

Honoring our past; Embracing our present; Planning our future

# Wylie Downtown Traffic Study

WELCOME TO HISTORIC DOWNTOWN WYLIE

Traffic Analysis Progress Report Meeting September 27, 2022



### Agenda for Today

- Study Purpose (refresher)
- Study Progress (what we've done)
- Study Methodology (how we did it)
- Recommended options
- Questions going forward for City & Stakeholders to answer



### Reminder - Study Purpose

#### What this study <u>is</u>:

- <u>Recommendation</u> of earlier NCTCOG
   Downtown Wylie Strategic Plan
- Detailed look at impacts of alternative roadway configurations
- Aid in helping City & stakeholders decide if one-way streets and/or other improvements should be introduced in Downtown Wylie to:
  - Improve safety and comfort for pedestrians (first), and then drivers
  - Maintain <u>or</u> improve vehicular access, parking convenience & traffic flow



### Reminder - Study Purpose

#### • What this study *is not*:

- Repeat of earlier NCTCOG study to document existing conditions
- Repeat discussion of priority goals
- Detailed **design** of improvements





- City & Lee Engineering:
  - Collected data on pedestrian & traffic counts
  - Estimated future traffic demand
  - Modeled traffic operations (pedestrian delay, vehicle delay) for each option
    - Weekday AM, PM, Sat. peak hours
    - Eliminated poor alternative combos



2%

1%

2%

1%

2%

1%

2% 1%

X% 2028 AM Build vs. 2045 AM Assumed Annual Growth 2028 PM Build vs. 2045 PM Assumed Annual Growth X%

Peak Direction

Off-Peak Direction

¥%

- 3% 2% **2%** 3% 1% Eubanks 2% 1% **2%** 3% 1% 2% SH 78 1% 2% 3% 2% 2% 1% 3% 2% 2% 3% 1% 2% • Grew existing traffic
  - volumes
    - Referred to NCTCOG travel demand model

 Re-assigned traffic for new roadway capacity (TxDOT, City)

Utilized
 StreetLight
 probe data to
 estimate
 bypass
 diversion



- Assumed new trips for future development
  - City (EDC) owned parcels
  - Other downtown redevelopment



- ~550,000 sf of new or redeveloped land downtown by 2045
- Coordinated trip generation & assignment w/ zoning

- **Re-assigned trips** to new traffic patterns
  - One-way streets
  - Manual reassignment (labor intensive):
    - 26 intersections x
    - 12 movements each x
    - 9 options x
    - 3 peak hours (AM, PM, Sat) x
    - Many origins & destinations each = 100,000+ data points to consider!



- Assumed improvements where needed & practical
  - Curb bump-outs, crosswalks, Rectangular Rapid-Flashing Beacons (RRFB) sign assemblies for pedestrians
  - Most downtown core intersections signalized by 2045



A Rectangular Rapid-Flashing Beacon (RRFB). Source: Carol Kachadoorian (2012) pedbikesafe.org

- Evaluated operations for future conditions:
  - 2024 medium-term design year with Parker Road widening & Park Blvd extension
  - Future (2045) long-term design year with increased business density downtown
  - With <u>and</u> without one-way street conversions



### **Scenarios Considered**

- One-way or two-way traffic (Ballard, Jackson & Birmingham)
  - I Two-Way (existing)
  - II Two-Way (with revised parking)
  - III One-Way (Ballard NB / Jackson SB)
  - IV One-Way (Ballard NB / Birmingham SB)
- Use existing Birmingham (i) or extend north to Brown (ii)?



Example:



### Too Many Scenarios!

4 two-way/one-way scenarios x
2 Birmingham extension scenarios x
2 north-side transition scenarios x
5 south-side transition scenarios =
80 scenarios = too many!

Even **more** scenarios to consider later for parking angles & sidewalk widths, so...

We'll focus on **pedestrian** & **traffic** analysis first



### Narrow to reasonable number of options

#### Solution:

- Conduct initial analysis on a few options judged most promising
- Eliminate options based on their traffic & pedestrian characteristics compared to the analyzed options
- Target 8 to 10 options for detailed traffic analysis (independent of parking angle)
- Narrow to 2 or 3 recommended options for final consideration



### **Option 1: Existing Conditions**

Two-Way Traffic on Birmingham

Two-Way Traffic on Jackson

Two-Way Traffic on Ballard



## **Option 2: Existing Conditions**

with Curb Bump-Outs

#### 2-Way Traffic on All Streets



## Option 3: Jackson-Ballard

**One-Way Pair** 

Two-Way Traffic on Birmingham

One-Way Southbound Traffic on Jackson

One-Way Northbound Traffic on Ballard

Option 3a: North Transition via Brown & South Transition via College

Option 3b: Same as 3a but without Birmingham Extension

Option 3c: Same as 3a but with South Transition via Butler

South Transition via College



### 3b



3c





North

**One-Way Pair** 

**One-Way Southbound Traffic** 

Two-Way Traffic on Jackson

One-Way Northbound Traffic on Ballard

**Option 4c:** Same as 4a except North Transition via Jackson Extension & Marble

Option 4d: Same as 4a but South Transition via Oak



### Level of Service

- Measure of quality of service based on:
  - Vehicle delay & congestion for drivers
  - Delay & comfort → proportion of satisfied pedestrians

For **drivers**:

- LOS A = Free Flow Traffic
- LOS B = Steady Traffic
- LOS C = Steady Traffic but Limited
- LOS D = Steady Traffic at High Density
- LOS E = Traffic at Saturation
- LOS F = Congestion
- Different methods & delay scales for signals vs. stop signs
- LOS A , LOS B , LOS C , LOS D usually considered acceptable
- **LOS E** usually **unacceptable** (but common on busy roads)
- LOS F represents over-capacity conditions for drivers

## Pedestrian Analysis

Downtown Wylie Traffic Study	Resul	ts																																
Worst Crosswalk Pedestrian LOS (HCM	5 Pedest	rian LO	S for sig	nals, HO	CM 7 Ped	lestrian I	LOS for	two-way	stop co	ontrol)																								
Option Number	Options 1 & 2													Option 3a Option 3b							Bc	0	Option 4	a	(	Option 4	ŀb		Option 4	lc	Option 4d			
Year	2021 2024														2045																			
Network Geometry	Existing Network Geometry (I & II)														Jackson/Ballard One-Way Pair (III)										Birr	ninghan	n/Ballar	d One-'	Way Pai	r (IV)				
Birmingham Extension?	No Birmingham Extension (i)													Birminរូ tension	gham (ii)	No E	No Birmingham with Birmingham Extension (i) Extension (ii)					with Ex	Birming tension	gham (ii)		No Bir	mingha	m Exte	n Extension (i)			with Birmingh Extension (		
North Transition	None													via Brown St (A)								via I	Brown S	t (A)	v Jacks	ria Brow on/Mar	n/ ble (A)	V EX	via Jackson Extension (B)			via Brown St (A		
South Transition																/Colleg	e (B2)		via	Butler S	t (A1)			via	Birmin	gham/C	College (	B2)			v	ia Oak (	2)	
Other Improvements	No Ir	nprove	ments	wi	th Base I	Pedest	rian Im	proveme	nts*				with E								Pedestr	ian Imp	roveme	nts**										
Scenario Number						(Scenar	ios I &	1)					(Scenario III-ii-A-B2)			(Scenario III-i-A-B2)			(Scen	(Scenario III-ii-A-A1)			(Scenario IV-ii-A-B2)			ario IV-	i-A-B2)	(Scenario IV-i-B-B2)			(Scenario IV-ii-A-C			
Downtown Intersections	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	
Brown St at Birmingham St (future)	-	-	-	-	-	-	-	-	-	-	-		В	С	В	•	-	-	В	С	В	E	E	E	-	-	-	-	-	-	E	E	E	
Brown St at Jackson Ave	F	F	E	В	В	В	В	В	В	С	С	В	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	В	С	В	С	С	С	
Brown St at Ballard Ave	N/A^	N/A^	N/A^	В	В	В	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	С	
Birmingham St at Jefferson St (future)	-	-	-	-	-	-	-	-	-	-	-		D	D	D	-	-	-	D	D	D	D	E	D	-	-	-	-	-	-	D	E	D	
Jackson Ave at Jefferson St	F	F	F	D	D	D	D	D	D	N/A~	N/A~	N/A~	В	С	С	С	С	С	В	С	С	В	в	В	В	С	С	В	С	С	В	в	В	
Ballard Ave at Jefferson St	D	D	D	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	
Birmingham St at Marble St	D	D	D	С	С	В	С	С	С	С	С	С	D	D	D	D	D	С	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Jackson Ave at Marble St	F	F	F	D	D	D	D	D	D	В	В	В	В	С	С	В	С	С	В	С	С	В	в	В	В	С	С	В	С	С	В	в	В	
Ballard Ave at Marble St	D	D	D	В	В	В	В	В	в	В	В	В	в	В	С	В	С	С	В	В	С	В	в	В	В	в	в	В	В	в	В	в	В	
Birmingham St at Oak St	E	E	E	С	С	С	D	D	D	D	D	D	В	В	В	D	D	D	В	В	В	В	В	В	В	В	В	В	В	В	В	В	В	
Jackson Ave at Oak St	F	F	F	D	D	D	D	D	D	В	в	В	в	В	в	В	В	в	В	В	В	в	в	В	В	в	в	В	В	в	В	в	В	
Ballard Ave at Oak St	D	D	D	В	В	В	В	В	В	В	В	В	В	С	С	В	С	С	В	С	С	В	В	В	В	В	В	В	В	В	В	С	В	
SH 78 Intersections	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	
SH 78 at Birmingham St	N/A!	N/A!	N/A!	N/A	N/A!	N/A!	N/A!	N/A!	N/A!	N/A'	N/A'	N/A'	N/A'	N/A'	N/A'	N/A!	N/A!	N/A!	N/A!	N/A!	N/A!	D	D	D	D	D	D	D	D	D	D	D	D	
SH 78 at Jackson Ave	N/A!	N/A!	N/A!	N/A	N/A!	N/A!	N/A!	N/A!	N/A!	N/A!	N/A!	N/A!	N/A'	N/A'	N/A'	N/A!	N/A!	N/A!	N/A!	N/A!	N/A!	E F	F	F	F	F	F	F	F	F	F	F	E .	
SH 78 at Ballard Ave	С	С	С	С	С	С	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Number of Intersection Peak hrs. by		A's:	0		A's:	0		A's:	0		A's:	3		A's:	0		A's:	0		A's:	0		A's:	0		A's:	0		A's:	0		A's:	0	
LOS for downtown core study		B's:	0		B's:	10		B's:	9		B's:	15		B's:	14		B's:	9		B's:	14		B's:	21		B's:	17		B's:	17		B's:	20	
intersections (excludes Birmingham at		C's:	0		C's:	5		C's:	3		C's:	3		C's:	7		C's:	10		C's:	7		C's:	0		C's:	4		C's:	4		C's:	1	
Jefferson and crossings of SH 78 &		D's:	12		D's:	9		D's:	12		D's:	3		D's:	3		D's:	5		D's:	3		D's:	3		D's:	3		D's:	3		D's:	3	
Brown):		E's:	3		E's:	0		E's:	0		E's:	0		E's:	0		E's:	0		E's:	0		E's:	0		E's:	0		E's:	0		E's:	0	
		F's:	9		F's:	0		F's:	0		F's:	0		F's:	0		F's:	0		F's:	0		F's:	0		F's:	0		F's:	0		F's:	0	
		D-F:	24		D-F:	9		D-F:	12		D-F:	3		D-F:	3		D-F:	5		D-F:	3		D-F:	3		D-F:	3		D-F:	3		D-F:	3	
		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24		Total:	24	

### Pedestrian Analysis (simplified)



## Vehicular Capacity Analysis

Downtown Wylie Traffic Study	Result	s																															
Overall Vehicular Intersection LOS for Sig	gnals / V	Vorst N	/lovemer	nt LOS fo	or Unsig	nalized																											
Option Number	Options 1 & 2												0	Option 3a Option 3b Optio					ption 3	Bc	0	Option 4	la	Option 4b Option 4c						Option 4d			
Year		2021			2024								2045																				
Network Geometry	Existing Network Geometry (I & II)												Jackson/Ballard One-Way Pair					ıir (III)						Birm	ninghar	m/Ballar	d One-	Way Pai	r (IV)				
Birmingham Extension?	No Birmingham Extension (i)													with Birmingham No Birmingham with Birmingha Extension (ii) Extension (i) Extension (iii)					gham (ii)	with Ex	Birmin; tension	gham (ii)		No Bir	m Exter	nsion (i)		with I Ext	Birming tension	ham (ii)			
North Transition	None												via Brown St (A)								via I	Brown S	it (A)	vi Jackso	via Brown/ via Jackson Jackson/Marble (A) Extension (B)						via Brown St (A)		
South Transition												via Jackson/College (B2)							utler Si	t (A1)			via	Birmin	zham/(	College (	vi	a Oak (	z)				
Other Improvements	No Improvements with Base I Vehicular Improvements*																	with	Base II	Vehicul	ar Impr	oveme	nts**				-						
Scenario Number						(Scenar	ios I & II						(Scena	ario III-i	i-A-B2)	(Scenario III-i-A-B2)			(Scena	rio III-i	i-A-A1)	(Scena	ario IV-i	i-A-B2)	(Scena	ario IV-	i-A-B2)	(Scen	ario IV-i	i-B-B2)	(Scena	ario IV-i	i-A-C)
Downtown Intersections	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
Brown St at Birmingham St (future)	-	-		-	-	-	-		-	-	-	-	Α	В	В	-	-	-	Α	В	В	В	С	В	-		-	-	-	-	В	С	В
Brown St at Jackson Ave	С	С	С	С	D	С	F	F	F	С	С	с	С	С	С	С	с	D	С	С	С	в	D	С	С	E	E	с	E	с	в	D	С
Brown St at Ballard Ave	С	F	С	В	С	в	D	F	F	D	F	F	С	D	С	С	D	С	С	D	С	С	D	С	С	D	С	С	D	с	С	D	С
Birmingham St at Jefferson St (future)		-			-		-		1.1		-		Α	А	Α			-	A	А	Α	В	В	В			-	-		-	В	В	в
Jackson Ave at Jefferson St	В	В	В	В	В	В	С	D	E	В	С	С	В	В	F	С	D	F	В	в	F	В	С	С	С	E	F	С	E	F	В	В	С
Ballard Ave at Jefferson St	в	В	в	С	с	С	F	F	F	в	D	E	в	С	F	В	E	F	в	С	F	в	D	E	В	D	E	В	D	E	A	D	E
Birmingham St at Marble St	А	А	А	A	А	А	Α	в	в	А	В	В	В	С	С	в	В	в	в	С	С	С	С	D	Α	А	А	А	А	А	С	С	D
Jackson Ave at Marble St	в	В	В	в	В	В	С	F	F	В	в	в	в	с	F	в	D	F	в	С	F	А	D	D	А	С	D	А	С	D	В	D	E
Ballard Ave at Marble St	с	С	С	С	с	С	F	F	F	А	в	D	в	с	F	С	E	F	в	С	F	В	D	D	В	D	D	В	D	D	в	С	D
Birmingham St at Oak St	В	В	В	В	В	В	В	С	D	В	С	D	Α	А	В	С	D	D	Α	А	В	С	С	В	в	в	В	в	В	в	в	D	E
Jackson Ave at Oak St	в	В	в	в	В	в	С	F	F	в	с	с	в	В	D	с	в	с	В	В	D	В	D	с	С	D	D	С	D	D	E	F	F
Ballard Ave at Oak St	с	С	с	с	D	D	F	F	F	в	с	E	с	E	F	D	E	F	с	E	F	А	D	E	с	С	E	с	С	E	F	F	E.
Intersections North/South of Downtown	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
Park Blvd at Parker Rd	F	F		В	В		С	С		С	С	-	С	С		С	С	-	С	С		С	С		С	С		С	С		С	С	-
Ballard Ave at Butler St	в	В	В	в	В	в	с	с	в	с	с	В	с	с	в	с	с	в	F	D	С	с	с	В	с	с	В	С	с	В	с	с	С
Jackson Ave at Caloway St	А	А	А	А	А	А	А	А	А	А	А	А	в	В	в	в	в	в	А	А	А	А	А	А	А	А	А	А	А	А	А	А	А
Ballard Ave at Caloway St	в	В	В	в	в	В	С	С	в	С	С	в	в	в	в	в	в	в	С	С	С	в	в	В	в	в	В	в	В	в	С	С	в
Birmingham St at College St	А	А	А	А	А	А	А	А	А	А	А	А	А	А	А	A	А	А	А	А	А	С	с	с	С	с	С	С	с	с	A	А	A
Jackson Ave at College St	А	А	А	A	А	А	A	А	A	А	А	А	с	С	с	С	С	С	A	А	А	в	В	в	в	В	В	В	В	в	A	А	А
Ballard Ave at College St	в	В	В	в	в	в	С	С	С	С	С	С	в	В	в	в	в	в	с	С	С	в	В	в	в	В	В	В	В	в	С	D	С
SH 78 Intersections	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
SH 78 at FM 544/Kirby St	D	E	-	E	F	-	F	F	-	D	F	-	D	F	-	E	F	-	D	F	-	E	F	-	E	F	-	E	F	-	E	F	-
SH 78 at Birmingham St	F	F	F	F	F	F	F	F	F	В	В	В	С	С	D	С	С	D	С	С	D	С	D	D	С	D	D	С	D	D	С	D	D
SH 78 at Jackson Ave	В	С	в	В	С	в	С	D	С	С	С	С	В	с	D	В	С	С	В	С	D	D	D	F	D	D	F	D	D	E.	D	D	F
SH 78 at Ballard Ave	D	D	с	E	D	D	E.	F	F	E	F	F	С	С	D	С	D	D	с	С	D	E	С	D	E	С	D	E	с	D	E	E	E.
SH 78 at Brown St	D	D	1.1	D	с		E F	E		E	D		E	E		E	E	-	E	E		E	E		E	E	-	E	E		D	D	-
SH 78 at Eubanks Ln	в	В		в	с		С	С		В	в		В	В		В	В	-	В	В	-	В	С	-	В	С	-	В	С		В	в	-
SH 78 at Spring Creek Pkwy/Kreymer Ln	В	В		С	D	-	F	F		С	D	-	С	D		С	D	-	С	D	-	С	D	-	С	D		С	D		С	D	-
Number of Signalized Intersections		6	-		7	7		7			14			18			16	-	18				16		16			16			16		
Number of Intersection Peak he hu	∆'s:	12		Δ'c·	12		Δ's:	10		Δ's·	11		Δ'c·	9		Δ's·	3		Δ's·	15		Δ'c·	5		∆'c·	7		Δ's·	7		Δ's:	10	
LOS for all study intersections:	B's	30		R's:	28		R's:	5		R's:	18		B's:	24		B's:	19		B's:	14		B's:	22		B's:	16		B's:	16		R's:	14	
Los joi un study miersections.	C's:	13		C's:	14		C's:	17		C's:	22		C's:	24		C's:	22		C's:	26		C's:	22		C's:	19		C's:	20		C's:	19	
	D'er	13		D'er	7		D'er	1		D'er	7		D'er	7		D'er	11		D'er	20		D'er	16		D'er	12		D'er	12		D'er	15	
	E'er	1		E's:	2		E'er	-		E'er	1		E'er	2	-	Eler	6		E'er	2		E'er	10	-	E's.	15		E'er	15		E'er	7	
	Fler	6	-	F's:	4		F'er	29		Flet	5		F's:	6		F'er	6		F's:	7		Fler	2		F's:	3		F'er	3		F's:	8	
	E.E.	7		E.E.	6		E.E.	21		E.E.	0		E.E.	0		E.E.	12		E.E.	10		E.E.			E.E.	12		E.E.	11		E.E.	15	
	Tetel	67		Totalı	67		Totali	67		Totalı	67		Totalı	72		Tabali			L-Fi Tatali	70		Tabali			Tetel	67		Tabala			Tetel	72	

### Vehicular Capacity Analysis (simplified)



## What happens next...

- Select preferred parking/sidewalk configuration for preferred <u>2 or 3</u> alternatives
  - Identify improvements for:
    - Short-term (2022)
    - Medium-term (2024)
    - Long-term (TBD)
  - <u>Examples</u>: parking, lighting, sidewalk & crosswalk connections
  - Develop recommended wayfinding signage layouts
- Cost Estimation (Planning-Level)



### What happens next...

- Final Report
- Present results to:
  - Stakeholders
  - City Council
- City officials to decide on preferred alternative
- Procure detailed design contract(s)



