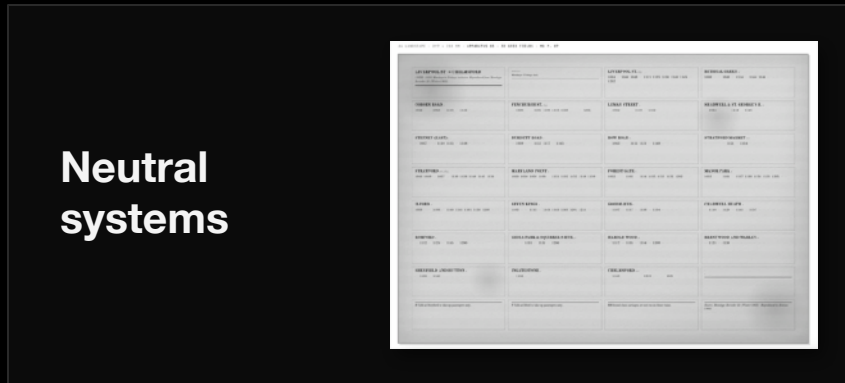




# From machine vision systems to grid systems.

The previous project asked how different systems read the same material differently. This response shifts that question from machine vision to the grid.



Neutral systems

same question, new apparatus

**TABLE 13—continued. LIVERPOOL STREET, FENCHURCH STREET, STRATFORD, ILFORD, ROMFORD, BRENTWOOD, SHENFIELD AND CHELMSFORD.**

**MONDAYS TO FRIDAYS INCLUSIVE.**  
(For trains on Saturdays see pages 43 to 46.)

	10:44	10:46	10:48	10:50	10:52	10:54	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	
<b>LIVERPOOL ST. dep</b>	10:44	10:46	10:48	10:50	10:52	10:54	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	
Belmal Green	10:45	10:47	10:49	10:51	10:53	10:55	10:57	10:59	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	
Coborn Road	10:42	10:44	10:46	10:48	10:50	10:52	10:54	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00
<b>FENCHURCH ST. dep</b>	10:50	10:52	10:54	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	
Louisa Street	10:51	10:53	10:55	10:57	10:59	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	
Shadwell & St. George's R.	10:52	10:54	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	
Stepney (East)	10:53	10:55	10:57	10:59	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	
Burdock Road	10:54	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	
Box Road	10:55	10:57	10:59	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	
Stratford Market	10:56	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	
Stratford	10:57	10:59	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	
Stratford	10:58	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	
Maryland Point	10:59	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	
Forest Gate	11:00	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	12:16	
Blanc Park	11:01	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	12:17	
Ilford	11:02	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	12:16	12:18	
Seven Kings	11:03	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	12:17	12:19	
Hoodmays	11:04	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	12:16	12:18	12:20	
Chadwell Heath	11:05	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	12:17	12:19	12:21	
Romford	11:06	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	12:16	12:18	12:20	12:22	12:24
(Sidon Park & Squares Heath)	11:07	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	12:17	12:19	12:21	12:23	
Harold Wood	11:08	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	12:16	12:18	12:20	12:22	12:24	12:26
Brentwood and Watley	11:09	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	12:17	12:19	12:21	12:23	12:25	
Shenfield and Hutton	11:10	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02	12:04	12:06	12:08	12:10	12:12	12:14	12:16	12:18	12:20	12:22	12:24	12:26	12:28
Inverstone	11:11	11:13	11:15	11:17	11:19	11:21	11:23	11:25	11:27	11:29	11:31	11:33	11:35	11:37	11:39	11:41	11:43	11:45	11:47	11:49	11:51	11:53	11:55	11:57	11:59	12:01	12:03	12:05	12:07	12:09	12:11	12:13	12:15	12:17	12:19	12:21	12:23	12:25	12:27	12:29
<b>CHELMSFORD</b>	11:12	11:14	11:16	11:18	11:20	11:22	11:24	11:26	11:28	11:30	11:32	11:34	11:36	11:38	11:40	11:42	11:44	11:46	11:48	11:50	11:52	11:54	11:56	11:58	12:00	12:02														



# How does grid resolution change the legibility, comparison and information loss of the same railway timetable?

---

I am not redesigning the timetable to make it better.  
I am using grid resolution as a testing method.

# Method: one source, three operations.

Each operation has a visible example: what is fixed, what changes, and how the audience can test it in the web reader.

## 01 FIXED MATERIAL

same timetable data, type style and page logic

same route title

same station rows

same time matrix

### Fixed condition

The source is not redesigned for usefulness first. It is held constant so the grid can be tested.

## 02 GRID ACTION

same material recomposed through 8 / 20 / 32 grid



8 GRID

20 GRID

32 GRID

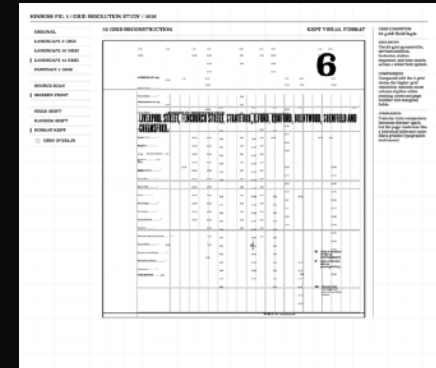
same source -> different grid resolution

### Action

Recompose the same typographic material and observe where legibility, comparison and information loss shift.

## 03 ACTIVE TEST

the printed comparison becomes an interactive reader



### Activated form

The web reader lets the audience switch, compare, shift fields and see the analysis rather than only view printed outcomes.

## grid resolution as a testing method

# The original is already a dense internal grid.

01 SOURCE SCAN

**TABLE 13—continued. LIVERPOOL STREET, FENCHURCH STREET, STRATFORD, ILFORD, ROMFORD, BRENTWOOD, SHENFIELD AND CHELMSFORD.**

**MONDAYS TO FRIDAYS INCLUSIVE.**  
(For trains on Saturdays see pages 63 to 68.)

Station	11.00	11.11	11.21	11.31	11.41	11.51	12.01	12.11	12.21	12.31	12.41	12.51	1.01	1.11	1.21	1.31	1.41	1.51	2.01	2.11	2.21	2.31	2.41	2.51	3.01	3.11	3.21	3.31	3.41	3.51	
<b>LIVERPOOL ST. dep.</b>	1034	1045	1056	1107	1118	1129	1140	1151	1202	1213	1224	1235	1246	1257	1308	1319	1330	1341	1352	1403	1414	1425	1436	1447	1458	1509	1520	1531	1542	1553	
Retinal Green	1038	1049	1060	1071	1082	1093	1104	1115	1126	1137	1148	1159	1210	1221	1232	1243	1254	1305	1316	1327	1338	1349	1360	1371	1382	1393	1404	1415	1426	1437	1448
Coborn Road	1042	1053	1064	1075	1086	1097	1108	1119	1130	1141	1152	1203	1214	1225	1236	1247	1258	1309	1320	1331	1342	1353	1364	1375	1386	1397	1408	1419	1430	1441	1452
<b>FENCHURCH ST. dep.</b>	1050	1100	1110	1120	1130	1140	1150	1200	1210	1220	1230	1240	1250	1300	1310	1320	1330	1340	1350	1400	1410	1420	1430	1440	1450	1500	1510	1520	1530	1540	1550
Leaman Street	1052	1102	1112	1122	1132	1142	1152	1202	1212	1222	1232	1242	1252	1302	1312	1322	1332	1342	1352	1402	1412	1422	1432	1442	1452	1502	1512	1522	1532	1542	1552
Shadwell & St. George's E.	1054	1104	1114	1124	1134	1144	1154	1204	1214	1224	1234	1244	1254	1304	1314	1324	1334	1344	1354	1404	1414	1424	1434	1444	1454	1504	1514	1524	1534	1544	1554
Stepney (East)	1057	1107	1117	1127	1137	1147	1157	1207	1217	1227	1237	1247	1257	1307	1317	1327	1337	1347	1357	1407	1417	1427	1437	1447	1457	1507	1517	1527	1537	1547	1557
Burbeck Road	1059	1109	1119	1129	1139	1149	1159	1209	1219	1229	1239	1249	1259	1309	1319	1329	1339	1349	1359	1409	1419	1429	1439	1449	1459	1509	1519	1529	1539	1549	1559
Bow Road	1048	1058	1068	1078	1088	1098	1108	1118	1128	1138	1148	1158	1208	1218	1228	1238	1248	1258	1308	1318	1328	1338	1348	1358	1408	1418	1428	1438	1448	1458	1508
Stratford Market	1121	1131	1141	1151	1201	1211	1221	1231	1241	1251	1301	1311	1321	1331	1341	1351	1401	1411	1421	1431	1441	1451	1501	1511	1521	1531	1541	1551	1601	1611	1621
Stratford	1046	1056	1066	1076	1086	1096	1106	1116	1126	1136	1146	1156	1206	1216	1226	1236	1246	1256	1306	1316	1326	1336	1346	1356	1406	1416	1426	1436	1446	1456	1506
Maryland Point	1052	1102	1112	1122	1132	1142	1152	1202	1212	1222	1232	1242	1252	1302	1312	1322	1332	1342	1352	1402	1412	1422	1432	1442	1452	1502	1512	1522	1532	1542	1552
Forest Gate	1055	1105	1115	1125	1135	1145	1155	1205	1215	1225	1235	1245	1255	1305	1315	1325	1335	1345	1355	1405	1415	1425	1435	1445	1455	1505	1515	1525	1535	1545	1555
Manor Park	1059	1109	1119	1129	1139	1149	1159	1209	1219	1229	1239	1249	1259	1309	1319	1329	1339	1349	1359	1409	1419	1429	1439	1449	1459	1509	1519	1529	1539	1549	1559
Ilford	1103	1113	1123	1133	1143	1153	1203	1213	1223	1233	1243	1253	1303	1313	1323	1333	1343	1353	1403	1413	1423	1433	1443	1453	1503	1513	1523	1533	1543	1553	
Seven Kings	1107	1117	1127	1137	1147	1157	1207	1217	1227	1237	1247	1257	1307	1317	1327	1337	1347	1357	1407	1417	1427	1437	1447	1457	1507	1517	1527	1537	1547	1557	
Goodmayes	1110	1120	1130	1140	1150	1200	1210	1220	1230	1240	1250	1300	1310	1320	1330	1340	1350	1400	1410	1420	1430	1440	1450	1500	1510	1520	1530	1540	1550	1600	
Chadwell Heath	1112	1122	1132	1142	1152	1202	1212	1222	1232	1242	1252	1302	1312	1322	1332	1342	1352	1402	1412	1422	1432	1442	1452	1502	1512	1522	1532	1542	1552	1602	
Romford	1115	1125	1135	1145	1155	1205	1215	1225	1235	1245	1255	1305	1315	1325	1335	1345	1355	1405	1415	1425	1435	1445	1455	1505	1515	1525	1535	1545	1555	1605	
Gidea Park & Squirrels Heath	1117	1127	1137	1147	1157	1207	1217	1227	1237	1247	1257	1307	1317	1327	1337	1347	1357	1407	1417	1427	1437	1447	1457	1507	1517	1527	1537	1547	1557	1607	
Harold Wood	1121	1131	1141	1151	1201	1211	1221	1231	1241	1251	1301	1311	1321	1331	1341	1351	1401	1411	1421	1431	1441	1451	1501	1511	1521	1531	1541	1551	1601	1611	1621
Brentwood and Wavley	1130	1140	1150	1200	1210	1220	1230	1240	1250	1300	1310	1320	1330	1340	1350	1400	1410	1420	1430	1440	1450	1500	1510	1520	1530	1540	1550	1600	1610	1620	1630
Shenfield and Hutton	1130	1140	1150	1200	1210	1220	1230	1240	1250	1300	1310	1320	1330	1340	1350	1400	1410	1420	1430	1440	1450	1500	1510	1520	1530	1540	1550	1600	1610	1620	1630
Ingatestone	1143	1153	1203	1213	1223	1233	1243	1253	1303	1313	1323	1333	1343	1353	1403	1413	1423	1433	1443	1453	1503	1513	1523	1533	1543	1553	1603	1613	1623	1633	1643
<b>CHELMSFORD</b>	1152	1202	1212	1222	1232	1242	1252	1302	1312	1322	1332	1342	1352	1402	1412	1422	1432	1442	1452	1502	1512	1522	1532	1542	1552	1602	1612	1622	1632	1642	

**D** Calls at Stratford to take up passengers only.  
**F** Calls at Ilford to take up passengers only.

**SS** Second class carriages are not run on these trains.

02 INTERNAL GRID OVERLAY

**TABLE 14—continued. LIVERPOOL STREET, FENCHURCH STREET, STRATFORD, ILFORD, ROMFORD, BRENTWOOD, SHENFIELD AND CHELMSFORD.**

**MONDAYS TO FRIDAYS INCLUSIVE.**  
(For trains on Saturdays see pages 63 to 68.)

## Baseline reading condition

Columns, station rows, dot leaders and time intervals already organise the information before any new grid is applied.



The overlay makes the existing order visible: columns, station rows and time intervals are already doing organisational work.

This experiment is not grid versus no grid. It is one information system placed under another grid system.

Baseline: functional but visually dense. It preserves information, but quick reading already requires effort.


# Why 8 / 20 / 32 grid?

These are not arbitrary grid choices. They are extracted from Josef Müller-Brockmann's grid construction examples and used as three controlled resolution conditions.

## 8 GRID


low resolution / broad fields

Brockmann reference



translated into

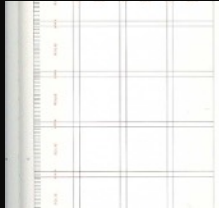
my timetable test



## 20 GRID


middle resolution / balance point

Brockmann reference



translated into


my timetable test



## 32 GRID

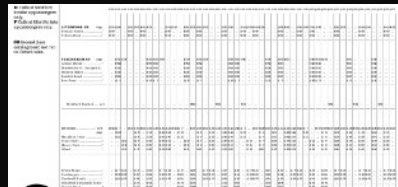
high resolution / dense comparison

Brockmann reference



translated into

my timetable test



The experiment therefore tests a borrowed grid system against a historical information system.





# 32 grid retains more information, but increases density pressure.

## LIVERPOOL STREET, FENCHURCH STREET, STRATFORD, ILFORD, ROMFORD, BRENTWOOD, SHENFIELD AND CHELMSFORD.

MONDAYS TO FRIDAYS INCLUSIVE. (For trains on Saturdays see pages 62 to 64.) TABLE 13—continued.

**D** Calls at Stratford to take up passengers only.  
**F** Calls at Ilford to take up passengers only.  
**SS** Second class carriages are not run on these trains.

	6.11	6.20	6.29	6.38	6.47	6.56	7.05	7.14	7.23	7.32	7.41	7.50	7.59	8.08	8.17	8.26	8.35	8.44	8.53	9.02	9.11	9.20	9.29	9.38	9.47	9.56	10.05	10.14	10.23	10.32	10.41	10.50	10.59	11.08	11.17	11.26	11.35	11.44	11.53	12.02	12.11	12.20	12.29	12.38	12.47	12.56	13.05	13.14	13.23	13.32	13.41	13.50	13.59	14.08	14.17	14.26	14.35	14.44	14.53	15.02	15.11	15.20	15.29	15.38	15.47	15.56	16.05	16.14	16.23	16.32	16.41	16.50	16.59	17.08	17.17	17.26	17.35	17.44	17.53	18.02	18.11	18.20	18.29	18.38	18.47	18.56	19.05	19.14	19.23	19.32	19.41	19.50	19.59	20.08	20.17	20.26	20.35	20.44	20.53	21.02	21.11	21.20	21.29	21.38	21.47	21.56	22.05	22.14	22.23	22.32	22.41	22.50	22.59	23.08	23.17	23.26	23.35	23.44	23.53	24.02	24.11	24.20	24.29	24.38	24.47	24.56	25.05	25.14	25.23	25.32	25.41	25.50	25.59	26.08	26.17	26.26	26.35	26.44	26.53	27.02	27.11	27.20	27.29	27.38	27.47	27.56	28.05	28.14	28.23	28.32	28.41	28.50	28.59	29.08	29.17	29.26	29.35	29.44	29.53	30.02	30.11	30.20	30.29	30.38	30.47	30.56	31.05	31.14	31.23	31.32	31.41	31.50	31.59	32.08	32.17	32.26	32.35	32.44	32.53	33.02	33.11	33.20	33.29	33.38	33.47	33.56	34.05	34.14	34.23	34.32	34.41	34.50	34.59	35.08	35.17	35.26	35.35	35.44	35.53	36.02	36.11	36.20	36.29	36.38	36.47	36.56	37.05	37.14	37.23	37.32	37.41	37.50	37.59	38.08	38.17	38.26	38.35	38.44	38.53	39.02	39.11	39.20	39.29	39.38	39.47	39.56	40.05	40.14	40.23	40.32	40.41	40.50	40.59	41.08	41.17	41.26	41.35	41.44	41.53	42.02	42.11	42.20	42.29	42.38	42.47	42.56	43.05	43.14	43.23	43.32	43.41	43.50	43.59	44.08	44.17	44.26	44.35	44.44	44.53	45.02	45.11	45.20	45.29	45.38	45.47	45.56	46.05	46.14	46.23	46.32	46.41	46.50	46.59	47.08	47.17	47.26	47.35	47.44	47.53	48.02	48.11	48.20	48.29	48.38	48.47	48.56	49.05	49.14	49.23	49.32	49.41	49.50	49.59	50.08	50.17	50.26	50.35	50.44	50.53	51.02	51.11	51.20	51.29	51.38	51.47	51.56	52.05	52.14	52.23	52.32	52.41	52.50	52.59	53.08	53.17	53.26	53.35	53.44	53.53	54.02	54.11	54.20	54.29	54.38	54.47	54.56	55.05	55.14	55.23	55.32	55.41	55.50	55.59	56.08	56.17	56.26	56.35	56.44	56.53	57.02	57.11	57.20	57.29	57.38	57.47	57.56	58.05	58.14	58.23	58.32	58.41	58.50	58.59	59.08	59.17	59.26	59.35	59.44	59.53	60.02	60.11	60.20	60.29	60.38	60.47	60.56	61.05	61.14	61.23	61.32	61.41	61.50	61.59	62.08	62.17	62.26	62.35	62.44	62.53	63.02	63.11	63.20	63.29	63.38	63.47	63.56	64.05	64.14	64.23	64.32	64.41	64.50	64.59	65.08	65.17	65.26	65.35	65.44	65.53	66.02	66.11	66.20	66.29	66.38	66.47	66.56	67.05	67.14	67.23	67.32	67.41	67.50	67.59	68.08	68.17	68.26	68.35	68.44	68.53	69.02	69.11	69.20	69.29	69.38	69.47	69.56	70.05	70.14	70.23	70.32	70.41	70.50	70.59	71.08	71.17	71.26	71.35	71.44	71.53	72.02	72.11	72.20	72.29	72.38	72.47	72.56	73.05	73.14	73.23	73.32	73.41	73.50	73.59	74.08	74.17	74.26	74.35	74.44	74.53	75.02	75.11	75.20	75.29	75.38	75.47	75.56	76.05	76.14	76.23	76.32	76.41	76.50	76.59	77.08	77.17	77.26	77.35	77.44	77.53	78.02	78.11	78.20	78.29	78.38	78.47	78.56	79.05	79.14	79.23	79.32	79.41	79.50	79.59	80.08	80.17	80.26	80.35	80.44	80.53	81.02	81.11	81.20	81.29	81.38	81.47	81.56	82.05	82.14	82.23	82.32	82.41	82.50	82.59	83.08	83.17	83.26	83.35	83.44	83.53	84.02	84.11	84.20	84.29	84.38	84.47	84.56	85.05	85.14	85.23	85.32	85.41	85.50	85.59	86.08	86.17	86.26	86.35	86.44	86.53	87.02	87.11	87.20	87.29	87.38	87.47	87.56	88.05	88.14	88.23	88.32	88.41	88.50	88.59	89.08	89.17	89.26	89.35	89.44	89.53	90.02	90.11	90.20	90.29	90.38	90.47	90.56	91.05	91.14	91.23	91.32	91.41	91.50	91.59	92.08	92.17	92.26	92.35	92.44	92.53	93.02	93.11	93.20	93.29	93.38	93.47	93.56	94.05	94.14	94.23	94.32	94.41	94.50	94.59	95.08	95.17	95.26	95.35	95.44	95.53	96.02	96.11	96.20	96.29	96.38	96.47	96.56	97.05	97.14	97.23	97.32	97.41	97.50	97.59	98.08	98.17	98.26	98.35	98.44	98.53	99.02	99.11	99.20	99.29	99.38	99.47	99.56	100.05	100.14	100.23	100.32	100.41	100.50	100.59	101.08	101.17	101.26	101.35	101.44	101.53	102.02	102.11	102.20	102.29	102.38	102.47	102.56	103.05	103.14	103.23	103.32	103.41	103.50	103.59	104.08	104.17	104.26	104.35	104.44	104.53	105.02	105.11	105.20	105.29	105.38	105.47	105.56	106.05	106.14	106.23	106.32	106.41	106.50	106.59	107.08	107.17	107.26	107.35	107.44	107.53	108.02	108.11	108.20	108.29	108.38	108.47	108.56	109.05	109.14	109.23	109.32	109.41	109.50	109.59	110.08	110.17	110.26	110.35	110.44	110.53	111.02	111.11	111.20	111.29	111.38	111.47	111.56	112.05	112.14	112.23	112.32	112.41	112.50	112.59	113.08	113.17	113.26	113.35	113.44	113.53	114.02	114.11	114.20	114.29	114.38	114.47	114.56	115.05	115.14	115.23	115.32	115.41	115.50	115.59	116.08	116.17	116.26	116.35	116.44	116.53	117.02	117.11	117.20	117.29	117.38	117.47	117.56	118.05	118.14	118.23	118.32	118.41	118.50	118.59	119.08	119.17	119.26	119.35	119.44	119.53	120.02	120.11	120.20	120.29	120.38	120.47	120.56	121.05	121.14	121.23	121.32	121.41	121.50	121.59	122.08	122.17	122.26	122.35	122.44	122.53	123.02	123.11	123.20	123.29	123.38	123.47	123.56	124.05	124.14	124.23	124.32	124.41	124.50	124.59	125.08	125.17	125.26	125.35	125.44	125.53	126.02	126.11	126.20	126.29	126.38	126.47	126.56	127.05	127.14	127.23	127.32	127.41	127.50	127.59	128.08	128.17	128.26	128.35	128.44	128.53	129.02	129.11	129.20	129.29	129.38	129.47	129.56	130.05	130.14	130.23	130.32	130.41	130.50	130.59	131.08	131.17	131.26	131.35	131.44	131.53	132.02	132.11	132.20	132.29	132.38	132.47	132.56	133.05	133.14	133.23	133.32	133.41	133.50	133.59	134.08	134.17	134.26	134.35	134.44	134.53	135.02	135.11	135.20	135.29	135.38	135.47	135.56	136.05	136.14	136.23	136.32	136.41	136.50	136.59	137.08	137.17	137.26	137.35	137.44	137.53	138.02	138.11	138.20	138.29	138.38	138.47	138.56	139.05	139.14	139.23	139.32	139.41	139.50	139.59	140.08	140.17	140.26	140.35	140.44	140.53	141.02	141.11	141.20	141.29	141.38	141.47	141.56	142.05	142.14	142.23	142.32	142.41	142.50	142.59	143.08	143.17	143.26	143.35	143.44	143.53	144.02	144.11	144.20	144.29	144.38	144.47	144.56	145.05	145.14	145.23	145.32	145.41	145.50	145.59	146.08	146.17	146.26	146.35	146.44	146.53	147.02	147.11	147.20	147.29	147.38	147.47	147.56	148.05	148.14	148.23	148.32	148.41	148.50	148.59	149.08	149.17	149.26	149.35	149.44	149.53	150.02	150.11	150.20	150.29	150.38	150.47	150.56	151.05	151.14	151.23	151.32	151.41	151.50	151.59	152.08	152.17	152.26	152.35	152.44	152.53	153.02	153.11	153.20	153.29	153.38	153.47	153.56	154.05	154.14	154.23	154.32	154.41	154.50	154.59	155.08	155.17	155.26	155.35	155.44	155.53	156.02	156.11	156.20	156.29	156.38	156.47	156.56	157.05	157.14	157.23	157.32	157.41	157.50	157.59	158.08	158.17	158.26	158.35	158.44	158.53	159.02	159.11	159.20	159.29	159.38	159.47	159.56	160.05	160.14	160.23	160.32	160.41	160.50	160.59	161.08	161.17	161.26	161.35	161.44	161.53	162.02	162.11	162.20	162.29	162.38	162.47	162.56	163.05	163.14	163.23	163.32	163.41	163.50	163.59	164.08	164.17	164.26	164.35	164.44	164.53	165.02	165.11	165.20	165.29	165.38	165.47	165.56	166.05	166.14	166.23	166.32	166.41	166.50	166.59	167.08	167.17	167.26	167.35	167.44	167.53	168.02	168.11	168.20	168.29	168.38	168.47	168.56	169.05	169.14	169.23	169.32	169.41	169.50	169.59	170.08	170.17	170.26	170.35	170.44	170.53	171.02	171.11	171.20	171.29	171.38	171.47	171.56	172.05	172.14	172.23	172.32	172.41	172.50	172.59	173.08	173.17	173.26	173.35	173.44	173.53	174.02	174.11	174.20	174.29	174.38	174.47	174.56	175.05	175.14	175.23	175.32	175.41	175.50	175.59	176.08	176.17	176.26	176.35	176.44	176.53	177.02	177.11	177.20	177.29	177.38	177.47	177.56	178.05	178.14	178.23	178.32	178.41	178.50	178.59	179.08	179.17	179.26	179.35	179.44
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# The grid produces a trade-off, not a simple improvement.

Version	Legibility	Comparison	Info retained	Density pressure
Original	65%	65%	100%	80%
Vertical 8 grid	35%	30%	45%	50%
Original 8 grid	40%	45%	55%	65%
Horizontal 8 grid	45%	40%	50%	55%
Original H-8 grid	45%	50%	60%	70%
Horizontal 20 grid	65%	70%	75%	70%
Original H-20 grid	75%	80%	85%	75%
Horizontal 32 grid	60%	85%	90%	90%
Original H-32 grid	70%	90%	95%	95%

## Reading condition score

It helps the audience see the trade-off between different grids.

resolution ↑  
comparison ↑  
information ↑  
density pressure ↑

# The web reader turns exported grid studies into a live comparative instrument.

It lets the audience test the timetable as a set of reading conditions rather than receive a single final layout.

## USER CONTROLS

### Layout Mode

Original / 8 / 20 / 32 / Portrait 8

### Print State

Source Scan / Modern Print

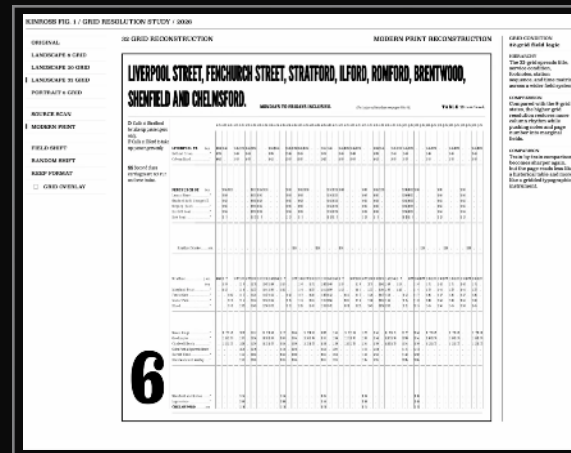
### Field Shift

drag, randomise, then keep a format

### Grid Overlay

make the underlying system visible

## LIVE TIMETABLE STAGE



The timetable is reconstructed from typographic objects, so the same information can be re-tested under different grid resolutions.

## RESEARCH MEANING

### Hierarchy

which block becomes dominant

### Compression

where detail is reduced, moved, or preserved

### Comparison

whether train-by-train reading stays possible

### Judgement

my visual analysis becomes visible

Current prototype: [index.html](#)

The web is not documentation after the work. It is the mechanism that makes the grid test readable, repeatable and criticisable.

# Bibliography

The bibliography is organised around three critical axes. Each reference must explain how it changes the project, not simply what it contains.

## 01 GRID / NEUTRALITY

the grid as rational order and rhetorical claim



**Müller-Brockmann, J. (1981)**

Grid Systems in Graphic Design: the canonical grid system tested as apparatus.



**Crouwel & van Toorn (1972/2015)**

The Debate: modernist order placed against political communication.



**Kinross, R. (1985)**

The Rhetoric of Neutrality: the timetable as rhetorical evidence.



**Haraway, D. (1988)**

Situated Knowledges: objectivity as position, not neutral distance.

## 02 INFORMATION / MEDIATION

visualisation as a political and epistemic apparatus



**Chun, W. H. K. (2018)**

On Patterns and Proxies: pattern recognition as constructed knowledge.



**Drucker, J. (2014)**

Graphesis: visual forms do not simply transmit knowledge; they produce it.



**Latour, B. (1986)**

Visualisation and Cognition: flat inscriptions gather and stabilise power.



**Becher, B. & Becher, H. (2004)**

Typologies of Industrial Buildings: serial comparison as visual method.



**Akten, M. et al. (2019)**

Learning to See: machine vision as an interpretive system.

## 03 INSTRUCTION / EXECUTION

systems, rules and repeated interpretation



**Ono, Y. (1964)**

Grapefruit: instruction as poetic system and open execution.



**LeWitt, S. (1969)**

Sentences on Conceptual Art: rule, idea and realisation separated.



**Conditional Design (2013)**

Conditional Design Manifesto: design generated through rules and conditions.

# Two critical analysis drafts now anchor the written component.

Brief requirement: one analysis of a text and one analysis of a project / practice. Each must be at least 500 words, with at least 1,000 words total.

## TEXT ANALYSIS

### Robin Kinross, *The Rhetoric of Neutrality* (1985)

- 01 Introduces neutrality as rhetoric rather than absence of style.
- 02 Reads timetable form through typography, dot leaders, hierarchy and spacing.
- 03 Reframes my timetable as an already rhetorical object, not raw data.
- 04 Shapes the web reader as a test of reading conditions.

## PROJECT / PRACTICE ANALYSIS

### Josef Müller-Brockmann, *Grid Systems in Graphic Design* (1981)

- 01 Treats the grid as a modernist practice of ordered visual construction.
- 02 Justifies 8 / 20 / 32 as reference-derived testing conditions.
- 03 Shows that grid resolution redistributes attention and information loss.
- 04 Turns the interface into a critique of the grid as apparatus.

studio response + web prototype + bibliography structure + two 500+ word draft.



