



ROUTE XL

DRIVE ANALYSIS &
ROUTE OPTIMIZATION

What is RouteXL?

- An add-in to SpatialXL. There are two versions of RouteXL. RouteXL plus is inclusive of the basic RouteXL version.
 - ❖ RouteXL – Drive Time or Distance analysis, Travelling Salesman, Set-to-Set Routing allocations, Point-to-Point routing, Matrix route calculations
 - ❖ RouteXL Plus – also known as QVR (Quantitative Vehicle Routing) – Optimized fleet planning and routing with different truck sizes, demands per point, shift times, time at depot, delay time and time windows. Optimized by time, distance or cost.

Why use RouteXL?

- Simple and easy to use
- Optimized segmentation of markets using road networks
- Optimized
 - ❖ Least cost routing
 - ❖ Least time routing
 - ❖ Least distance routing
- Master Route Planning
- Improved distribution planning
- Manage route compliance
- Daily sequenced routes for sales and delivery

Who uses RouteXL?



Case Studies

Marketing Surveying Company

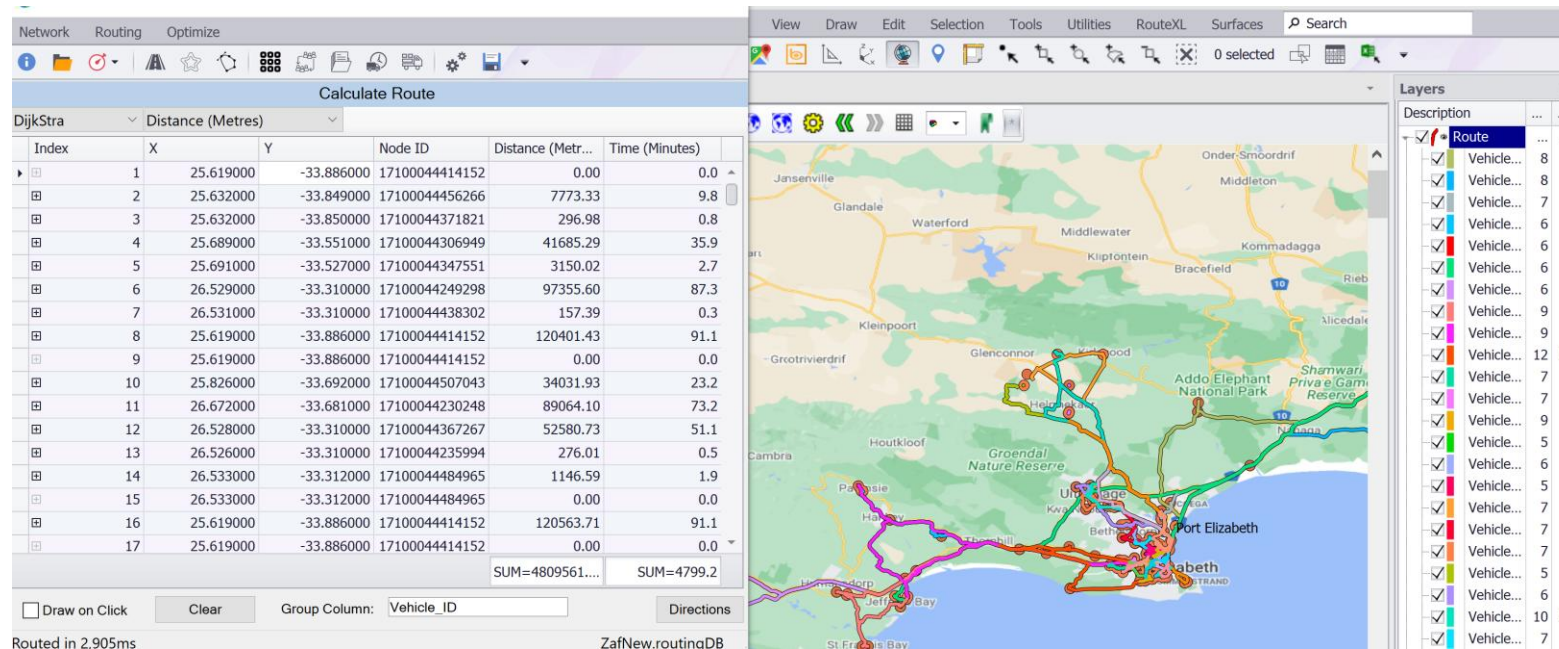
- Client (Marketing Surveying company) have a fleet of 19 vehicles countrywide to do surveys in urban areas.
- By doing a correct allocation of surveys to the closest survey office, an initial savings of over 10,000 km is made.
- Reduction of travel km with over 20K.
- Savings of over 15 overnight stops from 45 to 30.
- Reduction of man hours by 40%.
- Total savings R392,450

A	B	C	D	E	F	G	H	I	J	K
MainNo	SuplDfirst	Combined	Orig Distance	Orig Time	New Sup	New Distance	New Time	NewSupY/N	Diff Distance	Diff Time
619	17 619 17		187,062.41	159.84	15	276,253.44	159.0599213	Yes	89,191.03	(0.78)
620	17 620 17		192,885.63	165.87	15	282,076.66	165.0889282	Yes	89,191.03	(0.78)
621	17 621 17		171,744.56	140.18	17	171,744.56	140.1789703	No		
622	17 622 17		160,212.09	137.64	17	160,212.09	137.6429596	No		
623	17 623 17		182,613.48	151.30	15	269,166.09	148.8119202	Yes	86,552.61	(2.48)
624	17 624 17		172,724.05	148.68	17	172,724.05	148.6789703	No		
625	17 625 17		265,414.03	225.98	7	172,142.77	143.9150085	Yes	(93,271.27)	(82.06)
626	17 626 17		228,078.73	190.80	7	194,535.67	165,2689667	Yes	(33,543.06)	(25.53)
627	15 627 15		169,030.14	114.28	15	169,030.14	114.2830276	No		
628	15 628 15		189,871.83	155.47	15	189,871.83	155.4680328	No		
629	15 629 15		157,402.23	87.12	15	157,402.23	87.12007904	No		
630	15 630 15		158,925.30	88.64	15	158,925.30	88.64008331	No		
631	15 631 15		130,945.88	76.01	15	130,945.88	76.0120697	No		
632	15 632 15		193,671.84	127.92	15	193,671.84	127.9240494	No		
633	15 633 15		193,178.11	127.89	15	193,178.11	127.8880539	No		
634	15 634 15		110,182.27	66.65	15	110,182.27	66.6490097	No		
635	15 635 15		247,696.52	145.78	15	247,696.52	145.7759399	No		
636	15 636 15		261,447.17	162.40	15	261,447.17	162.3979187	No		
637	15 637 15		202,961.48	161.74	7	125,374.69	104.0140228	Yes	(77,586.80)	(57.73)
638	15 638 15		219,837.53	144.71	7	83,600.74	71.9710067	Yes	(136,236.79)	(72.74)
639	15 639 15		131,441.66	117.28	7	106,766.73	98.99501038	Yes	(24,674.93)	(18.29)
640	15 640 15		199,131.69	165.60	7	121,435.76	107.7680359	Yes	(77,695.93)	(57.84)
641	15 641 15		196,137.86	172.75	7	142,877.52	120.0690155	Yes	(53,260.34)	(52.68)
642	15 642 15		296,535.13	219.79	7	160,298.31	147.0429993	Yes	(136,236.81)	(72.74)
643	15 643 15		304,153.41	192.39	7	209,017.36	181.7840271	Yes	(95,136.05)	(10.61)
644	15 644 15		317,923.72	231.08	19	160,836.95	147.2770386	Yes	(157,086.77)	(83.81)
645	15 645 15		356,753.25	247.66	19	179,780.52	159.9569855	Yes	(176,972.73)	(87.70)
									(10,973,644.28)	(8,530.80)
									(10,973.64)	(142.18)

Case Studies

FMCG company

- Reduction of costs:
- Vehicle number reduction – 4 20 pallet trucks
- Distance 635,541 km reduction. Total time 624 hours reduction
- Translation into actual cost saving: R4,284,050.



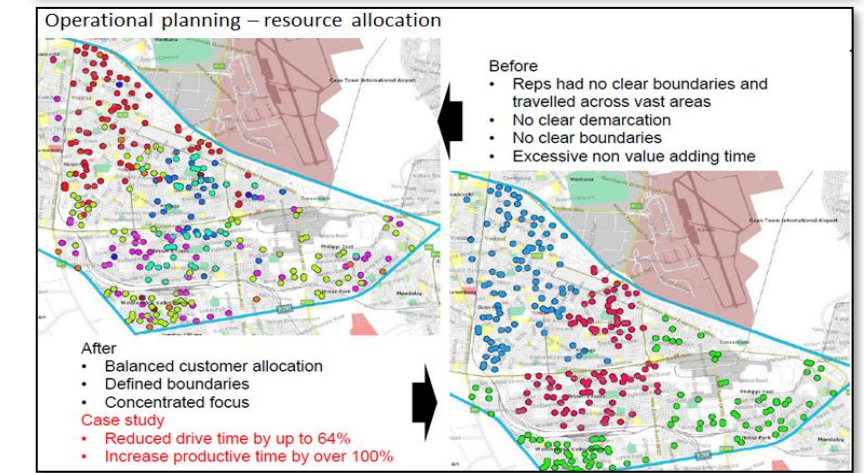
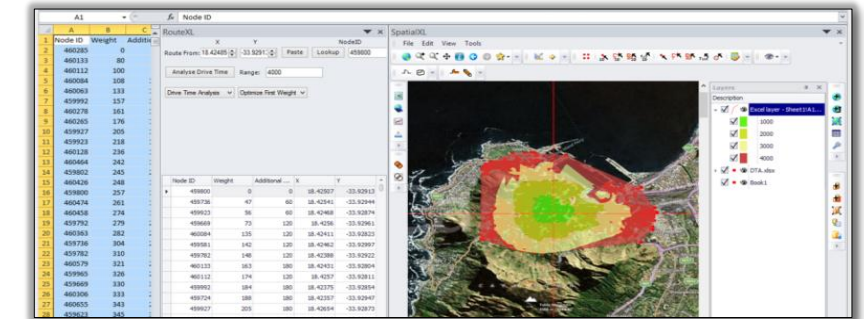
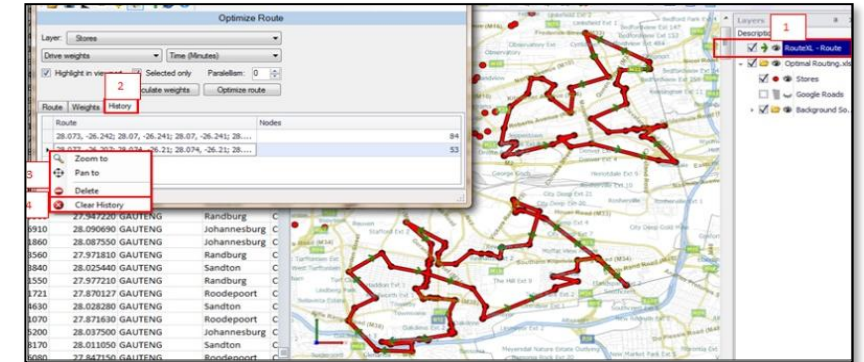
Routing in Excel - RouteXL

RouteXL

An add-in to SpatialXL for **Drive time & Distance Calculations & Analysis** and **Quantitative Vehicle Routing**

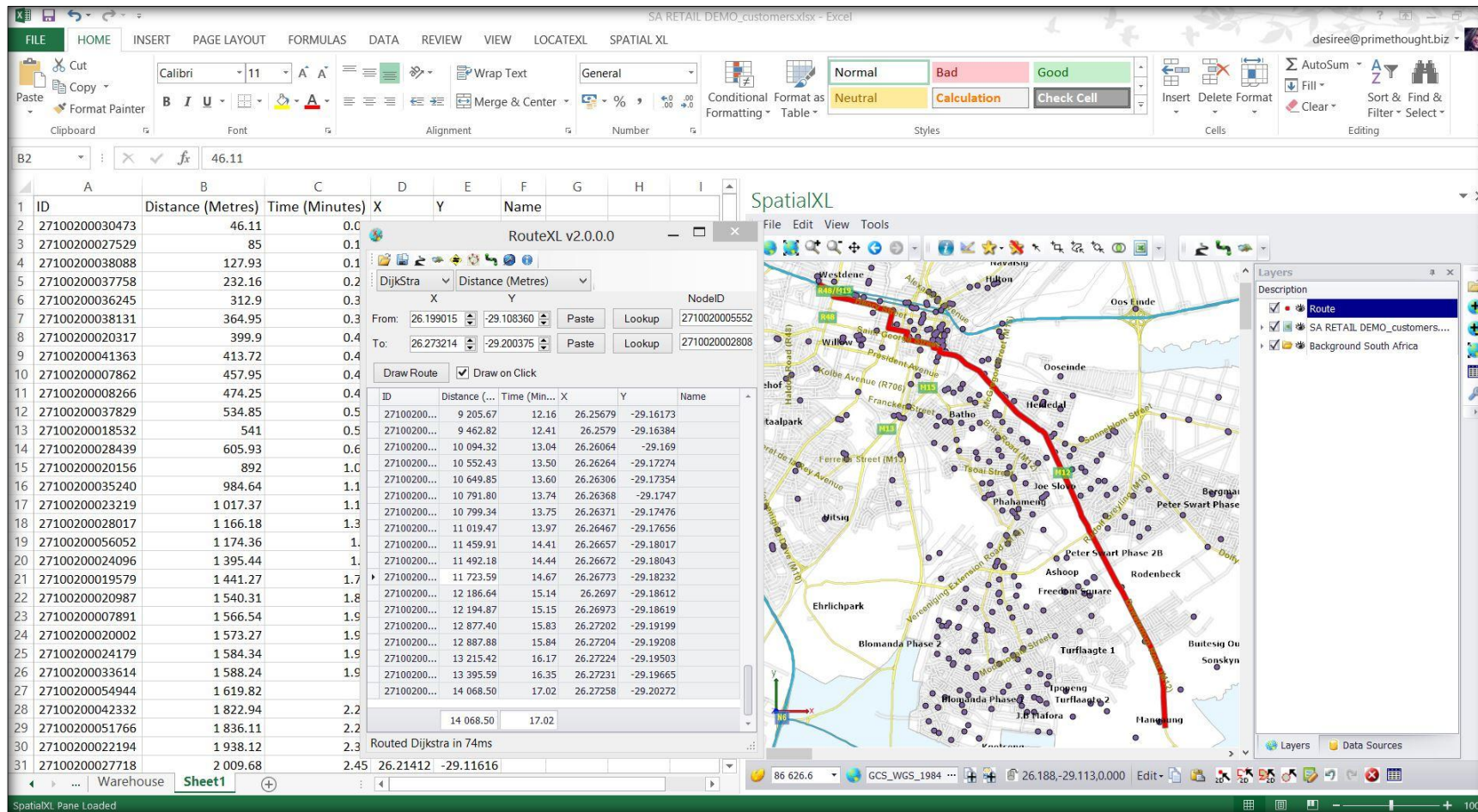
With RouteXL you can:

- Quickly calculate drive times & distances between individual or multiple locations
- Create optimized routes to improve efficiency & productivity. For operational planning & resource allocation
- Perform matrix routing calculations between millions of pairs of points for logistics
- Create drive time/distance polygons for point classification, market segmentation or outlet planning.
- Seamlessly integrate with SpatialXL
- Export results to Excel or download to GPS



Point to Point Routing

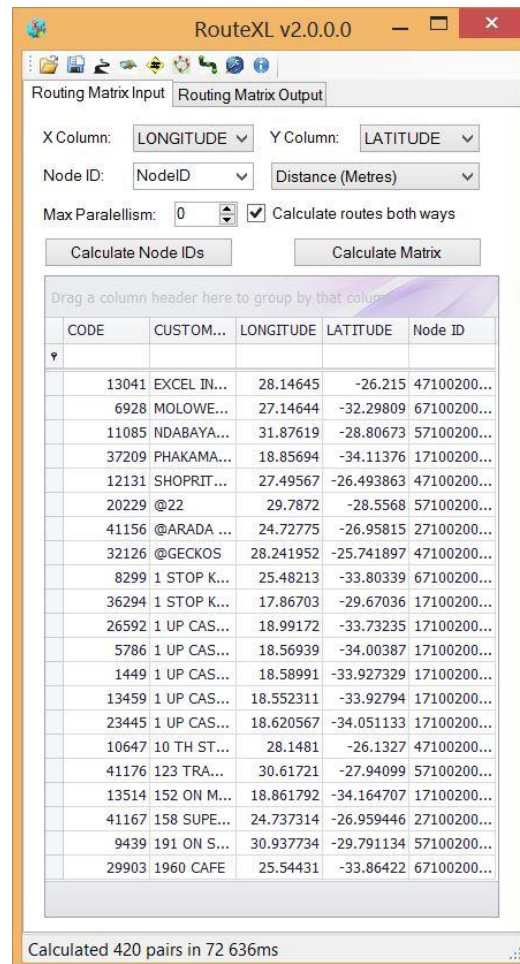
- Times and distance between points
- Will draw in sequence of points added
- Can draw multiple point to point routes per category as selected



Routing from multiple points in a spreadsheet to single points on a map or vice versa.

Routing matrix

- A routing matrix can be calculated and stored in a database
- This allow for times and distances between every point and every other point to be calculated
- This is stored in a database for a quick lookup of times and/or distances as needed



RouteXL v2.0.0.0

Routing Matrix Input Routing Matrix Output

X Column: LONGITUDE Y Column: LATITUDE

Node ID: NodeID Distance (Metres)

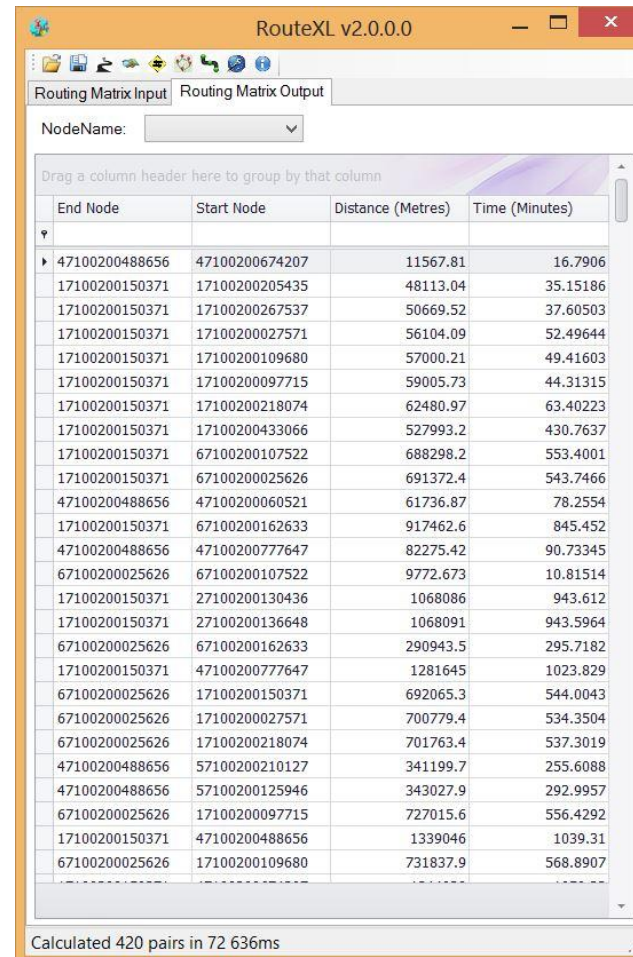
Max Parallelism: 0 ☒ Calculate routes both ways

Calculate Node IDs Calculate Matrix

Drag a column header here to group by that column

CODE	CUSTOM...	LONGITUDE	LATITUDE	Node ID
13041	EXCEL IN...	28.14645	-26.215	47100200...
6928	MOLOWE...	27.14644	-32.29809	67100200...
11085	NDABAYA...	31.87619	-28.80673	57100200...
37209	PHAKAMA...	18.85694	-34.11376	17100200...
12131	SHOPRIT...	27.49567	-26.493863	47100200...
20229	@22	29.7872	-28.5568	57100200...
41156	@ARADA ...	24.72775	-26.95815	27100200...
32126	@GECKOS	28.241952	-25.741897	47100200...
8299	1 STOP K...	25.48213	-33.80339	67100200...
36294	1 STOP K...	17.86703	-29.67036	17100200...
26592	1 UP CAS...	18.99172	-33.73235	17100200...
5786	1 UP CAS...	18.56939	-34.00387	17100200...
1449	1 UP CAS...	18.58991	-33.927329	17100200...
13459	1 UP CAS...	18.552311	-33.92794	17100200...
23445	1 UP CAS...	18.620567	-34.051133	17100200...
10647	10 TH ST...	28.1481	-26.1327	47100200...
41176	123 TRA...	30.61721	-27.94099	57100200...
13514	152 ON M...	18.861792	-34.164707	17100200...
41167	158 SUPE...	24.737314	-26.959446	27100200...
9439	191 ON S...	30.937734	-29.791134	57100200...
29903	1960 CAFE	25.54431	-33.86422	67100200...

Calculated 420 pairs in 72 636ms



RouteXL v2.0.0.0

Routing Matrix Input Routing Matrix Output

NodeName: NodeID

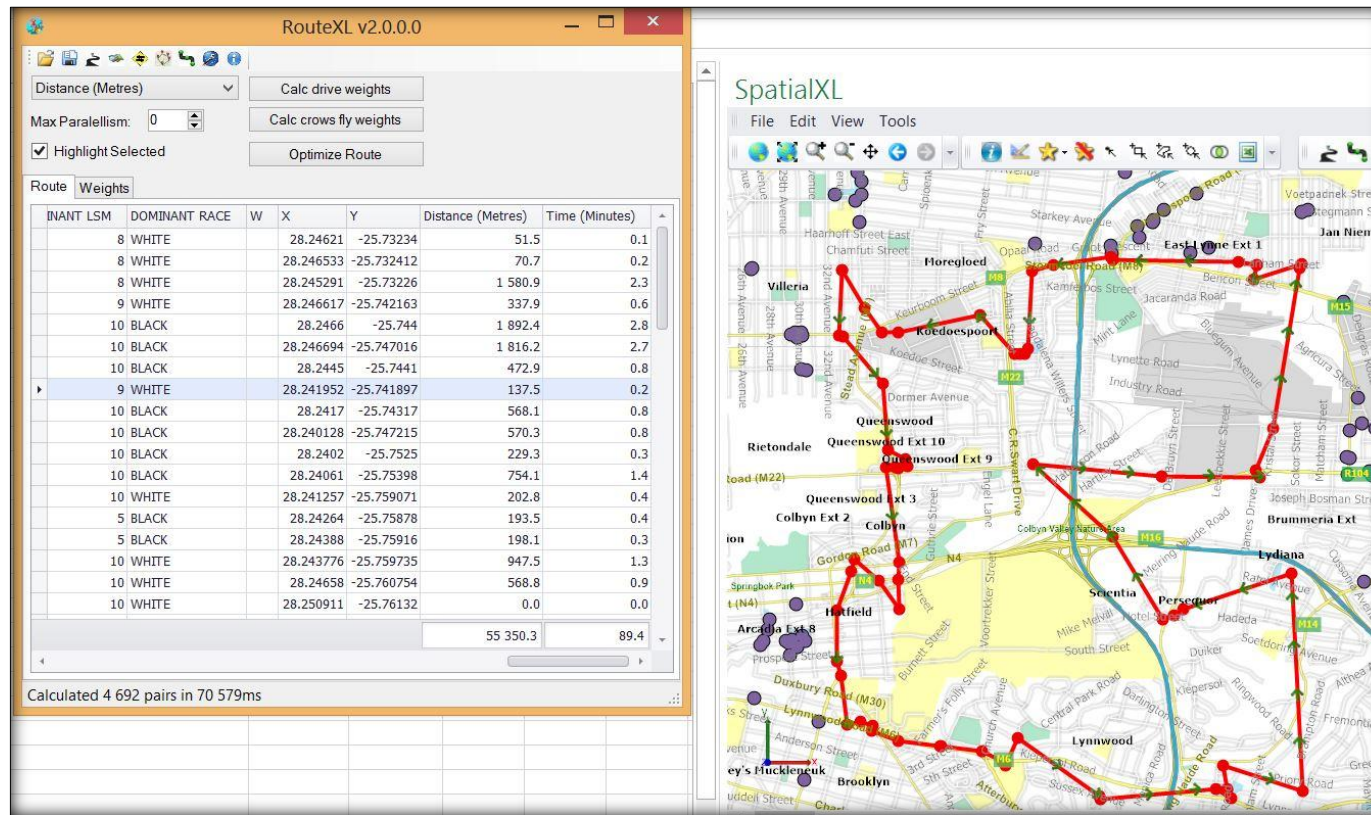
Drag a column header here to group by that column

End Node	Start Node	Distance (Metres)	Time (Minutes)
47100200488656	47100200674207	11567.81	16.7906
17100200150371	17100200205435	48113.04	35.15186
17100200150371	17100200267537	50669.52	37.60503
17100200150371	17100200027571	56104.09	52.49644
17100200150371	17100200109680	57000.21	49.41603
17100200150371	17100200097715	59005.73	44.31315
17100200150371	17100200218074	62480.97	63.40223
17100200150371	17100200433066	527993.2	430.7637
17100200150371	67100200107522	688298.2	553.4001
17100200150371	67100200025626	691372.4	543.7466
47100200488656	47100200060521	61736.87	78.2554
17100200150371	67100200162633	917462.6	845.452
47100200488656	47100200777647	82275.42	90.73345
67100200025626	67100200107522	9772.673	10.81514
17100200150371	27100200130436	1068086	943.612
17100200150371	27100200136648	1068091	943.5964
67100200025626	67100200162633	290943.5	295.7182
17100200150371	47100200777647	1281645	1023.829
67100200025626	17100200150371	692065.3	544.0043
67100200025626	17100200027571	700779.4	534.3504
67100200025626	17100200218074	701763.4	537.3019
47100200488656	57100200210127	341199.7	255.6088
47100200488656	57100200125946	343027.9	292.9957
67100200025626	17100200097715	727015.6	556.4292
17100200150371	47100200488656	1339046	1039.31
67100200025626	17100200109680	731837.9	568.8907

Calculated 420 pairs in 72 636ms

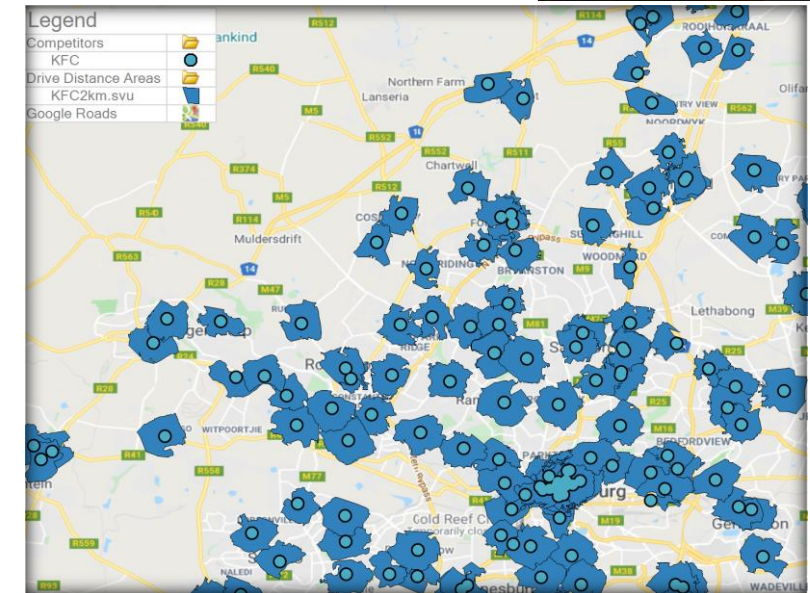
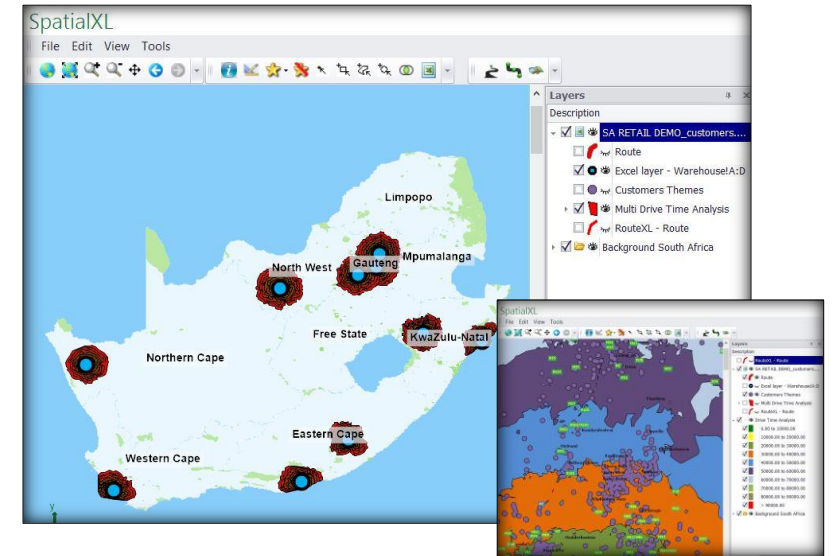
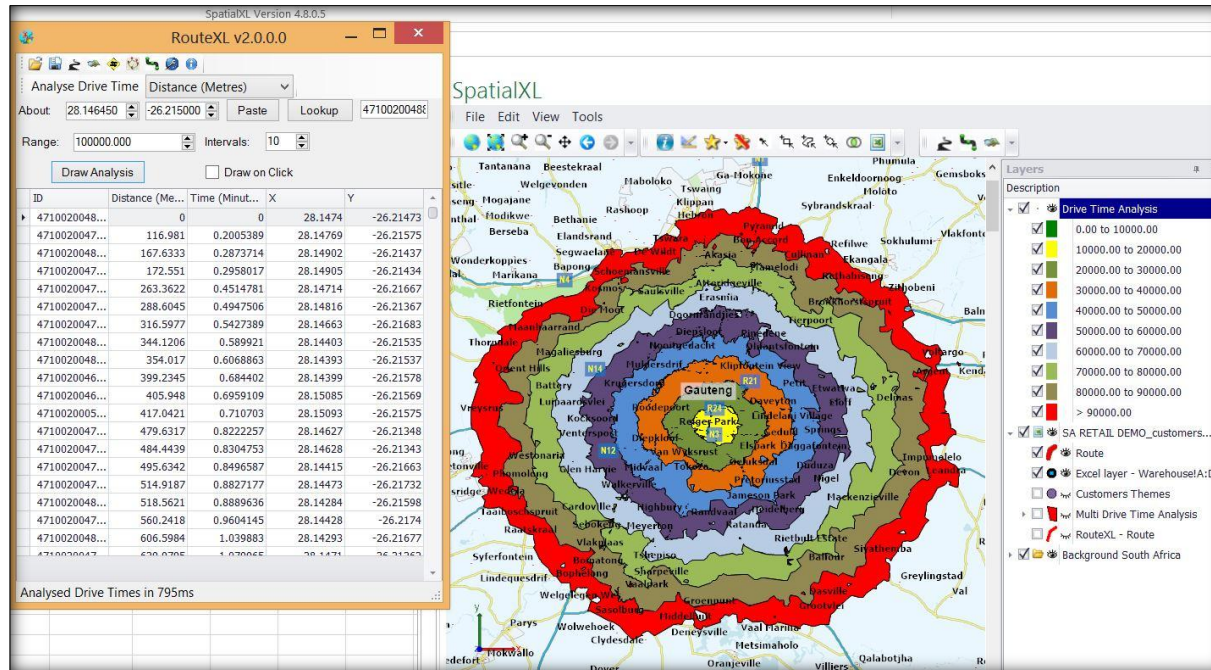
Travelling salesman routing

- Ordering of points in sequence for optimized route in RouteXL.
- Does not include fleets of vehicles, shift times or demands, just simple best ordering of points to visit based on either least time or least distance.
- Fleets, shift times and quantities are RouteXL plus (QVR) features.



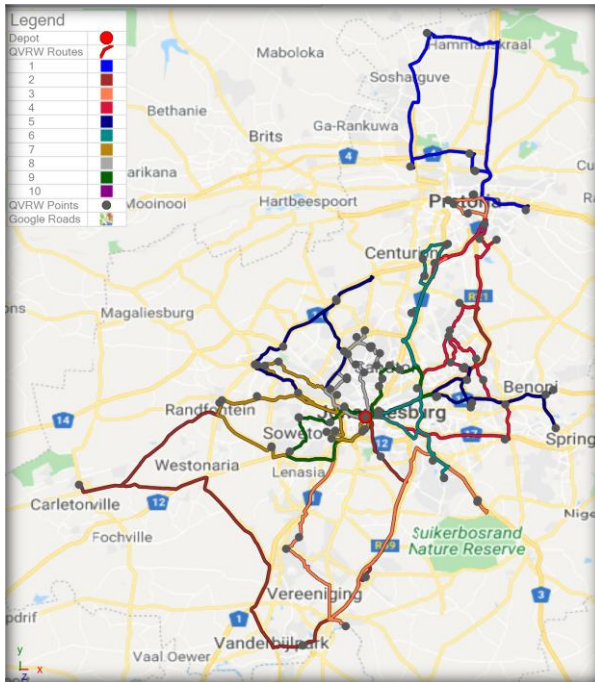
Drive time or distance analysis

- Drive time or distance analysis will draw the area around a select point or points. This is similar to a buffer but using the routable network.
- This is very useful in calculating the area of influence and what is happening in the area – such as points or demographics related to the area.
- Also useful in terms of classifying points in different drive distances and times related to a particular point.



QVR (Quantitative Vehicle Routing)

- Route optimization for reps or delivery vehicles
- Least distance, least time or least cost optimization
- Levelling of vehicle usage



The screenshot shows the QVR software interface with the 'Depot Gauteng' settings. The 'Point Columns' tab is active, showing a table with columns for ID, Row Labels, Brand, Latitude, Longitude, Demand, AdjustedDemand, Weekly, and TimeAt. The table lists 19 data points, including Depot Gauteng and various locations like Panorama, Centurion Lifestyle, Pan Africa, The Square (Boksburg), East Rand Mall, Dobsonville, Kolonnade, Bara Taxi, Anthos, Glen Balad Centre, Blu Valley, Lakeside Mall, Total Rangeview, Paardekraal, Bergbron, and Willocrest Engen.

ID	Row Labels	Brand	Latitude	Longitude	Demand	AdjustedDemand	Weekly	TimeAt
GP01	Depot Gauteng		-26.2121	28.0135	0	0	0	40
1003	Panorama	Blue Nova	-26.2967	28.0468	108.2470467	108	27	13.5
1004	Centurion Lifestyle	Blue Nova	-25.8797	28.1626	137.7910987	138	35	17.5
1005	Pan Africa	Blue Nova	-26.1095	28.0875	118.9431427	119	30	15
1009	Pan Africa	Blue Nova	-26.1094	28.0873	45.91334133	46	12	6
1012	The Square (Boksburg)	Blue Nova	-26.1907	28.2408	89.04908267	89	22	11
1013	East Rand Mall	Blue Nova	-26.1816	28.2428	66.65003333	67	17	8.5
1018	Dobsonville	Blue Nova	-26.2124	27.8704	35.51660933	36	9	4.5
1023	Kolonnade	Blue Nova	-25.6805	28.2481	42.39361733	42	11	5.5
1029	Bara Taxi	Blue Nova	-26.2588	27.941	46.26527467	46	12	6
1034	Anthos	Blue Nova	-26.1012	27.7973	70.12723867	70	18	9
1038	Glen Balad Centre	Blue Nova	-26.0862	28.2519	52.27117867	52	13	6.5
1039	Blu Valley previously Marylone Mall	Blue Nova	-25.9074	28.1407	72.246332	72	18	9
1044	Lakeside Mall ex Lakeside Express	Blue Nova	-26.1851	28.3152	65.50675333	66	17	8.5
1045	Total Rangeview Krugersdorp	Blue Nova	-26.0925	27.8265	27.67654267	28	7	3.5
1048	Paardekraal Krugersdorp	Blue Nova	-26.0996	27.7805	83.16909867	83	21	10.5
1052	Bergbron	Blue Nova	-26.1638	27.9522	59.97960267	60	15	7.5
1053	Willocrest Engen	Blue Nova	-26.1262	27.974	20.85104533	21	5	2.5

POSSIBLE INPUTS

- Shift time
- Count of vehicles
- Vehicles with different capacities
- Wait time at each point
- Load time at depot
- Vehicle pools
- Time windows
- Demand per point
- Adjusted road network speeds

QVR Results

- In the results you can see each instance of each type of vehicle, total distance travelled, total spent, etc
- Also available are the utilization of the shift time and the utilization of the vehicle capacity
- These can also be exported to Excel for further analysis

RouteXL v6.0.0.32

Network Routing Optimize

File and Network Optimization Display Input Sheet Home Insert Page Layout Formulas Data Review View Search

Optimize all Refresh Route Add Max Trips: 15 Handle all possible Paralellism: 1

Optimize visible clusters Previous Clear All Auto Level Tolerance% 10 Optimize By: Time (Minutes) Advanced...

Dynamic optimize Next

Optimize Clusters Settings

Inputs Summary Grid Pivot

Instance

Vehicle	Sequence	Point	X	Y	Load	Arrival time	Wait time	Demand	Delay
Instance: 1									
		8						SUM=486.49	
Instance: 2									
		12						SUM=942.15	
Instance: 3									
		15						SUM=950.79	
Instance: 4									
		18						SUM=986.51	
Instance: 5									
		17						SUM=992.56	
Instance: 6									
		19						SUM=1210.46	
Instance: 7									
		17						SUM=980.32	
Instance: 8									
		21						SUM=964.28	
Instance: 9									
		16						SUM=899.23	

Auto-Cluster

Times/Distances

Results

DemoDataQVR.Qvrw

Row Labels	Sum of Distance	Sum of Load	Sum of Total time	Max of Shift%	Max of Capacity%
1	290,408	1551	369	69	97
2	334,457	2678	555	99	100
3	344,586	3480	551	98	97
4	253,476	3850	536	95	99
5	245,530	3768	490	85	100
6	248,236	2954	600	100	99
7	171,164	3522	463	80	100
8	126,626	4436	425	72	99
9	115,956	3079	403	67	93
Grand Total	2,130,440	29318	4,393	100	100

What our clients say

- *“I can finally create my master routes and plan against these for effective optimization of our fleet”*
- *“The simplicity of RouteXL QVR compared to the bigger systems out there make it possible to run multiple what-if scenarios in route planning”*
- *“We reduced our fleet from over 900 vehicles to less than 700 effectively with the planning done in RouteXL.”*
- *“RouteXL has revolutionized the way we do our Route to Market optimizations in our business.”*



THANK YOU

Visit primethought.biz for more information

or email

sales@primethought.biz