TravTek Evaluation
Orlando Test Network Study

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FOREWORD

This report is one of eight reports produced as part of the evaluation of the TravTek operational field test, conducted in Orlando, Florida, during 1992-1993. TravTek, short for Travel Technology, was an advanced driver information and traffic management system that provided a combination of traveler information services and route navigation and guidance support to the driver. Twelve individual but related studies were conducted during the evaluation. Evaluation goals and objectives were represented by the following basic questions: (1) Did the TravTek system work? (2) Did drivers save time and avoid congestion? (3) Will drivers use the system? (4) How effective was voice guidance compared to moving map and turn-by-turn displays? (5) Was TravTek safe? (6) Could TravTek benefit travelers who do not have the TravTek system? (7) Will people be willing to pay for TravTek features?

Evaluation data were obtained from more than 4,000 volunteer drivers during the operation of 100 specially equipped automobiles for a l-year period. Results of the evaluation demonstrated and validated the concept of in-vehicle navigation and the provision of traveler information services to the driver. The test also provided valuable results concerning the drivers' interaction with and use of the in-vehicle displays. This project has made many important contributions supporting the goals and objectives of the Intelligent Transportation Systems Program.

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Traffic Operations Research and
Development

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16. Abstract

The Orlando Test Network Study was one of a series of investigations conducted as part of the TravTek operational test of an advanced traveler information and traffic management system (ATIS/ATMS). The TravTek system consisted of the Orlando Traffic Management Center (TMC), the TravTek vehicles, and the TravTek Information and Services Center. The TMC broadcast updated travel times for TravTek traffic links to the TravTek vehicles once each minute. The TravTek vehicles broadcast their link travel times back to the TMC for transmission to the other TravTek vehicles. The vehicles were equipped to provide route planning, route guidance, and a data base of local services and attractions. The primary purpose of this study was to evaluate the effects of alternative driver interfaces on driver performance, navigation performance, driver perception, driver preference, and willingness-to-pay.

A controlled experiment was conducted in which up to six TravTek vehicles traveled the same origin to destination (O/D) pairings to evaluate six alternative information presentation configurations: five TravTek alternatives and a control configuration. Three visual display conditions were tested: a moving map display, a symbolic guidance display, and a condition with no visual display. Two aural conditions were tested in combination with the three visual conditions: synthesized voice guidance and no voice guidance. The six information presentation configurations were evaluated both in the day and at night. Five of six combinations utilized the TravTek and one configuration (no visual display and no voice guidance) was considered the Control condition. The drivers in the Control condition had to plan and navigate to their destination as "they normally would" without the use of automated route planning and route guidance. Data from 3 18 drivers are presented.

TravTek benefits to individual drivers included travel time savings and a reduction in perceived workload. Both the moving map and simplified turn-by-turn visual displays were very effective compared to the Control condition, particularly when the visual displays were supplemented with synthesized voice guidance. User perception and performance data suggest that the system was easy to learn and easy to use. Participants in this study indicated that they would be willing to pay about $1000 for a system such as the one they drove.

17. Key Words TravTek, ATIS, ATMS, IVHS, ITS, Real-Time Traffic Information, Route Guidance, Route Planning	18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161		
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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Flhd	Symbol
LENGTH				
in	inches	254	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in2	square inches	645.2	square millimeters	**mm²**
ft2	square feet	0.093	square meters	m2
yd2	square yards	0.636	square meters	m2
ac	acres	0.405	hectares	ha
mi2	square miles	2.59	square kilometers	km2
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.765	liters	L
ft3	cubic feet	0.026	cubic meters	m3
yd3	cubic yards	0.765	cubic meters	m3
NOTE: Volumes greater than 1000 I shall be shown in m3.				
MASS				
oz	ounces	26.35	grams	**g**
Ib	pounds	0.454	kilograms	**kg**
T	short tons (2009 lb)	0.907	megagrams (or 'metric ton")	**Mg (or "t")**
TEMPERATURE (exact)				
"F	Fahrenheit temperature	5(F-32)/9 or (F-32)/1.8	Celcius temperature	"C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m2	cd/m2
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in2	poundforce per square inch	6.69	kilopascals	kPa

APPROXIMATE CONVERSIONS

Symbol	When You Know	Multiply By
LENGTH		
mm	millimeters	0.039
m	meters	3.26
m	meters	1.09
km	kilometers	0.621
AREA		
mm2	square millimeters	0.0016
m2	square meters	10.764
m2	square meters	1.195
ha	hectares	2.47
km2	square kilometers	0.366
VOLUME		
mL	milliliters	0.034
L	liters	0.264
m3	cubic meters	35.71
m3	cubic meters	1.307
MASS		
9	grams	0.035
kg	kilograms	2.202
mg (or "t")	megagrams (or "metric ton")	1.103
TEMPERATURE (		
"C	Celcius temperature	1.8C + 32
ILLUMINATIO		
lx	lux	0.0929
cd/m2	candela/m2	0.2919
FORCE and PRESSURE		
N	newtons	0.225
kPa	kilopascals	0.145

SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E360.

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