



intelligent school allocation

Optimized school catchment zones for the City of Laval

Oliver Dlabáč, PhD

VILLE JUSTE Ltd.

oliver.dlabac@villejuste.com

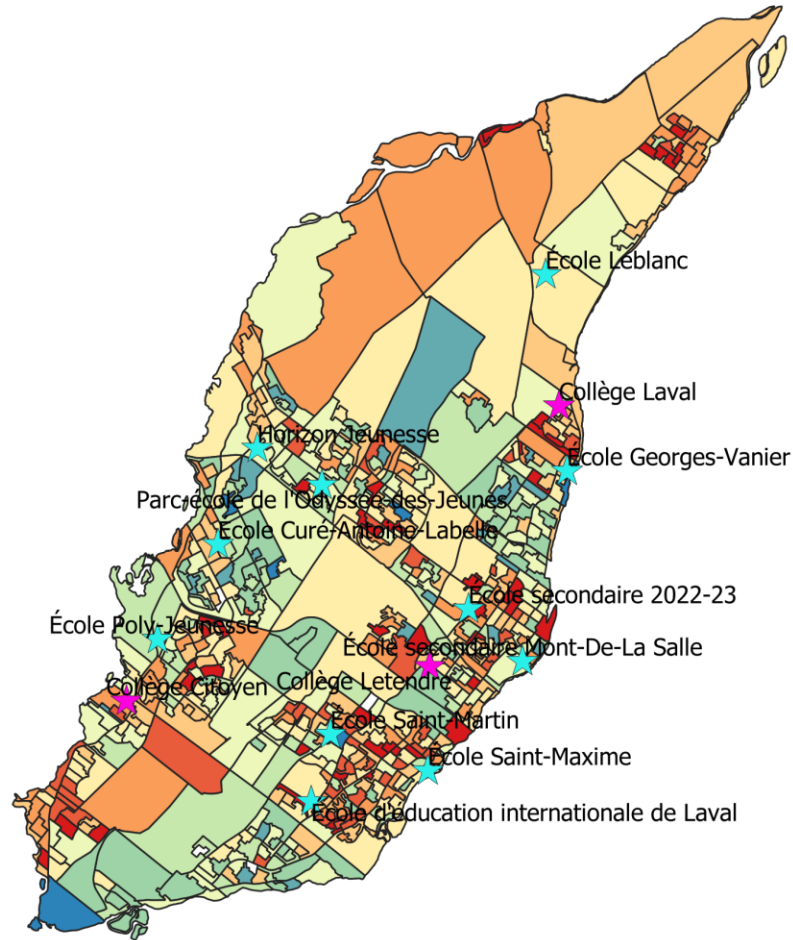
On order of **École ensemble**

9 February 2022



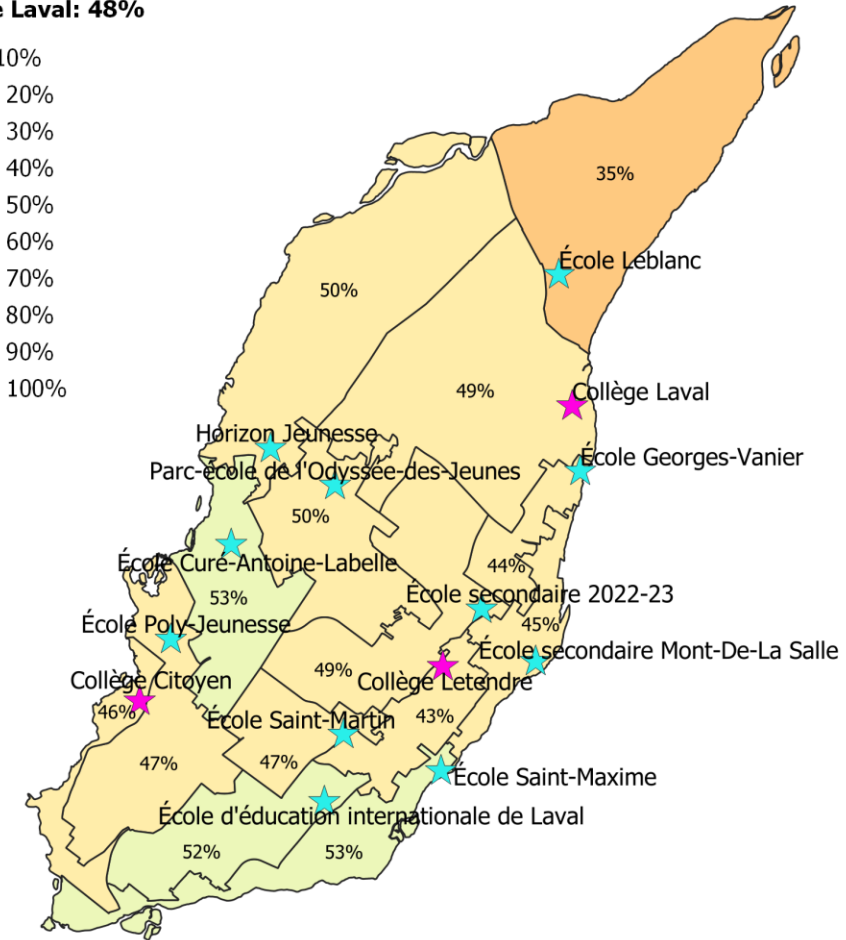
RÉPARTITION DES FAMILLES AVEC ENFANTS D'ÂGE SCOLAIRE DE LAVAL COMPTANT AU MOINS UN PARENT DIPLÔMÉ UNIVERSITAIRE

PAR AIRE DE DIFFUSION



PAR BASSIN SCOLAIRE OPTIMISÉ

Moyenne Laval: 48%



Source: Tableau de Statistique Canada : Famille de recensement ayant au moins un enfant de 18 ans et moins à la maison dans les ménages privés selon le plus haut certificat, diplôme ou grade du parent ayant le plus haut grade complété et le nombre d'enfants de 18 ans ou moins / Recensement de 2016 / données-échantillon 25 % / géo : 637 Aires de diffusion de la Subdivision de recensement de Laval

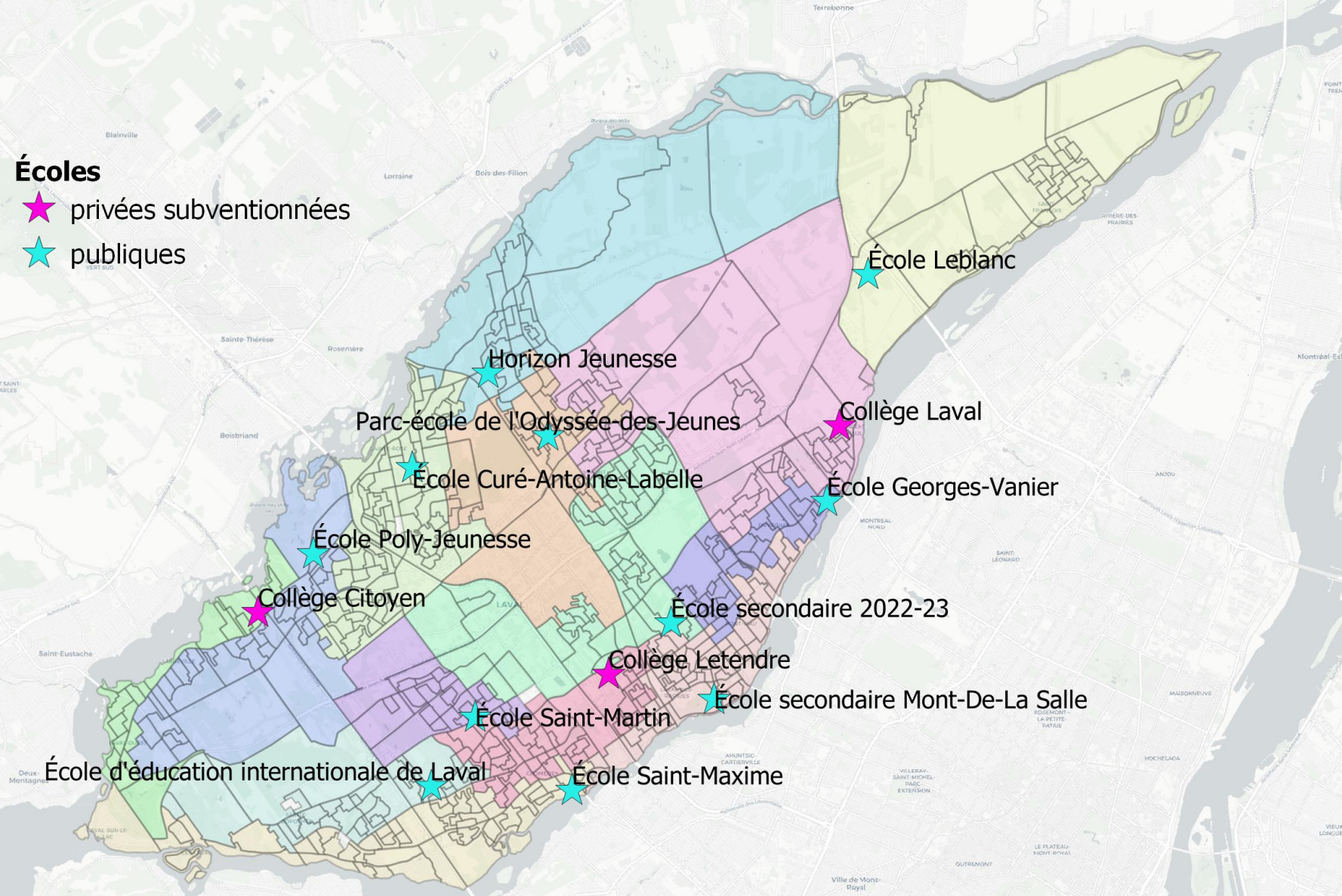
Écoles

- ★ privées subventionnées
- ★ publiques

BASSINS SCOLAIRES OPTIMISÉS

Ville de Laval

- Écoles**
- ★ privées subventionnées
 - ★ publiques



Répartition par école des familles avec enfants d'âge scolaire comptant au moins un parent diplômé universitaire (moyenne Laval: 48%)

Collège Citoyen	46%
Collège Laval	49%
Collège Letendre	43%
Horizon Jeunesse	50%
Parc-école de l'Odyssée-des-Jeunes	50%
École Curé-Antoine-Labelle	53%
École Georges-Vanier	44%
École Leblanc	35%
École Poly-Jeunesse	47%
École Saint-Martin	47%
École Saint-Maxime	53%
École d'éducation internationale de Laval	52%
École secondaire 2022-23	49%
École secondaire Mont-De-La Salle	45%

Current school populations and estimation of students' distribution

Secondary schools of City of Laval	Current student population
PUBLIC	
École Curé-Antoine-Labelle	2'600
École d'éducation internationale de Laval	1'500
École Georges-Vanier	1'000
Horizon Jeunesse	1'200
Parc-école de l'Odyssée-des-Jeunes	975
École Leblanc	1'400
École secondaire Mont-De-La Salle	1'800
École Poly-Jeunesse	1'800
École Saint-Martin	1'000
École Saint-Maxime	2'000
École secondaire 2022-23*	2'000
SUBTOTAL	17'275
SUBSIDISED PRIVATE	
Collège Citoyen	725
Collège Letendre	1'700
Collège Laval	2'000
SUBTOTAL	4'425
TOTAL	21'700
*Under construction. Will open in September 2022.	

- Distribution of 21'700 secondary students (see table) across statistical 'dissemination areas' (see preceding maps) was estimated based on distribution of children under 18 (Census 2015)*
- Share of students with academic parental background estimated on respective share among children under 18 (Census 2015)
- Academic background defined by a parent holding a university certificate, diploma or degree (either below bachelor level or at/above bachelor level)
- Non-subsidized private school North Star Academy not considered for the optimization

*Number of children per 'dissemination area' based on rounded indications on household categories counting 1, 2, 3, 4, 5, or 6 and more children under 18. Category counts were factored to add up to total count of households, category counts for households with academic background were corrected to fit within total count of respective category.

Optimization procedure

- The design of socially mixed catchment zones was supported by an algorithm developed at the **Centre for Democracy Studies Aarau (University of Zurich)** that is operated by **VILLE JUSTE Ltd.**
- Since there are no catchment zones at present, as a starting point, we defined contiguous catchment zones that fit the current student populations (previous table)
 - Provisional zones were defined as compact as possible, although coverage of remote areas required to stretch some zones along main transit routes
- The optimization procedure simulates individual school routes along a complete street network (OpenStreetMap) and iteratively searches for favourable exchanges of 'dissemination areas' along the borders of catchment zones, while keeping...
 - **maximum/average distances** per school at the initial length (max. +5%)
 - **school occupancies** within the margin of +/-5% of current population
 - **catchment zones contiguous** and schools located within their catchment zones
- Favourable exchanges defined as exchanges bringing the **schools' shares of students with academic background closer to the citywide share** (48%)
- Adaptation of the provisional catchment zones was enacted manually in an iterative process, selectively following the suggestions made by the algorithm (favouring compact zones over maximum mixing)
- Final catchment zones for Laval imply an **average school route distance of 4.0 km**
- VILLE JUSTE Ltd. is developing the web-application **isa** for school administrations, accounting for safety of walking routes (kindergarten) and travel times by public transportation (secondary schools)