

Walter Siembab

**Retrofitting Sprawl:  
A Cyber Strategy for Livable Communities**

“As we have rediscovered in our own day, there is an inescapable lag between the new urban concept and its actualization. Buildings are for more durable than paintings, sculpture, fashions of dress or thought.”

(Crouch, Garr, and. Mundigo, 1982, p. xv)

Retrofit: “To modify equipment that is already in service using parts developed or made available after the time of original manufacture.”

(Random House)

### Retrofitting Sprawl

There is a growing awareness among urban theorists, practitioners, and politicians that the sprawling metropolis built throughout America and many parts of Europe over the past 50 years needs to be spatially restructured. Large scale tracts of single function developments (residential, retail, office, industrial) have produced a number of unintended consequences.

The automobile has been the key technology enabling the scale of specialized developments. As expressed by architect Moshe Safdie, “As cars shaped the city, so the city itself is now shaped to require cars.” (1997, p.127)

As a result of the sprawl urban form and its auto dependence, society absorbs poor air quality and high costs of highway infrastructure construction and maintenance. The ‘underclass’ is spatially isolated, unable to easily access jobs and services. Consumers pay the myriad costs associated with private transportation including time wasted in congestion. Civilization faces global warming, fossil fuel depletion and threats of petroleum wars.

The most troubling consequence may be that the viability of modern metropolitan regions depends on an abundant supply of ubiquitously available, affordable petroleum. Not only are those conditions likely to

become impossible to guarantee in the future, but the act of pursuing them may contribute to the difficulty of achieving them.[...]

Urban space needs to be restructured. The question is how?

A candidate to correct sprawl is a reform movement that has been gaining support among metropolitan policy makers and practitioners throughout the United States. It is often referred to as Transit-Oriented Development (TOD), smart growth, traditional neighborhood development, or the livable communities strategy.

The livable communities strategy can be summarized as building compact, mixed-use town centers that feature walking distances to public transit which link residents to job opportunities and social services in order to reduce dependence on the automobile -- all under the guidance of a community planning process. (See “Characteristics of Livable Communities” at [www.fta.dot.gov](http://www.fta.dot.gov)).

The strategy is being driven by population growth. For example, by the year 2020, California’s population of 33 million is projected to reach 45.3 million -- an increase of 37%. At the current rate, the State is adding nearly 4 million people, or the equivalent of the population of Los Angeles, every seven years. The livable community strategy provides a political alternative to more suburban sprawl.

There is no doubt that the livable communities strategy is a prudent approach to new development. Its strength is that it can mitigate some of the impacts of metropolitan population growth.

However, its most significant shortcoming is that it cannot be implemented at the scale needed in the time available before the costs of the current urban form threaten regional stability and sustainability. In other words, metropolitan regions lack the money and the time for overcoming the legacy of the past by relying on bricks and mortar alone.

Brookings Institution Senior Fellow Anthony Downs provides the numbers. The livable communities strategy is “partly confounded by the fact that 85% of the developed portions of the nation that will exist in 2020 were already

in place as of 2000. Even if radical changes in the form of the to-be-added 15% could be achieved – which is not likely – that would not substantially change the patterns already in place today, which will necessarily dominate the overall picture in 2020.” (Downs, 2001) Basically, the best that the livable communities strategy can accomplish is to slow the pace at which conditions worsen.

Actually *improving current conditions* will require a retrofit of the 85% of the future that is here now. The retrofit must make metropolitan regions capable of quickly adapting their spatial structure by changing the *software* of behavior rather than the *hardware* of buildings. A *cyber strategy* can provide an alternative path to a livable community – for all places not just those expecting development.

### **Cyber Strategy for Livable Communities**

A cyber strategy uses digital network policies and initiatives to change the location of a wide range of urban functions, thereby enabling new transportation options and introducing new economic opportunities. It can also change the social context of technology access, use and control, thereby enabling a strength of place and introducing new civic opportunities.

Cyber strategy is a relatively new option for transportation authorities, local governments and regional planning agencies. It is a phenomenon of telecommunications market liberalization and the resulting emergence of globally integrated, broadband digital networks.

Before the AT&T divestiture in 1984, the regulated public telephone utility provided relatively homogenous service to every region. The subsequent competitive market resulted in regionally uneven levels of investment, services, prices, access, and utilization. At the same time, the flood of innovation spawned by competition provides the opportunity to apply entirely new tools to previously intractable problems like congestion, spatial isolation and urban decline.

To realize those opportunities requires three closely linked initiatives moving in parallel:

- Retrofit buildings and existing centers so that their functions are easily re-programmable,
- Modernize the business practices of public and private enterprise so that their functions are easily transportable, and
- Re-invent mobility around the one-mile trip to and between multi-functional centers.

### **Retrofitting Buildings and Existing Centers**

One structural problem with the sprawl model is the large single-function districts that form a complex checkerboard of specializations. The livable communities strategy addresses that problem by mixing land uses, often mixing functions within a single building (e.g., housing over ground floor retail). The idea is to build offices, storefronts and housing close together, even in the same building if possible, in order to fashion pedestrian or short transit access from home to jobs and some services.

Cyber strategy can contribute to that target proximity by providing virtual access to some jobs and services for all residential clusters, regardless of their density. There are two ways to do this.

Adding functions virtually to previously single function buildings is one approach. For example, common technologies such as kiosks, the Internet, audio conferencing and interactive video conferencing over ISDN can help city halls, county buildings, state facilities and federal buildings become multi-government employment and service centers. Public schools can become multi-grade community resource centers. Mini-malls can include a business conferencing center and distance education classroom next to the laundromat and convenience store.

The second approach is based on introducing a *Network Station* to an existing center. A Network Station is a public, shared-use, mixed-use telematics facility that can add functions to a typical village center, retail mall, or office park. A Network Station can be equipped, furnished, and staffed to function as a private office, meeting space, training center, public service counter, classroom, medical examination room, retail shop, etc. for a robust array of public, non-profit and private organizations with their nearest bricks and mortar presence miles away.

In addition to a wide array of functions “programmed” to satisfy the particular destination-needs of the proximate community, each Network Station will offer public access to a robust suite of technologies, and serve as a portal to e-commerce.

Network Stations can be developed at scales that include the neighborhood, village/town, city, and region. The total number and location of each should be determined by the economic geography and transportation infrastructure of the region. The facility should be established in existing vacant space, allowing it to be deployed in a relatively short period of time.

### **Fostering Distributed Organizations**

In order for the retrofit of existing centers to function successfully, a second initiative for modernizing the business practices of a critical mass of enterprises (from micro business to large public and private corporations) must be accomplished. For example, colleges must begin to offer distance education classes or there won't be content for distance education classrooms. Demand for shared work stations depends in part on the transition of the region's public and private enterprises from centralized to distributed structures.

Gartner, Inc. published a *Strategy and Tactics/Trends and Direction Memo* on January 3, 2002 that addressed many of the issues involved in the transition to what it refers to as the “e-workplace.” The memo was entitled “Creating Resiliency with the e-Workplace” utilizing the theme that collaboration applications and knowledge management systems provide the technology basis for resiliency in the distributed organization. The memo begins with the following:

“In the aftermath of the attacks on the World Trade Center and the Pentagon, the benefits of distributing operations were readily apparent. The trend toward greater distribution of operations has been evident for almost two centuries and has been accelerated by almost every new emerging information technology since the telegraph. However, until recently, the technology was used to communicate between distributed facilities or to collect and centrally analyze data. It was not until the emergence of PC technology that the physical disaggregation of the workplace

itself became possible, first through the exchange of data disks, then through LANs and WANs, and finally through IP virtual private network (VPN) technology. Now, new smart, wireless personal devices, are extending the disaggregation of the workplace to anywhere that a knowledge worker may be.”

In a distributed enterprise, the network is used to coordinate complex problem solving in distributed work teams, and to serve as the main customer service and service delivery channel. Cyber strategy provides a plan for guiding the transition from organizational hierarchies to *network* enterprise structure throughout the region.

### **Reinventing Mobility**

As trip lengths become shorter, markets for new private, short range, low speed, lower cost, *low impact* transportation options should grow. These options include walking, cycles, scooters, motor scooters, golf carts, station cars, and neighborhood vehicles. Neighborhood trams and smart shuttles are among the public possibilities.

In order to encourage the use of low impact vehicles, Neighborhood Transportation Zones (NTZ) should be established with a one-mile radius around the Network Stations. This will promote mixed-vehicle streets analogous to mixed-use buildings and projects. The innovative public transit options should be initiated within these zones. Rapid bus service routes can connect the largest or most significant Network Stations.

As a greater portion of household trips occurs within the NTZ, a greater portion of trips will be taken via a low performance vehicle or by innovative public transit service. This system of mobility could compare favorably with today’s high performance automobility, characterized as having “superiority [which] lies in its capacity to offer no-wait, no-transfer, door-to-door service.” (Webber, 1992)

As the vehicles get smaller and go slower consistent with trip limitations within NTZs, less land will be needed for the high performance automobile. The capacity of existing parking lots will appear to increase without any investment as the vehicles parked there become smaller. A Low Impact Vehicle takes-up approximately 20% of the volume of a contemporary SUV.

Eventually, some of the land devoted to the high performance automobile can be reclaimed and used for infill development. These infill projects could be designed to provide in bricks and mortar the functionality needed to complete the match between jobs, housing, and services within a one mile radius. Incentives can be offered for developers to build housing on surface parking lots in retail centers and in office parks. Landscaped walkways, community gardens and even housing projects may be possible in the middle of 128 feet or even 113 feet wide streets found throughout communities built on the sprawl model.

### **The Livable Communities Strategy Revisited**

The relatively low cost and short time to deploy a cyber strategy means that every region – growing or declining, high or low density, with or without rail transit – can immediately begin to develop a livable communities plan. A system of Network Stations, mixed-use buildings, and mixed-use streets can be deployed to retrofit a county or region so that a target of satisfying say 75% of today’s trip purposes within one or two miles from home can be approached. Under those cyber assumptions, the growth increment could then be more surgically used as a way to add the bricks and mortar facilities that are needed to achieve functional integration at the neighborhood or village scale.

The combination of both bricks and mortar and *bricks and bits* (Siembab and O’Brien, 1999) can create the *match* (not just a balance) between residents and their particular work opportunities and service needs. This same combination can also match resources with need in support of urban revitalization and economic development policies. Universal propinquity and economic equity may be achievable.

Based on the experience with a cyber strategy for livable communities (Siembab, 1994, 1997), it should be possible to substantially implement the initiatives in at least some regions within five years.

However, to do so requires that transportation agencies, rail transit authorities, local land use planners, air quality regulators, private developers, and especially livable community advocates be capable of engaging in what Graham has called “cross-sectoral thinking.” (Siembab, Graham and

Roldan, 2001) To cite just one example of a missed opportunity at cross-sectoral thinking: A recent survey of rail transit authorities in the U.S. and Europe to determine the strategic uses of fiber networks found virtually no best practices. Rail transit authorities on both continents persistently treated fiber networks developed in the authority's rights of way as a revenue generating asset for the authority rather than as a fundamental element of a cyber strategy for the region. [...]

Just as the livable communities strategy is a political option to sprawl, so cyber strategy for livable communities is a political option to a pure bricks and mortar approach. Will practitioners and politicians master the required level of cross-sectoral thinking in time to avoid instability and make metropolitan regions more livable in the short run and sustainable in the long run? The race is on!

## References

Crouch, D, Garr, D., and Mundigo, A, (1982) *Spanish City Planning in North America*, MIT Press : Cambridge, MA.

Downs, A (2001) "Testimony to the House Subcommittee on Highways and Transit: The Future of U.S. Ground Transportation from 2000 to 2020," published in *Metro Investment Report*, Abel Publishing, Los Angeles, April.

Safdie, M, (1997) *The City After the Automobile*, Basic Books, New York City.

Siembab, W (1994), "Telework Facilities Exchange: Final Report," Institute for Local Self-Government, Sacramento, California

Siembab, W (1997), "Blue Line TeleVillage: Final Report," Institute for Local Self-Government, Sacramento, California

Siembab, W. and O'Brien, T. (1999), "Digital Broadband Networks for Economic Development and Mobility: A Bricks and Bits Strategy for Retrofitting Cities," *Journal of Municipal Telecommunications*, Number 1, Volume 1, June.



Siembab, W, Graham, S and Roldan, M (2001), *Using Fiber Networks to Stimulate Transit Oriented Development: Prospects, Barriers and Best Practices*,. Norman Y. Mineta International Institute for Surface Transportation Policy Studies, Report 01-16, October.