ACCIDENTALITY OF PERSONAL MOBILITY DEVICES IN LYON

ELMOS
IRTAD – Road Safety Data
28/09/2022
ELMOS Project
Quantitative results
Thorough analysis of 115 accidents

PMD
Personal Mobility Devices
ELMOS project
ELMOS PROJECT

E = EDP engin de déplacement personal = french for PMD
L = Lyon
MO = Mobility
S = Road Safety

Lyon Metropole : 1,5 million people
Quantitative results

3 years (2019-2021) in Lyon Metropole, in urban area:
- 355 accidents involving PDM
- 388 injured (PDM or not), one death

Source: police accidents data
**WHO IS INJURED? PDM USERS OR OTHERS?**

<table>
<thead>
<tr>
<th>Category</th>
<th>Injured in PDM accidents (388)</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-e-PDM</td>
<td>38</td>
</tr>
<tr>
<td>e-PDM</td>
<td>303</td>
</tr>
<tr>
<td>pedestrian</td>
<td>33</td>
</tr>
<tr>
<td>others</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: BAAC (=police data) – base vivante – 2019-2021, Métropole de Lyon, urban area
WHO?

PDM injured Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>PMD Injured</th>
<th>Cyclists Injured</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-13 ans</td>
<td>26</td>
<td>8%</td>
</tr>
<tr>
<td>14-17 ans</td>
<td>23</td>
<td>7%</td>
</tr>
<tr>
<td>18-24 ans</td>
<td>109</td>
<td>32%</td>
</tr>
<tr>
<td>25-34 ans</td>
<td>96</td>
<td>28%</td>
</tr>
<tr>
<td>35-44 ans</td>
<td>54</td>
<td>16%</td>
</tr>
<tr>
<td>45-54 ans</td>
<td>18</td>
<td>5%</td>
</tr>
<tr>
<td>55-64 ans</td>
<td>13</td>
<td>4%</td>
</tr>
<tr>
<td>65-74 ans</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>75 ans et plus</td>
<td>1</td>
<td>0%</td>
</tr>
</tbody>
</table>

Percent of injured by age by mode

- PMD injured
- Cyclists injured
WHO ?

Age of women injured on PDM (total = 93)

Age of men injured on PDM (total = 242)
<table>
<thead>
<tr>
<th>PDM injured</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5h–7h</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>7h–10h</td>
<td></td>
<td>7</td>
<td>10</td>
<td></td>
<td>3</td>
<td>10</td>
<td>8</td>
<td>43</td>
</tr>
<tr>
<td>10h–13h</td>
<td>8</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>44</td>
</tr>
<tr>
<td>13h–16h</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>3</td>
<td>39</td>
</tr>
<tr>
<td>16h–19h</td>
<td>16</td>
<td>11</td>
<td>24</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>7</td>
<td>89</td>
</tr>
<tr>
<td>19h–22h</td>
<td>4</td>
<td>10</td>
<td>7</td>
<td>6</td>
<td>12</td>
<td>4</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td>22h–1h</td>
<td>5</td>
<td>2</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>36</td>
</tr>
<tr>
<td>1h–5h</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>11</td>
<td>38</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>48</td>
<td>43</td>
<td>65</td>
<td>52</td>
<td>53</td>
<td>46</td>
<td>34</td>
<td>341</td>
</tr>
</tbody>
</table>
Accidents involving a PDM (non e and e PDM) 2019-2021 – Lyon Metropole

City of Lyon
= 80 % of accidents involving a PDM
Thorough analysis of 115 accidents
115 police reports in Lyon (all police reported available – 350 accidents)

2019-2021

Investigation in the process of each accident (one hour per accident)

Constitution of typology of PMD accidents

Mechanisms, dysfunctional situations and factors in the « man-vehicle-road environnement » traffic system
CLASSIFICATION – 115 ACCIDENTS

With another vehicle - 82

- Class A: On a crossroad – perpendicular – 42

- Class B: On a crossroad – opposite direction – 14

- Class C: PDM on pedestrian crossing - 14

- Class D: Headon collision - 4

- Class E: Opening door - 5

- Class F: On the side walk – 3

- PDM alone – 13 cases – Class G

- PDM against pedestrian – 12 cases - Class H

- Others – 8 cases – Class K: 1 tram, 1 race, 2 blind-spots, 1 car from the back, …
CLASS A – CROSSROAD, PERPENDICULAR – 42 CASES

PDM and car are perpendicular

A1 – PDM : wrong way – 9 cases

A2 – PDM : countra flow cycling – 7 cases

A3 – PDM crosses, with red traffic line, stop, …, at the same time the car does – 10 cases

A4 – PDM crosses, in the right – the car driver doesn’t see him - 7 cases

A5 – other situation -7
CLASS B – 14 CASES – CROSS ROAD – OPPOSITE DIRECTION - THE CAR TURNS LEFT

PDM and car are face to face, the car turns left in front of the PDM

B1 – PDM rides in bus-cycling lane – 5 cases

B2 – PDM in countra flow cycling – 4 cases

B3 – other situation - 4 cases
CLASS C – 14 CASES
PDM ON PEDESTRIAN CROSSING

C1 – 6 cases – the car turns (left : 3 / right : 3), PDM rides face to the car

C2 : 3 cases - the PDM, suddenly, rides on the pedestrian crossing

C3 : 5 cases - other situation
CLASS D – 4 CASES – HEAD ON COLLISION

no in cross road
Opposite direction
PDM and the car in the same direction

The car is parked (2 cases) or just stopped at a traffic light
CLASS F – 3 CASES – ON THE SIDEWALK

PDM runs on the sidewalk (e-PDM only)
The car exits from a park

P
CLASS G – 13 CASES – PDM ALONE

G1 – no memory - 5 cases

G2 – loss of control (bend, going up the sidewalk, pothole,....) – 8 cases
CLASS H – 12 CASES – WITH PEDESTRIAN

G1 – 5 cases – the PDM rides on a countraflow cycling

G2 – 3 cases – the PDM rides on the wrong way

G3 – 4 cases - other situation
CONCLUSION

Cross road
Cuntraflow cycling (for car drivers and pedestrians)
Very few accidents with : tramway, blind spots, trucks.
THANK YOU FOR YOUR ATTENTION

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Appel à projet de la Direction à la Sécurité routière