

Intro to GIS Lab Tutorial

Material Adopted from Missouri University of Science and Technology Web-based instructional GIS Module through NSF

Fiber-Optic Right-of-Way Calculations Using GIS

The demands of the information transmission industry are quickly expanding beyond the capabilities of the current utility line network. As the quantity of available digitized resources expands and the medium for data transmission improves, the need to adapt new technology to the aging system becomes more apparent. This adaptation will involve the installation of new and improved transmission lines. Whenever a line is installed, a swath of land is removed, the line is inserted, and the soil is returned to cover the lines and eliminate exposure to the elements or vandals. This process requires the temporary appropriation of a strip of land and permanently limits its use in the future. To compensate for the inconvenience, a right-of-way must be purchased along the intended path. In most cases, the utility route crosses many plots of land that are owned by multiple individuals or entities. The route may also cross paved roadways which require additional costs associated with the destruction and reconstruction of the road.

In this laboratory, you will utilize a Geographic Information System (GIS) to plot a pre-determined utility route for a fiber-optic cable and calculate the cost associated with purchasing easements. A GIS is a system composed of electronic maps, information databases, and software tools. A software package manages this information and allows you to perform analysis to support engineering decisions.

You will be assigned a location rich in digital resources (i.e. a library) and a location with a high need for those resources (i.e. a university). You are to draw the specified route, apply the necessary right-of-way, and calculate the cost of installing the fiber-optic cable.

LAB OBJECTIVES:

Upon completion of this lab you should be able to:

1. Define the engineering objectives and requirements for installing a fiber-optic cable.
2. Plot a route for a fiber-optic cable installation based on global positioning system (GPS) coordinates.
3. Use a Geographic Information System (GIS) for determining the cost of installing a fiber-optic cable.

EQUIPMENT/MATERIALS:

- Computer
- Software – ArcGIS / Arcview®
- Data Packet to be downloaded (http://www.learn-civil-gis.org/Survey_data_R2.zip)

PROCEDURE:

A web-based learning system has been developed to guide you through the procedure on how to explore, examine, and analyze the spatial data necessary to support your evaluation of a utility route and determine the cost associated with its installation.

Before beginning, copy and paste to a web browser the following link: <http://www.learn-civil-gis.org/surveying.aspx>

Go to Step 2 to download data to Desktop or to a separate folder [Data is 53.3 MB]. Please download data beforehand and bring to the lab if at all possible.

Unzip the file. Proceed to Step 3 and Click Link to go through Module Tutorial.

DELIVERABLES (For Route B)

1. Map printout showing the proposed fiber-optic cable route (with right-of-way) superimposed onto the parcel data layer, the structures data layer, and the ortho-imagery. Ensure that you cover the entire effective area of the project. Your map should include: a title, a legend, a north arrow, and a scale (fit everything onto a standard 8 ½" x 11" sheet).
2. Map printout showing the existing utilities (i.e. sewer and storm drains) and the proposed fiber-optic cable route (with right-of-way) for the effective area of the project. These locations of intersection could require special attention for the installation process, so it is good to know. Again, your map should include: a title, a legend, a north arrow, and a scale (fit everything onto a standard 8 ½" x 11" sheet).
3. Table listing all the parcels that were crossed with the length of utility, the area of right-of-way, and the cost of installation indicated for each parcel. This is a deliverable, so try to make it look sharp. An example table is illustrated below (**use \$7 per sq ft as cost**).

Parcel ID	Length (ft)	Area (ft ²)	Cost (\$)
153594189	10	20	100
132265789	7	14	70
Total	17	34	170

REPORTING

The results and discussion will be reported in a professional memo format addressed to your TA. A memo template is attached. **Memo and Deliverables will be DUE before the start of your lab section the week of Dec. 3rd to Dec. 6th.**

Lab AA: Monday, Dec 3rd, 2012

Lab AB: Tuesday, Dec 4th, 2012

Lab AC: Wednesday, Dec 5th, 2012

Lab AD: Thursday, Dec 6th, 2012

From:
Your Name
University of Washington
Seattle, WA 98195
Phone #
yourEmail@uw.edu

Dec. 3, 2012

To:
Dr. Kamal Ahmed
121C More Hall
University of Washington
Seattle, WA 98195
206-543-7613
kamal@u.washington.edu

RE: Right-of-Way Cost Evaluation

Dear Sir,

This is the body of the memo. The body is where you describe: what tasks were requested, what tasks were accomplished, and what information was obtained from the laboratory procedure. The body should be one or two paragraphs long with the entire memo fitting one page (excluding attachments).

Different topics should be split into concise paragraphs that address each topic individually. Remember, clarity is the goal.

Thank You,

Your Name
Your Title

Attachments:

1. Attach documents in order of importance
2. List attachments in the order they appear
3. Label attachments in the upper-right corner and staple to the memo
4. Nothing is attached without listing it as attached.