Feedback on Fort Lauderdale's Fire Rescue Demand Analysis

Background

The city of Fort Lauderdale (FTL) is experiencing increased demand for fire rescue services without an adequate understanding of underlying causes. The City Manager's goal is to understand *why* calls to the Fire Rescue system are on the rise and use that evidence base to design informed strategies for reducing demand and/or optimizing the response. Because FTL's Structural Innovation (SI) Team is already well-positioned to execute this analytical project, the role of the Center for Government Excellence (GovEx) is simply to provide feedback and recommendations on the SI team's analytical work as needed. On July 21, 2016, members of the SI team provided GovEx a draft copy of their analysis and this document contains GovEx's feedback on that work.

From a cursory understanding of the demand for fire rescue services, based on brief discussions with FTL leadership, GovEx drafted this list of Key Analytical Questions to Tackle, which may help guide the analytical process and shape final deliverables for city leaders.

Key Analytical Questions to Tackle

1. What is the trend in Fire Rescue requests?
    a. How is volume changing?
    b. How is request type changing?
    c. How are the characteristics of the requestors changing?
    d. How is service delivery (e.g., response time) changing?
2. What, if anything, is causing changes in service requests and what might the city do differently to address those changes?
    a. How would those changes impact service delivery?
        i. What is a proposed timeline for service delivery change?
3. How can the city gain ongoing access to this data (and resulting insights) while protecting the security and medical privacy of individuals and residents?
4. How can the city produce informational products for decision-maker consumption that strike the appropriate balance between decision support and privacy protection?

What's Working

Data Diversity

The SI team is clearly tackling this problem from multiple angles. GovEx is encouraged by the diversity of datasets represented in the analysis. Information about residents, commuters, and visitors has all been visualized together to give leaders a holistic picture of all potential

populations causing changes in demand. The volume of calls to fire/rescue services is compared to call volumes for other services, which can provide a useful benchmark for evaluating the extent of demand shifts for city services. GovEx has suggestions for how to handle data which has no obvious correlation to the problem at hand, but in general, the pursuit of all potentially informative data sets is worthy of commendation.

Digging Below the Surface
The analysis does not rest at surface level analysis. Where others may have stopped short and looked at only total demand for services, the SI team is digging deeper. The analysis shows total call volumes, call volumes by type of call, and calls by day of the week and time of day. It also continuously compares changes in volume with percent changes - a useful juxtaposition.

Dual Axes
A large portion of the analysis takes advantage of an underutilized feature in data visualization: the dual axis. This allows the SI team to layer useful information together on one chart, optimizing the viewer's opportunities to notice meaningful patterns (or the absence of patterns) in the data. We have some suggestions for how to improve upon the use of dual axes below, but the sheer utilization of dual axes is a step in the right direction.

What to Build On

The SI team has laid a solid analytical foundation for this project and there are ample opportunities to build on this strong foundation. In our experience, operational decision makers want a clear definition of the problem, the key analytical findings, and the suggested remedies as early in the presentation as possible. Here are some recommendations for how to build that into the analysis, along with tips on compelling visualizations.

Context & Problem Definition
The underlying premise of this analysis is that FireRMS requests are increasing in a way that's alarming to city leaders and necessitates changes in service delivery, so the analysis must begin by proving or disproving that fundamental premise. Although there are a number of graphs related to the volume of FireRMS calls during the past 10 years, as well as charts of data potentially related to the number of requests for Fire Rescue services, there is no clear identification of key factors and no clear story about why Fort Lauderdale is experiencing two consecutive years of double-digit increases in Fire Rescue calls. We recommend tackling some of these questions head on early in the briefing, not just by showing a graph but also through a small bit of narrative text:

- Has there been a noticeable increase in call volume?
- What are the key drivers of the increase?
- What categories and in what locations do you see the most requests for services?
- What likely accounts for the increase in demand?

The opening charts show population and call volume precipitously increasing, so the viewer is left with the immediate impression that FTL is simply growing. Is that the correct conclusion? Later in the briefing (slide 22), it seems the adoption of the regional 911 system may have had an impact on the increase. However, the analysis appears to show an upward trend in calls prior to the adoption of the system. Although some of these questions are addressed later in the brief, they aren't clearly called out for the central role they play in the increase of calls to FTL Fire Rescue.

Meaningful Comparisons

Digging below the surface of total call volume is definitely a step in the right direction, but the analysis could go even further. To reveal which categories were the main drivers of the increase, consider comparing the categories with each other. For example:

- There was an increase of almost 6,000 calls between 2014 and 2015. The increase in service calls accounted was more than 2,600, or 44% of this increase. EMS/Rescue accounted for slightly less but an almost equal share of the increase.
- In 2014, the main driver of the increase during 2013 (4,064 calls) was "Good Intent" calls that accounted for approximately 43% of the increase.
- Further investigation of these calls, particularly by district may yield actionable results for the department by "shaving the peak" of high call volumes in these categories targeted to particular areas of the city where the increases are the most pronounced.

In addition to the comments above, it may be helpful to compare the number of calls per resident (full-time or daytime) to better tell the story of growth as it relates to the changing population of Fort Lauderdale.

Meaningful Correlations

As mentioned previously, data diversity is a critically important aspect of well-executed analysis. However, due to the lack of obvious correlation, the slides on seasonality and provision of other services (water in particular) may best be left out of the brief unless there is a specific interest in seeing this analysis. This will improve the telling of a clear and truthful story of the rise of Fire Rescue calls in Fort Lauderdale. Including these slides without proving their relevance, risks viewers' tendency toward finding spurious correlations and attaching meaning and creating relationships where none are proven to exist.

Actionable Findings

Regardless of what the analysis shows, decision makers will want recommendations from the SI team about what, if anything, should be done. If the call increases are normal outgrowths of population increases, what should the city do to resource that growth appropriately? If calls could be diverted to a different service based on the nature of the calls, what are more efficient and effective service delivery models to meet the demand a different way? If the calls reveal underlying truths about changing community needs, how can the city position its scarce resources to meet those needs?

Compelling Visualizations

GovEx has some visualization best practices which may prove useful to the SI team during the remainder of this analysis and beyond. The following are some simple changes to charts that could help improve their interpretability.

a. For charts with dual axes, it is best if the horizontal grid lines can align to tick marks on both axes. When grid lines align with only one of two axes, charts are more difficult to interpret.
b. The zero growth % line is a key visual indicator of change and should ideally be set out as a thicker line to make the growth percentage easier to understand. This is particularly important when the scale of change varies from chart to chart and the zero growth line moves vertically from relatively low on the graph to high (as in the transition from slide 16 to 17).
c. In some cases (particularly slide 2), you overstate the percent change visually. Ideally, the percent change in what you're measuring should be reflected in the percentage change in the area of the figures you're using (i.e., a 2% change in population estimates is represented by a much greater change in the area of the representative figures). This is an issue of scale that can be easily altered in Excel to better represent the data.
d. Whenever possible with dual-axis charts, we've found it helpful to have the axis the same or similar color to the data point to help easily identify the associated axis with the data point.
    i. For example, on slide 11, having the left axis colored a shade of blue and the right axis colored a shade of red will make it more interpretable.

Going Forward

GovEx appreciates the time and energy the SI team is putting into this important analysis and we welcome the opportunity to provide feedback, both now and in the future. To help facilitate the SI team's successful execution of the project, GovEx is willing to provide the following support before the SI team concludes its analysis and submits its final findings and recommendations:

1. Onsite training to review the analysis and provide technical assistance, further drilling down into the available data and possibly combining other data sources.
2. An extended video conference to share the underlying data and discuss trends and actionable recommendations.
3. Review a future draft of the analysis of the available data to provide further input ahead of briefing of senior Fire Rescue management and the City Manager.