Introduction

The City of Elk Grove

Elk Grove was established in 1850 as a hotel and stage stop, about 15 miles south of historic Sutter’s Fort. The area became a crossroads for business, entertainment, mail service and agricultural ventures as well as supplying many of the needs of the early miners in the gold fields of nearby Sheldon, Sloughhouse and Coloma. In spite of its close proximity to the City of Sacramento and it being in the same county, Elk Grove maintained a distinct personality and remained quietly independent of Sacramento’s growth and development until the 1980’s.¹

Today, Elk Grove is one of the fastest growing communities in Sacramento County. Elk Grove like many cities around California has grown with the promise of affordable housing, good schools and a quieter, suburban lifestyle. As an indicator of Elk Grove’s residential and suburban nature, the City now boasts one of the largest school districts in the State. The City incorporated in 2000 to have more local control over issues that affected their community. Consequently the Elk Grove community is politically active and is engaged in the issues that affect its quality of life.

There are three rail lines that traverse Elk Grove, one west of Highway 99, and two east of Highway 99 (see figures 1 and 2). All three rail lines are on a north/south orientation and are owned by Union Pacific Railroad (UPRR). The inactive Central California Traction Line (CCT) is approximately five miles to the east of Hwy 99. Passenger and freight service is not expected to be restored to this line. The City and other parties have interest in the use of the line as a multi-purpose trail. The Sacramento line, west of Highway 99, previously owned by Western Pacific Railroad (SP), has 10 trains a day crossing the three public at-grade crossings. The Fresno line just to the east of Hwy 99, previously owned by Southern Pacific Railroad (SP) has 16 trains a day crossing its six at-grade crossings. The 26 trains a day crossing the nine public grade crossings have become a concern for the residents of Elk Grove.

Many existing residents are affected by the train whistle and horn noise. Prior to the boom in development there was vacant land surrounding to the railroad tracks on the west side of SR 99, thus reducing the train whistle impact to residents. As new development encroached on the active railroads, new residents that were unaware of the hour of operations of the railroad began calling the City to mitigate the train whistle.

¹ [http://www.elkgrovecity.org/community/about-elk-grove.htm](http://www.elkgrovecity.org/community/about-elk-grove.htm); Website accessed 2005
Concurrently, in early 2004 various articles were published in local and national newspaper informing the public of the FRA allowing bans on train whistles. Now not only new residents, that were unaware of the train whistle impact when they purchased their house, as well as long standing residents began calling the City requesting a ban on the use of train whistles. Due to the high public interest in the whistle ban and the City of Elk Grove’s customer service approach, the City embarked on our train whistle ban study. After tracking the progress of the “Rule” the City of Elk Grove hired PB to develop an implementation plan for eliminating horn noise at grade crossings through the implementation of Quiet Zones and other solutions such as grade separations.

The Advent of Quiet Zones

After several years of investigation by the Federal Railroad Administration on December 18, 2003 the Federal Railroad Administration (“FRA”) published its Interim Final Rule on the Use of Locomotive Horns at Highway-Rail Grade Crossings. After a lengthy comment period, on April 27, 2005 FRA issued the Final Rule on Use of Locomotive Horns at Highway-Rail Grade Crossings, 70 Fed. Reg. 21844 (2005) (“Final Rule”) with an effective date of June 24, 2005. It requires locomotive horn use at all public highway-rail grade crossings in the nation except in certain qualifying areas known as “Quiet Zones.” The Quiet Zone exception is designed to enable state and local authorities like the City of Elk Grove to prohibit or otherwise restrict the use of locomotive horns in residential neighborhoods and other designated areas that have applicable grade crossing safety mechanisms in place. The establishment or maintenance of Quiet Zones will ensure that railroad noise mitigation measures are implemented in a manner that is consistent with federal railroad safety requirements. The City of Elk Grove was well positioned to pursue Quiet Zones given the resident’s interest in the reduction of train whistle and horn noise.

The Process of Establishing Quiet Zones

Inventory of Existing Grade Crossings in Elk Grove

The first step of the process was to inventory all public and private grade crossings in the City of Elk Grove. The nine public grade crossings in Elk Grove are controlled by the Union Pacific (UP). The six crossings on the Fresno line experience over 16 trains a day. These are made up of 12 Union Pacific and four Amtrak trains. The crossings on the Fresno line are, (from north to south): Calvine Road, Sheldon Road, Florin-Elk Grove Road, Bond Road, Elk Grove Boulevard and Grant Line Avenue. On the Sacramento line, there are approximately 10 Union Pacific Railroad trains a day. The three crossings on that line are at Dwight Road, Franklin Boulevard and Bilby Road.

2 Under the Rule, a locomotive engineer retains the discretion to sound the locomotive horn within a Quiet Zone in the event of certain specified hazards.
PB met with the City’s engineering and planning staff to discuss the schedule for planned future development of the at-grade crossings. Following the FRA guidelines for the implementation of Quiet Zones the PB team collected the following data from the City of Elk Grove:

1. Current roadway traffic volumes and percent of trucks,
2. Posted speed limits on all street approaches,
3. Maximum allowable train speeds, both passenger and freight,
4. Accident history for each crossing under consideration,
5. School bus or transit bus use at the crossing(s); and
6. Presence of U.S. DOT grade crossing inventory numbers clearly posed at each of the crossings in question.

Based on this information PB analyzed each at-grade crossing’s current condition.

Analysis of Current Opportunities and Constraints with Establishing Quiet Zones in Elk Grove

Based on the information gathered through the inventory stage, each grade crossing was analyzed for its applicability as a potential Quiet Zone. PB identified the characteristics of each grade crossing that would make it ineligible for Quiet Zone status (e.g. several recent accidents, no crossing arms, heavy traffic, etc.). PB compared the current characteristics of each of the at-grade crossings to the planned, if any, changes at each of the grade crossings. Some of the current at-grade crossings were going to be improved as a result of road widening; two examples are Bond and Sheldon Roads.

Identification of Supplemental and Alternative Safety Measures & Recommendations

Based on the results of the opportunity and constraints analysis, PB identified both Supplemental Safety Measures (SSMs) and Alternative Safety Measures (ASMs) that would qualify the grade crossings as a Quiet Zone. Specifically the grade crossings were analyzed to determine what improvements would be needed to achieve the “Significant Risk Threshold” that meets the requirements by the FRA for a Quiet Zone.

Cost effectiveness is one of the keys from the City’s perspective in implementing Quiet Zones. Solutions range in sophistication and cost. There are three basic solutions:

- Gates and flashers (least expensive)
- Channelized barriers and medians
- Quad gates (most expensive)

For example at one crossing, the Elk Grove – Florin Road grade crossing, a typical solution would be to add two more gates providing a quad gate system. However, because of the existence of the concrete median on the south side of the grade crossing at Florin, only three gates could be required (an additional gate just south of Campbell
Road). The possible reduction of one gate would translate into lower initial capital costs and lower operating costs over the long run. This is just one example of how PB is working within The Rule to develop creative and cost effective solutions.

Stakeholder Involvement: Getting Everyone to the Table

Both the City and PB realized that stakeholder involvement was going to be a critical element of the success of the establishment of Quiet Zones in the City of Elk Grove. Although the Rule only requires a 60 day “notification” of the operating railroads and the affected parties such as the counties, state departments of transportation, the California Public Utilities Commission and operating railroads, the City of Elk Grove and PB acknowledged that a more informal communication process would be appreciated by the stakeholders. Both The City and PB knew from working with these stakeholders on other projects that everyone preferred to be “in the know” on any project that might affect them, as opposed to being officially notified without any prior knowledge. The stakeholders involved in this study included: Sacramento County, California Department of Transportation (Caltrans), the California PUC, the Union Pacific Railroad, Amtrak and the Federal Railroad Administration. The City sent out letters to the stakeholders to inform them about the implementation plan process and to ask for their participation in the endeavor. Additionally the letter informed the stakeholders that they would be sent a copy of the first working paper regarding the implementation of Quiet Zones in Elk Grove. This working paper would be used to discuss possible short and long term strategies for establishing Quiet Zones in the City of Elk Grove. The City scheduled a meeting to discuss the plan and for all parties to understand how Quiet Zones will be implemented over the next few years in Elk Grove.

Public Outreach: It is as much about quality of life as it is about railroading

As was mentioned earlier, several communities along both the Sacramento line (Laguna West) and the Fresno line (between Sheldon Road and Elk Grove) expressed the greatest concern to the City about the train whistle and horn noise. For that reason, the City has planned several public outreach meetings. These meetings are aimed to include residents, the business community, and elected officials to inform them about the Quiet Zone program. As PB and the City of Elk Grove move forward with the public involvement process, the key messages will be:

- While a reduction of train whistle noise will provide quieter neighborhoods, the communities will need to adjust their behavior to be more aware of the fact that trains will not necessarily be blowing their horns at all the grade crossings in the City.
- Under The Rule locomotive engineers will still be allowed to use horns at their discretion if they feel that there is a possible safety risk.
- Operation Lifesaver offers public education campaigns to help communities understand the safety issues involved with at-grade crossings.

PB proposed four public meetings; two in the Franklin/Laguna West area and two between Sheldon Road and Elk Grove Boulevard. These meetings would be held for two
purposes 1) to inform the public about the proposed quite zones and 2) to listen to what
the resident’s concerns are about the grade crossings. As it is currently planned the
meetings will occur twice during the implementation plan process: shortly after the
stakeholders have reviewed Working Paper 1 and at the end of the process when the
Implementation Plan is complete. Briefings will also be made to the City Council to
make them aware of the progress with the Implementation plan.

A Short and Long Term Quiet Zone Implementation Plan

Based on the fact that a Quiet Zone only has to be one half mile in length, the City is
pursuing a “Small Zone” approach to implementing Quiet Zones. This strategy allows
for a gradual implementation of Quiet Zones based on:

- The individual grade crossing readiness (presence of Supplementary Safety
  Measures - SSMs and Alternative Safety Measures ASMs)
- The improvement plans for the at-grade crossings in the City.
- The grouping of the at-grade crossings based on the state of readiness and the
  Quiet Zone Risk Index scores of the groupings. This grouping is largely based
  on the calculations provided through the FRA Quiet Zone Calculator.

The FRA Quiet Zone calculator (www.fra.dot.gov) uses three indexes to measure a grade
crossing’s relative safety. The three indexes are:

- "Quiet Zone Risk Index (QZRI): represents the average severity weighted
collision risk for all public highway-rail grade crossings that are part of a quiet
zone. It includes added risk caused by the lack of a train horn and risk reductions
caused by the implementations of SSMs.
- Risk Index with Horn (RIWH): represents the level of risk that would exist if train
horns were sounded at every public crossing in the proposed quiet zone.
- Nationwide Significant Risk Threshold (NSRT): represents the average severity
weighted collision risk for all public highway-rail grade crossings equipped with
lights and gates nationwide where train horns are routinely sounded. FRA
developed the NSRT to serve as a threshold of permissible risk for quiet zones to
meet.”

Although the Quiet Zone notices are reviewed by FRA staff, the findings are derived
from the equations in the Quiet Zone calculator and are largely the foundation for the
implementation of Quiet Zones.

In order to implement a Quiet Zone the QZRI needs to be at or below the NSRT or
RIWH. If the QZRI is below the NSRT (without SSMs) the City can notify the railroad,
install signage, and institute the quiet zone. The City is required to check the FRA QZRI
annually as the NSRT changes annually. If the QZRI is below the RIWH, then the City
does not have to check the FRA’s NSRT annually. It is also important to note that

3 (http://safetydata.fra.dot.gov/quiet/quietzonehelp.htm#5); Website accessed: 2005
depending on location, it can sometimes be easier to be under the RIWH than the NSRT, because the RIWH may be higher than the NSRT.

**Quiet Zone Case Study**

If the City wanted to establish a Quiet Zone that covers three active grade crossings, two with SSMs and one without, there could be at least two possible scenarios:

**Scenario 1:** The QZRI for those three grade crossings is above the NSRT.
**Solution:** Installation of SSMs at the crossing without them. A Quiet Zone can be established if all the crossings within the proposed Quiet Zone are improved with SSMs.
**Ongoing Requirements:** An at-grade crossing protection inventory update to the FRA every 4.5 to 5 years. An annual review of the NSRT is required to ensure that it still qualifies as a Quiet Zone.

**Scenario 2:** Two of the three crossings have SSMs but the third does not, but the QZRI is below the RIWH or NSRT.
**Solution:** As long as the total QZRI is at or below the RIWH or NSRT for those crossings then the Quiet Zone can be implemented with out further improvements.
**Ongoing Requirements:** Inventory update to the FRA every 4.5 to 5 years. If QZRI is under the RIWH, then there are no additional reporting requirements. If the QZRI is under the NSRT, then the City has to annually review the NSRT to ensure that the Quiet Zone still qualifies.

Based on these types of calculations, factoring in safety needs, PB will develop the most economical combinations to establish the Quiet Zones. This plan will also consider operators on the railroad to ensure that the Quiet Zone pattern does not potentially confuse locomotive engineers operating on these corridors.

Overall this implementation plan will require considerable coordination with City staff, the Union Pacific Railroad and Amtrak to ensure that all future improvements to the potentially affected roadways are accounted for in the long term schedule of the Quiet Zone implementation. PB is working closely with the City in determining what the Quiet Zone or Zones should be. In some cases, some at-grade crossings will not be considered for a Quiet Zone. For example some current at-grade crossings are planned to be grade separated in the near future. These grade crossings will not be included in the Quiet Zone implementation plan.

**Lessons Learned in Elk Grove**

Although the implementation plan has only just gotten under way, there are early lessons learned from the process.

*Early Involvement of Stakeholders is Key*
The general feedback that the City received from the Stakeholders was that they appreciated the early involvement in the process regardless of their eventual role in the implementation of Quiet Zones.

*Flexibility in arranging Quiet Zones*

Flexibility and creativity in Quiet Zone application is necessary. The phased approach with smaller Quiet Zones will provide a cost effective means for the City to implement whistle bans on a manageable scale while not causing the project to fail from insurmountable capital cost.

*Public Involvement is Key for Support for Quiet Zones*

The public involvement process will prove to be helpful because it:
- Allows the City to inform the public about the Quiet Zone implementation process;
- Serves as an opportunity to educate the public about at-grade crossing safety;
- Helps to build support for possible future Quiet Zone funding initiatives.
Figure 2 Elk Grove At-Grade Crossings (Sacramento Subdivision)