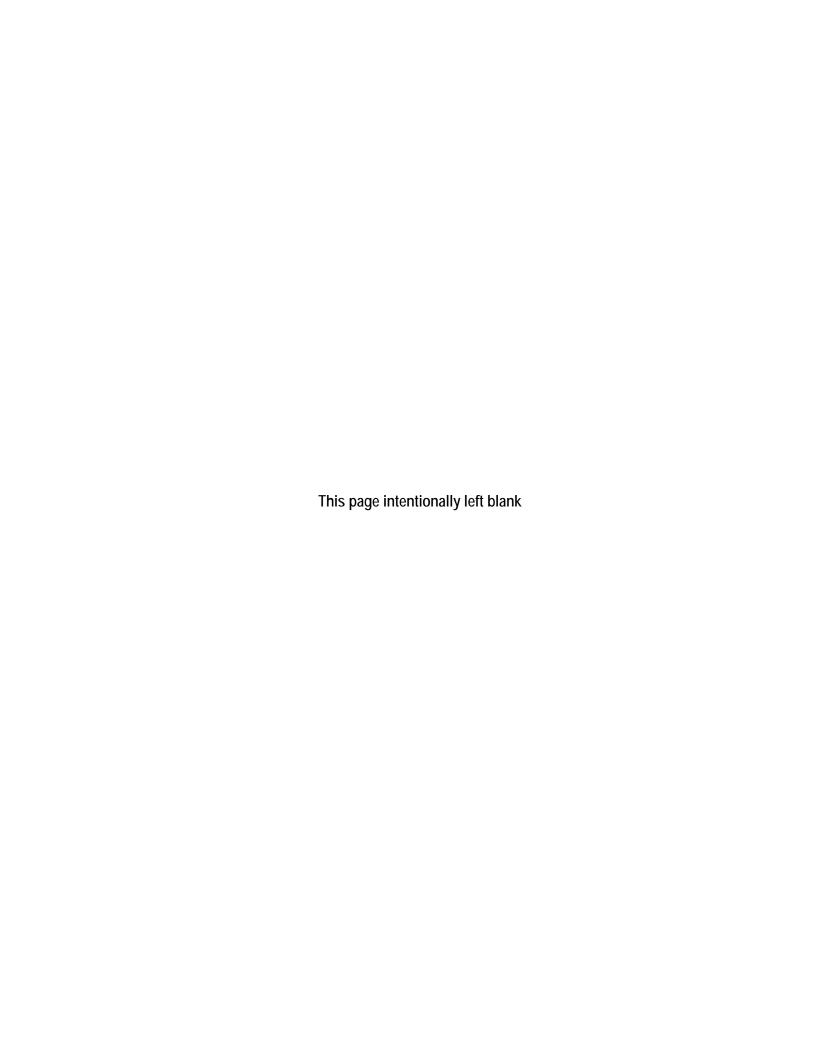
APPENDIX E

NOISE AND VIBRATION



Reference Vibration Curve Adjustment Factors

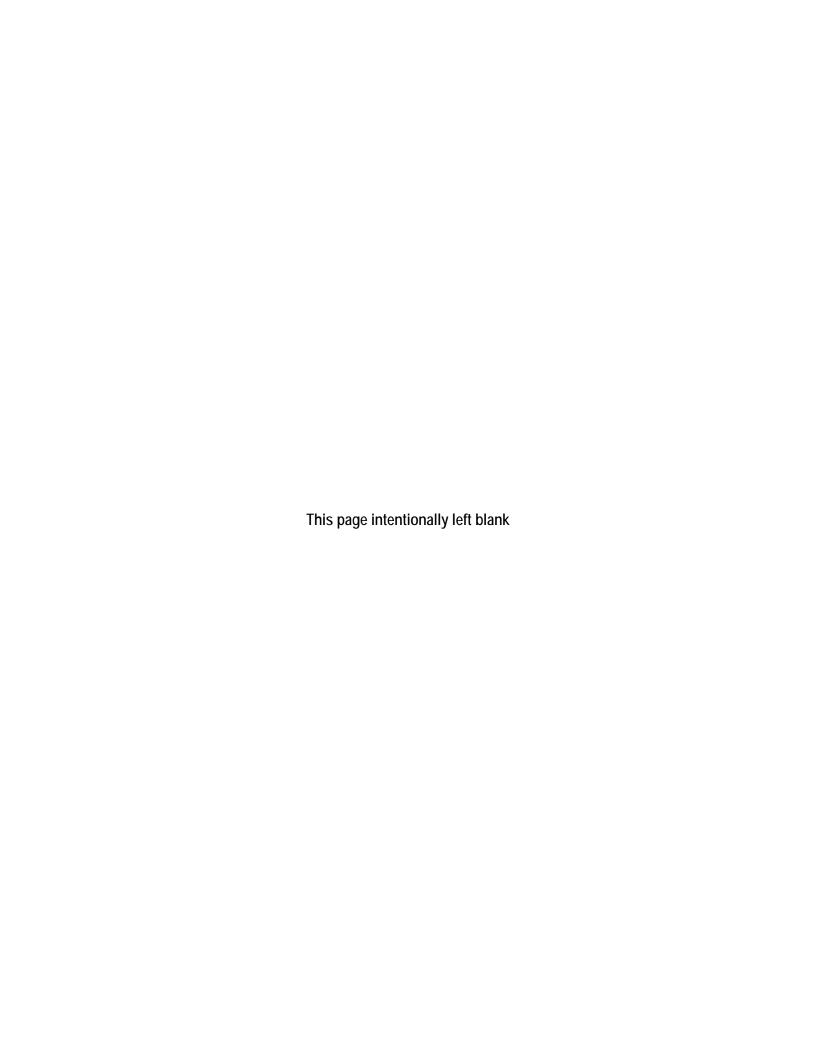


Table 1
Reference Vibration Curve Adjustment Factors (Existing Use)

Reference Curve Assumptions:			
Vehicle Type:		red Passenger or Freight	
Speed (mph):	50		
Track:	Continuously Welded Rail (CWR)		
Geology:	Normal soil, ineffi	cient at transmitting vibration	
Traffic Condition A (Chicago to Aurora):	
Train Type:	Locomotive Power	red Freight and Passenger	
Speed (mph):	60		
Track:	CWR (same as refe	erence case)	
Geology:	Till	149,704 Linear Ft	
	Sand/Gravel/Sed	31,583 Linear Ft	
	Total	181,287 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	1.6	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	8.3	dB, weighted average over section	
Total Adjustments:	9.8	dB	
Traffic Condition B (Aurora to Wyanet):			
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	70		
Track:	CWR (same as refe	·	
Geology:	Till	299,141 Linear Ft	
	Sand/Gravel/Sed	105,188 Linear Ft	
	Total	404,329 Linear Ft	
Reference Curve Adjus			
Increased Speed:	2.9	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	7.4	dB, weighted average over section	
Total Adjustments:	10.3	dB	

Table 1 (continued)

	rable i (continued)			
Traffic Condition C	(Wyanet to Silvis):			
Train Type:	Locomotive Powered Freight (no existing passenger trains)			
Speed (mph):	35			
Track:	CWR (same as ref	erence case)		
Geology:	Till	118,423 Linear Ft		
	Sand/Gravel/Sed	·		
	Total	229,300 Linear Ft		
Reference Curve Adju	stment Factors:	,		
Increased Speed:	-3.1	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
	0	dB, for sand/gravel/sediment (inefficient soil)		
	5.2	dB, weighted average over section		
Total Adjustments:	2.1	dB		
Traffic Condition D		= -		
Train Type:		red Freight (no existing passenger trains)		
Speed (mph):	5	to the transfer trains)		
Track:	CWR (same as ref	erence case)		
Geology:	Till	41,934 Linear Ft		
Georogy.	Sand/Gravel/Sed	,		
	Total	56,371 Linear Ft		
Reference Curve Adju		30,371 Emear 1 t		
Increased Speed:	-20.0	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
Geology.	0	dB, for sand/gravel/sediment (inefficient soil)		
	7.4	dB, weighted average over section		
Total Adjustments:	-12.6	dB		
Traffic Condition E				
Train Type:		red Freight (no existing passenger trains)		
Speed (mph):	35	red Freight (no emissing passenger trains)		
Track:	CWR (same as ref	erence case)		
Geology:	Till	0 Linear Ft		
Geology.	Sand/Gravel/Sed	268,415 Linear Ft		
	Total	268,415 Linear Ft		
Reference Curve Adju		200, 110 Linoui I t		
Increased Speed:	-3.1	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
	0	dB, for sand/gravel/sediment (inefficient soil)		
	0.0	dB, weighted average over section		
Total Adjustments:	-3.1	dB		
i otai Aujustilielits.	-5.1	מט		

Table 1 (continued)

Table 1 (Continued)			
Traffic Condition F (<u> Iowa City):</u>		
Train Type:	Locomotive Powered Freight (no existing passenger trains)		
Speed (mph):	5		
Track:	CWR (same as refe	erence case)	
Geology:	Till	0 Linear Ft	
	Sand/Gravel/Sed	14,129 Linear Ft	
	Total	14,129 Linear Ft	
Reference Curve Adju	stment Factors:	,	
Increased Speed:	-20.0	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	0.0	dB, weighted average over section	
Total Adjustments:	-20.0	dB	
Traffic Condition G (
Train Type:		red Freight (no existing passenger trains)	
Speed (mph):	35	red Freight (no emoting passenger trains)	
Track:	CWR (same as refe	erence case)	
Geology:	Till	0 Linear Ft	
Geology.	Sand/Gravel/Sed	589,517 Linear Ft	
	Total	589,517 Linear Ft	
Reference Curve Adju		307,317 Emedi 1 t	
Increased Speed:	-3.1	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
Geology.	0	dB, for sand/gravel/sediment (inefficient soil)	
	0.0	dB, weighted average over section	
Total Adjustments:	-3.1	dB	
Traffic Condition H (UD .	
Train Type:		red Freight (no existing passenger trains)	
Speed (mph):	10	red Freight (no existing passenger trains)	
Track:		oranga aasa)	
	CWR (same as reformed Till		
Geology:	Sand/Gravel/Sed	0 Linear Ft 73,699 Linear Ft	
Deference Comme Adding	Total	73,699 Linear Ft	
Reference Curve Adju		dD colo nor ETA quidence	
Increased Speed:	-14.0	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
TD + 1 A 1'	0.0	dB, weighted average over section	
Total Adjustments:	-14.0	dB	

Table 1 (continued)

	Table 1 (continued)			
Traffic Condition I (W. I	Traffic Condition I (W. Des Moines to Council Bluffs):			
Train Type:	Locomotive Power	ed Freight (no	existing passenger trains)	
Speed (mph):	35	,		
Track:	CWR (same as refe	erence case)		
Geology:	Till	0	Linear Ft	
	Sand/Gravel/Sed	653,157	Linear Ft	
	Total	653,157	Linear Ft	
Reference Curve Adjus	stment Factors:			
Increased Speed:	-3.1	dB, calc. per F	FTA guidance	
Track:	0	dB	_	
Geology:	10	dB, for till (ef	ficient soil)	
	0	dB, for sand/g	gravel/sediment (inefficient soil)	
	0.0	dB, weighted	average over section	
Total Adjustments:	-3.1	dB	_	
Traffic Condition J (Council Bluffs to Omaha):				
Train Type:	Locomotive Power	red Freight (no	existing passenger trains)	
Speed (mph):	10			
Track:	CWR (same as refe	CWR (same as reference case)		
Geology:	Till	16,353	Linear Ft	
	Sand/Gravel/Sed	86,094	Linear Ft	
	Total	102,447	Linear Ft	
Reference Curve Adjus	stment Factors:			
Increased Speed:	-14.0	dB, calc. per F	FTA guidance	
Track:	0	dB		
Geology:	10	dB, for till (ef	ficient soil)	
	0	dB, for sand/g	gravel/sediment (inefficient soil)	
	1.6	dB, weighted	average over section	
Total Adjustments:	-12.4	dB		

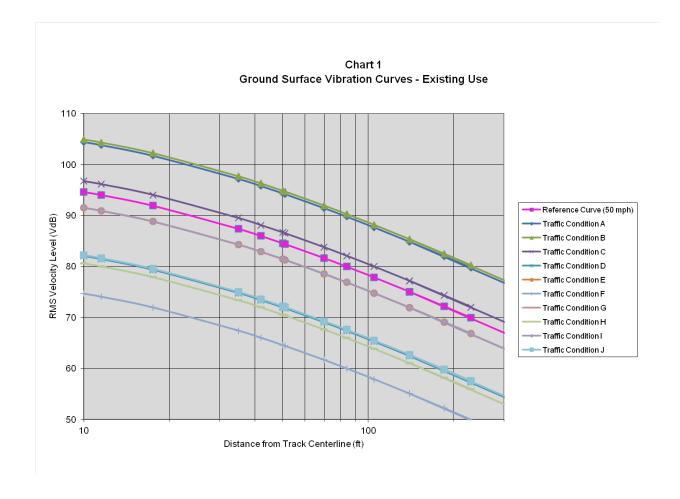


Table 2
Reference Vibration Curve Adjustment Factors (Future No-build Condition)

Reference Curve Ass	Reference Curve Assumptions:		
Vehicle Type:	•	red Passenger or Freight	
Speed (mph):	50		
Track:	Continuously Welded Rail (CWR)		
Geology:		Normal soil, inefficient at transmitting vibration	
Traffic Condition A (•	
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	60		
Track:	CWR (same as ref	erence case)	
Geology:	Till	149,704 Linear Ft	
	Sand/Gravel/Sed	31,583 Linear Ft	
	Total	181,287 Linear Ft	
Reference Curve Adju	stment Factors:	*	
Increased Speed:	1.6	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	8.3	dB, weighted average over section	
Total Adjustments:	9.8	dB	
Traffic Condition B (Aurora to Wyanet)	•	
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	70		
Track:	CWR (same as ref	erence case)	
Geology:	Till	299,141 Linear Ft	
	Sand/Gravel/Sed	105,188 Linear Ft	
	Total	404,329 Linear Ft	
Reference Curve Adju	stment Factors:		
Increased Speed:	2.9	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	7.4	dB, weighted average over section	
Total Adjustments:	10.3	dB	

Table 2 (continued)

	rable 2 (continued)			
Traffic Condition C (Traffic Condition C (Wyanet to Silvis):			
Train Type:	Locomotive Powered Freight (no existing passenger trains)			
Speed (mph):	35			
Track:	CWR (same as refe	erence case)		
Geology:	Till	118,423 Linear Ft		
	Sand/Gravel/Sed	, and the second		
	Total	229,300 Linear Ft		
Reference Curve Adjus				
Increased Speed:	-3.1	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
	0	dB, for sand/gravel/sediment (inefficient soil)		
	5.2	dB, weighted average over section		
Total Adjustments:	2.1	dB		
Traffic Condition D (= -		
Train Type:		red Freight (no existing passenger trains)		
Speed (mph):	5	red Freight (no existing passenger trains)		
Track:	CWR (same as refe	erence case)		
Geology:	Till	41,934 Linear Ft		
Geology.	Sand/Gravel/Sed	•		
	Total	56,371 Linear Ft		
Reference Curve Adjus		50,571 Emeal 1 t		
Increased Speed:	-20.0	dB, calc. per FTA guidance		
Track:	-20.0	dB guidance		
Geology:	10	dB, for till (efficient soil)		
Geology.	0	dB, for sand/gravel/sediment (inefficient soil)		
	7.4			
Total Adington anto.		dB, weighted average over section		
Total Adjustments:	-12.6	dB		
Traffic Condition E				
Train Type:		red Freight (no existing passenger trains)		
Speed (mph):	35			
Track:	CWR (same as refe			
Geology:	Till	0 Linear Ft		
	Sand/Gravel/Sed	268,415 Linear Ft		
D.C. C. A.	Total	268,415 Linear Ft		
Reference Curve Adjus		1D 1 17774 '1		
Increased Speed:	-3.1	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
	0	dB, for sand/gravel/sediment (inefficient soil)		
	0.0	dB, weighted average over section		
Total Adjustments:	-3.1	dB		

Table 2 (continued)

Table 2 (Continued)		
Traffic Condition F (<u> Iowa City):</u>	
Train Type:	Locomotive Powered Freight (no existing passenger trains)	
Speed (mph):	5	
Track:	CWR (same as refe	erence case)
Geology:	Till	0 Linear Ft
	Sand/Gravel/Sed	14,129 Linear Ft
	Total	14,129 Linear Ft
Reference Curve Adjus	stment Factors:	
Increased Speed:	-20.0	dB, calc. per FTA guidance
Track:	0	dB
Geology:	10	dB, for till (efficient soil)
	0	dB, for sand/gravel/sediment (inefficient soil)
	0.0	dB, weighted average over section
Total Adjustments:	-20.0	dB
Traffic Condition G (
Train Type:		red Freight (no existing passenger trains)
Speed (mph):	35	81
Track:	CWR (same as refe	erence case)
Geology:	Till	0 Linear Ft
	Sand/Gravel/Sed	589,517 Linear Ft
	Total	589,517 Linear Ft
Reference Curve Adjus		
Increased Speed:	-3.1	dB, calc. per FTA guidance
Track:	0	dB
Geology:	10	dB, for till (efficient soil)
	0	dB, for sand/gravel/sediment (inefficient soil)
	0.0	dB, weighted average over section
Total Adjustments:	-3.1	dB
Traffic Condition H (
Train Type:		red Freight (no existing passenger trains)
Speed (mph):	10	passenger trains)
Track:	CWR (same as refe	erence case)
Geology:	Till	0 Linear Ft
	Sand/Gravel/Sed	73,699 Linear Ft
	Total	73,699 Linear Ft
Reference Curve Adjus		, - , - , - , - , - , - , - , - , -
Increased Speed:	-14.0	dB, calc. per FTA guidance
Track:	0	dB
Geology:	10	dB, for till (efficient soil)
200087.	0	dB, for sand/gravel/sediment (inefficient soil)
	0.0	dB, weighted average over section
Total Adjustments:	-14.0	dB
Total Aujustilielits.	-14.0	uр

Table 2 (continued)

Traffic Condition I (W. I	Des Moines to Counc	il Bluffs):	
Traffic Condition I (W. Des Moines to Council Bluffs):			
Train Type:	Locomotive Powered Freight (no existing passenger trains)		
Speed (mph):	35		
Track:	CWR (same as ref	erence case)	
Geology:	Till	0 Linear Ft	
	Sand/Gravel/Sed	653,157 Linear Ft	
	Total	653,157 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	-3.1	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	0.0	dB, weighted average over section	
Total Adjustments:	-3.1	dB	
Traffic Condition J (Council Bluffs to Omaha):			
Train Type:	Locomotive Power	red Freight (no existing passenger trains)	
Speed (mph):	10		
Track:	CWR (same as reference case)		
Geology:	Till	16,353 Linear Ft	
	Sand/Gravel/Sed	86,094 Linear Ft	
	Total	102,447 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	-14.0	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	1.6	dB, weighted average over section	
Total Adjustments:	-12.4	dB	

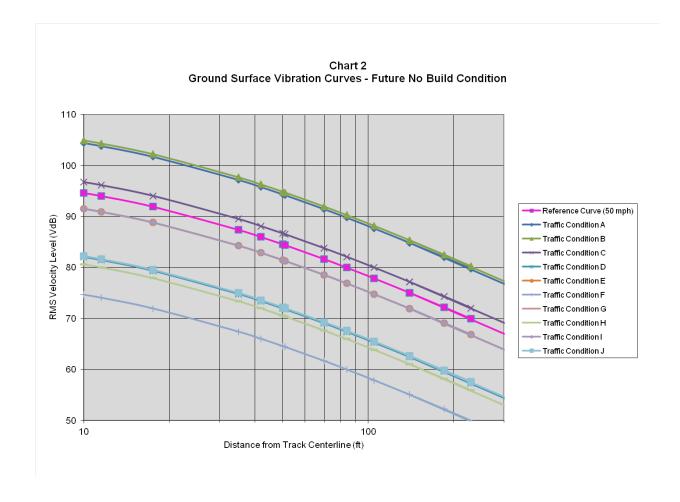


Table 3
Reference Vibration Curve Adjustment Factors (Future Build Condition)

Reference Curve Assumptions:			
Vehicle Type:		red Passenger or Freight	
Speed (mph):	50		
Track:	Continuously Welded Rail (CWR)		
Geology:	Normal soil, ineffic	Normal soil, inefficient at transmitting vibration	
Traffic Condition A (Chicago to Aurora):	
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	60		
Track:	CWR (same as refe	erence case)	
Geology:	Till	149,704 Linear Ft	
	Sand/Gravel/Sed	31,583 Linear Ft	
	Total	181,287 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	1.6	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	8.3	dB, weighted average over section	
Total Adjustments:	9.8	dB	
Traffic Condition B (Aurora to Wyanet):			
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	100		
Track:	CWR (same as refe	· · · · · · · · · · · · · · · · · · ·	
Geology:	Till	299,141 Linear Ft	
	Sand/Gravel/Sed	105,188 Linear Ft	
	Total	404,329 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	6.0	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	7.4	dB, weighted average over section	
Total Adjustments:	13.4	dB	

Table 3 (continued)

	rable 3 (continued)			
Traffic Condition C (Traffic Condition C (Wyanet to Silvis):			
Train Type:	Locomotive Powered Freight and Passenger			
Speed (mph):	100			
Track:	CWR (same as reference case)			
Geology:	Till	118,423 Linear Ft		
	Sand/Gravel/Sed	110,877 Linear Ft		
	Total	229,300 Linear Ft		
Reference Curve Adju	stment Factors:	,		
Increased Speed:	6.0	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
	0	dB, for sand/gravel/sediment (inefficient soil)		
	5.2	dB, weighted average over section		
Total Adjustments:	11.2	dB		
Traffic Condition D		=		
Train Type:		red Freight and Passenger		
Speed (mph):	40	100 1 101811		
Track:	CWR (same as ref	erence case)		
Geology:	Till	41,934 Linear Ft		
Georogy.	Sand/Gravel/Sed	,		
	Total	56,371 Linear Ft		
Reference Curve Adju		30,371 Emedi 1 t		
Increased Speed:	-1.9	dB, calc. per FTA guidance		
Track:	0	dB		
Geology:	10	dB, for till (efficient soil)		
Geology.	0	dB, for sand/gravel/sediment (inefficient soil)		
	7.4	dB, weighted average over section		
Total Adjustments:	5.5	dB		
Traffic Condition E (
Train Type:		red Freight and Passenger		
Speed (mph):	100	red i leight and i assenger		
Track:	CWR (same as ref	erence case)		
Geology:	Till	0 Linear Ft		
Geology.	Sand/Gravel/Sed	268,415 Linear Ft		
	Total	268,415 Linear Ft		
Reference Curve Adju		200,713 Linear I t		
Increased Speed:	6.0	dB, calc. per FTA guidance		
Track:	0.0	dB guidance		
Geology:	10	dB, for till (efficient soil)		
Geology.	0	dB, for sand/gravel/sediment (inefficient soil)		
	0.0	dB, weighted average over section		
Total Adjustments				
Total Adjustments:	6.0	dB		

Table 3 (continued)

rable 3 (continued)		
Traffic Condition F (Iowa City):	
Train Type:	Locomotive Powered Freight and Passenger	
Speed (mph):	40	
Track:	CWR (same as reference case)	
Geology:	Till	0 Linear Ft
	Sand/Gravel/Sed	14,129 Linear Ft
	Total	14,129 Linear Ft
Reference Curve Adjus		- ',',
Increased Speed:	-1.9	dB, calc. per FTA guidance
Track:	0	dB
Geology:	10	dB, for till (efficient soil)
	0	dB, for sand/gravel/sediment (inefficient soil)
	0.0	dB, weighted average over section
Total Adjustments:	-1.9	dB
Traffic Condition G (
Train Type:		red Freight and Passenger
Speed (mph):	100	red i reight und i ussenger
Track:	CWR (same as ref	erence case)
Geology:	Till	0 Linear Ft
deology.	Sand/Gravel/Sed	589,517 Linear Ft
	Total	589,517 Linear Ft
Poforonco Curvo Adina		369,317 Linear 1 t
Reference Curve Adjust	6.0	dD colo per ETA quidence
Increased Speed: Track:	0.0	dB, calc. per FTA guidance dB
Geology:	10	dB, for till (efficient soil)
	0	dB, for sand/gravel/sediment (inefficient soil)
TD 4 1 A 1' 4	0.0	dB, weighted average over section
Total Adjustments:	6.0	dB
Traffic Condition H (
Train Type:		red Freight and Passenger
Speed (mph):	40	
Track:	CWR (same as ref	· · · · · · · · · · · · · · · · · · ·
Geology:	Till	0 Linear Ft
	Sand/Gravel/Sed	73,699 Linear Ft
	Total	73,699 Linear Ft
Reference Curve Adjus	stment Factors:	
Increased Speed:	-1.9	dB, calc. per FTA guidance
Track:	0	dB
Geology:	10	dB, for till (efficient soil)
	0	dB, for sand/gravel/sediment (inefficient soil)
	0.0	dB, weighted average over section
Total Adjustments:	-1.9	dB

Table 3 (continued)

Traffic Condition I (W F	Des Moines to Counc	cil Bluffs):	
Traffic Condition I (W. Des Moines to Council Bluffs):			
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	100		
Track:	CWR (same as refe	ference case)	
Geology:	Till	0 Linear Ft	
	Sand/Gravel/Sed	653,157 Linear Ft	
	Total	653,157 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	6.0	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	0.0	dB, weighted average over section	
Total Adjustments:	6.0	dB	
Traffic Condition J (Council Bluffs to Omaha):			
Train Type:	Locomotive Powered Freight and Passenger		
Speed (mph):	40		
Track:	CWR (same as refe	erence case)	
Geology:	Till	16,353 Linear Ft	
	Sand/Gravel/Sed	86,094 Linear Ft	
	Total	102,447 Linear Ft	
Reference Curve Adjus	stment Factors:		
Increased Speed:	-1.9	dB, calc. per FTA guidance	
Track:	0	dB	
Geology:	10	dB, for till (efficient soil)	
	0	dB, for sand/gravel/sediment (inefficient soil)	
	1.6	dB, weighted average over section	
Total Adjustments:	-0.3	dB	

