



11/1/2019

### ADAM Sole Source Letter

This Sole Source Justification letter is a response to Panama City Fire Department's request for a scientific, industry-vetted software solution to support both short and long-term strategic planning decisions.

Panama City Fire Department responds to a variety of emergencies 24 hours a day, 365 days a year. Like all public safety agencies Panama City Fire Department has a critical obligation to offer the best possible service it can within the confines of the available budget. ADAM by Deccan International (based in San Diego, CA) is the only tool that meets the requirements of Panama City Fire Department's desired solution.

#### Deccan is the Sole Source for Strategic Planning Deployment Solutions

It is imperative for Panama City Fire Department to evaluate their deployment strategy to ensure proper distribution and optimal utilization of resources. In order to ensure efficient long-term planning, Panama City Fire Department needs powerful, calibrated analysis tools to examine different deployment scenarios and project the corresponding impact on response times and unit workloads. Such tools should have the following characteristics:

1. Enable the user to evaluate the impact on response times and unit workloads of the following changes in response environments:
  - a. Relocating units temporarily or permanently. Where should units be relocated to ensure best coverage?
  - b. Identifying optimal current and/or new station locations. Where should units be posted? Where is the optimal location for a new station that will provide the best impact on response times, allowing the user to constrain analysis to areas that are feasible to place a new station?
  - c. Adding or removing units from deployment. Where should additional resources be placed to ensure best coverage? Or if needing to remove a resource, which unit removal would hurt the least (have the least negative impact on response times)?
  - d. Increasing demand. What impact will a new building development have on response times for different call types?
  - e. Changing dispatch policies. How many of various types of units should be dispatched by type of call? For example, what if only engines are sent on certain types of fire calls?
  - f. Changes in call distributions by call type. For example, what if the department no longer responded to certain types of calls?
  - g. Changes in field intervention procedures. For example, what if a new protocol was added on cardiac incidents requiring 15 more minutes in the field?
2. Enable the user to order optimization analyses on given deployment scenarios for the following needs:



- a. Given a specified number of units of a given type, which stations should they be assigned to in order to minimize a specified response criterion?
  - b. Given target response times, how many units of a given type are minimally needed and at which cross-street locations should they be located?
3. Scenario projections should reflect actual historical travel time data and not be based simply on posted speed limits listed in the digital street network. The travel times are calculated based on Computer Aided Dispatch (CAD) data.
  4. The underlying analyses should account for units not being available at their assigned location while away on calls. As more distant units have to respond to calls when closer units are busy on other calls, the analyses, in turn, should account for degradation in response times. This is particularly important in the busy parts of the service area.
  5. The analysis should be map-based and enable the user to visualize response time projections in the form of color-coded maps.
  6. The tools should have been in use for over five years across the U.S. by at least five major metropolitan fire departments.

Currently there is only one tool — ADAM by Deccan International (based in San Diego, CA) — that meets the above requirements. Deccan and ADAM are described below, followed by a justification of their unique ability to meet the above requirements.

### **Deccan International**

A woman-owned small business, Deccan International is the leading provider of turnkey software solutions and services for public safety strategic and real-time deployment planning. Deccan has pioneered in the development of computer-aided-dispatch analysis software for over 23 years and continues to develop new and enhanced decision-support tools to help fire departments, Emergency Medical Services (EMS), and emergency communication centers operate more efficiently.

Through constant innovation, domain expertise, and strength in operations research, Deccan International provides comprehensive solutions with its unique project management approach and unparalleled client service. Deccan offers its clients a support team focused on customer service. Well qualified Project Managers (PMs), who manage application build projects of all sizes and levels of complexity, comprise the core of the Deccan team. The PMs are supported by expert Operations Research Developers, Software Engineers, and Analysts, professionals that are proficient in supporting EMS clients to help improve operational productivity. In addition, the Deccan team is proud to have ex-public safety personnel on its team who bring in real-world knowledge and experiences.

### **ADAM (Apparatus Deployment Analysis Module)**

ADAM (Apparatus Deployment Analysis Module) is a Deccan software product used by both major metropolitan and small community fire and EMS operations for strategic planning and deployment analysis. It is a practical, data-based application that combines a unique blend of analytical rigor and industry experience to assist fire departments and EMS agencies in making important administrative decisions.



ADAM provides an easy to understand, ESRI map-based graphical interface along with key performance data that can be used to perform quick analyses and generate results that can be easily understood by budget officials and public groups alike. The tool can be used by fire and EMS agencies to decrease the severity of budget cuts, justify budget increases, evaluate resource relocation, and much more.

Deccan International's flagship product, ADAM, is used to create objective, factual reports and analyses to explain how an agency has been functioning on key performance indicators. In addition, it is used to provide strategic planning solutions and to easily and effectively evaluate the impact of changes in the field via extensive simulation capabilities.

Additionally, ADAM factors unit availability into its calculations to present the projected impacts on availability and number of runs per day for the units in deployment. For example, a user can explore precisely how adding an engine to a busy area can create more balanced field performance. By simulating alternative deployment scenarios in a variety of ways, Panama City Fire Department can make informed deployment decisions directly tied to agency objectives.

A key challenge in modeling fire service and EMS deployment is that incidents occur in random fashion, and unit service times are random. For deployment models to be effective, they need to embrace and account for these random events – that is, if the closest units are not available when incidents occur, then further units have to respond. Deccan's Hypercube model is the only tool in the industry that:

- Uses stochastic, probability models to project the number of runs each individual unit will make and the corresponding impact on response times,
- Accounts for all manner of dispatch assignment schemes, which describe the number and type of resources to be sent on each incident type (i.e., a BLS Ambulance is to be sent to a low priority medical call, or an ALS Ambulance is to be sent to a high priority medical call, etc.), and,
- Projects and accounts for increases in future annual workloads.

#### **Unparalleled Analytical Power of Deccan's Optimizer**

When determining ideal station locations, all possible current station location combinations as well as all possible street segment locations must be explored. The magnitude of the calculations involved in this type of analysis is beyond the scale of what can reasonably be accomplished through manual computation.

Deccan's Optimizer is the only tool in the industry that can quickly explore all possible station combinations and street segments in a comprehensive fashion to calculate optimal recommendations. To achieve this performance, Optimizer uses a state-of-the-art model for modeling spatial queues called Hypercube, along with a powerful clustering algorithm used in the logistics research field called Location-allocation problem.

Optimizer's unique engine makes it the only tool available for optimizing fire and EMS resources. Only Optimizer accounts for the uncertainty experienced in fire and EMS services while simultaneously comprehensively exploring all possible deployment alternatives to compose optimal deployments. Optimizer uniquely supports a variety of criteria, including equity, run load balancing, and the tradeoff between geographical coverage versus incidents coverage. Such considerations are vital for Panama City Fire Department in its search for optimally using its scarce resources for maximal service to the public.

#### **Deccan is uniquely positioned to serve Panama City Fire Department**



In order for Panama City Fire Department to address its strategic deployment needs, it needs the best decision support technology available. Deccan is the only company with the industry experience and science-backed tools to adequately support Panama City Fire Department's operations as further explained below.

### **Over 20 Years of Supporting Fire and EMS**

In the space of deployment technology for fire departments and EMS agencies, Deccan has had the longest tenure in the industry, having been in business since 1995.

### **More Agencies Supported**

Deccan supports significantly more large metro agencies than any other vendor, with roughly 50% of major North American metro departments, and over 200 client application installations. Over 70 million Americans and 1 in 3 Canadians are served by agencies utilizing Deccan decision-support products.

### **Deccan Tools Combine Academically-Established Scientific Approaches with Real-World Experience**

Deccan's lead developers are unique in that they straddle the academic field of operations research, which involves developing mathematical models and algorithms to address practical needs, and real-world problem solving to support industry decision making. Deccan's head developer, Dr. Raj Nagaraj, worked in academia as an Assistant Professor at the University of Iowa Business School and served in the District of Columbia Fire and EMS Department, Washington, DC. Deccan's development team includes multiple Ph.Ds. in Operations Research.

### **Highly Customized Solutions**

Because of the type of real-time and long-term analyses needed to be done by Panama City Fire Department and the myriad considerations and business rules that need to be modeled, an analytical software solution needs to be able to reflect the agency's deployment practices and its leadership's priorities. Unlike other software products, Deccan builds each application around the specific needs of its clients. It can be quite complicated to configure the tool so that it accurately reflects Panama City Fire Department's operational goals. As such, the tool needs data analysts that are knowledgeable of the various ways in which the software solution can be tailored to an agency's dispatch and coverage policies. Deccan is only provider in the industry that has a dedicated team of project managers and data analysts whose sole role is to learn an agency's priorities and configure and customize the various settings within the application so that the agency can focus on tactical decision making and not be burdened with configuration details.

Deccan International's ADAM is the only application that can meet the above specified unique criteria. Only Deccan International can build, manage, install and maintain this application. Deccan International's ADAM is highly proprietary and considered a trade secret of Deccan International. Please let us know if we can provide any additional information.

Warmest Regards,

Latha Nagaraj



Deccan International Sole Source Letter

President & CEO  
Deccan International  
858.764.8324

