Bicycle Level of Comfort (BLOC) - The FIRST step to GIS Decision Support System (DSS)

Maryland State Highway Administration
GIS-T - Houston, TX
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Introduction and History

- Sprinkle Consulting conducted the research in Florida in 1997
- One hundred cyclists volunteered to participate in the survey
- Sprinkle Consulting derived a formula, called the Bicycle Level of Service (BLOS), from this survey
- In 2002, Maryland started using this formula, called the Bicycle Level of Comfort (BLOC)

Introduction and History

- Seventeen out of 52 states use the BLOC formula
- Two states (NE, MI) and FHWA use another formula, which is called the Bicycle Compatibility Index (BCI)

SHA BLOC Goals

- SHA's goal is to have BLOC scores of **D or better** (on a scale of A - F) on **80% or more** of all state maintained roadways where bicycles are permitted.

BLOC Formula Challenges

BLOC = a1*ln (Vol15/Ln) + a2*SPt (1+10.38HV)2 + a3*(1/PR5)2 + a4*(We)2 + C
BLOC = 0.507*VOLUME + 0.199*SPEED + 7.066*PAVEMENT – 0.005*WIDTH + 0.760

- Very **subjective** issue with a great deal of controversy surrounding it
- Approached the formula **objectively** when developing the Decision Support System
  - BLOC is the only formula that is widely used
  - SHA has worked with it for the last four years
  - All the parameters used to calculate BLOC are collected by HISD

BLOC Levels

Level of Comfort		BLOC Score
	A	≤ 1.5
	B	>1.5 and ≤2.5
	C	>2.5 and ≤3.5
PASS	D	>3.5 and ≤4.5
FAIL	E	>4.5 and ≤5.5
	F	>5.5

BLOC Compatibility Mileage Ratios

- Goal for Maryland - **80 %** or higher
  - FY 2003 – 79.82%
  - FY 2004 – 80.66%
  - FY 2005 – 79.03%
  - FY 2006 – 78.06%
  - FY 2007 – 77.8 *

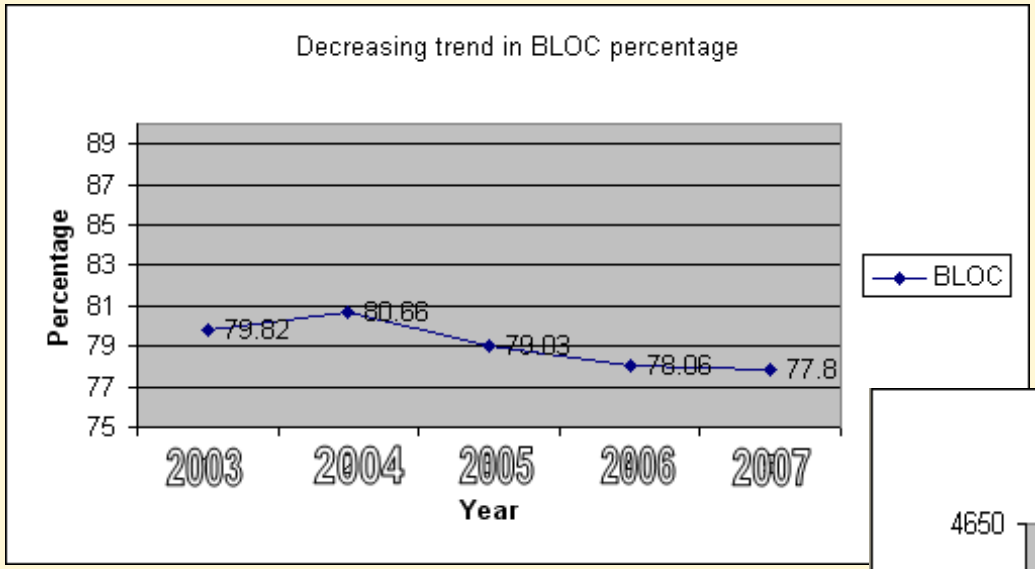
Mileage Ratio from BLOC Score:

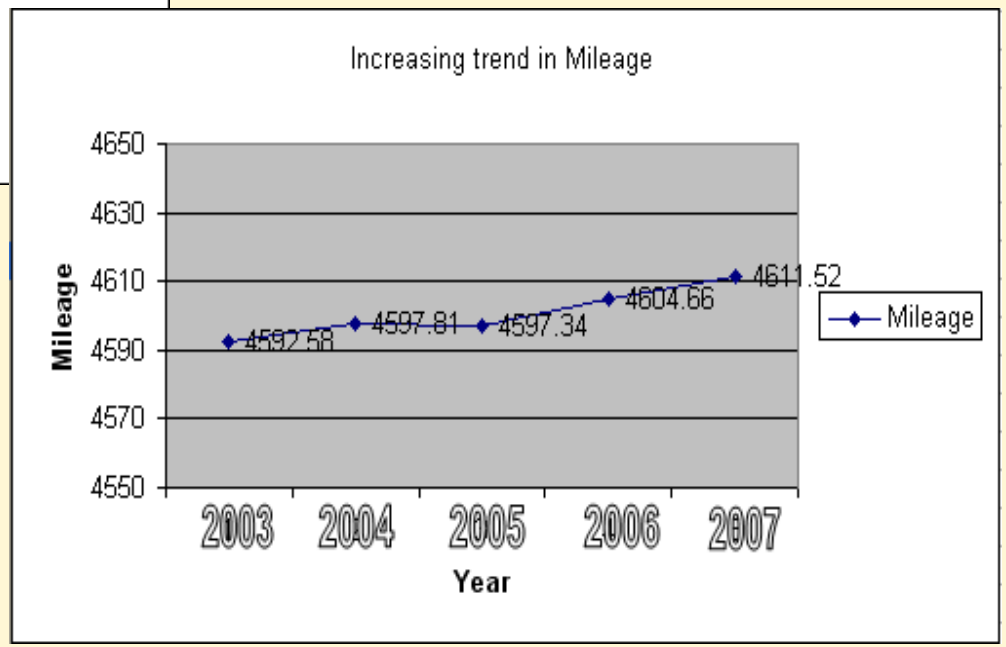
$$\frac{\text{Miles in A + B + C + D}}{\text{Miles in A + B + C + D + E + F}}$$

* Four data feed parameters were recalculated:

- Outside Lane Width recalculated in the inventory direction
- W1 = shoulder width (previously taken as default = 0)
- BLOC Ratio for 2007 changed to **78%** after applying the recalculation
- Prohibited Bike Routes were removed

BLOC Percentage and Mileage trend

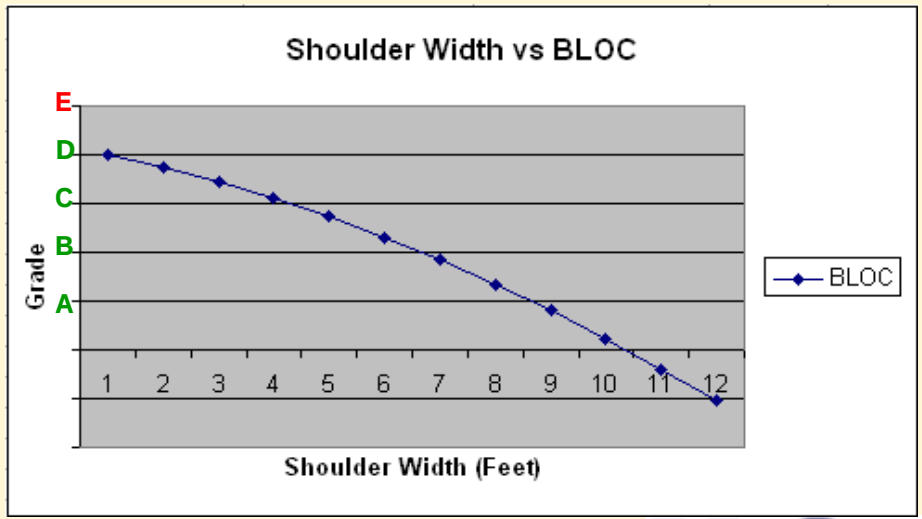




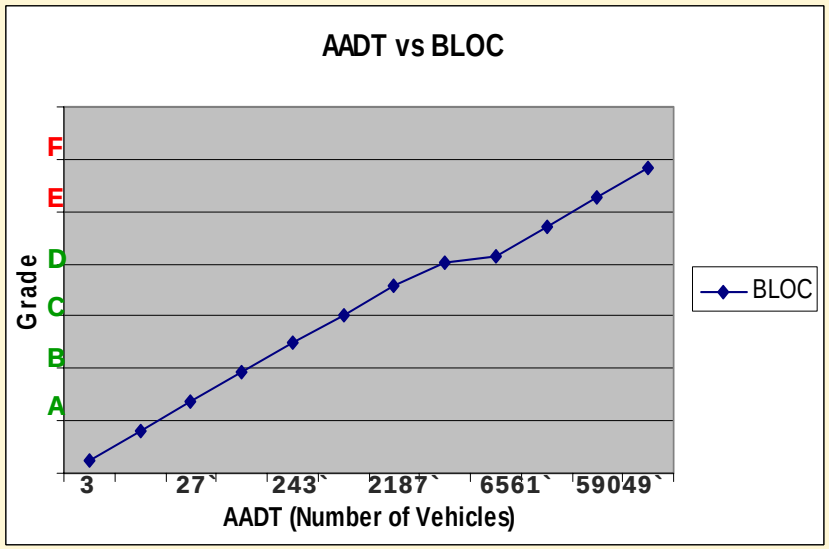
Shoulder Width Analysis for a section on Falls Road

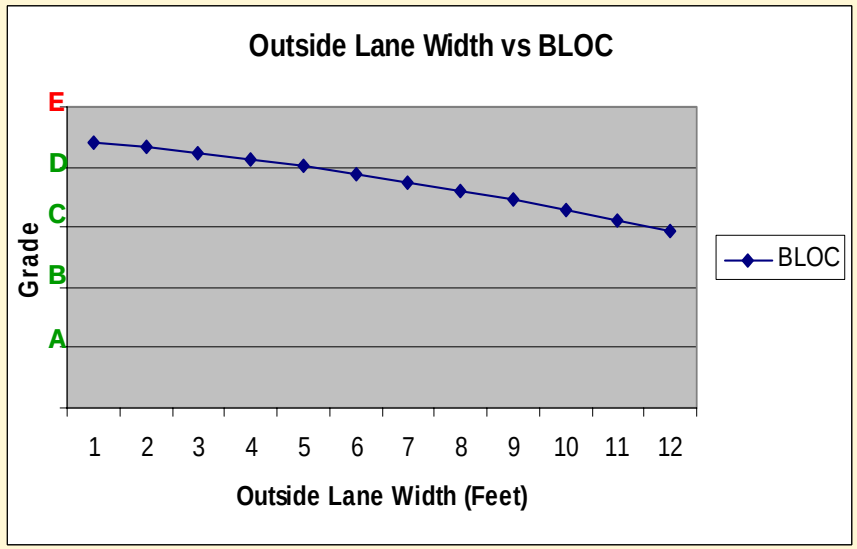
- Road Name : **Falls Road (6.01-6.63)**
- AADT : 4975
- Speed : 40
- Through Lanes : 2
- HV: 3
- Width of outer lane : 12
- Shoulder Width : 0
- Pavement Rating : 3

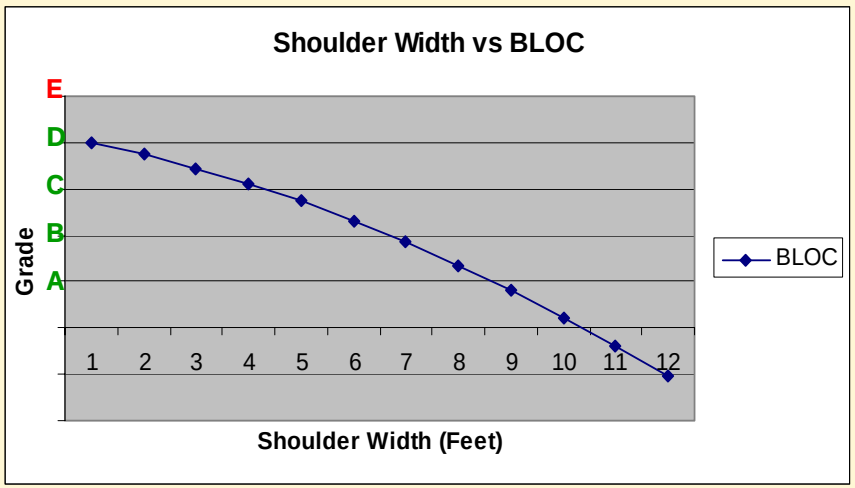
Shoulder Width	BLOC	Grade
0	**4.01**	**D**
1	3.75	D
2	3.45	C
3	3.11	C
4	2.73	C
5	2.31	B
6	1.85	B
7	1.35	A
8	0.81	A
9	0.23	A
10	-0.39	A
11	-1.05	A

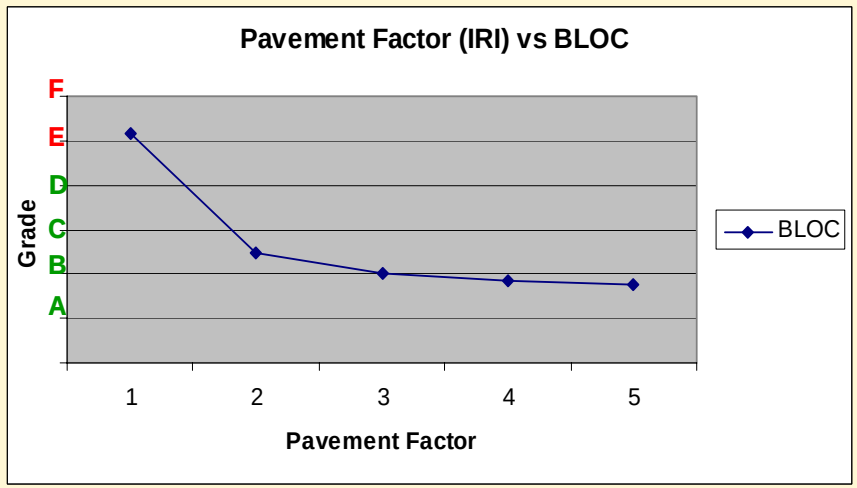


Parameter Trend Analysis for a section on Falls Road









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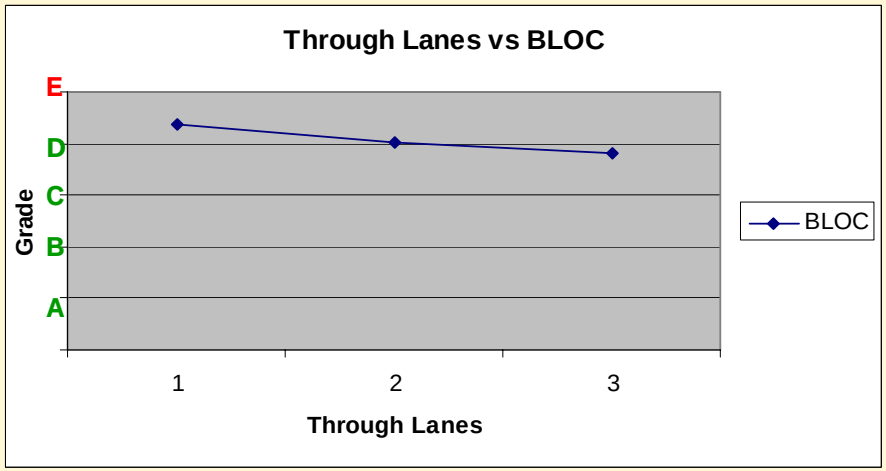

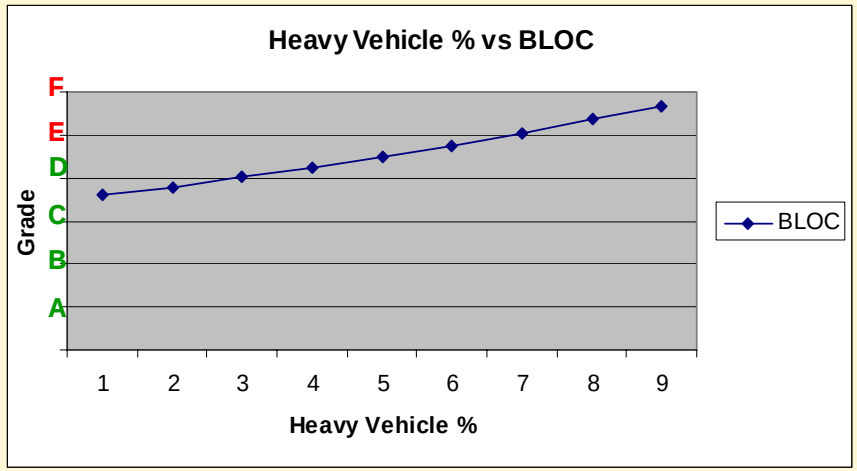

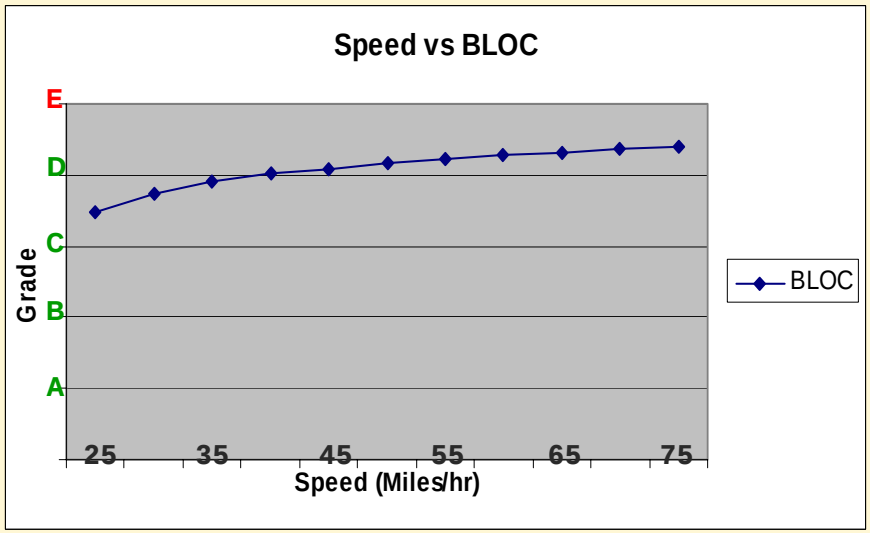

Summary of Trend Analysis

- Initial results show that these four parameters have a greater impact on the BLOC score in the following order:
    1. Shoulder Width
    2. Annual Average Daily Traffic
    3. Pavement Factor
    4. Heavy Vehicle
- Need further Sensitivity Analysis with multiple parameters

Data to Analyze

- Bicycle Level of Comfort (BLOC)
- Consolidated Financial Statement (CFS)
- Consolidated Transportation Project (CTP)
- Annual Average Daily Traffic (AADT)

BLOC Phases

Phase 1

- Query
  - Section
  - Project
  - Advanced
  - Map interface
- Develop Map Controls
- Section Analysis and Reporting

Phase 2

- Legend
- Statewide Analysis and Reporting
- Forecast Analysis and Reporting
- Reporting tab
  - Deficiency

Phase 3

- Cost Analysis
- Admin Section
- Help and Feedback
- Link to SHAWME
- Other Reports
  - Improvement
  - Bad Routes

BLOC Demo