

The 2009 NHTS Vermont

Uses of the Add-On Data for Modeling and Research in Vermont

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Research Collaborators

- Brian Lee, Ph.D., Assistant Professor
- Justine Sears, Research Specialist
- Lisa Aultman-Hall, Ph. D., Professor
- Paul Hines, Ph. D., Assistant Professor



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The 2009 NHTS Vermont

- Add-On Survey Design
- The Vermont Statewide Travel Model
- Spatial Analysis of Electric Vehicle Charging Demand and Travel Demand
- Measurement of Livability Attributes for Seniors
- Accessibility and Independent Mobility for Youth

Add-On Survey
Design

The Vermont
Statewide Travel
Model

Spatial Analysis of EV
Charging Demand
and Travel Demand

Measurement of
Livability Attributes for
Seniors

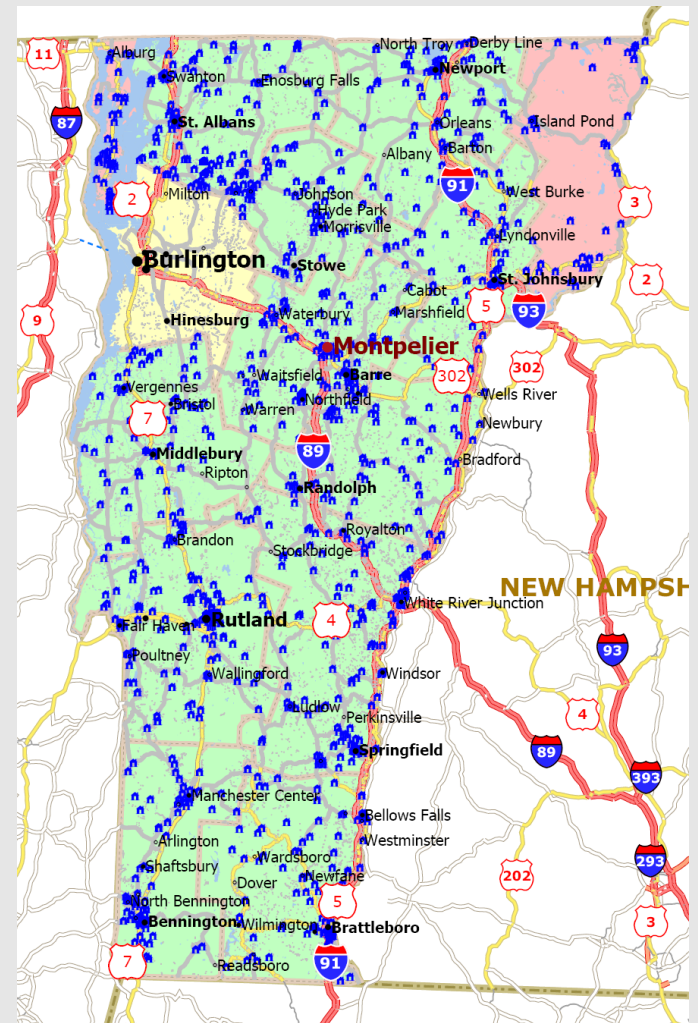
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- Over-sampling Vermont:
 1. Allocate samples randomly outside of Chittenden County up to 913 (1,041)
 2. Over-sample the 2 most rural counties until 1,000 total households is reached (1,188)
- Resulted in a statewide sampling rate 5x greater than the national average



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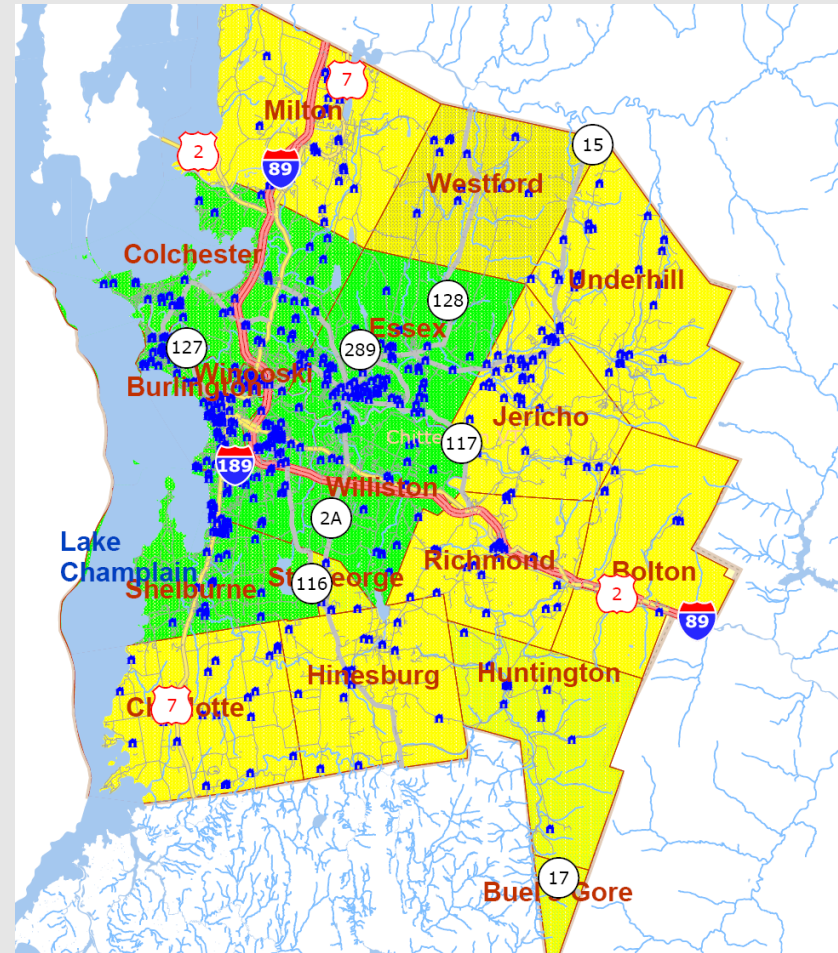
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- Over-sampling Chittenden County:
 1. Allocate samples randomly up to 350 (317)
 2. Over-sample the rural towns until 500 total households is reached (502)



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- **Research Objectives**
 - Use Vermont-specific travel behavior information to complete the first comprehensive update of the trip-generation and trip-distribution sub-modules of the statewide travel demand model
 - Evaluate the improvement in the quality and usefulness of the model following the update

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- **Uses of the NHTS**
 - Regression Factors for Trip Rate Table
 - Home-Based Trip Rates
 - Regression Equations for Trip Attraction and Non-Home-Based Trip Production
 - Vehicle Occupancies by Purpose
 - Transit Fractions by Purpose
 - Friction-Factor Equations by Purpose for Trip Distribution

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- Uses of the NHTS

Purpose	Vehicle Occupancy Rates				I↔E Distributions		Home-Based Trip Rates	New Transit %s	Internal Trip Distributions			
	Existing		New		Existing	New			Avg. Trip Length (min.)		% of Trips	
	I-I	I↔E	I-I	I↔E					Existing	New	Existing	New
HBO	1.56	1.74	1.75	1.85	38%	21%	↔	52%	18.6	20.5	34%	35%
HBSHOP	1.37	1.74	1.48	1.93	17%	15%	↑	0.4%	20.8	17.4	14%	21%
HBW	1.15	1.74	1.13	1.05	30%	9%	↓	6%	21.8	20.9	25%	13%
NHB	1.39	1.74	1.51	1.78	13%	55%		42%	14.5	19.1	21%	31%

Variable	Existing βs					New βs				
	NHB	HBW	HBSHOP (Urban)	HBSHOP (Rural)	HBO	NHB	HBW	HBSHOP (Urban)	HBSHOP (Rural)	HBO
No. of Households	0.297				1.143	0.817				1.043
Retail Jobs	1.143		4.115	6.660		2.935		5.796	6.693	
Manufacturing Jobs	0.668					0.929				
Non-Manufacturing	1.722	1.450			1.179	0.651	0.830			1.119
Government Jobs	2.450		1.302							
Primary School Jobs	1.485		0.424							
University Jobs	1.485		0.146							

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• Uses of the NHTS

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	Existing		New		Existing	New			Avg. Trip Length (min.)		% of Trips	
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- **Research Objectives**
 - Understanding the interaction between travel demand and electric vehicle charging
 - Research Questions:
 1. Who are the ideal candidates for electric vehicle ownership?
 2. What are ideal locations for charging stations?

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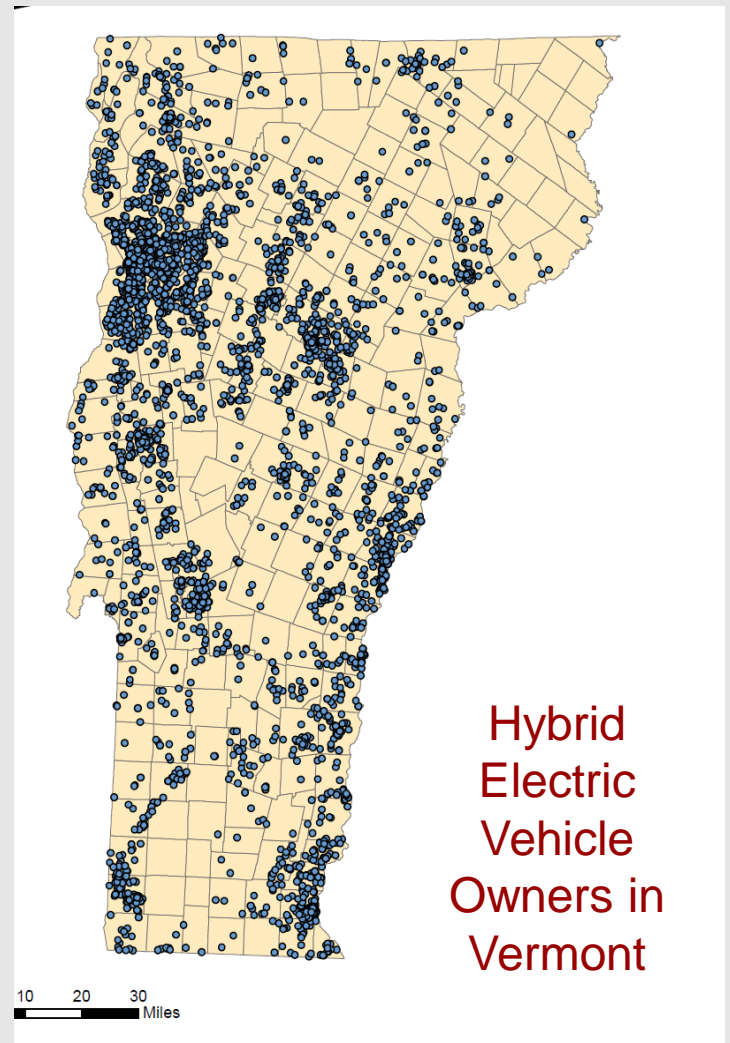


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- **Methods**

- Current distribution from our DMV records can be used as a “seed” predictor
- “Attach” these hybrid vehicle owners to certain spatially-based travel patterns
- Use characteristics of the households and drivers to attribute travel patterns to all hybrid owners in the state



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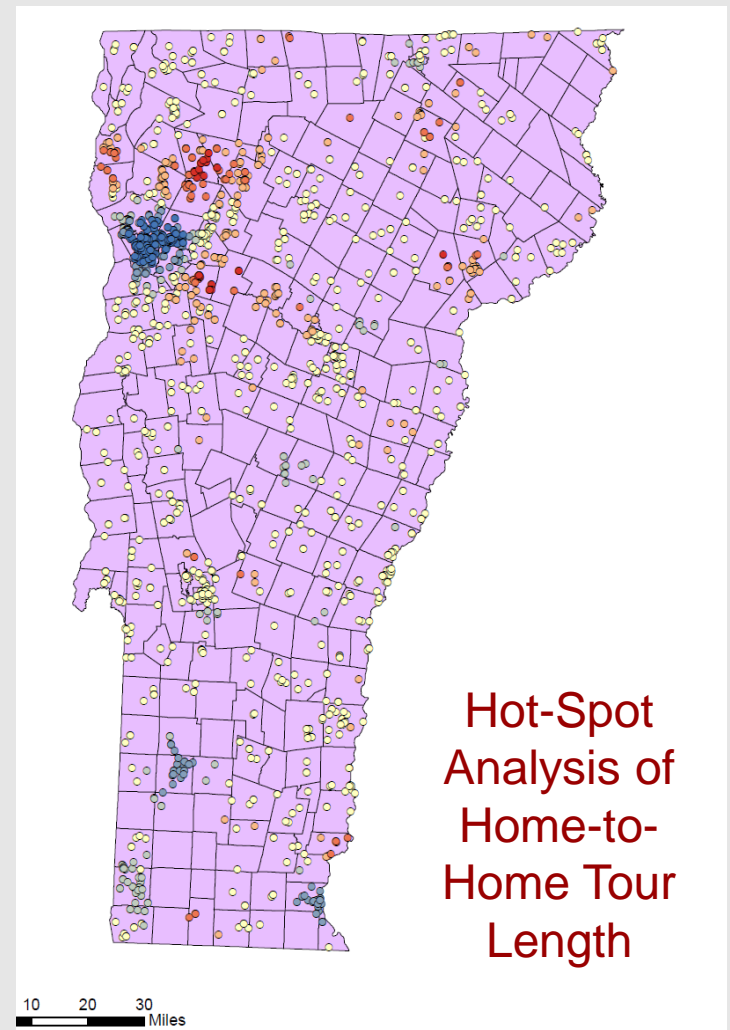
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- **Use of the NHTS**
 - Analyze the variation in home-to-home tour length to characterize total travel by vehicle spatially



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- **Research Objectives**

- Using stated-preference surveys from the AARP to rank community-attributes according to their contribution to livability for seniors
 - Sub-classified the ranks by age (55 to 64 and 65+) and geography (urban and rural)

Age Class (years)	Geographic Class			
	Rural		Urban	
	%	Respondents	%	Respondents
55-64	47	957	53	1,073
65+	46	1,186	54	1,363

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- Results suggest a distinction between age classifications and geographic classifications

Rank	Rural Seniors	Urban Seniors	Age 55 to 64	Age 65+	All Seniors
1	Safe Neighborhood	Safe Neighborhood	Safe Neighborhood	Safe Neighborhood	Safe Neighborhood
2	Hospital in the Community	Hospital in the Community	Hospital in the Community	Hospital in the Community	Hospital in the Community
3	Affordable Housing	Variety of Senior Housing Options	Affordable Housing	Variety of Senior Housing Options	Variety of Senior Housing Options
4	Variety of Senior Housing Options	Maintenance of Streets	Variety of Senior Housing Options	Place of Worship	Affordable Housing
5	Place of Worship	Affordable Housing	Maintenance of Streets	Affordable Housing	Place of Worship
6	Affordable Shopping	Convenient Public Transport	Place of Worship	Convenient Public Transport	Maintenance of Streets
7	Grocery Store Within ½ Mile	Place of Worship	Affordable Shopping	Access to Shopping	Convenient Public Transport

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- **Uses of the NHTS**

- To confirm the importance of these classifications:

Description	Rural Seniors	Urban Seniors	Age 55 to 64	Age 65+	All Seniors
Average no. of trips per week per person	24.7	25.3	27.9	22.5	25.1
Average no. of walk/bike trips per week per person	2.5	1.7	2.7	1.9	2.3
Average no. of transit trips per week per person	0.4	0.9	0.9	0.6	0.7
Average no. of shopping trips per week per person	12.9	14.1	14.5	13.3	13.8
Average length of shopping trip (miles)	10.9	5.8	8.0	6.7	7.3

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- **Research Objectives**
 - Research Questions
 - In what ways do existing transportation and land use patterns in rural communities impact youth in terms of their access to activities in different places (social and physical availability) and mobility (ability to reach destinations)?
 - What forms of rural built environment are more conducive to independent mobility among youth?
 - Which characteristics of these different rural forms have most significant influence on young people's access to activities and destinations?

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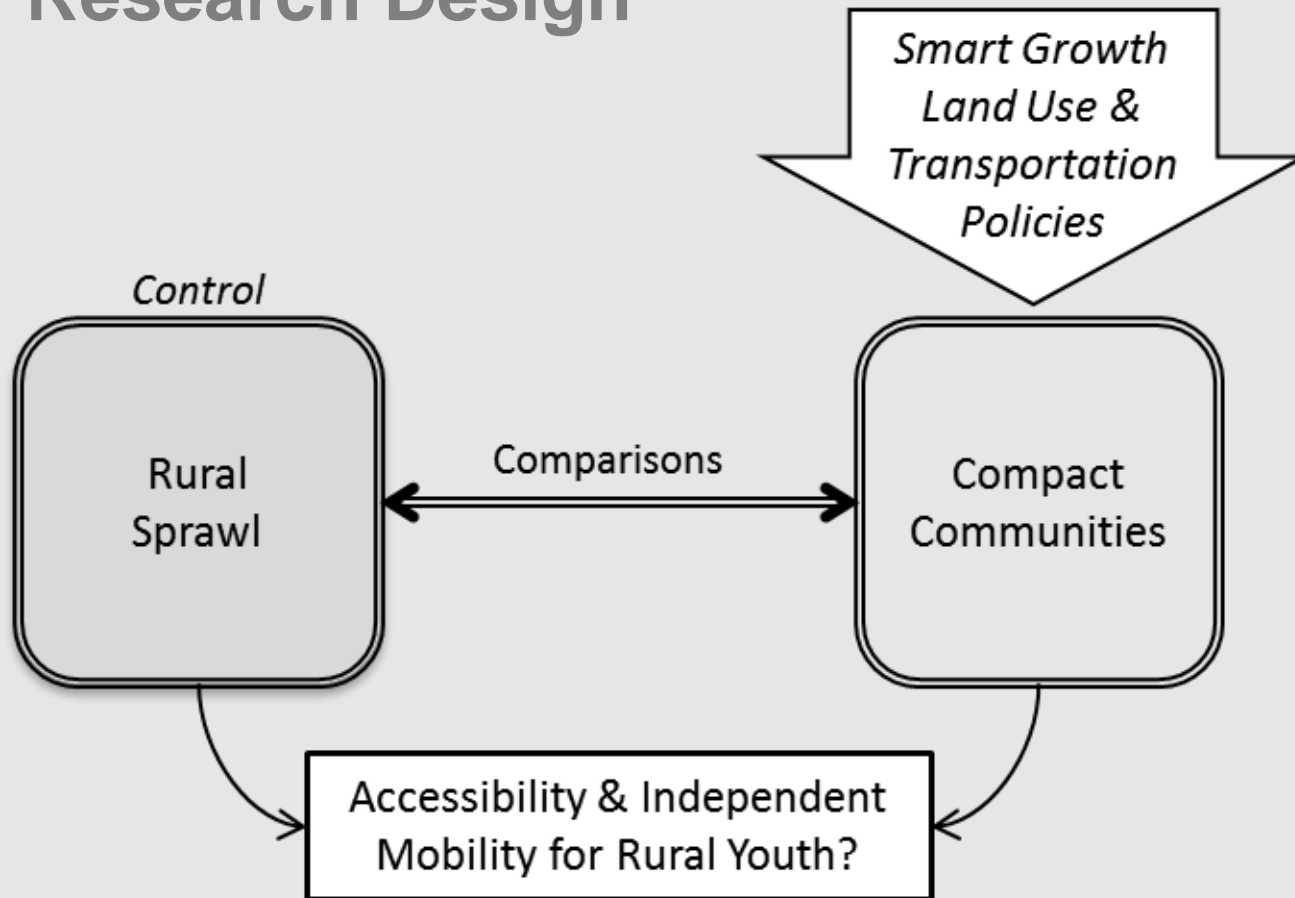
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- **Research Design**



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- **Uses of the NHTS**

- Identify travel behaviors that will inform the development of a household survey

Purpose	HHs with Youth		HHs without Youth	
	Count	Rank	Count	Rank
Home	597	1	1,442	1
Social / recreational	278	2	659	3
Shopping / errands	214	3	823	2
Work	189	5	506	4
Transport someone	196	4	276	5
School / daycare / religious activity	137	6	173	7
Meals	83	7	259	6
Family personal business / obligations	46	8	162	8
Medical / dental services	19	9	77	9
Other reason	10	10	26	10
Don't know	2	11	4	11
Grand Total	1,771		4,407	

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- **Uses of the NHTS**

Household 30963689, Rural, With One Youth Aged 14-18, 3 Drivers, 3 Vehicles; Tuesday 9/23/2008			
	Time	# on Trip	Activity
Person 01	8:15-8:45am	1	Drove veh 02 to Technology Park to attend meeting
	4:37-5:05pm	1	Drove veh 02 to Unleash Pet Store to buy goods
	5:15-5:40pm	1	Drove veh 02 home
	6:30-6:45pm	1	Drove veh 02 to pick up Child 01 at MMU
	6:46-7:00pm	2	Drove veh 02 home with Child 01
Person 02	7:50-8:00am	2	Drove veh 01 to drop off Child 01 at MMU
	8:01-8:20am	1	Drove veh 01 to go to work
	10:45-10:53am	1	Walked to go to gym/exercise/play sports
	1054:11:00am	1	Walked back to work
	1:20-1:43pm	1	Walked to go to gym/exercise/play sports
	1:44-1:55pm	1	Walked back to work
	2:55-3:10pm	1	Drove veh 01 to "Chittenden East Sup. Union" to attend business meeting
	4:40-4:50pm	1	Drove veh 01 home
	6:20-6:30pm	1	Drove veh 01 back to "Chittenden East Sup. Union" to attend business meeting
8:00-8:10pm	1	Drove veh 01 back home	
Child 01	7:50-8:00am	2	Passenger in veh 01 to be dropped off at "High School"
	1:45-2:30pm	1	Passenger in school bus to go to "Bellows Free Academy" for gym/play sports
	5:30-6:15pm	1	Passenger in school bus to go back to "High School" as student
	6:46-7:00om	2	Passenger in veh 02 picked up from school to be driven back home

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	1054:11:00am	1	Walked back to work
	1:20-1:43pm	1	Walked to go to gym/exercise/play sports
	1:44-1:55pm	1	Walked back to work
	2:55-3:10pm	1	Drove veh 01 to "Chittenden East Sup. Union" to attend business meeting
	4:40-4:50pm	1	Drove veh 01 home
	6:20-6:30pm	1	Drove veh 01 back to "Chittenden East Sup. Union" to attend business meeting
	8:00-8:10pm	1	Drove veh 01 back home
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- Questions?



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