

To: Merced City Council

March 13, 2017

From: Michael Belluomini *Michael Belluomini*

Ref: Railroad Quiet Zones at Existing and New Road Crossings

### BACKGROUND

The impact of railroad noise on Central Merced has been an issue for many years. The City General Plan for 2030 indicates that the 26 daily trains passing through Merced on the Burlington Northern Santa Fe (BNSF) Railroad generate an average of 100 decibels of sound at 110 feet from the track. In response to an increase in train collisions, the federal government enacted regulations in 2005 that require the use of train horns at at-grade crossings as follows: 1) the horn must sound at 96 to 110 decibels; 2) must sound between 15 and 20 seconds before reaching a crossing; 3) if the train is exceeding 60 mph, it must be within a quarter mile before sounding the horn. The BNSF rail line runs along 24th Street through residential neighborhoods for approximately four miles. There are at-grade railroad crossings at 1) North Highway 59; 2) Bear Creek; 3) "U" Street; 4) "R" Street; 5) "M" Street; 6) Canal Street; 7) "K" Street and 8) Glen Avenue. At "G" Street and Yosemite Parkway the street and rail line are not at-grade, but separated, so no sounding of the train horn is required. In 2007, 11 of the 26 daily train trips occurred between 10:00 p.m. and 7:30 a.m. The number of train trips has increased to 40 per day in 2017. The Downtown Neighborhood Association (DNA) raised train noise in Central Merced as a quality of life issue in 2016. Reducing train noise would improve the living environment of Central Merced. Establishing Quiet Zone Crossings is conditioned on increasing crossing safety.

### RAILROAD QUIET ZONES

The Federal Railroad Administration (FRA) allows an exemption from the regulations requiring trains to sound their horns at at-grade road crossings designated "quiet zone" crossings. Though the city is the driver of quiet zone establishment, crossing qualifications must be reviewed and approved by the railroad, the Public Utility Commission (PUC) and the FRA. Sometimes a quiet zone crossing can include: 1) a concrete median island over six inches high on both sides of the track extending a minimum of 100 feet from the crossing gate down the roadway (Exhibit 1); 2) four rather than two automated crossing gates with flashing light resulting in full closure of the crossing to cars (Exhibit 2); and 3) permanent closure of intersecting roadways within 60 feet of crossing gate and 4) creation of a quiet zone of minimum of half a mile in length.

### THE PROCESS

The establishment of quiet zone crossings must be at the request of the city, or if a county road, the county. The city is responsible for funding the quiet zone crossing improvements if any are required which cost between \$200,000-\$600,000 at each crossing.

The city works with the BNSF railroad and applies to the FRA and PUC for approval of quiet zone status for those railroad crossings it chooses. The city issues a Notice of Intent (NOI) to create a quiet zone. The NOI intent to BNSF, FRA, Cal Trans (for North 59 crossing only) and the PUC. A 60 day comment period begins. Representative of the BNSF, FRA, PUC, Cal Trans and the city meet at each proposed quiet zone crossing to discuss existing conditions and possible changes. The affected agencies agree on what changes, if any, need to be made to make the crossing a quiet zone.

The city uses the FRA's Quiet Zone Calculator online to determine whether the Quiet Zone Risk Index of the proposed quiet zone is less than the Nationwide Significant Risk Threshold. If it is less, then the city can designate the crossing a quiet zone and apply for PUC approval. After approval quiet zone signs are installed at each crossing and the affected agencies are notified. No significant physical changes to the crossing are required.

If the Quiet Zone Calculator shows the proposed crossing exceeds the Significant Risk Threshold, the city must pay for installation of Supplementary Safety Measures (SSM's) such as median islands, crossing gates or wayside horns. Such SSM's are installed by the railroad or the city as appropriate. If the crossings are equipped with one or more SSM's the Quiet Zone can be established through city designation of the crossings installation of required signage per crossing, notification of the affected agencies and application for PUC approval. The City of Richmond, California has 14 quiet zone crossings, none of them have four crossing gates. This design, application and review process is specialized such that the city may want to contract with a consultant engineer experienced in establishing quiet zones to assist it.

### WHICH CROSSINGS

Of the eight crossings of the BNSF railroad, "U" Street and "Glen Avenue" are the only ones that may not qualify as a quiet zone. This is because Santa Fe Avenue runs parallel and near the railroad tracks at the intersection making a raised median 100 feet long problematic for traffic flow and control. In such situations a permitted alternative is a "wayside horn" which are horns located at the crossing which sound when the train passes. Though loud, the noise is limited to 80 decibels within 400 feet of the crossing, compared to up to a quarter mile from the crossing experiencing a moving train horn blowing (Exhibits 3 & 4).

The city circulation pattern for north-south streets is to locate a major street every half a mile. These streets are North Highway 59, "R" Street, "M" Street, "G" Street, Glen Avenue and Parsons Avenue (planned.) If all eight existing crossing were changed to quiet zone crossings at \$400,000 each, 3.2 million is needed.

An alternative is to completely close street crossings of the railroad to avoid the cost of making quiet zone improvements. Streets which might be considered for closing are those that

duplicate the road access of other streets. "K" Street and Canal Street cross the railroad within two blocks of "M" Street crossing and are redundant of "M" Street in some ways. If "K" Street and Canal Street railroad crossings were closed at a cost of \$100,000, then the quiet zone crossings for six crossings plus two crossing closures is \$2.5 million, a reduction of \$700,000.

#### PARSONS AVENUE RAILROAD CROSSING

The City General Plan for 2030 Transportation and Circulation Element (page 4-38) states "The City has shown one additional rail crossing (Parsons Avenue/Santa Fe Railroad) on plans for many years. The PUC must approve any new railroad crossings for the city. Such approvals are rarely granted by the PUC, especially at-grade crossings and the crossings remain only on plans. As Merced continues to grow, the constraints imposed by a restricted number of railroad crossings will also increase." The reaction of the PUC to an additional railroad crossing at Parsons Avenue and BNSF Railroad is not known. The BNSF staff has indicated that it will consider supporting a new crossing at Parsons Avenue if two existing at-grade railroad crossings were eliminated. For the railroad, the goal is to increase safety and reduce liability. Fewer railroad crossings are safer than more crossings. A request by the city, with the support of BNSF, may be considered by the PUC for approval.

#### FUNDING QUIET ZONE IMPROVEMENTS

Quiet zones are for nearby residents an issue of noise reduction. For the railroad, the PUC and the general public quiet zones are an issue of increasing public safety and reducing hazards. Funding opportunities may exist in federal or state programs based on increasing safety or reducing noise. The cost of creating Merced's quiet zones will not be known until after the NOI, the meeting of the affected agencies at each crossing and the running of the FRA Quiet Zone Calculation for each crossing. The cost range is \$1.4 million to \$4.8 million for 7 to 8 crossings.

The areas benefitting significantly from noise reduction resulting from quiet zones is a function of distance from the noise source. For illustrative purposes if the area of significant benefit was set at half a mile, the benefit area is shown on Exhibit "5". In that area there are approximately 5,000 lots, If the cost of establishing quiet zones is \$3,000,000 then the cost per lot is \$600 or spread over five years \$10 per month approximately.

#### PROPOSAL

Based on the information above I recommend the council direct the city manager and city attorney to initiate a Notice of Intent to create quiet zone crossing designations for the eight existing BNSF railroad crossings with the FRA and BNSF Railroad, then report to council the required changes to these crossings and estimated costs to establish them as quiet zone crossings.

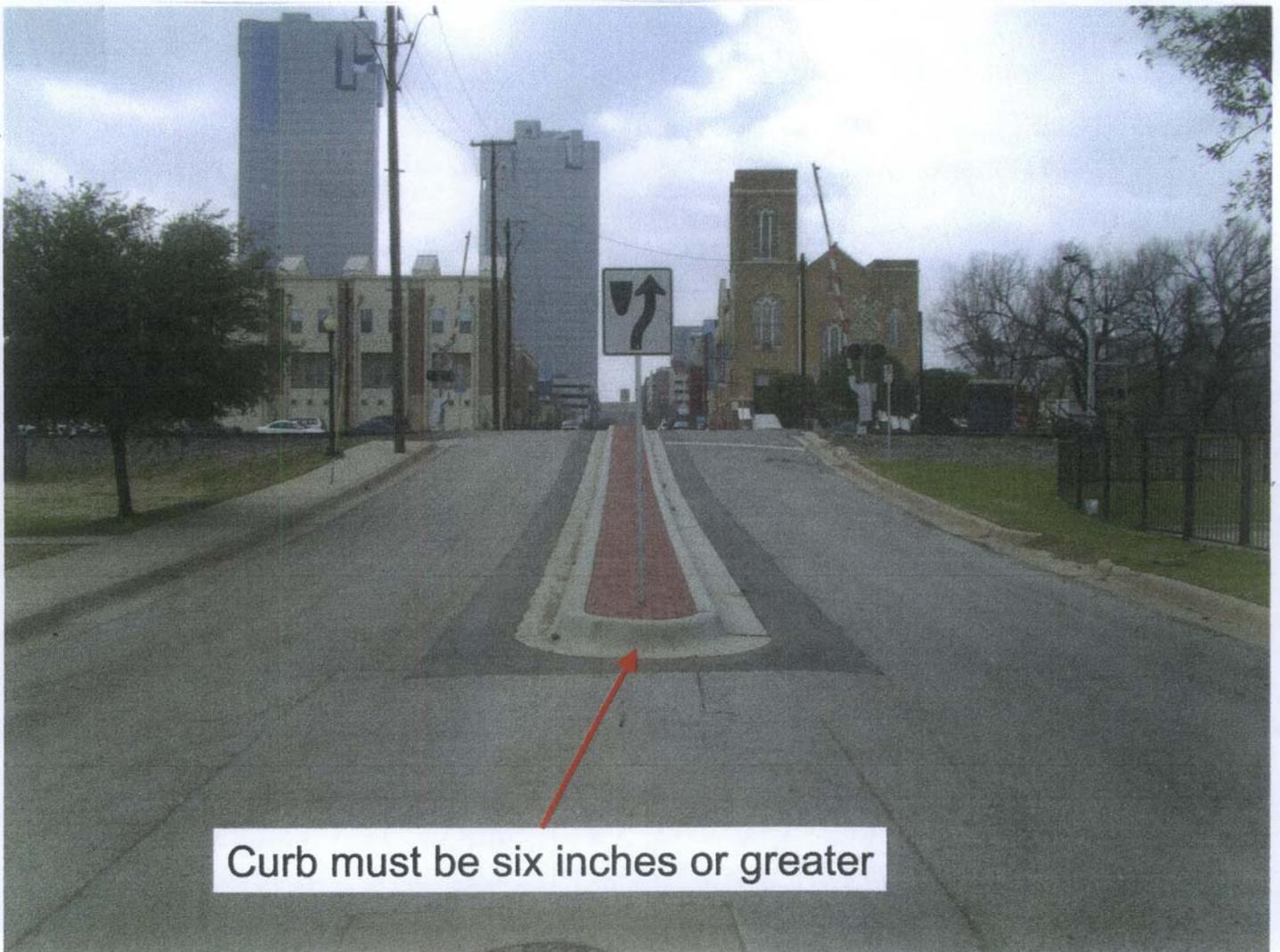
# Gates with Medians or Channelization Devices



Channelization Device



Non-traversable Curb



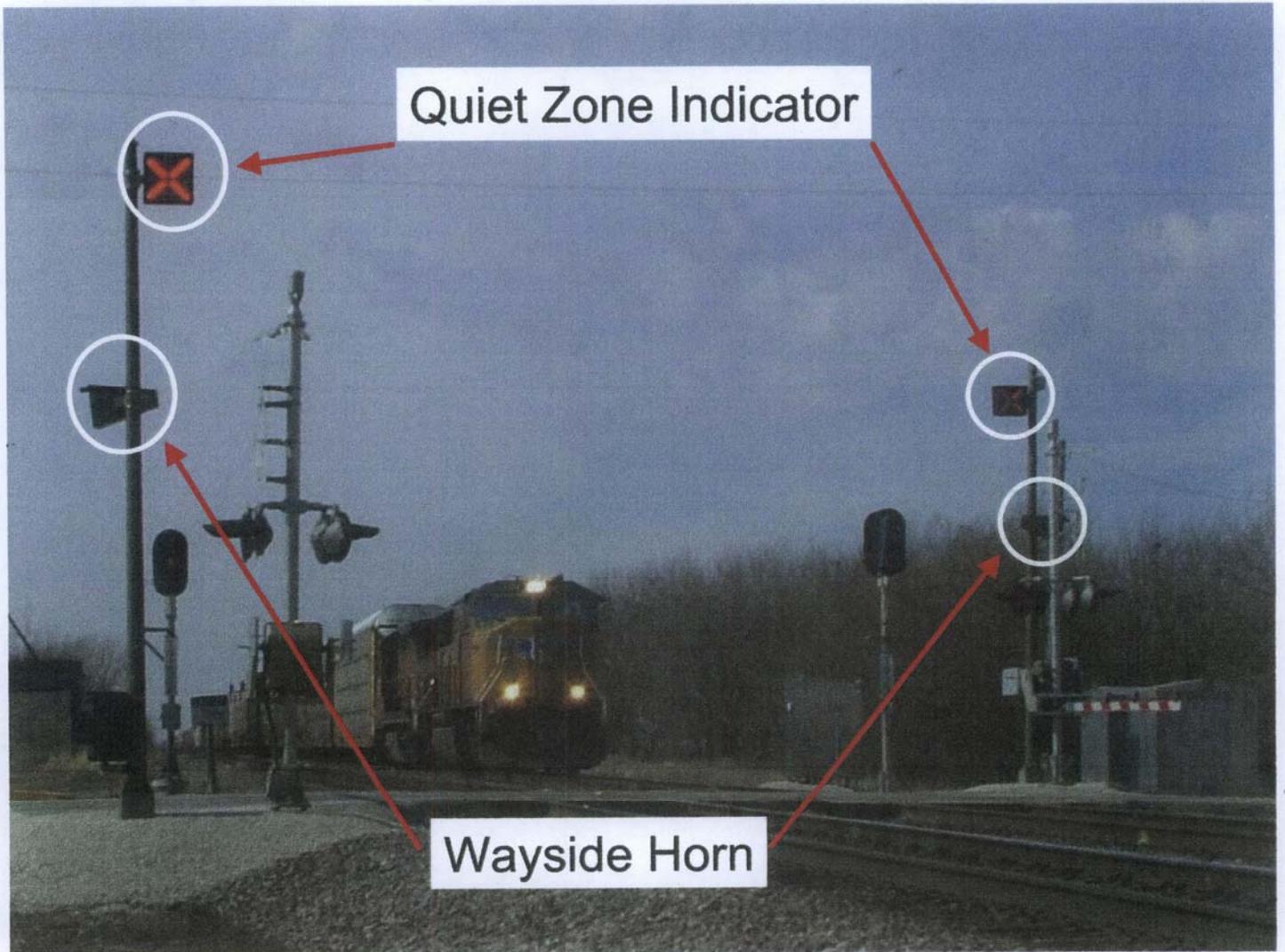
Curb must be six inches or greater

# Four-Quadrant Gates



## Four-Quadrant Gates





Quiet Zone Indicator

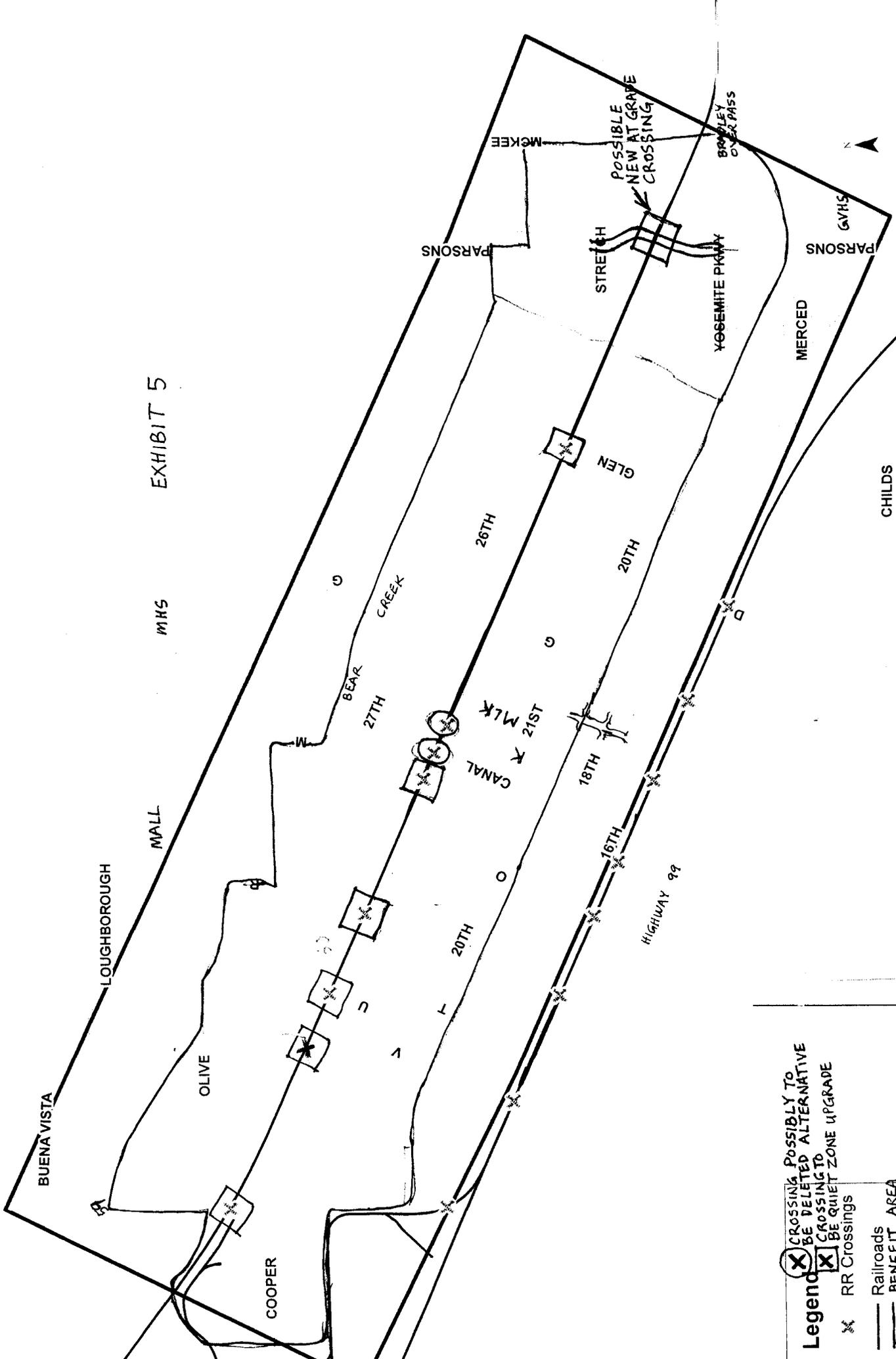
Wayside Horn



Red area is the 92dB sound contour  
Blue area is the 80dB sound contour



EXHIBIT 5



**Legend**

-  CROSSING POSSIBLY TO BE DELETED ALTERNATIVE
-  CROSSING TO BE QUIET ZONE UPGRADE
-  RR Crossings
-  Railroads
-  BENEFIT AREA