Keeping Eyes on the Road for Safer Driving: Voice Interfaces and Ford SYNC

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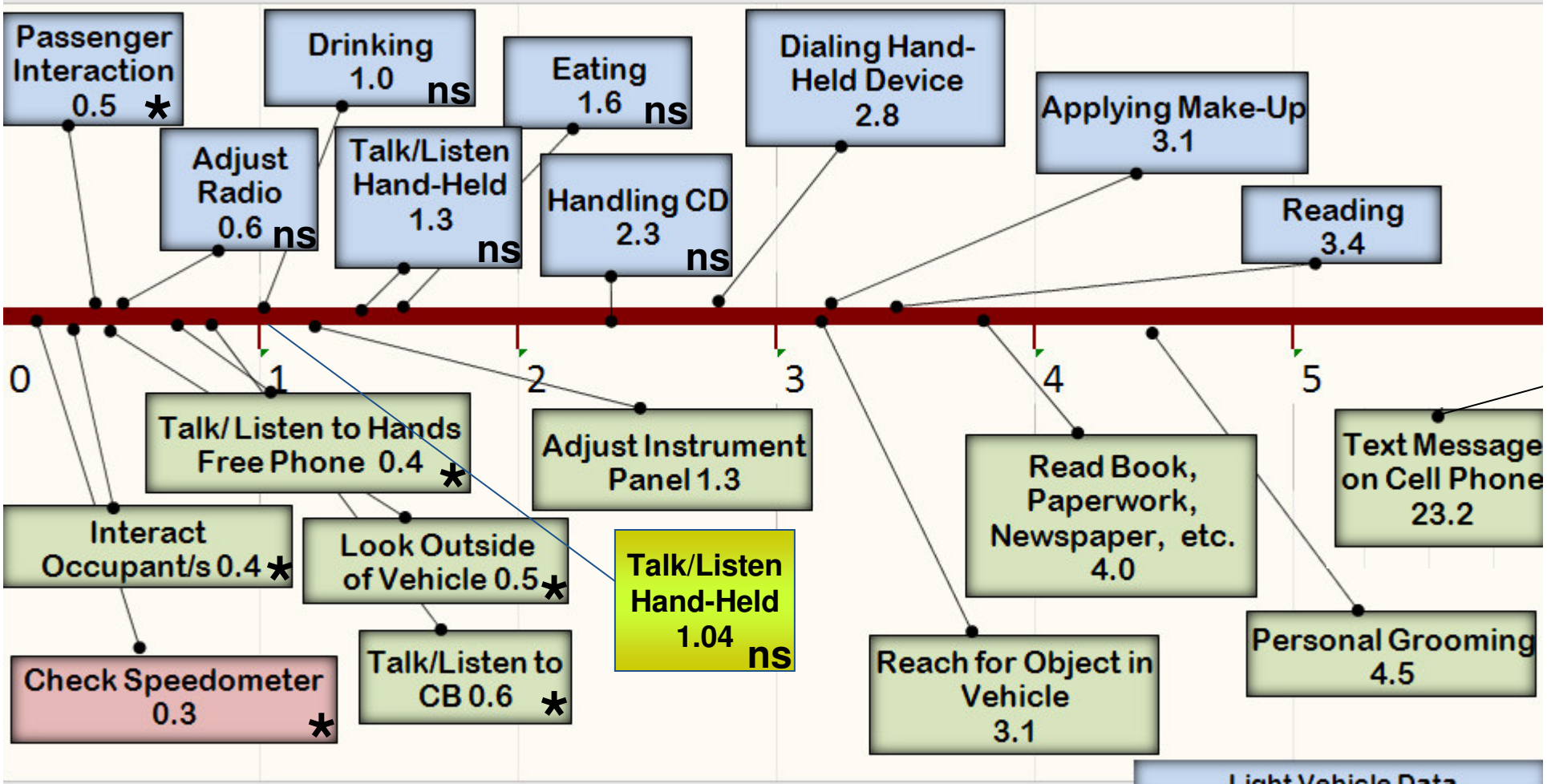
Looking Away From the Road Raises Crash/Near Crash Risk:

Non-Driving-Task Related Relative Crash/Near Crash Risk Estimates (Odds Ratio) (from Dingus, 2009)



ns: Not statistically significantly different than "Just Driving"

* : Protective; statistically significantly <u>safer</u> than "Just Driving"

Ford and Microsoft Voice Interface Technology

SYNC is a voice-activated, hands-free, in-car communication, entertainment, and information system which fully-integrates your mobile phone, digital media player, and off-board services.

SYNC

Voice-activated

calling:

- One-touch pick-up, hang-up
- Voice-dial by name
- Digit-dial by voice
- e911 Assist
- Multiple phone support
- Advanced calling features

Text-to-Speech

- Listen to text messages
- Pick a canned reply

Voice-activated

digital media player:

- Support for popular players, formats
- Access by artist, track, genre, album
- USB device charging
- “Play similar, Play all, Shuffle” feature
- Podcast and audio book support
- Bluetooth streaming audio

Voice-activated

off-board services:

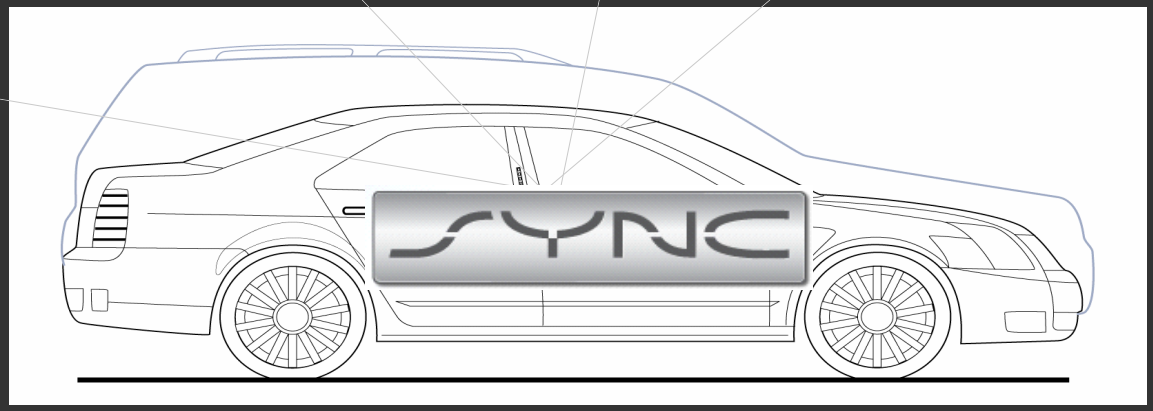
- Destination Entry
- Turn-by-Turn Navi
- Traffic Updates
- Weather Updates
- Business Search

Evolution

Sync Gen 1

Sync Gen 2

Version #1 Sept 2007	Version #2 Dec 2008	Version #3 May 2009	Version #4 TBD
USB/ Aux Jack	Vehicle Health Report	Traffic Update	TBD
Voice Command	911 Assist	Directions	
Media Players (iPod)		Business Search	
Hands-free Phone (Bluetooth)		Information	



Advanced Technology

Merits of the Technology: SYNC vs. Hand-Held Devices Compared

TASK	Total Task Time	Total Eyes-Off-Road Time	Standard Deviation of Lane Position	Percent of Trials with a Lane Exceedance	Maximum Speed Difference	Pedestrian Detection Task Reaction Time
Song	V	V	V	V	V	
Artist	V	V	V	V	V	V
Phone Book	V	V	V	V	V	
Incoming Call	V	M				
Digit Dial	M		V			V
Text Review		V	V			V
Text Send	V	V	V	V		

SYNC supports better driving by keeping eyes on the road and hands on the wheel.

Green: SYNC voice interface statistically better

Yellow: Manual, Hand-Held statistically better

White: No significant difference (at 0.05 alpha)

Obstacles or Challenges to SYNC

- Need support from device manufacturers to further increase the number of devices that are SYNC-compatible
- Need further development of voice recognition technology to accommodate the widest range of customers
- Need further work on voice-to-text technology so that sending and receiving text messages can both be done essentially through voice commands
- Continue to use test methods and criteria to test new applications for distraction potential (e.g., the Alliance DF-T Guidelines) and lock-out functions as needed

Roles FCC and Others can Play to Facilitate Adoption of Voice Interfaces to Reduce Distracted Driving

- **FCC**: Recognize that wireless communications offer significant safety opportunities (e.g., IntelliDrive)
  USDOT: Base regulation on sound science, with proper emphasis on naturalistic driving research
- **Device Manufacturers**: Further increase the number SYNC-compatible devices
- **Safety Groups**: Join Ford in research, education, and outreach:
  - Remind drivers that safe driving is their primary responsibility
  - Educate drivers on distraction risks, hazard recognition and response

Concluding Remarks

- A growing number of drivers are using hand-held electronics while driving
- Driver distraction is a real concern, but not all distractions are equal in their safety impacts:
  - Visual Distractions are the most serious crash/near crash hazards
  - Auditory-vocal distractions play less of a role in crash and near miss events
  - Some auditory-vocal activities are protective (e.g., to reduce driver fatigue)
- Bans on hand-held cell phones and texting with hand-held devices are consistent with the latest research
- Many studies show that hands-free, voice-based interfaces offer advantages over hand-held
- SYNC (a technology that is available today) provides drivers with a safer way to use nomadic devices by inserting a voice interface for control