Apéndice XII. Estudio Operacional de Transito, Cidra

ESTUDIO OPERACIONAL DE TRANSITO

Bosques de Cidra

PR-172 Km. 10.3 Barrio Bayamón
Municipio de Cidra, Puerto Rico

Diciembre 2006

Preparado para:

Bosques de Cidra, Inc.

Preparado por:

CMA
ARCHITECTS & ENGINEERS LLP

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RESUMEN EJECUTIVO

La corporación Bosques de Cidra, Inc. va a desarrollar una finca de unas 279 cuerdas ubicada en la Carretera Estatal PR-172 Km. 10.3, Barrio Bayamón del Municipio de Cidra donde se propone llevar a cabo un desarrollo de 540 unidades de vivienda (240 residencias y 300 apartamentos Tipo "Walk-Ups"). El proyecto será desarrollado por fases, a razón de 100 unidades por año, comenzando la construcción en el año 2009. Los predios de este desarrollo cuentan con acceso directo a la carretera estatal PR-172 Km. 10.3 en su intersección con el camino municipal de la Comunidad San José.

El propósito de este informe es determinar el impacto que tendrá el desarrollo propuesto en las vías circundantes al sector de influencia del proyecto. También en identificar si existe la necesidad de llevar a cabo mejoras viales para aliviar el impacto en el flujo vehicular debido al proyecto propuesto y de ser necesario, formular las medidas de mitigación necesarias para mantener las vías vehiculares en unos niveles de servicio aceptables para los usuarios de las mismas.

El informe se preparó siguiendo las "*Guías para la preparación de Estudios Operacionales de Accesos y de Tránsito para Puerto Rico Versión 1.0 (22-DIC-04")* redactado por la Autoridad de Carreteras y Transportación (ACT). Los análisis realizados para los escenarios actuales (año 2006) y los escenarios futuros (años 2014 y 2019, según las guías de ACT) demuestran que la vía estatal PR-172 operará satisfactoriamente dentro de los requerimientos de la Autoridad de Carreteras y el Departamento de Transportación y Obras Públicas.

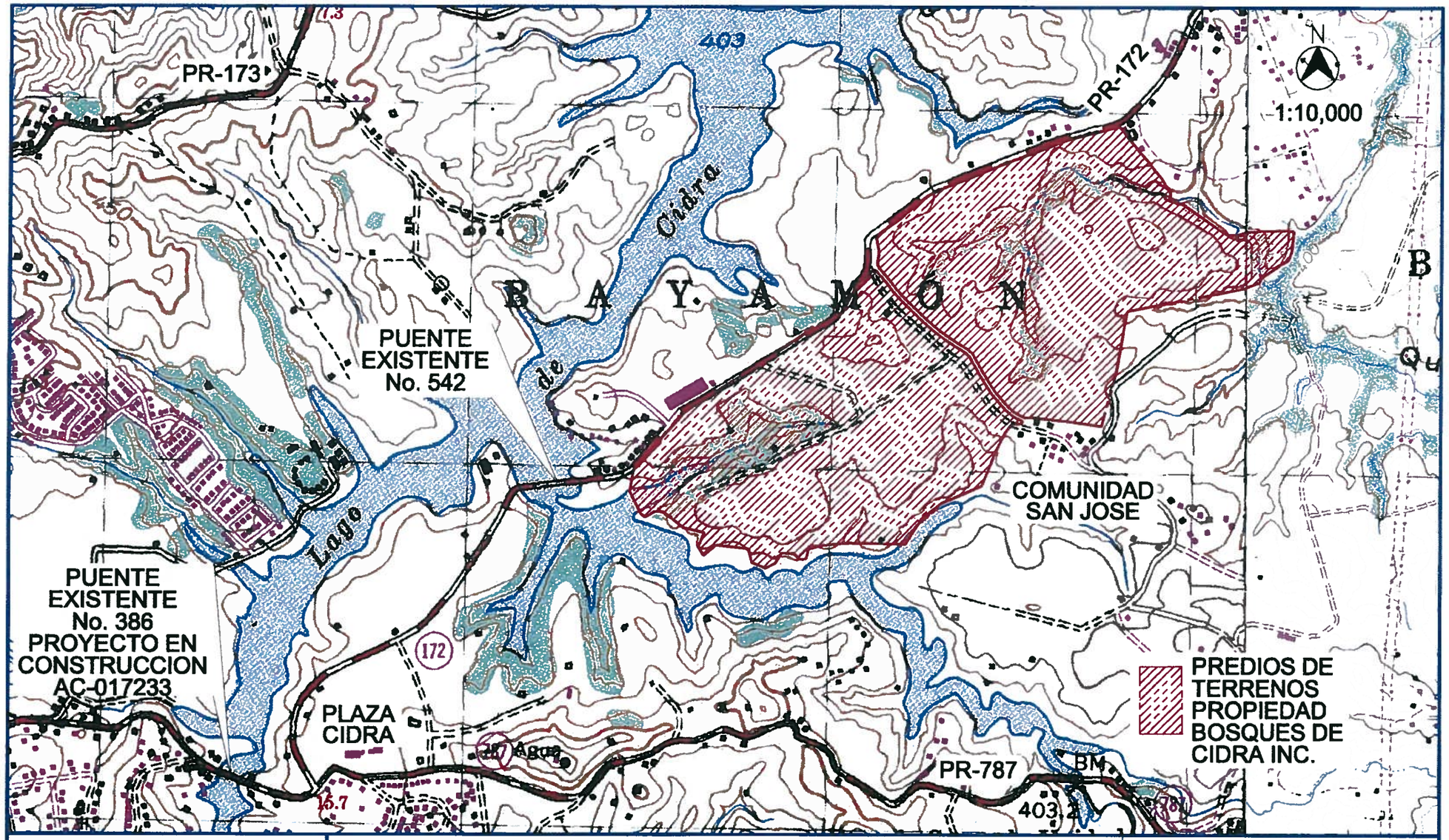
Como medidas de mitigación al nuevo tránsito generado por el desarrollo Bosques de Cidra se requiere llevar cabo mejoras geométricas e instalación de dispositivos de control en la carretera estatal PR-172. Estas medidas se llevarán a cabo en las intersecciones de la carretera estatal y los accesos propuestos al desarrollo.

SECCION 1.0 – DESCRIPCCION DEL PROYECTO

Bosques de Cidra, Inc. es la entidad que desarrollará el proyecto en una finca de unas 279 cuerdas ubicada en la Carretera Estatal PR-172 Kilómetro 10.3 (según rotulado en la parada de autobuses), Barrio Bayamón del Municipio de Cidra. (Ver Figura Núm. 1)

La propiedad consta de unas 10 parcelas con una cabida de 279 cuerdas de terreno. Se propone llevar a cabo un desarrollo de quinientas cuarenta (540) unidades de vivienda (240 residencias y 300 apartamentos Tipo "Walk-ups". El proyecto será desarrollado en etapas, a razón de 100 unidades por año, comenzando en el año 2009.

El predio propuesto para este desarrollo cuenta con acceso directo a la Carretera Estatal PR-172, a la altura del kilómetro 10.3 en su intersección con el camino San José. Ver Figura Núm. 3.



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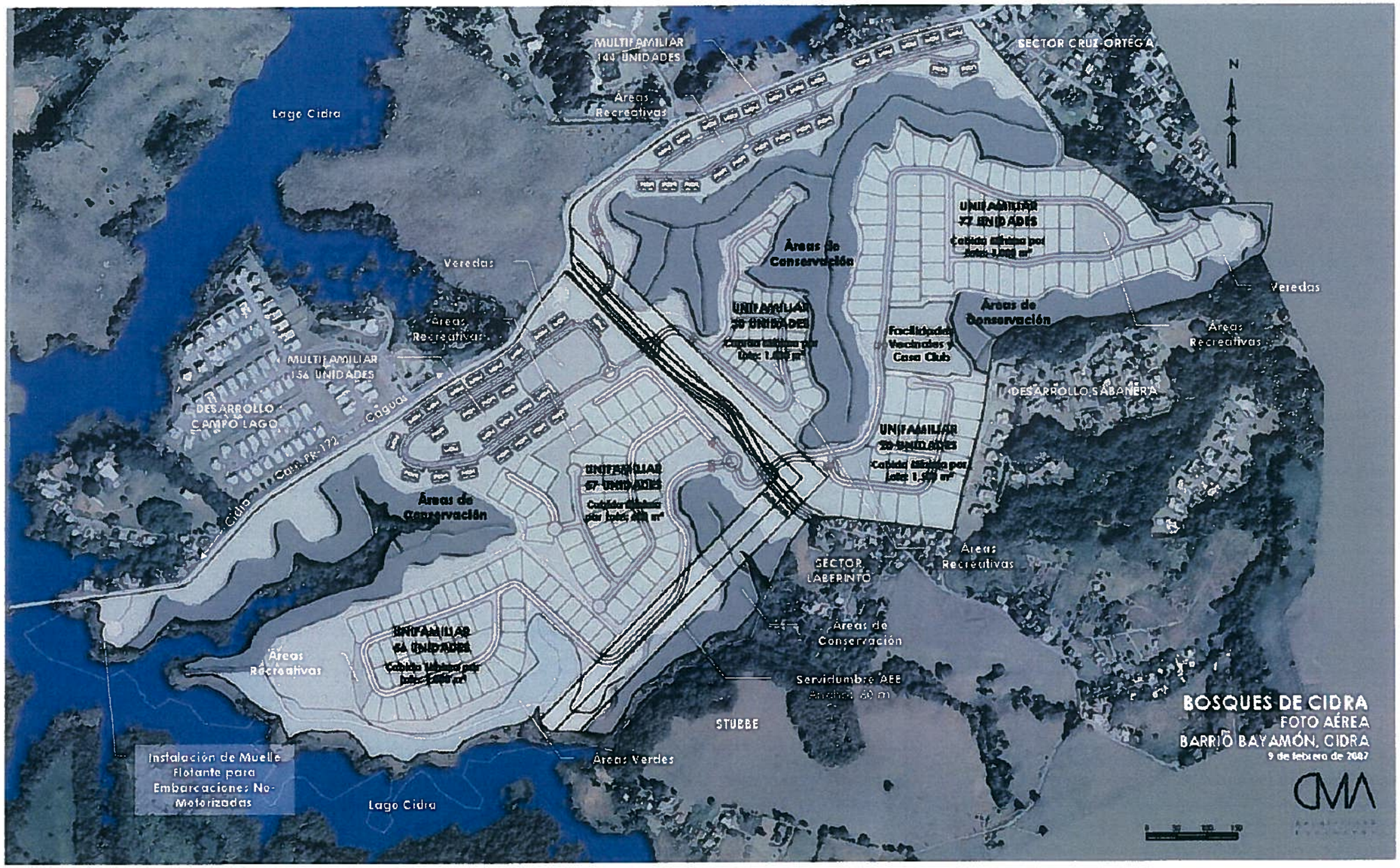
ESTUDIO OPERACIONAL DE TRANSITO
SEGMENTO DE CUADRANGULO MOSTRANDO LA LOCALIZACION
CIDRA DEL PROYECTO PROPUESTO Y LA PR-172 PUERTO RICO

PROYECTO	BOSQUES DE CIDRA		
POR RRF	FECHA12/08/06	PROYECTO #	06152
REVISADO JAC	FECHA12/08/06	FIGURA	1



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CIDRA

ESTUDIO OPERACIONAL DE TRANSITO
PLANO CONCEPTUAL DE USO DE TERRENOS
DEL PROYECTO PROPUESTO

PUERTO RICO

PROYECTO	BOSQUES DE CIDRA		
POR	RRF	FECHA12/08/06	PROYECTO # 06152
REVISADO	JAC	FECHA12/08/06	FIGURA 2

El objetivo de este estudio es determinar el impacto que tendrá el proyecto propuesto en las vías circundantes al sector de influencia del proyecto. También se identificará si existe la necesidad de llevar a cabo mejoras viales que alivien el impacto al flujo vehicular y de ser necesario, formular las medidas de mitigación necesarias para mantener las vías en unos niveles de servicio aceptables para los usuarios de las mismas.

Para lograr el objetivo arriba indicado se llevan a cabo las siguientes actividades según las guías de ACT:

- Determinación del flujo vehicular en el año base 2006 mediante conteos de tráfico.
- Análisis de capacidad de la red vial sin el proyecto en el año base utilizando un modelo de tráfico computarizado.
- Proyección del flujo vehicular para años futuros tomando en cuenta el año en que se estima el proyecto esté terminado y en operación completa (2014) reflejando las tendencias históricas del crecimiento vehicular propio de la zona.
- Análisis de capacidad de la red vial al año futuro utilizando un modelo de tráfico computarizado.
- Proyección del flujo vehicular a 5 años desde donde se estima que el proyecto esté terminado y en operación completa (2019) y análisis de capacidad.
- Comparación de los distintos escenarios y discusión de los resultados obtenidos.
- Formulación de mejoras a la red vial, de ser necesario.
- Conclusiones y recomendaciones

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ESTUDIO OPERACIONAL DE TRANSITO

FOTO AEREA DEL SITIO DONDE SE UBICARA EL PROYECTO PROPUESTO

CIDRA Y SU RED VIAL INMEDIATA PUERTO RICO

PROYECTO	BOSQUES DE CIDRA		
POR RRF	FECHA12/08/06	PROYECTO #	06152
REVISADO JAC	FECHA12/08/06	FIGURA	3

Este informe fue realizado a tenor con los requisitos de las siguientes publicaciones:

1. "GUIAS PARA LA PREPARACION DE ESTUDIOS OPERACIONALES DE ACCESOS Y DE TRANSITO PARA PUERTO RICO" Versión 1.0, preparado por la Autoridad de Carreteras y Transportación y el Departamento de Transportación y Obras Públicas, Diciembre 2004.

2. "Manual of Transportation Engineering Studies" publicado por el "Institute of Transportation Engineers" en el año 2000.

3. "Highway Capacity Manual 2000" publicado por el "Transportation Research Board" en el año 2000.

4. "Traffic Engineering Handbook" Quinta Edición publicado por el "Institute of Transportation Engineers" en el año 1999.

SECCION 2.0 – PARAMETROS DEL ANALISIS

- **Área de Estudio**

  El análisis operacional de tránsito se realizó en la red vial que comprenden las carreteras estatales PR-172, PR-787 y el camino San José en el Municipio de Cidra. El análisis se enfocó principalmente en la evaluación de las intersecciones existentes en la PR-172 entre la PR-787, el camino Comunidad San José y la entrada principal a la Farmacéutica Glaxo Smith Kline (GSK).

  Se realizaron conteos manuales de doce (12) horas el jueves 19 de octubre de 2006 en las siguientes intersecciones:

  1. PR-172 y PR-787 – intersección semaforizada
  2. PR-172 km. 10.3 y Camino San José
  3. PR-172 y entrada Farmacéutica GSK

- **Escenarios evaluados**

  Para este informe se evaluó la red vial existente (año 2006) desde la intersección de la PR-172 y PR-787 hasta la intersección de la PR-172 y la entrada a la farmacéutica.

  También se evaluaron los escenarios futuros (años 2014 y 2019) y sus intersecciones propuestas con la PR-172 y el proyecto propuesto.

- **Día típico**

  Los conteos manuales se realizaron el jueves 19 de octubre de 2006. Las actividades cotidianas a la fecha fueron normales y no se identificaron actividades extraordinarias que afectaran los patrones de flujo en la PR-172. Adyacente a la red vial se encuentran las obras de construcción en la intersección con la PR-787 del proyecto de la Autoridad de Carreteras AC-017233, Reemplazo Puente # 686 en PR-172.

- **Horas Pico A.M. y P.M.**

  Los conteos manuales comenzaron a las 6:00 A.M. y se extendieron hasta las 6:00 P.M. el día jueves 19 de octubre de 2006. Después de 12 horas de conteos las horas de mayor flujo vehicular para el periodo matutino y vespertino en el tramo bajo estudio fueron las: 6:30 A.M. a 7:30 A.M. y 5:00 P.M. a 6:00 P.M., respectivamente.

SECCION 3.0 – MATRIZ DEL ESTUDIO

En las siguientes tablas se incluyen los nombres de los archivos electrónicos en forma tabulada que incluyen la modelación de los escenarios y sus respectivos resultados. (Ver Apéndice C)

Tabla 1: Matriz del Estudio – Intersecciones (aaSIDRA) – Año 2006

Intersección	Hora Pico AM	Hora Pico PM
1 – PR-172 @ GSK	2006int1AM	2006int1PM
2 – PR-172 @ San José	2006int2AM	2006int2PM
3 – PR-172 @ PR-787	2006int3AM	2006int3PM

Tabla 2: Matriz del Estudio – Intersecciones (aaSIDRA) – Año 2014

Intersección	Hora Pico AM	Hora Pico PM
1 – PR-172 @ GSK	2014int1AM	2014int1PM
2 – PR-172 @ San José Bosques de Cidra	2014int2AM	2014int2PM
3 – PR-172 @ PR-787	2014int3AM	2014int3PM

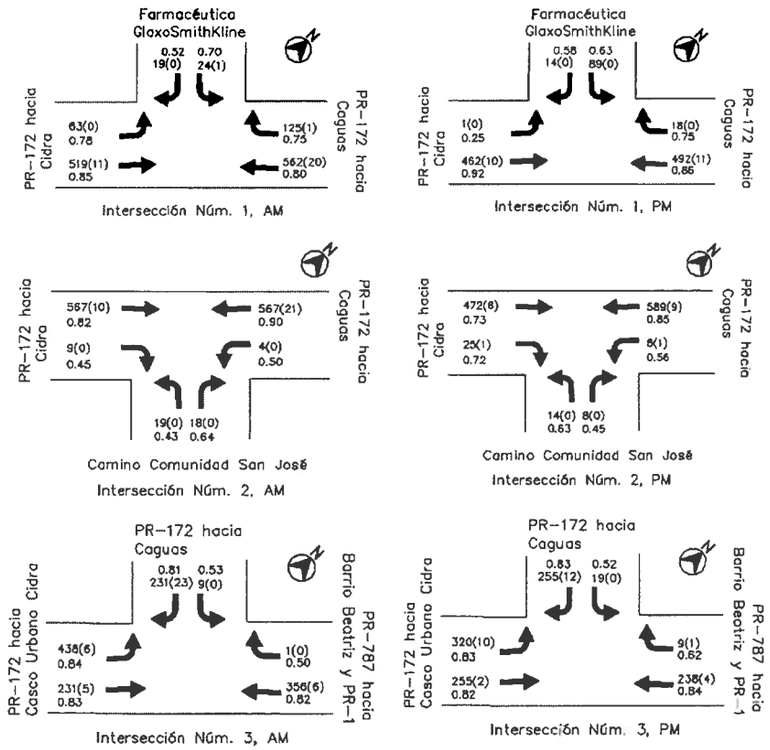
Tabla 3: Matriz del Estudio – Intersecciones (aaSIDRA) – Año 2019

Intersección	Hora Pico AM	Hora Pico PM
1 – PR-172 @ GSK	2019int1AM	2019int1PM
2 – PR-172 @ San José Bosques de Cidra	2019int2AM	2019int2PM
3 – PR-172 @ PR-787	2019int3AM	2019int3PM

SECCION 4.0 – ANALISIS DE CONDICION EXISTENTE - AÑO 2006

a. Volúmenes Tabulados - Año 2006- a continuación se incluyen los volúmenes tabulados en forma de gráfica por hora pico (AM/PM) y movimiento para el escenario presente Año 2006:

Figura 4: Volúmenes para las horas pico AM (6:30-7:30) y PM (5:00-6:00) y factores de hora pico (PHF, "Peak Hour Factor") por movimiento



b. Geometría de las Intersecciones Analizadas – a continuación se presenta en forma gráfica la geometría existente de las intersecciones analizadas incluyendo los siguientes parámetros: número y ancho de carriles, largo de carriles SOLO (aceleración y deceleración), existencia de estacionamientos paralelos, pendientes (%) y velocidad reglamentaria:

Figura 5: Geometría de la intersección PR-172 con la entrada principal de la Farmacéutica Glaxo Smith Kline (Intersección Núm. 1)

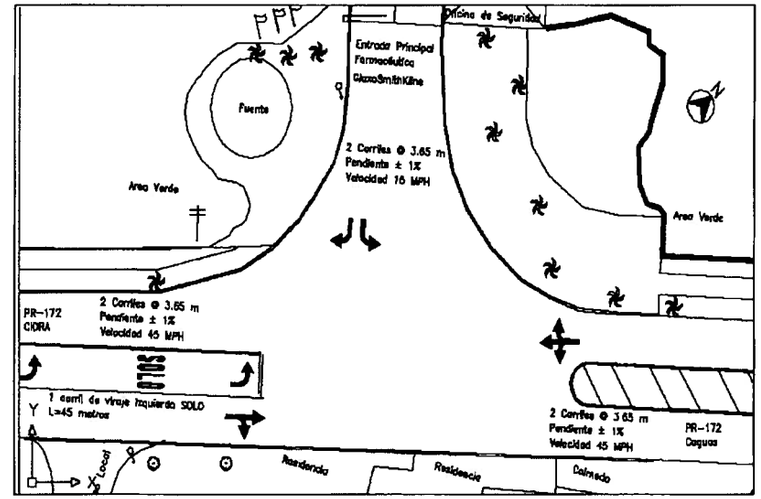


Figura 6: Geometría de la Intersección PR-172 km. 10.3 con el Camino Comunidad San José (Intersección Núm. 2)

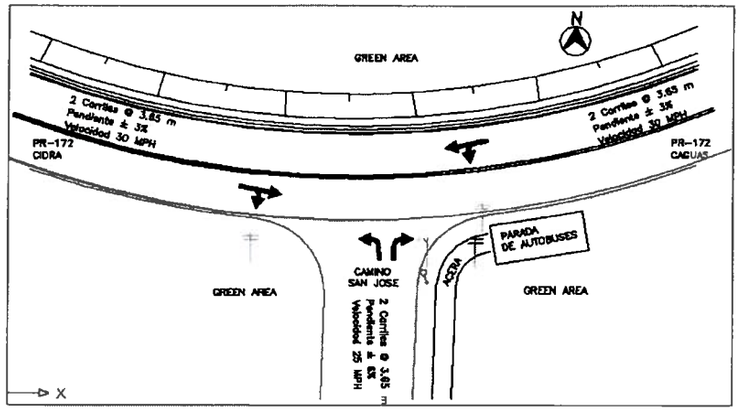
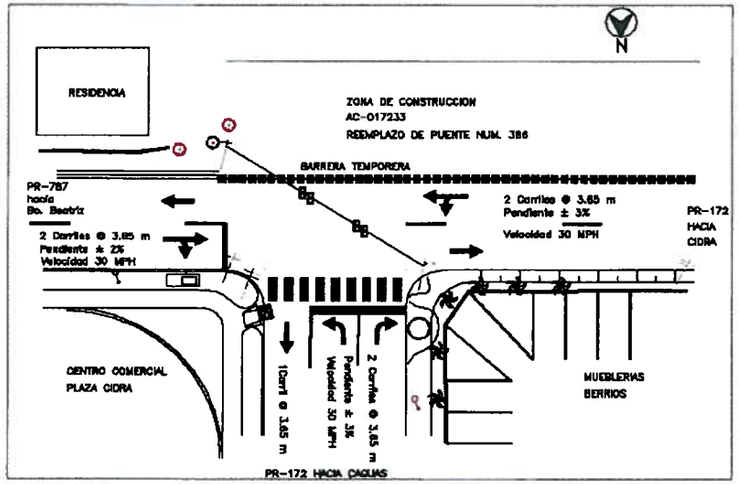


Figura 7: Geometría de la Intersección PR-172 con la carretera PR-787 Cidra (Intersección Núm. 3)



c. Control de la Intersección – a continuación se presenta de forma gráfica los dispositivos de control de tráfico en las intersecciones evaluadas para el escenario existente año 2006:

Figura 8: Intersección No Semaforizada Núm. 1 – PR-172 @ Farmacéutica GSK, Condición Existente.

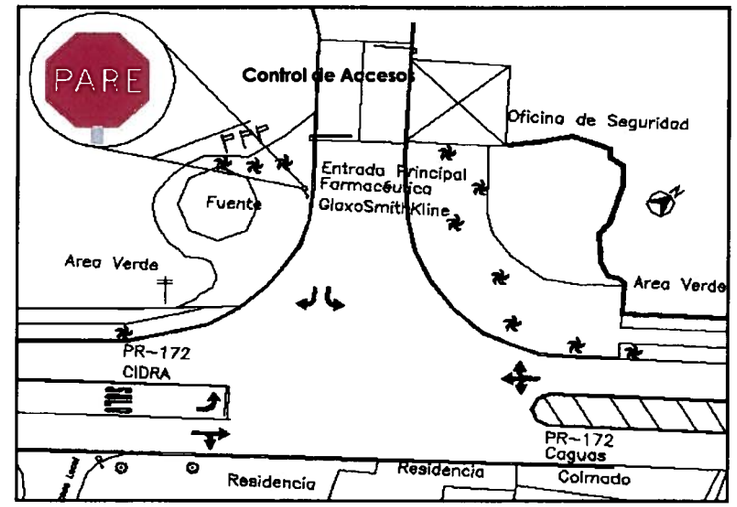


Figura 9: Intersección No Semaforizada Núm. 1 – PR-172 @ Camino San José, Condición Existente.

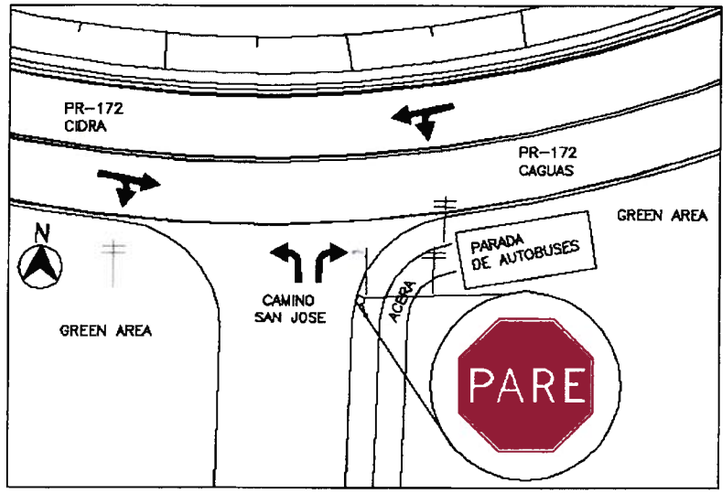
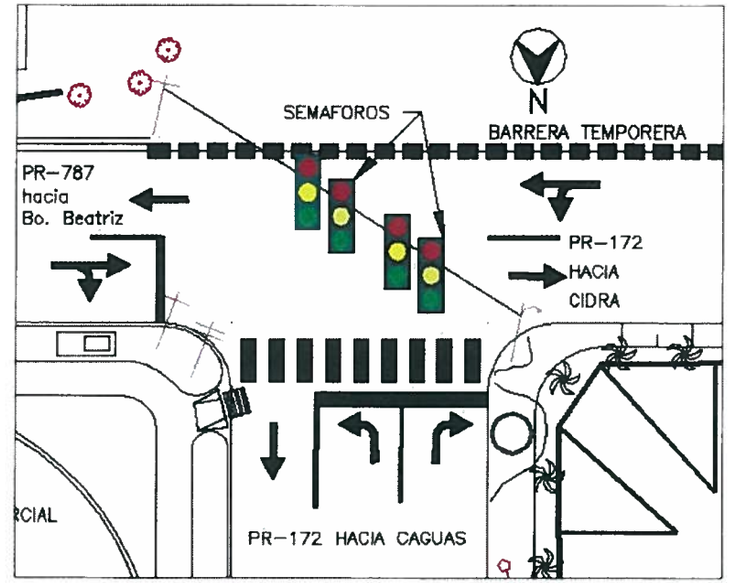


Figura 10: Intersección Semaforizada Núm. 2 – PR-172 @ PR-787 y Fases del Sistema de Semáforos, Condición Existente.

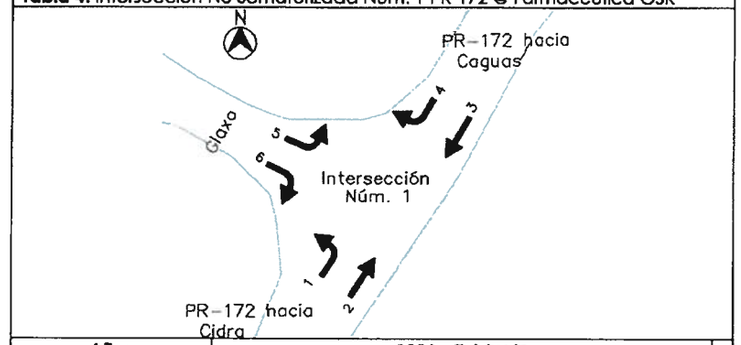


Tiempo de Verde 50 segundos	Tiempo de Verde 35 segundos	Tiempo de Verde 20 segundos

Tiempo de Amarillo = 3 segundos, Todo Rojo = 2 segundos Ciclo= 105 segundos

d. Análisis de Capacidad – a continuación se incluye el resumen de los resultados obtenidos del programa aaSIDRA al evaluarse las intersecciones en las horas pico AM y PM. Se presentan tablas con figuras y movimientos evaluados de manera tabulada por intersección y acceso, nivel de servicio LOS, demora promedio, largo de cola promedio y grado de saturación:

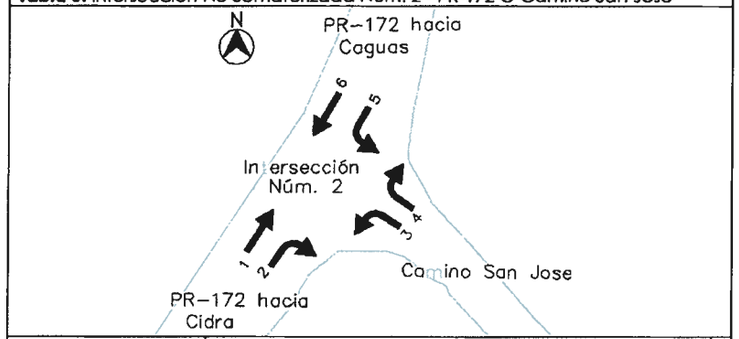
Tabla 4: Intersección No Semaforizada Núm. 1 PR-172 @ Farmacéutica GSK



Años		2006 - Existente			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1	C	15.7	B	12.2
	2	A	0.7	A	0.7
PR-172 Caguas	3	A	0.7	A	0.7
	4	A	9.6	A	9.5
Farmacéutica GSK	5	F	58.8	F	95.9
	6	F	58.8	F	95.9
Nivel de Servicio de la Intersección		C		C	
Demora Promedio en Intersección, seg		4.9		13.1	
Largo de cola máximo 95% (metros)		2		5	
Grado de Saturación (v/c)		0.536 ≤ 1.0, OK		0.923 ≤ 1.0, OK	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

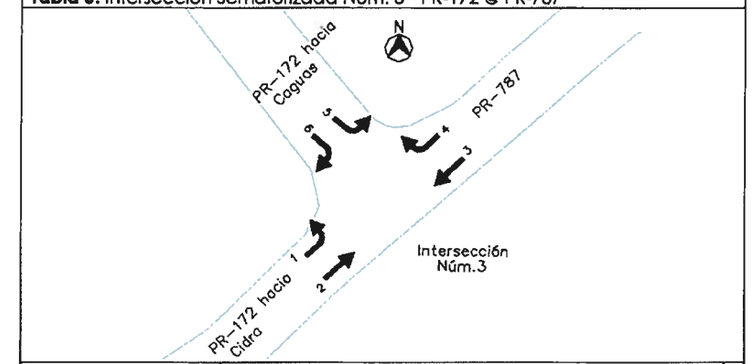
Tabla 5: Intersección No Semaforizada Núm. 2 - PR-172 @ Camino San José



Años		2006 - Existente			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1	A	0.7	A	0.7
	2	A	9.5	A	9.7
Camino San José	3	F	50.1	E	35.8
	4	F	50.1	E	35.8
PR-172 Caguas	5	A	16.0	C	17.0
	6	A	7.1	A	7.7
Nivel de Servicio de la Intersección		C		C	
Demora Promedio en Intersección, seg		6.2		5.4	
Largo de cola máximo 95% (metros)		5		5	
Grado de Saturación (v/c)		0.484 ≤ 1.0, OK		0.390 ≤ 1.0, OK	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

Tabla 6: Intersección Semaforizada Núm. 3 - PR-172 @ PR-787



Años		2006 - Existente			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1	C	28.6	C	22.2
	2	C	20.3	B	13.8
PR-787 Bo. Beatriz	3	C	30.4	C	25.2
	4	D	38.6	C	33.7
PR-172 Caguas	5	D	33.3	C	34.2
	6	B	11.4	B	10.1
Nivel de Servicio de la Intersección		C		B	
Demora Promedio en Intersección, seg		24.3		18.4	
Largo de cola máximo 95% (metros)		13		10	
Grado de Saturación (v/c)		0.797 ≤ 1.0, OK		0.645 ≤ 1.0, OK	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

SECCION 5.0 – ANALISIS DE CONDICION FUTURA - AÑOS 2014 y 2019

Generación de Viajes

El número de viajes generados por el proyecto Bosques de Cidra se estimó utilizando el *"Trip Generation, Volumes I, II & II 7th Edition 2003"* del ITE en función del uso del terreno y las características del desarrollo propuesto:

Tabla 7: Viajes a generarse por Bosques de Cidra en horas pico AM y PM

Desarrollo Considerado	HORA PICO AM			HORA PICO PM		
Uso del Terreno 210	Vehículos Entrando	Vehículos Saliendo	Total	Vehículos Entrando	Vehículos Saliendo	Total
540 unidades[1] Acceso Camino San José / PR-172	74	254	328	267	151	418

1. 540 unidades – 240 residencias y 300 apartamentos Tipo "Walk-Ups"

Este análisis permitió conocer el incremento en el volumen del flujo vehicular en la PR-172 y la red vial inmediata, específicamente la cantidad de vehículos entrando y saliendo del proyecto propuesto así como los períodos críticos para hacer los análisis.

En el portal electrónico de la Junta de Planificación (www.jp.gobiemo.pr) del Gobiemo de Puerto Rico se buscaron proyectos propuestos en el área de influencia desde la PR-172 y la Farmacéutica GSK hasta la intersección de la PR-172 y PR-787. Desde el año 2000 hasta el presente surgieron los siguientes proyectos:

Tabla 8: Proyectos Propuestos sometidos en la Junta de Planificación (JP) en la PR-172 en Municipio de Cidra, PR

Número Caso	Clasificación	Descripción
2000-44-0570-JPU	Denegado	UBICACION PARA PROYECTO DE 84 APARTAMENTOS EN FINCA DE 4.186 CUERDAS.
2000-44-0653-JPU	Denegado	UBICACION PARA PROYECTO DE CENTRO COMERCIAL DE 60000 PIES CUADRADOS EN FINCA DE 5.612 CUERDAS.
2000-44-0993-JPU	Denegado	UBICACIÓN DE PROYECTO INDUSTRIAL DE 16,000 PIES CUADRADOS EN FINCA DE 5.65 CUERDAS.
2003-44-0406-JPU	Denegado	CONSULTA PARA LA UBICACIÓN DE PROYECTO RESIDENCIAL UNIFAMILIAR DE 85 UNIDADES CON CABIDAS DE 600 METROS CUADRADOS,EN FINCA DE 26.0593 CDAS.ZONIFICADA R-0.
2004-44-0196-JPU	Archivado Falta de Interés	CONSULTA PARA LA UBICACION DE PROYECTO RESIDENCIAL UNIFAMILIAR DE 85 UNIDADES CON CABIDA DE 600 METROS CUADRADOS EN FINCA DE 26.2229 CUERDAS ZONIFICADAS R-0

A la fecha de la preparación de este informe no había proyectos aprobados por JP en el área de influencia del estudio en la PR-172. Por esta razón no se incluyeron nuevos proyectos a las proyecciones de tránsito utilizadas en el informe.

Proyecciones

Con base a la información de la ACT, se determinó la tasa de crecimiento anual vehicular para la red vial en el área de influencia del proyecto Bosques de Cidra, utilizando la formula:

$$F = P(1 + i)^n$$

Donde, **F** = ADT futuro
P = ADT presente
n = número de años
i = tasa de crecimiento anual vehicular.

La Tabla Núm. 9 muestra los datos de tránsito utilizados para calcular la tasa de crecimiento anual.

Tabla 9: Datos de ACT y conteos de 2006 utilizados para la tasa de crecimiento

Volúmenes PR-172 entre PR-787 y PR-785	
Año	Vehículos por día (vpd)
1994	14,400
1996	15,350
1998	16,400
1999	17,300
2000	18,300
2003	19,900
2004	20,700
2006	**16,000**

Reemplazando los valores de AADT en la fórmula se obtuvo la tasa promedio de crecimiento anual, desde el 1994 al 2004, de ***I* = 3.69%.** Utilizando los volúmenes calculados de los conteos realizados en septiembre de 2006 se obtuvo una tasa promedio negativa de ***I* = 1.00%** entre el año 1994 y 2006.

Para efectos de este informe utilizaremos una tasa promedio de crecimiento anual en el tráfico vehicular de ***I* = 2.35%** debido al constante desarrollo urbano en el área de influencia del estudio.

a. Volúmenes Tabulados Año – 2014 y 2019 - a continuación se incluyen los volúmenes tabulados en forma de gráfica por hora pico (AM/PM) y movimiento para los escenarios futuros:

Figura 11: Volúmenes para las horas pico AM y PM - 2014

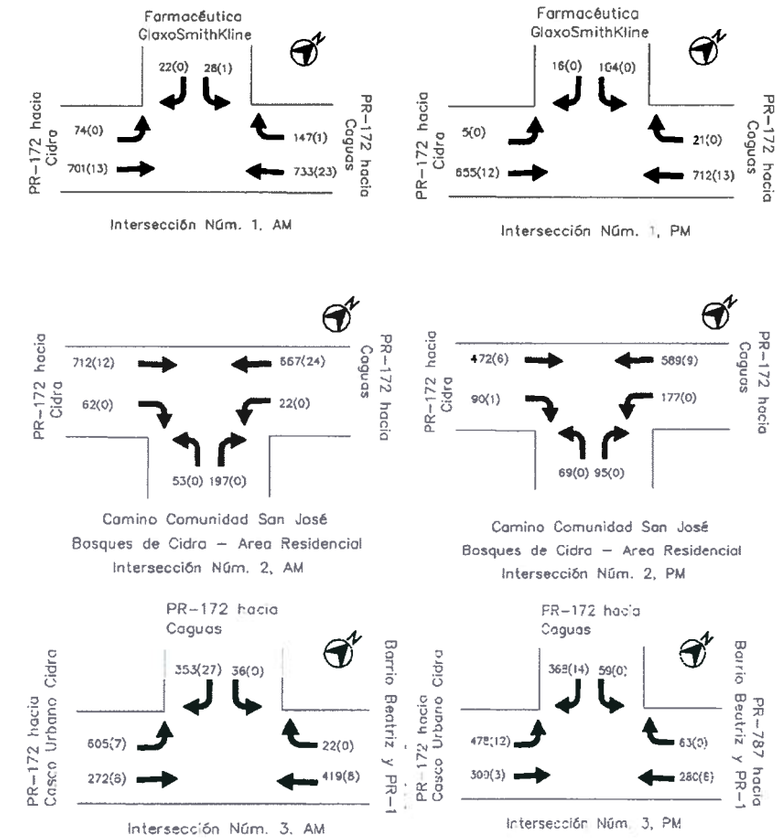
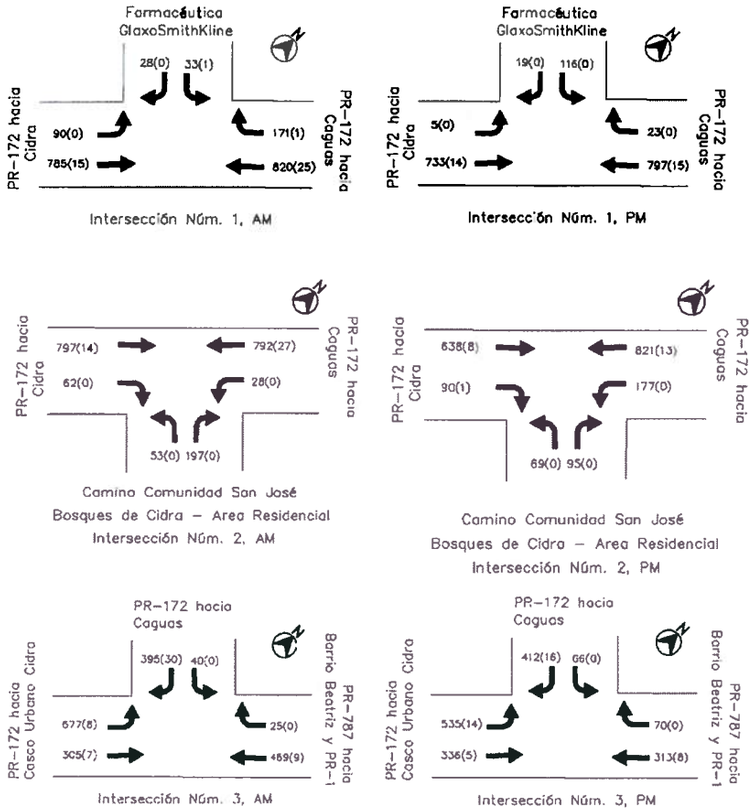


Figura 12: Volúmenes para las horas pico AM y PM - 2019



b. Geometría de las Intersecciones Analizadas – la geometría para la intersección Núm. 1 – PR-172 y Farmacéutica GSK se analizó según la Figura Núm. 5 para los escenarios futuros.

A continuación se presenta en forma gráfica la geometría propuesta, en las otras intersecciones evaluadas para los escenarios 2014 y 2019:

Figura 13: Geometría de la intersección propuesta en la PR-172 Camino San José y Bosques de Cidra (Intersección Núm. 2)

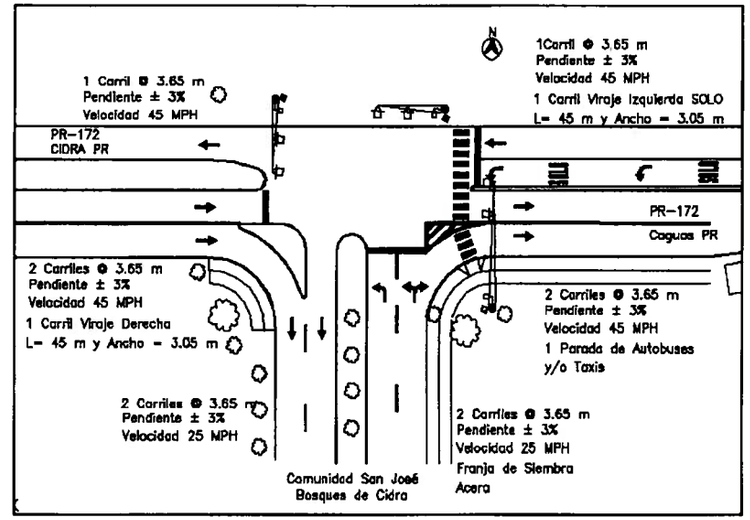
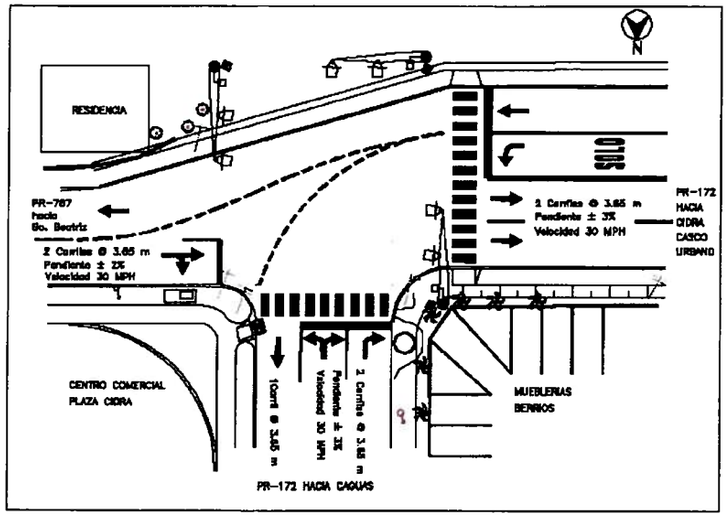


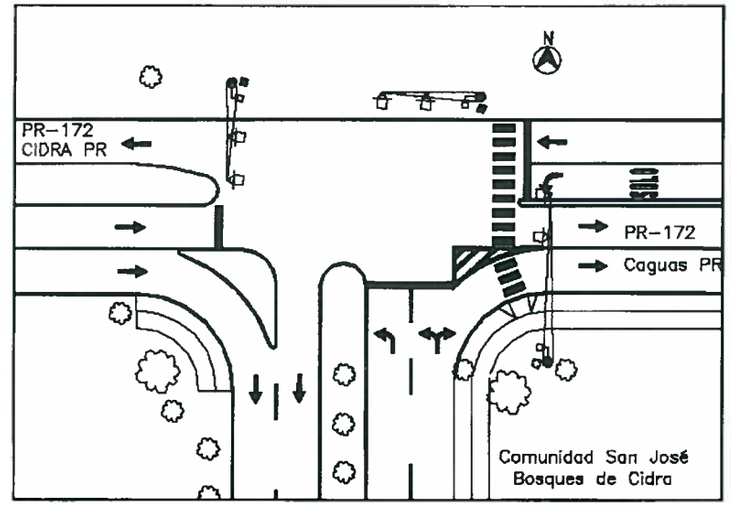
Figura 14: Geometría de la intersección propuesta en la PR-172 y PR-787 (Intersección Núm. 3)



c. Control de la Intersección – el control de la intersección Núm. 1 – PR-172 y Farmacéutica GSK se muestra en la Figura Núm. 5 para los escenarios futuros.

A continuación se presenta de forma gráfica el sistema de semáforos propuestos para los escenarios futuros 2014 y 2019:

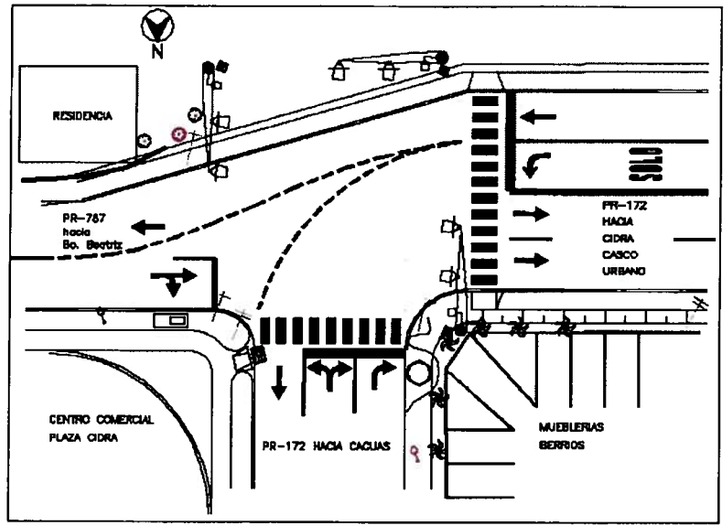
Figura 15: Intersección Semaforizada Núm. 2 – PR-172, Comunidad San José y Bosques de Cidra - Fases del Sistema de Semáforos, Condición Futura.



Tiempo de Verde 40 seg. AM 30 seg. PM	Tiempo de Verde 6 seg. AM 7 seg. PM	Tiempo de Verde 6 seg. AM 15 seg. PM

Tiempo de Amarillo = 3 seg., Todo Rojo = 2 seg. Ciclo=60 seg. AM, 60 seg. PM

Figura 16: Intersección Semaforizada Núm. 3 – PR-172 y PR-787 - Fases del Sistema de Semáforos, Condición Futura.



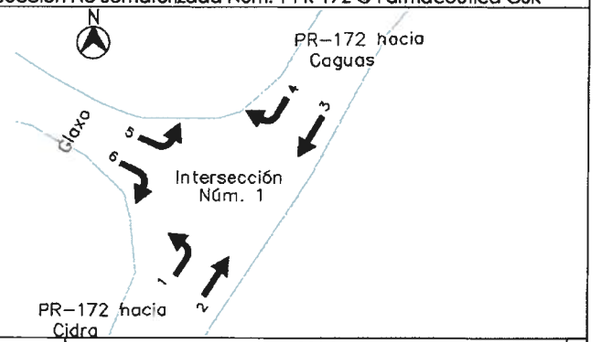
Tiempo de Verde 50 segundos	Tiempo de Verde 35 segundos	Tiempo de Verde 20 segundos

Tiempo de Amarillo = 3 segundos, Todo Rojo = 2 segundos Ciclo= 105 segundos

d. Análisis de Capacidad – a continuación se incluye el resumen de los resultados obtenidos del programa aaSIDRA para los escenarios futuros 2014 y 2019. Se presentan en forma tabulada por intersección y acceso los resultados de nivel de servicio LOS, demora promedio, largo de cola promedio y grado de saturación.

Escenario 2014

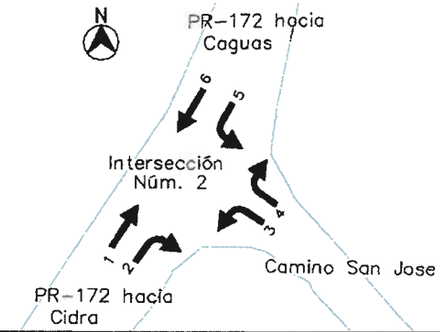
Tabla 10: Intersección No Semaforizada Núm. 1 PR-172 @ Farmacéutica GSK



Años		2014			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1	E	35.1	B	14.9
	2	A	0.7	A	0.7
PR-172 Caguas	3	A	0.7	A	0.7
	4	B	9.6	A	9.5
Farmacéutica GSK	5	F	189.5	F	373.0
	6	F	189.5	F	373.0
Nivel de Servicio de la Intersección		D		D	
Demora Promedio en Intersección, seg		13.0		40.8	
Largo de cola máximo 95% (metros)		6		18	
Grado de Saturación (v/c)		1.0 ≤ 1.0		1.64 ≥1.0	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

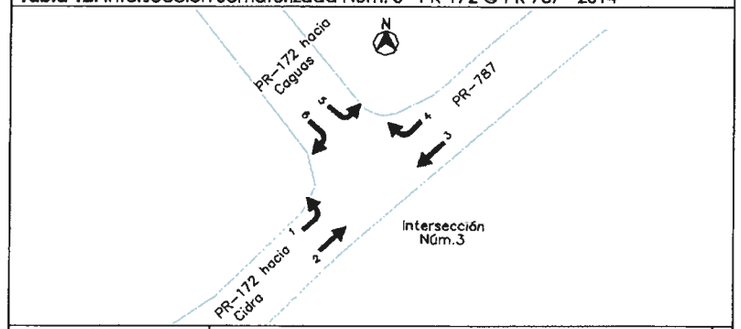
Tabla 11: Intersección semaforizada # 2 - PR-172, Comunidad San José y Bosques de Cidra – Año 2014



Años		2014			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
Bosques de Cidra San José	3	D	39.7	D	37.5
	4	A	9.7	A	9.7
PR-172 Caguas	1	A	3.9	B	13.4
	2	A	9.3	A	9.3
PR-172 Cidra	6	A	1.6	A	1.6
	5	D	3.8	C	29.9
Nivel de Servicio de la Intersección		A		B	
Demora Promedio en Intersección, seg		5.5		11.5	
Largo de cola máximo 95% (metros)		5		7.0	
Grado de Saturación (v/c)		0.603 ≤ 1.0		0.586 ≤ 1.0	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

Tabla 12: Intersección Semaforizada Núm. 3 - PR-172 @ PR-787 - 2014

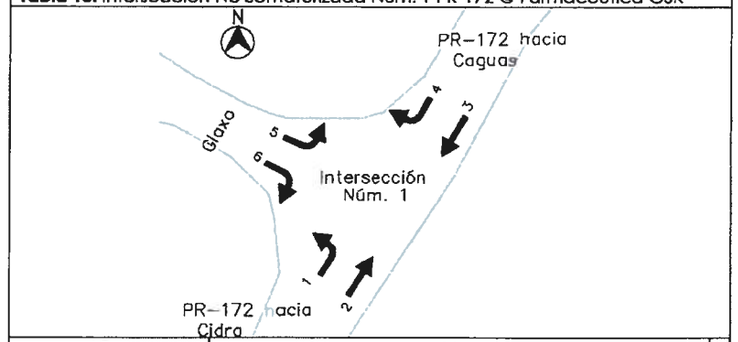


Años		2014			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1-13	C	31.9	C	29.1
	2-12	A	1.7	A	2.3
PR-787 Bo. Beatriz	3-22	C	29.3	B	17.5
	4-23	D	37.4	C	25.7
PR-172 Caguas	5-42	D	27.3	C	23.4
	6-43	B	15.6	B	11.9
Nivel de Servicio de la Intersección		C		B	
Demora Promedio en Intersección, seg		22.9		16.7	
Largo de cola máximo 95% (metros)		11.0		9.0	
Grado de Saturación (v/c)		0.811 ≤ 1.0, OK		0.751 ≤ 1.0, OK	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

Escenario 2019

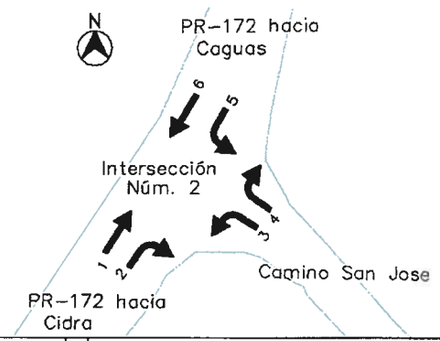
Tabla 13: Intersección No Semaforizada Núm. 1 PR-172 @ Farmacéutica GSK



Años		2019			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1-13	F	245.1	C	16.6
	2-12	A	0.7	A	0.7
PR-172 Caguas	3-22	A	0.7	A	0.7
	4-23	A	9.6	A	9.5
Farmacéutica GSK	5-42	F	166.3	F	456.6
	6-43	F	166.3	F	456.6
Nivel de Servicio de la Intersección		E		E	
Demora Promedio en Intersección, seg		42.8		49.9	
Largo de cola máximo 95% (metros)		22.0		24.0	
Grado de Saturación (v/c)		1.457 ≥1.0		1.833 ≥1.0	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

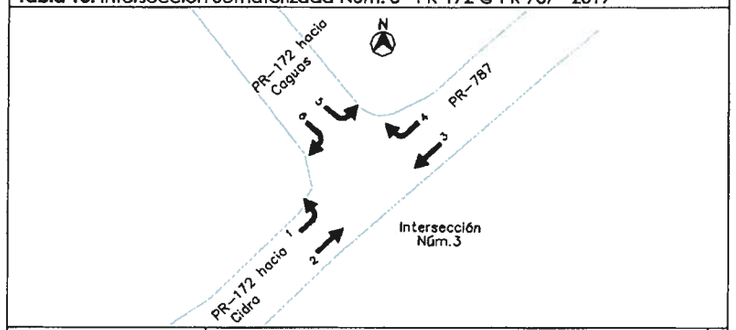
Tabla 14: Intersección semaforizada # 2 - PR-172, Comunidad San José y Bosques de Cidra – Año 2019



Años		2019			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
Bosques de Cidra San José	3	D	39.1	D	39.7
	4	A	9.7	A	9.7
PR-172 Caguas	1	B	13.4	A	4.8
	2	A	9.4	A	9.8
PR-172 Cidra	6	A	2.1	A	2.0
	5	C	31.6	D	38.8
Nivel de Servicio de la Intersección		B		A	
Demora Promedio en Intersección, seg		10.9		5.7	
Largo de cola máximo 95% (metros)		10.0		6.0	
Grado de Saturación (v/c)		0.713 ≤ 1.0		0.675 ≤ 1.0	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

Tabla 15: Intersección Semaforizada Núm. 3 - PR-172 @ PR-787 - 2019



Años		2018			
Periodos		AM		PM	
Niveles de Servicio y Demoras (segundos)		LOS	D	LOS	D
PR-172 Cidra	1-13	D	40.2	C	28.6
	2-12	A	1.8	A	1.8
PR-787 Bo. Beatriz Guayate	3-22	D	38.4	C	23.5
	4-23	D	46.6	C	31.7
PR-172 Caguas	5-42	C	29.9	C	34.9
	6-43	B	17.1	B	12.7
Nivel de Servicio de la Intersección		C		B	
Demora Promedio en Intersección, seg		28.2		19.0	
Largo de cola máximo 95% (metros)		15.0		11.0	
Grado de Saturación (v/c)		0.908 ≤ 1.0, OK		0.738 ≤ 1.0, OK	

Leyenda:
LOS = nivel de servicio del ingles "level of service"
D = demora del ingles "delay"
v/c = razón volumen versus capacidad menor a uno (1), intersección opera aceptablemente

SECCION 6.0 – DISCUSION DE RESULTADOS

Análisis de Capacidad ("Capacity Analysis")

Intersección Núm. 1 – *PR-172 y Farmacéutica GlaxoSmithKline* - esta intersección no semaforizada resultó con niveles de servicio promedio favorables (LOS B y C) en las horas de mayor flujo vehicular para el escenario actual. Al año 2006, el tiempo de demora promedio fluctuó entre 4.9 y 13.1 segundos por vehículo, el largo de cola promedio estuvo entre 2.0 y 5.0 metros; y el grado de saturación general resultó entre 0.536 y 0.923.

Al modelar la intersección para el año 2014, los resultados operacionales promedio se mantuvieron aceptables para las horas de mayor flujo vehicular. El tiempo de demora promedio varió entre 13.0 y 40.8 segundos por vehículo, el largo de cola promedio estuvo entre 6.0 y 18.0 metros; y el grado de saturación general resultó entre 1.0 y 1.64. Los niveles de servicio promedio obtenidos para las horas pico AM y PM fue LOS D.

Al año 2019, el modelaje de la intersección obtuvo resultados operacionales promedio para las horas de mayor flujo vehicular. El tiempo de demora promedio varió entre 42.8 y 49.9 segundos por vehículo, el largo de cola promedio estuvo entre 22.0 y 24.0 metros; y el grado de saturación general resultó entre 1.457 y 1.833. Los niveles de servicio promedio obtenidos para las horas pico fue LOS E.

El acceso a la farmacéutica es manejada por un control de acceso donde se registra a todo el personal. Esto ocasiona interrupción en el libre flujo vehicular, en especial en las horas de cambios de turnos de empleados. La operación del control de acceso ocasiona los niveles de servicio no favorables en la operación general de la intersección, pero el funcionamiento de la carretera estatal PR-172 continua su operación favorable.

Intersección Núm. 2 – *PR-172, Comunidad San José y proyecto propuesto Bosques de Cidra* - esta intersección no semaforizada en la actualidad resultó con niveles de servicio promedio favorables (C y C) en las horas de mayor flujo vehicular para el escenario actual. Al año 2006, el tiempo de demora promedio fluctuó entre 5.4 y 6.2 segundos por vehículo, el largo de cola promedio estuvo en 5.0 metros; y el grado de saturación general resultó entre 0.390 y 0.484.

El camino San José servirá como acceso principal a los desarrollos Bosques de Cidra. Al modelar la intersección al año 2014 se incluyó un semáforo como dispositivo de control y los resultados operacionales promedio se mantuvieron aceptables para las horas de mayor flujo vehicular. El tiempo de demora promedio varió entre 5.5 y 11.5 segundos por vehículo, el largo de cola promedio estuvo entre 5.0 y 7.0 metros; y el grado de saturación general resultó entre 0.586 y 0.603. Los niveles de servicio promedio obtenidos estuvieron en LOS A y B para las horas de mayor flujo vehicular AM y PM.

Al año 2019, el modelaje de la intersección obtuvo resultados operacionales promedio para las horas de mayor flujo vehicular. El tiempo de demora promedio varió entre 5.7 y 10.9 segundos por vehículo, el largo de cola promedio estuvo entre 6.0 y 10.0 metros; y el grado de saturación general resultó entre 0.675 y 0.713. Los niveles de servicio promedio obtenidos para las horas pico AM y PM fueron LOS A y B.

Intersección Núm. 3 – *PR-172 y PR-787* esta intersección semaforizada en la actualidad resultó con niveles de servicio promedio favorables (B y C) en las horas de mayor flujo vehicular para el escenario actual. Al año 2006, el tiempo de demora promedio fluctuó entre 18.4 y 24.3 segundos por vehículo, el largo de cola promedio estuvo entre 10.0 y 13.0 metros; y el grado de saturación general resultó entre 0.645 y 0.797. La Autoridad de Carreteras está realizando el proyecto AC-017233 donde se remplaza el Puente Núm. 386 sobre el Lago de Cidra en la PR-172. En las horas de mayor flujo vehicular esta intersección es controlada por los oficiales de tránsito de la Policía de Puerto Rico.

Al año 2014 se modeló la intersección completada según el proyecto de ACT. Los resultados operacionales promedio se mantuvieron aceptables para las horas de mayor flujo vehicular. El tiempo de demora promedio varió entre 16.7 y 22.9 segundos por vehículo, el largo de cola promedio estuvo entre 9.0 y 11.0 metros; y el grado de saturación general resultó entre 0.751 y 0.811. Los niveles de servicio promedio obtenidos estuvieron entre LOS B y C para las horas de mayor flujo vehicular AM y PM.

Al año 2019, el modelaje de la intersección obtuvo resultados operacionales promedio para las horas de mayor flujo vehicular. El tiempo de demora promedio varió entre 19.0 y 28.2 segundos por vehículo, el largo de cola promedio estuvo entre 11.0 y 15.0 metros; y el grado de saturación general resultó entre 0.738 y 0.908. Los niveles de servicio promedio obtenidos para las horas pico AM y PM fueron LOS B y C.

SECCION 8.0 – CONCLUSIONES Y RECOMENDACIONES

Escenario 2006

1. En las horas de mayor flujo vehicular (horas pico AM y PM), la intersección de la PR-172 y PR-787 está operando en niveles de servicio favorables, según la modelación realizada con los tiempos de ciclo del semáforo existente.

2. El funcionamiento de la intersección semaforizada de la PR-172 y PR-787 mejorará cuando la Autoridad de Carreteras complete el proyecto AC-017233 – Reemplazo Puente Núm. 386. Este proyecto aumentará la capacidad de la vía existente y disminuirá la congestión en el área en las horas de mayor flujo vehicular.

3. La intersección no semaforizada de la PR-172 y la Comunidad San José está operando en niveles de servicio aceptables según la modelación realizada para el escenario 2006 en las horas de mayor flujo vehicular (AM y PM).

4. La intersección no semaforizada de la PR-172 y la Farmacéutica Glaxo Smith Klyne está operando en niveles de servicio favorables según la modelación realizada para el escenario actual en las horas de mayor flujo vehicular (AM y PM).

Escenarios 2014 y 2019

5. Al año 2014 se espera que el proyecto Bosques de Cidra esté completado y en operación. La entrada principal al proyecto residencial Bosques de Cidra se propone en la intersección existente de la PR-172 km. 10. 3 y el camino a la Comunidad San José. La geometría propuesta proveerá nueve (9) movimientos y fue evaluada con un semáforo como dispositivo de control. Utilizando las proyecciones, generación de viajes y la distribución de viajes del proyecto propuesto los niveles de servicios obtenidos fueron favorables para los escenarios futuros, en especial para la PR-172.

6. La carretera estatal PR-172 entre su intersección con la PR-787 y la farmacéutica GSK, tiene capacidad para manejar el incremento de vehículos esperado por el desarrollo del proyecto propuesto Bosques de Cidra. Según se desarrolle el proyecto entre los años 2009 y 2014 se determinará el tipo de mejoras geométricas y dispositivos de control en la intersección del proyecto en la PR-172.

7. El desarrollo propuesto Bosques de Cidra no tendrá un impacto negativo en el comportamiento del tránsito en las vías adyacentes al área de influencia durante las horas de mayor flujo vehicular.

8. La Autoridad de Carreteras se encuentra en el proceso de estudio y diseño del proyecto Conector de Cidra. Este proyecto ofrecerá una conexión tipo expreso desde la PR-52 hasta el casco urbano de Cidra. Es de esperarse que las condiciones vehiculares en la PR-172 mejoren significativamente con la construcción del nuevo conector.

9. La Autoridad de Carreteras propone construir el proyecto de mejoras geométricas de la carretera PR-172 (AC-017234). El mismo consiste del ensanche a cuatro carriles de la PR-172 desde el Km. 22.00 hasta el Km. 27.40 aproximadamente. Estas mejoras servirán para aumentar la capacidad de la vía existente.

Recomendaciones - A continuación se presentan las recomendaciones en la infraestructura vial existente cercano al proyecto como consecuencia del desarrollo propuesto:

1. En la carretera PR-172 se proveerán los correspondientes carriles de aceleración y deceleración en la intersección con el acceso propuesto al desarrollo. Dichos carriles tendrán un ancho de 3.65 metros, largo aproximado de 60 metros y tendrán la transición correspondiente con la vía de rodaje existente.

2. Intersección PR-172 y Camino San José
   - Ensanche del Camino San José en la intersección con la PR-172 para acomodar cuatro carriles. Esta vía continuará brindando acceso continuo a los residentes de la Comunidad San José.
   - Proveer ensanche de la carretera PR-172 para acomodar carriles de viraje a la izquierda en ambas direcciones para acceder al desarrollo.
   - Proveer carriles de aceleración y deceleración en la PR-172.
   - Proveer dispositivos de control con semáforo para la totalidad de las unidades desarrolladas.
   - Proveer facilidades de aceras, franja de siembra e iluminación adecuada en el Camino San José.

SECCION 9.0 – CERTIFICACION DE LA VALIDEZ DE LOS DATOS

Certifico que la información presentada en este informe es cierta, correcta y completa, y que fue obtenida utilizando los criterios de la práctica usual y aceptada de la ingeniería de tránsito en la Autoridad de Carreteras y Transportación y el Departamento de Transportación y Obras Públicas en el Estado Libre Asociado de Puerto Rico.

Ing. José A. Carro Miranda

Lic. 12676, P.E.

SECCION 10.0 – APENDICES

Apéndice A	Material crudo de los conteos vehiculares realizados cada quince (15) minutos por un periodo de doce (12) horas
Apéndice B	Impresión y copia digital de las corridas de SIDRA 2.1.0.346
Apéndice C	Fotos de las intersecciones analizadas

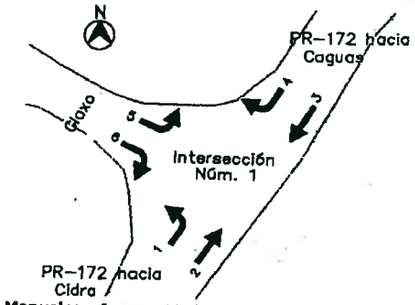
ANEJO A.

Material crudo de los conteos vehiculares realizados cada quince (15) minutos por en un periodo de 12 horas

ANEJOS

7	12:15 PM-12:30 PM	11	0	84	6	106	5	7	1	3	0	2	0
	12:30 PM-12:45 PM	10	0	90	7	122	6	15	0	6	0	0	0
	12:45 PM-1:00 PM	18	0	90	7	148	5	19	0	2	0	1	0
8	1:00 PM-1:15 PM	10	0	94	6	130	4	12	0	3	0	1	0
	1:15 PM-1:30 PM	2	0	105	4	139	5	11	3	8	0	2	0
	1:30 PM-1:45 PM	4	2	132	7	94	3	12	0	12	0	3	0
	1:45 PM-2:00PM	6	1	78	6	126	6	8	2	7	0	3	0
9	2:00 PM-2:15PM	6	0	116	7	119	10	7	1	23	2	8	0
	2:15 PM-2:30 PM	1	1	89	7	131	2	5	0	66	1	31	1
	2:30 PM-2:45 PM	0	1	41	3	87	3	6	0	18	0	7	1
	2:45 PM-3:00 PM	1	1	97	7	125	8	18	2	28	1	1	0
10	3:00 PM-3:15 PM	0	0	99	5	161	4	2	0	6	1	10	1
	3:15 PM-3:30 PM	1	0	41	3	96	0	4	0	20	1	3	0
	3:30 PM-3:45 PM	1	0	73	1	108	4	4	0	8	0	5	0
	3:45 PM-4:00 PM	0	0	111	2	92	3	2	0	6	1	4	0
11	4:00 Pm-4:15 PM	0	0	126	2	127	1	4	0	21	0	1	0
	4:15 PM-4:30 PM	0	0	101	3	111	2	6	0	16	0	2	0
	4:30 PM-4:45 PM	1	0	115	2	140	6	4		17	0	5	0
	4:45 PM-5:00 PM	0	0	120	3	114	2	4	0	35	0	6	0
12	5:00 PM-5:15 PM	0	0	83	1	105	1	7	0	42	0	3	0
	5:15 PM-5:30 PM	1	0	45	1	104	3	6	0	30	0	2	0
	5:30 PM-5:45 PM	3	0	73	3	91	0	7	0	31	0	2	0
	5:45 PM-6:00 PM	3	0	122	1	86	2	8	0	14	0	5	0

INTERSECCION NUM. 1 - CARRETERA ESTATAL PR-172 Y ENTRADA FARMACEUTICA GSK CIDRA



Conteos Manuales - Jueves 19 de octubre de 2006 - 6:00 a.m. - 6:00 p.m

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1	6:00 AM-6:15 AM	1	0	89	1	111	1	21	0	14	2	16	0
	6:15 AM-6:30 AM	2	0	106	4	134	4	21	0	9	2	16	0
	6:30 AM-6:45 AM	10	0	114	1	175	5	34	1	8	1	9	0
	6:45 AM-7:00 AM	19	0	120	4	148	5	42	0	2	0	4	0
2	7:00 AM-7:15 AM	20	0	133	2	142	4	33	0	7	0	4	0
	7:15 AM-7:30 AM	14	0	152	4	97	6	16	0	7	0	2	0
	7:30 AM-7:45 AM	6	0	95	4	119	7	20	0	8	1	2	1
	7:45 AM-8:00 AM	25	0	90	1	138	7	41	1	7	0	2	0
3	8:00 AM-8:15 AM	19	0	91	10	122	5	85	0	7	0	1	0
	8:15 AM-8:30 AM	14	0	142	8	152	13	78	0	11	1	1	0
	8:30 AM-8:45 AM	6	0	105	6	110	6	24	1	3	0	0	0
	8:45 AM-9:00 AM	9	0	112	7	106	3	23	0	5	1	1	0
4	9:00 AM-9:15 AM	8	1	79	5	108	8	21	0	4	0	1	0
	9:15 AM-9:30 AM	7	1	113	9	66	5	14	0	3	0	0	0
	9:30 AM-9:45 AM	3	0	94	12	92	6	8	3	5	0	1	0
	9:45 AM-10:00 AM	2	0	75	6	106	6	10	0	6	1	2	0
5	10:00 AM-10:15 AM	2	0	83	6	91	3	7	0	11	0	4	0
	10:15 AM-10:30 AM	3	1	91	1	94	6	12	1	15	1	5	0
	10:30 AM-10:45 AM	4	0	66	8	90	8	5	1	3	0	4	0
	10:45 AM-11:00 AM	8	0	109	2	72	6	10	0	2	2	2	0
6	11:00 AM-11:15 AM	4	0	97	17	110	6	9	0	8	0	2	0
	11:15 AM-11:30 AM	1	0	47	3	83	9	4	2	6	0	2	0
	11:30 AM-11:45 AM	9	0	100	9	87	11	9	0	10	0	1	0
	11:45 AM-12:00 PM	11	0	96	7	100	6	21	0	13	0	2	1
	12:00 PM-12:15 PM	6	0	103	3	141	3	18	0	18	0	5	0

8	1:00 PM-1:15 PM	79	8	3	0	5	0	1	0	2	0	119	11
	1:15 PM-1:30 PM	95	6	1	0	3	0	3	0	1	0	105	9
	1:30 PM-1:45 PM	106	5	2	0	4	0	3	0	1	0	127	7
	1:45 PM-2:00PM	102	5	7	0	3	0	2	0	0	0	97	6
9	2:00 PM-2:15PM	127	8	7	0	3	0	5	0	2	0	120	9
	2:15 PM-2:30 PM	121	6	6	0	4	0	5	0	4	0	161	6
	2:30 PM-2:45 PM	85	5	3	0	4	0	4	0	4	0	133	5
	2:45 PM-3:00 PM	89	7	6	0	5	0	1	0	4	0	117	9
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	3:15 PM-3:30 PM	84	13	13	0	1	0	2	0	2	0	149	0
	3:30 PM-3:45 PM	108	1	7	0	2	0	1	0	1	0	118	2
	3:45 PM-4:00 PM	150	1	5	0	4	0	0	0	2	0	139	5
11	4:00 Pm-4:15 PM	103	4	6	0	2	0	0	0	1	0	119	1
	4:15 PM-4:30 PM	92	2	5	0	2	0	2	0	0	0	100	5
	4:30 PM-4:45 PM	117	1	4	0	2	0	1	0	4	0	148	5
	4:45 PM-5:00 PM	112	1	3	0	5	0	1	0	1	0	151	4
12	5:00 PM-5:15 PM	95	1	4	0	2	0	1	0	1	0	129	2
	5:15 PM-5:30 PM	107	1	6	0	3	0	1	0	1	0	136	1
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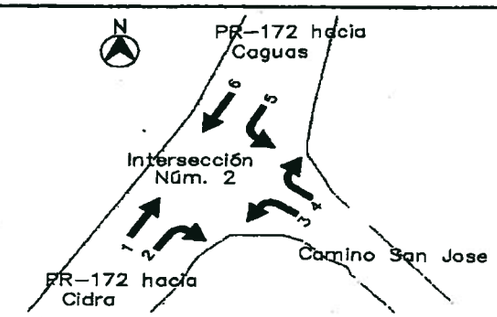
	5:45 PM-6:00 PM	161	1	8	1	5	1	4	1	2	1	172	3

INTERSECCION NUM. 2- CARRETERA ESTATAL PR-172 Y CAMINO COMUNIDAD SAN JOSE CIDRA



Conteos Manuales - Jueves 19 de octubre de 2006 - 6:00 a.m. - 6:00 p.m

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Hora	Horario	A	C	A	C	A	C	A	C	A	C	A	C
1	6:00 AM-6:15 AM	87	1	0	0	6	0	2	0	3	0	82	3
	6:15 AM-6:30 AM	126	3	1	0	2	0	4	0	2	0	141	6
	6:30 AM-6:45 AM	143	1	5	0	11	0	5	0	1	0	155	7
	6:45 AM-7:00 AM	119	2	2	0	1	0	3	0	0	0	142	3
2	7:00 AM-7:15 AM	133	3	2	0	6	0	7	0	2	0	158	5
	7:15 AM-7:30 AM	172	4	0	0	1	0	3	0	1	0	112	6
	7:30 AM-7:45 AM	94	4	1	0	4	0	2	0	2	0	108	6
	7:45 AM-8:00 AM	128	1	2	0	3	1	4	0	2	0	156	7
3	8:00 AM-8:15 AM	92	8	2	0	0	0	1	1	5	1	112	9
	8:15 AM-8:30 AM	80	6	2	0	3	0	1	0	1	0	154	9
	8:30 AM-8:45 AM	154	10	2	0	2	0	4	0	1	0	129	8
	8:45 AM-9:00 AM	91	10	1	0	1	0	1	0	0	0	116	6
4	9:00 AM-9:15 AM	81	7	0	0	7	0	1	0	0	0	82	15
	9:15 AM-9:30 AM	107	10	0	0	2	0	0	0	2	0	94	15
	9:30 AM-9:45 AM	109	13	2	1	4	1	4	1	1	1	92	5
	9:45 AM-10:00 AM	58	7	0	0	5	0	0	0	2	0	125	11
5	10:00 AM-10:15 AM	114	9	2	0	4	0	1	0	2	0	95	6
	10:15 AM-10:30 AM	110	3	5	0	5	0	2	0	1	0	101	7
	10:30 AM-10:45 AM	91	7	0	0	7	0	3	0	2	1	121	14
	10:45 AM-11:00 AM	94	4	2	0	3	0	0	0	1	0	93	6
6	11:00 AM-11:15 AM	83	13	1	0	3	0	3	0	3	0	119	6
	11:15 AM-11:30 AM	87	6	1	0	3	0	2	0	4	0	108	11
	11:30 AM-11:45 AM	99	12	4	0	6	0	1	0	3	0	112	13
	11:45 AM-12:00 PM	116	10	2	0	4	0	2	0	3	0	208	6
7	12:00 PM-12:15 PM	112	6	6	0	3	0	1	0	3	0	108	5
	12:15 PM-12:30 PM	118	10	2	0	3	0	5	0	2	0	115	10
	12:30 PM-12:45 PM	105	6	2	0	6	0	2	0	4	0	119	3
	12:45 PM-1:00 PM	124	7	0	0	4	0	1	1	1	1	128	12

7	12:15 PM-12:30 PM	69	7	40	1	50	0	4	1	8	0	40	4
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	4:15 PM-4:30 PM	66	2	47	1	71	1	1	0	4	0	47	4
	4:30 PM-4:45 PM	82	3	76	1	56	0	2	1	4	0	76	4
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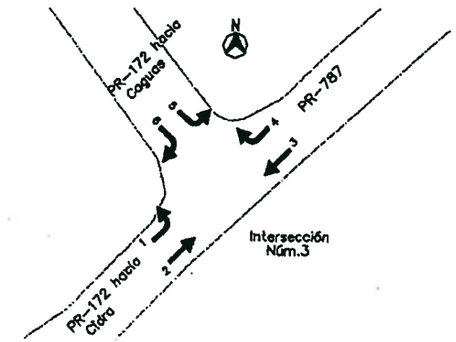
12	5:00 PM-5:15 PM	94	5	54	0	70	1	2	0	2	0	54	2
	5:15 PM-5:30 PM	56	2	40	0	35	0	1	0	6	1	40	0
	5:30 PM-5:45 PM	87	1	58	0	72	0	4	0	4	0	58	4
	5:45 PM-6:00 PM	56	2	42	0	62	0	3	0	1	1	42	0

INTERSECCION NUM.3 - CARRETERA ESTATAL PR-172 Y PR-787 CIDRA



Conteos Manuales - Jueves 19 de octubre de 2006 - 6:00 a.m. - 6:00 p.m.

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Hora	Horario	A	C	A	C	A	C	A	C	A	C	A	C
1	6:00 AM-6:15 AM	96	1	21	2	53	0	3	0	1	2	21	4
	6:15 AM-6:30 AM	121	4	22	1	64	1	4	0	2	2	22	6
	6:30 AM-6:45 AM	125	3	27	2	90	2	1	1	1	1	27	5
	6:45 AM-7:00 AM	131	1	69	0	110	0	0	0	4	0	69	6
2	7:00 AM-7:15 AM	90	1	44	1	71	2	0	0	1	0	44	4
	7:15 AM-7:30 AM	113	2	48	3	79	1	0	0	2	0	48	5
	7:30 AM-7:45 AM	104	2	70	1	96	3	0	0	2	0	70	8
	7:45 AM-8:00 AM	103	2	77	1	74	1	1	0	4	0	77	7
3	8:00 AM-8:15 AM	95	9	51	0	69	0	0	0	5	1	51	4
	8:15 AM-8:30 AM	94	5	52	2	62	0	0	0	1	0	52	6
	8:30 AM-8:45 AM	90	8	46	2	67	4	4	0	1	0	46	9
	8:45 AM-9:00 AM	60	4	54	3	71	2	2	0	2	0	54	7
4	9:00 AM-9:15 AM	45	5	28	0	60	3	1	0	6	3	28	6
	9:15 AM-9:30 AM	75	7	47	2	50	2	2	1	1	0	47	12
	9:30 AM-9:45 AM	83	9	43	0	68	2	2	0	7	1	43	9
	9:45 AM-10:00 AM	64	3	51	1	53	2	0	0	8	0	51	5
5	10:00 AM-10:15 AM	95	4	46	1	68	1	4	0	6	1	46	6
	10:15 AM-10:30 AM	75	3	43	0	52	2	2	0	4	0	43	5
	10:30 AM-10:45 AM	85	11	36	1	51	2	2	1	5	0	36	11
	10:45 AM-11:00 AM	57	4	48	0	62	2	4	2	6	1	48	6
6	11:00 AM-11:15 AM	83	12	61	2	60	2	0	0	4	0	61	5
	11:15 AM-11:30 AM	76	3	51	2	64	3	2	2	6	0	51	9
	11:30 AM-11:45 AM	86	8	47	2	57	3	1	0	7	0	47	10
	11:45 AM-12:00 PM	79	4	40	1	47	2	3	0	3	1	40	10
	12:00 PM-12:15 PM	72	5	46	0	58	3	2	0	5	0	46	8

SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2006 AM * 2006IN~3

INterseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	728	3.4	0.501	0.7	LOS A	0	0.00	0.08	69.1
6R	R	168	0.6	0.501	9.6	LOS A	0	0.00	0.70	54.3
Approach		**896**	**2.9**	**0.501**	**2.4**	**LOS A**		**0.00**	**0.19**	**65.8**
Farmaceutica GSK										
7L	L	36	2.9	0.530	58.8	LOS F	2	0.92	1.05	23.5
4R	R	37	0.0	0.536	58.8	LOS F	2	0.92	1.06	23.5
Approach		**72**	**1.4**	**0.534**	**58.8**	**LOS F**	**2**	**0.92**	**1.06**	**23.5**
PR-172 Desde Cidra										
5L	L	81	0.0	0.153	15.7	LOS C	0	0.71	0.92	47.2
2T	T	624	2.1	0.328	0.7	LOS A	0	0.00	0.08	69.1
Approach		**705**	**1.8**	**0.328**	**2.5**	**LOS A**	**0**	**0.08**	**0.17**	**65.6**
All Vehicles		**1673**	**2.4**	**0.536**	**4.9**	**Not Applicable**	**2**	**0.07**	**0.22**	**61.0**

SIDRA SOLUTIONS

A1687, CMA Architects & Engineers LLP, Small Office
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SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2006 AM * 2006IN~3

INterseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	1673 veh/h	2008 pers/h
Percent Heavy Vehicles	2.4 %	
Degree of Saturation	0.536	
Effective Intersection Capacity	3120 veh/h	
95% Back of Queue (m)	2 m	
95% Back of Queue (veh)	3.0 veh	
Control Delay (Total)	2.26 veh-h/h	2.71 pers-h/h
Control Delay (Average)	4.9 s/veh	4.9 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	370 veh/h	444 pers/h
Effective Stop Rate	0.22 per veh	0.22 per pers
Proportion Queued	0.07	0.07
Travel Distance (Total)	1044.2 veh-km/h	1253.1 pers-km/h
Travel Distance (Average)	624 m	624 m
Travel Time (Total)	17.1 veh-h/h	20.5 pers-h/h
Travel Time (Average)	36.8 secs	36.8 secs
Travel Speed	61.0 km/h	61.0 km/h
Operating Cost (Total)	279 $/h	279 $/h
Fuel Consumption (Total)	89.6 L/h	
Carbon Dioxide (Total)	224.1 kg/h	
Hydrocarbons (Total)	0.320 kg/h	
Carbon Monoxide (Total)	8.93 kg/h	
NOX (Total)	0.467 kg/h	

SIDRA SOLUTIONS

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ANEJO B.

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Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

```
 Bosques de Cidra Escenario 2006 AM                                  * 2006IN~3
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-------------------------------------------------
  Mov          Left        Through       Right
  ID        ---------    ---------    ---------
             LV    HV     LV    HV     LV    HV
-------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Cidra
   5L L      81     0      0     0      0     0
   2T T       0     0    611    13      0     0
-------------------------------------------------
East: PR-172 Desde Caguas
   6T T       0     0    703    25      0     0
   6R R       0     0      0     0    167     1
-------------------------------------------------
North: Farmaceutica GSK
   7L L      34     1      0     0      0     0
   4R R       0     0      0     0     37     0
-------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

```
 Bosques de Cidra Escenario 2006 AM                                  * 2006IN~3
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-------------------------------------------------
  Mov          Left        Through       Right
  ID        ----------   ----------   ----------
            Total  %HV   Total  %HV   Total  %HV
-------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Cidra
   5L L      81   0.0      0   0.0      0   0.0
   2T T       0   0.0    624   2.1      0   0.0
-------------------------------------------------
East: PR-172 Desde Caguas
   6T T       0   0.0    728   3.4      0   0.0
   6R R       0   0.0      0   0.0    168   0.6
-------------------------------------------------
North: Farmaceutica GSK
   7L L      35   2.9      0   0.0      0   0.0
   4R R       0   0.0      0   0.0     37   0.0
-------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```


SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2006 AM * 2006IN~3

INterseccion PR-172 @ Farmeceutica GSK

Run Information

```
* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile
```

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

```
 Bosques de Cidra Escenario 2006 AM                                  * 2006IN~3
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-----------------------------------------------------------------------
 From      To          Mov          Flow Rate   Flow   Peak Flow
 Approach  Approach    ID    Turn    LV    HV   Scale    Factor
-----------------------------------------------------------------------
 West: PR-172 Desde Cidra
           East        2T    Thru   611    13   1.00     0.85
           North       5L    Left    81     0   1.00     0.78
-----------------------------------------------------------------------
 East: PR-172 Desde Caguas
           West        6T    Thru   703    25   1.00     0.80
           North       6R    Right  167     1   1.00     0.75
-----------------------------------------------------------------------
 North: Farmaceutica GSK
           West        4R    Right   37     0   1.00     0.52
           East        7L    Left    34     1   1.00     0.70
-----------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% (vehs)	Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	0.35	0.42	15.7	0.71	0.92	0.7	0	1.68	47.2
2T T	0.13	0.15	0.7	0.00	0.08	0.0	0	5.81	69.1
East: PR-172 Desde Caguas									
6T T	0.15	0.18	0.7	0.00	0.08	0.0	0	6.78	69.1
6R R	0.45	0.54	9.6	0.00	0.70	0.0	0	2.55	54.3
North: Farmaceutica GSK									
7L L	0.57	0.69	58.8	0.92	1.05	3.0	2	1.55	23.5
4R R	0.60	0.72	58.8	0.92	1.06	3.0	2	1.64	23.5

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
705	0.328	0.48	0.58	2.5	0.08	0.17	0	7.49	65.6
East: PR-172 Desde Caguas									
896	0.501	0.60	0.72	2.4	0.00	0.19	0	9.32	65.8
North: Farmaceutica GSK									
72	0.536	1.18	1.41	58.8	0.92	1.06	2	3.18	23.5
ALL VEHICLES:									
1673	0.536	2.26	2.71	4.9	0.07	0.22	2	20.00	61.0
INTERSECTION (persons):									
2008	0.536		2.71	4.9	0.07	0.22		20.00	61.0

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	81	0.0	896	2.9	896	528	0.80	421	100	0.153
2T T	624	2.1	0			1900	0.80	144	100	0.328
East: PR-172 Desde Caguas										
6T T	728	3.4	0			1454	0.80	60	100	0.501
6R R	168	0.6	0			335	0.80	60	100	0.501
North: Farmaceutica GSK										
7L L	35	2.9	1517+	2.5	1517	66	0.80	51	100	0.530
4R R	37	0.0	812+	3.1	812	69	0.80	49	100	0.536*

+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	4.9
Largest average movement delay (s)	=	58.8
Largest back of queue, 95% (m)	=	2
Performance Index	=	20.00
Degree of saturation (highest)	=	0.536
Practical Spare Capacity (lowest)	=	49 %
Effective intersection capacity, (veh/h)	=	3120
Total vehicle flow (veh/h)	=	1673
Total person flow (pers/h)	=	2008
Total vehicle delay (veh-h/h)	=	2.26
Total person delay (pers-h/h)	=	2.71
Total effective vehicle stops (veh/h)	=	370
Total effective person stops (pers/h)	=	444
Total vehicle travel (veh-km/h)	=	1044.2
Total cost ($/h)	=	278.94
Total fuel (L/h)	=	89.6
Total CO2 (kg/h)	=	224.09

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	81	528	100	0.153	15.7	0.92	0.7	1.68
2T	T	624	1900	100	0.328	0.7	0.08	0.0	5.81
East: PR-172 Desde Caguas									
6T	T	728	1454	100	0.501	0.7	0.08	0.0	6.78
6R	R	168	335	100	0.501	9.6	0.70	0.0	2.55
North: Farmaceutica GSK									
7L	L	35	66	100	0.530	58.8	1.05	3.0	1.55
4R	R	37	69	100	0.536*	58.8	1.06	3.0	1.64

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
5L L	6.2	18.11	0.028	1.35	0.040	15.5
2T T	28.9	91.17	0.094	1.64	0.140	72.4
	35.1	109.29	0.122	2.99	0.181	87.8
East: PR-172 Desde Caguas						
6T T	34.8	107.98	0.110	1.92	0.164	87.2
6R R	12.4	34.48	0.054	2.68	0.082	31.1
	47.2	142.46	0.164	4.60	0.246	118.2
North: Farmaceutica GSK						
7L L	3.7	13.48	0.017	0.69	0.021	9.2
4R R	3.5	13.71	0.017	0.65	0.020	8.8
	7.2	27.20	0.033	1.34	0.041	18.0
INTERSECTION:	89.6	278.94	0.320	8.93	0.467	224.1

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	81	528	0.153	15.7	0.92	0.7	0.3	45.0T
2 T	624	1900	0.328	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	896	1789	0.501	2.4	0.19	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	72	135	0.534	58.8	1.06	3.0	1.7	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	81	0	0	81	81	528	0.153	100
2 T	0	624	0	624	624	1900	0.328	100
East: PR-172 Desde Caguas								
1 TR	0	728	168	896	896	1789	0.501	100
North: Farmaceutica GSK								
1 LR	35	0	37	72	72	135	0.534	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

35	0	37	72	1	0.534	58.8	2	
ALL VEHICLES			Total Flow 1673	% HV 2	Max X 0.536	Aver. Delay 4.9	Max Queue 2	

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	81	528	0.153	15.7	C	0.7	0
2T	T	624	1900	0.328	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	728	1454	0.501	0.7	A	0.0	0
6R	R	168	335	0.501	9.6	A	0.0	0
North: Farmaceutica GSK								
7L	L	35	66	0.530	58.8	F	3.0	2
4R	R	37	69	0.536*	58.8	F	3.0	2
ALL VEHICLES:		1673		0.536	4.9	NA	3.0	2

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods

" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	12.4	0.36	0.559	27.10	0.806	309.9
2T T	7.4	0.23	0.241	4.20	0.360	185.4
	8.0	0.25	0.277	6.80	0.411	199.5
East: PR-172 Desde Caguas						
6T T	7.6	0.24	0.242	4.21	0.360	191.4
6R R	11.9	0.33	0.519	25.76	0.786	298.4
	8.4	0.25	0.294	8.22	0.439	211.3
North: Farmaceutica GSK						
7L L	17.0	0.62	0.768	32.05	0.971	425.3
4R R	15.4	0.60	0.728	28.16	0.851	384.0
	16.2	0.61	0.748	30.05	0.909	404.1
INTERSECTION:	8.6	0.27	0.306	8.55	0.447	214.6

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 AM * 2006IN-3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 L	81			81	0				0.153	15.7	0	45
2 T		624		624	2				0.328	0.7	0	500
	81	624	0	705	2				0.328	2,5	0	
East: PR-172 Desde Caguas												
1 TR		728	168	896	3				0.501	2.4	0	500
	0	728	168	896	3				0.501	2.4		
North: Farmaceutica GSK												
1 LR	35		37	72	1				0.534	58.8	2	500

Lane No.	Satn x	he1	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.153	0.71	0.00	0.21	0.92	0.713	0.00
2 T	0.328	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.501	0.00	0.00	0.19	0.19	0.000	0.00
North: Farmaceutica GSK							
1 LR	0.534	0.92	0.06	0.08	1.06	0.924	0.80

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 AM * 2006IN~3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.153	0.0	0.2	0.0	0.2	0.4	0.5	0.6	0.7	0.8	0.01
2 T	0.328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	0.534	0.5	0.7	0.3	1.0	1.8	2.1	2.4	3.0	3.5	0.00

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2006 AM * 2006IN~3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.153	0.0	0.1	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.01
2 T	0.328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	129	No
	North	Right	10.0	20.2	15.7	500	121	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	123	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 AM * 2006IN~3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 L	0.153	6.1	0.0	6.1	2.7	3.4	0.0	3.4	9.6	15.7
2 T	0.328	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4
North: Farmaceutica GSK										
1 LR	0.534	26.7	27.1	53.8	1.9	51.9	1.3	50.6	5.0	58.8

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 AM * 2006IN~3
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Deg.	-- Effective Stop Rate --	Prop.	Queue Move-up

1 TR	0.501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	0.534	0.3	0.4	0.2	0.6	1.0	1.2	1.4	1.7	2.0	0.00

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

* 2006IN-3

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0			50.9	47.2	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.6
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	3.0		50.4	23.5	5.0
4R R	72.0	0.0	20.2	65.0	3.5		50.1	23.5	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 AM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

* 2006IN-3

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	896	4.10	2.28	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	1517+	7.50	3.50	2.0
4R R	Normal	812+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

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SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2006 PM * 2006IN~4

INterseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	1291 veh/h	1549 pers/h
Percent Heavy Vehicles	1.9 %	
Degree of Saturation	0.923	
Effective Intersection Capacity	1399 veh/h	
95% Back of Queue (m)	5 m	
95% Back of Queue (veh)	10.0 veh	
Control Delay (Total)	4.70 veh-h/h	5.64 pers-h/h
Control Delay (Average)	13.1 s/veh	13.1 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	294 veh/h	353 pers/h
Effective Stop Rate	0.23 per veh	0.23 per pers
Proportion Queued	0.13	0.13
Travel Distance (Total)	806.2 veh-km/h	967.4 pers-km/h
Travel Distance (Average)	624 m	624 m
Travel Time (Total)	16.3 veh-h/h	19.6 pers-h/h
Travel Time (Average)	45.5 secs	45.5 secs
Travel Speed	49.4 km/h	49.4 km/h
Operating Cost (Total)	246 $/h	246 $/h
Fuel Consumption (Total)	71.0 L/h	
Carbon Dioxide (Total)	177.7 kg/h	
Hydrocarbons (Total)	0.263 kg/h	
Carbon Monoxide (Total)	6.30 kg/h	
NOX (Total)	0.351 kg/h	

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SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2006 PM * 2006IN~4

INterseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	585	2.2	0.330	0.7	LOS A	0	0.00	0.08	69.1
6R	R	24	0.0	0.329	9.5	LOS A	0	0.00	0.70	54.3
Approach		**609**	**2.1**	**0.330**	**1.1**	**LOS A**		**0.00**	**0.10**	**68.4**
Farmaceutica GSK										
7L	L	141	0.0	0.904	95.9	LOS F	5	0.97	1.16	16.9
4R	R	24	0.0	0.923	95.9	LOS F	5	0.97	1.18	16.9
Approach		**165**	**0.0**	**0.906**	**95.9**	**LOS F**	**5**	**0.97**	**1.16**	**16.9**
PR-172 Desde Cidra										
5L	L	4	0.0	0.005	12.2	LOS B	0	0.53	0.69	51.0
2T	T	513	2.1	0.270	0.7	LOS A	0	0.00	0.08	69.1
Approach		**517**	**2.1**	**0.270**	**0.8**	**LOS A**	**0**	**0.00**	**0.08**	**68.9**
All Vehicles		**1291**	**1.9**	**0.923**	**13.1**	**Not Applicable**	**5**	**0.13**	**0.23**	**49.4**

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Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

```
 Bosques de Cidra Escenario 2006 PM                                  * 2006IN~4
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-----------------------------------------------
  Mov          Left        Through       Right
  ID        ---------    ---------    ---------
             LV    HV     LV    HV     LV    HV
-----------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Cidra
   5L L       4     0      0     0      0     0
   2T T       0     0    502    11      0     0
-----------------------------------------------
East: PR-172 Desde Caguas
   6T T       0     0    572    13      0     0
   6R R       0     0      0     0     24     0
-----------------------------------------------
North: Farmaceutica GSK
   7L L     141     0      0     0      0     0
   4R R       0     0      0     0     24     0
-----------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

```
 Bosques de Cidra Escenario 2006 PM                                  * 2006IN~4
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-------------------------------------------------
  Mov          Left         Through       Right
  ID        ----------    ----------    ----------
            Total  %HV    Total  %HV    Total  %HV
-------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Cidra
   5L L       4   0.0       0   0.0       0   0.0
   2T T       0   0.0     513   2.1       0   0.0
-------------------------------------------------
East: PR-172 Desde Caguas
   6T T       0   0.0     585   2.2       0   0.0
   6R R       0   0.0       0   0.0      24   0.0
-------------------------------------------------
North: Farmaceutica GSK
   7L L     141   0.0       0   0.0       0   0.0
   4R R       0   0.0       0   0.0      24   0.0
-------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```


SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2006 PM * 2006IN~4

INterseccion PR-172 @ Farmeceutica GSK

Run Information

```
* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile
```

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

```
 Bosques de Cidra Escenario 2006 PM                                  * 2006IN~4
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-------------------------------------------------------------------------------
From      To          Mov          Flow Rate   Flow   Peak Flow
Approach  Approach    ID    Turn    LV    HV   Scale    Factor
-------------------------------------------------------------------------------
West: PR-172 Desde Cidra
          East        2T    Thru   502    11   1.00     0.92
          North       5L    Left     4     0   1.00     0.25
-------------------------------------------------------------------------------
East: PR-172 Desde Caguas
          West        6T    Thru   572    13   1.00     0.86
          North       6R    Right   24     0   1.00     0.75
-------------------------------------------------------------------------------
North: Farmaceutica GSK
          West        4R    Right   24     0   1.00     0.58
          East        7L    Left   141     0   1.00     0.63
-------------------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% (vehs)	Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	0.01	0.02	12.2	0.53	0.69	0.0	0	0.07	51.0
2T T	0.11	0.13	0.7	0.00	0.08	0.0	0	4.78	69.1
East: PR-172 Desde Caguas									
6T T	0.12	0.15	0.7	0.00	0.08	0.0	0	5.45	69.1
6R R	0.06	0.08	9.5	0.00	0.70	0.0	0	0.36	54.3
North: Farmaceutica GSK									
7L L	3.76	4.51	95.9	0.97	1.16	10.0	5	8.76	16.9
4R R	0.64	0.77	95.9	0.97	1.18	10.0	5	1.50	16.9

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
517	0.270	0.12	0.14	0.8	0.00	0.08	0	4.85	68.9
East: PR-172 Desde Caguas									
609	0.330	0.18	0.22	1.1	0.00	0.10	0	5.81	68.4
North: Farmaceutica GSK									
165	0.923	4.39	5.27	95.9	0.97	1.16	5	10.26	16.9
ALL VEHICLES:									
1291	0.923	4.70	5.64	13.1	0.13	0.23	5	20.92	49.4
INTERSECTION (persons):									
1549	0.923		5.64	13.1	0.13	0.23		20.92	49.4

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	4	0.0	609	2.1	609	848	0.80	****	100	0.005
2T T	513	2.1	0			1900	0.80	196	100	0.270
East: PR-172 Desde Caguas										
6T T	585	2.2	0			1775	0.80	143	100	0.330
6R R	24	0.0	0			73	0.80	143	100	0.329
North: Farmaceutica GSK										
7L L	141	0.0	1114+	2.2	1114	156	0.80	-11	100	0.904
4R R	24	0.0	597+	2.2	597	26	0.80	-13	100	0.923*

+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	13.1
Largest average movement delay (s)	=	95.9
Largest back of queue, 95% (m)	=	5
Performance Index	=	20.92
Degree of saturation (highest)	=	0.923
Practical Spare Capacity (lowest)	=	-13 %
Effective intersection capacity, (veh/h)	=	1399
Total vehicle flow (veh/h)	=	1291
Total person flow (pers/h)	=	1549
Total vehicle delay (veh-h/h)	=	4.70
Total person delay (pers-h/h)	=	5.64
Total effective vehicle stops (veh/h)	=	294
Total effective person stops (pers/h)	=	353
Total vehicle travel (veh-km/h)	=	806.2
Total cost ($/h)	=	246.03
Total fuel (L/h)	=	71.0
Total CO2 (kg/h)	=	177.68

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	4	848	100	0.005	12.2	0.69	0.0	0.07
2T	T	513	1900	100	0.270	0.7	0.08	0.0	4.78
East: PR-172 Desde Caguas									
6T	T	585	1775	100	0.330	0.7	0.08	0.0	5.45
6R	R	24	73	100	0.329	9.5	0.70	0.0	0.36
North: Farmaceutica GSK									
7L	L	141	156	100	0.904	95.9	1.16	10.0	8.76
4R	R	24	26	100	0.923*	95.9	1.18	10.0	1.50

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
5L L	0.3	0.85	0.001	0.07	0.002	0.7
2T T	23.8	74.99	0.077	1.35	0.115	59.5
	24.1	75.84	0.079	1.41	0.117	60.3
East: PR-172 Desde Caguas						
6T T	27.2	85.58	0.088	1.54	0.132	68.0
6R R	1.7	4.86	0.008	0.37	0.011	4.3
	28.9	90.44	0.096	1.91	0.143	72.3
North: Farmaceutica GSK						
7L L	15.4	68.14	0.075	2.55	0.077	38.5
4R R	2.6	11.60	0.013	0.43	0.013	6.6
	18.0	79.75	0.088	2.98	0.091	45.0
INTERSECTION:	71.0	246.03	0.263	6.30	0.351	177.7

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	4	848	0.005	12.2	0.69	0.0	0.0	45.0T
2 T	513	1900	0.270	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	609	1848	0.330	1.1	0.10	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	165	182	0.906	95.9	1.16	10.0	5.0	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	4	0	0	4	4	848	0.005	100
2 T	0	513	0	513	513	1900	0.270	100
East: PR-172 Desde Caguas								
1 TR	0	585	24	609	609	1848	0.330	100
North: Farmaceutica GSK								
1 LR	141	0	24	165	120	182	0.906	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

141	0	24	165	0	0.906	95.9	5	

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	1291	2	0.923	13.1	5

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 PM * 2006IN~4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	4	848	0.005	12.2	B	0.0	0
2T	T	513	1900	0.270	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	585	1775	0.330	0.7	A	0.0	0
6R	R	24	73	0.329	9.5	A	0.0	0
North: Farmaceutica GSK								
7L	L	141	156	0.904	95.9	F	10.0	5
4R	R	24	26	0.923*	95.9	F	10.0	5
ALL VEHICLES:		1291		0.923	13.1	NA	10.0	5

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 PM * 2006IN~4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 PM * 2006IN~4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	12.1	0.34	0.543	26.75	0.797	303.1
2T T	7.4	0.23	0.241	4.20	0.360	185.6
	7.5	0.23	0.244	4.37	0.363	186.5
East: PR-172 Desde Caguas						
6T T	7.4	0.23	0.241	4.20	0.360	185.9
6R R	11.6	0.33	0.512	25.09	0.764	291.2
	7.6	0.24	0.252	5.02	0.376	190.0
North: Farmaceutica GSK						
7L L	17.6	0.78	0.865	29.21	0.887	441.1
4R R	17.6	0.78	0.862	29.10	0.886	440.4
	17.6	0.78	0.864	29.19	0.887	441.0
INTERSECTION:	8.8	0.31	0.326	7.82	0.435	220.4

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 PM * 2006IN~4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st 2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra											
1 L	4			4	0			0.005	12.2	0	45
2 T		513		513	2			0.270	0.7	0	500
	4	513	0	517	2			0.270	0.8	0	
East: PR-172 Desde Caguas											
1 TR		585	24	609	2			0.330	1.1	0	500
	0	585	24	609	2			0.330	1.1		
North: Farmaceutica GSK											
1 LR	141		24	165	0			0.906	95.9	5	500

Lane No.	Satn x	he1	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.005	0.35	0.00	0.34	0.69	0.525	0.00
2 T	0.270	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.330	0.00	0.00	0.10	0.10	0.000	0.00
North: Farmaceutica GSK							
1 LR	0.906	0.97	0.16	0.03	1.16	0.973	2.31

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
2 T	0.270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	0.906	2.2	1.4	2.0	3.4	5.6	7.0	8.0	10.0	11.7	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
2 T	0.270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	128	No
	North	Right	10.0	20.2	15.7	500	120	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Delay (seconds/veh) Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 L	0.005	2.6	0.0	2.6	2.0	0.6	0.0	0.6	9.6	12.2
2 T	0.270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
North: Farmaceutica GSK										
1 LR	0.906	19.8	71.1	90.9	2.0	88.9	3.7	85.3	5.0	95.9

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	Deg.	-- Effective Stop Rate --	Prop.	Queue Move-up

1 TR	0.330	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	0.906	1.1	0.7	1.0	1.7	2.8	3.5	4.0	5.0	5.9	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0			51.7	51.0	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	3.1		47.8	16.9	5.0
4R R	72.0	0.0	20.2	65.0	3.8		47.1	16.9	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 PM * 2006IN-4
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	609	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	1114+	7.50	3.50	2.0
4R R	Normal	597+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

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SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2006 AM * 200303~1

Interseccion PR-172 @ Camino San Jose

Performance Measure	Vehicles	Persons
Demand Flows - Total	1452 veh/h	1742 pers/h
Percent Heavy Vehicles	2.4 %	
Degree of Saturation	0.484	
Effective Intersection Capacity	3003 veh/h	
95% Back of Queue (m)	5 m	
95% Back of Queue (veh)	6.8 veh	
Control Delay (Total)	2.51 veh-h/h	3.01 pers-h/h
Control Delay (Average)	6.2 s/veh	6.2 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	154 veh/h	185 pers/h
Effective Stop Rate	0.11 per veh	0.11 per pers
Proportion Queued	0.43	0.43
Travel Distance (Total)	907.4 veh-km/h	1088.9 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	15.7 veh-h/h	18.8 pers-h/h
Travel Time (Average)	38.9 secs	38.9 secs
Travel Speed	57.9 km/h	57.9 km/h
Operating Cost (Total)	269 $/h	269 $/h
Fuel Consumption (Total)	91.8 L/h	
Carbon Dioxide (Total)	229.8 kg/h	
Hydrocarbons (Total)	0.357 kg/h	
Carbon Monoxide (Total)	14.19 kg/h	
NOX (Total)	0.543 kg/h	

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Movement Summary

Bosques de Cidra Escenario 2006 AM * 200303~1

Interseccion PR-172 @ Camino San Jose

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Camino San Jose										
3L	L	44	0.0	0.484	50.1	LOS F	1	0.91	1.05	25.8
8R	R	28	0.0	0.483	50.1	LOS F	1	0.91	1.07	25.8
Approach		**72**	**0.0**	**0.485**	**50.1**	**LOS F**	**1**	**0.91**	**1.06**	**25.8**
PR-172 Desde Caguas										
1L	L	4	0.0	0.364	16.0	LOS C	5	0.86	0.99	46.9
6T	T	653	3.5	0.361	7.1	LOS A	5	0.86	0.01	55.9
Approach		**657**	**3.5**	**0.361**	**7.2**	**LOS A**	**5**	**0.86**	**0.02**	**55.8**
PR-172 Desde Cidra										
2T	T	704	1.7	0.389	0.7	LOS A	0	0.00	0.08	69.1
2R	R	20	0.0	0.392	9.5	LOS A	0	0.00	0.70	54.3
Approach		**723**	**1.7**	**0.389**	**1.0**	**LOS A**		**0.00**	**0.09**	**68.6**
All Vehicles		**1452**	**2.4**	**0.484**	**6.2**	**Not Applicable**	**5**	**0.43**	**0.11**	**57.9**

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Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0	691	12	0	0
2R R	0	0	0	0	20	0
South: Camino San Jose						
3L L	44	0	0	0	0	0
8R R	0	0	0	0	28	0
East: PR-172 Desde Caguas						
1L L	4	0	0	0	0	0
6T T	0	0	630	23	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left Total	Left %HV	Through Total	Through %HV	Right Total	Right %HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0.0	703	1.7	0	0.0
2R R	0	0.0	0	0.0	20	0.0
South: Camino San Jose						
3L L	44	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	28	0.0
East: PR-172 Desde Caguas						
1L L	4	0.0	0	0.0	0	0.0
6T T	0	0.0	653	3.5	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2006 AM * 200303~1

Interseccion PR-172 @ Camino San Jose

Run Information

* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	South	2R	Right	20	0	1.00	0.45
	East	2T	Thru	691	12	1.00	0.82
South: Camino San Jose							
	West	3L	Left	44	0	1.00	0.43
	East	8R	Right	28	0	1.00	0.64
East: PR-172 Desde Caguas							
	West	6T	Thru	630	23	1.00	0.90
	South	1L	Left	4	0	1.00	0.90

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
2T T	0.15	0.17	0.7	0.00	0.08	0.0	0	6.55	69.1
2R R	0.05	0.06	9.5	0.00	0.70	0.0	0	0.30	54.3
South: Camino San Jose									
3L L	0.61	0.74	50.1	0.91	1.05	2.8	1	1.79	25.8
8R R	0.39	0.47	50.1	0.91	1.07	2.8	1	1.14	25.8
East: PR-172 Desde Caguas									
1L L	0.02	0.02	16.0	0.86	0.99	6.8	5	0.09	46.9
6T T	1.29	1.55	7.1	0.86	0.01	6.8	5	9.23	55.9

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
723	0.392	0.20	0.24	1.0	0.00	0.09	0	6.85	68.6
South: Camino San Jose									
72	0.484	1.00	1.20	50.1	0.91	1.06	1	2.93	25.8
East: PR-172 Desde Caguas									
657	0.364	1.31	1.57	7.2	0.86	0.02	5	9.32	55.8
ALL VEHICLES:									
1452	0.484	2.51	3.01	6.2	0.43	0.11	5	19.10	57.9
INTERSECTION (persons):									
1742	0.484		3.01	6.2	0.43	0.11		19.10	57.9

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
2T T	703	1.7	0			1809	0.80	106	100	0.389
2R R	20	0.0	0			51	0.80	104	100	0.392
South: Camino San Jose										
3L L	44	0.0	1370+	2.6	1370	91	0.80	65	100	0.484*
8R R	28	0.0	713+	1.7	713	58	0.80	66	100	0.483
East: PR-172 Desde Caguas										
1L L	4	0.0	703	1.7	703	11	0.80	120	100	0.364
6T T	653	3.5	0			1808	0.80	122	100	0.361

+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	6.2
Largest average movement delay (s)	=	50.1
Largest back of queue, 95% (m)	=	5
Performance Index	=	19.10
Degree of saturation (highest)	=	0.484
Practical Spare Capacity (lowest)	=	65 %
Effective intersection capacity, (veh/h)	=	3003
Total vehicle flow (veh/h)	=	1452
Total person flow (pers/h)	=	1742
Total vehicle delay (veh-h/h)	=	2.51
Total person delay (pers-h/h)	=	3.01
Total effective vehicle stops (veh/h)	=	154
Total effective person stops (pers/h)	=	185
Total vehicle travel (veh-km/h)	=	907.4
Total cost ($/h)	=	269.20
Total fuel (L/h)	=	91.8
Total CO2 (kg/h)	=	229.82

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

	/h)	/h)	(%)	x	(sec)		(veh)	
West: PR-172 Desde Cidra								
2T T	703	1809	100	0.389	0.7	0.08	0.0	6.55
2R R	20	51	100	0.392	9.5	0.70	0.0	0.30
South: Camino San Jose								
3L L	44	91	100	0.484*	50.1	1.05	2.8	1.79
8R R	28	58	100	0.483	50.1	1.07	2.8	1.14
East: PR-172 Desde Caguas								
1L L	4	11	100	0.364	16.0	0.99	6.8	0.09
6T T	653	1808	100	0.361	7.1	0.01	6.8	9.23

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
2T T	32.3	102.33	0.106	1.84	0.158	80.9
2R R	1.4	4.05	0.006	0.31	0.009	3.6
	33.8	106.38	0.112	2.16	0.168	84.5
South: Camino San Jose						
3L L	4.1	15.14	0.019	0.77	0.023	10.1
8R R	2.6	9.64	0.012	0.49	0.015	6.4
	6.6	24.78	0.031	1.26	0.038	16.6
East: PR-172 Desde Caguas						
1L L	0.3	0.90	0.001	0.07	0.002	0.8
6T T	51.1	137.14	0.212	10.71	0.335	128.0
	51.4	138.04	0.213	10.78	0.337	128.8
INTERSECTION:	91.8	269.20	0.357	14.19	0.543	229.8

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 TR	723	1860	0.389	1.0	0.09	0.0	0.0	500.0
South: Camino San Jose								
1 LR	72	149	0.485	50.1	1.06	2.8	1.4	500.0
East: PR-172 Desde Caguas								
1 LT	657	1819	0.361	7.2	0.02	6.8	4.7	500.0

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 TR	0	703	20	723	723	1860	0.389	100
South: Camino San Jose								
1 LR	44	0	28	72	72	149	0.485	100
East: PR-172 Desde Caguas								
1 LT	4	653	0	657	657	1819	0.361	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Dem Flow (veh	Total Cap. (veh	Lane Util	Deg. Satn	Aver. Delay	Eff. Stop Rate	95% Back of Queue	Perf. Index

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
2T	T	703	1809	0.389	0.7	A	0.0	0
2R	R	20	51	0.392	9.5	A	0.0	0
South: Camino San Jose								
3L	L	44	91	0.484*	50.1	F	2.8	1
8R	R	28	58	0.483	50.1	F	2.8	1
East: PR-172 Desde Caguas								
1L	L	4	11	0.364	16.0	C	6.8	5
6T	T	653	1808	0.361	7.1	A	6.8	5
ALL VEHICLES:		1452		0.484	6.2	NA	6.8	5

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods

" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Dist. (m)	Distance User Spec?

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
2T T	7.4	0.23	0.241	4.20	0.360	183.9
2R R	11.6	0.33	0.512	25.09	0.764	291.2
	7.5	0.24	0.249	4.77	0.371	186.8
South: Camino San Jose						
3L L	14.9	0.56	0.706	28.45	0.849	373.3
8R R	14.8	0.56	0.697	27.98	0.843	371.0
	14.9	0.56	0.703	28.27	0.847	372.4
East: PR-172 Desde Caguas						
1L L	12.5	0.36	0.564	27.39	0.812	311.8
6T T	12.5	0.34	0.518	26.23	0.822	313.5
	12.5	0.34	0.519	26.23	0.821	313.5
INTERSECTION:	10.1	0.30	0.393	15.64	0.598	253.3

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st 2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra											
1 TR		703	20	723	2			0.389	1.0	0	500
	0	703	20	723	2			0.389	1.0		
South: Camino San Jose											
1 LR	44		28	72	0			0.485	50.1	1	500
	44	0	28	72	0			0.485	50.1	1	
East: PR-172 Desde Caguas											
1 LT	4	653		657	4			0.361	7.2	5	500
	4	653	0	657	4			0.361	7.2	5	
ALL VEHICLES				Total Flow 1452	% HV 2			Max X 0.484	Aver. Delay 6.2	Max Queue 5	

South: Camino San Jose							
1 LR	0.485	0.91	0.06	0.09	1.06	0.905	0.90
East: PR-172 Desde Caguas							
1 LT	0.361	0.01	0.00	0.01	0.02	0.860	0.26

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.485	0.5	0.6	0.3	0.9	1.6	2.0	2.2	2.8	3.2	0.00
East: PR-172 Desde Caguas											
1 LT	0.361	0.2	1.9	0.4	2.2	3.9	4.8	5.4	6.8	7.9	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.485	0.3	0.3	0.1	0.4	0.8	1.0	1.1	1.4	1.6	0.00
East: PR-172 Desde Caguas											
1 LT	0.361	0.2	1.3	0.3	1.6	2.7	3.3	3.8	4.7	5.5	0.01

Values printed in this table are back of queue (metres).

West: PR-172 Desde Cidra							
South	Right	10.0	20.2	15.7	500	120	No
East	Thru	S	65.0	10.8	500	127	No
South: Camino San Jose							
West	Left	7.2	17.8	11.3	500	117	No
East	Right	10.0	20.2	15.7	500	120	No
East: PR-172 Desde Caguas							
West	Thru	S	65.0	10.8	500	129	No
South	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 TR	0.389	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
South: Camino San Jose										
1 LR	0.485	24.2	20.9	45.1	1.8	43.3	1.4	42.0	5.0	50.1
East: PR-172 Desde Caguas										
1 LT	0.361	5.9	0.5	6.4	7.7	0.0	0.0	0.0	0.8	7.2

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Cidra							
1 TR	0.389	0.00	0.00	0.09	0.09	0.000	0.00

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Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
2R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
South: Camino San Jose									
3L L	72.0	0.0	17.8	65.0	2.8		50.4	25.8	5.0
8R R	72.0	0.0	20.2	65.0	3.5		50.0	25.8	5.0
East: PR-172 Desde Caguas									
1L L	72.0	17.8	17.8	65.0	4.8		49.6	46.9	9.6
6T T	72.0	65.0	65.0	65.0	0.0		55.9	55.9	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 AM * 200303-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
No opposed movements on this approach					
South: Camino San Jose					
3L L	Normal	1370+	7.50	3.50	2.0
8R R	Normal	713+	6.90	3.30	2.0
East: PR-172 Desde Caguas					
1L L	Normal	703	4.10	2.20	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
\+ Percentage of exiting flow included in total opposing flow

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2006 PM * 200F33~1

Interseccion PR-172 @ Camino San Jose

Performance Measure	Vehicles	Persons
Demand Flows - Total	1445 veh/h	1734 pers/h
Percent Heavy Vehicles	1.5 %	
Degree of Saturation	0.390	
Effective Intersection Capacity	3705 veh/h	
95% Back of Queue (m)	5 m	
95% Back of Queue (veh)	8.1 veh	
Control Delay (Total)	2.15 veh-h/h	2.58 pers-h/h
Control Delay (Average)	5.4 s/veh	5.4 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS E	
Total Effective Stops	132 veh/h	159 pers/h
Effective Stop Rate	0.09 per veh	0.09 per pers
Proportion Queued	0.46	0.46
Travel Distance (Total)	903.1 veh-km/h	1083.8 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	15.2 veh-h/h	18.2 pers-h/h
Travel Time (Average)	37.8 secs	37.8 secs
Travel Speed	59.5 km/h	59.5 km/h
Operating Cost (Total)	261 $/h	261 $/h
Fuel Consumption (Total)	89.5 L/h	
Carbon Dioxide (Total)	223.9 kg/h	
Hydrocarbons (Total)	0.354 kg/h	
Carbon Monoxide (Total)	14.28 kg/h	
NOX (Total)	0.537 kg/h	

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Movement Summary

Bosques de Cidra Escenario 2006 PM * 200F33~1

Interseccion PR-172 @ Camino San Jose

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Camino San Jose										
3L	L	22	0.0	0.256	35.8	LOS E	1	0.86	1.02	30.9
8R	R	18	0.0	0.257	35.8	LOS E	1	0.86	1.02	30.9
Approach		**40**	**0.0**	**0.256**	**35.8**	**LOS E**	**1**	**0.86**	**1.02**	**30.9**
PR-172 Desde Caguas										
1L	L	11	10.0	0.385	17.0	LOS C	5	0.88	0.99	46.4
6T	T	704	1.6	0.390	7.5	LOS A	5	0.88	0.01	55.7
Approach		**714**	**1.7**	**0.390**	**7.7**	**LOS A**	**5**	**0.88**	**0.02**	**55.5**
PR-172 Desde Cidra										
2T	T	655	1.2	0.372	0.7	LOS A	0	0.00	0.08	69.1
2R	R	37	2.8	0.371	9.7	LOS A	0	0.00	0.70	54.3
Approach		**691**	**1.3**	**0.372**	**1.2**	**LOS A**		**0.00**	**0.11**	**68.1**
All Vehicles		**1445**	**1.5**	**0.390**	**5.4**	**Not Applicable**	**5**	**0.46**	**0.09**	**59.5**

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Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2006 PM * 200F33~1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0	647	8	0	0
2R R	0	0	0	0	35	1
South: Camino San Jose						
3L L	22	0	0	0	0	0
8R R	0	0	0	0	18	0
East: PR-172 Desde Caguas						
1L L	9	1	0	0	0	0
6T T	0	0	693	11	0	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2006 PM * 200F33~1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left Total	Left %HV	Through Total	Through %HV	Right Total	Right %HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
2T T	0	0.0	655	1.2	0	0.0
2R R	0	0.0	0	0.0	36	2.8
South: Camino San Jose						
3L L	22	0.0	0	0.0	0	0.0
8R R	0	0.0	0	0.0	18	0.0
East: PR-172 Desde Caguas						
1L L	10	10.0	0	0.0	0	0.0
6T T	0	0.0	704	1.6	0	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2006 PM * 200F33~1

Interseccion PR-172 @ Camino San Jose

Run Information

* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2006 PM * 200F33~1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	South	2R	Right	35	1	1.00	0.71
	East	2T	Thru	647	8	1.00	0.73
South: Camino San Jose							
	West	3L	Left	22	0	1.00	0.63
	East	8R	Right	18	0	1.00	0.45
East: PR-172 Desde Caguas							
	West	6T	Thru	693	11	1.00	0.85
	South	1L	Left	9	1	1.00	0.85

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% (vehs)	Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
2T T	0.14	0.16	0.7	0.00	0.08	0.0	0	6.10	69.1
2R R	0.10	0.12	9.7	0.00	0.70	0.0	0	0.55	54.3
South: Camino San Jose									
3L L	0.22	0.26	35.8	0.86	1.02	1.1	1	0.73	30.9
8R R	0.18	0.21	35.8	0.86	1.02	1.1	1	0.60	30.9
East: PR-172 Desde Caguas									
1L L	0.05	0.06	17.0	0.88	0.99	8.1	5	0.23	46.4
6T T	1.48	1.77	7.5	0.88	0.01	8.1	5	10.29	55.7

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2006 PM * 200F33~1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
691	0.372	0.23	0.28	1.2	0.00	0.11	0	6.65	68.1
South: Camino San Jose									
40	0.257	0.40	0.48	35.8	0.86	1.02	1	1.32	30.9
East: PR-172 Desde Caguas									
714	0.390	1.52	1.83	7.7	0.88	0.02	5	10.51	55.5
ALL VEHICLES:									
1445	0.390	2.15	2.58	5.4	0.46	0.09	5	18.48	59.5
INTERSECTION (persons):									
1734	0.390		2.58	5.4	0.46	0.09		18.48	59.5

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2006 PM * 200F33~1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
2T T	655	1.2	0			1762	0.80	115	100	0.372
2R R	36	2.8	0			97	0.80	116	100	0.371
South: Camino San Jose										
3L L	22	0.0	1387+	1.5	1387	86	0.80	213	100	0.256
8R R	18	0.0	673+	1.3	673	70	0.80	211	100	0.257
East: PR-172 Desde Caguas										
1L L	10	10.0	655	1.2	655	26	0.80	108	100	0.385
6T T	704	1.6	0			1805	0.80	105	100	0.390*

+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2006 PM * 200F33~1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	E
Average intersection delay (s)	=	5.4
Largest average movement delay (s)	=	35.8
Largest back of queue, 95% (m)	=	5
Performance Index	=	18.48
Degree of saturation (highest)	=	0.390
Practical Spare Capacity (lowest)	=	105 %
Effective intersection capacity, (veh/h)	=	3705
Total vehicle flow (veh/h)	=	1445
Total person flow (pers/h)	=	1734
Total vehicle delay (veh-h/h)	=	2.15
Total person delay (pers-h/h)	=	2.58
Total effective vehicle stops (veh/h)	=	132
Total effective person stops (pers/h)	=	159
Total vehicle travel (veh-km/h)	=	903.1
Total cost ($/h)	=	261.11
Total fuel (L/h)	=	89.5
Total CO2 (kg/h)	=	223.89

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

	/h)	/h)	(%)	x	(sec)		(veh)	
West: PR-172 Desde Cidra								
2T T	655	1762	100	0.372	0.7	0.08	0.0	6.10
2R R	36	97	100	0.371	9.7	0.70	0.0	0.55
South: Camino San Jose								
3L L	22	86	100	0.256	35.8	1.02	1.1	0.73
8R R	18	70	100	0.257	35.8	1.02	1.1	0.60
East: PR-172 Desde Caguas								
1L L	10	26	100	0.385	17.0	0.99	8.1	0.23
6T T	704	1805	100	0.390*	7.5	0.01	8.1	10.29

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
2T T	29.8	94.83	0.099	1.72	0.147	74.5
2R R	2.9	7.75	0.012	0.63	0.019	7.3
	32.7	102.58	0.111	2.35	0.167	81.7
South: Camino San Jose						
3L L	1.9	6.61	0.009	0.38	0.011	4.8
8R R	1.6	5.42	0.007	0.31	0.009	3.9
	3.5	12.03	0.016	0.69	0.021	8.7
East: PR-172 Desde Caguas						
1L L	1.0	2.65	0.004	0.23	0.007	2.6
6T T	52.3	143.85	0.223	11.00	0.342	130.9
	53.4	146.50	0.227	11.24	0.349	133.5
INTERSECTION:	89.5	261.11	0.354	14.28	0.537	223.9

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 TR	691	1859	0.372	1.2	0.11	0.0	0.0	500.0
South: Camino San Jose								
1 LR	40	156	0.256	35.8	1.02	1.1	0.6	500.0
East: PR-172 Desde Caguas								
1 LT	714	1830	0.390	7.7	0.02	8.1	4.8	500.0

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 TR	0	655	36	691	691	1859	0.372	100
South: Camino San Jose								
1 LR	22	0	18	40	40	156	0.256	100
East: PR-172 Desde Caguas								
1 LT	10	704	0	714	714	1830	0.390	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Dem Flow (veh	Total Cap. (veh	Lane Util	Deg. Satn	Aver. Delay	Eff. Stop Rate	95% Back of Queue	Perf. Index

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
2T	T	655	1762	0.372	0.7	A	0.0	0
2R	R	36	97	0.371	9.7	A	0.0	0
South: Camino San Jose								
3L	L	22	86	0.256	35.8	E	1.1	1
8R	R	18	70	0.257	35.8	E	1.1	1
East: PR-172 Desde Caguas								
1L	L	10	26	0.385	17.0	C	8.1	5
6T	T	704	1805	0.390*	7.5	A	8.1	5
ALL VEHICLES:		1445		0.390	5.4	NA	8.1	5

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
2T T	7.3	0.23	0.241	4.19	0.360	181.8
2R R	13.0	0.35	0.544	28.35	0.868	326.0
	7.6	0.24	0.257	5.44	0.386	189.2
South: Camino San Jose						
3L L	14.1	0.49	0.654	28.11	0.836	351.5
8R R	14.0	0.49	0.646	27.62	0.830	349.4
	14.0	0.49	0.651	27.89	0.833	350.5
East: PR-172 Desde Caguas						
1L L	16.7	0.43	0.668	37.73	1.140	420.0
6T T	11.9	0.33	0.507	24.99	0.778	297.3
	12.0	0.33	0.509	25.17	0.783	299.0
INTERSECTION:	9.9	0.29	0.392	15.81	0.594	247.9

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 TR	655	36		691	1				0.372	1.2	0	500
	0 655	36		691	1				0.372	1.2		
South: Camino San Jose												
1 LR	22	18		40	0				0.256	35.8	1	500
	22 0	18		40	0				0.256	35.8	1	
East: PR-172 Desde Caguas												
1 LT	10 704			714	2				0.390	7.7	5	500
	10 704	0		714	2				0.390	7.7	5	
ALL VEHICLES				Total Flow 1445	% HV 1				Max X 0.390	Aver. Delay 5.4	Max Queue 5	

West: PR-172 Desde Cidra										
	South	Right	10.0	20.2	15.7	500	124	No
	East	Thru	S	65.0	10.8	500	127	No
South: Camino San Jose								
	West	Left	7.2	17.8	11.3	500	117	No
	East	Right	10.0	20.2	15.7	500	120	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	10.8	500	127	No
	South	Left	7.2	17.8	11.3	500	128	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line 1st d1	2nd d2	Delay Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Cidra										
1 TR	0.372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2
South: Camino San Jose										
1 LR	0.256	23.0	7.7	30.8	1.7	29.1	0.4	28.7	5.0	35.8
East: PR-172 Desde Caguas										
1 LT	0.390	6.2	0.6	6.8	7.8	0.0	0.0	0.0	0.9	7.7

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Cidra							
1 TR	0.372	0.00	0.00	0.11	0.11	0.000	0.00

South: Camino San Jose								
1 LR	0.256	0.86	0.02	0.14	1.02	0.863	0.28
East: PR-172 Desde Caguas								
1 LT	0.390	0.01	0.00	0.01	0.02	0.877	0.31

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.256	0.1	0.3	0.1	0.4	0.7	0.8	0.9	1.1	1.3	0.00
East: PR-172 Desde Caguas											
1 LT	0.390	0.3	2.1	0.5	2.7	4.6	5.7	6.5	8.1	9.4	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 TR	0.372	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
South: Camino San Jose											
1 LR	0.256	0.1	0.2	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.00
East: PR-172 Desde Caguas											
1 LT	0.390	0.2	1.3	0.3	1.6	2.7	3.4	3.8	4.8	5.6	0.01

Values printed in this table are back of queue (metres).

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Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
2R R	72.0	20.2	20.2	65.0			54.3	54.3	9.7
South: Camino San Jose									
3L L	72.0	0.0	17.8	65.0	2.8		51.4	30.9	5.0
8R R	72.0	0.0	20.2	65.0	3.6		51.1	30.9	5.0
East: PR-172 Desde Caguas									
1L L	72.0	17.8	17.8	65.0	4.5		49.5	46.4	10.2
6T T	72.0	65.0	65.0	65.0	0.0		55.7	55.7	0.7

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2006 PM * 200F33-1
Interseccion PR-172 @ Camino San Jose
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
No opposed movements on this approach					
South: Camino San Jose					
3L L	Normal	1387+	7.50	3.50	2.0
8R R	Normal	673+	6.90	3.30	2.0
East: PR-172 Desde Caguas					
1L L	Normal	655	4.31	2.31	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
\+ Percentage of exiting flow included in total opposing flow

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Intersection Summary

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1373 veh/h	1 ped/h	1649 pers/h
Percent Heavy Vehicles	3.0 %		
Degree of Saturation	0.797	0.000	
Effective Intersection Capacity	1722 veh/h		
95% Back of Queue (m)	13 m	0 m	
95% Back of Queue (veh)	21.5 veh	0.0 ped	
Control Delay (Total)	9.27 veh-h/h	0.00 ped-h/h	11.12 pers-h/h
Control Delay (Average)	24.3 s/veh	2.1 s/ped	24.3 s/pers
Level of Service	LOS C	LOS A	
Level of Service (Worst Movement)	LOS D	LOS A	
Total Effective Stops	1167 veh/h	0 ped/h	1400 pers/h
Effective Stop Rate	0.85 per veh	0.27 per ped	0.85 per pers
Proportion Queued	0.83	0.27	0.83
Travel Distance (Total)	854.1 veh-km/h	0.0 ped-km/h	1024.9 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	24.1 veh-h/h	0.0 ped-h/h	28.9 pers-h/h
Travel Time (Average)	63.2 secs	25.8 secs	63.2 secs
Travel Speed	35.4 km/h	4.3 km/h	35.4 km/h
Operating Cost (Total)	388 $/h	0 $/h	388 $/h
Fuel Consumption (Total)	122.1 L/h		
Carbon Dioxide (Total)	305.7 kg/h		
Hydrocarbons (Total)	0.528 kg/h		
Carbon Monoxide (Total)	26.94 kg/h		
NOX (Total)	0.809 kg/h		

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Movement Summary

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

Signalised - Pretimed **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-787 Desde Guavate										
6T	T	381	1.6	0.766	30.4	LOS C	8	0.98	0.87	32.4
6R	R	1	0.0	0.638	38.6	LOS D	8	0.98	0.89	28.8
Approach		**382**	**1.6**	**0.767**	**30.4**	**LOS C**	**8**	**0.98**	**0.87**	**32.4**
PR-172 Desde Caguas										
7L	L	9	0.0	0.050	33.3	LOS C	0	0.93	0.67	30.8
4R	R	267	9.0	0.255	11.4	LOS B	4	0.39	0.74	44.6
Approach		**276**	**8.7**	**0.255**	**12.1**	**LOS B**	**4**	**0.41**	**0.73**	**43.9**
PR-172 Desde Pueblo Cidra										
5L	L	467	1.3	0.797	28.6	LOS C	13	0.90	0.90	33.0
2T	T	248	2.0	0.797	20.3	LOS C	13	0.90	0.84	37.9
Approach		**715**	**1.5**	**0.797**	**25.8**	**LOS C**	**13**	**0.90**	**0.88**	**34.6**
All Vehicles		**1373**	**3.0**	**0.797**	**24.3**	**LOS C**	**13**	**0.83**	**0.85**	**35.4**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	2.1	LOS A	0	0.27	0.27
All Peds	**1**	**2.1**	**LOS A**	**0**	**0.27**	**0.27**

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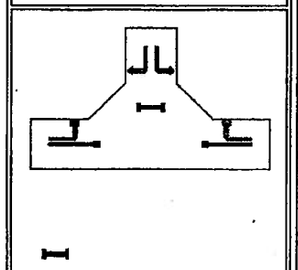
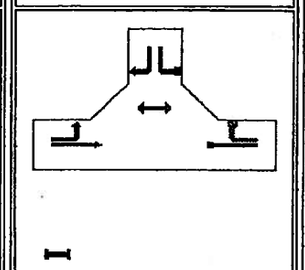
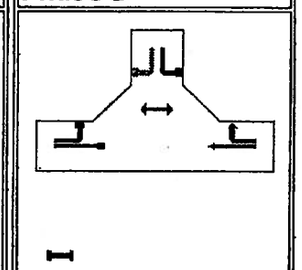
Phasing Summary

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

C = **60** seconds
Cycle Time Option: **Program calculated cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = **6** seconds Phase Time = **9** seconds Phase Split = **15 %**	Green Time = **29** seconds Phase Time = **32** seconds Phase Split = **53 %**	Green Time = **16** seconds Phase Time = **19** seconds Phase Split = **32 %**

Normal Movement · Permitted/Opposed · Stopped Movement
Slip-Lane · Opposed Slip-Lane · Continuous
Turn On Red

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```
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)
```

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Pueblo Cidra							
	East	2T	Thru	243	5	1.00	0.95
	North	5L	Left	461	6	1.00	0.95
East: PR-787 Desde Guavate							
	West	6T	Thru	375	6	1.00	0.95
	North	6R	Right	1	0	1.00	0.95
North: PR-172 Desde Caguas							
	West	4R	Right	243	24	1.00	0.95
	East	7L	Left	9	0	1.00	0.95

```
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

```
Estudio de Transito Bosques de Cidra                          * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)
```

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Pueblo Cidra						
5L L	461	6	0	0	0	0
2T T	0	0	243	5	0	0
East: PR-787 Desde Guavate						
6T T	0	0	375	6	0	0
6R R	0	0	0	0	1	0
North: PR-172 Desde Caguas						
7L L	9	0	0	0	0	0
4R R	0	0	0	0	243	24

```
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

```
Estudio de Transito Bosques de Cidra                          * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
```


SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra * 2006IN~1

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM

Unsettled Results

Solution for this case has some uncertainty. Review the iteration data in the RUN INFORMATION section to assess the acceptability of the solution.

Run Information

```
Cycle Time =   60  (Practical Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations =  5 (Max)
  The differences between main iterations indicate that this may be an
  unstable solution (see the information given below).
  Use of the optimum cycle time facility (LT 21) to check results for various
  cycle times can give a further idea about the stability of this case.
  Comparison of last two iterations:
    Difference in intersection degree of satn =  3.4 %
    Largest difference in eff. green times = 10 secs
    (max. value for stopping = 0 secs)
  Information on Previous Iteration:
    Cycle Time =  70
    Phase Times: 0,   9,  47
    Critical Movements:    7L,    5L,    6R(2nd)
```

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

```
Estudio de Transito Bosques de Cidra                          * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
```

```
  2T T        B     D                                  3        28.7              29
-----------------------------------------------------------------------------------------
East: PR-787 Desde Guavate
  6T T        D     A                                  3        16.6              16
  6R R        A     D      Y     *D     A              15   3   32.7     16.6     26   16
-----------------------------------------------------------------------------------------
North: PR-172 Desde Caguas
  7L L       *A     B                                  3         9.0Min            6
  4R R        A     D             D     A      Y       3  14   18.0Min   9.0Min  38    5
-----------------------------------------------------------------------------------------
Pedestrian Movements
  P5    (Ped) B     A                                  7        18.0Min           44
-----------------------------------------------------------------------------------------
  Current Phase Sequence: Sequence 1
  Input phase sequence: A B D
  Output phase sequence: A B D
-----------------------------------------------------------------------------------------
  *  Critical Movement/Green Period

Movement Types:                              Under heading 'Op':
  Slp  Slip Lane Movement                      Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

```
 Estudio de Transito Bosques de Cidra                                    * 2006IN~1
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------------------------------------
 Mov      Dem          Satn Flow   Flow Ratio  Total Prac.  Prac. Lane   Deg.
 ID       Flow        ----------  ---------   Cap.  Deg.   Spare Util   Satn
          (veh    HV   1st   2nd   1st   2nd   (veh  Satn   Cap.
           /h)   (%)   Grn   Grn   Grn   Grn   /h)   xp     (%)   (%)    x
-----------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
  5L L    467    1.3  1212         0.385         586  0.90    13   100  0.797*
  2T T    248    2.0   644         0.385         311  0.90    13   100  0.797*
-----------------------------------------------------------------------------------
East: PR-787 Desde Guavate
  6T T    381    1.6  1864         0.204         497  0.90    17   100  0.766
  6R R      1    0.0     3     0  0.265 0.204     2  0.90    41   100  0.638
-----------------------------------------------------------------------------------
North: PR-172 Desde Caguas
  7L L      9    0.0  1796         0.005         180  0.90  1696   100  0.050
  4R R    267    9.0  1512  1052   0.177 0.000  1045  0.90   252   100  0.255
-----------------------------------------------------------------------------------
Pedestrian Movements
  P5        1         12000         0.000        8800  0.90     0         0.000
-----------------------------------------------------------------------------------
```

Table S.3 - Intersection Parameters

```
 Estudio de Transito Bosques de Cidra                                    * 2006IN~1
```



```
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------------------------------------
 Mov          Left          Through         Right
 ID        ----------     ----------     ----------
          Total   %HV    Total   %HV    Total   %HV
-----------------------------------------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Pueblo Cidra
   5L L    467    1.3       0    0.0       0    0.0
   2T T      0    0.0     248    2.0       0    0.0
-----------------------------------------------------------------------------------
East: PR-787 Desde Guavate
   6T T      0    0.0     381    1.6       0    0.0
   6R R      0    0.0       0    0.0       1    0.0
-----------------------------------------------------------------------------------
North: PR-172 Desde Caguas
   7L L      9    0.0       0    0.0       0    0.0
   4R R      0    0.0       0    0.0     267    9.0
-----------------------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.3 - Pedestrian Flow Rates

```
 Estudio de Transito Bosques de Cidra                                    * 2006IN~1
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------
 Mov        Flow Rate   Flow   Peak Flow
 ID   Stage  (ped/h)    Scale   Factor
-----------------------------------------------
Across North Approach
  P5              1     1.00     0.95
-----------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.1 - Movement Phase and Timing Parameters

```
 Estudio de Transito Bosques de Cidra                                    * 2006IN~1
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

-----------------------------------------------------------------------------------------
 Mov     Mov          P R A S E   M A T R I X          Lost Tim  Req.Mov.Time     Eff. Grn
 ID      Typ     First Green        Second Green       -------  ------------     -------
                ------------------ ------------------  1st  2nd  1st      2nd    1st  2nd
                Fr    To   Op Pr   Fr    To   Op Pr    Grn  Grn  Grn      Grn    Grn  Grn
-----------------------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
  5L L       *B     D                                   3        28.7              29
```

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	Longest Queue 95% Back (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	3.71	4.46	28.6	0.90	0.90	21.5	13	19.58	33.0
2T T	1.40	1.68	20.3	0.90	0.84	21.5	13	9.77	37.9
East: PR-787 Desde Guavate									
6T T	3.21	3.86	30.4	0.98	0.87	13.4	8	16.61	32.4
6R R	0.01	0.01	38.6	0.98	0.89	13.4	8	0.05	28.8
North: PR-172 Desde Caguas									
7L L	0.08	0.10	33.3	0.93	0.67	0.4	0	0.37	30.8
4R R	0.85	1.02	11.4	0.39	0.74	3.9	4	6.59	44.6
Pedestrian Movements									
P5	0.00	0.00	2.1	0.27	0.27	0.0	0	0.01	4.3

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
715	0.797	5.11	6.14	25.8	0.90	0.88	13	29.35	34.6
East: PR-787 Desde Guavate									
382	0.766	3.23	3.87	30.4	0.98	0.87	8	16.65	32.4
North: PR-172 Desde Caguas									
276	0.255	0.93	1.12	12.1	0.41	0.73	4	6.95	43.9
Pedestrians:									
1	0.000	0.00	0.00	2.1	0.27	0.27	0	0.01	4.3
ALL VEHICLES:									
1373	0.797	9.27	11.12	24.3	0.83	0.85	13	52.96	35.4
INTERSECTION (persons):									
1649	0.797		11.12	24.3	0.83	0.85		52.97	35.4

Queue values in this table are 95% back of queue (metres).

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.385	0.428	28.7
6R	E_R	2nd	D	A	3	0.204	0.227	16.6
				Total:	15	0.590	0.655	54.3

- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
27	150	44	60

Intersection Level of Service	=	C
Worst movement Level of Service	=	D
Average intersection delay (s)	=	24.3
Largest average movement delay (s)	=	38.6
Largest back of queue, 95% (m)	=	13
Performance Index	=	52.97
Degree of saturation (highest)	=	0.797
Practical Spare Capacity (lowest)	=	13 %
Effective intersection capacity, (veh/h)	=	1722
Total vehicle flow (veh/h)	=	1373
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	1649
Total vehicle delay (veh-h/h)	=	9.27
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	11.12
Total effective vehicle stops (veh/h)	=	1167
Total effective pedestrian stops (ped/h)	=	0
Total effective person stops (pers/h)	=	1400
Total vehicle travel (veh-km/h)	=	854.1
Total cost ($/h)	=	387.92
Total fuel (L/h)	=	122.1
Total CO2 (kg/h)	=	305.65

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	29	41	3	32	53%
D	41	3	44	16	60	3	19	32%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

```
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (Practical Cycle Time)

Displayed (Phase) Green Times

 Phase A                Phase B                    Phase D

0       9                                  41                   60
I-------I----------------------------------I--------------------I
....GGGGG.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGGGGGGGGGGGGG.
   3       12                                 44


Effective (Movement) Green Times


 West: PR-172 Desde Pueblo Cidra

Mov.     5L (L)
I        I                                  I                     I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....................
              14                               43

Mov.     2T (T)
I        I                                  I                     I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....................
              14                               43


 East: PR-787 Desde Guavate

Mov.     6T (T)
I        I                                  I                     I
G.................................................GGGGGGGGGGGGGGGG
 2                                              46

Mov.     6R (R)
I        I                                  I                     I
GG..................GGGGGGGGGGGGGGGGGGGGGGGGGG....GGGGGGGGGGGGGGGGG
 2               17                           43   46


 North: PR-172 Desde Caguas

Mov.     7L (L)
I        I                                  I                     I
......GGGGGG.......................................................
     5     11

Mov.     4R (R)
I        I                                  I                     I
GG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.................GGGG
 2  5                                         43             57


 Pedestrian Movements

Mov.     P5
I        I                                  I                     I
...............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...
              14                                              58


I-----I------I------I------I------I------I------I------I------I------I---->
0     6      12     18     24     30     36     42     48     54     60

                            T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Effective Red and Green Times (sec) R1	G1	R2	G2	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Desde Pueblo Cidra												
1 LT	31	29	0	0	715	897	0.797	25.8	0.88	21.5	12.6	500.0
East: PR-787 Desde Guavate												
1 TR	15	1	28	16	382	498	0.767	30.4	0.87	13.4	7.8	500.0
North: PR-172 Desde Caguas												
1 L	54	6	0	0	9	180	0.050	33.3	0.67	0.4	0.2	500.0
2 R	3	38	14	5	267	1045	0.255	11.4	0.74	3.9	3.9	500.0

Table S.8 - Lane Flow and Capacity Information

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Flow Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Pueblo Cidra												
1 LT	467	248	0	715	3.60	1947	1856	0	0	897	0.797	100
East: PR-787 Desde Guavate												
1 TR	0	381	1	382	3.60	1871	428	1842	60	498	0.767	100
North: PR-172 Desde Caguas												
1 L	9	0	0	9	3.60	1890	1796	0	0	180	0.050	100
2 R	0	0	267	267	3.60	1890	1512	1052	58	1045	0.255	100

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

Estudio de Transito Bosques de Cidra * 2006IN-1

INTERSECTION:	122.1	387.92	0.528	26.94	0.809	305.7

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra						
5L L	10.7	0.42	0.629	26.23	0.611	268.8
2T T	9.4	0.37	0.581	23.53	0.517	236.1
	10.3	0.41	0.612	25.29	0.578	257.4
East: PR-787 Desde Guavate						
6T T	18.3	0.53	0.630	36.35	1.291	457.1
6R R	16.2	0.54	0.653	32.39	1.035	405.1
	18.3	0.53	0.630	36.34	1.291	457.0
North: PR-172 Desde Caguas						
7L L	13.9	0.49	0.641	29.23	0.806	348.1
4R R	19.3	0.47	0.616	41.50	1.446	484.9
	19.2	0.47	0.617	41.10	1.426	480.5
Pedestrian Movements						
P5		1.77				
		1.77				
ALL VEHICLES:	14.3	0.45	0.618	31.55	0.947	357.9
INTERSECTION:	14.3	0.45	0.618	31.55	0.947	357.9

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Eff. Grn 1st Grn	Eff. Grn 2nd Grn	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Pueblo Cidra											
5L	L	467	586	100	0.797*	29*		28.6	0.90	21.5	19.58
2T	T	248	311	100	0.797*	29		20.3	0.84	21.5	9.77
East: PR-787 Desde Guavate											
6T	T	381	497	100	0.766	16		30.4	0.87	13.4	16.61
6R	R	1	2	100	0.638	26	16*	38.6	0.89	13.4	0.05
North: PR-172 Desde Caguas											
7L	L	9	180	100	0.050	6*		33.3	0.67	0.4	0.37
4R	R	267	1045	100	0.255	38	5	11.4	0.74	3.9	6.59
Pedestrian Movements											
P5	(Ped)	1	8800	100	0.000	44		2.1	0.27	0.0	0.01

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra * 2006IN~1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra						
5L L	31.1	122.43	0.182	7.58	0.177	77.7
2T T	14.6	57.50	0.090	3.65	0.080	36.6
	45.7	179.93	0.272	11.23	0.257	114.3
East: PR-787 Desde Guavate						
6T T	43.5	126.70	0.150	8.66	0.308	108.9
6R R	0.1	0.33	0.000	0.02	0.001	0.3
	43.6	127.04	0.150	8.68	0.308	109.2
North: PR-172 Desde Caguas						
7L L	0.8	2.70	0.004	0.16	0.004	1.9
4R R	32.0	78.20	0.102	6.87	0.239	80.2
	32.8	80.90	0.106	7.03	0.244	82.2
Pedestrian Movements						
P5		0.05				
		0.05				
ALL VEHICLES:	122.1	387.87	0.528	26.94	0.809	305.7

P5	(Ped) 0.733	1	8800	0.000	2.1	A	0.0	0
ALL VEHICLES:		1373		0.797	24.3	C	21.5	13
INTERSECTION (persons):		1649			24.3		21.5	13

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the
SIDRA Output Guide or the Output section of the on-line help.
Intersection capacity is calculated considering vehicle movements only.
* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane
v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 LT	715	897	1883	1706	0.797	100
East: PR-787 Desde Guavate						
1 TR	382	498	1871	NA	0.767	100
North: PR-172 Desde Caguas						
1 L	9	180	1796	1197	0.050	100
2 R	267	1045	1607	1489	0.255	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												
1 LT	467	248		715	2	1947	29		0.797	25.8	13	500
	467	248	0	715	2				0.797	25.8	13	
East: PR-787 Desde Guavate												
1 TR		381	1	382	2	1871	1	16	0.767	30.4	8	500
	0	381	1	382	2				0.767	30.4	8	
North: PR-172 Desde Caguas												
1 L	9			9	0	1890	6		0.050	33.3	0	500
2 R			267	267	9	1890	38	5	0.255	11.4	4	500
	9	0	267	276	9				0.255	12.1	4	
Pedestrians												
Across N approach			1				44		0.000	2.1	0.0	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1373	3	60	0.797	24.3	13

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Pueblo Cidra										
5L	L	0.483*		467	586	0.797*	28.6	C	21.5	13
2T	T	0.483		248	311	0.797*	20.3	C	21.5	13
East: PR-787 Desde Guavate										
6T	T	0.267		381	497	0.766	30.4	C	13.4	8
6R	R	0.433	0.267*	1	2	0.638	38.6	D	13.4	8
North: PR-172 Desde Caguas										
7L	L	0.100*		9	180	0.050	33.3	C	0.4	0
4R	R	0.633	0.083	267	1045	0.255	11.4	B	3.9	4

Pedestrian Movements

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 LT	0.797	0.81	0.03	0.04	0.88	0.904	0.11
East: PR-787 Desde Guavate							
1 TR	0.767	0.84	0.04	0.00	0.87	0.978	0.40
North: PR-172 Desde Caguas							
1 L	0.050	0.62	0.00	0.05	0.67	0.929	0.00
2 R	0.255	0.33	0.00	0.40	0.74	0.395	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 LT	0.797	2.8	10.0	2.8	12.8	15.5	18.2	19.7	21.5	23.2	0.03
East: PR-787 Desde Guavate											
1 TR	0.767	1.6	5.7	1.6	7.3	8.9	10.7	11.8	13.4	15.0	0.02
North: PR-172 Desde Caguas											
1 L	0.050	0.0	0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.5	0.00
2 R	0.255	0.3	1.4	0.3	1.7	2.2	2.7	3.1	3.9	4.7	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Pueblo Cidra								
	East	Thru	S	65.0	14.4	500	127	No
	North	Left	9.2	19.5	14.4	500	120	No
East: PR-787 Desde Guavate								
	West	Thru	S	65.0	14.4	500	127	No
	North	Right	10.0	20.2	15.7	500	120	No
North: PR-172 Desde Caguas								
	West	Right	10.0	20.2	15.7	500	130	No
	East	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 LT	0.797	13.0	7.3	20.3	5.1	15.3	0.5	14.8	5.4	25.8
East: PR-787 Desde Guavate										
1 TR	0.767	19.6	10.8	30.4	8.4	22.0	0.7	21.3	0.0	30.4
North: PR-172 Desde Caguas										
1 L	0.050	24.4	0.5	25.0	3.4	21.5	0.0	21.5	8.4	33.3
2 R	0.255	2.3	0.6	2.9	1.6	1.3	0.0	1.3	8.5	11.4

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

1 LT	0.797	1.6	5.9	1.6	7.5	9.0	10.7	11.5	12.6	13.6	0.03
East: PR-787 Desde Guavate											
1 TR	0.767	0.9	3.4	0.9	4.3	5.2	6.3	6.9	7.8	8.8	0.02
North: PR-172 Desde Caguas											
1 L	0.050	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.00
2 R	0.255	0.3	1.4	0.3	1.7	2.1	2.7	3.1	3.9	4.7	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	19.5	19.5	65.0	11.5		43.5	33.0	8.3
2T T	56.0	0.0	65.0	65.0	11.5		47.5	37.9	0.0
East: PR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.0	0.0	33.4	32.4	0.0
6R R	56.0	20.2	20.2	65.0	1.0	8.5	43.1	28.8	8.2
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0			43.9	30.8	8.4
4R R	56.0	20.2	20.2	65.0			45.8	44.6	8.5

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: PR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA

North: PR-172 Desde Caguas								
7L L	PT	No	3	1.000	1.000	6	NA	
4R R	PT	No	3	1.000	1.000	6	NA	6 NA
Pedestrians								
P5	PT	No	3	1.000	1.000			

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra * 2006IN-1
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) AM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (Practical Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: PR-787 Desde Guavate					
6R R	Normal	467	6.00	3.00	2.0
North: PR-172 Desde Caguas					
4R R	Normal	381	6.24	3.12	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

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SIDRA INTERSECTION

Intersection Summary

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

Performance Measure	Vehicles	Pedestrians	Persons
Demand Flows - Total	1184 veh/h	1 ped/h	1422 pers/h
Percent Heavy Vehicles	2.6 %		
Degree of Saturation	0.645	0.000	
Effective Intersection Capacity	1837 veh/h		
95% Back of Queue (m)	10 m	0 m	
95% Back of Queue (veh)	15.8 veh	0.0 ped	
Control Delay (Total)	6.04 veh-h/h	0.00 ped-h/h	7.25 pers-h/h
Control Delay (Average)	18.4 s/veh	2.1 s/ped	18.4 s/pers
Level of Service	LOS B	LOS A	
Level of Service (Worst Movement)	LOS C	LOS A	
Total Effective Stops	908 veh/h	0 ped/h	1089 pers/h
Effective Stop Rate	0.77 per veh	0.27 per ped	0.77 per pers
Proportion Queued	0.70	0.27	0.70
Travel Distance (Total)	736.4 veh-km/h	0.0 ped-km/h	883.7 pers-km/h
Travel Distance (Average)	622 m	31 m	622 m
Travel Time (Total)	18.8 veh-h/h	0.0 ped-h/h	22.6 pers-h/h
Travel Time (Average)	57.3 secs	25.8 secs	57.3 secs
Travel Speed	39.1 km/h	4.3 km/h	39.1 km/h
Operating Cost (Total)	306 $/h	0 $/h	306 $/h
Fuel Consumption (Total)	97.5 L/h		
Carbon Dioxide (Total)	244.0 kg/h		
Hydrocarbons (Total)	0.428 kg/h		
Carbon Monoxide (Total)	21.75 kg/h		
NOX (Total)	0.644 kg/h		

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Movement Summary

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

Signalised - Pretimed **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-787 Desde Guavate										
6T	T	255	1.6	0.608	25.2	LOS C	5	0.94	0.79	35.0
6R	R	11	10.0	0.600	33.7	LOS C	5	0.94	0.83	30.8
Approach		**265**	**1.9**	**0.608**	**25.6**	**LOS C**	**5**	**0.94**	**0.79**	**34.8**
PR-172 Desde Caguas										
7L	L	20	0.0	0.111	34.2	LOS C	0	0.94	0.70	30.4
4R	R	281	4.6	0.241	10.1	LOS B	2	0.30	0.72	45.6
Approach		**301**	**4.3**	**0.241**	**11.7**	**LOS B**	**2**	**0.34**	**0.72**	**44.2**
PR-172 Desde Pueblo Cidra										
5L	L	347	3.2	0.645	22.2	LOS C	10	0.78	0.84	36.5
2T	T	271	0.7	0.644	13.8	LOS B	10	0.78	0.69	42.5
Approach		**618**	**2.1**	**0.645**	**18.6**	**LOS B**	**10**	**0.78**	**0.78**	**38.9**
All Vehicles		**1184**	**2.6**	**0.645**	**18.4**	**LOS B**	**10**	**0.70**	**0.77**	**39.1**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	1	2.1	LOS A	0	0.27	0.27
All Peds	**1**	**2.1**	**LOS A**	**0**	**0.27**	**0.27**

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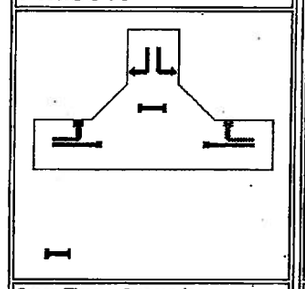
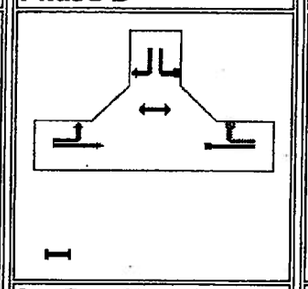
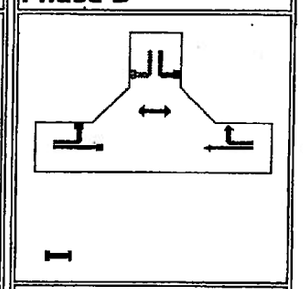
Phasing Summary

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

C = **60** seconds
Cycle Time Option: **User-specified cycle time**
Phase times determined by the program.

Phase A	Phase B	Phase D
		
Green Time = **6** seconds Phase Time = **9** seconds Phase Split = **15 %**	Green Time = **31** seconds Phase Time = **34** seconds Phase Split = **57 %**	Green Time = **14** seconds Phase Time = **17** seconds Phase Split = **28 %**

Normal Movement Permitted/Opposed Stopped Movement
Slip-Lane Opposed Slip-Lane Continuous
Turn On Red

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```
          West        6T   Thru    251     4    1.00     0.95
          North       6R   Right     9     1    1.00     0.95
-----------------------------------------------------------------
North: PR-172 Desde Caguas
          West        4R   Right   268    13    1.00     0.95
          East        7L   Left     20     0    1.00     0.95
-----------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

```
Estudio de Transito Bosques de Cidra                          * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------
  Mov          Left        Through       Right
  ID        ---------    ---------    ---------
             LV    HV     LV    HV     LV    HV
-------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Pueblo Cidra
   5L L     337    11      0     0      0     0
   2T T       0     0    268     2      0     0
-------------------------------------------------
East: PR-787 Desde Guavate
   6T T       0     0    251     4      0     0
   6R R       0     0      0     0      9     1
-------------------------------------------------
North: PR-172 Desde Caguas
   7L L      20     0      0     0      0     0
   4R R       0     0      0     0    268    13
-------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

```
Estudio de Transito Bosques de Cidra                          * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------
  Mov          Left        Through       Right
  ID        ---------    ---------    ---------
            Total  %HV   Total  %HV   Total  %HV
-------------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Pueblo Cidra
   5L L     348   3.2      0   0.0      0   0.0
   2T T       0   0.0    270   0.7      0   0.0
-------------------------------------------------
```


SIDRA INTERSECTION

Output Tables

Estudio de Transito Bosques de Cidra * 2006IN~2

Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM

Run Information

```
Cycle Time =  60  (User-given Cycle Time)

* Basic Parameters:
  Intersection Type: Signalised - Pretimed
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

* Iteration Data:
  No. of Main (Timing-Capacity) Iterations =  2
  Comparison of last two iterations:
    Difference in intersection degree of satn =  1.4 %
    Largest difference in eff. green times =  1 secs
    (max. value for stopping = 2 secs)
  Information on Previous Iteration:
    Cycle Time =  60
    Phase Times: 0,   9,  44
    Critical Movements:    7L,    5L,    6R(2nd)
```

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

```
Estudio de Transito Bosques de Cidra                          * 2006IN~2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-------------------------------------------------------------------------
From      To          Mov          Flow Rate   Flow   Peak Flow
Approach  Approach    ID    Turn    LV    HV   Scale    Factor
-------------------------------------------------------------------------
West: PR-172 Desde Pueblo Cidra
          East        2T    Thru   268     2    1.00     0.95
          North       5L    Left   337    11    1.00     0.95
-------------------------------------------------------------------------
East: PR-787 Desde Guavate
```

```
Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

*  Critical Movement/Green Period

Movement Types:                          Under heading 'Op':
  Slp  Slip Lane Movement                  Y   If opposed turn
  Ped  Pedestrian
  Dum  Dummy
```

Table S.2 - Movement Capacity Parameters

```
Estudio de Transito Bosques de Cidra                                  * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Dem Flow (veh /h)	HV (%)	Satn Flow 1st Grn	Satn Flow 2nd Grn	Flow Ratio 1st Grn	Flow Ratio 2nd Grn	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Pueblo Cidra											
5L L	348	3.2	1045		0.333		540	0.90	40	100	0.645*
2T T	270	0.7	811		0.333		419	0.90	40	100	0.644
East: PR-787 Desde Guavate											
6T T	255	1.6	1798		0.142		420	0.90	48	100	0.608
6R R	10	10.0	12	44	0.313	0.142	17	0.90	50	100	0.600
North: PR-172 Desde Caguas											
7L L	20	0.0	1796		0.011		180	0.90	708	100	0.111
4R R	281	4.6	1557	1102	0.180	0.000	1167	0.90	274	100	0.241
Pedestrian Movements											
P5	1		12000		0.000		8800	0.90		0	0.000

Table S.3 - Intersection Parameters

```
Estudio de Transito Bosques de Cidra                                  * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Crit Mov ID	App. and Turn	Green Period	Phases Fr	Phases To	Adjusted Lost Time	Adjusted Flow Ratio	Required Grn Time Ratio	Required Movement Time
7L	N_L		A	B	9	-	-	9.0Min
5L	W_L		B	D	3	0.333	0.370	25.2
6R	E_R	2nd	D	A	3	0.142	0.158	12.5

East: PR-787 Desde Guavate						
6T T	0	0.0	255	1.6	0	0.0
6R R	0	0.0	0	0.0	10	10.0
North: PR-172 Desde Caguas						
7L L	20	0.0	0	0.0	0	0.0
4R R	0	0.0	0	0.0	281	4.6

```
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.3 - Pedestrian Flow Rates

```
Estudio de Transito Bosques de Cidra                                  * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Stage	Flow Rate (ped/h)	Flow Scale	Peak Flow Factor
Across North Approach				
P5	1		1.00	0.95

```
Unit Time for Volumes :=  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.1 - Movement Phase and Timing Parameters

```
Estudio de Transito Bosques de Cidra                                  * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)
```

Mov ID	Mov Typ	PHASE MATRIX First Green Fr	First Green To	First Green Op Pr	Second Green Fr	Second Green To	Second Green Op Pr	Lost Tim 1st Grn	Lost Tim 2nd Grn	Req.Mov.Time 1st Grn	Req.Mov.Time 2nd Grn	Eff. Grn 1st Grn	Eff. Grn 2nd Grn
West: PR-172 Desde Pueblo Cidra													
5L L		*B	D					3		25.2		31	
2T T		B	D					3		25.2		31	
East: PR-787 Desde Guavate													
6T T		D	A					3		12.5		14	
6R R		A	D	Y	*D	A		11	3	31.9	12.5	32	14
North: PR-172 Desde Caguas													
7L L		*A	B					3		9.0Min		6	
4R R		A	D		D	A	Y	3	10	18.0Min	9.0Min	40	7
Pedestrian Movements													
P5	(Ped)	B	A					7		18.0Min		44	

	(veh-h/h)	(pers-h/h)	(sec)		Rate	(vehs)	(m)		(km/h)
West: PR-172 Desde Pueblo Cidra									
5L L	2.15	2.58	22.2	0.78	0.84	15.8	10	12.65	36.5
2T T	1.04	1.25	13.8	0.78	0.69	15.8	10	9.00	42.5
East: PR-787 Desde Guavate									
6T T	1.79	2.14	25.2	0.94	0.79	9.0	5	10.08	35.0
6R R	0.09	0.11	33.7	0.94	0.83	9.0	5	0.42	30.8
North: PR-172 Desde Caguas									
7L L	0.19	0.23	34.2	0.94	0.70	0.9	0	0.82	30.4
4R R	0.79	0.94	10.1	0.30	0.72	3.2	2	6.37	45.6
Pedestrian Movements									
P5	0.00	0.00	2.1	0.27	0.27	0.0	0	0.01	4.3

Table S.6 - Intersection Performance

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Pueblo Cidra									
618	0.645	3.19	3.83	18.6	0.78	0.78	10	21.65	38.9
East: PR-787 Desde Guavate									
265	0.608	1.88	2.26	25.6	0.94	0.79	5	10.50	34.8
North: PR-172 Desde Caguas									
301	0.241	0.98	1.17	11.7	0.34	0.72	2	7.20	44.2
Pedestrians:									
1	0.000	0.00	0.00	2.1	0.27	0.27	0	0.01	4.3
ALL VEHICLES:									
1184	0.645	6.04	7.25	18.4	0.70	0.77	10	39.34	39.1
INTERSECTION (persons):									
1422	0.645		7.25	18.4	0.70	0.77		39.35	39.1

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Effective Red and Dem Q u e u e

Total:	15	0.475	0.528	46.7

- Flow ratio not used for cycle time calculations and the adjusted lost time equals the required movement time (=Min or Max as shown in Table S.1)

Cycle Time:

Minimum	Maximum	Practical	Chosen
27	150	32	60

(Cycle time specified by the user)

Intersection Level of Service	=	B
Worst movement Level of Service	=	C
Average intersection delay (s)	=	18.4
Largest average movement delay (s)	=	34.2
Largest back of queue, 95% (m)	=	10
Performance Index	=	39.35
Degree of saturation (highest)	=	0.645
Practical Spare Capacity (lowest)	=	40 %
Effective intersection capacity, (veh/h)	=	1837
Total vehicle flow (veh/h)	=	1184
Total pedestrian flow (ped/h)	=	1
Total person flow (pers/h)	=	1422
Total vehicle delay (veh-h/h)	=	6.04
Total pedestrian delay (ped-h/h)	=	0.00
Total person delay (pers-h/h)	=	7.25
Total effective vehicle stops (veh/h)	=	908
Total effective pedestrian stops (ped/h)	=	0
Total effective person stops (pers/h)	=	1089
Total vehicle travel (veh-km/h)	=	736.4
Total cost ($/h)	=	305.88
Total fuel (L/h)	=	97.5
Total CO2 (kg/h)	=	243.95

Table S.4 - Phase Information

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Phase	Change Time	Starting Intgrn	Green Start	Displayed Green	Green End	Terminating Intgrn	Phase Time	Phase Split
A	0	3	3	6	9	3	9	15%
B	9	3	12	31	43	3	34	57%
D	43	3	46	14	60	3	17	28%

Current Phase Sequence: Sequence 1
Input phase sequence: A B D
Output phase sequence: A B D

Table S.5 - Movement Performance

Mov ID	Total Delay	Total Delay	Aver. Delay	Prop. Queued	Eff. Stop	Longest Queue 95% Back	Perf. Index	Aver. Speed

```
Effective (Movement) Green Times

 West: PR-172 Desde Pueblo Cidra

Mov.    5L (L)
I        I                                          I                   I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG..................
              14                                    45

Mov.    2T (T)
I        I                                          I                   I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG..................
              14                                    45

 East: PR-787 Desde Guavate

Mov.    6T (T)
I        I                                          I                   I
G.......................................................GGGGGGGGGGGGGGG
 2                                                   48

Mov.    6R (R)
I        I                                          I                   I
GG............GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...GGGGGGGGGGGGGGG
 2           13                                    45  48

 North: PR-172 Desde Caguas

Mov.    7L (L)
I        I                                          I                   I
......GGGGGG...........................................................
     5       11

Mov.    4R (R)
I        I                                          I                   I
GG....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...........GGGGGGG
 2   5                                              45         55

 Pedestrian Movements

Mov.    P5
I        I                                          I                   I
................GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG...
              14                                                       58

I-----I------I------I------I------I------I------I------I------I------I---->
0     6     12     18     24     30     36     42     48     54     60

                              T I M E  (s)
```

Table S.10 - Movement Capacity and Performance Summary

```
 Estudio de Transito Bosques de Cidra                                  * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

-----------------------------------------------------------------------------
 Mov      Mov  Dem   Total  Lane  Deg.  Eff. Grn  Aver.  Eff.    95%    Perf.
 ID       Typ  Flow   Cap.  Util  Satn  -------- Delay  Stop  Back of  Index
              (veh  (veh               1st  2nd         Rate   Queue
```


Lane No.	Green Times (sec) R1	G1	R2	G2	Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back (vehs)	(m)	Lane Length (m)
West: PR-172 Desde Pueblo Cidra												
1 LT	29	31	0	0	618	959	0.645	18.6	0.78	15.8	9.7	500.0
East: PR-787 Desde Guavate												
1 TR	11	1	34	14	265	436	0.608	25.6	0.79	9.0	5.4	500.0
North: PR-172 Desde Caguas												
1 L	54	6	0	0	20	180	0.111	34.2	0.70	0.9	0.4	500.0
2 R	3	40	10	7	281	1166	0.241	10.1	0.72	3.2	2.4	500.0

Table S.8 - Lane Flow and Capacity Information

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Lane Width (m)	Saturation Flow Adj. Basic (tcu)	Aver 1st (veh)	Aver 2nd (veh)	End Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Pueblo Cidra												
1 LT	348	270	0	618	3.60	1947	1855	0	0	959	0.645	100
East: PR-787 Desde Guavate												
1 TR	0	255	10	265	3.60	1871	595	1826	57	436	0.608	100
North: PR-172 Desde Caguas												
1 L	20	0	0	20	3.60	1890	1796	0	0	180	0.111	100
2 R	0	0	281	281	3.60	1890	1557	1102	60	1166	0.241	100

Basic Saturation Flow in this table is adjusted for lane width, approach grade, parking manoeuvres and number of buses stopping. Saturation flow scale applies if specified.

Table S.9 - Signal Timing Diagram

```
 Estudio de Transito Bosques de Cidra                                  * 2006IN-2
 Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time =  60 (User-given Cycle Time)

Displayed (Phase) Green Times

 Phase A                 Phase B                         Phase D

0        9                                         43                  60
I--------I-----------------------------------------I-------------------I
....GGGGG.....GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG.....GGGGGGGGGGGGGGG.
   3         12                                      46
```

Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Pueblo Cidra						
5L L	10.7	0.40	0.617	27.24	0.642	268.9
2T T	8.3	0.33	0.517	20.00	0.441	206.7
	9.7	0.37	0.573	24.05	0.554	241.6
East: PR-787 Desde Guavate						
6T T	17.8	0.50	0.603	35.51	1.274	446.0
6R R	21.0	0.59	0.727	43.84	1.476	526.9
	17.9	0.51	0.607	35.82	1.282	449.0
North: PR-172 Desde Caguas						
7L L	14.0	0.49	0.644	29.27	0.807	349.5
4R R	16.6	0.43	0.571	35.66	1.199	415.9
	16.4	0.43	0.576	35.24	1.173	411.5
Pedestrian Movements						
P5		1.77				
		1.77				
ALL VEHICLES:	13.2	0.42	0.582	29.53	0.874	331.3
INTERSECTION:	13.2	0.42	0.582	29.53	0.874	331.3

Table S.14 - Summary of Input and Output Data

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Pueblo Cidra												

	/h	/h	(%)	x	Grn	Grn	(sec)		(veh)	
West: PR-172 Desde Pueblo Cidra										
5L L	348	540	100	0.645*	31*		22.2	0.84	15.8	12.65
2T T	270	419	100	0.644	31		13.8	0.69	15.8	9.00
East: PR-787 Desde Guavate										
6T T	255	420	100	0.608	14		25.2	0.79	9.0	10.08
6R R	10	17	100	0.600	32	14*	33.7	0.83	9.0	0.42
North: PR-172 Desde Caguas										
7L L	20	180	100	0.111	6*		34.2	0.70	0.9	0.82
4R R	281	1167	100	0.241	40	7	10.1	0.72	3.2	6.37
Pedestrian Movements										
P5 (Ped)	1	8800	100	0.000	44		2.1	0.27	0.0	0.01

* Maximum degree of saturation, or critical green periods

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Pueblo Cidra						
5L L	23.1	85.67	0.133	5.87	0.138	57.9
2T T	14.0	55.35	0.087	3.38	0.075	34.9
	37.1	141.01	0.220	9.24	0.213	92.8
East: PR-787 Desde Guavate						
6T T	28.4	80.50	0.096	5.66	0.203	71.1
6R R	1.3	3.63	0.005	0.27	0.009	3.3
	29.7	84.14	0.101	5.93	0.212	74.4
North: PR-172 Desde Caguas						
7L L	1.7	6.05	0.008	0.36	0.010	4.3
4R R	28.9	74.63	0.099	6.21	0.209	72.4
	30.6	80.68	0.107	6.57	0.219	76.7
Pedestrian Movements						
P5		0.05				
		0.05				
ALL VEHICLES:	97.5	305.83	0.428	21.75	0.644	244.0
INTERSECTION:	97.5	305.88	0.428	21.75	0.644	244.0

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00

1 LT	348	270		618	2	1947	31		0.645	18.6	10	500
	348	270	0	618	2				0.645	18.6	10	
East: PR-787 Desde Guavate												
1 TR		255	10	265	2	1871	1	14	0.608	25.6	5	500
	0	255	10	265	2				0.608	25.6	5	
North: PR-172 Desde Caguas												
1 L	20			20	0	1890	6		0.111	34.2	0	500
2 R		281		281	5	1890	40	7	0.241	10.1	2	500
	20	0	281	301	4				0.241	11.7	2	
Pedestrians												
Across N approach				1			44		0.000	2.1	0.0	

ALL VEHICLES	Total Flow	% HV	Cycle Time	Max X	Aver. Delay	Max Queue
	1184	3	60	0.645	18.4	10

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows (in through car units) have been adjusted for grade, lane widths, parking manoeuvres and bus stops.

Table S.15 - Capacity and Level of Service

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Typ	Green Time Ratio (g/C) 1st grn	2nd grn	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Pueblo Cidra										
5L	L	0.517*		348	540	0.645*	22.2	C	15.8	10
2T	T	0.517		270	419	0.644	13.8	B	15.8	10
East: PR-787 Desde Guavate										
6T	T	0.233		255	420	0.608	25.2	C	9.0	5
6R	R	0.533	0.233*	10	17	0.600	33.7	C	9.0	5
North: PR-172 Desde Caguas										
7L	L	0.100*		20	180	0.111	34.2	C	0.9	0
4R	R	0.667	0.117	281	1167	0.241	10.1	B	3.2	2
Pedestrian Movements										
P5	(Ped)	0.733		1	8800	0.000	2.1	A	0.0	0
ALL VEHICLES:				1184		0.645	18.4	B	15.8	10
INTERSECTION (persons):				1422			18.4		15.8	10

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

Intersection capacity is calculated considering vehicle movements only.
* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table S.16 - SCATS MF Parameter

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Stopline Flow (veh/h)	Capacity (veh/h)	SCATS Satn Flow	SCATS MF	Deg. Satn x	Lane Util. %
West: PR-172 Desde Pueblo Cidra						
1 LT	618	959.	1891	1725	0.645	100
East: PR-787 Desde Guavate						
1 TR	265	436	1859	NA	0.608	100
North: PR-172 Desde Caguas						
1 L	20	180	1796	1197	0.111	100
2 R	281	1166	1607	1495	0.241	100

NA Not Applicable - SCATS MF was not calculated for this lane due to one of the following reasons:
- the lane is not controlled by signals (slip or continuous lane)
- two movements share this lane and do not run in the same phases

STOPLINE FLOW: Departure flow rate in veh/h as measured at the stop line. This cannot exceed capacity.

SCATS SATURATION FLOW: This allows for lane width, approach grade and turning vehicles. Saturation flow scale applies if specified. The effects of heavy vehicles, parking manoeuvres, number of buses stopping and conflicting pedestrian volume are not included.

SCATS MF: This emulates the MF (Maximum Flow) parameter used in the SCATS control system. It is calculated from the SCATS SATURATION FLOW parameter.

DEG. SATN: The Demand (Arrival) Flow Rate may exceed the Stopline Flow Rate, therefore x > 1 is possible.

Table D.0 - Geometric Delay Data

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream Distance (m)	User Spec?
West: PR-172 Desde Pueblo Cidra								

1 TR	0.608	0.78	0.01	0.00	0.79	0.942	0.17
North: PR-172 Desde Caguas							
1 L	0.111	0.66	0.00	0.04	0.70	0.939	0.00
2 R	0.241	0.26	0.00	0.47	0.72	0.302	0.00

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 LT	0.645	1.5	7.5	1.5	8.9	10.9	13.0	14.1	15.8	17.4	0.02
East: PR-787 Desde Guavate											
1 TR	0.608	0.7	3.8	0.7	4.5	5.6	6.8	7.6	9.0	10.4	0.01
North: PR-172 Desde Caguas											
1 L	0.111	0.0	0.3	0.0	0.3	0.4	0.6	0.7	0.9	1.0	0.00
2 R	0.241	0.3	1.0	0.3	1.4	1.7	2.2	2.5	3.2	3.8	0.00

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Pueblo Cidra											
1 LT	0.645	0.9	4.6	0.9	5.5	6.7	8.0	8.7	9.7	10.7	0.02
East: PR-787 Desde Guavate											
1 TR	0.608	0.4	2.3	0.4	2.7	3.4	4.1	4.6	5.4	6.3	0.01
North: PR-172 Desde Caguas											
1 L	0.111	0.0	0.2	0.0	0.2	0.2	0.3	0.3	0.4	0.5	0.00
2 R	0.241	0.2	0.8	0.2	1.0	1.3	1.7	1.9	2.4	2.9	0.00

Values printed in this table are back of queue (metres).

East	Thru	S	65.0	14.4	500	126	No
North	Left	9.2	19.5	14.4	500	122	No
East: PR-787 Desde Guavate							
West	Thru	S	65.0	14.4	500	127	No
North	Right	10.0	20.2	15.7	500	130	No
North: PR-172 Desde Caguas							
West	Right	10.0	20.2	15.7	500	125	No
East	Left	7.2	17.8	11.3	500	117	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	Delay (seconds/veh) Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
West: PR-172 Desde Pueblo Cidra										
1 LT	0.645	10.5	3.3	13.8	4.7	9.2	0.0	9.2	4.7	18.6
East: PR-787 Desde Guavate										
1 TR	0.608	19.1	6.2	25.2	7.9	17.3	0.1	17.1	0.3	25.6
North: PR-172 Desde Caguas										
1 L	0.111	24.6	1.3	25.8	3.5	22.4	0.0	22.4	8.4	34.2
2 R	0.241	1.2	0.5	1.7	1.2	0.5	0.0	0.5	8.4	10.1

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Estudio de Transito Bosques de Cidra * 2006IN~2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Lane No.	Deg. Satn x	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Prop. Queued pq	Queue Move-up Rate hqm
West: PR-172 Desde Pueblo Cidra							
1 LT	0.645	0.69	0.00	0.08	0.78	0.778	0.00
East: PR-787 Desde Guavate							

Table D.6 - Gap Acceptance Parameters

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Pueblo Cidra					
5L L	Normal	0	4.50	2.50	2.0
East: PR-787 Desde Guavate					
6R R	Normal	348	6.30	3.15	2.0
North: PR-172 Desde Caguas					
4R R	Normal	255	6.01	3.01	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.

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Table D.4 - Movement Speeds (km/h) and Geometric Delay

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Pueblo Cidra									
5L L	56.0	19.5	19.5	65.0			44.4	36.5	8.4
2T T	56.0	0.0	65.0	65.0			49.1	42.5	0.0
East: PR-787 Desde Guavate									
6T T	56.0	0.0	65.0	65.0	1.2	0.0	35.5	35.0	0.0
6R R	56.0	20.2	20.2	65.0	1.2	8.0	43.7	30.8	8.5
North: PR-172 Desde Caguas									
7L L	56.0	17.8	17.8	65.0			43.9	30.4	8.4
4R R	56.0	20.2	20.2	65.0			46.1	45.6	8.4

"Running Speed" is the average speed excluding stopped periods.

Table D.5 - Progression Factors and Actuated Signal Parameters

Estudio de Transito Bosques de Cidra * 2006IN-2
Interseccion Num.3 PR-172 @ PR-787 Ao 2006 (Existente) PM
Intersection ID: 3
Pretimed Signals, Cycle Time = 60 (User-given Cycle Time)

Mov ID	Control	Coord.	Arrival Type	Delay Prog. Factor	Queue Prog. Factor	Disp. Grn. Settings 1st Grn Gmin	1st Grn Gmax	2nd Grn Gmin	2nd Grn Gmax
West: PR-172 Desde Pueblo Cidra									
5L L	PT	No	3	1.000	1.000	6	NA		
2T T	PT	No	3	1.000	1.000	6	NA		
East: PR-787 Desde Guavate									
6T T	PT	No	3	1.000	1.000	6	NA		
6R R	PT	No	3	1.000	1.000	6	NA	6	NA
North: PR-172 Desde Caguas									
7L L	PT	No	3	1.000	1.000	6	NA		
4R R	PT	No	3	1.000	1.000	6	NA	6	NA
Pedestrians									
P5	PT	No	3	1.000	1.000				

SIDRA INTERSECTION

Intersection Summary

Bosques de Cidra Escenario 2014 AM

Interseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	2230 veh/h	2676 pers/h
Percent Heavy Vehicles	1.9 %	
Degree of Saturation	1.000	
Effective Intersection Capacity	2230 veh/h	
95% Back of Queue (m)	6 m	
95% Back of Queue (veh)	12.1 veh	
Control Delay (Total)	8.07 veh-h/h	9.68 pers-h/h
Control Delay (Average)	13.0 s/veh	13.0 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	679 veh/h	815 pers/h
Effective Stop Rate	0.30 per veh	0.30 per pers
Proportion Queued	0.16	0.16
Travel Distance (Total)	1390.5 veh-km/h	1668.6 pers-km/h
Travel Distance (Average)	624 m	624 m
Travel Time (Total)	27.8 veh-h/h	33.4 pers-h/h
Travel Time (Average)	44.9 secs	44.9 secs
Travel Speed	50.0 km/h	50.0 km/h
Operating Cost (Total)	430 $/h	430 $/h
Fuel Consumption (Total)	128.7 L/h	
Carbon Dioxide (Total)	321.9 kg/h	
Hydrocarbons (Total)	0.490 kg/h	
Carbon Monoxide (Total)	14.17 kg/h	
NOX (Total)	0.669 kg/h	

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SIDRA INTERSECTION

Movement Summary

Bosques de Cidra Escenario 2014 AM

Interseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	879	3.1	0.599	0.7	LOS A	0	0.00	0.08	69.1
6R	R	197	0.5	0.599	9.6	LOS A	0	0.00	0.70	54.3
Approach		**1076**	**2.6**	**0.599**	**2.4**	**LOS A**		**0.00**	**0.19**	**65.8**
Farmaceutica GSK										
7L	L	44	0.0	1.000*	189.5	LOS F	6	1.00	1.15	9.9
4R	R	38	0.0	1.000*	189.5	LOS F	6	1.00	1.17	9.9
Approach		**82**	**0.0**	**1.000**	**189.5**	**LOS F**	**6**	**1.00**	**1.16**	**9.9**
PR-172 Desde Cidra										
5L	L	296	0.0	0.831	35.1	LOS E	3	0.95	1.09	33.4
2T	T	776	1.8	0.408	0.7	LOS A	0	0.00	0.08	69.1
Approach		**1072**	**1.3**	**0.830**	**10.2**	**LOS B**	**3**	**0.26**	**0.35**	**53.5**
All Vehicles		**2230**	**1.9**	**1.000**	**13.0**	**Not Applicable**	**6**	**0.16**	**0.30**	**50.0**

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Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left LV	Left HV	Through LV	Through HV	Right LV	Right HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
5L L	296	0	0	0	0	0
2T T	0	0	762	14	0	0
East: PR-172 Desde Caguas						
6T T	0	0	852	27	0	0
6R R	0	0	0	0	196	1
North: Farmaceutica GSK						
7L L	44	0	0	0	0	0
4R R	0	0	0	0	38	0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Left Total	Left %HV	Through Total	Through %HV	Right Total	Right %HV
Demand flows in veh/hour as used by the program						
West: PR-172 Desde Cidra						
5L L	296	0.0	0	0.0	0	0.0
2T T	0	0.0	776	1.8	0	0.0
East: PR-172 Desde Caguas						
6T T	0	0.0	879	3.1	0	0.0
6R R	0	0.0	0	0.0	197	0.5
North: Farmaceutica GSK						
7L L	44	0.0	0	0.0	0	0.0
4R R	0	0.0	0	0.0	38	0.0

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2014 AM

Interseccion PR-172 @ Farmeceutica GSK

Run Information

* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
  Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

From Approach	To Approach	Mov ID	Turn	Flow Rate LV	Flow Rate HV	Flow Scale	Peak Flow Factor
West: PR-172 Desde Cidra							
	East	2T	Thru	762	14	1.00	0.92
	North	5L	Left	296	0	1.00	0.25
East: PR-172 Desde Caguas							
	West	6T	Thru	852	27	1.00	0.86
	North	6R	Right	196	1	1.00	0.75
North: Farmaceutica GSK							
	West	4R	Right	38	0	1.00	0.58
	East	7L	Left	44	0	1.00	0.63

Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue 95% Back (vehs)	(m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	2.89	3.47	35.1	0.95	1.09	6.9	3	9.51	33.4
2T T	0.16	0.19	0.7	0.00	0.08	0.0	0	7.23	69.1
East: PR-172 Desde Caguas									
6T T	0.18	0.22	0.7	0.00	0.08	0.0	0	8.19	69.1
6R R	0.52	0.63	9.6	0.00	0.70	0.0	0	2.99	54.3
North: Farmaceutica GSK									
7L L	2.32	2.78	189.5	1.00	1.15	12.1	6	5.20	9.9
4R R	2.00	2.40	189.5	1.00	1.17	12.1	6	4.50	9.9

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
1072	0.831	3.05	3.66	10.2	0.26	0.35	3	16.73	53.5
East: PR-172 Desde Caguas									
1076	0.599	0.71	0.85	2.4	0.00	0.19	0	11.17	65.8
North: Farmaceutica GSK									
82	1.000	4.32	5.18	189.5	1.00	1.16	6	9.70	9.9
ALL VEHICLES:									
2230	1.000	8.07	9.68	13.0	0.16	0.30	6	37.60	50.0
INTERSECTION (persons):									
2676	1.000		9.68	13.0	0.16	0.30		37.60	50.0

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	296	0.0	1076	2.6	1076	356	0.80	-4	100	0.831
2T T	776	1.8	0			1900	0.80	96	100	0.408
East: PR-172 Desde Caguas										
6T T	879	3.1	0			1467	0.80	34	100	0.599
6R R	197	0.5	0			329	0.80	34	100	0.599
North: Farmaceutica GSK										
7L L	44	0.0	2050+	2.0	2050	44	0.80	-20	100	1.000*
4R R	38	0.0	977+	2.8	978.	38	0.80	-20	100	1.000*

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	13.0
Largest average movement delay (s)	=	189.5
Largest back of queue, 95% (m)	=	6
Performance Index	=	37.60
Degree of saturation (highest)	=	1.000
Practical Spare Capacity (lowest)	=	-20 %
Effective intersection capacity, (veh/h)	=	2230
Total vehicle flow (veh/h)	=	2230
Total person flow (pers/h)	=	2676
Total vehicle delay (veh-h/h)	=	8.07
Total person delay (pers-h/h)	=	9.68
Total effective vehicle stops (veh/h)	=	679
Total effective person stops (pers/h)	=	815
Total vehicle travel (veh-km/h)	=	1390.5
Total cost ($/h)	=	430.14
Total fuel (L/h)	=	128.7
Total CO2 (kg/h)	=	321.95

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	296	356	100	0.831	35.1	1.09	6.9	9.51
2T	T	776	1900	100	0.408	0.7	0.08	0.0	7.23
East: PR-172 Desde Caguas									
6T	T	879	1467	100	0.599	0.7	0.08	0.0	8.19
6R	R	197	329	100	0.599	9.6	0.70	0.0	2.99
North: Farmaceutica GSK									
7L	L	44	44	100	1.000*	189.5	1.15	12.1	5.20
4R	R	38	38	100	1.000*	189.5	1.17	12.1	4.50

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
5L L	24.9	83.92	0.116	5.10	0.152	62.4
2T T	35.7	113.06	0.117	2.04	0.175	89.4
	60.7	196.98	0.233	7.14	0.327	151.8
East: PR-172 Desde Caguas						
6T T	41.7	129.81	0.133	2.31	0.198	104.3
6R R	14.5	40.35	0.063	3.13	0.096	36.3
	56.2	170.17	0.196	5.45	0.293	140.6
North: Farmaceutica GSK						
7L L	6.3	33.79	0.033	0.85	0.026	15.9
4R R	5.5	29.19	0.028	0.73	0.023	13.7
	11.8	62.99	0.061	1.59	0.049	29.6
INTERSECTION:	128.7	430.14	0.490	14.17	0.669	321.9

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	296	356	0.830	35.1	1.09	6.9	3.5	45.0T
2 T	776	1900	0.408	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	1076	1796	0.599	2.4	0.19	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	82	82	1.000	189.5	1.16	12.1	6.1	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	296	0	0	296	120	356	0.830	100
2 T	0	776	0	776	776	1900	0.408	100
East: PR-172 Desde Caguas								
1 TR	0	879	197	1076	1076	1796	0.599	100
North: Farmaceutica GSK								
1 LR	44	0	38	82	82	82	1.000	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2014 AM
Intersección PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

44	0	38	82	0	1.000	189.5	6

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	2230	2	1.000	13.0	6

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	296	356	0.831	35.1	E	6.9	3
2T	T	776	1900	0.408	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	879	1467	0.599	0.7	A	0.0	0
6R	R	197	329	0.599	9.6	A	0.0	0
North: Farmaceutica GSK								
7L	L	44	44	1.000*	189.5	F	12.1	6
4R	R	38	38	1.000*	189.5	F	12.1	6
ALL VEHICLES:		2230		1.000	13.0	NA	12.1	6

Level of Service calculations are based on
average control delay including geometric delay (HCM criteria),
independent of the current delay definition used.
For the criteria, refer to the "Level of Service" topic in the
SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods
" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	13.7	0.46	0.634	27.95	0.832	341.5
2T T	7.4	0.23	0.241	4.20	0.360	184.3
	9.1	0.29	0.349	10.69	0.489	227.3
East: PR-172 Desde Caguas						
6T T	7.6	0.24	0.242	4.21	0.360	189.7
6R R	11.9	0.33	0.518	25.66	0.783	297.3
	8.4	0.25	0.292	8.11	0.437	209.2
North: Farmaceutica GSK						
7L L	23.3	1.24	1.200	31.29	0.971	582.7
4R R	23.3	1.24	1.197	31.15	0.969	581.7
	23.3	1.24	1.199	31.22	0.970	582.3
INTERSECTION:	9.3	0.31	0.352	10.19	0.481	231.5

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st 2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra											
1 L	296			296	0			0.830	35.1	3	45
2 T		776		776	2			0.408	0.7	0	500
	296	776	0	1072	1			0.830	10.2	3	
East: PR-172 Desde Caguas											
1 TR		879	197	1076	3			0.599	2.4	0	500
	0	879	197	1076	3			0.599	2.4		
North: Farmaceutica GSK											
1 LR	44		38	82	0			1.000	189.5	6	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	128	No
	North	Right	10.0	20.2	15.7	500	121	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
		Delay (seconds/veh)								
West: PR-172 Desde Cidra										
1 L	0.830	12.0	13.5	25.5	3.6	22.0	2.3	19.7	9.6	35.1
2 T	0.408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.599	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4
North: Farmaceutica GSK										
1 LR	1.000	43.9	140.6	184.5	2.0	182.4	3.6	178.8	5.0	189.5

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	Deg.	-- Effective Stop Rate --	Prop.	Queue Move-up

Lane No.	Satn x	he1	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.830	0.95	0.10	0.03	1.09	0.955	1.45
2 T	0.408	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.599	0.00	0.00	0.19	0.19	0.000	0.00
North: Farmaceutica GSK							
1 LR	1.000	1.00	0.16	0.00	1.16	1.000	2.60

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.830	1.1	1.3	1.0	2.3	4.0	4.9	5.6	6.9	8.1	0.08
2 T	0.408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.599	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.000	3.5	1.6	2.5	4.1	6.7	8.4	9.6	12.1	14.2	0.01

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.830	0.6	0.6	0.5	1.1	2.0	2.4	2.8	3.5	4.0	0.08
2 T	0.408	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

1 TR	0.599	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.000	1.7	0.8	1.3	2.1	3.4	4.2	4.8	6.1	7.1	0.01

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0	3.2		47.4	33.4	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.6
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	2.6		48.0	9.9	5.0
4R R	72.0	0.0	20.2	65.0	3.0		47.5	9.9	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2014 AM
Interseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	1076	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	2050+	7.50	3.50	2.0
4R R	Normal	978+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

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Intersection Summary

Bosques de Cidra Escenario 2014 PM

INterseccion PR-172 @ Farmeceutica GSK

Performance Measure	Vehicles	Persons
Demand Flows - Total	1809 veh/h	2171 pers/h
Percent Heavy Vehicles	1.5 %	
Degree of Saturation	1.647	
Effective Intersection Capacity	1098 veh/h	
95% Back of Queue (m)	18 m	
95% Back of Queue (veh)	35.6 veh	
Control Delay (Total)	20.48 veh-h/h	24.57 pers-h/h
Control Delay (Average)	40.8 s/veh	40.8 s/pers
Level of Service	Not Applicable	
Level of Service (Worst Movement)	LOS F	
Total Effective Stops	406 veh/h	487 pers/h
Effective Stop Rate	0.22 per veh	0.22 per pers
Proportion Queued	0.11	0.11
Travel Distance (Total)	1129.8 veh-km/h	1355.7 pers-km/h
Travel Distance (Average)	625 m	625 m
Travel Time (Total)	36.7 veh-h/h	44.0 pers-h/h
Travel Time (Average)	73.0 secs	73.0 secs
Travel Speed	30.8 km/h	30.8 km/h
Operating Cost (Total)	495 $/h	495 $/h
Fuel Consumption (Total)	116.9 L/h	
Carbon Dioxide (Total)	292.3 kg/h	
Hydrocarbons (Total)	0.474 kg/h	
Carbon Monoxide (Total)	9.12 kg/h	
NOX (Total)	0.512 kg/h	

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Movement Summary

Bosques de Cidra Escenario 2014 PM * 2013IN~1

INterseccion PR-172 @ Farmeceutica GSK

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
PR-172 Desde Caguas										
6T	T	843	1.8	0.469	0.7	LOS A	0	0.00	0.08	69.1
6R	R	28	0.0	0.467	9.5	LOS A	0	0.00	0.70	54.3
Approach		**871**	**1.7**	**0.469**	**1.0**	**LOS A**		**0.00**	**0.10**	**68.5**
Farmaceutica GSK										
7L	L	165	0.0	1.602	373.0	LOS F	18	1.00	1.29	5.4
4R	R	28	0.0	1.647	373.0	LOS F	18	1.00	1.33	5.5
Approach		**193**	**0.0**	**1.608**	**373.0**	**LOS F**	**18**	**1.00**	**1.29**	**5.4**
PR-172 Desde Cidra										
5L	L	20	0.0	0.036	14.9	LOS B	0	0.67	0.88	48.0
2T	T	725	1.8	0.382	0.7	LOS A	0	0.00	0.08	69.1
Approach		**745**	**1.7**	**0.382**	**1.1**	**LOS A**	**0**	**0.02**	**0.10**	**68.3**
All Vehicles		**1809**	**1.5**	**1.647**	**40.8**	**Not Applicable**	**18**	**0.11**	**0.22**	**30.8**

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Table B.2A - Flow Rates (Separate Light and Heavy Vehicles)

```
 Bosques de Cidra Escenario 2014 PM                                  * 2013IN~1
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-----------------------------------------------
  Mov          Left       Through       Right
  ID        ---------    ---------    ---------
             LV    HV     LV    HV     LV    HV
-----------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Cidra
   5L L      20     0      0     0      0     0
   2T T       0     0    712    13      0     0
-----------------------------------------------
East: PR-172 Desde Caguas
   6T T       0     0    828    15      0     0
   6R R       0     0      0     0     28     0
-----------------------------------------------
North: Farmaceutica GSK
   7L L     165     0      0     0      0     0
   4R R       0     0      0     0     28     0
-----------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table B.2B - Flow Rates (Total Vehicles and Percent Heavy)

```
 Bosques de Cidra Escenario 2014 PM                                  * 2013IN~1
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-----------------------------------------------
  Mov          Left       Through       Right
  ID        ---------    ---------    ---------
            Total  %HV   Total  %HV   Total  %HV
-----------------------------------------------
Demand flows in veh/hour as used by the program
West: PR-172 Desde Cidra
   5L L      20   0.0      0   0.0      0   0.0
   2T T       0   0.0    725   1.8      0   0.0
-----------------------------------------------
East: PR-172 Desde Caguas
   6T T       0   0.0    843   1.8      0   0.0
   6R R       0   0.0      0   0.0     28   0.0
-----------------------------------------------
North: Farmaceutica GSK
   7L L     165   0.0      0   0.0      0   0.0
   4R R       0   0.0      0   0.0     28   0.0
-----------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```


SIDRA INTERSECTION

Output Tables

Bosques de Cidra Escenario 2014 PM * 2013IN~1

INterseccion PR-172 @ Farmeceutica GSK

Run Information

```
* Basic Parameters:
  Intersection Type: Unsignalised - Two-Way Stop Control
  Driving on the right-hand side of the road
  Input data specified in Metric units
  Model Defaults: US HCM (Metric)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  Delay definition: Control delay
                    Geometric delay included
  HCM Delay Model option selected
  HCM Queue Model option selected
  Level of Service based on: Delay (HCM method)
  Queue definition: Back of queue, 95th Percentile
```

Table B.1 - Movement Definitions and Flow Rates (Origin-Destination)

```
 Bosques de Cidra Escenario 2014 PM                                  * 2013IN~1
 INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

-------------------------------------------------------------------------------
 From       To          Mov                Flow Rate   Flow   Peak Flow
 Approach   Approach    ID     Turn        LV    HV    Scale    Factor
-------------------------------------------------------------------------------
 West: PR-172 Desde Cidra
            East        2T     Thru       712    13    1.00     0.92
            North       5L     Left        20     0    1.00     0.25
-------------------------------------------------------------------------------
 East: PR-172 Desde Caguas
            West        6T     Thru       828    15    1.00     0.86
            North       6R     Right       28     0    1.00     0.75
-------------------------------------------------------------------------------
 North: Farmaceutica GSK
            West        4R     Right       28     0    1.00     0.58
            East        7L     Left       165     0    1.00     0.63
-------------------------------------------------------------------------------
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Table S.5 - Movement Performance

Mov ID	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest 95% Back (vehs)	Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
5L L	0.08	0.10	14.9	0.67	0.88	0.2	0	0.40	48.0
2T T	0.15	0.18	0.7	0.00	0.08	0.0	0	6.75	69.1
East: PR-172 Desde Caguas									
6T T	0.17	0.21	0.7	0.00	0.08	0.0	0	7.85	69.1
6R R	0.07	0.09	9.5	0.00	0.70	0.0	0	0.42	54.3
North: Farmaceutica GSK									
7L L	17.10	20.51	373.0	1.00	1.29	35.6	18	31.28	5.4
4R R	2.90	3.48	373.0	1.00	1.33	35.6	18	5.31	5.5

Table S.6 - Intersection Performance

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Total Flow (veh/h)	Deg. Satn x	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Prop. Queued	Eff. Stop Rate	Longest Queue (m)	Perf. Index	Aver. Speed (km/h)
West: PR-172 Desde Cidra									
745	0.382	0.23	0.28	1.1	0.02	0.10	0	7.15	68.3
East: PR-172 Desde Caguas									
871	0.469	0.25	0.30	1.0	0.00	0.10	0	8.28	68.5
North: Farmaceutica GSK									
193	1.647	20.00	24.00	373.0	1.00	1.29	18	36.60	5.4
ALL VEHICLES:									
1809	1.647	20.48	24.57	40.8	0.11	0.22	18	52.03	30.8
INTERSECTION (persons):									
2171	1.647		24.57	40.8	0.11	0.22		52.03	30.8

Queue values in this table are 95% back of queue (metres).

Table S.7 - Lane Performance

Table S.2 - Movement Capacity Parameters

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Demand Flow (veh/h)	HV (%)	Opposing Movement Flow (veh/h)	HV (%)	Adjust. Flow (pcu/h)	Total Cap. (veh /h)	Prac. Deg. Satn xp	Prac. Spare Cap. (%)	Lane Util (%)	Deg. Satn x
West: PR-172 Desde Cidra										
5L L	20	0.0	871	1.7	871	554	0.80	2116	100	0.036
2T T	725	1.8	0			1900	0.80	110	100	0.382
East: PR-172 Desde Caguas										
6T T	843	1.8	0			1798	0.80	71	100	0.469
6R R	28	0.0	0			60	0.80	71	100	0.467
North: Farmaceutica GSK										
7L L	165	0.0	1602+	1.7	1602	103	0.80	-50	100	1.602
4R R	28	0.0	857+	1.8	857	17	0.80	-51	100	1.647*

\+ Percentage of exiting flow included in total opposing flow

Table S.3 - Intersection Parameters

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Intersection Level of Service	=	NA
Worst movement Level of Service	=	F
Average intersection delay (s)	=	40.8
Largest average movement delay (s)	=	373.0
Largest back of queue, 95% (m)	=	18
Performance Index	=	52.03
Degree of saturation (highest)	=	1.647
Practical Spare Capacity (lowest)	=	-51 %
Effective intersection capacity, (veh/h)	=	1098
Total vehicle flow (veh/h)	=	1809
Total person flow (pers/h)	=	2171
Total vehicle delay (veh-h/h)	=	20.48
Total person delay (pers-h/h)	=	24.57
Total effective vehicle stops (veh/h)	=	406
Total effective person stops (pers/h)	=	487
Total vehicle travel (veh-km/h)	=	1129.8
Total cost ($/h)	=	494.62
Total fuel (L/h)	=	116.9
Total CO2 (kg/h)	=	292.31

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections. See Table S.15 or Movement Displays for individual movement LOS values.

Mov ID	Mov Typ	Dem Flow (veh /h)	Total Cap. (veh /h)	Lane Util (%)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	95% Back of Queue (veh)	Perf. Index
West: PR-172 Desde Cidra									
5L	L	20	554	100	0.036	14.9	0.88	0.2	0.40
2T	T	725	1900	100	0.382	0.7	0.08	0.0	6.75
East: PR-172 Desde Caguas									
6T	T	843	1798	100	0.469	0.7	0.08	0.0	7.85
6R	R	28	60	100	0.467	9.5	0.70	0.0	0.42
North: Farmaceutica GSK									
7L	L	165	103	100	1.602	373.0	1.29	35.6	31.28
4R	R	28	17	100	1.647*	373.0	1.33	35.6	5.31

* Maximum degree of saturation

Table S.12A - Fuel Consumption, Emissions and Cost (TOTAL)

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Fuel Total L/h	Cost Total $/h	HC Total kg/h	CO Total kg/h	NOX Total kg/h	CO2 Total kg/h
West: PR-172 Desde Cidra						
5L L	1.5	4.42	0.007	0.33	0.010	3.8
2T T	33.4	105.61	0.109	1.90	0.163	83.5
	34.9	110.03	0.116	2.24	0.173	87.3
East: PR-172 Desde Caguas						
6T T	38.8	122.79	0.127	2.21	0.190	97.1
6R R	2.0	5.67	0.009	0.44	0.013	5.1
	40.8	128.46	0.136	2.65	0.203	102.1
North: Farmaceutica GSK						
7L L	35.2	218.97	0.190	3.62	0.116	87.9
4R R	6.0	37.16	0.032	0.61	0.020	14.9
	41.1	256.13	0.222	4.24	0.136	102.8
INTERSECTION:	116.9	494.62	0.474	9.12	0.512	292.3

PARAMETERS USED IN COST CALCULATIONS

Pump price of fuel ($/L)	=	0.650
Fuel resource cost factor	=	0.70
Ratio of running cost to fuel cost	=	3.0
Average income ($/h)	=	19.00
Time value factor	=	0.40
Light vehicle mass (1000 kg)	=	1.4
Heavy vehicle mass (1000 kg)	=	11.0
Light vehicle idle fuel rate (L/h)	=	1.350
Heavy vehicle idle fuel rate (L/h)	=	2.000

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh /h)	Cap (veh /h)	Deg. Satn x	Aver. Delay (sec)	Eff. Stop Rate	Queue 95% Back (vehs)	Queue 95% Back (m)	Lane Length (m)
West: PR-172 Desde Cidra								
1 L	20	554	0.036	14.9	0.88	0.2	0.1	45.0T
2 T	725	1900	0.382	0.7	0.08	0.0	0.0	500.0
East: PR-172 Desde Caguas								
1 TR	871	1857	0.469	1.0	0.10	0.0	0.0	500.0
North: Farmaceutica GSK								
1 LR	193	120	1.608	373.0	1.29	35.6	17.8	500.0

T Short lane due to specification of Turn Slot

Table S.8 - Lane Flow and Capacity Information

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Dem Flow (veh/h) Lef	Thru	Rig	Tot	Min Cap (veh /h)	Tot Cap (veh /h)	Deg. Satn x	Lane Util %
West: PR-172 Desde Cidra								
1 L	20	0	0	20	20	554	0.036	100
2 T	0	725	0	725	725	1900	0.382	100
East: PR-172 Desde Caguas								
1 TR	0	843	28	871	871	1857	0.469	100
North: Farmaceutica GSK								
1 LR	165	0	28	193	120	120	1.608	100

The capacity value for priority and continuous movements is obtained by adjusting the basic saturation flow for heavy vehicle and turning vehicle effects. Saturation flow scale applies if specified.

Table S.10 - Movement Capacity and Performance Summary

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

165	0	28	193	0	1.608	373.0	18	

ALL VEHICLES	Total Flow	% HV	Max X	Aver. Delay	Max Queue
	1809	2	1.647	40.8	18

Peak flow period = 15 minutes.

Queue values in this table are 95% back of queue (metres).

Note: Basic Saturation Flows are not adjusted at roundabouts or sign-controlled intersections and apply only to continuous lanes.

Table S.15 - Capacity and Level of Service

Bosques de Cidra Escenario 2014 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

* 2013IN~1

Mov ID	Mov Typ	Total Flow (veh /h)	Total Cap. (veh /h)	Deg. of Satn (v/c)	Aver. Delay (sec)	LOS	Longest Queue 95% Back (vehs)	(m)
West: PR-172 Desde Cidra								
5L	L	20	554	0.036	14.9	B	0.2	0
2T	T	725	1900	0.382	0.7	A	0.0	0
East: PR-172 Desde Caguas								
6T	T	843	1798	0.469	0.7	A	0.0	0
6R	R	28	60	0.467	9.5	A	0.0	0
North: Farmaceutica GSK								
7L	L	165	103	1.602	373.0	F	35.6	18
4R	R	28	17	1.647*	373.0	F	35.6	18
ALL VEHICLES:		1809		1.647	40.8	NA	35.6	18

Level of Service calculations are based on average control delay including geometric delay (HCM criteria), independent of the current delay definition used. For the criteria, refer to the "Level of Service" topic in the SIDRA Output Guide or the Output section of the on-line help.

NA Not Applicable - Intersection Level of Service is not calculated at two-way stop control or give-way/yield controlled intersections.

* Maximum v/c ratio, or critical green periods

" Movement Level of service has been determined using adjacent lane v/c ratio rather than short lane v/c ratio (v/c=1.0)

Table D.0 - Geometric Delay Data

Bosques de Cidra Escenario 2014 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

* 2013IN~1

Table S.12B - Fuel Consumption, Emissions and Cost (RATE)

Bosques de Cidra Escenario 2014 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

* 2013IN~1

Mov ID	Fuel Rate L/100km	Cost Rate $/km	HC Rate g/km	CO Rate g/km	NOX Rate g/km	CO2 Rate g/km
West: PR-172 Desde Cidra						
5L L	12.3	0.36	0.555	27.02	0.804	308.4
2T T	7.4	0.23	0.241	4.20	0.360	184.2
	7.5	0.24	0.250	4.80	0.372	187.5
East: PR-172 Desde Caguas						
6T T	7.4	0.23	0.241	4.20	0.360	184.2
6R R	11.6	0.33	0.512	25.09	0.764	291.2
	7.5	0.24	0.250	4.86	0.373	187.6
North: Farmaceutica GSK						
7L L	34.4	2.14	1.860	35.49	1.137	861.2
4R R	34.4	2.14	1.856	35.37	1.135	859.8
	34.4	2.14	1.860	35.48	1.137	861.0
INTERSECTION:	10.3	0.44	0.420	8.07	0.453	258.7

Table S.14 - Summary of Input and Output Data

Bosques de Cidra Escenario 2014 PM
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

* 2013IN~1

Lane No.	Demand Flow (veh/h) L	T	R	Tot	%HV	Adj. Basic Satf.	Eff Grn (secs) 1st	2nd	Deg Sat x	Aver. Delay (sec)	Longest Queue (m)	Shrt Lane (m)
West: PR-172 Desde Cidra												
1 L	20			20	0				0.036	14.9	0	45
2 T		725		725	2				0.382	0.7	0	500
	20	725	0	745	2				0.382	1.1	0	
East: PR-172 Desde Caguas												
1 TR		843	28	871	2				0.469	1.0	0	500
	0	843	28	871	2				0.469	1.0		
North: Farmaceutica GSK												
1 LR	165		28	193	0				1.608	373.0	18	500

From Approach	To Approach	Turn	Negn Radius (m)	Negn Speed (km/h)	Negn Dist. (m)	Appr. Dist. (m)	Downstream (m)	Distance User Spec?
West: PR-172 Desde Cidra								
	East	Thru	S	65.0	11.1	500	127	No
	North	Left	7.4	18.0	11.7	500	117	No
East: PR-172 Desde Caguas								
	West	Thru	S	65.0	11.1	500	127	No
	North	Right	10.0	20.2	15.7	500	120	No
North: Farmaceutica GSK								
	West	Right	10.0	20.2	15.7	500	120	No
	East	Left	9.0	19.4	14.2	500	119	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

Table D.1 - Lane Delays

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
		Delay (seconds/veh)								
West: PR-172 Desde Cidra										
1 L	0.036	5.3	0.0	5.3	2.5	2.8	0.0	2.8	9.6	14.9
2 T	0.382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
East: PR-172 Desde Caguas										
1 TR	0.469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
North: Farmaceutica GSK										
1 LR	1.608	30.0	338.0	368.0	2.0	366.0	6.7	359.2	5.0	373.0

dn is average stop-start delay for all vehicles queued and unqueued

Table D.2 - Lane Stops

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

	Deg.	-- Effective Stop Rate --		Prop.	Queue Move-up

Lane No.	Satn x	hel	he2	Geom. hig	Overall h	Queued pq	Rate hqm
West: PR-172 Desde Cidra							
1 L	0.036	0.64	0.00	0.24	0.88	0.670	0.00
2 T	0.382	0.00	0.00	0.08	0.08	0.000	0.00
East: PR-172 Desde Caguas							
1 TR	0.469	0.00	0.00	0.10	0.10	0.000	0.00
North: Farmaceutica GSK							
1 LR	1.608	1.00	0.29	0.00	1.29	1.000	4.80

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Table D.3A - Lane Queues (veh)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn x	Ovrfl. Queue No	Average (veh) Nb1	Nb2	Nb	Percentile (veh) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.036	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.00
2 T	0.382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											
1 TR	0.469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.608	11.0	2.9	10.6	13.6	18.0	23.4	27.5	35.6	42.4	0.04

Values printed in this table are back of queue (vehicles).

Table D.3B - Lane Queues (metres)

Bosques de Cidra Escenario 2014 PM * 2013IN-1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Lane No.	Deg. Satn. x	Ovrfl. Queue No	Average (metres) Nb1	Nb2	Nb	Percentile (metres) 70%	85%	90%	95%	98%	Queue Stor. Ratio
West: PR-172 Desde Cidra											
1 L	0.036	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.00
2 T	0.382	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
East: PR-172 Desde Caguas											

1 TR	0.469	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
North: Farmaceutica GSK											
1 LR	1.608	5.5	1.5	5.3	6.8	9.0	11.7	13.7	17.8	21.2	0.04

Values printed in this table are back of queue (metres).

Table D.4 - Movement Speeds (km/h) and Geometric Delay

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay (sec)
West: PR-172 Desde Cidra									
5L L	72.0	18.0	18.0	65.0			51.1	48.0	9.6
2T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
East: PR-172 Desde Caguas									
6T T	72.0	65.0	65.0	65.0			69.1	69.1	0.7
6R R	72.0	20.2	20.2	65.0			54.3	54.3	9.5
North: Farmaceutica GSK									
7L L	72.0	0.0	19.4	65.0	2.8		44.9	5.4	5.0
4R R	72.0	0.0	20.2	65.0	3.2		44.1	5.5	5.0

"Running Speed" is the average speed excluding stopped periods.

Table D.6 - Gap Acceptance Parameters

Bosques de Cidra Escenario 2014 PM * 2013IN~1
INterseccion PR-172 @ Farmeceutica GSK
Intersection ID: 1
Stop Sign Controlled Intersection

Mov ID	Mov Type	Opng Flow (pcu/h)	Crit Gap (s)	Foll-up Headway (s)	Entry HV Equiv
West: PR-172 Desde Cidra					
5L L	Normal	871	4.10	2.20	2.0
East: PR-172 Desde Caguas					
No opposed movements on this approach					
North: Farmaceutica GSK					
7L L	Normal	1602+	7.50	3.50	2.0
4R R	Normal	857+	6.90	3.30	2.0

Values in this table are adjusted for heavy vehicles in the entry stream.
+ Percentage of exiting flow included in total opposing flow

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