ARM M Series Processor

We would use one of these for a system with one or very few services. The example provided suggest to use for an automotive braking subsystem, for this application I would choose a cyclic executive, just a main loop in C is simple and deterministic in this simple processors making it easier to debug and understand. As for the choice of the processor it depends on our needs and budget, see table in next slide:

TABLE Comparing Different ARM Series Processors

Feature	Cortex-M0	Cortex-M0+	Cortex-M1	Cortex-M23	Cortex-M3	Cortex-M4	Cortex-M33	Cortex-M35P	Cortex-M55	Cortex-M7
Instruction Set Architecture	Armv6-M	Armv6-M	Armv6-M	Armv8-M Baseline	Armv7-M	Armv7-M	Armv8-M Mainline	Armv8-M Mainline	Armv8.1-M Mainline	Armv7-M
TrustZone for Armv8-M	No	No	No	Yes (option)	No	No	Yes (option)	Yes (option)	Yes (option)	No
Digital Signal Processing (DSP) Extension	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Hardware Divide	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Arm Custom Instructions	No	No	No	No	No	No	Yes	No	Yes	No
Coprocessor Interface	No	No	No	No	No	No	Yes	Yes	Yes	No
DMIPS/MHz*	0.87	0.95	0.8	0.98	1.25	1.25	1.5	1.5	1.6	2.14
CoreMark®/MHz*	2.33	2.46	1.85	2.64	3.34	3.42	4.02	4.02	4.2	5.01
Maximum # External Interrupts	32	32	32	240	240	240	480	480	480	240
Maximum MPU Regions	0	8	0	16	8	8	16	16	16	16
Bus Protocol	AHB Lite	AHB Lite	AHB Lite	AHB5	AHB Lite	AHB Lite	AHB	AHB	AXI	AXI
Instruction Cache	No	No	No	No	No	No	No	2-16kB	0-64kB	0-64kB
Data Cache	No	No	No	No	No	No	No	No	0-64kB	0-64kB
Instruction TCM	No	No	No	No	No	No	No	No	0-16MB	0-16MB
Data TCM	No	No	No	No	No	No	No	No	0-16MB	0-16MB
Dual Core Lock-Step (DCLS)	No	No	No	Yes	No	No	Yes	Yes	No	Yes
Common Criteria Certification	No	No	No	No	No	No	Yes	Yes	No	No
Reference Package and/or System Example	Corstone-101	Corstone-101	-	Corstone-102	Corstone-101	Corstone-101	Corstone-201	-	Corstone-300	-

Choosing a CPU

From the previous table I would go initially with a Cortex-M0 and only consider better CPUs if for some reason we need some extra features. However, we need: interrupts, caches, interrupts and DSP extensions.