Travel Model Improvement Program
Iowa Peer Exchange
Travel Demand Model Calibration/Validation

Iowa Department of Transportation

Ames, IA

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Presented by
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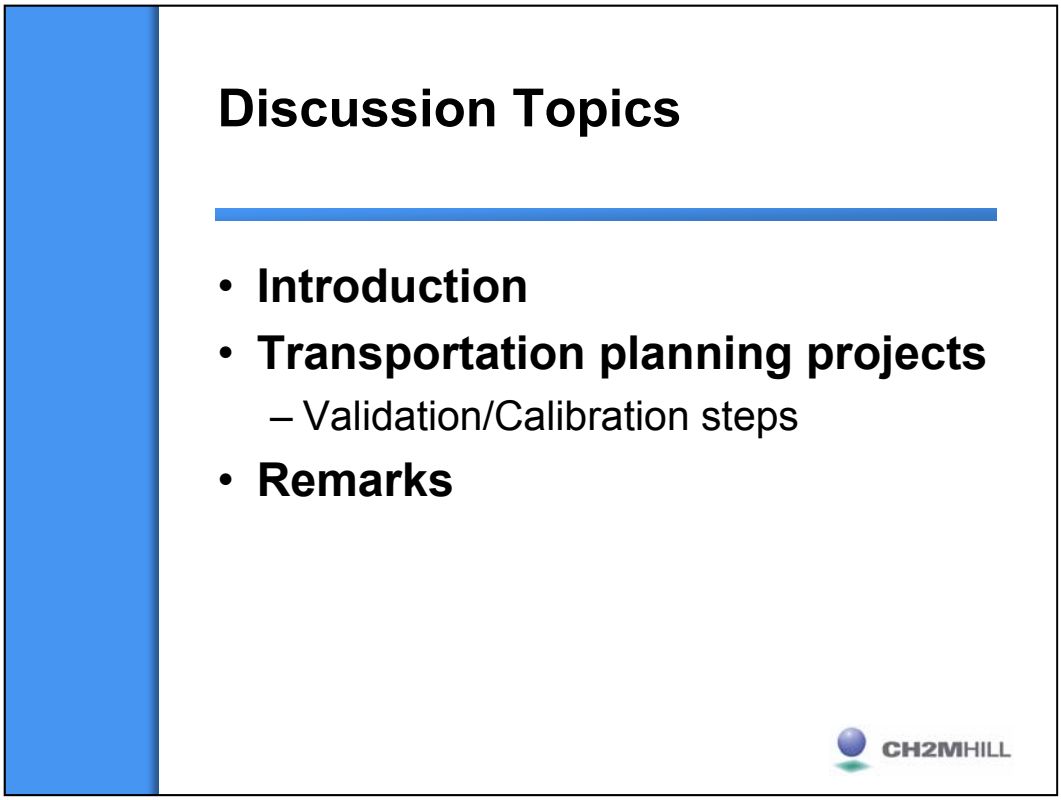

Introduction

-Context of projects

Consideration for level-of-effort

Available data

Relate topic to project experience

Establish travel demand

Calibration of models

Validation of overall traffic assignment

screenline comparisons

Fine tune model through network modifications

link codings – speed/capacity

time penalities

turn prohibitions, etc

SIMPCO Transportation System Planning Model

- Background
- Results
- Model Applications

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SIMPCO - Results

- **Steps**
  - iterations
- **Key items**
  - friction factors
  - time penalty - bridges
- **Screenline comparisons**

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Iterations - 10 iterations

Intrazonal trips - 0.5 times the average travel time to adjacent zones

Friction Factors - 3 runs

Time Penalties on Bridges - 10 minutes

External Stations

Calibration and Adjustment of System Planning Models – 1990 Guidelines

Friction factor adjustments

Trip Purpose	FHWA Suggested Trip Length (Minutes)	Initial Run Model Exponent	Initial Run Trip Length (Minutes)	Run Number 1 Model Exponent	Run Number 1 Trip Length (Minutes)	Run Number 2 Model Exponent	Run Number 2 Trip Length (Minutes)	Run Number 3 Model Exponent	Run Number 3 Trip Length (Minutes)
Home -Based Work(HBW)	8.99	0.8	7.85	0.45	8.75	0.5	8.75	0.75	8.13
Home-Based Other (HBO)	8.84	3	2.5	0.75	7.9	0.75	7.82	1	6.9
Non-Home Based (NHB)	6.49	3.2	1.88	1	6.66	1.25	5.7	1.25	5.7

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Screenline Comparisons

Screenline	Actual Count	Assigned Volume	% Deviation
1	66,287	72,161	8.9%
2	102,432	91,510	-10.7%
3	114,797	98,727	-14.0%
4	21,770	19,549	-10.2%
5	46,366	51,245	10.5%
6	97,640	102,468	4.9%
7	53,370	55,233	3.5%
8	106,109	98,602	-7.1%
TOTAL	**608,771**	**589,495**	**-3.2%**

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Go to worksheet for other comparisons and discussion

SIMPCO Model Applications

- Forecasted traffic volumes for the downtown (Sioux City) segment along I-29

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Kane County, IL

- Background
- Results
- Model Applications

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Kane County - Results

- **Steps**
  - iterations
- **Key Items**
  - friction factors
- **Mean travel time comparison**
- **Screenline comparisons**
  - within acceptable guidelines

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Iterations - 8 runs

Primarily friction factors

Network adjustments

Mean Travel Times by Purpose

Calibration Run/ Mean Travel Time by Trip Purpose	1	2	3	4	5	6	7	8
HBW	21.5	21.9	21.9	21.9	23.5	21.9	21.9	22.0
HBO	11.0	10.2	15.7	16.6	15.7	11.3	13.7	13.7
NHB	8.4	8.6	15.1	16.1	15.1	10.4	13.0	13.0
TRUCK	10.5	10.7	15.1	16.1	15.1	10.3	13.0	13.0

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Travel time comparisons made between model and the results from a sub-area study conducted by CATS - Chicago Metro Area MPO

Mean travel time for internal trips - 15.18 mins, CATS work 15.65 mins.

Kane County Model Applications

- Sub-area planning studies
- Impact fee program
- 2030 Long Range Transportation Plan
- Fox River bridge crossing

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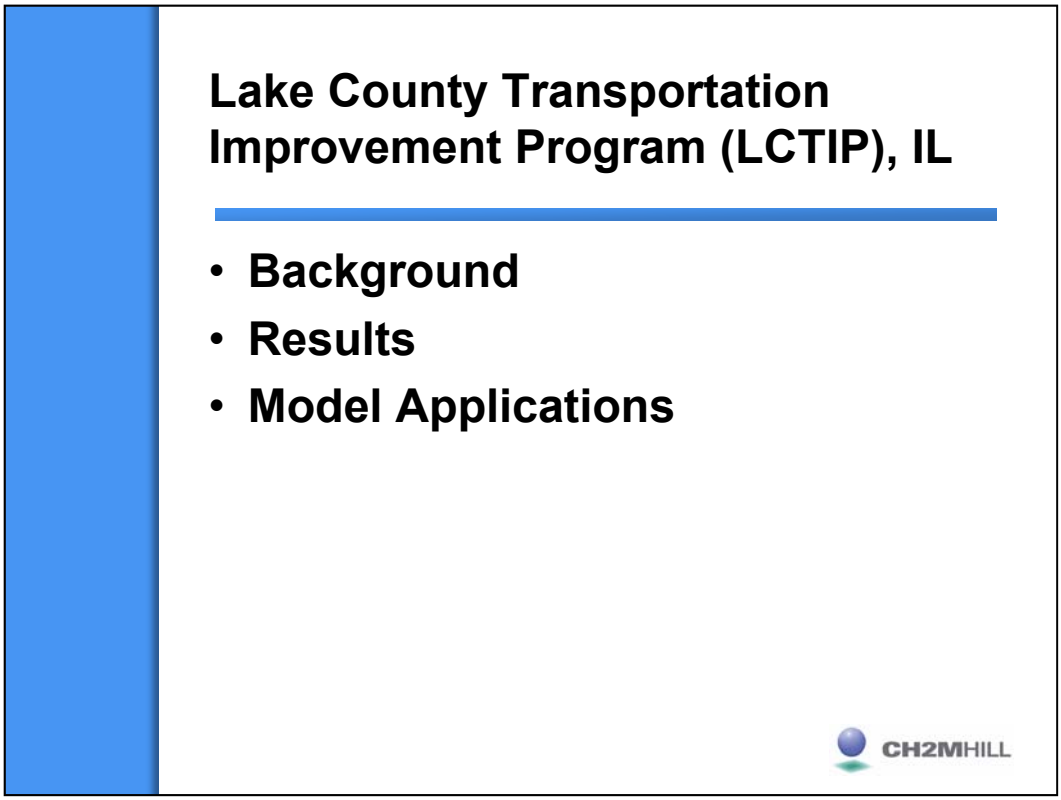

County wide transportation plan that evaluated major network improvements

- Extension of IL 53 into Lake County
- Arterial alternative

LCTIP - Results

- **Steps**
  - Iterations
- **Key items**
  - Zone splitting - centroid connectors
  - Volume delay functions
- **Screenline comparisons**

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9 iterations

Network modifications

BPR curve coefficient modifications

0.2 and an exponent of 10

MODEL (V8) OF CALIBRATION OF TP+ VERSION 1.5

TABLE A-8(A): Assigned Volume Comparison: CATS Assignment vs. LCTIP Volumes

SCREENLINE	CATS Assigned Volumes	LCTIP Assigned Volumes	% Deviation
1	41477	40708	-2%
2	47237	49511	5%
3	57371	57903	1%
4	79526	76812	-3%
5	43044	43636	1%
6	45856	40651	-11%
7	73997	69328	-6%
8	85278	84189	-1%
9	90443	90687	0%
10	113258	109890	-3%
TOTAL	677487	663315	-2%

TABLE A-8(B): Assigned Volume Comparison: Ground Counts vs. LCTIP Volumes

SCREENLINE	Ground Counts	LCTIP Assigned Volumes	% Deviation
1	32448	40708	25%
2	49585	49511	0%
3	60654	57903	-5%
4	80594	76812	-5%
5	37506	43636	16%
6	39293	40651	3%
7	72100	69328	-4%
8	72968	84189	15%
9	84521	90687	7%
10	103838	109890	6%
TOTAL	633507	663315	5%

LCTIP - Applications

- Traffic Model used in the alternative development phase
- Formed the basis of the County's Long Range Transportation Plan

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Remarks

- **Use practical guidelines - references**
- **Establish total travel demand, then adjust at the route/link level**
- **Key items**
  - "Good data" - traffic network and socioeconomic
  - Special Generators
  - Friction Factors
  - Volume Delay Functions
  - External trips
- **Model applications**

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