# Android Based Intelligent Trafic Notification Using Google Map

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## ABSTRACT

Traffic jam is very common now a day because vehicle drivers do not receive earlier traffic jam notification from any network. Notification is systems that sends or deliver the message to a number of clients and recipient. Notification system can sent text message through E-mail, SMS (Short Messaging Service), Tweet, Google talk, FM (Frequency Modulation) etc. to the recipients. Traffic Notification system is a system in which, the system notify the user about the traffic situation and the current condition of the route, where the traffic is jam and what is the alternate route to avoid the traffic to the client . The system just provides the message in text or audio form. Clientsare mostly use system in their cell phone which is text supported. In today's world, mostly people use the smart phone which contains software like (Chat, Map, Browser) include the sensors like (GPS, Gravity, Proximity, Compass) and also supports the WIFI connectivity and internet connectivity (EDGE/3G/4G-LTE) through the GSM Services. Here we integrate car with smart phone Wifi hotspot for internet connectivity. The main objective of this research is to propose and develop systems that provide the traffic notification with the map, analysis shows that through smart phones a traffic notification system can be start including map, which is shows the exact location on the map. Further we have compared different websites and different system of traffic notifications which is currently worked. This paper shows the need of the user about the alert of the traffic.

**INSPEC Classification :** A9365, C7840, C6160S

**Keywords :** Development, Analysis, Trafic, Notification, Alert, System, GIS, Google, Map

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# 1. Introduction

Notification System is the way for sending alert to the client. This system is providing the current situation of the traffic and how to avoid with traffic jam and how to take an alternate route to reach the destination. At present notification systems in GIS via GPS they have just provide the basic news about the traffic. They do not provide the exact location of the traffic like edited map on website or in Google map. Now days it is more convenient to read notification on mobile as compared to watch news on TV and hear news on FM, they are just provide the news on the time basis after that news flash out.In mobile phone there are too many phones in market like smart phone. Smart phones support many operating systems, which have includes several applications like (Google talk, GIS – Google Map, Browsers, etc.).

Android operating system is just supportedon smart phones and it is support all kind of application. If anyone is using Android phone then he/she does not need to install application to use application services. Analysis shows that Google provides the map of the world on with free of cost. User can view the map on website and Google earth is also available in android phone name as android map. This map shows the perfect image of the map in detailed view with zoom-in and zoom-out support. Map support the switch view from satellite to map view. Also Google API provides the facility to enhanced the website and integrate the Google map on the website through some coding, Google earth is a freeware software that can be used for visible map and also can be used to add and edit the layer on the map andwe can save map file as KML file, which can be used for sending other people via e-mail. KML file can also upload to the FTP server and that link of the file can be send to users of smart phone and note that internet connection should be available in smart phone. So the smart phone can open the KML file and the map which was edited in the Google Earth, it can be seen on the Android smart phone. By using these features we can set a new Traffic Notification System in very convenient way and by using very easy way to understand and we can provide an alert route highlighted along with the map for sending to the user of this system.

Intelligent Transportation System (ITS) provides traffic jam avoidance system which helps commuters to reach their destination on time. Currently many ITS projects are in progress with the aims traffic optimization, providing (multimodal) traffic information and increasing road safety [1].All these activities have the common objectives of optimizing the traffic flow to avoid unnecessary waiting times and congestion to reduce noise and emissions, providing information about traffic conditions and improving road safety [2]. As in previous research paper there was an ITS survey report which was given by volunteers, interest and new services. The following new services were described as"very interesting" by those who participated in the survey.Traffic optimization (93%), Information about alternative suggested routes and

time savings (92%), Traffic information and congestion alerts (83%), and an exact-to-the-kilometer highway toll (47%). [3] Geographical Information System is a computer-assisted system for acquisition, storage, analysis and display of geographic data. Data is the core and emphasis of GIS. Geographic data of GIS coming from different disciplines and sources, such as traditional and digital maps, databases, GPS and remote sensing, can be combined in models that simulate the behavior of complex systems [4].

## 2. Methodology

Aim of this research is to develop a website which provides update to the commuter about traffic flow and send alternate route map to the traffic jam commuters via GIS – Google Map. The Google Map is used here to add and edit the layer on the map where map contains the layer like; layer to show the location of the traffic jam, layer to show the alternate route of the road. FTP server is used here to save the edited map as a KML file, to share the link of the file to the user to view the map. A website is developed to give the brief description of the notification.

2.1. Algorithm
Proposed algorithm is as follows:
Step1 Graph(v,e)=0 all vertex and edge is unvisited
Step2 Country Dataset Graph(v,e)=[C R P Dv Ct D SD]
Dv=Ru or Ur i.e. C=Country, R= Region, P=Province, Dv=Division, Ct=City, D= Districts, SD=Sub Districts, Ru=Rural, Ur=Urban
Step3 Select any vertex let say vertex1 (v1)
Step4 Mark desired visited edge e-->ve
Step5 Select targeted edge let say e-->et
As marked target visited edge. Commentthenode which belongs to the shortest path so far unknown.
Step6 While ve<et, Set K=1
Len[kv]=ve+1
Calculate length of Len[kv]
End loop
Step7 Construct the cycle graph CG= 1-2-...n...-2-3-...n-1
Step8 Construct weight of the cyclic graph W [CG]=CG
Step9Save& Display W[CG] and CG
Step10Loop: Do you want to choose another path(Y/N)?
Ans:=yes  go to Step3
Else

End loop

<u>Step11</u> Calculate the path distance Len[CG]

<u>Step12</u> Combining real time dataset with GIS dataset using point of coordinate set, AD is the real time data.

Polygon overlay [AD]=DATA[RT]+DATA[GIS]

<u>Step13</u> If DATA [RT]=Infinite

MESSAGE:="Dead lock ahead change your route"

Find theses polygons& Calculate Polygon overlay

[AD]=Polygon overlay[AD]+1, Create another nearest facility

While current ve<et2 ,Set K=1

Len[kv]=ve+1

Calculate length of Len[kv]

End loop

End loop

End loop

<u>Step14</u> MESSAGE:="Follow Len[kv] path"

<u>Step15</u> Exit

## 3. Frame Work

Here Framework shows the process to generate the notification from editing to sending the alert to the client's mobile.



Figure1.Framework Diagram

Google Map API is used here to preview the KML file on the website. The notification is sending to the client through the SMS and the Google talk. For our proposed project android phone is mandatory for the user because the services we are providing, itis support android operating system. Generally people do not always watch TV and listen FM. Mobile phone is the only thing which is keep with the people the whole day that is why we have selected the android phone. If the user is not using the android phone, so he/she can read the message on SMS and he/she can also visit to the website to see the map.

## 3.1. Get the News

News can be get from any resources like; Reporter, TV Channels, FM/Radio. There are many services where we can get the news about the traffic live situation on the road.

## 3.2. Map Edit on Google Earth

Google Map provides the feature to edit and add the layer on the map. Layer contains the place mark, polygon, path, image overlay. In is project we have used the path layers to show the traffic jam and alternate route with highlighted colors to avoid the traffic jam route. Edit the map and save as a KML file format, as shown in Fig2.
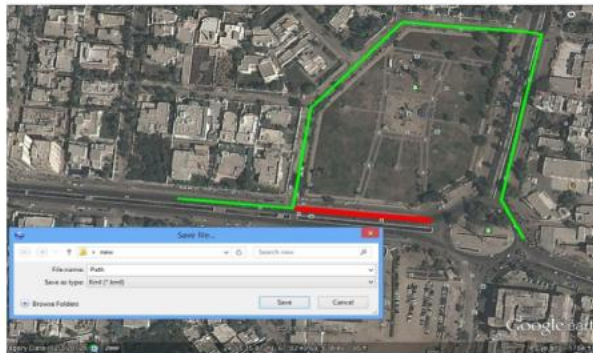


Figure2. Map Edit & Save as KML Format

## 3.3. Map Upload into FTP Server

FTP (File Transfer Protocol) server is the network protocol used to transfer file from one host to another host. It is the best way to save file and share it where you want to share. We saved it to our FTP server and the link of the file is being sharing. Android mobile has a facility that if any link occurs anywhere like; messages and chat. It shows as a hyper link. When we select the link it will open in browser, so we can get link of KML file, when we click on the link on android mobile, Google map will open along with the edited layer that one we have edited in the Google earth before. The Fig3 shows the KML files save in FTP server.

| All | Name | Type | Size | Owner | Group | Perms | Mod Time | Actions | | |
|-----|------|------|------|-------|-------|-------|----------|---------|---|---|
| | Up .. | | | | | | | | | |
| | forhomepage.kml | KML File | 1794 | a6836994 | a6836994 | rwr--r-- | Oct 22 17:20 | View | Edit | Open |
| | mapview.kml | KML File | 2309 | a6836994 | a6836994 | rwr--r-- | Oct 22 17:29 | View | Edit | Open |
| | mapview1.kml | KML File | 1448 | a6836994 | a6836994 | rwr--r-- | Oct 22 17:33 | View | Edit | Open |
| | roadblocked.kml | KML File | 1661 | a6836994 | a6836994 | rwr--r-- | Nov 3 03:54 | View | Edit | Open |
| | underattack.kml | KML File | 4252 | a6836994 | a6836994 | rwr--r-- | Oct 29 14:26 | View | Edit | Open |
| | vipactivity.kml | KML File | 1535 | a6836994 | a6836994 | rwr--r-- | Nov 16 14:50 | View | Edit | Open |

Figure3. Map KML File Upload into FTP Server

## 3.4. HTML File Edit for Web Preview

Website contains the HTML file which includes the codes in form of HTML file. Here we have coding and used Google API to show the map and the layer we have saved on FTP server.
The coding is defined below:

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
<meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
<style type="text/css">
html { height: 100% }
body { height: 100%; margin: 0; padding: 0 }
#map_canvas{ height: 100% }
</style>
<script type="text/javascript"src=
"http://maps.googleapis.com/maps/api/js?sensor=true">
</script>
<script type="text/javascript">
var map; var layers = [];
function initialize()
{varmapOptions =
{ zoom: 11,mapTypeId:google.maps.MapTypeId.ROADMAP};
map = new google.maps.Map
(document.getElementById("map_canvas"), mapOptions);
layers[3] = new google.maps.KmlLayer("http://"file location");
layers[3].setMap(map);}
functiontoggleLayer(i)
{
if (layers[i].getMap() == null)
{layers[i].setMap(map);}
Else
 {layers[i].setMap(null);}
}
google.maps.event.addDomListener(window, 'load', initialize);
</script>
</head>
<body>
```

```
<form id="form1" runat="server">
<div>
<asp:Button ID="Button1" runat="server" Text="Button"
OnClientClick="toggleLayer(3)" />
</div>
</form>
<div id="map_canvas" style="width:100%; eight:100%">
</div>
</body>
</html>
```

File location will locate on the FTP server where the KML file will saved.

## 3.5. HTML File Upload into FTP Server

The same procedure of HTML files uploading as the uploading of KML file. As shown in Fig3.

## 3.6. Publish NEWS on Website

Website is for those users who do not have an Android phone to view map on mobile. So the user can also visit to our website from anywhere, if he/she has the internet access. The procedure is very easy just edit the news using the admin panel of your website and describe the complete detail of the traffic jam and attach the html file link with the news, so the relevant map can be show with the news. The image for editing news is showing in Fig4.[7]
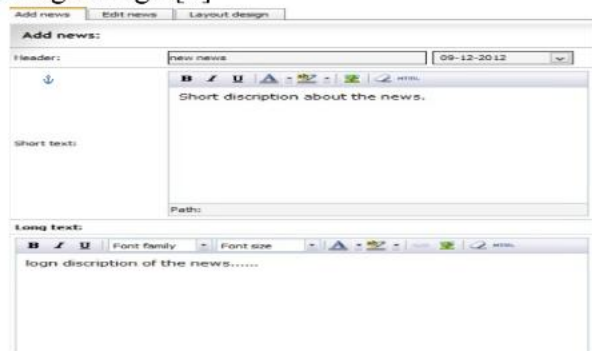


Figure4. NEWS Editing for Website

After publishing on website, it will look like as shown in the Fig5.

Figure5. NEWS Preview on Website

When user will select the news then page will be display, which shows the relevant news of that particular news. There is a hyperlink for that news to display the map to see the exact location of the traffic jam and the alternate route to avoid the traffic. Fig6 shows the preview of the map on the website.



Figure6. Map Preview on Website

### 3.7. Send SMS Alert via Google talk Software

Google talk is freeware chatting software and android phones contain the Google talk as a default chatting application. If the mobile is connected to the internet, so it can receive the Google talk SMS on the mobile phone also the SMS contains the same news which was published on the website. It also contain the link for the KML file, as the user select the link the map will be display all the layer which was edited on the Google earth before.[5][6]

Figure7. Sending SMS Alert via Google talk

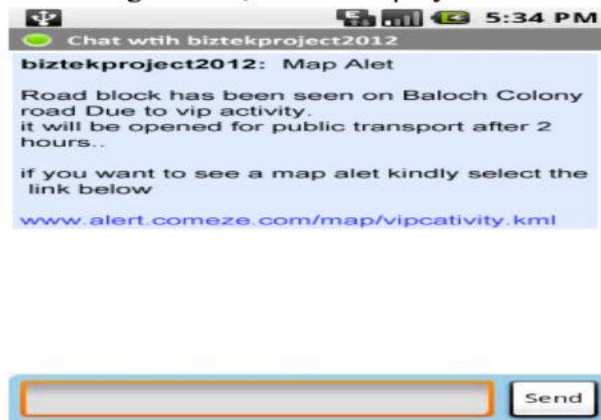When the user will get SMS, it will display like as shown in Fig8.



Figure8. Google talk SMS Received on Mobile

### 3.8. Send SMS via Mobile

Sending SMS is same as we send a simple message through our mobile, but here we are adding the KML file link with the message. The effect of message is same as Google talk message. This link will be display as a hyperlink and when user will select the link map will be display as shown in Fig9.



Figure9. Receive SMS with KML on Mobile

As the user will select the link then android map will be open and the map will be display automatically as shown in Fig10.
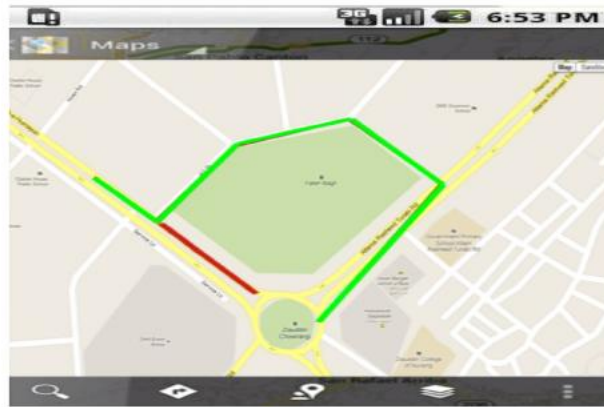
Figure10. Map Display on Mobile

## 4. Conclusion

Notification is the best way to keep the user aware with the news and the events of the city. SMS is the cheapest and the fastest way to send the alert to the user. Mostly people use the Google services like Google talk, Google earth, GPS and so on. New Smart phones are powered with the Google android, which supports the Google products like Google applications. These applications are free of cost and easy to install also these applications are pre-installed in Android OS mobile.

Traffic Notification System is the best way to provide the alert to the users through car GPS system or mobile GPRS or 3G system. Android mobile has a feature to open the KML file on its map application. It needs just software like; Google Map, Google Talk which is default in Mobile OS. FTP server is used to save the files on the database which can be access throughout the world, where the internet is available. FTP server is necessary to save the KML file and HTML file for sharing with the Clients. Android mobile is the client side to get the news and to get the map on mobile. The notification will be sent through the SMS and the Google Talk. There is also a website for this project where the Non-Android user can read the news on our website.

The website need a little bit HTML coding to show the map pane and to preview the news layer. Internet connection plays a key role to achieve the goal to view the map on mobile. User will receive the alert on mobile through Google talk and SMS when he/she will select the given link, the map will be appeared automatically. This process takes 3 to 4 minutes to generate a single notification. This project is totally based on internet, if availability of the internet is not possible then notification cannot generate and user cannot receive the alert. It is a proposed solution for

the traffic notification systemand can be established with the less amount of expense. Every tool for this project is free to download and some FTP servers are also freely available to use. This system is proper coded and implemented. This system is very cheap as compared to other system which is implemented in current today vehicles. Normal 3G Network per month cost is 1000 but installed system cost at least 8000 per month, so there is no match.

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