

Broadband supply

Providers and their service strategies

The availability of broadband services is market driven, and highly dependent on levels of demand, capital requirements, and the investment horizon for telecom firms in general. Appendix 4 of this document examines the specific market practices, strategies, and service offerings of individual providers in the Chicago market. Presently, the economics of supply overwhelmingly favor serving very large customers. Providers adopt a marketing approach that focuses on this segment for several reasons:

1. Large customers generally pay for the cost of building facilities to their locations.
2. Service providers have reduced marketing and operational overhead when serving one or two large customers versus many hundreds of smaller firms.
3. Large customers are usually pre-sold services. The contract reduces the risk of building out the network and speculating that new customers will connect.
4. Large customers are long-term customers. Once an enterprise selects a service provider, the large capital investment committed to the project makes switching a costly endeavor.

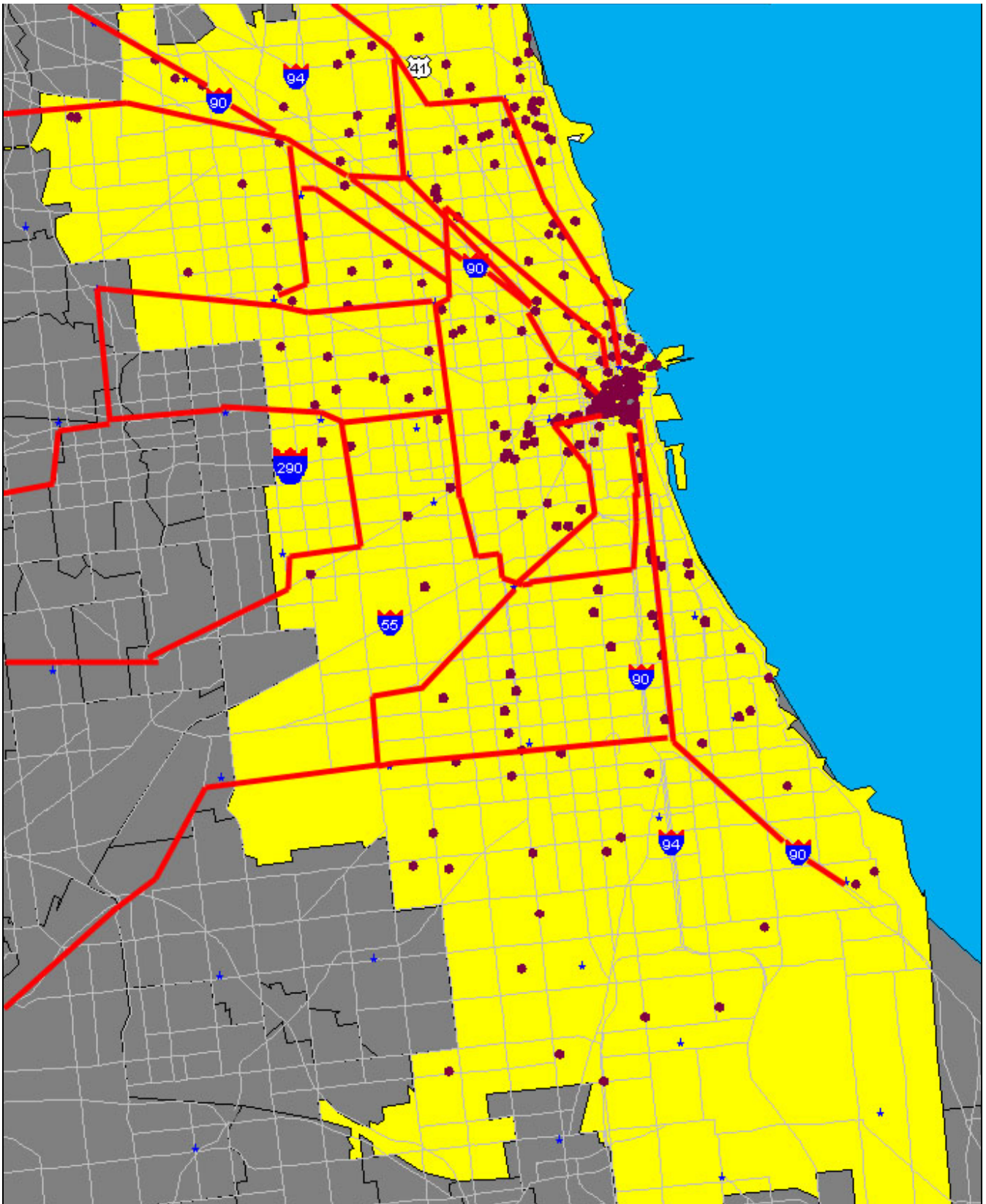
Due to these factors, SMBs are often solely dependent on the services and infrastructure of the provider — usually the incumbent local telephone company (SBC in Chicago) — makes available. Providers predicate their business cases on the likelihood of positive economic returns for their infrastructure investment. For instance, the current investment required to justify installing DSL equipment, plus the overhead of continuing operations, requires a minimum of 150 to 200 subscribers to be served from a telephone central office (see Appendix 4).

Demand studies (such as those conducted for this report) are overlaid with financial breakeven analysis and the presence of competitors, along with other strategic factors, when deployment decisions are made. The uniqueness of the CivicNet concept alters the minimum threshold required for service deployment by 1) reducing the risk of market entry by providing guaranteed minimum revenues from City sources, 2) reducing the costs of deployment (through use of City assets), and 3) increasing the potential take rate for services by combining education and marketing programs sponsored by the City and affiliated organizations.

Current networks

A number of metro fiber routes have been identified in Chicago. Map 4 shows the locations of these routes in conjunction with current Level 3 demand by SMBs. The routes shown are those that are available for business customers. Not shown in the map are fiber routes that are principally used for managing the internal transmission of data and voice traffic for the service provider networks (such as SBC and AT&T). The network currently favors the north and west sections of the city, where the concentrations of demand are greatest.

Map 4: Fiber Routes and Current Demand for High Bandwidth



Bandwidth glut?

The Bandwidth Glut refers to the over building of fiber resulting in the present supply of available bandwidth exceeding the demand for it. The recent debacle in the telecommunications industry has led many observers and critics to blame the demise on too many providers chasing too few customers. The over-building of networks has, however, been on long-haul networks between major cities and not within metropolitan areas that provide access to individual businesses.¹²

Advances in technology and redundant infrastructure have led to excess dark fiber (i.e., fiber with no transmission equipment installed on it) in the ground. The question, however, really depends on the perspective of the user. Bandwidth demand has increased sharply and continuously, even in the face of the so-called glut.¹³ Firms continue to add capacity and plan to order more.

The Chicago metro networks and this analysis of growing demand support the decisions of network planners. Forecasted demand shows that networks designed five years ago are addressing current needs. The problem is that construction in metro areas has virtually ceased while demand continues to grow. CivicNet is well timed to provide an impetus to new capital construction in the city of Chicago by guaranteeing demand for the services. Since government buildings (such as Teir 1 facilities identified in the CivicNet Request for Proposals) need to be connected by fiber-level services in the first phase of build-out (within four years), the question is how to build off of this infrastructure to "anchor" demand of the private sector in Chicago's neighborhoods.

Chicago's unmet demand

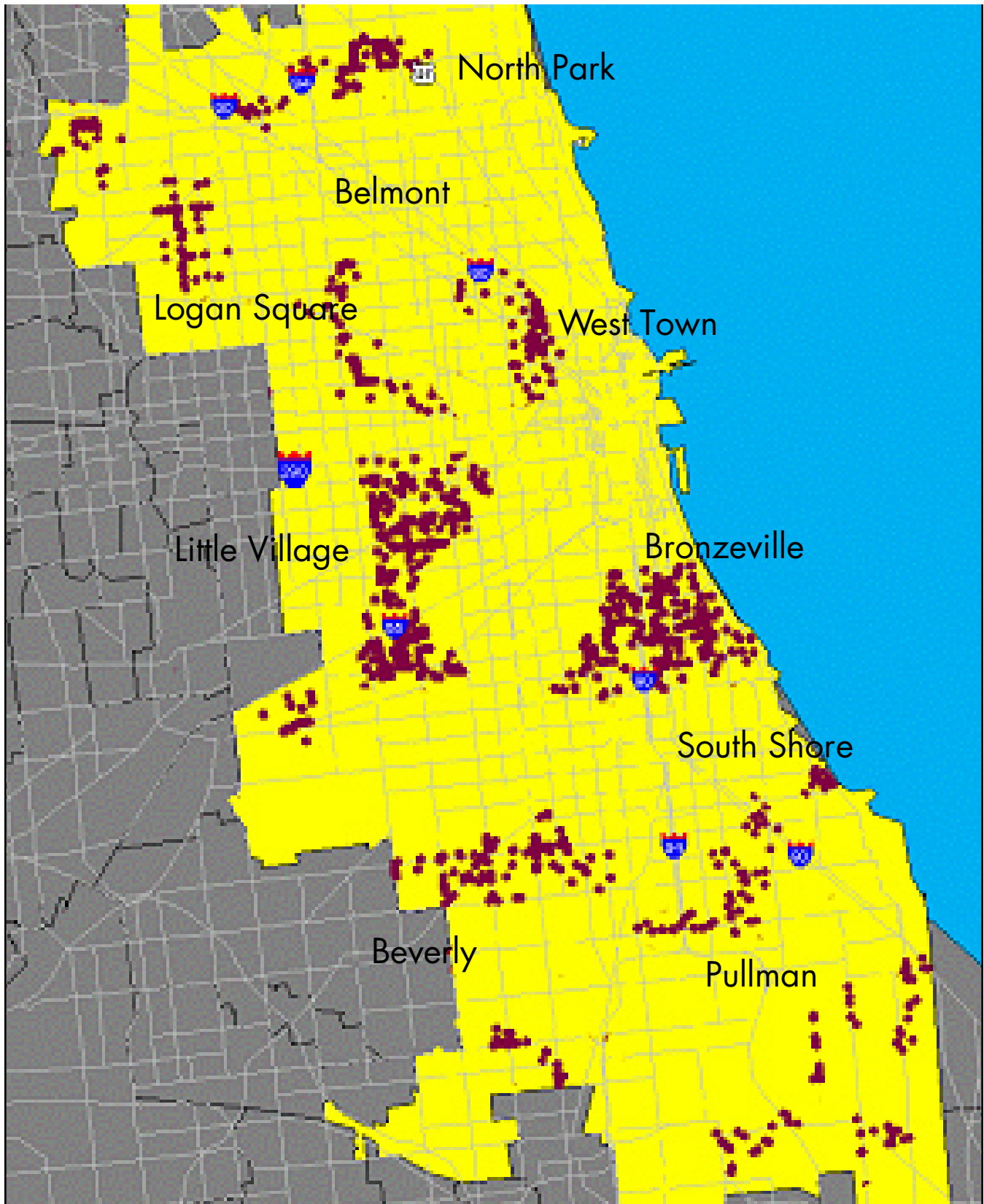
Comparing the demand forecast with available supply indicates two levels of unmet demand in Chicago. "Unserved" markets are defined as currently existing areas of demand for broadband whose needs are physically not being addressed in a consistent or affordable manner. "Underserved" demand consists of customers that need the type of multiple T1 service that a fiber network can deliver, but are not located near existing fiber routes.

Low bandwidth gaps: "Unserved" communities

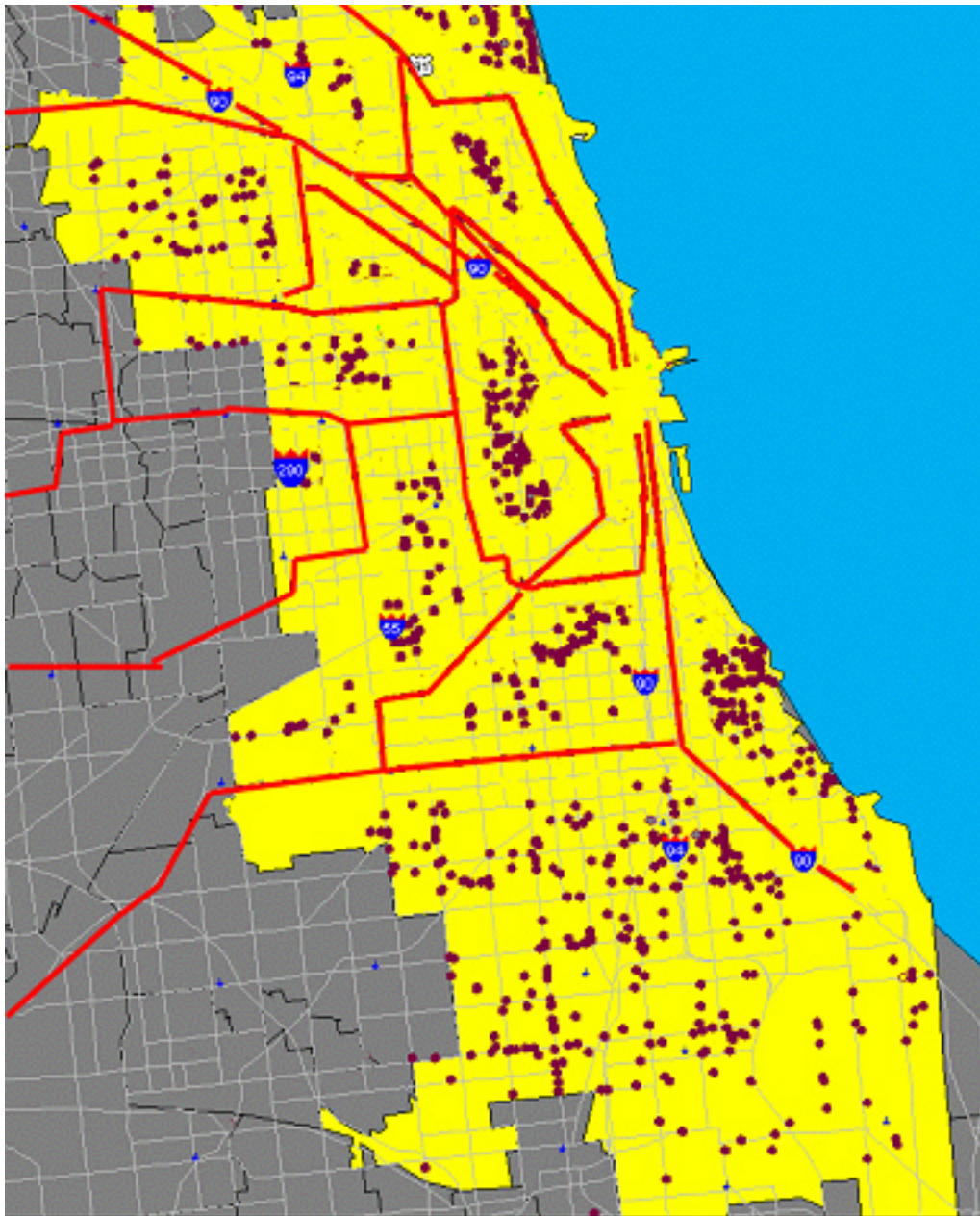
There are a number of communities unable to receive affordable broadband solutions. The study compared the concentration of SMBs with Level 1 (DSL) capacity needs with available supply of DSL services, and determined that a number of areas have insufficient services. As Map 5 shows, SMBs in North Park, Belmont/Central, West Town, Bronzeville, Little Village, South Shore, and on the Southwest Side are either unserved by any DSL provider or are located too far from a central office to receive service (see Appendix 5). The percentage of SMBs that cannot currently receive DSL in Chicago is approximately 10 percent.

Nearly all customers can receive some type of broadband via the existing telephone network (in the form of T1 or multiple T1 service). However, the price discrepancies between T1 and DSL service put unserved communities at a distinct disadvantage. SMBs must either add significantly to their cost structure or do without; in either case they are less productive and efficient than their counterparts in served communities.

**Map 5: Areas Unserved by Broadband
(DSL Level)**



**Map 6: Fiber Routes and Future Demand for High Bandwidth
(2 Mbs or more)**



High bandwidth gaps: "Underserved" communities

At the other end of the spectrum — the future demand of high broadband users (those SMBs with Level 3 demand) — can be analyzed relative to existing supply. Map 6 was developed by assuming (rather conservatively) that fiber solutions are available to any SMB within one mile of an existing fiber route. This assumption, while it overstates existing access, can be used to determine the most serious gaps between supply and demand. This map demonstrates a substantial number of firms with little or no fiber access. This segment is termed "underserved" since they have few alternatives to meet their broadband needs above Level 2 service without additional networks being built closer to these companies.

Alternative technology solutions

The development of broadband infrastructure has led to a hybrid network of technology solutions for service delivery. Advances in wireless and satellite services, new mechanisms for squeezing ever higher levels of bandwidth over existing copper wires, and efforts to bring telephone, cable TV, and data services to residential and business consumers have contributed to the mix of technologies available (Appendix 1).

All of these technologies need to connect with each other, usually by fiber. Although wireless networking, for example, is gaining in popularity, the wireline network is the core means of connecting different network topologies together.

When planning for the needs of SMBs, adequate wireline capacity and functionality need to be the foundation. To date, no technology surpasses fiber optic technologies in terms of reliability, security, scalability, and long-term affordability — the factors that businesses demand.

Addressing unserved and underserved demand

The implications of this research include:

1. Anticipated growth forecasts show strong demand for broadband by SMBs.
2. Unserved pockets of demand exist throughout the city. SMBs in these areas are already at a competitive disadvantage.
3. Communities that are already unserved and future areas that will be underserved provide a strong case for new investment. Planning for economic development without planning for new telecommunications infrastructure will compound the disadvantages neglected communities face.

CivicNet offers a viable solution. However, this solution is conditioned by two factors:

1. Ensuring that the needs of communities are addressed in early-stage network deployments; and
2. Creating an informed business community that demonstrates the advantages of broadband to SMBs and stimulates further demand.

One way to respond to these factors includes identifying potential access points in underserved and unserved areas to jump-start network deployment. The concept of the "neighborhood node," in which necessary equipment can be economically located to provide services to surrounding customers, is shown in Map 7. Specific sites — such as schools and police stations — have been highlighted in unserved markets to indicate how infrastructure can be brought quickly to neighborhoods that need the services most urgently. Using this approach, CivicNet can be an anchor to support private economic development in areas throughout the city.

While the research related to this report indicates strong awareness and growing demand, CivicNet can be further enhanced if targeted marketing and education is coupled with the opening of network facilities. As discussed above, applications are the true drivers of demand. Firms competing for CivicNet should consider adding a number of software vendors and solutions providers to the mix. These vendor partners could then be assigned to

deliver advice and education to SMBs, which would further drive demand. This process would benefit SMBs as they learn advanced ways to improve their organizations; the network providers, through improved network capacity utilization; the vendors, through sales of their products and services; and, of course, the City, through economic growth and development.

