Matching marking standards to One Network Road Classification,

Fergus Tate Lead Safety Advisor (Roads and Roadsides)

New Zealand Transport Agency

RTS 5

Road Marking	
edge and centrelines	sealed width
isolated or continuous	traffic volume
intersection markings	
Delineation Devices	
EMPs Layout A or B	traffic volume
	sealed width
RRPMs	traffic volume

Markings

Centrelines	only with widths >5.0 (>5.5) isolated >100 AADT continuous >250 AADT
Edgelines	only with widths >6.0 (6.6) isolated >250 AADT continuous >750AADT
Intersections	centreline >5.0 (5.5) >250 centre edge and continuity lines >6.0 (6.6) and >750AADT

Delineation

EMP	unsealed	isolated >100 AADT
		continuous >500 AADT
	sealed	isolated >100 AADT
		continuous >500 AADT
		new spacing >1500 AADT
RRMPs		isolated >500 AADT
		continuous >1,000 AADT

Why

RTS 5 was last up dated in 1992

Costs are dated

It doesn't consider newer treatments

- ATP
- High reflectivity
- Wide Line

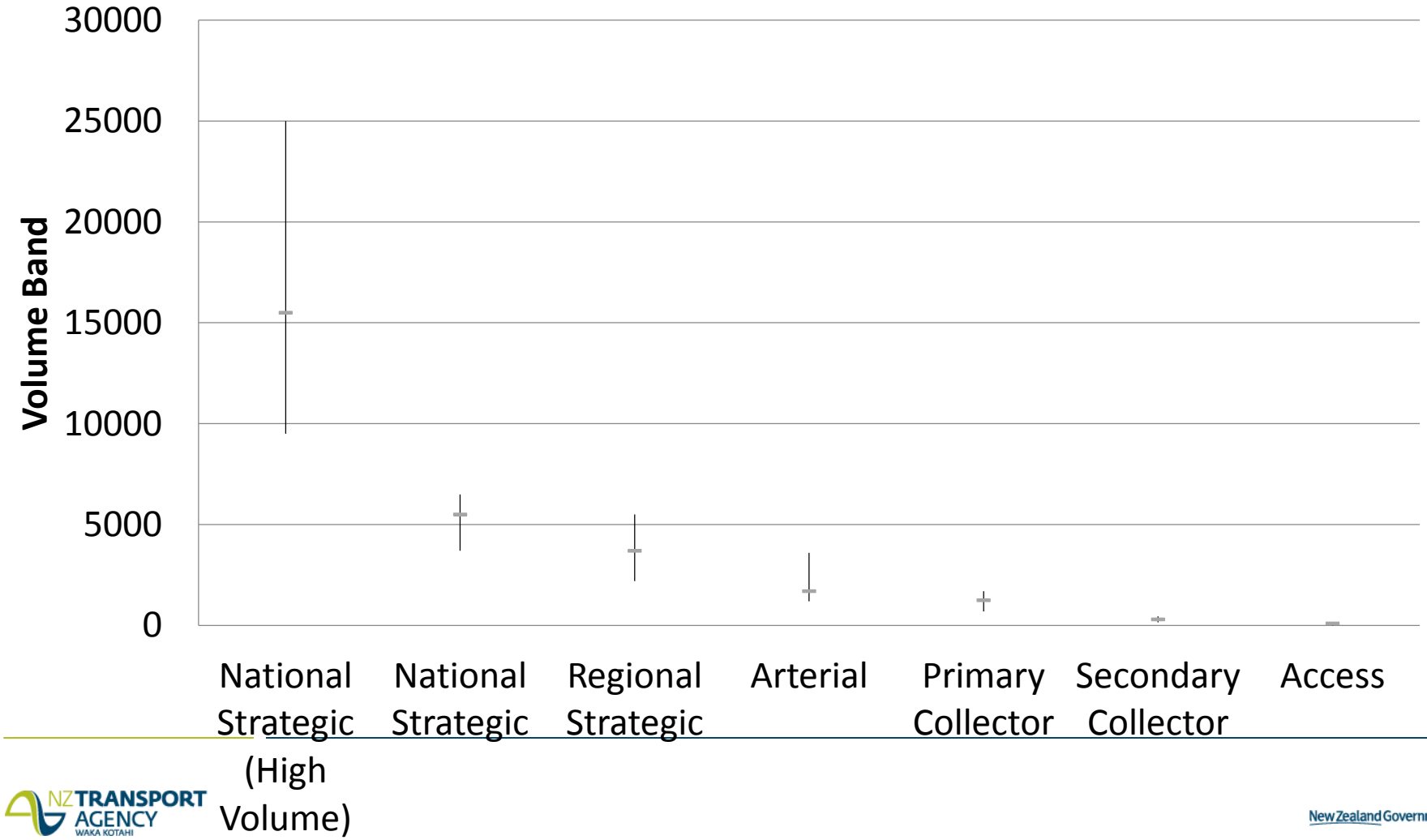
It only considers volume and road width

Need to embed the ONRC

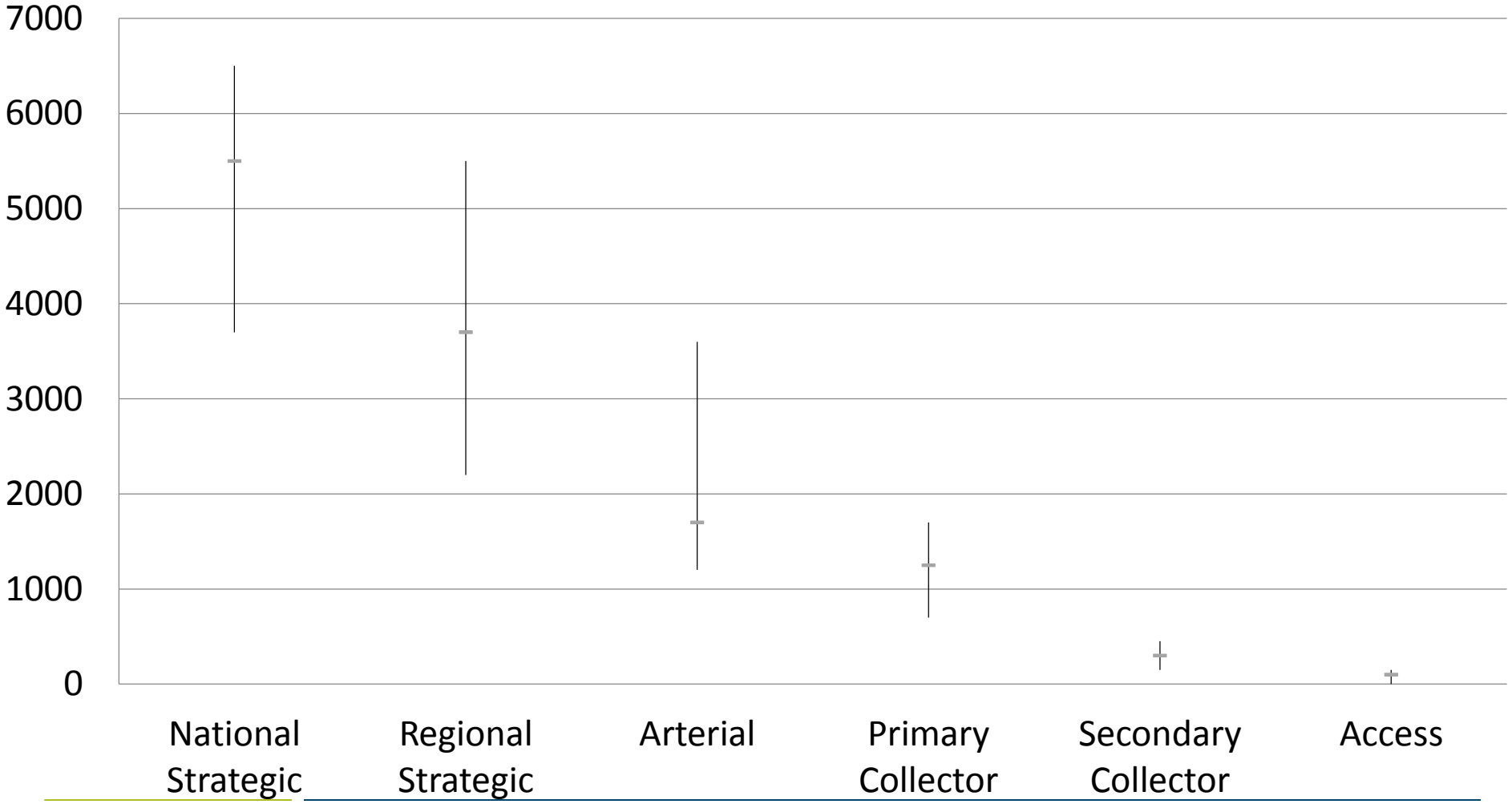
One network road classification - functional classification

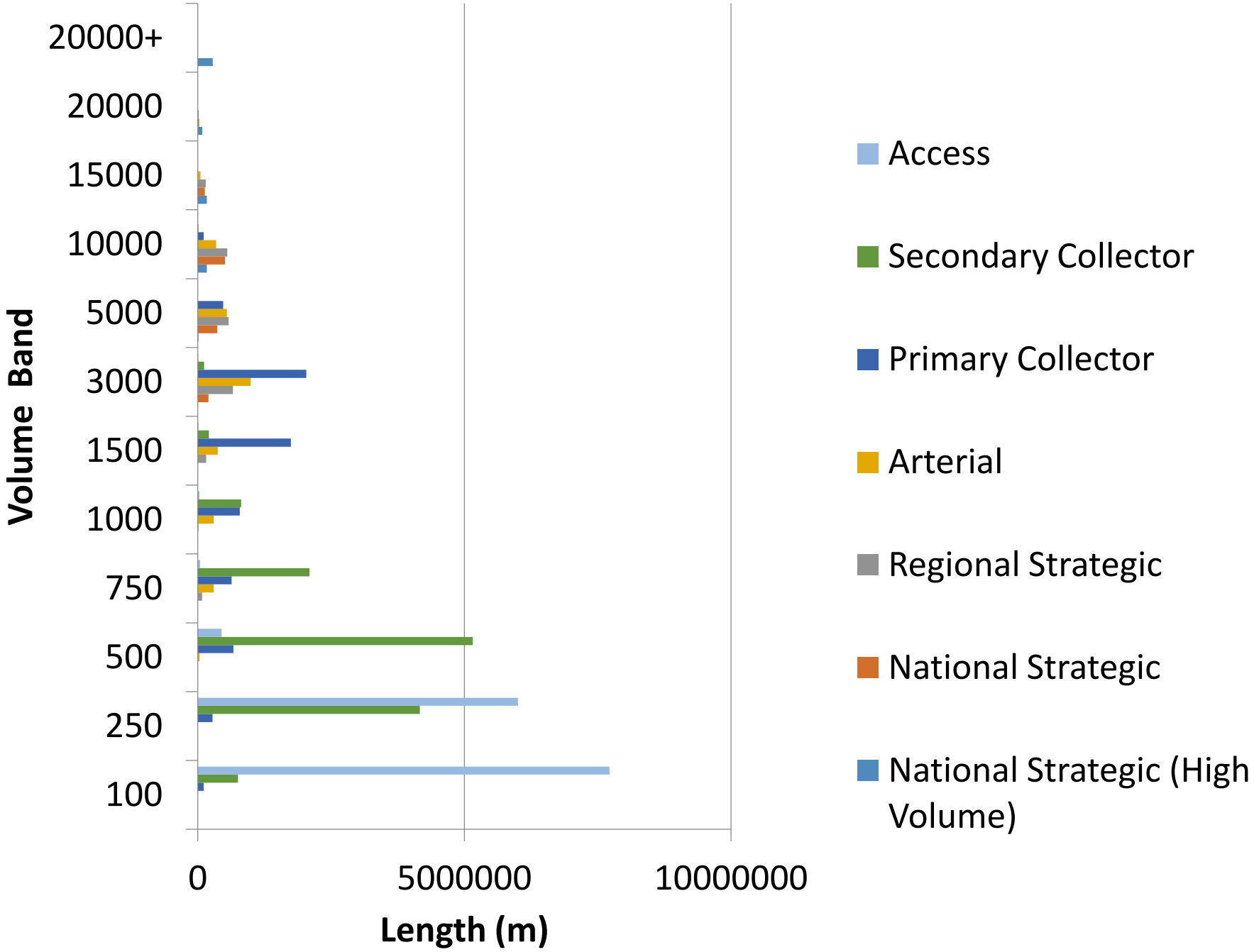
ROAD & STREET CATEGORIES/CRITERIA	FUNCTIONAL CRITERIA AND THRESHOLDS									
	MOVEMENT OF PEOPLE & GOODS				ECONOMIC AND SOCIAL					
	← LINK — PLACE →				← LINK — PLACE →					
	TYPICAL DAILY TRAFFIC (AADT)[1]	HEAVY COMMERCIAL VECHICLES[2] (daily flows)	BUSES (urban peak)[3]	ACTIVE MODES[4]	LINKING PLACES	CONNECTIVITY	FREIGHT - INLAND PORTS/PORTS (per annum)	AIRPORT PASSENGER NUMBERS (per annum)[5]	TOURISM[6]	HOSPITALS
NATIONAL Meet 3 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses & 1 economic or social) **(HIGH VOLUME)** Meet at least 1 high volume (Typical Daily Traffic or HCV)	U[7]: > 25,000 R: > 15,000 U: > 35,000 R: > 20,000	>800 >1200	> 40 buses or 2000 people per hour		>100,000 population[8]		>2 million tonnes (or >$3 billion)[9]	>3 million[10]		
REGIONAL Meet 2 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses & 1 economic or social)	U: > 15,000 R: > 10,000	>400	> 40 buses or 2000 people per hour		>30,000 population[11]	Linking remote regions (regional councils) or sole connectivity in urban areas	>1 million tonnes[12]	>500,000[13]	Top 5 tourist destinations	Access to tertiary hospitals
ARTERIAL Meet 2 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses)	U: > 5,000 R: > 3,000	>300	> 15 buses or 750 people per hour		>10,000 population[14]	Critical Connectivity (no alternative routes)		>250,000[15]		Access to regional hospitals
PRIMARY COLLECTOR Meet 1 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses)	U: > 3,000 R: > 1,000	>150	> 6 buses or 300 people per hour		>2,000 population					
SECONDARY COLLECTOR Meet 1 criteria (incl. at least 1 of Typical Daily Traffic or HCV)	U: > 1,000 R: > 200	>25		Significant numbers of pedestrians and cyclists (urban peak) or part of identified cycling or walking network	>250 population		< 1 million tonnes	<250,000	Regionally or locally significant tourist destinations or significant scenic routes	
ACCESS All other roads **(LOW VOLUME)** Meet low volume Typical Daily Traffic	U: < 1,000 R: < 200 U: < 200 R: < 50	<25			<250 population					

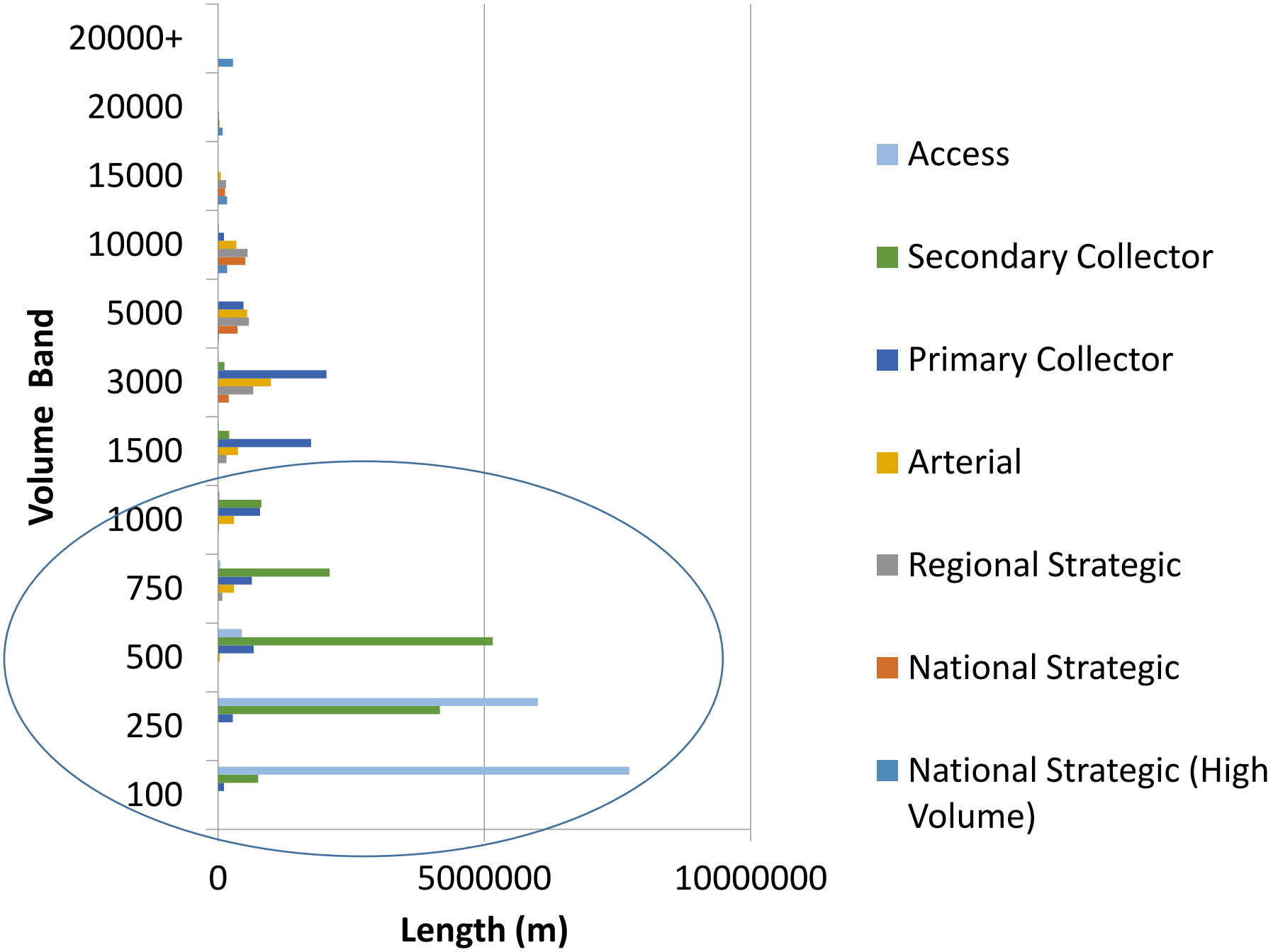
Relationship Between ONRC and Volume

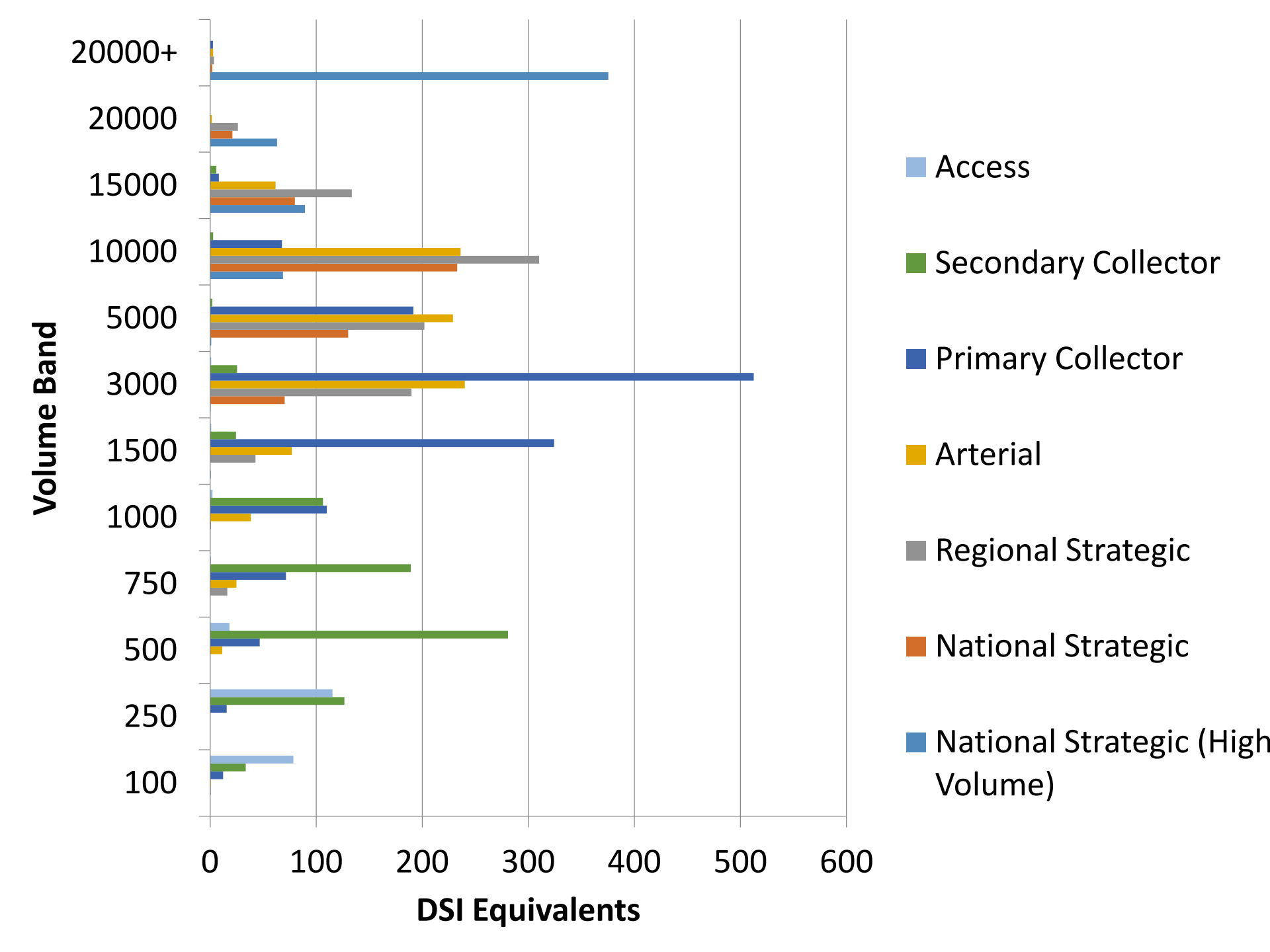


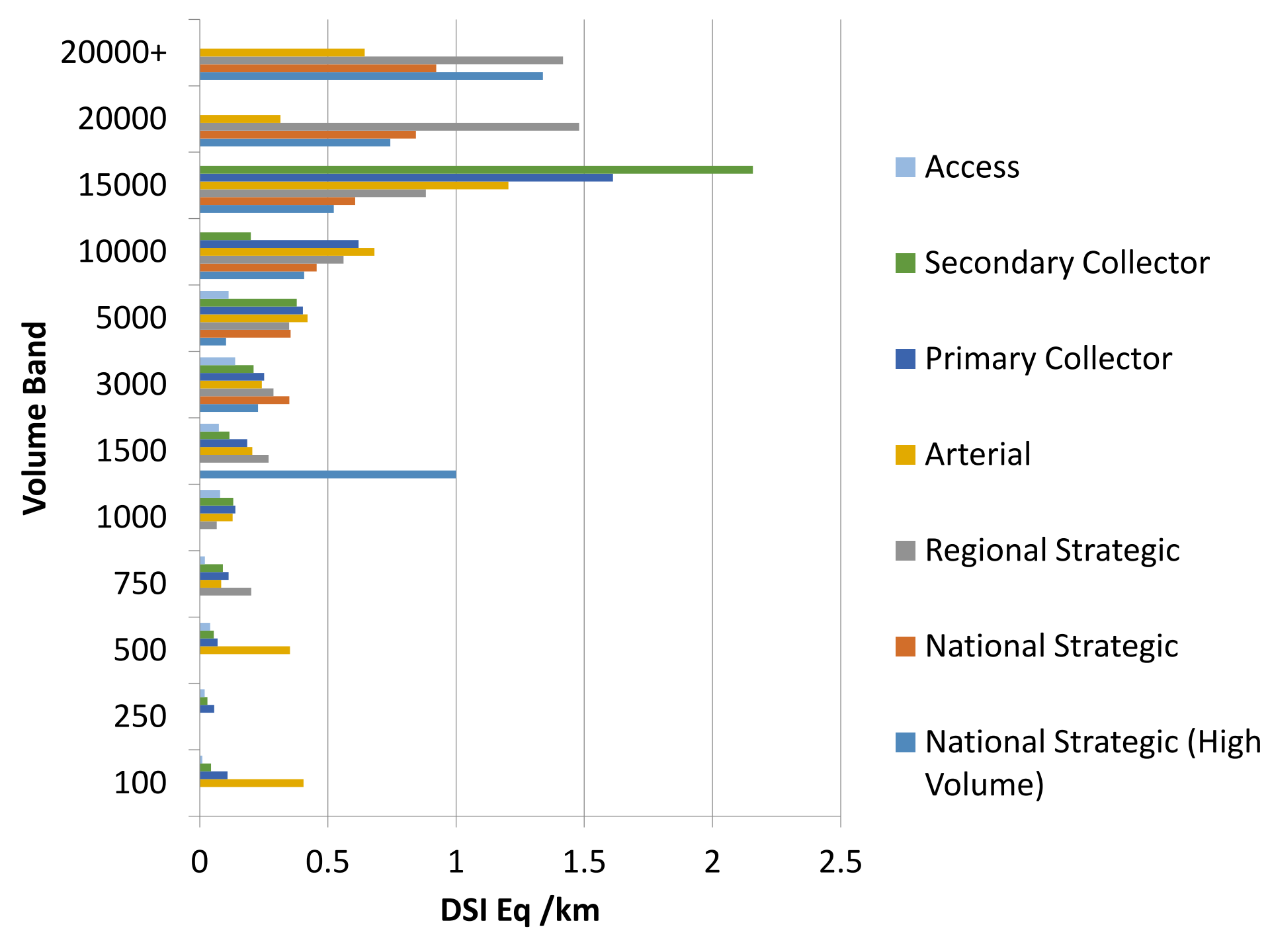
Relationship Between ONRC and Volume




20000+
20000
15000
10000
5000
3000
1500
1000
750
500
250
100
Volume Band
0
5000000
10000000
Length (m)
Access
Secondary Collector
Primary Collector
Arterial
Regional Strategic
National Strategic
National Strategic (High Volume)


20000+
20000
15000
10000
5000
3000
1500
1000
750
500
250
100
Volume Band
0
5000000
10000000
Length (m)
Access
Secondary Collector
Primary Collector
Arterial
Regional Strategic
National Strategic
National Strategic (High Volume)


20000+
20000
15000
10000
5000
3000
1500
1000
750
500
250
100
Volume Band
0
100
200
300
400
500
600
DSI Equivalents
Access
Secondary Collector
Primary Collector
Arterial
Regional Strategic
National Strategic
National Strategic (High Volume)


Volume Band
20000+
20000
15000
10000
5000
3000
1500
1000
750
500
250
100
0
0.5
1
1.5
2
2.5
DSI Eq /km
Access
Secondary Collector
Primary Collector
Arterial
Regional Strategic
National Strategic
National Strategic (High Volume)

Preliminary Analysis

Benefits

Marking	Injury Crash reduction	Expected Life
Standard Road Markings	10%	1 year
200mm long life	15%	4 years
High retroreflective RM's	15%	2.5 years
150mm ATP	20%	4 years
with RRPMs	5%	3 year

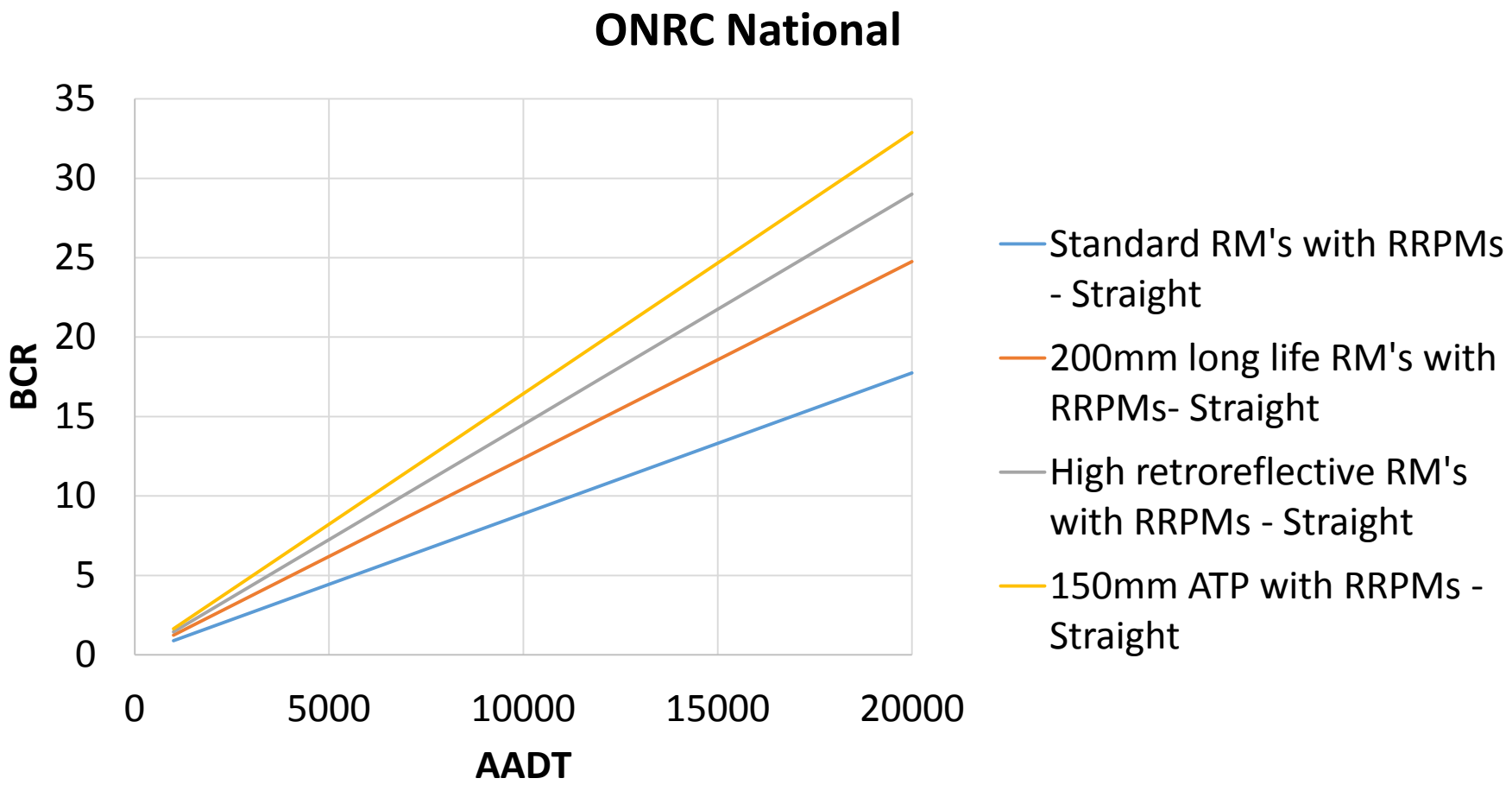
1 year analysis period 6% discount rate

Preliminary Analysis

Costs

ONRC	150mm ATP $/M	200mm Longlife $/M	High retroreflective RM's $/M	Standard RMs $/M
National (High Volume)	$7.81	$8.28	$5.72	$2.86
National	$6.88	$7.35	$3.86	$1.93
Regional	$5.95	$6.42	$2.00	$1.00
Arterial	$5.95	$6.42	$2.00	$1.00
Primary Collector	$5.95	$6.42	$2.00	$1.00
Secondary Collector	$5.95	$6.42	$2.00	$1.00

BCRs


ONRC National
BCR
35
30
25
20
15
10
5
0
0
5000
10000
15000
20000
AADT
Standard RM's with RRPMs - Straight
200mm long life RM's with RRPMs- Straight
High retroreflective RM's with RRPMs - Straight
150mm ATP with RRPMs - Straight

Draft Rural Delineation Hierarchy -Lower width roads

Level 1 All ONRC (including unsealed) All traffic volumes All road widths	
Level 2 All ONRC (sealed) All traffic volumes Min road width 5m	
Level 3 Secondary AADT 500 Min road width 5.5m	

Draft Rural Delineation Hierarchy

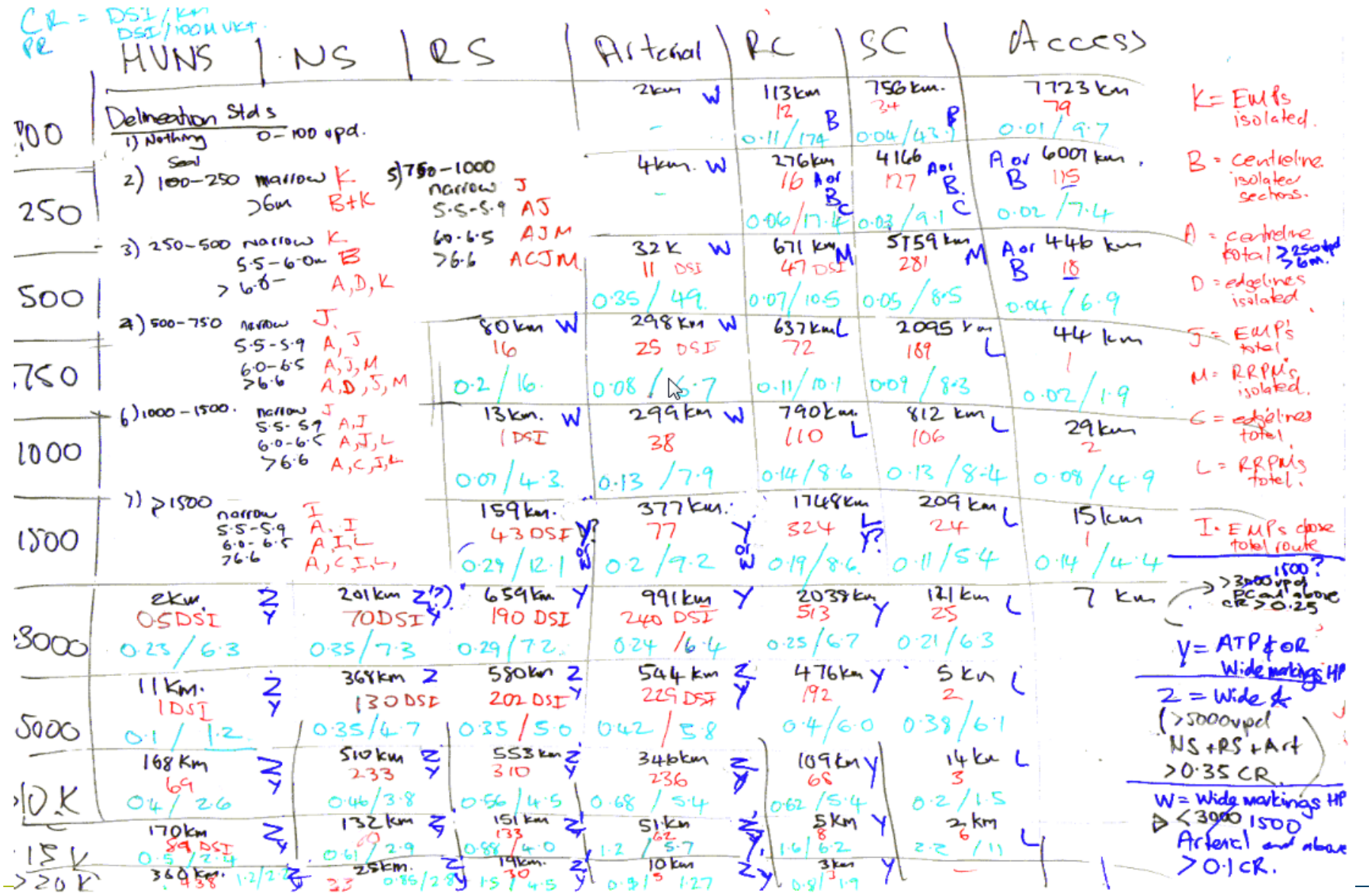
Level 4 Secondary/arterial AADT 1000 Min road width 6.0m	Wider road markings
Level 5 Regional/arterial AADT 2500 Min road width 6.0m	Improved material Edgeline Marking - Structured or ATP marking
Level 6 Regional/arterial AADT 3000 Min road width 6.0m	Improved material Edgeline with existing edgeline

Length (m) of Road by ONRC and AADT

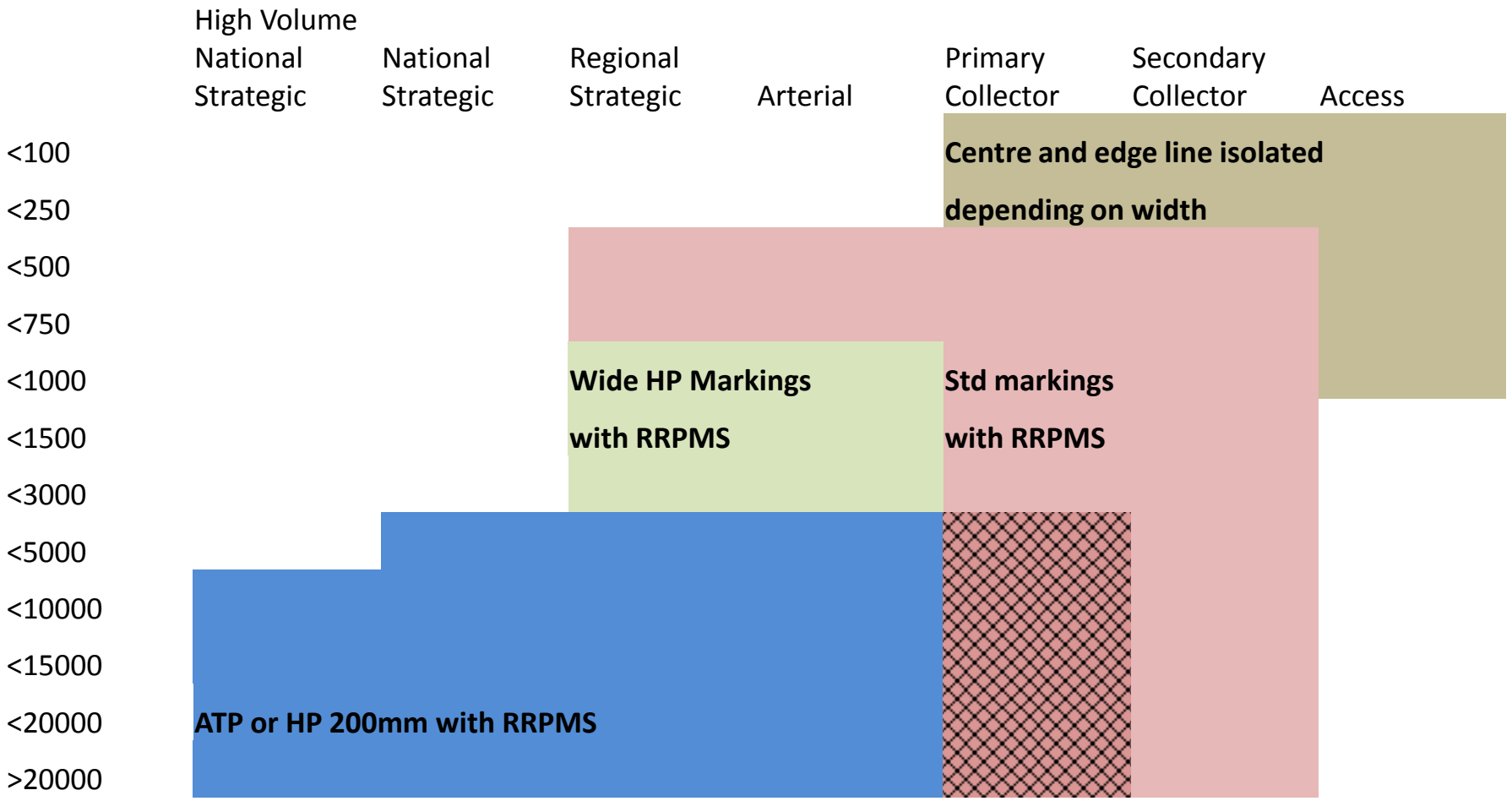
Row Labels	National Strategic (High Volume)	National Strategic	Regional Strategic	Arterial	Primary Collector	Secondary Collector	Access	**Grand Total**
100	195		1874	1855	112886	756109	7723309	**8596228**
250				4076	275943	4166353	6007590	**10453963**
500	303			32485	670765	5159266	446202	**6309020**
750			80713	297853	636671	2095827	43909	**3154973**
1000			13389	299351	790365	812745	29366	**1945215**
1500	590		159263	376471	1747598	209430	14823	**2508175**
3000	2206	200989	659280	991038	2037955	121262	7358	**4020088**
5000	11263	367691	579939	544230	476248	5674	2619	**1987664**
10000	168919	510752	553243	346392	109481	14922	2188	**1705896**
15000	170827	131788	151353	51358	5128	2680	714	**513848**
20000	84888	24872	17743	5149				**132651**
20000+	280329	2308	2578	4592	3352			**293159**
Grand Total	**719518**	**1238399**	**2219373**	**2954849**	**6866390**	**13344268**	**14278078**	**41620879**

Death and Serious Injury Equivalents by ONRC and AADT

DSIeq								
AADT	National Strategic (High Volume)	National Strategic	Regional Strategic	Arterial	Primary Collector	Secondary Collector	Access	Grand Total
100			1	1	12	34	79	**126**
250				0	16	127	115	**258**
500				11	47	281	18	**357**
750			16	25	72	189	1	**303**
1000			1	38	110	106	2	**258**
1500	1		43	77	324	24	1	**470**
3000	0.5	70	190	240	513	25	1	**1040**
5000	1	130	202	229	192	2	0	**757**
10000	69	233	310	236	68	3	0	**919**
15000	89	80	133	62	8	6	0	**379**
20000	63	21	26	2				**112**
20000+	375	2	4	3	3			**387**
Grand Total	**598**	**536**	**926**	**924**	**1363**	**797**	**217**	**5364**


CR = DSI / km
PR DSI / 100M VKT
HUNS
NS
RS
Arterial
RC
SC
Access
Delineation Stds
1) Nothing 0 – 100 vpd.
2) 100–250 narrow K
>6m B+K
3) 250–500 narrow K
5.5–6.0m B
> 6.0 A,D,K
4) 500–750 narrow J
5.5–5.9 A, J
6.0–6.5 A, J, M
>6.6 A, D, J, M
5) 750–1000 narrow J
5.5–5.9 AJ
6.0–6.5 AJM
>6.6 ACJM
6) 1000–1500 narrow J
5.5–5.9 A, J
6.0–6.5 A, J, L
>6.6 A, C, J, L
7) >1500 narrow I
5.5–5.9 A, I
6.0–6.5 A, I, L
>6.6 A, C, I, L
K = EMPs isolated.
B = centreline isolated sections.
A = centreline total >250 vpd >6m.
D = edgelines isolated.
J = EMP's total
M = RRPM's isolated.
C = edgelines total
L = RRPMs total.
I = EMPs close total route
1500?
>3000 vpd RC and above CR > 0.25
Y = ATP & OR Wide markings HP
Z = Wide & (>5000 vpd NS + RS + Art >0.35 CR.
W = Wide markings HP & <3000 1500 Artcl and above >0.1 CR.
100
250
500
750
1000
1500
3000
5000
10 K
15 K
>20 K

Straw Man sealed rural



Next Steps

Pull together a working group

- Industry
- RCAs
- NZTA

Confirm Approach

- Benefits and Cost
- Affordability