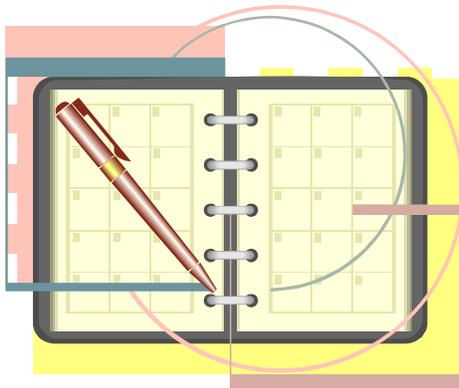
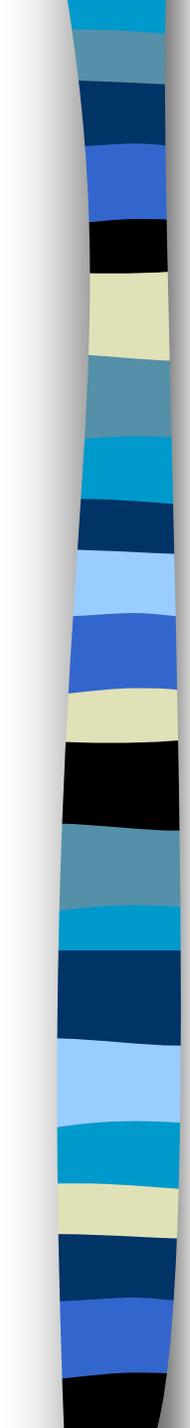


Implementing TimeTablePublisher



**T3 Webinar
May 14, 2006
David Sullivan**





What are Bus Timetables?

- A timetable is the publicly available document outlining the bus services for a particular route.
- The relevant operator is responsible for preparing, maintaining and distributing the timetable.

Key Timetable Components



- Effective date
- Schedule and timepoints
- Map with timepoints and transfer locations
- Transfer location and connecting route information
- Holiday schedule
- Fare information
- Wheelchair and bike rack service availability
- Information on different services provided
- Contact information

Why Timetables?



To board a transit bus an individual needs to know:

- which route to take
- where the bus goes
- where the bus stops
- when the bus arrives
- the travel time to the destination, and
- how much it costs to travel.

Accessing Timetable Information



- **Route maps and timetables** – Printed material
- **System maps** – Bird's eye view of a transit system
- **Information on stops** – Bus stop signs with bus routes with route information
- **Websites** – Information on all the services and routes
- **Trip-planning systems** – Point-to-point information for the public
- **Telephone service** – Call customer service and ask for information on a bus route
- **Headsign at the front of the bus**
- **Bus operators**
- **Other passengers**

Benefits of Timetables

- Enhanced ridership
- Increased awareness and usage
- Better image
- Improved rider satisfaction
- Improvement in making transfer connections
- Improvement in discovering alternative routes for trips
- Improvement in identifying routes serving each stop
- Reduced complaints
- Increased and more frequent ridership
- Increase in revenue



Published HRT Bus Schedule



Weekend Schedule

SATURDAY From Pembroke East to Shore Drive to Ocean View to Downtown Norfolk											
Time	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
6:21	6:21	6:44	6:44	6:00	5:50	6:00	6:19	6:24			
7:21	7:21	7:44	8:03	7:50	7:50	8:00	8:19	8:24			
8:21	8:21	8:44	9:03	8:50	8:50	9:00	9:19	9:24			
9:21	9:21	9:44	10:03	10:00	10:00	10:10	10:29	10:34			
10:21	10:21	10:44	11:03	11:00	11:00	11:10	11:29	11:34			
11:21	11:21	11:44	12:03	12:00	12:00	12:10	12:29	12:34			
12:21	12:21	12:44	1:03	1:00	1:00	1:10	1:29	1:34			
1:21	1:21	1:44	2:03	2:00	2:00	2:10	2:29	2:34			
2:21	2:21	2:44	3:03	3:00	3:00	3:10	3:29	3:34			
3:21	3:21	3:44	4:03	4:00	4:00	4:10	4:29	4:34			
4:21	4:21	4:44	5:03	5:00	5:00	5:10	5:29	5:34			
5:21	5:21	5:44	6:03	6:00	6:00	6:10	6:29	6:34			
6:21	6:21	6:44	7:03	7:00	7:00	7:10	7:29	7:34			
7:21	7:21	7:44	8:03	8:00	8:00	8:10	8:29	8:34			
8:21	8:21	8:44	9:03	9:00	9:00	9:10	9:29	9:34			
9:21	9:21	9:44	10:03	10:00	10:00	10:10	10:29	10:34			
10:21	10:21	10:44	11:03	11:00	11:00	11:10	11:29	11:34			
11:21	11:21	11:44	12:03	12:00	12:00	12:10	12:29	12:34			
12:21	12:21	12:44	1:03	1:00	1:00	1:10	1:29	1:34			

SATURDAY From Downtown Norfolk to Ocean View to Shore Drive to Pembroke East											
Time	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
4:57	5:02	5:15	5:20	5:40	5:30	5:45	5:50	6:03			
5:57	6:02	6:15	6:20	6:40	6:30	6:45	6:50	7:03			
6:54	7:02	7:15	7:20	7:40	7:30	7:45	7:50	8:03			
7:54	8:02	8:15	8:20	8:40	8:30	8:45	8:50	9:03			
8:54	9:02	9:15	9:20	9:40	9:30	9:45	9:50	10:03			
9:54	10:02	10:15	10:20	10:40	10:30	10:45	10:50	11:03			
10:54	11:02	11:15	11:20	11:40	11:30	11:45	11:50	12:03			
11:54	12:02	12:15	12:20	12:40	12:30	12:45	12:50	1:03			
12:54	1:02	1:15	1:20	1:40	1:30	1:45	1:50	2:03			
1:54	2:02	2:15	2:20	2:40	2:30	2:45	2:50	3:03			
2:54	3:02	3:15	3:20	3:40	3:30	3:45	3:50	4:03			
3:54	4:02	4:15	4:20	4:40	4:30	4:45	4:50	5:03			
4:54	5:02	5:15	5:20	5:40	5:30	5:45	5:50	6:03			
5:54	6:02	6:15	6:20	6:40	6:30	6:45	6:50	7:03			
6:54	7:02	7:15	7:20	7:40	7:30	7:45	7:50	8:03			
7:54	8:02	8:15	8:20	8:40	8:30	8:45	8:50	9:03			
8:54	9:02	9:15	9:20	9:40	9:30	9:45	9:50	10:03			
9:54	10:02	10:15	10:20	10:40	10:30	10:45	10:50	11:03			
10:54	11:02	11:15	11:20	11:40	11:30	11:45	11:50	12:03			
11:54	12:02	12:15	12:20	12:40	12:30	12:45	12:50	1:03			
12:54	1:02	1:15	1:20	1:40	1:30	1:45	1:50	2:03			

SUNDAY From Downtown Norfolk to Amphibious Base											
Time	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
4:20	4:20	4:45	7:00	7:15	7:20						
7:20	7:20	7:45	8:00	8:15	8:20						
8:20	8:20	8:45	9:00	9:15	9:20						
9:20	9:20	9:45	10:00	10:15	10:20						
10:20	10:20	10:45	11:00	11:15	11:20						
11:20	11:20	11:45	12:00	12:15	12:20						
12:20	12:20	12:45	1:00	1:15	1:20						
1:20	1:20	1:45	2:00	2:15	2:20						
2:20	2:20	2:45	3:00	3:15	3:20						
3:20	3:20	3:45	4:00	4:15	4:20						
4:20	4:20	4:45	5:00	5:15	5:20						
5:20	5:20	5:45	6:00	6:15	6:20						
6:20	6:20	6:45	7:00	7:15	7:20						
7:20	7:20	7:45	8:00	8:15	8:20						
8:20	8:20	8:45	9:00	9:15	9:20						
9:20	9:20	9:45	10:00	10:15	10:20						
10:20	10:20	10:45	11:00	11:15	11:20						
11:20	11:20	11:45	12:00	12:15	12:20						
12:20	12:20	12:45	1:00	1:15	1:20						

SUNDAY From Amphibious Base to Norfolk											
Time	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
4:20	4:50	7:00	7:15	7:20							
7:20	7:50	8:00	8:15	8:20							
8:20	8:50	9:00	9:15	9:20							
9:20	9:50	10:00	10:15	10:20							
10:20	10:50	11:00	11:15	11:20							
11:20	11:50	12:00	12:15	12:20							
12:20	12:50	1:00	1:15	1:20							
1:20	1:50	2:00	2:15	2:20							
2:20	2:50	3:00	3:15	3:20							
3:20	3:50	4:00	4:15	4:20							
4:20	4:50	5:00	5:15	5:20							
5:20	5:50	6:00	6:15	6:20							
6:20	6:50	7:00	7:15	7:20							
7:20	7:50	8:00	8:15	8:20							
8:20	8:50	9:00	9:15	9:20							
9:20	9:50	10:00	10:15	10:20							
10:20	10:50	11:00	11:15	11:20							
11:20	11:50	12:00	12:15	12:20							
12:20	12:50	1:00	1:15	1:20							

NO SUNDAY SERVICE											
Time	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
4:20	4:20	4:45	7:00	7:15	7:20						
7:20	7:20	7:45	8:00	8:15	8:20						
8:20	8:20	8:45	9:00	9:15	9:20						
9:20	9:20	9:45	10:00	10:15	10:20						
10:20	10:20	10:45	11:00	11:15	11:20						
11:20	11:20	11:45	12:00	12:15	12:20						
12:20	12:20	12:45	1:00	1:15	1:20						
1:20	1:20	1:45	2:00	2:15	2:20						
2:20	2:20	2:45	3:00	3:15	3:20						
3:20	3:20	3:45	4:00	4:15	4:20						
4:20	4:20	4:45	5:00	5:15	5:20						
5:20	5:20	5:45	6:00	6:15	6:20						
6:20	6:20	6:45	7:00	7:15	7:20						
7:20	7:20	7:45	8:00	8:15	8:20						
8:20	8:20	8:45	9:00	9:15	9:20						
9:20	9:20	9:45	10:00	10:15	10:20						
10:20	10:20	10:45	11:00	11:15	11:20						
11:20	11:20	11:45	12:00	12:15	12:20						
12:20	12:20	12:45	1:00	1:15	1:20						

To help you to better understand HRT's bus schedule, we have provided the following route planning example. Please refer to the sample timetable.

To determine which timetable you need, read the travel description above each timetable. **A** Next, locate your destination. For this example, you need to arrive at Riverside Regional Medical Center at 7:45am. In the Riverside Regional Medical Center column **B** locate the time that arrives before 7:45am. In this example, the best arrival time would be 7:25am. **C** Next, locate your pick up location. Remember, bus stops are sometimes located between the listed timepoints as well. In this example, the closest pick up location is Net Center. **D** Match up the coordinating time in the pick up location column. The arrival time at the destination by 7:00am. **E** Th at Net Center Medical Center

MONDAY THRU SATURDAY
From Downtown Newport News to Newmarket to Riverside Regional Medical Center to Christopher Newport University

Time	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
5:45	5:45	5:52	6:00	6:05	6:09	6:30	6:32	6:30			
6:15	6:19	6:22	6:20	6:25	6:29	6:50	6:52	7:00			
6:45	6:49	6:51	7:00	7:05	7:09	7:30	7:32	7:40			
7:15	7:19	7:21	7:30	7:35	7:39	7:50	7:52	8:00			
8:15	8:19	8:21	8:30	8:35	8:39	8:50	8:52	9:00			

Bus Fares

Contact Information

HRT BUS FARES

ADULT	\$1.50
SENIOR/PERSON with DISABILITIES	\$0.75*
YOUTH (up to age 18)	\$1.00*
CHILD UNDER 38"	FREE

Raw Data to Prepare Timetable



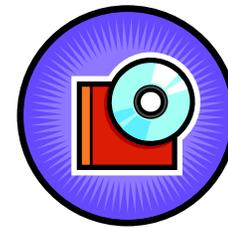
Hampton Roads Transit													Headway Report					
Vehicle schedule: SFAL2007 Saturday Scenario: 70 Google Transit																		
Route: 001 GRANBY ST																		
Garage: SOUTH NORFOLK																		
Direction: Inbound																		
Block	From	Note	PEMBM	HAYSC	PLSHO	PLSHO	AB	OV	OV	GRLC	GRLC	MNT26	MNT18	MNTCH	To			
001 - 2										550a	600a	603a	617a	619a	624a			
001 - 5	(530a)									600a	618a	620a	630a	633a	647a	649a	654a	
001 - 6										650a	700a	703a	717a	719a	724a			
001 - 4	036		622a	633a	644a	648a	700a	718a		720a	730a	733a	747a	749a	754a			
001 - 5										750a	800a	803a	817a	819a	824a			
001 - 1	036		722a	733a	744a	748a	800a	818a		820a	830a	833a	847a	849a	854a			
001 - 4										850a	900a	903a	917a	919a	924a			
001 - 3	036		822a	833a	844a	848a	900a	918a		920a	930a	933a	947a	949a	954a			
001 - 1										950a	1000a	1003a	1017a	1019a	1024a			
001 - 2	036		922a	933a	944a	948a	1000a	1018a		1020a	1030a	1033a	1047a	1049a	1054a			
001 - 3										1050a	1100a	1103a	1117a	1119a	1124a			
001 - 6	036		1022a	1033a	1044a	1048a	1100a	1118a		1120a	1130a	1133a	1147a	1149a	1154a			
001 - 2										1150a	1200p	1203p	1217p	1219p	1224p			
001 - 5	036		1122a	1133a	1144a	1148a	1200p	1218p		1220p	1230p	1233p	1247p	1249p	1254p			
001 - 6										1250p	100p	103p	117p	119p	124p			
001 - 4	036		1222p	1233p	1244p	1248p	100p	118p		120p	130p	133p	147p	149p	154p			
001 - 5										150p	200p	203p	217p	219p	224p			
001 - 1	036		122p	133p	144p	148p	200p	218p		220p	230p	233p	247p	249p	254p			
001 - 4										250p	300p	303p	317p	319p	324p			
001 - 3	036		222p	233p	244p	248p	300p	318p		320p	330p	333p	347p	349p	354p			
001 - 1										350p	400p	403p	417p	419p	424p			
001 - 2	036		322p	333p	344p	348p	400p	418p		420p	430p	433p	447p	449p	454p			
001 - 3										450p	500p	503p	517p	519p	524p			
001 - 6	036		422p	433p	444p	448p	500p	518p		520p	530p	533p	547p	549p	554p			
001 - 2										550p	600p	603p	617p	619p	624p			
001 - 5	036		522p	533p	544p	548p	600p	618p		620p	630p	633p	647p	649p	654p	(704p)		
001 - 6										650p	700p	703p	---	---	720p			
001 - 4	036		622p	633p	644p	648p	700p	718p		720p	730p	733p	---	---	750p	(800p)		
001 - 2										733p	750p	750p	800p	803p	---	---	820p	
001 - 6										833p	850p	850p	900p	903p	---	---	920p	
001 - 2										933p	950p	950p	1000p	1003p	---	---	1020p	
001 - 6										1033p	1050p	1050p	1100p	1103p	---	---	1120p	
001 - 2										1133p	1150p	1150p	1200x	1203x	---	---	1220x	
001 - 6										1233x	1250x	1250x	100x	103x	---	---	115x	(118x)
001 - 2										133x	150x	150x	200x	203x	---	---	215x	(218x)

Green boxes represent PM time

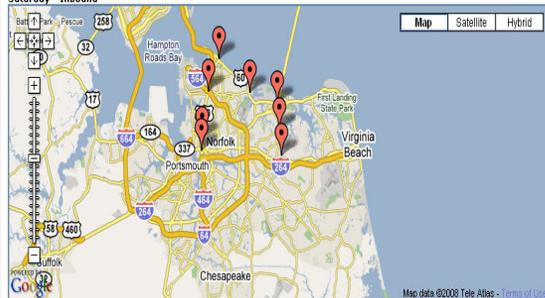
SATURDAY From Pembroke East to Shore Drive to Ocean View to Downtown Norfolk

Pembroke East	Haygood Shopping Center	Pleasure Center Shore Dr.	Amphibious Base	Ocean View Graby St.	Graby St. Little Creek Rd.	Monticello Ave. 18th St.	Charlotte St. Bank St.
T9	8	T7	T6	5	T4	3	T1
				5:50	6:00	6:19	6:24
			6:00	6:20	6:30	6:49	6:54
			6:50	7:00	7:19	7:24	
6:22	6:33	6:44	7:00	7:20	7:30	7:49	7:54
7:22	7:33	7:44	8:00	8:20	8:30	8:49	8:54
8:22	8:33	8:44	9:00	9:20	9:30	9:49	9:54
9:22	9:33	9:44	10:00	10:20	10:30	10:49	10:54
10:22	10:33	10:44	11:00	11:20	11:30	11:49	11:54
11:22	11:33	11:44	12:00	11:50	12:00	12:19	12:24
12:22	12:33	12:44	1:00	1:20	1:30	1:49	1:54
1:22	1:33	1:44	2:00	1:50	2:00	2:19	2:24
2:22	2:33	2:44	3:00	2:50	3:00	3:19	3:24
3:22	3:33	3:44	4:00	3:50	4:00	4:19	4:24
4:22	4:33	4:44	5:00	4:50	5:00	5:19	5:24
5:22	5:33	5:44	6:00	5:50	6:00	6:19	6:24
6:22	6:33	6:44	7:00	6:50	7:00	7:19	7:24
				7:33	7:50	8:00	8:20
				8:33	8:50	9:00	9:20
				9:33	9:50	10:00	10:20
				10:33	10:50	11:00	11:20
				11:33	11:50	12:00	12:20
				12:33	12:50	1:00	1:15
				1:33	1:50	2:00	2:15

Results from TimeTablePublisher



1-GRANBY ST
Saturday - Inbound



PEMBROKE EAST	HAYGOOD SHOPPING CENTER	PLEASURE HOUSE RD SHORE DRIVE	AMPHIBIOUS BASE	OCEAN VIEW GRANBY ST	GRANBY ST LITTLE CREEK RD	MONTICELLO AVE. 18TH ST	CHARLOTTE ST BANK ST
---	---	---	6:00	6:19	6:24	6:24	---
---	---	---	6:00	6:18	6:30	6:49	6:54
---	---	---	6:50	7:00	7:00	7:19	7:24
6:22	6:33	6:44	7:00	7:18	7:30	7:49	7:54
---	---	---	7:50	8:00	8:00	8:19	8:24
7:22	7:33	7:44	8:00	8:18	8:30	8:49	8:54
---	---	---	8:50	9:00	9:00	9:19	9:24
8:22	8:33	8:44	9:00	9:18	9:30	9:49	9:54
---	---	---	9:50	10:00	10:00	10:19	10:24
9:22	9:33	9:44	10:00	10:18	10:30	10:49	10:54
---	---	---	10:50	11:00	11:00	11:19	11:24
10:22	10:33	10:44	11:00	11:18	11:30	11:49	11:54
---	---	---	11:50	12:00	12:00	12:19	12:24
11:22	11:33	11:44	12:00	12:18	12:30	12:49	12:54
---	---	---	12:50	1:00	1:00	1:19	1:24
12:22	12:33	12:44	1:00	1:18	1:30	1:49	1:54
---	---	---	1:50	2:00	2:00	2:19	2:24
1:22	1:33	1:44	2:00	2:18	2:30	2:49	2:54
---	---	---	2:50	3:00	3:00	3:19	3:24
2:22	2:33	2:44	3:00	3:18	3:30	3:49	3:54
---	---	---	3:50	4:00	4:00	4:19	4:24
3:22	3:33	3:44	4:00	4:18	4:30	4:49	4:54
---	---	---	4:50	5:00	5:00	5:19	5:24
4:22	4:33	4:44	5:00	5:18	5:30	5:49	5:54
---	---	---	5:50	6:00	6:00	6:19	6:24
5:22	5:33	5:44	6:00	6:18	6:30	6:49	6:54
---	---	---	6:50	7:00	7:00	7:19	7:24
6:22	6:33	6:44	7:00	7:18	7:30	7:49	7:54
---	---	---	7:30	7:50	8:00	8:15	8:20
---	---	---	8:30	8:50	9:00	9:15	9:20
---	---	---	9:30	9:50	10:00	10:15	10:20
---	---	---	10:30	10:50	11:00	11:15	11:20
---	---	---	11:30	11:50	12:00	12:15	12:20
---	---	---	12:30	12:50	1:00	1:15	---
---	---	---	1:30	1:50	2:00	2:15	---

1-GRANBY ST

Saturday

Inbound

PEMBROKE EAST	HAYGOOD SHOPPING CENTER	PLEASURE HOUSE RD SHORE DRIVE	AMPHIBIOUS BASE	OCEAN VIEW GRANBY ST	GRANBY ST LITTLE CREEK RD	MONTICELLO AVE. 18TH ST	CHARLOTTE ST BANK ST
---	---	---	6:00	6:18	6:30	6:49	6:54
6:22	6:33	6:44	7:00	7:18	7:30	7:49	7:54
---	---	---	7:50	8:00	8:00	8:19	8:24
7:22	7:33	7:44	8:00	8:18	8:30	8:49	8:54
---	---	---	8:50	9:00	9:00	9:19	9:24
8:22	8:33	8:44	9:00	9:18	9:30	9:49	9:54
---	---	---	9:50	10:00	10:00	10:19	10:24
9:22	9:33	9:44	10:00	10:18	10:30	10:49	10:54
---	---	---	10:50	11:00	11:00	11:19	11:24
10:22	10:33	10:44	11:00	11:18	11:30	11:49	11:54
---	---	---	11:50	12:00	12:00	12:19	12:24
11:22	11:33	11:44	12:00	12:18	12:30	12:49	12:54
---	---	---	12:50	1:00	1:00	1:19	1:24
12:22	12:33	12:44	1:00	1:18	1:30	1:49	1:54
---	---	---	1:50	2:00	2:00	2:19	2:24
1:22	1:33	1:44	2:00	2:18	2:30	2:49	2:54
---	---	---	2:50	3:00	3:00	3:19	3:24
2:22	2:33	2:44	3:00	3:18	3:30	3:49	3:54
---	---	---	3:50	4:00	4:00	4:19	4:24
3:22	3:33	3:44	4:00	4:18	4:30	4:49	4:54
---	---	---	4:50	5:00	5:00	5:19	5:24
4:22	4:33	4:44	5:00	5:18	5:30	5:49	5:54
---	---	---	5:50	6:00	6:00	6:19	6:24
5:22	5:33	5:44	6:00	6:18	6:30	6:49	6:54
---	---	---	6:50	7:00	7:00	7:19	7:24
6:22	6:33	6:44	7:00	7:18	7:30	7:49	7:54
---	---	---	7:30	7:50	8:00	8:15	8:20
---	---	---	8:30	8:50	9:00	9:15	9:20
---	---	---	9:30	9:50	10:00	10:15	10:20
---	---	---	10:30	10:50	11:00	11:15	11:20
---	---	---	11:30	11:50	12:00	12:15	12:20
---	---	---	12:30	12:50	1:00	1:15	---
---	---	---	1:30	1:50	2:00	2:15	---

NOTE: This schedule data presented here is NOT up-to-date. This site is for demonstration purposes of the TimeTablePublisher only, and not intended as a travel resource. Please do not plan any trips based on this data. Please contact the transit agency directly for up-to-date information.

Data Required for Timetable: Dynamic vs. Static



Dynamic Data

- Scheduling information from systems such as Hastus or Trapeze
- Mapping info ([manual](#))
- Transfer locations ([manual](#))
- Connecting route information from transfer points ([manual](#))

Data Required for Timetable: Dynamic vs. Static



Static Data

- Holiday information ([manual](#))
- Fare information ([manual](#))
- Service information ([manual](#))
- Contact information ([manual](#))

Process Flow



HASTUS REPORTS

1. Schedule

Information from Scheduling

Mapping info

1. Transfer locations
2. Holiday info
3. Connecting routes
4. Wheel chair and bike rack avail
5. Fare information
6. Contact information

**Information sent to
Marketing for design**



**Timetables created manually
Using Quark Express software**



**Timetables sent to
Scheduling & Planning
For proofreading**

Design Process in Marketing



- Timetable is currently created manually
- Quark Express software is used
- Very time-consuming and labor-intensive process
- Can be prone to error
- Marketing is considering outsourcing this process

Cost of Preparing Timetables



Labor hours - 29 to 39 hours per route

- To prepare headway (schedule) – 8 hours per route
- To prepare maps – 12 to 20 hours per map
- To prepare timetable from headway report – 6 to 8 hours per route
- Proofreading – 3 hours per route

Publishing Cost

- To develop maps - \$16K in 2007
- To print and publish timetables for different routes - \$45K in 2007

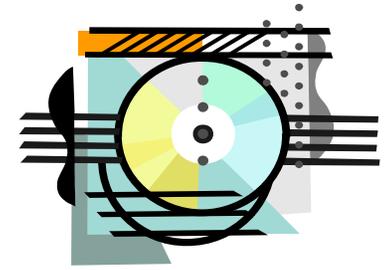
Cost of Preparing Timetables, cont'd



The cost also depends on other factors, such as

- Number of routes - 54
- How often board changes happen – (2 major changes Fall & Spring)
- Routes can change up to 6 times a year
- Reprinting due to mistakes

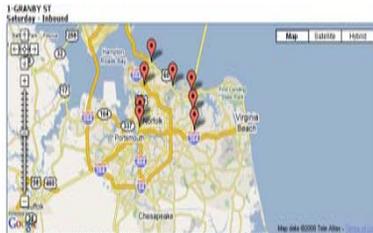
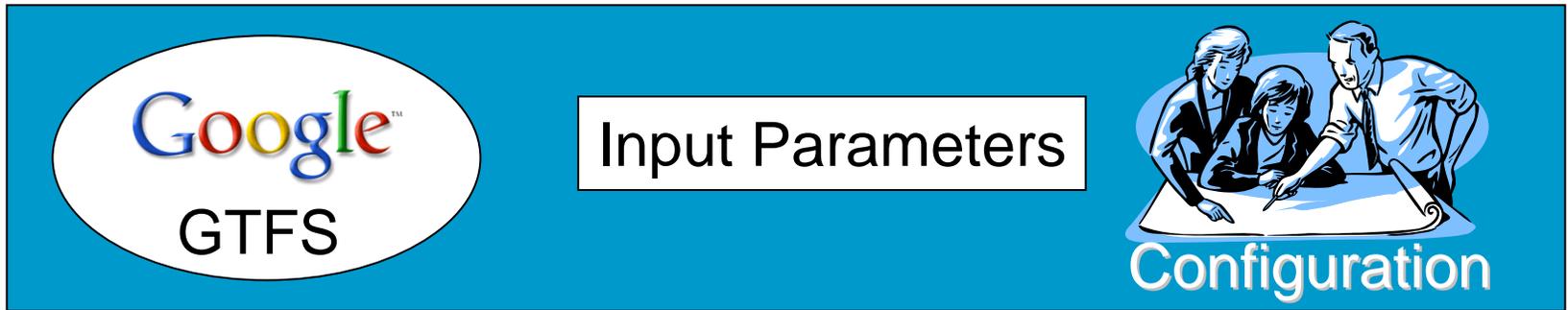
TimeTablePublisher Tool



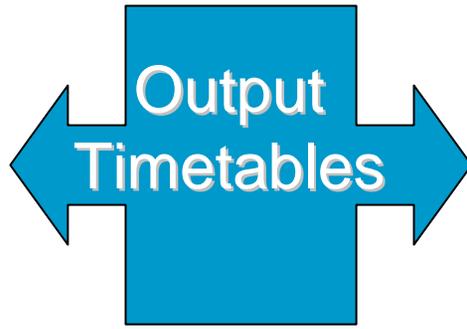
TimeTablePublisher:

- is an **open source application** – **available for free**
- enables a transit agency to examine, modify, and transform raw scheduling data into **easy-to-read** timetables
- **simplifies and accelerates** the production of printed on-street and web schedules
- results in more **accurate, current, and consistent** schedule information for the customer
- produces timetables in **a variety of formats**
- is designed to use data directly in the **Google Transit Feed Specification (GTFS)** format
- can be **very easy to implement**

Information Flow Using the TimeTablePublisher



PHIBRAKE EAST	HAYGOOD SHOPPING CENTER	PLEASURE HOUSE RD SHORE DRIVE	AMPHIBIOUS BASE	OCEAN VIEW GRANBY ST	GRANBY ST LITTLE CREEK RD	MONTICELLO AVE 10TH ST	CHARLOTTE ST BANK ST
--	--	--	5:50	6:00	6:10	6:24	6:34
--	--	--	6:00	6:10	6:20	6:34	6:44
6:22	6:33	6:44	7:00	7:10	7:19	7:34	7:44
7:22	7:33	7:44	8:00	8:10	8:19	8:34	8:44
8:22	8:33	8:44	9:00	9:10	9:19	9:34	9:44
9:22	9:33	9:44	10:00	10:10	10:19	10:34	10:44
10:22	10:33	10:44	11:00	11:10	11:19	11:34	11:44
11:22	11:33	11:44	12:00	12:10	12:19	12:34	12:44
12:22	12:33	12:44	1:00	1:10	1:19	1:34	1:44
1:22	1:33	1:44	2:00	2:10	2:19	2:34	2:44
2:22	2:33	2:44	3:00	3:10	3:19	3:34	3:44
3:22	3:33	3:44	4:00	4:10	4:19	4:34	4:44
4:22	4:33	4:44	5:00	5:10	5:19	5:34	5:44
5:22	5:33	5:44	6:00	6:10	6:19	6:34	6:44
6:22	6:33	6:44	7:00	7:10	7:19	7:34	7:44
--	--	--	7:33	7:50	8:00	8:15	8:20
--	--	--	8:33	8:50	9:00	9:15	9:20
--	--	--	9:33	9:50	10:00	10:15	10:20
--	--	--	10:33	10:50	11:00	11:15	11:20
--	--	--	11:33	11:50	12:00	12:15	12:20
--	--	--	12:33	12:50	1:00	1:15	1:20
--	--	--	1:33	1:50	2:00	2:15	2:20



1-GRANBY ST										
Saturday						inbound				
PHIBRAKE EAST	HAYGOOD SHOPPING CENTER	PLEASURE HOUSE RD SHORE DRIVE	AMPHIBIOUS BASE	OCEAN VIEW GRANBY ST	GRANBY ST LITTLE CREEK RD	MONTICELLO AVE 10TH ST	CHARLOTTE ST BANK ST			
--	--	--	6:00	6:10	6:20	6:34	6:44			
6:22	6:33	6:44	7:00	7:10	7:19	7:34	7:44			
7:22	7:33	7:44	8:00	8:10	8:19	8:34	8:44			
8:22	8:33	8:44	9:00	9:10	9:19	9:34	9:44			
9:22	9:33	9:44	10:00	10:10	10:19	10:34	10:44			
10:22	10:33	10:44	11:00	11:10	11:19	11:34	11:44			
11:22	11:33	11:44	12:00	12:10	12:19	12:34	12:44			
12:22	12:33	12:44	1:00	1:10	1:19	1:34	1:44			
1:22	1:33	1:44	2:00	2:10	2:19	2:34	2:44			
2:22	2:33	2:44	3:00	3:10	3:19	3:34	3:44			
3:22	3:33	3:44	4:00	4:10	4:19	4:34	4:44			
4:22	4:33	4:44	5:00	5:10	5:19	5:34	5:44			
5:22	5:33	5:44	6:00	6:10	6:19	6:34	6:44			
6:22	6:33	6:44	7:00	7:10	7:19	7:34	7:44			
--	--	--	7:33	7:50	8:00	8:15	8:20			
--	--	--	8:33	8:50	9:00	9:15	9:20			
--	--	--	9:33	9:50	10:00	10:15	10:20			
--	--	--	10:33	10:50	11:00	11:15	11:20			
--	--	--	11:33	11:50	12:00	12:15	12:20			
--	--	--	12:33	12:50	1:00	1:15	1:20			
--	--	--	1:33	1:50	2:00	2:15	2:20			

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Data Requirements



■ Raw Data – In **GTFS** files:

- Agency
- Calendar
- Calendar Dates
- Fare Attributes
- Fare Rules
- Routes
- Stops
- Stop Times
- Trips

■ Configuration Data – Saved in **CSV** files:

- Effective Date
- Pattern Notes
- Route Names
- Route Notes
- Timepoints
- Merge Timepoint Notes
- Phantom Timepoint
- Rename Timepoint
- Trip Notes

Google Feed Specifications



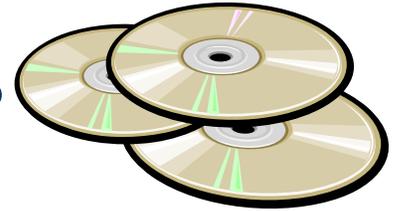
- [agency.txt](#) - **Required.** This file has information about the transit agency
- [stops.txt](#) - **Required.** This file contains information about individual locations where vehicles pick up or drop off passengers.
- [routes.txt](#) - **Required.** This file contains information about a transit organization's routes. A route is a sequence of two or more stops.
- [trips.txt](#) - **Required.** This file contains information about scheduled service along a particular route. Trips consist of two or more stops that are made at regularly scheduled intervals.
- [stop times.txt](#) - **Required.** This file lists the times that a vehicle arrives at and departs from individual stops for each trip along a route.
- [calendar.txt](#) - **Required.** This file defines service categories. Each category indicates the days that service starts and ends as well as the days that service is available.

Google Feed Specifications, cont'd



- [calendar_dates.txt](#) - **Optional**. This file lists exceptions for the service categories defined in the **calendar.txt** file. If `calendar_dates.txt` includes ALL dates of service, this file may be specified instead of `calendar.txt`.
- [fare_attributes.txt](#) - **Optional**. This file defines fare information for a transit organization's routes.
- [fare_rules.txt](#) - **Optional**. This file defines the rules for applying fare information for a transit organization's routes.
- [shapes.txt](#) - **Optional**. This file defines the rules for drawing lines on a map to represent a transit organization's routes.
- [frequencies.txt](#) - **Optional**. This file defines the headway (time between trips) for routes with variable frequency of service.

TTPUB Installation Process



- Install Apache Tomcat (*an open source application server which support Java Servlet*)
- Install binary files for Apache Ant (*an open source software tool for automating software build processes*)
- Install JDK (*Java Development Kit*)
- Deploy ttpub.war file to create website
- Create folder for Google Transit Feed file
- Modify configuration files for agency specific data
- Test the application
- Create timetables

Creating Timetables Using TTPUB



- Generate Google Transit Feed files from Hastus (*scheduling tool*)
- Copy these files into designated folder
- Configure routes using TimeTablePublisher tool
- View the route in HTML/PDF format
- Proofread timetable
- Publish timetable

Benefits of TimeTablePublisher Tool



- Open source application (**FREE**)
- Helps Marketing team to prepare public schedules and timetables in various formats
- Easy to use
- Information is dynamically generated
- Minimal effort to implement
- Acceptance of Google Transit Feed data makes the generation of raw data very simple and standardized
- Timetable output can be produced in a variety of formats

Questions?



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