



# Using Smart mobile Applications for extracting real-time transit information

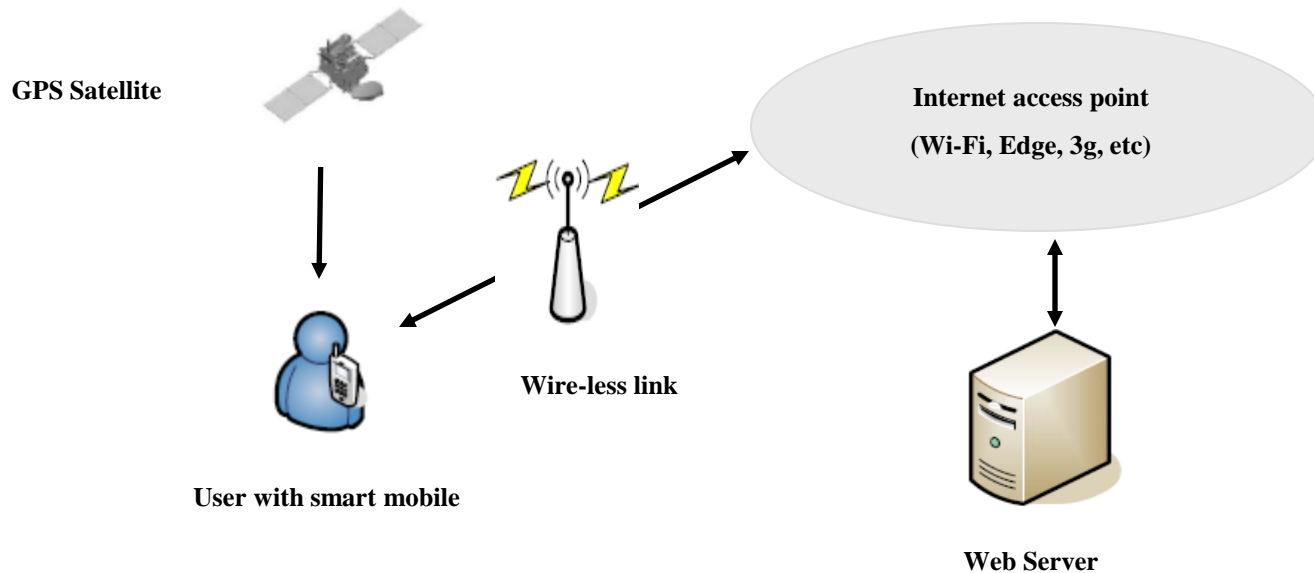
*Bashir Shalaik, Ricky Jacob and Adam Winstanley  
Department of Computer Science,  
National University of Ireland Maynooth  
Ireland*

***E-mail: [bsalaik@cs.nuim.ie](mailto:bsalaik@cs.nuim.ie)***



## Introduction and Background

- Smart mobile devices have the ability to browse the internet and obtain information and services based on their location

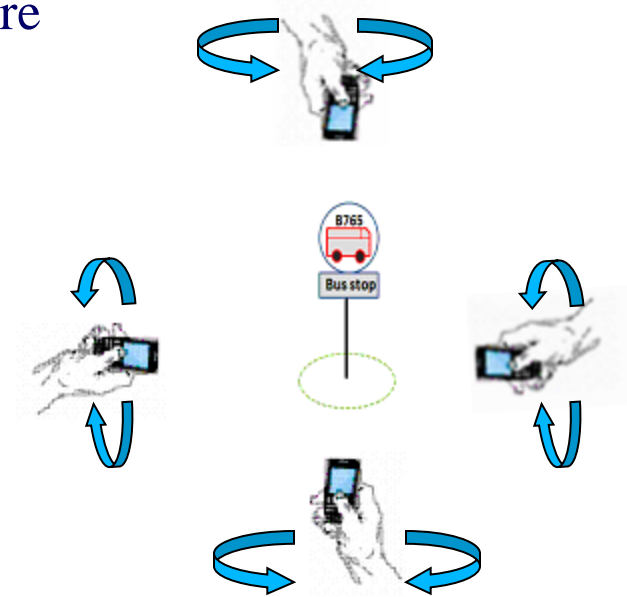


- These devices are equipped with GPS receivers and other sensors, like the accelerometer and the digital compass



## Introduction and Background ...

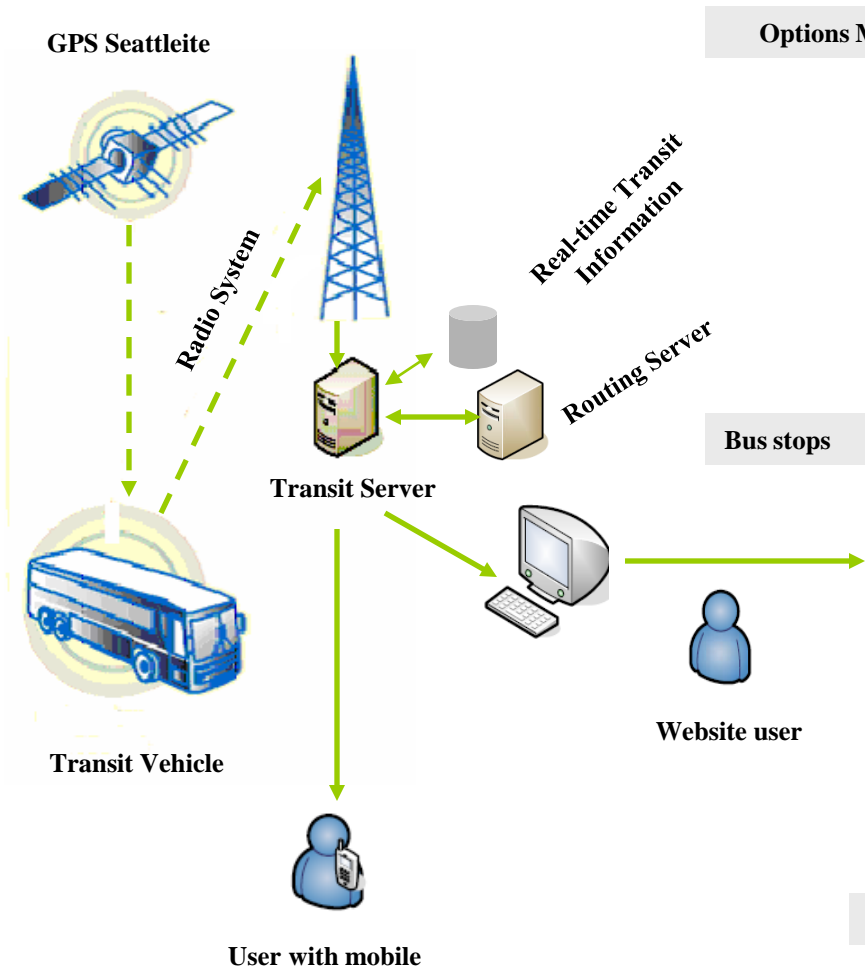
- Users who have smart mobile device can receive real-time transit information such as bus arrival/Departure times.



- The integration of small sensors like GPS and the digital compass provides orientation aware in addition to the traditional location based systems



# Our Real-time Bus Tracking System



**Real-time Bus Tracking System's Architecture**

**Options Menu**

**Updating Textual display**

**Vehicle Locations on Map**

Real-Time Bus Information As of 15:40:05 PM—2008-06-24

**BLACKPOOL** MORE

Routes:  
Line 5

Next Bus:

- Victoria Hospital (to Blackpool)
- Grange Road Layton Square
- Market Street MS
- Central Drive Rigby Road
- Royal Oak
- Farmers Arms
- Blackpool Business Park TERMINUS
- St Ammes Road Halfway House
- Lytham Road - Farmers Arms
- Waterloo Road Royal Oak
- Central Drive Rigby Road
- Corporation Street C3
- Talbot Road Layton Square
- Victoria Hospital TERMINUS

See/Hide Route  See/Hide Stops  Route No

All Vehicles  Timetable

248 out of service  
260  
261  
262  
263  
264  
265  
266  
267

ss  Trip Adviser

254  
255  
256  
257

All Vehicles

Bus #	Status	Last update	Last known Position	To Terminus
248	out of service	2008-06-24 00:00:00	Depot	-
250	in service	2008-06-24 15:38:54	Bank Hey Street/McDonalds	Blackpool Business Park TERMINUS
251	in service	2008-06-24 13:55:28	Depot	-
252	in service	2008-06-24 15:39:12	Central Drive/Bloomfield Road	Victoria Hospital TERMINUS
253	in service	2008-06-24 15:38:46	Victoria Hospital Street	Victoria Hospital TERMINUS
254	in service	2008-06-24 15:39:21	Central Drive/Chapel Street	Blackpool Business Park TERMINUS
255	out of service	2008-06-24 00:00:00	Depot	-
256	out of service	2008-06-24 00:00:00	Depot	-
257	in service	2008-06-24 15:38:53	St Ammes Road/Halfway House	Victoria Hospital TERMINUS

bing

**List of Transit Vehicles**

**Public user interface of real-time bus tracking system**



# We Provide Several Different Tools for Services Management

With real-time bus tracking, operators can:

- Detect any poor service phenomena such as vehicle- bunching or time-table adherence deviation.
- Provide better operation support.
- Provide customers with real-time service information.

Main Options

[Back to user interface](#)

**bustracking.co.uk**  
 Demonstration of fixed-route tracking and reporting system  
 See also: [Charter service tracking demonstration](#)

**MAIN SERVICES**

- + Excess Waiting Time
- + Headway Reliability
- + Check Bus Bunching
- + Travel Time Reliability
- + Vehicle Details
- + Off line reports
- + Route Progress
- + Visualize Time-Place
- + Bus Time Against Timetable
- + All Buses Time Against Timetable
- + Visualizing Service Gap and Headwaies
- + Adherence To Timetable
- + On-Time Performance
- + Vehicle Adherence
- + Variables Plot
- + Traffic Plot
- + Arrival Times
- + Playback

**Optare Solo**

Bus #:253  
 Lastupdate:19:44  
 Last Known Position: Talbot Road/Devonshire Road  
 Destination: Victoria Hospital TERMINUS

**History**  
 list of next timing point stops

- Talbot Road/Layton Square- 19:46:08
- Victoria Hospital TERMINUS- 19:50:19

**Real-Time Bus Tracking:**  
 lastupdate: 19:45:14

Location	Start	Dir	Time	Vehicle	Vehicle	Time	Dir	Status	Locat
Victoria Hospital (to Blackpool)									Victoria Hosp TERMINUS
St Walburgas Road Riversway									Whinney Hey
Grange Road St Walburgas Road									Grange Road Walburgas Ro
Grange Road Torsway Avenue									Grange Road Avenue
Grange Road Kingscote Road									Grange Road Drive
Grange Road Layton Square									Grange Road Square
Talbot Road Layton Square									Talbot Road Square
Talbot Road Rossal Road									Talbot Road Hotel
Talbot Road Devonshire Road					253	19:44			Talbot Road Road
Talbot Road Greashill									Talbot Road Court
Talbot Road Buchanan Street									Talbot Road Street
Talbot Road T3									Talbot Road (Woolworths)
Market Street M3									Corporation S
Bank Hey Street/McDonalds									Promenade To
Coronation Street/Vance Road									Central Drive Street
Central Drive Chapel Street									Central Drive Street
Central Drive Gymnasium									Central Drive Road
Central Drive Rigby Road									Central Drive Road

**Transit's operator interface of real-time bus tracking system**

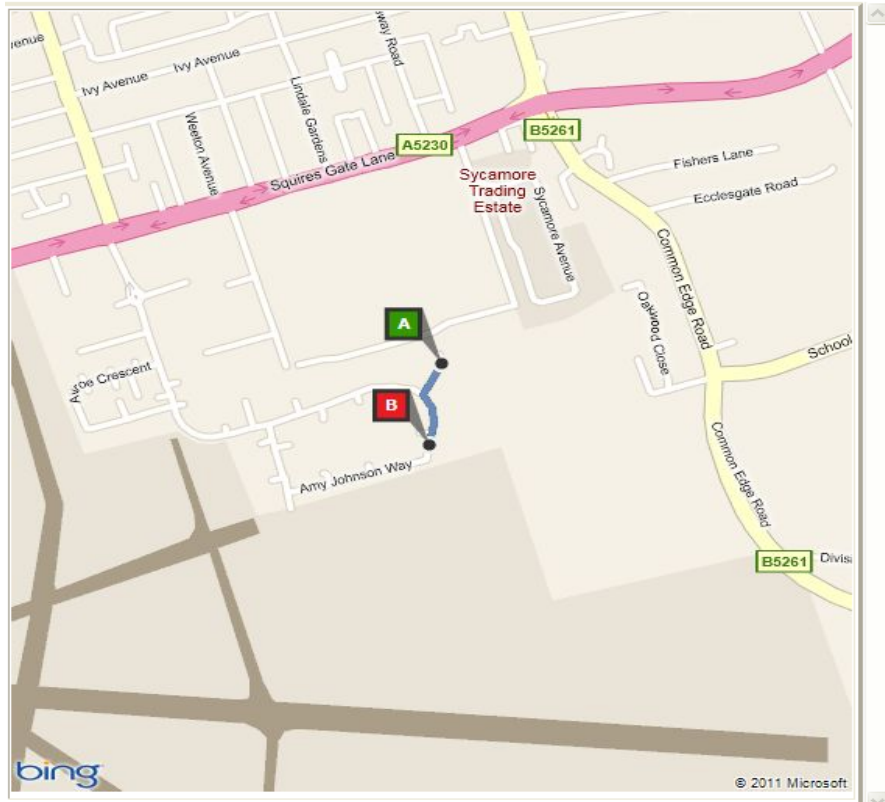




## Example: Enhancing Trip Planning including Walking Direction/ Advices

Trip Advisor  
Current Time: 17:45:04

From:  To:



List of upcoming Buses :2

Bus #	Last Known Position	Arrival Time	Comment
257	Highfield St Annes Road	17:52:42	there is no rush you should go after 7 Min(s)
252	Waterloo Hotel	18:03:24	there is no rush you should go after 17 Min(s)

### Pedisttrain Advices(s)

Travel Direaction: S

You are now at **A** you should go to busstop (Amy Johnson Way 2) at **B**

walking duration: 2 Min(s)

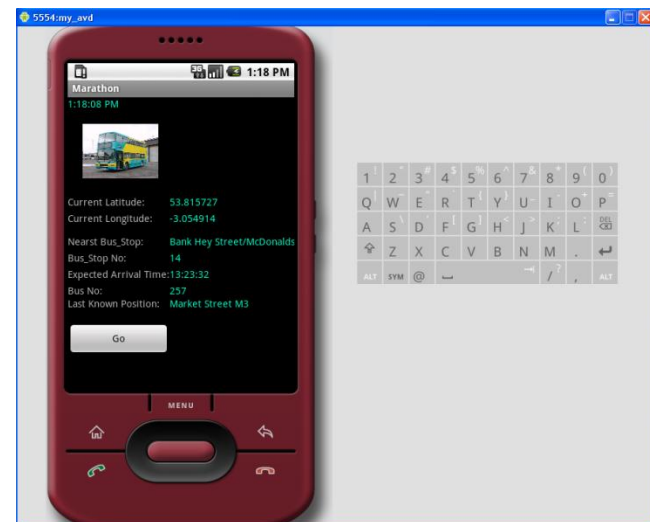
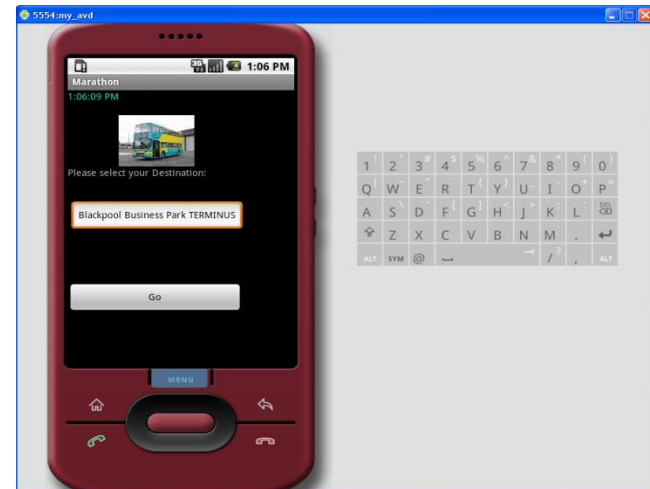
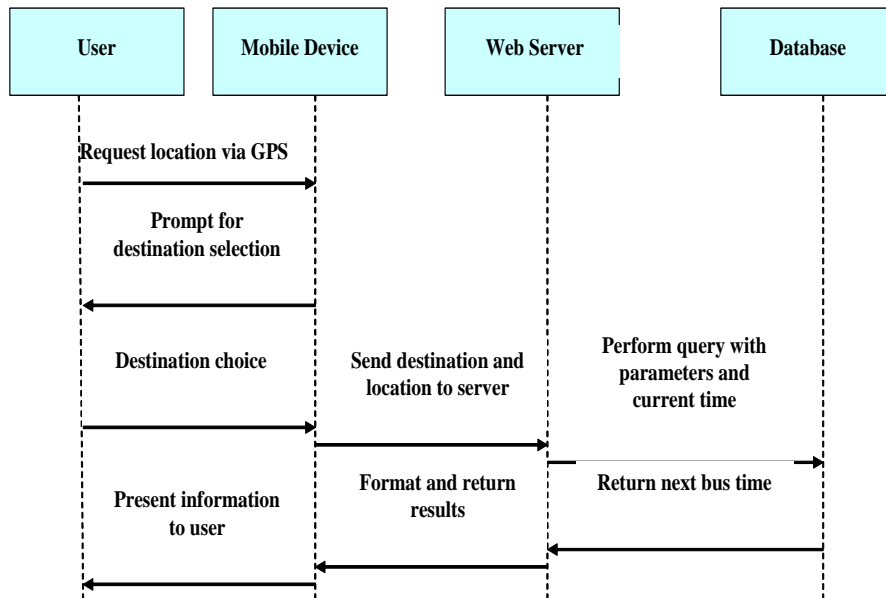
Average bus traveling time: 00:58:39

you should get off bus at busstop: 14

step #	Advice
1	Depart road toward Amy Johnson Way
2	Turn left onto Amy Johnson Way
3	Arrive at Amy Johnson Way



# Workflow Model for accessing real-time transit information



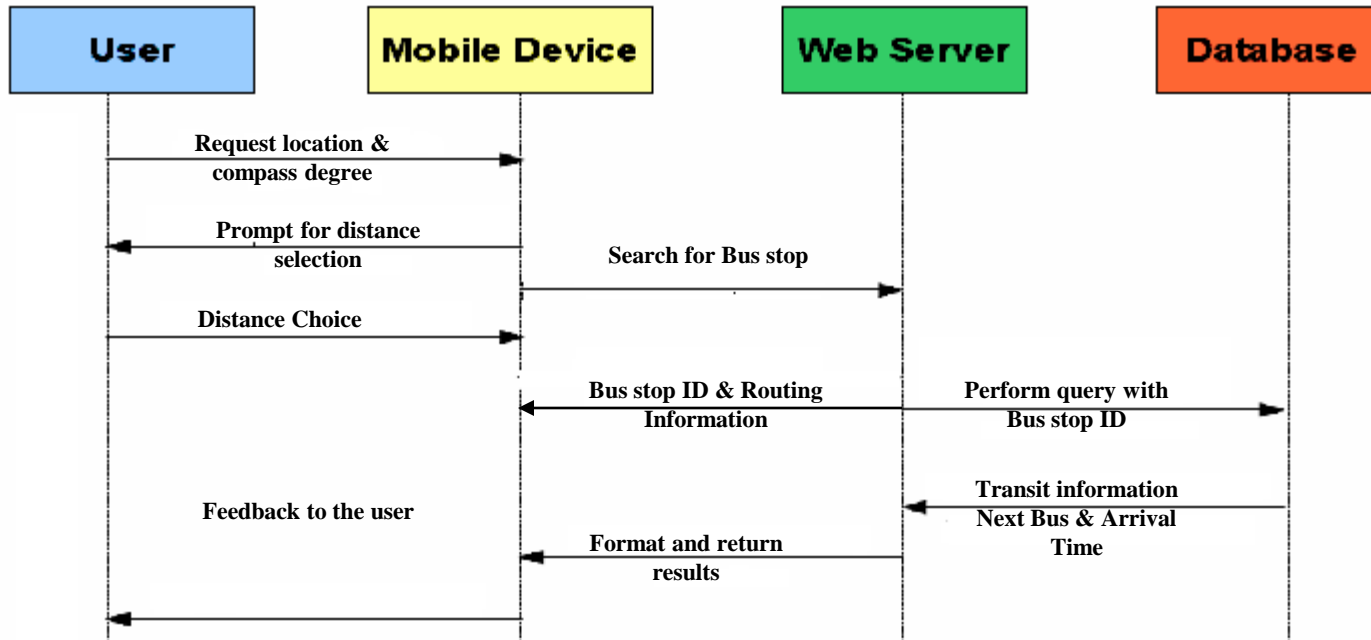


# Integration of real-time bus data with 'point-to-query' transit information system





# Workflow Model for Integration of point to query



The flow of information across the four parts of the system.



## Conclusion and Future work

- Smart mobile devices can provide orientation based services for passengers using public transport
- Instead of using websites, this prototype focuses on accessing transit information through mobile devices
- This can be useful when the user is particularly new to the area and is unsure which bus stop he/she should be at to catch the right bus.
- To demonstrate the success and use of such an application in the real-world, extensive user trials need to be carried out with a wide range of participants.



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**Thank you for your attention!**