# Status Of U.S. Small Cell Wireless/ 5G
# &
# Smart City Applications
# From The Community Perspective

RVA LLC
Market Research & Consulting

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**Primary Sponsor:**

Next Century Cities

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# Purpose Of Study

This study was conducted for the purpose of determining the current deployment status of and attitudes toward Smart City applications and small cell deployment (4G densification and 5G) from the community perspective, with the goal of producing the most comprehensive Smart City study to date. Prior to this research, little was known about the actual deployment levels of these technologies, or the issues communities face as these approaches are developed in practice. This study asks the who, why, what, ways, and whoa (pause worthy concern) questions.

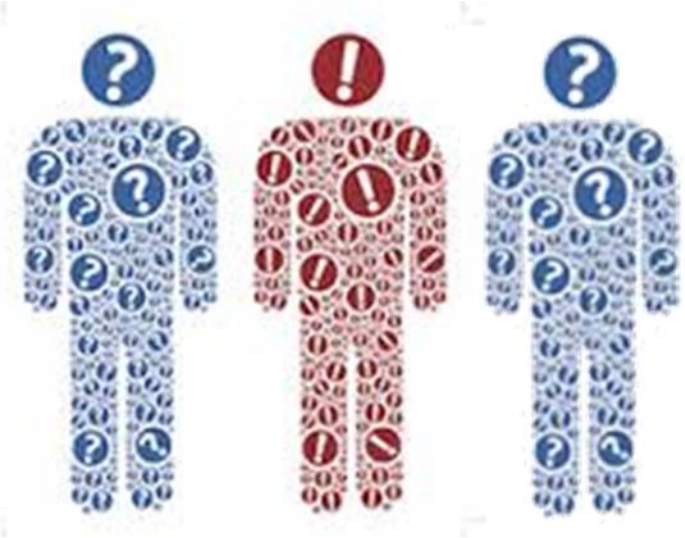
While primarily focusing on technology issues, the study also addresses some telecom policy issues. It should be noted that RVA LLC remains neutral on policy issues and is merely reporting the views of this study's particular group of respondents.

# Smart City Applications
# Small Cell Wireless

# Methodology

A total of 176 interviews were completed among members of a variety of organizations. Respondents were invited from a variety of organizations such primary partner and sponsor ***Next Centuries Cites***, and *National Association of Telecom Officers and Advisors (NATOA),* the *Urban Land Institute (ULI)*, *The American Planning Association (APA)* , and from subscribers to *Broadband Communities Magazine,* as well as some from an online panel of municipal community members.

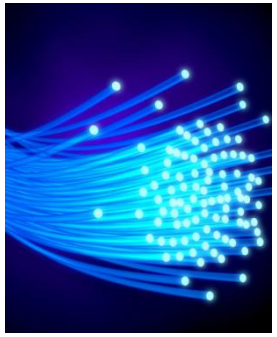
The study is not intended to be a totally random view of the average U.S. community, but rather a study of communities that are somewhat on the leading edge of technology and communications issue focus.



*176 total interviews.*

# Key Findings

# Key Findings Related To Small Cell Deployment



**Fiber…As Well As Urban Density Is Important To Early Small Cell Deployment**

Small cell deployment is now clearly underway in the United States. In the technology focused communities studied, a total of 44% note such deployment in their city. Presumably, much of this activity is currently related to 4G densification and 5G emulating fixed wireless, since actual industry certified 5G standards are not yet in place. Small cell deployment is clearly correlated with city size (and likely density) and also clearly correlated with fiber deployment (ease of actualizing fiber backhaul for small cells).

**Public/ Private Cooperation Is Enhancing Smart Cell Deployment**

A total of two-thirds of cities report they are collaborating with private providers on small cell deployment. Further, 60% note that an agreement is in place with providers. On the other hand, cities could be somewhat more proactive in developing actual written policies for small cell deployment. To date only 31% have completed policies (51% among those in cities where deployment is occurring).

# Key Findings Related To Small Cell Deployment (Cont.)

**Small Cells Are Being Installed On Multiple Kinds Of Structures**

About two-thirds of deployment appears to be occurring on traditional telephone and electric poles, and on street lights. Other deployment is on new poles and on buildings and various kinds of signage. The median lease rate reported was $1,200 per pole (note: caution given small sample and large variance).

**Cities Are Concerned About Maintaining Local Oversight And Control**

Most cities are quite concerned about laws being passed or proposed related to limiting local authority to maintain city aesthetics and safety, recovering reasonable permitting costs, and obtaining fair market rates for the use of city assets. Specifically, many have serious reservations about the unsightly nature of some early small cell deployments. At the same time, many cities note that providers are concerned about excessive permitting time, and some city representatives say cities should come to the table more to address those issues.

# Key Findings Related To Smart City Deployment

**Fiber… And Urban Density Is Also Important To Early Smart City Deployment**

Over half the cities interviewed noted that Smart City activity is now underway in their city. As it does with small cells, Smart City activity clearly correlates with both population size and fiber availability. A total of 100% of the cities in the sample with over 500,000 population… and with local commercial or residential fiber-to-the-premise activity, are now pursuing Smart City applications.

**Citizen Quality Of Life Is The Primary Smart City Driver**

Enhancing citizen quality of life over reducing municipal costs is clearly the motivation for Smart City deployment. (On the other hand, based on comparable RVA qualitative research, many cities note that reducing city costs is often an important tool to realize funding. Further, small cities are more likely to note reducing costs as a driver.) Key current uses of Smart City technology focus on public safety, city service delivery, broadband, and transportation. Specific current applications include adaptive traffic light timing, crime detection and prevention, parking availability applications, and mass transit applications such as bus location in route.

In cities deploying, smart technology is considered slightly more important to the city than traditional strategies such as building projects, and engaging human talent.

# Key Findings Related To Smart City Deployment (Cont.)

**The Number Of IoT Devices Used Is Currently Small, But Growing**

Based on this study, an average of 155 cameras and 115 sensors are currently estimated to be in use in Smart Cities. The number of devices of course correlates with city size. The higher number of cameras in use versus sensors may be, in part, related to the maturity of camera use versus IoT sensor use.

On average, in cities deploying smart city technologies, there are less than 7 camera and sensor devices per 10,000 citizens – certainly not yet an invasion of IoT devices.

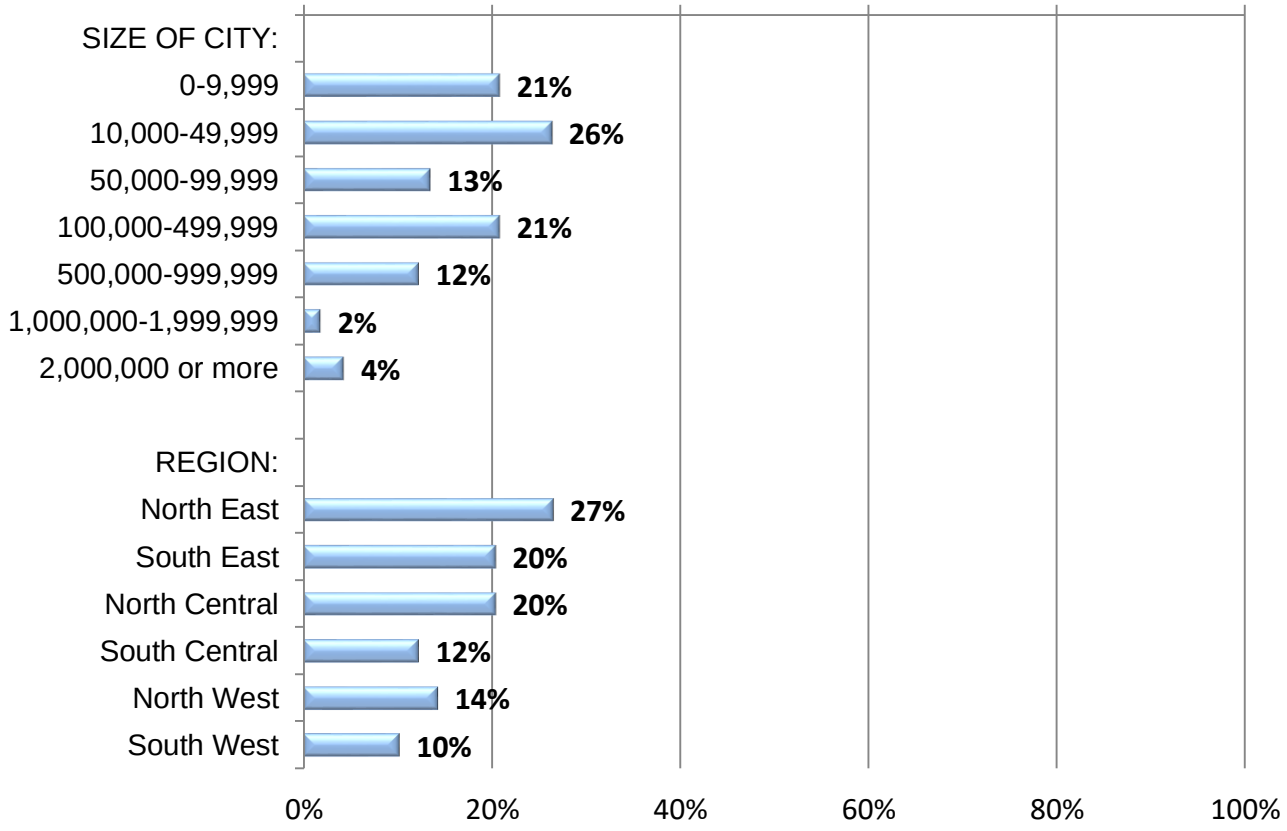
**Security and Privacy Lead Concerns About Smart City Deployment**

Municipal officials do have some concerns about Smart City deployment. Current concerns center on cyber security, maintaining citizen privacy, and serving all citizens equally. In terms of deployment strategy, many are concerned that vision and operations are not coordinated enough between different city silos. In fact, in larger cities only 26% say Smart City efforts are “very coordinated” in their city.

# Background Characteristics

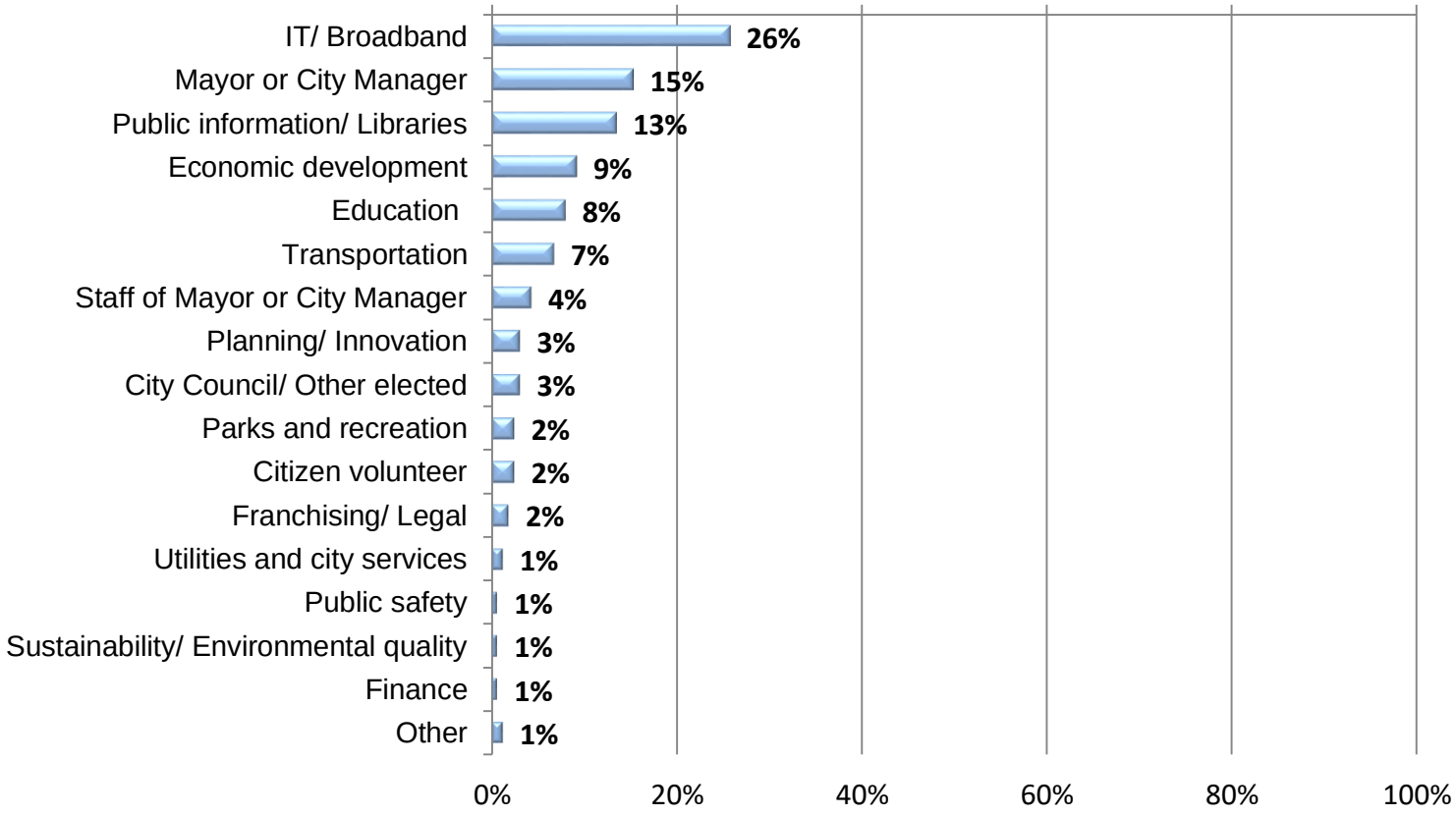
Respondents to the survey represent a wide range of city sizes from all sectors of the United States.

# General Demographics Of Sample



Respondents represent a wide range of departmental responsibilities.

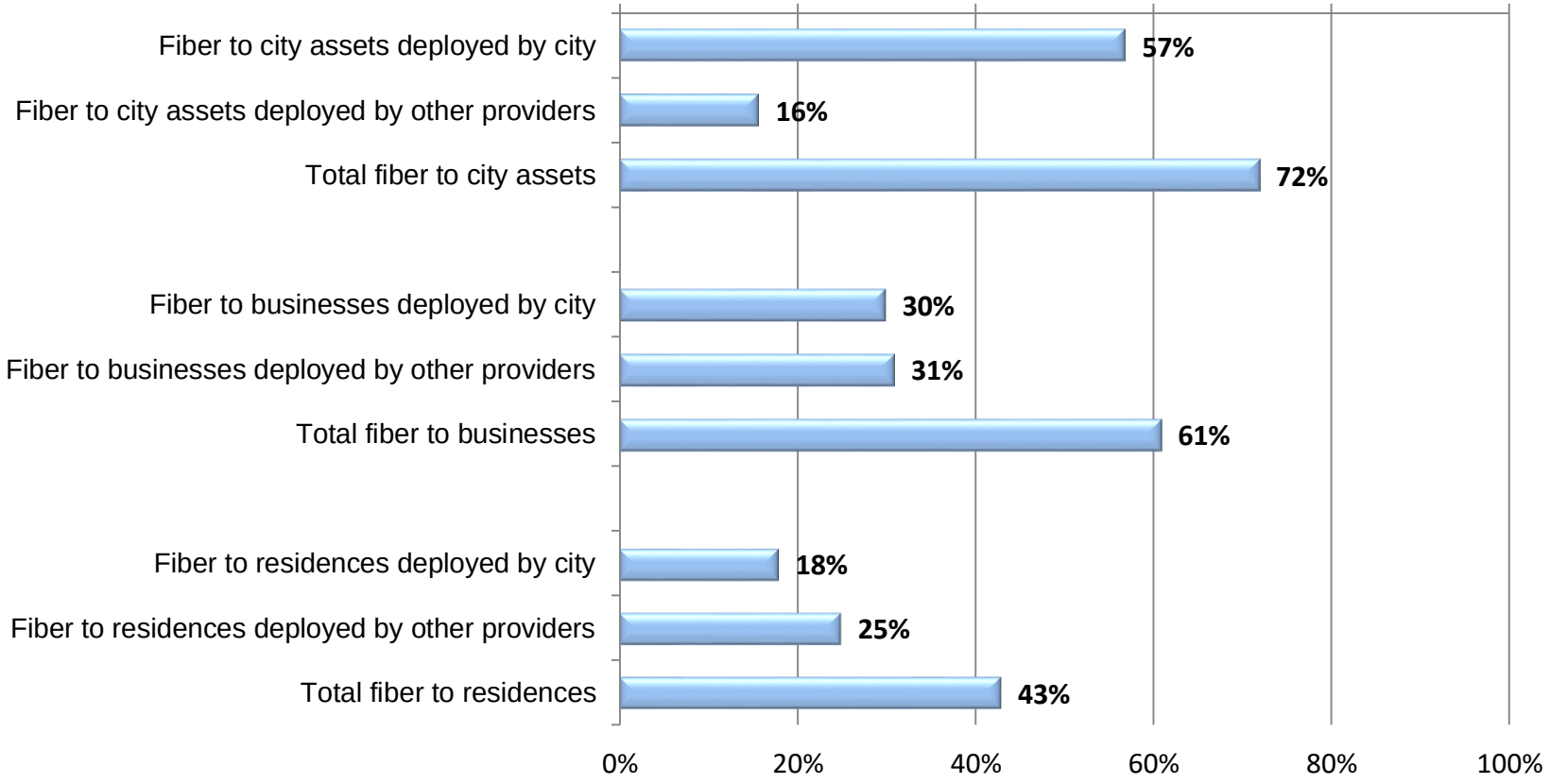
# Respondent Municipal Department Or Responsibility



Respondents have above average fiber deployment in their communities, including higher than average community involvement in deployment. A total of 18% of the cities have deployed or are deploying fiber to residents themselves, compared to about 3% nationally for cities with over 1,000 population.

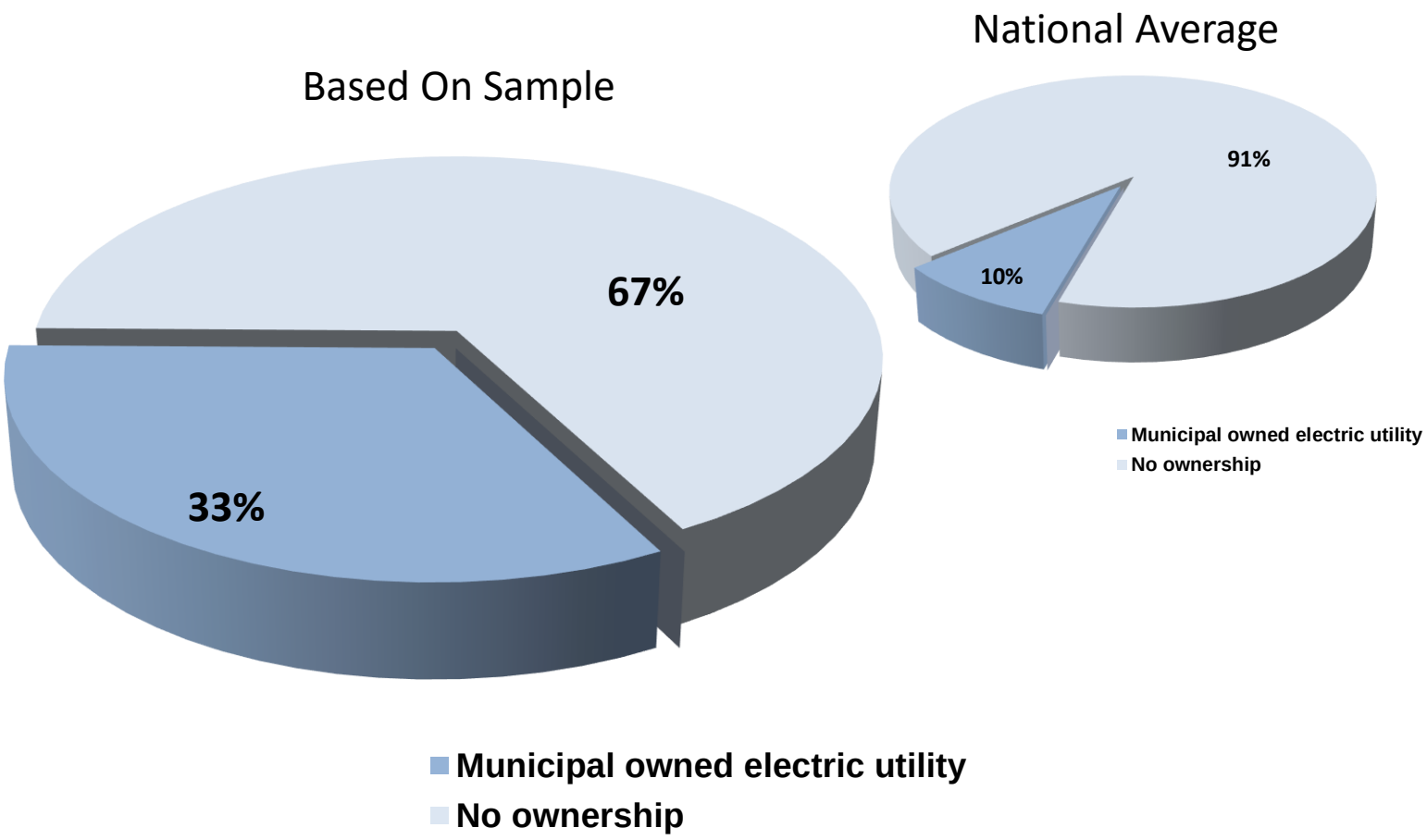
# Fiber Broadband Deployment Status

## Fiber Installation Complete Or in Progress



One-third of the communities surveyed own their own electric utility, which is also above average. Nationally, only about 9.5% of communities have a city run electric utility – based on data from the UDI Directory of Electric Power Producers and Distributors.

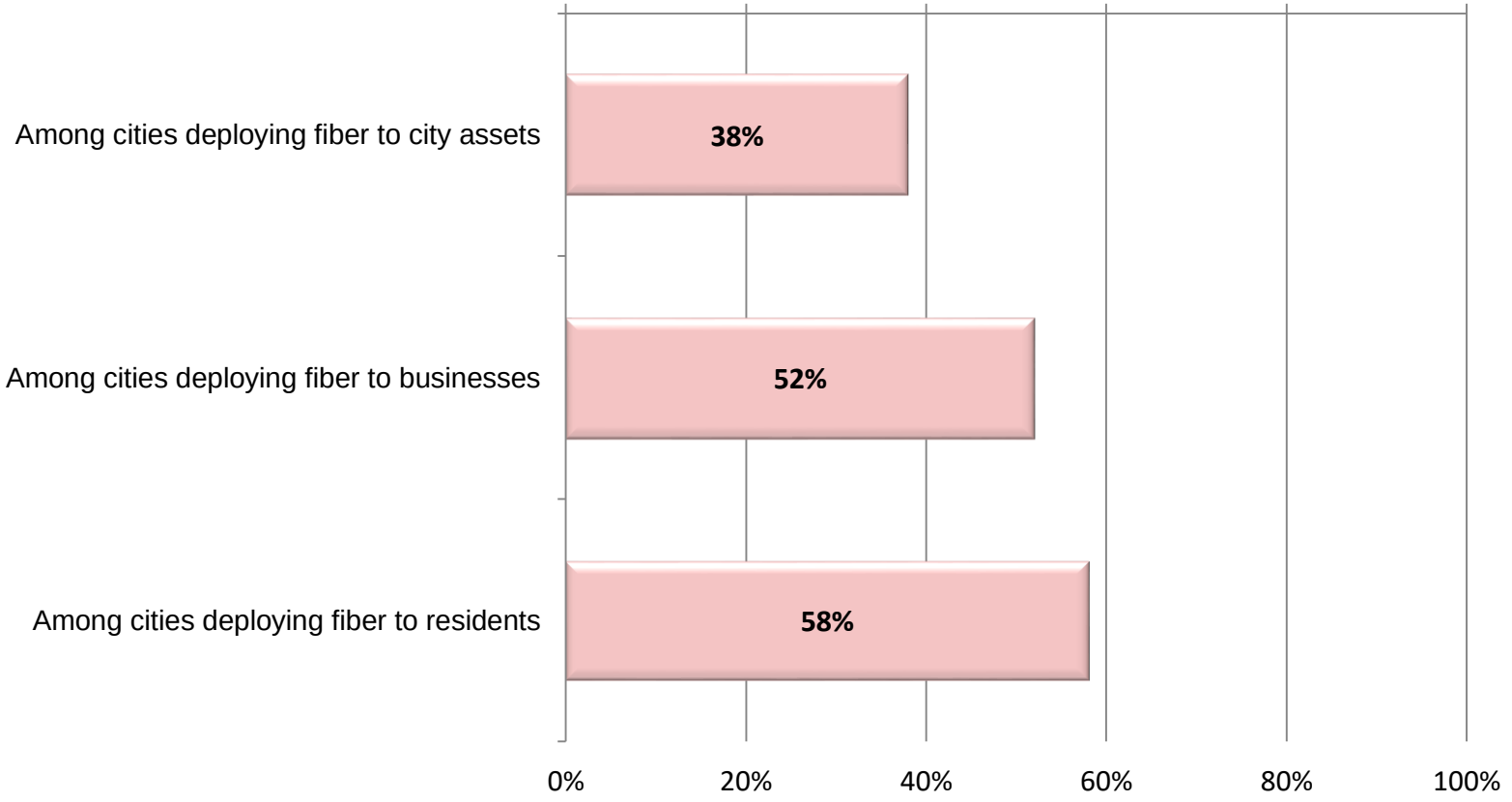
# Municipal Ownership Of Electric Utility



Based on crosstabulation (looking at the results among subgroups of the entire sample), electric utility ownership is correlated with city led fiber deployment. As an example, of the cities deploying fiber to residents, 58% own an electric utility.

# Municipal Ownership Of Electric Utility

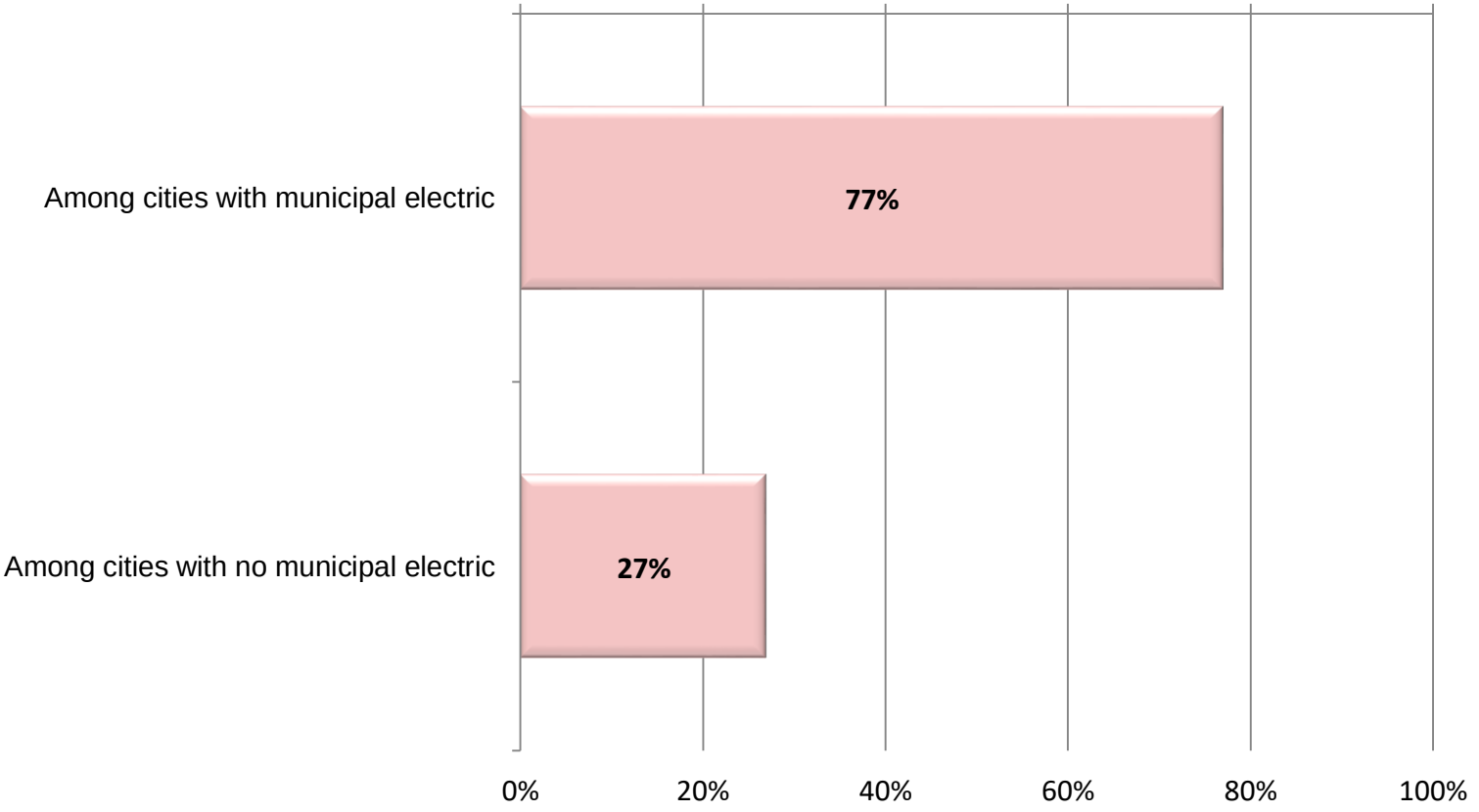
## Crosstabulation By City Fiber Deployment



Looking at crosstabulation in reverse, fiber deployment is also correlated with municipally owned electric utilities. Of sampled cities with a municipal electric utility, about 3 in 4 are deploying residential fiber versus 1 in 4 among those with no municipal electric. Even the last statistic is high based on a technically oriented sample. (Nationally, less than 1% of those with no municipal electric are deploying residential fiber.)

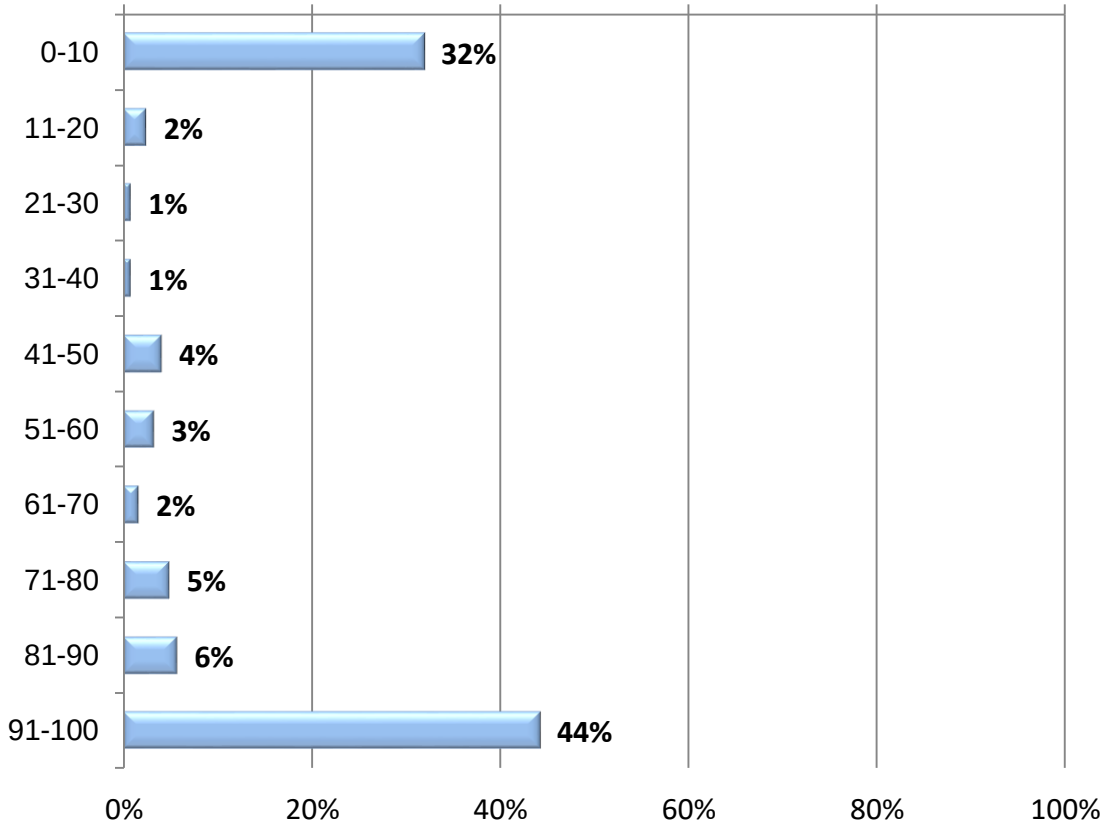
# City Deployment Of Residential Fiber

## Crosstabulation By Ownership of Municipal Electric Utility

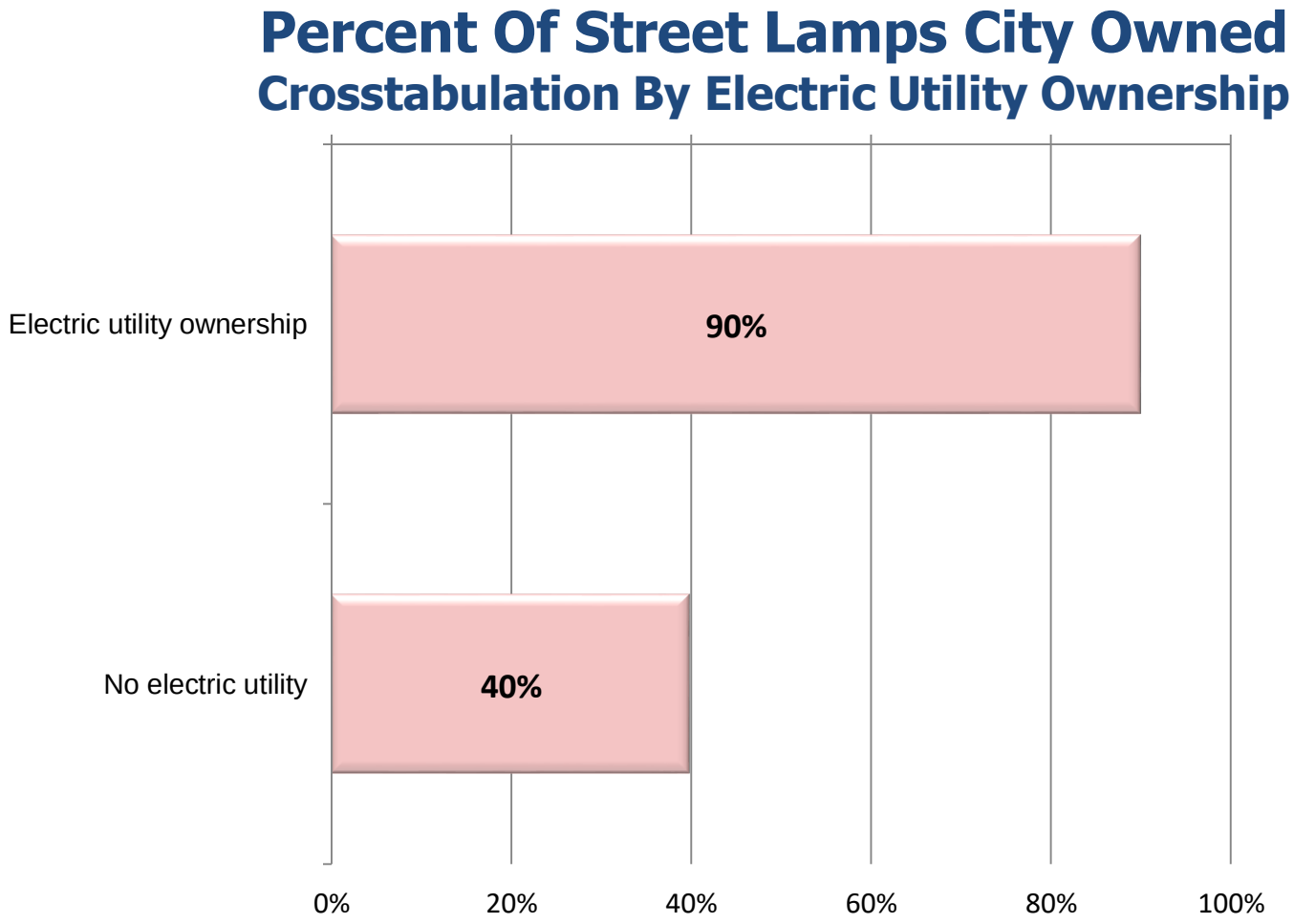


Municipal ownership of street lights represents an inverted bell curve. Most of the communities surveyed either own many, or relatively few, street lights.

## Percent Of Street Lights Owned By the City



As might be expected, ownership of street lamps is somewhat correlated with electric utility ownership.

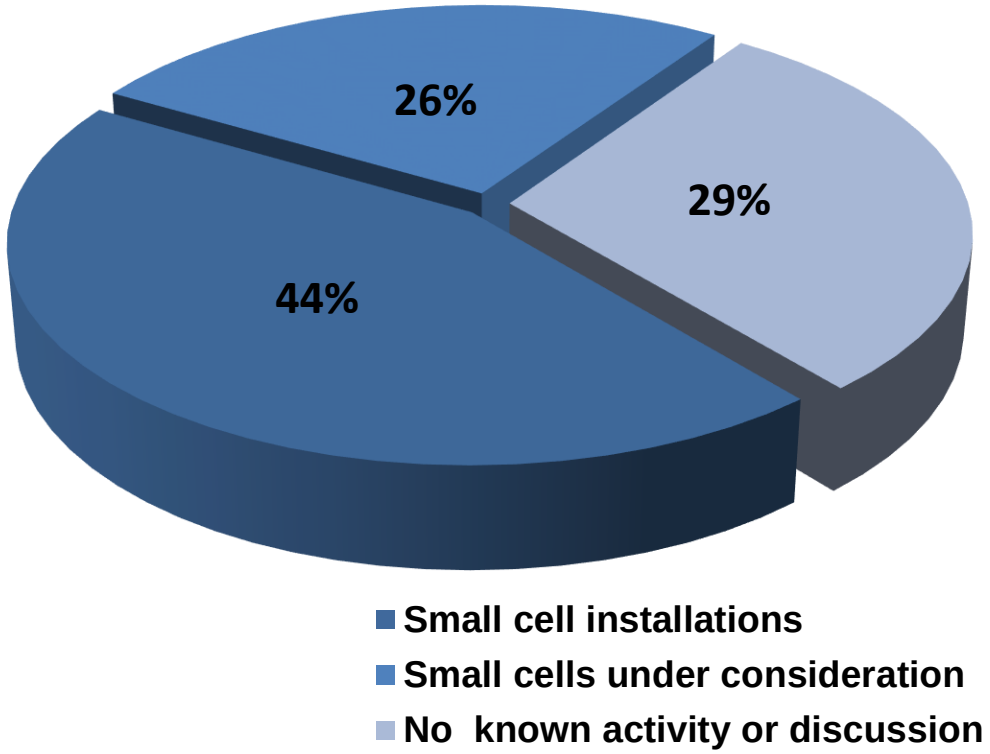


# Detailed Review Of Findings

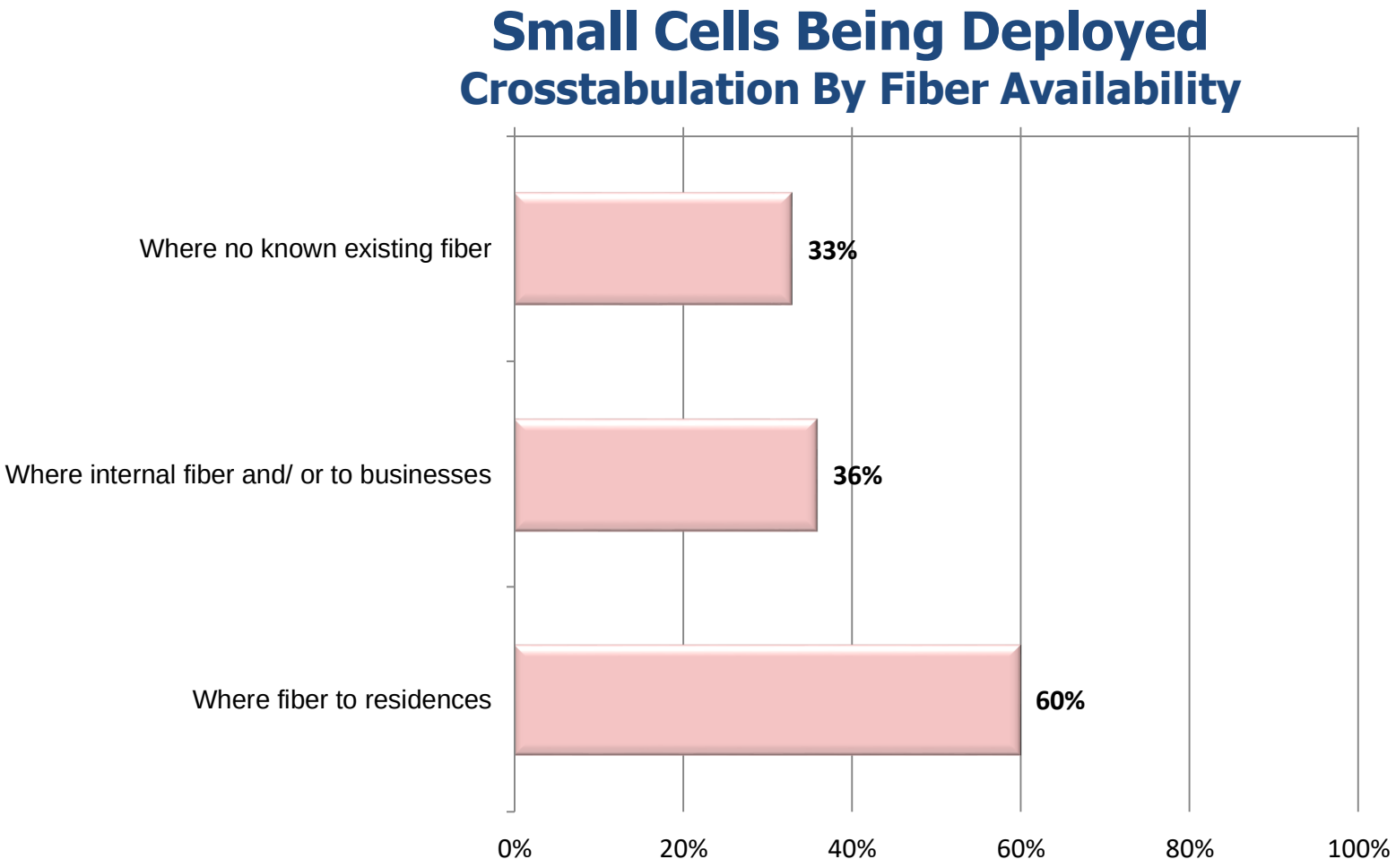
# Small Cell Activity

Small cell installation is now occurring. It is reported in 44% of the surveyed communities and is under consideration in another 26%, thus representing over two-thirds of the communities surveyed.

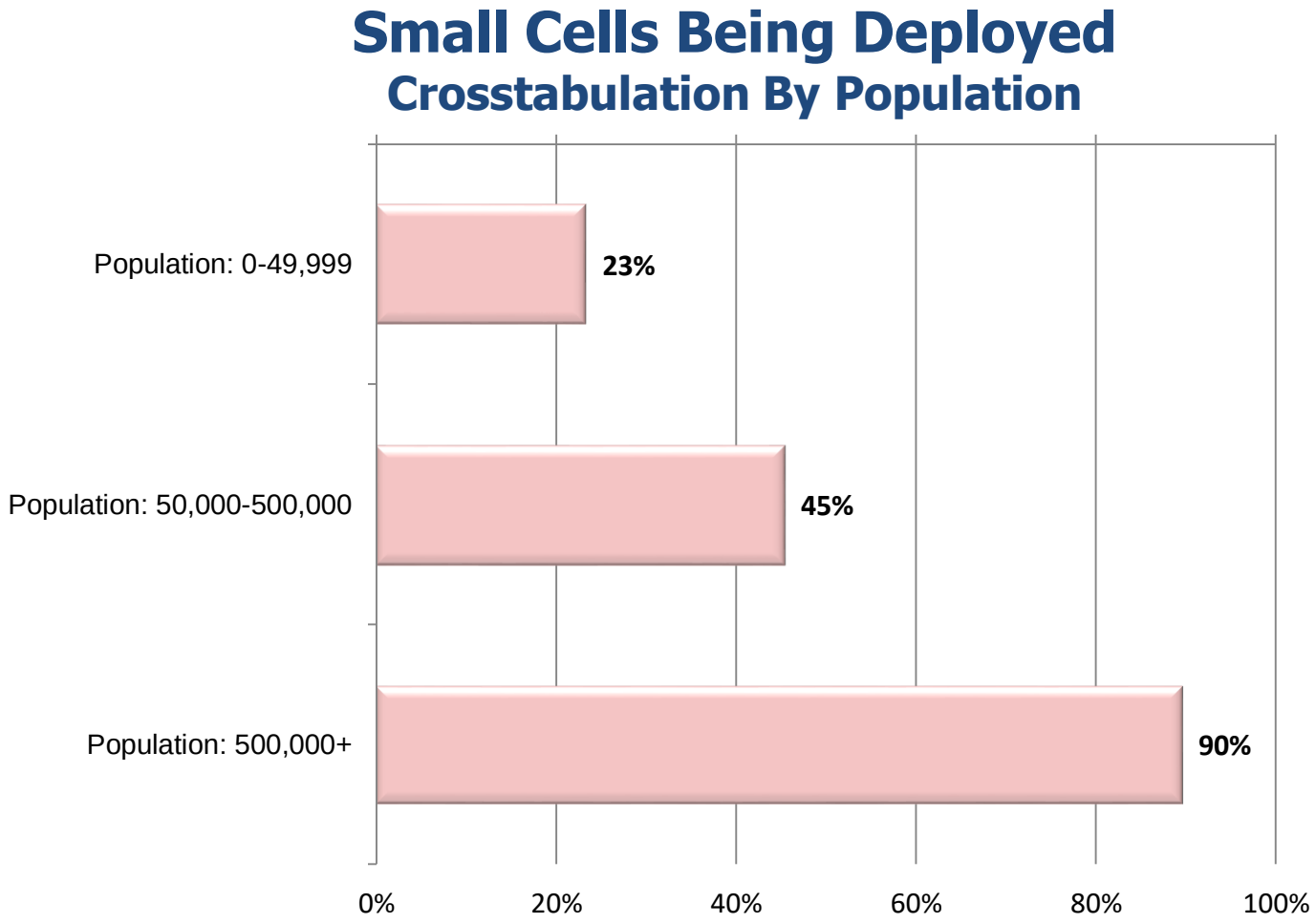
## Status Of Small Cell Activity In Community



Small cell activity is also most prevalent in cities with widespread fiber - fiber to the residence (deployment by any type of provider). For example, where there is no existing fiber, only 33% report Small Cell activity, versus 60% in cities with fiber to the residence.



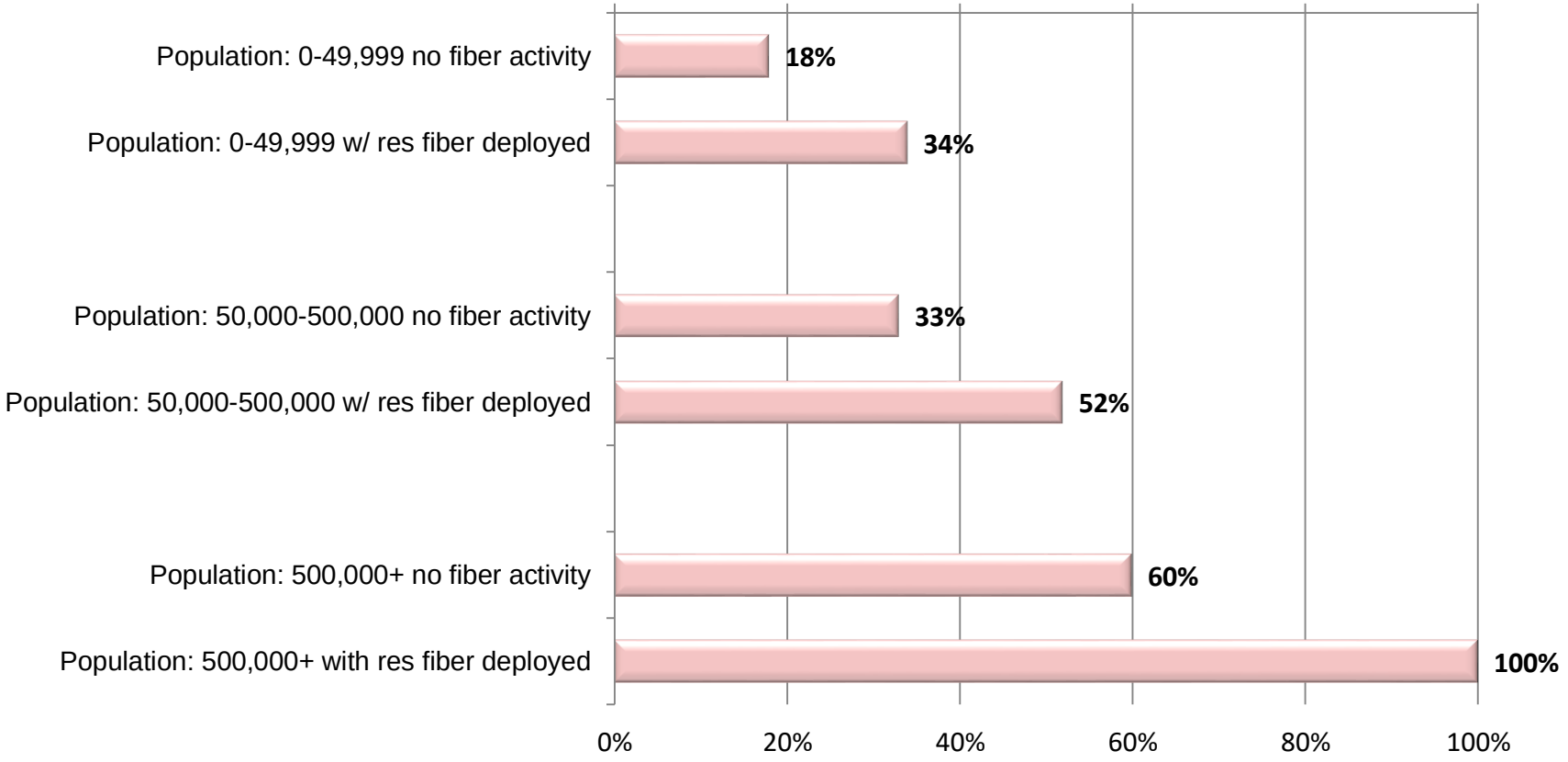
Small cell activity is also clearly most prevalent in larger communities.



The correlation with fiber deployment is maintained for all population groups.

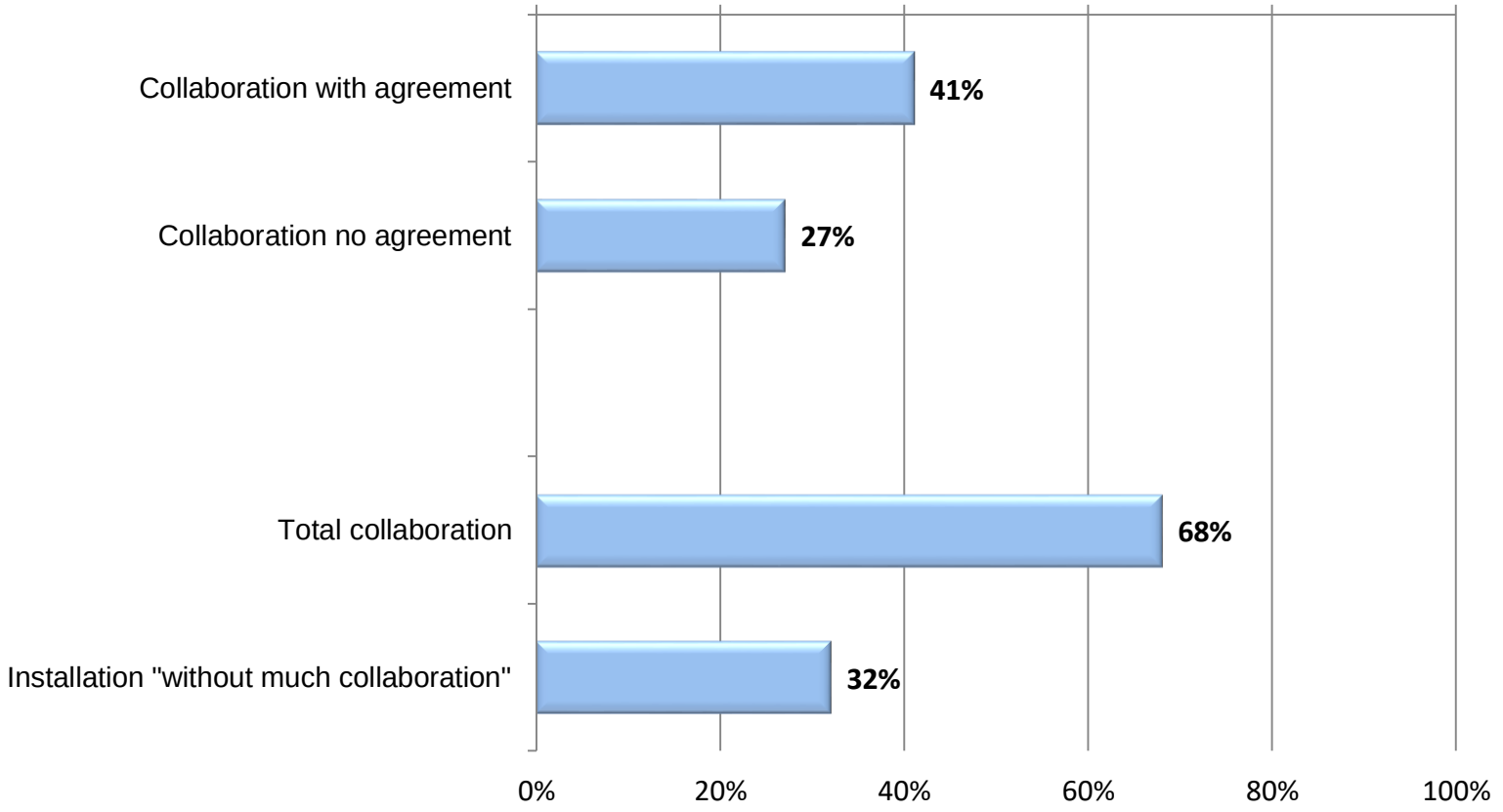
# Small Cells Being Deployed

## Crosstabulation By Population And Broadband Subgroups



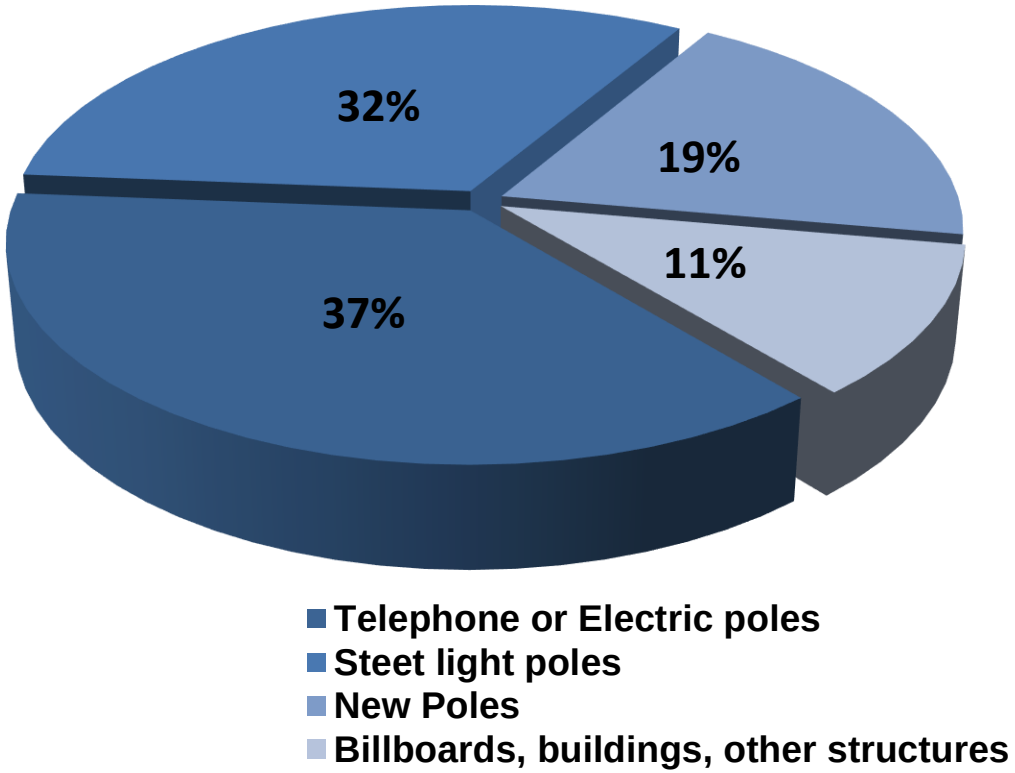
In total, two-thirds of cities with small cell activity say they are collaborating with providers. A total of 41% of this group say they have an official agreement in place with providers. About one-third say a provider is proceeding with installation “without much collaboration with the city”.

# City/ Provider Collaboration On Small Cells
## Among Those With Small Cell Deployments



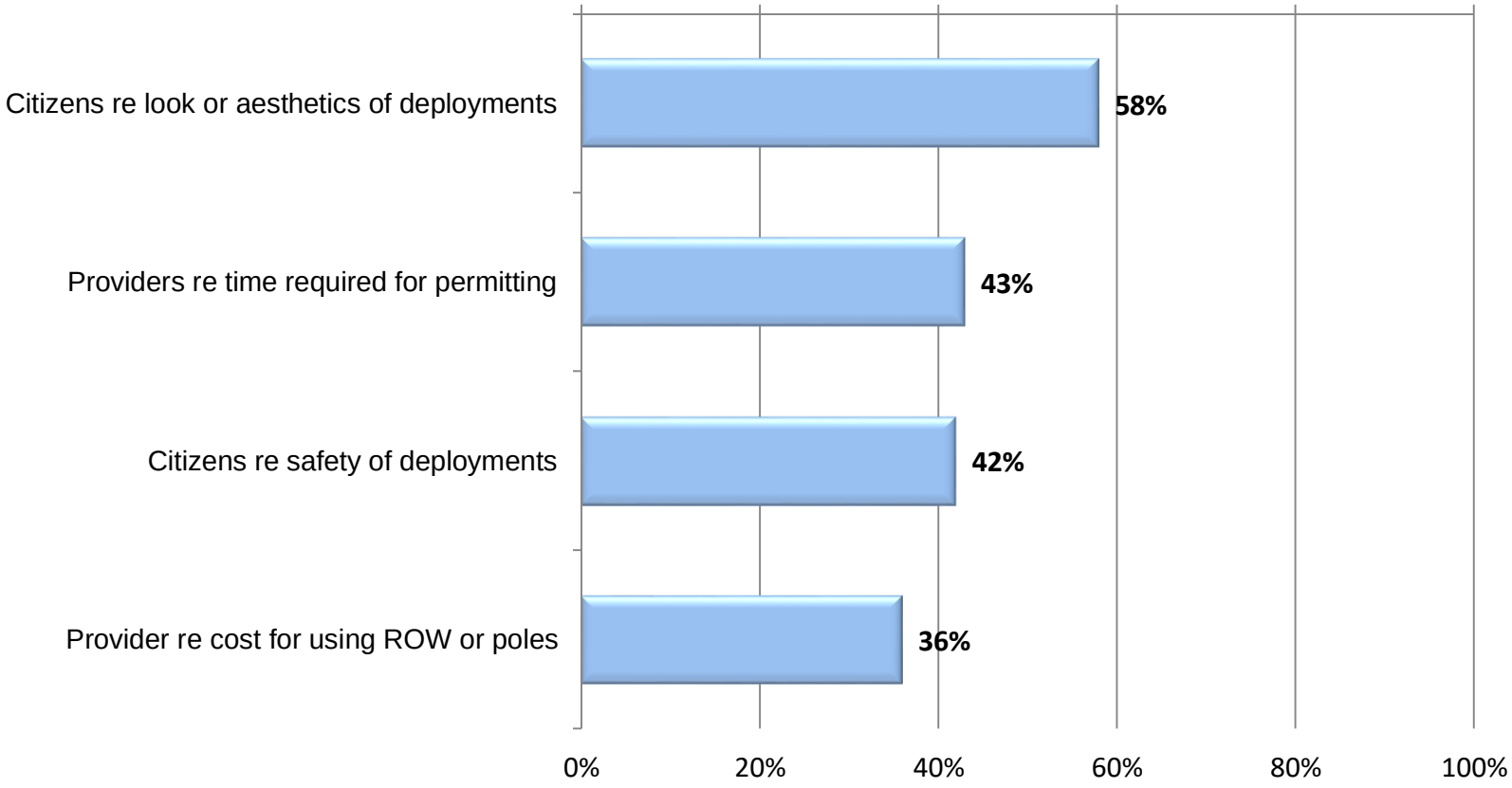
On average, 37% of small cell deployments are estimated to be occurring on telephone or electric distribution poles. Another 32% are on street light poles, and 30% are on new poles or other structures.

## Small Cell Deployment Locations



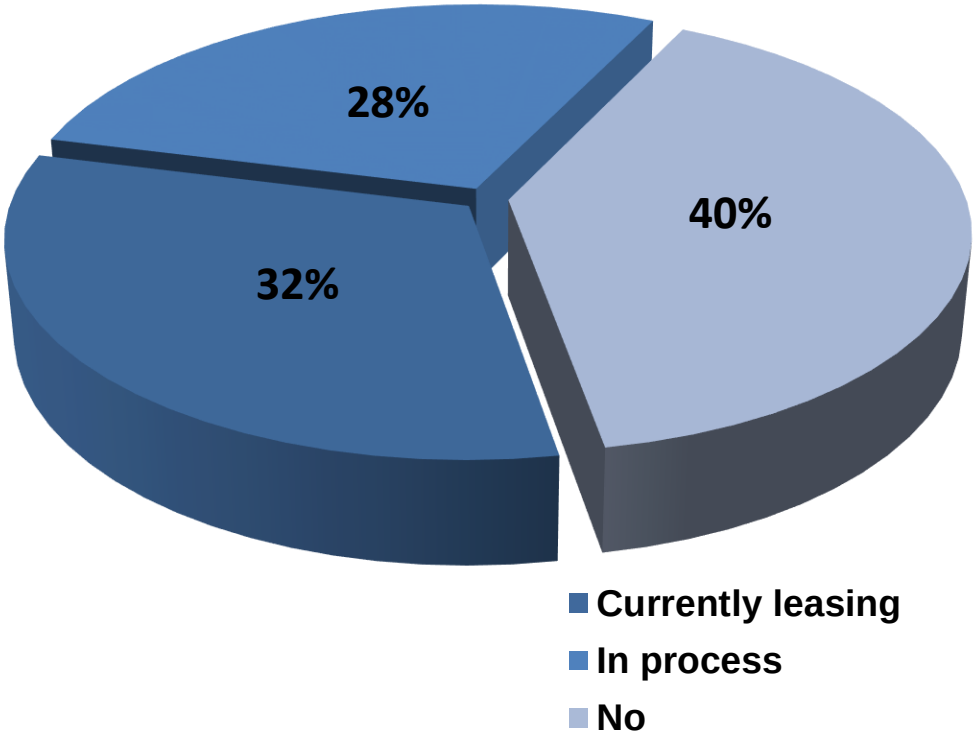
The primary complaint communities note is citizen concerns about the look or aesthetics of small cell deployments. Noted second are concerns from providers about the time required for permitting.

# Complaints Received Regarding Small Cell Deployment



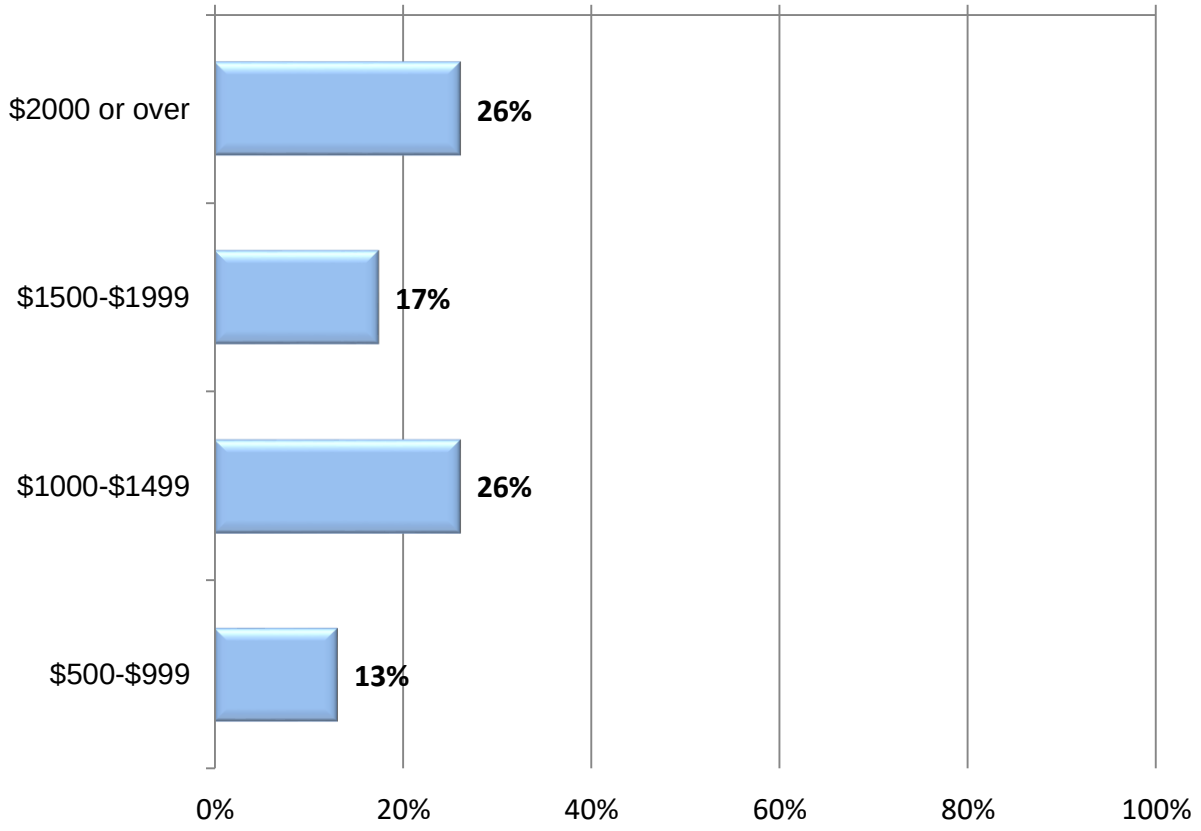
A total of 32% of respondents reported currently leasing space on city assets for small cell deployment.

## Space Leased On City Poles For Small Cell Deployment
### Among Those Aware



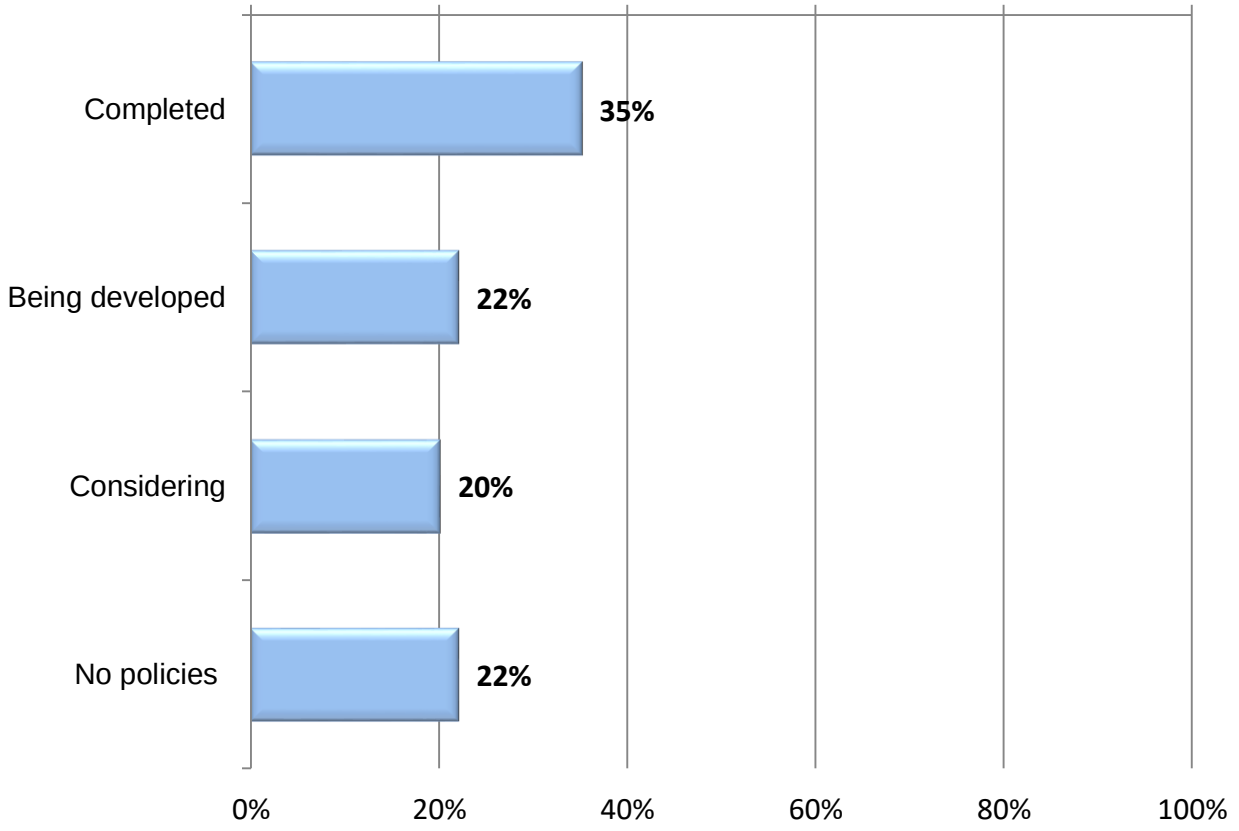
Of those currently leasing poles, the average annual lease rate per pole was $1,438, or a median rate of $1,200. Caution should be used because of the small sample and large variance probably relating to differing location circumstances.

## Lease Rate Per Pole

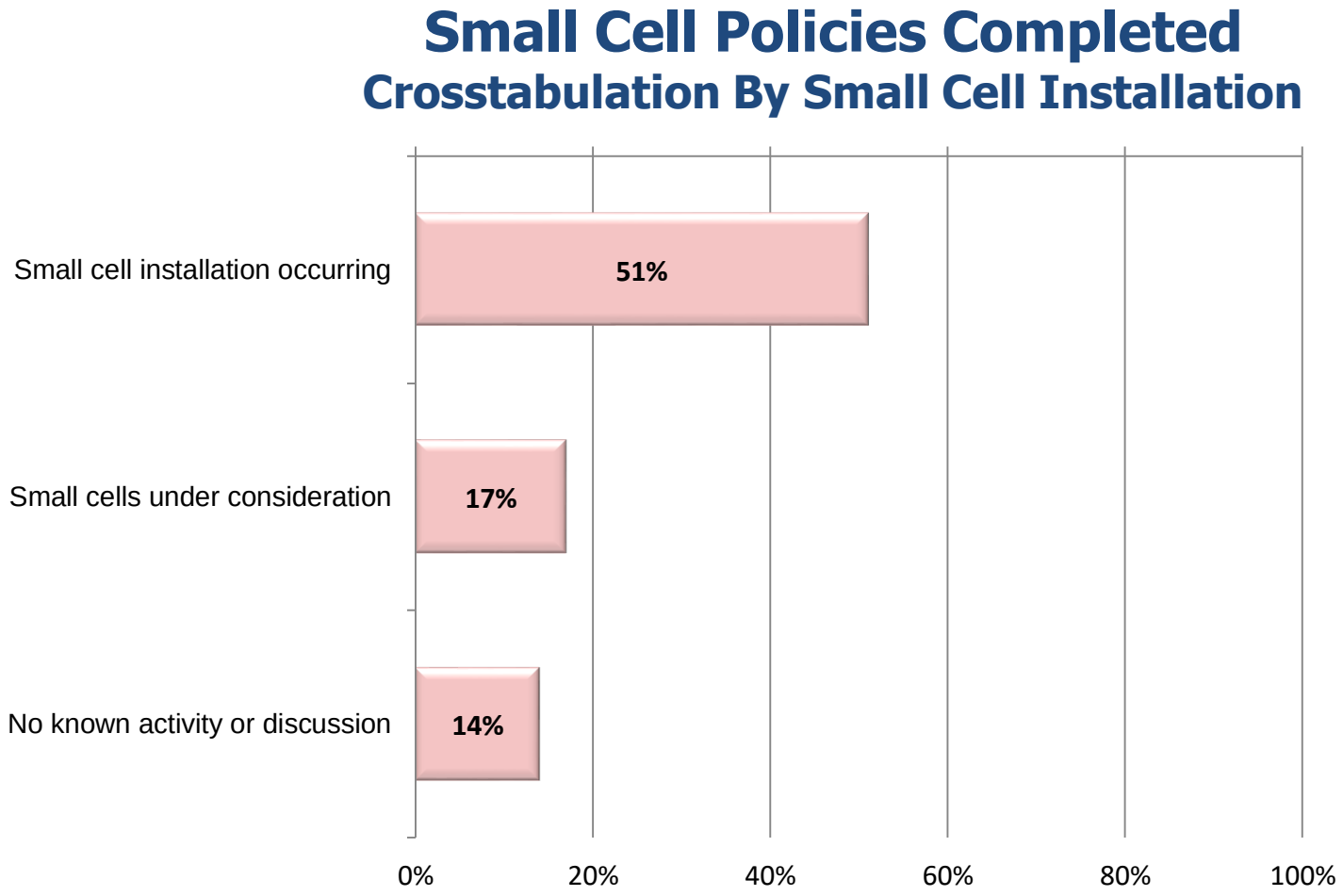


Overall, a total of 35% of cities say they have completed formal policies for small cell deployment.

# Status Of City Policies Related To Small Cells

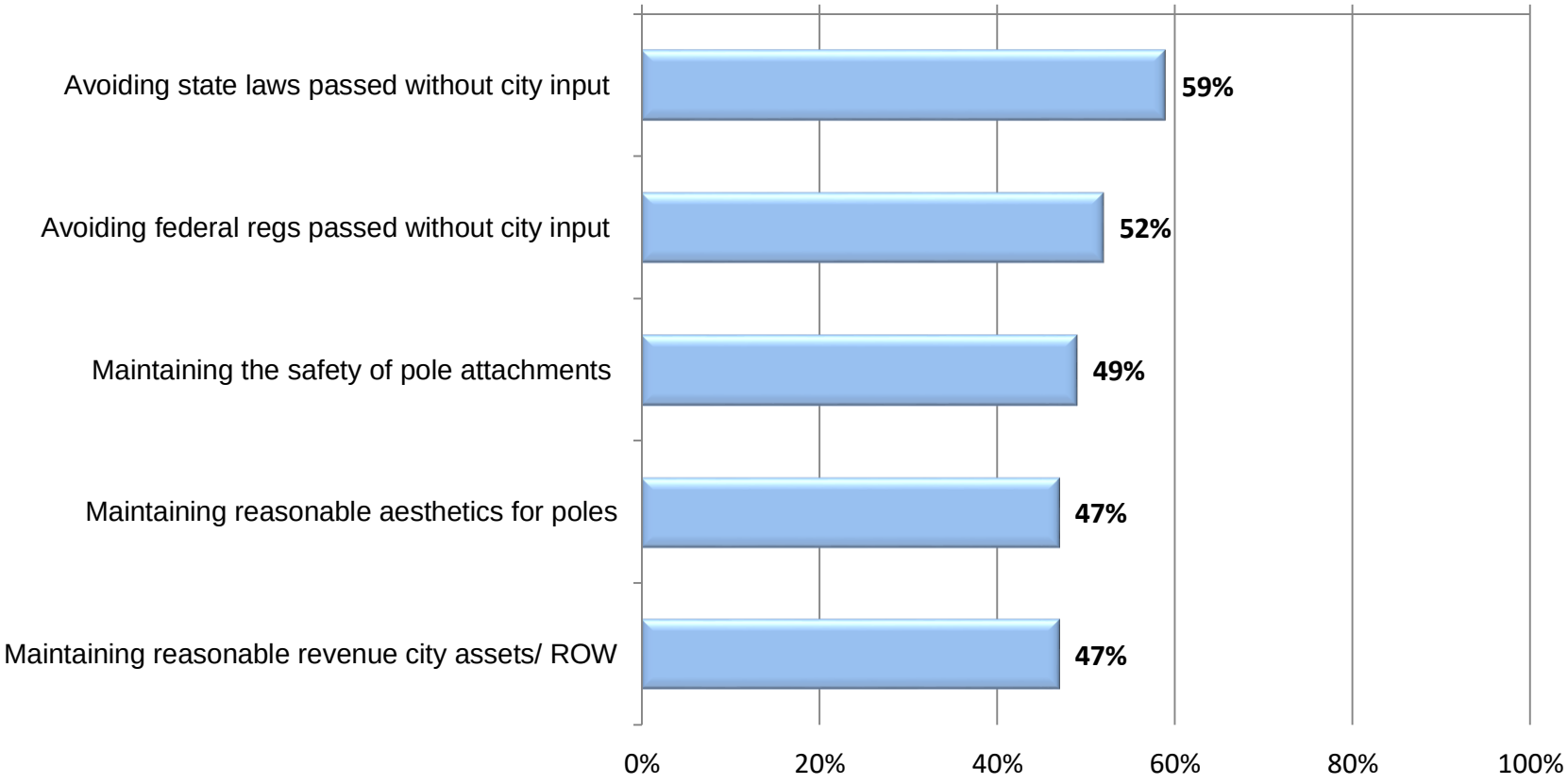


Among cities where small cell activity is now occurring, half have official policies in place. Among those where activity is under consideration, only 17% have policies in place.



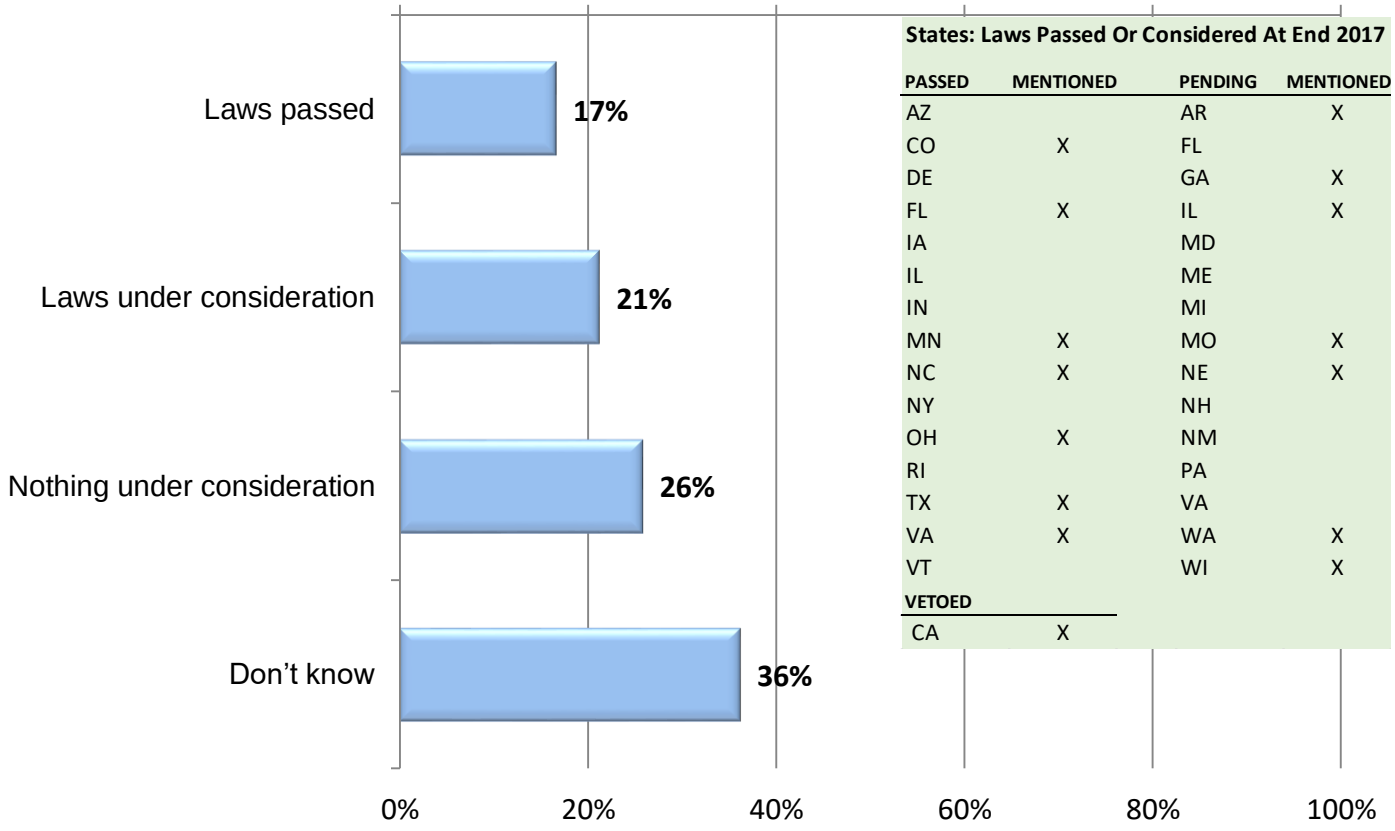
Based on a rating question containing a list of issues gleaned from qualitative pre-interviewing, respondents say they are currently most concerned about state laws being passed without sufficient city input.

# Percent "Greatly Concerned" About Small Cell Issues



A total of 17% report that state laws have been passed in their states related to municipal involvement in pole use for small cell deployment. Another 21% of respondents say there are laws under consideration. A total of 15 of these states were mentioned in the study as having laws passed or under consideration.

# Status Of State Laws Related To Pole Use For Small Cells

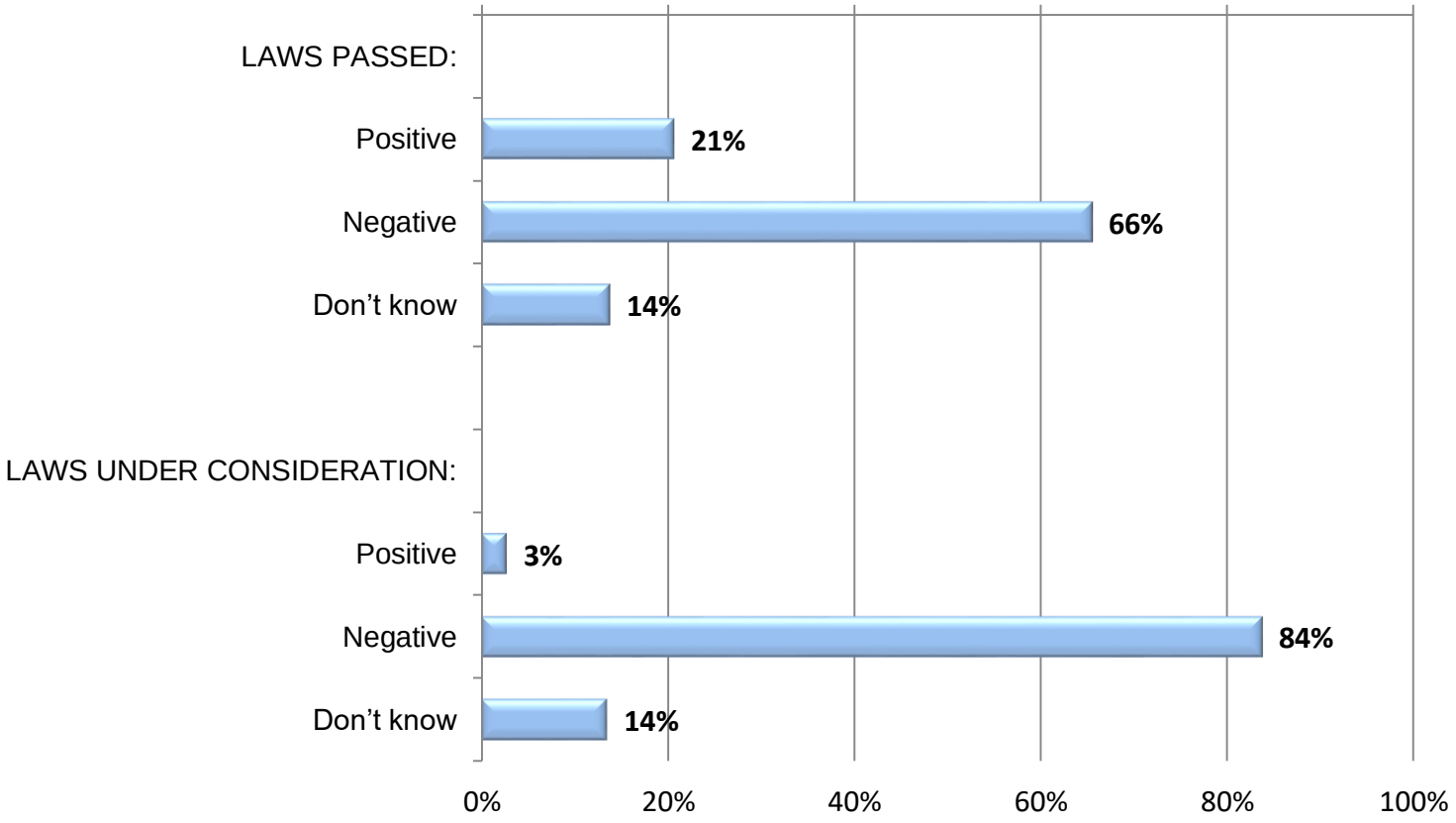



**States: Laws Passed Or Considered At End 2017**

| PASSED | MENTIONED | PENDING | MENTIONED |
|---|---|---|---|
| AZ | | AR | X |
| CO | X | FL | |
| DE | | GA | X |
| FL | X | IL | X |
| IA | | MD | |
| IL | | ME | |
| IN | | MI | |
| MN | X | MO | X |
| NC | X | NE | X |
| NY | | NH | |
| OH | X | NM | |
| RI | | PA | |
| TX | X | VA | |
| VA | X | WA | X |
| VT | | WI | X |
| **VETOED** | | | |
| CA | X | | |

The vast majority of community respondents believe these laws are negative to their community.

# Perception Of State Laws Related To Poles



Small cell related state laws are considered negative by most municipal respondents because of perceived pre-emption of local control, a perceived need for the local entity to control pole aesthetics, and concerns about fair lease rates and cost recovery. (Actual verbatim comments can be seen in the Appendix.)

# Reasons Small Cell Related State Laws Considered Negative

## Categorized Open End Responses

| | |
|---|---|
| Loss or pre-emption of local control/ Authority | 48% |
| Concerns controlling aesthetics including large cabinets | 21% |
| Devalues public assets/ Revenue below value | 17% |
| Reduced/ Unreasonable cost recovery for permitting etc. | 16% |
| Written by/ Weighted in favor of providers | 14% |
| Previous system worked well/ Public private partnership | 9% |
| Unrealistic time for permitting / Shot clock | 7% |
| Amounts to taxpayers subsidizing private companies | 7% |
| Bill was snuck in with no input from municipals | 7% |
| Concerns controlling safety in community | 7% |
| Local citizens paid for municipal infrastructure/ Deserve a say | 5% |
| Regulation adds to staffing requirements | 3% |
| One size fits all regulation is not appropriate | 3% |
| Concerns re limiting siting control | 3% |
| Limits ROW authority | 3% |
| Allows preferential access to government owned buildings | 2% |
| Requires small cells to be a permitted use | 2% |
| Talks with carriers are now less productive | 2% |
| Cities should be able to leverage assets for public good | 2% |
| Lack of design standards for small cells | 2% |
| Poorly written | 2% |

The few respondents believing the laws are positive mentioned factors such as establishing uniformity and assistance for small communities.

# Reasons Small Cell Related State Laws Considered Positive
## Categorized Open End Responses

| | |
|---|---|
| General positive | 3% |
| Could prevent hodge podge of ordinances, but devil is in the details | 2% |
| Positive - too small a city to write and enforce regulations | 2% |
| Gave more control to cities re: aesthetics | 2% |
| They set a reasonable baseline for us | 2% |

Respondents gave a variety of thoughts as to how the need for improved technology should be balanced with the need for an attractive and safe community.

# Balancing Tech Needs With An Attractive/Safe Community

## Categorized Open End Responses

| | |
|---|---|
| Stop limiting local control | 26% |
| Aesthetics should be determined by community | 12% |
| Cities have worked well with providers in the past | 8% |
| Local community has better understanding re safe and effective | 6% |
| Include municipal and county in any federal or state regulations | 6% |
| Reasonably balance federal, state and local control | 4% |
| Location should be set by community | 4% |
| Fees should be set by community based on reasonable value | 4% |
| Instead of laws, state should issue guidelines | 4% |
| One size fits all does not work | 4% |
| Need more input from public | 4% |
| Do more to educate providers about why regulation necessary | 4% |
| Local policies and regulations should be reasonable | 4% |
| Standards should be set by the community | 2% |
| Better legislation | 2% |
| Develop aesthetically pleasing structures for 5G | 2% |
| Work with community planners | 2% |

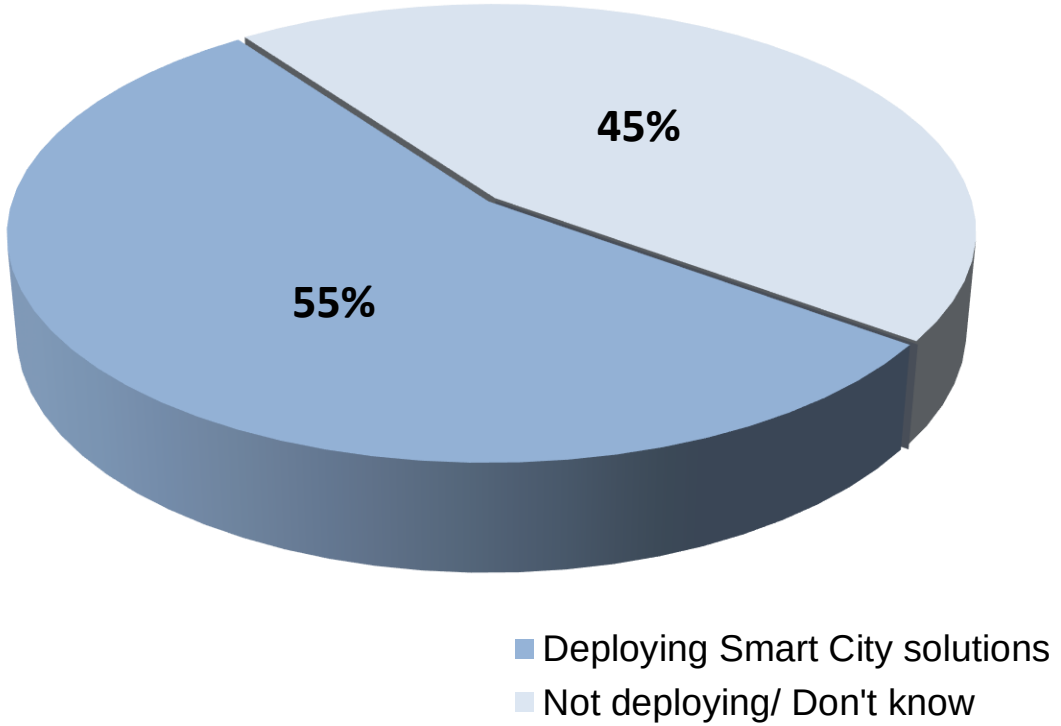
# Balancing Tech Needs With An Attractive/Safe Community
## Categorized Open End Responses (Cont.)

| | |
|---|---|
| Cities need to fund dedicated staff to improve permitting time | 2% |
| Develop regional collaborating for make ready and attachments | 2% |
| 5G is too new/unknown to lock in standards -- may hurt carriers | 2% |
| Carriers should be required to give all access | 2% |
| Create incentives to place utilities underground | 2% |
| Limited interference from state and federal | 2% |
| Providers should also share their ROW and pole sites | 2% |
| Need more time for local policies - but could set deadlines | 2% |
| List benefits providers can give cities for negotiation | 2% |
| Many street lights do not have structural integrity for small cell | 2% |
| Merging electric and wireless is delicate -requires more review | 2% |
| Wireless carriers are unfamiliar with city ROW/Permitting | 2% |
| Wireless needs to come to table and explain/ negotiate | 2% |
| Cities should develop model policies | 2% |
| Cites should update regulations for new technology | 2% |
| Need better public PR from cities to explain our position | 2% |

# Smart City Activity

Over half the communities interviewed say they are currently pursuing Smart City solutions.

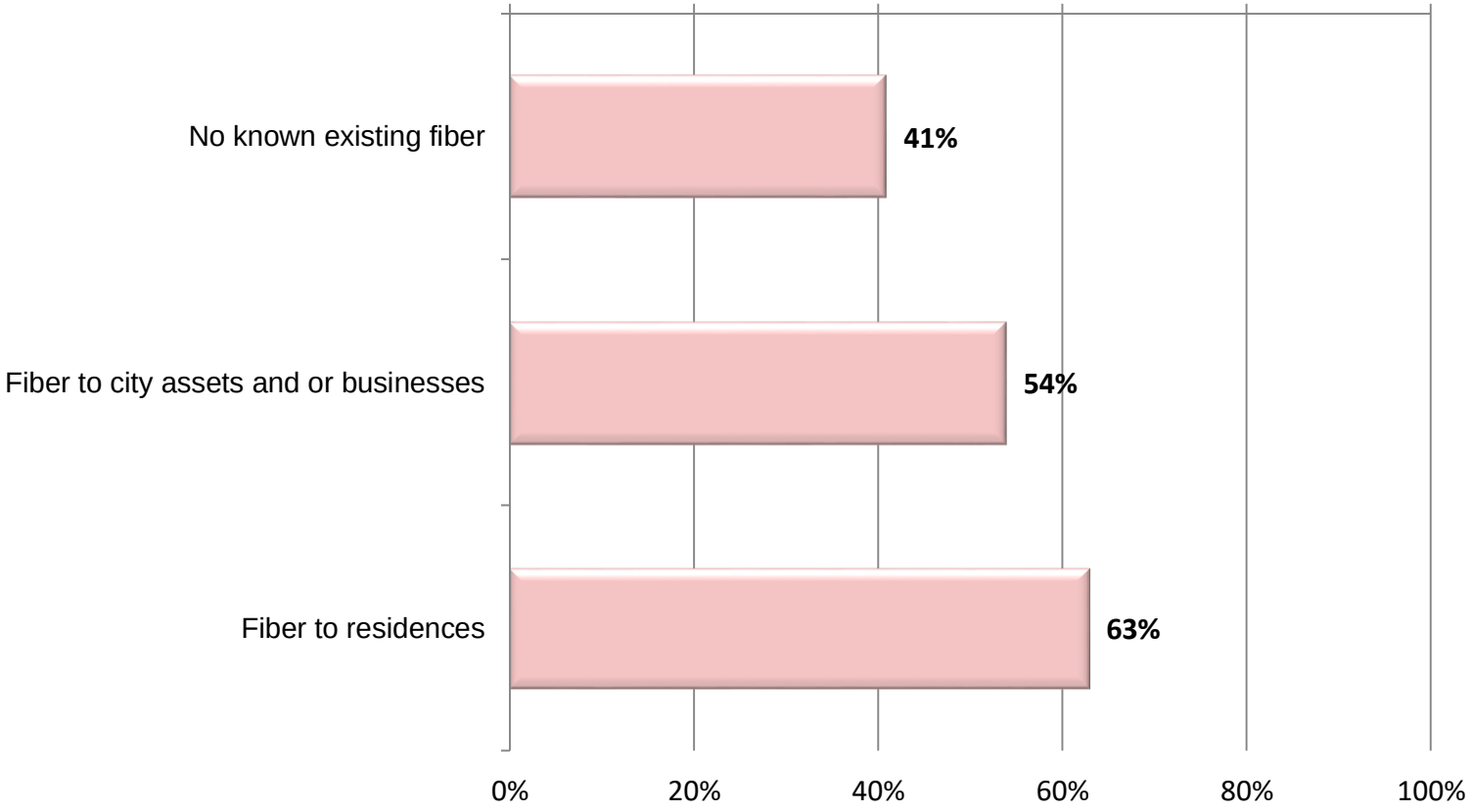
## Community Pursuing Smart City Solutions



Like Small Cells, Smart City activity is clearly correlated with the presence of existing fiber.

# Community Is Pursuing Smart City Applications

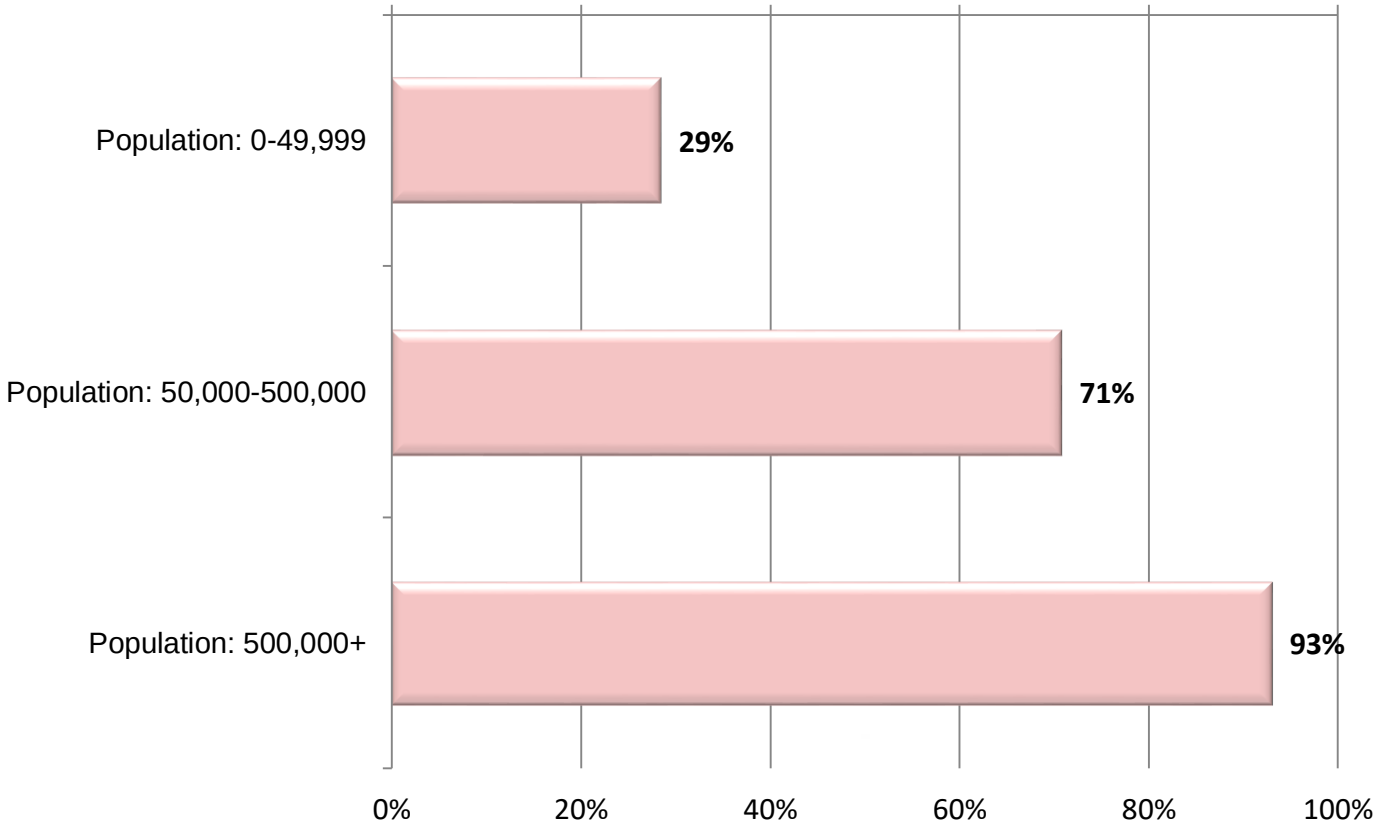
## Crosstabulation By Fiber Availability



Smart City activity is also clearly correlated with the population size of a city.

# Community Is Pursuing Smart City Applications

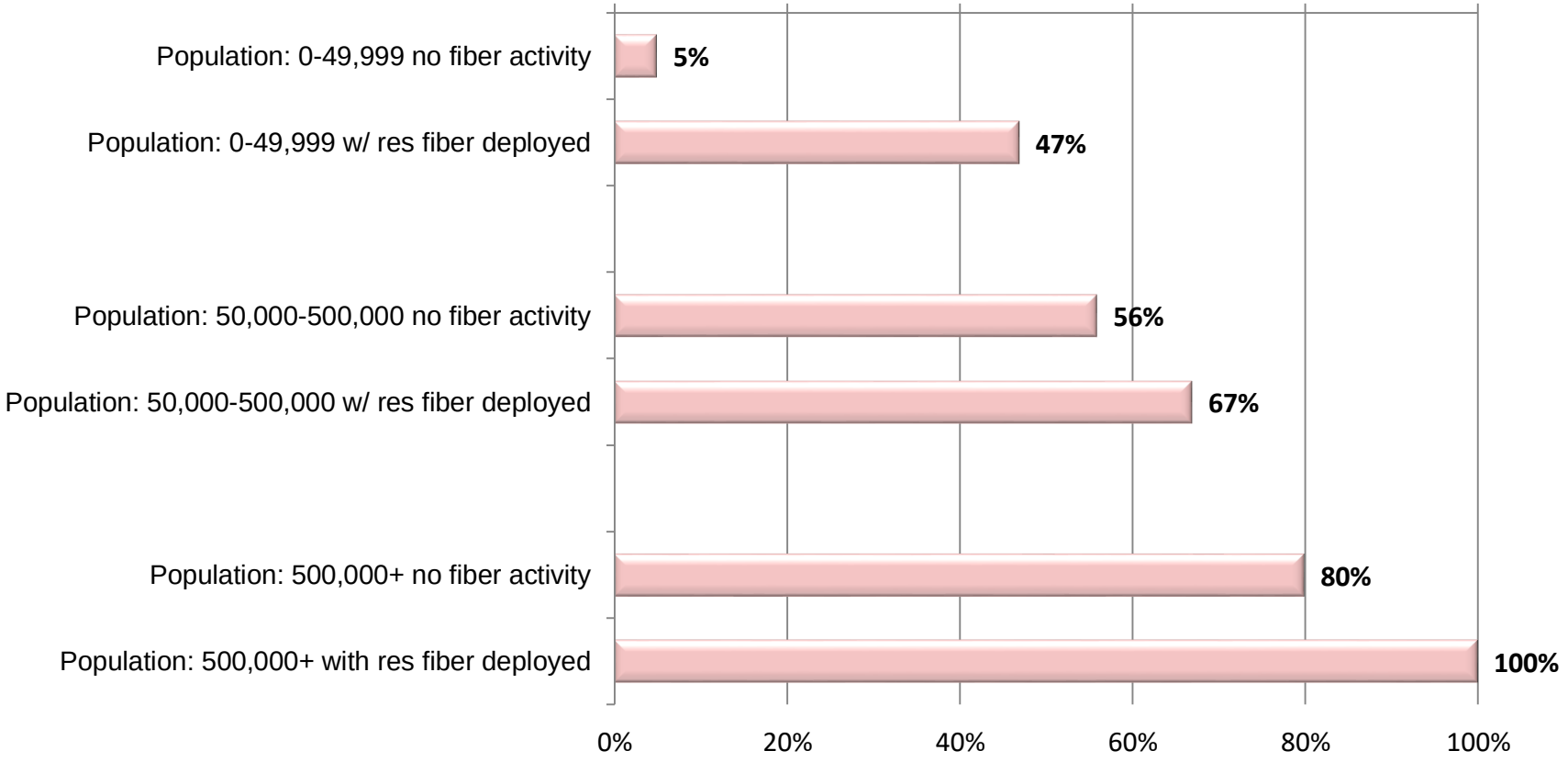
## Crosstabulation By Population



The correlation with fiber deployment is maintained for all population groups. Looking at extremes, only 5% of small cities with no existing fiber are pursuing Smart City applications, versus 100% of those in large cities with existing fiber.

# Community Is Pursuing Smart City Applications

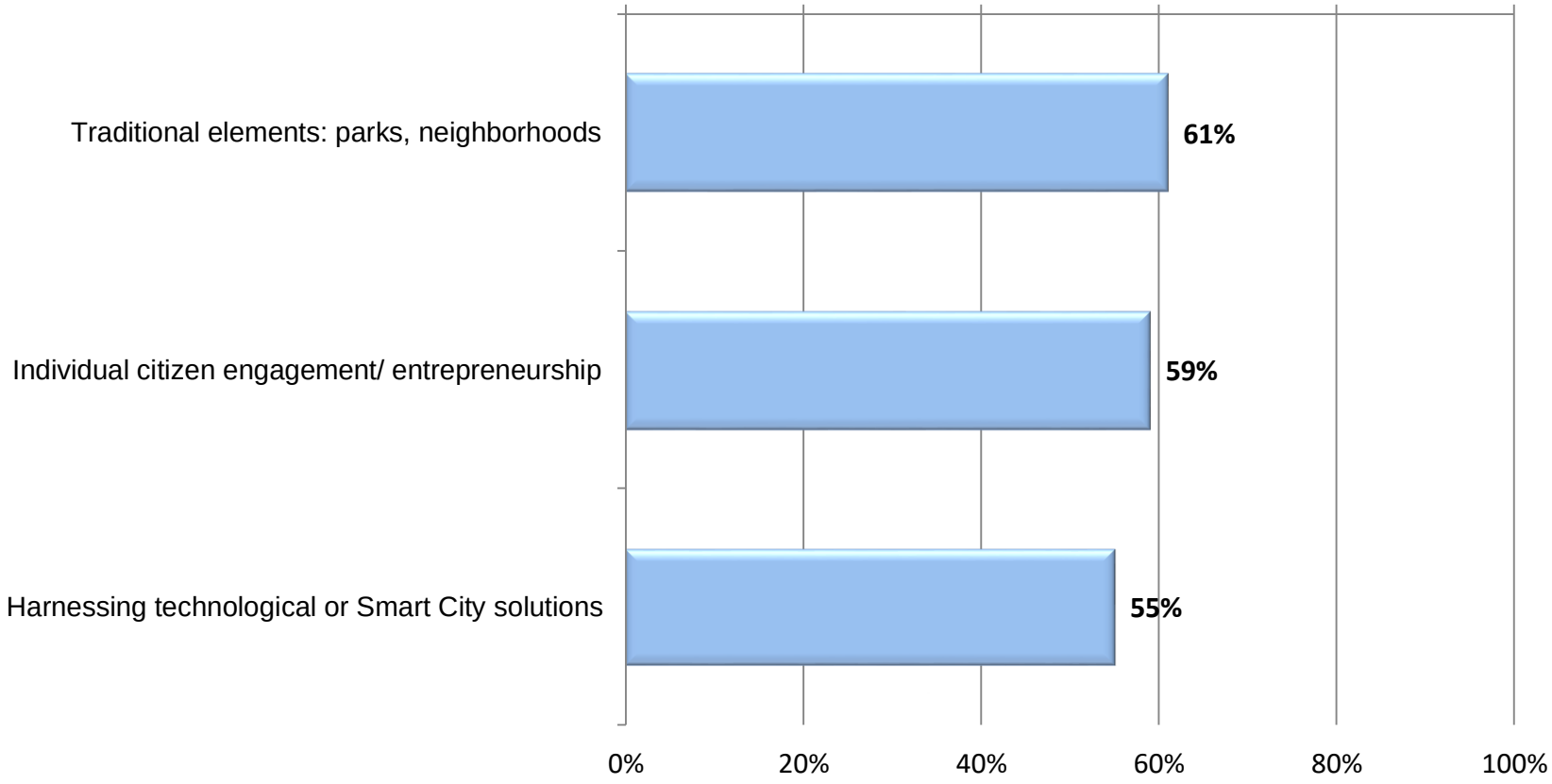
## Crosstabulation By Population And Fiber Availability



Overall, Smart City solutions are rated slightly less important than traditional improvement strategies for a community.

# Perceived Importance Of Community Improvement Strategies

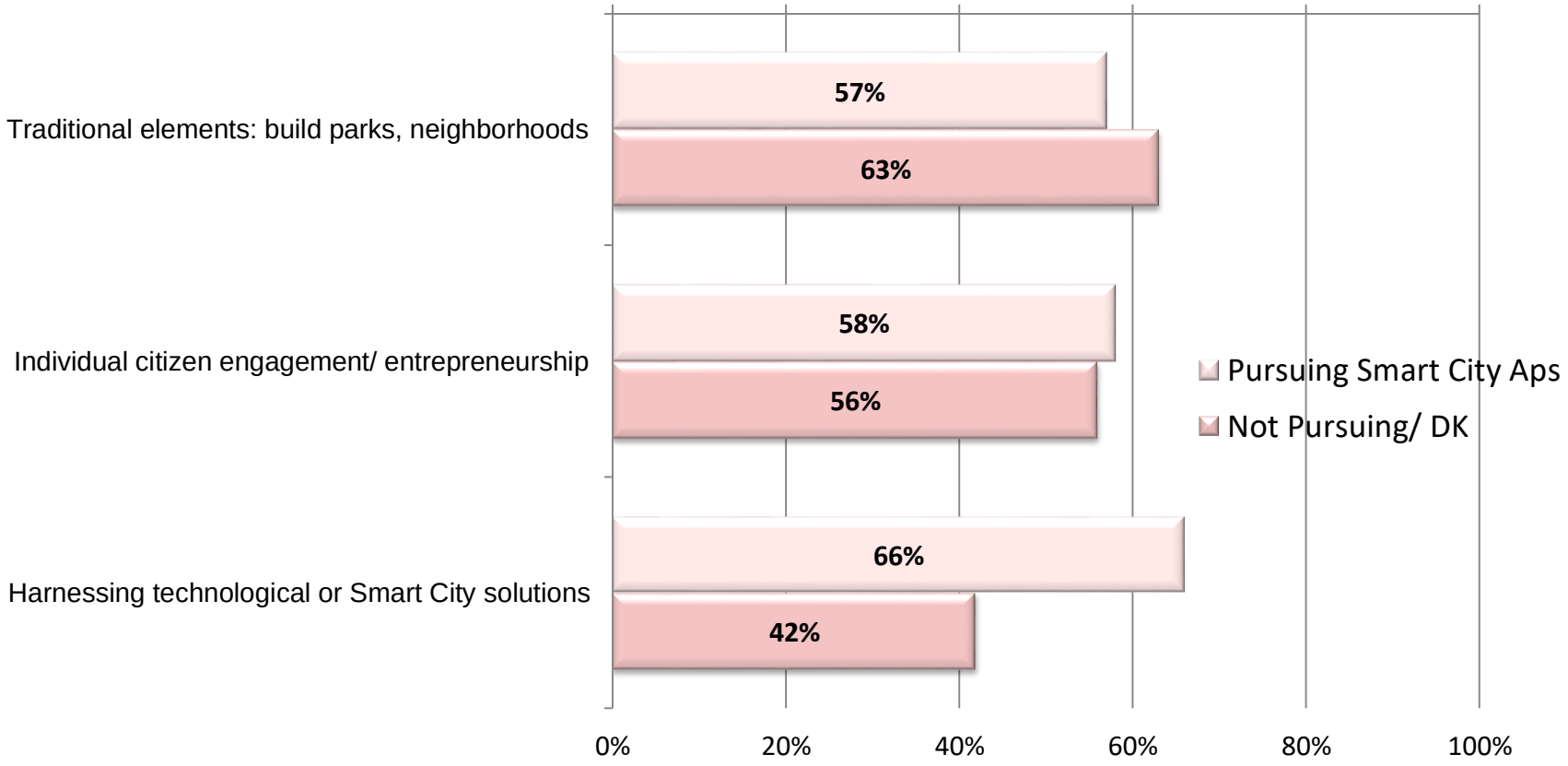
## Percent Very Important: Smart City Versus Traditional Strategies



Smart City solutions are considered the single most important strategy among respondents from cities currently pursuing those solutions.

# Perceived Importance Of Community Improvement Strategies

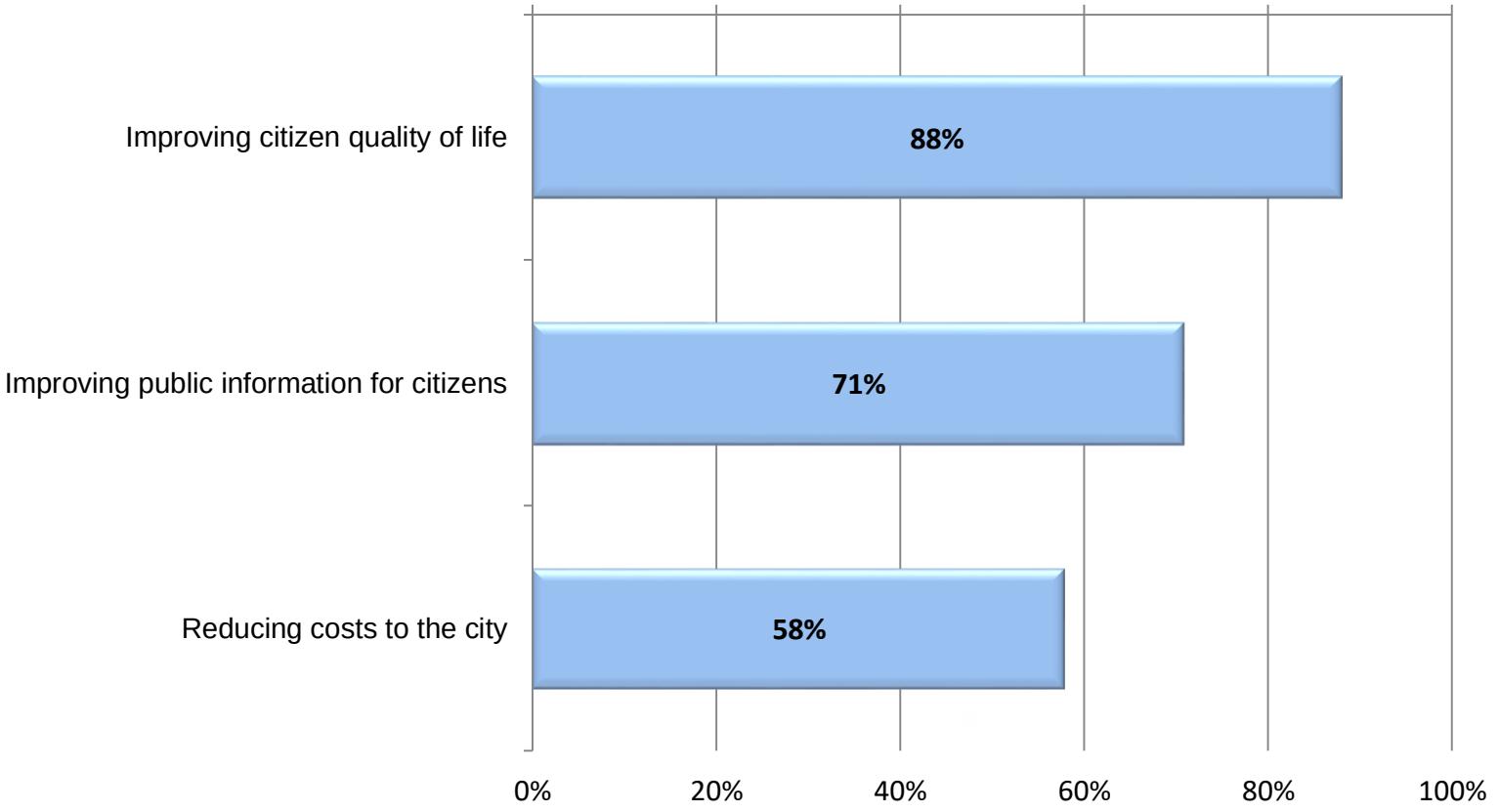
## Percent Very Important: Crosstabulation By Smart City Activity



Improved quality of life is rated the most important driver of Smart City activity, while cost reduction to the city is perceived to be the least important of the drivers listed.

# Perceived Importance Of Smart City Drivers

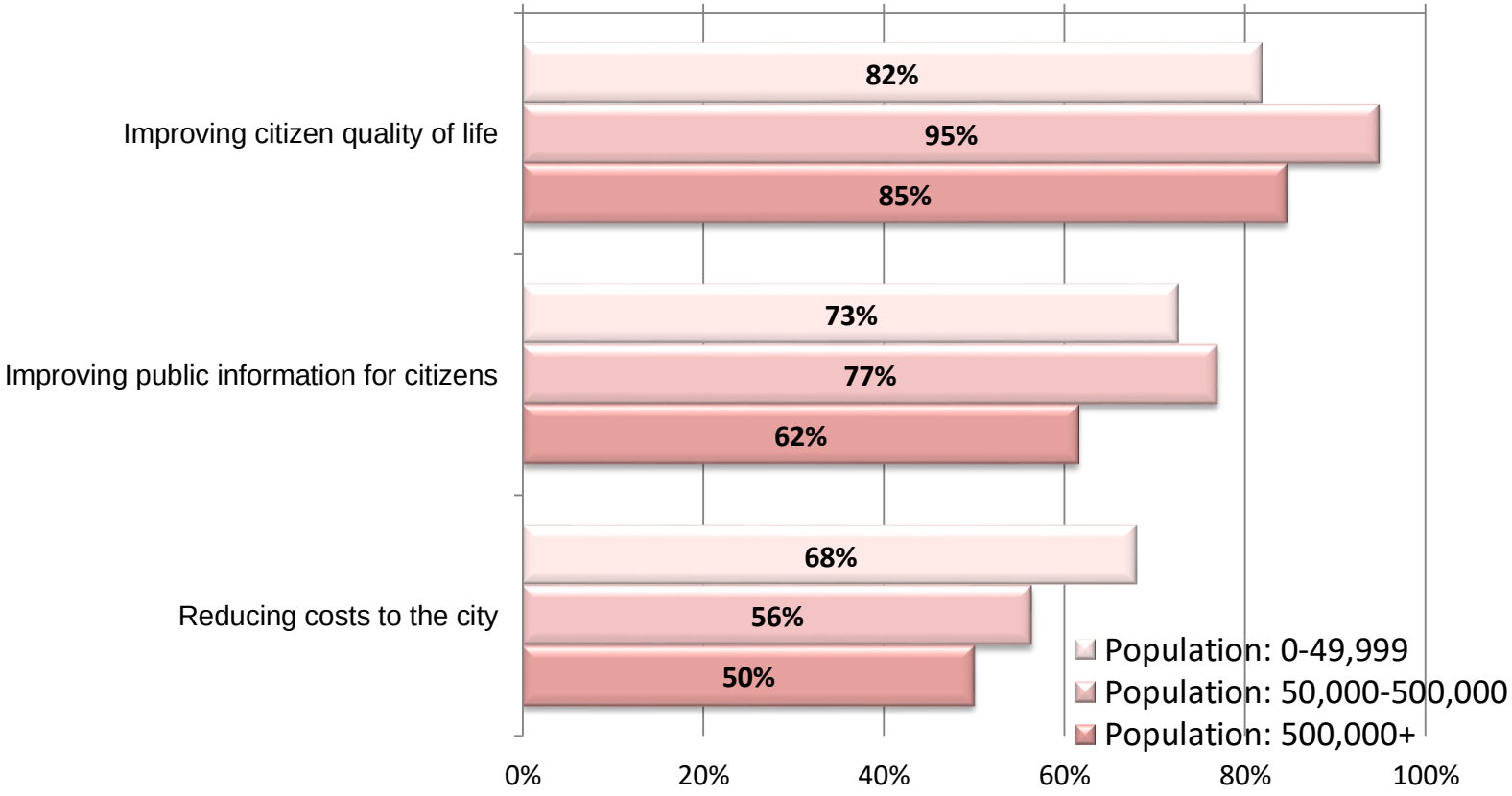
## Drivers Considered Very Important



The importance of some drivers appears to differ somewhat based on city size. As an example, reducing community costs currently appears to be most important to smaller cities.

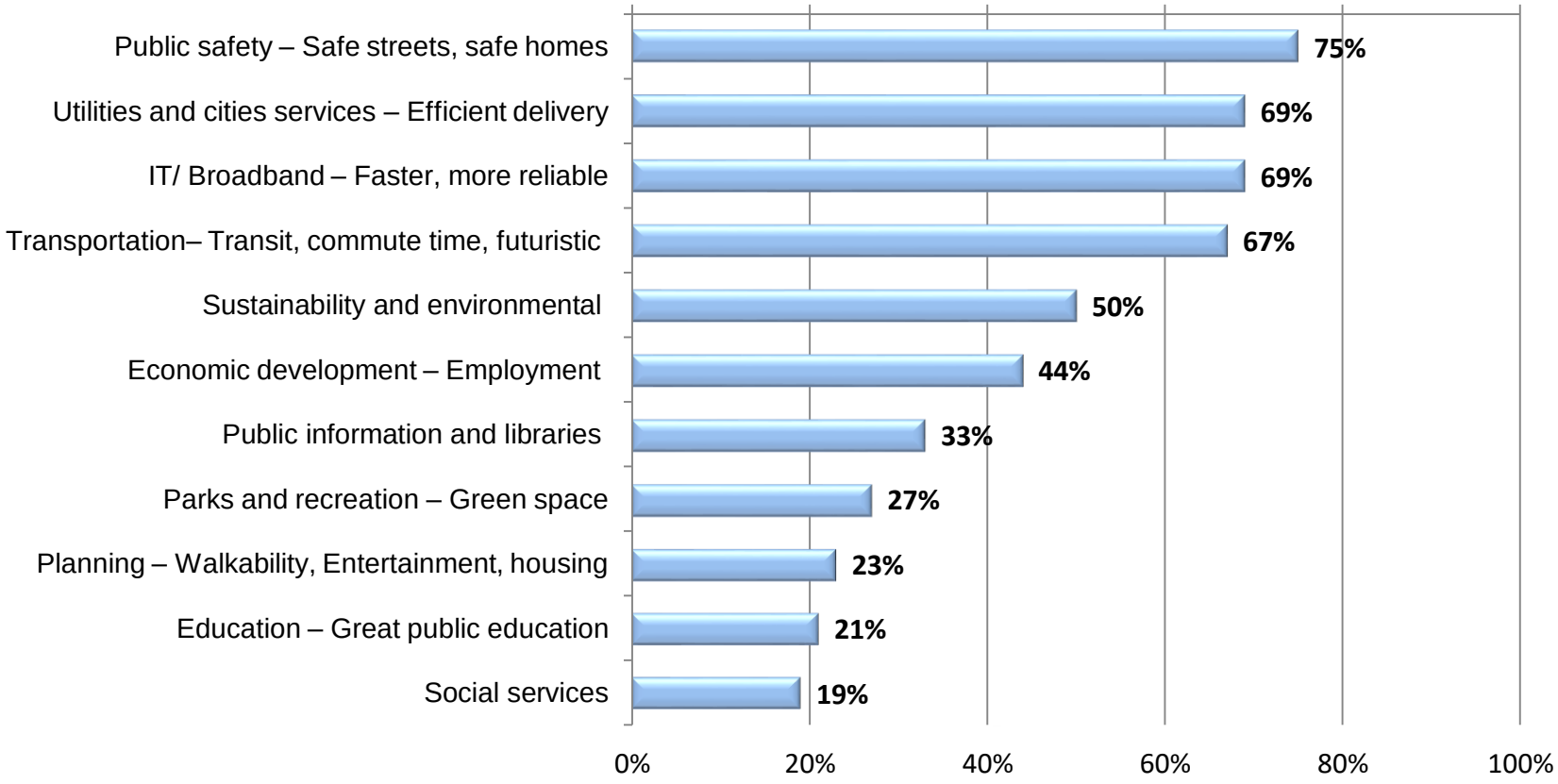
# Perceived Importance Of Smart City Drivers

## Drivers Very Important: Crosstabulation By Population Size



Actual Smart City applications are most reported for public safety, city service delivery, IT/Broadband, and transportation, but some applications are reported in areas as diverse as green space and social services.

# Purpose Of Smart City Applications Being Installed
## Among Those Pursuing



Smart City applications believed to most improve citizen quality of life are dominated by transportation related applications, followed by better broadband connectivity.

# Smart City Applications: Most Improve Citizen Quality Of Life

## Categorized Open End Responses

| | |
|---|---|
| Intelligent transportation/ Traffic management, cameras | 27% |
| WIFI (free/ faster, etc.), public spaces, sport practices, etc. | 21% |
| Fiber broadband | 12% |
| Parking space availability | 9% |
| Bus location information/ Intelligent transit | 5% |
| Public safety | 5% |
| Smart meters | 5% |
| 5G wireless | 2% |
| Array of things | 2% |
| Smart City information kiosks | 2% |
| Integrating road work information to Google | 2% |
| Real time tracking of snow plow progress | 2% |
| Reduced emissions through intelligent transportation | 2% |
| Online city information | 2% |
| Text notification for activities i.e. leaf pickup | 2% |
| Water sewer controls | 2% |

Smart City applications felt to be most cost efficient to the city include smart lighting, advanced metering, infrastructure monitoring, and again, intelligent transportation.

# Smart City Applications: Most Reduce Costs To City
## Categorized Open End Responses

| | |
|---|---|
| Smart lighting | 12% |
| Advanced metering | 11% |
| Infrastructure monitoring | 11% |
| Intelligent transportation systems/ Signal timing | 11% |
| Public safety related sensors and cameras | 8% |
| Energy use monitoring and analysis City | 4% |
| Wi-fi | 4% |
| Array of things | 2% |
| Water and waste system sensors | 2% |
| Night vision cameras | 2% |
| Fiber broadband | 2% |
| Smart data - water main break predictor | 2% |
| Smart data - Pot hole predictor | 2% |
| Street level citizen notification system | 2% |
| 5G | 2% |
| Not sure - no analysis | 5% |

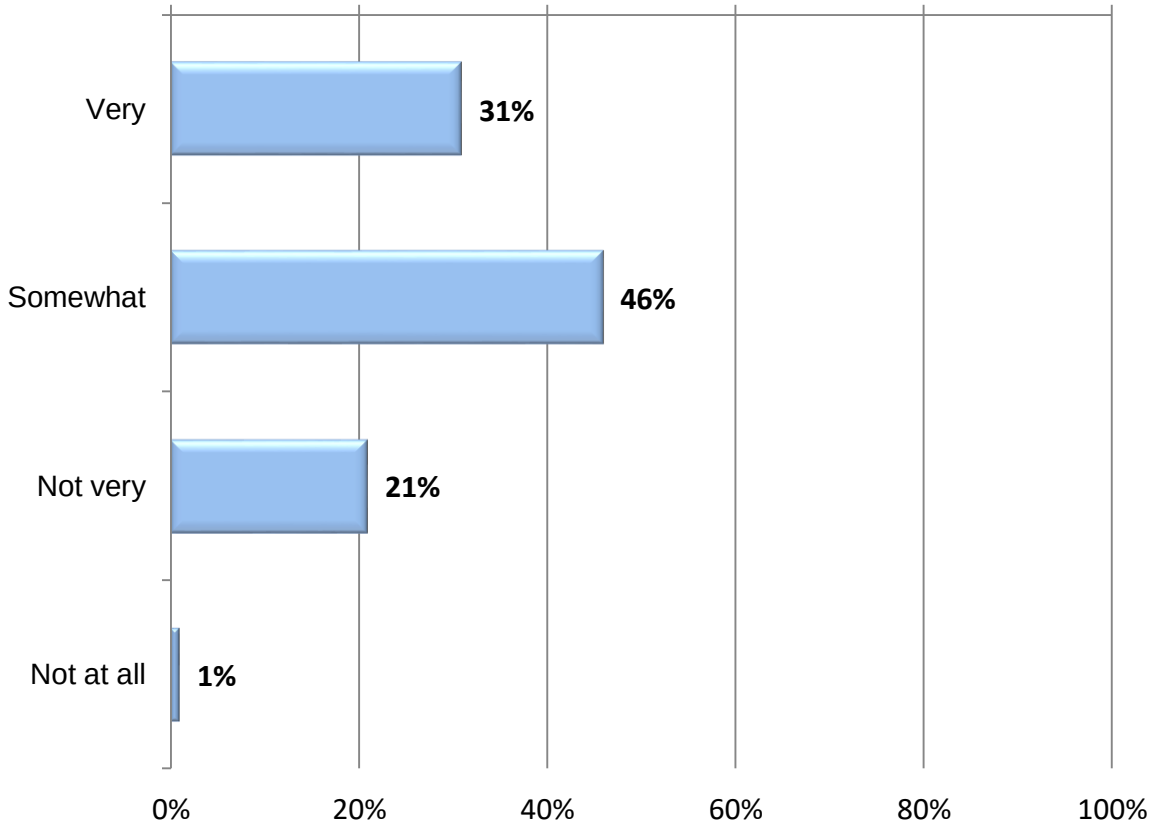
When respondents were asked to report on interesting new Smart City applications, some reported on applications others are already using. Intelligent transportation applications were mentioned often in both contexts – obviously currently growing in popularity. Respondents did mention a few interesting unusual applications.

# Interesting New Smart City Applications
## Categorized Open End Responses

| | |
|---|---|
| Intelligent transportation/ Adaptive signal timing | 20% |
| 5G/ Small cell | 12% |
| Autonomous vehicles/ Connected vehicles | 8% |
| Sensors to monitor construction (noise, air quality etc.) | 8% |
| Parking availability apps | 8% |
| Animal tracking | 4% |
| Array of things | 4% |
| Augmented reality/ Interpretive signs | 4% |
| Sensors to monitor foot traffic - test influence of events, etc. | 4% |
| Gun shot detection | 4% |
| Faster WIFI | 4% |
| Groundwater monitoring | 4% |
| Sensors to monitor sewer water re: clues for community health | 4% |
| First net | 4% |
| Smart lighting | 4% |
| Parking paid by cell phones | 4% |
| Pot hole predictor | 4% |
| Public garbage can level for efficient response | 4% |
| Fire wireless notification for historic structures | 4% |

Only 31% of respondents indicate that Smart City activity is currently well coordinated in their city.

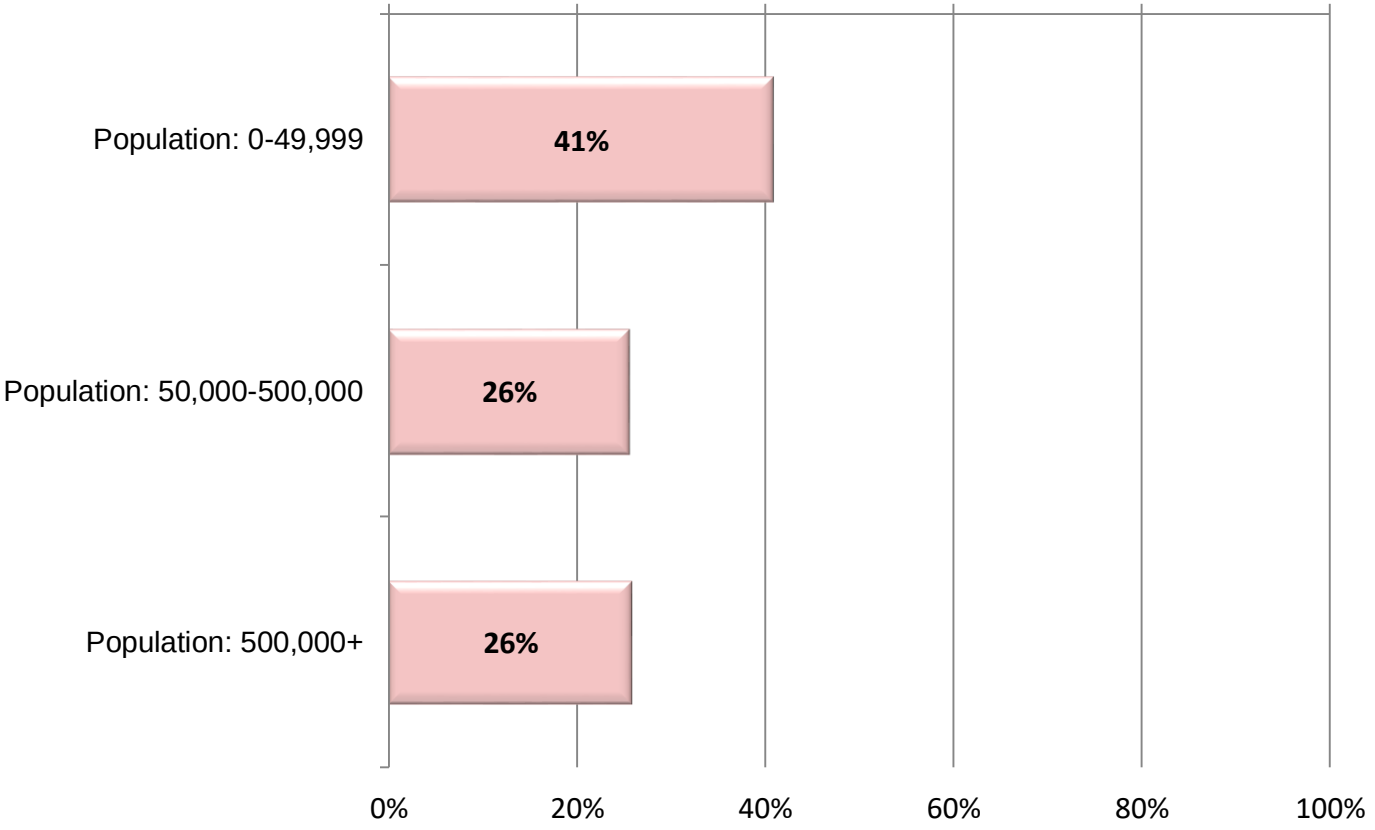
# Degree Of Coordination Of Smart City Activities By Leader/ Committee: Among Those Pursuing



Probably because of smaller staffs and inherently more cross communication, slightly more coordination is currently noted in smaller cities than in larger cities.

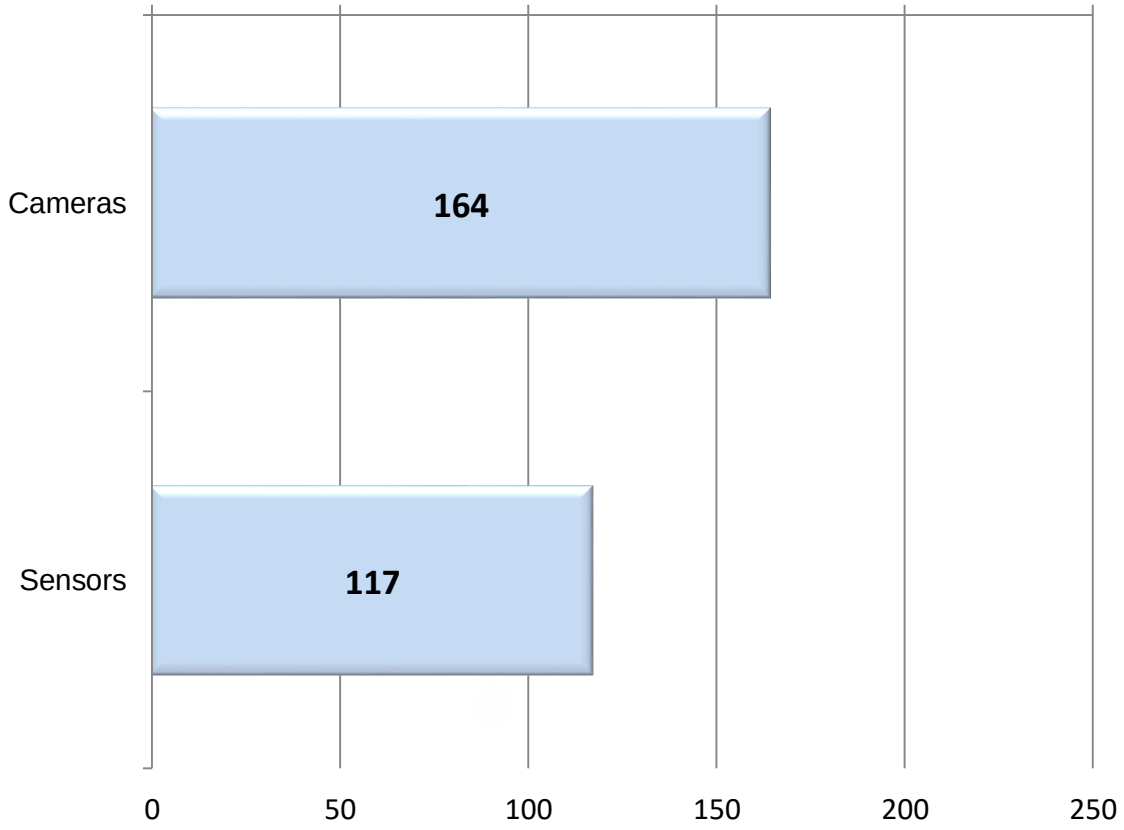
# Smart City Deployment "Very" Coordinated

## Crosstabulation By Population Size



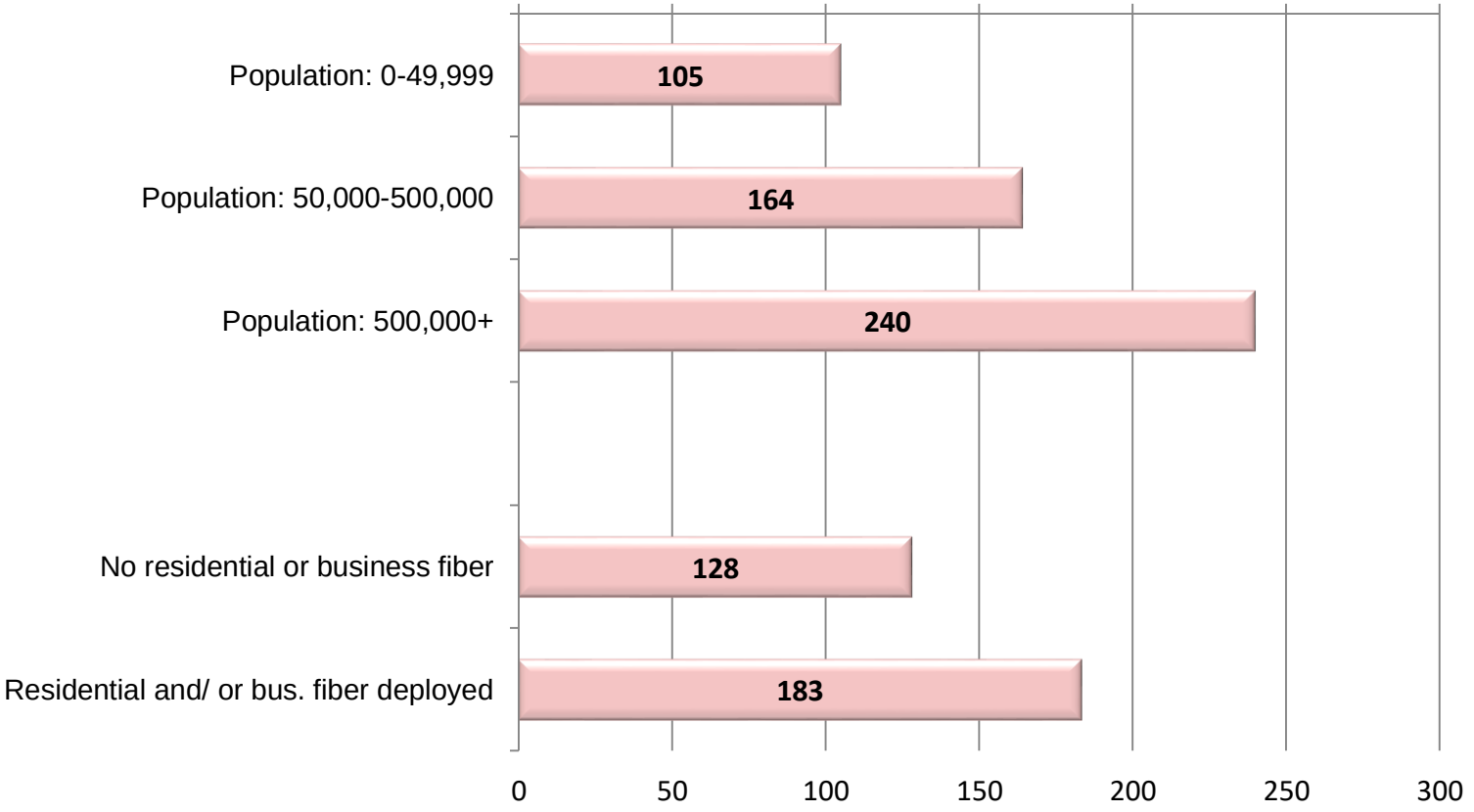
Currently, camera use outnumbers other types of sensor use in Smart City communities. Perhaps this relates to the amount of time cameras have been in operation in cities versus IoT sensors.

# Estimated Number Of Cameras And Sensors Used

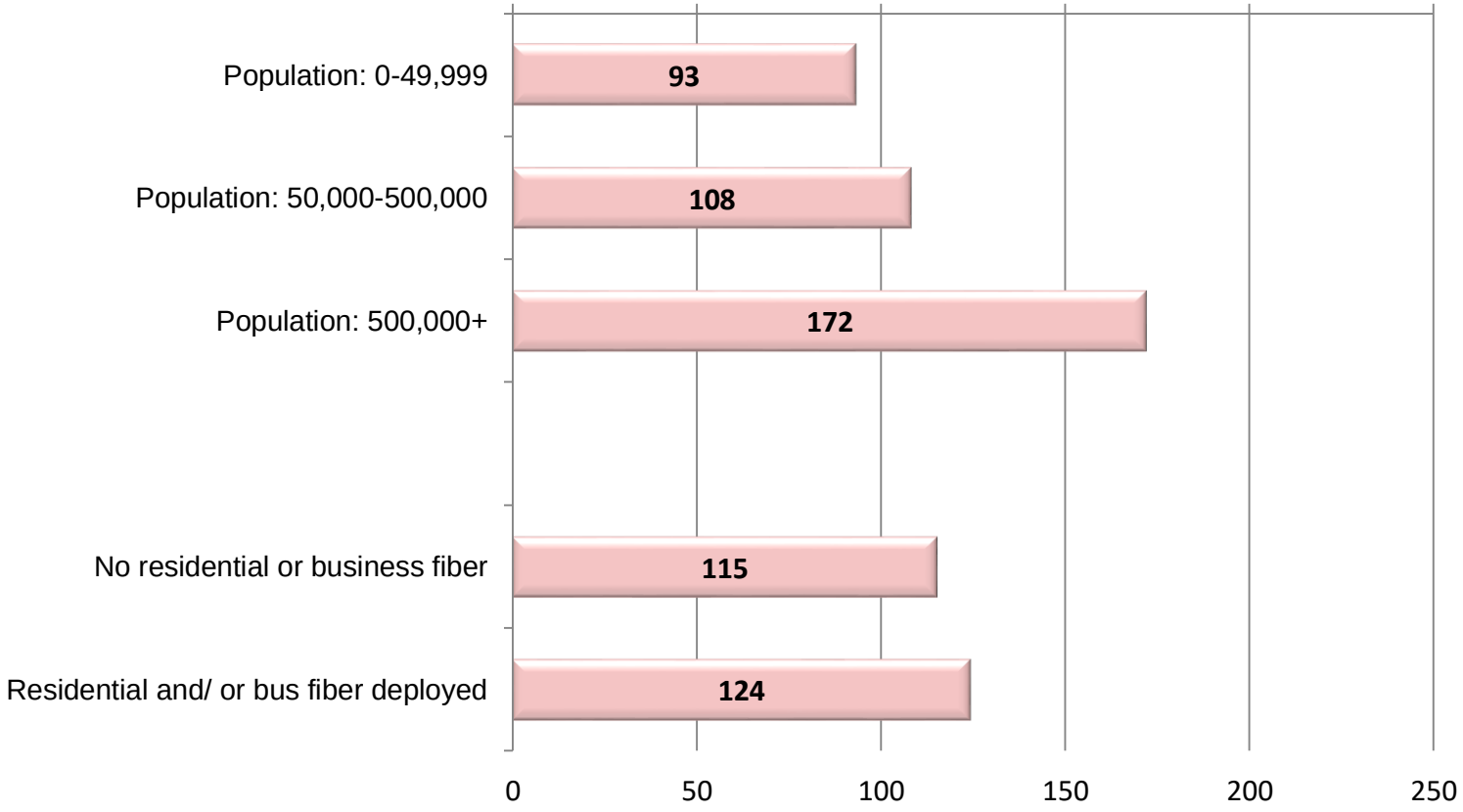


The number of cameras and sensors used increases in relationship to population size, but also with more fiber infrastructure.

## Estimated Number Of Cameras Used
### Crosstabulation By Subgroups Among Those Deploying

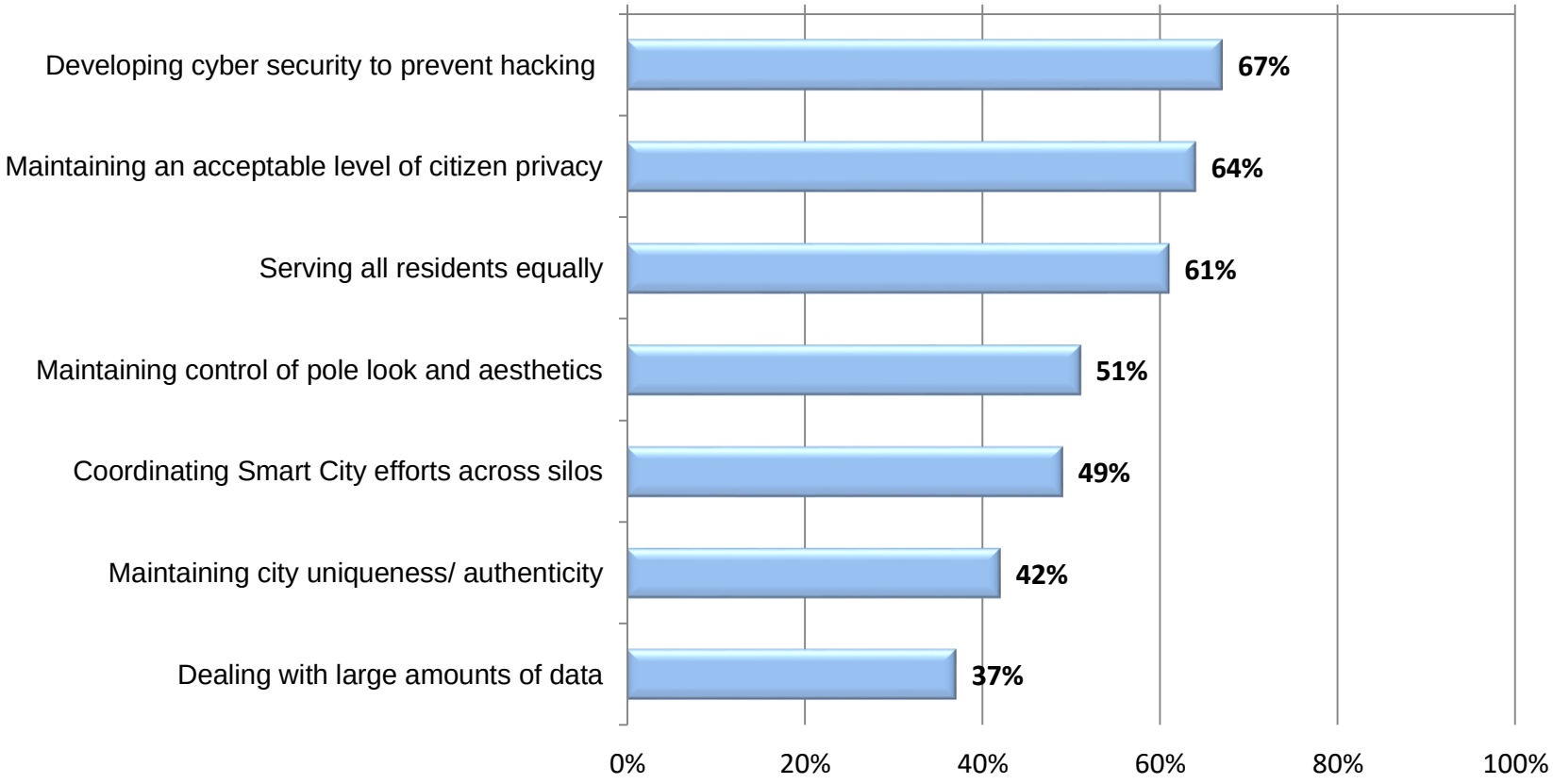


# Estimated Number Of Sensors Used
## Crosstabulation By Subgroups Among Those Deploying



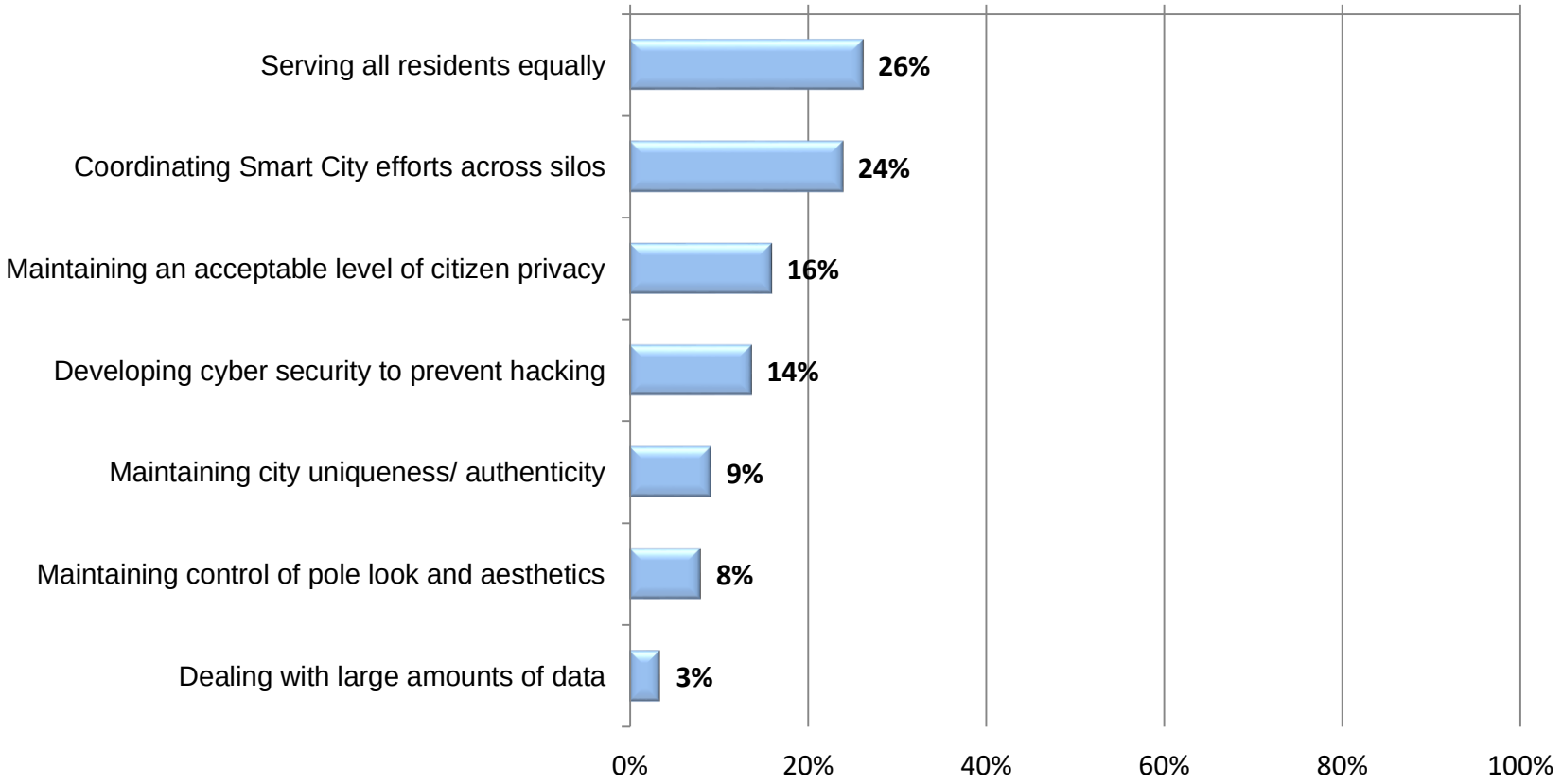
Even those with an affinity to Smart City deployment have concerns about the technology. Cities are currently most concerned about cyber security, citizen privacy, and citizen equity.

# Very Important Concerns About Smart City Deployment
## Among Those Pursuing



Posing the security question in a slightly different way shows respondent passion for the single most important concerns – a different order, but primarily the same key concerns, except that “coordinating Smart City efforts across silos” is elevated in this list.

# Single Most Important Concern About Smart City Deployment
## Among Those Pursuing



# Appendix

# Reasons State Laws Considered Negative Or Positive
## Verbatim Responses

* All written by the incumbent telecom companies. * Removes local control. * Doesn't allow the municipality to cover its costs.
* All local authority stripped from us.
* As a very small city <1000 the capacity to create and enforce ordinances is very limited. Therefore, having state (MN) default regulations is quite useful. Our reading of the newly adopted regulations seems to be fair to all and not overly restrictive to any (except the extremely fastidious).
* Attempt to preempt local authority.
* Because of state and federal pre-emption of local control for both the services of broadband and the management of the public's rights of way.
* Bill died in committee.
* California Senate Bill 649 (vetoed by Governor in Oct 2017) would have cluttered the ROW with technological blight, provided unlimited access and unlimited size of equipment on City poles, capped rentals rate at $250/pole per year, and prohibited in-kind contributions. Basically, giving City assets to private companies.
* Carriers lobby their position to State Senators. Worst case scenario produces legislation that will strip away the rights of a community to control and properly manage their ROW. It is up to the local communities who have extensive broadband (small cell) experience to educate State Legislators about the benefits of small cell and advanced wireless technology, while at the same time explaining the rationale of our business model and what is fair for both the community and carrier. This is about public-private partnerships, and we have had great success and feedback from the carriers we have leases with. The administration has embraced the technology, developed standards and specs for small cell deployments, and have implemented a digital permitting and plan review process to increase the likelihood of accelerated deployments. This has led to very positive relationships with carriers, and will hopefully reduce the probability of dealing with detrimental legislation.
* Cities need to maintain control of their assets for the benefit of the community that owns these assets! Subsidizing corporations with the benefit of free or below market rate lease rates on the public right of way is unacceptable. In the era of Smart Cities, it will be smart to for cities to continue to control what happens in the public right of way - from aesthetics to revenues, cities must be able to leverage their assets for the public good.
* Control over the community should be left with the community. Local decisions should be local.
* Could impact for municipal use.
* Did not have any choice.

# Reasons State Laws Considered Negative Or Positive
## Verbatim Responses (Cont.)

* Gave the cities more discretion over aesthetics of the equipment.
* Having the state involved simply complicates things. We were already in talks with carriers prior to it's passage, yet now those talks have become convoluted and frankly less productive.
* Home rule not considered.
* I haven't done all the research on this issue.
* I resent the fact that the State Legislature is being bought out by wireless providers in an attempt to pre-empt reasonable local regulations.
* In California, SB 649 was proposed and vetoed by the governor yesterday. It is expected that this legislation may return next session. Our concern was and still is the need for local control of land use decision making within our respective jurisdictions. Additionally, we have concern with a provision that would have allowed for preferential access to government owned buildings for the installation of small cells. And lastly, there was a provision to cap the cost recovery opportunity at an arbitrary level.
* In principal, it is mandating the means in which public rights-of-way can be administered to protect non-utility for profit telecommunications providers. A framework was already in place and working well without this legislation.
* It could benefit or not, depending on the way the bill to the senate and assembly is worded.
* It has placed a large burden on our City, but with none of the benefit. Caps on fees to be charged and the inability to charge franchise fee or other fees does not allow the City to recoup the cost of staff time to administer this. And in the end, we don't get much of a say in the aesthetics or safety of the pole anyway.
* It has placed some restrictions on the city's ability to regulate the installation and pricing of small cells.
* It is too early to tell how the utilities will use this law. The utility's interests are usually profit motivated, many times at the expense of the aesthetics of the built environment.
* It streamlines the telecoms ability to put large telecom cabinets in the ROW and not-so-small antennas on poles with little local oversight.
* Lack of consideration for local revenue considerations. Lack of design standards for small cell deployment.
* Law just passed last session at the state legislature and we have yet to see the impact of that law in our community.
* Laws were passed with no input from municipalities and were drafted to the benefit of wireless companies.
* Legendary member of the day.
* Legislation snuck into last minute bill without city consultation.

# Reasons State Laws Considered Negative Or Positive
## Verbatim Responses (Cont.)

* Lessens local authority to consider placement for safety or aesthetic reasons.
* Local citizens paid for the infrastructure and deserve a say in how it is managed. Local citizens also deserve a market lease rate for their assets.
* Loss of local control. These actions are because of the successful lobbying of the largest providers to weak politicians.
* Most state legislation introduced in Oregon is wireless, cable, and telecom industry backed to preempt local governments from managing right-of-way and collecting lease/rental fees for use of ROW and other city assets and property.
* Most state regs seek to limit or eliminate city's ability to regulate and charge for use of public assets. State legislators seem to be led by the industry without regard for local interests. In Kansas City, we have negotiated a reasonable pole attachment and new facility agreement. The fee is $540 annually per pole attachment and $1500 annually per new facility. We have reached this agreement with 9 small cell providers and are also partnering with a few on Smart City and digital equity initiatives.
* Negotiated with only certain municipal input and tends to come about without a great deal of warning.
* One state law cannot address individual needs of hundreds of communities. Local regulations for land use, why not local regulations for this land use?
* Pre-emption of local bodies for a one-size fits all state-wide policy does not allow for regional or location-specific planning.
* Proposed law significantly impacts cost-recovery related to permitting, inspection, and maintenance, and devalues public assets. Proposed laws also open the door for negative aesthetic impacts.
* Proposed laws take away local authority to control use of the PROW.
* Proposed state law will remove authority from localities and cap the fees that can be charged to providers.
* Removed local control of right of ways.
* Rent fees for municipal property would be severely limited and would be far below the value of the street light, traffic signal, or municipal structure. Also, costs of review would be sharply restricted and would literally eliminate carriers assuming the cost of review beyond the permit filing fee, which is usually nominal. Also, the proposed review time would not be consistent with the current federal shot clocks, and small cells would be compelled to be a permitted use in residential areas, which is not the case for macrocells or other communications towers or antennas. Those require a Special Use permit.

# Reasons State Laws Considered Negative Or Positive
## Verbatim Responses (Cont.)

* State law should help give uniformity and prevent a hodge-podge of different local ordinances, but the devil is in the details, and these are brand new laws whose effects are yet to be seen.
* State or federal regulations do not address local issues, such as view corridors, aesthetic impacts, etc.
* State tried a pre-emption of local control - cities fought it off and started their own consortium to provide guidance for local ordinances that help streamline permitting but maintain local control, safety, aesthetics, and desired placement.
* State wants to control the legislation and not the local municipalities.
* The adopted state-wide fees for permitting processing are below the cost of the city and it includes permitting shot clocks. In order to comply with State law, the City had to hire additional staffing to meet deadlines and won't recover costs. Taxpayers are essentially subsidizing the installation of private communications infrastructure for retail customer service. The state-wide ROW rental fees are below fair market value.
* The Industry has spent considerable lobbying dollars to request that proposed legislation with unrealistically low fees and limiting our right of way authority be passed by the state legislature.
* The NCGA has passed a number of regulations for small cell installation that remove our city's ability to manage the aesthetics of our community. Some of their regulations are not well written, and in fact unclear.
* They remove local control.
* The state law in Florida dictates rates which are not reflective of the market rate and timeframes for permitting with little or no input from the community. The state law was much in favor of the wireless community and not the concerns of the citizens within the communities.
* The state laws define response times for permit requests, and do not provide enough consideration regarding siting of equipment or aesthetics.
* They are stopping local governments from regulating right of ways and what goes there. Also creating an artificially low cap on what can be charged for right of way access to poles.
* They have the ability to usurp local authority to regulate our right-of-way.
* They set a reasonable baseline for us.
* This issue is very confusing with everyone claiming to be the good guy.
* Untested.
* We have been responsive and made changes based on carrier asks/ feedback. Proposed state laws threaten to usurp local control and apply processes that would affect visual aesthetics, safety, and staff capacity.
* Written by the incumbent telecom companies. Removes local control. Doesn't allow the municipality to cover its costs.

# Balancing Tech Needs With An Attractive/Safe Community
## Open End Verbatims

* A reasonable balance of Federal, State and Local control.
* Aesthetics should be determined by the community.
* Allow local control over local needs and looks.
* Allow local control. The local municipality has a better understanding on what can be accomplished in a safe and effective manner.
* Allow local governments authority to set the standards based on their community. Industry should be innovative in their design standards and not use cookie-cutter off the shelf design and large equipment.
* Allow local input as to location and fees.
* Allow local review of locations.
* Allow location of equipment to be required to be minimally invasive and/ or somewhat aesthetically unobtrusive, while meeting safety codes.
* Allow municipalities, within reason, to enact planning and zoning requirements and building permit requirements.
* Allowing local policy to prevail in the rights of way.
* Better legislature.
* Carriers need to work with the community's planners to propose installations that are consistent with design standards found in a Comprehensive Plan, overlay plan, or historic district plan. There are companies who are designing aesthetically-consistent structures for areas with design standards, however, carriers seem to be trying to avoid working with them.
* Cities need to establish reasonable rules of engagement in their communities ( good governance) with lease rates attached to City assets based on concrete analysis of City costs. And cities should be developing their own fiber optic infrastructure -- with new rules making it clear to incumbents that if they want to work in our cities, they need to pay a fair market value for right of way assets.
* Cities need to fund dedicated staff to these issues, and staff/ department work directly with industry to come up with viable solutions instead of industry putting funds into lobbying so legislators pass laws to force our hand into a one size fits all.

# Balancing Tech Needs With An Attractive/Safe Community
## Open End Verbatims (Cont.)

* Cities, for the most part, are not impediments when it comes to ensuring the advancement of technology in a community. Cities have had relationships with telecom providers for years when it comes to placement of technology on water towers and other similar locations. The idea that cities cannot work effectively with telecom providers is not correct.
* Local control.
* Design standards, pole attachment fees, pole replacement agreement standards should all be created by a national committee made up of municipal and county government representatives.
* Development of model policies that can be adopted by local governments that support the development and deployment of small cell and IoT technologies throughout our communities. Additionally, the ability to collaborate throughout a region, across jurisdictional boundaries is key for improving the speed and reducing the cost of deployment of services. It is also important to consider make-ready and one-touch polices for all pole attachments, again with input from industry and regulatory partners.
* Ensure local authority is maintained to some extent.
* Given municipalities are better able to balance the needs, less federal and state regulation would be helpful. Federal and state guidelines are helpful, but not where they reduce the ability to manage this balance.
* Have cities be proactive in adoption of reasonable codes - acknowledging the need for small cell - but maintaining community standards.
* I'm not so sure that 5G is fully defined as a standard enough to guarantee what is being 'marketed' as the benefits of 5G. Some of the technical issues of actually getting 5G and millimeter microwave to perform as advertised are extremely questionable. By locking in right of way and pole access and maybe one-touch, the carriers or service providers are staking out territory for a possibly dubious product.
* If state or federal laws pass, they should mandate that companies deploy facilities so all have access -- not just areas that are dense, and have opportunities for higher revenue. Use of ROW is a privilege reserved for the public benefit.
* Incentives to bury poles would be one
* Leave control with the local governments. They know more about what the community wants and how to balance their desires.
* Limited interference from the State Legislature and federal government. A requirement that providers share sites. Reasonable local regulations.

# Balancing Tech Needs With An Attractive/Safe Community
## Open End Verbatims (Cont.)

* Local governments should have control for what their cities look like.
* More time needs to be allowed to develop local ordinances, at the same time a deadline could be helpful.
* Nothing should be done to limit how municipalities can control the use of its poles to deploy wireless antennas
* Provide cities a template ordinance that creates an administrative process (not discretionary) for small cell deployment, with standard rates that reflect population densities, and which allow for negotiations between cities and telecoms for public benefit (i.e., inkind contributions, free wifi, etc.) so that City assets are not just providing a private benefit to a specific cell company subscriber.
* Providers should work with local communities for agreements. Proposing unreasonable legislation at the state level may work in some areas, but it will also increase resistance at the local level.
* Public education on the technology and its benefits. Design commission engagement with carriers; review and approval of attachments. Updating regulations that match the current state of technology to how we review and permit.
* Residents can voice their opinion when passing resolutions at council meetings.
* Safety is a priority. Proper management of public R-O-W, which is a limited asset, is a priority.
* Standards and specifications developed for small cell deployments ensure consistency in pole design and radio/antenna installation. We have also standardized pole heights as a result of these projects. The location of electric meters are part of the plan review process to reduce the number of meters in our streetscape. Small cell installations in Landmark Districts or other sensitive areas are reviewed by the respective committees to ensure we maintain our community aesthetic. As a result, the carrier may occasionally need to paint streetlight poles, pay for banners to match the surrounding environment, or find an alternative location. Educating the carriers about your community on the front end of the permitting process is critical to save them time and money. Once they understand the community perspective, deployment gets much easier. The utilization of local engineering firms in the site location and design process is also helpful.
* States need to work with cities to establish reasonable agreements and processes with local jurisdictions.
* Stop the telco lobbying for monopolistic control of public resources.
* Support cities in investing in policy and process development that works collaboratively with companies to meet local community needs. Advocate against local government pre-emption because otherwise, the large wireless, cable and telecom companies have no incentive to work with local governments and local governments have no leverage to engage in value trading to meet local needs.

# Balancing Tech Needs With An Attractive/Safe Community
## Open End Verbatims (Cont.)

* Systematic improvements that benefit all carriers. Carriers should be classified collectively as utilities and have the local rights and responsibilities of utilities.
* Telecommunications companies should realize that communities are unique in their approach to right of way management and aesthetic controls and work collaboratively with city staff to reach consensus on the permitting processes for each community.
* The balance is critical. We have spent millions over the years ensuring a beautiful built environment that still meets resident quality of life and safety demands. Small cells are no different - without prohibiting the critical equipment, cities need to be allowed to regulate certain terms of attachment, including size and quantity of the technology.
* The industry owns the narrative on this issue and consistently portrays cities as bad-faith, uncooperative actors based on a small number of incidents and anecdotes. Better coordination and leadership among cities is necessary to consistently demonstrate the value of the work we do as regulators and show what is being done to support network densification in a way that is balanced with community interest.
* The wireless community did a poor job in explaining the 5G technology and what was needed from an infrastructure perspective to get to 5G. As a municipal utility we have been working with the various carriers and wireless Infrastructure providers to have uniform workable small cell design. The wireless community was not familiar with working in the right of way and the associated work rules and permitting of projects. In addition the 5G small cell technology requires a merging of needs of the core Electric Utility mission of providing safe and reliable electricity and pole attachments codes (NESC / NEC) with the new technology needs of co-locating a wireless antenna, radio and cabinets, and electric power. All of this requires a deliberate review and design to allow it to co-exist together on the electric distribution poles. Stand-alone streetlight poles do not possess the structural integrity to hold small cell equipment and thus must be replaced. An attractive and functional streetlight needs to be designed and installed.
* There are many affordable but aesthetically pleasing options for small cells and the other concern is the height of such poles within a historic district.
* Thoughtful standards and policies.
* Wireless companies could better partner with communities instead of writing their own laws and rushing it through the legislature.
* Work through the issues in the local community so that both sides can present their concerns and hopefully come to a compromise. This can't be done at the state and federal level.

# Status Of U.S. Small Cell Wireless/ 5G
# &
# Smart City Applications
# From The Community Perspective

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