



Transportation Systems/ Infrastructure Planning, Management and Regulations Pathway:

Transit

Problem-based Scenario Outline

School Site: Triad High School

Pathway Knowledge and Skill(s):

- PO5.1 Plan public transportation infrastructure.
 - ◆ Students will plan and design the alignment and corridor that MetroLink should use for future development by Madison County Transit. Students will also determine an approximate cost of the construction for the proposed alignment.
- PO5.3 Plan Transportation Services
 - ◆ Students will plan a new schedule for Madison County Transit's bus route, and for the future MetroLink.

Performance Element(s):

The students will compile information required to properly assess the location of the route. They will use the information to develop a plan for the location of a new MetroLink line in Madison County. They must look at location of utilities, existing railroads, roads, and bridges, and population of the area. They must consider the benefit that the new line will have on the community and also the negative impact that the community may suffer. The students should develop a written report and route model that will be submitted to the Madison County Transit Authority at the completion of this project. They should also present their proposal to the Authority Project Coordinator at the completion of the project.

- Feasibility of MetroLink extension into Madison County
- Route alignment
- Station Locations
- Facilities needed
- Predicted ridership
- Hours of operation
- Changes to current bus system
- Cost analysis

Title: Madison County Transit

Completion Time: 2 weeks

Problem Statement: You are a member of the transportation planning committee for Madison County Transit. You have been asked to design a MetroLink route into

Madison County. You should consider the location of the route, the ridership that will be expected, and feasibility of the route. As a result of this study you should develop the best route, and create a model of the area in which the line will run. Your plan is due in two (2) weeks.

Occupations and Related Job Titles (*Examples*):

- Planning Commissioner
 - Civil Engineer
 - Train Operator
 - Bus Driver
 - Operations Engineer
 - Operating Engineer
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Business/Industry/Government Partner(s):

Madison County Transit Authority
Madison County Transit Headquarters
MetroLink Station-Southwest Illinois College

Students:

- Students will produce population projections for the cities and townships in Madison County, Illinois.
- Students will produce a map projecting the location of future and current MetroLink Lines in Madison and St. Clair Counties, Illinois.
- Students will prepare a written report detailing the history of MetroLink.
- Students will plot the location of existing Madison County Transit bus lines.
- Students will synthesize the researched information to determine the best location for MetroLink to operate in Madison County, Illinois.
- Students will compile their information into a written report to be presented to Madison County Transit at the completion of the project.
- Students will complete an oral report to Madison County Transit detailing their findings at the completion of the project.

Required Materials and Resources:

The partner will provide the students with the problem and additional information such as the maps of abandoned railroads in the area, population data of the communities in Madison county, etc. The partner will also be available for questions from the students/teacher. The teacher will e-mail or call the partner with questions and updates of the project.

- Computers
- Word processing and presentation software
- Madison County maps
- St. Clair County maps

- Census reports
- Current MetroLink schedules
- Current MCT bikeway maps
- Current MCT bus schedules
- Bi-State Transit website
- East-West Gateway reports
- Cost factors of MetroLink Construction
- Governing restrictions surrounding construction of mass transit system
- Ridership statistics for MCT bus routes

Suggested Assessment Approaches:

Cluster: The students will be assessed utilizing several different methods. They will be assessed for style, correctness of grammar, and spelling on their written report. They will also be assessed on the use of resource materials. The final assessment will be determined by how well the students compile and present their findings of the project to Madison County Transit with the use of the scoring rubric.

Pathways: The students will be assessed via tests and daily assignments. A scoring rubric will be used to fully assess the students overall performance. Since the students are working in team settings, they will evaluate each of the team members and themselves for a final participation grade for the project

Cluster Foundation Knowledge and Skills:

- F2.1 Read technical materials with understanding and fluency
 - ◆ Students are required to read technical data and draw conclusions from that data.
- F2.2 Compose written materials containing technical information
 - ◆ Students must complete a written report detailing the findings of the study. They must use correct grammar, punctuation, and spelling. Charts, graphs and tables should be used to better communicate ideas. Furthermore, the students should use multimedia devices to aid in the presentation of the material.
- F2.3 Listen effectively in formal and informal situations
 - ◆ Students are required to attend the initial meeting where they are presented the problem. The initial meeting is to be setup as a board meeting. Students are also required to listen to each other in a team setting.
- F2.4 Present information orally in formal and informal settings
 - ◆ Students will present their findings in class as the complete parts of the project. They will then present their final findings to the planning committee composed of teachers at the school. Finally, they will present the final report to the Planning Director at Madison County Transit.

- F3.1 Formulate and evaluate ideas, proposals, and solutions to problems.
 - ◆ Students will use the problem solving method to simplify complex problems into simple parts and formulate solutions to the proposed situation.

- F4.1 Use computers to process information
 - ◆ The students will complete online research. They will also complete a written report that must be typed and presented to Madison County Transit. The written report will include charts, graphs, and text that the students either generate or cite as sources.

Module Plans

<p>3. Counting wheat</p>	<p>Students will engage in a counting exercise. The students will estimate the number of seeds in a given bucket. They will then count a few wheat seeds (about 100) and place them in a container. Next they will use proportions to estimate the number of seeds in one cup (by weight). Total number can be estimated by the number of seeds per cup and the number of cups total.</p>	<p>Students will be given the opportunity to guess the total number of seeds. They will then use proportions to determine the true estimated number of seeds. Correctness of the estimation will be evaluated.</p>
<p>4. Map reading</p>	<p>Students will be plotting points on large-scale maps. The students will need to plot the points using current MetroLink line and also current Madison County Transit bus lines.</p>	<p>Students will be evaluated on the accuracy of their map reading.</p>
<p>5. Population distribution and estimation</p>	<p>Students will accurately plot populations from current census reports and project population counts for future development. This should be completed for cities and townships.</p>	<p>Students will be evaluated by the accuracy of their projections and research techniques.</p>
<p>6. Analysis of data.</p>	<p>Students should use the populations to determine the best possible alignment for MetroLink. Each student should create his/her own alignment and then compare it with the other members of their group.</p>	<p>Class will vote after the oral presentation to determine which alignment is the best for MetroLink to use in Madison County, Illinois.</p>

	<p>The group should come up with a consensus and present its alignment to the class using overhead sheets to draw the alignment. The group must also give reasoning behind the choice of the alignment. Students will then need to vote on the “best” alignment. Place the overhead sheets on the wall for all students to see and refer to for their voting. Many may be similar. Have students type their justification for the alignment that was chosen to include in the final report.</p>	
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