# Station 36 Response Area Needs Analysis

## Supplemental Report

South Metro Fire Rescue Authority

October 10, 2008

## Executive Summary

Starting on July 15, 2007, a study was conducted to analyze various opportunities for improving service to the station 36 response area. The details of that study are summarized in the August 1, 2008 report "Station 36 Response Area Needs Analysis". The final recommendation in the report was to pursue opportunities to relocate station 36 to a more central location within its response area; specifically, areas referred to as "36A" (located at the northwest corner of Castle Pines Pkwy. and Monarch Blvd.) and "36B" (located approximately 1/2-mile north of the 36A site, on Monarch Blvd.).

Since that report, South Metro Fire Rescue Authority (SMFRA) staff has met with several citizen and community representative groups to discuss the recommendations and obtain feedback. There has been some opposition to the recommendation to move the station to the "36A" site, primarily due to concerns with loss of tax revenue, noise, decline in property values, traffic, and philosophical concerns with whether the relocation of the station is necessary. Based on the feedback, staff has continued to re-analyze the original recommendations, verify and respond to concerns, and conduct any new analyses to assist in the development of a final recommendation to the board of directors. This supplemental report summarizes that additional information.

Staff continues to recommend that SMFRA pursue the relocation of station 36 to a more central location. More specifically, it is recommended that the station be relocated to the "36A" site, as it provides improved service to the highest population and call density, locates the station closer to areas with a higher potential for serious calls, and will help bring the station's travel times closer to response standards. It is further recommended that the "36B" site no longer be pursued due to site development costs and traffic safety concerns.

## Introduction

The objective of the "Station 36 Response Area Needs Analysis" was to improve performance in the response area using existing resources and to identify if any further improvement was needed through the addition or relocation of fire stations. The August 1, 2008 report on that study concluded that there is room for improvement that could be realized through the relocation of station 36 to a more central location. This was seen as a unique opportunity since land was available in an optimal location and there would be a cost savings when compared to the original plan of building a second fire station in the area. However, community concerns over the plan to relocate to the "36A" site have caused staff to look deeper into the original analysis in order to respond to those concerns and more thoroughly understand the benefits of moving the station.

This supplemental report is intended to summarize additional research and analysis that has been conducted since the initial August 1, 2008 report. A more detailed look at "option #2" is conducted where station 36 is relocated to a more central location within the response area. Further research includes the current performance of station 36, desired performance levels, the feasibility of relocating the station to the "36B" site, the effects of relocation to the "36A" site on specific communities within the response area, the impact of future fire stations in surrounding areas, and responses to specific community concerns. This additional information is used to provide a more detailed recommendation to the fire district and fire authority boards of directors to assist with the decision-making process.

## A Closer Look at Current Performance

### Response Standards

Since the intent of this supplemental report is to help determine if any improvements in station 36's performance are sufficient, it is important to look at how that performance compares to the desired standard, or goal, of the organization. While SMFRA's response standard is still in development, it is useful in this analysis to measure station 36's performance against a known standard. As stated in the August 1, 2008 report, there are national standards (e.g., National Fire Protection Association Standards (NFPA) 1221 and 1710) that set dispatch, turnout and travel time goals for the fire service. These are not mandatory standards and only serve to provide a framework for each organization when developing their own response standards. SMFRA's dispatch center, MetCom, currently meets the NFPA 1221 standard for dispatch time.

When planning the fire service response for an area similar to station 36's response area, it is difficult to meet the NFPA 1710 travel times, as that standard does not account for the street layouts, call volumes, types of hazards, etc. that are typical of a more suburban and rural population. Therefore, SMFRA will be creating a more custom response standard that reflects the various population and commercial densities throughout the jurisdiction. Since both South Metro Fire Rescue and Parker Fire Protection District have obtained accreditation through the Commission on Fire

Accreditation International (CFAI), it is appropriate to compare performance with CFAI's standards, which define travel time goals that are similar to NFPA's, but expand them into more specific types of population categories. The CFAI defines five population density categories (metropolitan, urban, suburan, rural, wilderness) and provides a range of performance within each category. Table 1 shows examples of the most applicable ranges and Figure 1 shows a distribution of the various categories within SMFRA's jurisdiction. The station 36 response area is primarily "suburban", with small areas of "rural" near Surrey Ridge and McArthur Ranch.

| Category | Travel Time Range | Performance |
|---|---|---|
| **Urban** | 4:00-5:12 | 90% |
| **Suburban** | 5:00-6:30 | 90% |
| **Rural** | 10:00-13:00 | 90% |

**Table 1. CFAI travel time standards by population density category.**

It should be noted that the August 1, 2008 report utilized "averages" to provide insight into overall data trends. The standards mentioned above measure performance at the 90$^{th}$ percentile. In other words, they are interested in how a function is performed 90% of the time. Therefore, in order to measure performance against standards, this report will incorporate both measurement methods.

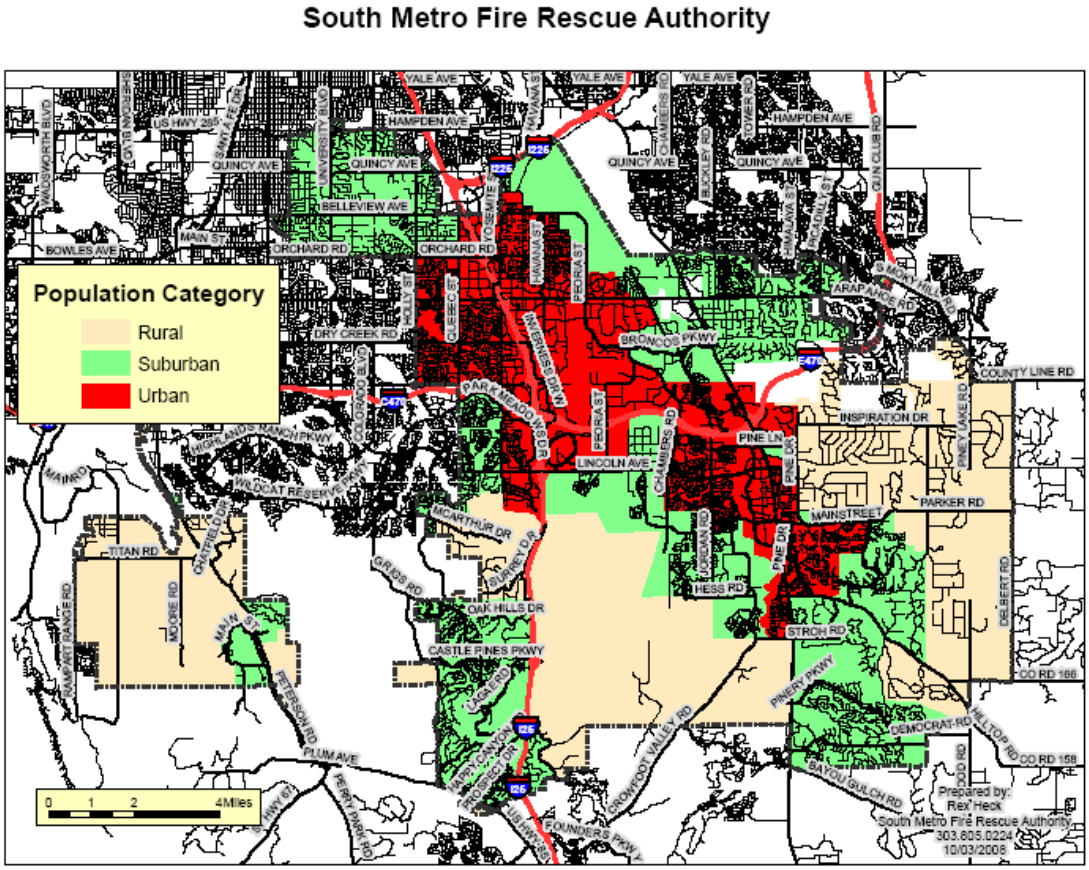


**Figure 1. SMFRA population density categories using CFAI criteria.**

Current Performance

Table 2 shows the average and 90th percentile travel times in the 10 months before and after July 15, 2007 for the station 36 response area. The table also shows station 36's current performance relative to the suburban travel time standard shown in Table 1. These values are shown as a percent of calls that fell within the 5:00 – 6:30 range.

| Travel Time Measurement | Pre-Study Period (9/15/06-7/14/07) | Post-Study Period (7/15/07-5/15/08) |
|---|---|---|
| **Average** | 5:58 | 4:55 |
| **90%** | 9:28 | 8:15 |
| **5:00-6:30 range** | 40-63% | 55-78% |

**Table 2. Station 36 travel time performance during 10 months before and after 7/15/07.**

Whether comparing the average or 90th percentile, there has been a significant (greater than 12%) improvement in station 36's performance after the ambulance changes were made on 7/15/07. Despite those improvements, however, travel time performance is still outside of the desired range when measuring at the 90th percentile. Table 2 shows that after 7/15/07, it took station 36 an average of 4 minutes and 55 seconds to travel to calls. However, 90% of the time it took 8 minutes and 15 seconds to travel to calls. Compared to all 16 fire stations in SMFRA's jurisdiction, station 36 ranks 15th in travel time in the period after 7/15/07.

The critical question, then, is whether moving station 36 to a more central location will further improve performance enough to justify the cost and to overcome community concerns. The remainder of this supplemental report will look closer at the predicted performance if station 36 is relocated.

## The Impact of Relocating Station 36

The "36B" Site

The August 1, 2008 report indicated that relocating station 36 to the "36B" site has some advantages over station 36 with its ability to respond faster to calls within the higher population density. However, there were also concerns with the site that needed to be researched further. Since that report, a conceptual site analysis has been conducted of the 36B site and has found the following significant concerns:

1. The land is currently considered "open space" and would need to be re-zoned to allow construction. This process has the potential to be long and costly and the request could ultimately be denied.
2. Due to the geography of the site, a large amount of retaining walls and fill will be needed, resulting in additional development costs estimated to be as much as $500,000.
3. Due to the cross slope of Monarch Blvd., turning north onto Monarch may be difficult for fire apparatus.

4. The most significant concern is the curve in Monarch Blvd. north of the 36B site. This curve in the road prevents south-bound traffic from seeing fire apparatus leaving the station. The distance between the curve and the fire station would make it difficult to safely stop that traffic prior to reaching the fire station.

Based on the site challenges, it is recommended that the 36B site no longer be considered as an option.

The "36A" Site

This section provides additional insight into the effectiveness of moving station 36 to the 36A site. If there were no station serving the area today, it is very likely that SMFRA would need to decide between available land in the commercial area near I-25 versus the land available at Monarch Blvd. and Castle Pines Pkwy. That decision would be based on which location would provide the best response times to the highest population, call density, and most potential for serious calls, and which location would result in performance that is as close to response standards as possible. Several factors to address these criteria are analyzed below.

*Surrey Ridge/Oak Hills*

The August 1, 2008 report identified that these communities have unique access difficulties and should seek alternate access points to improve service. Additional analysis confirms that the call volume is low in the areas, with only 25 calls to Surrey Ridge and 7 calls in the Oak Hills area during the 20 months that were analyzed in the study, or about 3% of the station 36 call volume.

If station 36 is moved to the 36A site, it is important to look at the future fire stations that will improve service to the Surrey Ridge/Oak Hills areas. In particular, a fire station is planned for the Ridgegate development on the east side of I-25 near the new interchange at Ridgegate Pkwy. When travel times are predicted from that station, there is a 1- to 2-minute improvement to Surrey Ridge compared to the current station 36. Also, there is a predicted 1- to 3-minute improvement to the entire Oak Hills and Surrey Ridge areas compared to 36A. Figures 2 and 3 compare the predicted travel times with the station 36/Ridgegate and station 36A/Ridgegate combinations, respectively, and show that response to these areas will be similar between stations 36 and 36A.

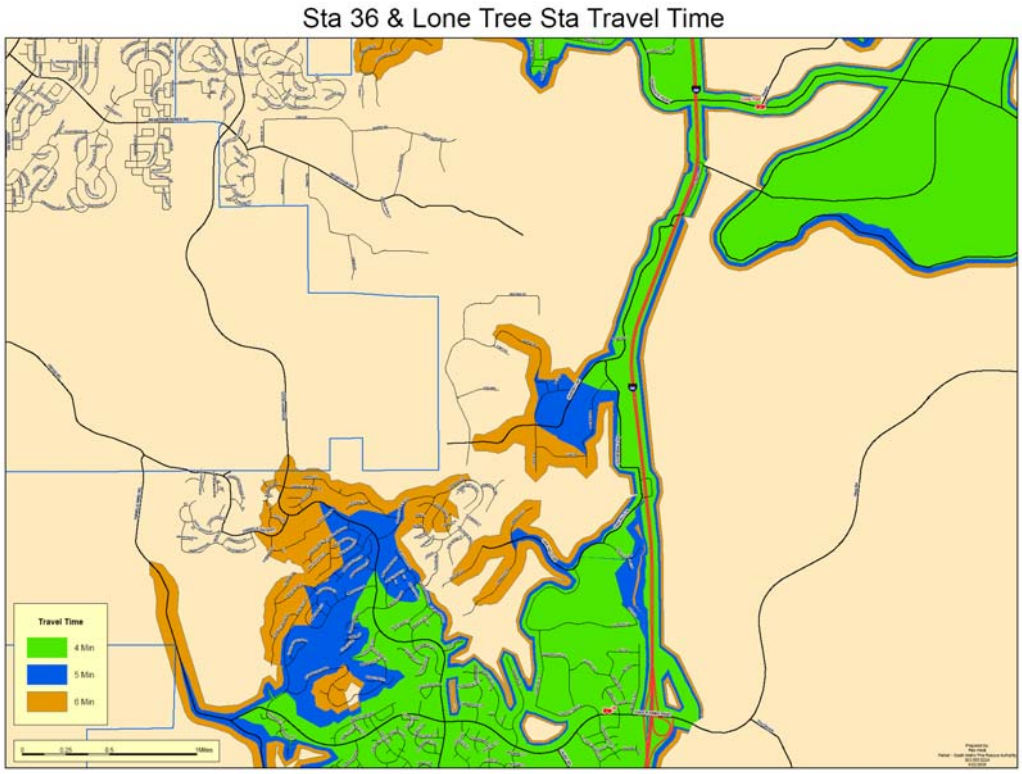


**Figure 2. Station 36 and Ridgegate predicted travel times.**

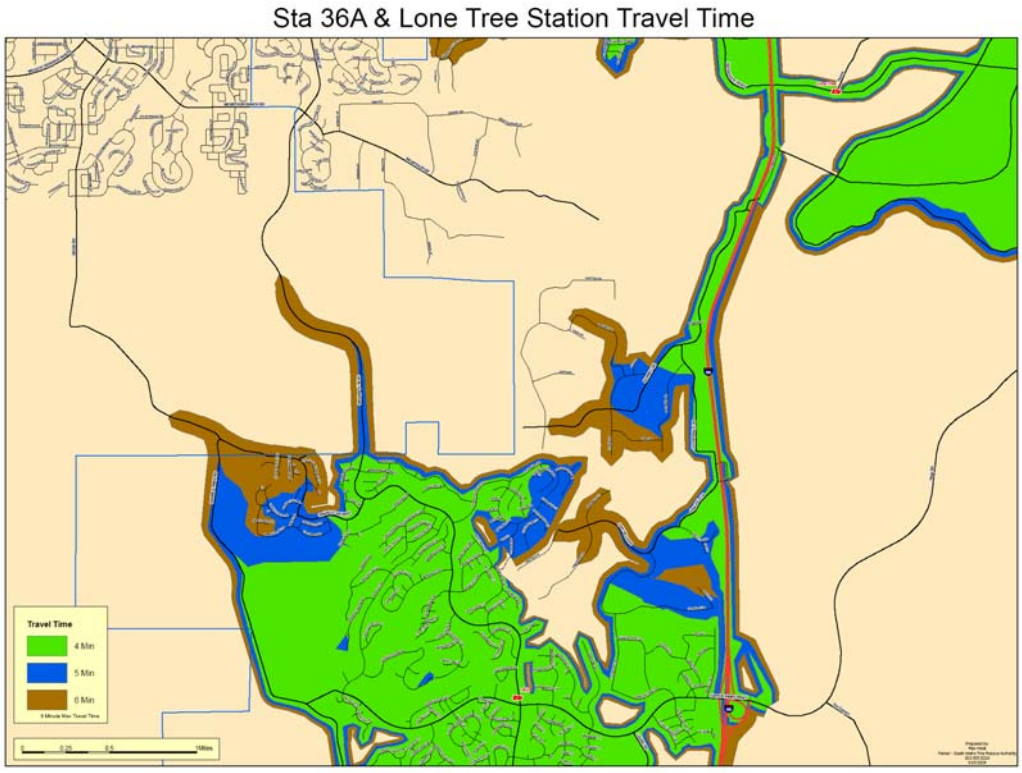


**Figure 3. Station 36A and Ridgegate predicted travel times.**

The construction of the Ridgegate station is several years away, so in the meantime alternate emergency access should be investigated. Figure 4 shows an example of how an emergency access onto Heather Drive in Oak Hills can improve the travel times beyond the service currently provided from station 36. Comparing Figure 4 with Figure 18 in the August 1, 2008 report, there appears to be a predicted improvement of up to 3 minutes. At this time, an emergency access does not exist to either area, nor are there any plans to construct such an access. Discussions with citizens and community leaders would need to occur, along with a more detailed engineering analysis.

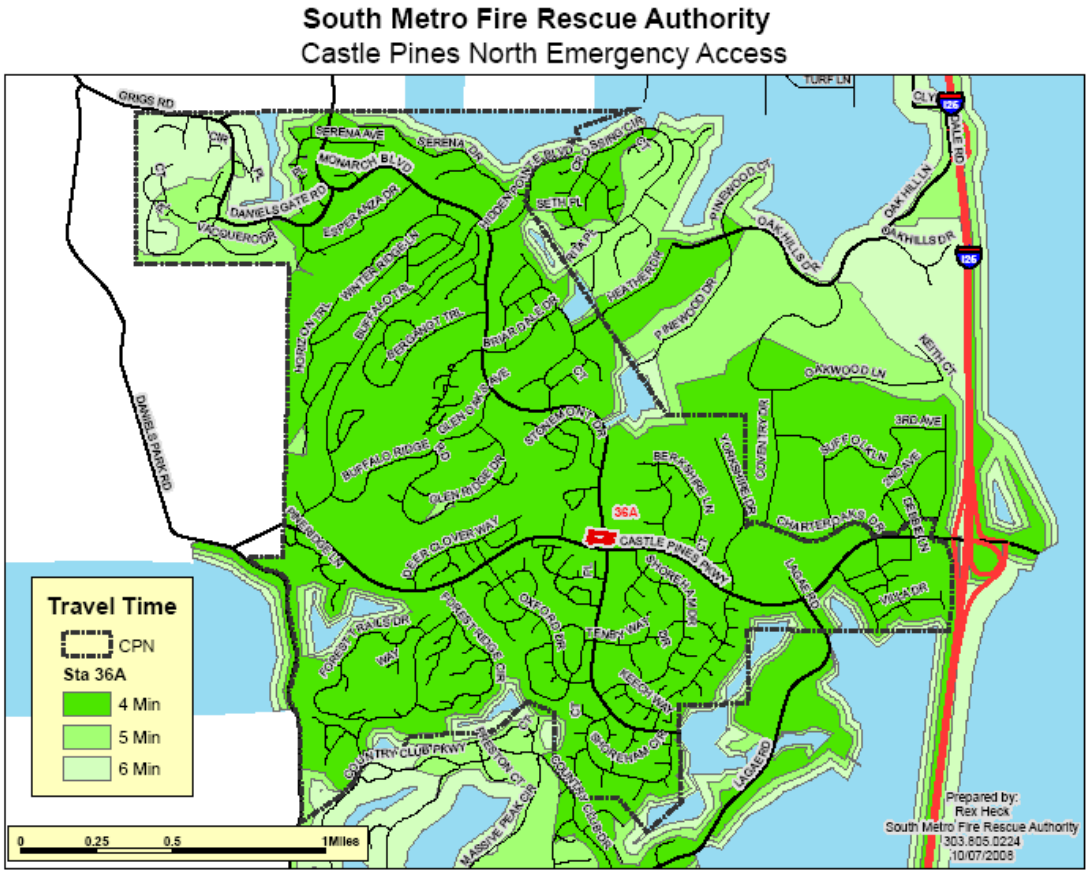


**Figure 4. Example of travel time improvements to Oak Hills area using emergency access connection.**

Overall, the Surrey Ridge and Oak Hills areas are low density and low call volume areas that appear to be adequately served from either station 36 or 36A using current resources. The analysis shows that service can improve further in the future.

*Castle Pines Village*

An error was found in the August 1, 2008 report where the predicted travel times were not accounting for an emergency access gate located between Castle Pines North and Castle Pines Village. This gate does not improve travel times from station 36, but does improve response times from 36A (compared to Figure 18 in August 1, 2008 report). Overall, travel times are predicted to decrease 1 to 2 minutes in the north end of Castle Pines Village when compared to station 36's current performance (see Figure 5).

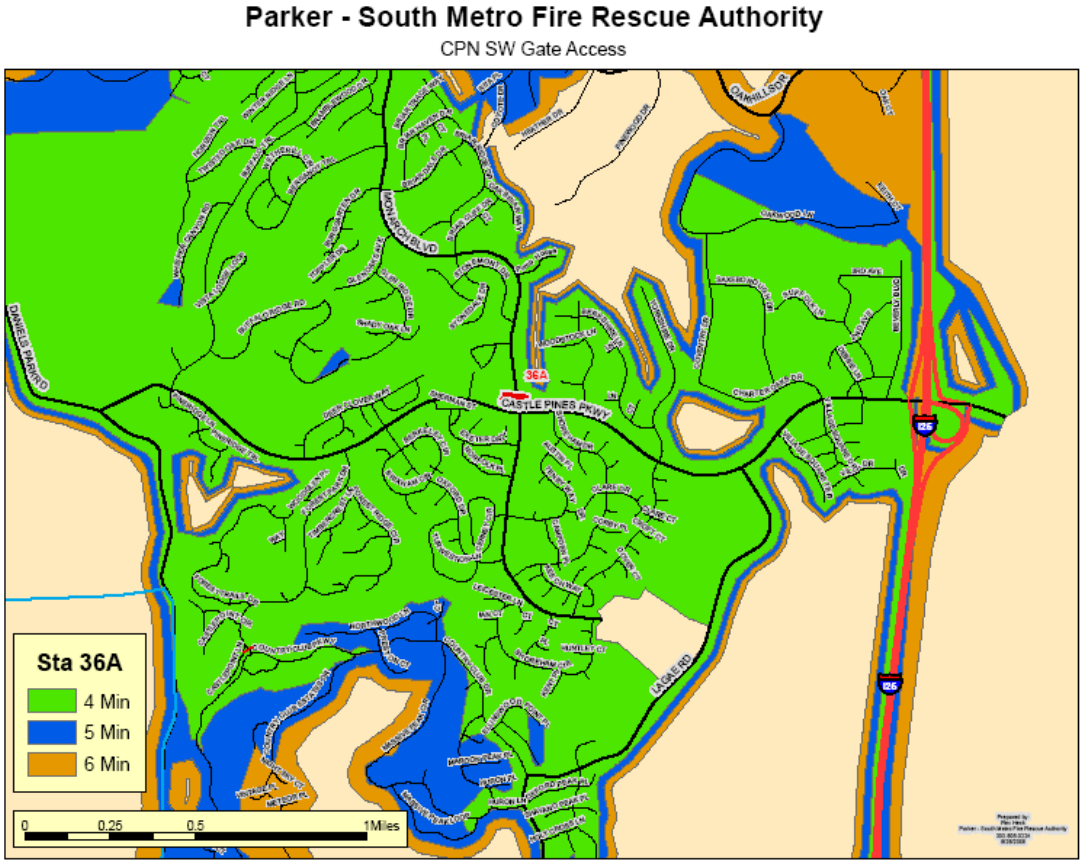


**Figure 5. Station 36A predicted travel times to north end of Castle Pines Village.**

*Lagae Ranch*

Figures 6 and 7 show the predicted travel times from stations 36 and 36A to the new development "Lagae Ranch". This analysis shows that relocating to the 36A site does not have an adverse impact on the response to this area, as both stations provide similar service.

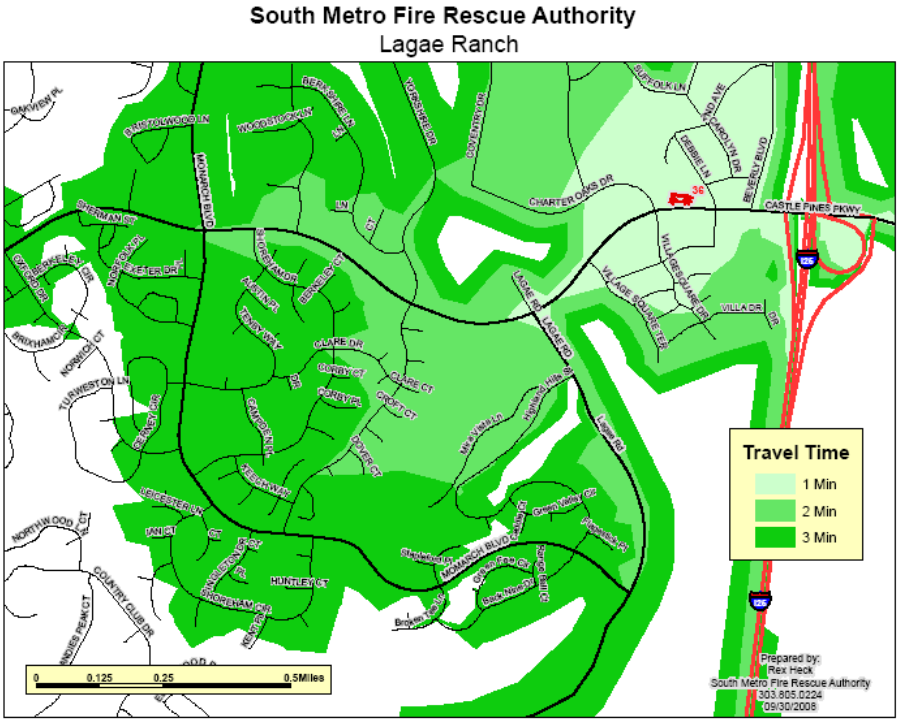


**Figure 6. Station 36 predicted travel times to Lagae Ranch.**

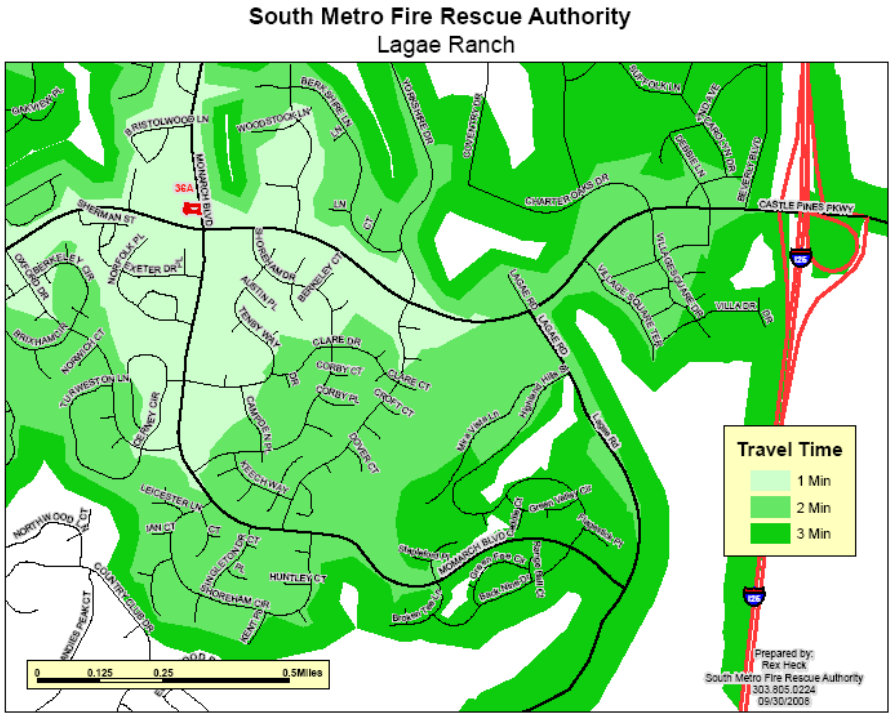


**Figure 7. Station 36A predicted travel times to Lagae Ranch.**

*Interstate 25*

In the August 1, 2008 report, the discussion on relocating station 36 contained an analysis that excluded I-25 calls. The purpose of that analysis was to show that moving the station to the 36A location would result in a quicker response to more calls that occur in the fixed residential and commercial populations. This was based on the assumption that there is a higher potential for serious calls in the fixed property areas than on I-25, and so a higher priority should be given to those serious calls when locating a fire station. "Serious" calls include confirmed emergencies such as fires, vehicles accidents with injuries, emergency medical incidents, and gas leaks.

In order to compare the relative seriousness of calls, the number and types of calls that occurred on I-25 were compared to one of the busier non, I-25 areas. Of the 1,004 calls that occurred during the 20 months that were analyzed in the report, approximately 300 calls occurred on I-25. The types of calls that occurred on I-25 were compared to map page AB-28, which includes the central portions of Castle Pines North. Table 3 provides the number of calls occurring in each area, along with an estimate of the number of calls that had the potential to be serious.

| Area | # of Calls | # of Serious Calls | % |
|---|---|---|---|
| **I-25** | 294 | 99 | 34 |
| **AB-28** | 151 | 102 | 68 |

**Table 3. Relative call hazard between I-25 and fixed properties.**

The results of this analysis show that the calls within the residential and fixed properties of the response area have more potential to be serious than those that occur on I-25. This makes sense, as there are more types of emergencies that can occur in the residential areas. Therefore, it is more strategic to locate the fire station closer to those fixed properties while maintaining good access to I-25.

*Overall Estimated Performance Improvement*

Based on the information in the August 1, 2008 report, if station 36 were moved to the 36A site, it is estimated that some areas may benefit in travel time reduction by as much as 1 to 2 minutes. Of course, other areas will experience an increase in travel time and other areas will have small differences. So, in order to provide a better estimate on the increase or reduction in travel times throughout the whole response area, an analysis was conducted where travel times to actual call locations were predicted from the station 36 and station 36A sites.

The first scenario looked at all call locations and the second scenario excluded I-25 calls. When all calls are considered, there was little change in predicted travel times when moving the station to the 36A site. However, when the I-25 calls are excluded, there is a predicted 41-second reduction in travel times, at the $90^{th}$ percentile. This result is consistent with the August 1, 2008 report that used a different analysis to predict that station 36A could travel to a higher number of calls within the fixed properties in a shorter amount of time than station 36.

## Recommendation

The purposes of the August 1, 2008 report and this supplemental report were to evaluate if moving station 36 to the 36A site could improve service to the highest population and call density, locate the station closer to areas with a higher potential of serious calls, and bring the station's travel times as close to response standards as possible. Overall, staff has utilized various methods to analyze the effect of moving station 36 to the 36A site and has concluded that this move will accomplish the desired service improvements. The recommendation remains strong to take this unique opportunity to relocate the station to the 36A site. Several key points from these two reports can be summarized as follows:

- The areas that gain the most improvement in service include all of the residential areas of Castle Pines North and the north end of Castle Pines Village. These areas have the highest population, number and density of fixed properties and have the highest potential for serious calls. The travel time improvement to just these areas should be in excess of the overall response area prediction of 41 seconds. Moving station 36 to the 36A site ultimately puts the fire station in a location that provides the most reward using available resources.
- The station will be strategically located to maximize the potential for meeting travel time standards. Compliance with standards will increase over time as the influence of I-25 decreases with response from new fire stations to the east and north. Therefore, today's decisions will still make sense in the future and we will experience continual improvement beyond the initial gains.
- Station 36 currently focuses its best service on the transient population on I-25, low-density residential areas, and commercial developments that often have fixed fire protection systems. Staff recommends that we shift the focus away from those areas and concentrate on the higher-density and higher-risk residential areas near the center of the response area.
- If there were no fire stations in this response area and a location had to be chosen today, the analysis shows that the 36A site would be the better choice.

## Citizen Concerns

Several of the concerns heard from citizens since the August 1, 2008 report have challenged SMFRA staff to provide further proof of the benefit in moving to the 36A site and led to some of the additional analyses discussed earlier. Additional feedback was also received that concerned the impact of having a fire station close to the citizens' homes, as well as the financial impact to Castle Pines North in losing the 36A site to potential tax income. Each of the main concerns is discussed briefly in this section.

*Noise/Lights*

Some citizens have expressed a concern for the noise and lights associated with having a fire station near their home. In order to provide citizens the best possible response times, fire departments across the metro area often need to locate fire stations within or near residential areas. In fact, the current station 36 is adjacent to homes as are other SMFRA fire stations in Castle Pines Village, Cherry Hills Village, Greenwood Village, The Pinery, and others. All of these fire stations have enjoyed a long, positive relationship with their neighbors. The fact that we design our fire stations to fit in with the surrounding architecture and use low-level site lighting also helps us to go unnoticed.

Station 36 only responds to about 700 calls per year. That's less than 2 calls per day and about 80% of those calls occur between the hours of 7 am and 9 pm. Late at night, we use sirens with discretion to avoid unnecessary noise while residents are sleeping.

*Traffic Problems*

Some citizens have expressed a concern that the addition of a fire station at the 36A site will increase traffic and cause more traffic problems. Our only desired outcome in locating a fire station at the 36A site is to help increase safety, not make things worse. We recognize that driving "code 3" with lights and sirens adds risk to our response to an emergency, so we take several precautions to keep our firefighters and citizens safe. Before we exit the station, strategically located traffic signals will stop all opposing traffic and clear the intersection to carefully control traffic and reduce our delays. Once we exit the station, our policies require our drivers to stop at red lights before proceeding through intersections to ensure all traffic has stopped and is aware of our presence. Also, if we confirm that a call is not an emergency, we may continue to the scene without lights and sirens to avoid distractions to other drivers. We believe these responsible policies have helped us to keep our emergency vehicle collisions down to less than 0.03% of our call volume.

We are very aware of surrounding pedestrians as we drive too. The current station 36 has a school adjacent to it, as do others such as our Cherry Hills Village station. We see our proximity to a school as a great opportunity to respond quickly to any emergencies at the school and for students and teachers to visit our facilities.

There has also been a concern that the fire station site will create more traffic in the normal course of business. However, original conceptual site plans for the "CC-20" development showed a 2-tenant retail building and a bank on the 36A site where our fire station has been proposed. It is anticipated that the traffic associated with the retail uses would be much greater than the limited uses of our fire station.

*Property Values*

Some citizens have expressed a concern that having a fire station near their home will decrease their property value. In response to this concern, we asked for input from a group of residential appraisers that determine the value of homes on a daily basis. That group did not know of any evidence that the value of an existing home would decrease based on proximity to a fire station. Typically, this feature of a home becomes a preference of the potential homebuyer. If the potential homebuyer does not want to live near a fire station, then they will not buy the home (as opposed to asking for a decreased price). This homebuyer behavior is similar to when a home is near a school, hospital, police station, or commercial area.

There is an example of a fire station affecting new home construction within the former Parker Fire District at the Estancia development on Arapahoe Rd. This was a unique circumstance where the fire district was condemning the land in order to build a fire station. Based on those proceedings, it was determined that the fire district had to pay damages to the developer based on the potential impact that the fire station might have on surrounding lots. To our knowledge, so far none of the lots have actually been impacted.

*City Tax Revenue*

SMFRA recognizes that the commercial development at the corner of Castle Pines Pkwy. and Monarch Blvd. is a source of tax revenue to Castle Pines North and that relocating station 36 to the 36A site may decrease that revenue potential. A possible method of addressing this issue is to annex the current station 36 into the city limits so that future development of that site may bring in tax revenues. Staff has only started preliminary discussions with the city on this topic.

*Appropriate Use*

Some citizens feel that a fire station will not fit in with the desired “town center” feel of the overall commercial development. In response to this concern, SMFRA staff has prepared preliminary architectural drawings showing how the fire station will match the architecture of the remainder of the development. Plans for the fire station also include a community room where citizens can gather. The firefighters also host station tours and demonstrations for schools and other groups to help SMFRA be an integral part of every community that it protects.

## Conclusion

SMFRA staff has thoroughly analyzed the feasibility and impact of moving station 36 to the 36A site. In staff’s opinion, such a move would have a great benefit to the community by improving our response to their fire, medical and other emergency needs. This improvement is not only measured in averages, 90$^{th}$ percentiles, or the overall gains in reaching desired standards, but also in the careful placement of resources to

best serve the most critical areas now and in the future. Staff believes that all technical aspects of the move have been addressed as well as the critical concerns expressed by the community. Therefore, staff recommends that SMFRA move forward with the 36A land acquisition and begin designing and preparing for the construction of the fire station.