

Activity choice modeling for pedestrian facilities

Modélisation du choix d'activité pour les infrastructures piétonnes

- **Où, quand, pour combien de temps** et **pourquoi** les piétons effectuent-ils des activités ?
- A partir des **données des antennes** de communication déjà existantes



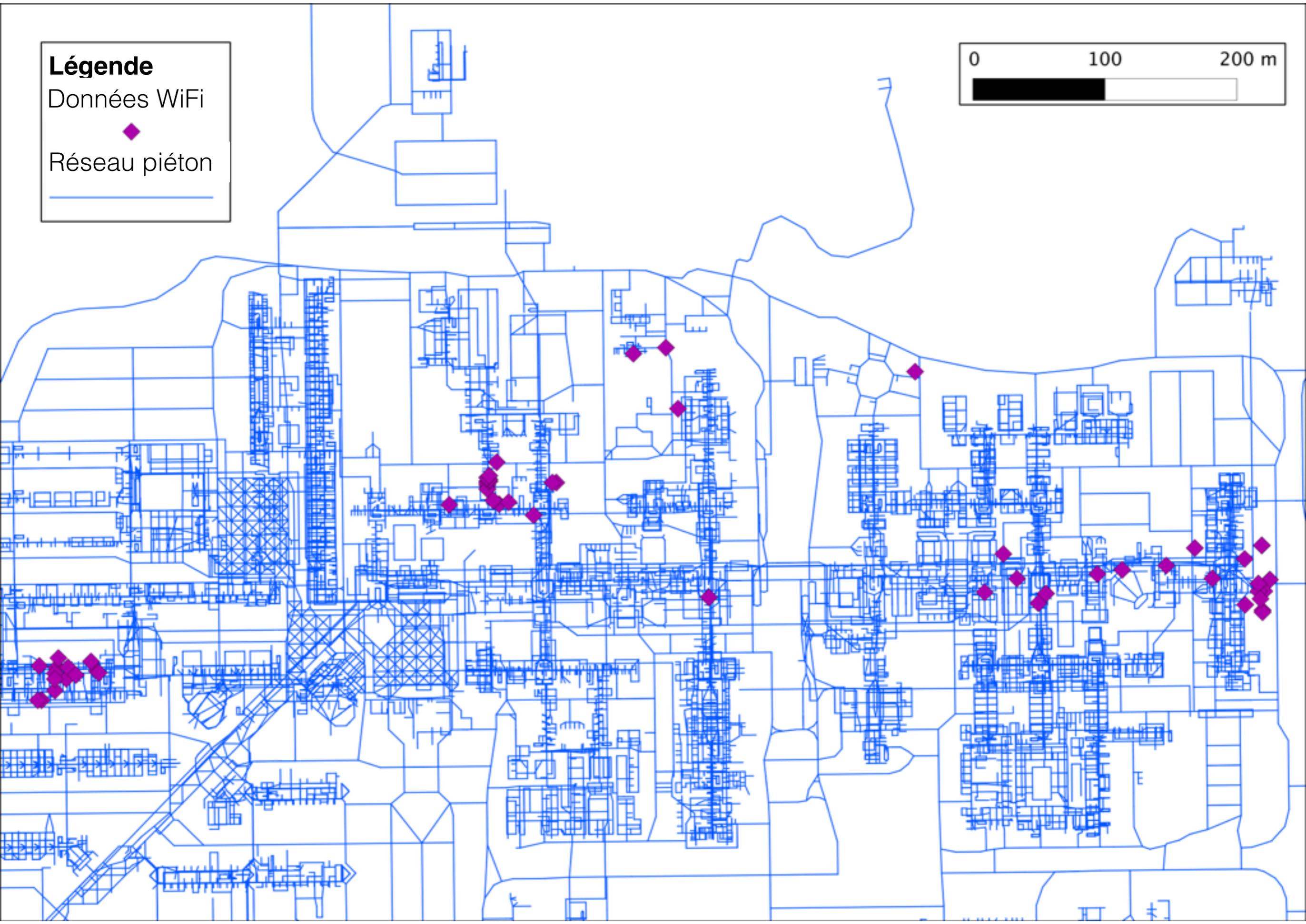
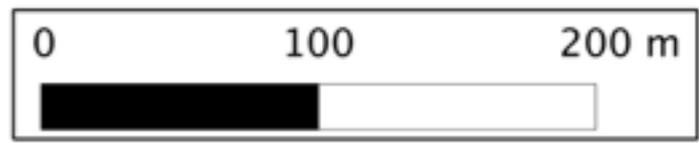


Légende

Données WiFi



Réseau piéton



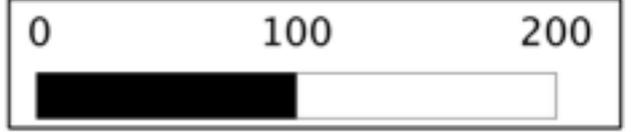
Légende

Réseau piéton

Destinations



Chemin



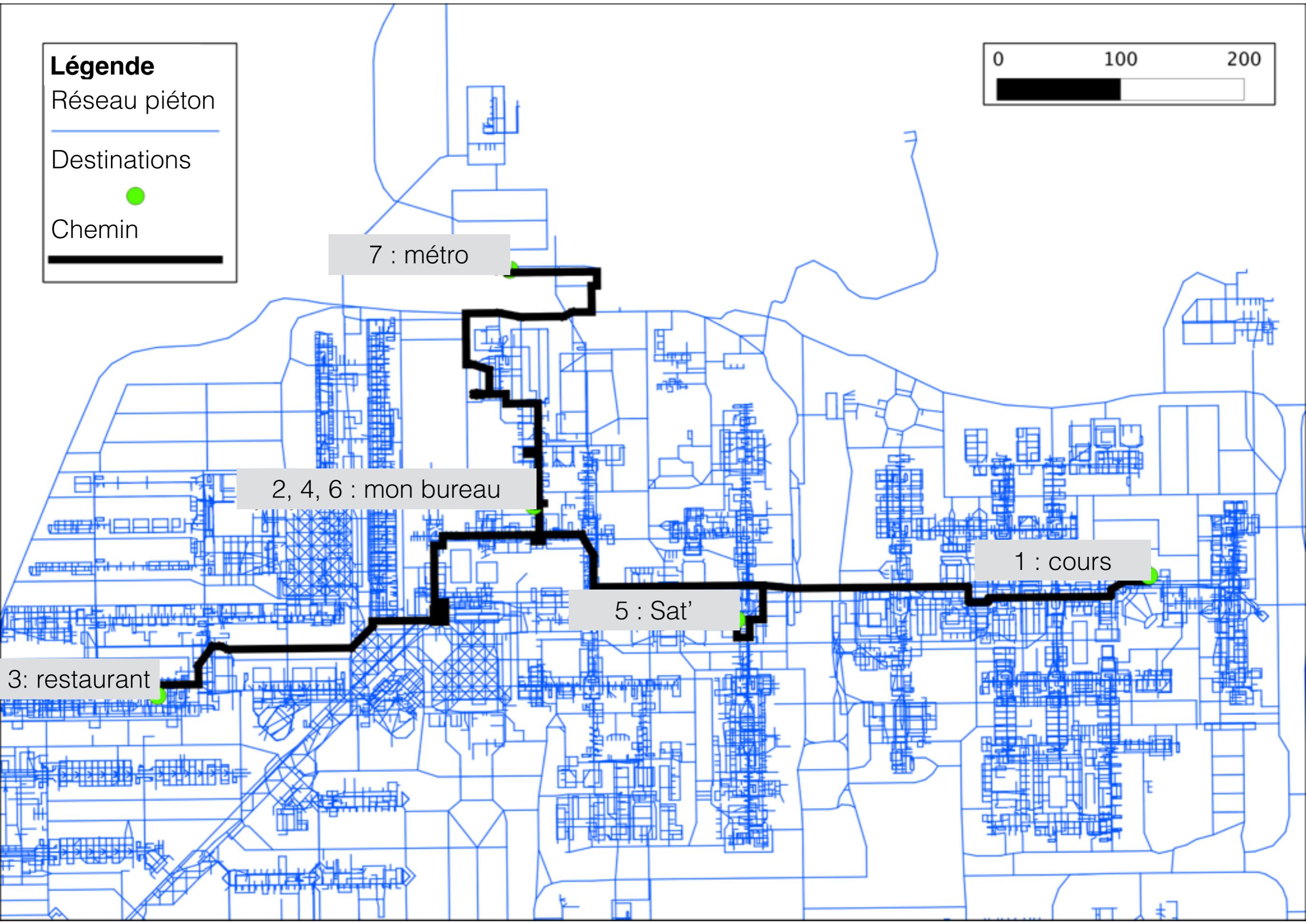
7 : métro

2, 4, 6 : mon bureau

1 : cours

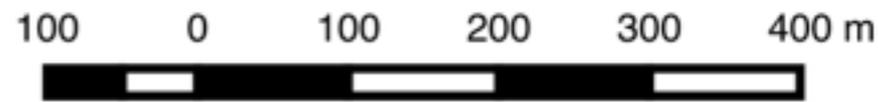
5 : Sat'

3 : restaurant



Légende

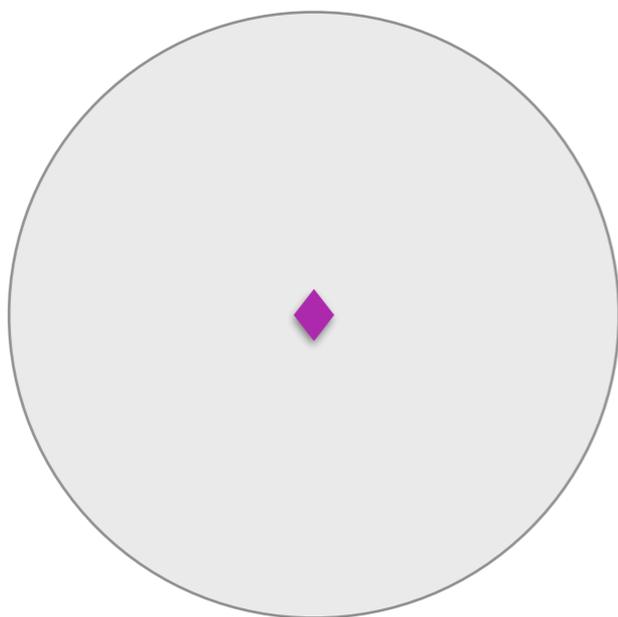
- Autre
- ★ Bibliothèques
- ◆ Magasins
- Restaurants
- Bureaux
- Laboratoires
- Salles de classe
- Réseau piéton



12h20



12h20



Confidence factor (cF)

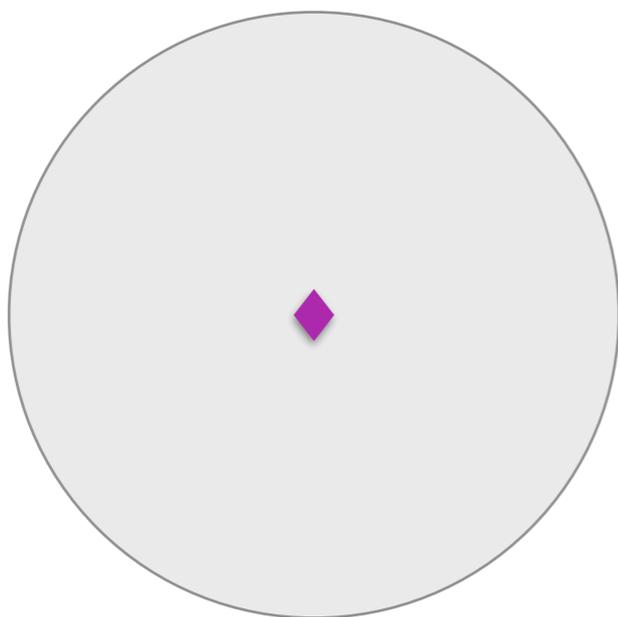
- 16 - 64 m
- 64 - 120 m
- 120 - 200 m
- 200 - 312 m
- 312 - 1480 m



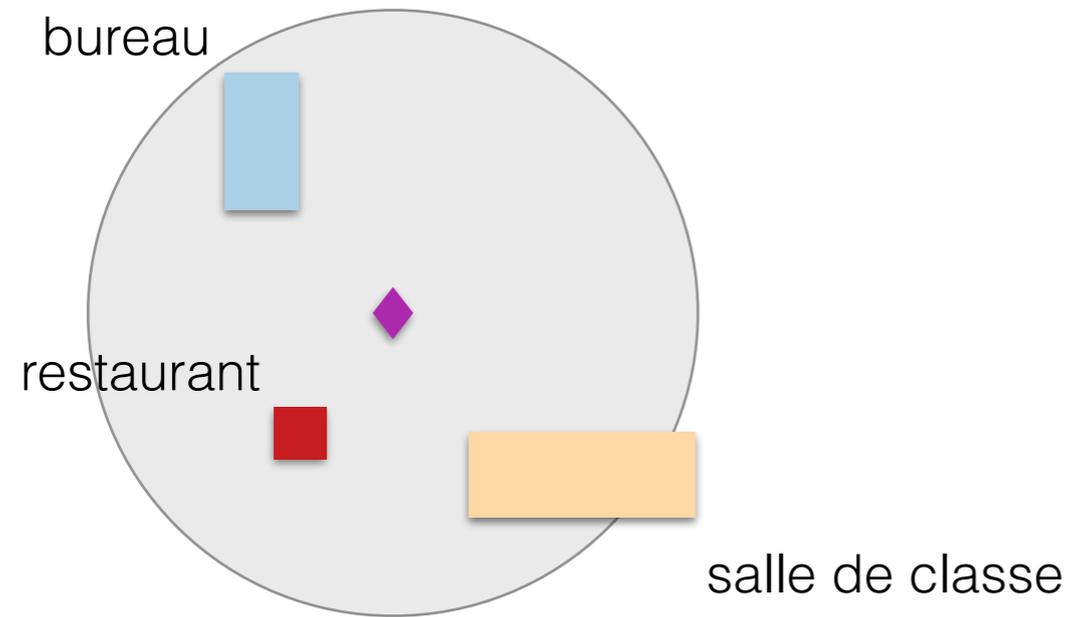
100 0 100 200 300 400 m



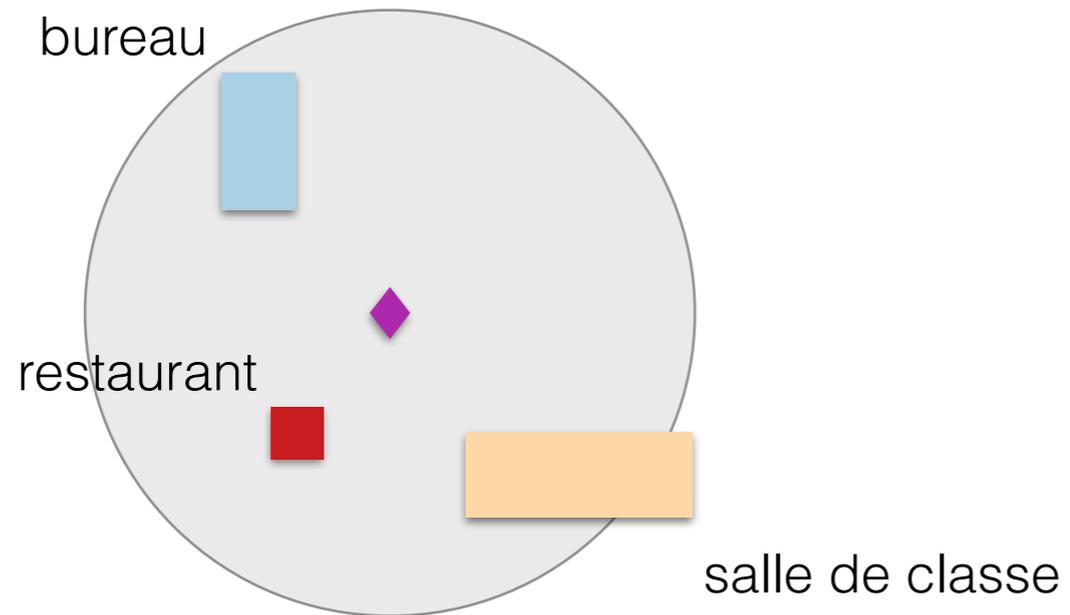
12h20



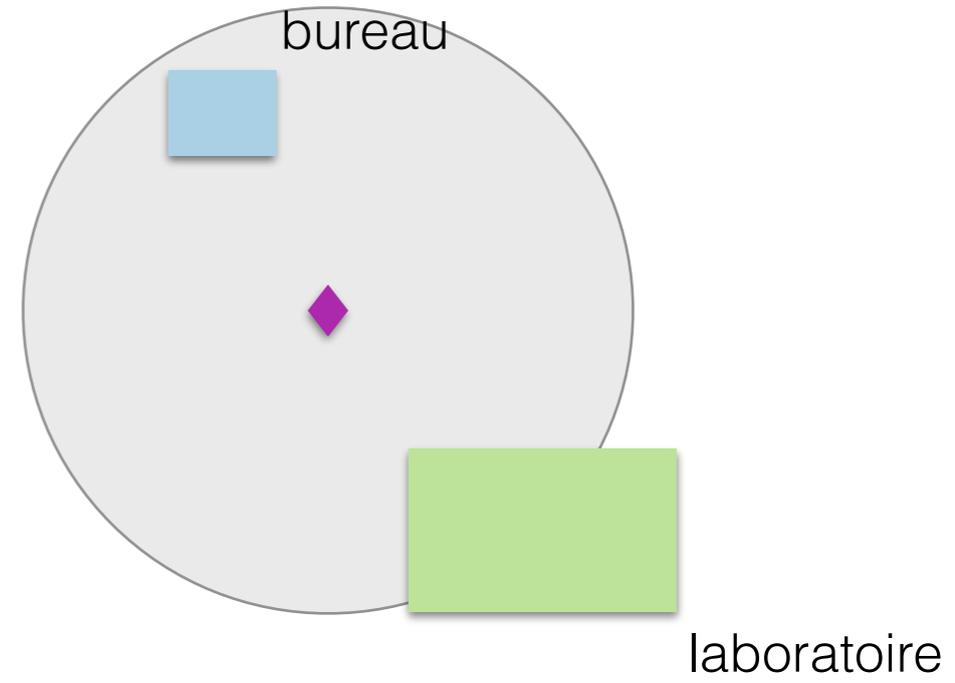
12h20



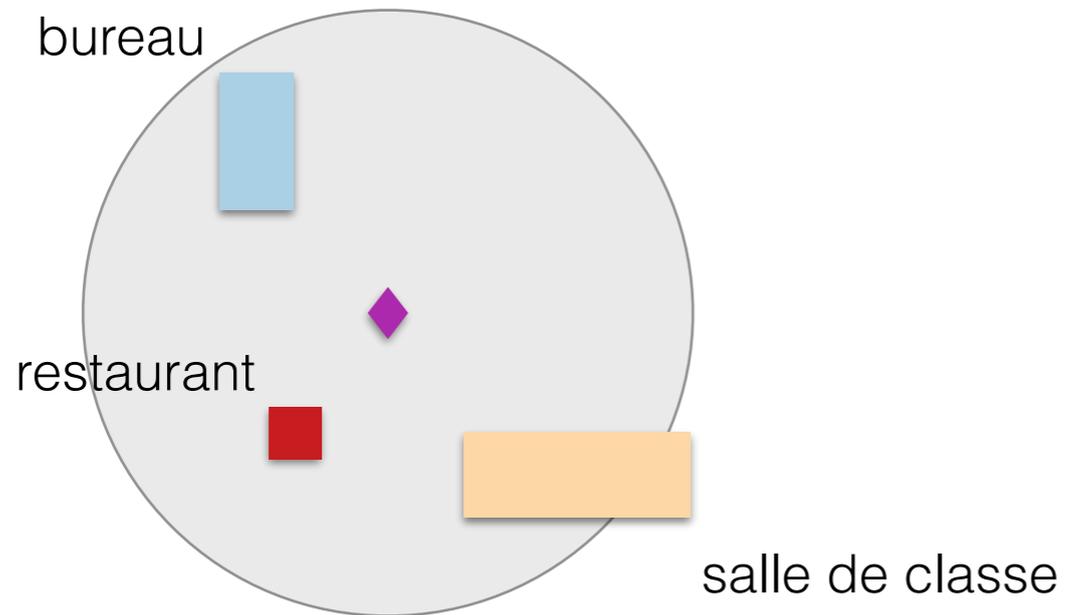
12h20



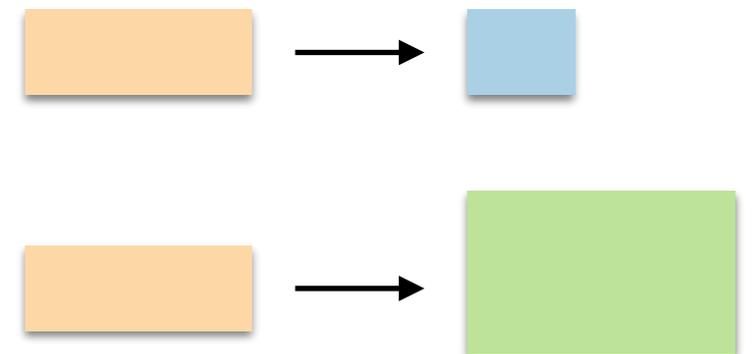
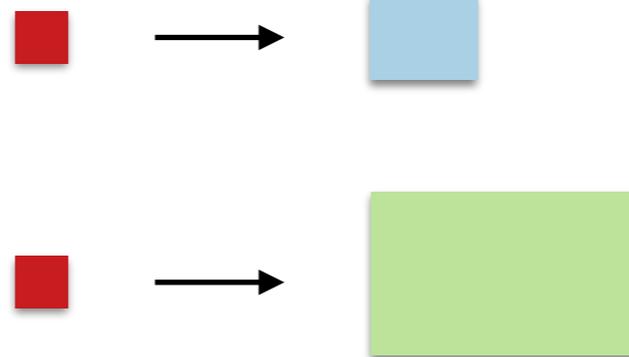
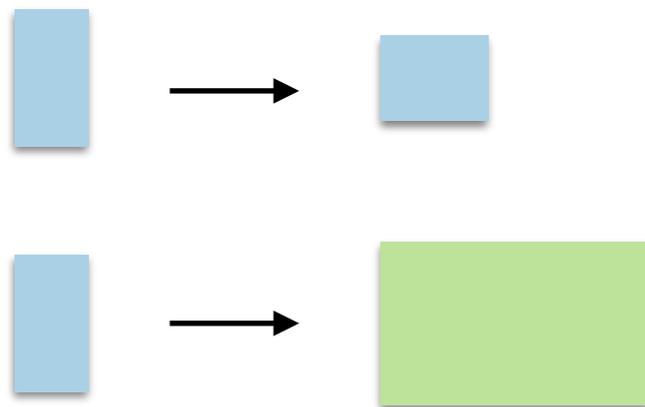
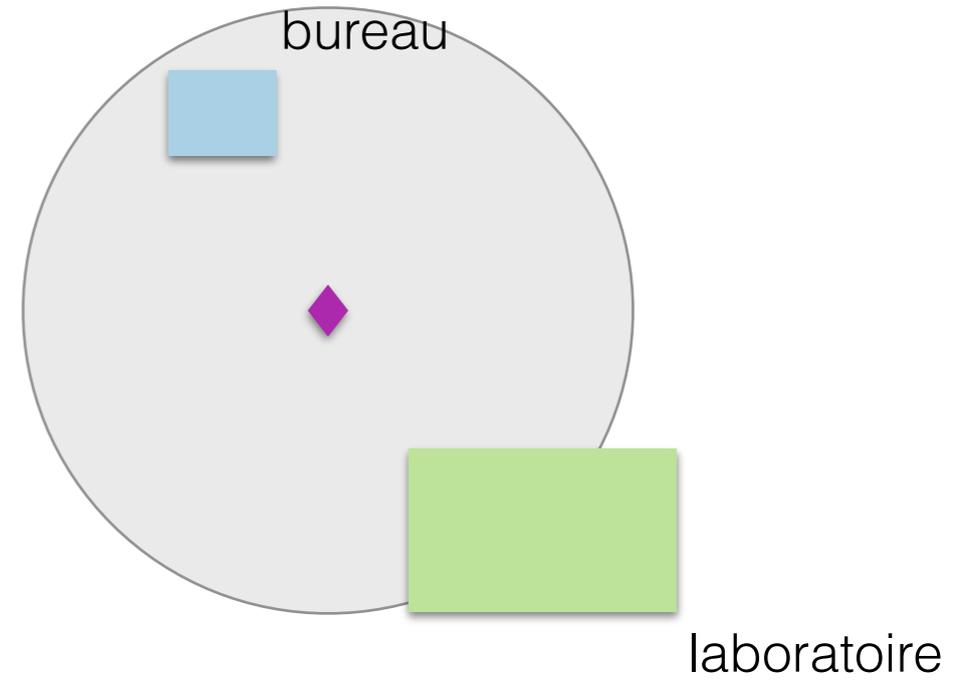
12h35



12h20

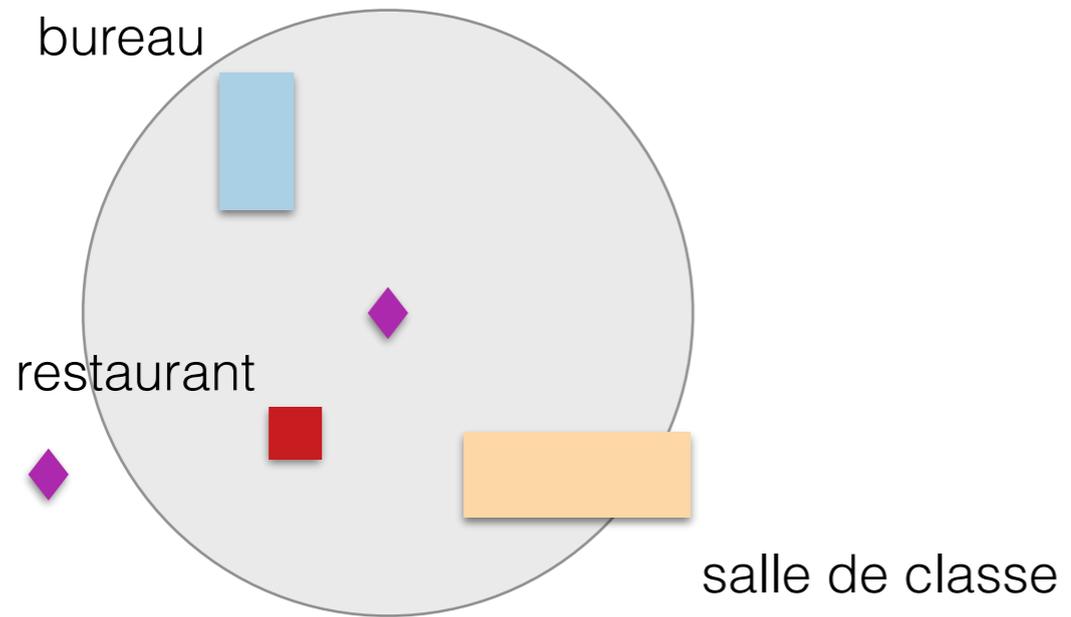


12h35



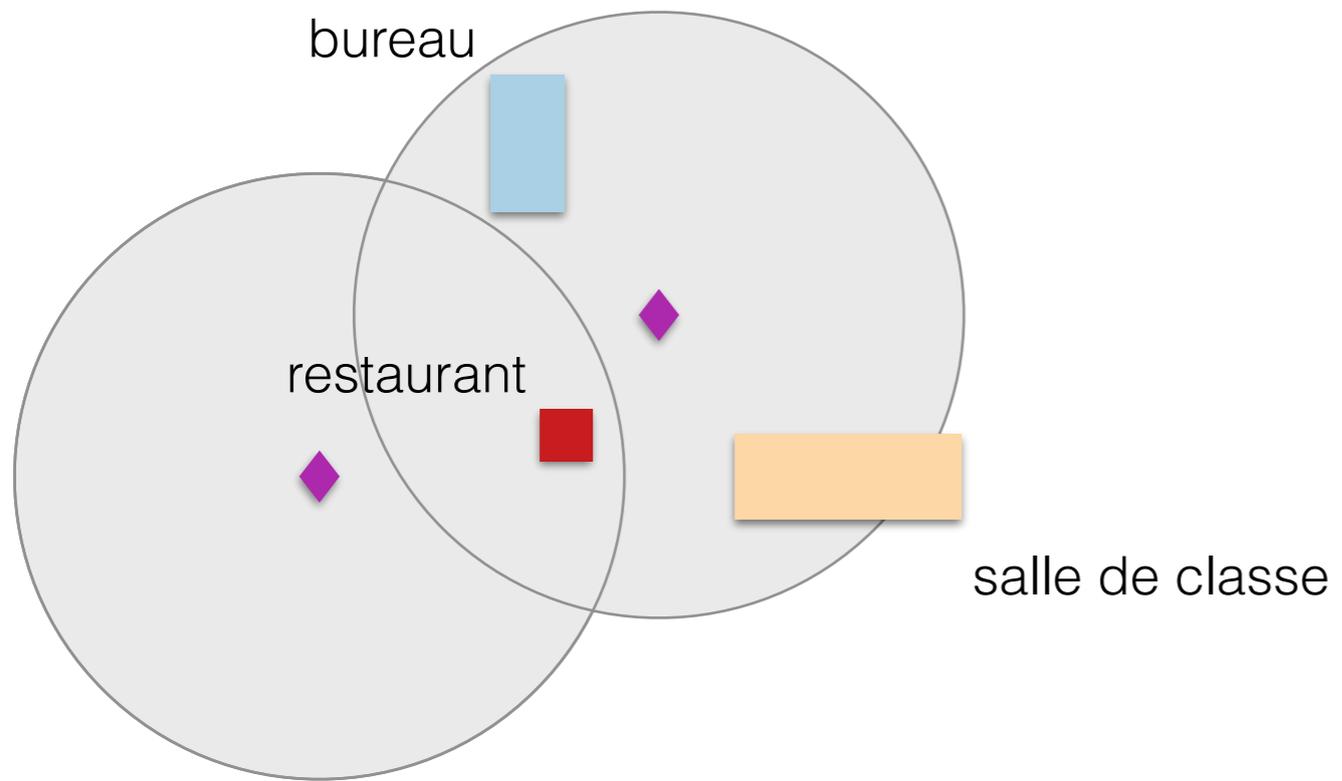
12h06

12h20

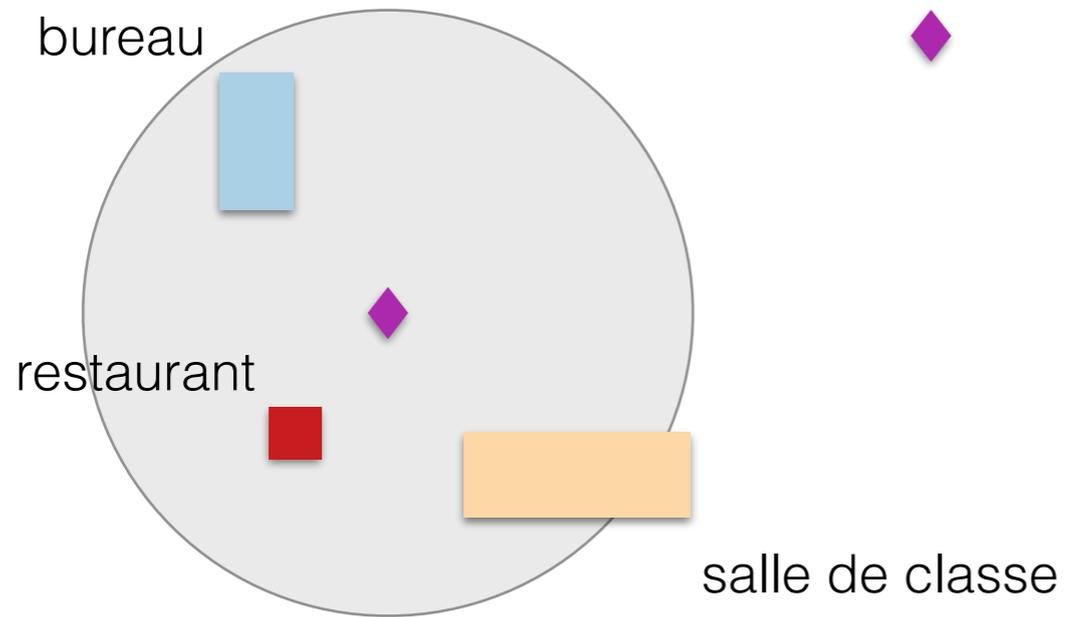


12h06

12h20



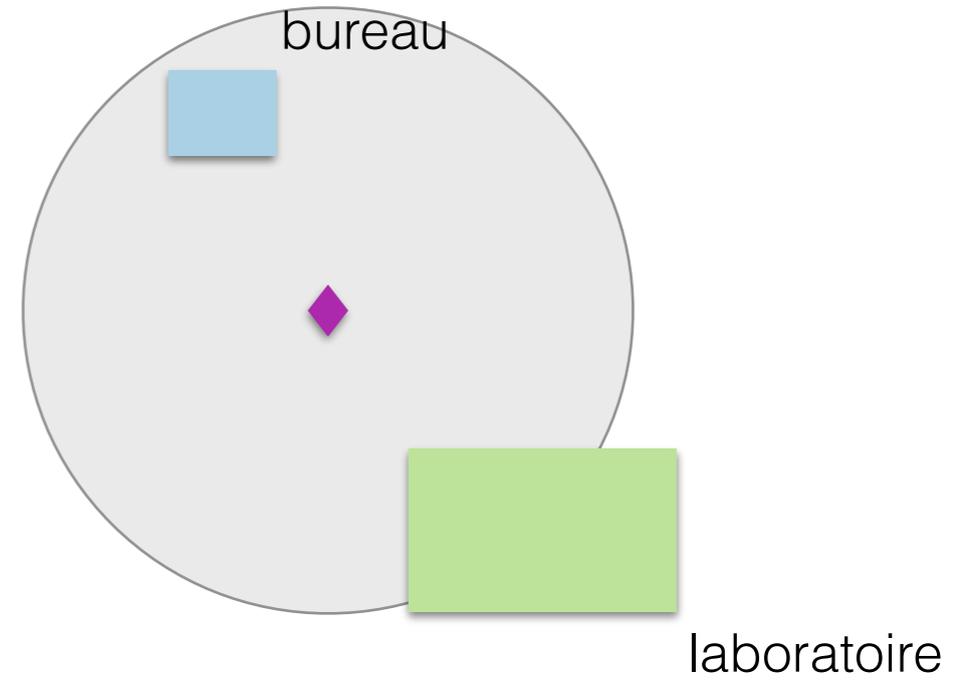
12h20



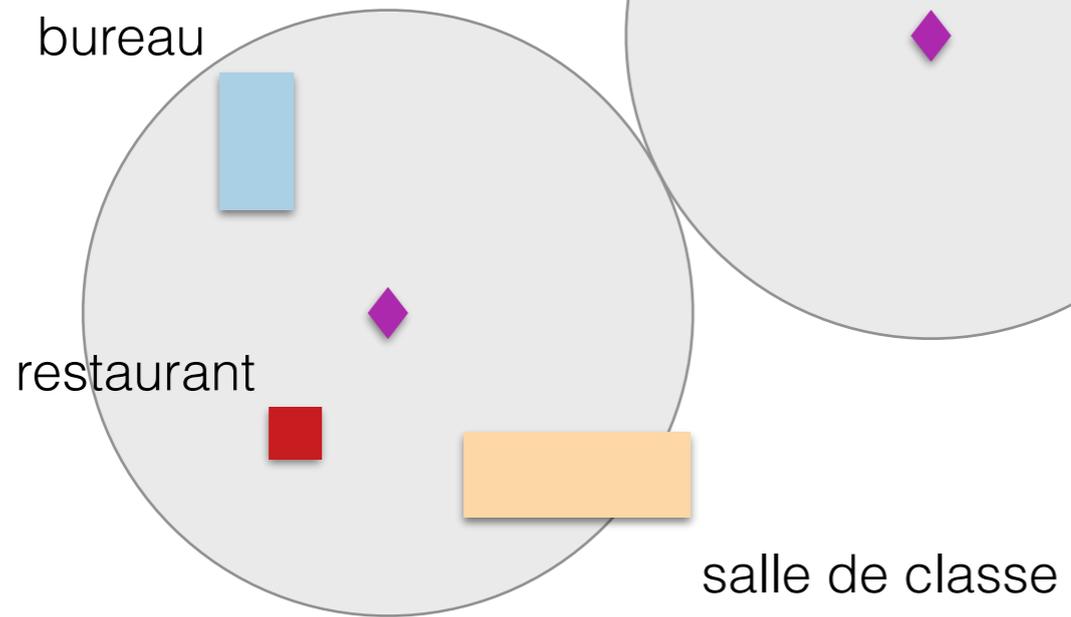
12h24



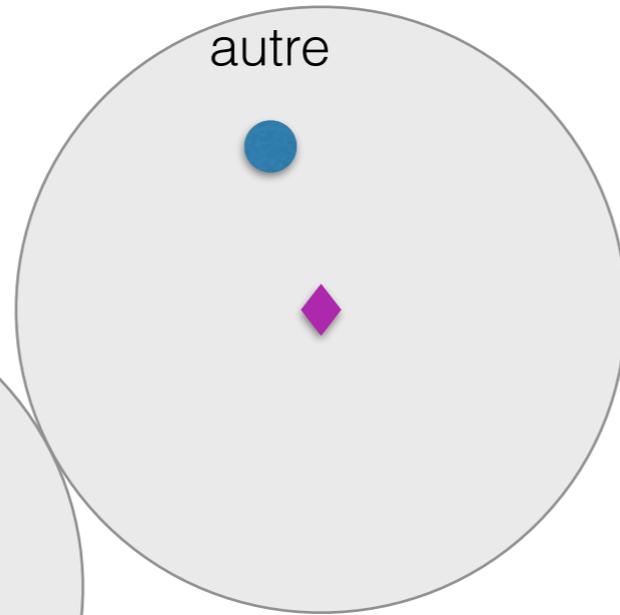
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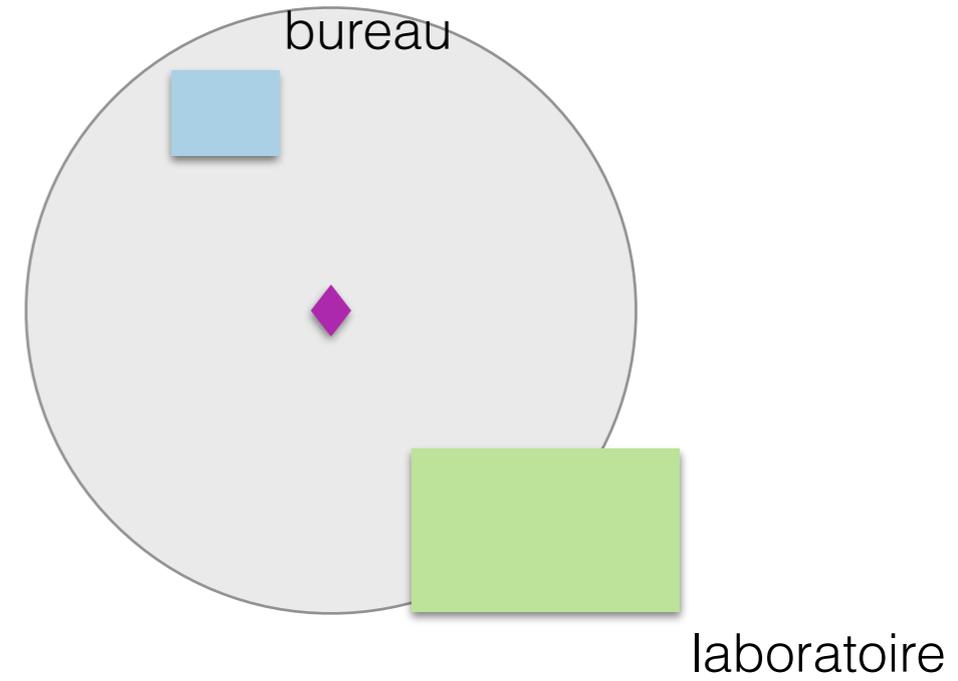
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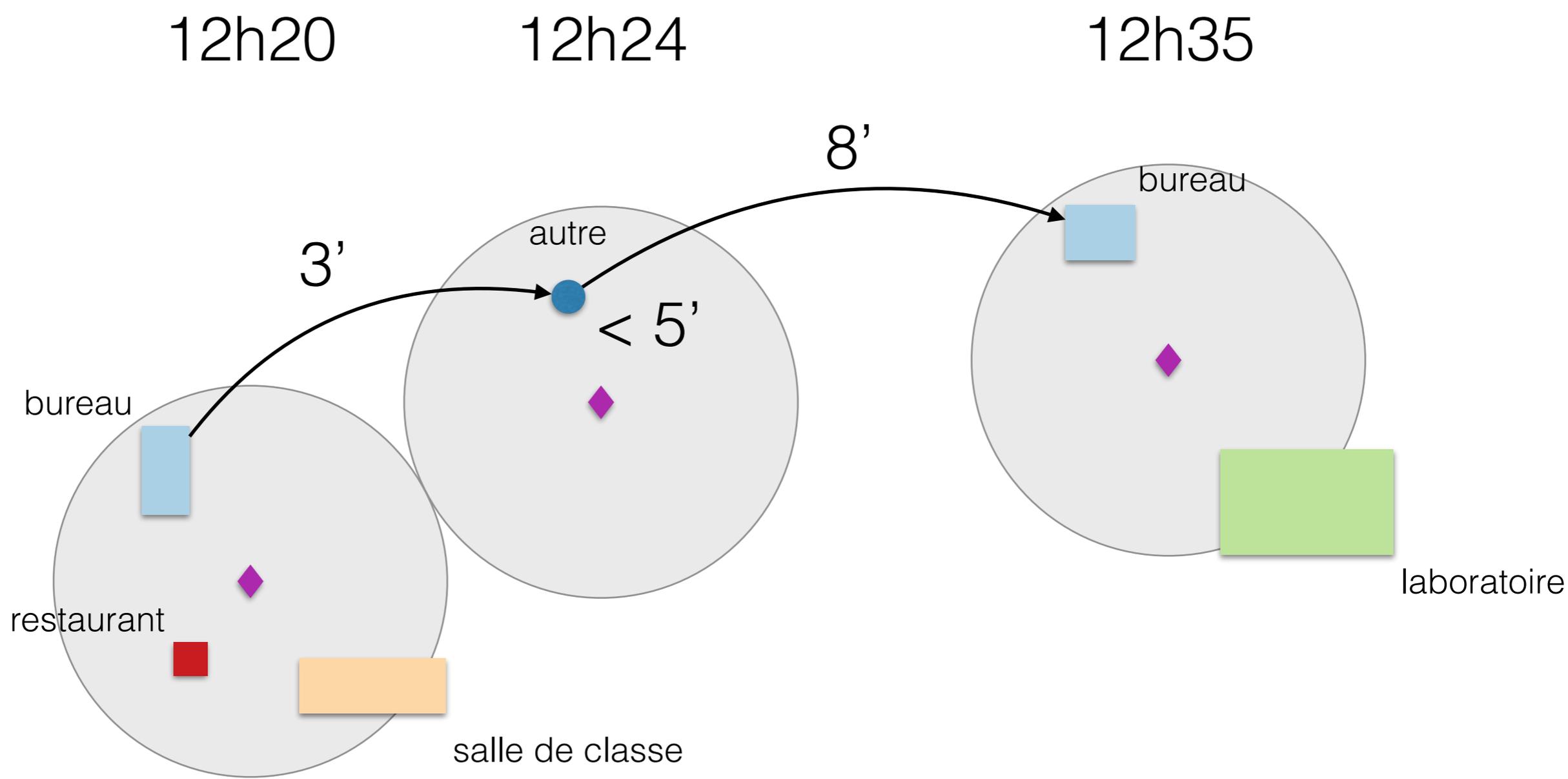


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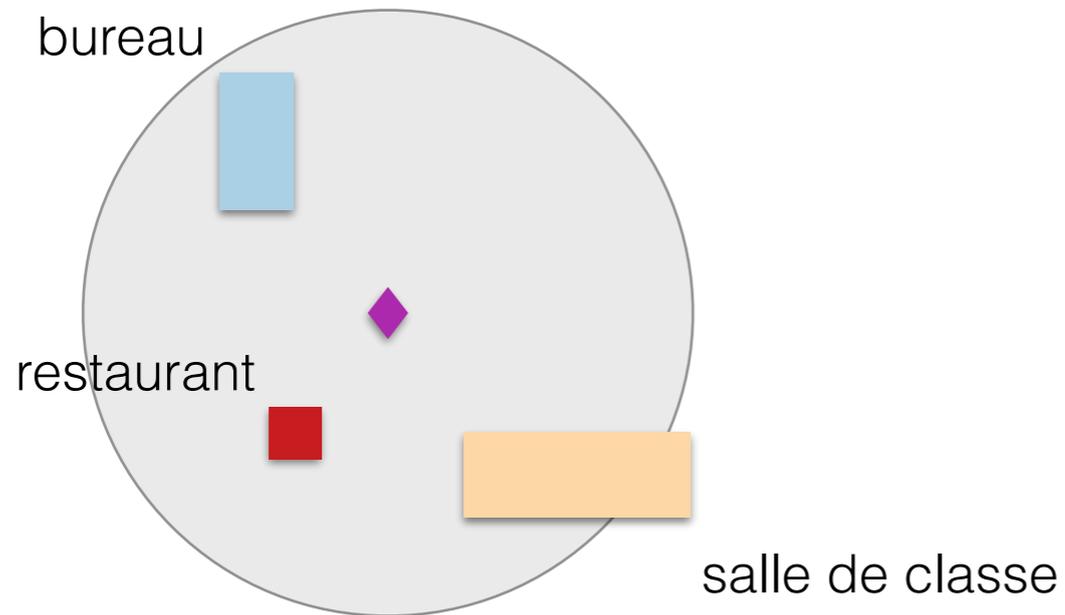


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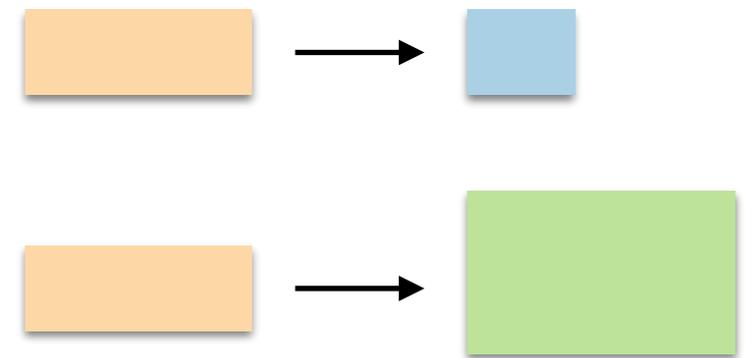
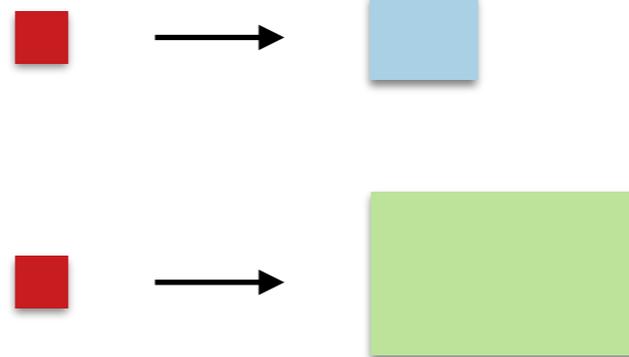
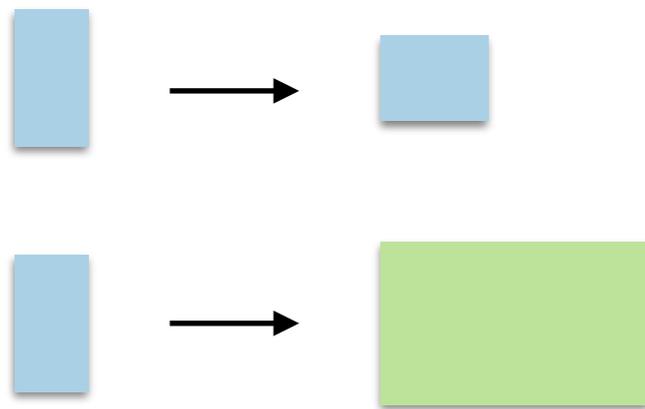
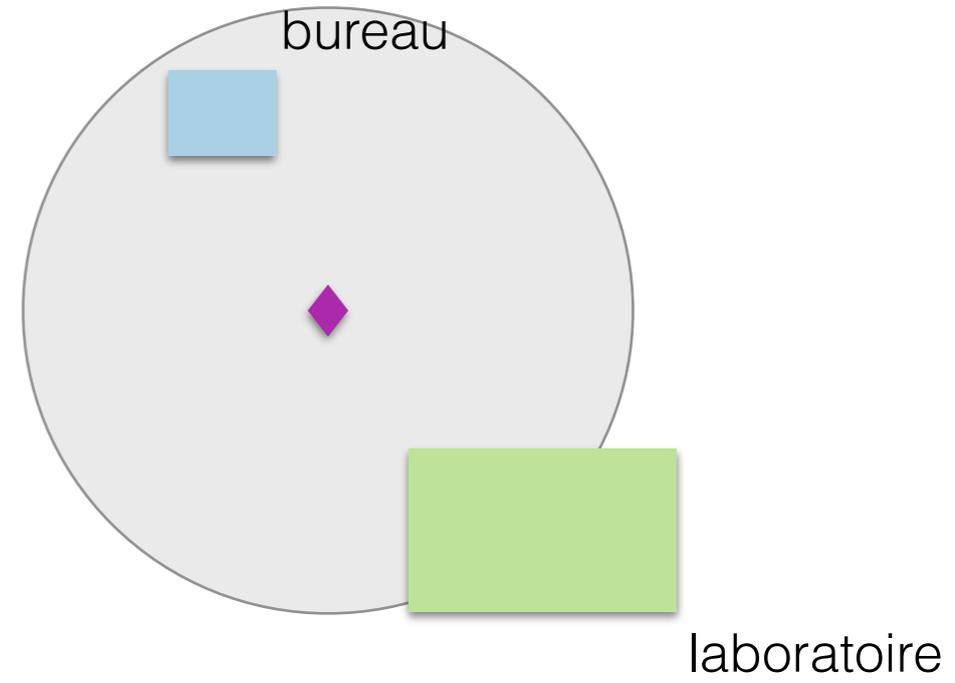




12h20

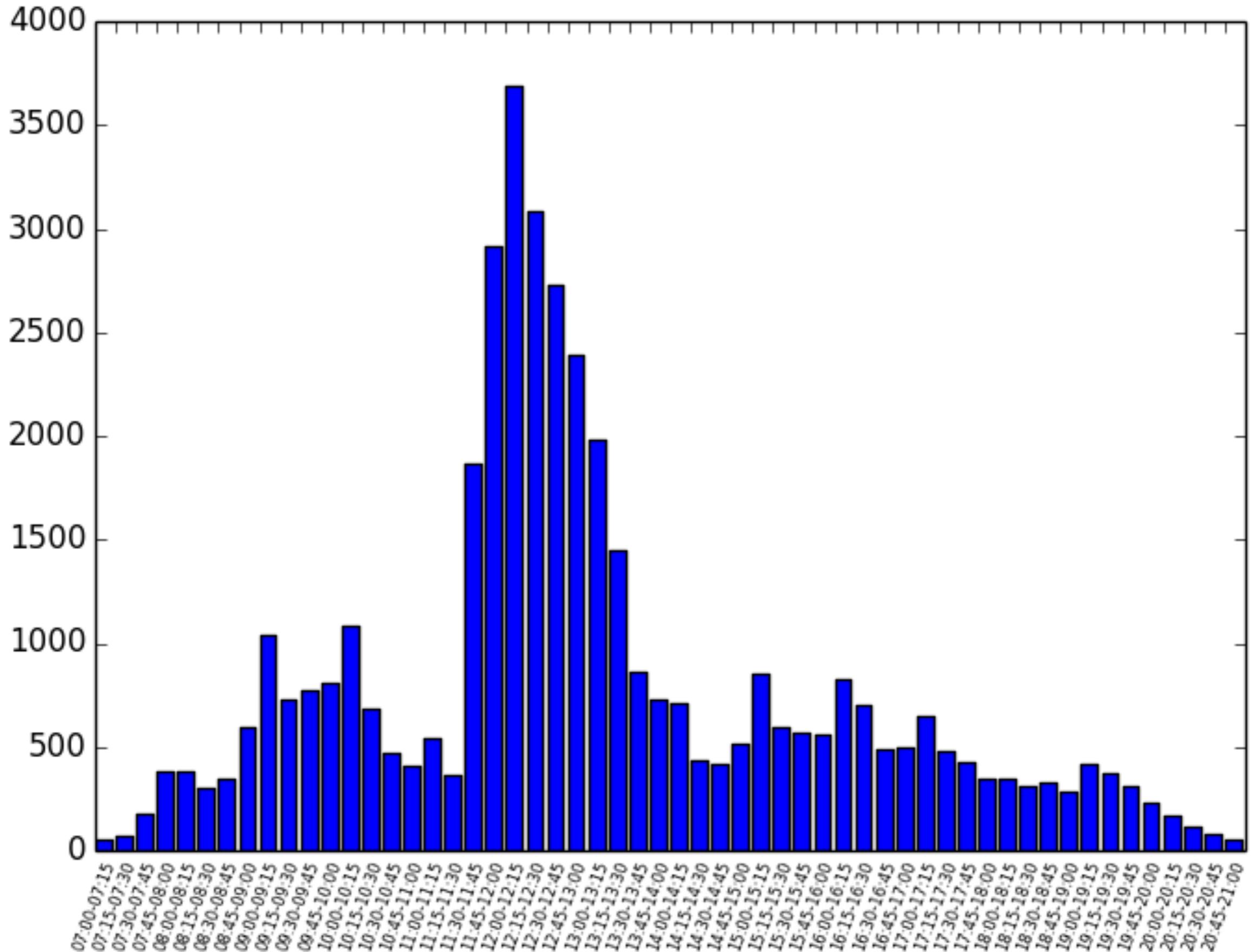


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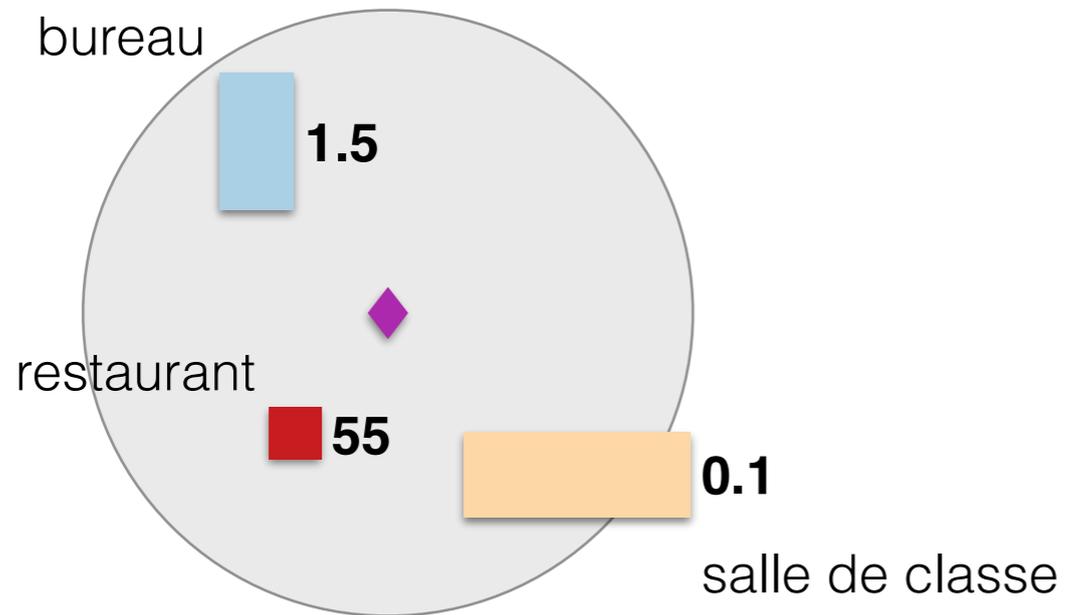
Nombre de transactions de caisses à l'EPFL

Nombre de transactions entre le 17 et le 23 mai 2012

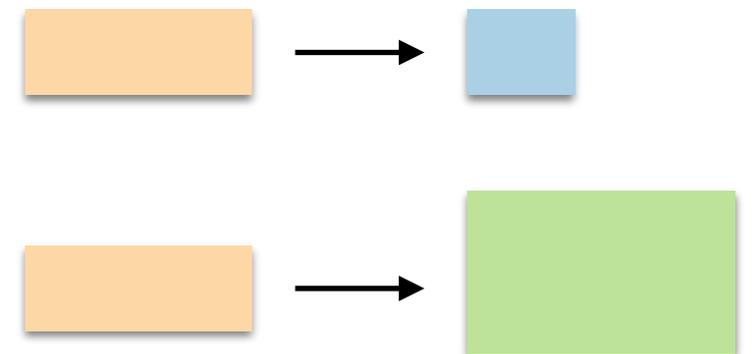
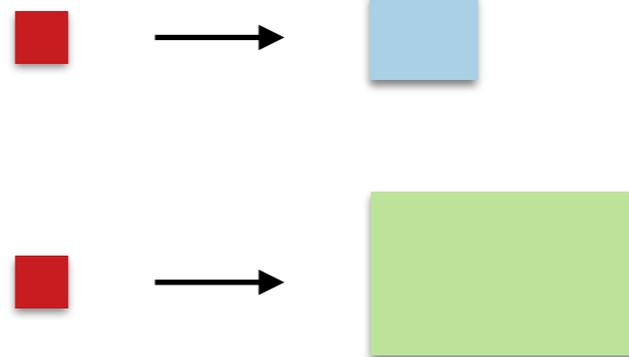
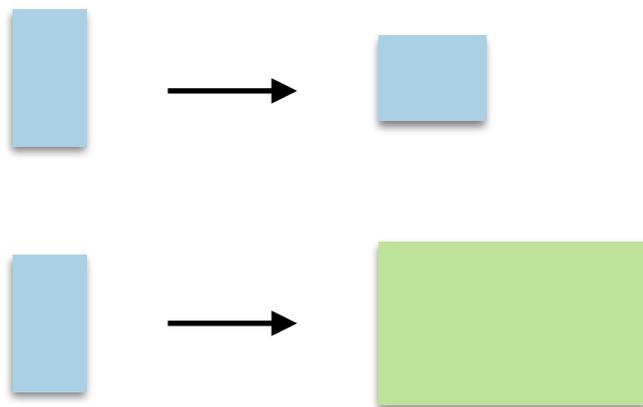
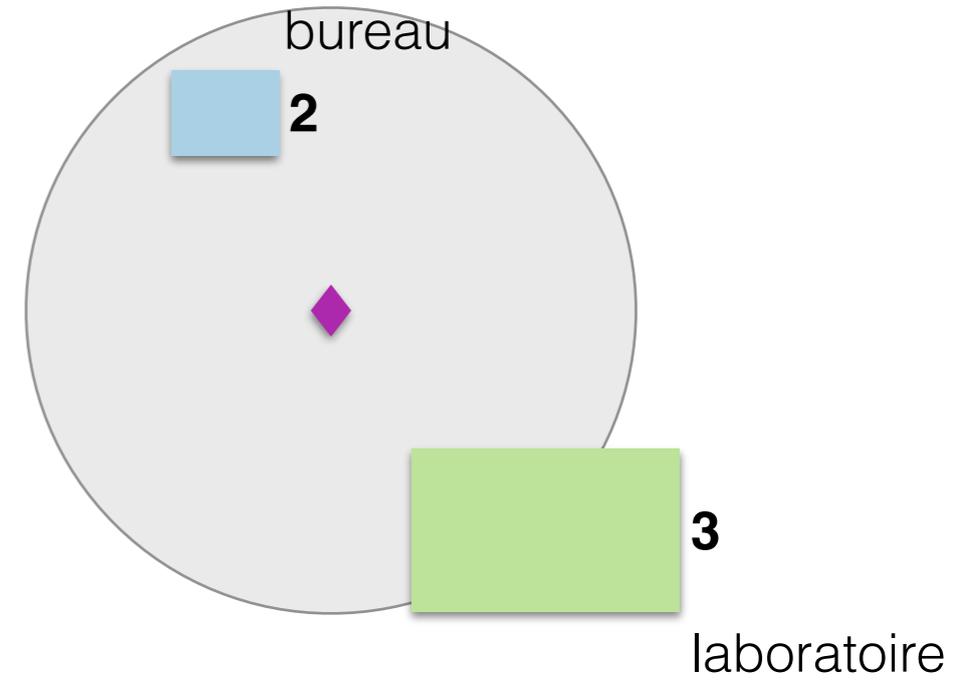


Heure de la journée (en quarts d'heure)

12h20



12h35





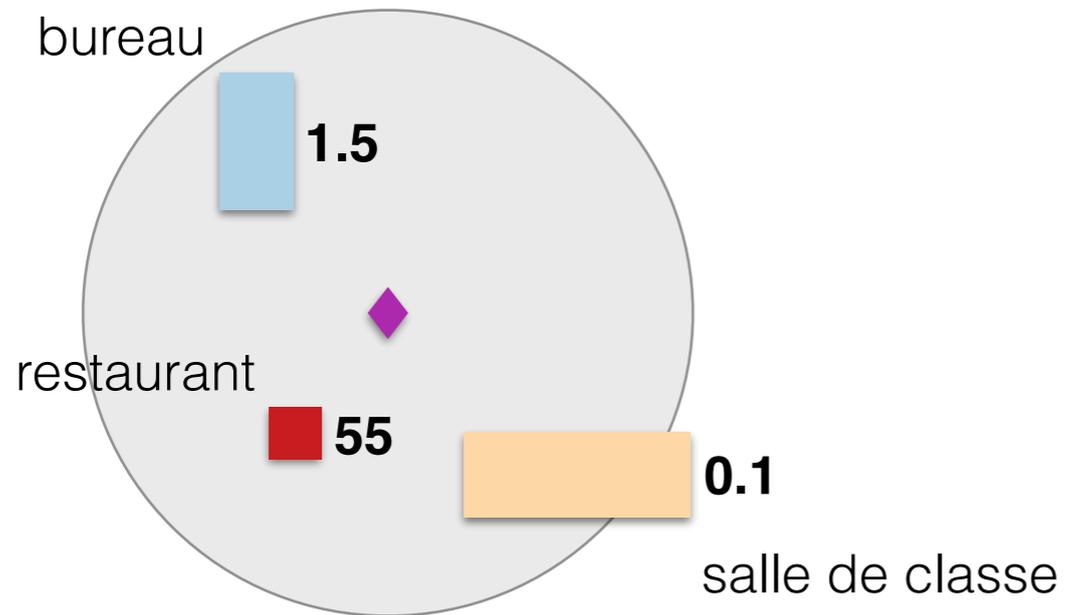
Probabilité de la séquence

Probabilité *a priori*

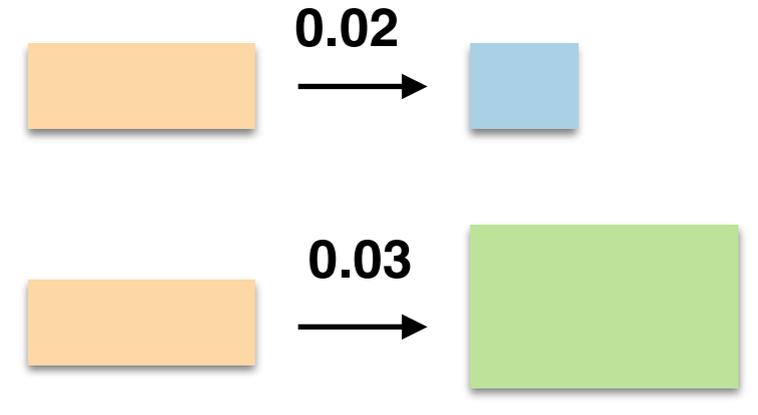
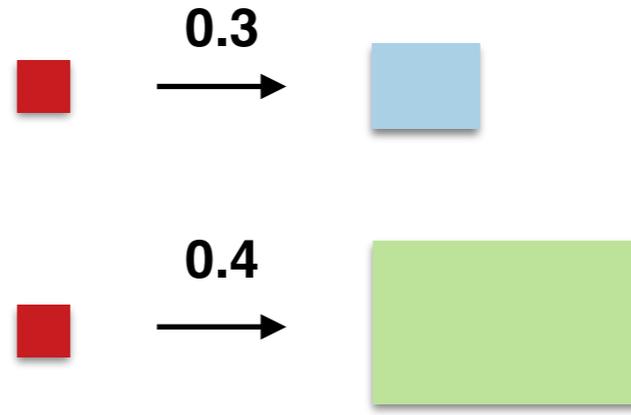
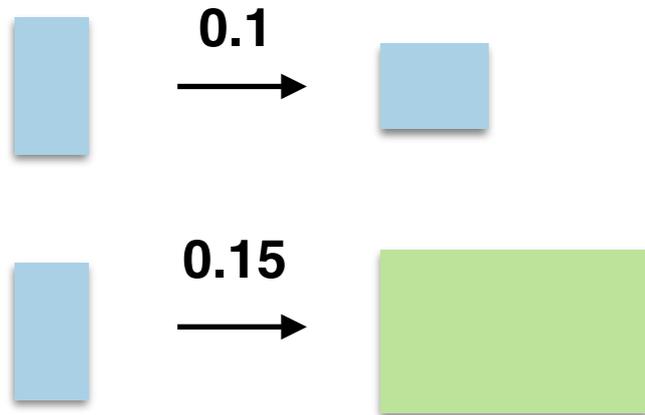
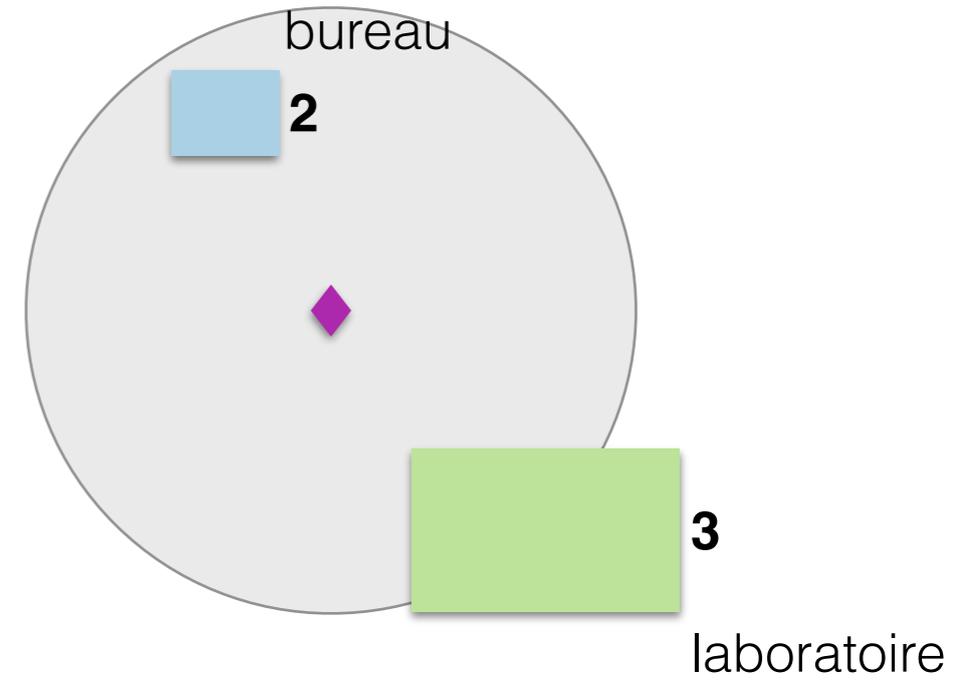
$$P(a_{1:K} | \hat{m}_{1:J}) \propto P(\hat{m}_{1:J} | a_{1:K}) \cdot P(a_{1:K})$$

Equation de mesure

12h20



12h35

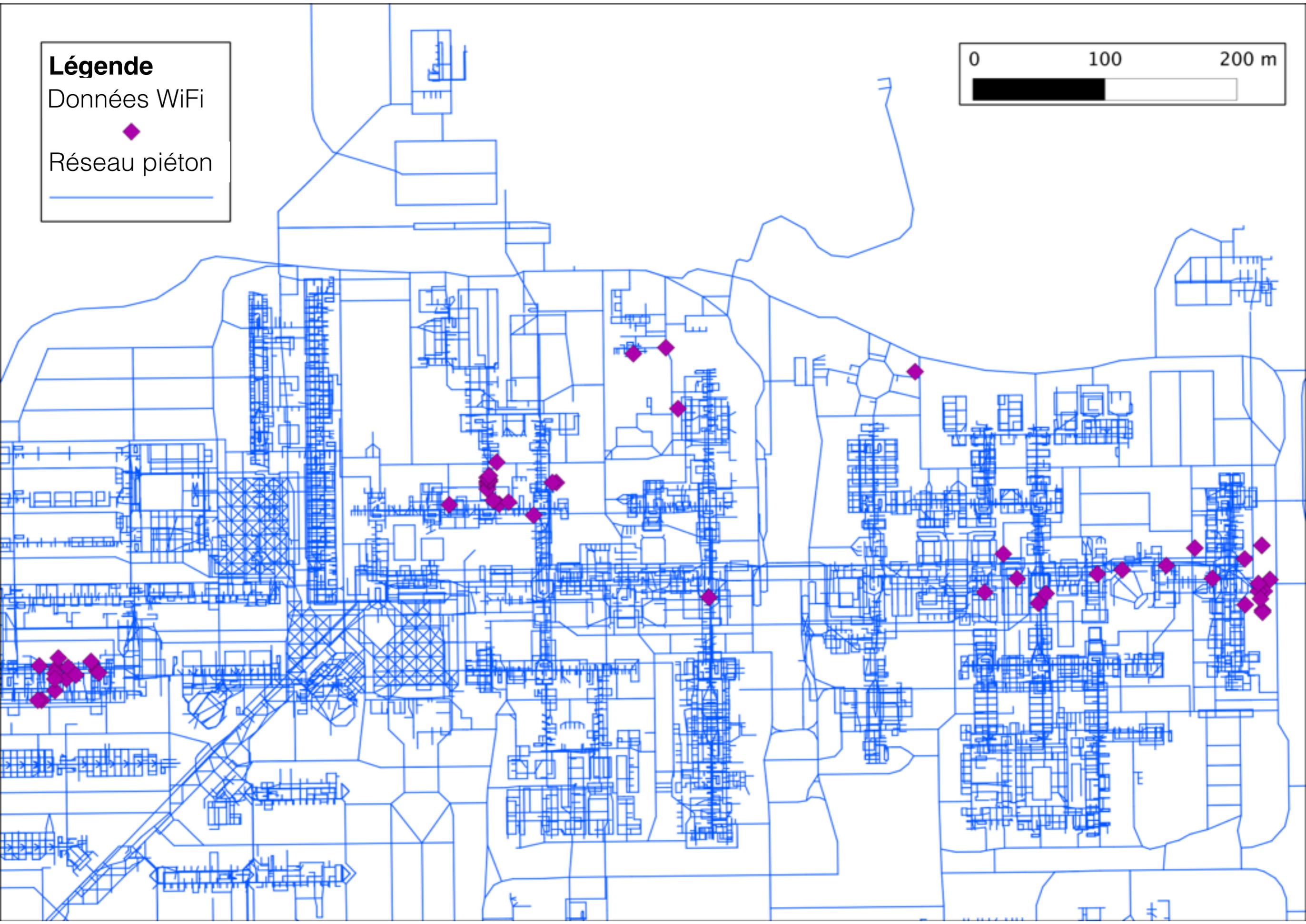
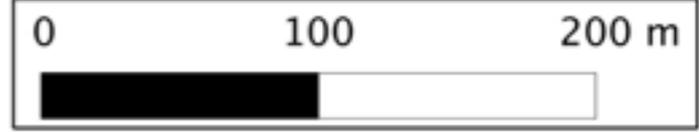


Légende

Données WiFi



Réseau piéton



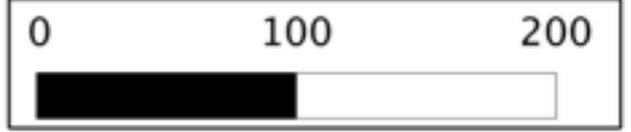
Légende

Réseau piéton

Destinations



Chemin



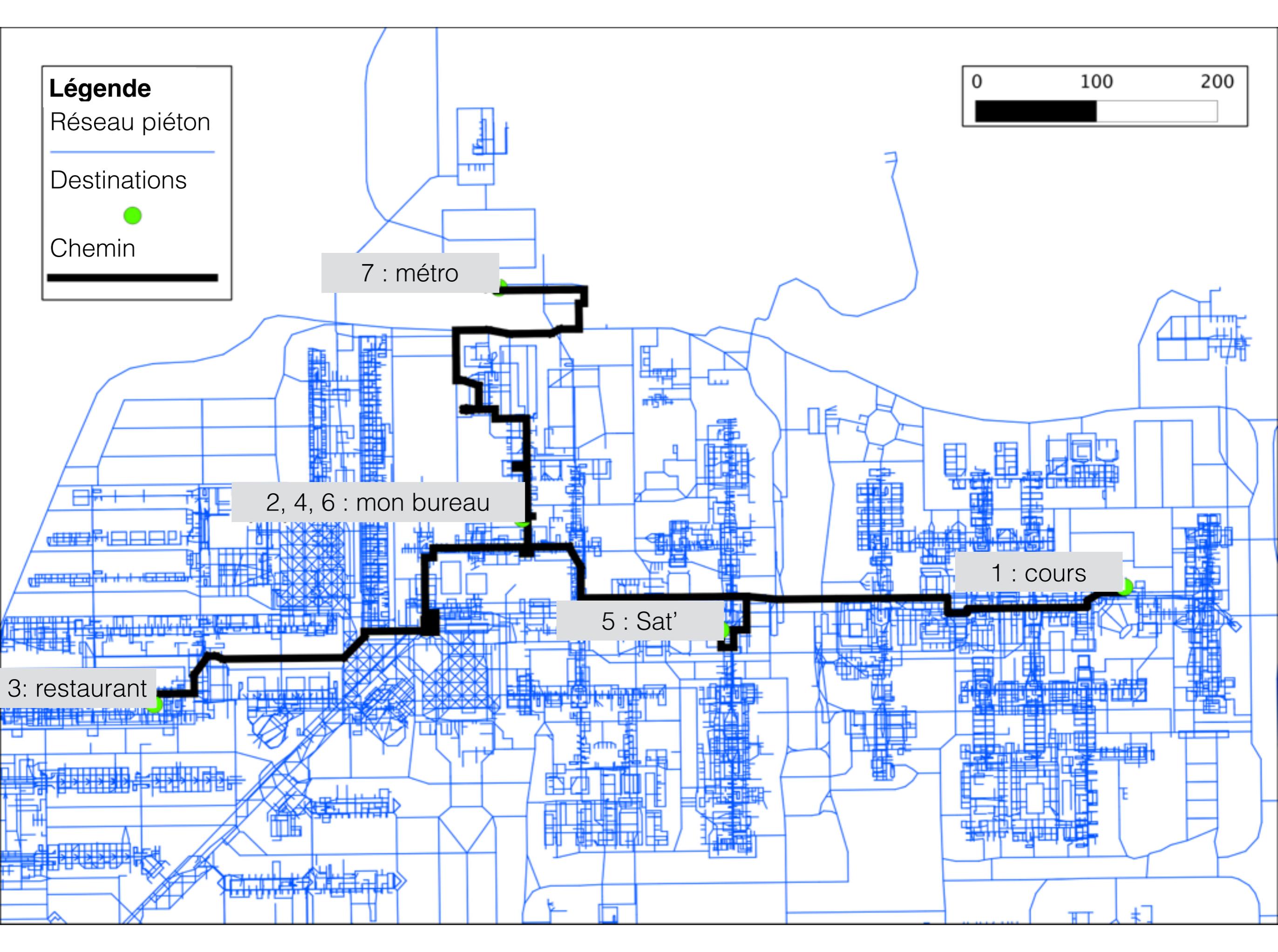
7 : métro

2, 4, 6 : mon bureau

1 : cours

5 : Sat'

3 : restaurant



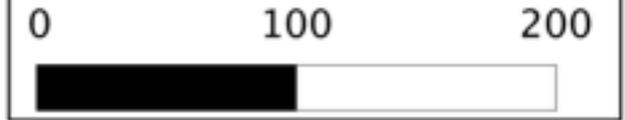
Légende

Réseau piéton

Destinations



Chemin



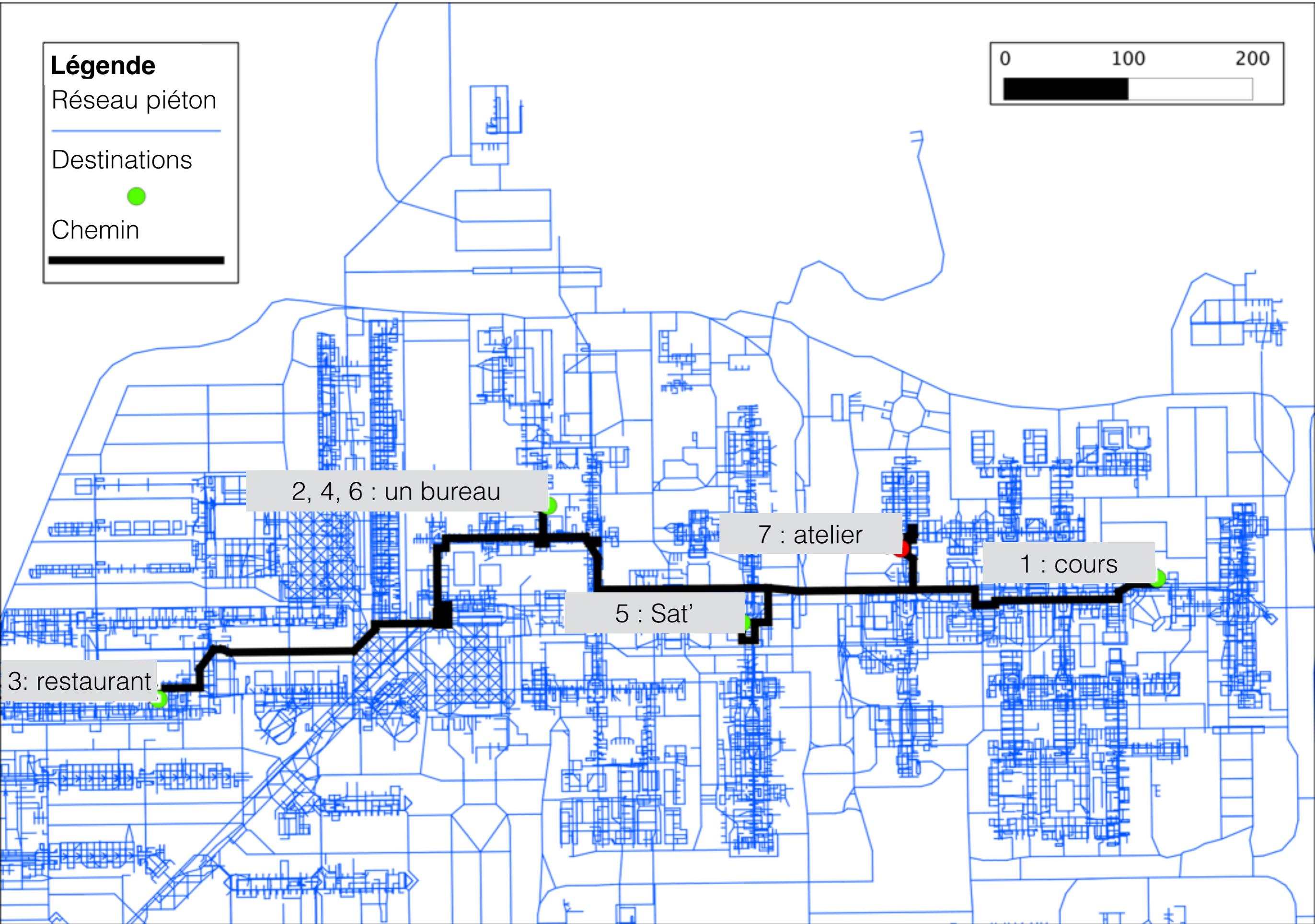
2, 4, 6 : un bureau

7 : atelier

1 : cours

5 : Sat'

3 : restaurant



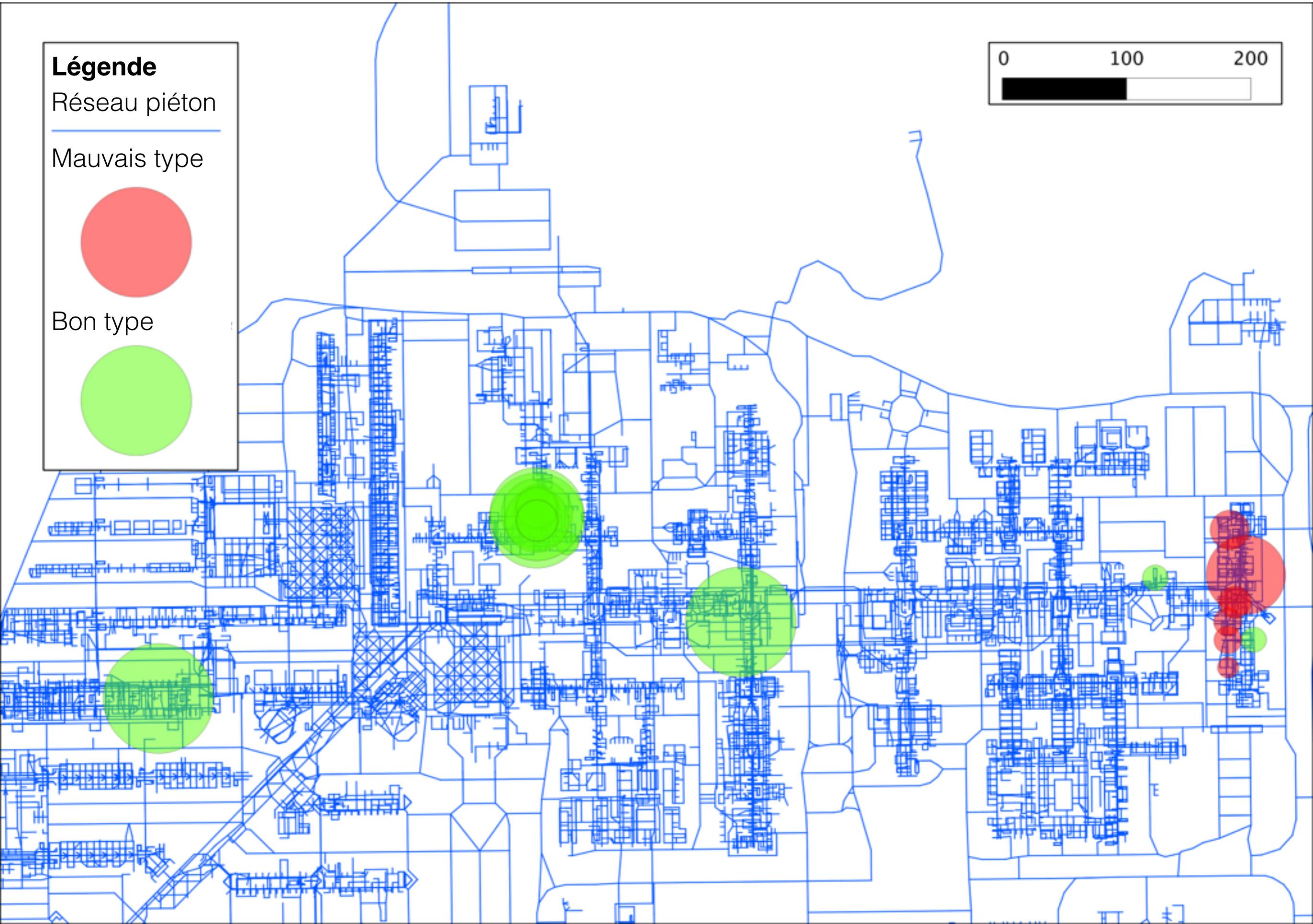
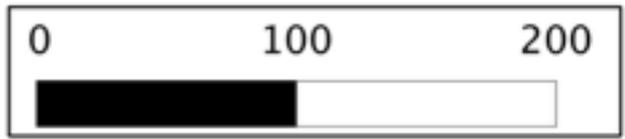
Légende

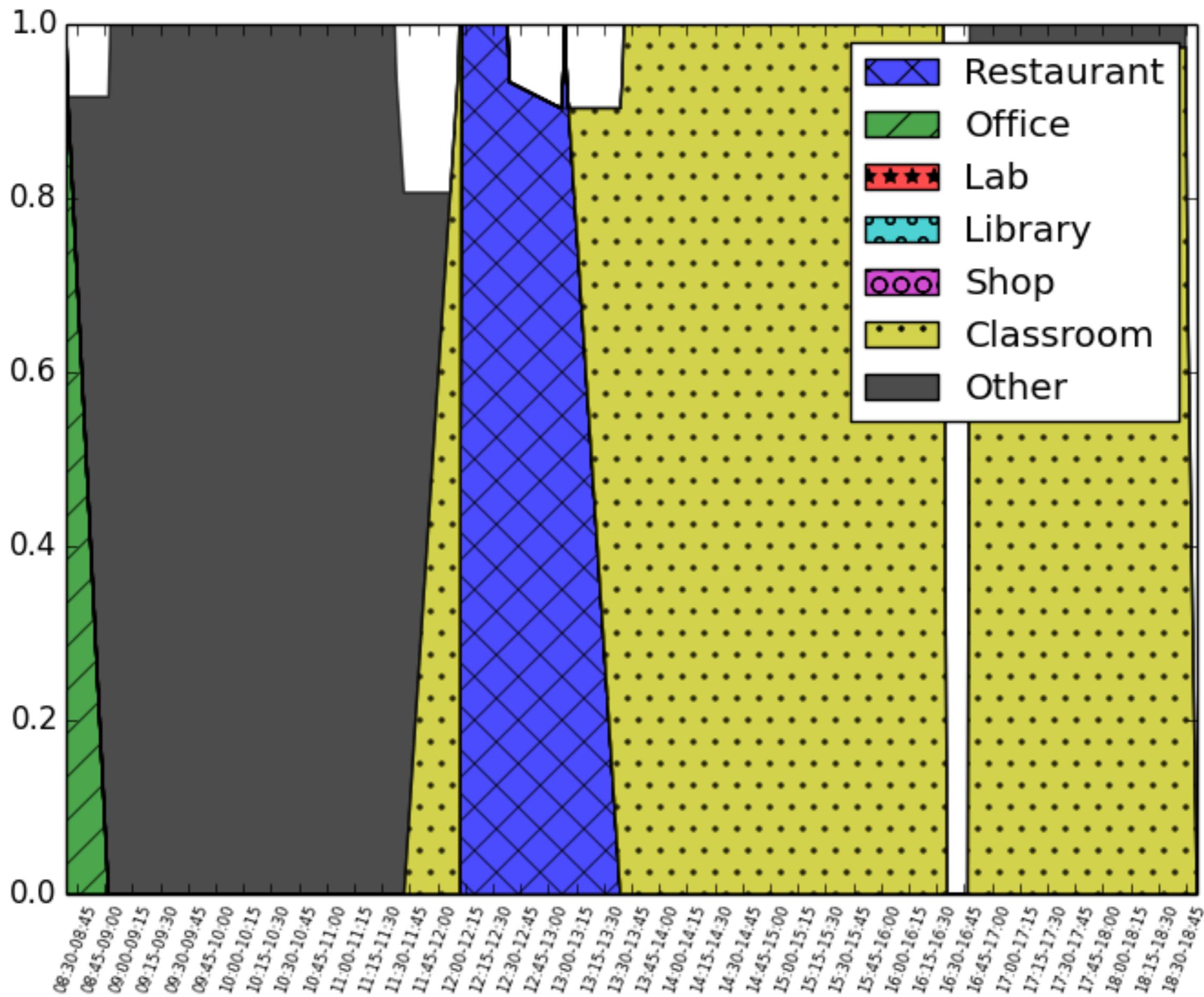
Réseau piéton

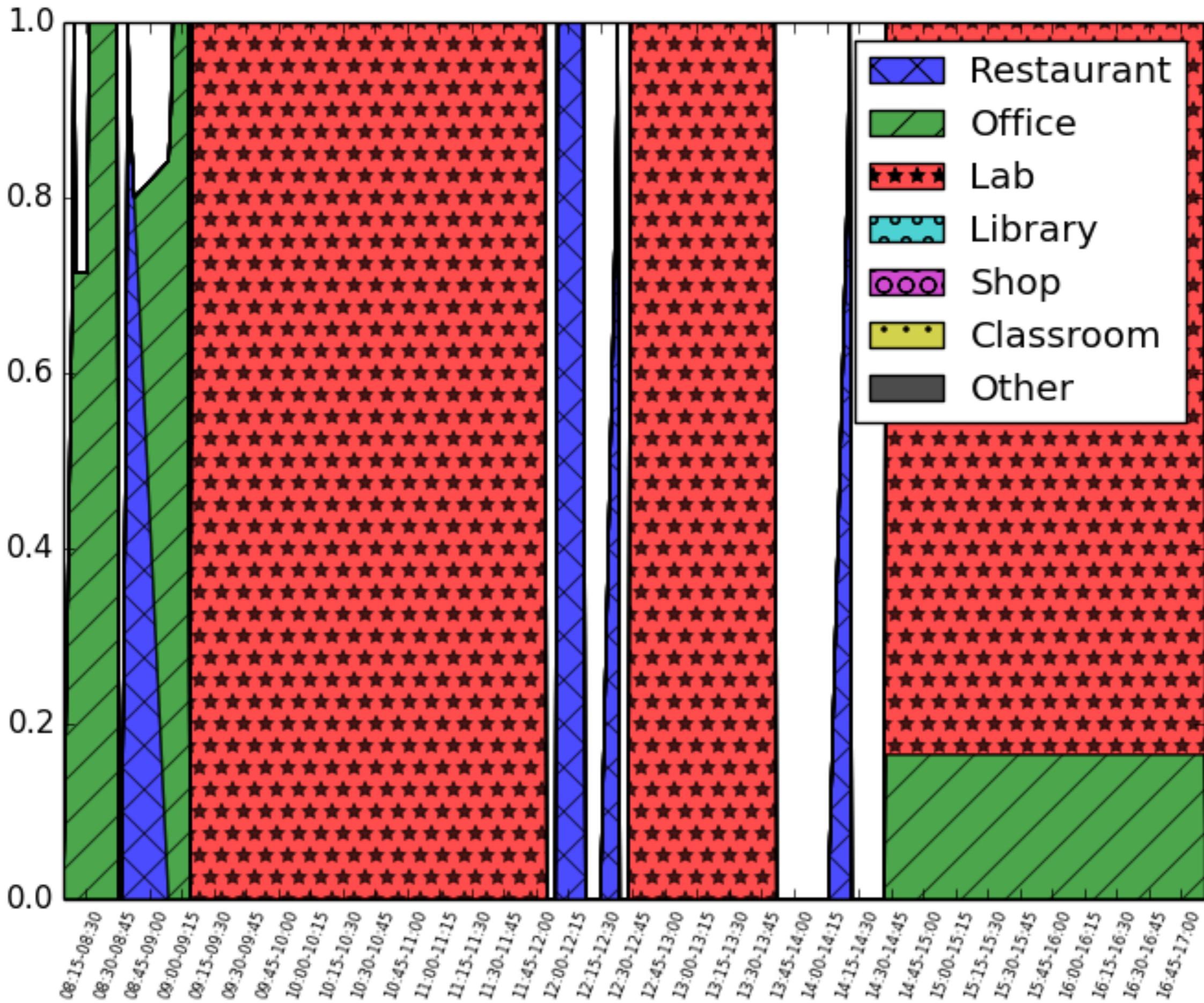
Mauvais type

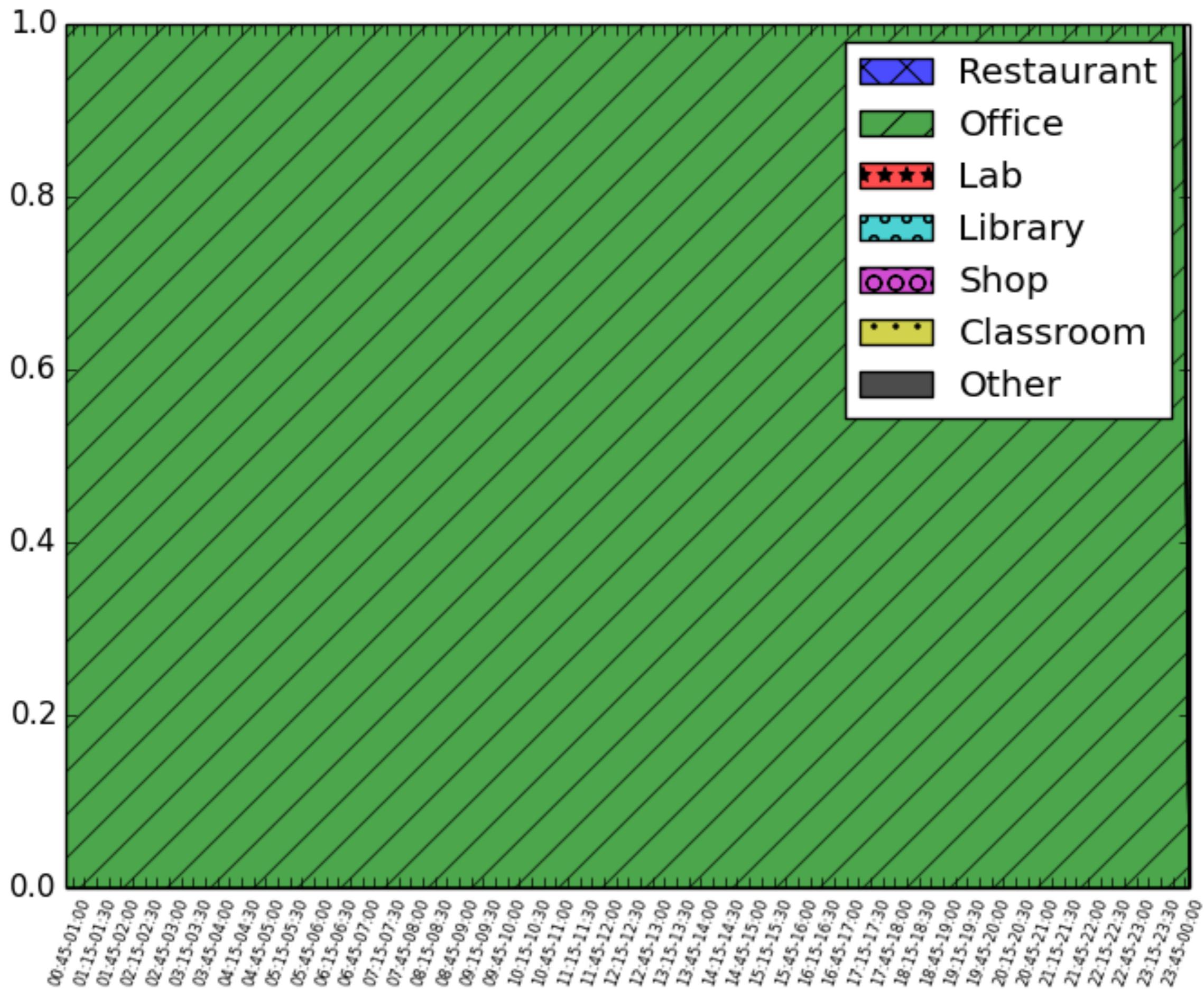


Bon type









- Environ 5 mesures par heure

Arrivée/départ	Destination
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8:35-10:38	CE 1 105
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10:40-11:51	GC B3 445
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11:54-12:50	Ornithorynque
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12:54-13:24	GC B3 445
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13:27-13:58	Sat'
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14:00-19:42	GC B3 445
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Arrivée/départ **Destination**

Arrivée/départ **Activité**

8:35-10:38 CE 1 105

8:35-10:38 Cours

10:40-11:51 GC B3 445

10:40-11:51 Bureau

11:54-12:50 Ornithorynque



11:54-12:50 Restaurant

12:54-13:24 GC B3 445

12:54-13:24 Bureau

13:27-13:58 Sat'

13:27-13:58 Restaurant

14:00-19:42 GC B3 445

14:00-19:42 Bureau

Types d'activité

Bureau

Salle de classe

Laboratoire

Magasin

Restaurant

Bibliothèque

Autre

Pas sur la campus

Réseau d'activité

Types d'activité

Réseau d'activité

Bureau

Salle de classe

Laboratoire

Magasin

Restaurant

Bibliothèque

Autre

Pas sur la campus

8 :30-9 :00

9 :00-9 :30

9 :30-10 :00

10 :00-10 :30

10 :30-11 :00

11 :00-11 :30

11 :30-12 :00

12 :00-12 :30

12 :30-13 :00

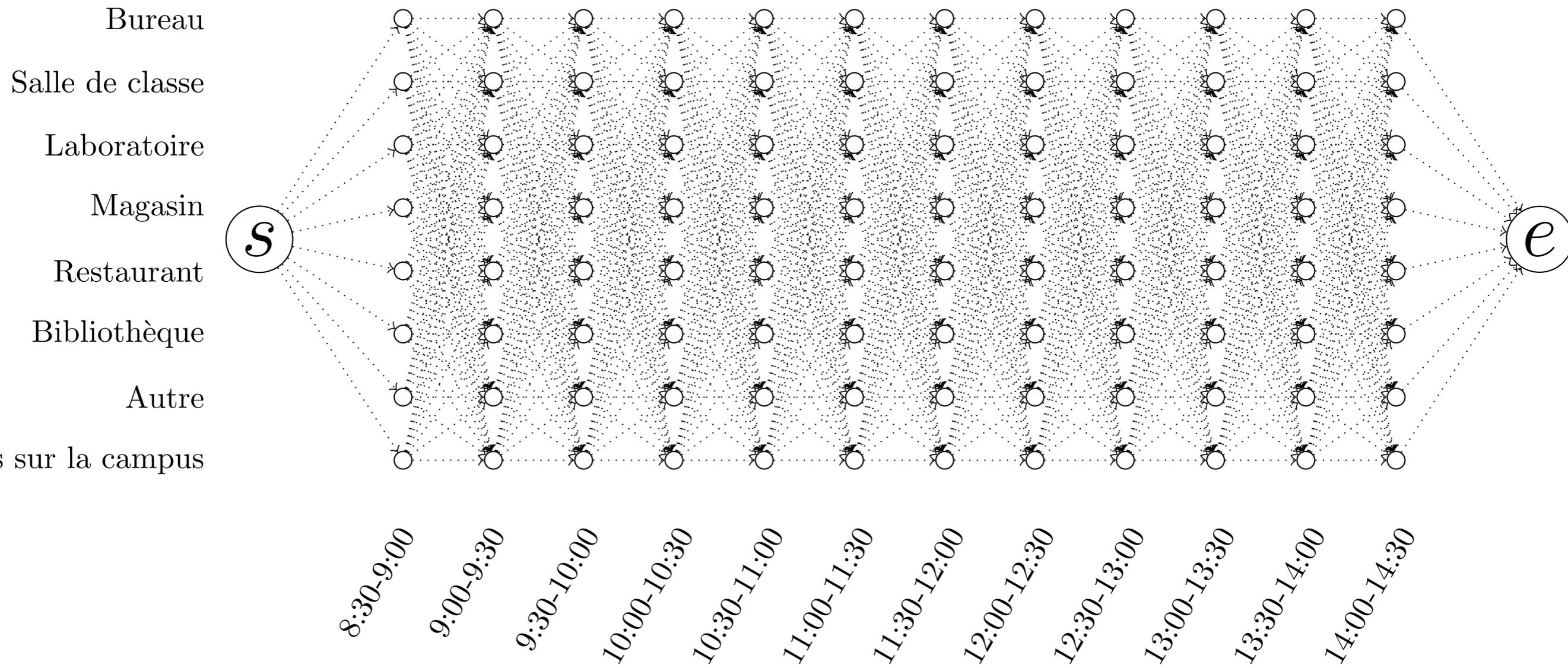
13 :00-13 :30

13 :30-14 :00

14 :00-14 :30

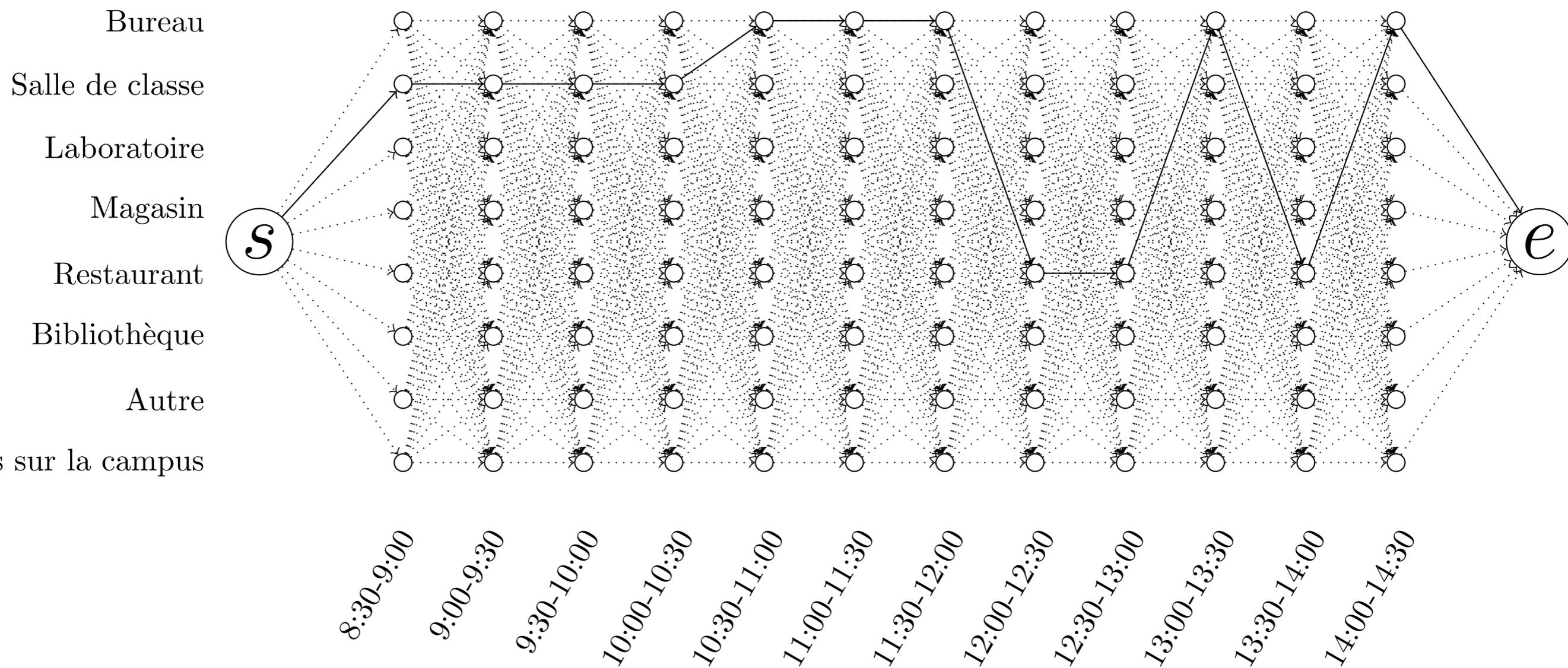
Types d'activité

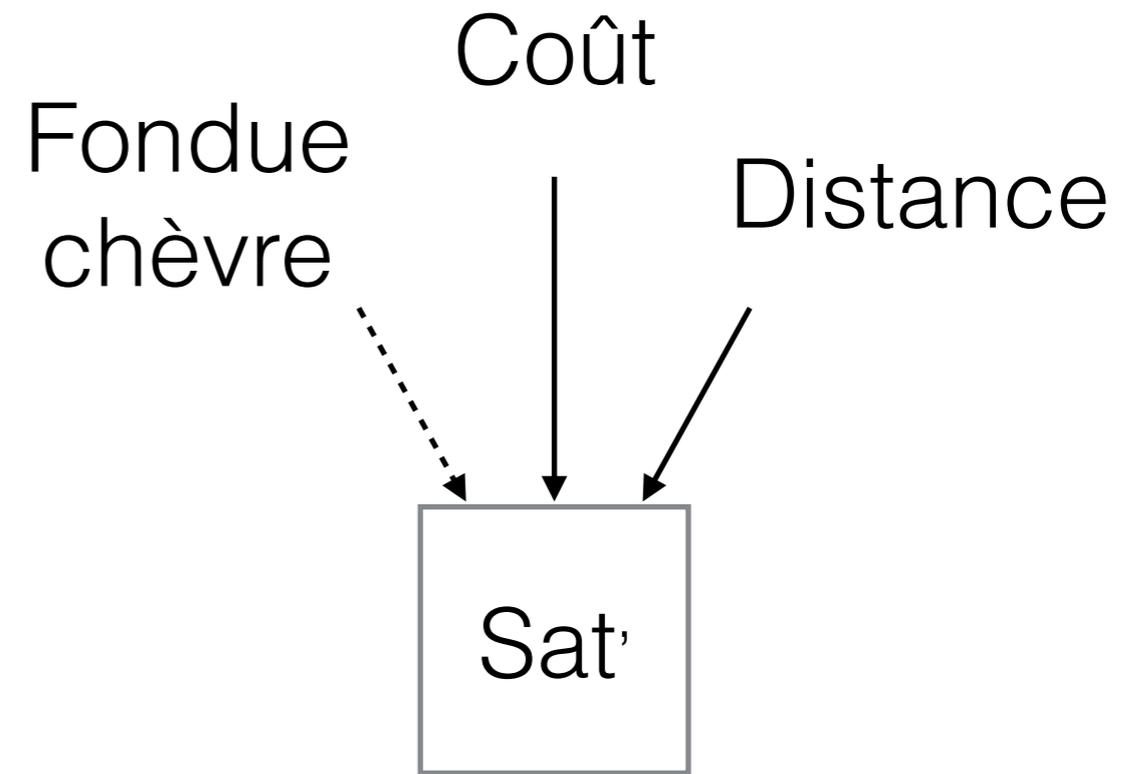
Réseau d'activité



Types d'activité

Réseau d'activité





SV

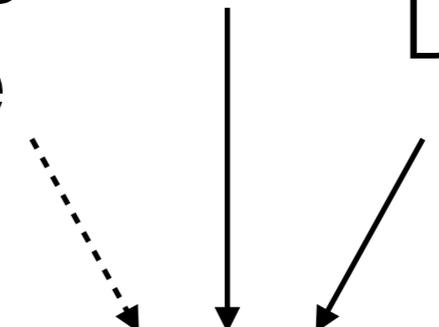
Sat'

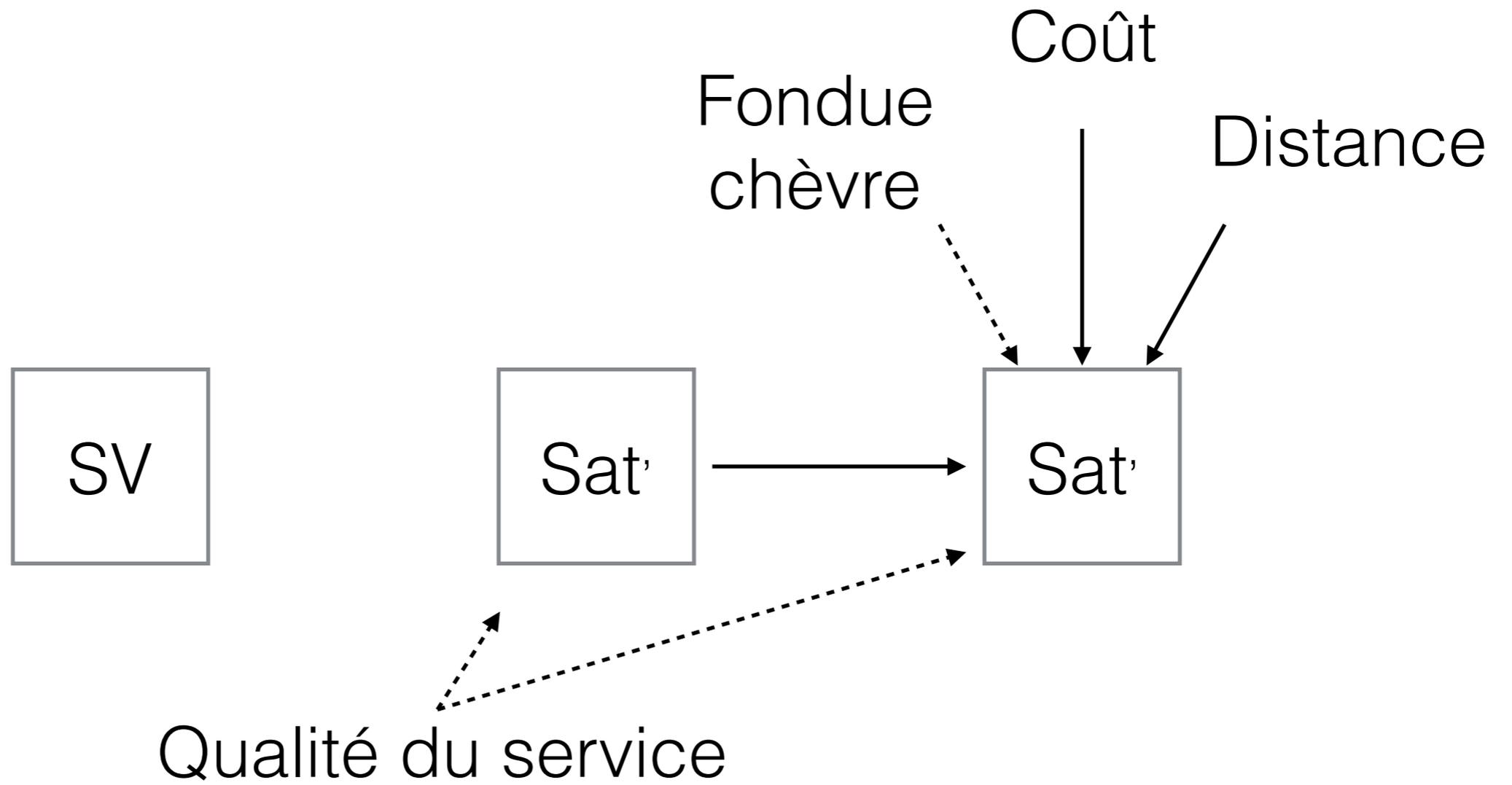
Sat'

Fondue
chèvre

Coût

Distance





Nombre de visiteurs

- **Distance** à marcher : impact **néгатif**
- **Evaluation** annuelle : impact **positif**
- **Bière** à la pression après 14h : impact **positif**
- **Coût** : impact **néгатif**
- Repas du **soir** : impact **positif**
- **Capacité** du restaurant : impact **positif**

Elasticité prix

- Employés : prix +1% \rightarrow visiteurs -2.5%

Elasticité prix

- Employés : prix +1% \rightarrow visiteurs -2.5%
- Etudiants : prix +1% \rightarrow visiteurs -3%

Ouverture de l'Épicure

- Modèle : 0.4-1.1% des visiteurs

Ouverture de l'Épicure

- Modèle : 0.4-1.1% des visiteurs
- Données de caisse : 1.5% des transactions

En résumé

- Détection des épisodes d'activité
- Modélisation du comportement :
 - Choix du chemin d'activité
 - Choix de destination

Infrastructures piétonnes

- Gares
- Aéroports
- Supermarchés
- La Mecque
- Musées
- Hôpitaux

Plus de visiteurs

- Aéroport de Genève : +76% (2004-2014)
- Gare de Lausanne : +100% (2000-'10 & '10-'30)
- Musée du Louvre : +35% (2004-2014)

Applications

- Déterminer la source des embouteillages
- Localiser les points d'intérêt
- Modifier ou construire de nouvelles infrastructures

De l'EPFL à Haïti



De l'EPFL à Haïti

