

# Appendix F

## Cost Estimates





# APPENDIX F

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## Cost Estimates

### F.1 Cost Estimates

WMH prepared preliminary planning level cost estimates for the various adaptation scenarios. The cost estimates are high level planning for the purposes of this long term planning and include some assumptions for right-of-way acquisition and mitigation costs. Further refinements and analysis of the cost estimates would be needed during future project development phases. The cost estimates for the preliminary and revised adaptation scenarios is attached.

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**A1 - Existing Alignment (2-Lane Roadway)**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Two-Lane Expressway (2ft Widening)	2.61	\$21,910,000	\$57,185,100	4	55123	\$10	\$551,232
Two-Lane Expressway on Piles	0.46	\$67,853,000	\$31,212,380	40	97152	\$10	\$971,520
Two-Lane Expressway with DLT (4ft Widening)	0.16	\$22,491,000	\$3,598,560	8	6758	\$10	\$67,584
Two-Lane Expressway on Piles	0.99	\$67,853,000	\$67,174,470	40	209088	\$10	\$2,090,880
Two-Lane Bridge (Replacement)	0.12	\$161,083,000	\$19,329,960	0	0	\$10	\$0
Two-Lane Expressway with DLT (2ft Widening)	0.63	\$21,910,000	\$13,803,300	4	13306	\$10	\$133,056
Two-Lane Expressway on Piles	0.62	\$67,853,000	\$42,068,860	40	130944	\$10	\$1,309,440
Two-Lane Expressway with DLT (10ft Widening)	0.36	\$24,236,000	\$8,724,960	20	38016	\$10	\$380,160
Two-Lane Expressway on Piles	0.61	\$67,853,000	\$41,390,330	40	128832	\$10	\$1,288,320
Intersection Improvements (each)	4	\$2,000,000	\$8,000,000				
<b>Construction Cost Total</b>			<b>\$292,487,920</b>	<b>Right of Way Cost Total</b>			<b>\$6,792,192</b>
						<b>Total Cost</b>	<b>\$299,280,112</b>

**A2A - G12 Widening to 4-Lane**

<b>Section</b>	<b>Length (mi)</b>	<b>Cost per Mile</b>	<b>Section Cost</b>	<b>Right of Way Take - Width (ft)</b>	<b>Total ROW Take (sqft)</b>	<b>Cost per sqft</b>	<b>Section ROW Cost</b>
Widen from 2 Lanes to 4 Lanes	10.25	\$24,827,000	\$254,476,750	24	1298880	\$10	\$12,988,800
Intersection Improvements (each)	13	\$2,000,000	\$26,000,000				
Utility Relocations	10.25	\$5,000,000	\$51,250,000				
<b>Construction Total</b>			<b>\$331,726,750</b>			<b>Right of Way Cost Total</b>	<b>\$12,988,800</b>
						<b>Total Cost</b>	<b>\$344,715,550</b>

**A2B - G12 Widening to 6-Lane**

<b>Section</b>	<b>Length (mi)</b>	<b>Cost per Mile</b>	<b>Section Cost</b>	<b>Right of Way Take - Width (ft)</b>	<b>Total ROW Take (sqft)</b>	<b>Cost per sqft</b>	<b>Section ROW Cost</b>
Widen from 2 Lanes to 4 Lanes	10.25	\$30,380,000	\$311,395,000	60	3247200	\$10	\$32,472,000
Intersection Improvements (each)	13	\$2,000,000	\$26,000,000				
Utility Relocations	10.25	\$6,000,000	\$61,500,000				
<b>Construction Total</b>			<b>\$398,895,000</b>	<b>Right of Way Cost Total</b>			<b>\$32,472,000</b>
						<b>Total Cost</b>	<b>\$431,367,000</b>





**A4/B1 - Phase 1, New Combined 2-Lane Highway/Single Track**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Single Track Railroad on Fill	4.42	\$6,823,000	\$30,157,660	35	816816	\$10	\$8,168,160
Two-Lane Freeway (2ft Widening)	2.42	\$21,910,000	\$53,022,200	70	894432	\$10	\$8,944,320
Construct Frontage Road West of SR-1	2.42	\$27,181,000	\$65,778,020	44	562214	\$10	\$5,622,144
Two-Lane Freeway on Piles	0.94	\$67,853,000	\$63,781,820	46	228307	\$10	\$2,283,072
Single Track Railroad on Trestle	0.94	\$35,680,000	\$33,539,200	35	173712	\$10	\$1,737,120
Two-Lane Freeway Bridge, Single Track on Bridge	0.36	\$306,518,000	\$110,346,480	0	0	\$10	\$0
Two-Lane Freeway on Piles	2.84	\$67,853,000	\$192,702,520	46	689779	\$10	\$6,897,792
Single Track Railroad on Trestle	3.42	\$35,680,000	\$122,025,600	35	632016	\$10	\$6,320,160
Interchange (each)	3	\$40,000,000	\$120,000,000				
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
<b>Construction Cost Total</b>			<b>\$801,353,500</b>	<b>Right of Way Cost Total</b>			<b>\$39,972,768</b>
						<b>Total Cost</b>	<b>\$841,326,268</b>

**A4/B1 - Phase 2, New Combined 4-Lane Highway/Dual Track**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Dual Track Railroad on Fill	2.00	\$8,176,000	\$16,352,000	70	739200	\$10	\$7,392,000
Four-Lane Freeway, Dual Track Railroad on Fill	2.42	\$37,990,000	\$91,935,800	162	2069971	\$10	\$20,699,712
Four-Lane Freeway on Piles, Dual Track on Trestle	0.94	\$166,499,000	\$156,509,060	180	893376	\$10	\$8,933,760
Four-Lane Freeway Bridge, Dual Track on Trestle	0.36	\$397,949,000	\$143,261,640	0	0	\$10	\$0
Four-Lane Freeway on Piles, Dual Track on Trestle	0.42	\$166,499,000	\$69,929,580	180	399168	\$10	\$3,991,680
Four-Lane Freeway on Piles	2.42	\$114,902,000	\$278,062,840	131	1673866	\$10	\$16,738,656
Dual Track Railroad on Trestle	3.00	\$62,751,000	\$188,253,000	52	823680	\$10	\$8,236,800
Interchange (each)	3	\$40,000,000	\$120,000,000				
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
<b>Construction Cost Total</b>			<b>\$1,074,303,920</b>	<b>Right of Way Cost Total</b>			<b>\$65,992,608</b>
						<b>Total Cost</b>	<b>\$1,140,296,528</b>

**B2 - Dual Track**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Dual-Track Railroad on Trestle	7.00	\$62,751,000	\$439,257,000	52	1921920	\$10	\$19,219,200
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
<b>Construction Total</b>			<b>\$449,257,000</b>			<b>Right of Way Cost Total</b>	<b>\$19,219,200</b>
						<b>Total Cost</b>	<b>\$468,476,200</b>

**C1 - Existing Alignment (2-Lane Roadway/Single Track Railroad)**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Two-Lane Expressway (2ft Widening)	2.61	\$21,910,000	\$57,185,100	4	55123	\$10	\$551,232
Two-Lane Expressway on Piles	0.46	\$67,853,000	\$31,212,380	40	97152	\$10	\$971,520
Two-Lane Expressway with DLTl (4ft Widening)	0.16	\$22,491,000	\$3,598,560	8	6758	\$10	\$67,584
Two-Lane Expressway on Piles	0.98	\$67,853,000	\$66,495,940	40	206976	\$10	\$2,069,760
Two-Lane Bridge (Replacement)	0.12	\$161,083,000	\$19,329,960	0	0	\$10	\$0
Two-Lane Expressway with DLTl (2ft Widening)	0.63	\$21,910,000	\$13,803,300	4	13306	\$10	\$133,056
Two-Lane Expressway on Piles	0.62	\$67,853,000	\$42,068,860	40	130944	\$10	\$1,309,440
Two-Lane Expressway with DLTl (10ft Widening)	0.24	\$24,236,000	\$5,816,640	20	25344	\$10	\$253,440
Two-Lane Expressway on Piles	0.61	\$67,853,000	\$41,390,330	40	128832	\$10	\$1,288,320
Intersection Improvements (each)	5	\$2,000,000	\$10,000,000				
Single Track Railroad on Trestle	7.00	\$35,680,000	\$249,760,000	35	1293600	\$10	\$12,936,000
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
<b>Construction Cost Total</b>			<b>\$550,661,070</b>	<b>Right of Way Cost Total</b>			<b>\$19,580,352</b>
						<b>Total Cost</b>	<b>\$570,241,422</b>

**C2 - G12 Widening**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Widen from 2 Lanes to 4 Lanes	10.25	\$24,827,000	\$254,476,750	24	1298880	\$10	\$12,988,800
Intersection Improvements (each)	13	\$2,000,000	\$26,000,000				
Widen Expressway 4 Lanes to 6 Lanes	1.32	\$25,500,000	\$33,660,000	24	167270	\$10	\$1,672,704
Interchange Improvement	1	\$25,000,000	\$25,000,000		0	\$10	\$0
Single Track Railroad on Trestle	7.00	\$35,680,000	\$249,760,000	35	1293600	\$10	\$12,936,000
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
Utility Relocations	10.25	\$5,000,000	\$51,250,000				
<b>Construction Total</b>			<b>\$650,146,750</b>	<b>Right of Way Cost Total</b>			<b>\$27,597,504</b>
						<b>Total Cost</b>	<b>\$677,744,254</b>

**C2 - G12 Widening**

<b>Section</b>	<b>Length (mi)</b>	<b>Cost per Mile</b>	<b>Section Cost</b>	<b>Right of Way Take - Width (ft)</b>	<b>Total ROW Take (sqft)</b>	<b>Cost per sqft</b>	<b>Section ROW Cost</b>
Widen from 2 Lanes to 6 Lanes	10.25	\$30,380,000	\$311,395,000	24	1298880	\$10	\$12,988,800
Intersection Improvements (each)	13	\$2,000,000	\$26,000,000				
Widen Expressway 4 Lanes to 6 Lanes	1.32	\$25,500,000	\$33,660,000	24	167270	\$10	\$1,672,704
Interchange Improvement	1	\$25,000,000	\$25,000,000		0	\$10	\$0
Single Track Railroad on Trestle	7.00	\$35,680,000	\$249,760,000	35	1293600	\$10	\$12,936,000
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
Utility Relocations	10.25	\$5,000,000	\$51,250,000				
<b>Construction Total</b>			<b>\$707,065,000</b>	<b>Right of Way Cost Total</b>			<b>\$27,597,504</b>
						<b>Total Cost</b>	<b>\$734,662,504</b>

**C3A - Existing Alignment (4-Lane Roadway/Single Track Railroad)**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Four-Lane Expressway with DLT (14ft Widening)	2.61	\$27,632,000	\$72,119,520	28	385862	\$10	\$3,858,624
Construct Frontage Road West of SR-1	2.61	\$28,214,000	\$73,638,540	44	606355	\$10	\$6,063,552
Four-Lane Expressway on Piles	0.62	\$114,902,000	\$71,239,240	113	369917	\$10	\$3,699,168
Four-Lane Expressway	0.98	\$33,850,000	\$33,173,000	40	206976	\$10	\$2,069,760
Four-Lane Bridge (Replacement)	0.12	\$194,144,000	\$23,297,280	0	0	\$10	\$0
Four-Lane Expressway	0.63	\$33,850,000	\$21,325,500	28	93139	\$10	\$931,392
Four-Lane Expressway on Piles	0.62	\$114,902,000	\$71,239,240	113	369917	\$10	\$3,699,168
Four-Lane Expressway	0.24	\$33,850,000	\$8,124,000	44	55757	\$10	\$557,568
Four-Lane Expressway on Piles	0.61	\$114,902,000	\$70,090,220	113	363950	\$10	\$3,639,504
Intersection Improvements (each)	4	\$2,000,000	\$8,000,000				
Single Track Railroad on Trestle	7.00	\$35,680,000	\$249,760,000	35	1293600	\$10	\$12,936,000
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
<b>Construction Cost Total</b>			<b>\$712,006,540</b>	<b>Right of Way Cost Total</b>			<b>\$37,454,736</b>
						<b>Total Cost</b>	<b>\$749,461,276</b>

**C3B - Existing Alignment (4-Lane Roadway/Single Track Railroad)**

Section	Length (mi)	Cost per Mile	Section Cost	Right of Way Take - Width (ft)	Total ROW Take (sqft)	Cost per sqft	Section ROW Cost
Four-Lane Expressway with DLT (14ft Widening)	2.61	\$27,632,000	\$72,119,520	28	385862	\$10	\$3,858,624
Construct Frontage Road West of SR-1	2.61	\$28,214,000	\$73,638,540	44	606355	\$10	\$6,063,552
Four-Lane Expressway on Piles	1.60	\$114,902,000	\$183,843,200	113	954624	\$10	\$9,546,240
Four-Lane Bridge (Replacement)	0.12	\$194,144,000	\$23,297,280	0	0	\$10	\$0
Four-Lane Expressway	0.63	\$33,850,000	\$21,325,500	28	93139	\$10	\$931,392
Four-Lane Expressway on Piles	0.62	\$114,902,000	\$71,239,240	113	369917	\$10	\$3,699,168
Four-Lane Expressway	0.24	\$33,850,000	\$8,124,000	44	55757	\$10	\$557,568
Four-Lane Expressway on Piles	0.61	\$114,902,000	\$70,090,220	113	363950	\$10	\$3,639,504
Intersection Improvements (each)	4	\$2,000,000	\$8,000,000				
Single Track Railroad on Trestle	7.00	\$35,680,000	\$249,760,000	35	1293600	\$10	\$12,936,000
Rail Overcrossing (each)	1	\$10,000,000	\$10,000,000				
<b>Construction Cost Total</b>			<b>\$791,437,500</b>	<b>Right of Way Cost Total</b>			<b>\$41,232,048</b>
						<b>Total Cost</b>	<b>\$832,669,548</b>