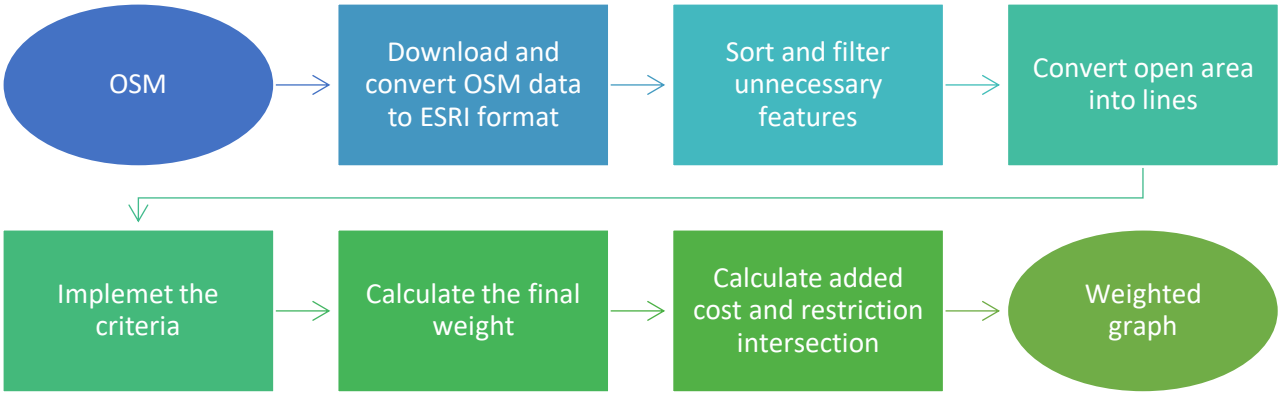
Supp Table 1. Derived Costs for 'Footway=Crossing' Key

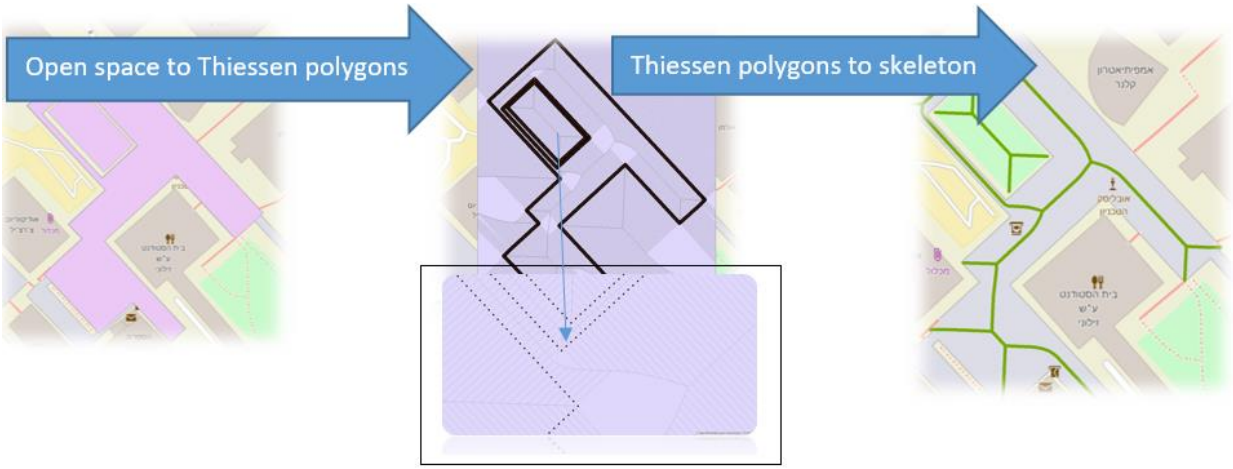
'Footway=*Crossing*'	***APS***	***Tactile Paving***	***Cost***
Crossing with *Traffic Lights*	✓	✓	**Preferred (1)**
	×	✓	**Less Preferred (4)**
	×	×	**Better to avoid (5)**
Crossing without *Traffic Lights*	Irrelevant	✓	**Neutral (3)**
	Irrelevant	×	**Less Preferred (4)**
Uncontrolled *Intersection*	Irrelevant	Irrelevant	**Must avoid (6)**



Supp Fig 1. Workflow for Generating Weighted Graph

Supp Table 2. Used Key-Value Pairs of Stored Features

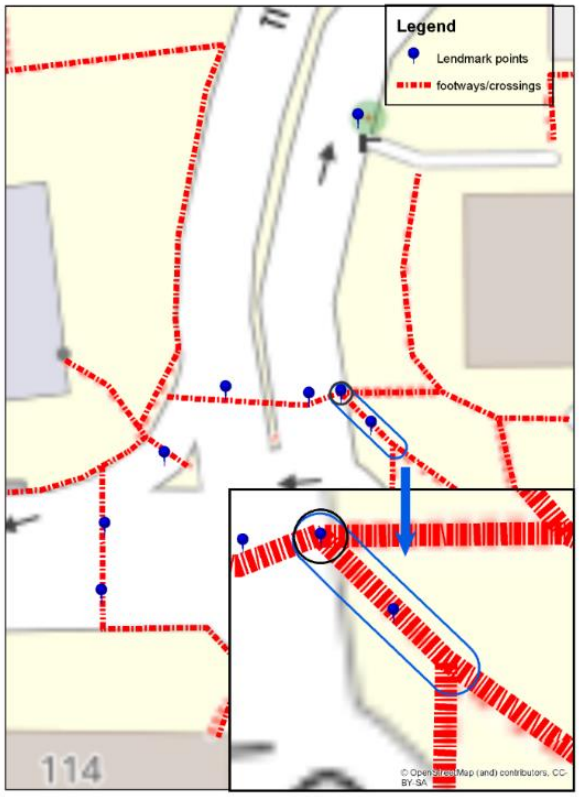
Nodes		Lines		polygons
Highway	**Amenity**	**Highway**	**Highway**	**Highway**
'traffic signals'	'telephone'	'footway'	'cycleway'	'pedestrian
'street lamp'	'fountain'	'path'	'motorway'	
'crossing'	'bicycle parking'	'pedestrian'	'motorway link'	
'bus stop'	'bicycle rental'	'service'	'primary'	
'stop'	'fast-food'	'steps'	'residential'	
'steps'	'waste disposal'	'unclassified	'secondary'	
Building	'wastebasket'		'tertiary'	
'entrance'	'vending machine'		'trunk'	
Natural	'restaurant'		'trunk link'	
'tree'	'recycling'			
Power	'post-box'			
'pole'	'parking'			
Leisure	'fuel'			
'picnic table'	'food court'			
Shop	'fast-food'			
'supermarket'	'cafe'			
'bakery'	'bus station'			
'kiosk'	'bench'			



Supp Fig 2. From Open Spaces to Network Lines

Criteria implementation

Landmarks –. Supp Fig **3** illustrates this concept whereby two landmarks (depicted as blue dots) are found near the examined footway (within the blue buffer). Moreover, one landmark is near a decision point (within the black buffer). Consequently, the overall cost of the examined footway regarding Landmarks is -3.

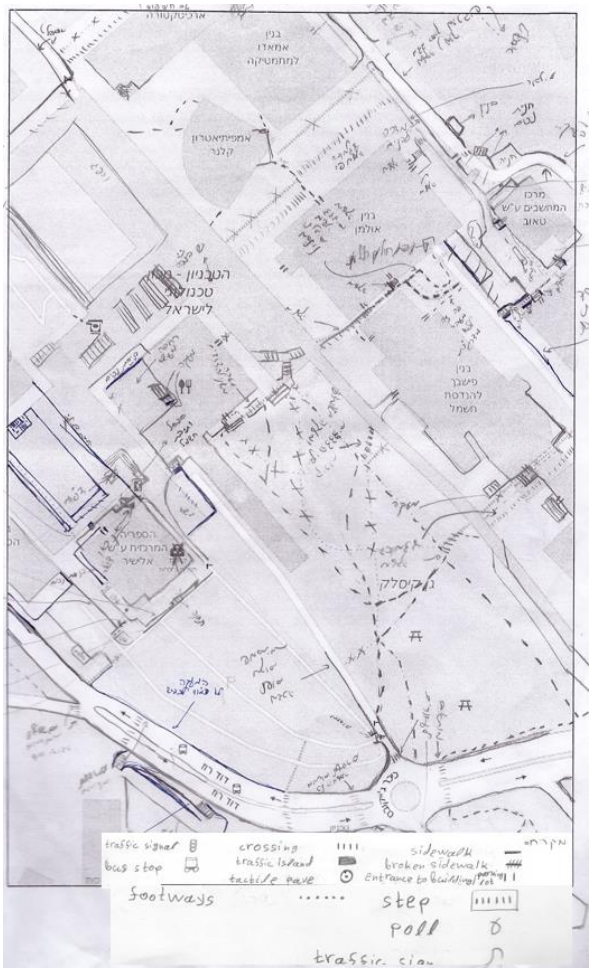


Supp Fig 3. Example of Landmark Criterion Implementation

Way Type –Supp Table **3** depicts an example in which all attributes are relevant to the Way Type criterion and are calculated in the overall cost (‘way_w’). For instance, 'way ID 410' has the following tags: ‘highway=footway’; ‘OSM handrail=NULL’; ‘OSM surface=NULL’; ‘OSM footway=crossing’; 'OSM tactile paving=yes’; ‘Traffic signals=NULL’, and ‘Traffic signals: sound/vibration=Null’. Based on Supp Table **3**, the ‘way_w’ cost value of 'way ID 410' is 3.

Supp Table 3. Example of Way Features with Relevant Fields for Way Type Criterion

Object ID	Highway	OSM Handrail	OSM Surface	OSM Footway	OSM Tactile Paving	Traffic Signals	Traffic Signals: Sound/ Vibration	way_w Cost Value
2	Service							6
29	Footway							1
47	Steps	yes						3
95	Path							3
410	Footway			crossing	yes			3
548	Footway			crossing	no			4
741	Footway		0					3
751	Steps	no						4
778	Pedestrians							6



Supp Fig 4. Area Surveyed and Mapped in the Technion Campus

Restrictions and added costs

Restriction points that should be avoided by blind pedestrians include the intersection points of specific roads with lines from the GraphWays FC (except lines with ‘way type=crossing’ tag). For example, uncontrolled crossing that presents accessibility and safety problems for blind pedestrians, and as such has a total weight of an examined route that is increased by 6. This is a value that denotes the ‘avoid’ cost. Added costs are also significant on the weighted graph, created by intersections of ways that are intended for both pedestrians and cars, such as the entrance to a parking lot. These costs are identified by locating all intersection points of ways with

'highway=Living Street/Path/Service/Unclassified' tags and with 'highway= Steps/Footway' keys, all from the same GraphWays FC. Added costs increase the total weight of an examined route by 5. This is a value that denotes the 'better to avoid' cost.

Personal preferences

As stated in the Methodology Section, one of the seven central elements of wayfinding among blind pedestrians includes *personal preferences*, included in Equation 1. The results presented in **Supp Table 4** were calculated with increased effect of Length criterion and no effect of Landmarks criterion , whereas those presented in Table 7 were calculated with Way Type criterion have no effect. In the former, where users prefer a shorter route and landmarks have no effect but way type has a cost, our algorithm computed the green route as optimal, with its weight ('total weight=45.92') being lower than both the orange route ('total weight=66.02') and the blue route ('total weight=48.36'). In the latter, however, the algorithm calculated the orange option as the optimal route, since it is the shortest and navigation through a service road (Way Type=0) does not affect the overall weight (similar to seeing pedestrians).

Supp Table 4. Weight of Routes (Coefficients Criteria:
Way Type=1, Landmark=0, Complexity=1, Length=2)

The blue route		The orange route		The green route	
ID	Final Weight	ID	Final Weight	ID	Final Weight
10	3.30	1134	13.97	397	1.91
11	2.10	1139	14.02	400	2.65
12	4.27	1140	10.29	401	2.10
417	7.87	1141	14.25	402	6.26
1033	19.43	1142	13.51	430	2.30
1135	11.40			432	2.74
				433	2.05
				735	5.69
				1034	4.10
				1035	16.13
Total weight	48.36		66.02		45.92

Supp Table 5. Weight of Routes (Coefficients Criteria: Way Type=0, Landmark=1, Complexity=1, Length=2)

The blue route		The orange route		The green route	
ID	Final Weight	ID	Final Weight	ID	Final Weight
10	1.63	1134	0.00	397	0.25
11	0.43	1139	0.27	400	0.99
12	2.60	1140	0.29	401	0.43
417	2.87	1141	1.75	402	1.26
1033	7.76	1142	0.00	430	0.63
1135	0.00			432	1.07
				433	0.38
				735	0.69
				1034	1.18
				1035	14.46
Total weight	15.29		2.30		21.34

Supp Fig 5. Lack of Separation Between Sidewalk and Road at Car Park Entrance (Denoted as Dashed Red Line) (Source: Google Maps).