

## **System Ridership Report: November 2016**

System-wide ridership decreased 1.7%, or more than 9,700 passengers, for the month of November as compared to November 2015. When comparing ridership to November 2015, both UCSB and senior ridership increased. Contributing to this increase of UCSB ridership could be from the extra day of service provided this year, as well as the increase in enrollment at UCSB. The number of tokens used throughout November increased as well.

**Table A: Ridership Trends by Fare Component** 

		Month			Fiscal Year to Date	
Fare Categories	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
General Fare	67,966	73,733	-7.8%	407,303	466,694	-12.7%
Transfers	39,920	44,660	-10.6%	230,254	267,462	-13.9%
Full Fare Prepaid <sup>(1)</sup>	76,228	85,132	-10.5%	440,346	533,539	-17.5%
Santa Barbara City College	81,443	94,598	-13.9%	339,539	418,900	-18.9%
Senior & Disabled Prepaid <sup>(2)</sup>	54,624	53,053	3.0%	283,720	287,066	-1.2%
Shuttle (DWE & Seaside)	14,420	16,773	-14.0%	114,094	124,882	-8.6%
UC Santa Barbara	143,129	116,335	23.0%	432,164	370,786	16.6%
Student Prepaid <sup>(3)</sup>	46,481	49,357	-5.8%	251,724	272,727	-7.7%
Free	10,433	11,538	-9.6%	58,616	72,299	-18.9%
My Ride	7,309	7,517	-2.8%	45,136	51,057	-11.6%
Senior	14,641	14,276	2.6%	87,785	78,173	12.3%
Persons with Disabilities	3,044	2,894	5.2%	16,678	16,138	3.3%
Tokens	1,916	1,634	17.3%	10,180	9,702	4.9%
Total	561,554	571,500	-1.7%	2,717,539	2,969,425	-8.5%

<sup>(1)</sup> Includes adult 10-Ride and Unlimited 30-Day Passport use.

**Table B: Revenue Hours and Revenue Miles** 

		Month			Fiscal Year to Date		
Metrics	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change	
Passengers	561,554	571,500	-1.7%	2,717,539	2,969,425	-8.5%	
Revenue Hours	17,677	16,516	7.0%	91,301	87,745	4.1%	
Passengers per Rev Hour	31.77	34.60	-8.2%	29.76	33.84	-12.0%	
Miles	217,071	202,302	7.3%	1,103,737	1,060,429	4.1%	
Passengers per Mile	2.59	2.82	-8.4%	2.46	2.80	-12.1%	

Source: MTD Passdat Program, MTD Transit Development Department, Planning Section

<sup>(2)</sup> Includes seniors' and persons with disabilities' 10-Ride and Unlimited 30-Day Passport use.

<sup>(3)</sup> Includes student 10-Ride and Unlimited 30-Day Passport use.

**Table C: November 2016 System Ridership** 

			Month		F	iscal Year to Date	
	LINE	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
1	West Santa Barbara	27,435	30,190	-9.1%	146,618	168,002	-12.7%
2	East Santa Barbara	41,983	46,875	-10.4%	223,234	263,328	-15.2%
3	Oak Park	16,144	15,482	4.3%	83,418	89,497	-6.8%
4	Mesa/SBCC	10,628	10,231	3.9%	55,749	60,335	-7.6%
5	Mesa / La Cumbre	12,239	12,622	-3.0%	62,821	71,314	-11.9%
6	Goleta	47,647	51,877	-8.2%	252,679	285,739	-11.6%
7	County Health / Fairview	21,302	10,166	109.5%	93,561	59,476	57.3%
8	County Health	-	7,641	-100.0%	13,743	44,325	-69.0%
9	Calle Real / Old Town Shuttle	-	2,853	-100.0%	4,257	15,080	-71.8%
10	Cathedral Oaks	1,713	2,105	-18.6%	9,028	11,445	-21.1%
11	UCSB	79,546	93,675	-15.1%	392,006	471,742	-16.9%
12x	Goleta Express	17,768	20,367	-12.8%	99,108	107,365	-7.7%
14	Montecito	6,609	7,147	-7.5%	36,216	41,507	-12.7%
15x	SBCC / UCSB Express	30,293	34,698	-12.7%	118,528	153,078	-22.6%
16	City College Shuttle	11,538	16,482	-30.0%	43,706	61,862	-29.3%
17	Lower West / SBCC	13,316	12,976	2.6%	69,018	77,100	-10.5%
20	Carpinteria	22,491	24,430	-7.9%	124,631	137,883	-9.6%
21x	Carpinteria Express	6,767	7,459	-9.3%	36,416	43,415	-16.1%
23	Winchester Canyon	5,176	4,702	10.1%	27,093	27,103	0.0%
24x	UCSB Express	52,090	62,579	-16.8%	249,408	293,362	-15.0%
25	Ellwood	5,418	3,466	56.3%	24,774	21,374	15.9%
27	Isla Vista Shuttle	29,640	34,031	-12.9%	93,902	114,644	-18.1%
28	UCSB Shuttle	45,663	-	100.0%	119,348	-	100.0%
36	Seaside Shuttle	4,364	6,097	-28.4%	29,218	34,363	-15.0%
37	Crosstown Shuttle	6,985	7,309	-4.4%	38,548	41,926	-8.1%
	Booster Services	21,766	21,726	0.2%	90,419	92,149	-1.9%
Syst	em Subtotal	538,521	547,186	-1.6%	2,537,447	2,787,414	-9.0%
Dow	ntown Waterfront Shuttles		'			-	
30	Downtown Shuttle	19,631	19,365	1.4%	147,986	145,827	1.5%
31	East Beach Waterfront Shuttle	2,300	2,576	-10.7%	22,848	22,229	2.8%
32	West Beach Waterfront Shuttle	1,102	2,373	-53.6%	9,532	13,955	-31.7%
Unk	nown/Miscellaneous	-	-	0.0%	-	-	0.0%
Syst	em Total	561,554	571,500	-1.7%	2,717,813	2,969,425	-8.5%
-	ted Routes				1	Т	
	1x Carpinteria	29,258	31,889	-8.3%	161,047	181,298	-11.2%
-	37 East/West & Crosstown	76,403	84,374	-9.4%	408,400	473,256	-13.7%
	15x, 16, 17 Mesa Lines	78,014	87,009	-10.3%	349,822	423,689	-17.4%
	9 Calle Real	21,302	20,660	3.1%	111,561	118,881	-6.2%
6, 11	State/Hollister	127,193	145,552	-12.6%	644,685	757,481	-14.9%

Source: MTD Passdat Program, MTD Transit Development Department, Planning Section

<u>Table C Notes - Period over period comparison exceptions</u>: System changes and enhancements occur throughout the year. These affect the quality of conclusions drawn when comparing ridership period over period for those lines that are modified.

Table D: November 2016 - Passengers per Hour

			Month			Fiscal Year to Date	
	LINE	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
1	West Santa Barbara	30.1	35.4	-15.1%	30.2	36.2	-16.6%
2	East Santa Barbara	29.0	35.3	-17.8%	29.0	36.6	-21.0%
3	Oak Park	20.2	19.8	2.0%	19.2	20.6	-6.6%
4	Mesa/SBCC	29.3	29.1	0.9%	28.8	31.1	-7.6%
5	Mesa / La Cumbre	22.2	23.3	-4.8%	21.5	24.3	-11.9%
6	Goleta	32.4	33.9	-4.4%	32.2	35.2	-8.6%
7	Calle Real / Fairview	17.9	25.3	-29.5%	18.9	27.2	-30.7%
8	Calle Real / Turnpike	-	27.3	-100.0%	26.0	28.4	-8.5%
9	Calle Real / Old Town Shuttle	-	14.2	-100.0%	11.7	14.1	-17.3%
10	Cathedral Oaks	14.3	18.8	-24.2%	13.9	17.7	-21.4%
11	UCSB	33.6	38.5	-12.6%	31.0	36.4	-14.8%
12x	Goleta Express	31.4	36.3	-13.4%	33.3	37.4	-11.0%
14	Montecito	16.8	19.0	-11.4%	17.3	19.8	-12.7%
15x	SBCC / UCSB Express	39.9	48.5	-17.8%	37.1	48.0	-22.8%
16	City College Shuttle	37.9	57.2	-33.7%	39.6	57.3	-30.9%
17	Lower West / SBCC	52.8	53.2	-0.8%	50.9	56.9	-10.5%
20	Carpinteria	19.7	23.0	-14.4%	20.8	24.2	-14.0%
21x	Carpinteria Express	23.9	23.6	1.3%	22.5	24.1	-6.8%
23	Winchester Canyon	25.2	18.2	38.5%	22.7	19.6	15.6%
24x	UCSB Express	53.4	64.4	-17.2%	48.3	59.4	-18.6%
25	Ellwood	29.0	29.2	-0.6%	28.4	33.4	-15.0%
27	Isla Vista Shuttle	47.6	56.6	-16.0%	36.5	45.1	-19.1%
28	UCSB Shuttle	68.2	-	100.0%	55.9	-	100.0%
36	Seaside Shuttle	13.0	18.4	-29.3%	16.5	19.4	-15.0%
37	Crosstown Shuttle	15.0	16.5	-9.3%	15.1	16.4	-7.9%
	Booster Services	89.0	95.1	-6.4%	88.8	93.9	-5.4%
Syste	em Average	32.4	35.7	-9.3%	30.1	34.6	-13.2%
Dow	ntown Waterfront Shuttles						
30	Downtown Shuttle	24.3	21.5	13.1%	28.9	27.0	7.1%
31	East Beach Waterfront Shuttle	14.4	16.3	-11.6%	18.6	18.3	1.8%
32	West Beach Waterfront Shuttle	14.3	19.1	-25.5%	17.1	21.8	-21.4%
Syste	em Total	31.8	34.6	-8.2%	29.8	33.8	-12.0%

Related Routes						
20, 21x Carpinteria	20.5	23.1	-11.3%	21.2	24.2	-12.4%
1, 2, 37 East/West & Crosstown	27.0	32.2	-16.0%	27.0	32.9	-17.9%
4, 5, 15x, 16, 17 Mesa Lines	35.0	40.6	-13.9%	33.2	40.4	-17.7%
7, 8, 9 Calle Real/Fairview	17.9	23.4	-23.7%	19.1	24.7	-22.9%
6, 11 State/Hollister	33.2	36.7	-9.7%	31.5	35.9	-12.5%

Source: MTD Passdat Program, MTD Transit Development Department, Planning Section

Table E: November 2016 – 'At Capacity' Loads Indicated

Classified as a 30-foot vehicle with 10 or more standees, or a 40-foot vehicle with 20 or more standees.

			Month		F	iscal Year to Date	
	LINE	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
1	West Santa Barbara	1	5	-80.0%	9	11	-18.2%
2	East Santa Barbara	2	8	-75.0%	19	54	-64.8%
3	Oak Park	-	2	-100.0%	10	10	0.0%
4	Mesa/SBCC	3	1	200.0%	5	3	66.7%
5	Mesa / La Cumbre	5	1	400.0%	22	21	4.8%
6	Goleta	23	10	130.0%	154	90	71.1%
7	Calle Real / Fairview	1	1	0.0%	7	16	-56.3%
8	Calle Real / Turnpike	-	1	-100.0%	1	3	-66.7%
9	Calle Real / Old Town Shuttle	-	-	0.0%	-	-	0.0%
10	Cathedral Oaks	1	-	100.0%	1	-	100.0%
11	UCSB	33	37	-10.8%	142	182	-22.0%
12x	Goleta Express	3	4	-25.0%	25	31	-19.4%
14	Montecito	1	2	-50.0%	4	10	-60.0%
15x	SBCC / UCSB Express	17	20	-15.0%	75	85	-11.8%
16	City College Shuttle	2	9	-77.8%	15	50	-70.0%
17	Lower West / SBCC	1	1	0.0%	15	29	-48.3%
20	Carpinteria	1	4	-75.0%	14	34	-58.8%
21x	Carpinteria Express	-	-	0.0%	6	6	0.0%
23	Winchester Canyon	3	-	100.0%	5	-	100.0%
24x	UCSB Express	39	65	-40.0%	187	309	-39.5%
25	Ellwood	2	-	100.0%	4	-	100.0%
27	Isla Vista Shuttle	12	61	-80.3%	30	152	-80.3%
28	UCSB Shuttle	30	-	100.0%	73	-	100.0%
36	Seaside Shuttle	-	3	-100.0%	5	23	-78.3%
37	Crosstown Shuttle	3	2	50.0%	3	6	-50.0%
	Booster Services	22	45	-51.1%	77	189	-59.3%
Syste	em Subtotal	205	282	-27.3%	908	1,314	-30.9%
Dow	ntown Waterfront Shuttles						
30	Downtown Shuttle	9	3	200.0%	82	157	-47.8%
31	East Beach Waterfront Shuttle	1	-	100.0%	7	8	-12.5%
32	West Beach Waterfront Shuttle	-	-	0.0%	-	-	0.0%
Unkr	nown	21	2	100.0%	21	3	100.0%
Syste	em Total	236	287	-17.8%	1,018	1,482	-31.3%

 $Source: GFI\ Genfare,\ MTD\ Transit\ Development\ Department,\ Planning\ Section$ 

Table F: November 2016 – 'Too Full to Board' Loads Indicated

Passengers were refused service because a vehicle was too full to safely board additional riders.

			Month		F	Fiscal Year to Date	
	LINE	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
1	West Santa Barbara	-	2	-100.0%	6	3	100.0%
2	East Santa Barbara	1	1	0.0%	10	31	-67.7%
3	Oak Park	-	-	0.0%	5	1	400.0%
4	Mesa/SBCC	-	-	0.0%	1	-	100.0%
5	Mesa / La Cumbre	1	2	-50.0%	2	13	-84.6%
6	Goleta	10	3	233.3%	60	69	-13.0%
7	Calle Real / Fairview	-	-	0.0%	2	6	-66.7%
8	Calle Real / Turnpike	-	-	0.0%	-	-	0.0%
9	Calle Real / Old Town Shuttle	-	-	0.0%	-	-	0.0%
10	Cathedral Oaks	-	-	0.0%	-	-	0.0%
11	UCSB	45	58	-22.4%	157	189	-16.9%
12x	Goleta Express	3	4	-25.0%	23	35	-34.3%
14	Montecito	-	-	0.0%	3	-	100.0%
15x	SBCC / UCSB Express	10	16	-37.5%	51	123	-58.5%
16	City College Shuttle	2	2	0.0%	6	22	-72.7%
17	Lower West / SBCC	-	-	0.0%	6	11	-45.5%
20	Carpinteria	-	4	-100.0%	5	18	-72.2%
21x	Carpinteria Express	-	-	0.0%	-	1	-100.0%
23	Winchester Canyon	-	-	0.0%	4	-	100.0%
24x	UCSB Express	52	85	-38.8%	279	415	-32.8%
25	Ellwood	2	-	100.0%	4	-	100.0%
27	Isla Vista Shuttle	50	31	61.3%	116	109	6.4%
28	UCSB Shuttle	-	-	0.0%	-	-	0.0%
36	Seaside Shuttle	1	2	-50.0%	11	6	83.3%
37	Crosstown Shuttle	1	1	0.0%	3	5	-40.0%
	Booster Services	15	26	-42.3%	39	98	-60.2%
Syste	em Subtotal	193	237	-18.6%	793	1,155	-31.3%
Dow	Downtown Waterfront Shuttles						
30	Downtown Shuttle	52	17	205.9%	424	455	-6.8%
31	East Beach Waterfront Shuttle	5	2	150.0%	28	13	115.4%
32	West Beach Waterfront Shuttle	-	2	-100.0%	1	8	-87.5%
Unkr	nown	1	-	100.0%	48	5	860.0%
Syste	em Total	251	258	-2.7%	1,294	1,636	-20.9%

Source: GFI Genfare, MTD Transit Development Department, Planning Section

Table G: November 2016 – Bicycles Carried

			Month		F	Fiscal Year to Date	
	LINE	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
1	West Santa Barbara	181	191	-5.2%	1,011	1,037	-2.5%
2	East Santa Barbara	457	410	11.5%	2,422	2,544	-4.8%
3	Oak Park	152	208	-26.9%	702	1,217	-42.3%
4	Mesa/SBCC	135	159	-15.1%	856	993	-13.8%
5	Mesa / La Cumbre	266	244	9.0%	1,382	1,324	4.4%
6	Goleta	1,309	1,343	-2.5%	6,643	7,625	-12.9%
7	Calle Real / Fairview	513	280	83.2%	2,305	1,516	52.0%
8	Calle Real / Turnpike	-	190	-100.0%	330	1,099	-70.0%
9	Calle Real / Old Town Shuttle	-	40	-100.0%	51	177	-71.2%
10	Cathedral Oaks	38	41	-7.3%	226	267	-15.4%
11	UCSB	1,934	2,118	-8.7%	9,425	10,916	-13.7%
12x	Goleta Express	614	749	-18.0%	3,483	3,945	-11.7%
14	Montecito	132	135	-2.2%	744	859	-13.4%
15x	SBCC / UCSB Express	425	457	-7.0%	1,707	2,230	-23.5%
16	City College Shuttle	96	128	-25.0%	383	574	-33.3%
17	Lower West / SBCC	117	117	0.0%	657	640	2.7%
20	Carpinteria	585	681	-14.1%	3,113	3,685	-15.5%
21x	Carpinteria Express	222	304	-27.0%	1,173	1,447	-18.9%
23	Winchester Canyon	102	91	12.1%	507	396	28.0%
24x	UCSB Express	1,175	1,272	-7.6%	6,003	6,511	-7.8%
25	Ellwood	164	43	281.4%	513	287	78.7%
27	Isla Vista Shuttle	184	307	-40.1%	700	1,025	-31.7%
28	UCSB Shuttle	330	-	100.0%	735	-	100.0%
36	Seaside Shuttle*	-	-	0.0%	-	-	0.0%
37	Crosstown Shuttle*	3	-	100.0%	15	-	100.0%
	Booster services	22	10	120.0%	90	61	47.5%
Syst	em Subtotal	9,156	9,518	-3.8%	45,176	50,375	-10.3%
Dow	ntown Waterfront Shuttles						
30	Downtown Shuttle*	-	-	N/A	-	-	N/A
31	East Beach Waterfront Shuttle*	-	-	N/A	-	-	N/A
32	West Beach Waterfront Shuttle*	-	-	N/A	-	-	N/A
Unk	nown	39	14	178.6%	595	87	583.9%
Syst	em Total	9,195	9,532	-3.5%	45,771	50,462	-9.3%

\* The electric shuttles cannot carry bicycles. Source: GFI Genfare, MTD Transit Development Department, Planning Section

Table H: November 2016 - Wheelchairs Boarded

			Month		F	Fiscal Year to Date	
	LINE	Nov 16	Nov 15	%Change	Jul 16 - Nov 16	Jul 15 - Nov 15	%Change
1	West Santa Barbara	113	105	7.6%	571	590	-3.2%
2	East Santa Barbara	139	155	-10.3%	838	815	2.8%
3	Oak Park	91	165	-44.8%	612	663	-7.7%
4	Mesa/SBCC	5	7	-28.6%	57	45	26.7%
5	Mesa / La Cumbre	68	66	3.0%	340	369	-7.9%
6	Goleta	187	196	-4.6%	889	1,051	-15.4%
7	Calle Real / Fairview	138	113	22.1%	735	539	36.4%
8	Calle Real / Turnpike	-	59	-100.0%	86	288	-70.1%
9	Calle Real / Old Town Shuttle	-	23	-100.0%	33	131	-74.8%
10	Cathedral Oaks	2		100.0%	8	2	300.0%
11	UCSB	179	226	-20.8%	1,014	1,232	-17.7%
12x	Goleta Express	49	62	-21.0%	306	332	-7.8%
14	Montecito	16	19	-15.8%	109	112	-2.7%
15x	SBCC / UCSB Express	23	6	283.3%	110	17	547.1%
16	City College Shuttle	42	17	147.1%	159	101	57.4%
17	Lower West / SBCC	24	6	300.0%	120	41	192.7%
20	Carpinteria	110	166	-33.7%	452	639	-29.3%
21x	Carpinteria Express	21	27	-22.2%	112	111	0.9%
23	Winchester Canyon	3	8	-62.5%	24	27	-11.1%
24x	UCSB Express	56	30	86.7%	236	190	24.2%
25	Ellwood	9	6	50.0%	31	34	-8.8%
27	Isla Vista Shuttle	-	3	-100.0%	7	25	-72.0%
28	UCSB Shuttle	5		100.0%	12	-	100.0%
36	Seaside Shuttle	4	15	-73.3%	33	65	-49.2%
37	Crosstown Shuttle	3	7	-57.1%	42	37	13.5%
	Booster Services	1	1	0.0%	2	1	100.0%
Syste	em Subtotal	1,288	1,488	-13.4%	6,938	7,457	-7.0%
Dow	ntown Waterfront Shuttles						
30	Downtown Shuttle	93	45	106.7%	446	258	72.9%
31	East Beach Waterfront Shuttle	11	23	-52.2%	61	69	-11.6%
32	West Beach Waterfront Shuttle	3	9	-66.7%	10	18	-44.4%
Unkn	own	2	-	100.0%	29	8	262.5%
Syste	em Total	1,397	1,565	-10.7%	7,484	7,810	-4.2%

Source: GFI Genfare, MTD Transit Development Department, Planning Section

Table I: Ridership by Day Type

November 2016

November 2015

	Ridership	Days	Avg Daily Ridership	Ridership	Days	Avg Daily Ridership	Change in Daily Ridership	% Change in Daily Ridership
Weekday	463,118	19	24,375	456,253	18	25,347	-973	-3.8%
Saturday	57,327	5	11,465	62,132	5	12,426	-961	-7.7%
Sunday	41,109	5	8,222	53,115	6	8,853	-631	-7.1%
Total	561,554	29	19,364	571,500	29	19,707	-343	-1.7%

FY 2017

FY 2016

	Ridership	Days	Avg Daily Ridership	Ridership	Days	Avg Daily Ridership	Change in Daily Ridership	% Change in Daily Ridership
Weekday	2,252,211	104	21,656	2,451,501	104	23,572	-1,916	-8.1%
Saturday	264,440	23	11,497	299,871	23	13,038	-1,540	-11.8%
Sunday	201,162	25	8,046	218,053	25	8,722	-676	-7.7%
Total	2,717,813	152	17,880	2,969,425	152	19,536	-1,655	-8.5%

Source: GFI Genfare, MTD Transit Development Department, Planning Section

## **External Factors Affecting Ridership**

**Service Days & School Days:** MTD provided one more day of weekday service this November as compared to November 2015. All schools had one more school day this November.

	Weekdays	Saturdays	Sundays	HS + JHS	SBCC	UCSB
Nov-16	19	5	5	16	19	19
Nov-15	18	5	6	15	18	18

Source: Gregorian Calendar, SB Area School Districts, SBCC, UCSB. SS = Summer Session

**Weather:** Average temperatures for November 2016 were significantly cooler than in November 2015. There was also a slight increase in precipitation in November 2016, but with one less day, as compared to 2015.

	Temperature (°F)	High	Average	Low	Precipitation	
Nov-16	Maximum	71	60	48	Weekday: .1 in (2 days)	
	Mean	68	56	44	Saturday: 0 in (0 days)	.5 in
	Minimum	66	54	41	Sunday: .4 in (1 day)	
Nov-15	Maximum	96	80	69	Weekday: 0 in (0 days)	
	Mean	82	71	58	Saturday: .41 in (1 day)	.9 in
	Minimum	69	61	50	Sunday: .48 in (1 day)	

Source: www.wunderground.com

## **Addendum: Data Source Documentation**

GFI Genfare data is taken directly from the electronic fare box system on each MTD vehicle so equipped. In general, GFI data has not been verified, modified, adjusted, added, or removed since being captured at the time of the driver/passenger transaction. GFI data is considered raw data.

Passdat program accuracy is determined by the amount of GFI fare box data that remains unchanged as compared to Trapeze Run and Trip templates for the evaluation time period. Both human and mechanical errors influence the need to make manual adjustments. These corrections are defined and determined by evaluation of historical and experiential ridership patterns.