

Does Your Fire Department Have a Seat at the Planning Table?

DECCAN INTERNATIONAL

Optimize and Stay Ahead of the Curve when Planning for New Developments in Your Community

Population Growth: It's Unavoidable

Growth – It's a simple concept, but one which nearly every fire department must grapple with at some point. When it comes to population growth and corresponding infrastructure growth, your fire department must rise to the challenge of responding to the additional demands that inevitably accompany that growth. With more calls coming in, what changes need to be made to your deployment plans? Where should your units be stationed to ensure they can respond to these additional emergencies as quickly as possible?

Without proper planning and preparation, deployment planning can quickly devolve into a game of cat and mouse – with units 'chasing' calls, but never seeming to be able to 'catch up.' By failing to participate in the initial planning process, strategic deployment planning decisions then happen after-the-fact. And to truly make strategic decisions, they must be made proactively – not reactively.

Consider this: Your call volumes are steadily increasing across your service area, but have you actually kept up with the number and location of resources needed to effectively and efficiently respond to this changing demand? Are you simply guessing at the resources you need, or do you have reliable data to help you determine what deployment changes need to be made? Statistics on New Development in the U.S.



876,000 single-family homes > \$770 million



374,000 multi-unit homes > \$254 million



907 million sq ft commercial space > \$340 million



Image Caption: Cumulative value of projects that began construction in 2018, broken down by metropolitan areas.

Resource: Dodge Data & Analytics



Image Caption: Percent population change in cities and towns since 2010, broken down by region.

Resource: United States Census Bureau The West and South Lead the Way (census.gov)

Getting the Fire Department Involved

If your department is not proactively involved in planning for new developments, the cards are already stacked against you. If you aren't equipped with the necessary data to share with stakeholders during the planning process, then your department will continue to be relegated to playing 'catch-up' – with an increase in workloads, as well as over-time shifts, your crews are effectively left holding the bag.

Your fire department has the ability to take control and secure a seat at the planning table. How? By making smart, evidence-based recommendations. Constantly watch for increasing and changing demographics and incident call volumes, set up "triggers" – a process for identifying resource changes necessary to keep up with increases in call volume, and have a strong database backed by compelling maps that your department can use to justify the necessity of additional resources.

City planners and developers demand tangible evidence on which to base their financial decisions – in other words, they want proof. Your department can provide the proof they are looking for by illustrating the impact of new growth on your ability to respond to emergencies, as well as offer a solution on how to efficiently and effectively navigate the necessary changes to mitigate this impact.

In this paper we will share with you what we like to call the "Superior Approach", to help you establish an institutionalized process that provides indisputable justifications for the resources needed in order to handle both general and new development population growth.

Why Should You Care?

- It's a window of opportunity for your department to have a voice in the planning process
- You can stay ahead of the game by estimating the impact that new growth will have on your ability to service your community
- Your department can realize a direct return by identifying and lobbying for impact mitigation measures
- You can optimize your budget by securing private funding for public facilities, resources needed, etc.
- It's an opportunity to improve and optimize your system performance



Image Caption: Increasing incident counts (blue) and response times (green) over a 6-year period.

Resource: This is a Deccan International graphic sourced from client data.

COMMON NEW DEVELOPMENT SCENARIOS

The Scenario

Matching Your Resources to New Risk

A new development is proposed for a mixed-use residential and commercial property. The building structure is slated to be wood-based residences, on top of concrete commercial structures. The fire department anticipates added risk due to the building height and materials of the new residential portion of the structure, and needs to ensure they have the appropriate resources to service this new property.

The Facts:

- Less than 7 floors (not a high-rise)
- Mixed-use
- Floor 1: Commercial (concrete)
- Floors 2-4: Garage (Concrete)
- Floors 5-7: Residential (Wood stick)

The Solution

The fire department needs to be ahead of the curve – they should review the new development proposal and get involved during the approval process for those plans. By doing so, the fire department can make the case that this new building will result in an increase in risk in the area.

Using Deccan applications, the department can estimate the impact this new development will have on response times and unit availabilities due to the projected increase in call volumes. For the fire department to properly serve the future residents of this building, they propose and receive approval for a new ladder truck. Bonus ask – they can even work with the developer to assist in funding this new ladder truck!



The Scenario

Simultaneously Managing Multiple New Developments

Three developers in town are bidding on three separate new developments in three separate locations. Understandably, the fire department is concerned about the cumulative impact these three new developments will have on their units' workloads, incident call volumes, and response times. To circumvent any potential negative impacts, the fire department needs to quickly identify the ideal locations for their existing resources, as well as identify any additional resources they may need, so as not to compromise response times. Further, they'll need to determine how to distribute the cost of any necessary additional resources across the three developers in a manner that is proportional to the response time impact of each of their respective projects.

The Facts:

- 3 development proposals 1 mega and 2 smaller
- A negative impact on response times was calculated
- The number of resources needed to fill the created gap in response times was calculated
- New resource needs were attributed to the developments
- Surprise the mega development needed the least number of new resource

The Solution

Using Deccan applications, the fire department can establish a baseline for current response times, and then project the increased incident volumes, by area, in each of the three new development locations. Not surprisingly, the projected response times in the areas of each new project are much worse than current response times. By comparing the three worsening response times, Deccan's Apparatus Deployment Analysis Module (ADAM) then calculates the proportion of response time increases that each developer is responsible for.



By providing this concrete evidence to the developers, the department is able to persuade each developer to provide funds for the additional resources necessary to negate the impact their respective development will have on response times.

Deccan also offers the ability to simultaneously model all three developments and identify their resulting cumulative response time impacts. Further, Deccan is able to both add and move resources until response times improve back to their baseline levels. To determine the true financial impact of the new developments, the dollar value for all additional resources can be calculated and then divvied up among the three projects according to each project's respective impact on response time increases.

It is important to note that when simultaneously dealing with multiple new developments, the answers may not be as simple or straightforward as expected. For instance – in this scenario, the largest of the three planned developments was projected to have the smallest impact on response times, while the smallest development was projected to have the largest impact on response times. How is this possible? The largest development was planned to be located near an existing station that doesn't experience a lot of demand – in other words, it isn't that busy. In contrast, the smaller development was slated to be located in a more rural area, further away from current populations. As a result, while the increase in call volume was much lower for the rural area, a new unit would need to be allocated to the area just to address the increase in call volume – making it the more costly build. The takeaway? Larger developments do not necessarily result in a larger impact on response times, and location always matters.

The Scenario Managing New Ongoing Operating Costs

Let's say the fire department is able to make the case that a new unit is needed to properly serve the community of a new development project. It's one thing to be reimbursed for the one-time purchase of a unit, but it's another thing entirely to be reimbursed for the ongoing operating costs of that unit. The department is still on the hook to budget for this additional annual overhead cost.



The Facts:

- The Project: 1,120 single-family homes spread over 582 acres
- Developers reached an agreement with the town
- Developer agreed to contribute \$500,000 if the town decided to construct a new fire station to serve the new development area
- It's a step in the right direction, but does not address new needs for staffing and equipment

The Solution

Using Deccan's applications, the department can estimate the workload that this new unit is expected to handle due to the increased incident demand. By identifying an existing similar unit in the department with a similar workload, the department can estimate the operating costs of the new unit and include this information in the impact assessment of the new development.

ESTIMATING NEW DEVELOPMENT IMPACT FEES

Current Approach: Using Impact Fees

The current approach fire departments use to estimate the impact cost of a new development is to determine standard rates and then apply those rates to different types of facilities and their varying uses. While this approach is fast and easy, it does not account for the specifics of the current department situation, like unique geography, or any special needs of the service area – it is a reactive, conservative estimate. And, it is one that leaves the fire department on its own, with no guidance regarding how to mitigate potential impacts on their ability to serve their community.

Land Uses	Rates based on Planned Growth (1)		
Residential Uses	-	14 C	
Base Rate	\$299	per service population	
Single Family	\$879	per dwelling unit	
Multi Family	\$655	per dwelling unit	
2nd Unit	\$655	per dwelling unit	
Other Unit Types	\$299	per service population	
Non-Residential Uses			
Base Rate	\$173	per employee	
Retail	\$433	per 1,000 gross sqft	
Hotel	\$347	per 1,000 gross sqft	
Office - R&D	\$572	per 1,000 gross sqft	
Industrial	\$217	per 1,000 gross sqft	
Other Unit Types	\$173	per employee	

Image Caption: Illustrated above is an example of impact fees derived from the typical approach, which assigns values based on facility/industry type.

Resource: Menlo Park Fire Protection District Emergency Services and Fire Protection Impact Fee Nexus Study

Pros of this approach:

- It provides an absolute value
- It's not affected by changes to general plan growth estimates

Cons of this approach:

- It's a conservative estimate
- It does not account for any special needs of the service area, like unique geography
- It ignores any overhead and support costs for the facilities

A Superior Approach: Using Response Time Modeling Tools

To maximize their negotiating leverage with developers, the fire department needs to commit to putting in the time and effort necessary for a more detailed approach in estimating the impact cost of a new development. In the current approach, there is no differentiation among varying geography types with varying needs within a jurisdiction. Yet by using an alternate approach, these different needs can be appropriately accounted for.

For instance, consider that a new station can only serve 500 homes in a hilly area within a county, but it can serve over 2,000 homes in a flatland area within that same county – a drastic difference.

While the cost to build the station remains the same, when geography type is accounted for, the impact of building a new station varies considerably based on its location.

Pros of this approach:

• Accommodates the uniqueness of each development and fire department

Cons of this approach:

• Requires more effort, information, and more frequent updates

Steps for A Superior Approach to Determine the Impact of New Development

Step 1

Identify your fire department's baseline response times. One method for tracking current response times is through the Center for Public Safety Excellence (CPSE) Standards of Cover (SOC) process for Accreditation.

Similarly, the guidelines in the NFPA 1710/1720 Standards for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public can also be used to help identify baseline response times. Whatever approach is taken, a baseline for response times should be established by geography, by incident type, and by response type.

Deccan's applications can help you measure your response times and generate reports to continuously monitor your performance.



Response Criteria	Urban Time Target	Rural Time Target	Average	Percent
First Unit Enroute to Onscene (Priority 1,2,3,4	4:00	10:00	4:14	97%
First Unit Dispatch to Onscene (Priority 1,2,3,	5:00	11:00	6:11	94%
Second Unit Dispatch to Onscene (Priority 1	6:00	10:00	7:18	83%



Response Criteria	Urban Time Target	Rural Time Target	Average	Percent
First Unit Enroute to Onscene (Priority 1,2,3,4	4:00	10:00	3:44	61%
First Unit Dispatch to Onscene (Priority 1,2,3,	5:00	11:00	5:31	46%
Second Unit Dispatch to Onscene (Priority 1,	6:00	10:00	6:34	49%

Image Caption: Rural and Urban response time targets within Deccan's ADAM application.

Step 2

Identify the increased population your fire department will now be responsible for servicing. Population characteristics can strongly predict the types of incidents your department will be responding to (i.e., age, gender, income level, etc.). For example, an elderly population in a new nursing home facility will result in an increase in high priority incident types such as falls, strokes and heart attacks.

Step 3

Identify the impact the new development will have on your streets and traffic patterns. For instance, the addition of new streets can result in an increase in traffic due to speed reductions in construction zones. Further, an increase in traffic not only negatively impacts response times, but can also result in even more incidents (such as vehicle collisions).

Step 4

Identify the increase in call volumes by incident type that the new development will create. Will there be an increase in EMS incidents, in structure fires, etc.? When identifying the increase in incident volumes by incident type, the department must: account for steps (2) and (3) listed above, use segmentation by type to help determine increases at a response level, and use segmentation by geography.

Step 5

Calculate the new development's direct impact on response times. Given the increased call volumes and (likely) modified road networks, the fire department should use analysis models to project this impact.

Calculate the impact on response times by:

- Noting the impact by geography, by type of incident, and by type of response
- Reviewing the impact on First Unit response time, as well as on Effective Fire Force (EFF) response time
- Factoring in your second due, and even third due, unit response times
- Accounting for reduced unit availabilities
- Assessing both your average response time scores and 90th percentile response time scores

Deccan's ADAM can help you determine the impact of increased call volumes and altered street networks on your response times. Call volume can be added by geography, by type of incident, and even by time of day/day of week, and the resulting impact on response times accounts for reduced unit availabilities. You can also view the impact on 90th percentile response times and Effective Fire Force (EFF) response times.

Image Caption: The image above shows how an increased call volume around EMS Post 4 impacts response times. Yellow, orange, and red areas signify degrees of worsening performance. Note how performance also worsens around EMS Post 5 in this example.



Step 6

Identify minimal impact mitigation measures to return response times to their baselines. Use an analytical model to determine the least possible increase in resources necessary to do so. This may include new stations, additional personnel, or new equipment.

Deccan's ADAM can help you experiment with adding new stations, resources, and/or crew members to your deployment. Choose between multiple candidate locations for your new station and/or new unit. Deccan's Optimizer can recommend the ideal location for your new station, down to the nearest street corner, to maximize the benefit of your specified objectives.



Dispatch to First Engine On-scene (Time Target: 5:20)



Image Caption: The image on the left displays current deployment response performance as seen in Deccan's ADAM application. The image on the right shows the improvement in response performance after adding three new engines.

Step 7

Pinpoint the costs of impact mitigation measures.



SECURE FUNDING AND YOUR SEAT AT THE TABLE

Get Funding Out of New Development Projects

A new development creates the need for additional resources to adequately serve the changing needs of the community – but who's going to foot the bill? To help cover the cost of these new resources, the fire department can obtain funding in a variety of ways. First and foremost, it is imperative that you have the right information readily available to use as leverage during the planning and negotiation process. Deccan applications can provide you with this vital data.

Ways to Gain Funding:

- Impact development fees (non-recurring) these are popular in states such as California and Florida
- S One-time capital costs (non-recurring)
- Property taxes, benefit assessment charges, subscriptions (recurring)
- Some recurring fees can be phased in with the development and can also be phased out (costs reduced as the taxes base increases)

Secure Your Seat at the Table

New developments provide the opportunity for a myriad of funding options for the fire department. And in today's data-driven world, it is imperative that the fire department uses a proactive, data-based approach to justify their monetary requests. By presenting the right data during developer and city negotiations, the fire department can maximize their leverage to gain their requested funding.

Key Takeaways:

- New and re-development projects are an opportunity to coordinate funding and better serve your community by improving response performance
- Fire departments must have a scientifically backed response to present to developers and community leaders
- Q Do your homework! Know the processes for new and re-development projects both within your department and your jurisdiction
- Create and implement a comprehensive process for estimating the impact of a new or re-development project on your response performance, and gaining the necessary funding to safeguard the services you provide to your community

About Deccan and New Development

The right information at the right time is critical to effective decision making. Understanding the impact that changes to deployment will have on response performance provides lasting benefits to departments and their communities.

Deccan's Apparatus Deployment Analysis Module (ADAM) helps Fire and EMS leaders quickly evaluate the impact of a new development project and the affect it will have on your city's population growth, demographics, and of course – response performance. Deccan routinely collaborates with agencies to incorporate expected future changes in their service area to allow for reliable, tested forecasting in ADAM.

Deccan's products use powerful Esri-based tools and can be used to show different map layers, including population density, transportation systems, area land use, topography, geography, and many others. These mapping tools provide the ability to visually demonstrate the impact a proposed new development will have on your department's response performance, giving you the credibility and confidence to justify budget requests to city planners and developers. Whether it's introducing a new station, or securing funding to procure and staff additional units, ADAM can simulate the elements of your proposed plan and demonstrate how additional resources will benefit your community with quantifiable data and visual reports.

ADAM allow users to clearly visualize both the positive and negative impacts of proposed deployment changes, and geographically displays those areas where a change in performance is projected. Additionally, users can prescriptively generate optimal solutions to a wide range of deployment questions, providing value for both long-term planning as well as addressing day-today operational challenges, delivering the most effective deployment plan in mere minutes.

Deccan's powerful predictive modeling and deployment analysis efficiently delivers the data you need for decision-making and planning, giving your fire department a seat at the planning table.

For more information on how Deccan can help your fire department with new development and population growth planning, please contact sales@deccanintl.com.

Additional Resources:

https://www.census.gov/construction/nrc/pdf/quarte rly_starts_completions.pdf

https://www.eia.gov/consumption/commercial/repor ts/2012/buildstock/

https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf



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