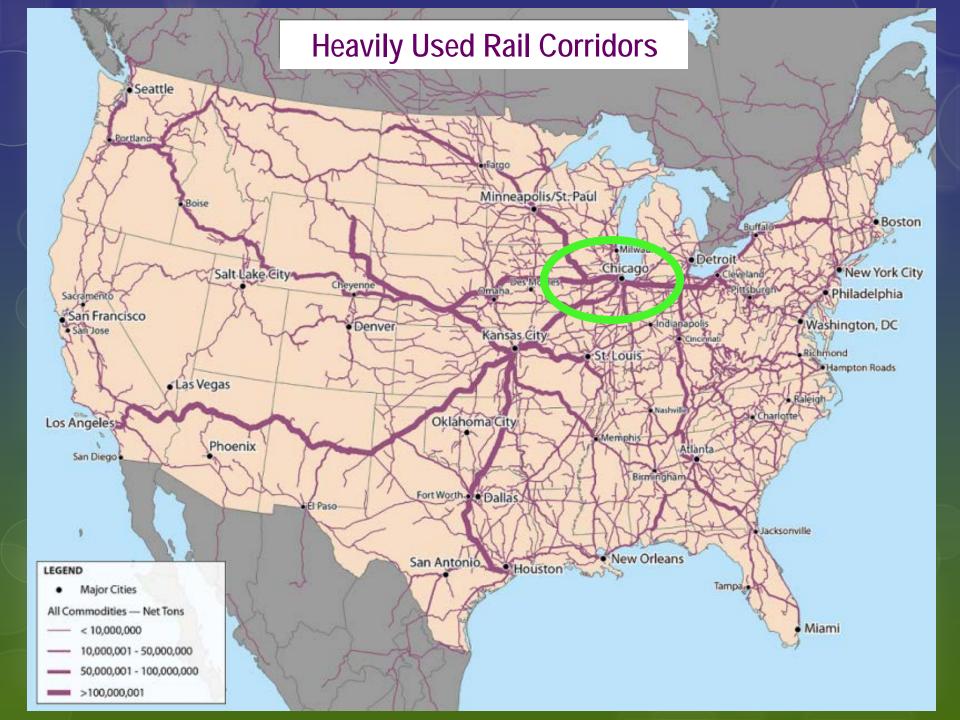
Illinois DOT's CREATE 75th Street Corridor Improvement Project EIS Noise Analysis Chicago, IL

Kim Glinkin, Jacobs



TRB ADC40 2014 Summer Meeting



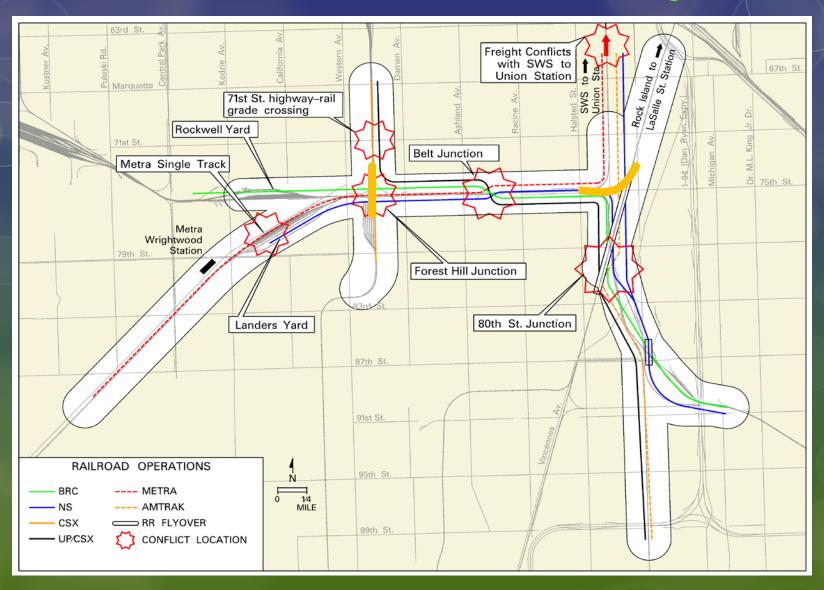


The CREATE Program

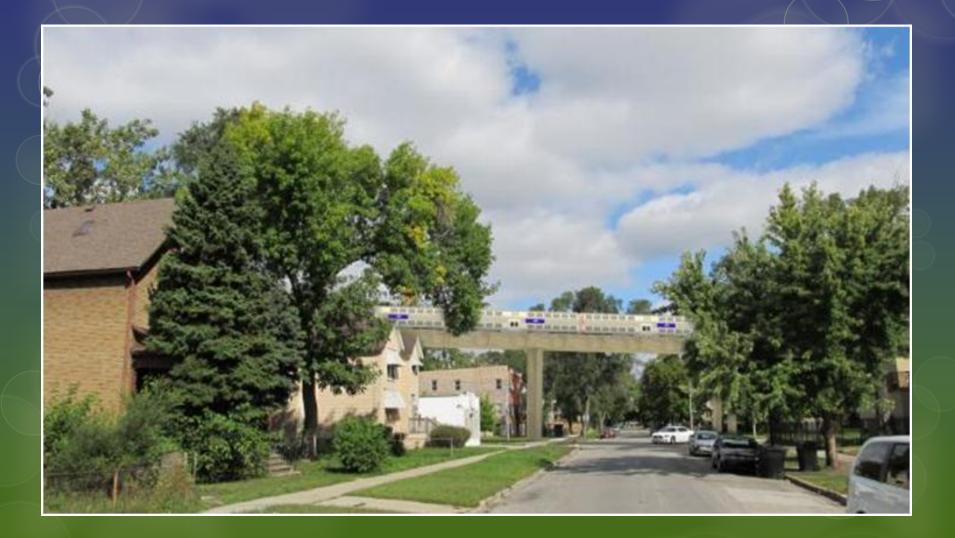
o Chicago • Region **6** Environmental o And • **T**ransportation • Efficiency Program



The CREATE 75th Street CIP Project



Metra Flyover Photosimulation



Methodology

CREATE Noise and Vibration Assessment Methodology

- Based on FTA Noise and Vibration Impact Assessment
- modifications to add freight traffic

IDOT Manuals

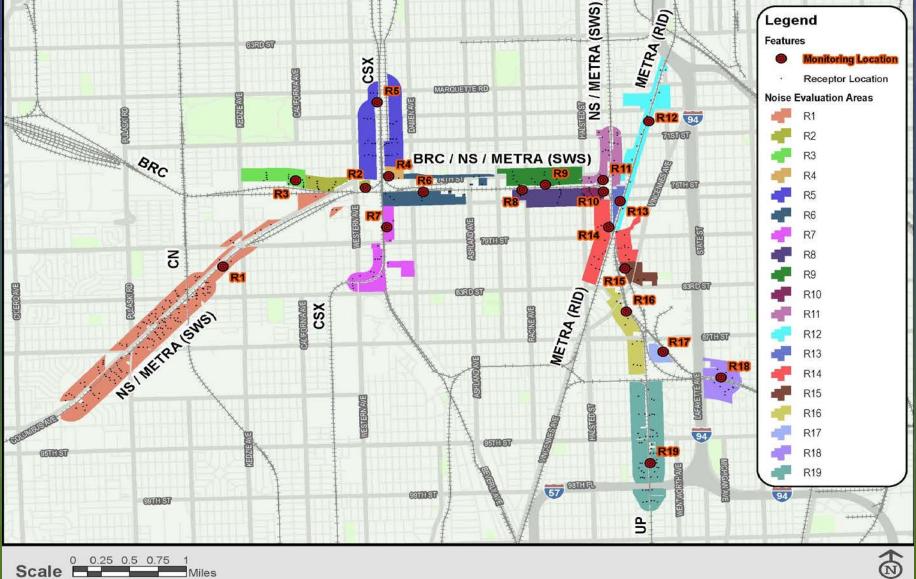
- Highway Traffic Noise Assessment Manual
- IDOT Bureau of Design and Environment Manual

Work Plan

Identification of Screening Distances
 Existing sound levels – monitoring data

- collected excluding train passbys
- o Train volumes
- Population density
- Distance from a grade crossing
- 2. Model Existing, No-Build and Build
 - General analysis
- 3. Identify impacts, then refine model
 Detailed analysis
- 4. Design and evaluate barriers

Screening Area



Miles

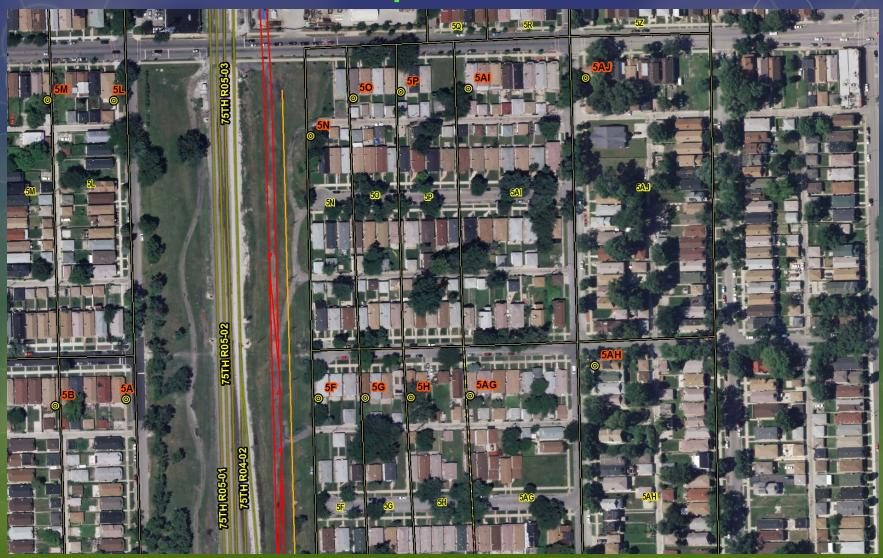
Cluster Map Near Grade Crossings



Scale 500 1000 Feet

 $\overline{\mathbb{Q}}$

GIS-Based Analysis of Distances Between Rail Lines and Receptors



GIS-Based Computation of Distances

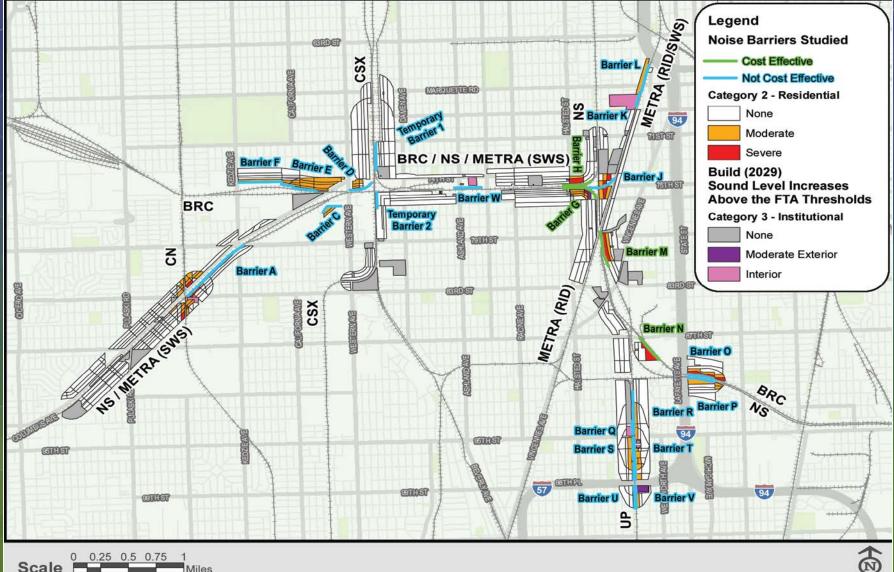


FTA Spreadsheets Used in Database

Noise Model Based on Federal Transit Administration General Transit Noise Assessment Developed for Chicago Create Project Copyright 2006, HMMH Inc. Case: A B C D E CALCULATION OF Alsurver Note: Do not need this if no barrier	M tion
Copyright 2006, HMMH Inc. Case: A B C D E F G H J K L Case: Calculation of Abarrier 1 Calculation of Abarrier 1 Calculation of Abarrier 1 Calculation of Abarrier 9.45 Abarrier to Use in Ilbarrier Calculation of Inst sheet 1 Calculation of Inst sheet 1 Abarrier 9.45 Abarrier Calculation of Inst sheet 1 Input automatic from first sheet 1 Input automatic from first sheet 1 1 Abarrier Calculation 1	M .
Case: A B C Calculation of Abarrier RESULTS 3 Source Leq - 1-hr (dB) 3 Abarrier - 945 Abarri	tion
RESULTS 3 Source Height (H ₅) + Embankment Height (H ₅) = 30 Aberrier 9.45 Aberrier to Use in IL berrier All sources 66.234842679 66.234842679 66.234842679 Aberrier to Use in IL berrier All source 1 5 Note: Do not need this if no barrier present Source 1 58.024562619 6 7 Distance from Source to Barrier (D _{5:8}) = 10 Note: Do not need this if no barrier present Source 3 62.597887583 6 10 Jinput automatic from first sheet 10 Source 5 46 6 11 6 6 6 Source 6 47 40 11 6 6 6	tion
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Source 3 62.597687365 9 10 10 Source 4 51.579010772 9 10	
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Source 6 47 11 Source 7 40 12	
Source 7 40 Barrier Barrier	
Source o 43	Ť
	HR
Enter noise receiver land use category below.	_
	↓
	round
Noise receiver land use category $(1, 2 \text{ or } 3)$	
Enter data for up to 7L R04-04 7L R04-04 7L R07-02 20 H ₅ NOTE: Barrier must be more than 5 feet from track for this calculation. Otherwise,	
Incled and a mark block of the Rote of the	
Parameter Source 1 Source 2 Source 3 22 Calculations 24 Calculations 25 Calculations 26 Calculations 27 Calculations 27 Calculations 27 Calculations 28	
Source Num. Freight Locomotive 9 Freight Cars 10 Commuter Diese 2	
Distance (course to distance (ft) 72 distance (ft) 72 distance (ft) 50 24 A = 10.19804 (A=Path length from Source to top of Barrier)	
Noisiest Hour of speed (mph) 10 speed (mph) 24 25 B = 46.14109 (B=Path length from top of Barrier to Receiver)	
Activity During trains (hour 1 trains (hour 1 trains (hour 1 trains (hour 1)	
Sensitive Hours locos/train 2 length of cars (ft) / train 7304 locos/train 2 27 P = 0.43743 (P=bifference in path length between with Barrier and without Barrier)	
27.6 27.6 23 24 Amore = 945015 (Calculated Amore used for predictions is 15)	
0.55556 0.22222 00 0010	
2 6608.2 2 50	_
Wheel Flats? % of cars w/ wheel flats 1.00% % o	
Jointed Track? Y/N Y/N Y/N Y/N Y/N Y/N	
Embedded Track? Y/N Y/N Y/N Y/N Y/N Y/N Y/N	
Barrier Present? Y/N y Y/N Y/N Y/N	

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123		Stack Lookups					Defeats				Noise Prediction								Topo Details	for SRST ON	LY			Even Slope Topography (EST)							
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Impacts and Noise Barriers Studied

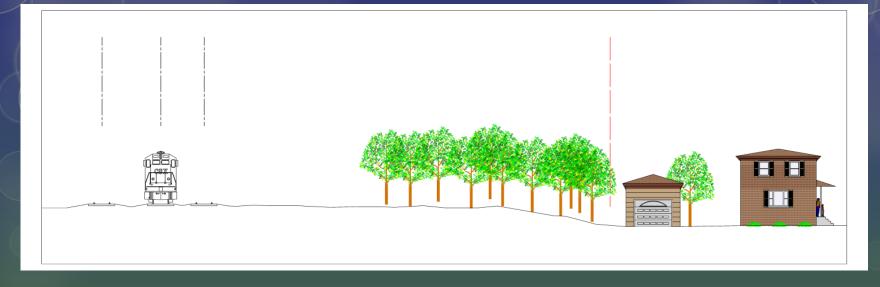


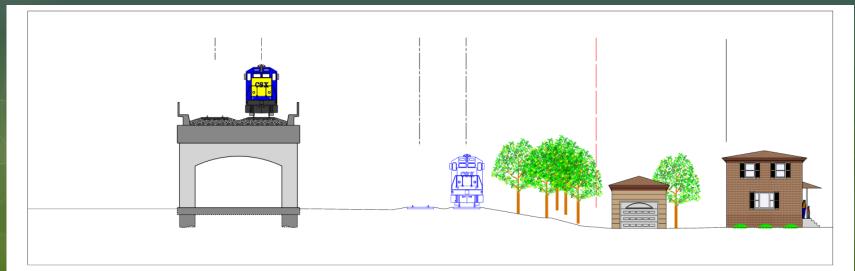
0 0.25 0.5 0.75 1 Scale Miles

No-Build vs. Build

	No-Build Alternative	Build	Mitigated
Residences above the FTA moderate impact threshold	1,009	1,092	66
Residences above the FTA severe impact threshold	90	267	180
Institutional facilities above FTA moderate impact threshold	1	3	1
Institutional facilities above FTA interior impact threshold	7	7	0
Total	1,107	1,369	249

Temporary Track Impacts





Lessons Learned

 Identify the constraints associated with the construction of noise barriers

- How close can the barrier be to the railroad?
- Is access to the railroad necessary?
- Are there overhead elements that would conflict with barrier?
- Will the barrier block required sightlines?
- Identify what is included in barrier cost effectiveness evaluation
 - If elevated, include the additional cost to either widen the structure or the berm?
 - If the barrier would be outside of ROW, include the additional land acquisition cost?