

# CITY OF SHAWNEE TRAIN HORN REPORT

December 30, 2014



## INTRODUCTION

The volume and frequency of train horns has become a quality of life concern for an increasing number of Shawnee residents. In northern Shawnee, citizens from the Crimson Ridge, and Riverview subdivisions have inquired about reducing train horns on the Burlington Northern Santa Fe (BNSF) Topeka Subdivision line. Horns adjacent to Woodland/Martindale Road, from the BNSF Emporia Subdivision line, generate inquiries from subdivisions such as Lakepointe, Ridgestone Meadows, Brittany Ridge, and Little Fall Estates. Residents from other neighborhoods have also questioned what could be done with train horns. The City is aware of the concern and this report is an effort to provide information on the complex challenge of train horns in our community.

## BACKGROUND

A number of factors are involved when reviewing train horn concerns:

- Quality of Life: neighborhoods hear a lot of horns
- Public or Private Crossings: different authorities, responsibilities and regulations
- Legal Issues: property owner rights, Federal Railroad Administration (FRA) regulations, state statutes and city ordinances
- Program Prioritization: multiple crossing locations, limited funding, competing priorities

### Quality of Life

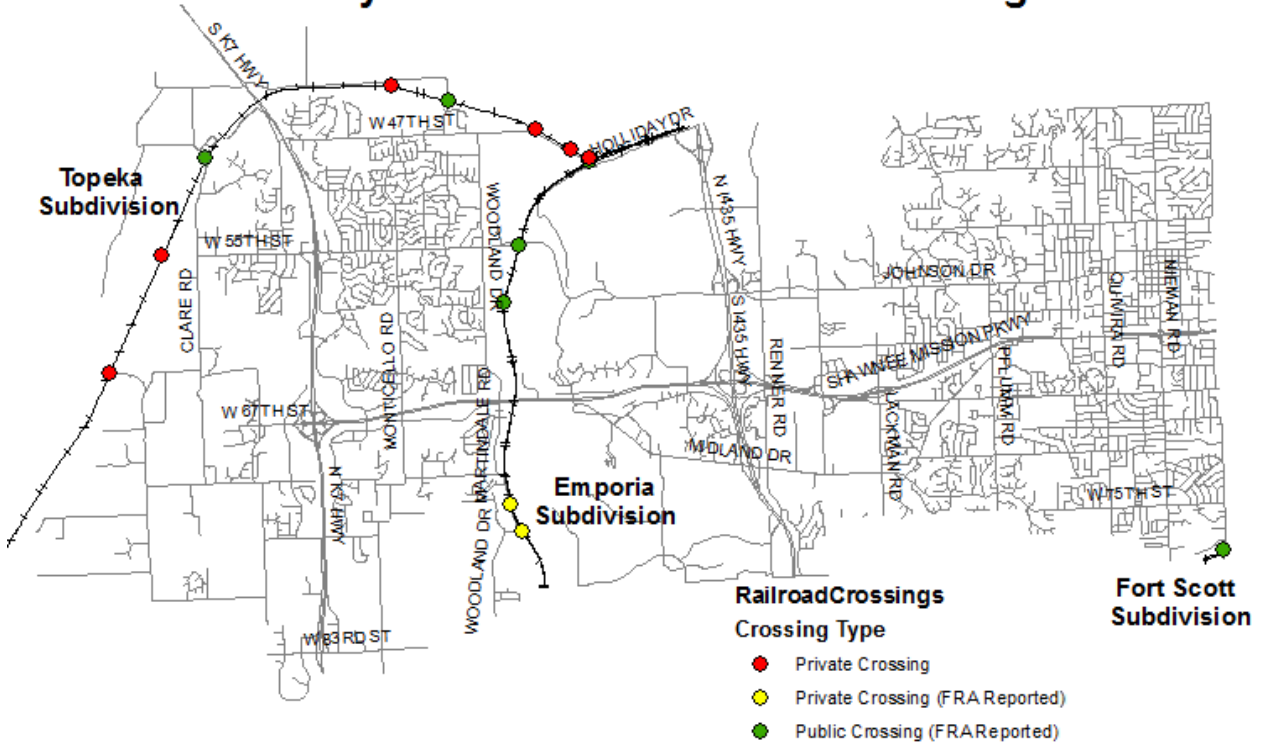
Train horns may be heard from three BNSF rail lines in Shawnee.

| BNSF Rail Line         | Average Trains/Day | General Location  |
|------------------------|--------------------|---|
| Topeka Subdivision     | 7 trains/day       | Northern and western border from I-435 to Mize  |
| Emporia Subdivision    | 89 trains/day      | Central Shawnee running north and south just east of Woodland Road                        |
| Fort Scott Subdivision | 30 trains/day      | Diagonal crossing of southeast corner of Shawnee near 79 <sup>th</sup> Street and Switzer |

Source: FRA

Eighty trains a day equally staggered throughout a 24-hour period result in train horns every 18 minutes along the Emporia Subdivision line.

## City of Shawnee - Railroad Crossings



**Figure 1**

Figure 1 includes a map of BNSF rail lines, crossing locations and crossing types.

The FRA passed a ruling in April of 2005 that requires horns to be sounded at every public crossing. The ruling overrides State law and railroad standard operational procedures. In addition to the FRA ruling, railroad companies may establish their own horn policy and procedures for private crossings.

The FRA ruling also enabled communities to apply for and establish railroad quiet zones, provided that Supplemental Safety Measures (SSM) are installed to offset the increased safety risk resulting from the removal of train horns. A quiet zone is a section or rail line, at least one-half mile in length, which contains one or more consecutive public crossings at which locomotive horns are not routinely sounded.

### Public or Private Crossings

According to the FRA, train horns are the single most effective safety device for an at-grade railroad crossing.

Figure 1 provides information on the public or private status for fourteen known crossings in the City. The eight green and yellow dots represent the crossings recorded by the FRA. Please note that one green dot is hidden by a red dot close to Holliday Drive where the Topeka and Emporia lines intersect.

- **Public crossings**

Green dots represent the six public railroad crossings. They are recorded by the FRA, and the Kansas Department of Transportation (KDOT). Public crossing maintenance is the responsibility of the railroad company who owns the railroad tracks. The City of Shawnee does not maintain any

public railroad crossings.

FRA quiet zones may be established for zones that include a public crossing. In order for the crossing to qualify for quiet zone status, new SSM's installed at the crossing need to provide as much or more safety benefit than what was removed by silencing the horns. Safety measures typically consist of gates and medians, flashing lights and alarms, fail safe monitoring and battery back-up power systems.

- Private crossings

The yellow dots represent two private railroad crossings that likely have agreements between private owners and BNSF and are recorded with the FRA. The red dots represent six private railroad crossings that likely have agreements between private owners and BNSF that have not been recorded by the FRA. Train horns are sounded at these locations per BNSF policy and procedure. Private crossing maintenance for existing crossings is typically the responsibility of the railroad company whose lines they provide access across. The City of Shawnee does not maintain any private railroad crossings.

FRA quiet zones can include a private crossing; however, BNSF policy requires the private crossing owner to enter an agreement with BNSF to indemnify them of liability. The private owner may not be required to install SSM's to reduce their own liability, but would be responsible for the installation cost and annual maintenance of the devices once installed.

The City is not a party in private crossing agreements, and has no authority to make a change to private agreements between property owners and BNSF. This fact makes it challenging for the City to make headway on requests to mitigate horns at private crossings.

#### Legal Issues

Regardless of public or private crossing status, all property owners have a right of access to the public Street network that cannot be taken away. Several of the railroad crossings in Shawnee serve only one or two properties and provide the only public Street network access.

The FRA, BNSF, KDOT or the City cannot remove the only access to an existing property. In situations where a railroad crossing provides the only access, closing the crossing requires permanent alternative access be provided to the public street network from another location.

#### Program Prioritization

With fourteen railroad crossings in Shawnee, a policy should be established by the Governing Body that addresses the City's role in railroad crossing concerns.

Engineering solutions to train horn concerns will require additional study to assess reasonable SSM improvements and the associated construction costs which are not presently a City provided program. Quiet zone regulations, private crossing indemnification of liability, and maintaining property access do not lend themselves to low cost solutions. The prioritization for funding future projects for construction, or potential land purchase when available, would need to be reviewed when the City's six-year Capital Improvement Program (CIP) annual update discussions take place.

### **PAST CITY ACTIVITIES CONCERNING TRAIN HORNS**

#### 2006

The City first looked into the requirements of establishing a quiet zone in 2006 and a presentation on quiet zones, crossings, and alternatives was made to the Public Works and Safety Committee on September 19, 2006.

#### 2007

A Quiet Zone Field Diagnostic Review for the Emporia Subdivision line was completed in April of 2007 with assistance from the FRA and BNSF and Kansas Department of Transportation (KDOT). The report provided alternatives, reviewed at the time, for making the line eligible for quiet zone designation to help with this quality of life issue. However, funding required for surveying, engineering, and the calculation of construction cost estimates was not available and no Quiet Zone program was pursued.

2009

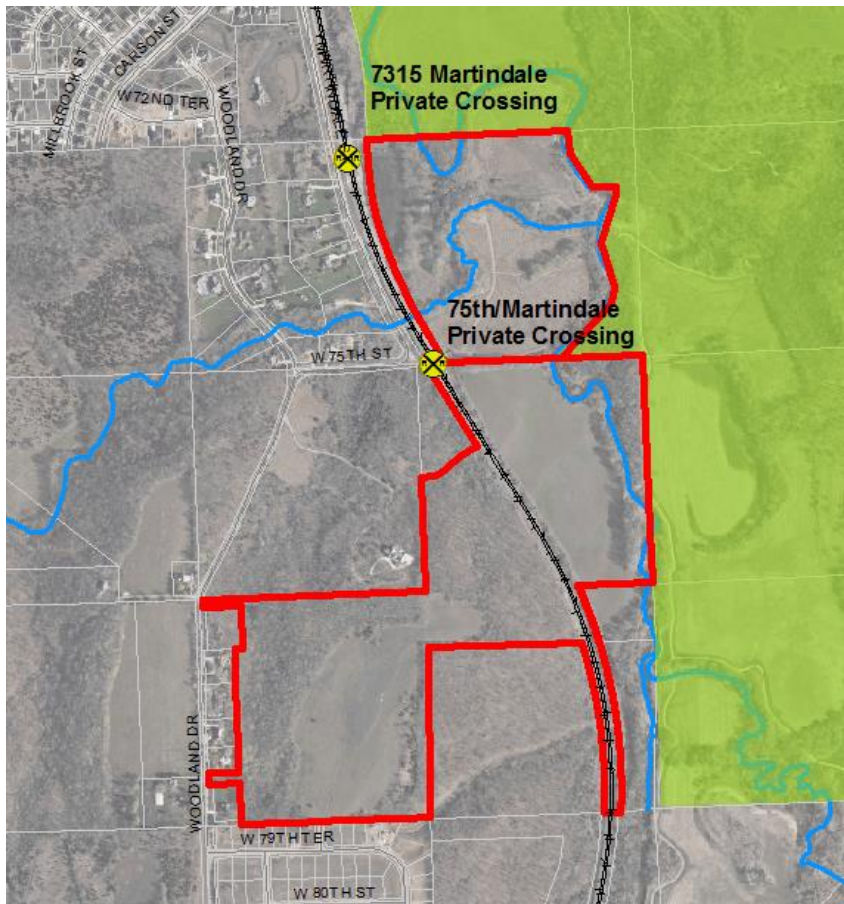
In November 2009, the City met with representatives of BNSF and KDOT to discuss the actions taken by BNSF to remove the crossing material near at public crossing near 71st Street and Martindale. Because of this action, the crossing was not functional, but trains were still activating their train horn for this location.

2014

In the spring of 2014, the public railroad crossing near 71st Street and Martindale was officially closed when BNSF completed the purchase and transfer of ownership of the last property accessed by the crossing. Trains no longer sound their horn at this former crossing location. This action reduced the number of crossings in this area from three to two.

Because train horns are still used at the remaining two crossings in the area of 71<sup>st</sup> Street and Martindale, several property owners in the surrounding subdivisions asked the City in the spring of 2014 if property owners could pay the cost of a project to silence the train horns at one or both of the crossings. The subject crossings are the two private railroad crossings at 7315 Martindale and 75<sup>th</sup> Street east of Martindale. Figure 2 includes a map of these two crossings and the properties they access.

**Figure 2**



Six ideas for reducing/eliminating train horns at these two crossings were identified and reviewed. The six ideas are listed below under following three headings:

- No Train Horns
- Reduce Train Horns
- Alternative Horn System

#### No Train Horns (Silence Train Horns at Both Crossings)

##### 1. Quiet Zone

A quiet zone would silence train horns at both private crossing locations. To install a quiet zone at both the 75th Street and the 7315 Martindale private crossings, BNSF has indicated the following would be required:

- At least one public crossing would need to be part of the quiet zone
- Private crossing users written agreement with BNSF to not sound the train horns at the private crossing
- Private crossing users indemnification of BNSF liability
- Installation of new signals and equipment at each public crossing at an estimated \$275,000-\$300,000 each per BNSF
- The installation of any new signals and equipment will require the relocation of existing equipment that currently convey information to train engineers that is located closest to 7315 Martindale at an estimated cost of \$500,000 per BNSF

The private users of the crossings have indicated that they would not enter into an agreement to indemnify BNSF.

It has been noted by City's legal counsel the City cannot enter into an agreement to pay for the crossing improvements or to indemnify BNSF on behalf of the property owner.

The crossing improvements would be on private property and the City has no authority to expend public funds to pay for improvements on private property. City indemnification would also be a contract obligation to pay future annual premium costs of unknown sums through an insurance company, and the City cannot enter into an agreement to expend future public funds that have not been appropriated or for which the expense is unknown. The Governing Body could not enter into an agreement which obligated unknown amounts of City funds for future years. An agreement would have to be subject to the Kansas Cash Basis laws, with the right to cancel each year if funds are not appropriated for such purpose at the sole discretion of the Governing Body. This would not meet the BNSF requirement for indemnification.

##### 2. Property Purchase of Both Properties

To silence the train horns at both private crossings, the City could purchase both properties and donate this land to Johnson County Parks and Recreation to use as park land. This would eliminate the need for both crossings. The property south of 75th Street is currently on the market. Two-thirds of this tract of ground is located west of BNSF tracks and is not served by the private crossing at 75th Street. However, the property owner at 7315 Martindale has stated he is not interested in selling his property. To condemn this property, the Governing Body would need to establish that silencing the train horns at this location is a public purpose and that achieving this public good is a high priority and would justify relocating the property owner to another location. In regard to the occupied property at 7315 Martindale, the City would incur the additional expenses of Eminent Domain and compliance with the federal uniform relocation assistance and real property acquisition policies act, including fair and reasonable relocation payments and assistance for displaced persons.

##### 3. Automotive Underpass

The City of Shawnee has established a pedestrian/bike easement to allow an underpass access point to the mill creek stream way for a multi-use trail at approximately 75th Street. The easement is only large enough for a narrow bike/pedestrian underpass. The proposed underpass will not be large

enough to accommodate most vehicles at this location and the current easement agreement with BNSF would not allow vehicles to use the underpass.

#### Reduce Train Horns (Silence Train Horns at the 75th St Crossing)

##### 4. Access Drive

To silence the train horns at the 75th Street private crossing, both the property owner to the south of 75th Street and the owner of 7315 Martindale would need a new way to access their property. An easement between both interested property owners could be established and a private access driveway would need to be built from the private crossing access at 7315 Martindale. BNSF would not allow the access drive on their right-of-way. The 7315 Martindale property owner has indicated that he would not allow the access drive on his property. This drive would require the placement of a low water crossing, possible relocation of a fence, and construction of a driveway.

A private engineering firm was hired by BNSF in 2013 to determine the price of installing an access road and any other costs associated. Their project was projected to cost \$450,000.

##### 5. Property Purchase of the Tract South of 75th Street

To silence the train horns at the 75th Street private crossing, the City could purchase the property to the south of 75th Street and donate this land to Johnson County Parks & Recreation to use as park land for Shawnee Mission Park. This would eliminate this property's need for this crossing. As previously stated, the property owner is open to the idea of selling his property. The other property owner that uses this crossing has access to a bridge on his property that the City could rework to make adequate for large farming equipment to use and thereby eliminate his need to the crossing at 75th Street.

A City project with a project budget would be needed to further explore this option. The City would have to conduct an engineering study to identify the costs of renovating the 7315 Martindale property owner's bridge and develop a budget to purchase the property south of 75th Street.

At this time, it is unknown if the Johnson County Parks & Recreation board would agree to the transfer of property to Johnson County Parks & Recreation. A proposal to the Johnson County Parks & Recreation Board would be required once a project is initiated.

#### Alternative Horn System

##### 6. Automated Train Horns (Wayside Horns)

To potentially reduce the noise of the train horns at one or both locations, an automated train horn could be installed. Although a horn is still sounded at these locations, some of the area around the crossing is significantly quieter due to the directional nature of the horns. Each automated train horn is approximately \$100,000. BNSF does not install or maintain automated train horns. The private crossing user would also be required to enter into an agreement to indemnify BNSF for them to stop using the train horns.

It has been noted by City's legal counsel the City could not enter into a maintenance agreement to fund the purchase, installation, and maintenance of these automated train horns on private property without first determining that it was for a valid public purpose. In addition, as noted in item 1, the Governing Body could not enter into an ongoing agreement which obligated City funds beyond those appropriated for the current year.

#### **FINANCIAL INFORMATION**

The City can only use debt service financing for expenditures for public good. Once public good is established by the Governing Body, the debt can be allocated one of two ways: at large or in a special assessment.

The use of City at large debt service would require strict compliance with state regulations for establishing public good.

The use of special assessments will require strict compliance with state regulations for establishing public good and properly allocating the assessments to the properties in the assessment district. State statutes provide two methods to establish special assessments for improvements to property:

- **Benefit District**

The benefit district statute has limitations on projects the city can finance. The municipal improvements limitation defines a qualified improvement as being restricted to an improvement between the curb lines on a Street. There is no public Street crossing the railroad tracks, so we cannot use the benefit district approach for improvements on private property.

If there were public improvements where the city could use a benefit district, all similarly situated properties, including those that are currently undeveloped but are developable would be included in the district and would be assessed. A greater number than 50% of the property owners in a district would have to agree to the assessment. A benefit district is also required to assess costs in a manner which results in imposing substantially equal burdens and shares of the cost upon property in the district. Due to the differing proximity of properties in the district to the tracks, this could be difficult to establish.

- **Community Improvement District (CID)/Transportation Development District (TDD)**

If the city were to pursue a CID or TDD, 100% of the property owners in this district will have to agree to the assessment. This requirement would be even more difficult to establish than the greater than 50% requirement for a Benefit District.

At Large funding can also be accomplished through annual budget allocation. However, high cost items are generally financed with General Obligation bonds and not paid from the annual operating budget. This practice keeps from raising and lowering the mill levy from year to year to cover a large one-time expense with funds from the annual operating budget.

## **SUMMARY**

Going forward, the Council should first adopt a policy that establishes the City's involvement with train horn concerns. It should also indicate how the City would prioritize crossing locations, support private funding initiatives, or consider authorization of public funds for public good.

Specific to the review of the two crossings along Martindale, there are no simple, low cost, solutions for silencing the horns at either one or both of these private crossings. In addition to the complexity of a solution to silence the train horns, the City is limited in available ways to allow residents to pay special assessments for the costs associated with a solution to silence the train horns.

If a policy is created, the best overall solution is to purchase the two properties when they become available and convey title to the Johnson County Parks and Recreation Department, as was done in 2014 to remove the 71st Street public crossing. At this time, one property owner is willing to sell, the other is not. The property south of 75th Street is on the market for \$25,000 per acre for an approximate total of \$1,968,750 for the entire tract of ground.

Attachment: April, 2007 Quiet Zone Field Diagnostic Review



# **CITY OF SHAWNEE**

## **QUIET ZONE FIELD DIAGNOSTIC REVIEW**

**BNSF RAILWAY – EMPORIA SUBDIVISION**

**WILDER TO 75<sup>TH</sup> STREET**

**April, 2007**



# INTRODUCTION

In 2005, the Federal Railroad Administration issued the Final Rule governing the use of locomotive horns at grade crossings. The rule allows for the implementation of quiet zones or railroad crossings where train horns are not routinely sounded. This has drawn interest from residents of Shawnee.

In October 2006, the City Council directed staff to investigate the feasibility of quiet zones for improving safety at BNSF Railway (BNSF) grade crossings in western Shawnee. Staff requested officials from the BNSF, Federal Railroad Administration (FRA), the Kansas Department of Transportation (KDOT), and TranSystems to attend a field diagnostic review meeting. The field meeting focused on the BNSF – Emporia Subdivision line that runs north and south through the City from Wilder Road to 75<sup>th</sup> Street.

The members of the field diagnostic review team included:

**Federal Railroad Administration**

Howard Gillespie

**BNSF Railway**

Bill Thomson

**Kansas Department of Transportation City of Shawnee**

Al Cathcart, P.E.

Jill Burton

Doug Wesselschmidt, P.E.

Mark Sherfy, P.E.

This report is a result of the meeting held on December 13, 2006. Items discussed at the meeting included:

- General questions about Quiet Zones
- How the application process works
- Likely project timelines
- Differences and challenges of private versus public crossings
- Potential avenues for funding improvements
- Field review of six crossing locations in Shawnee
- Determine what supplemental safety measure (SSM) would be required to make the location quiet zone eligible
- Briefly identify possible hidden costs to the safety measures
- Discuss what appear to be 'bare bone' minimum alternatives

Each agency has reviewed this document. The intent of this report is to identify what could be done at each location and options to address a potential quiet zone project. The report provides general information about quiet zone requirements and safety measures. It also identifies possible alternatives and preliminary cost ranges for construction.

In order to develop a more solid probable construction cost estimate, safety measure alternatives need to be selected and engineered through preliminary plans to identify the scope of the project and its construction and material costs.

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# OVERVIEW

This preliminary diagnostic review meeting focused on six railroad crossings in Shawnee as shown on the map below:

- |   |                               |                    |
|---|-------------------------------|--------------------|
| 1 | <b>Wilder Drive</b>           | - Public crossing  |
| 2 | <b>55<sup>th</sup> Street</b> | - Public crossing  |
| 3 | <b>5901 Woodland Drive</b>    | - Public crossing  |
| 4 | <b>71<sup>st</sup> Street</b> | - Public crossing  |
| 5 | <b>7315 Martindale</b>        | - Private crossing |
| 6 | <b>75<sup>th</sup> Street</b> | - Private crossing |



**EXISTING  
CONDITIONS**



**1 Wilder Drive** – Flashing lights with gates and constant warning time monitoring



**2 55<sup>th</sup> Street** – Passive warning device only



**3 5901 Woodland Drive** – Passive warning device only. Signed as private but records show this as a public crossing



**4 71<sup>st</sup> Street** – Flashing lights only, no constant warning time monitoring



**5 7315 Martindale** – Passive warning device only



**6 75<sup>th</sup> Street** – Passive warning device only

# MEETING SUMMARY

## Defining a quiet zone:

- A quiet zone is a segment of a rail line where the locomotive horn is not routinely sounded at public highway-rail grade crossings. A locomotive engineer may sound the locomotive horn to provide a warning in an emergency situation if the engineer judges it as an appropriate action.
- The initial requirements for a quiet zone focus on the corridor length and the warning devices installed at each crossing. A quiet zone must be one-half mile in length and each highway-rail grade crossing must be equipped with active warning devices comprising of flashing lights and gates operated with constant warning time devices and power-out indicators. One or more Supplemental Safety Measures (SSMs) must be installed at each public crossing in the quiet zone.
- Private crossings that fall within a defined quiet zone corridor may be included. Additionally, if a private crossing is located within one-quarter mile of the last crossing in the quiet zone corridor it can be included in the quiet zone.
- Upgrades to the private crossings will be required; however, full warning device installation and SSMs may not be required. However, all parties agree that efforts should be made to do more than meet minimum requirements at each crossing.
- If the City wishes to implement a quiet zone, a letter of intent must be issued to the FRA, KDOT and BNSF to initiate the process. The City must then be prepared to make the required safety improvements to qualify for a quiet zone. This process could take 1-2 years considering application filing and comment periods, design, material acquisition, and construction.

## Defining a quiet zone on the Emporia Subdivision line in Shawnee:

- Any single public crossing could be defined if no other public crossing is within one quarter mile.
  - Any zone could be defined between Wilder and 71<sup>st</sup> Street.
- The private crossings at 7315 Martindale and 75<sup>th</sup> Street cannot be included in a quiet zone because they are more than a quarter mile from the public crossing at 71<sup>st</sup> Street.

There are two ways to get 7315 Martindale and 75<sup>th</sup> Street included in a quiet zone:

- 1) Reclassify 7315 Martindale as a public crossing. This would require property owner approval, road improvements, and approval from KDOT and the BNSF. If this is done, 75<sup>th</sup> Street is within a quarter mile of 7315 Martindale and could be included.
- 2) Define a longer quiet zone between 71<sup>st</sup> Street (or public crossings to the north) and the public crossing at 87<sup>th</sup> Lane in the City of Lenexa.

## Potential Funding:

- KDOT has an incentive program that can provide funds for a permanent closure of any public crossing.
- KDOT may provide funding assistance for safety upgrades to existing railroad crossing equipment. It does not appear that any of the crossings in Shawnee would qualify for this funding.
  - The BNSF may provide some minimal incentives for closures.
  - Private funding (i.e. homeowners, developers) could be sought

# SUPPLEMENTAL SAFETY IMPROVEMENT ALTERNATIVES

Five supplemental safety measures (SSMs) were considered.

## PERMANENT CLOSURE

Definition: Closes the crossing to all traffic.



Potential Advantages:

- No railway improvements required. Lowest construction cost
- Lowest future maintenance expense and liability
- May qualify for some funding if closed

Potential Disadvantages:

- Access severed to some adjacent properties
- May require property purchase
- May result in highest overall implementation cost

Comments:

If property access were available from other directions, permanent closures would emerge as a highly viable alternative. For the majority of the crossings investigated on this corridor, the existing crossings function as the only access to property. Land purchases or new road construction to connect property from another direction are required in most cases.

## TEMPORARY CLOSURE

Definition: Close the crossing to traffic during designated quiet periods



### Potential Advantages:

- Not as many required roadway improvements
- Typically less cost than other alternatives
- Access is maintained
- Less maintenance cost due to no motorized moving gates

### Potential Disadvantages:

- City is responsible for compliance
- Ongoing maintenance costs still exist (i.e. roadway and crossing maintenance)
- Private landowners must cooperate with the system(s) and manually lock/unlock and move the gates

### Comments:

The diagnostic team discussed Temporary Closures in detail as they are not common and are often misunderstood. The existing yellow gates with padlocks found at 55<sup>th</sup> Street, 71<sup>st</sup> Street, and 75<sup>th</sup> Street could be construed as a crude temporary closure device; however, they lack failsafe monitoring and are not periodically inspected.

It is the view of this diagnostic team that the removal of the horn safety feature of a locomotive should be counter measured by crossing improvements exceeding the safety benefits of the horn. The review team's recommendation for a temporary closure device shall consist of flashing lights, constant warning time monitoring and reflective arms for each approach to the crossing. Keys to the padlocked gates would be provided to private land owners; however, they will need to be made aware of the system and be required to close them after crossing. The City would be responsible for ensuring property owner compliance and routine inspections.

This is a viable safety alternative; but does come at a significant cost and commitment of staff to coordinate and monitor the closure. In the event the temporary closure gate is not closed, the locomotive horn will be used at the crossing.

## GATES WITH MEDIANS OR CHANNELIZATION

Definition: Install medians or channelization devices on both approaches that deny users the option of circumventing the gates by switching into the oncoming traffic lane.



### Potential Advantages:

- Maintains access
- Does not require private landowner compliance

### Potential Disadvantages:

- Typically a higher cost than a temporary closure
- Not as safe a SSM as a four quadrant gate
- Less aesthetically pleasing
- Higher maintenance cost than a temporary closure due to the motorized gates and channelization devices

### Comments:

Medians and channelization devices for a quiet zone must by definition extend for 100 feet in each direction of the gate arm. If there is an intersection within 100 feet of the gate arm there must be a median a minimum of 60 feet. Intersections within 60 feet must be closed or relocated. These constraints pose problems for a few of the locations reviewed in Shawnee.



## FOUR-QUADRANT GATES

Definition: Install gates at a crossing sufficient to fully block traffic from entering while the gates are lowered.



### Potential Advantages:

- Safest physical improvement that maintains access
- Could be considered to be more aesthetically pleasing than medians or channelizers
- Maintains access

### Potential Disadvantages:

- Highest typical construction cost
- Highest future maintenance cost

### Comments:

A four-quadrant gate system is an available option for each crossing location reviewed. Short of a permanent closure, this alternative provides the highest level safety improvement upgrades to a crossing within a quiet zone. The improvements; however, come with the highest construction cost and may not be suitable from a benefit cost standpoint for the low volume crossings in Shawnee as reviewed in this study.

## WAYSIDE HORNS

Definition: Stationary horn system activated at the railroad-street grade crossing, mounted at the crossing, rather than on the locomotive which delivers an audible warning to motorists and pedestrians.



### Potential Advantages:

- Although a horn is still sounded at these locations, the area around the crossing is significantly quieter due to the directional nature of the horns
- A wayside horn combined with a single gate arm may result in a lower cost than four-quadrant gates or medians with associated road improvements

### Potential Disadvantages:

- These devices must be accompanied by flashing lights, gates and constant warning time monitoring
- There is still the sound of a horn

### Comments:

Wayside horns are considered as a SSM; however, they do not make a crossing location completely quiet. This alternative would be more heavily considered if the existing flashing lights, gates and constant warning time monitoring were already in place. The only location reviewed that meets this criteria is the Wilder crossing. At every other crossing reviewed, the gates and monitoring required for a wayside horn are not in place making this a less desirable alternative.

## TYPICAL PRELIMINARY CONSTRUCTION COST ESTIMATES

| Supplemental Safety Measure | Cost Range      |
|-----------------------------|-----------------|
| Permanent Closure           | \$5k - \$30k    |
| Temporary Closure           | \$250k - \$450k |
| Gates with Medians          | \$300k - \$500k |
| Four-Quadrant Gates         | \$500k - \$600k |
| Wayside Horns               | \$80k - \$450k  |
| Do Nothing                  | \$0k            |

Above costs are estimated initial cost and do not include future maintenance.

## SUPPLEMENTAL SAFETY ALTERNATIVE MATRIX

The following safety alternative matrix has been developed as a result of the field meeting. It illustrates which safety alternatives would be acceptable at each of the six locations reviewed. The following pages address each location in more detail.

| Location                | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|-------------------------|-------------------|-------------------|--------------------|---------------------|---------------|
| Wilder Drive            |                   |                   |                    | X                   | X             |
| 55 <sup>th</sup> Street | X                 | X                 |                    | X                   |               |
| 5901 Woodland Drive     | X                 | X                 |                    |                     |               |
| 71 <sup>st</sup> Street | X                 | X                 | X                  | X                   |               |
| 7315 Martindale         |                   |                   | X                  | X                   |               |
| 75 <sup>th</sup> Street | X                 | X                 | X                  | X                   |               |

## WILDER DRIVE - RECOMMENDATIONS

| Location     | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|--------------|-------------------|-------------------|--------------------|---------------------|---------------|
| Wilder Drive |                   |                   |                    | X                   | X             |

There has been little if any residential complaint about noise at this crossing. Permanent and temporary closures are not a viable option. There are approximately 1800 vehicles per day at this location and traffic is expected to increase. Gates with medians are not a favorable solution at this location due to the curved nature of Wilder Road and the sight obstruction caused by the railroad overpass. The median option should extend 100 feet in advance of the signal arm which would extend to somewhere under the railroad overpass on the curve. Medians may also reduce sight distance depending on their configuration. The only reasonable safety improvement for this location would be four-quad gates; however, this is a costly measure.



Safety Alternative Recommendation: Exclude this location from any further quiet zone consideration.

**55th STREET - RECOMMENDATIONS**

| Location                | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|-------------------------|-------------------|-------------------|--------------------|---------------------|---------------|
| 55 <sup>th</sup> Street | X                 | X                 |                    | X                   |               |

A permanent closure of this crossing would be easy to implement were it not for the 37 acres of private property situated on 2 parcels. These parcels would cease to have access with a closure and are shown in the photograph below.

This crossing may go for weeks on end with no traffic which makes the cost to benefit ratio for safety improvements high. A temporary closure may represent the lowest cost alternative available that would maintain access to the properties.

The field team identified added expenses for installation of constant warning time devices at this location as there are rail line switches within 500 feet in each direction of this crossing. The ability for trains to switch tracks in this area would require additional circuitry to provide constant warning.



Safety Alternative Recommendation: Temporary Closure.

## 5901 WOODLAND DRIVE - RECOMMENDATIONS

| Location            | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|---------------------|-------------------|-------------------|--------------------|---------------------|---------------|
| 5901 Woodland Drive | X                 | X                 |                    |                     |               |

A permanent closure of this crossing is possible were it not for the approximate 150 acres of private property situated on several parcels. These parcels would cease to have access with a closure.

One property appears to have occasional occupancy which may result in up to 10 trips per day at the crossing. A temporary closure represents the lowest cost alternative available that would maintain access.

The street is 10-12 feet wide and would require significant improvements. At that width, four quad gates or gates with medians would be cost prohibitive due to the approach roadway widening that would be required.

This location does not appear to have the rail line switches within the area around the crossing. As a result, the electronic components of constant warning would be more reasonable here; however, a considerable amount of fill and potentially some drainage improvements would be required before any active warning device could be installed.



Safety Alternative Recommendation: Temporary Closure.

## 71<sup>st</sup> STREET - RECOMMENDATIONS

| Location                | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|-------------------------|-------------------|-------------------|--------------------|---------------------|---------------|
| 71 <sup>st</sup> Street | X                 | X                 | X                  | X                   |               |

There is approximately 20 acres of land on two parcels currently served by this crossing. There is field access between these two properties on the east side of the railroad that can be reached from a gated entry point at 7315 Martindale. It appears that this access is used from time to time.

This location is the southernmost public railroad crossing in Shawnee and as a result, must serve as a starting or end point for any quiet zone in this area. All of the safety alternatives are possible at this location. Wayside Horns are possible at this location, however they are not desirable. If arrangements can be made to ensure access from the south, through either a City purchase of ROW or agreements between landowners a permanent closure of this crossing is feasible.



Safety Alternative Recommendation: Permanent closure with reclassification of 7315 Martindale to a public crossing and access provided to 71<sup>st</sup> Street from the east side of the 7315 Martindale crossing.



### 7315 MARTINDALE - RECOMMENDATIONS

| Location        | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|-----------------|-------------------|-------------------|--------------------|---------------------|---------------|
| 7315 Martindale |                   |                   | X                  | X                   |               |

This private crossing serves as the driveway for the residence at 7315 Martindale. Two parcels are provided access by this crossing. As pointed out in the previous discussion of the 71<sup>st</sup> Street crossing, it appears access has been provided to the north between these two parcels; however, this has never been an arrangement ensured by the City of Shawnee.

This private crossing is approximately 1475 feet from the public crossing at 71<sup>st</sup> Street. As a result, it falls outside of the ¼ mile limits to be included in a quiet zone. It cannot be included in a quiet zone unless it is converted to a public crossing or defined in a zone between two public crossings.

Due to the fact that this crossing serves an established home, permanent or temporary closure are not viable safety alternatives. If it were converted to a public crossing, gates with medians, or four quadrant gates would be acceptable; however, the City would become responsible for the crossing and the street approaches.



**Safety Alternative Recommendation:** Conversion to a public crossing with gates and medians and permanent access to 71<sup>st</sup> Street from the east side.



## 75<sup>th</sup> STREET - RECOMMENDATIONS

| Location                | Permanent Closure | Temporary Closure | Gates With Medians | Four-Quadrant Gates | Wayside Horns |
|-------------------------|-------------------|-------------------|--------------------|---------------------|---------------|
| 75 <sup>th</sup> Street | X                 | X                 | X                  | X                   |               |

There are approximately 35 acres of land on 4 parcels that are provided access by the private crossing at 75<sup>th</sup> Street. There is currently no access to this land from 7315 Martindale due to a creek that bisects that property. Providing access from 7315 would require the purchase of right of way, construction of an access road, and a crossing of the creek.

There is 1270 feet between the crossing at 7315 Martindale and 75<sup>th</sup> Street which is less than the ¼ mile required to include this private crossing as an extension of a quiet zone. However, 7315 Martindale would need to be reclassified as a public crossing to make 75<sup>th</sup> Street quiet zone eligible.

All of the safety alternatives are possible at this location. Wayside Horns are possible at this location; however, they are not desirable. Because it is a private crossing the land owners would have to agree to the improvements. If 7315 Martindale were made a public crossing, this location could be included in the quiet zone with the potential for minimal upgrades. The members of the field team all agree that meeting the bare minimum requirements here is probably not advised. A temporary closure should be seriously considered here.



Safety Alternative Recommendation: Temporary Closure is possible with conversion of 7315 Martindale to a public crossing.

# SUMMARY

The field diagnostic team meeting was beneficial. Viable alternatives that would meet the minimum supplemental safety measures were identified for each crossing location. Although this meeting and report were not intended to develop recommendations, several solutions emerged as logical for further consideration.

| <u>Crossing Location</u>        | <u>Recommended Alternative</u>  |
|---------------------------------|---|
| <b>1 Wilder Drive</b>           | No action, do not include in quiet zone   |
| <b>2 55<sup>th</sup> Street</b> | Temporary closure   |
| <b>3 5901 Woodland Drive</b>    | Temporary closure   |
| <b>4 71<sup>st</sup> Street</b> | Permanent closure, provide access from 7315 Martindale  |
| <b>5 7315 Martindale</b>        | Convert to a public crossing with gates and medians.<br>Upgrade driveway to street standards and ensure permanent access to 71 <sup>st</sup> Street on the east side of the tracks. |
| <b>6 75<sup>th</sup> Street</b> | Temporary closure   |

## NEXT STEPS

A general list of activities required to continue progress towards a completed quiet zone project include:

1. Meet with impacted property owners.
2. Council direction to proceed.
3. Meet with the public in the area of influence.
4. Obtain public and council approval on the defined quiet zone and desired safety alternatives with preliminary cost estimates.
5. Update the national crossing inventory with KDOT and FRA assistance.
6. Submit a Notice of Intent to the FRA to create a New Quiet Zone. There is a 60-day comment period associated with this filing.
7. Calculate appropriate risk values.
8. Determine appropriate SSMs to install at each crossing.
9. File a Public Authority Application to the FRA. The recommended SSMs should be reviewed by the FRA and BNSF to determine if they will meet Quiet Zone requirements before installation. There is a 60-day comment period associated with this filing.
10. Install SSMs and update the National Inventory with new crossing information. Allow 6-12 months for the BNSF to develop construction plans and another 6-12 months for materials to be ordered and construction to begin. The City would initiate road improvements as required at this time.
11. Provide Notice of Quiet Zone Establishment and implement the Quiet Zone. This is the final step that will silence the train horns and install signage at crossings notifying drivers that the train horns will not sound.
12. Annual recalculations of the National Safety Risk Threshold will require the City to periodically review the Quiet Zone status with the FRA.