

**Call Routing for 311: The Issues and Solutions
A White Paper**

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Introduction

As 311 call centers become increasingly prevalent around the country, local governments, state public-service regulatory boards, local telephone companies, and private contractors need to take a closer look at the unique demands posed by these non-emergency lines. While similar in the geographic service-area requirements of 911 (in that service is bound by local geopolitical boundaries), 311 cannot use the same routing database as 911 does and therefore must devise alternatives to appropriately route calls.

While some local exchange carriers (LECs) have accommodated the development of a separate database, others don't believe it is necessary and have offered alternatives to creating a second database. In addition, many of the state tariffs were written at a time when 311 implementations were few in number. As a result, they did not take into account the complexities that emerged as 311 began to grow in popularity. Further, most tariffs do not consider the geopolitical needs of the service, raising additional interrelated issues.

Though 311 legislation was passed at the federal level,¹ all approval and oversight are directed through the state-level regulatory body/commission. And as many state tariffs do not address multijurisdictional issues, state regulatory commissions must consider every individual application on its own merit. As a result, there have been some inconsistent and contradictory applications of the state tariffs.

The International City/County Managers Association (ICMA) recently conducted a survey of nearly 2,300 local governments studying centralized call centers and 311 services. From this survey, it was learned that 33 percent of the respondents cited as the reason for *not* establishing a 311 call center the "application process involved in obtaining the 311 designation."² Moreover, because state tariffs are typically not uniform, the application and number-designation process have caused confusion and misinformation to be perpetuated³. This has led to apprehension of the process and its results. Nearly 200 cities and counties cited number designation as a problem, but there was no particular region where these concerns originated. This indicates that state tariffs across the country may need to be revisited to better reflect today's 311 environment.

The purpose of this paper is to address 311 call routing in the context of two predominant issues: (1) geographic boundaries and the historical organization of the central offices and (2) the efficacy of existing state tariffs.

¹ *Fact Sheet: Abbreviated Dialing Codes--N11*. Federal Communications Commission. Washington, DC: United States Government, 2000.

² Moulder, Evelina. *ICMA's Local Government Customer Service Systems Survey, 2007*. International City/County Managers Association. Washington, DC: ICMA, 2008. 4.

³ "Interviews with emerging 311 jurisdictions." 2006–2007. Kristin M. Howlett.

History

Across the country, area codes are broken into a collection of central offices (COs), through which all individual land-based telephone lines are routed. COs are the central switches for all numbers with the same exchange and often house multiple exchanges. Local telephone companies in the United States and Canada provide service to individual telephone lines through these COs.

While area-code boundaries correlate with state boundaries, “exchange boundaries do not [necessarily] correspond with city, county, [and] postal addresses or other boundaries”⁴ Subsequently, there are often “shared” COs that overlap across multiple local jurisdictions. This occurs because “exchange boundaries were [originally] established by extending lines to connect customers in all directions from the switch until they encountered customers receiving service from the opposite direction.”⁵ As telephone service expanded to new areas, the primary concern for the LECs was comprehensive service rather than the accommodation of political boundaries.

If a 311 call center is “live” in a particular city or county that has these shared COs and it was implemented without the inclusion of some type of call-routing provision, it is likely that the call center is receiving calls from outside its jurisdiction, is not able to receive calls from some of its own residents, or both. Further, because the local government has already adopted COs and is translating incoming 311 calls to a number that reaches its call center, neighboring jurisdictions cannot reclaim those COs with their own numbers without some type of retrofitted call-routing system.

The good news is that the problem is neither universal nor without a solution. When 311 service areas are bound by area-code boundaries, routing calls from the CO is not an issue. For instance, New York City’s 311 service serves all five of the city’s boroughs. The city’s area codes (212, 917, and 646 for Manhattan; 718, 917, and 347 for the outer boroughs) are exclusive to New York City. The Bronx/Westchester and Queens/Nassau county lines, by virtue of being area-code boundaries, are also CO boundaries. As a result, all of the COs that the city acquired are made up of exclusively New York City customers, and the call center has no multijurisdictional COs from which calls must be rerouted.⁶

Another example of this is the City of Chicago. The city’s central business district is the exclusive holder of the 312 area code, and the remainder of the incorporated city is the exclusive holder of the 773 area code. Since the area-code boundaries coincide with the

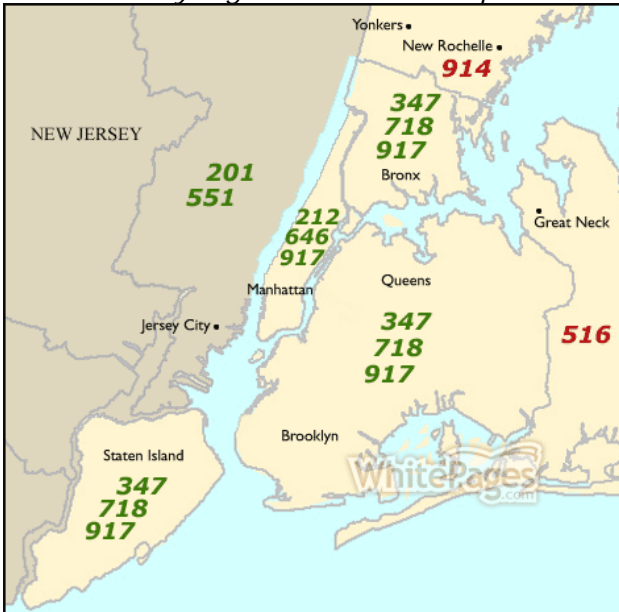
⁴ *Calling Areas: Before You Dial, Know What the Call Will Cost*. WI Public Service Commission; WI Department of Agriculture, Trade and Consumer Protection; WI Department of Justice. State of Wisconsin, 2003.

⁵ *Calling Areas: Before You Dial, Know What the Call Will Cost*. WI Public Service Commission; WI Department of Agriculture, Trade and Consumer Protection; WI Department of Justice. State of Wisconsin, 2003.

⁶ “New York City, New York County, New York State.” Chart. *Area Code (NPA) Boundaries*. Washington, DC: North American Number Plan Administration, 2008.

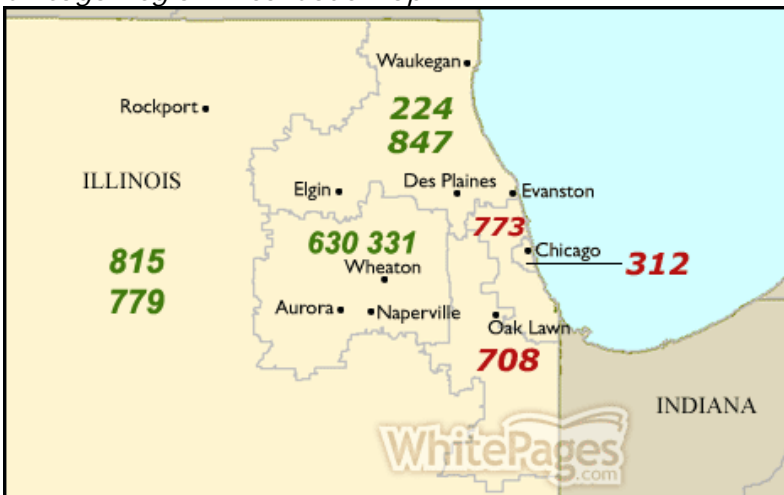
city's political boundaries, there are no non-city customers in the city's adopted COs, and thus no call-routing solution is needed.⁷

New York City Region Area-Code Map



<http://whitepages.org/maps/NYC>

Chicago Region Area-Code Map



<http://whitepages.org/maps/CHI>

Central Offices

Many state tariffs dictate that incoming 311 calls from the designated CO are translated and routed to a uniform ten-digit number that terminates at the 311 call center that owns the CO.⁸ This concept relies upon the jurisdiction that "owns" the CO and has no

⁷ "City of Chicago, Cook County, State of Illinois." Chart. *Area Code (NPA) Boundaries*. Washington, DC: North American Number Plan Administration, 2008.

⁸ *Call Routing and Its Implications for 311*. Intelligent Transportation Systems. Washington, DC: United States Department of Transportation, 2001. 1.

regard for the jurisdictional origin of the call. “When an end user places a call using an N11 code, that call is translated...at the level of that user’s local central office”--meaning that 311 callers are routed through a named CO and have their call translated to the same ten-digit number and routed to the same 311 call center.⁹ Adherence to this tariff does not allow incoming 311 calls within a single CO to be routed to different numbers.

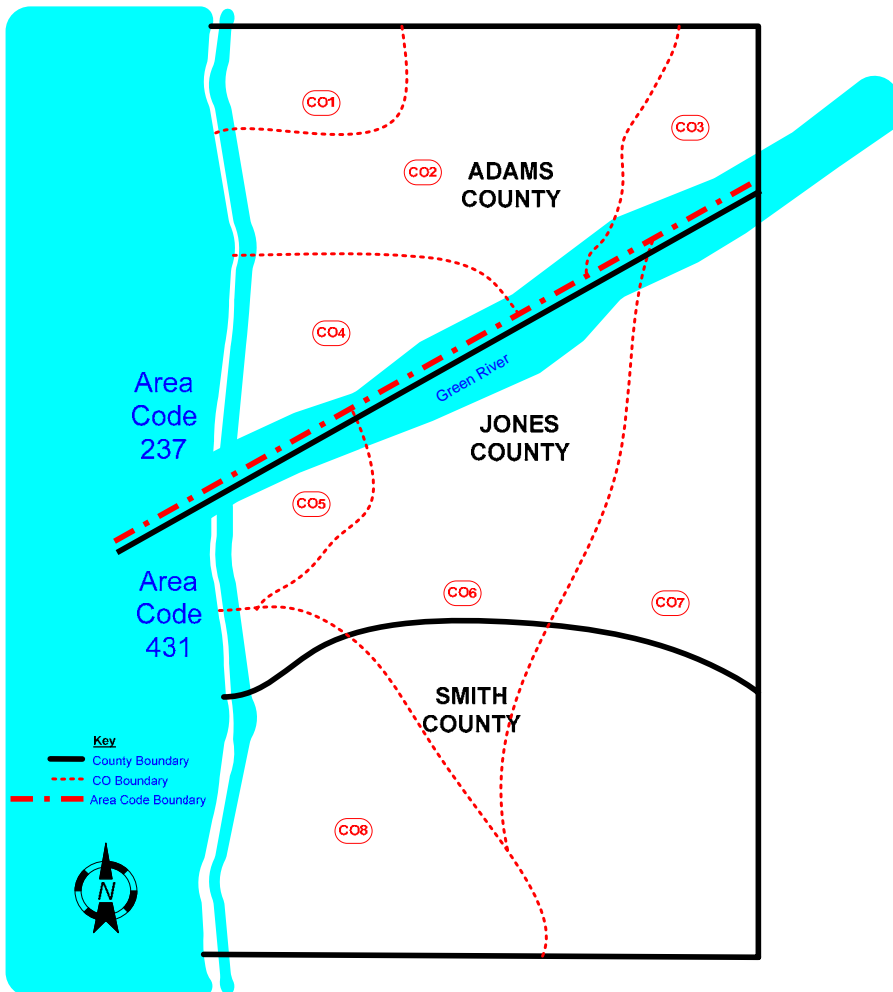


Diagram 1: CO Overlap¹⁰

Diagram 1 illustrates some possible CO scenarios. Adams County is the exclusive user of area code 237 and houses four COs. Since area-code and county boundaries coincide, so do the county and CO boundaries. When Adams County implements 311, there will be no need for a call-routing solution. This is comparable to the previous New York City and Chicago 311 examples. South of the Green River are Jones and Smith counties, which

⁹ Pelletier, Erich, and Sharon Strover. *Telecommunications and 211: A Primer*. Telecommunications and Information Policy Institute. Austin, Texas: University of Texas at Austin, 2002. 8.

¹⁰ “Central Office Map (Hypothetical).” Tyler P. Reinagel.

are served by area code 431 and have four COs between them. While CO5 exclusively serves Jones County, CO6, CO7, and CO8 are shared by the two counties. If either of these counties opts to implement 311, a call-routing solution is recommended to ensure they are able to receive calls from their residents and the other county is not precluded from receiving calls from its residents (should they opt to establish 311 in the future). As many tariffs were established when 311 was emerging in just a handful of communities, the issue has only more recently become a handicap to implementation.

As far back as 1991, the State of Delaware, during a pending area-code expansion, identified CO overlap as a concern in the context of a discussion of local versus long-distance calling. However, the recommendations focused on billing solutions rather than a call-routing solution.¹¹ While billing-based solutions are effective in correcting calling charges, they do not provide a routing model from which 311 call centers can operate. While the Delaware case identified the CO overlap problem six years before federal 311 legislation, the situation and solution for routing 311 calls still needed to be addressed.

Tariffs

Each state-tariff structure is written by the individual LECs within that state and approved by the state public-service regulatory board. These tariffs lay out the protocols and charges the LECs will follow and often limit the company's responsibility in routing calls within the jurisdiction to those identified in the tariff.

Embedded within the rules governing the Colorado Public Utilities Commission is a subsection regarding "Numbering Administration," and addressed in this subsection are 311 assignments. Colorado's regulations focus heavily on the coverage area, mandating that applying jurisdictions submit both a map of the affected area and a "proposed method for routing the 311 calls to the call center."¹²

By contrast, the Georgia code does not have a comparable call-routing definition. In Georgia, an applicant is asked to submit a request for the COs that support all or a majority of their jurisdiction (but may include numbers outside of the jurisdiction as well).¹³ As a result, most 311 call centers in Georgia receive calls from outside their jurisdictional boundaries, which must be redirected once they hit the call center.

¹¹ *Investigation on motion of the commission into the situation where telephone exchange areas cross county boundary lines* (Docket No.28, Order No. 3328). Delaware Public Service Commission. Dover, Delaware, 1 October 1991.

¹² State of Colorado. Public Utilities Commission. Department of Regulatory Agencies. *Code of Colorado Regulations: Rules Regulating Telecommunications Providers, Services, and Products; Numbering Administration* (4 CCR 723-2). 1 August 2007.

¹³ *Petition of DeKalb County for Assignment of Abbreviated Dialing Code 311 for Access to Non-Emergency Services in DeKalb County, Georgia* (Docket No. 19330-U). Georgia Public Service Commission. Atlanta, Georgia, 9 January 2007.

DeKalb County was the first metropolitan Atlanta county to apply for the 311 number. After filing its original application, DeKalb realized that application of the state tariff raised several concerns and barriers to implementation, including:

1. Of the 26 COs serving DeKalb County, only three contained all DeKalb County numbers. The other 23 COs held numbers in [between] one to four other counties.¹⁴
2. Per the state tariff, acquiring a CO meant taking the CO in its entirety, precluding any future jurisdiction from implementing 311 in that CO.¹⁵
3. Because DeKalb is part of a densely populated metropolitan area, the volume of “outside-of-jurisdiction” calls the county would receive was estimated to be over one million per year. This raised two additional tariff related concerns:
 - i. Determining adequate staffing levels in the call center based upon the county’s leadership vision for 311 and its subsequent call volume.
 - ii. As the tariff required a “per-incoming-call” charge, the fees associated with the county paying for the million-plus calls per year it would receive but could not serve was cost-prohibitive.¹⁶

This began conversations among the LEC, the Georgia Public Service Commission, and DeKalb County to develop a call-routing solution to more appropriately suit the needs of the Atlanta metropolitan area.

Technical Needs

Because the basic technical infrastructure in land-based telephone lines and exchanges is comparable across carriers, the technical components for solutions are similar. Calls to 311 dialed by an end user are connected to their respective CO. The CO converts the abbreviated number to the designated ten-digit “go-to” number, and the caller’s telephone number is identified and screened. When no area jurisdictions have a 311 call center in operation, callers may receive a recording or some other indication informing them of such (see diagram 2).

¹⁴ Rogers and Hardin, Attorneys At Law. Letter to Georgia Public Service Commission. 18 December 2006. Re: DeKalb County’s Petition for Assignment of Dialing Code 311, Docket No. 19330. Atlanta, Georgia.

¹⁵ *Petition of DeKalb County for Assignment of Abbreviated Dialing Code 311 for Access to Non-Emergency Services in DeKalb County, Georgia (Docket No. 19330-U)*. Georgia Public Service Commission. Atlanta, Georgia, 9 January 2007.

¹⁶ “311 Implementation Research.” 2008 data. Kristin M. Howlett.

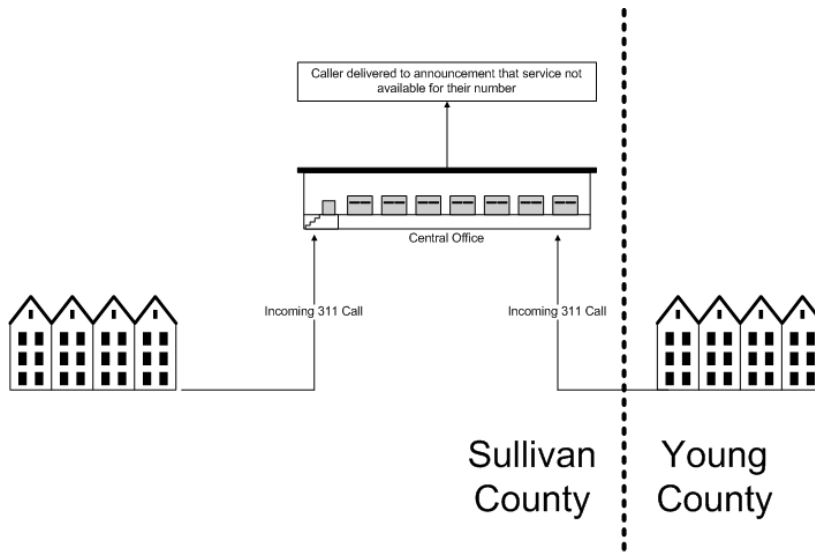


Diagram 2: Routing When No Jurisdictions Have 311 Service¹⁷

On the other hand, if a 311 call center is in place and the number is identified as having originated from within the jurisdiction's CO, the screening mechanism routes the caller to the 311 call center. Implementing 311 in a shared CO *without* a call-routing solution uniformly routes calls to a single call center, regardless of origin of the call.

When 311 is implemented in shared COs, several scenarios are possible; two are illustrated below (see diagrams 3 and 4).

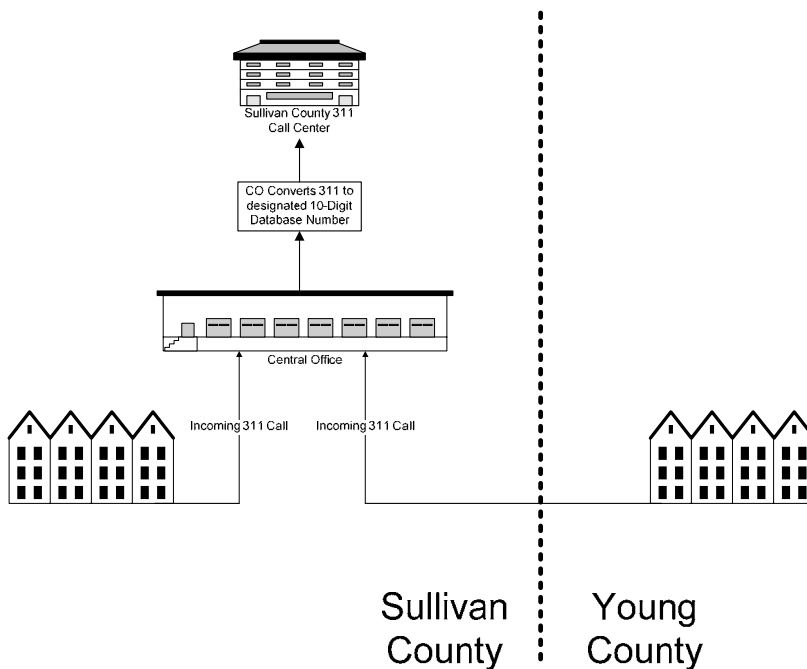


Diagram 3: 311 Call Routing When Call-Routing Solution Is Not Included in Sullivan County's 311 Implementation¹⁸

¹⁷ "Call Routing--No 311." Diagram. Tyler P. Reinagel.

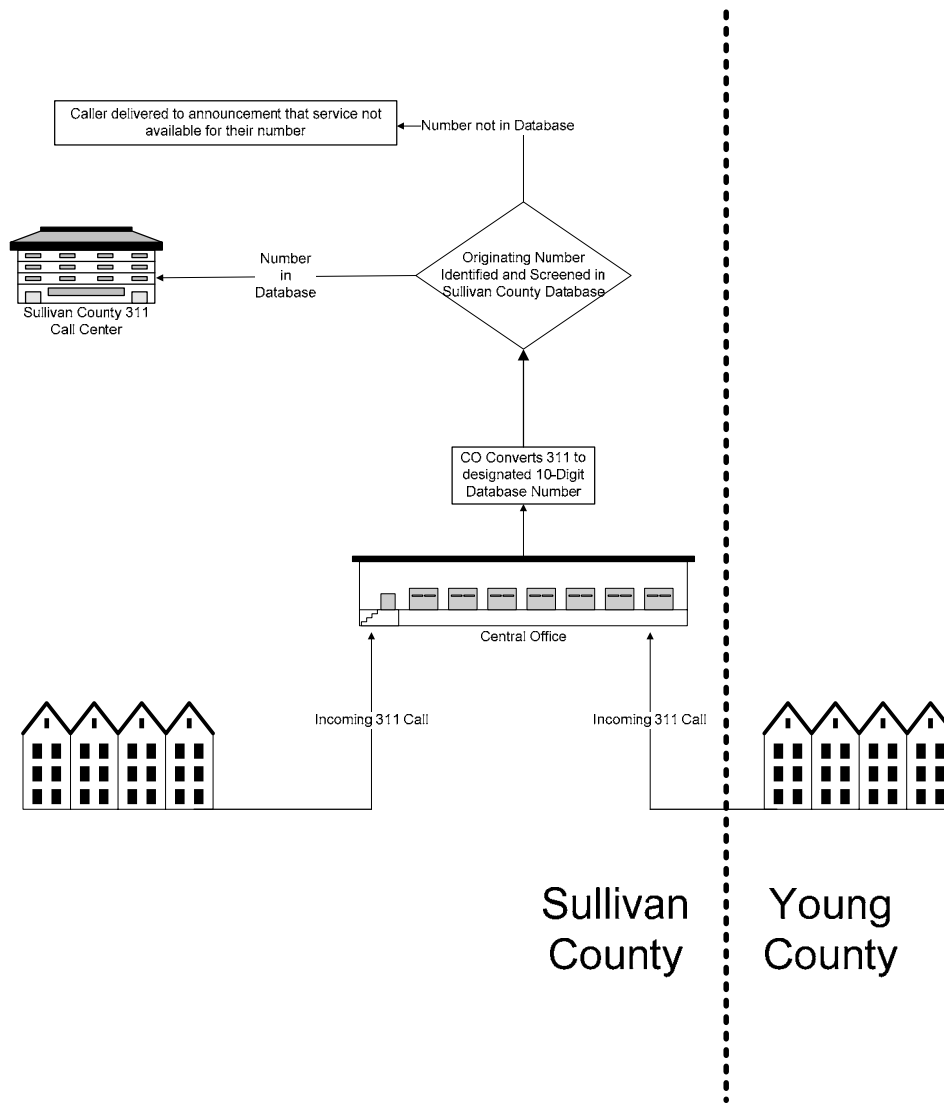


Diagram 4: 311 Call Routing When Call-Routing Solution Is Included in Sullivan County's 311 Implementation¹⁹

In a November 2007 United States patent, a flowchart identified the path of a call from the end user to the call center, passing through multiple screening processes and databases. The process first screens at the CO level, where incoming calls at COs exclusively serving a single jurisdiction are forwarded directly to the call center and bypass any further screening.²⁰ In the context of diagram 1, this is the case for CO5 in Jones County. For incoming calls at shared COs, a more in-depth screening process is initiated, which followed the basic flow of diagram 4. In this diagram, only one 311 implementation is

¹⁸ "Call Routing—311 Without Routing Solution." Diagram. Tyler P. Reinagel.

¹⁹ "Call Routing – 311 with Routing Solution." Diagram. Tyler P. Reinagel.

²⁰ Sabinson, Richard, et.al. "Geographical Call Routing for a Non-Emergency Calling Service." U.S. Patent 7,292,688. 6 November 2007.

in place in the shared CO. Consequently, if the call is not “screened in” to the Sullivan County call center through this database, the caller is routed to a recorded message or other indication that 311 is not available in his or her area. This routing solution not only allows Young County future access should it opt to implement 311, but it also limits the number of extraneous calls entering the Sullivan County call center.

Call-Routing Solutions

To have the ability to designate a ten-digit go-to number for incoming 311 calls, local governments must identify the COs from which they wish to access calls and apply for these COs through the state public-service commission. The commission can either grant the application on its merit or qualify which COs the jurisdiction may adopt.

For jurisdictions that determine that the state tariff is not practicable, there are three generally accepted methods to ensure calls are properly routed to their 311 call center: a ten-digit vanity number, interactive voice recording (IVR), and a selective-routing database, which has been implemented as both zip-code-based and database-driven models. Two of the three options avoid the central-office hindrance to implementation: the vanity number and the IVR. However, that does not mean that these solutions are problem-free. The third option, a routing database, has two basic methods for service delivery. This option will require agreements for implementation and service between the jurisdiction and the LEC or an outside vendor.

Vanity Number

A vanity number is a ten-digit number selected by the jurisdiction and serves the same purpose as a 311 number. In forgoing the convenience of abbreviated dialing, jurisdictions bypass the translation, fees, and tariff altogether, and a vanity number does not require approval from the state public-utilities commission. In fact, many jurisdictions currently operate customer call centers using a vanity number.

Interactive Voice Recording

After dialing 311, callers would receive a voice prompt to select their jurisdiction. For instance, in a CO that covers portions of three counties, callers would be instructed to press a corresponding number for the 311 center they are trying to reach (“Press 1 for County A, Press 2 for County B, and Press 3 for County C”). However, an IVR option relies on the callers to know the jurisdiction they are in and possibly the difference between city and county services. It also requires some level of interjurisdictional relationships between the cities and/or counties sharing COs.

Selective-Routing Database

The third option addresses the routing problem through a database identifying a call's point of origin and routing the call to the appropriate call center. Should the development of a database emerge as a viable solution to the complexities posed by the state tariff structure, the following questions should be asked and answered by the jurisdiction to determine the most appropriate adaptation:

1. What are the costs of the services?
 - One time
 - Recurring
 - Per call charge
 - Annual contract
2. What source(s) will be used to populate the database?
3. Can multiple sources of data be used?
4. Does the jurisdiction have the ability to modify the database?
5. Who owns the data?
6. What is the frequency of database updates and at what cost?
7. Will remapping of ZIP+4's to reflect jurisdictional boundary changes be included?

One vendor may offer a database for routing calls from the COs based strictly on public-directory information. As a result, residents and businesses with private or unlisted numbers would not be included in the database, nor would any other sources of data. Another vendor might propose using publicly available information as well as data from other sources, including existing city and county records.

It is also important to inquire about the ability to add information to the database. Sometimes referred to as an opt-in process, it "allow[s] citizens not already identified by the vendor-supplied sources to have their telephone number(s) added to the 311 database," if desired.²¹

Data ownership is also important. The jurisdiction may want to opt for ownership of the database for two reasons: to have the ability to modify or update the information at will, and if the implementing vendor ceases to exist or the contract expires, the jurisdiction will want to ensure the database information does not become lost or unavailable.

The sixth consideration is database updates. Updates will add new numbers and purge outdated numbers to maintain database accuracy. Local governments should determine how often updates will occur and the cost of each. While a daily update might be

²¹ *RFP No. 06-500019 for Call Routing, Call Delivery, and Related Services System for the 311 Citizen Help Center.* DeKalb County Government. Decatur, GA, 2006.

desirable, it may not be fiscally plausible. Alternatively, while a yearly update might be the most cost-effective, the accuracy of the database will likely deteriorate significantly after several months, and quality of service may suffer.

ZIP+4 adds an additional four-digit number to the end of the traditional five-digit zip code and provides users with a more specific routing area. By mapping customers based on the extension of the traditional five-digit zip code, a database can be built based on more localized information. However, there are two limits to this option: There is no guarantee that the additional four digits correspond with political boundaries, and the database will likely identify callers based on their phone line's billing address as opposed to their physical address. Because the billing address and physical address do not necessarily correspond, there would likely be a number of outside-of-jurisdiction calls being routed to the call center and a number of inside-of-jurisdiction calls unable to reach the call center without an opt-in process.

An alternative to this automatic number identification (or caller ID) method of routing calls is an option for a database-driven routing solution. The number is not routed based on being a part of a particular telephone exchange, ZIP, or ZIP+4, but is either included in or excluded from the database. This may also include data from a variety of sources, including public directories, tax records, utility billing information, and other city/county records.

Though many of the database considerations will be the same for neighboring jurisdictions, the characteristics of the resulting database do not have to be the same. Therefore, a future jurisdiction's choice for call routing can be different. The call-routing solution in a shared CO can have as many variations as there are implementations.

The last example, depicted in diagram 5, illustrates a possible routing scenario with multiple 311 implementations in a shared CO. Sullivan County's database serves as the first filter for incoming 311 calls, but the database diverts all non-Sullivan County calls to a different ten-digit number, as designated by Young County's database provider. The call is then screened in a second database. This flowchart process is replicable for as many databases and providers as necessary and allows all jurisdictions a choice in database characteristics and providers as well as unfettered access to their citizens.²²

²² U.S. LEC in Coordination With DeKalb County Government. Letter to Georgia Public Service Commission. 18 December 2006. IN RE: DeKalb County Petition for N11; Docket No. 19330-U.

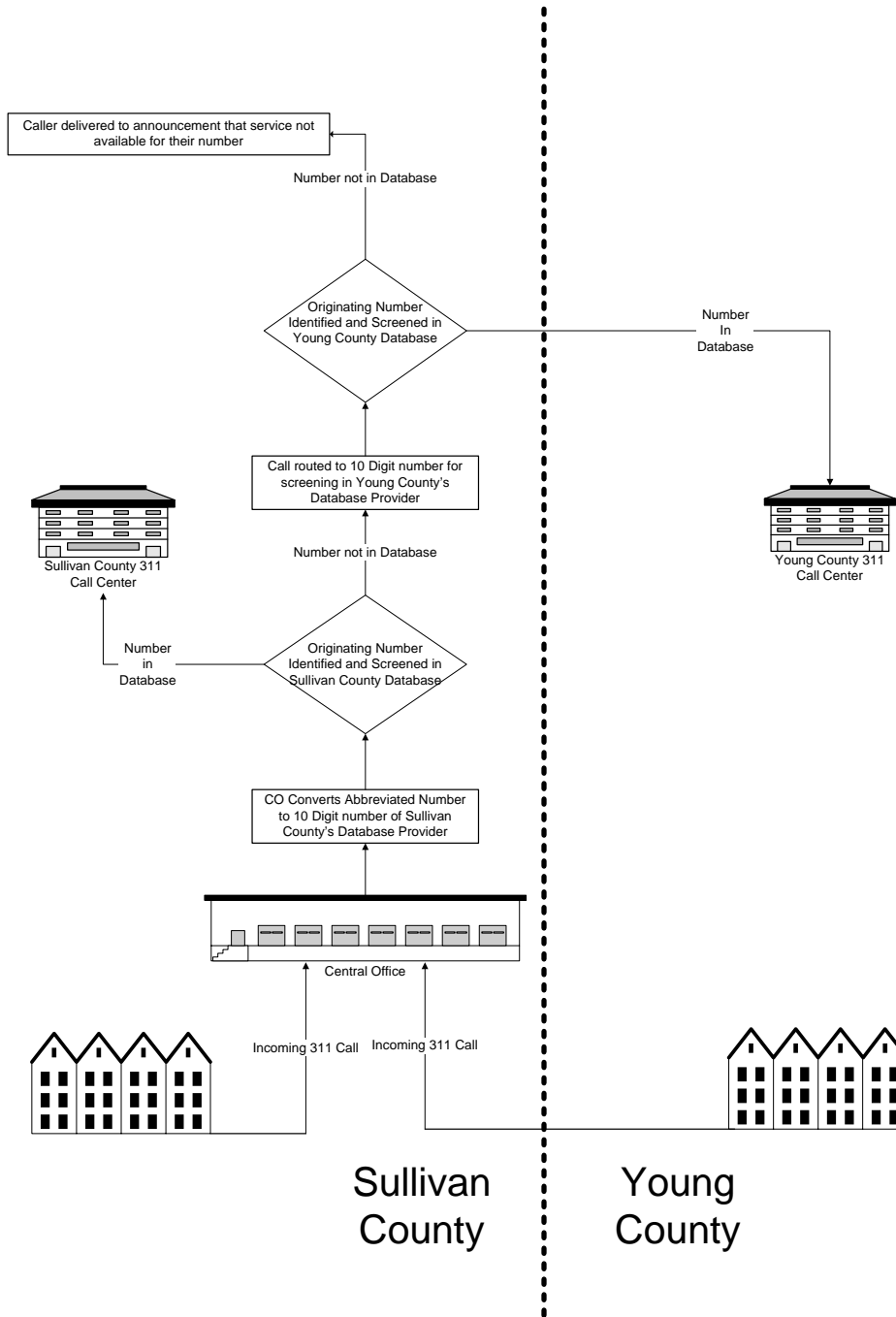


Diagram 5: 311 Call Routing When Call-Routing Solution Is included in Sullivan County's 311 Implementation^{23,24}

This configuration allows calls passing through the same shared CO to ultimately access two or more different ten-digit go-to numbers and thus different call centers. At any stage in the process, it is possible that an extraneous call will be screened out or screened

²³ "Call Routing – Multiple 311 Call Centers with Routing Solution." Diagram. Tyler P. Reinagel.

²⁴ U.S. LEC in Coordination with DeKalb County Government. Letter to Georgia Public Service Commission. 18 December 2006. IN RE: DeKalb County Petition for N11; Docket No. 19330-U.

in, but for the most part, it has a high degree of accuracy. It is also a solution that works within the existing telephone infrastructure and many of the state tariffs.

Jurisdictional Solutions

Due to a combination of state-specific tariffs, CO configuration, and varying organizational structures of local governments, most call-routing solutions will be jurisdiction-specific. Although their approaches varied, in application to the Georgia Public Service Commission, both Columbia County and the City of Savannah accepted the premise of the existing state-tariff structure. Rather than identifying coverage areas based on geography, Columbia County identified the specific exchanges within the COs that would have access to 311.²⁵ Because these exchanges and COs are not bound by county boundaries, Columbia County is still likely to receive out-of-jurisdiction calls. Their application acknowledges that these extrajurisdictional calls will occur, and the following was proposed: "Operators will transfer callers who are requesting information and/or services that are outside of our county directly to the appropriate service."²⁶

In an assignment application the following year (referencing proposed service area), Savannah identified three COs and the areas that would be covered outside their city limits, (including unincorporated areas of Chatham County and portions of two other cities).²⁷ Like their counterparts in Columbia County, Savannah officials acknowledged that calls from outside the jurisdiction would be received.

The geographic boundaries of a specific exchange may be smaller than the entire CO, which may house many exchanges. Since exchanges, like COs, do not necessarily correspond to exact city or county boundaries, the origin of a call does not necessarily determine its destination. Without a database solution, calls from within or outside of a jurisdiction cannot be distinguished. As noted in their applications, variations in definition of the tariff still result in extraneous calls being directed to both jurisdictions' call centers.

As mentioned earlier, the Colorado Public Utilities Commission (PUC) issued a ruling in 2006 requiring a detailed plan for call routing from local governments. In the ruling, the PUC requires a "proposed method for routing the 311 calls to the call center."²⁸

²⁵ Columbia County, Georgia to Georgia Public Service Commission. "Request for Dialing Code 3-1-1." 14 October 2004. Evans, Georgia, 2004.

²⁶ Columbia County, Georgia to Georgia Public Service Commission. "Request for Dialing Code 3-1-1." 14 October 2004. Evans, Georgia, 2004.

²⁷ City of Savannah, Georgia to Georgia Public Service Commission. "Request for Approval of the Assignment of the Abbreviated Dialing Code 3-1-1." 7 September 2005. Savannah, Georgia, 2005.

²⁸ State of Colorado. Public Utilities Commission. Department of Regulatory Agencies. *Code of Colorado Regulations: Rules Regulating Telecommunications Providers, Services, and Products; Numbering Administration* (4 CCR 723-2). 1 August 2007.

Rather than being rooted in specific COs and exchanges (as was the case in Columbia County), Pueblo, Colorado, based its routing on city zip codes. Pueblo's 311 addressed these requirements in its application as follows: The three COs that serve the city limits of Pueblo screen calls from seven zip codes (though *not* ZIP+4).²⁹ Calls are routed based on the zip-code databases located within those three wire centers. For calls received by the city that require a referral to another jurisdiction, the caller is provided with the appropriate telephone number to call.

Call routing was also a topic in a September 2003 follow-up analysis of the Austin, Texas, 311 call center, which originally went live in 2001. The call-routing solution incorporated into the center's implementation was a focus in the report. They worked with their LEC, Southwestern Bell, to develop a geofile database serving as a filter. Southwestern Bell established and maintains the database based on geographic areas designated by the City of Austin. Modifications to the database are made at the discretion of the City of Austin and limited to major events like annexations. Although the routing solution is not flawless, it addresses the city's need for all citizens in Austin to have access to 311 and how they will achieve the desired results.

Implementations in Canada have also had to address this call-routing question. In November 2004, the Canadian telecommunications regulatory body, the Canadian Radio-Television and Telecommunications Commission, issued a nationwide decision on the assignment of the 311 number and its appropriate call routing. This ruling was a result of differing views the telephone companies and municipalities had about geographical boundaries and call routing. While telephone companies expressed interest in accommodating 311 service within the realm of the existing telephone infrastructure, local governments believed that "the boundary issue was fundamental to the definition of the proposed service and that the implementation of 311 would be adversely affected if municipalities were forced into shared cost/service delivery arrangements."³⁰

The commission determined that "call-routing arrangements should be based on the exchange boundaries, unless otherwise negotiated" by the local government and telephone service provider. The telephone companies noted that "an exchange area may serve parts of several municipalities" and require "special provisioning measures" to route calls to the appropriate municipal call center. Further, if additional expenses were incurred to route calls based on municipal boundaries rather than exchange boundaries, the phone service providers lobbied that the municipalities should bear the extra expense. According to the

²⁹ *Order Granting Petition and Setting Response Time* (Docket No. 07M-285T). City of Pueblo, Colorado. Public Utilities Commission of the State of Colorado, 26 September 2007.

³⁰ *Assignment of 311 for Non-Emergency Municipal Government Services* (Reference: 8665-C126-200315699). Canadian Radio-Television and Telecommunications Commission. Ottawa, Ontario, 5 November 2004.

commission decision, those considerations were so ordered, and it now has routing requirements similar to that of Canada's 911 service.³¹

The ruling defined variations in service delivery due to jurisdiction overlap. For telephone exchanges and COs that are entirely within a jurisdiction, a Bell Canada concept called Municipal Routing has been implemented, routing all incoming 311 calls to the jurisdiction's 311 call center. This is comparable to the call flow that was described earlier in the patent filed in the United States and would be the case of CO5 in Jones County in diagram 1. For those COs not entirely within the jurisdiction's boundaries, enhanced postal codes are used to route incoming calls, with the additional expense for the work being borne by the local government.³²

Though the ruling does not specifically address what measures should be taken to remedy the call-routing problem posed by multijurisdictional COs, it acknowledges the fundamental problem and lays the groundwork for individual solutions and the responsible party.

Conclusion

Once considered a way to offload non-emergency calls from 911, 311 has become a central point of contact for citizens to reach their government. As 311 continues to set the national standard for exceptional customer-service delivery in local government, it must also evolve in both its definition and its ability to have the service readily available to all citizens the jurisdiction serves.

More recent implementations have found that connecting residents to their call center sometimes requires more forethought than many state tariffs had taken into consideration. The fundamental problem is that in many states, "the tariff does not address the situation...where a central office serves multiple jurisdictions."³³ As 311 implementations are now occurring at an exponential pace, this lack of clarity may slow the assignment process as well as raise concerns by adjacent jurisdictions. In addition, telephone infrastructure was not necessarily designed or built to accommodate a geographical or political boundary that further complicates the appropriate routing of calls.

This paper discusses many of the variables to consider in routing calls to a jurisdiction's call center while working within the regulatory confines of the state tariff. As

³¹ *Assignment of 311 for Non-Emergency Municipal Government Services* (Reference: 8665-C126-200315699). Canadian Radio-Television and Telecommunications Commission. Ottawa, Ontario, 5 November 2004.

³² *Assignment of 311 for Non-Emergency Municipal Government Services* (Reference: 8665-C126-200315699). Canadian Radio-Television and Telecommunications Commission. Ottawa, Ontario, 5 November 2004.

³³ *Petition of DeKalb County for Assignment of Abbreviated Dialing Code 311 for Access to Non-Emergency Services in DeKalb County, Georgia* (Docket No. 19330-U). Georgia Public Service Commission. Atlanta, Georgia, 9 January 2007.

the telephone infrastructure in land-based lines was designed and built for user access, it is impractical to contemplate a redesign to facilitate 311 routing. However, we can revisit the practicality of current tariff structures and rewrite them to better suit local exchange-carrier central-office configurations in an emerging multijurisdictional 311 environment.

For now, cities and counties should be aware of how their central-office exchange boundaries are configured and whether the implementing jurisdiction will be able to conform to the existing tariff structure or if it should consider an alternative. Solutions are available at all price points, including some at no cost. The basic need is to address call routing as a part of the overall 311 strategic plan. Without it, citizens may be unable to reach their call center without dialing a ten-digit number, while others may reach another jurisdiction's center. In addition, cities and counties will pay for and have to field calls from outside of their jurisdiction. This can be costly to the government and a nuisance to callers.

The service of 311 was designed to connect citizens to their local government. Ensuring that all 311 callers are connected is, and will remain, one of the most fundamental components of 311's success.