

Grayling Region I-75 Access Project

TIGER Grant Application

Benefit Summary Matrix

Current Status/Baseline & Problem to be Addressed	Changes to Baseline	Type of Impact/Benefit	Population Affected by Impact/Benefit	Economic Benefit	Summary of Results	Page Reference in BCA
Half interchange. Access between North Down River Road and I-75 only to/from north.	Full access interchange. Add access to/from south.	Reduced driving distance and associated reduced time and emissions.	Motorists traveling between north/east portions of Grayling region and areas to the south	Monetized value of reduced vehicle operating costs, travel times, and emissions.	\$37,718,025 28,569 tons of carbon	Tab 7
In-town congestion and delay at intersections.	Improved intersections; more efficient route, reducing congestion.	Reduced delay time.	Motorists traveling through and around Grayling; traffic counts per Grayling Transportation Study.	Monetized value of reduced travel time.	\$17,380,066	Tabs 5, 8
Load limits for North Down River Road bridge over E. Branch AuSable River require commercial traffic to detour.	New bridge with adequate capacity.	Reduced driving distance and associated reduced time and emissions.	Commercial (and military) vehicles traveling between east and west portions of region.	Monetized value of reduced vehicle operating costs, travel times, and emissions.	\$271,770 434 tons of carbon	Tab 9
Low safe speeds due to geometry and condition of Wilcox Bridge Road	Improvements to Wilcox Bridge Road increase safe speed by 10 mph or more.	Reduced travel time.	Motorists traveling via Wilcox Bridge Road.	Monetized value of reduced travel time.	\$435,834	Tab 10
Accidents due to current road conditions and delay in emergency response due to half interchange.	Safer roadways and improved access to accidents.	Reduced number and severity of accidents.	Number of accidents provided by Grayling Transportation Study.	Monetized value of reduced accidents, injuries, and severity of injuries.	\$23,879,775	Tabs 6, 11
Half interchange requires patients bound for emergency room from south to drive through town.	Full access interchange. Faster access to hospital from south.	Reduced severity/acuity of ER patients' conditions.	Number of ER visits per origin provided by Mercy Hospital Grayling.	Monetized value of reduced severity/acuity for most severe patients.	\$146,280,837	Tab 12
Limited and discontinuous bicycle/pedestrian facilities.	More bicycle facilities and increased connectivity.	Increased mobility, health, and recreation; decreased auto use.	Bicyclists and potential bicyclists.	Monetized value of increased mobility, health, and recreation; and decreased auto use.	\$19,305,066	Tab 13
Existing roads and bridges deteriorating and in need of intensive maintenance and rehabilitation/replacement.	New, durable, facilities with adequate design capacity.	Precluded major maintenance.	Roads proposed to be improved by project.	Value of precluded maintenance.	\$1,022,121	Tab 14

Note:

Present value of benefits over 20 years at 3% discount rate.

Grayling Region I-75 Access Project
TIGER Grant Application
Summary of Benefits & Costs

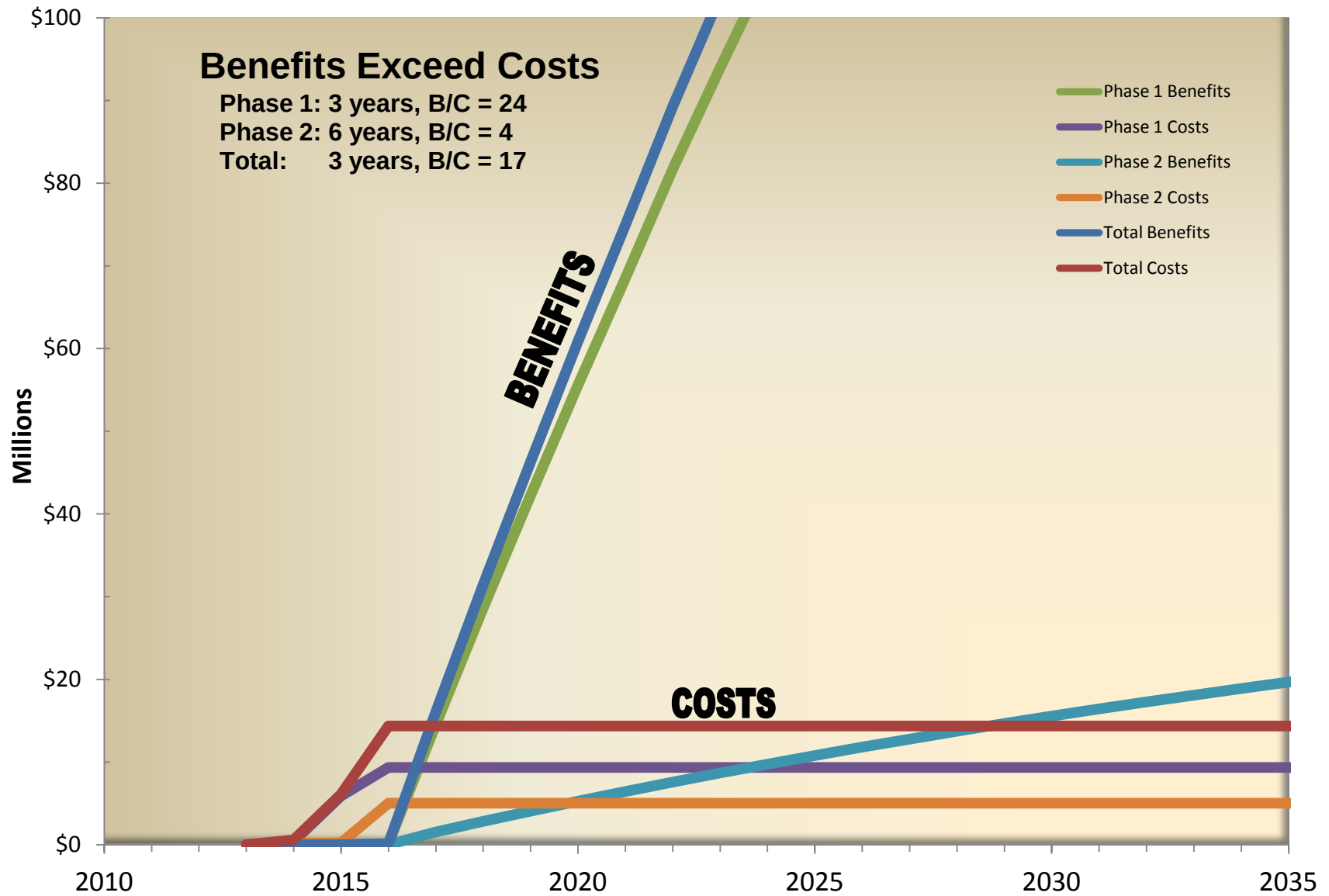
Phase 1													Costs			
Present Value of Benefits																
Year	Distance/Time Reduced by NDRR Interchange	Delay Reduced at Intersections	Commercial Distance/Time Reduced by NDRR Bridge	Time Reduced by Wilcox Bridge Road Improvements	Safety Improvements	Emergency Room Response Time	Bicycle Facilities	Reduced Maintenance	Total PV Benefits	Cumulative Total PV Benefits	Present Value (3% Discount Rate)	Cumulative PV of Costs (3%)	Present Value (7% Discount Rate)			
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$393,664	\$393,664	\$393,664
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,653,994	\$5,489,314	\$5,882,979
2016	\$0	\$0	\$0	\$24,821	\$0	\$0	\$108,462	\$3,596	\$136,878	\$136,878	\$136,878	\$136,878	\$136,878	\$3,662,156	\$3,451,933	\$3,934,912
2017	\$2,229,127	\$1,030,329	\$0	\$24,366	\$1,455,951	\$9,545,990	\$105,303	\$3,491	\$14,394,557	\$14,531,435	\$14,531,435	\$14,531,435	\$14,531,435	\$0	\$0	\$0
2018	\$2,188,903	\$1,011,445	\$0	\$23,919	\$1,413,545	\$9,267,952	\$102,236	\$96,592	\$14,104,591	\$28,636,026	\$28,636,026	\$28,636,026	\$28,636,026	\$0	\$0	\$0
2019	\$2,149,405	\$992,907	\$0	\$23,481	\$1,372,373	\$8,998,011	\$99,258	\$3,291	\$13,638,727	\$42,274,753	\$42,274,753	\$42,274,753	\$42,274,753	\$0	\$0	\$0
2020	\$2,110,620	\$974,710	\$0	\$23,050	\$1,332,401	\$8,735,933	\$96,367	\$3,195	\$13,276,276	\$55,551,029	\$55,551,029	\$55,551,029	\$55,551,029	\$0	\$0	\$0
2021	\$2,072,773	\$956,845	\$0	\$22,628	\$1,293,594	\$8,481,489	\$93,560	\$3,102	\$12,923,990	\$68,475,020	\$68,475,020	\$68,475,020	\$68,475,020	\$0	\$0	\$0
2022	\$2,035,487	\$939,308	\$0	\$22,213	\$1,255,916	\$8,234,455	\$90,835	\$634,539	\$13,212,754	\$81,687,773	\$81,687,773	\$81,687,773	\$81,687,773	\$0	\$0	\$0
2023	\$1,998,986	\$922,093	\$0	\$21,806	\$1,219,336	\$7,994,617	\$88,189	\$2,924	\$12,247,951	\$93,935,724	\$93,935,724	\$93,935,724	\$93,935,724	\$0	\$0	\$0
2024	\$1,963,027	\$905,193	\$0	\$21,407	\$1,183,821	\$7,761,764	\$85,621	\$2,839	\$11,923,671	\$105,859,396	\$105,859,396	\$105,859,396	\$105,859,396	\$0	\$0	\$0
2025	\$1,927,826	\$888,603	\$0	\$21,014	\$1,149,341	\$7,535,693	\$83,127	\$2,756	\$11,608,360	\$117,467,755	\$117,467,755	\$117,467,755	\$117,467,755	\$0	\$0	\$0
2026	\$1,893,146	\$872,317	\$0	\$20,629	\$1,115,855	\$7,315,207	\$80,706	\$2,676	\$11,301,545	\$128,769,301	\$128,769,301	\$128,769,301	\$128,769,301	\$0	\$0	\$0
2027	\$1,859,197	\$856,329	\$0	\$20,251	\$1,083,364	\$7,102,113	\$78,355	\$2,598	\$11,003,208	\$139,772,508	\$139,772,508	\$139,772,508	\$139,772,508	\$0	\$0	\$0
2028	\$1,825,531	\$840,533	\$0	\$19,877	\$1,051,810	\$6,896,226	\$76,073	\$2,522	\$10,712,572	\$150,485,080	\$150,485,080	\$150,485,080	\$150,485,080	\$0	\$0	\$0
2029	\$1,792,474	\$825,028	\$0	\$19,511	\$1,021,175	\$6,695,365	\$73,857	\$2,449	\$10,429,858	\$160,914,939	\$160,914,939	\$160,914,939	\$160,914,939	\$0	\$0	\$0
2030	\$1,760,117	\$809,809	\$0	\$19,151	\$991,432	\$6,500,355	\$71,706	\$2,377	\$10,154,946	\$171,069,885	\$171,069,885	\$171,069,885	\$171,069,885	\$0	\$0	\$0
2031	\$1,728,244	\$794,870	\$0	\$18,798	\$962,555	\$6,311,024	\$69,617	\$2,308	\$9,887,417	\$180,957,301	\$180,957,301	\$180,957,301	\$180,957,301	\$0	\$0	\$0
2032	\$1,697,045	\$780,208	\$0	\$18,451	\$934,520	\$6,127,208	\$67,590	\$2,241	\$9,627,262	\$190,584,563	\$190,584,563	\$190,584,563	\$190,584,563	\$0	\$0	\$0
2033	\$1,666,314	\$765,816	\$0	\$18,110	\$907,300	\$5,948,746	\$65,621	\$2,176	\$9,374,740	\$199,958,646	\$199,958,646	\$199,958,646	\$199,958,646	\$0	\$0	\$0
2034	\$1,636,233	\$751,689	\$0	\$17,776	\$880,874	\$5,775,481	\$63,710	\$2,112	\$9,127,876	\$209,086,522	\$209,086,522	\$209,086,522	\$209,086,522	\$0	\$0	\$0
2035	\$1,606,603	\$737,821	\$0	\$17,448	\$855,218	\$5,607,263	\$61,854	\$2,051	\$8,888,260	\$217,974,782	\$217,974,782	\$217,974,782	\$217,974,782	\$0	\$0	\$0
2036	\$1,576,966	\$724,212	\$0	\$17,127	\$830,308	\$5,443,945	\$60,053	\$1,991	\$8,654,602	\$226,629,384	\$226,629,384	\$226,629,384	\$226,629,384	\$0	\$0	\$0
	\$37,718,025	\$17,380,066	\$0	\$435,834	\$22,310,700	\$146,280,837	\$1,722,098	\$781,825	\$226,629,384	\$226,629,384	\$226,629,384	\$226,629,384	\$226,629,384	\$9,709,814	\$9,334,912	\$8,876,440
Benefit									=	\$226,629,384				=	24.3	
Cost										\$9,334,912						

Phase 2													Costs			
Present Value of Benefits																
Year	Distance/Time Reduced by NDRR Interchange	Delay Reduced at Intersections	Commercial Distance/Time Reduced by NDRR Bridge	Time Reduced by Wilcox Bridge Road Improvements	Safety Improvements	Emergency Room Response Time	Bicycle Facilities	Reduced Maintenance	Total PV Benefits	Cumulative Total PV Benefits	Present Value (3% Discount Rate)	Cumulative PV of Costs (3%)	Present Value (7% Discount Rate)			
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$183,374	\$183,374	\$183,374
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$44,242	\$42,954	\$226,328
2016	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,087,885	\$4,795,820	\$5,022,148
2017	\$0	\$0	\$16,007	\$0	\$102,395	\$0	\$1,195,852	\$229,701	\$1,543,954	\$1,543,954	\$1,543,954	\$1,543,954	\$1,543,954	\$0	\$0	\$5,022,148
2018	\$0	\$0	\$15,723	\$0	\$99,412	\$0	\$1,161,022	\$888	\$1,277,045	\$2,820,999	\$2,820,999	\$2,820,999	\$2,820,999	\$0	\$0	\$5,022,148
2019	\$0	\$0	\$15,444	\$0	\$96,517	\$0	\$1,127,205	\$863	\$1,240,029	\$4,061,028	\$4,061,028	\$4,061,028	\$4,061,028	\$0	\$0	\$5,022,148
2020	\$0	\$0	\$15,170	\$0	\$93,706	\$0	\$1,094,374	\$837	\$1,204,088	\$5,265,116	\$5,265,116	\$5,265,116	\$5,265,116	\$0	\$0	\$5,022,148
2021	\$0	\$0	\$14,905	\$0	\$90,976	\$0	\$1,062,499	\$813	\$1,169,194	\$6,434,309	\$6,434,309	\$6,434,309	\$6,434,309	\$0	\$0	\$5,022,148
2022	\$0	\$0	\$14,642	\$0	\$88,327	\$0	\$1,031,553	\$789	\$1,135,311	\$7,569,620	\$7,569,620	\$7,569,620	\$7,569,620	\$0	\$0	\$5,022,148
2023	\$0	\$0	\$14,386	\$0	\$85,754	\$0	\$1,001,507	\$765	\$1,102,414	\$8,672,034	\$8,672,034	\$8,672,034	\$8,672,034	\$0	\$0	\$5,022,148
2024	\$0	\$0	\$14,133	\$0	\$83,256	\$0	\$972,337	\$744	\$1,070,471	\$9,742,505	\$9,742,505	\$9,742,505	\$9,742,505	\$0	\$0	\$5,022,148
2025	\$0	\$0	\$13,886	\$0	\$80,831	\$0	\$944,017	\$722	\$1,039,456	\$10,781,961	\$10,781,961	\$10,781,961	\$10,781,961	\$0	\$0	\$5,022,148
2026	\$0	\$0	\$13,641	\$0	\$78,477	\$0	\$916,521	\$701	\$1,009,341	\$11,791,302	\$11,791,302	\$11,791,302	\$11,791,302	\$0	\$0	\$5,022,148
2027	\$0	\$0	\$13,403	\$0	\$76,191	\$0	\$889,826	\$681	\$980,101	\$12,771,403	\$12,771,403	\$12,771,403	\$12,771,403	\$0	\$0	\$5,022,148
2028	\$0	\$0	\$13,165	\$0	\$73,972	\$0	\$863,909	\$661	\$951,707	\$13,723,110	\$13,723,110	\$13,723,110	\$13,723,110	\$0	\$0	\$5,022,148
2029	\$0	\$0	\$12,931	\$0	\$71,818	\$0	\$838,747	\$642	\$924,138	\$14,647,247	\$14,647,247	\$14,647,247	\$14,647,247	\$0	\$0	\$5,022,148
2030	\$0	\$0	\$12,704	\$0	\$69,726	\$0	\$814,317	\$623	\$897,370	\$15,544,617	\$15,544,617	\$15,544,617	\$15,544,617	\$0	\$0	\$5,022,148
2031	\$0	\$0	\$12,478	\$0	\$67,695	\$0	\$790,599	\$605	\$871,377	\$16,415,995	\$16,415,995	\$16,415,995	\$16,415,995	\$0	\$0	\$5,022,148
2032	\$0	\$0	\$12,259	\$0	\$65,723	\$0	\$767,572	\$587	\$846,141	\$17,262,136	\$17,262,136	\$17,262,136	\$17,262,136	\$0	\$0	\$5,022,148
2033	\$0	\$0	\$12,041	\$0	\$63,809	\$0	\$745,216	\$570	\$821,636	\$18,083,772	\$18,083,772	\$18,083,772	\$18,083,772	\$0	\$0	\$5,022,148
2034	\$0	\$0	\$11,829	\$0	\$61,950	\$0	\$723,510	\$554	\$797,843	\$18,881,615	\$18,881,615	\$18,881,615	\$18,881,615	\$0	\$0	\$5,022,148
2035	\$0	\$0	\$11,619	\$0	\$60,146	\$0	\$702,437	\$536	\$774,740	\$19,656,355	\$19,656,355	\$19,656,355	\$19,656,355	\$0	\$0	\$5,022,148
2036	\$0	\$0	\$11,405	\$0	\$58,394	\$0	\$681,978	\$522	\$752,299	\$20,408,654	\$20,408,654	\$20,408,654	\$20,408,654	\$0	\$0	\$5,022,148
	\$0	\$0	\$271,770	\$0	\$1,569,075	\$0	\$18,324,999	\$242,809	\$20,408,654	\$20,408,654	\$20,408,654	\$20,408,654	\$20,408,654	\$5,315,502	\$5,022,148	\$4,668,678
Benefit									=	\$20,408,654				=	4.1	
Cost										\$5,022,148						

Total													Costs			
Present Value of Benefits														Costs		
	Distance/Time Reduced by NDRR Interchange	Delay Reduced at Intersections	Commercial Distance/Time Reduced by NDRR Bridge	Time Reduced by Wilcox Bridge Road Improvements	Safety Improvements	Emergency Room Response Time	Bicycle Facilities	Reduced Maintenance	Total PV Benefits	Cumulative Total PV Benefits	Present Value (3% Discount Rate)	Cumulative PV of Costs (3%)	Present Value (7% Discount Rate)			
Year											Cost					
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0			
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$577,038	\$577,038	\$577,038			
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,698,236	\$5,532,268	\$5,109,307			
2016	\$0	\$0	\$0	\$24,821	\$0	\$0	\$108,462	\$3,596	\$136,878	\$136,878	\$8,750,042	\$8,247,753	\$14,357,060			
2017	\$2,229,127	\$1,030,329	\$16,007	\$24,366	\$1,558,346	\$9,545,990	\$130,155	\$233,192	\$15,938,511	\$23,147,025	\$0	\$0	\$14,357,060			
2018	\$2,188,903	\$1,011,445	\$15,723	\$23,919	\$1,512,957	\$9,267,952	\$1,263,257	\$97,480	\$15,381,636	\$31,457,025	\$0	\$0	\$14,357,060			
2019	\$2,149,405	\$992,907	\$15,444	\$23,481	\$1,468,890	\$8,998,011	\$1,226,643	\$4,153	\$14,878,756	\$46,355,781	\$0	\$0	\$14,357,060			
2020	\$2,110,620	\$974,710	\$15,170	\$23,050	\$1,426,107	\$8,735,933	\$1,190,741	\$4,032	\$14,400,364	\$60,816,145	\$0	\$0	\$14,357,060			
2021	\$2,072,773	\$956,645	\$14,905	\$22,628	\$1,384,570	\$8,481,459	\$1,156,059	\$3,915	\$14,093,184	\$74,909,329	\$0	\$0	\$14,357,060			
2022	\$2,035,487	\$939,308	\$14,642	\$22,213	\$1,344,243	\$8,234,455	\$1,122,388	\$635,328	\$14,346,065	\$89,257,393	\$0	\$0	\$14,357,060			
2023	\$1,998,998	\$922,093	\$14,386	\$21,806	\$1,305,000	\$7,994,617	\$1,089,697	\$3,690	\$13,350,965	\$102,607,759	\$0	\$0	\$14,357,060			
2024	\$1,963,027	\$905,193	\$14,133	\$21,407	\$1,267,078	\$7,761,764	\$1,057,958	\$3,583	\$12,994,142	\$115,601,900	\$0	\$0	\$14,357,060			
2025	\$2,927,826	\$888,603	\$13,886	\$21,014	\$1,230,172	\$7,535,693	\$1,027,144	\$3,478	\$12,647,816	\$128,249,716	\$0	\$0	\$14,357,060			
2026	\$1,893,146	\$872,317	\$13,641	\$20,629	\$1,194,342	\$7,316,207	\$997,227	\$3,377	\$12,310,886	\$140,560,602	\$0	\$0	\$14,357,060			
2027	\$1,859,197	\$856,329	\$13,403	\$20,251	\$1,159,595	\$7,103,113	\$968,181	\$3,279	\$11,983,309	\$152,543,911	\$0	\$0	\$14,357,060			
2028	\$1,825,531	\$840,677	\$13,167	\$19,877	\$1,125,878	\$6,894,745	\$938,683	\$3,183	\$11,666,626	\$164,208,193	\$0	\$0	\$14,357,060			
2029	\$1,792,474	\$825,028	\$12,931	\$19,511	\$1,092,992	\$6,695,365	\$912,604	\$3,091	\$11,353,996	\$175,562,186	\$0	\$0	\$14,357,060			
2030	\$1,760,117	\$809,809	\$12,694	\$19,151	\$1,061,158	\$6,500,355	\$886,023	\$3,001	\$11,052,316	\$186,614,502	\$0	\$0	\$14,357,060			
2031	\$1,728,244	\$794,870	\$12,478	\$18,798	\$1,030,250	\$6,311,024	\$860,217	\$2,913	\$10,758,794	\$197,373,296	\$0	\$0	\$14,357,060			
2032	\$1,697,045	\$780,208	\$12,259	\$18,451	\$1,000,243	\$6,127,208	\$835,162	\$2,828	\$10,473,403	\$207,846,699	\$0	\$0	\$14,357,060			
2033	\$1,666,314	\$765,816	\$12,041	\$18,110	\$971,100	\$5,949,745	\$810,637	\$2,746	\$10,195,719	\$218,042,418	\$0	\$0	\$14,357,060			
2034	\$1,636,233	\$751,689	\$11,829	\$17,777	\$942,825	\$5,775,481	\$787,220	\$2,662	\$9,925,719	\$227,968,137	\$0	\$0	\$14,357,060			
2035	\$1,606,603	\$737,823	\$11,619	\$17,448	\$915,364	\$5,607,263	\$764,291	\$2,588	\$9,663,000	\$237,631,137	\$0	\$0	\$14,357,060			
2036	\$1,576,966	\$724,212	\$11,405	\$17,127	\$888,703	\$5,443,945	\$742,030	\$2,513	\$9,406,901	\$247,038,038	\$0	\$0	\$14,357,060			
	\$37,718,025	\$17,380,066	\$271,770	\$435,834	\$23,879,775	\$15,280,839	\$2,004,097	\$1,024,634	\$24,928,038		\$15,025,316	\$14,357,060	\$13,545,118			
Benefit										=	\$247,038,038					
Cost										=	\$14,357,060	17.2				

Grayling Region I-75 Access Project

TIGER Grant Application



Grayling Region I-75 Access Project

TIGER Grant Application

Summary of Emissions Benefits

	Phase 1		Phase 2		Total Project	
	Distance Reduced by NDRR Interchange		Commercial Distance/Time Reduced by NDRR Bridge Improvements		Total Emissions Reduced	
Year	Metric Tons	Value	Metric Tons	Value	Metric Tons	Value
2013	0	\$0	0.0	\$0	0	\$0
2014	0	\$0	0.0	\$0	0	\$0
2015	0	\$0	0.0	\$0	0	\$0
2016	0	\$0	0.0	\$0	0	\$0
2017	1,284	\$34,854	19.5	\$530	1,303	\$35,383
2018	1,298	\$35,952	19.7	\$547	1,318	\$36,498
2019	1,312	\$37,070	20.0	\$564	1,332	\$37,634
2020	1,327	\$38,209	20.2	\$581	1,347	\$38,790
2021	1,342	\$39,662	20.4	\$603	1,362	\$40,265
2022	1,357	\$40,994	20.6	\$623	1,377	\$41,618
2023	1,372	\$42,502	20.9	\$646	1,393	\$43,148
2024	1,387	\$43,885	21.1	\$667	1,408	\$44,553
2025	1,402	\$45,448	21.3	\$691	1,424	\$46,139
2026	1,418	\$46,885	21.6	\$713	1,440	\$47,598
2027	1,434	\$48,506	21.8	\$737	1,456	\$49,243
2028	1,450	\$49,991	22.0	\$760	1,472	\$50,751
2029	1,466	\$51,504	22.3	\$783	1,488	\$52,287
2030	1,482	\$53,206	22.5	\$809	1,504	\$54,015
2031	1,498	\$54,775	22.8	\$833	1,521	\$55,608
2032	1,514	\$56,538	23.0	\$859	1,537	\$57,398
2033	1,531	\$58,166	23.3	\$884	1,554	\$59,050
2034	1,548	\$59,992	23.5	\$912	1,572	\$60,904
2035	1,565	\$61,680	23.8	\$938	1,589	\$62,618
2036	<u>1,582</u>	<u>\$62,359</u>	<u>24.1</u>	<u>\$948</u>	<u>1,606</u>	<u>\$63,307</u>
	28,569	\$962,180	434	\$14,626	29,003	\$976,806

Grayling Region I-75 Access Project

TIGER Grant Application
Delay at Intersections

Intersection	Approach/Movement	Phase	Traffic (Peak Hour)				Delay (s)				Total Delay (s)				Traffic (Peak Hour)				Delay (s)				Total Delay (s)				Savings (s, per vehicle)				Total Savings (s)			
			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
			Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon		
M-72 East/I-75BL	EB M-72	Phase 1	4.4	55.0	6.2	54.2	36	82.3	36.3	99.8	158	4530	224	5407	4.4	55.0	6.2	54.2	35.6	46.7	38	37.4	157	2570	234	2026	0.4	35.6	-1.7	62.4	2	1959	-10	3381
	WB M-72	Phase 1	383.7	498.8	380.2	553.0	26.7	43.6	26.6	42.2	10244	21748	10112	23336	383.7	498.8	380.2	553.0	26.1	37.3	26	35.7	10014	18605	9884	19741	0.6	6.3	0.6	6.5	230	3142	228	3594
	NB I-75 BL	Phase 1	592.2	944.3	562.3	969.2	17.6	25.5	19.8	30.3	10423	24079	11134	29367	528.0	860.9	513.0	900.4	13	39.5	13	22.7	6864	34004	6670	20440	4.6	-14	6.8	7.6	3559	-9925	4464	8928
	State Street	Phase 1	49.3	40.4	44.0	43.0	3.2	6.1	9.1	12.2	158	247	400	525	49.3	40.4	43.0	43.0	3.6	14.8	5.7	12.1	177	598	251	520	-0.4	-8.7	3.4	0.1	-20	-352	150	4
M-72 West/M-93	EB M-72 West	Phase 1	299.2	271.8	350.2	319.9	20	19.5	20.6	20.2	5984	5299	7215	6462	299.2	271.8	350.2	319.9	19.9	19.5	20.6	20.2	5954	5299	7215	6462	0.1	0	0	0	30	0	0	0
	WB M-72 West	Phase 1	217.4	396.5	294.8	613.2	18.8	20.6	20.9	49.2	4086	8167	6161	30168	217.4	396.5	294.8	613.2	18.8	20.6	20.9	49.2	4086	8167	6161	30168	0	0	0	0	0	0	0	0
	NB M-93 (Ole Down)	Phase 1	108.2	140.2	196.2	258.0	18.2	18.4	18.7	19.7	1970	2579	3670	5083	108.2	140.2	196.2	258.9	18.2	18.4	18.7	19.7	1970	2579	3670	5100	0	0	0	0	0	0	0	-17
	SB M-93 (Ole Down)	Phase 1	110.9	79.1	89.8	98.0	22.6	19.3	19.5	19.5	2506	1527	1750	1912	110.9	79.1	89.8	98.0	22.6	19.3	19.5	19.5	2506	1527	1750	1912	0	0	0	0	0	0	0	0
North Down River/Alexia Ln	EB North Down River Rd	Phase 1	61.6	192.6	86.2	244.2	3.4	4.5	3	4.8	209	867	259	1172	60.7	192.6	86.2	244.2	3.4	4.5	3	4.8	206	867	259	1172	0	0	0	0	3	0	0	0
	WB North Down River Rd	Phase 1	117.9	90.3	104.7	134.2	0	0	0	0	0	0	0	0	117.9	90.3	104.7	134.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Alexia Ln	Phase 1	123.2	92.0	120.6	93.7	9.8	9.8	9.7	10.3	1207	902	1169	966	123.2	92.0	120.6	93.7	9.8	9.8	9.7	10.3	1207	902	1169	966	0	0	0	0	0	0	0	0
I-75BL/State Street	State Street	Phase 1	49.3	40.4	44.0	43.0	12.1	19.8	11.5	23.3	596	800	506	1002	49.3	40.4	41.4	43.0	12.5	15.9	12.2	19.1	616	643	505	821	-0.4	3.9	-0.7	4.2	-20	158	1	181
	NB I-75 BL	Phase 1	592.2	944.3	562.3	969.2	0	0	0	0	0	0	0	0	528.0	860.9	513.0	900.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SB I-75 BL	Phase 1	504.2	768.8	462.0	858.3	0.2	0.2	0.2	0.2	101	154	92	172	368.7	661.3	354.6	757.7	0.3	0.2	0.2	0.3	111	132	71	227	-0.1	0	0	0	-0.1	-10	22	21
North Down River/I-75 SB Exit Ramp	WB North Down River	Phase 1												291.3	218.4	256.1	243.4	3	1.4	2.1	0.8	874	306	538	195									
	EB North Down River	Phase 1												184.8	333.7	188.3	407.6	0	0	0	0	0	0	0	0									
	SB I-75 Exit Ramp	Phase 2												112	104.8	10.7	11.5	11.3	11.2	10.8	10.7	11.5	1133	1161	979	1806								
North Down River/Michigan/Roberts	EB North Down River	Phase 1	123.2	173.7	139.0	207.3	1.1	1.2	0.6	1.1	136	208	83	228	170.7	211.6	168.1	222.7	0.4	0.7	0.2	0.8	68	148	34	178	0.7	0.5	0.4	0.3	67	60	50	50
	WB North Down River	Phase 1	391.6	312.2	343.2	386.1	6.3	5	5.8	5.4	2467	1561	1991	2085	365.2	314.8	315.0	371.5	4.3	3.5	4.1	3.3	1570	1102	1292	1226	2	1.5	1.7	2.1	897	459	699	859
	Michigan	Phase 1	162.8	286.4	105.6	311.3	97.7	36.5	18.5	189.7	15906	10453	1954	59057	148.7	264.9	98.6	303.6	15.7	19.2	12.4	24.6	2335	5086	1222	7468	82	17.3	6.1	165.1	13571	5367	731	51589
	Roberts	Phase 1	66.0	49.0	65.1	55.0	62.1	74.6	51	430.6	4099	3657	3321	23700	66.0	49.0	65.1	55.0	16.5	66.5	13.8	164.3	1089	3260	899	9043	45.6	8.1	37.2	266.3	3010	397	2422	14657
North Down River/I-75BL	EB North Down River	Phase 1	16.7	24.1	23.8	15.5	12.6	12.3	12.7	14.1	211	296	302	218	16.7	24.1	23.8	15.5	13	100.3	9.3	10.3	217	2415	221	159	-0.4	-88	3.4	3.8	-7	-2119	81	59
	WB North Down River	Phase 1	187.4	75.7	105.6	149.6	20.4	14.4	14.8	22.7	3824	1090	1563	3397	218.2	110.1	136.4	178.0	13.4	10.2	9.6	11.6	2924	1123	1309	2065	7	4.2	5.2	11.1	899	-33	253	1332
	NB I-75 BL	Phase 1	389.8	265.7	268.4	368.1	0.2	0.4	0.3	0.4	78	106	81	147	359.0	231.3	246.4	339.7	6.9	3.6	4.4	5.4	2477	833	1084	1834	-6.7	-3.2	-4.1	-5	-2399	-727	-1004	-1687
	SB I-75 BL	Phase 1	314.2	275.2	235.8	338.0	2.7	1.3	2	1.5	848	358	472	507	314.2	275.2	235.8	338.0	6	3.5	4.1	4.9	1885	963	967	1656	-3.3	-2.2	-2.1	-3.4	-1037	-605	-495	-1149
North Down River/I-75 NB Ramp	WB North Down River	Phase 1												245.5	147.1	212.1	200.4	6	3.6	4.3	3.7	1473	529	912	741									
	EB North Down River	Phase 1												116.2	286.4	169.8	371.5	0	0	0	0	0	0	0	0									
	NB I-75 Ramp	Phase 1												64.2	83.4	49.3	68.8	12.1	0	11.8	16.6	777	0	582	1142									
I-75BL (James)/Michigan	NEB Michigan	Phase 1	66.0	115.2	54.6	136.7	33.1	50.4	32.5	51.8	2185	5808	1773	7083	66.0	115.2	54.6	136.7	29	20.5	28.7	20.1	1914	2362	1566	2748	4.1	29.9	3.8	31.7	271	3446	207	4335
	SWB Michigan	Phase 1	242.0	302.7	224.4	413.7	24.2	44.7	24.1	49.5	5856	13532	5408	20476	154.9	233.9	147.8	329.4	30.3	33.7	31.6	37.3	4693	7883	4672	12286	-6.1	11	-7.5	12.2	1164	5648	736	8190
	NWB James	Phase 1	403.9	587.4	383.7	778.3	12.5	10.3	9.7	88.9	5049	6050	3722	69191	351.1	520.3	345.8	726.7	2.5	3.9	1.5	11.1	878	2029	519	8066	10	6.4	8.2	77.8	4171	4021	3203	61125
	SEB James	Phase 1	411.0	506.5	460.2	643.3	134	37.7	16.9	36.5	55069	19097	7778	23480	362.6	467.8	429.4	626.9	3.3	8	4.1	18.3	1196	3743	1761	11473	130.7	29.7	12.8	18.2	53872	15354	6017	12007
I-75BL (James)/M-72 West	NB I-75BL	Phase 1	342.3	473.9	359.9	743.9	11.9	18.3	12.1	22.4	4074	8672	4355	16663	311.5	439.5	337.9	715.5	12.5	9.3	23.7	66.4	3894	4087	8009	47511	-0.6	9	-11.6	-44	180	4585	-3654	-30847
	SB I-75 BL	Phase 1	230.6	264.0	238.5	365.5	30.7	51.2	29.7	62.3	7078	13518	7083	22771	183.0	226.2	205.9	350.0	37	35.5	317.9	34.4	6772	8029	65462	12041	-6.3	15.7	-288.2	27.9	306	5488	-58379	10730
	NEB M-72	Phase 1	529.8	499.7	517.4	648.4	27.1	26.2	15.8	32.3	14356	13091	8176	20945	529.8	499.7	517.4	648.4	20.7	20.3	16.7	27.3	10966	10143	8641	17702	6.4	5.9	-0.9	5	3390	2948	-466	3242
	SWB M-72	Phase 1	120.6	138.5	88.9	157.4	20.5	36.8	23.3	31.2	2471	5095	2071	4910	119.7	137.6	87.1	156.5	21.8	27.6	24.5	23.3	2609	3798	2134	3647	-1.3	9.2	-1.2	7.9	-138	1298	-64	1263

Source:

Traffic data per URS (2008) Grayling Area Transportaion Study. Traffic volumes reduced by 12% (AM) and 14% PM to reflect 2012 supplemental traffic counts.

Fig. B-5 Fig. B-6 Fig. B-7 Fig. B-8 pg. 40-45.

Fig. B-9 Fig. B-11 Fig. B-13 Fig. B-15

pg. 68-70.

Total: 23 11 -12 42 hrs

Delay for
Avg PHT
16 hrs

Delay for AADT**
177 hrs/day = 64,649 hrs/yr

**(Convert Peak Hour Traffic to AADT by dividing by 0.09,
per Highway Capacity Manual)

Grayling Region I-75 Access Project
TIGER Grant Application
Level of Service and Accidents

Per TIGER Benefit-Cost Analysis (BCA) Resource Guide. In
2013 dollars. (Using GDP Price Deflators.)
Cost of Injury = \$668,577 (Serious Injury)
Cost of PDO = \$3,446

Intersection	Approach/Movement	Phase	Level of Service (LOS)										Level of Service (LOS) - Numerical										Level of Service (LOS)										Cost of PDO = \$3,446									
			Future No-Build				Future Build				Future No-Build				Future Build				Improvement				Average	Max	Accidents/Injuries (existing conditions, 6 year period)			Injuries Prevented/year		PDO Prevented/year												
			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer				Total Crashes	% Injury Crashes	# People Injured	Crashes/ year	Injuries/ year	PDO/year	Number	Cost	Number	Cost								
			Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon										
M-72 East/I-75BL	EB M-72	Phase 1*	D	F	D	F	D	D	D	D	4	6	4	4	6	4	4	4	4	4	0	2	0	0	2	1	2	9	22.22	2	1.50	0.33	1.17	0.100	\$66,858	0.350	\$1,206					
	WB M-72		C	D	C	D	C	D	C	D	3	4	3	4	3	4	3	4	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
	NB I-75 BL		B	C	B	C	B	D	B	C	2	3	2	3	4	2	4	2	3	0	-1	0	0	0	-0.25	0	0	0	0	0	0	0	0	0	0	0	0					
	State Street		A	A	A	B	A	B	A	B	1	1	1	1	2	1	2	1	2	0	-1	0	0	0	-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0				
M-72 West/M-93	EB M-72 West	Phase 1*	B	B	C	C	B	B	C	C	2	2	3	3	3	2	2	3	3	3	0	0	0	0	0	0	0	27	22.22	7	4.50	1.17	3.50	0.117	\$78,001	0.350	\$1,206					
	WB M-72 West		B	C	C	D	B	C	C	D	2	3	3	4	2	3	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
	NB M-93 (Ole Down)		B	B	B	B	B	B	B	B	2	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	SB M-93 (Ole Down)		C	B	B	B	C	B	B	B	B	3	2	2	2	2	3	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
North Down River/Alexia Ln	EB North Down River Rd	Phase 1*	A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0															
	WB North Down River Rd		A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Alexia Ln		A	A	A	B	A	B	A	B	1	1	1	1	2	1	2	1	2	0	-1	0	0	0	-0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
			B	C	B	C	B	C	B	C	2	3	2	3	3	2	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
I-75BL/State Street	State Street	Phase 2	A	C	B	C	B	C	B	C	2	3	2	3	3	2	3	2	3	0	0	0	0	0	0	0																
	NB I-75 BL		A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	SB I-75 BL		A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
			A	A	A	B	A	A	A	A	A	1	1	1	1	2	1	1	1	1	0	0	0	0	1	0.25	1															
North Down River/I-75 SB Exit Ramp	WB North Down River	Phase 1*																																								
	EB North Down River		A	A	A	A	A	A	A	A																																
	SB I-75 Exit Ramp		B	B	B	B	B	B	B	B																																
			A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	8	0	0	1.33	0.00	1.33	0.000	\$0	0.667	\$2,297					
N. Down River/Michigan/Roberts	EB North Down River	Phase 1	A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0																
	WB North Down River		A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Michigan		F	E	C	F	C	C	B	C	6	5	3	6	3	3	2	3	3	3	2	1	3	2.25	3																	
	Roberts		F	F	F	F	C	F	B	F	6	6	6	6	3	6	2	6	3	0	4	0	1.75	4																		
N. Down River/I-75BL	EB North Down River	Phase 2	B	B	B	B	B	B	A	B	2	2	2	2	2	2	2	1	2	0	0	1	0	0.25	1	7	42.8	5	1.17	0.83	0.67	0.167	\$111,430	0.133	\$460							
	WB North Down River		C	B	B	C	B	B	A	B	3	2	2	3	2	2	1	2	1	0	1	1	0.75	1																		
	NB I-75 BL		A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	SB I-75 BL		A	A	A	A	A	A	A	A	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N. Down River/I-75 NB Ramp	WB North Down River	Phase 1																																								
	EB North Down River		A	A	A	A	A	A	A	A																																
	NB I-75 Ramp		B	B	B	B	B	B	B	C																																
I-75BL (James)/Michigan	NEB Michigan	Phase 1*	C	D	C	D	C	C	C	C	3	4	3	4	4	3	3	3	3	0	1	0	0	1	0.5	1																
	SWB Michigan		C	D	C	D	C	C	C	D	3	4	3	4	4	3	3	3	4	0	1	0	0	0	0.25	1																
	NWB James		B	B	A	F	A	A	A	B	2	2	1	6	1	1	1	2	1	1	0	4	1.5	4																		
	SEB James		B	D	B	D	A	A	A	B	2	4	2	4	4	1	1	1	2	1	3	1	2	1.75	3																	
I-75BL (James)/M-72 West	NB I-75BL	Phase 1*	B	B	B	C	B	A	C	E	2	2	2	3	3	2	1	3	5	0	1	-1	-2	-0.5	1	26	15.4	10	4.33	1.67	3.67	0.500	\$334,289	1.100	\$3,790							
	SB I-75 BL		C	D	C	E	D	D	F	C	3	4	3	5	4	4	6	3	-1	0	-3	2	-0.5	2																		
	NEB M-72		C	C	B	C	C	C	B	C	3	3	2	3	3	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	SWB M-72		C	D	C	C	C	C	C	C	3	4	2	3	3	3	3	3	3	0	1	0	0	0	0.25	1																

Source:

URS (2008) Grayling Area Transportaion Study.
pg. 40-45. pg. 68-70.

Phasing for each intersection is assigned to that phase which will affect the function at that intersection most.
Where identified as Phase 1*, this intersection will not be reconstructed by either phase, but improved traffic flow initiated by Phase 1 will be most influential.

LOS	Numerical Code
A	1
B	2
C	3
D	4
E	5
F	6

Phase 1:	70.00		19.00	11.67	3.17	9.67	0.72	\$479,147	2.47	\$8,499
Phase 2:	7.00		5.00	1.17	0.83	0.67	0.17	\$111,430	0.13	\$460
Total:	77.00	102.64	24.00	12.83	4.00	10.33	0.88	\$590,576	2.60	\$8,959 per year

Source:
URS (2008) Grayling Area Transportaion Study.
pg. 30-31

Phase 1:	\$	487,646.28
Phase 2:	\$	111,889.42
Total:	\$	599,535.70

Considers accident rate reduced by 10% in all improved segments and an additional 10% for each Level of Service increase.

Grayling Region I-75 Access Project

TIGER Grant Application

Distance/Time Benefit due to New Full Access Interchange

Phase 1													
		AADT		Miles Saved	Operating	Time Saved		Reduced	Societal Cost	Value of	Total	Present	Present
		NB		per Year	Cost Savings	(vehicle-	Value of	Carbon	of Carbon	Reduced	Distance/Time	Value (3%	Value (7%
Year	SB		Total			hours/year)	Time Saved	Emissions	(\$/Ton)	Emissions	Benefit	Discount	Discount
								(metric ton)				Rate)	Rate)
2013	0	0	0	0	\$0	0	\$0	0	\$24.9610	\$0	\$0	\$0	\$0
2014	0	0	0	0	\$0	0	\$0	0	\$25.5084	\$0	\$0	\$0	\$0
2015	0	0	0	0	\$0	0	\$0	0	\$26.0558	\$0	\$0	\$0	\$0
2016	0	0	0	0	\$0	0	\$0	0	\$26.6032	\$0	\$0	\$0	\$0
2017	1333	692	2025	2,350,583	\$675,557	88,701	\$1,725,416	1,284	\$27.1506	\$34,854	\$2,435,827	\$2,229,127	\$1,988,361
2018	1348	700	2048	2,376,727	\$683,071	89,688	\$1,744,607	1,298	\$27.6980	\$35,952	\$2,463,630	\$2,188,903	\$1,879,492
2019	1363	708	2070	2,403,161	\$690,669	90,685	\$1,764,011	1,312	\$28.2454	\$37,070	\$2,491,750	\$2,149,405	\$1,776,583
2020	1378	716	2093	2,429,890	\$698,350	91,694	\$1,783,631	1,327	\$28.7928	\$38,209	\$2,520,190	\$2,110,620	\$1,679,309
2021	1393	724	2117	2,456,916	\$706,118	92,714	\$1,803,469	1,342	\$29.5591	\$39,662	\$2,549,249	\$2,072,773	\$1,587,544
2022	1408	732	2140	2,484,243	\$713,971	93,745	\$1,823,528	1,357	\$30.2160	\$40,994	\$2,578,494	\$2,035,487	\$1,500,707
2023	1424	740	2164	2,511,873	\$721,912	94,788	\$1,843,810	1,372	\$30.9823	\$42,502	\$2,608,224	\$1,998,986	\$1,418,701
2024	1440	748	2188	2,539,811	\$729,942	95,842	\$1,864,317	1,387	\$31.6392	\$43,885	\$2,638,145	\$1,963,027	\$1,341,099
2025	1456	757	2213	2,568,060	\$738,060	96,908	\$1,885,053	1,402	\$32.4055	\$45,448	\$2,668,562	\$1,927,826	\$1,267,814
2026	1472	765	2237	2,596,623	\$746,269	97,986	\$1,906,019	1,418	\$33.0624	\$46,885	\$2,699,174	\$1,893,146	\$1,198,466
2027	1489	773	2262	2,625,503	\$754,570	99,076	\$1,927,219	1,434	\$33.8288	\$48,506	\$2,730,294	\$1,859,197	\$1,132,975
2028	1505	782	2287	2,654,384	\$762,870	100,165	\$1,948,418	1,450	\$34.4856	\$49,991	\$2,761,279	\$1,825,531	\$1,070,872
2029	1521	791	2312	2,683,582	\$771,262	101,267	\$1,969,851	1,466	\$35.1425	\$51,504	\$2,792,616	\$1,792,474	\$1,012,173
2030	1538	799	2337	2,713,102	\$779,745	102,381	\$1,991,519	1,482	\$35.9088	\$53,206	\$2,824,470	\$1,760,117	\$956,746
2031	1555	808	2363	2,742,946	\$788,323	103,507	\$2,013,426	1,498	\$36.5657	\$54,775	\$2,856,524	\$1,728,244	\$904,302
2032	1572	817	2389	2,773,118	\$796,994	104,646	\$2,035,573	1,514	\$37.3321	\$56,538	\$2,889,106	\$1,697,045	\$854,782
2033	1590	826	2415	2,803,622	\$805,761	105,797	\$2,057,965	1,531	\$37.9889	\$58,166	\$2,921,892	\$1,666,314	\$807,927
2034	1607	835	2442	2,834,462	\$814,624	106,961	\$2,080,602	1,548	\$38.7553	\$59,992	\$2,955,219	\$1,636,233	\$763,685
2035	1625	844	2469	2,865,641	\$823,585	108,137	\$2,103,489	1,565	\$39.4122	\$61,680	\$2,988,754	\$1,606,603	\$721,823
2036	1643	853	2496	2,897,163	\$832,645	109,327	\$2,126,627	1,582	\$39.4122	\$62,359	\$3,021,631	\$1,576,966	\$682,022
								28,569				\$37,718,025	\$24,545,382

Notes & Assumptions:

- 6% Commercial/Military
- Automobile operating cost = \$0.264/mile, Commercial operating cost = \$0.654/mile (MinnDOT Report 2003-19); converted to 2013\$
- Miles saved = 3.18 miles/vehicle (Distance from NDRR/I-75 to I-75BL/I-75 via NDRR & I-75 BL)
- Time saved = 0.12 hours/vehicle
- Assume 1.5 people per non-commercial vehicle
- Value of Personal Time = \$12.76/hour (The Value of Travel Time Savings: Departmental Guidance for Conducting Economic Evaluations, Sept 2011; converted to 2013\$)
- Value of Business Time = \$24.34/hour (The Value of Travel Time Savings: Departmental Guidance for Conducting Economic Evaluations, Sept 2011; converted to 2013\$)
- Carbon Dioxide Emissions = 8.8 kg/gallon gasoline, 10.1 kg/gallon diesel (Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel. EPA420-F-05-001. 2005)
- Societal Cost of Carbon per Technical Support Document: - Societal Cost of Carbon for Regulatory Impact Analysis, Feb. 2010, converted to 2013\$)
- Fuel Efficiency = 18 mpg non-commercial, 7 mpg commercial (MinnDOT Report 2003-19 / www.fhwa.dot.gov/ohim/onh00/onh2p3.htm)
- *Traffic based on 1.1 annual growth, based on 2027 estimated values.
- 2027 traffic based on Grayling Area Transportation Study (URS, 2008), reduced by 13%, per 2012 supplemental traffic count data.

Grayling Region I-75 Access Project

TIGER Grant Application
Intersection Delay Benefit

Year	Phase 1			
	Time Saved (vehicle- hours/year)	Value of Time Saved	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
2013	0	\$0	\$0	\$0
2014	0	\$0	\$0	\$0
2015	0	\$0	\$0	\$0
2016	0	\$0	\$0	\$0
2017	57,879	\$1,125,868	\$1,030,329	\$919,044
2018	58,523	\$1,138,390	\$1,011,445	\$868,473
2019	59,174	\$1,151,052	\$992,907	\$820,684
2020	59,832	\$1,163,854	\$974,710	\$775,525
2021	60,498	\$1,176,799	\$956,845	\$732,851
2022	61,170	\$1,189,888	\$939,308	\$692,526
2023	61,851	\$1,203,122	\$922,093	\$654,419
2024	62,539	\$1,216,504	\$905,193	\$618,409
2025	63,234	\$1,230,034	\$888,603	\$584,380
2026	63,938	\$1,243,715	\$872,317	\$552,224
* 2027	64,649	\$1,257,548	\$856,329	\$521,838
2028	65,360	\$1,271,381	\$840,533	\$493,063
2029	66,079	\$1,285,366	\$825,028	\$465,876
2030	66,806	\$1,299,505	\$809,809	\$440,187
2031	67,541	\$1,313,800	\$794,870	\$415,915
2032	68,284	\$1,328,252	\$780,208	\$392,982
2033	69,035	\$1,342,862	\$765,816	\$371,313
2034	69,794	\$1,357,634	\$751,689	\$350,838
2035	70,562	\$1,372,568	\$737,823	\$331,493
2036	71,338	\$1,387,666	<u>\$724,212</u>	<u>\$313,214</u>
			\$17,380,066	\$11,315,255

Notes & Assumptions:

1. 6% Commercial/Military
2. Assume 1.5 people per non-commercial vehicle
3. Value of Personal Time = \$12.76/hour (The Value of Travel Time Savings: Departmental Guidance for Conducting Economic Evaluations, Sept 2011; converted to 2013\$)
4. Value of Business Time = \$24.34/hour (The Value of Travel Time Savings: Departmental Guidance for Conducting Economic Evaluations, Sept 2011; converted to 2013\$)
5. *Traffic based on 1.1 annual growth, based on 2027 estimated values. (URS, 2003, Grayling Area Transportation Study and 2012 supplemental traffic count data.)
6. Intersection delay from difference between 2027 No-Build and Build scenarios. (URS, 2008, Grayling Area Transportation Study)

Grayling Region I-75 Access Project

TIGER Grant Application

Distance/Time Benefit for Heavy Commercial Detour Around NDRR over East Branch AuSable River

Phase 2												
			Miles Saved per Year	Operating Cost Savings	Time Saved (hours/year)	Value of Time Saved	Reduced Carbon Emissions (metric ton)	Societal Cost of Carbon (\$/Ton)	Value of Reduced Carbon Emissions	Total Distance/Time Benefit	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
Year	AADT	Comm										
2013	0	0	0	\$0	0	\$0	0.0	\$24.9610	\$0	\$0	\$0	\$0
2014	0	0	0	\$0	0	\$0	0.0	\$25.5084	\$0	\$0	\$0	\$0
2015	0	0	0	\$0	0	\$0	0.0	\$26.0558	\$0	\$0	\$0	\$0
2016	0	0	0	\$0	0	\$0	0.0	\$26.6032	\$0	\$0	\$0	\$0
2017	156	9	15,523	\$10,152	280	\$6,809	19.5	\$27.1506	\$530	\$17,491	\$16,007	\$14,278
2018	158	9	15,695	\$10,265	283	\$6,885	19.7	\$27.6980	\$547	\$17,696	\$15,723	\$13,500
2019	159	10	15,870	\$10,379	286	\$6,961	20.0	\$28.2454	\$564	\$17,904	\$15,444	\$12,765
2020	161	10	16,046	\$10,494	289	\$7,039	20.2	\$28.7928	\$581	\$18,114	\$15,170	\$12,070
2021	163	10	16,225	\$10,611	292	\$7,117	20.4	\$29.5591	\$603	\$18,331	\$14,905	\$11,416
2022	165	10	16,405	\$10,729	296	\$7,196	20.6	\$30.2160	\$623	\$18,549	\$14,642	\$10,795
2023	166	10	16,588	\$10,848	299	\$7,276	20.9	\$30.9823	\$646	\$18,771	\$14,386	\$10,210
2024	168	10	16,772	\$10,969	302	\$7,357	21.1	\$31.6392	\$667	\$18,993	\$14,133	\$9,655
2025	170	10	16,959	\$11,091	306	\$7,439	21.3	\$32.4055	\$691	\$19,221	\$13,886	\$9,132
2026	172	10	17,148	\$11,214	309	\$7,522	21.6	\$33.0624	\$713	\$19,449	\$13,641	\$8,636
* 2027	174	10	17,338	\$11,339	312	\$7,606	21.8	\$33.8288	\$737	\$19,682	\$13,403	\$8,167
2028	176	11	17,529	\$11,464	316	\$7,689	22.0	\$34.4856	\$760	\$19,913	\$13,165	\$7,723
2029	178	11	17,722	\$11,590	319	\$7,774	22.3	\$35.1425	\$783	\$20,147	\$12,931	\$7,302
2030	180	11	17,917	\$11,718	323	\$7,859	22.5	\$35.9088	\$809	\$20,386	\$12,704	\$6,905
2031	182	11	18,114	\$11,846	326	\$7,946	22.8	\$36.5657	\$833	\$20,625	\$12,478	\$6,529
2032	184	11	18,313	\$11,977	330	\$8,033	23.0	\$37.3321	\$859	\$20,869	\$12,259	\$6,174
2033	186	11	18,514	\$12,108	334	\$8,121	23.3	\$37.9889	\$884	\$21,114	\$12,041	\$5,838
2034	188	11	18,718	\$12,242	337	\$8,211	23.5	\$38.7553	\$912	\$21,364	\$11,829	\$5,521
2035	190	11	18,924	\$12,376	341	\$8,301	23.8	\$39.4122	\$938	\$21,615	\$11,619	\$5,220
2036	192	12	19,132	\$12,512	345	\$8,392	<u>24.1</u>	\$39.4122	\$948	\$21,853	<u>\$11,405</u>	<u>\$4,932</u>
							434.3				\$271,770	\$176,771

Notes & Assumptions:

1. 6% Commercial/Military
2. Commercial operating cost = \$0.654/mile (MinnDOT Report 2003-19; converted to 2013\$)
3. Miles saved = 4.55 miles/vehicle (Distance for reroute from I-75 BL/NDRR to Wilcox Bridge Rd/NDRR via M-93)
4. Time saved = 0.082 hours/vehicle
5. Value of Business Time = \$24.34/hour (The Value of Travel Time Savings: Departmental Guidance for Conducting Economic Evaluations, Sept 2011; converted to 2013\$)
6. Carbon Emissions = 8.8 kg/gallon of fuel (Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel. EPA420-F-05-001. 2005)
7. Societal Cost of Carbon per Technical Support Document: - Societal Cost of Carbon for Regulatory Impact Analysis, Feb. 2010, converted to 2013\$)
8. Fuel Efficiency = 7 miles/gallon (MinnDOT Report 2003-19)
9. *Traffic based on 1.1 annual growth, based on 2027 estimated values.
10. 2027 traffic based on Grayling Area Transportation Study (URS, 2008), reduced by 13%, per 2012 supplemental traffic count data.

Grayling Region I-75 Access Project

TIGER Grant Application

Time Benefit for Increased Safe Travel Speed on Wilcox Bridge Road

Phase 1					
Year	AADT	Time Saved (vehicle- hours/year)	Value of Time Saved	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
2013	0	0	\$0	\$0	\$0
2014	0	0	\$0	\$0	\$0
2015	0	0	\$0	\$0	\$0
2016	179	1,376	\$26,332	\$24,821	\$23,000
2017	181	1,391	\$26,625	\$24,366	\$21,734
2018	184	1,407	\$26,921	\$23,919	\$20,538
2019	186	1,422	\$27,221	\$23,481	\$19,408
2020	188	1,438	\$27,523	\$23,050	\$18,340
2021	190	1,454	\$27,830	\$22,628	\$17,331
2022	192	1,470	\$28,139	\$22,213	\$16,377
2023	194	1,487	\$28,452	\$21,806	\$15,476
2024	196	1,503	\$28,769	\$21,407	\$14,624
2025	198	1,520	\$29,089	\$21,014	\$13,820
2026	200	1,537	\$29,412	\$20,629	\$13,059
* 2027	203	1,554	\$29,739	\$20,251	\$12,341
2028	205	1,571	\$30,066	\$19,877	\$11,660
2029	207	1,588	\$30,397	\$19,511	\$11,017
2030	209	1,606	\$30,731	\$19,151	\$10,410
2031	212	1,623	\$31,069	\$18,798	\$9,836
2032	214	1,641	\$31,411	\$18,451	\$9,293
2033	216	1,659	\$31,757	\$18,110	\$8,781
2034	219	1,677	\$32,106	\$17,776	\$8,297
2035	221	1,696	\$32,459	\$17,448	\$7,839
2036	224	1,715	\$32,816	<u>\$17,127</u>	<u>\$7,407</u>
				\$435,834	\$290,589

Notes & Assumptions:

1. No Commercial
2. Assume 1.5 people per non-commercial vehicle
3. Safe travel speed increases from 30 mph to 40 mph per conceptual geometric design
4. Time saved = .021 hours/vehicle
5. Value of Personal Time = \$12.76/hour (The Value of Travel Time Savings: Departmental Guidance for Conducting Economic Evaluations, Sept 2011; converted to
6. *Traffic based on 1.1 annual growth, based on 2027 estimated values.
7. 2027 traffic based on Grayling Area Transportation Study (URS, 2008), reduced by 13%, per 2012 supplemental traffic count data.

Grayling Region I-75 Access Project
TIGER Grant Application
Safety Benefit

Year	Phase 1										Phase 2								Total		
	Reduced Injuries per Year	Value of Reduced Injuries	Reduced PDO Accidents/Year	Value of Reduced PDO Accidents	Number of Injuries with Reduced Severity	Value of Reduced Severity	Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)		Reduced Injuries per Year	Value of Reduced Injuries	Reduced PDO Accidents/Year	Value of Reduced PDO Accidents	Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)		Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
2013	0.00	\$0	0.00	\$0	0	\$0	\$0	\$0	\$0		0	\$0	0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
2014	0.00	\$0	0.00	\$0	0	\$0	\$0	\$0	\$0		0	\$0	0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
2015	0.00	\$0	0.00	\$0	0	\$0	\$0	\$0	\$0		0	\$0	0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
2016	0.00	\$0	0.00	\$0	0.00	\$0	\$0	\$0	\$0		0	\$0	0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
2017	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,455,951	\$1,298,695		0.17	\$111,430	0.13	\$460	\$111,889	\$102,395	\$91,335		\$1,702,846	\$1,558,346	\$1,390,030
2018	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,413,545	\$1,213,733		0.17	\$111,430	0.13	\$460	\$111,889	\$99,412	\$85,360		\$1,702,846	\$1,512,957	\$1,299,093
2019	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,372,373	\$1,134,330		0.17	\$111,430	0.13	\$460	\$111,889	\$96,517	\$79,776		\$1,702,846	\$1,468,890	\$1,214,106
2020	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,332,401	\$1,060,122		0.17	\$111,430	0.13	\$460	\$111,889	\$93,706	\$74,557		\$1,702,846	\$1,426,107	\$1,134,678
2021	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,293,594	\$990,768		0.17	\$111,430	0.13	\$460	\$111,889	\$90,976	\$69,679		\$1,702,846	\$1,384,570	\$1,060,447
2022	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,255,916	\$925,951		0.17	\$111,430	0.13	\$460	\$111,889	\$88,327	\$65,121		\$1,702,846	\$1,344,243	\$991,072
2023	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,219,336	\$865,375		0.17	\$111,430	0.13	\$460	\$111,889	\$85,754	\$60,860		\$1,702,846	\$1,305,090	\$926,236
2024	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,183,821	\$808,762		0.17	\$111,430	0.13	\$460	\$111,889	\$83,256	\$56,879		\$1,702,846	\$1,267,078	\$865,641
2025	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,149,341	\$755,852		0.17	\$111,430	0.13	\$460	\$111,889	\$80,831	\$53,158		\$1,702,846	\$1,230,172	\$809,010
2026	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,115,865	\$706,404		0.17	\$111,430	0.13	\$460	\$111,889	\$78,477	\$49,680		\$1,702,846	\$1,194,342	\$756,084
2027	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,083,364	\$660,191		0.17	\$111,430	0.13	\$460	\$111,889	\$76,191	\$46,430		\$1,702,846	\$1,159,555	\$706,621
2028	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,051,810	\$617,001		0.17	\$111,430	0.13	\$460	\$111,889	\$73,972	\$43,393		\$1,702,846	\$1,125,782	\$660,393
2029	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$1,021,175	\$576,636		0.17	\$111,430	0.13	\$460	\$111,889	\$71,818	\$40,554		\$1,702,846	\$1,092,992	\$617,190
2030	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$991,432	\$538,912		0.17	\$111,430	0.13	\$460	\$111,889	\$69,726	\$37,901		\$1,702,846	\$1,061,158	\$576,813
2031	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$962,555	\$503,656		0.17	\$111,430	0.13	\$460	\$111,889	\$67,695	\$35,421		\$1,702,846	\$1,030,250	\$539,078
2032	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$934,520	\$470,707		0.17	\$111,430	0.13	\$460	\$111,889	\$65,723	\$33,104		\$1,702,846	\$1,000,243	\$503,811
2033	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$907,300	\$439,913		0.17	\$111,430	0.13	\$460	\$111,889	\$63,809	\$30,938		\$1,702,846	\$971,109	\$470,851
2034	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$880,874	\$411,133		0.17	\$111,430	0.13	\$460	\$111,889	\$61,950	\$28,914		\$1,702,846	\$942,825	\$440,048
2035	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$855,218	\$384,237		0.17	\$111,430	0.13	\$460	\$111,889	\$60,146	\$27,023		\$1,702,846	\$915,364	\$411,260
2036	0.72	\$479,147	2.47	\$8,499	2.99	\$1,103,311	\$1,590,957	\$830,308	\$359,100		0.17	\$111,430	0.13	\$460	\$111,889	\$58,394	\$25,255		\$1,702,846	\$888,703	\$384,355
	14		49		60	\$21,486,100		\$22,310,700	\$14,721,478		3		3			\$1,569,075	\$1,035,338		\$23,879,775	\$15,756,816	

Notes & Assumptions:

1. Accident rate reduced by 10% in all improved segments and an additional 10% for each Level of Service increase.
2. Average injury is Serious (AIS 3); with a value of \$668,557. (Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses - 2011 Revision; converted to 2013\$)
3. Value of Property Damage Only (PDO) accident is \$3,446. (The Economic Impact of Motor Vehicle Crashes, 2000; converted to 2013\$)
4. Response times to incidents will decrease by 5 - 10 minutes, reducing severity of estimated 25% of accidents (remaining after Phase 2) from AIS 3 to AIS 2. (\$668,577 - \$299,268 = \$369,309)
5. Accident data and LOS estimates per URS, 2008, Grayling Area Transportation Study

Grayling Region I-75 Access Project

TIGER Grant Application

Emergency Room Response Time/Reduced Acuity Benefit

Phase 1								
ER Acuity Level	2011 ER Visits	2011 Visits Affected by Interchange	Approx Equivalent AIS	AIS Unit Value	2011 Values of ER Visits	Future ER Visits Affected by Interchange	Future Values of ER Visits	Benefit
LEVEL 1	43	26.7	-	\$148	\$3,956	26.7	\$3,956	\$0
LEVEL 2	3,679	2281.0	-	\$297	\$676,995	2281.0	\$676,995	\$0
LEVEL 3	5,151	3193.6	1	\$19,102	\$61,005,168	3193.6	\$61,005,168	\$0
LEVEL 4	8,416	5217.9	2	\$299,268	\$1,561,555,439	5246.0	\$1,569,945,831	-\$8,390,392
LEVEL 5	4,522	2803.64	3 - 4	\$668,577	\$1,874,449,220	2775.63	\$1,855,721,309	\$18,727,911
Critical Care	4	2.48	5	\$3,775,868	\$9,364,153	2.46	\$9,270,512	\$93,642
Total:	21,815	13525.3			\$3,507,054,932	13525.3	\$3,496,623,770	\$10,431,161

Year	Value of Reduced Acuity	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
2013	\$0	\$0	\$0
2014	\$0	\$0	\$0
2015	\$0	\$0	\$0
2016	\$0	\$0	\$0
2017	\$10,431,161	\$9,545,990	\$8,514,935
2018	\$10,431,161	\$9,267,952	\$7,957,883
2019	\$10,431,161	\$8,998,011	\$7,437,274
2020	\$10,431,161	\$8,735,933	\$6,950,723
2021	\$10,431,161	\$8,481,489	\$6,496,003
2022	\$10,431,161	\$8,234,455	\$6,071,031
2023	\$10,431,161	\$7,994,617	\$5,673,861
2024	\$10,431,161	\$7,761,764	\$5,302,673
2025	\$10,431,161	\$7,535,693	\$4,955,770
2026	\$10,431,161	\$7,316,207	\$4,631,560
2027	\$10,431,161	\$7,103,113	\$4,328,561
2028	\$10,431,161	\$6,896,226	\$4,045,384
2029	\$10,431,161	\$6,695,365	\$3,780,733
2030	\$10,431,161	\$6,500,355	\$3,533,395
2031	\$10,431,161	\$6,311,024	\$3,302,239
2032	\$10,431,161	\$6,127,208	\$3,086,204
2033	\$10,431,161	\$5,948,746	\$2,884,303
2034	\$10,431,161	\$5,775,481	\$2,695,610
2035	\$10,431,161	\$5,607,263	\$2,519,262
2036	\$10,431,161	\$5,443,945	\$2,354,450
		\$146,280,837	\$96,521,854

Notes & Assumptions:

1. AIS Unit Value of LEVEL 1 assumed based on 4 hours each of personal (\$12.76/hour) and business time (\$24.34)
2. AIS Unit Value of LEVEL 2 assumed based on 8 hours each of personal (\$12.76/hour) and business time (\$24.34)
2. AIS Unit Values per TIGER Benefit-Cost Analysis (BCA) Guide; converted to 2013\$
3. Assume acuity will be decreased by one level for 1% of ER visits LEVEL 5 and up, due to the decrease in travel time
4. 2011 emergency room visits data provided by Mercy Hospital Grayling
5. Per Hospital data, 62% of ER visits originate from south and are therefore affected by interchange

Grayling Region I-75 Access Project

TIGER Grant Application

Benefit of Bicycle Facilities

Year	Phase 1			Phase 2			Total		
	Wilcox Road Bike Lanes	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)	N Down River Road Path	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)	Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2016	\$115,067	\$108,462	\$100,504	\$0	\$0	\$0	\$115,067	\$108,462	\$100,504
2017	\$115,067	\$105,303	\$93,929	\$1,306,740	\$1,195,852	\$1,066,689	\$1,421,807	\$1,301,155	\$1,160,618
2018	\$115,067	\$102,236	\$87,784	\$1,306,740	\$1,161,022	\$996,906	\$1,421,807	\$1,263,257	\$1,084,690
2019	\$115,067	\$99,258	\$82,041	\$1,306,740	\$1,127,205	\$931,688	\$1,421,807	\$1,226,463	\$1,013,729
2020	\$115,067	\$96,367	\$76,674	\$1,306,740	\$1,094,374	\$870,736	\$1,421,807	\$1,190,741	\$947,410
2021	\$115,067	\$93,560	\$71,658	\$1,306,740	\$1,062,499	\$813,772	\$1,421,807	\$1,156,059	\$885,430
2022	\$115,067	\$90,835	\$66,970	\$1,306,740	\$1,031,553	\$760,535	\$1,421,807	\$1,122,388	\$827,505
2023	\$115,067	\$88,189	\$62,589	\$1,306,740	\$1,001,507	\$710,780	\$1,421,807	\$1,089,697	\$773,369
2024	\$115,067	\$85,621	\$58,494	\$1,306,740	\$972,337	\$664,280	\$1,421,807	\$1,057,958	\$722,775
2025	\$115,067	\$83,127	\$54,668	\$1,306,740	\$944,017	\$620,823	\$1,421,807	\$1,027,144	\$675,490
2026	\$115,067	\$80,706	\$51,091	\$1,306,740	\$916,521	\$580,208	\$1,421,807	\$997,227	\$631,299
2027	\$115,067	\$78,355	\$47,749	\$1,306,740	\$889,826	\$542,251	\$1,421,807	\$968,181	\$589,999
2028	\$115,067	\$76,073	\$44,625	\$1,306,740	\$863,909	\$506,776	\$1,421,807	\$939,982	\$551,401
2029	\$115,067	\$73,857	\$41,706	\$1,306,740	\$838,747	\$473,623	\$1,421,807	\$912,604	\$515,328
2030	\$115,067	\$71,706	\$38,977	\$1,306,740	\$814,317	\$442,638	\$1,421,807	\$886,023	\$481,615
2031	\$115,067	\$69,617	\$36,427	\$1,306,740	\$790,599	\$413,680	\$1,421,807	\$860,217	\$450,108
2032	\$115,067	\$67,590	\$34,044	\$1,306,740	\$767,572	\$386,617	\$1,421,807	\$835,162	\$420,661
2033	\$115,067	\$65,621	\$31,817	\$1,306,740	\$745,216	\$361,324	\$1,421,807	\$810,837	\$393,141
2034	\$115,067	\$63,710	\$29,735	\$1,306,740	\$723,510	\$337,686	\$1,421,807	\$787,220	\$367,422
2035	\$115,067	\$61,854	\$27,790	\$1,306,740	\$702,437	\$315,595	\$1,421,807	\$764,291	\$343,385
2036	\$115,067	\$60,053	\$25,972	\$1,306,740	\$681,978	\$294,948	\$1,421,807	\$742,030	\$320,921
Phase 1:		\$1,662,045	\$1,139,272	Phase 2:	\$17,643,021	\$11,796,607	Total:	\$19,305,066	\$12,935,880

Notes & Assumptions:

1. Benefits computed by *Benefit-Cost Analysis of Bicycle Facilities* application (www.bicyclinginfo.org/bikecost).
2. Mid estimate values used.
3. Value for I-75 BL reflects improvement to, and new connectivity of, existing bike lanes.

Bicycle Facilities Data and Assumptions

Benefit-Cost Analysis of Bicycle Facilities (www.bicyclinginfo.org/bikecost)

Proposed Facility	Facility Type	Length (m)	Residential Density (per square mile)			Recreation	Annual Benefits			Decreased Auto Use
			w/in 800m	801 - 1,600m	1,601 - 2,400m		Mobility	Health		
North Down River Road Bike Lanes	On-Street Bicycle Lanes w/o Parking	1,600	994	515	515	\$1,256,516	\$5,925	\$44,291		\$8
Wilcox Bridge Road Bike Lanes	On-Street Bicycle Lanes w/o Parking	4,100	37	37	37	\$110,631	\$534	\$3,900		\$2

Notes:

Population densities estimated using 2000 census data as provided in Grayling Transportation Study (URS, 2003).

Grayling Region I-75 Access Project
TIGER Grant Application
Reduced Maintenance Compared to No-Build Alternative

Year	Phase 1			Phase 2			Total		
	Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)	Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)	Total Value	Present Value (3% Discount Rate)	Present Value (7% Discount Rate)
2013	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2015	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2016	\$3,815	\$3,596	\$3,332	\$0	\$0	\$0	\$3,815	\$3,596	\$3,332
2017	\$3,815	\$3,491	\$3,114	\$251,000	\$229,701	\$204,891	\$254,815	\$233,192	\$208,005
2018	\$108,715	\$96,592	\$82,938	\$1,000	\$888	\$763	\$109,715	\$97,480	\$83,701
2019	\$3,815	\$3,291	\$2,720	\$1,000	\$863	\$713	\$4,815	\$4,153	\$3,433
2020	\$3,815	\$3,195	\$2,542	\$1,000	\$837	\$666	\$4,815	\$4,032	\$3,208
2021	\$3,815	\$3,102	\$2,376	\$1,000	\$813	\$623	\$4,815	\$3,915	\$2,999
2022	\$803,815	\$634,539	\$467,828	\$1,000	\$789	\$582	\$804,815	\$635,328	\$468,410
2023	\$3,815	\$2,924	\$2,075	\$1,000	\$766	\$544	\$4,815	\$3,690	\$2,619
2024	\$3,815	\$2,839	\$1,939	\$1,000	\$744	\$508	\$4,815	\$3,583	\$2,448
2025	\$3,815	\$2,756	\$1,812	\$1,000	\$722	\$475	\$4,815	\$3,478	\$2,288
2026	\$3,815	\$2,676	\$1,694	\$1,000	\$701	\$444	\$4,815	\$3,377	\$2,138
2027	\$3,815	\$2,598	\$1,583	\$1,000	\$681	\$415	\$4,815	\$3,279	\$1,998
2028	\$3,815	\$2,522	\$1,480	\$1,000	\$661	\$388	\$4,815	\$3,183	\$1,867
2029	\$3,815	\$2,449	\$1,383	\$1,000	\$642	\$362	\$4,815	\$3,091	\$1,745
2030	\$3,815	\$2,377	\$1,292	\$1,000	\$623	\$339	\$4,815	\$3,001	\$1,631
2031	\$3,815	\$2,308	\$1,208	\$1,000	\$605	\$317	\$4,815	\$2,913	\$1,524
2032	\$3,815	\$2,241	\$1,129	\$1,000	\$587	\$296	\$4,815	\$2,828	\$1,425
2033	\$3,815	\$2,176	\$1,055	\$1,000	\$570	\$277	\$4,815	\$2,746	\$1,331
2034	\$3,815	\$2,112	\$986	\$1,000	\$554	\$258	\$4,815	\$2,666	\$1,244
2035	\$3,815	\$2,051	\$921	\$1,000	\$538	\$242	\$4,815	\$2,588	\$1,163
2036	\$3,815	<u>\$1,991</u>	<u>\$861</u>	\$1,000	<u>\$522</u>	<u>\$226</u>	\$4,815	<u>\$2,513</u>	<u>\$1,087</u>
	Phase 1:	\$779,834	\$583,407	Phase 2:	\$242,287	\$213,102	Total:	\$1,022,121	\$796,509

Notes & Assumptions:

1. Annual grading, dust control, and patching on Wilcox Bridge Road eliminated (\$3,815/yr).
2. Annual patching on North Down River Road eliminated (\$1,000/yr).
3. Avoid overlay of paved portion of Wilcox Bridge Road in 2018 (\$104,900).
4. Avoid North Down River Road/E. Br. Au Sable R. bridge rehabilitation in 2017 (\$250,000).
5. Avoid North Down River Road/I-75 bridge rehabilitation in 2022 (\$800,000).

Grayling Region I-75 Access Project

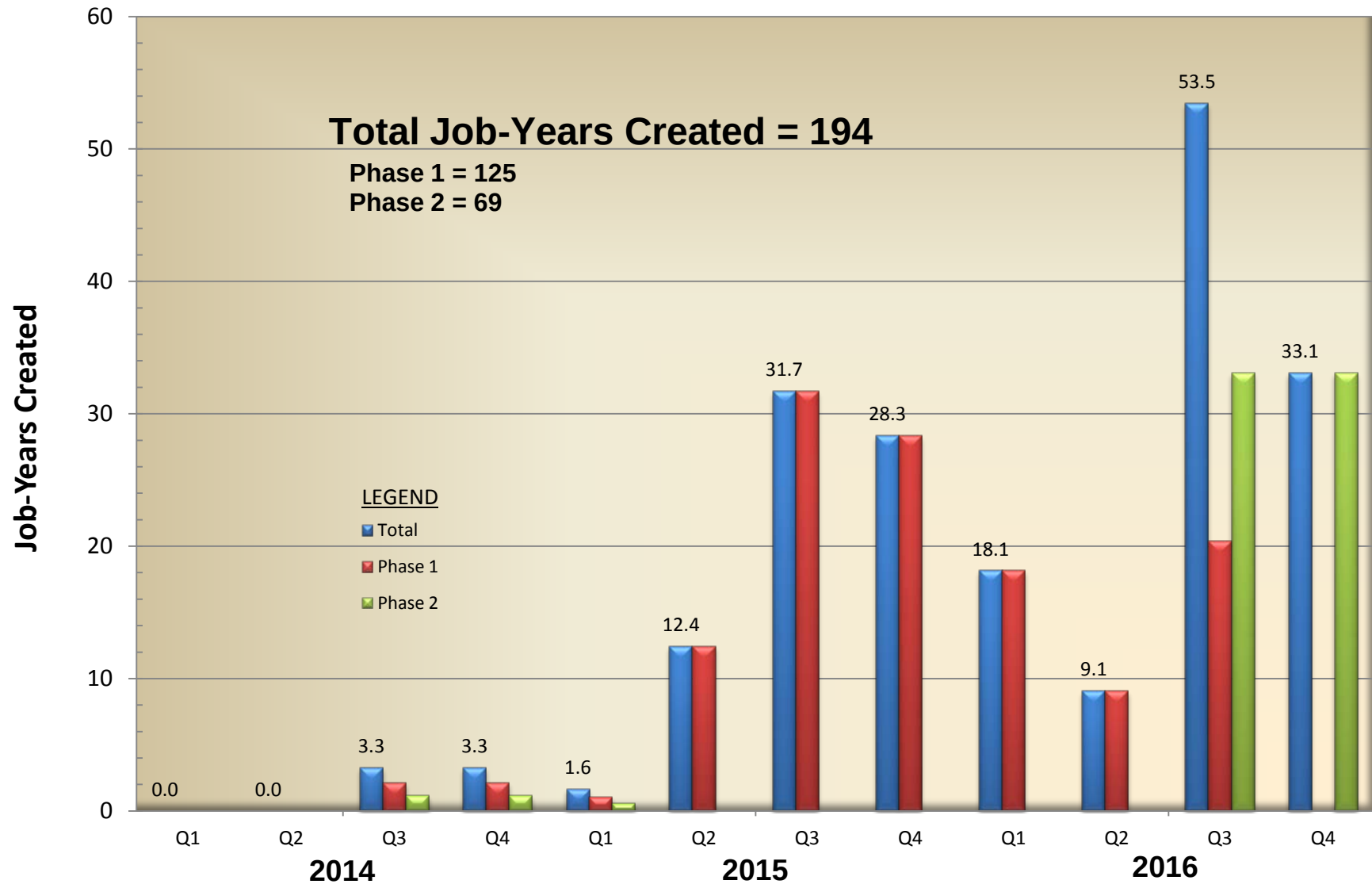
TIGER Grant Application
Summary of Job Creation

	Year	Quarter	Phase 1		Phase 2		Total	
			Project Cost	Job-Years	Project Cost	Job-Years	Project Cost	Job-Years
3/31/2014	2014	Q1	\$0	0.0	\$0	0.0	\$0	0.0
6/30/2014		Q2	\$0	0.0	\$0	0.0	\$0	0.0
9/30/2014		Q3	\$161,832	2.1	\$88,485	1.2	\$250,317	3.3
12/31/2014		Q4	\$161,832	2.1	\$88,485	1.2	\$250,317	3.3
3/31/2015	2015	Q1	\$80,916	1.1	\$44,242	0.6	\$125,159	1.6
6/30/2015		Q2	\$955,461	12.4	\$0	0.0	\$955,461	12.4
9/30/2015		Q3	\$2,437,588	31.7	\$0	0.0	\$2,437,588	31.7
12/31/2015		Q4	\$2,180,029	28.3	\$0	0.0	\$2,180,029	28.3
3/31/2016	2016	Q1	\$1,395,804	18.1	\$0	0.0	\$1,395,804	18.1
6/30/2016		Q2	\$697,902	9.1	\$0	0.0	\$697,902	9.1
9/30/2016		Q3	\$1,568,450	20.4	\$2,543,943	33.1	\$4,112,393	53.5
12/31/2016		Q4	<u>\$0</u>	<u>0.0</u>	<u>\$2,543,943</u>	<u>33.1</u>	<u>\$2,543,943</u>	<u>33.1</u>
			\$9,639,814	125	\$5,309,098	69	\$14,948,912	194

Based on \$76,923 per job-year, per NOFA. Does not include ROW costs.

Grayling Region I-75 Access Project

TIGER Grant Application



Grayling Region I-75 Access Project
TIGER Grant Application
Cost Summary

				Cost	Duration (Quarters)			Cost	Duration (Quarters)			Cost	Duration (Quarters)			
ROW:				\$76,404.00	1	Construction:		Wilcox Bridge Road:	\$1,827,838.10	1	Total:	\$15,025,316.30	12.5			
Engineering:	Design:	Wilcox Bridge Road:		\$83,083.55	0.5			Interchange Ramps:	\$2,999,207.10	2						
		Interchange Ramps:		\$137,692.54	0.5			Interchange Bridge:	\$4,003,608.50	3						
		Interchange Bridge:		\$183,804.26	0.5			NDRR Bridge:	\$999,108.00	2						
		NDRR Bridge:		\$45,414.00	0.5			NDRR:	<u>\$3,867,565.00</u>	<u>2</u>						
		NDRR:		<u>\$175,798.45</u>	<u>0.5</u>			subtotal:	\$13,697,326.70	10.0						
		subtotal:		\$625,792.80	2.5											
	CE:	Wilcox Bridge Road:		\$83,083.55												
		Interchange Ramps:		\$137,692.54												
		Interchange Bridge:		\$183,804.26												
		NDRR Bridge:		\$45,414.00												
		NDRR:		<u>\$175,798.45</u>												
subtotal:			<u>\$625,792.80</u>													
Total:			\$1,327,989.60													
		Phase 1					Phase 2					Total				
Quarter	Year	Design/ROW	CE	Wilcox Bridge Road	Interchange Ramps	Interchange Bridge	Total	Design/ROW	CE	NDRR Bridge	NDRR	Total	Design/ROW	CE	Construction	Total
3/31/2014	Q1	\$231,832.14					\$0.00	\$94,888.98				\$0.00	\$0.00	\$0.00	\$0.00	\$577,038.24
6/30/2014	Q2						\$0.00					\$0.00	\$0.00	\$0.00	\$0.00	
9/30/2014	Q3						\$231,832.14					\$94,888.98	\$326,721.12	\$0.00	\$0.00	\$326,721.12
12/31/2014	Q4						\$161,832.14					\$88,484.98	\$250,317.12	\$0.00	\$0.00	\$250,317.12
3/31/2015	Q1	\$80,916.07					\$80,916.07	\$44,242.49				\$44,242.49	\$125,158.56	\$0.00	\$0.00	\$125,158.56
6/30/2015	Q2						\$955,460.83					\$0.00	\$0.00	\$41,541.78	\$913,919.05	\$955,460.83
9/30/2015	Q3						\$2,437,587.86					\$0.00	\$0.00	\$106,598.95	\$2,330,988.91	\$2,437,587.86
12/31/2015	Q4						\$2,180,029.16					\$0.00	\$0.00	\$95,691.22	\$2,084,337.94	\$2,180,029.16
3/31/2016	Q1						\$1,334,536.17					\$0.00	\$0.00	\$61,268.09	\$1,334,536.17	\$1,395,804.25
6/30/2016	Q2						\$697,902.13					\$0.00	\$0.00	\$30,634.04	\$667,268.08	\$697,902.13
9/30/2016	Q3						\$1,568,449.82					\$0.00	\$0.00	\$179,452.50	\$3,932,940.05	\$4,112,392.55
12/31/2016	Q4						\$0.00					\$0.00	\$0.00	\$110,606.23	\$2,433,336.50	\$2,543,942.73
Total:		\$474,580.35	\$404,580.35	\$1,827,838.10	\$2,999,207.10	\$4,003,608.50	\$9,709,814.40	\$227,616.45	\$221,212.45	\$999,108.00	\$3,867,565.00	\$5,315,501.90	\$702,196.80	\$625,792.80	\$13,697,326.70	\$15,025,316.30
		5%	4%	19%	31%	41%	100%	4%	4%	19%	73%	100%	5%	4%	91%	100%