**FHWA Bicycle and Pedestrian Transportation University Course**

**Module: 12 – Facility and Network Analysis**

**Assignment: Bicycle Level of Service and Level of Traffic Stress Analyses**

*This assignment and description were originally created by the UNC Highway Safety Research Center and Toole Design Group for the Pedestrian and Bicycle Information Center under FHWA Grant Agreement no. DTFH61-11-H-00024*

**PURPOSE**

Planning a bicycle network for any geography requires assessing the existing conditions for bicycling in the community. This assessment helps planners select streets to include in a network that are already comfortable for bicycling and those to include which will need infrastructure improvements to be made comfortable. Identification of the study network of streets can also help pinpoint locations for recommending spot improvements, such as improved crossing treatments like median refuge islands and bicycle detection at signals.

There are currently two widely used methods for assessing the comfort of streets for bicycling: Bicycle Level of Service (BLOS) and Level of Traffic Stress (LTS). BLOS uses a model that includes 11 elements of street design and traffic characteristics which are used to determine an average score for the street. LTS, on the other hand, uses fewer inputs and a “weakest link” approach whereby the element rated most stressful for a given segment governs the final rating. It is important to be aware of the benefits and drawbacks of each of these methods so as to better understand which to use when assessing a city’s streets for biking. LTS uses a scale of 1 to 4 to rate the bicyclist’s level of stress experienced while riding with 4 being the most stressful. BLOS uses a scale of A to F with F being the most stressful.

**PROCESS**

This assignment has two parts: a comparison of the two analysis types for a single street segment, and a map assessment and routing.

*Part I*

Use the table below to compare the two analysis techniques for a single street segment. Evaluate the different inputs and resulting ratings. Consider what components lead to the ratings based on your knowledge of the BLOS equation and the fact that LTS is a “weakest link” assessment. Consider data about the street and what you know of bicyclists’ comfort and explain which assessment you believe is more accurate.

*Part II*

Use two maps of the same street network to identify a route from Point A to Point B for a bicycle study network. The maps show the LTS and BLOS analysis of the same streets. Select an optimal route on each version of the map. For example, planners may select routes that are already comfortable for bicycling or the most direct route (in a real world scenario, planners would also consider projects that have already been planned or programmed). Explain your reasoning for choosing what is optimized and any trade-offs in that routing. If the route you chose on each map differs, speculate as to what characteristics of the streets cause the difference in rating between the two analyses.

**MATERIALS**

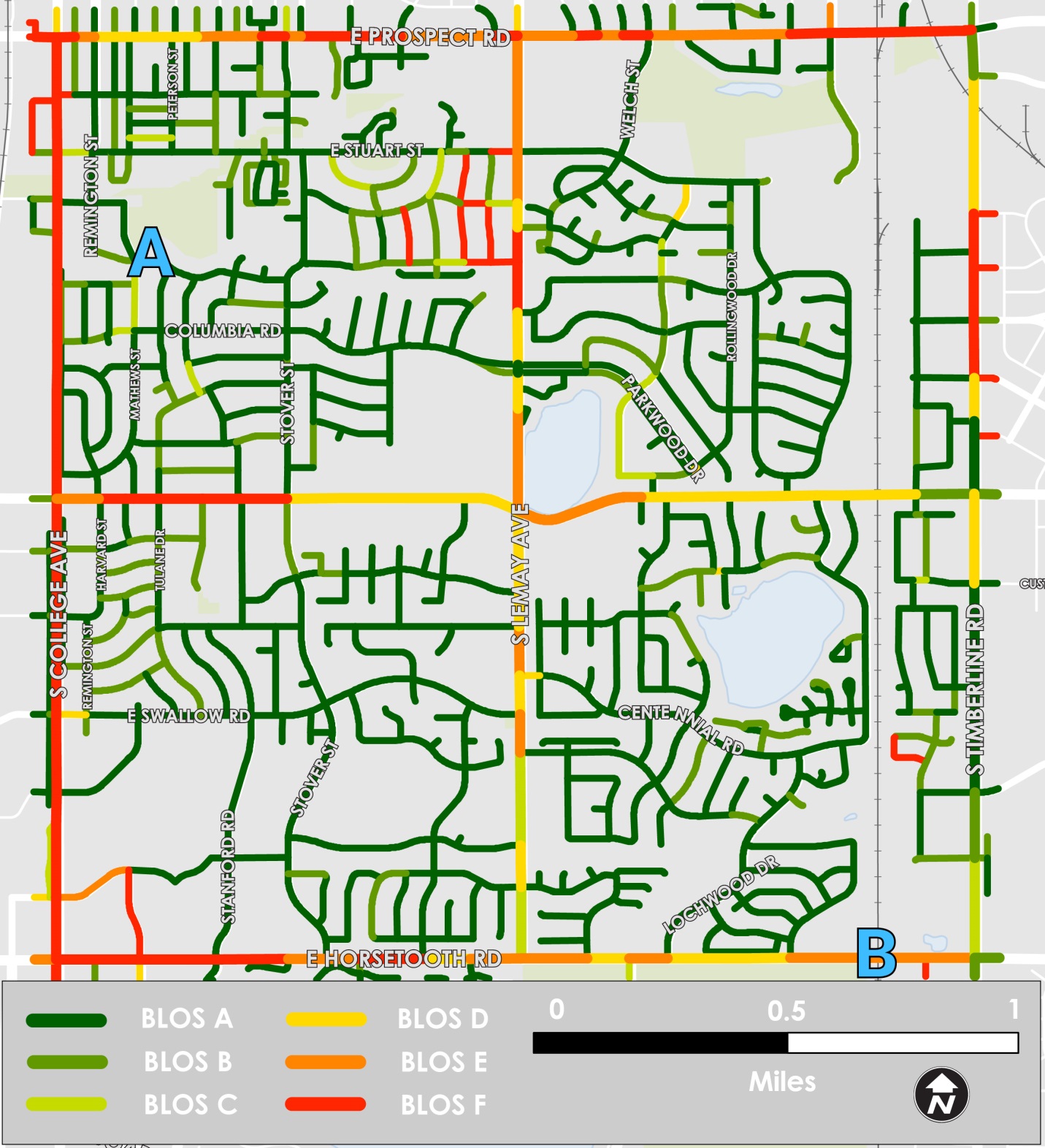
*Part I*

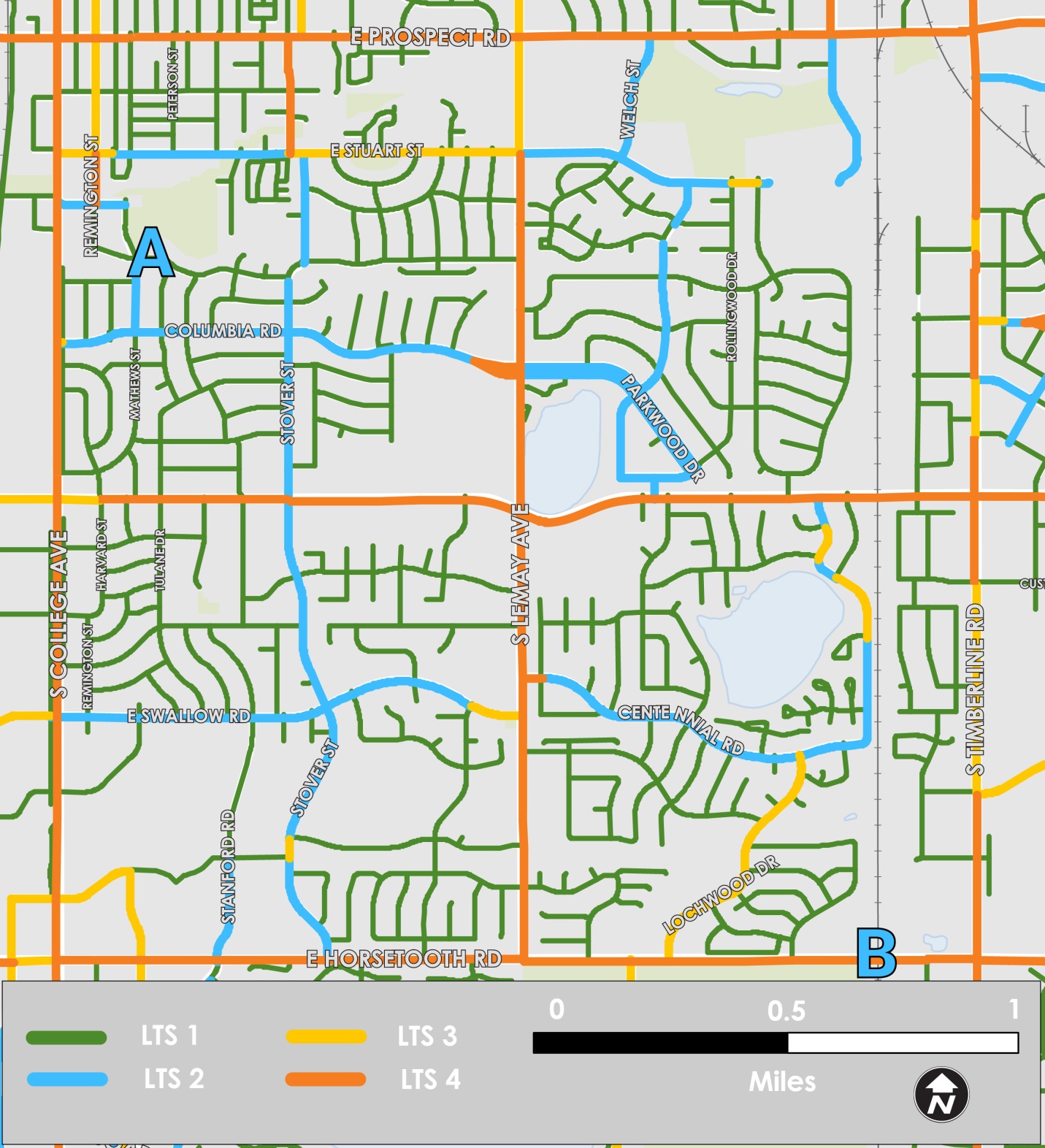
The characteristics of one street are included below along with its rating in the BLOS and LTS scales.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bicycle Level of Service Data** | |  | **Level of Traffic Stress Data** | |
| Number of through lanes | 3 |  | Facility type | Bike lane, no parking |
| Median present | Yes |  | Number of through lanes | 3 |
| Pavement condition rating  (5 = excellent to 1 = poor) | 4 |  | Median present | Yes |
| Motorized vehicle running speed | 45 |  | Speed limit | 45 |
| Mid-segment automobile flow rate (veh/hr) | 4,200 |  | Bike lane blockage | Rare |
| Percent heavy vehicle volume | 4 |  | Bike lane width (feet) | 8 |
| Width of the outside through lane (feet) | 12 |  |  |  |
| Width of the bicycle lane (feet) | 8 |  |  |  |
| Width of the paved outside shoulder or parking area (feet) | 0 |  |  |  |
| Curb is present | No |  |  |  |
| Percent of on-street parking occupied | 0 |  |  |  |
| **Bicycle LOS grade for the roadway link** | **B** |  | **LTS Score** | **4** |

*Part II*

The maps below represent a portion of the street network in a city. Intersection stress has been evaluated in the LTS map to influence the rating of adjacent street segments.





**DELIVERABLE**

Prepare a two-page memo that addresses the prompts outlined in the “Process” section. Ensure your write-up demonstrates critical comparison of the two methods of analyzing streets for bicyclists’ comfort. Students should also submit their routing for Part II in **[manner defined by instructor (digital, hand drawn, etc.)].**