APPENDIX C

Graphical Representation of Answers to Selected Questions by Respondents to the Questionnaire Survey (see Appendix A)

RIOH–ALF				
WesTrack				
RRT–Rom				
NCAT				
MnROAD	TRACKER	RIOH–ALF		
LCPC–Fr	RRT–Romania	TRL–PTF		
ISETH	PRF–La	PRF–La	TRACKER	
In–APLF	MnROAD	NCAT	TRL–PTF	
HVS–SA	LINTRACK	LINTRACK	MnROAD	
HVS–Nordic	K–ATL	K–ATL	LCPC–Fr	
FHWA–PTF	ATLaS	ATLaS	ATLaS	
NAPTF	ISETH	ISETH	ISETH	
DRTM	HVS–SA	In–APLF	HVS–SA	
HVS–CRREL	DRTM	FDOT–HVS	NAPTF	HVS–A
CEDEX	HVS–CRREL	HVS–CRREL	DRTM	TxMLS
CAPTIF–NZ	CAPTIF–NZ	CAL/APT	CAL/APT	ISETH
ARRB–ALF	CAL/APT	ARRB–ALF	ARRB–ALF	HVS–SA
Oh–APLF	Oh–APLF	Oh–APLF	Oh–APLF	CAL/APT
National research program	Academic research program	State research program	Partnership with others in private sector	Service rendered for others; e.g., state DOTs, military, etc.

FIGURE C1 Nature of your APT program. (*Source*: Significant findings from full-scale/APT testing, Question 1.1).

RIOH–ALF					
HVS–A		RIOH–ALF			
TxMLS		WesTrack			
TRL–PTF		HVS–A			
RRT–Rom		TRACKER	RIOH–ALF		
PRF–La		TxMLS	WesTrack		
NCAT		TRL–PTFTRL–PTF	HVS–A		
MnROAD	HVS–A	RRT–Rom	TxMLS		
LINTRACK	TxMLS	PRF–La	PRF–La		HVS–A
LCPC–Fr	TRL–PTF	NCAT	NCAT		TxMLS
K–ATL	MnROAD	MnROAD	MnROAD		MnROAD
ATLaS	LINTRACK	LINTRACK	LINTRACK		LINTRACK
ISETH	LCPC–Fr	LCPC–Fr	LCPC–Fr	HVS–A	LCPC–Fr
In–APLF	ATLaS	K–ATL	ATLaS	TRL–PTF	K–ATL
HVS–SA	ISETH	ATLaS	ISETH	PRF–La	ATLaS
HVS–Nordic	In–APLF	ISETH	INDOT	MnROAD	ISETH
FHWA–PTF	HVS–SA	In–APLF	HVS–SA	LCPC–Fr	In–APLF
FDOT–HVS	FHWA–PTF	HVS–SA	FHWA–PTF	K–ATL	HVS–SA
NAPTF	NAPTF	FHWA–PTF	NAPTF	ATLaS	HVS–Nordic
DRTM	DRTM	FDOT–HVS	DRTM	In–APLF	FHWA–PTF
HVS–CRREL	HVS–CRREL	HVS–CRREL	HVS–CRREL	HVS–SA	FDOT–HVS
CEDEX	CEDEX	CEDEX	CEDEX	FDOT–HVS	NAPTF
CAPTIF–NZ	CAPTIF–NZ	CAPTIF–NZ	CAPTIF–NZ	HVS–CRREL	HVS–CRREL
CAL/APT	CAL/APT	CAL/APT	CAL/APT	CEDEX	CEDEX
ARRB–ALF	ARRB–ALF	ARRB–ALF	ARRB–ALF	CAL/APT	CAL/APT
Oh–APLF	Oh–APLF	Oh–APLF	Oh–APLF	ARRB–ALF	ARRB–ALF
Pavement structural composition	Loading environment (traffic/climate)	Materials and tests	Performance models	Construction techniques	Rehabilitation strategies

FIGURE C2 Implementation of your APT is geared towards. (*Source*: Significant findings from full-scale/APT, Question 1.2).

		WesTrack			WesTrack
		HVS–A			HVS–A
		TxMLS			TxMLS
		RRT–Rom			TRL–PTF
		PRF–La			RRT–Rom
		NCAT			NCAT
		MnROAD			MnROAD
		LINTRACK			LINTRACK
		LCPC–Fr			LCPC–Fr
		ATLaS			K–ATL
		ISETH			ATLaS
RIOH–ALF		HVS–Nordic			ISETH
WesTrack	TRACKER	FHWA–PTF			NAPTF
TxMLS	TxMLS	FDOT–HVS		RIOH–ALF	DRTM
PRF–La	TRL–PTF	NAPTF		HVS–A	HVS–CRREL
MnROAD	K–ATL	HVS–CRREL	TxMLS	NCAT	CAL/APT
HVS–SA	In–APLF	CEDEX	MnROAD	MnROAD	ARRB–ALF
FHWA–PTF	DRTM	CAPTIF–NZ	CAL/APT	ARRB–ALF	Oh–APLF
CAL/APT	HVS–CRREL	CAL/APT	ARRB–ALF		
ARRB–ALF	Oh–APLF	Oh–APLF			
Field	Laboratory	Fixed site	In-service pavements	Test roads	Specially constructed

FIGURE C3 Type of APT application. (*Source*: Significant findings from full-scale/APT, Question 1.3).

RIOH–ALF									
PRF–La	HVS–A								
FHWA–PTF	TRACKER								
FDOT–HVS	DRTM								
TRL–PTF	TRL–PTF								
LINTRACK	LINTRACK								
K–ATL	K–ATL								
ATLaS	ATLaS								
In–APLF	In–APLF								
HVS–SA	HVS–SA								
HVS–Nordic	HVS–Nordic								
ARRB–ALF	FDOT–HVS								
HVS–CRREL	HVS–CRREL		HVS–A	RRT–Rom				Mn/ROAD	Mn/ROAD k
CAL/APT	CAL/APT	TxMLS	NAPTF	ISETH	LCPC–Fr			WesTrack	WesTrack
Oh–APLF	Oh–APLF	K–ATL	K–ATL	CAPTIF–NZ	CAPTIF–NZ	CEDEX		NCAT	NCAT
Unidirectional Single axles	Bidirectional Single axles	Unidirectional Multiple axles	Bidirectional Multiple axles	Single axles	Multiple axles	Single axles	Multiple axles	Single axles	Multiple axles
Linear				Circular		Elliptical (Oval)		Trucks	

FIGURE C4 Type of APT device/system. (*Source*: Significant findings from full-scale/APT, Question 1.4).

				HVS–A
	TxMLS		RIOH–ALF	MnROAD
	LINTRACK		WesTrack	LCPC–Fr
TRACKER	K–ATL		TRL–PTF	In–APLF
ISETH	HVS–Nordic	RRT–Rom	NCAT	HVS–SA
FDOT–HVS	NAPTF	PRF–La	CEDEX	FHWA–PTF
HVS–CRREL	Oh–APLF	CAPTIF–NZ	CAL/APT	ARRB–ALF
1–5	6–10	11–20	21–50	>50*

FIGURE C5 Number of pavement sections tested. (*Source*: Significant findings from full-scale/APT, Question 1.5).
*Upper limit not defined in questionnaire.

TRACKER	RIOH–ALF			
TRL–PTF	TxMLS			
LCPC–Fr	LINTRACK			
K–ATL	LCPC–Fr	HVS–A		
In–APLF	FHWA–PTF	NAPTF		
HVS–SA	FDOT–HVS	DRTM		
HVS–Nordic	HVS–CRREL	CEDEX	RRT–Rom	WesTrack
CAL/APT	CAL/APT	CAPTIF–NZ	PRF–La	MnROAD
Oh–APLF	ARRB–ALF	CAL/APT	NCAT	ISETH
1–3	4–6	7–11	12–24	>24*

FIGURE C6 Typical duration of an APT test per test section in months. (*Source*: Significant findings from full-scale/APT, Question 1.6).
*Upper limit not defined in questionnaire.

	RIOH–ALF		
	TRL–PTF		
	ATLaS	PRF–La	WesTrack
RRT–Rom	HVS–SA	FHWA–PTF	MnROAD
LINTRACK	CAPTIF–NZ	FDOT–HVS	LCPC–Fr
K–ATL	ARRB–ALF	CEDEX	NAPTF
In–Oh–APLF	Oh–APLF	CAL/APT	HVS–CRREL
<$1 M	$1–2 M	$2–5 M	>$5 M*

FIGURE C7 Estimated capital cost of APT facility equipment. (*Source*: Significant findings from full-scale/APT, Question 1.7).
*Upper limit not defined in questionnaire.

	RIOH–ALF				
	TRL–PTF				
	RRT–Rom			WesTrack	
	ISETH	LINTRACK		FDOT–HVS	
	CAPTIF–NZ	K–ATL	TxMLS	NAPTF	NCAT
In–APLF	ARRB–ALF	HVS–Nordic	PRF–La	HVS–CRREL	MnROAD
HVS–Nordic	Oh–APLF	FHWA–PTF	HVS–SA	CEDEX	CAL/APT
<$0.1 M	$0.1–0.2 M	$0.2–0.4 M	$0.4–0.8 M	$0.8–1.6 M	>$1.6 M*

FIGURE C8 Yearly APT budget without pavement construction cost. (*Source*: Significant findings from full-scale/APT, Question 1.8).
*Upper limit not defined in questionnaire.

									WesTrack
									HVS–A
									TxMLS
									TRL–PTF
									PRF–La
									LINTRACK
				WesTrack	HVS–A	RIOH–ALF			K–ATL
				TxMLS	TRACKER	TRL–PTF			ATLaS
				TRL–PTF	NCAT	RRT–Rom			ISETH
				RRT–Rom	ATLaS	PRF–LA			In–APLF
	PRF–La			NCAT	HVS–SA	LINTRACK			FHWA–PTF
	ATLaS			K–ATL	FHWA–PTF	K–ATL			NAPTF
	In–APLF			ISETH	FDOT–HVS	ISETH			CAPTIF–NZ
	FHWA–PTF			CAPTIF–NZ	CAL/APT	INDOT			CAL/APT
TRACKER	FDOT–HVS			CAL/APT	ARRB–ALF	NAPTF		RRT–Rom	ARRB–ALF
LINTRACK	Oh–APLF	NAPTF		ARRB–ALF	Oh–APLF	CAPTIF–NZ	FDOT	NCAT	DRTM	Oh–APLF
<10%	10–20%	20–30%		>30%*	<10%	10–20%	<10%	10–20%	20–30%	>30%
Operational					Maintenance		Staff			

FIGURE C9 Breakdown of budget (N/A). (*Source*: Significant findings from full-scale/APT, Question 1.9).
*Upper limit not defined in questionnaire.

RIOH–ALF			
WesTrack			
HVS–A			
TRACKER			
TRL–PTF			
RRT–Rom			
NCAT			
LINTRACK			
LCPC–Fr			
K–ATL			
ATLaS			
ISETH			
In–APLF			
HVS–SA			
HVS–Nordic			
FHWA–PTF			
DRTM			
HVS–CRREL			
CAPTIF–NZ	TxMLS		
ARRB–ALF	PRF–La		
Oh–APLF	FDOT–HVS	CEDEX	
<$0.5 M	$0.5–1 M	$1–2 M	>$2 M*

FIGURE C10 Average (typical) operational cost/test section. (*Source*: Significant findings from full-scale/APT, Question 1.10).
*Upper limit not defined in questionnaire.

RIOH–ALF					RIOH–ALF	
HVS–A					HVS–A	
TxMLS					TRACKER	
TRL–PTF					TxMLS	
RRT–Rom					TRL–PTF	
PRF–La		RIOH–ALF			RRT–Rom	
NCAT		HVS–A			PRF–La	
LINTRACK		TRACKER			NCAT	
K–ATL		TRL–PTF			LINTRACK	
ATLaS		RRT–Rom			ATLaS	
ISETH		PRF–La			ISETH	
In–APLF		NCAT			In–APLF	
HVS–SA		LINTRACK			HVS–SA	
HVS–Nordic		K–ATL			HVS–Nordic	
FHWA–PTF		ATLaS			FHWA–PTF	
FDOT–HVS		In–APLF			FDOT–HVS	
NAPTF		FHWA–PTF			NAPTF	
HVS–CRREL		HVS–CRREL			HVS–CRREL	
CEDEX		CEDEX	HVS–SA		CEDEX	
CAPTIF–NZ	WesTrack	CAPTIF–NZ	HVS–Nordic	WesTrack	CAPTIF–NZ	CAL/APT
ARRB–ALF	MnROAD	ARRB–ALF	FDOT	MnROAD	CAL/APT	ARRB–ALF
Oh–APLF	CAL/APT	Oh–APLF	NAPTF	CAL/APT	Oh–APLF	HVS–Nordic
<5	>5*	<5	5–10	>10*	<5	>5*
Professional		Technical			Administrative	

FIGURE C11 Number of direct APT personnel. (*Source*: Significant findings from full-scale/APT, Question 1.11).
*Upper limit not defined in questionnaire.

					WesTrack
					HVS–A
					NCAT
					MnROAD
					NAPTF
					CAPTIF–NZ
					CAL/APT
			ISETH		ARRB–ALF
<$100 k	$100–200 k	$200–500 k	$0.5–1 M	$1–2 M	>$2 M*

FIGURE C12 Overall estimated savings/benefits in monetary terms for the respective programs. (*Source*: Significant findings from full-scale/APT, Question 1.12).
*Upper limit not defined in questionnaire.

				ISETH			NCAT
				HVS–SA			NAPTF
				CAL/APT		In–APLF	CAPTIF–NZ
<1:1	1:1	2:1	5:1	10:1	15:1	20:1	>20:1*

FIGURE C13 Benefit-cost ratio** of APT programs. (*Source*: Significant findings from full-scale/APT, Question 1.13).
*Upper limit not defined in questionnaire.
**Details to be found elsewhere in the report.

	RIOH–ALF						RIOH–ALF						
	HVS–A						WesTrack						
	TxMLS						HVS–A						
	PRF–La	RIOH–ALF	HVS–A				TxMLS						
	NCAT	WesTrack	TRACKER				PRF–La		RIOH–ALF				
	MnROAD	HVS–A	TxMLS				NCAT		WesTrack				
	LIN-TRACK	TxMLS	TRL–PTF	RIOH–ALF			MnROAD		HVS–A				
	LCPC–Fr	PRF–La	RRT–Rom	WesTrack			LINTRACK		TxMLS				
	K–ATL	NCAT	PRF–La	TRL–PTF			LCPC–Fr		TRL–PTF				
	ISETH	MnROAD	MnROAD	PRF–La	WesTrack		K–ATL		PRF–La				
	In–APLF	LINTRACK	LINTRACK	NCAT	TxMLS		In–APLF		NCAT		RIOH–ALF		
	HVS–SA	LCPC–Fr	LCPC–Fr	MnROAD	PRF–La		HVS–SA		MnROAD		TxMLS		
	FHWA–PTF	ISETH	ISETH	LINTRACK	MnROAD		FHWA–PTF		LINTRACK		PRF–La		
	NAPTF	In–APLF	In–APLF	In–APLF	ISETH		DRTM		LCPC–Fr		NCAT	WesTrack	
	DRTM	HVS–SA	HVS–SA	HVS–SA	In–APLF		HVS–CRREL		ISETH		MnROAD	PRF–La	
	CEDEX	FHWA–PTF	FHWA–PTF	NAPTF	HVS–SA		CEDEX	RRT–Rom	In–APLF		LCPC–Fr	MnROAD	
	CAPTIF–NZ	CEDEX	DRTM	CEDEX	NAPTF	WesTrack	CAPTIF–NZ	MnROAD	DRTM	WesTrack	ISETH	LCPC–Fr	
	CAL/APT	CAL/APT	CEDEX	CAPTIF–NZ	CEDEX	HVS–A	CAL/APT	LINTRACK	CEDEX	TxMLS	In–APLF	K–ATL	
	ARRB–ALF	ARRB–ALF	CAL/APT	CAL/APT	CAL/APT	LINTRACK	ARRB–ALF	CEDEX	CAPTIF–NZ	NCAT	CAL/APT	In–APLF	
ATLaS	Oh–APLF	Oh–APLF	ARRB–ALF	ARRB–ALF	ARRB–ALF	CEDEX	Oh–APLF	ARRB–ALF	ARRB–ALF	In–APLF	ARRB–ALF	FHWA–PTF	
None	Improved structural design procedures	Improved material design procedures	Use of new or innovative materials	Development of performance-related specifications	Material databases	Other	Improved performance modeling	Improved pavement management	Better understand-ing of variability	Warranty contracts	Weather databases	Evalua-tion/ validation of Superpave	

FIGURE C14 Benefits of APT. (*Source*: Significant findings from full-scale/APT, Question 1.14).

RIOH–ALF	
WesTrack	
HVS–A	
TxMLS	
RRT–Rom	
PRF–La	
NCAT	
MnROAD	
LINTRACK	
LCPC–Fr	
ATLaS	WesTrack
ISETH	HVS–A
HVS–SA	TxMLS
HVS–Nordic	RRT–Rom
FHWA–PTF	NCAT
FDOT–HVS	MnROAD
NAPTF	LINTRACK
HVS–CRREL	LCPC–Fr
CAPTIF–NZ	ISETH
CAL/APT	In–APLF
ARRB–ALF	HVS–CRREL
Oh–APLF	ARRB–ALF
Structural performance	Functional performance

FIGURE C15 Purpose of the structural compositions used in APT programs. (*Source*: Significant findings from full-scale/APT, Question 2.1).

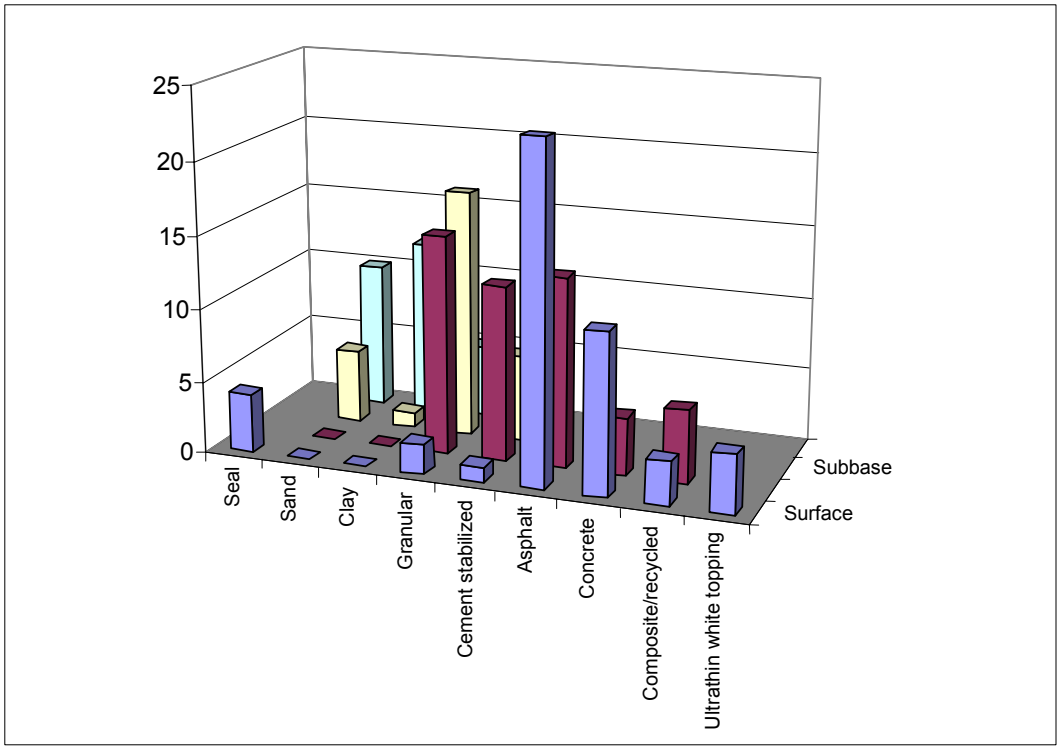

FIGURE C16 Pavement layers evaluated/validated in the structural performance tests. (*Source*: Significant findings from full-scale/APT, Question 2.2).

				PRFL–La
				WesTrack
				HVS–A
				TxMLS
				TRL–PTF
				NCAT
				LINTRACK
				K–ATL
				FHWA–PTF
				FDOT–HVS
			MnROAD	NAPTF
MnROAD	MnROAD	MnROAD	ISETH	DRTM
HVS–SA	HVS–SA	HVS–SA	HVS–SA	CAL/APT
ARRB–ALF	ARRB–ALF	CAPTIF–NZ	ARRB–ALF	Oh–APLF
Ravelling	Bleeding	Other	Aggregate loss	Not applicable

FIGURE C17 Distress criterion evaluated for seals. (*Source*: Significant findings from full-scale/APT, Question 2.3).

			RIOH–ALF		
			HVS–A		
			TxMLS		
			TRL–PTF		
			MnROAD		
			LINTRACK		
			K–ATL		
			ISETH		
			HVS–SA		
			HVS–Nordic		
			NAPTF		
			DRTM		
			HVS–CRREL	FHWA–PTF	
			CEDEX	WesTrack	
	HVS–A	MnROAD	CAPTIF–NZ	NCAT	
	HVS–SA	DRTM	CAL/APT	FDOT–HVS	MnROAD
ISETH	ARRB–ALF	HVS–CRREL	ARRB–ALF	Oh–APLF	NAPTF
Collapsing	Swelling	Freeze/thaw	Permanent deformation	Not applicable	Other

FIGURE C18 Distress criterion evaluated for pavements with clay/sand material. (*Source*: Significant findings from full-scale/APT, Question 2.4).

RIOH–ALF						
WesTrack						
HVS–A						
TxMLS						
TRL–PTF	RIOH–ALF					
RRT–Rom	WesTrack					
PRF–La	TxMLS					
NCAT	TRL–PTF					
MnROAD	RRT–Rom					
LINTRACK	PRF–La					
LCPC–Fr	NCAT					
K–ATL	MnROAD					
ISETH	LINTRACK					
In–APLF	LCPC–Fr					
HVS–SA	K–ATL					
FHWA–PTF	ISETH					
FDOT–HVS	In–APLF		RIOH–ALF			
DRTM	HVS–SA		WesTrack			
HVS–CRREL	FHWA–PTF		TxMLS			
CEDEX	DRTM		NCAT	TxMLS		
CAPTIF–NZ	CEDEX	RIOH–ALF	MnROAD	RRT–Rom	WesTrack	
CAL/APT	CAPTIF–NZ	WesTrack	In–APLF	MnROAD	MnROAD	
ARRB–ALF	CAL/APT	MnROAD	HVS–SA	HVS–SA	K–ATL	
Oh–APLF	ARRB–ALF	HVS–CRREL	CAL/APT	FHWA–PTF	Oh–APLF	NAPTF
Rutting	Fatigue	Low temperature cracking	Moisture damage/ stripping	Aging	Other	Not applicable

FIGURE C21 Distress criterion evaluated for pavements with asphaltic materials. (*Source*: Significant findings from full-scale/APT, Question 2.7).

HVS–A												
TRL–PTF												
RRT–Rom												
MnROAD												
LCPC–Fr												
K–ATL												
ATLaS			HVS–A	HVS–A								
In–APLF			MnROAD	TRL–PTF								
HVS–SA	HVS–A		LCPC–Fr	MnROAD								
HVS–Nordic	MnROAD	TRL–PTF	ATLaS	LCPC–Fr	TRL–PTF					MnROAD		WesTrack
NAPTF	ATLaS	MnROAD	In–APLF	ATLaS	MnROAD					K–ATL		TxMLS
	HVS–SA	ISETH	HVS–SA	In–APLF	K–ATL					ATLaS		NCAT
	HVS–Nordic	HVS–SA	NAPTF	CAL/APT	ATLaS	K–ATL	TRL–PTF	TRL–PTF		HVS–SA		FDOT–HVS
ARRB–ALF	DRTM	CAL/APT	CAL/APT	ARRB–ALF	HVS–SA	HVS–SA	MnROAD	MnROAD		CAL/APT		HVS–CRREL
Oh–APLF	CAL/APT	ARRB–ALF	ARRB–ALF	Oh–APLF	CAL/APT	ARRB–ALF	ARRB–ALF	ATLaS	TRL–PTF	ARRB–ALF	RRT–Rom	CAPTIF–NZ
Cracking	Stress ratio	Joint failure	Fatigue	Curling and warping	Load transfer failure	Faulting	Spalling	Punchouts	Steel rupture	Erosion of subbase	Other	Not applicable

FIGURE C22 Distress criterion evaluated for pavements with concrete. (*Source*: Significant findings from full-scale/APT, Question 2.8).

	PRF–La					
	PRF–La					
	HVS–A					
	TxMLS					
HVS–A	TRL–PTF					
TxMLS	RRT–Rom			HVS–A		
TRL–PTF	NCAT		TxMLS	TxMLS		
RRT–Rom	MnROAD		TRL–PTF	TRL–PTF		
NCAT	K–ATL		NCAT	MnROAD		FDOT–HVS
ISETH	ISETH		ISETH	In–APLF		NAPTF
DRTM	In–APLF		In–APLF	FHWA–PTF	RRT–Rom	HVS–CRREL
CAL/APT	FHWA–PTF	NCAT	FHWA–PTF	DRTM	MnROAD	CAPTIF–NZ
ARRB–ALF	ARRB–ALF	DRTM	ARRB–ALF	ARRB–ALF	FHWA–PTF	Oh–APLF
Rutting	Cracking	Slippage	Fatigue	Debonding	Other	Not applicable

FIGURE C23 Distress criterion evaluated for pavements with composite materials. (*Source*: Significant findings from full-scale/APT, Question 2.9).

			WesTrack		
			PRF-La		
RIOH-ALF			HVS-A		
TxMLS			TxMLS		
RRT-Rom			RRT-Rom		
NCAT			NCAT		
MnROAD	NCAT		LCPC-FR		
LINTRACK	MnROAD		ISETH		TRL-PTF
HVS-SA	HVS-SA		CEDEX		In-APLF
HVS-CRREL	HVS-CRREL	WesTrack	CAPTIF-NZ		FDOT-HVS
CEDEX	Oh-APLF	NCAT	ARRB-ALF	K-ATL	NAPTF
Safety	Environment	User cost	Roughness	Other	Not applicable

FIGURE C24 Which aspects of functional performance were addressed? (*Source*: Significant findings from full-scale/APT, Question 2.10).

RIOH–ALF							
WesTrack							
TxMLS							
TRL–PTF							
RRT–Rom							
PRF–La							
NCAT							
MnROAD							
LINTRACK		WesTrack					
LCPC–Fr		HVS–A					
ISETH	WesTrack	TxMLS					
HVS–SA	TxMLS	RRT–Rom					
FHWA–PTF	TRL–PTF	PRF–La					
FDOT–HVS	PRF–La	NCAT					
HVS–CRREL	NCAT	MnROAD					
CAPTIF–NZ	MnROAD	LCPC–Fr					K–ATL
CAL/APT	CEDEX	ISETH	RIOH–ALF				NAPTF
Oh–APLF	ARRB–ALF	ARRB–ALF	HVS–SA	HVS–SA	MnROAD	MnROAD	DRTM
Rutting	Skid resistance	Roughness	Punchouts	Delamination	Spalling	Other	Not applicable

FIGURE C25 Which safety aspects were addressed in your APT program? (*Source*: Significant findings from full-scale/APT, Question 2.11).

			WesTrack
			HVS–A
			TRL–PTF
			RRT–Rom
			PRF–La
			LINTRACK
			K–ATL
			ISETH
			FHWA–PTF
		NCAT	FDOT–HVS
		LINTRACK	NAPTF
TxMLS		HVS–CRREL	CAPTIF–NZ
HVS–SA	MnROAD	Oh–APLF	ARRB–ALF
Noise	Dust pollution	Other	Not applicable

FIGURE C26 Which environmental aspects were addressed in your APT program? (*Source*: Significant findings from full-scale/APT, Question 2.12).

RIOH												
WesTrack												
TxMLS												
TRL–PTF							WesTrack					
RRT–Rom	RIOH–ALF						HVS–A					
PRF–La	HVS–A						TxMLS					
NCAT	TxMLS						TRL–PTF					
LINTRACK	TRL–PTF						RRT–Rom					
LCPC–Fr	RRT–Rom						PRF–La					
K–ATL	MnROAD						ISETH					
ISETH	LINTRACK	RIOH–ALF					In–APLF					
In–APLF	LCPC–Fr	TRL–PTF	RIOH–ALF	HVS–A			HVS–SA					
HVS–SA	ISETH	MnROAD	WesTrack	TRACKER			HVS–Nordic					
HVS–Nordic	In–APLF	LINTRACK	HVS–A	TRL–PTF			FHWA–PTF					
FHWA–PTF	HVS–SA	LCPC–Fr	TRACKER	PRF–La			FDOT–HVS			RIOH–ALF	WesTrack	
NAPTF	HVS–Nordic	In–APLF	TRL–PTF	MnROAD			NAPTF			TxMLS	RRT–Rom	
DRTM	FHWA–PTF	HVS–SA	LINTRACK	LINTRACK			DRTM			TRL–PTF	PRF–La	
HVS–CRREL	DRTM	HVS–Nordic	HVS–SA	LCPC–Fr		WesTrack	HVS–CRREL			MnROAD	NCAT	
CEDEX	HVS–CRREL	FHWA–PTF	DRTM	ISETH		NCAT	CEDEX	NCAT		LINTRACK	MnROAD	
CAPTIF–NZ	CEDEX	DRTM	CEDEX	FHWA		MnROAD	CAPTIF–NZ	MnROAD		HVS–SA	ISETH	
ARRB–ALF	CAPTIF–NZ	CEDEX	CAPTIF–NZ	NAPTF	MnROAD	HVS–SA	ARRB–ALF	CEDEX	LCPC–Fr	HVS–CRREL	CAPTIF–NZ	
Oh–APLF	ARRB–ALF	ARRB–ALF	ARRB–ALF	CEDEX	CAPTIF–NZ	CAPTIF–NZ	Oh–APLF	Oh–APLF	FHWA	ARRB–ALF	ARRB–ALF	HVS–SA
Applied wheel load	Tire pressure	Tire type	Contact stress	Load configuration	Suspension system	Vehicle/ pavement dynamics	Channelized/ Wandering	Speed	Rest periods	Overloading	Roughness/ PSI	Other

FIGURE C27 Load characteristics that have been related to APT. (*Source*: Significant findings from full-scale/APT, Question 3.1).

	RIOH–ALF							
	WesTrack							
	HVS–A							
	TxMLS							
	TRL–PTF							
	RRT–Rom							
	PRF–La							
	NCAT							
RIOH–ALF	MnROAD							
WesTrack	LCPC–Fr							
TxMLS	K–ATL							
RRT–Rom	ISETH					HVS–A		
PRF–La	In–APLF					PRF–La		
NCAT	HVS–SA	RIOH–ALF				MnROAD		
MnROAD	HVS–Nordic	TxMLS				LCPC–Fr		
ISETH	FHWA–PTF	PRF–La				ISETH	HVS–A	
In–APLF	NAPTF	NCAT				HVS–SA	TxMLS	
HVS–SA	DRTM	MnROAD		WesTrack		HVS–Nordic	NCAT	
DRTM	HVS–CRREL	LCPC–Fr		PRF–La		DRTM	MnROAD	
HVS–CRREL	CEDEX	HVS–SA	PRF–La	MnROAD		HVS–CRREL	K–ATL	
CEDEX	ARRB–ALF	CEDEX	NCAT	HVS–SA		CEDEX	HVS–SA	TxMLS	MnROAD
ARRB–ALF	APLF	ARRB–ALF	MnROAD	FHWA–PTF		ARRB–ALF	ARRB–ALF	MnROAD	K–ATL
Air temperature	Pavement temperature	Rainfall	Relative humidity	Aging		Water table	Drainage	Depth to bedrock	Other

FIGURE C28 Environment/weather data that have been related to APT performance. (*Source*: Significant findings from full-scale/APT, Question 3.2).

		RIOH–ALF				
	HVS–A					
	TRL–PTF					
	RRT–Rom			RIOH–ALF		
HVS–A	LINTRACK			HVS–A		
RRT–Rom	LCPC–Fr			LCPC–Fr		
LCPC–Fr	K–ATL			K–ATL		
	K–ATL	In–AP			HVS–Nordic	
In–APLF	HVS–SA			DRTM		
HVS–SA	HVS–Nordic			HVS–CRREL		
HVS–Nordic	FHWA–PTF			CEDEX		
DRTM	DRTM			CAPTIF–NZ		WesTrack
HVS–CRREL	HVS–CRREL			ARRB–ALF		K–ATL
Oh–APLF	ARRB–ALF	Oh–APLF		Oh–APLF	HVS–SA	NAPTF
Air temperature	Pavement temperature	Relative humidity		Subgrade moisture	Aging	Other

FIGURE C29 Environment/weather conditions that are controlled. (*Source*: Significant findings from full-scale/APT, Question 3.3).

		RIOH–ALF	
		WesTrack	
		HVS–A	
		TRACKER	
		TxMLS	
		TRL–PTF	
		RRT–Rom	
		PRF–La	
		NCAT	
		LINTRACK	
	RIOH–ALF	LCPC–Fr	
	WesTrack	K–ATL	
	TxMLS	ISETH	
PRF–La	HVS–SA	WesTrack	
NCAT	HVS–Nordic	TxMLS	
LCPC–Fr	FHWA–PTF	NCAT	
K–ATL	FDOT–HVS	LINTRACK–NL	
In–APLF	NAPTF	LCPC–Fr	
HVS–SA	DRTM	HVS–SA	WesTrack
FHWA–PTF	HVS–CRREL	HVS–CRREL	TxMLS
FDOT–HVS	CEDEX	CEDEX	NCAT
CEDEX	CAPTIF–NZ	CAPTIF–NZ	K–ATL
ARRB–ALF	ARRB–ALF	ARRB–ALF	DRTM
Oh–APLF	Oh–APLF	Oh–APLF	HVS–CRREL
Hot (>40°C) (>104°F)	Moderate (>10°C <40°C) (>50°F <104°F)	Cold (<10°C) (<50°F)	Freezing (<5°C) (<41°F)

FIGURE C30 APT test temperatures used. (*Source*: Significant findings from full-scale/APT, Question 3.4).

		TRACKER						
		TxMLS						
		TRL-PTF						
		RRT-Rom						
RIOH-ALF		PRF-La						
HVS-A		NCAT						
TxMLS		MnROAD						
TRL-PTF	RIOH-ALF	LINTRACK						
MnROAD	TxMLS	LCPC-Fr						
LCPC-Fr	TRL-PTF	K-ATL						
K-ATL	RRT-Rom	ISETH						
ISETH	PRF-La	In-APLF				HVS-A		
HVS-SA	MnROAD	HVS-SA				TRL-PTF		MnROAD
HVS-CRREL	LCPC-Fr	FHWA-PTF	MnROAD	TRL-PTF		NCAT		K-ATL
CEDEX	ISETH	CEDEX	LCPC-Fr	RRT-Rom	TRL-PTF	MnROAD	TRL-PTF	HVS-SA
CAPTIF-NZ	HVS-SA	CAL/APT	K-ATL	MnROAD	MnROAD	HVS-CRREL	RRT-Rom	FDOT-HVS
CAL/APT	CEDEX	ARRB-ALF	ISETH	LCPC-Fr	In-APLF	CEDEX	ISETH	CAL/APT
ARRB-ALF	ARRB-ALF	Oh-APLF	HVS-SA	HVS-SA	FHWA-PTF	ARRB-ALF	CEDEX	ARRB-ALF
Granular materials	Stablized/ cemented materials	Asphalt (Hot mix)	Asphalt (Cold mix)	Concrete	Whitetopping	Geofabrics	Reinforce-ments	Other

FIGURE C31 APT has led to the improved characterization of: (*Source*: Significant findings from full-scale/APT, Question 4.1).

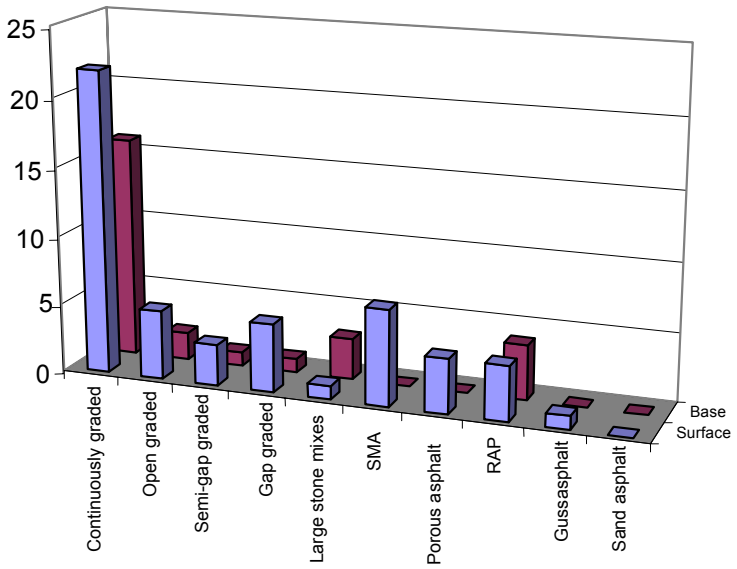

FIGURE C32 Asphaltic materials tests. (*Source*: Significant findings from full-scale/APT, Question 4.2).

Stiffness	Poisson's ratio	Density	Gradation	Atterberg limits	Volumetric properties	Binder content	Film thickness	Moisture content	Visco-elastic properties	Aging index	Other
WesTrack		RIOH–ALF									
HVS–A		WesTrack									
TRACKER		HVS–A									
TxMLS		TxMLS	RIOH–ALF								
TRL–PTF		TRL–PTF	WesTrack								
PRF–La		RRT–Rom	HVS–A			WesTrack					
MnROAD		PRF–La	RRT–Rom			HVS–A					
LINTRACK		NCAT	NCAT		WesTrack	TxMLS					
LCPC–Fr		MnROAD	MnROAD		HVS–A	TRL–PTF					
ISETH		LINTRACK	LCPC–Fr		NCAT	RRT–Rom					
HVS–SA		LCPC–Fr	K–ATL		MnROAD	NCAT					
FHWA–PTF		K–ATL	ISETH		LINTRACK	MnROAD			WesTrack		
FDOT–HVS		ISETH	In–APLF		K–ATL	LCPC–Fr		TxMLS	TxMLS		
CEDEX		In–APLF	HVS–SA		ISETH	K–ATL		TRL–PTF	MnROAD		
CAL/APT	MnROAD	HVS–SA	FHWA–PTF	HVS–A	In–APLF	ISETH		MnROAD	LINTRACK		MnROAD
ARRB–ALF	ISETH	CEDEX	CEDEX	MnROAD	HVS–SA	In–APLF		K–ATL	LCPC–Fr		K–ATL
Oh–APLF	CEDEX	CAPTIF–NZ	CAPTIF–NZ	HVS–SA	FDOT–HVS	HVS–SA	MnROAD	HVS–SA	FHWA–PTF		FHWA–PTF
		CAL/APT	ARRB–ALF	CEDEX	CEDEX	CEDEX	In–APLF	CEDEX	FDOT–HVS	MnROAD	NAPTF
		ARRB–ALF	Oh–APLF	ARRB–ALF	ARRB–ALF	ARRB–ALF	HVS–SA	ARRB–ALF	CAL/APT	ISETH	Oh–APLF

FIGURE C33 Material properties that have been related to APT performance. (*Source*: Significant findings from full-scale/APT, Question 4.3).

							WesTrack				
				WesTrack	TRACKER		TxMLS				WesTrack
			WesTrack	PRF–La	TRL–PTF		PRF–La				TxMLS
		WesTrack	TxMLS	NCAT	NCAT		NCAT	TxMLS			PRF–La
		LCPC–Fr	NCAT	MnROAD	In–APLF		In–APLF	PRF–La			NCAT
	WesTrack	FHWA–PTF	K–ATL	FHWA–PTF	HVS–SA		FHWA–PTF	FHWA–PTF	TxMLS		FHWA–PTF
	TxMLS	ARRB–ALF	FHWA–PTF	FDOT–HVS	CEDEX		CAL/APT	ARRB–ALF	PRF–La	HVS–A	CAL/APT
PTF	MMLS3	French Rut Tester	Hamburg Tester	Asphalt Pavement Analyzer	Other wheel tracking	Volu-metric shear test	Repeated shear test at constant height	Simple shear test at constant height	Repeated shear test at constant stress	Uniaxial strain test	Shear frequency sweep test at constant height
Wheel Trafficking Tests		Wheel Tracking Tests				SST					

RIOH							
TxMLS							
TRL–PTF	WesTrack						
RRT–Rom	TxMLS						
PRF–La	TRL–PTF						
NCAT	PRF–La						
MnROAD	NCAT						
LINTRACK	MnRoad	WesTrack	WesTrack				
LCPC-Fr	LCPC-Fr	PRF-La	TRL-PTF				
K–ATL	K–ATL	NCAT	PRF–La				
HVS–SA	HVS–SA	MnROAD	NCAT				
TRL–PTF	FHWA–PTF	LCPC–Fr	MnROAD		TRL–PTF	WesTrack	
NAPTF	FDOT–HVS	K–ATL	HVS–SA	TRL–PTF	MnROAD	TRL–PTF	
DRTM	CEDEX	FHWA–PTF	FHWA–PTF	HVS–SA	ISETH	RRT–Rom	
CEDEX	CAL/APT	FDOT–HVS	FDOT–HVS	FDOT–HVS	In–APLF	MnROAD	
ARRB–ALF	ARRB–ALF	CEDEX	CEDEX	ARRB–ALF	HVS–SA	LINTRACK	
Penetration, Softening point, Ductility	Dynamic shear rheometer	Bending beam rheometer	Rotational viscometer	Sliding plate rheometer	Other asphalt binder tests	Other	
Asphalt Binder Tests							

FIGURE C34 Laboratory tests used in conjunction with APT of asphalt pavements. (*Source*: Significant findings from full-scale/APT, Question 4.4).

	RIOH–ALF				HVS–A			
	WesTrack				TRL–PTF			
	HVS–A				PRF–La			
	TxMLS				NCAT			
	TRL–PTF				MnROAD			
	RRT–Rom				LINTRACK			
	PRF–La				LCPC–Fr			
	NCAT	RIOH–ALF			ISETH		RIOH–ALF	
	MnROAD	WesTrack			In–APLF		HVS–A	
TRACKER	LINTRACK	HVS–A			HVS–SA	HVS–A	PRF–La	
TxMLS	LCPC–Fr	TRL–PTF			FDOT–HVS	PRF–La	NCAT Auburn	
TRL–PTF	K–ATL	NCAT			NAPTF	NCAT	MnROAD	
RRT–Rom	ISETH	MnROAD			CEDEX	MnROAD	ISETH	
PRF–La	HVS–SA	LINTRACK			CAPTIF–NZ	HVS–SA	HVS–SA	
LCPC–Fr	FDOT–HVS	HVS–SA			CAL/APT	FDOT–HVS	CEDEX	
K–ATL	CEDEX	FHWA–PTF			ARRB–ALF	CEDEX	ARRB–ALF	HVS–SA
NAPTF	CAPTIF–NZ	CEDEX	LCPC–Fr	MnROAD	Oh–APLF	ARRB–ALF	Oh–APLF	CAL/APT
Oh–APLF	ARRB–ALF	CAL/APT	ISETH					
Direct tensile tests	Indirect tensile tests	Bending beam fatigue	Cantilever fatigue tests	Semi–circular bending test	Triaxial testing	Dynamic creep	Static creep	Other performance related tests
Other performance related tests								

RIOH–ALF										
WesTrack										
HVS–A		WesTrack					RIOH–ALF			
RRT–Rom		HVS–A					WesTrack			
PRF–La		TRACKER					TxMLS			
NCAT		PRF–La					RRT–Rom			
MnROAD		NCAT					NCAT			
K–ATL		MnROAD					MnROAD			
ISETH		LCPC–Fr		WesTrack	WesTrack		LCPC–Fr	RIOH–ALF	RIOH–ALF	
In–APLF		K–ATL		NCAT	RRT–Rom		K–ATL	MnROAD	TxMLS	
HVS–SA		In–APLF		In–APLF	MnROAD		ISETH	K–ATL	TRL–PTF	
NAPTF		HVS–SA	HVS–A	HVS–SA	LCPC–Fr		HVS–SA	ISETH	MnROAD	
DRTM		FDOT–HVS	LCPC–Fr	FHWA–PTF	HVS–SA		FHWA–PTF	HVS–SA	ISETH	
CEDEX		CAL/APT	HVS–SA	CEDEX	FHWA–PTF	MnROAD	DRTM	CEDEX	HVS–SA	
ARRB–ALF		ARRB–ALF	CAL/APT	CAPTIF–NZ	CEDEX	K–ATL	CEDEX	ARRB–ALF	CEDEX	TxMLS
Oh–APLF	HVS–SA	Oh–APLF	ARRB–ALF	CAL/APT	ARRB–ALF	FDOT–HVS	ARRB–ALF	Oh–APLF	ARRB–ALF	MnROAD
Marshall	Modified Marshall (Hugo)	Gyratory	Roller	Other compaction tests	Short or long term aging	Perme-ability	Basic aggregate tests	Unconfined compressive strength	California bearing ratio	Seismic measure–ments
Laboratory compaction										

FIGURE C34 (*Continued*).

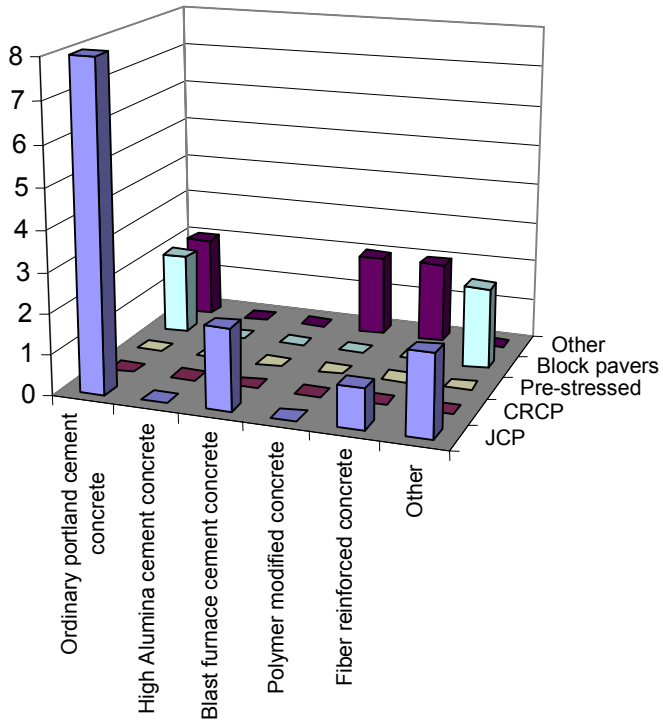

FIGURE C35 Concrete materials/structures tested with APT. (*Source*: Significant findings from full-scale/APT, Question 4.5).

		HVS–A		HVS–A
		RRT–Rom		TRL–PTF
		MnROAD	HVS–A	RRT–Rom
		LCPC–Fr	MnROAD	MnROAD
		K–ATL	K–ATL	LCPC–Fr
	HVS–A	FHWA–PTF	HVS–SA	K–ATL
	MnROAD	NAPTF	FHWA–PTF	FHWA–PTF
LCPC–Fr	CAL/APT	CAL/APT	CAL/APT	MnROAD
K–ATL	ARRB–ALF	ARRB–ALF	Oh–APLF	Oh–APLF
Tensile strength	Flexural strength	Compressive strength	Stiffness modulus	Other

FIGURE C36 Properties that have been related to APT performance of concrete pavements. (*Source*: Significant findings from full-scale/APT, Question 4.6).

Direct tensile strength test	Direct tensile fatigue tests	Cylinder compression tests	Strength tests on field cores	Split tensile strength test	Split tensile fatigue tests	Cube compression tests	Other
MnROAD		HVS–A	HVS–A	HVS–A			TRL–PTF
NAPTF		RRT–Rom	MnROAD	MnROAD		TRL–PTF	RRT–Rom
		MnROAD	HVS–SA	LCPC–Fr		RRT–Rom	FHWA–PTF
		LCPC–Fr	CAL/APT	NAPTF		HVS–SA	NAPTF
		K–ATL	ARRB–ALF	Oh–APLF			
		HVS–SA	Oh–APLF				
		FHWA–PTF					
		NAPTF					
		CAL/APT					
		ARRB–ALF					
		Oh–APLF					

FIGURE C37 Laboratory tests used in conjunction with APT of concrete pavements. (*Source*: Significant findings from full-scale/APT, Question 4.7).

Scaled wheel trafficking (MMLS3)	Penetration tests (DCP)	Density/ moisture measurements	Benkelman beam	Seismic measurements	Ground penetrating radar	FWD	Permeability	Rolling Dynamic Deflectometer	Relative concrete joint movement	Plate load tests	In situ concrete strength	Other
WesTrack	CAPTIF–NZ	CAL/APT	CAPTIF–NZ	TxMLS	CEDEX	CAL/APT	MnROAD		CAL/APT	NAPTF		MnROAD
TxMLS	CAL/APT	ARRB–ALF	CAL/APT	HVS–SA	CAL/APT	ARRB–ALF	HVS–SA	TxMLS	ARRB–ALF	HVS–CRREL	TRL–PTF	NAPTF
HVS–SA	ARRB–ALF	Oh–APLF	ARRB–ALF	CEDEX	ARRB–ALF	Oh–APLF	CAL/APT	FHWA–PTF	Oh–APLF	CEDEX	MnROAD	CAPTIF–NZ
	CEDEX	CAPTIF–NZ	CEDEX	HVS–A	HVS–CRREL	CAPTIF–NZ	NCAT		NAPTF	HVS–Nordic		
	HVS–CRREL	CEDEX	HVS–SA		FDOT–HVS	CEDEX			FHWA–PTF	ISETH		
	NAPTF	HVS–CRREL	ISETH		FHWA–PTF	HVS–CRREL			MnROAD	K–ATL		
	FDOT–HVS	DRTM	LCPC–Fr		ISETH	DRTM				MnROAD		
	HVS–SA	NAPTF	LINTRACK		MnROAD	NAPTF				TRL–PTF		
	ISETH	FDOT–HVS	MnROAD		TRL–PTF	FDOT–HVS				HVS–A		
	LINTRACK	HVS–Nordic	TRL–PTF		TxMLS	FHWA–PTF						
	MnROAD	HVS–SA	HVS–A		HVS–A	HVS–Nordic						
	TRL–PTF	In–APLF				HVS–SA						
	TxMLS	ISETH				In–APLF						
	HVS–A	LCPC–Fr				ISETH						
		LINTRACK				K–ATL						
		MnROAD				LINTRACK						
		NCAT				MnROAD						
		PRF–La				NCAT						
		TRL–PTF				PRF–La						
		TxMLS				TRL–PTF						
		HVS–A				TxMLS						
		WesTrack				HVS–A						
		FHWA–PTF				WesTrack						

FIGURE C38 Field tests used in conjunction with APT. (*Source*: Significant findings from full-scale/APT, Question 4.8).

RIOH–ALF				RIOH–ALF				
WesTrack		RIOH–ALF		WesTrack				
HVS–A	RIOH–ALF	HVS–A		HVS–A				
TRACKER	HVS–A	TxMLS		TxMLS				
MnROAD	TxMLS	RRT–Rom		PRF–La				
LINTRACK	RRT–Rom	PRF–La		MnROAD				
LCPC–Fr	MnROAD	MnROAD	RIOH–ALF	LINTRACK				
In–APLF	LINTRACK	LINTRACK	WesTrack	LCPC–Fr				
HVS–SA	LCPC–Fr	LCPC–Fr	PRF–La	ISETH				
HVS–Nordic	ISETH	In–APLF	MnROAD	In–APLF	RIOH–ALF			
FHWA–PTF	HVS–SA	HVS–SA	LINTRACK	HVS–SA	TxMLS			
NAPTF	NAPTF	FHWA–PTF	LCPC–Fr	HVS–Nordic	RRT–Rom			
DRTM	DRTM	NAPTF	In–APLF	DRTM	PRF–La			
HVS–CRREL	HVS–CRREL	DRTM	HVS–SA	HVS–CRREL	MnROAD	HVS–A		
CEDEX	CEDEX	HVS–CRREL	FHWA–PTF	CEDEX	LINTRACK	TxMLS		
CAPTIF–NZ	CAPTIF–NZ	CEDEX	HVS–CRREL	CAPTIF–NZ	In–APLF	PRF–La		
CAL/APT	CAL/APT	CAPTIF–NZ	CEDEX	CAL/APT	HVS–SA	MnROAD		
ARRB–ALF	ARRB–ALF	CAL/APT	CAL/APT	ARRB–ALF	CAPTIF–NZ	ISETH	RIOH–ALF	
Oh–APLF	Oh–APLF	ARRB–ALF	ARRB–ALF	Oh–APLF	ARRB–ALF	ARRB–ALF	MnROAD	DRTM
Stress/strain modeling	Deflection modeling	Deformation modeling	Fatigue modeling	Back-calculation of modulus	Load equivalency	Pavement serviceability	Cracking	Other

FIGURE C39 Aspects of modeling studied using APT. (*Source*: Significant findings from full-scale/APT, Question 5.1).

Strain gauges	Pressure cells	Load cells	Displacement gauges	Subgrade moisture sensors	Other*
RIOH–ALF			RIOH–ALF		
WesTrack			HVS–A	RIOH–ALF	
HVS–A			TxMLS	WesTrack	
TxMLS			RRT–Rom	HVS–A	
PRF–La			MnROAD	TxMLS	
MnROAD			LCPC–Fr	RRT–Rom	
LINTRACK			K–ATL	NCAT	
LCPC–Fr	RIOH–ALF		In–APLF	MnROAD	
K–ATL	HVS–A		HVS–SA	LCPC–Fr	
ISETH	TxMLS		HVS–Nordic	K–ATL	
In–APLF	PRF–La		NAPTF	HVS–SA	MnROAD
HVS–SA	MnROAD		HVS–CRREL	NAPTF	LINTRACK
HVS–Nordic	LCPC–Fr	RIOH–ALF	CEDEX	DRTM	FHWA–PTF
FHWA–PTF	K–ATL	HVS–A	CAPTIF–NZ	HVS–CRREL	DRTM
NAPTF	HVS–Nordic	TxMLS	CAL/APT	CEDEX	CAPTIF–NZ
DRTM	NAPTF	PRF–La	ARRB–ALF	CAL/APT	CAL/APT
HVS–CRREL	DRTM	MnROAD	Oh–APLF	ARRB–ALF	Oh–APLF
CEDEX	HVS–CRREL				
CAL/APT	CEDEX				
ARRB–ALF	CAPTIF–NZ				
Oh–APLF	ARRB–ALF				

*Other instruments cited by respondents:

Temperature sensors—Oh–APLF; CAL/APT

Temperature gauge—DRTM

Emu & Bison strain coils—CAPTIF–NZ

LVDT—FHWA–PTF

Several attempts for measurement of asphalt sublayers: LINTRACK–NL

MnROAD—see website (http://mnroad.dot.state.mn.us/researc/Mnresearc.asp) and beyond the surface handout.

FIGURE C40 Instrumentation used to gather modeling data. (*Source*: Significant findings from full-scale/APT, Question 5.2).

	RIOH–ALF				
	WesTrack				
	HVS–A			RIOH–ALF	
	TxMLS			WesTrack	
	RRT–Rom			HVS–A	
	PRF–La			TxMLS	
	NCAT			PRF–La	
	LINTRACK			MnROAD	
	LCPC–Fr			LINTRACK	
	K–ATL			LCPC–Fr	
	ISETH			In–APLF	
	HVS–SA			HVS–SA	
	HVS–Nordic	WesTrack		FHWA	
	NAPTF	TxMLS		NAPTF	
	DRTM	PRF–La		DRTM	
	HVS–CRREL	MnROAD		HVS–CRREL	
	CEDEX	LINTRACK		CEDEX	
	CAPTIF–NZ	LCPC–Fr	TxMLS	CAPTIF–NZ	PRF–La
	CAL/APT	ISETH	MnROAD	CAL/APT	MnROAD
	ARRB–ALF	FHWA–PTF	HVS–SA	ARRB–ALF	In–APLF
	Oh–APLF	CEDEX	CAL/APT	Oh–APLF	DRTM
None	Elastic layer analysis	Visco-elastic analysis	Elasto-plastic analysis	Finite element analysis	Other

FIGURE C41 Models used with APT studies. (*Source*: Significant findings from full-scale/APT, Question 5.3).

HVS–A				RIOH–ALF				
TxMLS				WesTrack				
TRL–PTF				HVS–A				
RRT–Rom				NCAT				
MnROAD				MnROAD				
LCPC–Fr	MnROAD		RRT–Rom	In–APLF	HVS–A			
ISETH	K–ATL		MnROAD	HVS–SA	TRL–PTF		NCAT	
HVS–SA	ISETH		LCPC–Fr	HVS–CRREL	RRT–Rom	RIOH–ALF	MnROAD	
CEDEX	HVS–SA	TRL–PTF	ISETH	CAPTIF–NZ	LCPC–Fr	TxMLS	HVS–SA	
CAL/APT	ARRB–ALF	MnROAD	HVS–CRREL	CAL/APT	HVS–Nordic	MnROAD	CEDEX	MnROAD
ARRB–ALF	Oh–APLF	ISETH	CEDEX	ARRB–ALF	HVS–CRREL	ARRB–ALF	ARRB–ALF	HVS–SA
Uncon-ventional materials	Joints	Buried pipes	Durability	Compaction	Reinforcement	Preventive maintenance	Surface texture	Surface drainage

									PRF–La	
									NCAT	
				MnROAD		WesTrack	HVS–A		MnROAD	PRF–La
	PRF–La	MnROAD		HVS–SA	HVS–A	NCAT	NCAT		CAL/APT	MnROAD
Oh–APLF	CEDEX	CEDEX	ARRB–ALF	ARRB–ALF	LCPC–Fr	MnROAD	CEDEX	NCAT	ARRB–ALF	HVS–Nordic
Gradients	Slippage	Road marking	Traffic accomo–dation	Patching	Risk mana-gement	QA/QC	Surface tolerance	Layers	Subsurface drainage	Other

FIGURE C42 Aspects of pavement engineering that enhance construction and rehabilitation through APT. (*Source*: Significant findings from full-scale/APT, Question 6.1).

RIOH–ALF					
WesTrack					
TRL–PTF					
NCAT					
K–ATL				TxMLS	
ISETH				RRT–Rom	
HVS–SA		WesTrack		PRF–La	
CEDEX		HVS–A		In–APLF	
CAL/APT	WesTrack	NCAT		HVS–CRREL	
ARRB–ALF	NCAT	CAL/APT	ARRB–ALF	Oh–APLF	MnROAD
Performance-related specifications	Warranties	Pay factors	Risk management	Not applicable	Other

FIGURE C43 APT aids in development of construction specifications and contracts with regards to: (*Source*: Significant findings from full-scale/APT, Question 6.2).