

MetroLink Into Madison County

Project-Based Learning in Cooperation
with
Madison County Transit
&
Triad High School

Student Guide

Metro link into Madison County Project:

Student Guide

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MetroLink Into Madison County Project Overview

About This Project

Welcome to the MetroLink into Madison County Project. This Project allows you to explore career opportunities in the development of mass transportation projects. You will learn about an issue that will, in the very near future, be affecting the area.

Madison County Transit (MCT) is the sponsor of this project. You will be working on the development of MetroLink into Madison County.

You will visit MCT, ride MetroLink, and ride an MCT bus. You will learn about the many different and varying fields that are available in the transit industry. You will learn about the development of new lines and how they can be determined to be feasible. You will also learn how the MCT bus system and MetroLink systems are used properly.

You will complete a written business report and finish with a presentation of your proposed MetroLink line into Madison County to MCT.

Project Goals

The Major Goals of this project:

- Provide students with an orientation to career opportunities in the transportation industry.
- Provide students with the necessary career exploration experiences for them to decide whether they wish to explore these career opportunities.
- Provide students with an orientation into how these careers relate to aspects of their daily lives.
- Demonstrate the application and integration of academic and technical subject matter as well as problem solving, teamwork, computer skills, and learning experiences in a working environment.

More specific learning objectives are presented at the beginning of each learning module.

Project Outline	<p>The MetroLink into Madison County Project has ten (10) major learning modules. These Modules are:</p> <ul style="list-style-type: none">Module 1 Overview of Mass Transportation Light Rail SystemsModule 2 Site TourModule 3 MetroLink Field TripModule 4 History of MetroLinkModule 5 What is a Million?Module 6 Map ReadingModule 7 Population CountsModule 8 Writing Business ReportsModule 9 Making Business PresentationsModule 10 Company Presentation and Discussion <p>Each module provides you with the knowledge and skills you will need to solve the problem. Each module contains the following:</p> <ul style="list-style-type: none">• Objectives: Each module begins with a set of learning objectives that you will be able to accomplish through the completion of the module.• Vocabulary: Each module contains key vocabulary words that should become a fluent part of your vocabulary.• Readings: Each module contains short readings that will assist you in the completion of the module. These are designed to give you a background for the activities.• Activities: Each module provides a group of activities that are designed to help you learn and apply the concepts and skills in the problem. <p>After your team completes the project, the company representatives and your instructor will work with you and your fellow students to evaluate your proposed solution.</p>
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Module 1

Overview of Mass Transportation Light Rail Systems

Module 1

Overview of Mass Transportation Light Rail Systems

Objectives

After completing this activity, you will be able to:

- Define the key vocabulary of the unit.
- Describe the role of mass transportation on our society.
- Describe the difference between light rail and freight rail.
- Develop a series of questions that could be asked on our site tour.

Vocabulary

- Light Rail
- Alignment
- Corridor
- At-grade
- Sub-grade
- Elevated
- Tunnel
- Emissions
- Subway
- Monorail

Defining Mass Transportation And Light Rail

Mass transportation is a large part of our daily lives. Without mass transportation many of our goods would not efficiently travel from one point to another. Mass transportation is commonly thought of as only trucks, trains, and ships carrying goods from one place to another. We, however, will explore another type of mass transportation.

Mass transportation can also include trains and buses that carry people from one place to another. In our region we have both trains and buses that are used for this purpose. Bi-state and Madison County Transit (MCT) facilitate the operation of these entities. Bi-State is the coordinator of the MetroLink and bus system in St. Louis and St. Clair Counties. MCT is the coordinator of the bus system in Madison County.

MetroLink is the true focus of the experience in which you are about to become entrenched. MetroLink is a light rail system

that carries passengers from Lambert International Airport to Southwest Illinois College in Belleville. MetroLink currently has 27 stops covering the approximate 71 miles of track.

This light rail system is comprised of dual track similar to those used for standard freight train traffic. The major difference between this and a freight track is that the MetroLink uses electricity to provide the movement of the train. Each track has an overhead electric source that allows for the movement of the train. This provides for an emission free, environmentally friendly trip.

MetroLink utilizes overhead electric lines because of the diverse settings, which it travels through. Typically, light rail systems utilized a three-track system with one being the electricity. MetroLink, however, uses tracks that are in several different alignments. Some of the track is in tunnels, elevated, sub-grade, or at-grade. Moreover, the tracks cross roads and crosswalks. With the overhead electric track this diversity can be achieved without the risk of electrocution of citizens.

Activity

Research the following in groups:

1. What are the major differences between MetroLink and other major cities' light rail systems?
2. What are the differences between the different alignments used by MetroLink?
3. What are the advantages and disadvantages of a light rail system?

In groups assigned by your teacher, you are to research the questions above. You should use the Internet and the library to complete this task. Most major cities have incorporated some sort of light rail system. You should look at cities such as Chicago, New York, Seattle, Houston, and Los Angeles. Information can usually be found on these cities' official web pages.

After you have researched topics that you were assigned, you should complete a typed report of your findings. Each report should be no less than $\frac{3}{4}$ page. Double-space your report and use 12-point font.

Module 2

Site Tour

Module 2

Site Tour

Objectives

After completing this activity, you will be able to:

- Describe the function of MCT in the light rail development process.
- Identify major job opportunities at MCT.
- Ask questions pertaining to MetroLink.

Vocabulary

- Feasibility
- Alignment
- Ridership
- Policymaker
- Census
- Federal Transit Administration

Preparing For The Site Visit

You need to make sure that all or most of your questions are answered at the site visit. You also need to make sure you understand the goal or task at hand. Here are some tips that may help you get the most out of your visit:

Finding questions

- Read the problem statement provided to you.
- Read the study issues and concerns provided to you.
- Read the assumptions.
- Look at some of the resources with which you will be provided.
- Write down the questions that you may have on the topics.

Asking questions

- Ask your questions to your classmates.
- Write down the questions as they are being asked (paraphrase).
- Write down the answers.
- Listen carefully to the whole question.

Activity

With your group do the following:

Ask the questions that you wish to ask MCT to your classmates and teacher. Ask them if they are clear or how they could be made clearer. Make any changes to the questions that may be necessary.

After The Site Visit

After the site visit, you will have more information to solve the problem. You, however, will quickly forget some of the aspects. Review your notes and write down everything you know. Here are some tips to help:

- As soon as possible you should write out your notes in more complete form. Your notes will be just that after leaving MCT: notes. You want to make them into a more easily useable form. Use a separate sheet of paper to write complete notes. The sooner this is done, the better.
- List the things you know and the things you don't know.
- List the questions that you need answered and whether you think you may be able to find the answer.
- Meet with your team and compile the information that you already have and come up with what you still need.
- Prioritize the information that you need. This will help if you cannot find information or if something takes a long time to find. You don't want to submit a half-completed project because you could not find an insignificant piece of information.

Problem Analysis Work Sheet

What I Know	What I Don't Know (need to ask)

What Questions Do I Need Answered

Questions (What do I need to know)	Action Plan (Where do I find the answers)

Module 3

MetroLink Field Trip

Module 3

MetroLink Field Trip

Objectives

When you complete this activity, you will be able to:

- Legally and safely ride MetroLink.
- Legally and safely ride Madison County Transit Buses.
- Correctly read MetroLink and bus schedules.
- Purchase tickets to MetroLink.
- Pay fares for Madison County Transit Buses.

Vocabulary

- Validation
- Fare
- Shuttle
- Metro bus
- Express

Why Should We Know How To Ride MetroLink And Buses?

At some time in our lives, all of us may be forced to ride some sort of mass transit system. This activity will allow you to understand the proper methods of riding both buses and trains. Many similarities and differences exist between the two systems. With the overcrowding of our highway systems, it is becoming more and more important to use alternative methods to reach the same destination.

Activity

To be successful in today's activity, you will need to do the following:

- Read a schedule for Madison County Transit System locating the stop location and time for pick-up with the proper destination.
- Read the MetroLink schedule locating the stop locations that correspond with the MCT schedule.
- Play fares in the fare box on the MCT bus.
- Request a stop at the appropriate location and time.
- Purchase and validate tickets for the MetroLink.
- Correctly board MetroLink.

After completing this activity, you should spend 20 minutes analyzing your trip on both MCT and MetroLink. Write out your observations and thoughts about both. You should use complete sentences and correct grammar. Some things that you should consider are:

- Security
- Simplicity
- Locations
- Cleanliness
- Friendliness
- Cost

Module 4

History of MetroLink

Module 4

History of MetroLink

Objectives	<p>When you complete this activity, you will be able to:</p> <ul style="list-style-type: none"> • Describe the need for MetroLink. • Identify the hardships MetroLink encountered at its start. • Explore the negative and positive aspects of MetroLink for a community.
Vocabulary	<ul style="list-style-type: none"> • Feasibility • Traffic Study • Ridership
How Did MetroLink Come Into Existence?	<p>With any project, MetroLink experienced many hardships and roadblocks when the idea of it was first explored. Many citizens thought that crime would increase, property values would decrease, and noise pollution would become a problem. It is evident that many of the worries were false. Most of these worries have proven to be just that, worries. Many other problems were encountered during the development stages of the MetroLink, however.</p>
Activity	<p>To be successful in today's activity, you will need to do the following:</p> <ul style="list-style-type: none"> • Utilize the Internet to perform research. • Read and understand corridor studies. • Summarize technical documents. • Cite information using APA style. • Utilize the library's resources. • Proofread your document for grammar and spelling errors. <p>After completing this activity, you should submit an errorless document outlining the history of MetroLink. You should complete the above tasks to write a detailed history of MetroLink. You should look at not only MetroLink before it was built, but also the history of it throughout its operation. You must cite all of your sources.</p>

Module 5

What is a Million?

Module 5

What Is A Million?

Objectives	<p>After completing this activity, you will be able to:</p> <ul style="list-style-type: none"> • Estimate large numbers using approximations. • Convert weight into quantities. • Use ratios to determine quantities.
Vocabulary	<ul style="list-style-type: none"> • Ratio • Proportions • Estimation • Quantities
How Do I Find A Million?	<p>Many times we think about a million as a large number, but what is it really? How many times have you thought that something was a million to find out that it wasn't even close? You will be given the opportunity to estimate the value of a million today. Would a million dollars be enough money for you to live the rest of your lifetime? Probably not, but we often think of it as more money than we will ever need. In 1960 the average starting teaching salary was \$4000 per year. In 2002 the average is \$30,000, a difference of almost 8 times. In 40 more years, if the trend continues, the salary could be \$240,000 per year. One million dollars could be obtained in four years at that rate. So really what is a million?</p>
Activity	<p>Given a bucket of wheat seed, estimate the amount of seed. Write your estimation on a piece of paper and give it to your teacher.</p> <p>Your teacher will then give you a few seeds to count. Every student in the class will work on counting a few seeds. Add all of the seeds that the class counted and place them in a container that will hold one cup of seed.</p> <p>Weigh the cup empty and then weigh it with the seeds. Subtract the weight of the cup from the seed and cup weight. This will give you only the weight of the seeds. Fill the cup with seeds and weigh them. Again, subtract the weight of the cup.</p>

	<p>Set up a proportion or ratio to determine the number of seeds in one cup.</p> <p>After you have determined the number of seeds per cup, calculate the number of seeds that are in the entire bucket. You know the number of seeds in a cup, so determine the number of cups and multiply by the number of seeds in a cup.</p>
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Module 6

Map Reading

Module 6 Map Reading

Objectives	<p>After completing this activity, you will be able to:</p> <ul style="list-style-type: none"> • Read a map to determine the location of specific places. • Determine the shortest route between two points. • Understand and accurately use a map legend.
Vocabulary	<ul style="list-style-type: none"> • Legend • Key
Maps Are All Around Us	<p>How do we find our way around an unknown location? We use a map. Often when we are lost, we must rely on a map. When we buy concert tickets, we use a form of map. Maps are a part of our daily lives. They come in many different styles and sizes, but they all are very similar. The locations of specific items are pinpointed on a map to make it easier for us to determine where to go or what to do. You have been exposed to maps for much of your life. You will now have to look at a map and determine the location of the existing and new MetroLink stops.</p>
Activity	<p>In your group you will need to do the following:</p> <ul style="list-style-type: none"> • Locate the existing MetroLink stops. • Locate the proposed MetroLink stops. • Determine the location of the existing MetroLink track. • Determine the location of the proposed MetroLink track. <p>Using different color markers, you and your partners need to complete the above tasks. Each phase of the task should be marked in a different color marker. The different colors should then be identified in a legend located somewhere on the map. You should mark the map in a way that is clear and easy to read.</p>

Module 7

Population Counts

Module 7

Population Counts

Objectives	After completing this activity, you will be able to: <ul style="list-style-type: none">• Estimate population growth.• Convert percentages.• Understand the use of the census.• Project populations of given areas.
Vocabulary	<ul style="list-style-type: none">• Census• Population growth• Percentage• Township• Jurisdiction
How Did The Town Grow?	<p>Every ten years the United States Census Bureau conducts its census report. After every person in the US is sent a survey about his or her home, the bureau counts the results. Many people do not answer the survey, so the census bureau has to send people out into the community to knock on doors to obtain the completed survey. This takes time and money.</p> <p>Why is it important that these be filled out? The government uses the information for many different purposes, but the main goal is for the funding of local communities. Many different elements are involved, but for simplicity, the more people that live in a community, the more funding that community will receive.</p> <p>Besides the government using the census reports, many independent companies use the reports to their advantage. For example, MCT uses the report to determine the number of persons in a given area, which shows it how many potential riders it may have for that area.</p>

Activity	Using the information given in your packet, project the estimated populations of the different jurisdictions and townships in Madison County. You have been given 1990 and 2000 census numbers. Use those numbers to determine the projected growth of the jurisdictions and townships in the year 2020. We are using 2020 because this is the year that MetroLink is projected to open in Madison County.
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Module 8

Writing Business Reports

Module 8

Writing Business Reports

<p>Objectives</p> <p>Developing And Evaluating Business Reports</p> <p>Purpose And Content</p> <p>Activity</p>	<p>After completing this activity, you will be able to:</p> <ul style="list-style-type: none">• Develop an outline of a business report.• Write a business report.• Evaluate the quality of a business report. <p>Your business report should clearly and effectively communicate to your audience the purpose, methods, and results of your project.</p> <p>In developing and evaluating your business report, you should focus on three issues:</p> <ul style="list-style-type: none">• Purpose and content.• Organization and structure.• Communication clarity and accuracy. <p>The first step in developing or evaluating your business report is to make sure that you have clearly defined the purpose of the report and have addressed the needs and requirements of your audience.</p> <p>You should start developing a clear statement of the purpose of the report and a listing of major topics and types of information that must be included.</p> <p>With your team:</p> <ol style="list-style-type: none">1. Develop a clear and concise statement of the purpose of the report.2. Develop a list of major topics and types of information that must be included to meet the requirements of the customer.
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<p>Organization And Structure</p>	<p>The second step is to make sure that you have organized your report in the most effective way. In general, reports should have four major parts:</p> <ul style="list-style-type: none"> • Introduction to the report--the introduction should state the purpose of the report and should summarize what is described in the report. • Body of the report--the body should contain the major sections that address all major issues and summarize all required information, which may include graphs, charts, tables, and figures. • Conclusion--the conclusion should summarize the body of the report and major conclusions, and recommendations. • Appendix materials--the report may contain appendix materials that support or provide additional information for major sections in the body of the report. <p>You should start by developing an outline of your report that shows the content and sequencing of each major section of your report. This outline should contain titles for each section and a list of bulleted statements that summarize the purpose and content. It should also list any graphs, charts, tables, and figures.</p> <p>As you are developing your outline, you should ask:</p> <ul style="list-style-type: none"> • Do the report sections organize information logically? • Does the information under each section belong there? • Do the report sections contain all of the necessary information? • Do the sections contain information that is not necessary? • Are the report sections sequenced in the most effective order? • Do the sections' titles clearly communicate the purpose and content of the sections?
<p>Activity</p>	<p>With your team:</p> <ol style="list-style-type: none"> 1. Develop a draft outline of your report. 2. Critique and revise your outline.

<p>Communication Clarity And Accuracy</p>	<p>The next step is to write and edit your report. In writing and editing our report, you should make sure that you are communicating clearly and presenting accurate information.</p> <p>Remember, business reports should be short and to the point. They should communicate information effectively and efficiently.</p> <p>Here are some tips:</p> <ul style="list-style-type: none"> • Write your report using short sentences and paragraphs. • Use supporting charts, graphs, tables, and figures to better convey your information whenever possible. • Use consistent report formats for easy reading. • Make sure your report does not contain spelling or grammatical errors. • Make sure your report does not contain inaccurate information or math errors.
<p>Activity</p>	<p>With your group, do the following:</p> <ul style="list-style-type: none"> • Write your first draft of each section and include your graphs, tables, and figures. • Evaluate the clarity and accuracy of your first draft using the five tips and develop a second draft.
<p>Evaluating Your Draft report</p>	<p>The final step in developing your business report is to conduct a final review and editing of your report before submitting it to your customer. This review should make sure that you have addressed the following criteria:</p> <p>Purpose and content</p> <ul style="list-style-type: none"> • Do you clearly communicate the purpose of the report? • Does the report contain all of the information needed to meet the requirements of the customer? <p>Organization and structure</p> <ul style="list-style-type: none"> • Does the report contain an introduction that summarizes the purpose and contents for the customer? • Is the body of the report divided into sections that logically group related information?

<p>Activity</p>	<ul style="list-style-type: none">• Does each section contain the necessary information?• Does any section contain information that is not necessary?• Are the sections properly sequenced?• Do the section titles clearly communicate the purpose and content of each section?• Does the report have a final section that summarizes the conclusions and recommendations of the project? <p>Communication, clarity, and accuracy</p> <ul style="list-style-type: none">• Does the report contain long sentences and paragraphs?• Does the report effectively use supporting charts, graphs, tables, and figures to better convey your information?• Does the report use consistent report formats for easy reading?• Does the report contain spelling and grammatical errors?• Does the report contain inaccurate information or math errors? <p>With your team:</p> <ul style="list-style-type: none">• Review and evaluate the final draft of your report or another team's report.• Develop the final draft of your report based on the evaluation.
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Module 9

Making Business Presentations

<p>Making Your Presentation</p>	<p>Developing effective business presentations is only half the job. You also must deliver an effective presentation.</p> <p>Here are some tips for making effective business presentations:</p> <p>Start on time--Make sure you are prompt and ready to begin your presentation when it is scheduled.</p> <p>Project a professional image--Make sure that you are dressed appropriately for a business presentation. Show good posture and stand up straight when you speak.</p> <p>Show enthusiasm and confidence--Show you are very excited about your report and that you are confident in presenting and explaining the information.</p> <p>Maintain eye contact and show friendliness and respect--Show interest in your audience by maintaining eye contact during your presentation. Show respect for your audience and do not use negative body language.</p> <p>Use effective speaking techniques--Speak slowly and distinctly. Use standard grammar. Avoid meaningless words like "you know".</p> <p>Use visual aids--Use visual aids effectively to communicate information and maintain the interest and engagement of the audience.</p> <p>Answer questions completely--Welcome questions and reactions. Make sure you understand the question. Answer the question completely. Don't be defensive if you don't know the answer. Show interest in finding the answers. Follow through on any promises about finding answers.</p> <p>End on time--Complete your presentation within the planned time.</p>
<p>Practicing And Evaluating Your Presentation</p>	<p>Most people cannot deliver effective presentations without practice and feedback. It is critical that you practice your presentation aloud with your instructor and students using your visual aids and notes.</p> <p>Ask for feedback following:</p> <p>Introduction</p> <ul style="list-style-type: none"> • Did we present our name and the name of our group or organization?

	<ul style="list-style-type: none">• Did we present the purpose of our presentation?• Did we present the major topics or sections of our presentation in the order in which we will present each section?• Did we effectively gain the interest and attention of the audience? <p>Presentation content and visual aids</p> <ul style="list-style-type: none">• Did we present the most critical information for the purpose of the presentation?• Did we organize this information in a logical way and in the most appropriate sequence?• Did we effectively explain the importance of the information for the purpose of the presentation?• Did we prepare neat and clear visual aids and handout materials without errors?• Did we present a summary of the major conclusions and recommendations?• Did we ask for questions, comments, and reactions? <p>Presentation Delivery</p> <ul style="list-style-type: none">• Did we dress appropriately to project a professional image?• Did we stand up straight and maintain eye contact with the audience at all times?• Did we demonstrate confidence in presenting the information?• Did we speak clearly and at the appropriate rate?• Did we speak in complete sentences and use professional terminology?• Did we speak with intonation and volume that engaged the audience?• Did we effectively use our visual aids?• Did we present and explain the information effectively?• Did we show respect for the audience in presenting and responding to questions, comments, and reactions?• Did we effectively seek a full understanding of questions, comments, and reactions?
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<p>Activity</p>	<ul style="list-style-type: none">• Did we completely answer questions or respond to comments and reactions? <p>With your team:</p> <ul style="list-style-type: none">• Prepare your presentation and develop your note cards and visual aids.• Practice your presentation with your instructor and fellow students. Make improvements based on their evaluations.
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Module 10

Company Presentation & Discussion

Module 10

Company Presentation and Discussion

<p>Objectives</p> <p>Company Presentations</p> <p>Improving Your Report And Presentation</p> <p>Learning More About Mass Transportation Systems</p>	<p>After completing this activity, you will be able to:</p> <ul style="list-style-type: none">• Know specific details of the agenda for your presentation at MCT.• Discuss ways to improve upon the project if asked to do it again.• Learn more about the types of issues facing companies like MCT everyday. <p>Your instructor will review the agenda for the presentation of student reports to MCT representatives.</p> <ul style="list-style-type: none">• Make sure you know your schedule of time for the presentation and how long you have to make your presentation.• Make sure you are prepared for MCT representatives to ask questions.• Be sure you are prepared to take notes to evaluate the presentations of the other students.• Make sure you know how to dress for the presentation. <p>Discuss with the class how you would do the project differently if you were asked to do it again.</p> <p>MCT representatives will talk briefly about the types of mass transportation systems they deal with everyday. They will also discuss the career opportunities that exist in the mass transportation industry.</p> <p>Be prepared to ask questions about mass transportation systems and careers in the industry.</p>
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