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DEPARTMENT OF
TRANSPORTATION

CITY OF SACRAMENTO
CALIFORNIA

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June 1, 2004

City Council
Sacramento, California

Honorable Members in Session:

**SUBJECT: REPORT BACK ON TRAIN HORN RULE – APPROVE TRAIN HORN
QUIET ZONE OPTIONS, RANKING CRITERIA AND SCORED AND
RANKED LIST**

LOCATION AND COUNCIL DISTRICT: Highway-Rail Grade Crossings - All Council
Districts.

RECOMMENDATION:

This report recommends that the City Council adopt the attached resolution approving Train Horn Quiet Zone options, ranking criteria, and scored and ranked list shown in Exhibits A and B.

CONTACT PERSONS: **Saed Hasan, Associate Civil Engineer, 808-7923**
Hector Barron, Supervising Engineer, 808-2669

FOR COUNCIL MEETING OF: June 15, 2004

SUMMARY:

This report is in response to the request by the City Council that staff report back on Train Horn Quiet Zone options citywide, including expanding an existing Quiet Zone to a twenty-four hour quiet zone. Staff was also requested to consider evaluation criteria reflecting train horn impacts on residential areas. This report recommends specific train horn quiet zone options, ranking criteria that give priority to quiet zones where residential areas are most impacted, and a scored and ranked list that outlines implementation priorities.

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In summary, all railroad lines have train horn impacts on residential areas. Staff developed an objective criterion to measure the relative impact on the affected population. The criterion takes into consideration the amount of population and the number of train horn soundings along specific railroad lines. The criterion is measured in Person-Sounding per Mile of Railroad Track.

Staff also calculated the relative cost efficiency of implementing quiet zones and found that in most cases, the most impacted areas also have the highest cost efficiency to implement Quiet Zones. Costs reported were based on the guidelines and requirements stated in the Federal Railroad Administration Interim Final Rule (Rule), where appropriate, and may change when the Rule becomes final in December 18, 2004.

The proposed Quiet Zone options, ranking criteria, and scored and ranked list is shown in Exhibits A and B.

COMMITTEE/COMMISSION ACTION:

None

BACKGROUND INFORMATION:

General Overview

On December 18, 2003, the Federal Railroad Administration (FRA) published an Interim Final Rule (Rule) in the Federal Register (68 FR 70575) addressing the use of locomotive horns at highway-rail grade crossings. The Rule allows establishing Quiet Zones by either applying for a Pre-Rule Quiet Zone or applying for a New Quiet Zone. Currently, the City of Sacramento has a partial train horn ban between 6:00 PM and 7:00 AM at railroad crossings along the Union Pacific Railroad (UPRR) line from Meadowview Road to C Street.

On April 13, 2004, the City Council directed staff to apply for a Pre-Rule Quiet Zone along the above mentioned UPRR line to keep the existing train horn ban. Staff was also directed to report back on options to expand the existing train horn ban to a twenty-four hour ban and on new Quiet Zones along the six (6) railroad lines shown in Attachment A. Staff was also requested to consider criteria reflecting train horn impacts on residential areas.

Existing Conditions/Factors Considered

- **Impacted Population:** The Rule requires that locomotive horn sound levels be a minimum of 96 decibels and a maximum of 110 decibels. The City's General Plan has a goal of providing a residential outdoor average maximum noise level of 60-65 decibels. Noise level attenuates with distance and generally varies depending on several factors. Areas within approximately 1.5 miles from a railroad crossing can be exposed to noise levels above the General Plan goal. Attachment B shows the City General Plan Land Use and areas impacted by the sounding of train horns.
- **Number of Trains:** Attachment B shows the approximate number of daily trains along each line as provided by the respective railroad companies. Line 3 and Line 4 have the highest number of trains while Line 6 has the lowest.
- **Risk Index:** Silencing of train horns would increase the risk index, while implementing safety measures to comply with the Quiet Zone requirements would reduce the risk index. Risk Index is a number reflecting the average level of risk to the motoring public at public highway-rail grade crossings equipped with flashing lights and gates and at which locomotive horns are sounded. Prior to implementing a quiet zone, safety measures must be in place to reduce the risk index to either lower than existing and lower than the National Significant Risk Threshold (NSRT), or lower than existing compensating for the loss of the train horn sounding. Exhibit B shows the expected risk index after implementing safety measures along each railroad line. All lines except Line 2 would meet the NSRT standard after implementation of safety measures. It is expected that Line 2 would have a risk index approximately 5 times higher than the NSRT after implementation of safety measures. Implementing safety measures, in combination with keeping the train horn sounding and monitoring, should be considered prior to silencing train horns on Line 2.

Criteria Considered

- **Persons-Sounding Per Mile Of Railroad Track:** The Rule requires railroads to sound train horns 15-20 seconds prior to arrival at crossings, but not more than ¼ mile in advance of the crossing, and repeat the sounding until the train occupies the crossing. This series of train horn soundings at one crossing is referred to in this report as one "Sounding." Each time a person hears one sounding, is considered a "Person-Sounding" (PS). This report assumes that two persons hearing the Sounding once a day is similar to one person hearing the Sounding twice a day and is equal to two Person Sounding (2 PS). The total PS along one line divided by the

total length of the line will be referred to as "Person-Sounding per Mile of Railroad Track" (PSPM). The PSPM reflects the density of PS along each line. Exhibit B shows the PSPM for each line.

- **Cost Efficiency:** The cost of implementing a Quiet Zone divided by the PSPM is calculated for each of the lines and referred to as "Cost per PSPM." The Cost per PSPM reflects the relative cost efficiency of implementing Quiet Zones. The lower the value the higher the cost efficiency. Exhibit B shows the cost efficiency for each line.

Recommendation

At the direction of the City Council, staff has evaluated the impact of train horn soundings along each of the six railroad lines in residential areas. It is recommended that areas most impacted by train horn soundings should have the highest priority to implement a Quiet Zone. The criteria on Person Sounding per Mile of Railroad Track (PSPM), is an objective criterion to determine relative impact on residential population and should be used to rank implementing Quiet Zones in the City of Sacramento. The relative priority for implementing quiet zones at each railroad line using this methodology is shown in Exhibits A and B. Coincidentally, and in most cases, the higher ranked Quiet Zones also are the most cost effective Quiet Zones to implement.

FINANCIAL CONSIDERATIONS:

No funding recommendation is made at this time. By law, funding and implementing supplemental and or alternative measures to comply with Quiet Zone requirements is the responsibility of the public entity. The total cost of implementing new Quiet Zones throughout the City is approximately \$1.8 million. Costs are based on the Federal Railroad Administration Interim Final Rule (Rule) and may change when the Rule becomes final in December 18, 2004. Funding for the unknown annual improvements that may be needed to maintain a quiet zone is also the responsibility of the public entity. Staff will report back to City Council with a funding recommendation and request for implementation upon publishing of the final Rule. It is anticipated that these improvements will be funded with Transportation funds, where appropriate.

ENVIRONMENTAL CONSIDERATIONS:

There are no environmental considerations associated with the actions in this report.

POLICY CONSIDERATIONS:

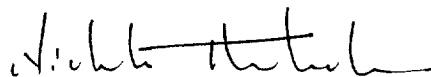
Creating new Quiet Zones is consistent with the City's Strategic Plan goals of enhancing and preserving neighborhoods, promoting and supporting economic vitality, and enhancing the quality of life.

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ESBD CONSIDERATIONS:

None.

Respectfully submitted,



Nicholas Theocharides
Engineering Services Manager

RECOMMENDATION APPROVED:



ROBERT P. THOMAS
City Manager

Approved:



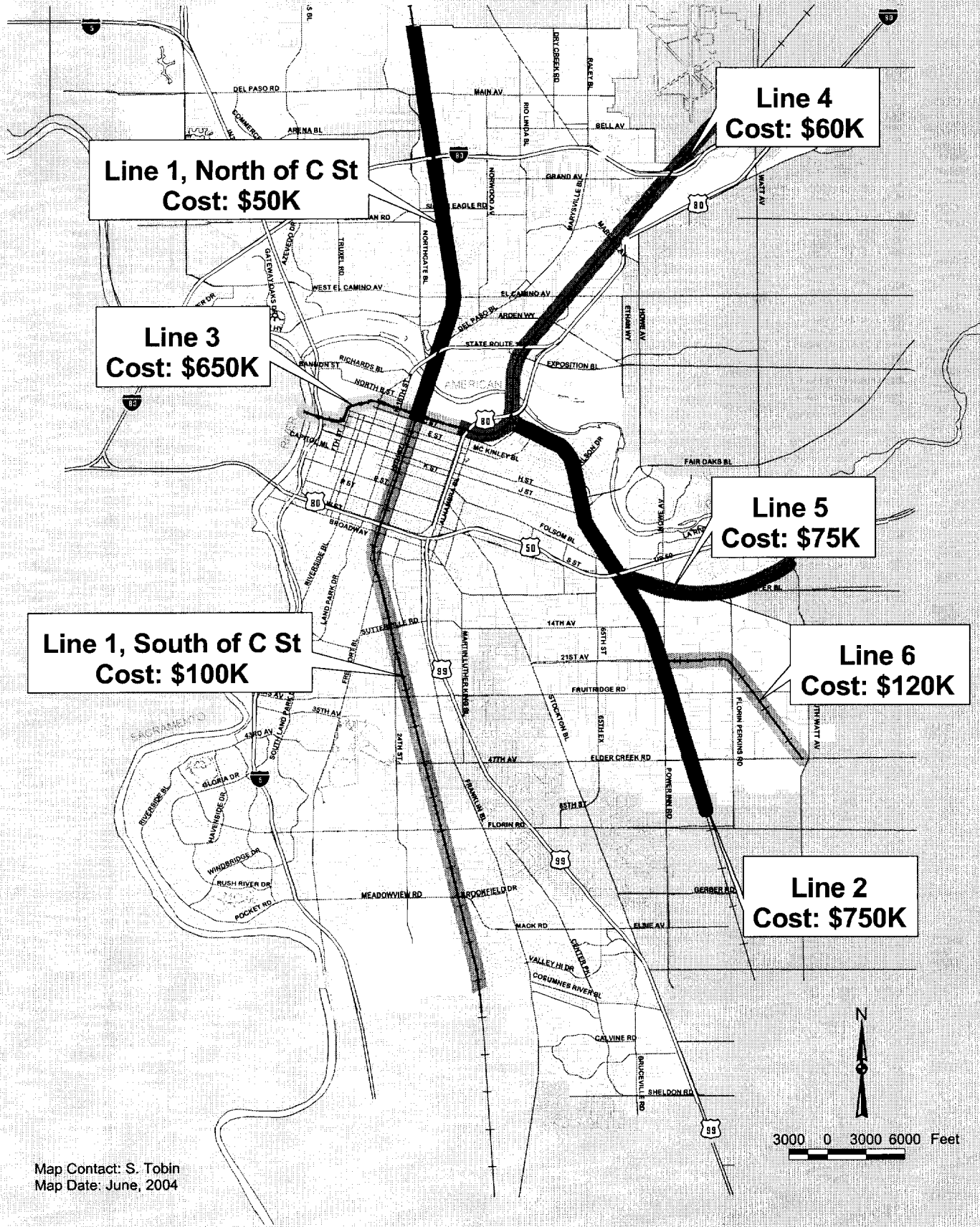
Marty Hanneman
Director, Department of Transportation

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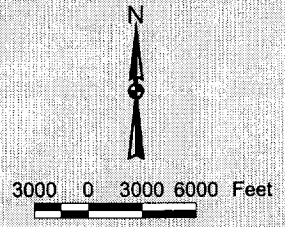
1. Attachment A, Existing Railroad Lines, page 6
2. Attachment B, Impacted Population, page 7
3. Resolution, page 8
4. Exhibit A, Quiet Zone Options, Ranking Criteria, Scored and Ranked List, page 9
5. Exhibit B, Quiet Zone Ranking Including Risk Index, PSPM, Cost Efficiency, page 11
6. Presentation Material, pages 12

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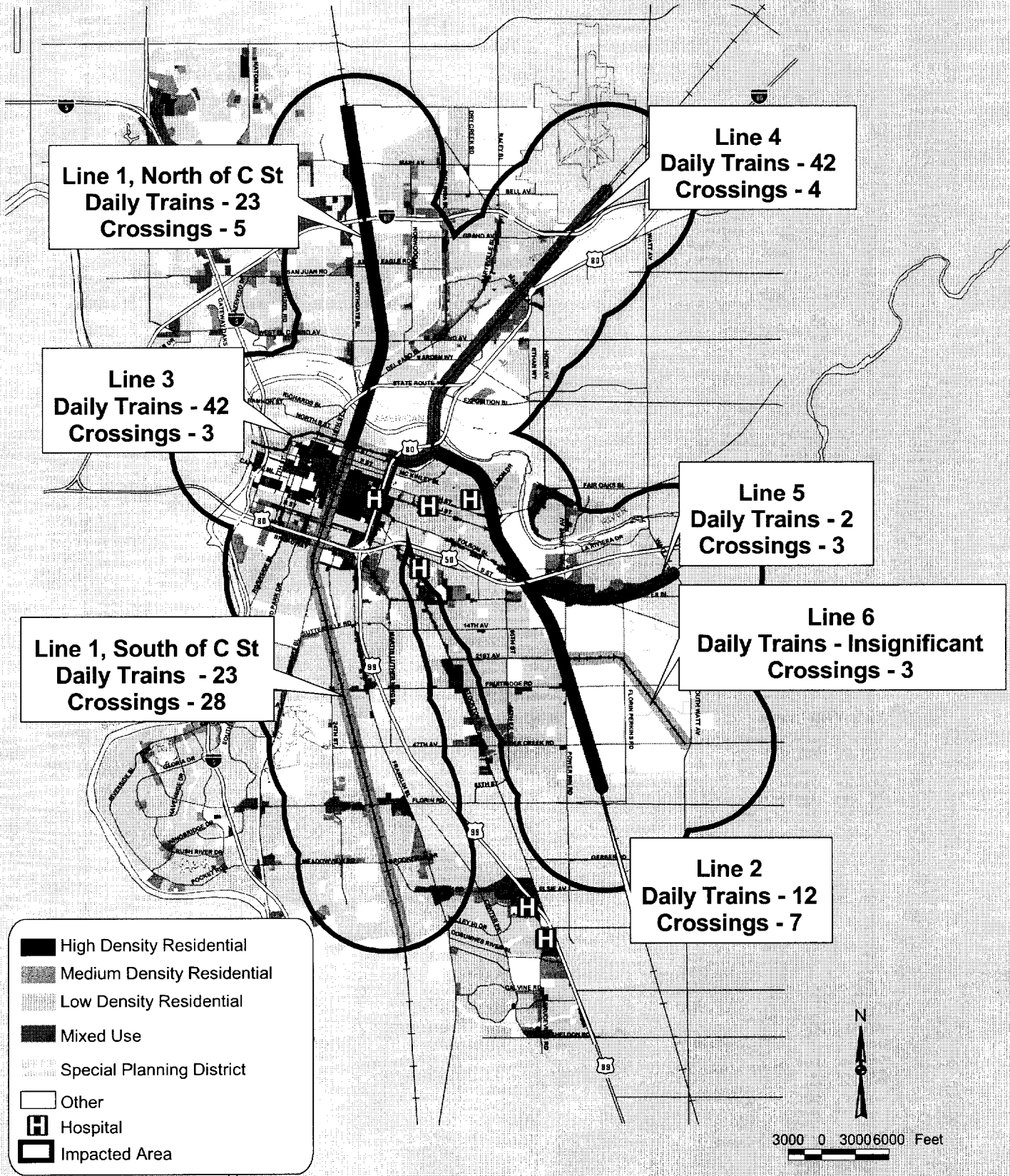
RAILROAD LINES NEW QUIET ZONES ADJUSTED COSTS



Map Contact: S. Tobin
Map Date: June, 2004



RAILROAD LINES IMPACTED POPULATION



Map Contact: S. Tobin
Map Date: June, 2004

RESOLUTION NO.

ADOPTED BY THE SACRAMENTO CITY COUNCIL

ON DATE OF _____

**REPORT BACK ON TRAIN HORN RULE – APPROVE TRAIN HORN QUIET
ZONE OPTIONS, RANKING CRITERIA AND SCORED AND RANKED LIST**

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF SACRAMENTO THAT:

- The Train Horn Quiet Zone options, ranking criteria, and scored and ranked list shown in Exhibits A and B are approved.

MAYOR

ATTEST:

CITY CLERK

FOR CITY CLERK USE ONLY

RESOLUTION NO.: _____

DATE ADOPTED: _____

EXHIBIT A

Ranking Criteria:

Implementing New Quiet Zones along each of the railroad lines and expanding the existing train horn ban to twenty-four hours is scored and ranked based on the Person Sounding Per Mile of Tracks (PSPM). A railroad line that has higher PSPM value (higher score) has a higher impact on residential population and therefore is given higher priority (higher rank) to implement a Quiet Zone along that line. PSPM is calculated as follows:

$$\text{PSPM} = \frac{\text{Sum of impacted population at all crossings} \times \text{Number of daily trains}}{\text{Length of railroad line (miles)}}$$

Options and Scored and Ranked List:

Rank	Option	PSPM (Score)	Additional Information		
			Cost	CE ⁽¹⁾	Risk Index /NSRT
1	Expand Existing Quiet Zone to 24-hours (Line 1, South C St.)	1,745,000	\$100K	573	13,300/17,000
2	New Quiet Zone on Line 3	1,544,000	\$650K	4,210	8,700/17,000
3	New Quiet Zone on Line 1, North C St.	1,038,000	\$50K	481	14,400/17,000 ⁽²⁾
4	New Quiet Zone on Line 4	969,000	\$60K	619	7,300/17,000
5	New Quiet Zone on Line 2	436,000	\$750K	16,055	82,200/17,000 ⁽³⁾
6	New Quiet Zone on Line 5	72,000	\$75K	10,417	9,100/17,000
7	New Quiet Zone on Line 6	24,000	\$120K	50,000	13,600/17,000

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RESOLUTION NO.: _____

DATE ADOPTED: _____

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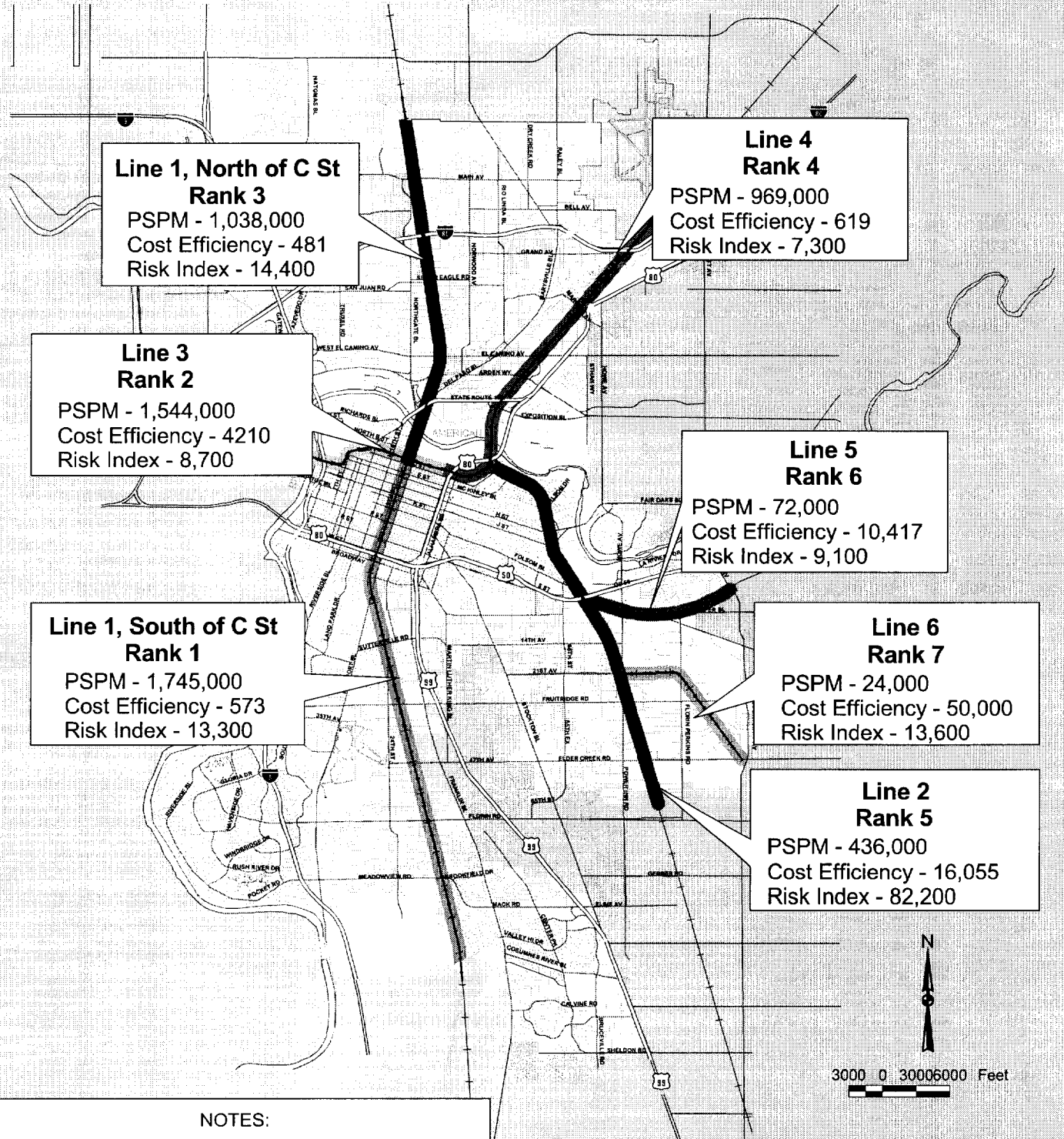
- (1) Cost Efficiency (CE): Cost of implementing a Quiet Zone along specific railroad line divided by PSPM for that line multiplied by 10,000. Low CE value indicates high cost efficiency.
- (2) Assumes Main Avenue Overpass is constructed.
- (3) Target risk index that compensates for the loss of the train horn is 82,500. If the segment from Elder Creek southward is excluded, the resulting risk index would drop to 40,500.

FOR CITY CLERK USE ONLY

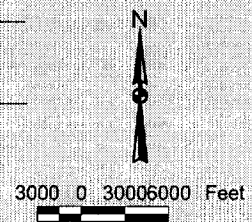
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DATE ADOPTED: _____

RAILROAD LINES NEW QUIET ZONES RANKING



NOTES:
- Ranking based on PSPM
- Risk Index for Line 1, North of C Street
Assumes Constructed Main Avenue Overpass



Map Contact: S. Tobin
Map Date: June, 2004

RESOLUTION NO. _____

Train Horn Rule Report Back

Department of Transportation

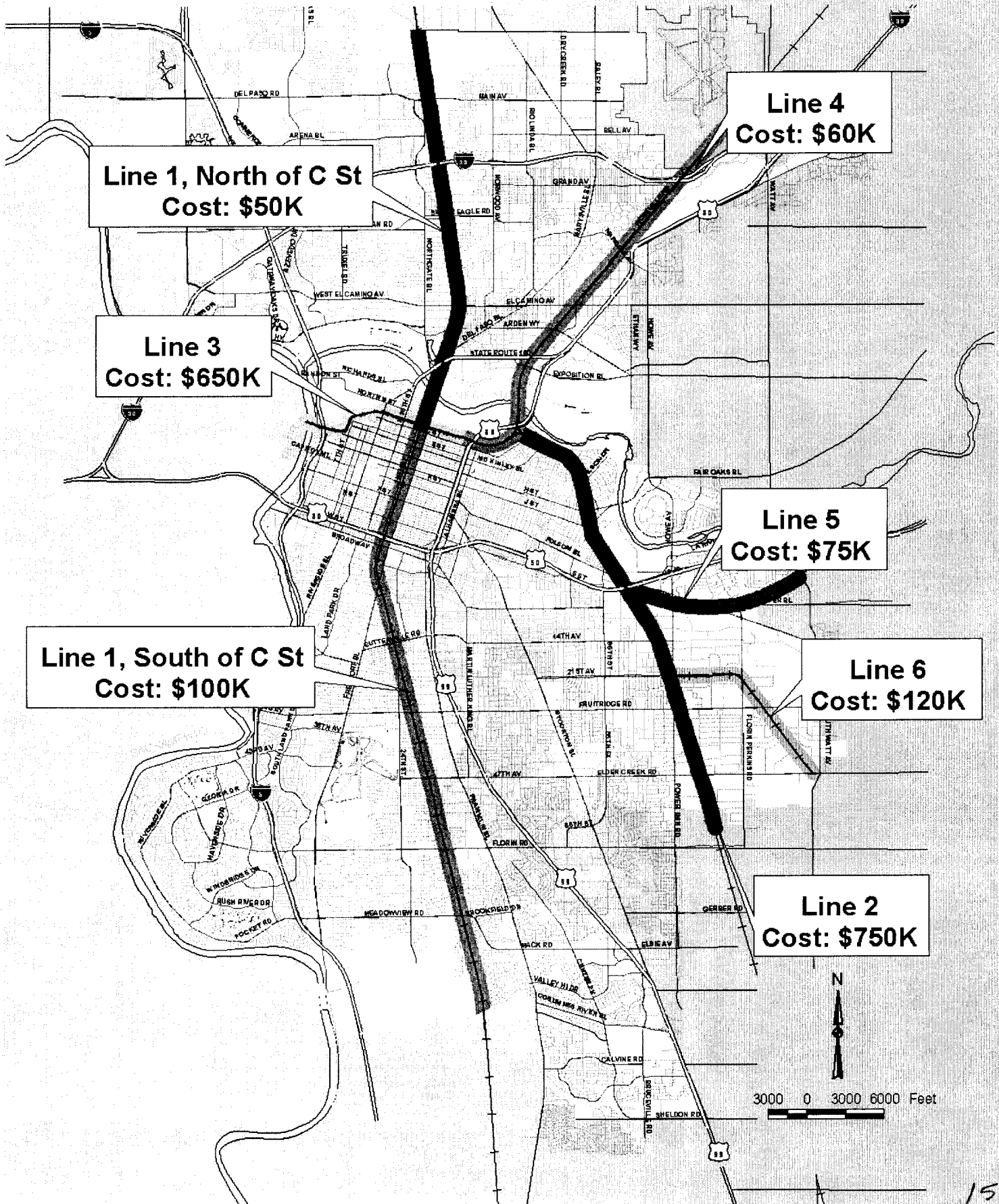
Purpose

- **Request Council to Approve Train Horn New Quiet Zone Options, Ranking Criteria, and Scored and Ranked List**

Background

- **FRA Interim Final Rule Published 2003**
- **Council Meeting April 2004**
 - **Apply for Pre-Rule Quiet Zone:**
Meadowview Rd to C St.
 - **Direct Staff to Send Comments to**
FRA.
 - **Report Back Implementation Options**

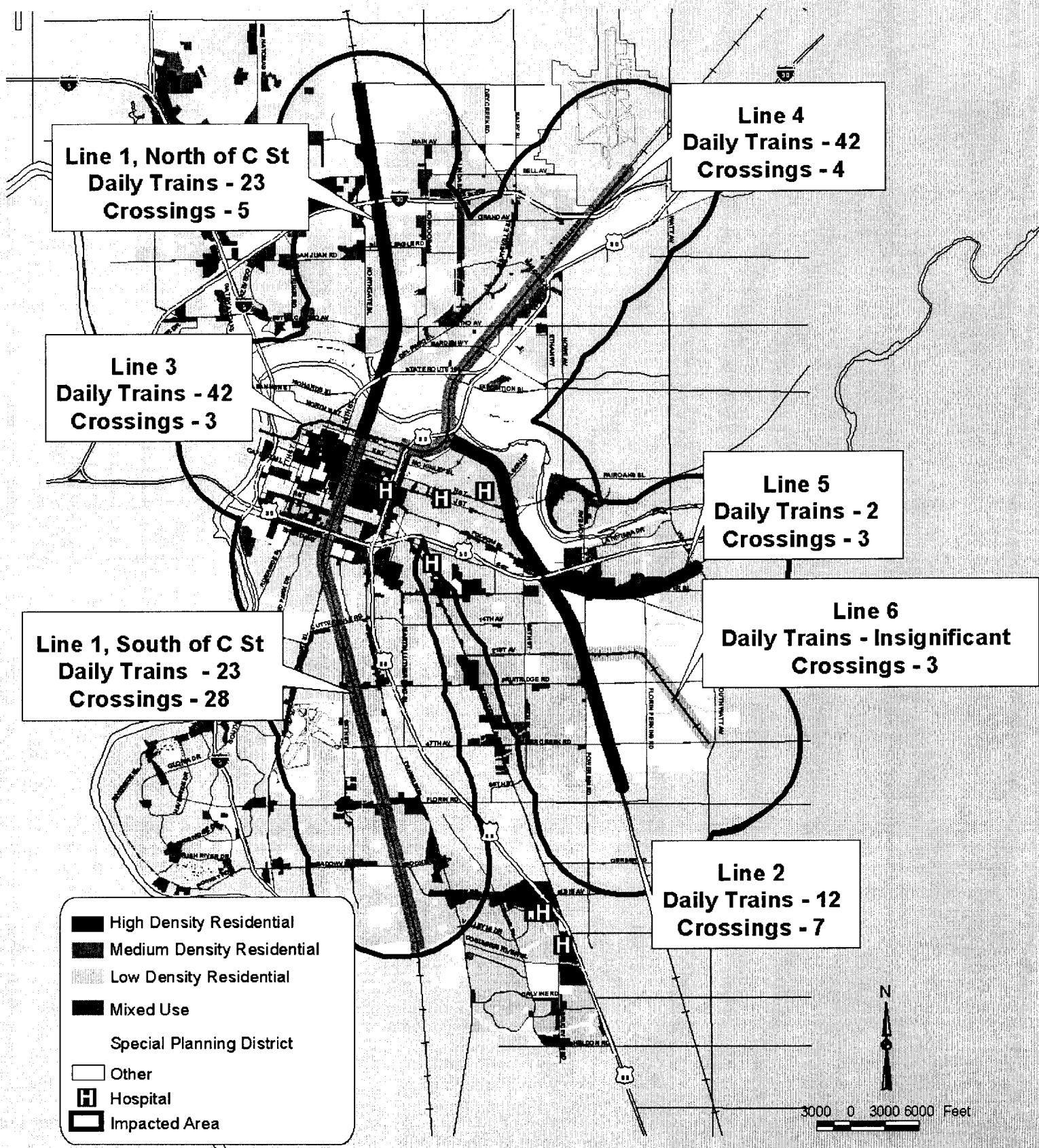
RAILROAD LINES NEW QUIET ZONES ADJUSTED COSTS



Impacted Population

- **Population Within 1.5 Mile Radius (Over 60-65dB)**
- **All Crossings/Lines Impact Population**
- **Population Impacted by Number of Trains and Number of Crossings**
- **Approx. 350,000 Affected**

RAILROAD LINES IMPACTED POPULATION



Factors Considered

- Population
- Number of Soundings
- Risk Index
- Cost Efficiency

Criteria

- **Person Sounding Per Mile of Tracks (PSPM): PS/Length of Line**
 - **Person: Living Within 1.5 Mile Xing**
 - **Sounding: 15-20 Second From Xing**
 - **Person Sounding (PS): 1 Person – 1 Sounding**
- **Cost Efficiency: Cost/PSPM**

Recommended Criteria/Ranking

- **PSPM: Higher PSPM Higher Rank**

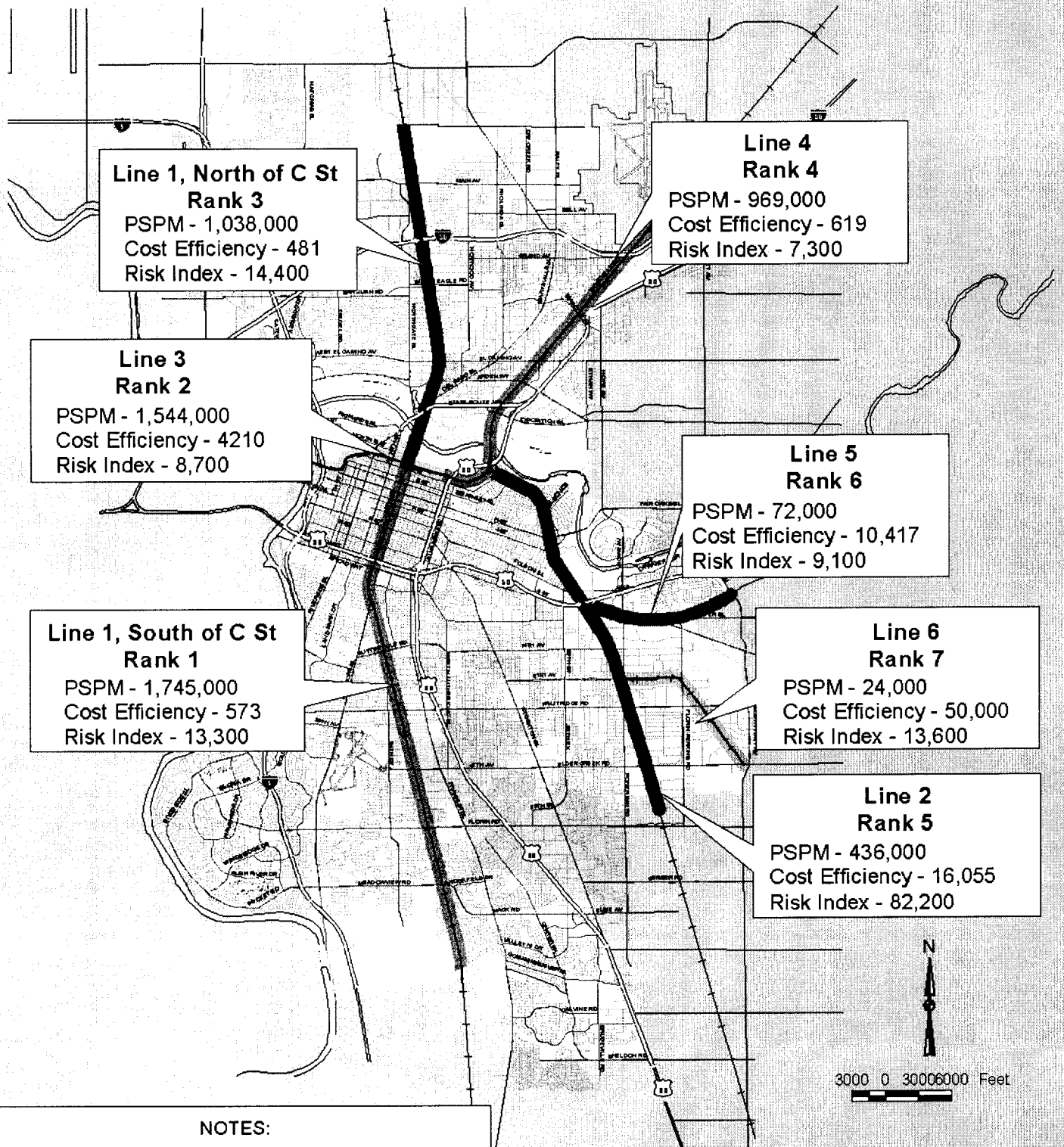
Options & Ranked List

Rank	Option	PSPM(Score)	CE	RI
1	Expand Existing(Line 1 S. C St.)	1,745,000	573	13,300
2	Line 3	1,544,000	4,210	8,700
3	Line 1, N C St.	1,038,000	481	14,400
4	Line 4	969,000	619	7,300
5	Line 2	436,000	16,055	82,200
6	Line 5	72,000	10,417	9,100
7	Line 6	24,000	50,000	13,600 ₁₆

Safety/Risk Index

- **Quiet Zone Risk Index (RI) - Lower than NSRT or Lower Than RI With Train Horn**
- **Line 2**
 - **Six Accidents**
 - **Excluding Elder Creek Xing and Southward lowers RI to 40,500**
 - **Implement Measures, Keep Train Horn, & Monitor**

RAILROAD LINES NEW QUIET ZONES RANKING



NOTES:
 - Ranking based on PSPM
 - Risk Index for Line 1, North of C Street
 Assumes Constructed Main Avenue Overpass

Recommendations

- **Approve Options, Criteria, and Ranking**
- **No Funding Decisions Until Final Rule Published**