TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

APPENDIX A – DISTRIBUTION OF INTELLIGENCE TABLE

The following table shows the allocations of each of the functions for each of an early set of eleven alternative AHS Concepts. Note that these alternatives are quite generic, and there are different allocations shown in many cases. The following notation is used:

P person

V vehicle

Vs vehicle in concert with other vehicles

R roadway

C centralized

[option]

(Alternatives)

{set within list of alternatives)

	Baseline	ACC and Lane-keeping	Auto-nomous	locally Cooper-ative	Distrib-uted Across Region	Infra-structure Supported
Sense relative longitudinal position	P,[V]	[P],[V]	V	Vs	Vs	(Vs,V)
Adjust relative longitudinal position	P	[P],[V]	V	Vs	Vs	(Vs,V)
Sense lateral position relative to lane	P,[V]	[P],[V]	V	Vs	Vs	(Vs,V)
Adjust lateral position relative to lane	P	[P],[V]	V	Vs	Vs	(Vs,V)
Determine lateral position/ velocity relative to other vehicles	P	P,[V]	V	Vs	Vs	(Vs,V)
Determine safety of lane change	P	P, [V— warning?]	V	Vs	Vs	(Vs,V)
Adjust longitudinal position/speed for lane change	P	P	V	Vs	Vs	(Vs,V)
Direct other vehicles to accommodate lane change	N	N	N	Vs	Vs	(Vs,N)
Command execute lane change	P	P	V	Vs	Vs	(Vs,V)
Sense potential hazard due to other vehicle	P	P,[V]	V	Vs	Vs	(Vs,V), [R]
Sense obstacle hazard	P	[P],[V]	V	Vs	Vs	(Vs,V), [R]
React to hazard	P	[P],[V]	V	Vs	Vs	(Vs,V)
Adjust traffic to optimize flow	(C,N)	(C,N)	(C,N)	(C,N)	({[C], [Vs]},N)	Vs,[C,R]

	Baseline	ACC and Lane-keeping	Auto-nomous	locally Cooper-ative	Distrib-uted Across Region	Infra-structure Supported
Determine route	P	P	[P],[V]	[P], [V]	[P],[V]	[P],[V]
Modify route	P	P	[P],[V]	[P], [V]	[P],[V], [Vs]	[P],[V], [Vs]
Determine lane	P	P	[P],V	[P],V, [Vs]	Vs	(V,Vs), [R]
Monitor traffic	[R],[C],[V],[N]	[R],[C],[V],[N]	[R],[C],[V],[N]	[R],[C],[V],[Vs],[N]	[R],[C], [V],Vs	[R],[C], [V],[Vs], [N]
Determine traffic management strategy	(C,N)	(C,N)	(C,N)	(C,N)	[C],Vs	[C],[Vs], [N]
Determine optimal traffic flow parameters	(C,N)	(C,N)	(C,N)	(C,N)	[C],[Vs]	[R],[C], [Vs],[N]
Sense incident/ malfunction	P,[V], [R],[C]	P,[V], [R],[C]	V,[P], [R],[C]	V,Vs, [P],[R],[C]	V,Vs, [P], [C]	V,[R],[C], [Vs],[P]
React to incident/ malfunction	P, C	P,C,[V]	V,[P], [R],[C]	V,Vs, [P],[R],[C]	V,Vs, [P],[R], [C]	V,[R],[C], [Vs],[P]
Test for entry	P	P, [V]	P,V	Vs,[P]	Vs,[P]	V,[R], [Vs],[P]
Manage entry	P	P, [V]	[P],V	Vs	Vs	(Vs,V), [R]
Test for exit	P	P	[P],[V]	Vs,[V],[P]	Vs	(Vs,V), [R],[P]
Manage exit	P	P, [V]	[P],[V]	Vs	Vs	(Vs,V), [R],[P]
Command vehicle actuators	P	[P],[V]	[P],V	[P],V	[P],V	V,[P],[R]
Tell vehicles about road geometry	R—exists	R	R	Vs,R, [R—active]	Vs,R	R,[Vs]

	Directed Platoons	Medium-Term Goal Control	Short-term Goal Control	Throttle, Steering Control	GPS-based
Sense relative longitudinal position	Vs	V,[Vs]	R,[V]	R	Vs using C-GPS
Adjust relative longitudinal position	Vs	V,[Vs]	V under R direction	R	Vs
Sense lateral position relative to lane	Vs	V,[Vs]	R,[V]	R	Vs using C-GPS
Adjust lateral position relative to lane	Vs	V,[Vs]	V under R direction	R	Vs

	Directed Platoons	Medium-Term Goal Control	Short-term Goal Control	Throttle, Steering Control	GPS-based
Determine lateral position/ velocity relative to other vehicles	Vs	V,[Vs,[R]]	R	R	Vs using C-GPS
Determine safety of lane change	Vs	R,[Vs]	R	R	Vs
Adjust longitudinal position/speed for lane change	Vs	R,[Vs]	R	R	Vs
Direct other vehicles to accommodate lane change	Vs	R	R	R	Vs
Command execute lane change	Vs	R	R	R	Vs
Sense potential hazard due to other vehicle	Vs	R,[V],[Vs]	R,[V], [Vs]	R	Vs
Sense obstacle hazard	Vs	R,[V],[Vs]	R,[V]	R	Vs
React to hazard	Vs,R	R,V, [Vs]	R,[V]	R	Vs
Adjust traffic to optimize flow	Vs,R, [C]	R,[C], [Vs]	({R, [C]},N)	({R, [C]},N)	({[C], [Vs]},N)
Determine route	[P],[V], [R,[C]]	[P],[V], [R,[C]]	[P],[V], [R,[C]]	[P],[V], [R,[C]]	[P],[V]
Modify route	[P],[V], [Vs], [R,[C]]	[P],[V], [R,[C]]	[P],[V], [R,[C]]	[P],[V], [R,[C]]	[P],[V], [Vs]
Determine lane	[R],[Vs]	R,[V]	R	R	[P],V, [Vs]
Monitor traffic	R,[Vs], [C]	R,[C]	R,[C]	R,[C]	[R],[C], [V],[Vs],[N]
Determine traffic management strategy	R,[C], [Vs]	R,[C]	R,[C]	R,{C]	({[C], [Vs]},N)
Determine optimal traffic flow parameters	R,[C], [Vs]	[R],[C]	[R],[C]	[R],[C]	({[C], [Vs]},N)
Sense incident/ malfunction	V,R,Vs, [C],[P]	R,[V], [C],[P]	R,[V], [C],[P]	R,[V], [C],[P]	V,Vs, [P],[R], [C]
React to incident/ malfunction	V,R,Vs, [C],[P]	R,V, [C],[P]	R,V, [C],[P]	R,V, [C],[P]	V,Vs, [P],[R], [C]
Test for entry	Vs,[V], [R],[P]	R,[V],[P]	R,[V], [P]	R,[V], [P]	Vs,[P]
Manage entry	Vs,[R]	R,[V]	R	R	Vs using C-GPS
Test for exit	Vs,[R]	R,[V]	R,[V]	R	Vs
Manage exit	Vs,R	R,[V]	R,[V]	R,[V]	Vs
Command vehicle actuators	V,[P]	V	V	R	V
Tell vehicles about road geometry	Vs,[R]	R	N	N	C-Maps, [R]