Abstract. A metrized graph is a compact singular 1-manifold endowed with a metric. A given metrized graph can be modelled by a family of weighted combinatorial graphs. If one chooses a sequence of models from this family such that the vertices become uniformly distributed on the metrized graph, then the ith largest eigenvalue of the Laplacian matrices of these combinatorial graphs converges to the ith largest eigenvalue of the continuous Laplacian operator on the metrized graph upon suitable scaling. The eigenvectors of these matrices can be viewed as functions on the metrized graph by linear interpolation. These interpolated functions form a normal family, any convergent subsequence of which limits to an eigenfunction of the continuous Laplacian operator on the metrized graph.