York Region

PEDESTRIAN & CYCLING MASTER PLAN STUDY

APPENDIX B

Unit Cost Schedule

ITEM	UNIT	UNIT PRICE 2007 DOLLARS	COMMENTS/ASSUMPTIONS
ON ROAD ROUTES			*Note: unit prices for LKM are for both sides of a road unless otherwise noted.*
1. Add 1.5m ashpalt shoulder (both sides) over existing gravel shoulders	LKM	100,000	assumes cycling project pays for additional granular base and asphalt
2. Widen existing asphalt shoulders (when road is resurfaced or reconstructed)	LKM	10,000	assumes cycling project pays for change in granular base and asphalt beyond standard asphalt shouldering e.g. increase from 1.2m to 1.5 or 1.8m
2. Wide curb lane in conjunction with construction of a new road	LKM	50,000	assumes 0.5m widening on both sides of the road (3.5m to 4.0m)
3. Wide curb lane in conjunction with a road reconstruction project	LKM	200,000	see note 4 below
4. Wide curb lane as a separate project	LKM	300,000	includes curb replacement, catch basin adjustments, lead extensions and driveway ramps
5. Add Bike lane marking (1.5 to 1.8m both sides) (unit price given for paint and not thermoplastic)	LKM	10,000	includes signs ($2k/km both sides), stencils ($200 each x 10/km 5/side) and markings ($1.30 LM/paint x 2 sides) or $5.40 LM x 2 for thermoplastic
6. Construct Bike lane in conjunction with construction of a new or road widening project	LKM	150,000	assumes 1.5m bike lanes on both sides of the roadway (1.5m x 2 sides = 3.0m). Includes asphalt, signs, pavement markings sub-base only
7. Retro-fit (widen road) to add bike lane in conjunction with road reconstruction/resurfacing project	LKM	425,000	see note 5 below
8. Retro-fit (widen road) and construct 1.5m Bike lane with road resurfacing project	LKM	550,000	includes the cost to adjust catch basins, lead extensions, new curbs/driveway ramps, asphalt and sub-base, pavement markings and signs.
9. On-road signed-only route (rural area)	LKM	165	price for two sides, assumes signs every 2km in rural areas
10. On-road signed-only route through residential (urban) area (no repainting required)	LKM	1,650	average 5 signs / km / direction of travel (signs = $165.00 each including labour and materials)
11. Replace catch basin covers with bicycle friendly model	each	260	
12. Construct median refuge	each	20,000	average price for basic refuge
13. Construct pedestrian activated traffic signal (IPS)	each	60,000	varies depending on number of signal heads required
14. Construct concrete sidewalk	LKM	100,000	one side of street only
15. Construct pre-fabricated pedestrian overpass of major arterial	each	750,000	requirements vary widely and dependent on width of crossing and structure design and material, use price as general guideline only
TRANSITION AREAS (ON-ROAD TO OFF-ROAD)			
1. Trail / Road transition	each	2,500	typically includes 3 bollards, warning signs, curb cuts an minimal restoration (3.0m trail)
2. Trail / Road transition at existing signalized intersection	each	3,000	(at intersection with pedestrian crosswalk) typically includes 6 bollards, warning signs and minimal restoration
3. At grade mid-block crossing	each	5,000	typically includes pavement markings, 6 bollards, warning signs, curb cuts and minimal restoration (median refuge island extra)
4. At grade railway crossing	each	100,000	flashing lights, motion sensing switch (C.N. estimate)
5. At grade railway crossing with gate	each	250,000	flashing lights, motion sensing switch and automatic gate (C.N. estimate)
6. Below grade railway crossing	each	500,000	3.0m wide, unlit culvert style approx 10 m long for single elevated railway track
7. Multi use subway under 4 lane road	each	1,200,000	guideline price for basic 3.3 m wide, lit
OFF ROAD ROUTES			
1. Rough grading	LKM	12,000	includes levelling and packing after levelling (3.0m wide)
2. Construct new stone dust limestone trail	LKM	100,000	normal site conditions (3.0m wide)
3. Construct new asphalt trail	LKM	150,000	normal site conditions (3.0m wide)
4. Upgrading gravel trail to tar and chip	LKM	12,000	includes 1 coat primer and 2 coats surface (areas requiring "trail hardening" - 3.0m wide)
5. Upgrading gravel trail to asphalt	LKM	45,000	price includes some upgrades to the base (3.0m wide)
6. Construct single track trail	LKM	10,000	includes clearing and grubbing with minor regrading to eliminate high and low points (1.5m wide)
OTHER ITEMS			
A. Signage			
1. Regulatory and caution Signage (off-road trail) on new post	each	150	trailside sign, 300mm x 300mm c/w metal post
2. Bike lane or bike route sign (on-road) on new post	each	165	per M.T.O. specs
3. Regulatory sign	each	100	same as 1 above
4. Interpretive sign	each	800	for structure, does not include design, or sign panels
5. Signboards for interpretive sign	each	800	does not include graphic design
6. Trailhead kiosk	each	3,000	does not include design and supply of signboards
7. Signboards for trailhead kiosk sign	each	2,000	typical production cost, does not include graphic design
8. Major gateway	each	15,000	based on previously constructed units
9. Trail directional sign	each	150	bollard / post / w 100mm x100mm marker
10. Trail marker sign	each	75	bollard / post / w 100mm x100mm marker
B. Barriers and Access			
1. Lockable gate (2 per road crossing)	each	2,500	price indicated for one side of road (2 required per road crossing)
2. Berming/boulders at road crossing	each	500	price indicated for one side of road (2 required per road crossing)
3. Granular parking lot at staging area (15 car capacity-gravel)	each	10,000	
4. Metal offset gates	each	1,200	provide 4 ($4,800.00) per crossing to create maze-type barrier
5. Page wire fencing	LKM	12,000	
6. Chain link fencing	LKM	50,000	range from $35,000 to $65,000 per LKM depending on height, gauge and site location
C. Accessories			
1. Self weathering steel truss pedestrian bridge	LM	2,800	3.5m wide
2. Self weathering steel truss pedestrian bridge	LM	1,800	1.8m wide
3. New boardwalk (pedestrian light-duty)	LM	450	new construction - includes floating foundation and decking 1.5m wide
4. New boardwalk (pedestrian light-duty)	LM	600	new construction - includes footings and decking 2.5m wide
5. New boardwalk (pedestrian light-duty)	LM	1,200	new construction - includes footings and decking 3.0m wide
6. New concrete box culvert (walkthrough)	LM	10,000	crossing below major roadway
7. Metal stairs with hand railing and gutter to roll bicycle	vertical M	3,000	1.8m wide, galvanized steel stairs
8. Bicycle rack	each	70	post and ring style stand
9. Bicycle rack	each	500	holds 6 bicycles, price varies depending on manufacturer
10. Bicycle locker	each	2,500	price varies depending on manufacturer
11. Benches	each	600	can be as low as $250.00 for a "low tech" bench
12. Garbage container	each	150	as high as $2,000.00 for below grade, high capacity units
13. Construct washroom building	each	3,500	wood structure with concrete holding unit
14. Servicing of port-o-let	each	600	per season

NOTES:

1. Unit Prices Reflect 2007 Dollars, and do not include the cost of property acquisition, utility relocations, or major roadside drainage works
2. LKM = Linear kilometres
3. LM = Linear metres
4. Road portion of project includes the cost to reconstruct curbs. Cycling portion of project includes the cost to adjust catch basins, lead extensions, and driveway ramps. No sidewalk replacement is included.
5. Road portion of project includes the cost to reconstruct sidewalks (where required) and curbs. Cycling portion of project includes the cost to adjust catch basins, lead extensions, and driveway ramps.

York Region

York Region Pedestrian and Cycling Master Plan

TABLE B1: UNIT COST SCHEDULE

March 2008

MMM GROUP

Jurisdiction	Phase 1 Implementation Cost by Facility Type														Total Cost	%
	Multi - Use Trail[A]		Bike Lane				Paved Shoulder Bikeway				Signed Only Route		Proposed Sidewalk Links			
			Pavement Marking + Signs Only		Road Widening Anticipated		Signs Only[B]		Road Widening Anticipated							
	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost		
Region of York	0.0	$0.00	7.4	$73,603.86	59.3	$8,890,781.04	96.8	$159,645.49	85.6	$4,710,383.56	43.1	$71,057.98	0.0	$0.00	$13,905,471.93	59.1
Provincial (Highways / Hwy 407 Corridor)	6.3	$692,273.66	0.0	$0.00	3.8	$572,456.97	0.0	$0.00	2.0	$111,263.03	0.0	$0.00	0.0	$0.00	$1,375,993.66	5.8
Local Municipality																
Aurora	0.2	$23,024.72	0.7	$6,857.03	0.0	$0.00	0.0	$0.00	0.1	$7,896.71	8.8	$14,471.27	10.9	$1,094,036.87	$1,146,286.59	4.9
East Gwillimbury	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.1	$5,771.11	0.5	$857.86	1.8	$175,775.80	$182,404.76	0.8
Georgina	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	4.1	$6,752.47	0.0	$0.00	$6,752.47	0.0
King	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	17.3	$28,583.06	0.0	$0.00	$28,583.06	0.1
Markham	18.6	$2,047,715.52	0.0	$0.00	3.9	$585,979.74	0.0	$0.00	0.0	$0.00	3.6	$5,924.01	17.0	$1,704,644.49	$4,344,263.77	18.5
Newmarket	0.2	$23,252.87	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.4	$712.65	1.5	$153,488.93	$177,454.45	0.8
Richmond Hill	0.4	$43,085.30	0.5	$5,128.10	0.0	$0.00	0.0	$0.00	0.0	$0.00	2.1	$3,497.70	7.2	$720,744.46	$772,455.57	3.3
Vaughan	8.1	$890,762.82	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	4.7	$468,105.65	$1,358,868.48	5.8
Whitchurch-Stouffville	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	4.9	$8,005.61	2.2	$215,684.59	$223,690.21	1.0
TOTAL	**33.8**	**$3,720,114.88**	**8.6**	**$85,588.99**	**67.0**	**$10,049,217.75**	**96.8**	**$159,645.49**	**87.9**	**$4,835,314.41**	**84.8**	**$139,862.62**	**45.3**	**$4,532,480.80**	**$23,522,224.94**	
Roads Identified in Towards Great Regional Street Study[C]	0.0	$0.00	2.0	$19,975.86	25.4	$3,808,901.05	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	$3,828,876.91	
Adjusted Total	**33.8**	**$3,720,114.88**	**6.6**	**$65,613.13**	**41.6**	**$6,240,316.70**	**96.8**	**$159,645.49**	**87.9**	**$4,835,314.41**	**84.8**	**$139,862.62**	**45.3**	**$4,532,480.80**	**$19,693,348.02**	
Surrounding Areas[D]	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	9.1	$498,748.60	0.0	$0.00	0.0	$0.00	$498,748.60	

[A] Includes distances for both off-road trails and trails in the road rights-of-ways.

[B] Includes existing rural cross-section roads with 1.2 to 1.5 m paved shoulders that can be signed as an interim measure until such time as road is resurfaced.
Paved shoulders could be widened slightly (upto 0.5 m per side) where road is resurfaced to satisy preferred paved shoulder design width (on a road posted speed 80 km/hr = 2.0 m)

[C] Cost for bike facilities already included in cost estimate for widening of streets indentified in Towards Great Regional Streets Study.

[D] Portion of York/Durham Line in Durham Region

Cost Estimate Based on Following Unit Prices

Facility Type	Cost / Km[1]
Multi - Use Trail	$110,000
Bike Lane (Road Widening Not Required)[2]	$10,000
Bike Lane (Road Widening Required)	$150,000
Paved Shoulder Bikeway	$55,000
Signed Only Route	$1,650
Sidewalk (per Linear Kilometre)	$100,000

[1] Cost for facility in both directions

[2] Assumes road does not require widening, or is already scheduled to be widened as per the Region's Capital Work Schedule. Therefore, the cost for the bike facility is based on the pavement marking and sign unit price only.

Table B2:
Phase 1 Implementation Cost by Facility Type and Jurisdiction (March 2008)

York Region

MMM GROUP

Jurisdiction	Phase 2 Implementation Cost by Facility Type														Total Cost	%
	Multi - Use Trail[A]		Bike Lane				Paved Shoulder Bikeway				Signed Only Route		Proposed Sidewalk Links			
			Pavement Marking + Signs Only		Road Widening Anticipated		Signs Only[B]		Road Widening Anticipated							
	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost	Distance (Km)	Cost		
Region of York	0.0	$0.00	3.8	$38,218.50	79.2	$11,882,350.34	34.0	$56,118.98	70.3	$3,866,013.48	14.3	$23,628.15	0.0	$0.00	$15,866,329.44	73.6
Provincial	4.8	$525,435.84	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	$525,435.84	2.4
Local Municipality																
Aurora	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	1.5	$2,519.82	0.0	$0.00	$2,519.82	0.0
East Gwillimbury	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	7.9	$12,978.41	0.0	$0.00	$12,978.41	0.1
Georgina	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	$0.00	0.0
King	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	$0.00	0.0
Markham	8.2	$901,213.12	0.0	$0.00	0.8	$121,552.14	0.0	$0.00	6.3	$345,780.50	3.9	$6,483.27	1.1	$109,473.82	$1,484,502.84	6.9
Newmarket	1.0	$110,267.81	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	7.9	$786,768.35	$897,036.16	4.2
Richmond Hill	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	2.9	$292,660.98	$292,660.98	1.4
Vaughan	12.6	$1,381,401.26	0.0	$0.00	3.8	$576,272.56	0.0	$0.00	0.0	$0.00	0.2	$358.69	4.7	$473,041.27	$2,431,073.78	11.3
Whitchurch-Stouffville	0.2	$22,129.09	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	11.1	$18,267.50	0.0	$0.00	$40,396.59	0.2
TOTAL	**26.7**	**$2,940,447.12**	**3.8**	**$38,218.50**	**83.9**	**$12,580,175.04**	**34.0**	**$56,118.98**	**76.6**	**$4,211,793.97**	**38.9**	**$64,235.84**	**16.6**	**$1,661,944.42**	**$21,552,933.87**	
Roads Identified in Towards Great Regional Street Study[C]	6.1	$673,784.06	1.8	$17,639.13	1.8	$272,905.95	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	$964,329.14	
Adjusted Total	**20.6**	**$2,266,663.06**	**2.1**	**$20,579.37**	**82.0**	**$12,307,269.09**	**34.0**	**$56,118.98**	**76.6**	**$4,211,793.97**	**38.9**	**$64,235.84**	**16.6**	**$1,661,944.42**	**$20,588,604.72**	
Surrounding Areas[D]	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	0.0	$0.00	$0.00	

[A] Includes distances for both off-road trails and trails in the road rights-of-ways.

[B] Includes existing rural cross-section roads with 1.2 to 1.5 m paved shoulders that can be signed as an interim measure until such time as road is resurfaced.
Paved shoulders could be widened slightly (upto 0.5 m per side) where road is resurfaced to satisy preferred paved shoulder design width (on a road posted speed 80 km/hr = 2.0 m)

[C] Cost for bike facilities already included in cost estimate for widening of streets indentified in Towards Great Regional Streets Study.

[D] Portion of York/Durham Line in Durham Region

Cost Estimate Based on Following Unit Prices

Facility Type	Cost / Km[1]
Multi - Use Trail	$110,000
Bike Lane (Road Widening Not Required)[2]	$10,000
Bike Lane (Road Widening Required)	$150,000
Paved Shoulder Bikeway	$55,000
Signed Only Route	$1,650
Sidewalk (per Linear Kilometre)	$100,000

[1] Cost for facility in both directions

[2] Assumes road does not require widening, or is already scheduled to be widened as per the Region's Capital Work Schedule. Therefore, the cost for the bike facility is based on the pavement marking and sign unit price only.

Table B3:
Phase 2 Implementation Cost
by Facility Type and Jurisdiction
(March 2008)

York Region

MMM GROUP

Jurisdiction	Maintenance Cost					
	Phase 1 (0 to 5 Years)		Phase 2 (6 to 10 Years)		Total Cost	%
	Distance (Km)	Cost	Distance (Km)	Cost[a]		
Region of York	0.0	$0.00	0.0	$0.00	$0.00	0.0
Provincial (Highways / Hwy 407 Corridor)	6.3	$62,933.97	4.8	$110,700.86	$173,634.83	18.4
Local Municipality						
Aurora	0.2	$2,093.16	0.0	$2,093.16	$4,186.31	0.4
East Gwillimbury	0.0	$0.00	0.0	$0.00	$0.00	0.0
Georgina	0.0	$0.00	0.0	$0.00	$0.00	0.0
King	0.0	$0.00	0.0	$0.00	$0.00	0.0
Markham	18.6	$186,155.96	8.2	$268,084.42	$454,240.38	48.1
Newmarket	0.2	$2,113.90	1.0	$12,138.24	$14,252.14	1.5
Richmond Hill	0.4	$3,916.85	0.0	$3,916.85	$7,833.69	0.8
Vaughan	8.1	$80,978.44	12.6	$206,560.37	$287,538.81	30.5
Whitchurch-Stouffville	0.0	$0.00	0.2	$2,011.74	$2,011.74	0.2
TOTAL	**33.8**	**$338,192.26**	**26.7**	**$605,505.64**	**$943,697.90**	

[a] Includes maintenance costs for Phase 1 facilities in addition to costs associated with maintaining Phase 2 facilities.

Maintenance Cost Estimate Based on Following Unit Prices

Maintenance Cost for Facility Type	Cost / Km / Year
Multi - Use Trail	$2,000

Table B4: Maintenance Cost by Jurisdiction