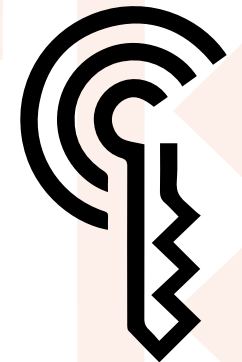


# CCC Digital Key: *Unlocking the Future of Global Car Connectivity*

Dr. Michael Leitner    CCC BoD and VP Communications  
NXP GM Smart Car Access

**CARCONNECTIVITY**  
consortium<sup>®</sup>



**DIGITAL KEY**

# Car Connectivity Consortium



- Since 2011
- The CCC brings automotive and consumer technology industries together to create standards.
- Every significant manufacturer in every corner of the world — from Shanghai to Munich, Germany to New York City, USA — is a vital part of our member-based organization.

# Dedicated to cross-industry collaboration

- Developing global standards and solutions for smart device and in-vehicle connectivity.
- 215+ plus member companies represent a large portion of the global automotive and smart device market.



## Charter Member Companies



Apple



BMW

**DENSO**  
Crafting the Core

Denso



Ford



General Motors

Google **HONDA**

Google

Honda



Hyundai



Mercedes-Benz

Mercedes Benz



NXP

**Panasonic**

Panasonic



Samsung

**THALES**

Thales



Volkswagen Group



Xiaomi



```
graph TD; A[USE CASES] --> B[SPECIFICATION DEVELOPMENT]; B --> C[CERTIFICATION TESTING]; C --> D[CERTIFIED PRODUCT];
```

USE CASES

SPECIFICATION  
DEVELOPMENT

CERTIFICATION  
TESTING

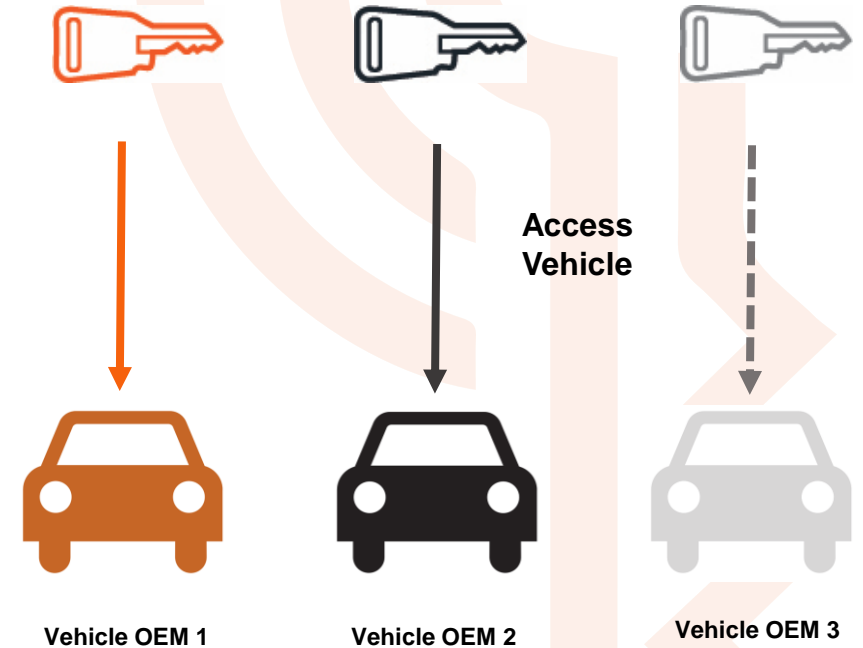
The CCC Process

CERTIFIED  
PRODUCT

# Traditional Vehicle Access

Industry is diversified:

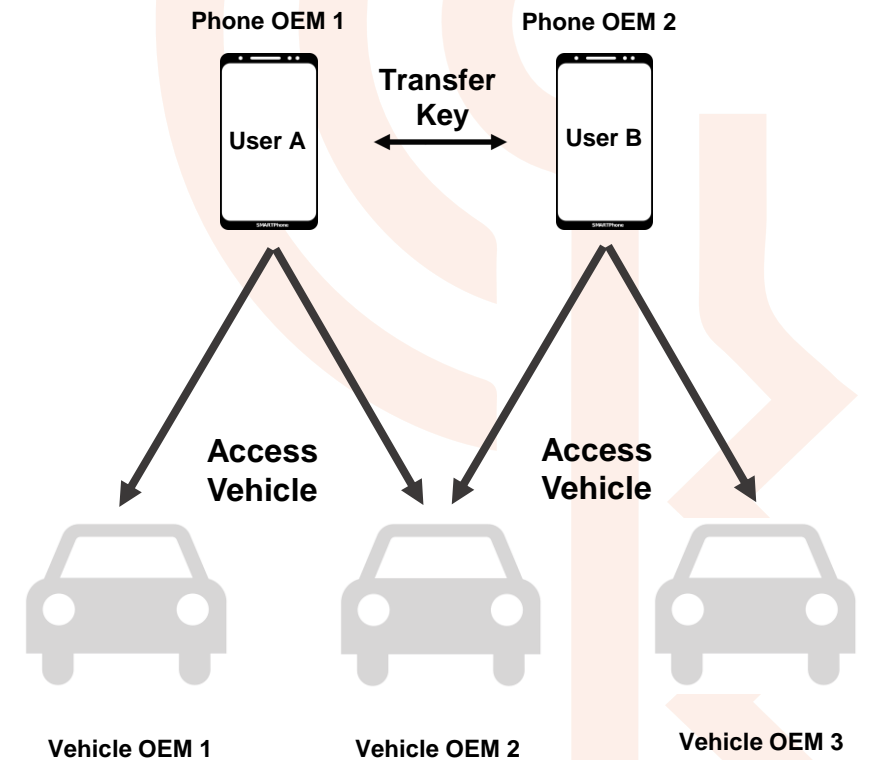
- Each Vehicle OEM uses proprietary key fobs & technology.
- No scale / parallel development without technology differentiation.
- Similar user story on all vehicles and devices.



# Vehicle Access with CCC Digital Key

Standardized Vehicle Access for all vehicles and devices

- Digital keys are transferrable between devices.
- Common user experience on all vehicles and devices.
- High Security.



# Why CCC Digital Key?

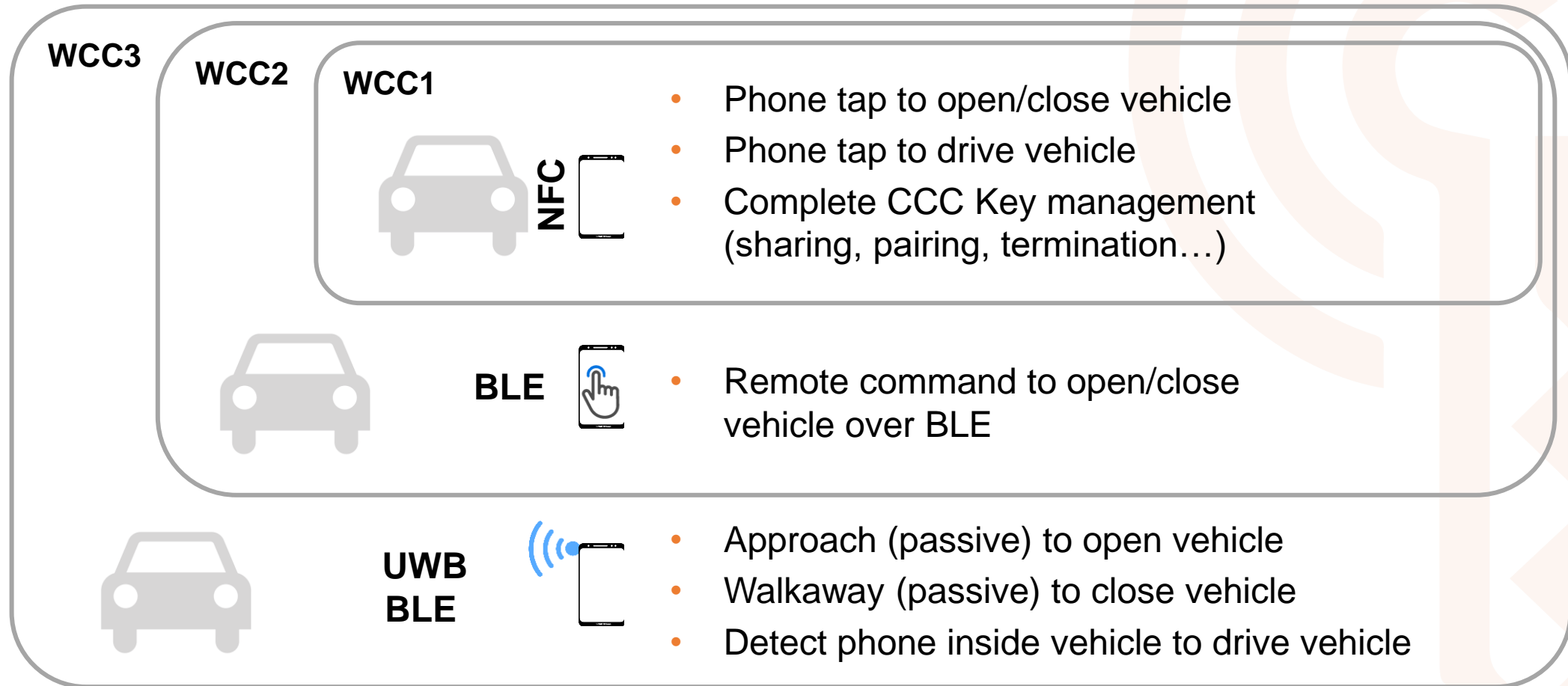
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- Standardized and backward compatible vehicle access protocol over NFC and UWB in combination with BLE
- Highest level of security which is required in global markets
- Superior user experience through consistent accurate localization
- Scalable architecture for wide-scale deployment of services across different vehicles and devices



# Full Backward Compatibility

## Wireless Capabilities Enhance User Experience





# Ultra Wideband Ranging for Proximity detection

Ultra Wideband technology allows unprecedented accuracy and security for Distance Bounding

01.

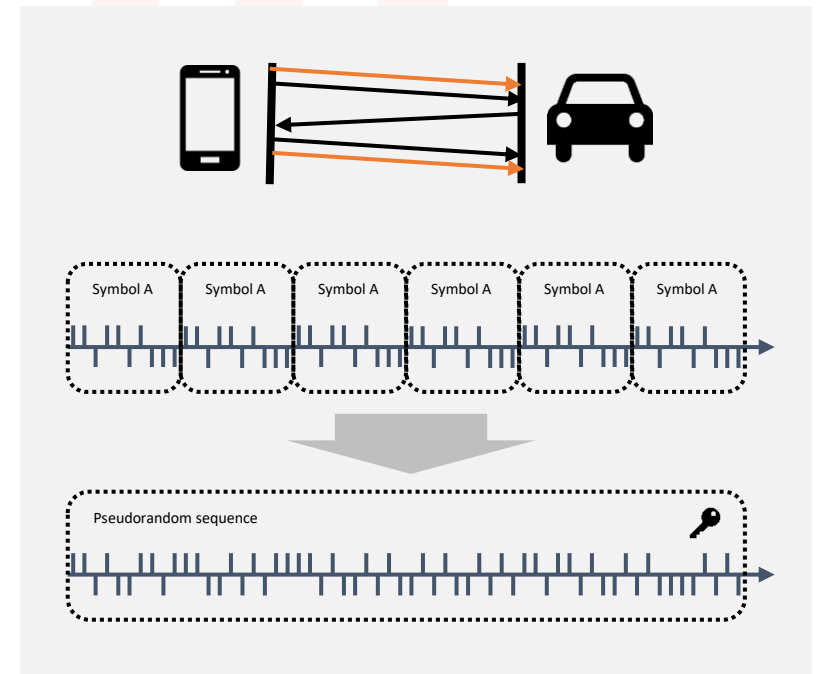
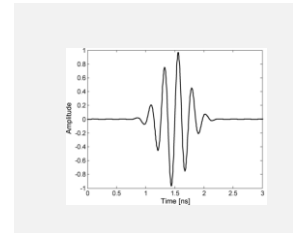
Time-of-Flight measurement between vehicle and device

02.

High Accuracy: Wideband Impulses allow separation of reflections

03.

High Security Secure Training Sequence cryptographically secures ranging



# Security and Privacy

---



Malware on Device:  
**Use Secure Elements  
for all security relevant  
functions**



RF Relay:  
**Distance bounding with  
NFC / Secure distance  
measurement with UWB**



Attack Credentials:  
**Use Secure Element for  
storage of credentials**



Software Relay:  
**Direct binding between  
SE and NFC / UWB**



Privacy:  
**Smart phone identity  
not revealed to vehicles**



# DIGITAL KEY



## CCC Digital Key Certification Program

### Accessible

Local Authorized Test Labs (ATLs)  
for easy access

- Europe
- North America
- Asia

### Inexpensive

Free certification for all members:

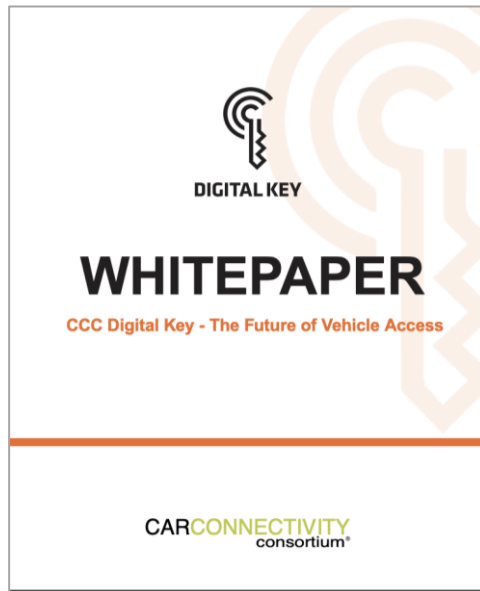
- Adopter = 1 free annually
- Core/Charter = unlimited free

### Valuable

- Globally accepted test specifications
- Two certifications available:
  - Security Certification
  - End to end Interoperability
- PlugFest in Shanghai in this summer included 13 companies!

# THANK YOU

For further information about CCC projects and to get involved, please visit [www.carconnectivity.org](http://www.carconnectivity.org) or email to [admin@carconnectivity.org](mailto:admin@carconnectivity.org)



Download the CCC Digital Key 3.0 Specification now!  
<https://carconnectivity.org/digital-key-release-3-0-specification-download/>



CCC Digital Key Release 3.0 Whitepaper  
<https://carconnectivity.org/whitepapers/>

Take the lead  
in developing  
CCC Digital  
Key and  
more!

CCC BENEFIT and ACCESS	CHARTER MEMBERS	CORE MEMBERS	ADOPTER MEMBERS
Board of Directors	✓	✗	✗
Voting Rights	✓	✓	✗
Chairperson Candidacy	✓	✓	✗
CCC Meeting Attendance	✓	✓	3x F2F only
Participate in CCC Working Groups	✓	✓	✗
Access to Certification Program	✓	✓	Yes (Limited)
Access to Draft Specs and Guidance	✓	✓	✗
Access to Final Specifications	✓	✓	✓
Use of Digital Key Logo	✓	✓	✓
Access to Members-only Website	✓	✓	Yes (Limited)