is Employed Residents Less Total Employment.

"Percent" is adjusted job surplus as a percent of employment.

San Francisco is adjusted using cascade flows from SDs 2-5, half of SD 6, Marin, Napa, Contra Costa, and Alameda Counties and SD 25.

The cascade flows through SDs 5, 18, 19, 22, and 30.

Palo Alto/Los Altos is adjusted using SD 7, half of SD 6, and half of SD 10.
 Sunnyvale/Mountain View is adjusted using half of SD 10, all SDs 11 to 14, and SD16 not used by SD17, and includes cascade flows through SD 11.
 Livermore/Pleasanton was reduced by SD 23 and Tracy less the deficit in SD22.
 "Adjacent" means the worker deficit is covered entirely by adjacent superdistricts.

Table 2

Table 2. Job Surpluses by MTC 34 Superdistrict 2020

Superdistrict	Employed Residents		Total Employment		Worker Surplus	
	2020	2020	2020	2020	Adjusted	Percent
1 Downtown San Francisco	75,479	431,362	(355,883)	(146,996)		34%
2 Richmond District	138,349	95,976	42,373			
3 Mission District	180,142	173,606	6,536			
4 Sunset District	73,322	30,720	42,602			
5 Daly City/San Bruno	184,740	193,990	(9,250)	adjacent		
6 San Mateo/Burlingame	146,814	122,563	24,251	split to 1 and 8		
7 Redwood City/Menlo Park	140,950	135,278	5,672			
8 Palo Alto/Los Altos	117,334	180,881	(63,547)	(26,436)		15%
9 Sunnyvale/Mountain View	182,785	469,008	(286,223)	(106,170)		23%
10 Saratoga/Cupertino	213,152	174,525	38,627	split to 8 and 9		
11 Central San Jose	185,365	184,188	1,177			
12 Milpitas/East San Jose	226,408	124,441	101,967			
13 South San Jose/Almaden	143,742	78,714	65,028			
14 Gilroy/Morgan Hill	69,006	96,462	(27,456)	adjacent		
15 Livermore/Pleasanton	147,291	187,629	(40,338)	Tracy		
16 Fremont/Union City	203,746	177,759	25,987	split to 9 and 17		
17 Hayward/San Leandro	185,550	194,013	(8,463)	adjacent		

18 Oakland/Alameda	237,725	261,932	(24,207)	adjacent
19 Berkeley/Albany/Emeryv.	97,597	124,009	(26,412)	adjacent
20 Richmond/El Cerrito	131,179	100,197	30,982	
21 Concord/Martinez	152,374	140,303	12,071	
22 Walnut Creek/Lamorinda	89,162	87,802	1,360	
23 Danville/San Ramon	102,586	79,391	23,195	split to 15 and 22
24 Antioch/Pittsburg	163,997	92,988	71,009	
25 Vallejo/Benicia	88,505	68,862	19,643	
26 Fairfield/Vacaville	191,506	141,918	49,588	
27 Napa	58,533	63,859	(5,326)	adjacent
28 St. Helena/Calistoga	26,866	25,961	905	
29 Petaluma/Sonoma	117,155	93,564	23,591	
30 Santa Rosa/Sebastopol	141,341	173,558	(32,217)	adjacent
31 Healdsburg/Cloverdale	58,499	31,988	26,511	
32 Novato	39,681	38,268	1,413	
33 San Rafael	71,173	65,387	5,786	
34 Mill Valley/Sausalito	56,247	46,855	9,392	
Bay Area	4,438,301	4,687,957	(249,656)	
San Francisco	467,292	731,664	(264,372)	
San Mateo	472,504	451,831	20,673	
Santa Clara	1,137,792	1,308,219	(170,427)	
Alameda	871,909	945,342	(73,433)	
Contra Costa	639,298	500,681	138,617	
Solano	280,011	210,780	69,231	
Napa	85,399	89,820	(4,421)	
Sonoma	316,995	299,110	17,885	
Marin	167,101	150,510	16,591	

"Worker surplus" is Employed Residents Less Total Employment.

3) Policies to reduce externalities. We have looked at a cost-benefit analysis based on job location externalities. We have discussed quantifying the job surplus/housing deficit using a model and a spreadsheet. Now we discuss policy that would prevent the imposition of even more externalities by a few businesses and cities.

Currently, hyper-growth in a few locations (3 of 34 superdistricts) has created a two-tier society because the disadvantaged, and even the middle class, are completely priced out of local housing markets. Abusive practices by a few cities-expanding jobs grossly in excess of local housing supply-are anti-environmental and anti-equity. Part of the solution is smart growth and transit over moderate distances in dense corridors to reach the severe surpluses, but also part of the solution is to restrain job growth.

Regional job location management requires a willingness to take effective action against a small number of cities. Should severe job surplus locations be allowed to continue to increase jobs even more despite costs to the region?

Regional job location management does not assume a reduction in the number of jobs; it affects only their location in the region or outside it. We have three main choices: losing jobs because of housing and transportation problems (current policy); uncontrolled job growth that is unsustainable (also current policy); and sustainable job growth. When linked to the other policies, job management helps improve the prosperity of people in the region. Those other policies require, for example, that the jobs be accessed by short to mid-distance commutes served by transit, and that they shorten and shift modes for existing commutes and not be a basis for more sprawl.

Total regional jobs are affected only when some jobs leave the region. Jobs outside the Bay Area help other regions and sustainability. Jobs would go to places like Tracy, giving them a better job-housing balance. They would go to other places in the U.S., taking advantage of their affordable housing and shorter commutes. They would go abroad, helping economic development of less wealthy nations. They would, in short, follow the pattern of the jobs that have already gone. The Bay Area gets a better job housing balance, more affordable housing, shorter commutes, cleaner air, and customers in other regions.

The concepts for sustainability in one region apply to all. For example, job growth in Tracy should redress the existing imbalance and not be so great that it leads to more sprawling hypergrowth, spreading ever-outwards to meet Sacramento and Fresno. The jobs should be within a tight urban limit line and accessed by transit; neighborhood development should be Smart Growth at higher densities.

Regional consensus is the necessary political basis for creation of a regulatory scheme to be implemented by a regional agency or initiative. Regional job location management would place a **job-creation moratorium on a small number of cities** with severe job surpluses. In the Bay Area, for example, only five cities seem cause regional costs greater than benefits. They would be barred from making decisions that create new jobs. These decisions would be those relating to general plans, land use designations, zoning, building permits, use permits, and so on. Job growth is strongly influenced by, if not fully controlled by, such city decisions. Dominant paradigm land use policies, which are usually used to promote unsustainable growth, would be reversed. Instead of perpetuating a never-ending quest to build houses to meet job growth, job growth would be slowed to let housing catch up.

The moratorium would be performance-based, using quantified, objective criteria that can be specifically stipulated ahead of time. Severe surplus cities could escape controls by not

externalizing costs: building enough housing, or providing enough transit from close-in housing, so that housing costs, commute durations, and air pollution fall to acceptable norms. Freeway performance could be used to measure the results.

Would a moratorium work? Land use controls have already been used to stop growth completely, with an impact on growth and jobs that is not just a possibility but accomplished fact. Whole counties like Marin have restricted growth so much that their population is stable or close to it. Similar growth management exists in Northern Napa, Western San Mateo, and most of Santa Cruz counties. These policies have affected the distribution of the population, in other words, migration.

Restrictive land use policies have been motivated by environmental protection and by social and economic exclusivity with little consideration for growth and equity. They have mostly ruled large areas off-limits to growth. While the incidental restriction on job growth may be helpful for sustainability, the resulting elitism and lack of equity give them a bad name in the context of social justice. The sustainability paradigm, however, deals effectively with affordable housing with policies that reduce demand (job location management, this section) and promote supply (section 1 Smart Growth; section 7 Fiscal reform and affordable housing).

Regional job management is not an entirely new idea. Santa Barbara in the 1970s reduced designations for development in its plan for purposes of stabilizing population with a target of 85,000 people, a plan approved by the voters and placed in the city charter. New zoning cut residential potential and land zoned for industrial and commercial development. Santa Barbara County voters reinforced the city growth limits by rejecting water from the state water plan. From 1967 to 1989 these voters approved 13 of 16 measures restricting growth, and slow growthers controlled city and county governments.¹⁵ A severe drought complicated the use of restricted water capacity, and in any event the city grew to 90,000 even by 1990, so it is difficult to judge the success of the plan.

Is it feasible for the job surplus cities to meet their housing need? There is no real physical impediment to serious increases in density using new urbanist and Smart Growth concepts. Such changes, however, are foreign to the dominant paradigm of suburban local government, and not even very well understood in "urban" San Francisco. Since it is very difficult to overcome a long history of irresponsible land use planning, these cities would probably have job growth limited for some time, especially the four in Silicon Valley. They could even decide they do not want to grow if it means more housing, and would accept the job moratorium. Ironically, an unwillingness to supply needed housing could result in some second rate sustainability. The solutions are not clear to local leaders, and in the meantime the new sustainability paradigm of responsibility is much needed to turn off the job-housing hypergrowth treadmill.

How many jobs could be affected by regional job location management? Using the spreadsheet approach, the actual numbers seem quite manageable.

In 2020 ABAG estimated that the Bay Area would have about 4,438,000 employees and 4,688,000 total jobs, a surplus of 250,000 jobs, or 5.3 percent of total jobs in 2020. We will assume that the surplus jobs should relocate outside the region in order to achieve a balance of

¹⁵ Santa Barbara Planning Task Force, *The Effects of Urban Growth: A Population Impact Analysis*, Praeger, 1976, by Richard Appelbaum et al. The Santa Barbara City Council, based on a range of choices documented in the task force report, chose an eventual size of 85,000 people and approved job zoning consistent with that number. Voters overwhelmingly approved the plan in a citywide advisory referendum. See also Kee Warner and Harvey Molotch, "Growth Management in Three Areas: Use and Exchange Values in Political Practice," paper for Western Political Science Meeting, Newport Beach, March 22-24, 1990, 19 pages. Covers Santa Barbara, Santa Monica, and Riverside.

jobs and housing in the region. Considered each year over the 20 years, 12,500 jobs per year would turn up elsewhere, worth a lot of headlines, or a quarter of one percent of the 2020 job total, not worth any headlines.

Despite jobs moved outside the region, jobs in the region keep growing. They grow by 750,000 excluding the 250,000 sent to other regions. Hopefully the resulting growth of 37,500 jobs per year would get three times as many headlines as the jobs moving away, just to reassure the old paradigm.

Some jobs would move within the region. ABAG figures, adjusted for reasonable commutes and for jobs moved outside the region, indicate that the severe job surplus areas would get worse in 2020 by about 100,400 jobs. This figure, or most of it, would move within the region from severe surplus areas to others, improving all balances. Only about 13 percent (100,400/750,000) of new jobs would wind up in a different location within the region. The 100,400 moved jobs are only 2.3 percent of the total balanced employment (100,400/4,438,000) in 2020. The relocation would take place over 20 years, or about 5,000 jobs per year relocating to better balanced locations.

Given powerful and dynamic national and international economic forces affecting the regional economy, these relatively small shifts in job location would not be significant in the larger picture.

To recapitulate much of the above, under the dominant paradigm, a small number of new jobs in job-rich cities will aggravate already severe regional problems with impunity. In the Bay Area, a few cities-Palo Alto, Sunnyvale, Mountain View, Santa Clara, and San Francisco-with huge job surpluses derive fiscal benefits while imposing severe costs on the Region. The dominant paradigm holds that these cities should build more housing, but is unwilling to impose any "sticks" to make it happen. In the new paradigm, cities which create the need for housing would have primary responsibility to supply it, and regional job location management would prevent them from making the situation worse. Stabilizing jobs while increasing housing would help lower housing costs for less affluent workers, improve commutes, and clean the air.

There needs to be a wider perception that businesses and cities creating the problem are **behaving unethically**. Neighborhoods, environmentalists, and cities with housing surpluses should not be blamed.

While the focus of this discussion has been severe policies to deal with the most irresponsible cities, there are additional ideas for **linking housing creation to job creation**. Such policies would apply where job creation does not aggravate an existing severe imbalance, but does create problems of increased housing demand. Policy can focus on the major land use decisions that affect employment, such as the approval of new industrial buildings and of new offices. New state law could link approvals to the building or rehabilitating of some of the housing needed by the job-creating project. The applicant for the job project could be required to invest in or otherwise guarantee creation of housing. The law would give a city less ability to get the jobs and avoid the housing, and would instead have an incentive to expedite housing if it wanted the jobs. To work economically, there would also have to be measures to prevent a competitive disadvantage to older central cities by competing areas creating more sprawl and auto-based commuting.

7. Fiscal reform and affordable housing

Perverse local tax incentives encourage one city to get taxes from people who live in other cities, and penalize cities for providing affordable housing.

This discussion focuses on the revenue which supports the urban services of cities and counties and how it relates to affordable housing. It does not look at county-wide services or schools.

The Problem. "Fiscal zoning" or "zoning for dollars" is endemic, particularly for the sales tax. Currently, the sales tax goes to the city where the point of sale is located, not necessarily the city where the purchaser resides. A small or rich city with a shopping center next to a big or poor city whose residents shop there drains sales tax from its neighbor. Cities get only one cent of a sales tax of eight cents or more, yet it is enough, given the lack of other options, to determine the location of shopping centers, big box retail, warehouse stores, auto malls, and multiplex theaters, particularly along freeways convenient for people from out of town.

(While our focus is on urban systems, the sales tax also has other problems. It burdens a narrow part of the economy, store-based sales of goods other than food and medicine. Food and medicine, services, and most mail order, telephone, faxed, and Internet sales are exempt. Unlike all other sales taxes, the sales tax on gasoline is designated for transportation and therefore functions like an excise tax and reduces general fund revenues. Sales taxes are also regressive.)

The property tax has similar incentives. Currently, high income residents in a high income city share their property taxes with very few lower income residents, while in the same county high income residents in a low income city share their property taxes with many lower income residents. High income residents in low income cities should be leading the campaign for tax justice. Also, cities with relatively more commerce and industry generate more property tax per resident, while high population cities get much less per resident, especially if they have low incomes.

The sales and property tax incentive results not only from revenue from commerce and industry, but also decreased expenditures to serve them compared with housing. Service costs for commercial and industrial uses are a fraction of the cost of serving neighborhoods. Affordable housing gets a double whammy because service costs rise and revenues decline with household income.

Finally, the state of California took needed revenues from cities and counties during the Gov. Pete Wilson Administration (1990-1998), crippling the local tax base and intensifying the local quest for revenue.

Cities, in effect, are punished if they provide affordable housing and are rewarded for upper income housing, commerce and industry. They act like small businesses in response to income opportunities. They look at the "fiscal balance," the balance of revenues and expenditures of development proposals. Job rich areas have no incentive to provide affordable housing, and, in fact, have good reasons not to. The lower the income of households served by proposed housing, the greater the potential fiscal deficit and the lower the political support.

The Results. The results are evident in unbalanced land use planning. Data on zoning and land availability compiled by ABAG shows that far too little land is zoned for housing, even less land for Smart Growth, and too much land for industry, office, and commerce. Fiscal zoning and unbalanced plans contribute to extreme job surpluses in a few places and artificially high housing prices in many areas.

Fiscal incentives also contribute to gentrification in certain high-growth neighborhoods of regions such as the Bay Area. The more gentrification and dislocation, the greater the revenues and the lower the expenditure for services, encouraging dislocation of the working poor.

Another result is inequity among cities due to wealth, making it difficult for low wealth cities to provide adequate services.

The dominant paradigm behind local fiscal policy, if any, is, at best, one of inertia, incrementalism, and self-interest. It is hard to find any other explanation; no one really defends the system, just their own revenues. The sales and property taxes when created were more broad-based, with rich and poor in the same jurisdiction. Minor changes along the way in the taxes have not dealt with major changes in the urban system. The legislature has created a game only a few cities can win. Cities benefitting from the system oppose sharing revenues, and poorer cities prefer to try to play the game, too. Local officials tend to define "fiscal reform" as "more money for my local government." The public is blissfully unaware of how things work and are, surprisingly, generally satisfied with local services.

The sustainability paradigm supports revenue sharing and devolution of state revenues to local government, but is still searching for consensus behind some specific proposals.

The Reform. Fiscal reform is needed and would reinforce other sustainability policies if it provides adequate incentives for balanced planning, affordable housing, and fair services. Property and sales taxes need to be shared more rationally to meet service needs. A recent study showed that one possible scenario would benefit 64 percent of the Bay Area population.¹⁶ Property and sales taxes need to be redistributed from high income cities to lower income cities and from business to neighborhoods. Fiscal reform also requires devolution of local revenues taken by the state. While the situation may seem hopeless taking each problem in isolation, in combination there may be hope: use devolution of state revenues as an incentive for locally negotiated revenue sharing plans.

While not perfect, counties are a fairly good basis to frame revenue sharing. (The problem of variation in tax base among counties would have to be managed at the state level.) Sales and property taxes within a county should be distributed, primarily, by population with adjustment to favor lower income households and, secondarily, to uses like retail, office, and industrial, based on reasonable and uniform service costs. Such distribution requires sharing among jurisdictions. This is easier said than done, due to the multiplicity of services, fragmentation of governments, incompatibility of budget categories among governments, and diversity and complexity of revenue sources and transfers. Complexity combined with self-interest is a formula for stasis.

The solution may be legalized bribery: With so many vested interests at stake, great complexity, and public disinterest, local taxes will be reformed only if the state government puts significant new money on the table which counties and their cities would get if they agreed to share revenues. A local fiscal reform law would lay out rules or a framework for how to do it, allowing some flexibility for negotiation and varying circumstances. For example, county governments, which provide county service county-wide and city services in unincorporated areas, would apply revenue sharing to the city service parts of their budgets. The distinction between city and county services is mostly clear in practice, but counties would have to also make it clear in their budgets. Also, special districts both elected and appointed need to be integrated into the scheme.¹⁷

The reform law would call for and facilitate county-wide compacts among cities and counties to share property and sales revenues and, in the process, simplify and make more

¹⁶ Urban Habitat Program, What if we shared? San Francisco, May 1998, based on Myron Orfield, San Francisco Bay Area Metropolitcs; A Regional Agenda for Community and Stability, 1998.

¹⁷ Concerning the property tax, assessment districts would probably be unaffected. Mosquito abatement, paramedic, vector control, flood control and urban runoff would be considered county-wide functions and would not be affected. School maintenance assessments and other education amounts would be assigned to education and not be affected. The countywide tax, landscape and lighting fees, park debt service, park maintenance, and recreational assessments would be part of the scheme.

uniform the system of accounts, taxes, transfers, taxes, licenses, permits, charges, fees, fines, and special funds. Revenue sharing could start with a small percent of the total tax and small amounts of money, but phase in over a period of years to comprehensive sharing. These complex agreements (which should lead to simplification) will be impossible to negotiate without the carrot of new money. Devolution can provide the incentive to fiscal reform.

Since the economy and state revenues have recovered, there are resources to pay for reform. Governor Davis has shown little interest, but many new legislators come from local government and are sympathetic to sounder funding. Many local officials and interested experts support fiscal reform, and could work out a scheme and even find some consensus. If legislation fails, interested cities could support a state-wide initiative. The major barrier to reform at this time is the lack of consensus among those who want to do it about how to do it.

Fiscal reform would remove a major stimulus to bad land use planning. Cities would lose their reasons for excessive zoning for industry, office, and retail, and be more rewarded for converting that zoning to residential. In the best of worlds, the bias towards unending job growth and beggar-thy-neighbor fiscal zoning would become balanced planning for sustainability. Cities would have more adequate, secure, and equitable funds for services.

Affordable housing. A major impetus supporting fiscal reform is to increase affordable housing. Fiscal reform and Smart Growth should increase housing supply while job management dampens poorly located and destabilizing job growth. We need to discuss the conflict of paradigms, how much housing is enough, and how to manage inequitable dislocation due to gentrification.

Conflict of paradigms. While the sustainability paradigm strongly supports affordable housing, it does not support all the policies advocated by the dominant paradigm, which cause hyper-growth and will not solve the problem. Current law in California, for example, allocates a housing responsibility to cities with no clear connection to how much a city has actually caused the housing need. A state law requires, fortunately without teeth, that cities build enough "fair share" housing to meet a need determined by the state Department of Finance (demographic projections), the Department of Housing and Urban Development, and regional councils of government. Theoretically, a failure to meet targets can lead to loss of federal or state funds, and the hypergrowth paradigm calls for making penalties tougher.

The allocation method, however, seems to have no legitimate basis. ABAG, which implements the law, assumes nothing will be done about job growth and assigns housing responsibilities to cities based on a method few people understand or accept. Cities with housing surpluses that would like to get more jobs are told they must increase their housing. Home builders and coopted housing and environmental advocates support the housing targets without knowing their ethical basis and without dealing with how the lack of growth management means that housing supply can never catch up. The policy would only build more housing, but can never succeed in building enough housing.

Cities with more jobs than local workers are given a mandate, but without a connection to their job surplus. ABAG, for example, assigned Pleasanton 4,947 units, but the city's plan allows only 2,881 more houses. The Bernal property, once proposed to develop to 1,900 units, is likely to get only 581, further reducing the potential. Pleasanton protested the ABAG number as an "unfunded mandate" because there was no money for infrastructure and mitigation of traffic, sewer, and water needs. Pleasanton, which now has its local solution of more jobs than workers,

said housing is a regional problem.¹⁸ Pleasanton is a cause of the housing responsibility it rejects, but there is no clear jobs-housing connection in ABAG policy.

ABAG, to its credit, is paying new attention to job surplus areas, a step towards a new paradigm that needs to be strengthened and more clearly explained. As discussed, the sustainability paradigm considers job location externalities and would impose controls on them. For example, a regional scheme could impose a moratorium on more job development until the housing need is met. It would be interesting to hear Pleasanton's response. Dublin is even worse.

How much housing is enough? The housing crisis is real but exaggerated by the hyper-growth paradigm. The great majority of Bay Area residents are at least adequately housed and many have more than enough. Americans in general are far better housed than most people in the world. The market generally works. Most people who can't afford to live in the Bay Area don't live there. From a market view, high housing prices are their own solution; supply meets demand.

The demand for affordable housing cannot be satisfied if the definition is too generous and too subsidized. Many statistics on affordable housing are more political than economic, and have unrealistic notions about affordability. Focusing only on increasing housing supply ignores the role of excessive job growth and sustainability. Housing may be unnecessarily elevated as an absolute good, to the detriment of other values.

We need a coherent definition of what is meant by an "affordable house." A house in 1950 was often 800 square feet on a cement slab on a small lot and a narrow street. Now a house can easily mean a monster home of over 3,000 square feet for two people on a big lot on a wide street, with many technological advances and features over the 1950 house. Statistics based on a constant value home for the same size of family dramatically reduce the estimate of housing need. Using a constant value home focuses on basic housing rather than the enhancements and investment value.

Similarly, the history of home ownership reveals there used to be many more renters. Fewer could buy, and those who did would typically purchase a home later in life than now, and to house bigger families. For a few years of the early suburbanization boom of 1946-1965, housing was more affordable than before or since, but that is an unrealistic basis for understanding housing. The long-term picture still shows great success. Nationally, as a result of the Home Mortgage Disclosure Act, the Community Reinvestment Act, and vigorous enforcement by the Clinton administration, loans to low and moderate income home buyers rose 80 percent from 1993 to 1998. Home ownership is now 68.8 percent, the highest in U.S. history.¹⁹

The true housing crisis, where the disadvantaged suffer deprivation, affects a small percent of the population. The problem is to define carefully where markets result in social inequities that government should correct, and to fix the problem in a way consistent with sustainability. There is a middle ground between unsophisticated advocacy of unending building and blind faith that the market will solve everything.

The affordable housing problem falls primarily on lower income renters with stable incomes facing rising rents. Migrants are both a factor in keeping wages down and in pushing housing prices up, but are generally better off than in their impoverished areas of origin. There is some irony in the fact that they partly cause the crisis, suffer from the crisis, and are better housed than before. The affordability crisis falls secondarily on middle income workers with jobs in job-surplus centers like Silicon Valley and San Francisco.

¹⁸ "Pleasanton takes aim at ABAG numbers," *Valley Times*, Sept. 28, 2000.

¹⁹ Neal Pierce, "Disclosure: Key Weapon for Neighborhoods," *Washington Post Writers Group*, July 23, 2000.

Inequitable dislocation due to gentrification. Inequitable dislocation is not a sustainability problem, but a simple matter of social justice. Market forces, current fiscal incentives, and Smart Growth may cause gentrification. Gentrification is a process of neighborhood improvement based on newcomers paying higher rents. Cities always have some neighborhoods where decay pushes middle income people out and others where reinvestment pushes lower income people out.

Not all gentrification means inequitable dislocation. More affluent people may move into new buildings on vacant lots, or convert old non-residential buildings to housing, or use other developments that do not affect low to moderate income renters. In some cases there may not be clear equity issues in dislocation.

There are typically four housing situations affecting equity in low to moderate income neighborhoods. 1) Some residents are owners, who love gentrification because it brings retail improvements, reduces crime, and restores the neighborhood to the higher quality the old-timers remember. They are better off if they keep living there, and better off if they sell for a good gain on their investment. 2) Other residents are at the bottom of society; they are highly transient and generally have many problems. It takes an effort to find and help them. They are difficult to house without comprehensive social intervention. They are the first to disappear when a neighborhood starts to come up. 3) The third type of residents are working poor not rooted in the neighborhood and willing or wanting to move, e.g., closer to work or other family, for the same reasons that other people move.

4) The fourth type of residents are **renters rooted in their neighborhood**, who are important for the economy and the social fabric of the neighborhood and city. They can be subject to evictions above normal levels and undergo great stress in finding alternatives. Through no fault of their own, their world gets turned upside down.

The dominant paradigm tolerates some charitable efforts but mostly supports dislocation as part of a free market process that revitalizes the city and expands the housing supply, with benefits trickling down to low and moderate income households. The sustainability paradigm holds that working class renters often need and deserve help with housing.

There are many ways to help. For example, the Community Capital Investment Initiative of the Bay Area Alliance is looking for ways to invest in local businesses in low income neighborhoods so as to benefit disadvantaged residents. In addition, education and training of the disadvantaged can help their incomes and thus their housing. Welfare (TANF, SSI) and minimum wage floors need to be high enough to pay for adequate housing without undercutting incentives to work. More money for section 8, vendor pay, board and care reimbursement, foster care, nursing home, and tax credit and other financing of projects by non-profit agencies like Bridge Housing and Eden Housing can help. Such subsidized housing tends to be restricted to seniors, the disabled, and, in a few cases, working families of moderate (not low) income, and the program needs to be expanded. Also, many redevelopment agencies have accumulated large surpluses they must somehow spend on affordable housing. Requirements for ten percent affordable units in larger housing projects can help.

Rent control may have some role if sharply focused. Circuit-breaker policies might be needed, so that when rents and evictions rise too far above normal rates, as started happening in Oakland in 2000, rent moderation policies would kick in until supply catches up with demand or other assistance can help the household. Overly strict rent controls, however, can reduce the supply of rental housing and favor politically skillful sitting tenants over those of comparable income who are willing to pay more to live in a neighborhood.

It generally is more effective in the long run to raise incomes and increase housing supply rather than to hold investment returns down. Here the dominant paradigm and the sustainability paradigm overlap, but sustainability also calls for more aggressive protections of working class renters, more Smart Growth housing (which is inherently more affordable), and management of job growth. Realistically, affordable housing programs are not going to get large-scale new funding, and they cannot work well unless job growth is also moderated to allow housing supply to catch up with demand. The new paradigm solves the affordable housing problem with policies that also lead to sustainability.

8. Global warming

People, especially Americans, have already substantially and irreversibly changed the global climate, requiring a dramatic reduction in carbon loadings.

Global warming is already happening on such a massive and global scale that it defies our imagination. The science is conclusive. The evidence is overwhelming.²⁰ The computer models work with increasing accuracy. No data are inconsistent with the views of the International Panel on Climate Change, the large international body of climate scientists. They are now essentially working on the details: on cloud formation, the North Atlantic oscillation, other ocean currents, details of climate history and back-casting, and why the process is uneven. How much agriculture will be lost in Texas? How much of Florida will be flooded? Recently, the IPCC decided global warming was happening a little faster than some projections.

The global average temperature is increasing slowly in human terms, but very rapidly in geologic terms. Ice cores from the Himalayas show the late 20th century to be the warmest period in 1,000 years. The 1980s and 1990s broke heat records. Seas are rising, storm events are increasing. A few years ago a piece of ice the size of Rhode Island broke off the Antarctic ice cap. Around the North Pole is water in summer, not ice. Both ice caps are melting, along with the glaciers of Asia, South America, and Africa, and most of the Greenland ice sheet (some of the top of Greenland is getting thicker from increased snowfall, also due to global warming). The ice sheets are so reduced that they feed less water into their rivers.²¹ In the northern hemisphere, plant and animal species are moving their northern and southern ranges ever northward, as spring comes earlier and fall starts later. Tropical disease-bearing insects are moving north, and warmer temperatures allow the outbreak and spread of more communicable diseases. The permafrost is melting, releasing more warming gases, yet also partially offsetting this with more plant growth. Coral reefs are bleaching.

The primary cause of these effects is increased carbon dioxide in the atmosphere caused mainly by human burning of fossil fuels for transportation and electrical energy. Atmospheric carbon has been increasing slowly in human terms, but very rapidly in geologic terms. The cause and effect the scientist can see so clearly over hundreds of thousands of years is not visible to the uninformed person in a few years.

America causes more global warming than any other nation in the world, both per capita and in aggregate. In the Bay Area, for example, fossil fuels supply 80 percent of energy. The region emits about six tons of fossil carbon per person per year. Adding the weight of oxygen to the carbon makes 20 tons of carbon dioxide per year.²² The Bay Area is doing virtually nothing about global warming. The dominant paradigm simply ignores the issue.

²⁰ Sherman Lewis, 2000 Christmas essay, has a 3 page summary of evidence.

²¹ AP, "Himalayas heating up, sample finds," SF Chronicle, September 15, 2000.

²² Peter Lydon, "The climate change issue and Bay Area metropolitan planning," personal communication, July 20, 2000.

The sustainability paradigm calls for a carbon tax, which would internalize the external cost of global warming by placing a tax on fossil carbon (called a Pigovian tax). The tax would be highest on coal, which is mostly carbon, lower on oil, which is hydrogen and carbon, and lowest on natural gas, which has even more hydrogen. A parallel tax could also be applied to other global warming gases. Activities like reforestation and insulation which reduce carbon dioxide could get an incentive, assuming a simple and fair way to do it could be found.

The carbon tax to be effective would produce too much revenue, so it should be swapped with other taxes. As carbon tax revenues go up, other tax revenues would come down equally, maintaining steady governmental revenues and constant aggregate demand. This is the "tax swap" idea. As a result, the price of carbon would go up relative to other prices, with no windfall for government or the oil business, and no loss of purchasing power in the economy.

Elasticity is an extremely important for policy. Elasticity is the amount of change inspired by a change in price. A small, short-term price change causes little if any measurable change in behavior. A large, long-term price increase can cause much change, but can be very disruptive and costly in the short term. Optimal increases in price, balanced between minimal change and excessive disruption, can spur changes in consumer preferences and technology in ways that reduce environmental costs and support long term growth. The amount of carbon tax increase should be high enough to get some people to make some changes based on the relatively higher price. It should not be so high that it causes too much disruption of the economy. In short, it would be tailored to the elasticity of improving energy productivity and developing alternative supply. Technology would then change at the margins to reduce carbon emissions without hurting the economy. The economy also benefits by reducing warming costs.²³

Market price is an equally important for policy. Generally, the more each consumer pays directly and fully for the cost of a purchase, the more efficient the economy becomes. Such choices by millions of optimizers generally work better than governmental allocation decisions by a few, no matter how well-intentioned. When market prices are severely distorted by indirect pricing, elasticities cannot work to improve efficiency. Ironically, government must intervene to make markets work. However, a jump to full market price could create costs of disruption greater than the benefit, especially in the short run, and could engender a political reaction against the policy. Elasticity and market price have to work together.

Elasticity and market pricing thus balance two policy principles: including external costs in the market price, and moving towards it with optimal speed. To the extent other problems like sprawl, pollution, and inefficient use of fossil fuels are mitigated, the carbon tax makes the economy even more productive. It is an example of robust policy, something we should be doing for many different reasons.

Education for opinion for politics. There is as yet no visible political support for the new paradigm. We need to educate people about carbon taxes, tax swaps, elasticities, and market prices that drive systemic change, support incentives for productivity, and stimulate growth of the non-fossil economy. There is considerable evidence that major improvements are possible in both productivity and equally important reductions of environmental impacts across a wide range of industries. In fact, more efficient alternative technologies are on the verge of commercialization and are beginning to happen already.²⁴ Therefore, a properly implemented carbon tax would probably not cause too much disruption.

²³ Sherman Lewis, "Comparing Gas Costs; Elasticity Illustration," draft, 2000.

²⁴ Paul Hawken, Amory B. Lovins, L. Hunter Lovins, *Natural Capitalism; Creating the Next Industrial Revolution*, Little Brown, 1999.

Of the many issues of sustainability, global warming is the strongest indicator yet that we are going in the wrong direction and may not be able to change.

9. Carism

Auto dependency has unacceptable economic, social, and environmental costs. Car use should generally be a market good (drivers pay), not a social good (public pays).

Carism, the dominant paradigm, is not use of cars. Carism is, rather, a way of thinking that supports indirect pricing of car use, dramatically reduces the cost of car use, and externalizes costs to others. Americans are almost totally unaware of indirect pricing. They know about many of the resulting problems but don't connect them to each other or relate them to a common cause. As a result, pricing reforms proposed by the sustainability paradigm are seen as "punishing drivers" and as an assault on equity.

Carism is the major cause of a host of other problems related to indirect pricing. Congestion delay is a substitute for a user price. Land use is dispersed, inefficient, and auto-dependent. Farmland, open space, and wildlife are lost to sprawl. Transit declines with loss of ridership and interference from cars and in suburbia becomes inefficient and heavily subsidized. Walking and bicycling decline. Older walkable neighborhoods and community centers decline. "Free" parking and roadway consumes large land areas. Construction of uneconomic parking is forced by zoning regulations. Parking costs are bundled into property rents and sales. Taxes for military defense of oil are disproportionately imposed on the less car-dependent. Auto use causes public health and safety externalities. Energy and resource use are intense and inefficient. Auto use causes air, water, land, noise, and solid waste pollution, and ozone depletion. Carism, considering its transportation and land use aspects, is the single most important reason for unsustainable global warming. About half of carbon dioxide in the U.S. comes from transportation.

The combination of carism and sprawl create auto dependency. Auto dependency is the dominance of car travel, a lack of alternatives to car travel, and loss of mobility for those unable or unwilling to use cars. High levels of vehicle miles traveled, high vehicle hours traveled, high auto trips per person, high drive-alone mode split, and low walk/bike/transit mode use are correlated with indirect pricing of auto use.

Carism and auto dependency are not sustainable.

The U. S. is by far the most carist and auto-dependent nation in the world. See Exhibit 1. Americans use cars for 84 percent of their trips. Western European countries average about 40 percent, with England halfway between them and the U.S. Canada and Australia (not shown) are between England and the U.S. Using a car is about three times as expensive for a German as for an American. Taxes on gasoline equaled \$3 per gallon and the pump price was \$4.20 in 1997 compared with \$1.22 in the US. Germany is taxing cars to pay for alternatives and is reducing the share of auto trips.

Exhibit 1
 Modal Split Distributions for Urban Travel in Europe and North America
 (1990 or latest available year)

Country (Ranked by bicycle use)	Percent of Trips by Travel Mode (All trip purposes) Public				
	Bicycle	Walking	Public Transport	Auto	Other
Netherlands	30	18	5	45	2
Denmark	20	21	14	42	3

Germany (Western)	12	22	16	49	1
Switzerland	10	29	20	38	3
Sweden	10	39	11	36	4
Austria	9	31	13	39	8
Germany (Eastern)	8	29	14	48	1
England and Wales	8	12	14	62	4
France	5	30	12	47	6
Italy	5	28	16	42	9
Canada	1	10	14	74	1
U.S.A.	1	9	3	84	3

Source: Ministries of transport and departments of transport in each of the individual countries.

Source: John Pucher, "Bicycling Boom in Germany: A Revival Engineered by Public Policy," *Transportation Quarterly* 5:4 fall 1997 p. 32.

Indirect pricing takes many forms.²⁵ The major categories of indirect pricing are environmental externalities,²⁶ congestion delay, parking, local government,²⁷ federal and state government,²⁸ zoning regulation, market imperfections,²⁹ energy (foreign dependence, dispersion costs), resources (dispersion, distance, and vehicle costs), land use,³⁰ other social,³¹ and other economic.³²

American carists generally see congestion as a sign of a need for more roadway, which can be called the "**capacity model.**" It treats road supply as a public good which has a public benefit

²⁵ Sherman Lewis, "Paying Directly for Driving Alone," draft, 2000.

²⁶ Air (ROG, NOx, CO, PM, CFCs), water (pollution, sediment, runoff volume), noise, solid waste (auto bodies, tires, batteries, litter), vibration, land contamination, wildlife; mining, construction and industry impacts.

²⁷ Road capital projects and maintenance not from user fees; local road user services: police, fire, ambulance, hospital, legal, liability costs; municipal revenues forgone to ROW.

²⁸ Road capital projects and maintenance not from user fees, Strategic Petroleum Reserve, petroleum subsidies in tax code, petroleum research and development subsidies, export financing subsidies, Army Corps of Engineers subsidies, Dept. of Interior Oil Resources Management Programs; car share of Mideast oil military expenditures, moral jeopardy and turpitude in supporting violent, non-democratic governments, regulatory costs for oil pollution oversight, monitoring, inspection, enforcement, clean up, and liability not paid for by polluter, Coast Guard and DOT Maritime Administration uncompensated protection services, mortgage subsidies.

²⁹ Bundling of property rents and sales to include parking, new road capacity impact on localities competing for commercial and industrial development to raise revenues, "fiscal zoning," impact on downtowns, old industry, lack of car rentals in dense neighborhoods, lack of location efficient mortgages (LEM); lender bias toward sprawl houses, construction liability costs for condos.

³⁰ Land consumption, shadow effects on agriculture, nuisance lawsuits, land value and opportunity costs of ROW and parking, decline of older neighborhoods, industrial areas, and downtowns, land inefficiency of low density, increased cost of freeway-served land for open space protection, hindering acquisition.

³¹ Quality of life along streets, in neighborhoods, driver externalities, costs to pedestrians and bicyclists, increased walking distances, barrier effects, decreased amenity, increased danger, pedestrian intimidation, sedentation (making sedentary), costs to non-drivers, costs to drivers as chauffeurs, driver social isolation and loss of neighborhood networks, diminished choice of modes, aesthetic degradation costs, impacts on historical and cultural heritage.

³² Induced demand, economic inefficiency, inequity of externalities among income levels, gas tax cross-subsidy from local road users to state and federal road users, gas tax cross-subsidy from present, unbenefitted payers to future, benefitted, but non-paying, users of new capacity, cross-subsidy from those who drive less or not at all to those who drive more, cross-subsidy from those who pollute less, pay to park, don't drive during peak hour, to the opposites, economic risks of auto dependency (dependency on imported oil, monoculture instabilities).

and which should be free to the user. Congestion is evidence of excess demand which, even at a price of zero, justifies more capacity. For example, the proposed Foothill Freeway in Hayward, mentioned in part 2 above, would be paid for by the sales tax (not the gas tax).

A related carist idea is "reasonable" commute time. More roads have made commutes longer, faster, and more dominated by drive-alone. The media pay attention with great sympathy to the outer margin: the very small number of long distance commuters who cause, and suffer from, most of problem. The political concept of reasonable time is shorter than what people, in practice, want, so people use new capacity to move even further away from work to find better housing values in even more dispersed settlement. Then, to justify more pavement, policy makers project unrealistic trend lines about current congestion and make false claims about how much things will get worse. They overlook the fact that congestion itself reduces demand, while expanding capacity induces demand and facilitates more sprawl.³³ Carist solutions just yield more traffic.

People are willing to spend a certain amount of time getting to work, typically about 26 minutes, which strongly influences locational decisions. Once the **locational decision** about where to live or work has been made, the value of commute time is essentially zero. If a commute would be too long, a person does not look for work or a home in the distant area, or is willing to move or change jobs.

The highway lobby ignores indirect pricing and induced demand. Its leading lobbyist, William Fay, said, in support of more roads, "In fact, probably the greatest threat we have to future air quality improvements is the traffic congestion that is snarling our cities. . ." Environmentalists ". . . want to force people out of their cars . . . they still want to do everything they can to make it so miserable for us to choose to drive that we have to get out of our cars. That's a terrible thing for America's working mothers. I think that's a terrible thing for people that are struggling to try to go from welfare to work because, in most cases, they are going to try to get to work using a vehicle."³⁴

This carist rhetoric ignores pricing issues as well as the importance of urban buses, but environmentalists have not yet unified in support of pricing reforms. They are stuck on CAFE (Corporate Average Fuel Economy) standards, which do not work partly because of political erosion and partly because they are not directly related to the goals of conserving gasoline and reducing pollution.³⁵

Europeans are aware that more supply just leads to more traffic without solving anything, and generally refuse to increase capacity. Reducing capacity, by the same token, reduces trips. This "**congestion model**" works but causes pollution and wastes time. It does not answer the question, how much pavement is needed?

The best answer for sustainability is "the pricing model." The amount of pavement needed is that which would meet demand if drivers paid more fully and directly the costs now externalized. If drivers paid closer to the true price, travel demand would fall so much that there would be little congestion and new freeway capacity would not make sense economically. This sustainability paradigm treats car use as a market good like most goods in our society, instead of as a social good, like national defense, police, education, health, and welfare.

³³ Sherman Lewis, "Better Roads Cause More Driving," draft, March 1999.

³⁴ William Fay, President, American Highway Users Alliance, quoted by Jim Burns, CNS Senior Staff Writer, "Transportation Group Criticizes Environmentalists On Highway Construction," September 13, 2000.

³⁵ Richard C. Porter, *Economics at the Wheel; the Costs of Cars and Drivers*, Academic Press, 1999, pp. 44-53, 60, 63, 106, 192, 201.

Implementation of direct pricing in Europe is partial because, according to economists, prices, despite seeming to be high by American standards, are still much too low. European governments use gas taxes for revenue rather than for sustainability, and there is little effort to understand and to educate the public about market pricing, tax swaps, and elasticities.³⁶

The amount of land needed for transportation is decided politically by the dominant paradigm of tax-and-spend central planning rather than economically by a sustainability paradigm. From a market point of view it is difficult if not impossible to have efficient allocation of resources when demand is subsidized. Those benefitting from the subsidy will always demand more than they pay for, so others have to pay, and they resist paying. Gas tax purchasing power in relation to car miles driven eroded after 1970 by two-thirds from its effective average rate from 1930 to 1970. Underpricing causes congestion, reduces revenues, and creates the appearance of demand exceeding supply.

Indirect pricing not only affects travel demand, it also affects land use. Transportation facilities and subsidies do not create growth, but they almost dictate where and how development occurs on the land. In the 1950s Caltrans (then the California Dept. of Highways) made two decisions, on financing and alignments that determined the next fifty years of land use in California.

One, Caltrans decided that drivers on old roads should subsidize drivers on new roads. The gas tax on drivers using existing roads, rather than tolls or other direct charges, financed new roads. The new roads would be free of charge to new users. The gas tax would cover all of the state's road costs, but only a small part of local road costs. Local governments had to use local sales and property taxes for local roads and road services. Thus, the subsidy flowed from local taxpayers and local drivers on existing roads to new long-distance drivers on freeways.

Two, Caltrans laid out the alignments of the state freeway plan. The developers then knew where to buy land for future neighborhoods, shopping centers, industrial parks, and office complexes. Next, the developers told the cities how to change their land use plans, and the cities did so. Almost all these decisions were politically very successful. People got "solutions" without understanding why they would not work, elected officials got campaign contributions to persuade the voters they were right, and suburbanizers and Caltrans prospered.

The challenge now to the sustainability paradigm is to persuade people-voters, officials, media, developers-that the costs of sprawl are too great and that there is a market-based alternative that works better. The alternative, however, cannot complete on a playing field tilted toward cars. Driving is so cheap that substantial price changes over time are needed for elasticities to kick in. The marginal cost of driving a new car 25 miles has fallen from \$4 in 1929 to \$1 in 1989 (1986 dollars).³⁷

Pricing reforms generally have common characteristics: they impose costs directly on drivers, reduce costs now externalized to others, and improve economic efficiency. When the prices are right, drivers pay their own way. Pricing reforms shift from indirect to direct payments

³⁶ The AFFORD Project, www.vatt.fi/afford/, urban transport research by a consortium of 11 European partners coordinated under Concerted Action on Transport Pricing Research Integration (CAPRI) conducted for the General Directorate for Transport, DG VII Research and Technological Development Programme (DGVII), Commission of the European Communities 4th Framework Programme, Jul 2 00 (last update). See also European Conference of Ministers of Transport, *Internalising the Social Costs of Transport*, Paris: OECD, May 1994 and *Efficient Transport for Europe, Policies for Internalisation of External Social Costs*, Paris: OECD, 1998. See also European Federation for Transport and Environment, *Getting the Prices Right, A European scheme for making transport pay its true costs*, T&E 93/7, May 1993.

³⁷ Hawken et al, p. 40.

for all kinds of subsidies. There are, however, many different ways to implement these principles.

One example of a reform, already discussed, is the **carbon tax swap** needed for global warming, which might push the price of gasoline above bottled water, maybe even milk. The gas tax should also be increased to cover related costs, such as local road and road user services (police, fire, emergency, legal). In another application of the tax swap idea, taxes now covering these costs would be reduced.

Congestion. Until a few years ago, it was technically difficult to charge on major roads for use during peak hour. Now variable congestion charges on gridlocked highways can use electronic tags in vehicles with stored value or with billing information like a credit card. These tags can be read by readers along an equipped and designated lane of roadway. They are already used for bridges and could be used on bridge-like distances of freeway on land. They are theoretically very effective but require careful planning in practice, because most existing commuters, as explained, do not place much value on their time. Such charges seem to work best when they can vary with demand, and when drivers have an alternative route even if it is slower. The productive impact of such charges is to give drivers some flexibility, to pay if they are short on time, or not pay if they have time. Charges also influence new users, who make more market-based locational decisions. This very important impact takes place gradually over time.

Parking charges. Sustainability requires moving gradually and pragmatically to more parking charges in tandem with increasing alternatives.

We should **cash-out** "free" employee parking. In the Bay Area a survey found that 67 percent of commuters drove alone mostly to free parking and 80 percent of them drove because of free parking.³⁸ Cash-out gives employees with free parking a choice of the parking or its value in cash. If the value of parking at work is about \$4 a day, then we are paying people about \$1,000 each per year to drive their cars to work and, in the process, causing congestion, long commutes, and air pollution. Since cash-out reduces peak hour trips, it has some of the benefits of congestion charges.

BART should levy **market-rate parking charges** at high-demand BART stations. BART now charges nothing for parking, yet at the West Oakland station a private lot successfully charges \$5 a day. A market charge would lose no riders but generate funds to improve service, lower fares, and improve access with shuttle transit. Thus, parking charges properly used will increase ridership.³⁹

Suburbia is characterized by so much parking that the market price may be zero. Without some economic demand for parking, a business that tried to charge could face a competitive disadvantage. Parking lots and structures in old centers commonly do impose a charge, but street parking is too often free. Some streets have hourly parking charges that rely on a comparatively ancient technology, the parking meter. Experimentation is needed with more convenient methods and with less risk of draconian fines. For example, treating a neighborhood grid of street parking like a parking garage should be fairly easy, with kiosks for entry tickets and exit payments. Parked cars would display a valid ticket. The system could be further automated with kiosks that use credit cards or electronic tags with stored value read by a reader, a technology already widely implemented on bridges.

³⁸ Carl Nolte, "Driving force for many - Parking survey finds 67% are alone at the wheel," *San Francisco Chronicle*, Sept. 4, 2000. This article is a rare violation of the media blackout on reporting the role of free parking.

³⁹ Sherman Lewis, "Market Economics and Social Justice in BART Parking," June 2000.

Some places already have neighborhood parking permit programs on public streets. These programs could be expanded. They could use auctions to establish a market price and avoid overselling the spaces. They could provide an incentive for neighborhood support by using the proceeds to improve the neighborhood.

Parking supply involves a mix of pricing and design considerations. German cities have made parking more expensive toward centers (\$3 per hour in 1997), and reduced supply. Parking in some residential neighborhoods is limited to residents with official permits.

Traffic Calming. Another pricing reform is "traffic calming," which deals with a non-monetary pricing problem. Drivers impose social costs on non-drivers on neighborhood streets and shopping streets. They go too fast to be compatible with the social uses of streets, and their parking often preempts space needed by others for non-car transportation and for social purposes. Traffic and parking degrade the aesthetic qualities of neighborhoods and shopping areas. To make life work on the street for pedestrians and transit, cars should be more expensive and less convenient, based on having to pay their own way. Drivers can be prevented from imposing many externalities if they slow down. The regulatory cost of effective policing is high, and occasional policing is ineffective.

The solution has been to change the architecture of the street to change driver behavior and make it compatible with other needs. Most German streets have a speed limit of 19 mph, often enforced by narrowing streets, which has also been implemented in a few places in the U.S. ("skinny streets"). Germans have also increased the sharpness of curves, built bottlenecks (chicanes) and wider sidewalks, and installed speed bumps, speed humps, ornamental posts (bollards) and big planters (to block illegal parking). Slower traffic alone increases safety and comfort for walkers and bikers, making streets usable for bicycles.

Where pedestrian access is great enough, typically on shopping streets in town centers, cars may be banned altogether, with strong support for walk, bike, and transit access.

In California the sustainability paradigm had a small victory with the passage of the Safe Routes to School bill in 1999. The new law dedicated a few million dollars to pedestrian safety projects, which had been grossly underfunded.

Bicycling. Despite their variable climates, Germany, Denmark, and the Netherlands have substantially increased bicycling with strong bicycling programs. German cities have built bicycle lane networks, expanded bike racks and bike lockers, and increased rental services. Muenster, which used the bicycle once as an official symbol, is building a 3,000 space parking garage to deal with excessive parking demand by bicycles (over 10,000 per day at that location, a train station). The city has even converted car lanes and parking lots to bicycle use. Bicycles line up at stop lights in front of cars and get their own, early, green light. Cyclists can use bus lanes, make turns prohibited to cars, and, on some streets, can go both ways while cars can go only one way. Some car routes go the long way around while the bike route is direct. Education, festivals, awards, and police enforcement supplement the design measures. Switzerland, Sweden, and Austria are not far behind. European bicycling is not just a spandex and speed youth cult; elders in street clothes pedal sedately along on fat-tired one-speed bikes with big baskets in front.

In the U.S. bicycles have .2 percent of person travel miles and 2.0 percent of traffic deaths. Only a few college campuses and smaller cities support bicycle use.

Transportation meets land use. The Location Efficient Mortgage (LEM) corrects a problem with dominant paradigm mortgages, the failure to consider transportation costs in calculating income available to repay a loan. Despite underpricing, cars are still expensive to own and operate, about \$7,000 per year in major metropolitan areas of California, less than what

is spent housing but more than that spent on health care, education, and utilities combined.⁴⁰ A household in a dense area near transit can save up to \$6,000 on transportation, yielding up to \$60,000 in increased borrowing power on a mortgage.

The LEM reminds us of the link between land use and transportation, and how subsidies on the land use side, for single family detached housing, have distorted land markets in ways that reinforce carism. Subsidizing sprawl creates demand that cannot be met, just like subsidizing roads.

Other reforms include removing parking requirements from zoning, reforming real estate markets to rent and sell parking separately from other uses, ending tax breaks for the oil business, and taxing oil to pay for military defense of oil supply.

Each reform needs to be carefully tailored to the problem it is trying to solve. Surprisingly, much **research remains to be done**. Who is hurt, and how much, by subsidies to drivers? How much, for example, are non-drivers, low mileage drivers, non-parkers, non-peak hour travelers, and non-freeway users paying for the flip side? In a given case, should we use a tax swap or spend the money? Should we spend congestion charges and parking charges on transit? How much do pricing reforms boost efficiency and productivity? How can we get people to see existing cost and future benefit when they focus only on a new cost? How can we mobilize those disadvantaged by the current system?

The **initial adjustments by drivers** to pricing changes will be modest and easy to make. Cars can easily become more fuel efficient, and can be used more efficiently. Fuel economy can be dramatically improved by more aerodynamic design, cutting weight by half to two thirds using lighter materials, and using hybrid electric motors or, in the longer term, fuel cells.⁴¹ Commute modes can shift from incentives created by just two pricing reforms: cash-out, and congestion pricing. More effective use of existing land use balances can take place by household moves among existing dwellings, i.e., moves closer to work and by taking jobs closer to home.

Urban system change. As this slack in existing car use and land use is taken up, urban system change kicks in, the change to Smart Growth and non-car modes. Long-term rebuilding of cities is always going on. Pricing reform, after the initial elasticity responses, would be a profound incentive for improving the urban system.

The optimal elasticity for urban system change can be estimated based on the "**net moving rate**." The total moving rate is the number of people who move to a new location in a region in a given time period, mostly into existing dwellings. The net moving rate counts only moves into new or rehabilitated dwellings. The net moving rate is about equal to the number of new and rehabilitated units created in a given time period. The rate of change of the urban system depends on the location and number of these units.

Since World War II, the net moving rate has grossly favored suburbia. Pricing reform helps reverse that process and create market demand for dwellings which are closer in, denser, mixed use, and transit-served. Pricing reform makes suburbia more expensive and reduces negative impacts of cars in central areas. Suburban housing demand declines as the commute becomes too expensive in time and money. Pricing reform provides an incentive to supply new and rehabilitated units closer to jobs and stores so that Smart Growth dominates the net moving rate.

Increasing demand for units closer to jobs tends to increase the price of such units, which in turn stimulates the supply of such units until a new equilibrium is reached. The new market price

⁴⁰ Surface Transportation Policy Project and Center for Neighborhood Technology, *Driven to Speed*, 2000. [Www.transact.org/ca/](http://www.transact.org/ca/).

⁴¹ Hawken, chapter 2.

is the one created by pricing reforms which increase the cost of car travel and thus increase the value of closer in housing. The equilibrium is such that savings from less car use is greater than the increased cost of the dwelling.

Pricing reform also encourages new jobs to move toward housing surpluses, e.g., to Tracy, thus improving imbalances from the job side. Over fifty years, the change would become substantial, even shrinking the urbanized area.

Education before politics. Given the lack of awareness, education in the sustainability paradigm is the critical first step toward eventual stronger political action and sustainability. Simply getting housing closer to jobs, or stopping freeways, or pushing more subsidized transit on reluctant riders, will not work, because driving is still so inexpensive and subsidized, and because people are willing to spend a lot of time commuting to reach good jobs. Directly charging for currently externalized costs would increase the costs of car use, parking, and peak hour road use would create a context for more responsible personal choices, which in turn lead to demand for more balanced land uses, higher density, and non-car modes.

10. Indicators

Sustainability requires a radical change in accounting systems to include social and environmental values in income statements, balance sheets, and regional accounts.

The dominant paradigm measures best what it cares about the most, money changing hands. Often money does not help measure a problem or indicate a solution. Sustainability is currently unmeasured. The sustainability paradigm measures environmental and social realities that are now poorly measured and relates them to a more comprehensive definition of progress.

The indicators paradigm deals with the issue of how rich do we want to be? How rich do we need to be? And what does being rich mean? It is not clear if business seeks to increase money wealth for its own sake or because of cultural values about shareholders, historical traditions of score keeping, socialization, prestige, and a lack of better things to do. Success in business results from immersion in the details of competitive situations, organization, planning and execution; the money results seem as much a feedback reporting mechanism as a reward. Really successful people build mansions they spend little time in and give huge chunks of wealth to foundations in order to give their money away. They get to be prestigious and can buy a lot of stuff. Too much of this is nonsense and would come up short with a better measuring stick.

In the dominant paradigm, if a private company owns a tree, cuts it down, and sells it for lumber, the company records the income from the sale. The company also makes a corresponding reduction in the value of its assets to equal the value of the tree. Such is the elegance of double entry book keeping. If the U.S. Forest Service owns a tree, cuts it down, and sells it for lumber, the Service records the income but makes no entry for reduction in asset value. The federal government, the world's biggest business, has no balance sheet. An oil company may reduce the value of its reserves as it extracts oil, but based on a market value that ignores its true value.

Thus, we live off nature's capital--fossil capital, forest capital, soil capital, ocean capital, air capital, water capital, species capital. We are almost totally unaware of it, no different from uneducated barbarians that ravaged the treasures of civilization to steal gold and silver. Much of our income comes from using up our fortune, and we don't even know how much.

Government has generally been wise to avoid picking winners and losers in the market place, preferring to let competition improve productivity and wealth. Government, however, has unwisely failed to measure fairly obvious and quantifiable costs not measured by money transactions. In the sustainability paradigm, the human economy is a wholly owned subsidiary of

nature. The decline, even collapse, of habitats and their carrying capacities eventually can only cause economic decline, and already we have lost many assets.

Nature sustains our economy three ways, with resources, dumps, and services.

1) Resources. Our food, energy, water, built environment, and other consumption are derived from nature. We now understand better that the application of technology and energy allows a great deal of growth without clear unsustainability for some resources, like inorganic construction materials and minerals. Other resources, however-fresh water, cultivable land, forests, ocean fisheries-are not being used sustainably. Ocean fisheries, in fact, have largely collapsed and we are strip mining the remaining ocean life at a colossal and unsustainable rate. Arable land is being lost to deforestation, over-grazing, salinization, humus depletion, erosion, and urbanization, with losses hidden by increased use of fossil fuel fertilizers, by vulnerable monocultures based on hybrid seeds, and by massive applications of pesticides. Ancient aquifers are dropping from over-pumping, as we mine fossil water to depletion.

2) Dumps. Nature is where we dump our air pollution, water pollution, hazardous chemicals, solid waste, and radioactivity.

3) Services. Nature provides many services. It is the world's biggest biochemical research and development business, producing genetic material for plants, animals, and medicines. Its bees pollinate our farms and gardens. Its good bugs eat its bad bugs. Nature provides recreation and spiritual re-creation. It provides wilderness and habitat so that we might be awed by creation and see ourselves as part of a larger whole, rather than become greedy and ignorant exploiters with only a mirror for measurement. Nature cleans the rain and stores it for gradual release into streams, and its vegetation cleans the air and reflects the heat. Worms, ants, bugs and microbes decompose organic matter providing the basis for the next round of life. Nature takes carbon dioxide out of the air, cooling the climate. Nature is the infinite sandbox for scientists to pursue infinite questions, and their discoveries edify us all. Nature is the creation where we came from and where we are going.

Current calculations of the U.S. Gross Domestic Product put the value of nature's resources, dumps and services at approximately zero. It's not just the government; the whole country lacks a meaningful balance sheet.

Two major, new analyses light the way to better score keeping: "Genuine Progress Indicator" and "Ecological Footprint." The regional GDP (Gross Domestic Product) can be recalculated to subtract some "bads" and add some "goods," creating a new measure, regional Genuine Progress Indicator (GPI). While experimental and not yet widely accepted, GPI quantifies our declining welfare while, for the same years, GDP purports to show its rise.⁴² Once we get past the single measure of GDP per capita, or other money-based average measures, it becomes clear the U.S. is not very advanced.

Besides measuring the value of natural resources, dumps, and services, GPI assesses social equity. Progress is indicated more by median income and median wages than by average income. Median household income in constant dollars in the U.S. has risen in fits and starts over the years, from \$32,783 in 1967 (first year available) to \$40,816 in 1999, a 25 percent increase. Over this same 33 year period average household income rose from \$36,666 to \$54,842, a 50 percent increase. In 1967 average household income was 12 percent ahead of the median; in 1999 it was 34 percent ahead.

Median household income topped \$37,000 in 1973, fell, rose, fell, rose to over \$38,000, fell, and rose to over \$37,000 in 1995 and 1996. Thus, the gains over 1973 have occurred just in the

⁴² Redefining Progress, <http://www.rprogress.org/>.

last three years, 1997 - 1999. Except for these last three years, the rise in income of the affluent pulled up average income, but the stagnation of the less affluent left median income unchanged. Equity of income distribution can also be measured by family median income, male and female persons over 14 median income, quintile ratios, and Gini coefficients. The U.S. has a more unequal income distribution than Western European nations (as mentioned under 4 Aggregate Growth above).

Median wages in 1998 were 8.1 percent below the 1973 peak. Household income increased by having more women work and by working more hours. Americans work eight weeks more than Western Europeans and recently surpassed Japan.

GPI covers many other indicators and showed improvement in 1999, but is still 13 percent below its 1976 peak.⁴³

Ecological Footprint measures our impact on land and water, looking at the land area needed to supply us with food, clothing, shelter, etc. What we consume leaves its "footprint" both within a region and globally as we take resources from distant corners of earth. Americans in general and of the Bay Area in particular have a huge footprint compared with other nations and regions. Our consumption does not look equitable or sustainable. Urban development policy should not ignore the larger footprint beyond the urbanized area.

Sustainability emphasizes improving the earning power of the less affluent, not necessarily direct redistribution of income. The American tax system is so complex it is hard to tell if more direct redistribution is needed. The income tax is definitely progressive, but its loopholes allow many to escape, and other taxes are regressive, making the total system somewhat proportional. The income tax may be for some a disincentive to work. Taxing "bads" like carbon emissions, resource severance, or pollution may be better for sustainability than taxing "goods" like labor.

We should tax waste, not work. The challenge of sustainability is to allow scope for entrepreneurship without damaging the environment or equity. Better indicators are a better way of keeping score; they help change the rules of the game without ending the game.

The dominant paradigm fails to measure adequately what it is doing; therefore it cannot see signs of failure. As stated above, "the air is polluted, commutes are terrible, housing prices are astronomical, and open space and agriculture are being lost." Sustainability requires more comprehensive measurement. Improved indicators are essential for measuring the results of policy, which in turn is essential for improving policy. The industrial investor, subdivider, and city are not playing with a full deck. Externality cost cards are not being laid on the table. Too many people are working more hours for less money. Better score keeping will tell us we are losing the game and need to change the way we play for sustainability.

Achieving Sustainability Goals

The ten paradigms and their policies interact to achieve sustainability goals in three areas: environment, economy, and equity.

Environment.

Environmental goals are to move toward population stabilization, promote sustainable consumption and technologies, and support a high quality of urban life.

Population stabilization.

A major difference between the dominant paradigm and the sustainability paradigm is that the first assumes that significant population growth is inevitable and the second believes it can

⁴³ Redefining Progress, <http://www.rprogress.org/>

and should move towards stabilization. Urban planners, reinforced by demographers, elected officials, editors, and campaign contributors of the dominant paradigm, assume aggregate growth is destiny and take population projections as a given. They avoid discussing population stabilization and the tools available to local government for that end.

In the sustainability paradigm the impacts of the human population on the environment result from the number of people multiplied by technology and consumption.⁴⁴ All three are important. We do not have to do one or the other; we can work on all three. In fact, we can't deal effectively with consumption and technology unless we also deal with population. How otherwise do we attain sustainability?

The next logical question is, how many people can a given area support? What is the "carrying capacity" of a given area or of the earth as a whole? The answer is complicated by the inter-dependence of areas, particularly the "ecological footprint" of one area on others for food, energy, other resources, natural services, and waste disposal. Conclusions about ultimate carrying capacity should be tenuous because there is so much we are still learning about technology and economic feasibility. Sustainability could allow more people-but could require fewer. Whatever the answer, it is not just a population number; it will have to consider consumption and technology.

Population carrying capacity is closely related to the quality of life. Generally, the lower the quality, the higher the possible population. Thus, for some, sustainability allows accommodating many more people at a lower quality of life: the Bay Area, for example, could grow towards a Japanese density of population and be sustainable. For others, it means protecting more of nature and preserving a higher quality of life. We will use this definition. Pending more definitive research, it is safe to say that less population growth at least makes it easier to attain sustainability.

The issue of population carrying capacity is increasingly world-wide, as to total numbers, quality of life, and the impact of the wealthy on carrying capacity needed by others. World population growth is a matter of natural increase, and is affected mainly by national and international policies which affect the status of women, such as legal protections, educational and economic opportunities, and health care including family planning services and teen health services. The impact of the wealthy through globalization is also largely addressed in terms of national and international policy. Local, urban, and regional policies can, however, still affect natural increase and globalization, but they are rarely assessed or integrated into planning.

The debate has not just a rational analysis for pragmatic survival, but also an emotional side. Those who feel comfortable with a Bay Area population of four million may be uneasy about six million, and the Region is still growing. We are already at seven million and are planning for one million more because it is projected to happen. But are we better off because of the last million that joined us? Will we be better off if a million people more come in the future? Many people feel there are too many people: At some point, a gut feeling kicks in: no, this just isn't right, there has to be a better way. We may apply the feeling mainly to China and India. Some bury the feeling, not knowing where to go with it in a media opinion climate supporting hypergrowth, or fearing political incorrectness. Others are ready to talk, if only to speculate about what now seems politically impossible. People who feel this way have largely been excluded from regional planning and dismissed as politically unrealistic, economically ignorant, personally selfish, overly pessimistic, and even racist.

⁴⁴ Robert Engelman, *People in the Balance*, Population Action International, Washington DC: 2000. www.populationaction.org shows the centrality of the impacts of population.

Stabilization of population is happening more by regions than uniformly throughout the world. Some areas, from groupings of nations like Western Europe all the way down to a few cities, are attaining population stability in ways largely consistent with prosperity and opportunity. Places that achieve some stability face the dilemma that the resulting quality of life can attract migrants, who would undermine that quality. The movement of people is usually discussed as immigration among nations, but can also be studied as migration among regions, metropolitan areas, cities, and even neighborhoods. Successful areas need to export ideas about sustainability instead of unsustainably importing more people.

Regional population growth has three sources: native population natural increase, migration, and migrant population natural increase. Regions can gain population from any of the three sources, it doesn't matter which: the population goes up and thus the impacts go up. From 2000 to 2020, for example, the Bay Area will grow by 1,415,610 people according to the State Dept. of Finance (1,096,300 according to ABAG). The Dept. of Finance estimates 59 percent of growth will be by natural increase and 41 percent by migration.

The sustainability paradigm has three policies relating to population: improving the status of women, education and training, and managing job creation. Status of women policies would reduce natural increase, although probably not by a large amount. Status of women policies and education and training help residents compete with migrants for jobs, indirectly affecting migration. Similarly, job management would tend to prevent job growth faster than the growth of the local labor supply, indirectly affecting migration. Of the three policies, job management seems to be the most powerful for reducing excessive short term population growth. The other two can be important medium and long term. The three policies can significantly lower projected population growth in the region while improving equity and the economy.

While sustainability is facilitated by a stable population, some ways of getting there are not acceptable. Two problems should be prevented. 1. Natural increase may be greater than permitted job growth. Localities should be required to accommodate their own growth; they should not be allowed to externalize their net population growth. 2. Localities may also try to get a fiscal advantage from disproportionate retail or employment, and they should be required to share revenues.

Promote sustainable consumption and technologies. Technologies that use fewer natural resources, less energy, water, and land, and that pollute and waste less can sustain more people at the same level of end-use consumption. Sustainability policies provide strong, effective incentives for reducing fossil and auto dependencies and for more efficient urban systems.

Support a high quality of urban life. Smart Growth systems can have a comparable quality of life to suburbia, losing back yards and car-mobility while gaining street amenity, walking and transit accessibility. There are some interesting cultural issues about how comfortable suburbanites may feel with higher density and less car use, and how much travel time and expense they will tolerate to get a dispersed neighborhood. There are some practical and attitudinal issues about urban crime, race, and schools. Most people don't know that urban crime has fewer victims than suburban auto accidents. The range of densities for Smart Growth is very wide, and it is not clear what a reformed market would demand. Smart growth, however, already works well in many places, showing that problems can be overcome.

Economy

Sustainability population policy would advance economic growth defined as per capita growth, and measured with better indicators. Sustainability needs entrepreneurship to advance the new technologies and consumption that close the circle and benefit the bottom 60 percent.

The policies emphasize quantitative economic analysis of land use imbalances, pedestrian neighborhood potential, externalities, elasticities, Pigovian taxes, market prices, tax swaps, etc., designed to reduce governmental direction and optimize—indeed, make responsible—individual and business choices in the marketplace. Such choices in turn encourage innovation for sustainability and increase economic efficiency. Sustainability does not rebel against consumption, but tries to channel it towards sustainability, a kind of informed materialism for the long run, for future generations as well as ourselves. It may be possible to increase consumption while changing it toward sustainability.

Equity

A balanced population policy would affect both migration and natural increase in ways that advance social equity. Sustainable local and regional land use policies do not mean "pulling up the drawbridge," but helping others build their own sustainability. The issue of sustainable population has never been posed this way before. The anti-equity effects of migration have not been recognized, nor the equity potential of giving some growth away, nor the need to shift from investing in infrastructure for "inevitable" growth to investing in overcoming inequity. While conceptually logical and clear, the details of how to make these new ideas work have yet to be discussed by the Bay Area. There are risks in this uncharted policy territory, but more promise of sustainability.

How do moderate to low income families improve their well-being without consuming more? Sustainability can have an anti-consumption bias that raises this question. We can discourage unsustainable aspects of consumption while still allowing upward mobility, as discussed under economy. Sustainability policies will make housing affordable and greatly improve transit, with great equity benefit.

Equity and ethics. The ten policy areas often have ethical issues overlooked by the dominant paradigm. These issues have been discussed above and are summarized below. The following ethical questions have answers from which sustainability policies logically follow.

- Should working class renters rooted in a neighborhood be protected from excessive dislocation? Yes, this carefully defined group needs help in ways that allow gentrification without excessive dislocation. There is a middle ground between ruthless change and lack of neighborhood improvement. (1. Smart Growth, 7. Fiscal Reform)
- Should we invest more in low-income neighborhoods in ways that benefit current residents? Yes, investments in their small businesses and training workers can benefit everybody if done carefully and intelligently. (1. Smart Growth, 4. Social equity and jobs)
- Should "Transit Villages" have more car access after completion than before? No, more parking makes redevelopment less sustainable. (1. Smart Growth, 2. Cost-effective transit)
- Is it ethical to continue to urbanize open space and agricultural land even at the fringe? No, we've lost too much already. What looks empty to energy-inefficient developers looks full to energy-efficient nature. We should restore healthy ecosystems and even recover land from over-development. (1. Smart Growth)
- Should the disadvantaged clients of Planned Parenthood Golden Gate get more services? Yes, there are unrecognized unmet needs that harm women and society as a whole. (5. Status of women)
- Should more investment be made in the education and skills of the resident disadvantaged population, as the major means to meet the regional skills shortage? Yes, although exactly how to do this is unclear, it is better than emphasizing migration. (3. Human capital)

- Should all job creation be supported, or do jobs range from hurtful to helpful, depending on social, economic, and environmental impact? Some jobs cost more than they are worth; other jobs are consistent with sustainability, equity, and prosperity. (4. Social equity and jobs)
- Do the four severe job surplus superdistricts (of 34 in the region) have a special and serious responsibility to provide more housing? Yes, and their avoidance of that responsibility has externalized enormous costs to the rest of the region and to the less affluent. (6. Housing responsibility)
- Is the ethical basis for preventing externalities stronger than that for imposing responsibilities?
 - Should the region insist that neighborhoods accept more density because of a housing shortage, or should the push for Smart Growth be based on persuasion? Generally, persuasion, if necessary overcoming vetoes by a few, but in very special cases, as defined above near High Quality Transit where there are significant system gains, neighborhoods should be overruled. (1. Smart Growth; 6. Housing responsibility)
 - Should the region try to prevent actions by a few cities that hurt the region? Or try to compel cities which do not impose such costs to meet needs they don't create? The region should act to control the most egregiously unbalanced cities however rich they may be, and should allow housing surplus cities some reasonable chance to improve their balance and their revenues. (6. Housing responsibility, 7. Fiscal reform)
 - Should the region make a major effort to reduce our contribution to global warming? Yes, and in the process, a carbon tax will produce many other benefits. (8. Global warming)
 - Should drivers of cars pay their own way, or should the general public? Drivers. Gradually and systematically, subsidies and indirect payments of many kinds must be eliminated, to overcome current inequities and to produce many other benefits. (9. Carism)
- Should property and sales taxes be shared among cities to reward housing, especially affordable housing? Yes, based on devolution as an incentive for county revenue sharing compacts, and at some expense over time to a few fiscally rich jurisdictions. (7. Fiscal reform)
- Should economic measurements use traditional indicators or include equity concerns and the environment? This looks like a technical issue but contains many ethical questions. Current measurements assume hypergrowth answers, like ever more jobs, houses, sprawl, and freeways, and they need to be redesigned for sustainability and to include economic values related to equity and environment. (10. Indicators)

Ethical decisions lead to new policy ideas, to education about those policies, to political debate and feasibility, and to eventual implementation based on new social paradigms.

Conclusion: A Spiritual Crisis Requires Spiritual Transformation

Concerning sustainability, Americans are ignorant, arrogant, selfish, and self-indulgent. We are destroying the earth for future generations and we have lost any right to claim moral leadership in the world. We are rich, but not an advanced country. When we buy commercial fish

from Lake Victoria we are causing the malnutrition of the children of the subsistence fishermen. When we buy old growth redwood we are destroying the forest primeval. We no longer buy cod from the North Atlantic, or from many other fisheries; it is all gone. Our beef consumption is denuding the forests of Central and South America, as well as causing massive soil erosion in Australia. Our oil consumption is degrading the land of the Ibos in Nigeria, and, in Venezuela, salinizing water that once produced fish for local villagers near Lake Maracaibo. Our clothing purchases too often throw Americans out of work and exploit cheap labor from Saipan to China, labor that does not know freedom, labor that does not have the right to organize.

Many crises loom just out of sight of our daily life: the extermination of more species than in any geologic era since the end of the dinosaurs, pollution by chlorine and cyanide and other chemicals from the stratosphere to the ocean, the loss of fixed nitrogen and humus from soil due to lack of organic fertilizer, dwindling supplies of clean water, burgeoning populations, and global warming.

The problems are not only global and environmental but also local and social, hurting the life chances of people just a few blocks away because the richest nation in the world can't quite afford to provide health care, or dental care, or a safe neighborhood, or a good education for our less fortunate children. Our educational system in poor neighborhoods failed many years ago, and the population in our prisons has never been higher, at the same time we are draining the talent of other nations to work in our high tech industries. We are thus, compounding the problem of population growth at the same time we fail to provide real opportunity for low income families.

We should radically change the way we think about our economy, our cities, and ourselves. We should learn to think about sustainability, to think green.