the VOLPE center

NCDOT "Sealed" High Speed Rail Corridor Analysis Update

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The 2008 Rail Corridor Safety Conference

May 14, 2008

U.S. Department of Transportation
Research and Innovative Technology Administration

Purpose

The purpose of this assessment is to update the 2001 Report to Congress to document the potential lives saved, and result of the State of NC's phase I, II, and III "Sealed Corridor" Program, and improvements completed through December 2004 at highway-rail grade crossing

Also, determine whether the resulting reduction in accidents is sustainable through the year 2010 when train speeds along the corridor are projected to achieve 110 mph.

Proposed Southeast
High Speed Rail Corridor

Scope

The Corridor was divided into three different phases, based on location over 173.3 track miles.

Phase 1: Charlotte to Greensboro
100 grade crossings

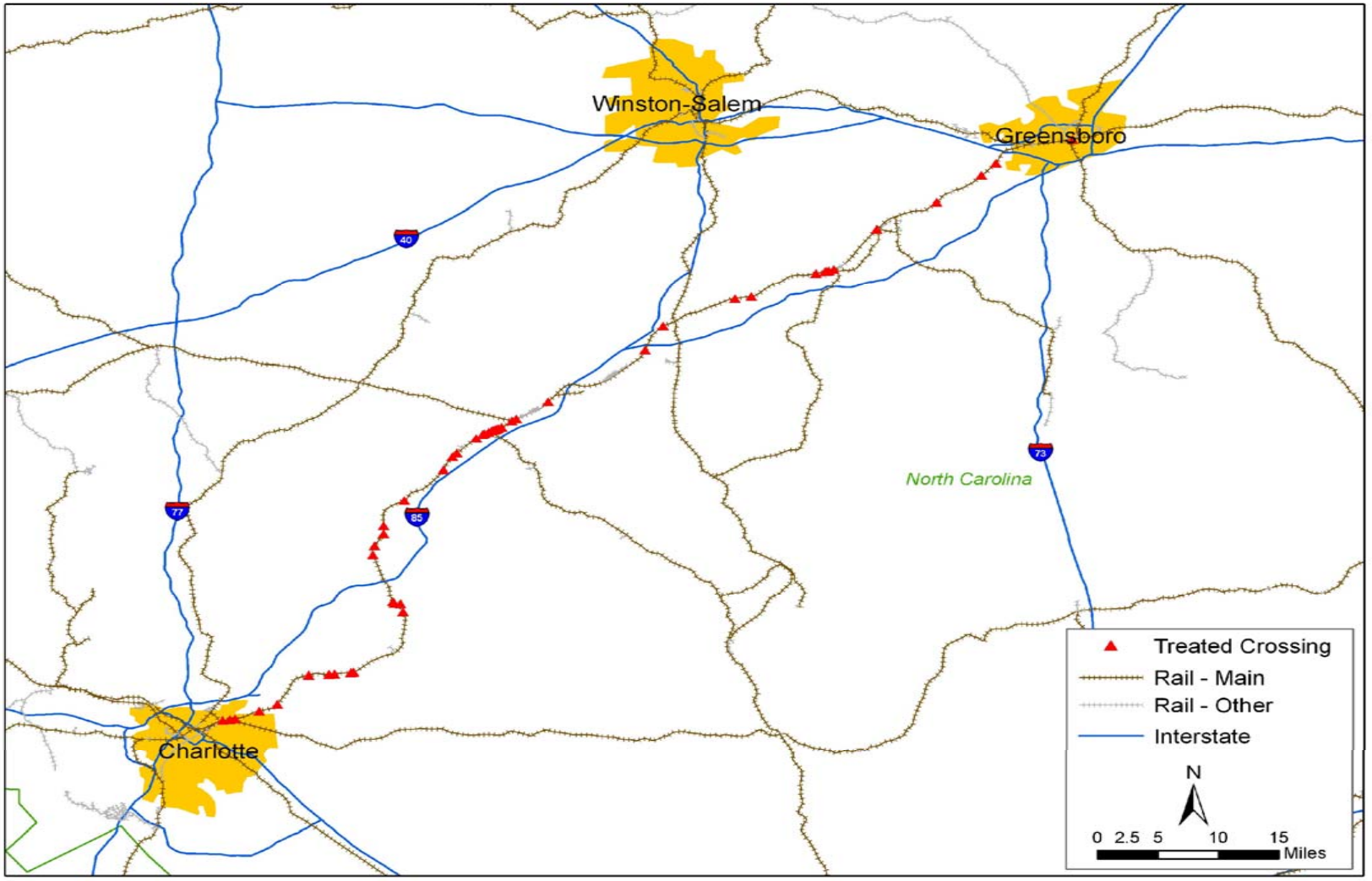
Phase 2: Greensboro to Cary
96 grade crossings

Phase 3: Cary to Raleigh
9 grade crossings

Phase I Report to Congress Results

- The analysis determined that five potential lives were saved since the implementation of the Phase I portion of the “Sealed Corridor” program
- Effectiveness of treatments was sustained
- Predictions indicated that additional lives will be saved over a five-year post-improvement period
- Predictions indicated a sustainable risk reduction despite planned increases in exposure and train speed

GIS Map of Phase I, Report to Congress
52 Treated Crossings as of September 2000



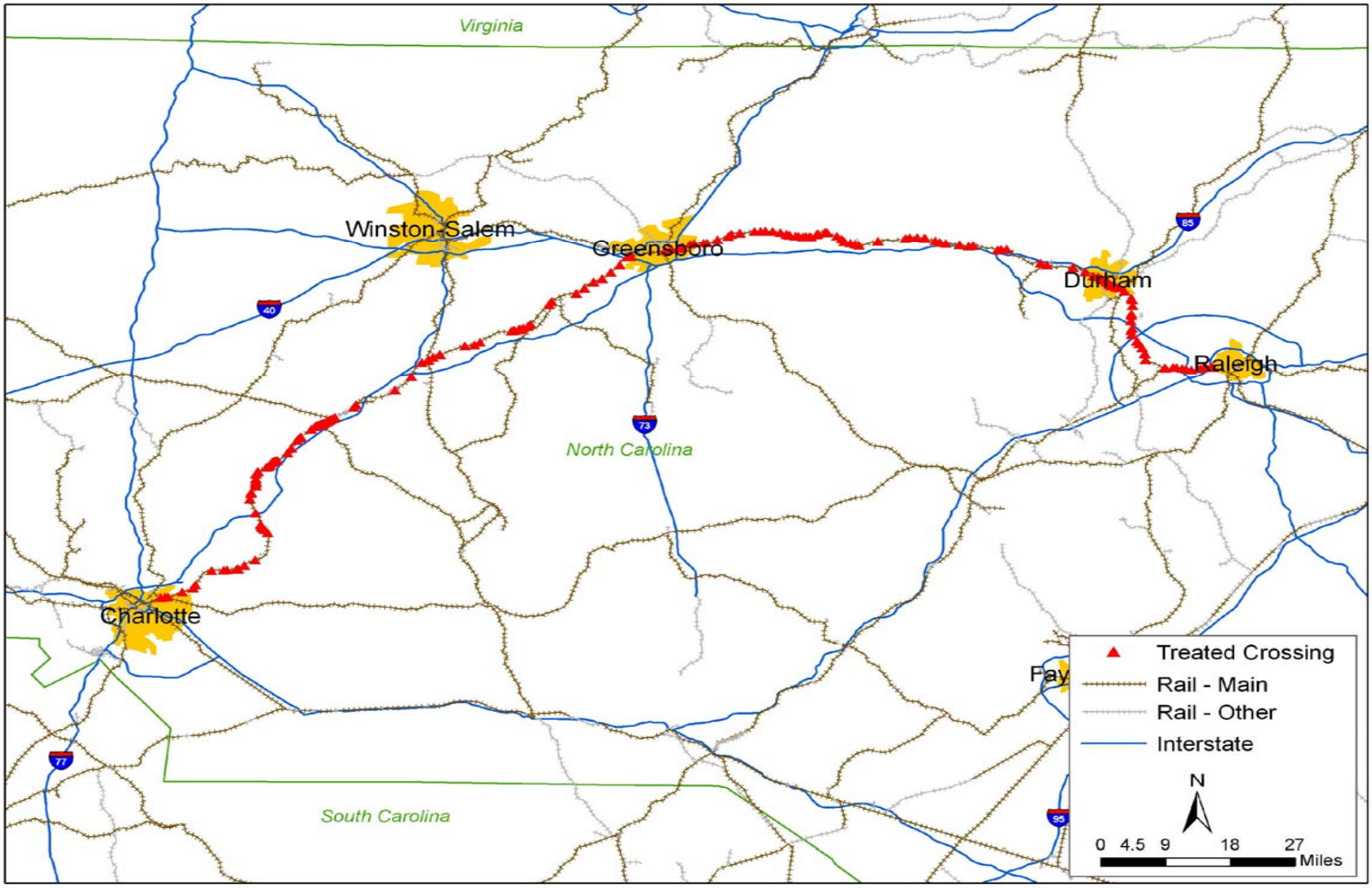
Example 1 - Treated Crossings

Blue Ridge Rd – Four Quadrant Gates with Median Barrier, Raleigh

Example 2 - Treated Crossings

East 13th St – Closure, Lexington

Current Assessment - Phase I, II, and III, 189 Treated Crossings as of September 2004



Previous and Current Findings

Report to Congress Findings

Year	Phase	Total crossings	Total treated	Total not treated
1995-2000	I	100	52	48

Current Project - Phase I,II, and III

2000-2004	I	103	93	10
2000-2004	II	96	87	9
2000-2004	III	9	9	0
1987-2004	Total	208	189	19

Fatal Incident History on Entire Corridor

Phase	Fatal Incident	Fatalities	1987-2000	2001-2004
I	29	37	33	3
II	12	17	16	1
III	1	1	0	1
Total	**42**	**55**	**49**	**5**

Methodologies Employed in 2001 Report to Congress

Fatal Crash Analysis (Phase I, 52 crossings)

- All crashes were used for the analysis of the "Sealed Corridor", but only crossings with fatal crashes were selected.
- From 1987 to treatment a ***fatality-rate*** (holding the warning device constant for pre-treatment period) was calculated using the crash history for each of the crossings
- From time of "Sealed Corridor" treatment through December 2000, actual experience was compared with the ***pre-treatment fatality rate*** to determine potential **"Lives Saved"**

Phase I – Report to Congress
Fatal Crash Analysis Results

Phase I			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives Saved"
4-Quad Gates	W. Craighead Road	374.39	3	99	0	69	2.091
Video	Henderson Street	336.24	3	93	0	27	0.871
4-Quad & TCD	Sugar Creek Road	374.02	1	104	0	64	0.615
Closure	C Avenue	335.4	1	116	0	40	0.345
Long Arm Gate	Lower Lake Road	311.99	2	160	0	8	0.1
Closure	Ebenezer Road	348.06	1	159	0	9	0.057
TCD	Hickory Ridge Road	370.71	1	161	0	7	0.043
TCD	Corban Avenue	356.3	1	150	0	18	0.12
Closure	Lumber Street	334.85	3	145	0	23	0.476
Closure	Knox Street	334.45	3	124	0	44	1.065
Total			19		0		5.783

Current Project Assessment
Fatal Crash Analysis Results

Summary of "Lived Saved" Analysis by Warning Device Type

Phase I, II and III	Pre-Treatment		Post-Treatment		
Warning Device Improvement	Fatalities	Ave Time Frame (Months)	Fatalities	Ave Time Frame (Months)	Analysis of "Lives Saved"
Closure Subtotal	15	142	0	68	8.727
4-Quadrant Gate Subtotal	14	139	2	49	6.013
Long Gate Subtotal	16	135	1	36	4.012
Median Barrier Subtotal	3	157	0	51	0.988
Totals	48		3		19.74

Closure - CL
Four Quadrant Gate – 4Q
Long Gate – LG
Median Barrier – MB
Health Monitoring – HM

Current Project Assessment
Fatal Crash Analysis Results

Phase I,II, and III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives Saved"
CL	C Avenue	335.4	1	116	0	88	0.759
CL	E. 13th Ave	317.84	1	166	0	38	0.229
CL	Ebenezer Rd	348.06	1	159	0	57	0.358
CL	Lumber Street	334.85	3	145	0	71	1.469
CL	Knox Street	334.45	3	124	0	92	2.226
CL	Bashford Rd	163.1	4	172	0	33	0.767
CL	Ashe Street	68.66	1	109	0	95	0.872
CL	Turner Xing	370.21	1	63	0	129	2.048
Subtotal			15		0		8.727

Closure - CL

Current Project Assessment
Fatal Crash Analysis Results

Phase I,II, and III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives Saved"
4Q	Henderson St	336.24	4	93	0	49	2.108
4Q	Winecoff School Rd	352.72	1	185	0	17	0.092
4Q	Main St	21.36	1	179	0	25	0.140
4Q	Fifth St*	31.64	0	147	1	21	-1.000
4Q	Gilmer St	21.86	1	185	0	19	0.103
Subtotal			7		1		1.442

*Train struck an automobile

Four Quadrant Gate – 4Q

Current Project Assessment
Fatal Crash Analysis Results

Phase I,II,III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives
4Q/MB/HM	Sugar Creek St	374.02	1	104	0	112	1.077
4Q/MB/HM	E. 11th St.	332.94	1	153	0	39	0.255
Subtotal			2		0		1.332

Phase I,II,III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives
4Q/HM	Salem St./ NC-109	305.97	0	148	1	56	-1.000
4Q/HM	W. Craighead Rd*	374.39	3	99	0	117	3.545
4Q/HM	E. Kerr St./ SR-2052	333.57	2	98	0	34	0.694
Subtotal			5		1		3.329

* Double suicide (trespassing)

Four Quadrant Gate – 4Q
Median Barrier – MB
Health Monitoring – HM

Current Project Assessment
Fatal Crash Analysis Results

Phase I,II,III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives
LG/HM	E. Centerview Dr.	343.2	1	159	0	46	0.289
LG/HM	E. Mills St.	345.69	2	159	0	42	0.528
LG/HM	E. 18th St.	347.55	1	163	0	41	0.252
Subtotal			4		0		1.069

Phase I,II,III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives
LG	Lower Lake Rd	311.99	2	160	0	50	0.625
LG	Powell Drive*	161.33	0	157	1	42	-1.000
LG	Hopson Rd	64.57	3	106	0	38	1.792
LG	Plum Street	56.4	1	195	0	9	0.046
LG	Mt. Herman Church/S	47.07	1	109	0	35	0.321
LG	Fair bault lane	41.2	1	85	0	35	0.412
LG	Randhurst Rd	7.6	2	71	0	37	1.042
Subtotal			10		1		2.522

*Woman attempted to flag the train

Long Gate – LG
Health Monitoring – HM

Current Project Assessment
Fatal Crash Analysis Results

Phase I,II,III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	"Lives Saved"
MB/HM	Hickory Ridge Rd	370.71	1	149	0	55	0.369
MB/HM	Corban Avenue	356.3*	1	150	0	66	0.440
MB/HM	Ellis Rd	57.57	1	173	0	31	0.179
subtotal			3		0		0.988

Phase I,II,III			Pre-Treatment		Post-Treatment		
Improvement	Crossing Name	Mile Post	Fatalities	Time Frame (Months)	Fatalities	Time Frame (Months)	Analysis of "Lives
LG/MB/HM	E. 22nd St./ SR-1254	347.28	1	147	0	50	0.340
LG/MB/HM	E. Council St.	333.77	1	111	0	9	0.081
Subtotal			2		0		0.421

*Woman suicidal

Long Gate – LG
Median Barrier – MB
Health Monitoring – HM

Current Project Assessment
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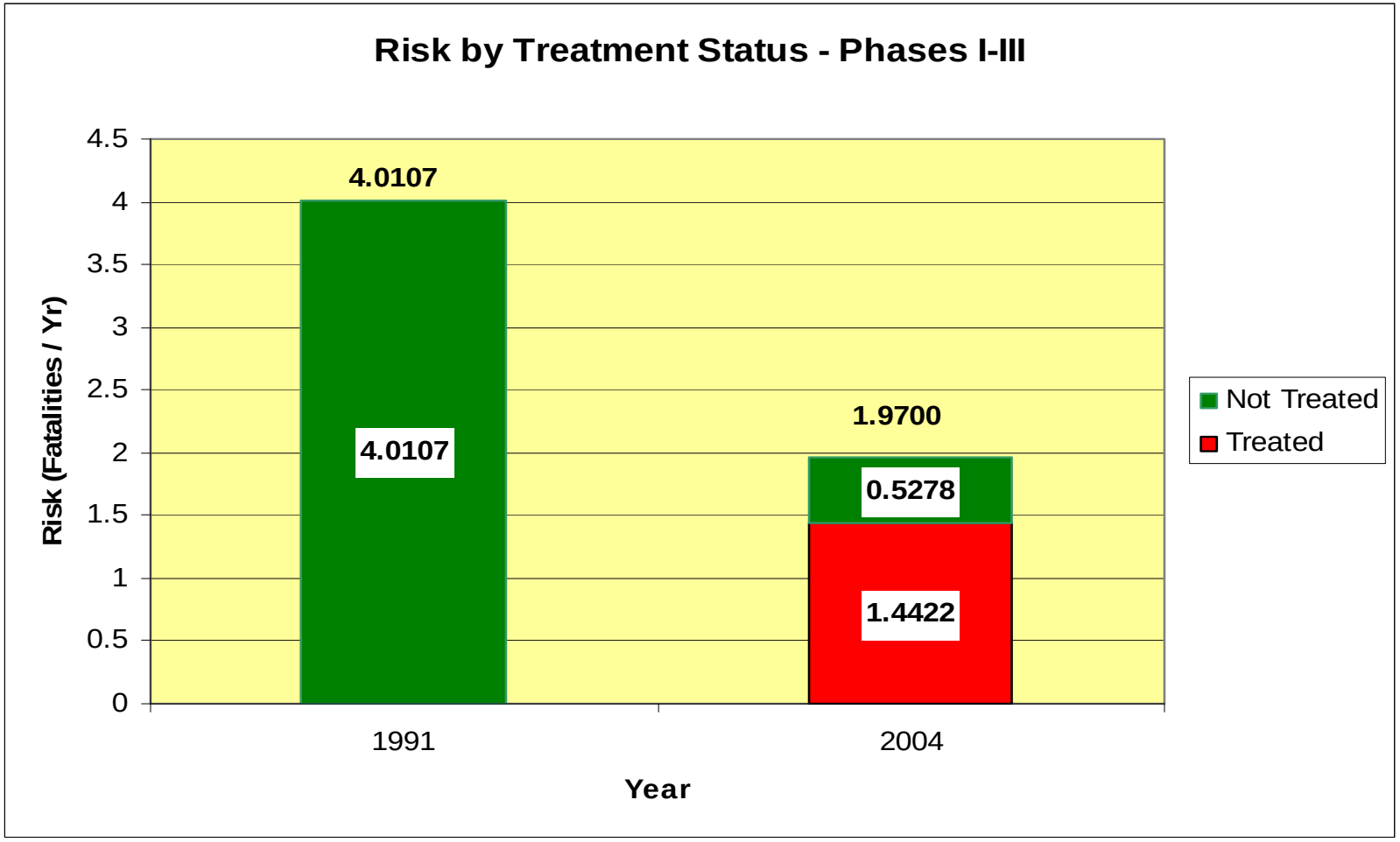
Framework for the Predictive Analysis

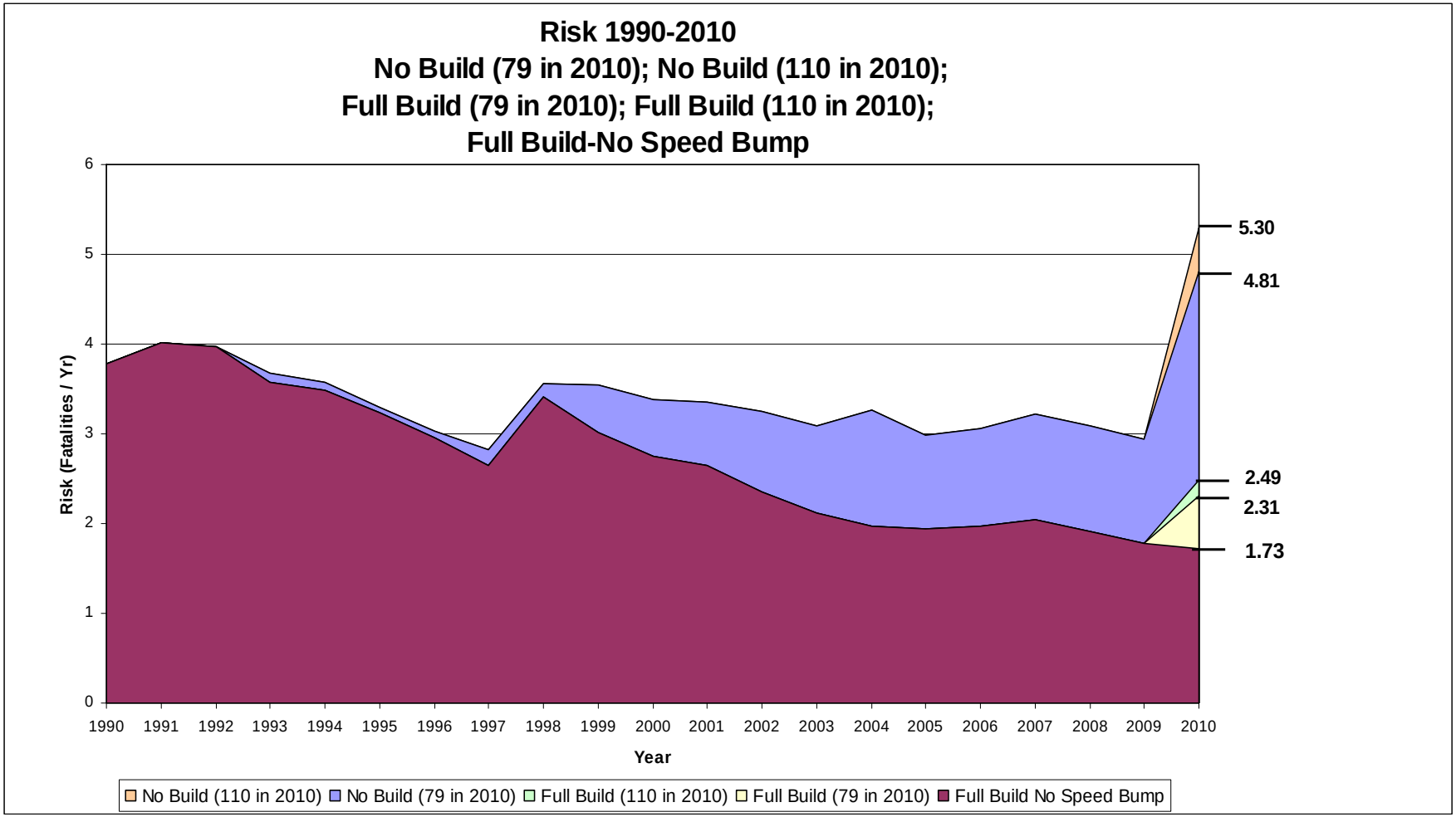
Enhanced Fatal Accident Prediction Model

- Estimated five year pre-and post-treatment periods for warning device effectiveness calculations
- Populated year-by-year input variables from both the FRA Inventory and NCDOT data into the model
- The model calculates the effect of the five-year actual incident history for prediction of future incidents
- In the model after the year 2004, we assumed 2% per year growth in AADT and Train Frequency
- For 2010 only, two main track, and train speeds increase to 79 and 110 mph respectively.

Risk Reduction through the year 2004



Risk Reduction through the year 2010



Findings / Conclusions

- Nineteen lives have been potentially saved since the implementation of the “Sealed Corridor” program through 2004
- Approximately 52% of the risk would be eliminated. Therefore, effectiveness of treatments has been sustained
- Predictions indicate that additional lives will be saved with the implementation of Phase IV, Private Crossing Safety Initiative (PCSI)
- Predictions still indicate a sustainable risk reduction despite planned increases in vehicle exposure, train frequency and speed

Questions ?

Thank You

For additional information, please contact

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