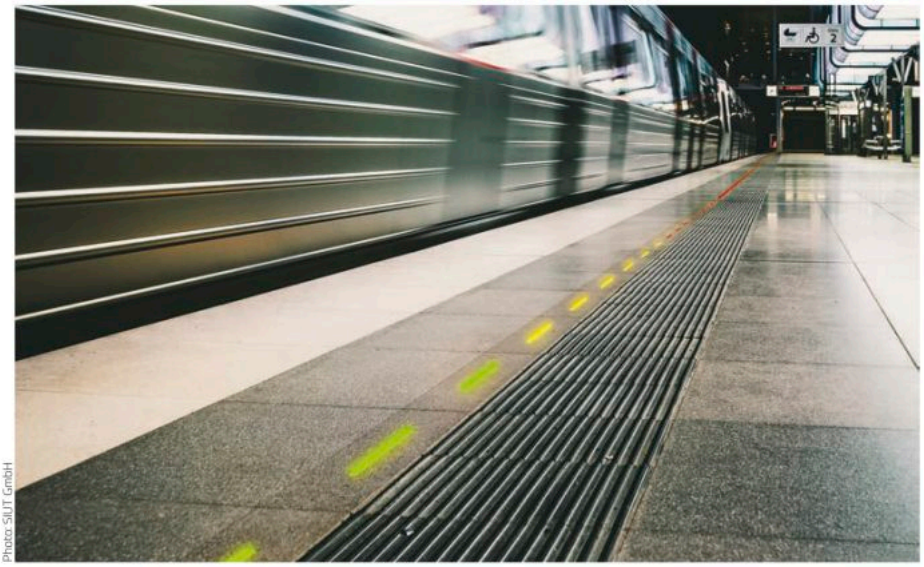


Photo: SIUT GmbH

Combining real-time passenger counting with historic boarding and alighting data will enable more accurate predictions of train loadings.

Controlling occupancy in real time

Above: Coloured LED indicators from SIUT can be fitted along the platform edge to inform waiting passengers about the capacity available on an approaching train.

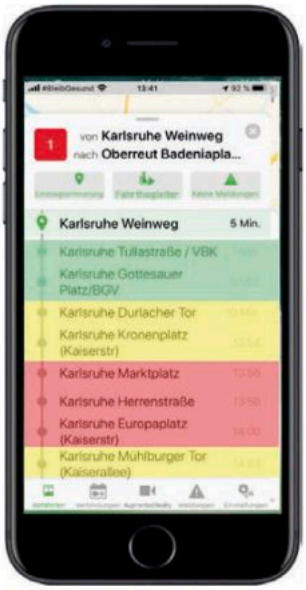
Facing page: Station-by-station vehicle loading data for an individual train can be presented as a heat map.

Right: Passengers can check predicted occupancy levels using an app, enabling them to adjust their travel plans if necessary.

Georg Koenig
Product Manager,
INIT

Public transport operators in many countries are currently facing the challenge of 'smooth reopening' as coronavirus lockdown restrictions are gradually eased. But winning back passengers means rebuilding their confidence that mass transit can be safe.

High among user concerns is the potential health implications of crowded trains and platforms. One way to allay those concerns is to present passengers with better data to make informed travel decisions, and ensure that they can meet social distancing rules while travelling. To this end, Karlsruhe-based transport information specialist Init has introduced a passenger guidance system based on technology patented in both Europe and the USA.



MOBILEguide is designed to provide accurate predictions of occupancy levels in metro or suburban trains, which can be distributed using multiple passenger information channels. This would enable travellers to spread out to the least crowded vehicles or decide to wait for a later train.

Quite apart from addressing the aftermath of Covid-19, achieving a more even distribution of passengers at busy times offers longer-term benefits for operators. It is a common phenomenon on suburban and metro lines for regular commuters to cluster in certain parts of the platforms and on board trains, strategically positioning themselves to be close to the exit at their destination. This results in some vehicles becoming overcrowded, while there is plenty of space available elsewhere. That affects the perceived quality of service, while crowding at the doorways extends the station dwell times and can lead to a build-up of delays.

More even loadings would facilitate a faster changeover and shorten dwell times. Having accurate information on ridership also enables operators to gain insights into vehicle occupancy rates and potentially adjust the service frequency to match supply with demand.

Intelligent counting

MOBILEguide builds on Init's proven MOBILE-APC passenger counting technology. As soon as the train doors close, sensors determine the car loading and an on-board processor transmits the data to a central system.

Some counting systems already display the loading on board each vehicle and transmit the data to indicators at the next station. MOBILEguide goes one step further, as the central processor can correlate the real-time measurements with historic operational data about passenger boarding and alighting behaviour. A self-learning algorithm determines the expected loading for each vehicle after the predicted number of passengers

have alighted at the next station. Other factors that can be taken into account include the particular line and station, or even the time of day.

The aim is to provide a more accurate prediction of the space likely to be available in different parts of the approaching train. This can be important at major stations and interchanges where there is a significant changeover of passengers.

The thresholds for determining whether the occupancy of each vehicle is low, medium or heavy can be adjusted by the operator, giving them the flexibility to specify the increased space needed for social distancing, for example.

The occupancy indications can also be managed directly by the driver or from the operations control centre. An add-on to Init's MOBILE-ITCS fleet management system allows data to be displayed to drivers or dispatchers in real time, so that they can intervene when necessary. This could include designating a train as 'set down only' at selected stations, for example.

The occupancy predictions can be presented to waiting passengers in various ways. One is to use green, yellow or red LED indicators along the platform and another is to show the loadings on the station's passenger information displays. Data can also be fed to journey planning apps or internet sites.

Having accurate information in real time enables the passengers to position themselves near an area with free space before the train arrives, or to re-plan their trip using less-busy trains or a different route.

> 'MOBILEguide is designed to provide accurate predictions of occupancy levels in metro or suburban trains'

Line	Direction	Station Name	Date	Act Arr Time	CAR 1	CAR 2	CAR 3	CAR 4	CAR 5	CAR 6	CAR 7	CAR 8	Train Load (total)
LINE 5	down	George Town	14-OCT-16	07:45:36	4	20	12	77	56	114	20	15	318
LINE 5	down	Kingston North	14-OCT-16	07:47:54	11	33	24	81	62	119	33	19	382
LINE 5	down	Iceland Park	14-OCT-16	07:49:52	20	45	41	98	80	131	45	21	481
LINE 5	down	Stadium	14-OCT-16	07:51:32	22	65	44	98	91	156	65	35	576
LINE 5	down	Central Park	14-OCT-16	07:53:10	45	88	66	127	106	176	88	32	728
LINE 5	down	Bayside View	14-OCT-16	07:55:02	42	70	34	116	99	153	70	64	649
LINE 5	down	Exhibition Centre	14-OCT-16	07:56:54	60	95	109	205	175	231	95	59	1029
LINE 5	down	Amusement Park	14-OCT-16	07:58:50	67	87	150	196	168	227	150	68	1113
LINE 5	down	King George Field	14-OCT-16	08:00:26	83	115	169	220	188	226	142	63	1296
LINE 5	down	Unification Gate	14-OCT-16	08:02:16	65	120	166	174	167	218	120	47	1077
LINE 5	down	Memorial Station	14-OCT-16	08:04:56	55	105	145	154	118	194	105	45	921
LINE 5	down	Kings Castle	14-OCT-16	08:06:30	30	95	80	109	66	140	95	42	657
LINE 5	down	University SCSU	14-OCT-16	08:08:48	22	65	35	78	101	82	65	33	481
LINE 5	down	Steelers Field	14-OCT-16	08:10:40	18	44	39	63	36	61	44	10	315
LINE 5	down	Strip District	14-OCT-16	08:12:48	16	30	19	33	26	54	30	12	226
LINE 5	down	Airport	14-OCT-16	08:14:26	9	15	12	20	20	27	15	8	126
LINE 5	down	Convention Centre	14-OCT-16	08:16:10	0	0	0	0	0	0	0	0	0
LINE 5	up	Convention Centre	14-OCT-16	08:19:28	4	28	114	56	12	20	21	7	262
LINE 5	up	Airport	14-OCT-16	08:20:42	16	45	119	62	24	33	41	21	361
LINE 5	up	Strip District	14-OCT-16	08:22:14	26	69	131	80	41	45	49	25	466
LINE 5	up	Steelers Field	14-OCT-16	08:24:18	33	74	156	91	44	65	48	26	537
LINE 5	up	University SCSU	14-OCT-16	08:25:58	54	90	176	106	66	88	50	44	674
LINE 5	up	Kings Castle	14-OCT-16	08:28:06	69	83	153	99	67	70	80	62	683
LINE 5	up	Memorial Station	14-OCT-16	08:30:24	68	95	231	175	109	95	79	56	908
LINE 5	up	Unification Gate	14-OCT-16	08:32:20	52	125	227	168	150	87	42	46	897
LINE 5	up	Liberty Fields	14-OCT-16	08:34:16	51	142	226	188	169	115	41	42	974
LINE 5	up	King George Field	14-OCT-16	08:35:42	70	135	218	167	166	120	47	39	962
LINE 5	up	Exhibition Centre	14-OCT-16	08:37:18	43	99	194	118	145	103	47	30	781
LINE 5	up	Bayside View	14-OCT-16	08:39:14	38	54	140	66	80	95	81	30	584
LINE 5	up	Central Park	14-OCT-16	08:41:10	25	43	82	101	35	65	47	16	414
LINE 5	up	Stadium	14-OCT-16	08:42:48	16	26	61	36	39	44	46	15	283
LINE 5	up	Iceland Park	14-OCT-16	08:45:36	12	32	54	26	19	38	30	16	227
LINE 5	up	Kingston North	14-OCT-16	08:48:24	9	14	27	20	12	15	16	12	125