Florida Department of Transportation
Summary of Final Report, BB-353-4
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OPERATING CHARACTERISTICS OF THE INLINE SKATER

PROBLEM STATEMENT

Inline skating is growing rapidly in the United States, not only as a sport but also as a new mode of transportation. In order to accommodate inline skaters, either on the road or on trails or paths, it is necessary to have data on operational characteristics of inline skaters for geometric design purposes and policy installation purposes.

OBJECTIVES

The main purpose of this research project was to measure the operational characteristics of inline skaters, which included operating speeds, operating space (sweep width), stopping techniques, stopping distance, and stopping width, by videotaping inline skaters both on road facilities and on trails in south and west Florida.

FINDINGS AND CONCLUSIONS

The videotapes were used to determine the operational characteristics of inline skaters. The skaters were analyzed for different categories, including male, female, learner, advanced, and all skaters. Logit models were used to fit the cumulative distributions to determine the 15th, 50th, and 85th percentile values for the operational characteristics, which, in turn, would impact the desirability of allowing inline skaters on the street system as well as provide important information for geometric design of inline skater paths.

Analyses indicate that speed, sweep width, and stopping distance are related since the highest speeds also had the highest sweep width and longest stopping distances.

TABLE 12 Operational Characteristics of Inline Skaters

Categories	Operational Characteristics of Inline Skaters								
	Speed (mph)			Lower Sweep Width (ft)			Lower/Upper Sweep Width (ft)		
	15th Perc	50th Perc.	85th Perc.	15th Perc.	50th Perc.	85th Perc.	15th Perc.	50th Perc.	85th Perc.
All	7.13	9.86	12.59	3.00	3.93	4.86	3.09	4.00	4.91
Male	7.49	10.28	13.07	3.33	4.24	5.15	3.40	4.28	5.16
Female	6.64	9.34	12.04	3.00	3.82	4.63	3.01	3.81	4.61
Learner	5.30	7.03	8.76	2.48	3.15	3.82	2.69	3.21	3.74
Advanced	8.29	10.63	12.97	3.29	4.17	5.05	3.40	4.23	5.05

The speed values for the 15th, 50th, and 85th percentiles were 7.13 mph, 9.86 mph, and 12.59 mph, respectively, for the all skaters category as shown in Table 12 (tables used in the summary are referenced as in the report). These values for the all skater category range between the values of the other categories. Males were shown to have higher percentile speeds than females, and advanced skaters

higher speeds than learners.

In reference to sweep width, it was found that lower/upper sweep width values were just a little higher than the values for lower sweep width. The 15th, 50th, and 85th percentile values for lower/upper sweep width for the all skaters category were 3.09 feet, 4.00 feet, and 4.91 feet, respectively (see **Table 12**). Percentile values for lower/upper sweep width for male and advanced skaters were higher than for female and learner skaters.

Furthermore, skaters with sweep widths of 4 feet or less or 5 feet or less varied significantly (by percentages) between categories, indicating that male and advanced skaters require a greater lateral clearance than female skaters and learners. For the male and advanced categories, the percentage of skaters with a lower/upper sweep width of 5 feet or less are 81.04 % and 83.90 %, respectively (see **Table 13**). This means that 5 feet for lateral clearance will not accommodate 85 % of the skaters in these categories. The values for lower sweep widths and lower/upper sweep widths (as regards 4 ft or less and 5 ft or less groupings) are very similar.

TABLE 13 Percentage of Skaters with a Sweep Width and Stopping Width of 4 ft or less, or 5 ft or less

Categories	Percentage of Skaters with 4 or 5 ft or less					
	Lower Sweep Width		Lower/Upper Sweep Width		Stopping Width	
	Percent 4 ft or less	Percent 5 ft or less	Percent 4 ft or less	Percent 5 ft or less	Percent 4 ft or less	Percent 5 ft or less
All	51.43%	86.96%	51.15%	86.96%	80.41%	81.00%
Male	41.90%	81.04%	41.60%	81.04%	76.27%	76.84%
Female	59.84%	92.18%	59.57%	92.18%	84.85%	85.45%
Learner	94.24%	99.28%	93.53%	99.28%	80.00%	82.86%
Advanced	40.79%	83.90%	40.61%	83.90%	80.81%	80.81%

Field data showed that advanced skaters and male skaters occupy wider sweep widths than learners and female skaters, respectively. It could be assumed that wider sweeps are preferred by faster skaters because wider sweeps are more efficient to reach faster speeds. Thus, more available lateral space should be provided in order to accommodate wider sweeps.

In reference to stopping distances, the difference is high between the male and advanced skaters and the female and learner skaters. The values for the 15th, 50th, and 85th percentiles for stopping distances for the all skaters category were 15.07 feet, 31.52 feet. and 47.97 feet, respectively (see **Table 14**).

TABLE 14 Stopping Characteristics of Inline Skaters

Categories	Stopping Characteristics of Inline Skaters					
	Stopping Distance (ft)			Stopping Width (ft)		
	15th Perc.	50th Perc.	85th Perc.	15th Perc.	50th Perc.	85th Perc.
All	15.07	31.52	47.97	3.23	4.31	5.36
Male	16.40	32.65	48.91	3.55	4.55	5.56
Female	13.72	30.26	46.80	2.94	3.87	4.78
Learner	10.06	25.24	40.42	3.41	4.27	5.14
Advanced	16.68	33.02	49.35	3.17	4.28	5.38

The values for stopping widths were very similar for all categories except female, which had lower values. The 15th, 50th, and 85th percentile values for stopping sweep width for the all skaters category were 3.23 feet 4.31 feet, and 5.36 feet, respectively.

The six basic stopping techniques observed were brake pad, wall-stop, run out, T-stop, spin out, and hockey stop. The brake pad technique was the most commonly used in all categories (59.70% for all skaters). The T-stop was the second most preferred stopping technique (15.22%, all skaters). Stopping techniques were also combined to produce combination stops (12.85%, all skaters).

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