

# Navajo Route 7 Street Lighting Pre-Scoping Report

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Prepared for:  
Chinle Chapter of the Navajo Nation  
and  
Navajo Division of Transportation  
in collaboration with  
ADOT – Multimodal Planning Division

March 23, 2016



## PRE-SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 2/5/2016	ADOT Project Manager: Don Sneed
Project Name: Navajo Route 7 Street Lighting Project	
City/Town Name: Chinle Chapter	County: Navajo
Primary Route/Street: Navajo Route 7	
Beginning Limit: (Milepost / Cross Street) MP 0.0 / US 191 Intersection	
End Limit: (Milepost / Cross Street) MP 2.2 / Holiday Inn	
Project Length: 2.2 Miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): <i>(Check all that apply)</i> <input type="checkbox"/> City/Town; <input type="checkbox"/> County; <input type="checkbox"/> ADOT; <input type="checkbox"/> Private; <input type="checkbox"/> Federal; <input type="checkbox"/> Tribal; <input checked="" type="checkbox"/> Other: Bureau of Indian Affairs	
Adjacent Land Ownership(s): <i>(Check all that apply)</i> <input type="checkbox"/> City/Town; <input type="checkbox"/> County; <input type="checkbox"/> ADOT; <input type="checkbox"/> Private; <input type="checkbox"/> Federal; <input type="checkbox"/> Tribal; <input checked="" type="checkbox"/> Other: Bureau of Indian Affairs <a href="http://gis.azland.gov/webapps/parcel/">http://gis.azland.gov/webapps/parcel/</a>	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION <i>(If applicable)</i>	
LPA/Tribal Name: Chinle Chapter of the Navajo Nation	
LPA/Tribal Contact: Tyrone J. Begay, Chinle Chapter Planner	
Email Address: chinleplanner2014@gmail.com	Phone Number: (928) 674-2072
Administration: <input checked="" type="checkbox"/> ADOT Administered <input type="checkbox"/> Self-Administered <input type="checkbox"/> Certification Acceptance	

PROJECT NEED
<i>(Describe the issues and deficiencies that need to be fixed)</i> Inadequate street lighting along Navajo Route 7

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation <input type="checkbox"/>	Modernization <input checked="" type="checkbox"/>	Expansion <input type="checkbox"/>
<i>(Generally describe the project goals. What will be done to fix the problem?)</i> Install Solar Street Lighting within BIA ROW			

PROJECT TYPE		
Pavement Preservation <input type="checkbox"/>	Roadway Widening <input type="checkbox"/>	System Enhancement <input type="checkbox"/>
Bridge Scour/Rehab <input type="checkbox"/>	Bridge Replacement <input type="checkbox"/>	Sign Replacement <input type="checkbox"/>
Other <input checked="" type="checkbox"/> : Lighting		

## PROJECT RISKS

Check any risks identified that may impact the project's scope, schedule, or budget:

<input type="checkbox"/> Access / Traffic Control / Detour Issues	<input type="checkbox"/> Right-of-Way
<input type="checkbox"/> Constructability / Construction Window Issues	<input checked="" type="checkbox"/> Environmental
<input type="checkbox"/> Stakeholder Issues	<input checked="" type="checkbox"/> Utilities
<input checked="" type="checkbox"/> Structures & Geotech	<input type="checkbox"/> Other:

**Risk Description:** (If a box is checked above, briefly explain the risk)

New light poles should not be mounted to existing structure

New light pole foundation excavation may require environmental investigation

New light pole conduit/conductor excavation (if conventional lighting is used instead of solar lighting) may require environmental investigation

New light pole foundation and/or conduit may impact existing utilities

## FUNDING SOURCE(S)

Anticipated Project Design/Construction Funding Type: (Check all that apply)	<input checked="" type="checkbox"/> STP	<input type="checkbox"/> TAP	<input type="checkbox"/> HSIP	<input type="checkbox"/> State
	<input checked="" type="checkbox"/> Local	<input type="checkbox"/> Private	<input checked="" type="checkbox"/> Other: Tribal Transportation Program (TTP)	

## COST ESTIMATE

Preliminary Engineering \$TBD	Design \$137,038	Right-of-Way \$0	Construction \$	Total \$TBD
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## PROJECT DELIVERY

**Delivery:** ☒ Design-Bid-Build    ☐ Design-Build    ☐ Other:

**Design Program Year:** FY TBD

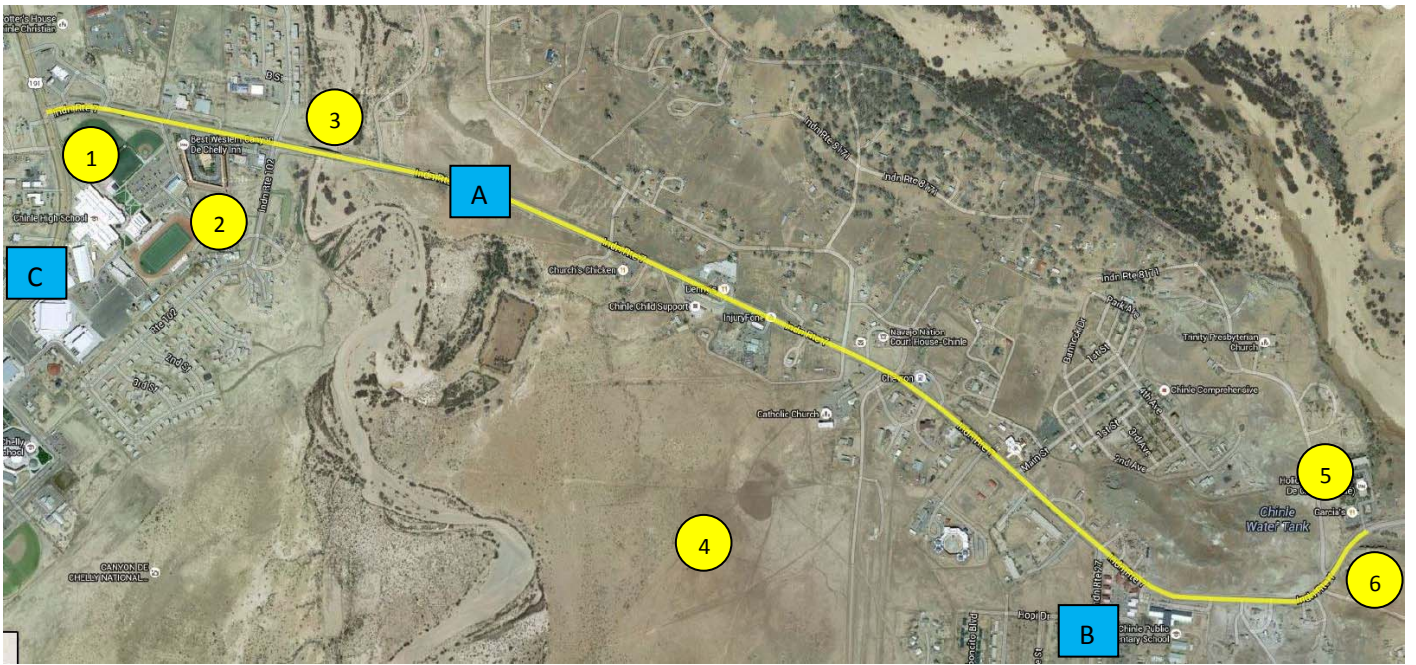
**Construction Program Year:** FY TBD

## ATTACHMENTS

- 1) State Location Map
- 2) Project Vicinity Map
- 3) Project Scope of Work
- 4) Project Schedule
- 5) Itemized Cost Estimate
- 6) 15% Design Plan Sheets (as needed)

[illegible]

## ATTACHMENT 2 – PROJECT VICINITY MAP



### Key

1	Begin Project
2	Chinle High School
3	Existing Bridge over Nazlini Wash
4	Future Navajo Nation Public Safety Training Facility
5	Holiday Inn
6	End Project
A	Indian Route 7
B	Indian Route 27
C	US 191

## ATTACHMENT 3 – SCOPE OF WORK

### SCOPE OF WORK

#### FINAL DESIGN

- Complete a quick project verification (Stage I) review to assure the scope contained in this document is still valid
- Select a design consultant familiar with conventional and solar lighting to complete the final design
- Complete the final design in close conformance to the schedule shown below (actual durations may vary depending on workload and other factors and will be more accurately determined during final design.
- Refine the design and cost estimate.
- Prepare the project for bid advertisement, bid analysis and award.
- Navajo Division of Transportation (NDOT) finalize contract and provide NTP to contractor to begin construction.
- Public Involvement should be utilized throughout the project to keep everyone informed.
- Contractor staging area has not been identified and would be done during final design.
- Complete all clearances (environmental, right-of-way, utilities) prior to completion of design
- Complete Right-of-Way (ROW) purchase prior to construction.
- Complete final design, bid and award project.

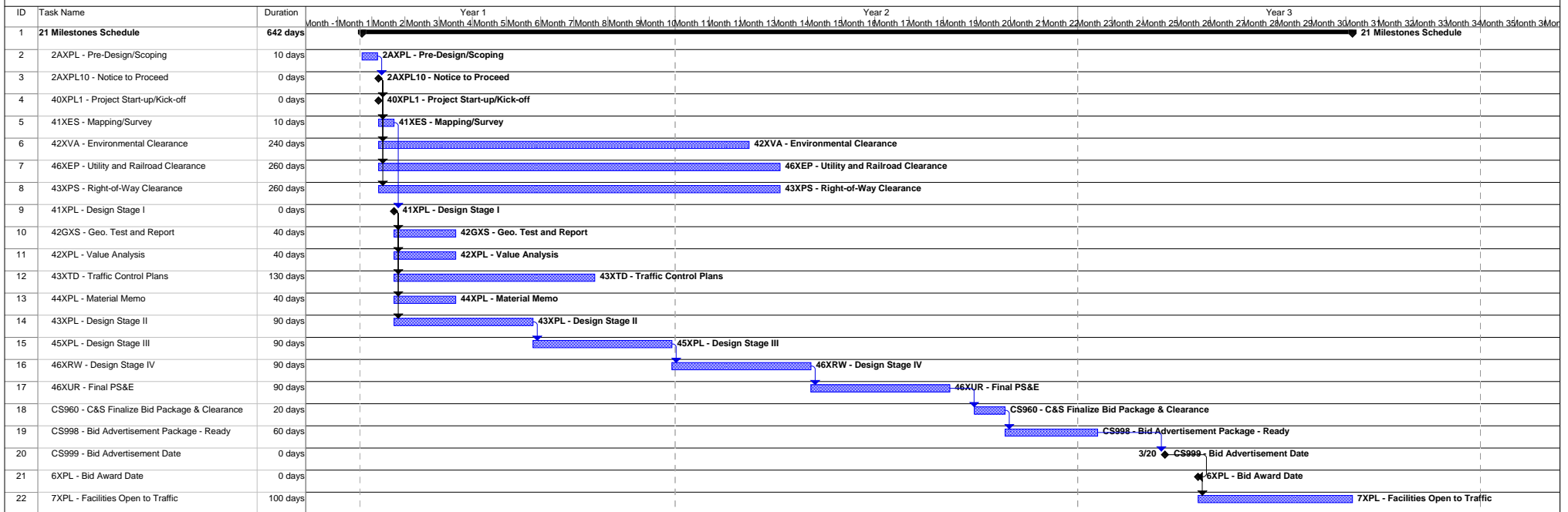
#### CONSTRUCTION

- Conduct partnering meeting and start construction mobilization.
- Contractor staking and layout. Utility relocation plan developed and implemented.
- Set up traffic control and any detours if need and determined by final design.
- Maintain access to adjacent properties.
- Complete the installation of new lights per the plans developed in final design
- Complete the installation of new pavement markings.

## **ATTACHMENT 4 – PROJECT SCHEDULE**



21 Milestone Schedule  
Chinle Street Lighting Pre-Scoping



Date: 3/21/16

Task  
Split  
Milestone



Summary  
Project Summary  
External Tasks



External MileTask  
Inactive Milestone  
Inactive Summary



Manual Task  
Duration-only  
Manual Summary Rollup



Manual Summary  
Start-only  
Finish-only



External Tasks  
External Milestone  
Progress



Split



## **ATTACHMENT 5 – ITEMIZED COST ESTIMATE**

ITEM NO	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
704XX01	PAVEMENT MARKING	L. SUM	1	\$45,000.00	\$45,000.00
731XX01	OFF-GRID SOLAR-ENHANCED STREET LIGHTING	L. SUM	1	\$721,000.00	\$721,000.00
	<b>SUBTOTAL 1</b>				<b>\$766,000.00</b>
934XX01	MISCELLANEOUS WORK			15.00%	\$114,900.00
	<b>SUBTOTAL 2</b>				<b>\$880,900.00</b>
701XX01	MAINTENANCE AND PROTECTION OF TRAFFIC			10.00%	\$88,090.00
810XX01	EROSION CONTROL AND POLLUTION PREVENTION			1.00%	\$8,809.00
924XX02	CONTRACTOR QUALITY CONTROL			2.00%	\$17,618.00
925XX01	CONSTRUCTION SURVEY AND LAYOUT			2.00%	\$17,618.00
	<b>SUBTOTAL 3</b>				<b>\$1,013,035.00</b>
901XX01	MOBILIZATION			10.00%	\$101,303.50
	<b>SUBTOTAL 4</b>				<b>\$1,114,338.50</b>
	CONTINGENCY			5.00%	\$55,716.93
	INDIRECT COST ALLOCATION (ICAP)			10.35%	\$115,334.03
	CONSTRUCTION ENGINEERING			9.00%	\$100,290.47
	TRIBAL EMPLOYMENT RIGHT ORDINANCE (TERO) TAX			5.00%	\$55,716.93
	<b>LIGHTING CONSTRUCTION SUBTOTAL</b>				<b>\$1,441,396.85</b>
<b>OTHER COST</b>					
	UTILITY RELOCATION	L. SUM	1	\$20,000.00	\$20,000.00
	RIGHT OF WAY AND TCE REQUIREMENTS	L. SUM	1		\$0.00
	<b>OTHER COST SUBTOTAL</b>				<b>\$20,000.00</b>
	<b>CONSTRUCTION TOTAL</b>				<b>\$1,461,396.85</b>
<b>DESIGN COST</b>					
	PRELIMINARY AND FINAL DESIGN ENGINEERING			10.00%	\$146,139.68
	NDOT PMDR FEE	L. SUM	1	\$30,000.00	\$30,000.00
	NEPA FEE	L. SUM	1	\$40,000.00	\$40,000.00
	<b>DESIGN COST SUBTOTAL</b>				<b>\$216,139.68</b>
	<b>PROJECT TOTAL</b>				<b>\$1,677,536.53</b>

**FUNDING**

	94.3% FEDERAL			94.30%	\$1,581,916.95
	5.7% LOCAL MATCH			5.70%	\$95,619.58
	<b>FUNDING TOTAL</b>				<b>\$1,677,536.53</b>



# Inovus Financial Analysis: Off-Grid

Customer Profile	
Project Name:	Navajo - Chinle Rte 7
City and State:	Chinle, AZ
Application:	Roadway
Current System:	None

Technical Details	
# of Poles:	64
Pole Height:	30ft
Pole Type:	Design
Battery Type:	AGM

## Project Cost and Sustainability

The analysis below examines the economics over a 10 year period, implementing an Inovus Off-Grid Solar-Enhanced lighting solution instead of a traditional On-Grid 100 watt HID lighting solution.

Cost		
Payback Period:	Immediate	
Overall Cost Savings:	\$36,068.69	5%

Sustainability	
Energy Savings:	35880.96 kWh / year
Carbon Reduction:	53821.44 lbs / year

### Up Front Capital Expenses

Capital Expense	Inovus	Traditional
Hardware	\$581,862	\$83,200
Infrastructure	\$0	\$506,304
Installation	\$64,000	\$64,000
Total Project Cost	\$645,862	\$653,504
Net Savings	\$7,642	

### Operating Cost

Operating Cost	Inovus	Traditional
Energy Cost	\$0	\$45,131
Maintenance Cost	\$69,504	\$52,800
Total Operating Cost	\$69,504	\$97,931
Net Savings	\$28,427	



## MEETING NOTES

**SUBJECT:** Chinle Street Lighting Pre-Scoping Kick-off-Meeting & Field Review  
**DATE:** Thursday, August 13, 2015  
**TIME:** 1:00 pm – 5:00 pm (MDT)  
**LOCATION:** Chinle Chapter House, Off of Navajo Route 7, Chinle, AZ

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### 1. INTRODUCTIONS AND PRE-SCOPING PROCESS OVERVIEW

- See sign-in sheet for attendees (attached)
- This is the first tribal PARA project
  - Input from the team is needed

### 2. PROJECT BACKGROUND

- Background
  - Process began 4 years ago
  - Project is included in the Chapter's comprehensive land use plan, but is not on the TIP
  - Chinle Chapter is LGA certified since 2010
    - Responsible to take care of their own funds
    - Officials can control things
    - Obtain their own funding
      - Not required to go through the Navajo Nation
  - Chinle is a growth area
    - Advocating for improving their economy
    - Central on the Navajo Nation
    - Priority is economic development
      - 6 business site licenses along N7
      - Tourism is part of this as well
- Project Need
  - Safety is a concern
  - Pedestrians and livestock can't be seen at night
- Project Goals
  - Prepare Pre-Scoping Documents
    - Scope, Schedule, and Budget
  - Assist Chapter in adding project to the TIP

### 3. ENGINEERING CONSIDERATIONS

- Scope of Work
  - Provide street lighting
  - Provide crosswalk warning lights
- Existing Conditions
  - Road
    - US 191 to Nazlini Wash bridge
      - 4 lanes with two-way left-turn lane

- The sidewalk is at the ROW on the north side of N7
  - There is no sidewalk along the south side of N7 adjacent to the high school
  - The sidewalk is at the ROW on the south side of N7 between the high school and Nazlini Wash
- Naslini Wash bridge to N27
  - 4 lanes without turn lanes
  - The sidewalk is behind the curb on the north and south side of N7
- Drainage
  - Nazlini Wash
  - Sheet flow on road
- Existing Data Review
  - US 191 MP 444 to 465 RSA (April 2012) Recommendations
    - Install a countdown timer at the US 191/N7 intersection
    - Add a “Keep Right” sign on N7 WB median approaching US 191
  - Chinle Street Plan (September 2000)
    - Identified flood prone area between Chinle and Nazlini washes
  - Crash Data
    - 9 at US191/N7; 22 along N7; 2 at N7/N27
  - Transit Needs
    - Navajo Transit System stops 2 times per day at US 191/N7

#### **4. ENVIRONMENTAL CONSIDERATIONS**

- A public hearing may be needed
  - Some houses are close to roadway
    - There may be lighting issues in bedrooms
      - Shielding may be an option
    - Concern with where a pole height would be and whether or not it could hit your house
- Excavation for foundations will have to be considered
- Excavation for conduit will have to be considered (if conventional lighting is used)

#### **5. RIGHT-OF-WAY CONSIDERATIONS**

- Owned by BIA
- 75 feet left and right of N7 centerline from US 191 to Nazlini Wash bridge
- 50 feet left and right of N7 centerline from Nazlini Wash bridge to N27
- There are structures within their right of way that shouldn't be there
- ADOT has near the U191/N7 intersection
  - Coordination with ADOT ROW Group will be necessary

#### **6. UTILITY CONSIDERATIONS**

- There are existing overhead power lines on the north side of N7 for the entire length of the project
- There are existing water lines on the north side of N7 for the entire length of the project
- There are multiple existing water lines crossing N7 throughout the project

- There is existing fiber optic cable on the south side of N7 for the entire length of the project
- There are existing gas lines on the south side of N7 from US 191 to N27
- There are existing gas lines on the north side of N7 from N27 to the Holiday Inn
  - New facilities must be separated from the natural gas facilities by a minimum of five feet
- Prior right determination will be required

## **7. BRIDGE CONSIDERATIONS**

- The intent with this project is to not put lighting on the bridge
- We don't anticipate attaching anything to the bridge

## **8. TRAFFIC/LIGHTING CONSIDERATIONS**

- The intent is to locate light poles behind sidewalk except where the sidewalk is at the existing ROW.
- Lighting
  - The Chapter prefers solar LED lights
  - Solar LED lights
    - LEDs put out more light at a much lower wattage
    - Information from solar light manufacturer Innovus
      - Approximately the same upfront cost as conventional lighting
      - Recommended wrap around solar panels instead of top of pole mounts
        - No snow or dust impact
        - Bullet proof
      - 10-year operating cost is less than conventional lighting
      - Battery life is 5 years
  - Conventional Lights
    - Trenching impacts
      - Utilities
      - Environmental footprint
      - Avoid trenching through Nazlini Wash
    - Tie in to existing lights along US 191
    - Tie in to existing power source east of Nazlini Wash
    - Copper theft is a concern with conventional lighting
- Crosswalk warning lights
  - Chinle Unified School District is working on installing warning lights
    - 2 locations
      - 0.17 miles east of US 191
      - 0.35 miles east of US 191
      - Locations are currently striped as crosswalks
    - Lighting systems are anticipated to be solar powered
    - They need justification for the lighting system
      - Number of people going across the crosswalk
  - This project team should work with the school if they have funding

- Build together with an JPA/IGA
- Build separately and coordinate designs
- MOT
  - Outside lane closure will be required for light pole installation

## 9. MAINTENANCE CONSIDERATIONS

- Once a solar system is in place, who will be responsible for maintaining it? Do they have the equipment on hand?
  - The Fort Defiance project included:
    - Cost sharing NDOT and chapter to replace pole
    - Cleaning and battery – done by BIA; assistance by NTA with boom truck
    - Will look at the same kind of agreement for maintenance on this project

## 10. REVIEW OF PROJECT RISKS

- Existing sidewalk is 3 feet. If we widen to 5 feet, ROW may an issue
- Battery location in light pole
  - Vandalism
  - Ditches do overtop occasionally; location of battery is critical

## 11. REFINE PROJECT SCOPE AND LIMITS

- Extend the end of the project to Holiday Inn (additional 0.5 miles)
- BIA has a roundabout project at N7 and N27
  - Lighting design will need to be coordinated
  - ROW is being widened where the roundabout is going in
- Update/add sidewalk
  - Add new 5-foot sidewalk where there isn't any
  - Replace existing 3-foot sidewalk with 5-foot sidewalk
    - Upgrade sidewalk ramps to current ADA standards

## 12. FIELD REVIEW REPORT

- Chinle High School
  - Add sidewalk on the south side of N7
  - Replace existing lights at the school entrance
- Best Western
  - Add curb and gutter to prevent trucks from parking along the road
    - May require curb inlets for drainage
  - Replace existing lighting
- Businesses throughout
  - Lighting spacing design will have to accommodate existing driveways
  - Pole locations will have to consider existing ditches and utilities
  - Replace existing lighting at driveways
- Pavement marking needs to be refreshed throughout the entire project

## ATTACHMENTS:

1. Sign-in Sheet

# Chinle Street Lighting Pre-Scoping Kick-Off Meeting & Field Review

Thursday, August 13, 2015 • 1:00 PM to 5:00 PM (MDT)

Chinle Chapter House • Navajo Route 7 Building 4600 • Chinle, AZ 86503

Completion of this sign-in sheet is completely voluntary and helps the project team keep an accurate record of meeting attendees. Under state law, any identifying information provided below will become part of the public record and, as such, must be released to any individual upon request. Please print clearly.

NAME	TITLE	AGENCY	PHONE	EMAIL
Dan Sneed	Senior Planner	ADOT	602-712-6736	dsneed@azdot.gov
Dan Gabiou	PARA Program Manager	ADOT	602-712-7025	dgabiou@azdot.gov
Todd Williams	Environmental Services Director	Michael Baker Int'l	602-798-7556	todd.williams@mbakerintl.com
Chad Andrews	Design Manager	Michael Baker Int'l	602-798-7560	candrews@mbakerintl.com
Marco Sells	Planner	Navajo DOT	(928) 674-2136	msells@navajodot.org
Calvin Castillo	Highway Engineer	NR DOT	(505) 863-8282	Calvin.Castillo@bia.gov
Garret Silversmith	Supervisory Highway Engineer	Chinle/Central	928 674 5175	garret.silversmith@bia.gov
Walton Vazzie	Chapter Manager	Chinle/Central	928-674-2418	wvazzie@navajochapters.org
Tyrone J. Begay	Chapter Planner	Chinle Chp. Govt	928-674-2072	chinleplanner2014@gmail.com
CONTRELLA A.D. Dixon	ADOT URR FLACSTAFF/HOLBROOK CORP	ADOT URR	602.712.6232	cdixon@azdot.gov
Kyle Yozzo	Project Development Engineering Specialist	ADOT-Holbrook	928-524-5406	kyozzo@azdot.gov

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NAME	TITLE	AGENCY	PHONE	EMAIL
Pe-shen Yang	Assistant State Bridge Eng.	ADOT	(602) 712-8606	Pyang@azdot.gov
Michael Dini	CCG - Electrician	Chinle Chapter	(928) 289-4268	msddini@gmail.com
Ron Curtis	Highway Operations Supervisor	ADOT-Granado	928-755-3579	rcurtis@azdot.gov
Jade John	CCG - Acting Coordinator	Chinle Chapter	(928) 349-9630	Jade_John_15@yahoo.com
Danny W. Halwood Jr.	CCG - Acting Admin. Asst.	Chinle Chapter	928 674-2054	dhalwood@navajochapters.org
Cynthia Hunter	Chinle Chapter Secretary/Treasurer	Chinle	928-674-2052	chunter@navajochapters.org
Sharon Yarcie	Legislative District Assistant to Chinle Council Delegate Lt. Pete	Chinle	928/221-3224	shyarcie@navajo-nsn.gov
Randy Routhier	District Develop. Engineer	ADOT-HOLBROOK	928-524-5402	rrouthier@azdot.gov
Melvin Toliman Jr.	NTWA - CEM ENGR TECH W/WW	NTWA FIDELANCE	928.729.5721 ext. 6215	melvint@ntwa.com
Corwyn D. Henry	Struct. Engr.	BIA NRDOT	505-863-8457	Corwyn.Henry@BIA.gov
Harold Riley	P&D Branch Chief	BIA NRDOT	" " 8281	harold.riley@bia.gov

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NAME	TITLE	AGENCY	PHONE	EMAIL
SHAWN MITCHELL	FRONTIER COMM.	FRONTIER	928-871-3800	shawn.mitchell@frontier.com















