

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**  
**ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ**  
**МІСЬКОГО ГОСПОДАРСТВА імені О. М. БЕКЕТОВА**

**МЕТОДИЧНІ ВКАЗІВКИ**  
для самостійної роботи  
з дисципліни  
**«ІНОЗЕМНА МОВА»**

*(для студентів 1 курсу денної форми навчання  
напряму 6.080101 – Геодезія, картографія та землеустрій)*

**Харків – ХНУМГ ім. О. М. Бекетова – 2015**

Методичні вказівки для самостійної роботи з дисципліни «Іноземна мова» (для студентів 1 курсу денної форми навчання напряму 6.080101 – Геодезія, картографія та землеустрій) / Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова; уклад.: А. М. Крохмаль. – Харків : ХНУМГ ім. О. М. Бекетова, 2015. – 55 с.

Укладач: к. пед. н., доцент А. М. Крохмаль

Методичні вказівки призначені для організації самостійної роботи студентів першого курсу згідно з затвердженою робочою програмою навчальної дисципліни «Іноземна мова», укладеної відповідно освітньо-кваліфікаційним вимогам до знань і вмінь студентів напряму підготовки «Геодезія, картографія та землеустрій», які в майбутньому будуть працювати у сфері будівництва.

Рецензент: канд. філол. наук, доцент О. Л. Ільєнко

Рекомендовано кафедрою іноземних мов,  
протокол № 1 від 27.08.2014 р.

## **Introduction**

The methodical recommendations are designed to help intermediate learners of geographic information systems (GIS) master and improve their active vocabulary. It is for learners studying English for specific purposes and for those who will need English in their job.

The booklet presents 15 units the information of which explains how, and why people use GIS and is also supported by the description of the GIS application by many organizations.

Only authentic materials are offered to the students.

Each unit presents a set of tasks which helps students integrate their skills in reading, writing and skills of vocabulary enlarging. The students are also expected to develop strong skills for vocabulary recording and memorizing.

The tasks cover topics relevant to the students to widen and deepen their knowledge in the subject.

The tasks can be done both in class or at home (as self-study) with further discussing and evaluating of the results.

Depending on the teacher's project as well as learning styles of the students some tasks or units can be omitted without damaging the aim of the present methodical recommendations.

We hope that the students will not only learn a lot but will also enjoy doing the tasks.

## ***UNIT 1***

### ***INTRODUCTION TO GIS***

In recent years people have been taking more responsibility for running their own communities, from deciding about education and public safety to planning growth and development. But running a community is not easy. Even within the smallest neighborhoods people often have differing points of view. In many towns, less and less money is available for public services. Having good information about the people, places, and things in the community is critical for making decisions that are practical and for working more efficiently.

Since geographic information systems came into common use in the early 1980s, more and more people have used computers to get detailed, up-to-date information about their community in the form of digital maps. But even more people who could be using GIS have yet to discover it. It's not for lack of books on the subject—a number of books about GIS exist. Some explain how GIS works from a conceptual or technical perspective. Others address the management side of GIS—how to implement it in an organization—while many other books teach how to use GIS software. But few books have shown how real people actually use GIS.

This book does just that, introducing what GIS is and how it works by showing some of the many ways people are using GIS to solve everyday problems in their communities. In these ‘tales from the digital map age’, people talk about why, and how, they use GIS. You'll see GIS put to a variety of uses: quickly finding an address in an emergency, creating efficient delivery routes, drawing new school boundaries, comparing the health of children from different neighborhoods, tracking the change in crime throughout a city, and many others.

For many years, GIS was a specialized field, composed of people whose sole job was to build geographic databases, perform analyses, and create maps. And while many still do specialize in GIS, many more use GIS as just one of the tools of their job, like a word processor or an electronic spreadsheet. Some use GIS software and data right out of the box, adding in their own data. Others customize the software with menus and buttons designed specifically for their data and their tasks. Still others combine GIS with information from other programs, such as spreadsheets or computer models.

What all this information presents is how GIS affects the daily lives of all of us, those who use it as well as those who benefit from it. You may even start to think about how GIS can play a role in your work and your community.

#### **Task 1.** Reading comprehension:

1. What does running the community include?
2. Is there enough money for public services?

3. What must be available for making practical decisions and efficient work?

**Task 2.** Give the corresponding translation of the following word-combinations:

1. come into common use \_\_\_\_\_
2. for lack of books \_\_\_\_\_
3. variety of uses \_\_\_\_\_
4. electronic spreadsheet \_\_\_\_\_
5. specialised field \_\_\_\_\_

**Task 3.** Match the words on the left with the corresponding translation on the right:

- |                    |                           |
|--------------------|---------------------------|
| 1. neighbourhood   | a. многочисленные способы |
| 2. public services | b. район                  |
| 3. many ways       | с. коммунальные услуги    |
| 4. critical        | d. общество               |
| 5. community       | e. основной, определяющий |

1	2	3	4	5

**Task 4.** Find in the text suitable adjectives to the following words as in the example:

**book(s) : *this / many other / few***

1. information: \_\_\_\_\_
2. tools: \_\_\_\_\_
3. software: \_\_\_\_\_

**Task 5.** Mind the difference between the following words:

affect [ 'fekt] = (v) (often passive)

effect [ i'fekt] = (v, n)

Now fill in the word ***affect*** or ***effect*** which best fits the following gaps:

1. We now suffer some harmful \_\_\_\_\_ on modern technology.
2. Your opinion will not \_\_\_\_\_ my decision.
3. A system failure has a knock-on \_\_\_\_\_ throughout the whole hotel.
4. Will government be \_\_\_\_\_ by the appointment of a new minister?

**Task 6.** Give the answers to the following questions in writing. Use the answers to reproduce the passage.

1. When did GIS come into use?

---

2. What form of information is used in GIS?

---

3. Why do people use GIS?

---

4. What do books on GIS explain?

---

5. What are the uses of GIS?

---

## **UNIT 2**

### **FINDING A LOCATION**

You can use GIS to quickly find and map the location of a person, building, or event. That lets you see who or what is closest to the location and how best to get there. Emergency dispatchers in Kennebunk, Maine, use a GIS-based dispatch system to find the location of people calling for help so they can give exact direction to emergency crews.

#### **What the system does...**

**1 ..Gets information about the location.** The dispatch system is tied into the police

department's phone lines. When an emergency call comes in, the dispatch system automatically gets the caller's phone number.



5	Winding Brook Drive	555-8642
90	Old Alfred Road	555-4201
24	Sea Garden Circle	555-3121
26	Sea Garden Circle	555-1734

**2 Searches the GIS database for a match.** The dispatch system uses the number to find the parcel that matches.

**3 *Displays the location.*** Once the system finds the matching parcel, it draws the

parcel in the center of the screen and shades it red. It also draws other features

from the database, such as streets and building outlines. The dispatchers know

exactly where the caller is located and can direct emergency crews to the scene.

### **More examples of using GIS to find a location...**

- Voters in Ontario, California, can call the local library on election day to find out

where their polling place is. The caller gives his or her nearest cross street, and a

clerk uses the GIS to display a map of the location, find out which precinct the

caller is in, and provide the location of the polling place, with directions, if necessary.

- VISA cardholders can use the World Wide Web to find a nearby ATM that takes

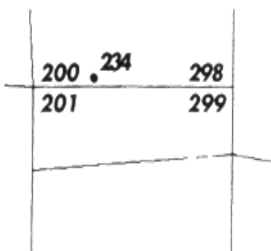
VISA. The cardholder enters a street address or intersection, city, and state. In a

few seconds, the GIS displays a map showing the cardholder's location and the

three nearest ATMs. The cardholder can then zoom to get a more detailed map.

### **An alternate way of finding a location...**

*200 Block of State Street*



A GIS can also use street address to find a location. It first locates the right street using the street name, the street type (e.g., 'Road' or 'Avenue'), and prefix (e.g., 'East' or 'West'). Then it uses the house number to find the correct block (234 State Street is in the 200 block). The GIS knows in which direction the house numbers increase, so it can calculate where the address is along the block (234 State Street would be about one-third of the way from the beginning of the block). Finally, since the GIS

knows which side of the street the odd and even numbers are on, it offsets the address to the correct side, and draws its location with a dot or other symbol.

**Task 1.** Reading comprehension.

1. What system is used to find the location of people, a building or an event?
2. What the three operations does the dispatch system perform?
3. What does a GIS use as a an alternate way of finding a location?

**Task 2.** Find the corresponding English equivalents to the following word combinations.

1. диспетчерская система \_\_\_\_\_
2. диспетчер, собирающий информацию \_\_\_\_\_
3. банковский автомат \_\_\_\_\_

**Task 3.** Match the adjective and the noun that best go together and give the corresponding translation in Russian.

- |             |              |
|-------------|--------------|
| 1. building | a. number    |
| 2. detailed | b. map       |
| 3. exact    | c. address   |
| 4. house    | d. outline   |
| 5. street   | e. direction |

**Task 4.** Form a noun denoting a person. Use the suffix *-er*. Then fill in the blanks with the new words in the following sentences.

1. dispatch \_\_\_\_\_
2. vote \_\_\_\_\_
3. call \_\_\_\_\_
4. provide \_\_\_\_\_
5. hold \_\_\_\_\_

1. A clear majority of \_\_\_\_\_ were in favour of a large sum of money for a new road.
2. A \_\_\_\_\_ gets information about the location.
3. We are one of the largest \_\_\_\_\_ of employment in the area.
4. Season-ticket \_\_\_\_\_ are furious at the rise in rail fares.
5. The \_\_\_\_\_ hung up.



**Task 5.** Match the words on the left with their Russian equivalents on the right.

- |                   |                                  |
|-------------------|----------------------------------|
| 1. emergency      | a. место голосования             |
| 2. dispatch       | b. отправка                      |
| 3. match          | c. чрезвычайное обстоятельство   |
| 4. parcel         | d. событие                       |
| 5. precinct       | e. всемирная сеть                |
| 6. feature        | f. пространственный объект       |
| 7. event          | g. округ, прилегающая территория |
| 8. polling place  | h. (земельный) участок           |
| 9. World Wide Web | i. ряд (движения машин)          |
| 10. lane          | j. соответствие, совпадение      |

1	2	3	4	5	6	7	8	9	10

**Task 6.** Find in the text the following verbs and translate the sentences with the following verbs into Russian in writing.

- |                            |       |
|----------------------------|-------|
| 1. искать                  | _____ |
| 2. давать, предоставлять   | _____ |
| 3. увеличивать изображение | _____ |
| 4. выяснить, понять        | _____ |
| 5. отмечать, размечать     | _____ |

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

### **UNIT 3**

#### **MAPPING WHAT'S HERE**

You can use GIS to create up-to-date customized maps of a neighbourhood, town, or city; maps that can focus attention on a specific issue by presenting information about the place in a graphic way. Several community development corporations in Philadelphia used GIS to map the status of housing and commercial property in their neighbourhoods, helping generate investment in new projects.

## What they did...

**1 Decided what the maps should show.** The neighborhood groups wanted to show

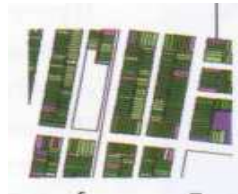
the need for investment in the neighborhood overall, as well as to identify blocks that might have the most potential for redevelopment (e.g., blocks with many vacant properties).

**2 Assembled the data in the GIS.** With help from staff at the City of Philadelphia,

the groups obtained the GIS database of property boundaries for their neighbourhood. The properties were already linked to the parcel tax database. They

also linked the parcels to other computer databases of tax delinquent and vacant properties.

APN	Mkt. Val.	Delinq.	Absentee
1813-058	\$4475	\$110	N
1813-080	\$2380	\$0	N
1813-139	\$11310	\$455	Y



**3 Created the maps.** Since the GIS tags each property with all its characteristics, it was easy for the groups to create the set of maps. For one map, they colour-coded the properties based on market value; for another, by amount of tax delinquency and so on. The maps were included in each neighbourhood's five-year plan.

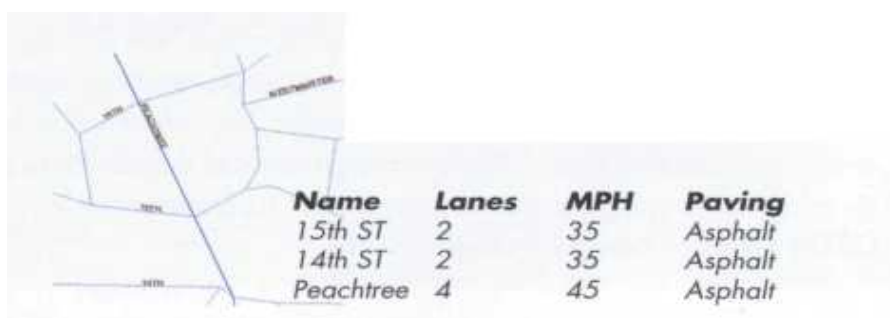
## How the GIS makes a map...

To draw a map using GIS, you tell the GIS which features to display. The GIS stores the 'geographic coordinates' of all the features. If you're mapping individual locations, such as customer addresses, the GIS draws a symbol at the spot

defined by the pair of geographic coordinates for each address. For linear features, such as streets, the GIS draws lines to connect the points (coordinate pairs) that define the shape of each street. For areas, such as a parcel of land, the GIS

can draw its outline or fill it in with a color or pattern. You specify the symbols, lines, and colors to use, or you can let the GIS pick them for you.

The GIS also stores the characteristics of each feature. So for each street the GIS may store a name, the number of lanes, posted speed, and pavement type. You can use these characteristics to specify how to draw the features. You could draw four-lane streets with a thick line and two-lane streets with a thin one. The GIS automatically draws each street using the right type of line since it knows which streets are four lanes and which are two.



**Task 1.** Reading comprehension. Answer the following questions in writing.

1. What system is used to get information in case of emergency?

---

2. What system helps to create a customized map?

---

3. What are the main steps to make a map?

a. 

---

b. 

---

c. 

---

**Task 2.** Circle **T** if the sentence is true and **F** if it is false.

	<b>True</b>	<b>False</b>
1. They present information about the place in a graphic way.	T	F
2. The maps cannot show what people need.	T	F
3. People assemble the data in the GIS.	T	F
4. The set of maps is usually white-and-black.	T	F
5. Each feature has an individual location on the map.	T	F

**Task 3.** Find the corresponding English equivalents to the following word-combinations.

1. доходный / прибыльный земельный участок \_\_\_\_\_

2. свободный / незанятый земельный участок \_\_\_\_\_

3. просрочка в уплате налогов \_\_\_\_\_

4. участок земли \_\_\_\_\_

5. карта, выполненная по индивидуальному заказу \_\_\_\_\_

6. конкретная тема для обсуждения \_\_\_\_\_

7. улица с четырьмя полосами движения \_\_\_\_\_

8. рыночная стоимость \_\_\_\_\_

9. индивидуальное местоположения \_\_\_\_\_

10. строительные работы на месте \_\_\_\_\_

\_\_\_\_\_ постоянного проживания группы людей

**Task 4.** Match the words on the left with their definitions on the right.

- |                 |  |
|-----------------|--|
| 1. to customize | a. определять                          |
| 2. to map       | b. размечать, определять место         |
| 3. to present   | c. хранить                             |
| 4. to obtain    | d. наносить на карту                   |
| 5. to tag       | e. выполнять по индивидуальному заказу |
| 6. to store     | f. передавать на рассмотрение          |
| 7. to specify   | g. устанавливать подлинность           |
| 8. to identify  | h. точно обозначать                    |
| 9. to define    | i. получать, применять(ся)             |
| 10. to spot     | j. отмечать, помечать                  |

1	2	3	4	5	6	7	8	9	10

**Task 5.** Choose the best word from those given to complete the sentences which follow.

customize	commercial	lanes	tag	parcels
delinquents	obtain	colour-coded	line	spot

1. You can \_\_\_\_\_ the software in several ways.
2. The movie was not \_\_\_\_\_ success.
3. Not everyone has an access to the database of vacant properties and tax \_\_\_\_\_.
4. 50 five-acre \_\_\_\_\_ have already been sold.
5. Why do they want to build a house on this particular \_\_\_\_\_?
6. The files have labels that are \_\_\_\_\_ according to subject.
7. They were stuck in a \_\_\_\_\_ of traffic.
8. The quickest way is through the back \_\_\_\_\_ behind the bus station.
9. They \_\_\_\_\_ each animal with a number for identification.
10. I finally managed to \_\_\_\_\_ a copy of the document.

## UNIT 4

### FINDING THE BEST ROUTE

You can GIS to find the shortest path between two points. That can help you get to your destination fast or help you create efficient delivery and pick-up routes. Customer service reps at Sears use a GIS-based system to map the best routes for their home delivery trucks.

#### What the system does...



- 1 **Locates the stops.** The GIS uses the street address to place each customer on the map.



**2 Groups the stops.** The system then assigns each stop to a route according to the number of available trucks, the size and weight of the merchandise, and how close the stops are to each other



**3 Sequences the stops.** The system determines the best order to make the stops, based on the time the delivery was promised. It avoids making the truck backtrack or travel too far out of its way.



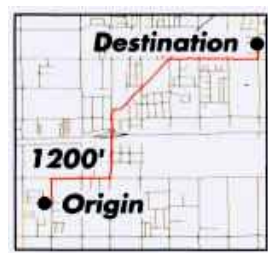
**4 Finds the shortest path.** Finally, the system finds the shortest path between the stops for each route and prints a list of directions for the driver.

### How the GIS finds the shortest path...

The GIS checks the distance from the starting point, or origin, to the next intersection in each direction. It picks the intersection closest to the origin and continues from there. That way, it identifies the intersections most likely to end up in the final shortest route. As it goes, it builds a list of the intersections it has reached and the distance from the origin to each, repeating the process until it reaches

the destination intersection. It then draws the shortest path between

the stops using the list of intersections.



### Using time instead of distance...

In many cases, the best route is better measured in travel time than in mileage. A GIS can calculate a fastest path by substituting time for distance. Some systems use the speed limit and the length of the street to calculate a travel time for each block. Others use average travel times calculated from traffic data, often with different values based on the time of day the trip occurs.

### More examples of using GIS to find the best path...

- In Ontario, California, residents who are elderly or disabled can call a Dial-A-Ride service staffed by volunteer drivers. The dispatcher uses GIS to calculate the shortest path between the caller and the driver, and then gives exact directions to the driver.

- To quickly restore electrical power after a storm, Boston Edison often runs a new cable to bypass the interrupted cable. Workers use GIS to find the best path for the new cable through available conduits. The GIS considers the size of the cable, which manholes are flooded, and other factors.

**Task 1.** Reading comprehension. Choose the best answer A, B, C or D to each question.

1. A GIS-based system helps in everything EXCEPT
  - A. finding the shortest path between two points.
  - B. creating efficient delivery routes.
  - C. picking-up the trucks.
  - D. mapping the best routes.
2. The underlined word ‘backtrack’ in No.3 is closest in meaning to
  - A. going in the right direction.
  - B. going along the wrong route.
  - C. going back in the same route.
  - D. going towards the nearest destination.
3. The most efficient measurement of the route is
  - A. travel time.
  - B. distance.
  - C. order of stops.
  - D. traffic data.

1	2	3

**Task 2.** Match the words with their definitions.

- |                 |                                 |
|-----------------|---------------------------------|
| 1. to measure   | a. обещать                      |
| 2. to sequence  | b. определять, измерять         |
| 3. to avoid     | c. перекресток                  |
| 4. to promise   | d. устанавливать порядок        |
| 5. intersection | e. предупреждать, предотвращать |
| 6. to bypass    | f. трубопровод                  |

- |                |                     |
|----------------|---------------------|
| 7. merchandise | g. нетрудоспособный |
| 8. manhole     | h. обходить         |
| 9. disabled    | i. люк              |
| 10. conduit    | j. товары           |

1	2	3	4	5	6	7	8	9	10

**Task 3.** Give the correct translation in writing of the word ‘way’ in the underlined sentences.

- \_\_\_\_\_
- \_\_\_\_\_

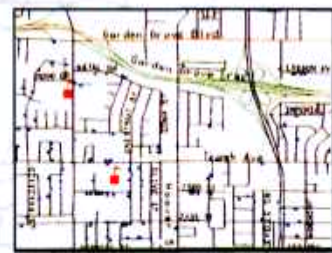
## UNIT 5

### WORKING WITH ADDRESS DATA

#### What’s in an address database?

An address database consists of a set of people, events, or things that have a known street address. Each address has at least a street name and number. **It** often also includes the street type (Rd, Blvd) and a directional prefix or suffix (East, NW). Each address also has a location in geographic coordinates.

That way it can be drawn on a map. Any amount of information may be associated with an address details about the people living there, the business or building at the address, or an event that occurred there.



**Students and school locations in Garden Grove, California**

#### Where does address data come from?

In most cases, the address information is already in a computer database: student records, customer records an organization's members, and so on. Usually, these addresses need geographic coordinates assigned to them. The GIS will automatically do this using a process called ‘address matching.’ In some cases, the address is supplied ‘on-the-fly,’ as when someone calls 911 and gives their address to the operator.



## What can a GIS address database be used for?

Just about anything for which you need to know the location of a street address:

- Locating customers and seeing where they are in relation to your stores
- Locating students to create attendance areas and bus routes
- Mapping the locations of crimes and looking for patterns and trends
- Responding to emergencies

## How is address information made available?

Many private companies and organizations sell databases of information that include a street address. In some cases, the addresses are already geographically located so they can be mapped in a GIS right away. You can also your own list of addresses by address matching it to a digital street map in the GIS.

**Task 1.** Put tick ( ✓ ) if a sentence is true or false.

1. Different types of information may be associated with an address database.
2. **Rd** and **Blvd** are directional suffixes.
3. A computer database usually has the assigned geographic coordinates.
4. To know the location of a street address you need to respond to emergencies.
5. In some cases you don't need to map the address into a GIS.

	1	2	3	4	5
True					
False					

**Task 2.** Choose the one best answer A, B, C or D to each question.

1. The underlined word 'it' stands for
  - A. a set of events.
  - B. a known address.
  - C. an address database.
  - D. a street number.
2. Each address has everything EXCEPT
  - A. geography.
  - B. a street name.
  - C. a directional suffix.
  - D. a prefix.
3. Any information dealing with an address includes

- A. database.
  - B. grammar details.
  - C. living things.
  - D. small facts about people
4. 'Address matching' is closest in meaning to
- A. combining the address well.
  - B. connecting the address.
  - C. doing the address shorter.
  - D. comparing the address with another one.
5. Private companies
- A. buy address information.
  - B. give address information for money.
  - C. exchange address information with some organizations.
  - D. map it in a GIS.

1	2	3	4	5

**Task 3.** Choose the best word from those given to complete the sentences which follow.

address	street	way	coordinates	list
---------	--------	-----	-------------	------

1. Address matching is a \_\_\_\_\_ of getting a list of street addresses into a GIS.
2. The GIS matches a \_\_\_\_\_ name and a number from the list to the same street name and the range of address numbers on the map.
3. The GIS assigns geographic \_\_\_\_\_ to the address.
4. The key to successful \_\_\_\_\_ matching is making sure the addresses on the list are correct and as specific as possible.
5. You find out the correct address and charge it on the \_\_\_\_\_.

## **UNIT 6**

### **FINDING WHAT'S NEARBY**

You can use GIS to find out what features are near a location and get information about them. This can save a lot of time and effort, especially if you need to look at many locations on a daily basis. Property owners in San Antonio, Texas, use a GIS at the Bexar Appraisal District to compare surrounding properties to theirs, so they can decide whether to file an appeal on their assessment.

#### **What the system does...**

**1 Finds the location.** To identify their parcel, property owners enter either their street address or the account number from their assessment notice.

**2 Defines the box around the location.** The GIS centres the map on the parcel and calculates a box—or ‘geographic extent’—around the parcel.



**3 Selects the features within the box.** Out of the 400,000 parcels in the district, the GIS selects just those that fall within the geographic extent.

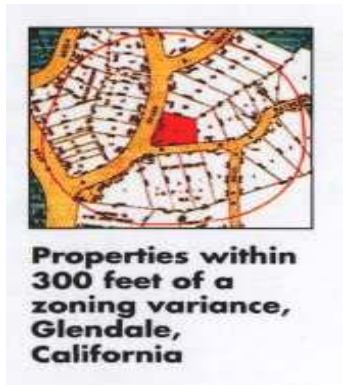
**4 Gets information about the features and displays it.** The GIS compares each selected property to the owner’s property for each characteristic (e.g., value, size) and creates color-coded maps. Owners can see right away whether their property has been valued the same as comparable ones.

#### **Another example of using GIS to find what's nearby...**

The City of Bellevue, Washington, uses GIS to find out which properties will be affected by street improvement projects. They create a 300-foot buffer around intersection projects, and a 100-foot buffer around roadway projects, and overlay the buffers on top of a parcel map. They then know exactly which property owners to notify before construction starts.

## Other ways of finding what's nearby...

If you need to find out what's within a certain distance of a location, you can create an area, or 'buffer', around the location. You tell the GIS which property or other feature to create the buffer around, and specify the distance.



The GIS creates the buffer and selects all the features that lie within it. The GIS also knows which features share boundaries. That lets you get information, for example, about just those properties bordering selected parcels of land.

**Task 1.** Choose the one best answer A, B or C to each question.

1. When finding what's nearby you
  - A. need to look at many locations.
  - B. save a lot of time.
  - C. consult many property owners.
2. Any property owner's parcel has everything EXCEPT
  - A. a notice.
  - B. an account number.
  - C. a street address.
3. The colour-coded maps characterize a parcel from the point of view of its
  - A. owners.
  - B. colour.
  - C. features.
4. A 300-foot buffer here is
  - A. a big round metal device in the City of Bellevue.
  - B. a thing that protects a street against difficulties.
  - C. a specifically created area to find out some specifications.
5. The underlined phrase 'knows which features share boundaries' is closest in meaning to
  - A. which properties border distant locations.
  - B. which parcels have long boundaries.

C. which parcels are the adjacent ones.

**Task 2.** Put a tick ( ✓ ) to show if the sentence is true or false.

1. GIS is an efficient means of assessing the location of features.
2. Property owners use a GIS to assess different features.
3. The procedure of finding what's nearby includes four steps.
4. The geographic extent defines the parcel to be compared.
5. The dispatchers notify those owners whose properties can be affected by the street improvement projects.
6. Improvement projects cannot cause an adverse effect on the owners' properties.
7. Buffers are special areas within a certain distance.
8. Buffers are created to specify the distance between the locations.
9. The characteristic of a property includes its size and value.
10. The text deals with the description of features that are nearby.

1	2	3	4	5	6	7	8	9	10

**Task 3.** Complete the following table.

Abstract noun	Adjective	Abstract noun	Adjective
geography	_____	_____	distant
information	_____	_____	district
construction	_____	_____	creative

## UNIT 7

### WORKING WITH LAND PARCEL DATA

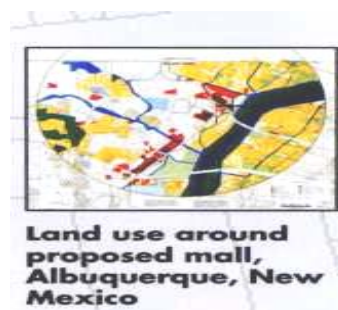
**What is a parcel database?** A city or country parcel database contains boundaries (lot lines) that denote land ownership. The database also includes the characteristics of each parcel, often over a hundred different pieces of information about each.



**Where does parcel data come from?** The boundary information is digitized or scanned from paper maps, drafted and digitized from aerial photos, or entered on the computer keyboard using COGO. The parcel characteristics come from deeds, building permits, field inspection, and other sources.

**What are parcel database used for?** Almost anything having to do with land ownership. Here are some examples:

- Property tax assessment
- Land use and zoning maps and studies
- Economic development analysis
- Real estate transactions



**How is parcel information made available?** Many local governments have set up public-access terminals that let you see the information and create custom maps. Others will create custom maps for you, for a fee. Some cities and countries also sell their parcel database on tape or CD-ROM at a nominal cost.

**Task 1.** Read the text.

**Task 2.** Match the left~ and right-hand columns.

- |             |                             |
|-------------|-----------------------------|
| 1. lot      | a. недвижимое имущество     |
| 2. boundary | b. сделка, дело             |
| 3. deed     | c. составлять план, чертить |

4. COGO (Coordinate GeOmetry) d. зональная карта, карта зонального распре-  
деления объектов
5. real estate e. дело, акт
6. transaction f. область знаний, сфера деятельности
7. to draft g. участок (земли)
8. custom map h. граница, очертание, линия раздела
9. field i. карта для покупателя, клиентов
10. zoning map j. язык программирования для решения  
(некоторых) геометрических и инженерных задач

**Task 3.** Put a tick ( ✓ ) if a sentence is true or false.

1. A parcel database includes many pieces of information about a land owner.
2. Parcel data come from different sources.
3. The boundary information comes from paper maps.
4. Aerial photographs are drafted from paper maps
5. Parcel databases have specific uses.
6. Parcel information is accessible to general public.
7. One can get or find the parcel information free of charge.
8. Local governments are not interested in making the parcel information available.
9. Custom maps present information about parcels.
10. The parcel information is usually sold at a nominal cost.

	1	2	3	4	5	6	7	8	9	10
True										
False										

**Task 4.** Choose the best answer A, B, C or D to each question.

1. Parcel data contain information on everything EXCEPT
  - A. land ownership.
  - B. parcel boundaries.
  - C. owner's address.
  - D. characteristics of each parcel.
2. Parcel data comes from everything EXCEPT
  - A. paper maps.
  - B. aerial photos.
  - C. parcel characteristics.
  - D. digital forms.
3. The parcel characteristics come from everything EXCEPT
  - A. field inspection.
  - B. field of science.
  - C. field data.
  - D. research of the field of application.
4. Parcel databases are used by everything EXCEPT
  - A. land owners.
  - B. experts in GIS.
  - C. scientists and learners.
  - D. navigators.
5. One cannot get, find or buy the information about parcels
  - A. at an airport terminals.
  - B. from parcel database on tape or CD-ROM.
  - C. from custom maps.
  - D. at public-access terminals.

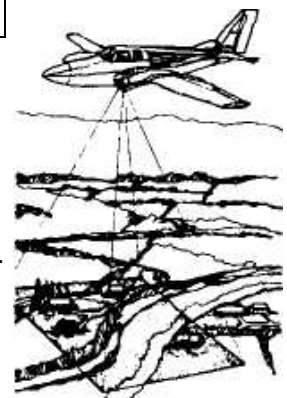
1	2	3	4	5

**Task 5.** Choose the best word from those given to complete the sentences in the passage.

parcel photograph computer coordinates community

### AERIAL PHOTOGRAPH

Taken from a small plane at a low altitude (around 1,000 feet), aerial (1) \_\_\_\_\_ cover an area of about a half-mile square. Usually a series of photos is taken to cover an entire (2) \_\_\_\_\_. Once scanned into the (3) \_\_\_\_\_,





the photos can be registered to geographic (4) \_\_\_\_\_ and displayed with other features in the GIS. They are often used to create or update information on (5) \_\_\_\_\_ boundaries, streets, and land use.

**Task 6.** Now translate the above given passage in writing into Russian.

## **UNIT 8**

### **FINDING WHAT'S INSIDE AN AREA**

You can use GIS to get information about the people and things in a specific area. The Greenville, South Carolina, Fire Department uses GIS in case of a toxic gas leak or other emergency to find out which streets, schools, and hospitals need to be evacuated. The GIS also calculates the total number of residents within the area, so the Red Cross knows how many shelters are needed.

#### **What they do...**

**1 Define the affected area.** The fire chief uses a computer model to estimate how

far the toxic plume is likely to spread, and in which direction. That becomes the

evacuation area.

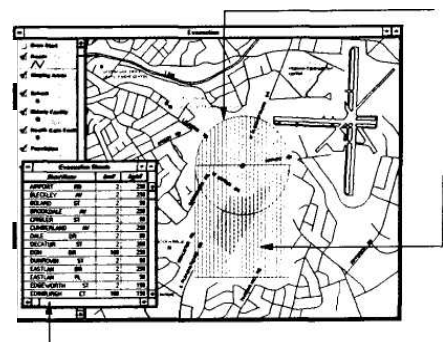
**2 Draw the boundary in the GIS.** The chief draws the boundary of the evacuation

area on the computer screen, using streets as a backdrop for reference.

**3 Query the GIS database.** The GIS uses

boundary to find the streets, schools, and hospitals that fall within it. It also overlays the boundary with census tracts to find

the tracts inside the evacuation area.



**3 Display the map and information.** The GIS displays a map with the selected streets, schools, and hospitals highlighted. It also lists the address ranges for each street, and the name and address of each school or hospital. The GIS totals the population within the census tracts to find the number of residents affected. The chief relays the information to police and to the Red Cross so they can begin the evacuation.

**Other Ways of defining the area...**

There are several ways to create an area in the GIS, besides drawing it freehand. You could use an existing area, such as a ZIP Code, census tract, or school attendance area. Or you could specify all the area within a certain distance of a place. Whichever method you use, once you define the area, the GIS can list individual features with their characteristics, find just those features that meet some criteria you specify, or create summary statistics for the area.

**Task 1.** Read the text.

**Task 2.** Match the left~ and right-hand columns.

- |                |  |
|----------------|--|
| 1. emergency   | a. султан; шлейф загрязняющих веществ                |
| 2. tract       | b. рисунок от руки                                   |
| 3. fire chief  | c. участок, пространство, территория                 |
| 4. toxic plume | d. начальник пожарной службы                         |
| 5. backdrop    | e. территория, где произведена перепись населения    |
| 6. to query    | f. подводить итог, подсчитывать                      |
| 7. census      | g. фон, основа                                       |
| 8. to overlay  | h. накладывать, совмещать                            |
| 9. to total    | i. критическое положение, авария                     |
| 10. freehand   | j. делать запрос, давать задание на поиск информации |

1	2	3	4	5	6	7	8	9	10

**Task 3.** Put a tick ( ✓ ) if a sentence is true or false.

1. GIS is the only source of information about the people and things.
2. In case of emergency the situation is estimated by using a computer model.
3. The information necessary for the people's evacuation is displayed on the computer screen.
4. It is the police and the Red Cross who start evacuating people.
5. The list of individual features partially characterizes the affected area.

	1	2	3	4	5
True					
False					

**Task 4.** Choose the best answer A, B, C or D to each question.

1. A specific area for people is everything EXCEPT
  - A. a place where a toxic gas leaks.
  - B. a region which has been badly damaged.
  - C. the parts of the country that have been covered by a large amount of water.
  - D. a region of a country or the world where something often happens or exists in large numbers.
2. The affected area is
  - A. a greatly changed place.
  - B. a place that produces strong feelings.
  - C. a place producing a successful results.
  - D. a place that makes something happen.
3. The 'highlighted objects' mean
  - A. objects that started to burn.

- B. objects easy to leave of move to.
  - C. objects made easy to notice.
  - D. objects made lighter on the map.
4. The process of officially counting some particular information is called
- A. census.
  - B. sense.
  - C. screen.
  - D. security.
5. ZIP code is
- A. postcode.
  - B. computer code.
  - C. instruction code.
  - D. source code.

**Task 5.** Choose the best word from those given to complete the passage below.

mapped   boundary   data   lots   noise

MORE EXAMPLES OF USING GIS TO FIND WHAT'S INSIDE AN AREA...

- The Illinois Department of Nuclear Safety used GIS to find residential (1) \_\_\_\_\_ within a contaminated area in West Chicago, Illinois. The department mapped the area using GPS, then overlaid the (2) \_\_\_\_\_ with the map of lot lines. The information helped them decide where to start and to track the progress of the cleanup.
- GIS helped determine who would be affected by (3) \_\_\_\_\_ from the Munich Airport II near the city of Freising, Germany. Different air traffic patterns were (4) \_\_\_\_\_ and overlaid with population (5) \_\_\_\_\_. The information helped airport planners make traffic patterns that would affect the fewest people.

**Task 6.** Now translate the above given text into Russian in writing.

## UNIT 9

### DRAWING THE BOUNDARY

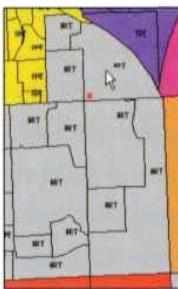
You can use GIS to draw boundaries in different ways so you can create an area that best meets your needs. Members of the planning committee for the Blue Valley School District in Overland Park, Kansas, use GIS to create attendance boundaries for new schools.

#### Here's what they do...

**1 Set the criteria.** Each attendance area has to have a certain number of students so

the School will be neither overcrowded nor underused. The school has to be small

enough so students won't have too far to travel to school, and should avoid splitting neighbourhood



Subdivision	Students
100231	62
100344	51
100267	32
101233	46
101465	16
102298	21
102399	27
102429	12
102688	41
105744	24
105322	43
105245	17
<b>TOTAL</b>	<b>392</b>

**2 Combine areas to create the boundary.** Committee members select which

subdivisions they want to include within the boundary, and the GIS tags them

with the school's code. The GIS knows the number of elementary students within each subdivision, so it can total the number of students within the proposed boundary.

**1 Evaluate the options.** Committee members can change the boundary by changing

which subdivisions they select. The GIS automatically retotals the number of

students. Committee members and parents can focus on the options that have the

right number of students to see which would best meet the other criteria.

**2 Create the final map** The GIS shades all the tagged subdivisions in one colour so committee members can easily see the area they have created. The they send the proposed boundary to the school board for final approval.



**Other ways of creating boundaries...**

You can also use GIS to create a boundary by defining an area within a set distance of a location. This is especially useful for locations that have to be at or near the centre of the area, such as fire stations. The GIS works outwards from the location, totalling the distance along each street until the specified limit is reached. Or, instead of distance, you could have the GIS total up the travel time or the number of people living along each street until it reaches some limit.

You can also create a boundary just by drawing it on the screen wherever you want. Usually you display other information to guide you. If you are creating a sales territory, for example, you'd probably display streets and the locations of your customers.

**Task 1.** Read the text.

**Task 2.** Put a tick ( ✓ ) if a sentence is true or false.

1. There are different ways of drawing boundaries of a particular area.
2. The planning committee creates and approves the final map.
3. They evaluate the options when drawing the boundaries.
4. When creating the boundaries the distance, the number of people and the travel time are considered.
5. New boundaries are only created for the sake of analysis.

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
True					
False					

**Task 3.** Choose the one best answer A, B, C or D to each question.

1. They draw boundaries
  - A. to define the best place that meets the particular needs.
  - B. to measure the size of the particular territory.
  - C. to limit the edges of an area.
  - D. to separate one area from another.
2. The procedure of drawing boundaries involves
  - A. two steps.
  - B. three steps.
  - C. four steps.
  - D. unlimited number of steps.
3. The number of students is totaled in order to
  - A. include them within the new boundaries.
  - B. tag them with the school code.
  - C. not to make the school overcrowded or underused.
  - D. provide them with a final map.
4. A set distance of a location means
  - A. a group of locations.
  - B. a fixed or planned distance.
  - C. an amount of space between the places.
  - D. a place outside the location.
5. When creating boundaries they use the following pieces of information EXCEPT
  - A. the distance to the centre of the area.
  - B. the number of people.
  - C. the relevance to the needs.
  - D. the performance of a computer.

**Task 4.** Match the left~ and right-hand columns.

- |               |                                     |
|---------------|-------------------------------------|
| 1. attendance | a. район сбыта, сбытовая территория |
| 2. to split   | b. делить на части                  |

- |                      |   |
|----------------------|---|
| 3. to tag            | c. посещаемость                           |
| 4. code              | d. одобрение; санкция; согласие           |
| 5. underused         | e. размещение; определение местоположения |
| 6. proposed boundary | f. связывать, соединять                   |
| 7. fire station      | g. свод законов, кодекс                   |
| 8. sales territory   | h. граница, ограничение                   |
| 9. location          | i. недостаточно используемый              |
| 10. approval         | j. пожарная станция                       |

1	2	3	4	5	6	7	8	9	10

**Task 5.** Choose the best word from those given to complete the passage below.

GIS maps public districts creation
------------------------------------

**ANOTHER VEXAMPLE OF USING GIS TO CREATE BOUNDARIES**

...

The Texas Attorney General’s Office uses (1) \_\_\_\_\_ to analyze legislative districts, both current and proposed. (2) \_\_\_\_\_ created with the GIS are often used as courtroom exhibits, to show that (3) \_\_\_\_\_ comply with the Voting Rights Act and to examine voting patterns. The office also makes maps available to the (4)\_\_\_\_\_ and has assisted interested parties in the (5) \_\_\_\_\_ of legislative and juridical districts as well as city council, county commissioner, and justice of the peace precincts.

**Task 6.** Now translate the above given text into Russian in writing.

**UNIT 10**

**WORKING WITH DISTRICTS AND BOUNDARY DATA**

**How does a GIS store boundary data?**

The GIS stores the boundary lines that enclose a district or other area, identifying it by a unique number and usually also by a name. The GIS also stores



information about each area, such as its size, the number of people living within it, and other characteristics.

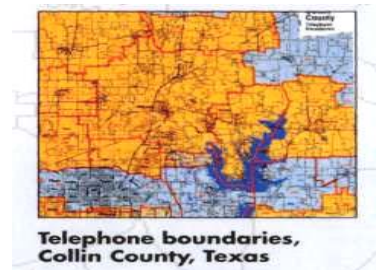
### **Where does boundary data come from?**

Some boundaries are part of a nationwide system (census tracts, counties, ZIP Codes) created by the U. S. Bureau of the Census, the U. S. Postal Service, and other agencies. Many local public and private organizations, such as school board, police departments, and retail businesses, create boundaries for their own purposes.

### **What are districts used for with GIS?**

People use districts and other areas to help organize or subdivide a place so it can be more easily managed. Districts are often also used to summarize information about people or activities. Here are some examples:

- Assigning officers and summarizing weekly crimes by police beat.
- Assigning sales people and summarizing quarterly revenues by sales territory.
- Creating congressional districts and summarizing population and ethnic makeup.
- Summarizing income and age by ZIP Code to target sales promotions.



### **How is boundary information made available?**

Census and ZIP Code boundaries are available from government or private sources already in digital format, on disk, CD-ROM, or via the Internet. Locally created boundaries are generally used only by the organization that created them, although the information may be displayed as maps or on a computer during public meetings. Some local organizations may make their boundary databases available on disk or tape

**Task 1.** Read the text.

**Task 2.** Put a tick ( ✓ ) if a sentence is true or false.

1. Every district or any area has its unique number or name.
2. Each area is identified by its size and the number people living within it.
3. The agencies and organizations store boundaries for their own purposes.

4. Districts and boundary data manage people who live there.
5. Boundary information is available from different sources.

**Task 3.** Match the left~ and right-hand columns.

- |                       |   |
|-----------------------|---|
| 1. to enclose         | a. округ (в США)  |
| 2. census tract       | b. школьный совет   |
| 3. county             | c. полицейский дозор, ~ обход                                   |
| 4. ZIP Code           | d. заключать, включать в себя                                   |
| 5. school board       | e. этнический состав, ~ структура                               |
| 6. retail business    | f. почтовый индекс (в США)                                      |
| 7. boundary           | g. граница, контур, очертание                                   |
| 8. police beat        | h. поквартальный доход, доходные статьи                         |
| 9. quarterly revenues | i. предприятие розничной торговли                               |
| 10. ethnic makeup     | j. участок, территория, где произведена<br>перепись (населения) |

1	2	3	4	5	6	7	8	9	10

**Task 4.** Translate into Russian in writing the passage ‘How is boundary information made available?’

## ***UNIT 11***

### ***WORKING WITH STREET DATA***

#### **What’s in a street database?**

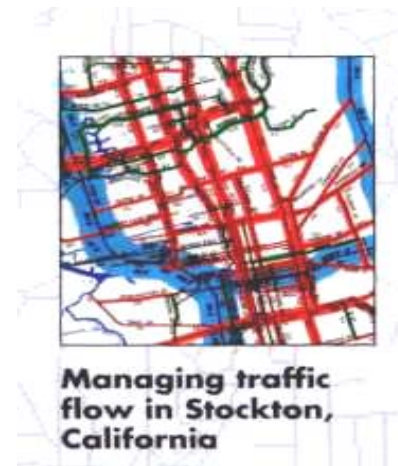
A city or county street database consists of street centrelines and the intersections, or nodes, where streets cross or meet. The centrelines and intersections show where streets are located and how they are connected. The database also includes information about each street.

## Where does street data come from?

Many city and county departments have surveyed their streets and store this data in a CAD system. This data can also be used by a GIS. Some counties have created street databases from their parcel databases by drafting and digitizing the street centrelines. The U. S. Bureau of the Census has also created a nationwide database of streets with addresses. Many local agencies start with this data and update it using locally collected information on address ranges, street types, traffic flow, and so on.

## What can a GIS street database be used for?

- Creating and updating street maps.
- Scheduling and tracking street maintenance.
- Dispatching and routing emergency vehicles.
- Managing traffic flow.
- Creating bus routes. Routing delivery trucks.



## How is street data made available?

The U. S. Bureau of the Census sells its street files, known as TIGER/Line files, on CD-ROM. Many libraries also have the TIGER/Line CDs for their state. A number of private companies sell corrected and updated versions of the Census Bureau streets. Some local and regional governments also sell street databases they've created.

**Task 1.** Read the text.

**Task 2.** Put a tick ( ✓ ) if a sentence is true or false.

1. Street databases involve information about people living on the city streets.
2. CAD systems store information about street centerlines and intersections.
3. The U. S. Bureau of the Census deals with street databases.
4. A GIS street database has a wide range of uses.
5. Street data is hardly available.

**Task 3.** Match the words on the left with the corresponding translation on the right.

- |                                |  |
|--------------------------------|--|
| 1. centreline                  | a. учреждение, организация   |
| 2. node                        | b. движение транспорта   |
| 3. to survey                   | c. узловая точка, точка пересечения                                  |
| 4. CAD (computer-aided design) | d. транспортное средство   |
| 5. to digitize                 | e. система автоматизированного проектирования                        |
| 6. agency                      | f. осевая линия, линия центров                                       |
| 7. to update                   | g. текущий ремонт, техническое обслуживание                          |
| 8. traffic flow                | h. обновлять, корректировать, исправлять                             |
| 9. maintenance                 | i. преобразовывать в цифровую форму, отцифровывать, дискретизировать |
| 10. vehicle                    | j. осматривать, исследовать, обследовать                             |

1	2	3	4	5	6	7	8	9	10

**Task 4.** Choose the best word to fill each gap from the alternatives given below.

#### TIGER/Line

TIGER/Line is the geographic (1) \_\_\_\_\_ the U. S. Bureau of the Census uses in conducting the census. It includes (2) \_\_\_\_\_ and addresses, census tracts, city and county boundaries, and more. TIGER/Line data can be converted into a (3) \_\_\_\_\_

\_\_\_\_\_ readable by a GIS and used for many types of analysis and mapping. The data is soled by the Census Bureau on CD-ROM, as well as by (4) \_\_\_\_\_

\_\_\_\_\_ Vendors who have enhanced the data with additional information. TIGER is an (5) \_\_\_\_\_

\_\_\_\_\_ for Topologically Integrated Geographic Encoding and Referencing system.

1. A. data                      B. number                      C. letter
2. A. lines                      B. lanes                      C. streets
3. A. form                      B. format                      C. formula
4. A. private                      B. general                      C. common
5. A. article                      B. word                      C. acronym

**Task 5.** Translate into Russian in writing the text ‘TIGER/Line’.

## **UNIT 12**

### **MAPPING NETWORKS**

You can use GIS to map complex networks such as gas, water, or electric, so you can take quick action if there’s a break or other interruption. Workers at Cherokee Metropolitan District in Colorado Springs, Colorado, use GIS in case of a water main break to find out which houses are connected to the main.

#### **What they do...**

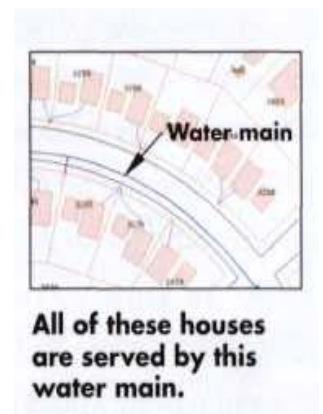
**1 Zoom in the location.** The district manager enters the address where the leak was reported. The GIS displays a street map of that block.

**2 Draw the network features.** The manager then clicks several buttons to display the critical features: the main, building

footprint of each house on the block, and the location of the water service for each.

He prints the map.

**3 Identify the connected features.** The repair crew uses the map in the field to identify the houses that are connected to the broken main. The workers then notify



residents that they are starting repairs.

### How a geographic network works...

The point where networked lines connect to each other, such as an electrical pole, is called a 'node'. The GIS stores a list of all the nodes and the lines that connect to each .



The GIS also knows which other features, such as transformers, switches, and meters, the lines connect to.

Since the GIS also knows the direction of flow along each line, it can determine what is upstream and downstream from a given point in the network. If, for example, a transformer goes out, you can immediately see which houses are affected.

The GIS stores information about each feature: the type of pole or transformer, whether lines are above or underground, whether switches are open, or closed. Different symbols on the map indicate what each feature is. There may be additional information for each feature, such as the last date a pole was serviced. The information can be displayed by simply clicking on it.

**Task 1.** Read the text.

**Task 2.** Choose the one best answer A, B, C or D to each question.

1. The failure of a complex network can be eliminated thanks to everything EXCEPT

- A. the use of GIS which displays the critical features.
- B. mapping the location of a failure.
- C. quick actions of the repair group.
- D. many examples of using a GIS.

2. The word 'main' is closest in meaning to

- A. a large pipe that carries water or gas.

- B. the largest or most important thing.
  - C. personal property.
  - D. the centre of an area.
3. The underlined phrase in the text 'uses the map in the field' is closest in meaning to
- A. in a particular area of land.
  - B. by a group of people with special technical skills.
  - C. in practice work rather than working in a laboratory.
  - D. on one's own.
4. The nodes and lines of a geographic network are
- A. interconnected.
  - B. continuous.
  - C. displaced.
  - D. boundary.
5. The printed map with network features is helpful in
- A. giving additional information for each feature.
  - B. remembering the location.
  - C. identifying the location of a break.
  - D. displaying the information.

**Task 3.** Match the left~ and right-hand columns.

- |            |   |
|------------|---|
| 1. zoom in | a. фидер, питающее устройство                   |
| 2. main    | b. полюс (эл.)                                  |
| 3. node    | c. магистраль, трубопровод, основная линия      |
| 4. pole    | d. извещать, уведомлять                         |
| 5. switch  | e. быстро перемещаться в каком-либо направлении |
| 6. feeder  | f. узловая точка, место соединения              |
| 7. sewer   | g. (пространственный) объект                    |

8. meet the requirements    h. соответствовать требованиям  
 9. to notify    i. канализация, канализационная труба  
 10. feature    j. переключатель

1	2	3	4	5	6	7	8	9	10

**Task 4.** Use the following verbs to fill the gaps.

uses    helps    keeps    think    monitors    calculate    deliver    turns

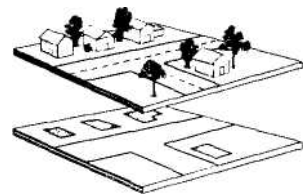
GIS is not the only computer technology the district (1) \_\_\_\_\_. Another system (2) \_\_\_\_\_ the water level in the tanks and automatically (3) \_\_\_\_\_ wells and pumps on and off. And when they read the meters, crews use handheld computers to enter and (4) \_\_\_\_\_ water usage. But it's the GIS that (5) \_\_\_\_\_ the repair crew maintain the network of pipes and valves that (6) \_\_\_\_\_ the water to people's homes. Water is one of the basic services that people usually don't (7) \_\_\_\_\_ about until it's not there. The district's GIS helps make sure the water (8) \_\_\_\_\_ flowing.

**Task 5.** Translate the passage from Task 3 into Russian in writing.

**Task 6.** Complete the passage with words from the box.

**BUILDING FOOTPRINT**

companies    outline    databases    features    located



A building footprint is the (1) \_\_\_\_\_ a building makes on the ground. Building

footprints are often used on maps to show where the building is (2) \_\_\_\_\_ in relation to other (3) \_\_\_\_\_ such as curbs, lot lines, water and sewer lines, and other buildings. Building footprints are common in the GIS (4) \_\_\_\_\_ used by utility(5) \_\_\_\_\_, property tax assessors, police, and fire departments.



## **UNIT 13**

### **WORKING WITH UTILITY DATA**

#### **What's in utility database?**

A utility database contains the objects that make up the network of that utility: pipes, valves, and meters for water utility; wires, transformers, poles, and meters for an electric utility; and so on. The database also contains information about the characteristics of each of the objects.

#### **Where does utility data come from?**

Traditionally, utility companies have used paper maps to show where objects in the network are. These maps are digitized or scanned and added to the GIS database. Utilities also use aerial photography to get the location of objects in the network that are above ground – manhole covers, valve covers, hydrants, street lights, utility poles, and so on – and then digitize that information into the GIS. Information about the objects is kept in tables and databases. The GIS is used to link this information to the digital maps.

#### **What can a GIS utility database be used for?**

Anything having to do with managing the flow through a network. Here are a few examples:

- Tracing through an electrical grid to find the source of a power outage
- Monitoring the condition of pipes in a natural gas pipeline
- Keeping track of scheduled flushings of sewers
- Designing the layout of fiber-optic cables for a telecommunication system

#### **Who uses the utility information?**

Utility databases are mainly used by the private companies and public utility districts that provide the utility service. These organizations may exchange data with each other and with local government agencies. When they work with a common set of information, the organizations can be more efficient when planning, performing maintenance, and responding to emergencies. Many communities also use a GIS utility database for the One Call or DigSafe telephone numbers that homeowners or construction crews call to find out where the utility lines are before they dig.

**Task 1.** Read the text.

**Task 2.** Put a tick ( ✓ ) if a sentence is true or false.

1. An organized set of data that contains the information about complex networks and utilities is called a utility.
2. Paper maps of the utility companies are digitized into the GIS database.
3. The location of objects in the network can be obtained in different ways.
4. A GIS utility database has a very specific application.
5. Private companies and public utility districts provide the utility information.

	1	2	3	4	5
True					
False					

**Task 3.** Match the left~ and right-hand columns.

1. utility
  2. to add
  3. valve
  4. hydrant
  5. pole
  6. to manage
  7. to trace
  8. outage
  9. maintenance
  10. to flush
- a. особая точка
  - b. техобслуживание, текущий ремонт
  - c. предприятия общественного пользования, коммунальные предприятия
  - d. гидрант, водоразборный кран, вывод
  - e. прибавлять, добавлять
  - f. промывать, смывать (водой)
  - g. утечка
  - h. уметь обращаться, справляться, владеть
  - i. следить, прослеживать
  - j. клапан; вентиль, задвижка

1	2	3	4	5	6	7	8	9	10

**Task 4.** Use the following words and phrases to fill the gaps.

efforts	computer	community	network	GIS
analysis	mapping	rainfall	heavy	spots

#### LOCATING STORM SEWER PROBLEMS IN CINCINNATI, OHIO

The Metropolitan Sewer District of Greater Cincinnati uses (1) \_\_\_\_\_ to locate trouble (2) \_\_\_\_\_ in the storm sewer (3) \_\_\_\_\_ by tracking

complaints after a (4) \_\_\_\_\_ rain. By (5) \_\_\_\_\_ the relationship between complaints and amount of (6) \_\_\_\_\_, they can see where to focus preventive maintenance (7) \_\_\_\_\_ - keeping sewers free of debris, for instance. 'This spatial (8) \_\_\_\_\_ could not be feasibly performed by any other means than GIS', says Dr. Michael Sweeney, the district's deputy director. Sweeney also uses GIS on laptop (9) \_\_\_\_\_ to present the information to citizens at (10) \_\_\_\_\_ meetings.

**Task 5.** Translate the passage from Task 3 into Russian in writing.

### **UNIT 14**

#### **MEASURING TIME AND DISTANCE**

You can use GIS to find an area within a given distance or travel time of a location. You can then find out who or what is in that area. Planners at Portland Metro measured travel time along streets to find out how many people were within a fifteen-minute drive of yard debris recycling depots so they could estimate how many people were likely to use them.

#### **What they did...**

**1 Assigned an average travel time to each street.** The planners started by having the GIS calculate the average time needed to drive each street segment, from intersection to intersection. They first assigned each segment an average travel time value, based on its type – local residential, major thoroughfare, and so on. The

GIS multiplied the street length by the travel time value to get the time needed to drive each particular segment. For example, a residential street may be driven at 30 m.p.h., on average. That converts to two minutes per mile. If a block is one-tenth of a mile long, it would take 0.2 minutes to drive the length of that block.

**2 Found the streets within the specified travel time.** The GIS started at the intersection nearest the recycling depot, the ‘origin’, and worked outward. At each intersection it checked the street segments in all directions and tagged

them if the cumulative travel time from the origin was less than the limit (fifteen minutes in this example). If continued until all street segments within fifteen minutes of the origin had been tagged. The GIS worked outward from simultaneously. That way streets were always allocated to the closest depot.



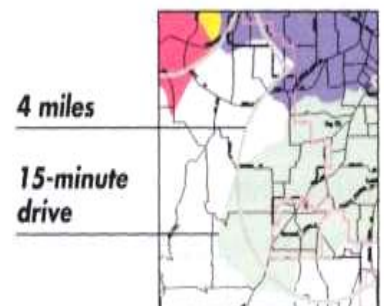
**3 Created the travel time boundaries.** Once the GIS had tagged the streets within fifteen minutes of each depot, the planners drew boundaries to enclose the area covered by the tagged streets surrounding each depot.



**4 Overlaid the boundaries with other data.** The planners then used the GIS to overlay the travel time boundaries with census information to find the number of house-holds within fifteen minutes of each depot.

**Other way of finding the distance from a location...**

Instead of travel time, you can use actual mileage along the streets. Travel time varies based on speed limit, time of



day, and other factors, but mileage is constant. Another way of finding the distance from a location is to have the

GIS draw a circle around the location. You specify the radius of the circle. This method is quicker, but less exact, than using mileage or travel time along streets.

**Task 1.** Read the text.

**Task 2.** Put a tick ( ✓ ) if a sentence is true or false.

1. The passage primarily describes the use of GIS to measure distance.
2. The number of people in a particular place can be estimated by measuring their travel time.
3. The estimation of travel time is closely connected with the name and length of the street.
4. The specified travel time is used to create the travel time boundaries.
5. The presented steps of measuring time and distance were done by the designers at Portland Metro.

	1	2	3	4	5
True					
False					

**Task 3.** Match the left- and right-hand columns.

- |                |   |
|----------------|---|
| 1. yard debris | a. направленный наружу                                |
| 2. deport      | b. отмечать, помечать                                 |
| 3. outward     | c. уличный мусор                                      |
| 4. to estimate | d. размещать, распределять                            |
| 5. to tag      | e. (точно) определенный, установленный<br>вычисленный |
| 6. cumulative  | f. (лат.) перепись, учет (населения)                  |
| 7. census      | g. изменяться   |

- |                |                            |
|----------------|----------------------------|
| 8. to allocate | h. суммарный, совокупный   |
| 9. to vary     | i. склад, хранилище, база  |
| 10. specified  | j. оценивать, подсчитывать |

**Task 4.** Use the following verbs to complete the passage. Make necessary changes.

map   show   create   may   made
----------------------------------

MORE EXAMPLES OF USING GIS TO FIND WHAT'S WITHIN A GIVEN  
A GIVEN DISTANCE

- The City of Las Vegas used GIS to (1) \_\_\_\_\_ the area within a three-minute response time of each fire station. The map clearly (2) \_\_\_\_\_ which areas of the city were well covered by the existing stations and which areas might benefit from a new one.
- The City of Newton, Massachusetts, used GIS to map an area of 1,000 feet around each school to (3) \_\_\_\_\_ 'drug-free zones'. People dealing drugs within the zone (4) \_\_\_\_\_ be subject to additional sanctions. Each arrest is mapped to see if it was (5) \_\_\_\_\_ within the 1,000-foot zone.

**Task 5.** Translate the passage from Task 4 into Russian in writing.

## UNIT 15

### *PLANNING FOR THE FUTURE*

You can use GIS to help plan what a place will be like in the future. That gives a community the time it needs to provide housing, facilities, and other services. Planners at Washoe County, Nevada, use GIS to help create twenty-year plans for areas within the county.

**What they do...**

**1 Forecast future growth.** Based on how population has grown in the past,

planners

predict how it will grow in each area over the next twenty years.

**2 *Map what's already there.*** They use GIS to create maps

Showing where the existing population lives, what the

Land use is, where roads are and so on. They also map which

Undeveloped areas are suitable for future growth.

**3 *Develop the plan.*** Using the GIS-generated maps, planners

work with community groups to make sure enough land

is set aside for the housing and other services needed to

support the projected population growth over the next twenty

years. They use GIS to create maps showing where the new

housing and other services should be built, and to calculate how much land is

allocated to the different types of housing.

**4 *Put the plan into practice.*** The various agencies that provide the services (police,

schools, libraries, and so on) use GIS to create maps of each phase of the plan as it

develops – for example, which parks are built and which are still planned, and

where water and sewer lines have been put in.

**5 *Make revisions.*** As population forecast and the needs of the community change,

the community groups and the planners use GIS to make changes to the plan and

create revised maps and figures.

**Task 1.** Read the text

**Task 2.** Put a tick ( ✓ ) if a sentence is true or false.

1. It is planners of a city or town who make detailed arrangements for the future.
2. The planners' forecast is based on the information they will have in the future.
3. The information about both developed and undeveloped areas is mapped.
4. The plan of a community development is put into practice by special organizations.
5. Once the development is planned and the relevant maps are created it is impossible

to change anything.

	1	2	3	4	5
True					
False					

**Task 3.** Match the left~ and right-hand columns.

- |                 |   |
|-----------------|---|
| 1. facilities   | a. зд. жители; сообщество                   |
| 2. housing      | b. почва, грунт, земля                      |
| 3. community    | c. средства обслуживания, сооружения        |
| 4. sewer line   | d. заболоченная территория                  |
| 5. soil         | e. общий, генеральный план                  |
| 6. slope        | f. (растительный) покров земли              |
| 7. land cover   | g. жилищное строительство; жилищные условия |
| 8. wetland      | h. канализация, канализационная система     |
| 9. forecast     | i. прогноз; предвидеть, предсказывать       |
| 10. master plan | j. склон                                    |

1	2	3	4	5	6	7	8	9	10



**Task 4.** Use the following nouns to complete the passage.

changes   databases   areas   maps   information
--

#### HOW GIS HELPS MAKE THE PLAN...

- Information from a variety of maps and (1) \_\_\_\_\_ can be combined in the GIS and displayed on one map or on a series of them.
- The GIS lets you combine data to create new (2) \_\_\_\_\_ about a place. For example, you could combine digital (3) \_\_\_\_\_ of soils, slopes, and land cover to find areas suitable for building on (e.g., (4) \_\_\_\_\_ having suitable soils, on a gradual slope, and not on a wetland).
- Since all edits are made on the computer, it's easy to map several different scenarios or make (5) \_\_\_\_\_ to the maps. When you're ready, you can print as many copies of the maps as you need, right from the GIS.

**Task 5.** Fill in the gaps with the verbs from the box.

need   provide   collect   develop   uses
---

#### MORE EXAMPLES OF USING GIS TO PLAN THE FUTURE ...

The William S Hart Union School District in Santa Clarita, California, (1) \_\_\_\_\_ GIS to help forecast student enrollment seven years into the future. They (2) \_\_\_\_\_

and analyse demographic and development data for each neighbourhood. That tells them where and when they will (3) \_\_\_\_\_ to build new schools.

A private consulting firm used GIS to help (4) \_\_\_\_\_ a master plan for the City of Kuwait by integrating information on population, construction, and employment. The plan will help the city tackle long-term development issues, as well as (5) \_\_\_\_\_ a guide for day-to-day decisions such as evaluating building permits.

**Task 6.** Translate the passage from Task 5 into Russian in writing.

## VOCABULARY

aerial photography	- аэрофотосъемка
affect (v)	- (воз)действовать, влиять, наносить ущерб
alternate	- другой, иной
altitude	- высота над горизонтом; высота над уровнем моря
approval	- одобрение; санкция, согласие; рассмотрение
assemble (v)	- собирать, компоновать; устанавливать
attendance	- посещаемость, присутствие
available	- имеющийся (в распоряжении); годный, применимый; действительный
avoid (v)	- предупреждать, предотвращать
backdrop	- фон, основа
backtrack	- обратный путь, маршрут
building permit	- разрешение на строительство
bypass (v)	- обходить, блокировать
census	- (лат.) учет численности (населения), территория, где произведена перепись; полный набор характеристик
certain	- определенный; известный
COGO (Coordinate GeOmetry)	- язык программирования для решения (некоторых) геометрических и инженерных задач
colour-code (v)	- кодировать с помощью цвета
comply with (v)	- подчиняться, соответствовать
conduit	- трубопровод; (электрический) провод
critical	- опасный; основной; ответственный

curb	- обочина, край тротуара
current	- настоящий , современный
customize(v)	- выполнять по индивидуальному заказу
debris	- мусор, остатки, отходы
deed	- действие; дело
define (v)	- определять; характеризовать; обозначать
delivery truck	- грузовой автомобиль для доставки
deport	- депо, хранилище
destination	- назначение, целевое положение (состояние)
dig (v)	- копать, рыть
digitize (v)	- преобразовывать в цифровую форму
dispatch system	- диспетчерская система, служба
dispatcher	- диспетчер
draft (v)	- составлять план, чертить, рисовать
effect (v)	- действовать, воздействовать, оказывать влияние
electric utility	- электростанция (общего пользования)
emergency	- критическое положение, авария
estimate	- оценка, значение
estimate (v)	- оценивать, подсчитывать
evacuate (v)	- удалять, эвакуировать
event	- событие, факт, ситуация, авария
facilities	- средства обслуживания, сооружения
failure	- повреждение, неисправность; неблагоприятный исход
feature	- пространственный объект
field data	- эксплуатационные данные

field of application	- область (сфера) применения
flushing	- промывка ( <i>струёй воды</i> )
footprint	- след, отпечаток
for the sake of	- ради
freehand	- рисунок от руки
guide (v)	- управлять, направлять; руководить
housing	- жилищное строительство; жилищные условия
intersection	- перекресток; пересечение
issue	- спорный вопрос; вопрос, тема, предмет для обсуждения
land cover	- (растительный) покров земли
lane	- ряд (движения машин); узкая дорога
location	- место, (место)положение
lot	- участок (земли)
lot line	- граница земельного участка
manage (v)	- управлять, руководить; уметь обращаться
manhole	- лаз, люк; смотровое отверстие
master plan	- общий, генеральный план; сводный план
match	- соответствие, совпадение
match (v)	- подгонять, подбирать
measure (v)	- измерять, оценивать, определять
merchandise	- товары
navigator	- мореплаватель
neighbourhood	- округа, район
occur (v)	- происходить, случаться; иметь

	место; наблюдаться
ownership	- собственность, владение
outward	- направленный наружу
overlay	- накладывать, совмещать
parcel	- участок ( <i>земли</i> )
path	- путь; маршрут; линия; участок; курс
pattern	- образец; пример; шаблон; схема; (общая) картина; система, структура
performance	- быстроедействие, рабочая характеристика
precinct	- огороженная территория, прилегающая к ( <i>зданию</i> ); окрестности; ( <i>амер.</i> ) избирательный или полицейский участок, округ
property	- 1. свойство, качество; характеристика, параметр; 2. собственность
query (v)	- делать запрос, давать задание на поиск информации
real estate	- недвижимое имущество
relevance	- соответствие, отношение к делу, уместность
sequence (v)	- устанавливать порядок, упорядочивать
sewer	- канализационная труба, канализация
sewer line	- канализационная система, канализация
shade (v)	- затенять, штриховать
shelter	- укрытие, прикрытие; навес

specific	- точный, определённый; конкретный;  ограниченный
specific area	- удельная площадь (поверхность)
split (v)	-разделять(ся)
spot (v)	- определять место, размечать
spot	- место, область, зона
spreadsheet	- электронная таблица
stand for	- символизировать, означать
surrounding	- близлежащий, соседний
tag (v)	- отмечать, помечать
tag	- метка, обозначение, признак
terminal	- терминал, конечный пункт
total (v)	- подводить итог, подсчитывать
toxic plume	- султан; шлейф загрязняющих веществ
tract территория	- участок, пространство,
utility	- коммунальная служба; предприятия  общественного пользования, коммунальные предприятия
water utility	- водопроводное хозяйство
way	- метод, способ, средство, образ действия

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*Навчальне видання*

МЕТОДИЧНІ ВКАЗІВКИ  
для самостійної роботи  
з дисципліни  
**«ІНОЗЕМНА МОВА»**

*(для студентів 1 курсу денної форми навчання  
напряму 6.080101 «Геодезія, картографія та землеустрій»*

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