

# Kegel LaneMap Report

Pro Bowling – Czech Republic

29 August 2018



## Introduction

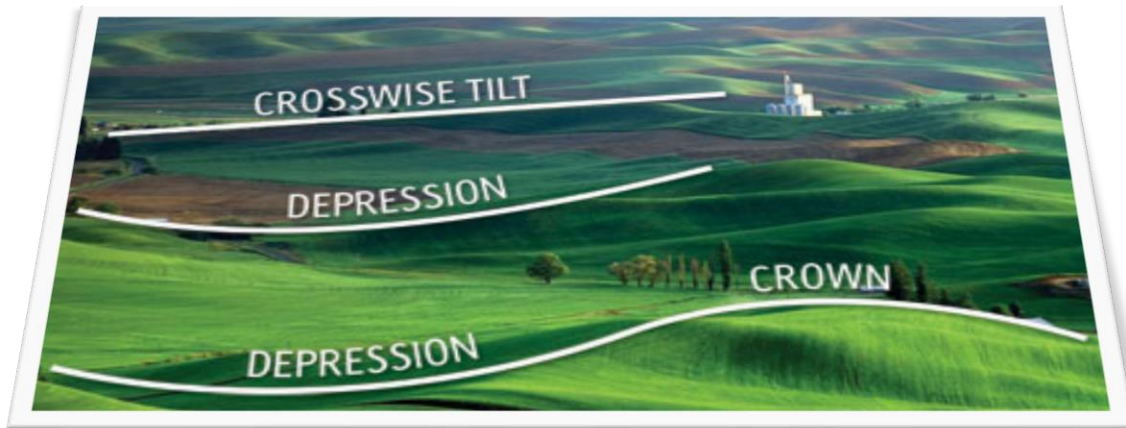
Kegel is pleased to provide you with this detailed bowling lane topography report. This report is an evaluation of the surface of each lane in your bowling center and will assist you in corrective actions that will provide a more consistent playing surface from lane to lane across the center which will ultimately give more styles of play an increased opportunity to score higher.

**The Kegel LaneMapper™** is a state of the art device that can efficiently and accurately log digital recordings of surface topography.

Designed by Kegel specifically for bowling lanes, the LaneMapper™ reads and records both length and crosswise levels while simultaneously logging crowns and depressions of all 39 boards at any distance on the lane to an accuracy of .0001 inch.

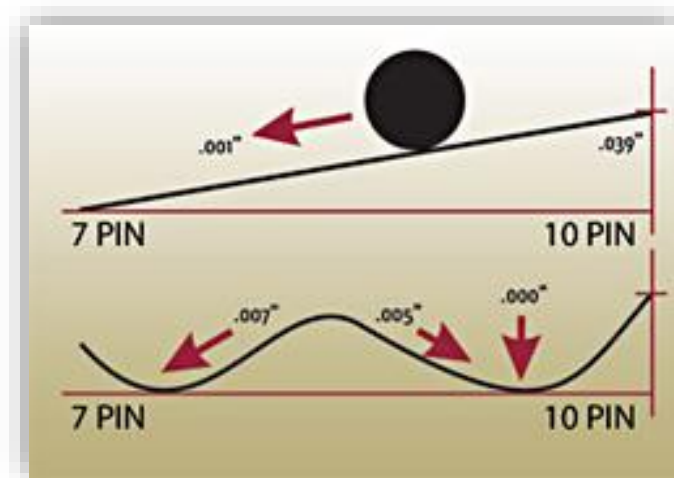


**Topography** is defined as the graphical representation of surface features indicating relative positions and elevations. It's a known fact that changes in topography adversely affect the ball path and ball motion (rate of energy depletion). When topographical features are randomly different on a bowling lane, so is ball motion which causes inconsistency.



Another variable is **Slope per Board**. Each board has a specific slope, calculated from the crosswise tilts, crowns, and depressions. The degree of this slope also has a proportional effect on the ball path.

For example, a board with a  $2/1000''$  slope will affect the ball twice as much as a board with a  $1/1000''$  slope. Bowlers throw balls on different boards and each ball is only affected by the slope of the board it's on at that moment in time. The other slopes don't matter to that ball because quite simply, it's not on them.



## Understanding the Data

This report is designed to compare each pair of lanes in the bowling center.

The data presented are:

- ✎ Raw Data Table of all the individual topography readings - crosstils lengthwise level, crowns (highs) and depressions (lows) of each board at every scan distance for every lane
- ✎ Lengthwise Level Graph of each pair of lanes
- ✎ LaneMap™ - A colored gravitational slope graph of each lane
- ✎ 3-D contour map of each lane

## Raw Data Table

The data table shows all the scanned topography measurements. There are no decimals in this table because all measurements were multiplied by a thousand. This means .020" = 20 thousandths of an inch. A double pound sign (##) is above 99 thousands of an inch.

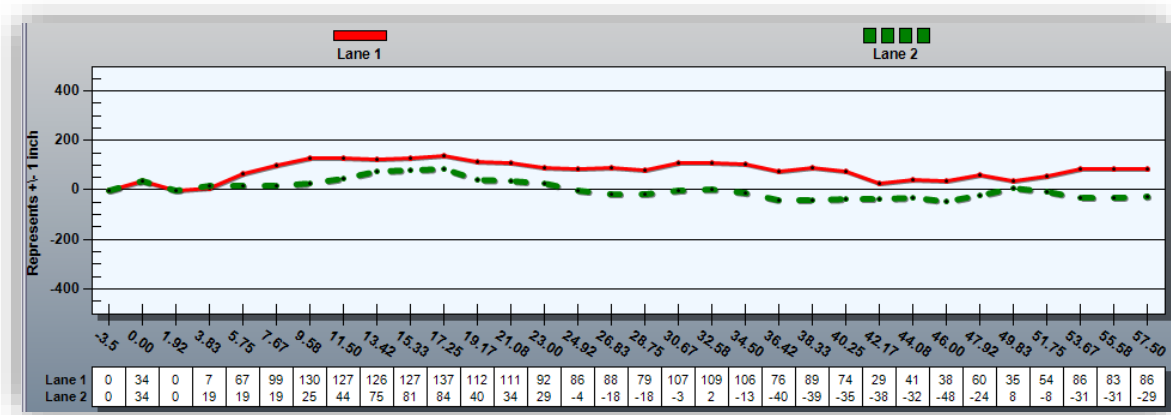
A (-) before the number indicates a depression at that point on the lane. Unless otherwise noted, the crowns and depressions are calculated against zero (flat).

The below example shows that on Lane 1 at a distance of 11.5' from the foul line, board number 3 on the left side (L3) is depressed by (-10) or (ten thousandths).

Lane	Distance	Cross	Length	L1	L2	L3	L4	L5	L6	L7
1	9.6	-0.016	-0.003	0	-2	-5	-10	-19	-25	-
1	11.5	-0.005	-0.001	0	-7	-10	-16	-20	-25	-
1	13.4	-0.011	0.001	0	-5	-7	-9	-12	-13	-
1	15.3	0.013	0.01	0	-1	-3	-2	-4	-5	-

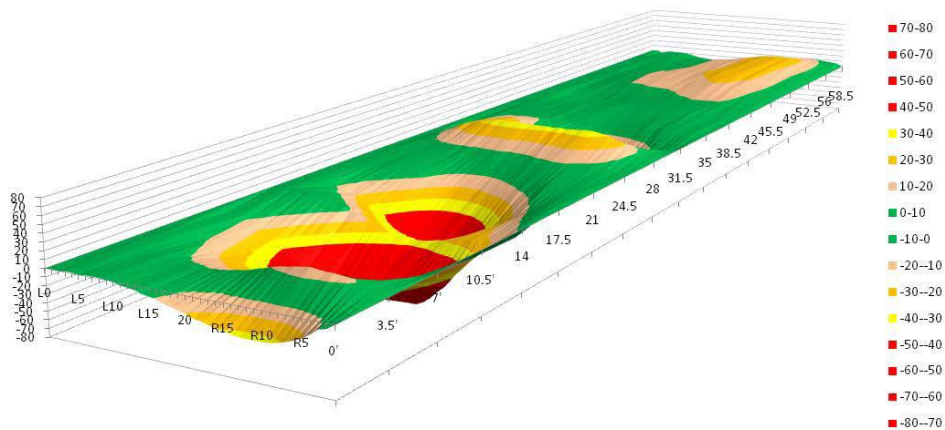
## Lengthwise Level Graph

Although this is not a required specification for existing centers, it has been adopted by the USBC, the specification governing body of tenpins. See USBC form EQ-09101, page 4, and dated 12/08 for this specification. Considering front-to-back level has a critical effect on consistent lane to lane ball reaction, we measure at each leveler.



## 3-D Contour Graph

The 3D graph is a visual aid showing the highs (crowns) and lows (depressions) of each bowling lane surface. The data was multiplied by a factor of four to make differences more obvious when viewing the graph.





## LaneMap™ Graph

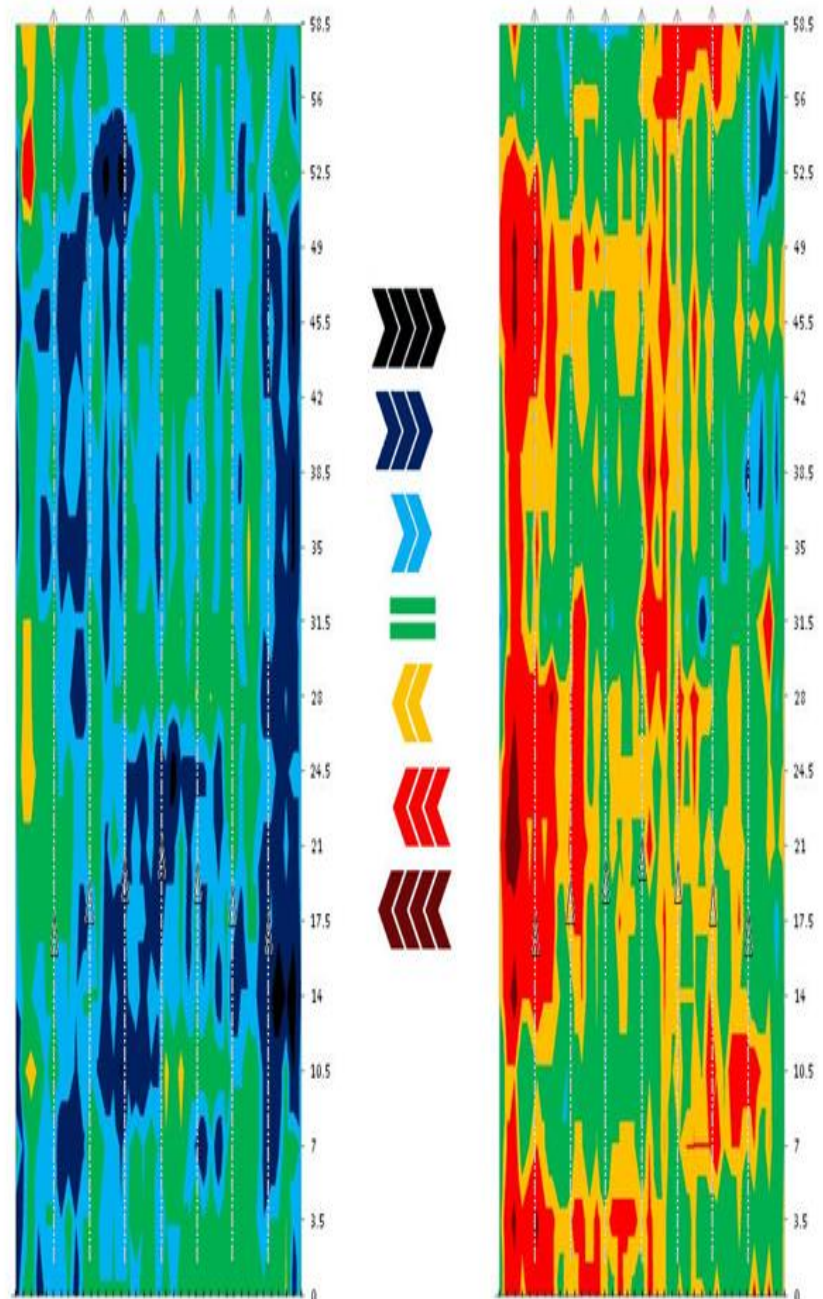
The revolutionary Kegel LaneMap™ graph shows the slope per board and is the gravitational influence on the “canvas” (lane) prior to the application of “paint” (lane conditioner). Gravity and friction are separate forces on a bowling ball but gravity problems cannot be fixed with friction solutions.

Since the lanes are generally oiled identically, differences between lanes in ball reaction will be a function of differences in gravitational forces “under” the conditioner. In order for two lanes to play the same, they must not only be oiled the same, but they also must have similar gravitational influences in comparable places.

The black and dark blue areas on the LaneMap™ graph are very strong gravitational influences to the right while light blue areas are less, but still substantial influences to the right.

The maroon and red areas are very strong gravity influences to the left, while orange areas are less but still substantial influences to the left.

Green represents areas of very little gravity influence. The bottom of the graph is the foul line and the top of the graph is right before the pins.

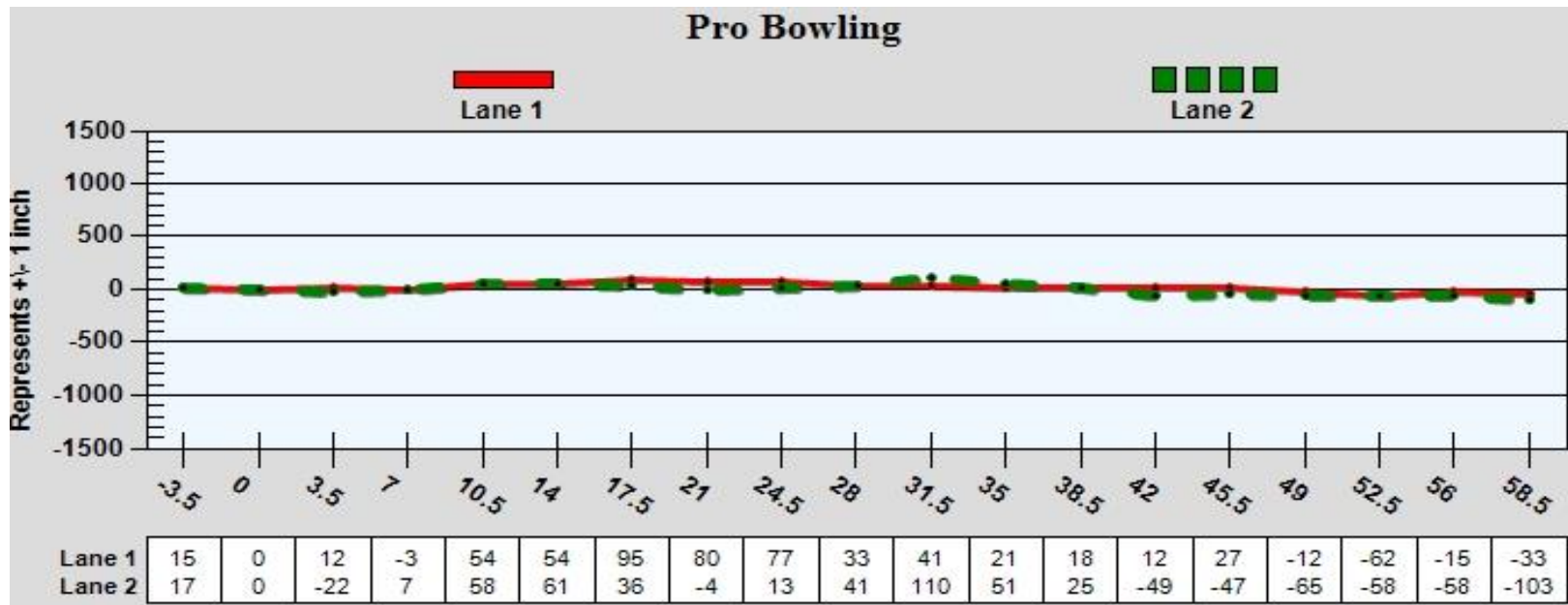


## Bowling Center Lane Details

- ✎ Number of lanes: 3
- ✎ Lane Surface: HPL
- ✎ Approaches: HPL
- ✎ Pin Decks: HPL

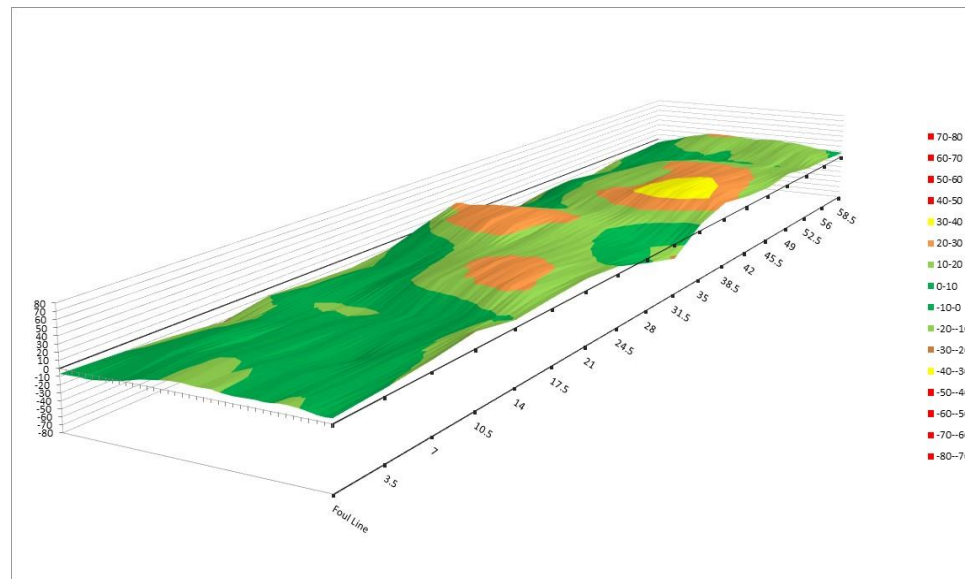
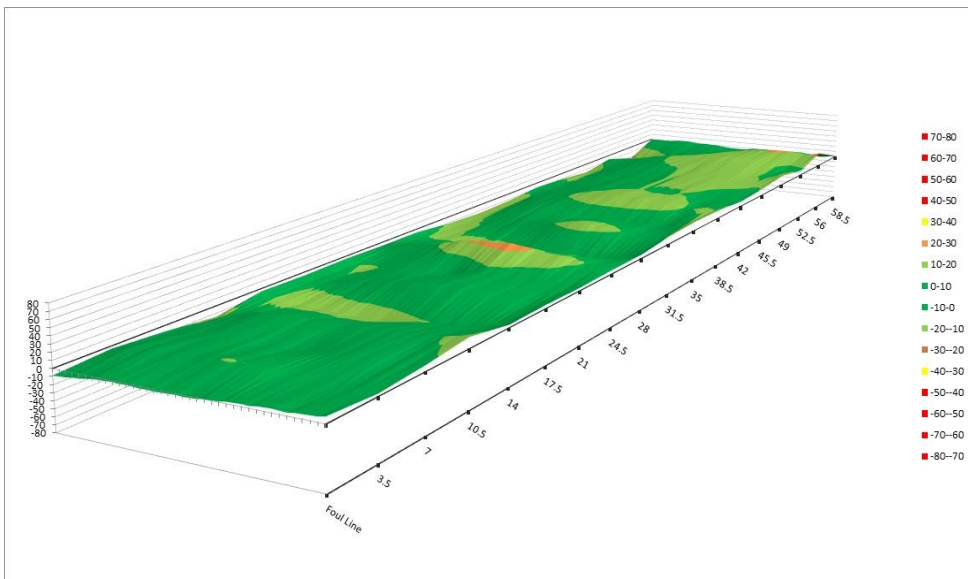
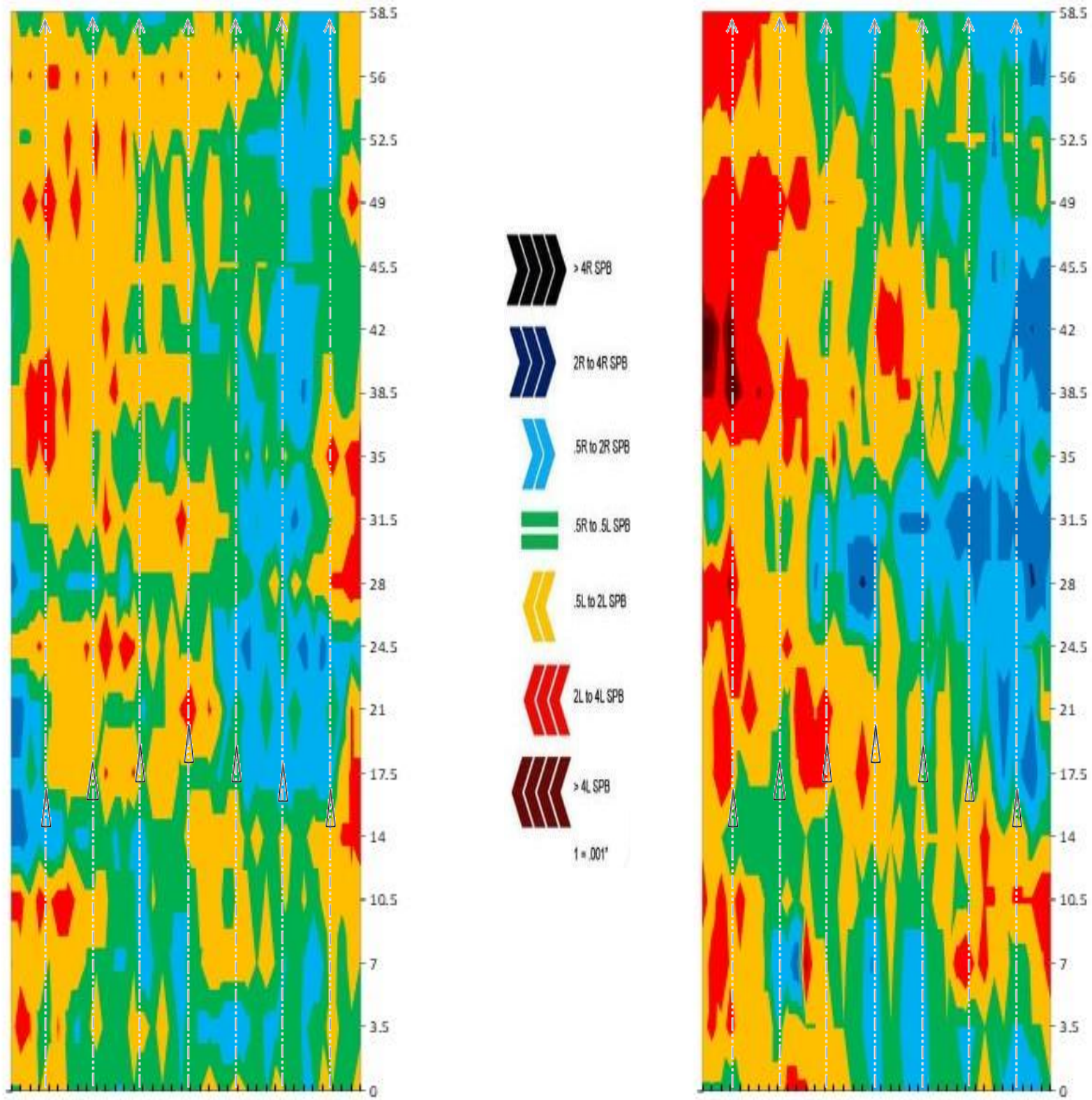
### Lanes 1 - 2

Lane	Distance	Cross	Length	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	C	R19	R18	R17	R16	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	
1	58.5	2	-18	0	1	1	1	1	2	3	3	3	2	1	1	1	0	0	-1	-2	-3	-3	-3	-3	-1	0	0	1	0	0	-1	0	0	1	1	0	-1	-3	-4	-3	-1	0	
1	56	46	47	0	1	1	2	2	3	4	4	5	5	5	6	6	6	7	7	7	8	8	9	9	9	10	10	11	11	11	10	10	9	7	6	4	2	0	0	0	0	0	
1	52.5	15	-50	0	1	1	1	2	3	4	6	7	8	10	11	12	14	14	15	15	16	16	16	17	17	17	17	16	16	15	14	13	12	10	8	7	5	3	1	1	1	0	0
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Lane	Distance	Cross	Length	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	C	R19	R18	R17	R16	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	
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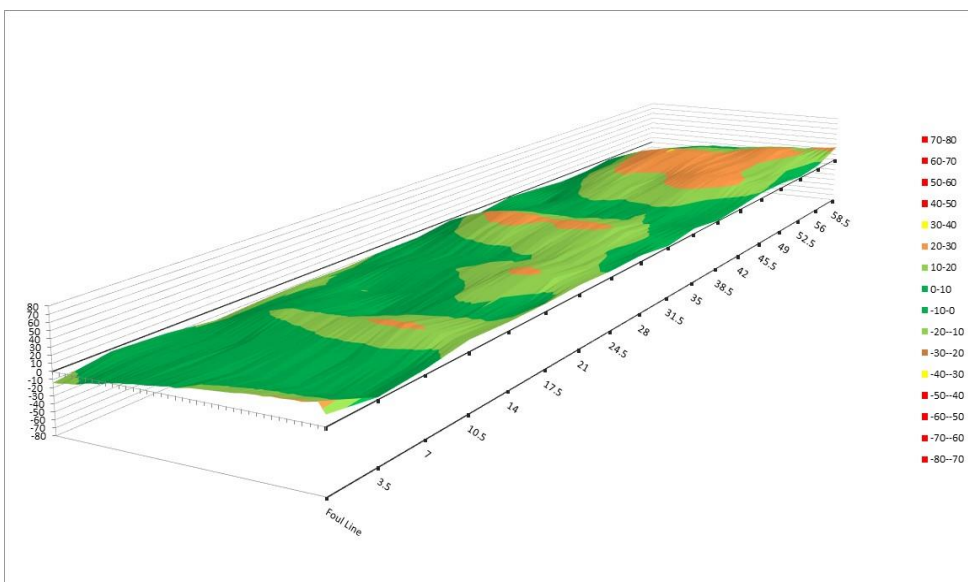
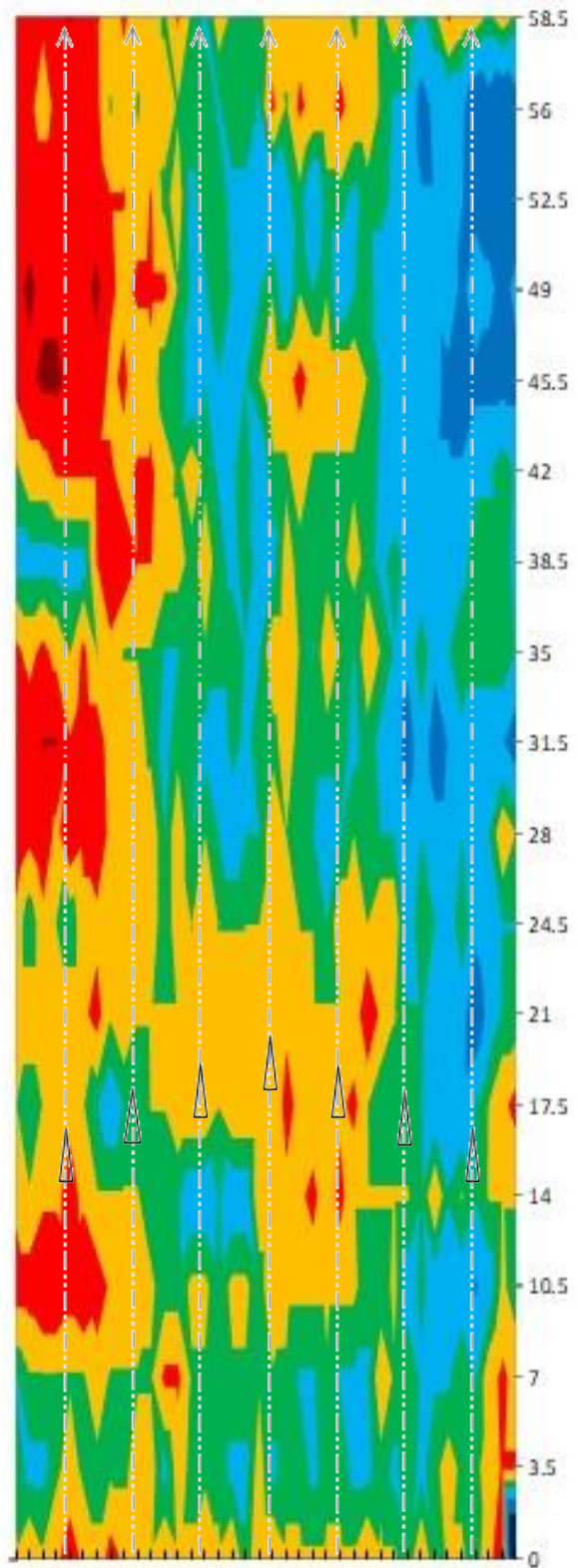
### Lanes 1 - 2



### Lanes 3 - 4

Lane	Distance	Cross	Length	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	C	R19	R18	R17	R16	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1
3	58.5	48	-45	0	2	4	5	7	10	11	12	12	13	13	13	12	13	12	10	10	9	8	7	7	7	7	7	7	6	6	5	5	4	2	1	2	2	2	1	1	0	
3	56	14	34	0	3	5	6	8	10	12	14	14	15	15	16	17	17	17	16	16	16	15	17	17	19	20	21	23	24	25	25	24	23	20	18	16	14	10	7	3	0	
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3	17.5	22	-37	0	0	-1	-1	-1	0	0	-1	-3	-4	-5	-5	-5	-4	-3	-2	-2	-1	0	1	1	3	4	4	5	6	8	8	7	6	5	4	2	0	-2	-3	-3	-2	0
3	14	24	48	0	1	1	2	3	5	6	6	6	6	6	5	4	3	1	-1	-2	-4	-6	-5	-4	-3	-2	0	0	2	2	2	2	2	2	1	2	1	1	0	0	0	
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### Lanes 3 - 4



### Pro Bowling\_AIF

Lane	Dist	Step	Cross	Length
1	1	1	6	
1	456	2	2	
1	710	3	19	
1	7	4		-63
1	15	5		-56
1	10	6		-60

Lane	Dist	Step	Cross	Length
2	1	1	9	
2	456	2	1	
2	710	3	10	
2	7	4		-60
2	15	5		-60
2	10	6		-44

Lane	Dist	Step	Cross	Length
3	1	1	37	
3	456	2	38	
3	710	3	68	
3	7	4		50
3	15	5		27
3	10	6		29