Cell Phone Filter/Blocker Technology Field Test

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UMTRI

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Cell Phone Filter/Blocker Technology

- Cell Phone Filter/Blocker background

- Field Study

- State-of-the-Art 2015

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Cell Phone Filter/Blocker Technology

- Means of restricting incoming and outgoing communications while a device is in motion
  - Software only approach (GPS)
  - Hardware + Software approach (OBDII + Bluetooth)

- Filtering/blocking can include voice calls, text, and apps/data transmission.

- Overrides generally can be allowed.
  - "White list' numbers
  - Some allow "white list" apps
  - 911 calls

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Cell Phone Filter/Blocker Technology

- Some targeted to phone user vs. monitor
  - Manual vs. Auto enable
  - Automated responses to incoming comm.
  - Notification when blocked comm. comes in

- Most provide on-line "dashboard" for monitoring use

- Wide range of pricing
  - Some monthly, some one-time, generally low cost
  - Hardware approaches tend to cost more $$

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Cell Phone Filter/Blocker Field Test

- Objective: Examine…

  - Participant behavior
  - Participant acceptance
  - Organizational impacts

…of cell phone filtering/blocking technologies.

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Research Collaboration

- VTTI

- UMTRI
  - Jim Sayer, Ph.D.
  - Dillon Funkhouser

- Participant Organization
  - Michigan Department of Transportation (MDOT)

- Technology Providers
  - Illume Software, Inc
  - obdEdge, LLC

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Selecting Technology Partners

- Is there a commercial product on the market?

- Can data be collected in the baseline period?

- What is the range of platforms supported?

- Is it a software only solution, or is there hardware too?

- Can data be stored remotely from handset?

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Selecting Technology Partners (2011)

- Software only:
  - Izup
  - Guardian Angel
  - PhonEnforcer
  - Text Arrest
  - TxtBlocker
  - PhoneGuard
  - DriveSmart
  - CellSafety

- Hardware/Software:
  - Cell Control
  - DriveAssist
  - ZoomSafer
  - Key2SafeDriving
  - Safe Phones4 U

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Procedure

- 9-week experience for each participant
- A-B-A (3-3-3) design
- Data sent remotely to UMTRI
  - No content collected
  - Overrides allowed

- Study Sample
  - 44 participants in final dataset
 - MDOT employees, some with dedicated vehicles

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Data Collection

- Time of day, location, speed of handset
- Incoming and outgoing calls (begin and end time)
- Also when:
  - An SMS was sent or received
  - The phone had a web browser displayed
  - The phone had an email application displayed
  - The phone had an app displayed (maps, calculator, etc.)
  - Manual overrides occurred

- Online survey completed at the end of week 6

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Results: Driving Exposure
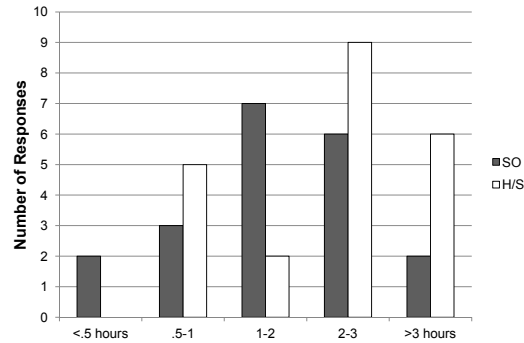
"On average, over the last 6 weeks, how much time did you spend driving as a portion of each 8-hour workday?"

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Results: Cell Phone Use Behavior

	Software Only Application		
	Monitor 1	Blocking	Monitor 2
Percent of calls made at zero-speed	72.4%	79.1%	73.2%
Unanswered incoming calls (non-zero speed)	0.0%	26.5%	1.4%

- About 27% of calls made while moving, down to 21% with app

- All incoming calls answered in baseline, 26.5% of calls blocked during testing, the rest required overrides to answer

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Results: Cell Phone Use Behavior

	Hardware/Software Application		
	Monitor 1	Blocking	Monitor 2
Percent of calls made at zero-speed	4.0%	16.0%	1.7%
Unanswered incoming calls (non-zero speed)	2.5%	50.7%	4.8%

- Most calls made while moving in baseline period. 16% of calls made when stopped during blocking period

- Most incoming calls answered in baseline, 50.7% of calls blocked during testing, the rest required overrides to answer

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Results: Cell Phone Use Behavior

- Software-only participants at speed less, often rode as passengers (3/4 of calls placed at zero speed)

- Hardware/Software participants drove often, would always be the driver (less overrides on incoming calls)

- No significant difference in duration of calls between data collection periods

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Results: User Acceptance

Participants' least favorite aspect of the application
(counts of open-ended responses):

	Overall	SO	H/S
Battery drain	11	11	0
Incoming calls blocked	9	6	3
Inconvenient not being able to make call	5	2	3
General loss of productivity	5	0	5
Have to override often, override diffcult	4	3	1
Can't read email while driving	3	0	3
Had to pull off to call, dangerous	3	0	3
Post-drive blocking latentcy	3	3	0

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Results: Gaming of the System

- Optional nature of program removed some incentive to "game" the system

- 2 participants reported providing personal phone numbers to co-workers

- Many "Tamper alerts" and "Violations" reported
  - Likely due to downtime in phone/vehicle use (vacation etc.)
  - Not likely due to "tinkering"

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Results: Organizational Costs

- Acquisition and subscription costs of the application and any associated equipment (low)

- Education, training and installation (medium)

- Maintenance and monitoring (likely medium)

- Effects on productivity (medium to high)

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Conclusions

- Participants are resistant because of job impacts even if they see the safety benefit

- Even with overrides available (and many performed), use rates while at speed significantly declined during Blocking period

- Productivity losses likely largest cost of implementation

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Lessons Learned

- GPS approach has issues with latency
  - Good for sitting in traffic, bad at the end of trips
  - Beholded to GPS reception
  - Extra drain on handset battery

- No distinction whether phone user is actually the driver of the vehicle

- Hardware approach lacks continuous monitoring
  - Ambiguous whether device disabled or just not driving

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Considerations for Future Research

- Test hardware/software application with continuous monitoring of phone activity (not just while in vehicle)

- Obtain phone use logs from participants or gain access to phone records for data verification

- Possibly not allow overrides

- Possibly only block SMS/email/applications, not phone use

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Technology State-of-the-Art (2015)

- Software only:
  - Guardian Angel
    - (New features available with Autolog)
  - PhonEnforcer
  - Text Arrest
  - TxtBlocker
  - PhoneGuard
  - CellSafety
    - Now "WebSafety"
  - DriveScribe
  - OneProtect
  - SafeCell
  - Live2Txt
  - Textecution
  - Text-STAR
  - DriveFirst (Sprint)
  - Safely Go (Verizon)
  - DriveSmart (T-mobile)
  - DriveMode(AT&T)
  - DriveOff (Esurance)

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Technology State-of-the-Art (2015)

- Hardware/Software:
  - Cell Control
    - (new features available with DriveID)
  - DriveAssist
  - Key2SafeDriving
  - Safe Phones4 U
  - TextBuster
  - cellSAFE
  - KyrusMobile

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Technology State-of-the-Art (2015)

- Guardian Angel (Trinity-Noble, LLC)
  - Passenger/Driver detection
  - Autolog employs patch antenna array
  - Skybloc is being developed to jam in-car only (currently illegal in the US)

- CellControl DriveID (obdEdge, LLC)
  - Also employs passenger detection
  - Uses solar power for on-windshield unit

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Questions?

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