APPENDIX A –

SURVEY QUESTIONNAIRES

MDOT TSC Survey for Alternative Utilization of Roadside ROW
(Abbreviated for formatting purposes)

1. Have you been faced with non-traditional/non-transportation right-of-way (ROW) use or development requests from outside entities?
2. Approximately how many such requests have you received in the past two (2) years?
3. What type(s) of use/development requests have you received?

   [] Vegetation Management; [] Wind Power Generation; [] Solar Power Generation;
   [] Biofuel; [] Other (please specify)

4. When receiving such a ROW development request, how do you (or would you) make the decision to permit or deny?
5. Would you typically perform public outreach for such requests?
6. If so, would you involve only adjacent property owners or include others as well?

   [] Adjacent Property Owners Only; [] Others (please specify)

7. What types of information are necessary to assist in decision making?

   [] Roadside Features; [] ROW Lines; [] Adjacent Parcel Information/Land Uses;
   [] Zoning; [] Planned Unit Developments; [] Environmental/Habitat;
   [] Future Use/MDOT Needs; [] Other (please specify)

8. If a statewide database of such information were available, would that be helpful?
9. Please provide any additional information that you may have

Nationwide DOT Survey for Alternative Utilization of Roadside ROW
(Abbreviated for formatting purposes)

1. Has your agency been faced with non-traditional/non-transportation right -of-way (ROW) use or development requests from outside entities?
2. In reference to the previous question, please indicate the specific types of non-traditional/non-transportation ROW development projects

   [] Solar Power Generation; [] Wind Power Generation; [] Biofuel Farming;
   [] Other Agriculture/Farming; [] Vegetation/Forest Management; [] Other (please specify)
3. Related to the previous question, please describe any large-scale and/or high-profile project(s)
4. How are roadside ROW development projects typically initiated? Please feel free to reference specific projects listed in question #3
5. How was this/these roadside ROW development projects implemented?

   [] Permit; [] Public/Private partnership (P3 Agreement); [] Utility Accommodation Policy (UAP);
   [] Airspace Agreement; [] Other (please specify)
6. What local and/or regulatory agencies were involved with the permitting/planning process for the projects described in question #3?

   [] Municipal Government; [] Metropolitan Planning Organization; [] Department of Natural Resources; [] Department of Environmental Quality; [] Other (please specify)
7. What was learned by implementing the roadside ROW development project(s) listed in question #3?
8. Was the project(s) considered to be a success?
9. Has/will this program be expanded?
10. Which entity ultimately "owns" the project?
11. What is/was the return on investment period for the ROW projects discussed in Question #3?

    [] 0-10 years; [] 11-20 years; [] 21-30 years; [] Greater than 30 years
12. For solar/wind projects, are they tied to a grid?
13. Is the electricity utilized on-site, or is excess electricity generated?

    [] Used on-site; [] Excess generated
14. Are there other types of ROW development projects being considered? If so, please provide details.
15. How are spatial (i.e., GIS) datasets maintained within your state?

    [] In-House/Agency Data Collection; [] Contracted Data Collection; [] Other
16. How frequently do you utilize GIS datasets for roadside ROW development permit requests and related decisions?

    [] Always; [] Usually; [] Sometimes; [] Rarely; [] Never
17. How are these datasets utilized for preliminary project scoping?

    [] Location selection/project limits; [] Utility identification; [] Access identification;
    [] Not utilized for project scoping; [] Other (please specify)
18. Please provide any additional information that you may have

APPENDIX B –
MDOT TSC SURVEY RESPONSES

Name/Office	What type(s) of non-traditional/ non-transportation ROW use or development requests from outside entities have you received? (Approx. number of total requests within past 2 years in parentheses)	When receiving such a ROW development request, how do you (or would you) make the decision to permit or deny?	How is public outreach handled?	What types of information are necessary to assist in decision making?	If a statewide database of such information were available, would that be helpful?
Jack Hofweber, Bay City TSC	Vegetation Management, water towers, pump stations (3)	FHWA or MDOT has policy	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Environmental/Habitat, Future Use/MDOT Needs, current policy	No
Pete Pfeiffer, Coloma TSC	Vegetation Management, Wind Power (5)	Consult various work units and departmental guidance if it was not clear whether any particular request was a permitted activity.	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Environmental/Habitat, Future Use/MDOT Needs,	Yes
Linda Burchell, Davison TSC	Vegetation Management, Biofuel (2)	follow up with Lansing about statewide direction	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs, profit/nonprofit maintenance liability	Yes
Gabe Phelps, Gaylord TSC	Vegetation Management, Biofuel, Timber Resources, Seismic Exploration. (12)	MDOT "policy" which in most cases doesn't make sense. It would be nice have the flexibility to use our own judgment here at the TSC instead of "just because we haven't done this in the past".	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes
Bart Franklin, Grand Rapids TSC	Vegetation Management, grading, rain gardens, cell towers, murals, linear parks, special planting requests (24)	Based on location & impact. In coordination with Region, Lansing and FHWA staff.	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes

Name/Office	What type(s) of non-traditional/ non-transportation ROW use or development requests from outside entities have you received? (Approx. number of total requests within past 2 years in parentheses)	When receiving such a ROW development request, how do you (or would you) make the decision to permit or deny?	How is public outreach handled?	What types of information are necessary to assist in decision making?	If a statewide database of such information were available, would that be helpful?
Jeff Rautiola, Ishpeming TSC	Vegetation Management, Log MDOT ROW, Sell Sand Borrow, License/ Lease (6)	Follow MDOT Policy. Consider effect on the Public or use of ROW.	Adjacent Property Owners Only	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes
Andy Sikkema, Ishpeming TSC	Vegetation Management, cell tower, parking, merchandise display, ORV trail, storm water runoff retention, grade separated private road crossing, snowmobile trail bridge, snowmobile trails, (20)	Follow state law or department policy.	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Environmental/Habitat, Future Use/MDOT Needs, state laws department policy	Yes
Jared Boll, Jackson TSC	Biofuel, Utility Companies (Gas, electric, telecom, etc.) (6)	The utilities can only cross transversely and we try not to allow utility poles in limited access ROW.	None	Roadside Features, ROW Lines, Future Use/MDOT Needs,	Yes
Stephen Palmer, Lansing TSC	Vegetation Management, Municipal gateway signage/art. (1)	Review the department's guidelines and look at the request from a safety standpoint.	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, , Environmental/Habitat, Future Use/MDOT Needs,	Yes
Ghazi Mustafa, Lansing TSC	(1)	decision depends on the nature of the permit, it is something MDOT allows I will approve, otherwise it will be denied	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes

Name/Office	What type(s) of non-traditional/ non-transportation ROW use or development requests from outside entities have you received? (Approx. number of total requests within past 2 years in parentheses)	When receiving such a ROW development request, how do you (or would you) make the decision to permit or deny?	How is public outreach handled?	What types of information are necessary to assist in decision making?	If a statewide database of such information were available, would that be helpful?
Robert Coy, Marshall TSC	Vegetation Management, Biofuel (3)	severity of impact to travelling public, safety, management of MDOT resources.	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Environmental/Habitat, Future Use/MDOT Needs,	No
Art Green, Muskegon TSC	Vegetation Management, Wind Power, Solar Power (12)	Current Guidance on similar items and impacts, experience in the area of influence, engineering judgment.	Depending on anticipated impact, Local agency, adjacent properties and then regionally.	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes
John Batchelder, Newberry TSC	Vegetation Management, use of old radio towers for cell phone tower, purchase of old radio tower, concrete hut for use as same at their tower (10)	review within tic, region, Lansing real estate, review results and develop decision approved by all	It depends upon the situation. some would not have public outreach and some would	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs, each case is unique within its own conditions. some or all may be used	Yes
Gary Niemi, Traverse City TSC	(several)		None		
Mary Lajko, Traverse City TSC	(5 to 10)	review of the right-of-way designation, internal conversation inside TSC and/or Region specialists	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Future Use/MDOT Needs,	Yes
Doug Wilson, Alpena TSC	None		None		

Name/Office	What type(s) of non-traditional/ non-transportation ROW use or development requests from outside entities have you received? (Approx. number of total requests within past 2 years in parentheses)	When receiving such a ROW development request, how do you (or would you) make the decision to permit or deny?	How is public outreach handled?	What types of information are necessary to assist in decision making?	If a statewide database of such information were available, would that be helpful?
Jonathan Langley, Bay City TSC	None	I would reference Permit Manual or call Lansing for instruction	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes
Jay Gailitis, Gaylord TSC	None	Probably deny, but first review rules and regs and consult Lansing real estate	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Zoning, Planned Unit Developments, Environmental/Habitat, Future Use/MDOT Needs,	Yes
Darrell Harden, Southwest Region	None	My primary concern would be future ROW needs we would have for that area.	None	Roadside Features, ROW Lines, Adjacent Parcel Information/Land Uses, Environmental/Habitat, Future Use/MDOT Needs,	Yes

APPENDIX C –
NATIONWIDE DOT SURVEY RESPONSES

Contact information for respondents from agencies that <u>have</u> received non-traditional ROW development/use requests (24 states responded; two responses were received from Minnesota DOT and Utah DOT and were subsequently combined; does not include Michigan)

State	Name City/Town	Company/Office Email Address	Title Phone Number
Alaska	Robert Wright Juneau, AL	Alaska DOT robert.wright1@alaska.gov	State Right-of-Way Chief (907) 269-6240
Arizona	Raul Torres Phoenix, AZ	AZ Department of Transportation RTorres@azdot.gov	Manager ROW Property Mgmt. (602) 712-6568
Arkansas	Perry Johnston Little Rock, AR	Arkansas State Highway & Trans. Dept. perry.johnston@ahtd.ar.gov	Division Head (501) 569-2311
California	Jack Broadbent Sacramento, CA	Caltrans Jack_broadbent@dot.ca.gov	Sup. Landscape Architect (916) 653-3170
Colorado	Sarah Mitchell Denver, CO	CDOT sarah.mitchell@state.co.us	Sustainability Coordinator (303) 757-9764
Delaware	Robert Cunningham Dover, DE	Delaware DOT robert.cunningham3@state.de.us	Assistant Director, Right of Way (302) 760-2078
Idaho	Janet Brown Boise, ID	Idaho Transportation Dept. janet.brown@itd.idaho.gov	Sr. Right of Way Agent (208) 334-8511
Illinois	Justan Mann Springfield, IL	IL Dept. of Transportation justan.mann@illinois.gov	Engineer of Operations (217) 782-7231
Iowa	Joy Williams Ames, IW	Iowa DOT - Office of Design joy.williams@dot.iowa.gov	Agronomist (515) 233-7729
Kansas	Thad Fowler (via phone) Topeka, KS	Kansas DOT Thad@ksdot.org	Coordinating Land Specialist, Bureau of Right of Way (785) 296-6939
Maine	Todd Pelletier Augusta, ME	Maine Department of Transportation todd.pelletier@maine.gov	Property Office (207) 624-3551
Massachusetts	Roy Avellaneda Boston, MA	Mass DOT/ Office of Real Estate roy.avellaneda@dot.state.ma.us	Project Manager (857) 368-8945
Minnesota	Rick Morey (via phone) St. Paul, MN	Minnesota DOT (Office of Land Management) richard.morey@state.mn.us	Assistant Director of Surveying and Mapping (651) 366-3504
Minnesota	Philip Barns (via phone) St. Paul, MN	Minnesota DOT N/A	N/A (651) 366-3171
Montana	Dave Hand Helena, MT	Montana Dept. of Transportation dhand@mt.gov	Maintenance Operations Manager (406) 444-6157

State	Name City/Town	Company/Office Email Address	Title Phone Number
Nebraska	Robert Frickel Lincoln, NE	Nebraska Dept. of Roads bob.frickel@nebraska.gov	Right of Way Manager (4020 479-4460
New Jersey	David Kook Trenton, NJ	NJDOT ROW&AM david.kook@dot.state.nj.us	Manager (609) 530-5596
New York	Robert Seymour Albany, NY	Right-of-Way robert.seymour@dot.ny.gov	Real estate Specialist 2 (518) 457-9646
North Carolina	Derek Smith Raleigh, NC	NCDOT dcsmith@ncdot.gov	Vegetation Asset management Engineer (919) 707-2939
Ohio	Mike Gramza Bowling Green, OH	OHIO DOT mike.gramza@dot.state.oh.us	Planning and Engineering Admin. (419) 373-4466
Oregon	Allison Hamilton Salem, OR	Oregon Dept. of Transportation allison.m.hamilton@odot.state.or.us	Manager, Oregon Solar Highway Program (503) 551-9471
Tennessee	Gale Wagner Nashville, TN	Tennessee Dept. of Transportation gale.wagner@tn.gov	Transportation Manager 1 (615) 253-1154
Utah	Russ Scovil Salt Lake City	UDOT rgscovil@utah.gov	Project Management Engineer (801) 870-4665
Utah	Rod McDaniels Salt Lake City	UDOT rmcdaniels@utah.gov	Program Mgr. Outdoor Advertising, Access Mgt., and Statewide Permits (801) 633-6214
Vermont	Robert M. White Montpelier, VT	Vermont Agency of Transportation rob.white@state.vt.us	Right of Way Chief (802) 828-2619
Wisconsin	Leif Hubbard Madison, WI	WisDOT leif.hubbard@dot.wi.gov	State Transportation Landscape Architect (608) 267-6884

Q: Please indicate the specific types of non-traditional/non-transportation ROW development projects for which requests have been received. (select all that apply)

Response	Percent	Count
Solar Power Generation	55.6%	10
Wind Power Generation	27.8%	5
Biofuel Farming	33.3%	6
Other Ag./Farming	44.4%	8
Vegetation/Forest Mgmt.	27.8%	5
Other	11.1%	2
	Total Answered	18
	Total Skipped	6

State	"Other" Response
Maine	Interstate 95 in Maine has been identified as an Statutory recognized Utility Corridor. The purpose is to allow DC transmission (sub-surface) of power from Northern Maine and Canada to be connected to the Northeastern grid.
Minnesota	CO_2 sequestration via vegetation plantings; Pheasant nesting at the request of the DNR; Possible revenue generation via billboard leases.

Q: Related to the previous question, please describe any particularly large-scale and/or high-profile project(s)

State	Response
Alaska	None have been allowed.
Arizona	We currently have a Privately Funded Research Project under lease.
California	Solar placed in the RW was found to be non-cost effective. Wind generation along the median barriers sounded positive however was a traffic safety issues neither green energy source was found to be compatible with Transportation corridors. US Forest service and other federal agencies work cooperatively with Caltrans for management of the vegetation within their jurisdiction.
Colorado	CDOT applied to a DOT Volpe Center/FHWA request for Renewables in ROW Projects. CDOT's proposal to develop a Solar in ROW Program was accepted. The project is currently developing a summary of primary questions/considerations. The following steps are: - Hosting a meeting with internal stakeholders (pertinent CDOT discipline reps, Volpe, FHWA) - Hosting an external stakeholder meeting to discuss questions/concerns - Developing a Solar in ROW Program
Idaho	We just had an unusual request from an oil & gas company wanting to have permission to drill on private land but suck out gas or oil from beneath our highway right of way. I had to send that request up the ladder to see if anyone here would allow that to happen.
Illinois	No large scale or high profile projects have been initiated to date.
Kansas	Joint Use agriculture in extra ROW
Maine	Just got passed and we are currently in the early stages. Just finished rule making.
Minnesota	Nothing committed yet. Still trying to work out the details. Such non-traditional developments would require changing Minnesota state law, as there are currently strict provisions as to ROW uses.
Nebraska	Haying permits only
New Jersey	Linear solar generation plant
North Carolina	NCDOT, in cooperation with Dr. Matt Veal at NC State University, conducted a research trial to determine the validity of planting crops for biofuels along roadsides. Three tillage methods were included in this research: maximum tillage, minimum tillage and no-till planting methods were included. Over the three year project it was determined based upon yield, that maximum tillage is needed the first year to loosen soils compacted by road construction activities. After the initial planting, no-till methods could be used to establish crops along the rights of way. Because our rights of way are narrow, we chose a 10 foot planting width. We obtained an average yield of 1580 lbs. /10 ft. strip/mile. Products realized included: 72 gallons B-100 canola oil (Pure Canola oil), and 1031 pounds of canola meal. Calculating all costs, Dr. Veal determined that we needed to produce 900 pounds of seed to break even. NCDOT blended the B-100 with diesel fuel to produce 600 gallons of B-20. B-20 biofuel can be utilized in diesel equipment. As a result of this work, NCDOT was the first DOT in the nation to in a calendar year grow a canola crop from seed, harvest and process the seed to extract oil, produce B-20 from that oil and use that biofuel in our equipment. I will, under a separate cover, send you a copy of our power point. If you have questions about the ppt please contact me.
Ohio	We own a 1.5 MW solar field at the Greenbelt Parkway and I-280...Installed in our ROW. Also have a number of cell towers that we lease property for. ODOT also permits landscaping improvements and maintenance by outside agencies within interchange areas.
Oregon	Two solar projects alongside Interstate 5 in Oregon's Willamette Valley. See www.oregonsolarhighway.com. No wind projects have yet been developed but the department has been contacted by wind developers regarding potential projects. There has been some interest in growing biofuel crops alongside the ROW, but nothing actually on the ground (yet).
Tennessee	All projects have been small site specific (landscaping/roadside maintenance). Primarily beautification projects at intersections/interchanges.

Utah	The University of Utah uses a small plot of land 300' x 25', adjacent a rest stop, along I-15, with the following objectives: 1. test optimal agronomic practices given roadside growing conditions, 2. determine optimum feedstock crops to be grown, 3. increase yield of biofuel feedstocks for bioenergy, 4. model new efforts for the national alliance. The seeding has already taken place and the results will be seen this year and document in a Fall 2013 report.
Vermont	A private company has asked to use limited access right of way to erect a solar farm.
Wisconsin	Wisconsin Ditchmass: A 2010 Road Shoulder Biomass Energy Harvesting Pilot Project. A partnership was developed between Derr Solarmass LLC, Wisconsin's Office of Energy Independence and WisDOT. Darr Solarmass harvested a 2.2 mile section of right-of-way. Thirty-five large square bales were harvested producing an average yield of 2.03 tons/acre or 5.55 tons per mile. Chemical analysis was completed. The pilot showed that harvesting roadside biomass with farm equipment is feasible and yield and quality was sufficient to warrant further study.

Q: How are roadside right-of-way (ROW) development projects typically initiated? Please feel free to reference specific projects listed in the previous question.

State	Response
Arizona	Usually through written submittal from interested parties.
California	Cooperative Agreement Freeway Agreement MOU Maintenance Agreement
Colorado	Typically through a request submitted to the permitting department.
Idaho	We have only had one project that I am aware of in Idaho and it was in cooperation with the Indian Tribe to take care of and run a convenience shop and bathroom facility 24/7 with funds from ITD and them together making this happen.
Illinois	Private entity requests a permit for switch grass harvesting or hay harvesting
Kansas	Comprehensive highway plan and request from adjacent land owner or farmer, make inquiry to local DOT facility and gets directed to bureau of right of way for further consideration
Maine	Governor's Energy Office actually solicits potential interest in entities that may want to use the Statutory corridors
Minnesota	These are specifically internal investigations and are not a result of external non-state governmental entities requesting a permit. The DOT is exploring non-traditional ROW uses for two reasons 1) potential revenue through lease agreements and revenue generated from power and 2) to become more green and reduce carbon footprint.
Nebraska	Written requests
New Jersey	Requests are made; we have not yet had an application run to a successful conclusion.
North Carolina	In this case, our Department Secretary asked us to investigate the feasibility of growing crops along the ROW.
Ohio	Usually approached by utility companies or farmers.
Oregon	The solar projects were initiated inside ODOT by staff (Allison Hamilton). Interest in a small scale ROW wind project was brought to ODOT by a wind developer who worked with ODOT staff to locate a demonstration project site, but the effort lost traction when ODOT's ability to staff a project was removed. (The federal grant which funds the Oregon Solar Highway Program is dedicated solely to solar; the funds cannot be used to explore wind energy, and there weren't additional funds which could be tapped for a project.) The biofuels interest came from inside the department but there wasn't sufficient interest or support higher up to move it into actuality.
Tennessee	Projects are initiated through TDOT's local programs office. The local programs office administers the distribution of state and federal grant monies.
Utah	Through a problem statement generated by UDOT or a university.
Vermont	They are typically initiated through the request of an access permit (1111 Permit).
Wisconsin	Initiated by private party Derr Solarmass

Q: How was this/these roadside ROW development projects implemented? (select all that apply)

Response	Percent	Count
Permit	75.0%	12
Public/Private Partnership	31.3%	5
Utility Accommodation Plan (UAP)	6.3%	1
Airspace Lease Agreement	12.5%	2
Other	43.8%	7
	Total Answered	16
	Total Skipped	8

State	"Other" Response
Colorado	Application to DOT Volpe/FHWA
Maine	Occupancy Agreement
Minnesota	We are currently unsure, but exploring all types; specifically a public/private partnership for power generation or least to private for billboards
North Carolina	No permit was necessary in this case as we were working on our own rights of way. As far as I know we have not developed a Departmental policy to cover requests other than in-house requests.
Tennessee	license
Utah	Research problem statement.
Vermont	This is new to us and we have not got to that point yet.

Q: What was learned by implementing the roadside ROW development project(s) described previously?

State	Response
Arizona	That there is potential revenue possibilities.
California	The RW corridor has a primary function of Moving people goods and services. This is done primarily by cars and trucks. The safety of the traveling public and the safety of maintenance personnel and traffic operations is the first priority will often be in direct conflict with an innovative alternative use of the RW thus causing the innovative Ideas not to be implemented due to cost and other issues.
Colorado	In Progress
Nebraska	Permits worked when initiated at the District level.
New Jersey	We do not have a strategy in place to address antiquated laws on how we can deal with our right of way
North Carolina	The success of a seed-crop to biofuel program along the ROW will be based upon the proximity of the crop to the processing plant. In our research we used a small mobile extraction 'plant' to process the seed to oil. On a large scale operation, private party processors (independent companies) would have to be contracted to accept the seed before we plant it and we would have to address the economics of shipping seed to these plants. Currently, in NC there is one known processor located in eastern NC.
Ohio	ODOT can benefit from additional uses of our ROW
Oregon	See www.oregonsolarhighway.com for the "Lessons Learned" document and manual on how to develop a solar highway project. (See "Technical Documents" sidebar on right-hand side of page.)
Tennessee	There seems to be a persistent assumption that state owned ROW is available for local agency use unconditionally. It is a problem we deal with on virtually every local project that involves state ROW
Utah	The project is midterm, with results expected Fall of 2013.
Wisconsin	It is feasible to harvest roadside biomass with farm equipment. Natural biomass quality is limited

Q: Was the project(s) considered to be a success?

State	Response
California	Solar and wind power generation have not occurred on the state RW yet Veg management is more common occurrences. Farming of the RW is done for vegetation management and done on a very limited basis. The primary reasons and not done to produce a viable farm crop though the swath and bailing of roadside grasses is used for feed or other uses.
Colorado	In Progress
Idaho	We think this will be a way for ITD to save money while allowing a 24/7 access to bathroom facilities that the Tribe will be fully responsible for and the public can purchase products from the convenience store.
Nebraska	Haying in the Right of Way when permitted was allowed.
New Jersey	Project did not get beyond initial discussions.
Oregon	Both solar highway projects are operating seamlessly and public feedback has been excellent. Both projects are national award-winners providing multiple benefits to the department and to the utility owning and operating the projects.
Tennessee	We have processed dozens of leases and license for local use of ROW. Because of their small, site specific nature, there is typically not a quantifiable "success". The projects have been completed without incident if that is considered success.
Utah	The project is midterm, with results expected Fall of 2013.
Vermont	Unknown at this time
Wisconsin	The stake holders learned what was outlined in the objectives.

Q: Has/will this program be expanded?

Response	Percent	Count
Yes/Likely	31.3 %	5
No	25.0%	4
Unsure	43.7%	7
	Total Answered	16
	Total Skipped	8

State	Comment
Colorado	Current project will only be completed once, but the resulting program will hopefully be implemented and further developed.
Idaho	If this works well, we will most likely try to do this again in another area of Idaho.
Maine	No idea yet
North Carolina	The correct response is "I am not sure". NC recently elected a new Governor and our new Departmental Secretary may have priorities that differ from our previous Secretary.
Ohio	As we continue to investigate additional funding sources, the use of our ROW for commercial purposes may be expanded.
Oregon	Working on third project now...
Tennessee	Our excess land program is at this time reactionary. We respond to requests from the outside. Expansion of the program is dependent on the market, in this case, the funding sources going to local agencies. The ROW division has no involvement in the allocation of these funds.
Utah	Not sure at this point.
Vermont	Unknown at this time
Wisconsin	Unsure with change in state administration.

Q: Which entity ultimately "owns" the project?

State	Comment
Arizona	The private entity
California	maintenance for the Veg control Other programs did not become reality
Colorado	DOT Volpe is completing the work for CDOT
Idaho	ITD
Kansas	Jointly between the DOT and the farmer.
Minnesota	The state, most likely
Nebraska	Nebraska Department of Roads
New Jersey	Never determined
North Carolina	NCDOT through its Roadside Environmental Unit.
Ohio	ODOT owns the solar field. The other projects maintenance and upkeep is the outside entities responsibility.
Oregon	The first project is owned by the utility serving the area - Portland General Electric. The second project is owned by Bank of America but after the tax recapture period (60 months give or take), PGE will most likely purchase the project from the bank. At this time, PGE leases the project from the bank.
Tennessee	The local agency
Utah	University of Utah
Vermont	The private company
Wisconsin	WisDOT

Q: What is/was the return on investment period for the aforementioned ROW projects?

State	Comment
Colorado	Not Determined
Idaho	I don't have that information.
Kansas	Not specified
Maine	DOT receives a yearly lease payment for the life of the transmission line
Nebraska	unknown
New Jersey	No return was generated.
North Carolina	A profit was realized the first year.
Ohio	Only for the Solar field. Utility projects had an immediate return. Beautification projects provided future maintenance support.
Oregon	The projects are fully amortized at the end of tax recapture period (6 years). Project life is expected to be 35+ years. First project PPA is for 20 years with ability to extend beyond that. Second project uses a Solar Site License Agreement, which is for 25 years with extensions allowed up to 35 years.
Tennessee	The types of projects that we deal with do not measure a ROI
Vermont	Unknown at this time
Wisconsin	It was a pilot there wasn't a return on investment

Q: For solar/wind projects, are they tied to a grid?

Response	States	Count
Yes	Ohio, Oregon	2
No	Arizona	1

Q: Is the electricity utilized on-site, or is excess electricity generated?

Response	States	Count
Used on-site	Arizona, Oregon	2
Excess generated	Ohio, Oregon	2

Q: Are there other types of right-of-way (ROW) development projects being considered? If so, please provide details.

State	Comment
Alaska	No
Arizona	Yes we are looking at developing a partnership to establish a solar project to generate power for our Freeway system.
California	not that I am aware of
Colorado	Not presently
Idaho	Solar has been talked about but nothing is in the works.
Illinois	No
Kansas	No
Maine	No
Minnesota	No
Nebraska	No
New Jersey	At present, there are no projects.
North Carolina	Not at this time.
Ohio	Considering allowing advertising within interchanges, rest areas etc.
Oregon	More solar at this point; wind potentially in the future. Going to the previous two questions, both are grid connected so the energy isn't used on-site, actually. For the first project, ODOT buys the energy generated and it provides about 1/3rd of needed energy for the site. For the second project, more is generated than is required for the site but ODOT doesn't buy any of it, instead ODOT receives a share of RECs generated and an annual site license payment.
Tennessee	None that I am aware of at this time
Utah	Not currently.
Vermont	Not at this time.

Q: How are spatial (i.e., GIS) datasets maintained within your state?*

Response	Percent	Count
In-House Data Collection	60.6%	20
Contracted or Other Entity	3.0%	1
Both In-House and Contract	27.3%	9
GIS Data Not Used	9.1%	3
	Total Answered	33
	Total Skipped	9

Q: How frequently do you utilize GIS datasets for roadside right-of-way (ROW) development permit requests and related decisions?*

Response	Percent	Count
Always	8.8%	3
Usually	14.7%	5
Sometimes	32.4%	11
Rarely	14.7%	5
Never	29.4%	10
	Total Answered	34
	Total Skipped	8

Q: How are these datasets utilized for preliminary project scoping?* (select all that apply)

Response	Percent	Count
Location selection/proj. limits	38.2 %	13
Utility identification	14.7%	5
Access identification	14.7%	5
Other	11.8%	4
Not utilized for proj. scoping	58.8%	20
	Total Answered	34
	Total Skipped	8

State	"Other" Response
California	Asset identification
North Carolina	Locate fixed assets along the ROW, including guardrail, ornamental plantings, capped islands, etc.
Oregon	Ownership, access to grid, proximity to development or other potential impacts
Alabama	Still working on getting ROW information integrated with GIS

***Includes responses from all states, including those that have not received any non-traditional ROW development/use requests**

Contact information for respondents from agencies that <u>have not</u> received non-traditional ROW development/use requests (18 states responded; GIS related responses were combined within previous section)

State	Name City/Town	Company/Office Email Address	Title Phone Number
Alabama	Steve Walker (via phone) Montgomerey, AL	Alabama DOT walkers@dot.state.al.us	State ROW Engineer (334) 242-6187
Connecticut	William Britnell Newington, CT	Connecticut DOT william.britnell@ct.gov	Principal Engineer (860) 594-3274
Florida	Tim Allen Tallahassee, Fl	Florida DOT Maintenance tim.allen@dot.state.fl.us	Roadside Manager (850) 410-5633
Hawaii	Dean Yogi (via phone) Kapolei, HA	Hawaii DOT dean.yogi@hawaii.gov	Right-of-Way Manager (808) 692-7325
Kentucky	Greg Morgan (via phone) Frankfort, KY	Kentucky Trans. Cabinet greg.morgan@ky.gov	District 1 Right of Way Supervisor (270) 898-2431
Louisiana	Beyong Lim (via phone) Baton Rouge, LA	Louisiana DOT N/A	Headquarters Right-of-Way Permit Engineer (225) 379-1927
Maryland	Gina Anthony Baltimore, MD	Maryland State Hwy Admin. ganthony@sha.state.md.us	Director (410) 545-0021
Mississippi	Lillie Minor/Wallie Williamson (via phone) Jackson, MS	Mississippi DOT lminor@mdot.state.ms.us	ROW Agent Supervisor (601) 359-7630/(601) 359-7538
Missouri	Vernon Koch (via phone) Jefferson City, MO	Missouri DOT vernon.koch@modot.mo.gv	Traffic Operations Sup. (contact for RWO permits) (816) 607-2190
New Mexico	Clyde Archibeque (via phone) Santa Fe, NM	New Mexico DOT clyde.archibeque@state.nm.us	Property Management (505) 490-2643
Oklahoma	Kurt Harms Oklahoma City, OK	Oklahoma Dept of Trans kharms@odot.org	Chief, R/W & Util (405) 521-2661
Pennsylvania	Larry Ditty Harrisburg, PA	PennDOT lditty@pa.gov	Utility Relocation Administrator (717) 214-8762
Rhode Island	Paul Katchiri (via phone) Providence, RI	Rhode Island DOT N/A	Property Management (401) 734-4831
South Carolina	Rob Bedenbaugh Columbia, SC	SCDOT bedenbaugr@scdot.org	Roadway Design Support Engineer (803) 737-1134
South Dakota	Joel Gengler(via phone) Pierre, SD	South Dakota DOT N/A	Office of Right of Way Department Manager (605) 773-8398

State	Name City/Town	Company/Office Email Address	Title Phone Number
Virginia	Mutaz Richmond, VA	VDOT mutaz.alkhadra@vdot.virginia.gov	Land Use Permit Manager (804) 786-0622
Washington	Steven Paul Olympia, WA	Washington DOT N/A	RW Plans Supervisor (360) 705-7465
Wyoming	Michael Miller Cheyenne, WY	Wyoming DOT mikej.miller@wyo.gov	RW Administrator (307) 777-4249

Q: If a request for a non-traditional/non-transportation roadside ROW development project were to be submitted to the DOT, what process would typically be used for approval/denial? (select all that apply)

Response	Percent		Count
Permit	93.3%		14
Public/Private partnership	6.7%		1
Utility Accommodation Plan (UAP)	13.3%		2
Airspace Agreement	6.7%		1
		Total Answered	15
		Total Skipped	3

Q: What local and/or regulatory agencies would need to be involved with ROW development permitting process and/or projects? (select all that apply)

Response	Percent		Count
Municipal Government	100.0%		15
Metropolitan Planning Organization	13.3%		2
Department of Natural Resources	13.3%		2
Department of Env. Quality	13.3%		2
		Total Answered	15
		Total Skipped	3

State	"Other" Response
Connecticut	Department of Transportation
Florida	It would depend on the type of roadway and location
South Carolina	Dependent upon type of encroachment
Wyoming	None

Q: How would public outreach handled, particularly with the adjacent property owners? (select all that apply)

Response	Percent		Count
Newspaper Ad	86.7%		13
Door-to-Door	6.7%		1
Letters Mailed	20.0%		3
		Total Answered	15
		Total Skipped	3

State	"Other" Response
Connecticut	Public meeting(s)
Florida	Public notices are handled by our Public Information Office and depending on the project they could also use project site signs, radio, and TV ads.
South Carolina	Public Information Meetings

APPENDIX D –

AVAILABLE GIS SHAPEFILES

Category	Shapefile Description	Source Agency
Census	Amish Population	MDOT
Census	Block Group	MDOT
Census	Census Block 2012	MDOT
Census	Census Designated Place	MDOT
Census	Census Tract	MDOT
Environmental	Leaking Underground Storage Tanks (Closed)	DEQ
Environmental	Leaking Underground Storage Tanks (Open)	DEQ
Environmental	Oil and Gas Contamination Sites	DEQ
Environmental	Underground Storage Tanks (Active)	DEQ
Environmental	Underground Storage Tanks (Closed)	DEQ
Environmental	Environmental Township Range	DNR
Environmental	Hazardous Waste Management Sites	DNR
Environmental	Sites of Environmental Contamination	DNR
Environmental	Solid Waste Management Sites	DNR
Environmental	Contamination Lead Paint Bridges	MDOT
Environmental	Ecological Reference Areas	MDOT
Environmental	Environmental Areas	MDOT
Environmental	Environmental Townships	MDOT
Environmental	Impaired Water with Total Maximum Daily Loads	MDOT
Environmental	Natural Areas	MDOT
Environmental	Natural Areas Dedicated	MDOT
Environmental	Public Act 116 - Agriculture	MDOT
Environmental	Redbook (Protected) Sites	MDOT
Environmental	Source Water Protection Area	MDOT
Environmental	Superfund Sites	MDOT
Environmental	Water Quality TMDL	MDOT
Environmental	Wild Scenic Rivers	MDOT
Environmental	Wild Scenic Rivers (Water Quality)	MDOT
Environmental	Agricultural Water Use	MGDL
Geology / Soils	High Risk Erosion Areas	MDOT
Geology / Soils	MDOT Soil Borings	MDOT
Geology / Soils	Soils	MGDL
Geology / Soils	Statewide Reserved Minerals	MGDL
Groundwater	Wellhead Protection Area	MDOT
Groundwater	State Water Table	MGDL
Historical	Historic Bridges	MDOT
Historical	Historic District	MDOT
Historical	Historic Listed Eligible Properties HPMS Ingham	MDOT
Historical	Historic Markers pre2004	MDOT
Historical	Historic National Register Sites pre1999	MDOT
Historical	Historic state Register pre2004	MDOT
Historical	Historical Eligible Complexes Farmsteads HPMS Ingham	MDOT
Historical	Historical Heritage Routes	MDOT
Hydrography	Trout Lakes	DEQ
Hydrography	Trout Streams	DEQ
Hydrography	Hydrography	Local Agency (Battle Creek)
Hydrography	Kalamazoo Watersheds	Local Agency (Battle Creek)
Hydrography	Waterbodies	Local Agency (Kalamazoo Co.)
Hydrography	Watersheds	Local Agency (Kalamazoo Co.)

Category	Shapefile Description	Source Agency
Hydrography	Waterways	Local Agency (Kalamazoo Co.)
Hydrography	Wetlands (National Wetlands Inventory)	Local Agency (Kalamazoo Co.)
Hydrography	Base Management Plan	MDOT
Hydrography	Coastal Barrier Resources	MDOT
Hydrography	Designated Streams	MDOT
Hydrography	Floodplains	MDOT
Hydrography	Floodplains FEMA Defirms	MDOT
Hydrography	Great Lakes	MDOT
Hydrography	Hydrography (line)	MDOT
Hydrography	Hydrography (poly)	MDOT
Hydrography	MDOT Water Version 8	MDOT
Hydrography	Monitoring Wells	MDOT
Hydrography	Natural Rivers	MDOT
Hydrography	Natural Tributaries	MDOT
Hydrography	Nested Management Plan	MDOT
Hydrography	Rabbit River Management Plan	MDOT
Hydrography	State Wildlife Areas	MDOT
Hydrography	Water Intakes	MDOT
Hydrography	Wetland Mitigation Sites	MDOT
Hydrography	Fishery Management Boundaries	MGDL
Hydrography	Hydraulic Wells	MGDL
Hydrography	Trout Streams 2008	MGDL
Hydrography	Watersheds	MGDL
Jurisdictional Boundaries	Cemeteries	MDOT
Jurisdictional Boundaries	Census Designated Places	MDOT
Jurisdictional Boundaries	City Points	MDOT
Jurisdictional Boundaries	Congressional Districts	MDOT
Jurisdictional Boundaries	Conservation and Recreation Lands (CARL)	MDOT
Jurisdictional Boundaries	Counties	MDOT
Jurisdictional Boundaries	Designated Dunes	MDOT
Jurisdictional Boundaries	House District	MDOT
Jurisdictional Boundaries	Landmarks	MDOT
Jurisdictional Boundaries	Local Parks	MDOT
Jurisdictional Boundaries	Michigan Cities	MDOT
Jurisdictional Boundaries	School District	MDOT
Jurisdictional Boundaries	Senate District	MDOT
Jurisdictional Boundaries	Surrounding States	MDOT
Jurisdictional Boundaries	Township Range	MDOT
Jurisdictional Boundaries	Townships	MDOT
Jurisdictional Boundaries	Urban Boundary	MDOT
Jurisdictional Boundaries	Village Boundary	MDOT
Jurisdictional Boundaries	DNR Ownership Boundary	MGDL
Jurisdictional Boundaries	Minor Civil Divisions	MGDL
Jurisdictional Boundaries	Tribal Lands	U.S. TIGER
Land Cover / Use	Battle Creek Master Plan	Local Agency (Battle Creek)
Land Cover / Use	Battle Creek Planned Development	Local Agency (Battle Creek)
Land Cover / Use	Charleston Twp Master Plan	Local Agency (Charleston Twp)
Land Cover / Use	Emmett Twp Master Plan	Local Agency (Emmett Twp)
Land Cover / Use	Marshall Twp Master Plan	Local Agency (Marshall Twp)

Category	Shapefile Description	Source Agency
Land Cover / Use	1800 Land Cover	MDOT
Land Cover / Use	MDOT 5-Year Plan Lines	MDOT
Land Cover / Use	MDOT 5-Year Plan Points	MDOT
Land Cover / Use	MDOT 5-Year Plan Polygons	MDOT
Land Cover / Use	Lower Peninsula Land Cover 2001	MGDL
Land Cover / Use	National Land Cover Dataset 2006	USGS
Management Boundaries	Battle Creek Parks	Local Agency (Battle Creek)
Management Boundaries	City Boundaries (Battle Creek)	Local Agency (Battle Creek)
Management Boundaries	Lot Lines	Local Agency (Battle Creek)
Management Boundaries	Parcels (Battle Creek)	Local Agency (Battle Creek)
Management Boundaries	Property Easements (Battle Creek)	Local Agency (Battle Creek)
Management Boundaries	Parcels (Kalamazoo County)	Local Agency (Kalamazoo Co.)
Management Boundaries	PLSS Corners	Local Agency (Kalamazoo Co.)
Management Boundaries	Adjusted Census Urban Boundaries	MDOT
Management Boundaries	Coastal Zone Management Area	MDOT
Management Boundaries	Conservation Land	MDOT
Management Boundaries	County and Local Land	MDOT
Management Boundaries	Federal Land	MDOT
Management Boundaries	MDOT ISD	MDOT
Management Boundaries	MDOT Planning Regions	MDOT
Management Boundaries	MDOT Regions	MDOT
Management Boundaries	MDOT Sections	MDOT
Management Boundaries	MDOT TSC Locations	MDOT
Management Boundaries	MDOT Excess Parcels	MDOT Southwest Region Office
Management Boundaries	Forest Mineral & Fire Management Division	MGDL
Management Boundaries	Parks and Recreation Management Units	MGDL
Management Boundaries	Wildlife Management Units	MGDL
Plant and Animal Locations	Hines Emerald Habitat	MDOT
Plant and Animal Locations	Kirtland Warbler Units	MDOT
Plant and Animal Locations	Piping Plover Units	MDOT
Plant and Animal Locations	Biodiversity Index and Probability	Mich. Natural Features Inventory
Right of Way	Right of Way (ROW) Maps	MDOT (Georeferenced by WSU)
Topography	DEM	Local Agency (Kalamazoo Co.)
Topography	Topographic Contours	Local Agency (Kalamazoo Co.)
Topography	Digital Elevation Map	MGDL
Topography	Michigan Digital Elevation Map	MGDL
Topography	Water Table Elevation	MGDL
Transportation Network	Battle Creek Centerlines	Local Agency (Battle Creek)
Transportation Network	Railroads	Local Agency (Kalamazoo Co.)
Transportation Network	Roads	Local Agency (Kalamazoo Co.)
Transportation Network	ADA Ramps	MDOT
Transportation Network	Airports	MDOT
Transportation Network	All Roads	MDOT
Transportation Network	All Roads (Route V10)	MDOT
Transportation Network	All Roads (Route V11)	MDOT
Transportation Network	All Roads (Route V12)	MDOT
Transportation Network	Carpool Lots	MDOT
Transportation Network	Control Section Delineated Routes	MDOT
Transportation Network	Indian Reservation Roads	MDOT

Category	Shapefile Description	Source Agency
Transportation Network	MDOT AADT by Segment	MDOT
Transportation Network	MDOT Billboards	MDOT
Transportation Network	MDOT Bridge Mounted Signs	MDOT
Transportation Network	MDOT Bridges	MDOT
Transportation Network	MDOT Cantilevers	MDOT
Transportation Network	MDOT Facility Location	MDOT
Transportation Network	MDOT Federal Aid Highways	MDOT
Transportation Network	MDOT Future Federal Aid Locations	MDOT
Transportation Network	MDOT Guardrail	MDOT
Transportation Network	MDOT Lane Mile Inventory 2011	MDOT
Transportation Network	MDOT Lane Mile Inventory 2012	MDOT
Transportation Network	MDOT Linear Bridge	MDOT
Transportation Network	MDOT Maintenance Responsibility	MDOT
Transportation Network	MDOT Mile Markers 2011	MDOT
Transportation Network	MDOT National Highway System	MDOT
Transportation Network	MDOT Pavement Condition	MDOT
Transportation Network	MDOT Port Locations	MDOT
Transportation Network	MDOT Railroad Locations	MDOT
Transportation Network	MDOT Rest Area Locations	MDOT
Transportation Network	MDOT Roadside Parks 2011	MDOT
Transportation Network	MDOT Scenic Turnouts	MDOT
Transportation Network	MDOT Shields	MDOT
Transportation Network	MDOT Site Closures	MDOT
Transportation Network	MDOT Sufficiency 2011	MDOT
Transportation Network	MDOT Trunkline Routes	MDOT
Transportation Network	MDOT Trunklines	MDOT
Transportation Network	MDOT Trusses	MDOT
Transportation Network	MDOT Weight Stations 2011	MDOT
Transportation Network	MDOT Welcome Centers 2011	MDOT
Transportation Network	NTFA Segments	MDOT
Transportation Network	NTFA Station Locations	MDOT
Transportation Network	Recreation Public Access Poitns	MDOT
Transportation Network	Snowmobile Trails	MDOT
Transportation Network	All Roads	MGDL
Transportation Network	Railroads	MGDL
Utilities	Sewer and Water	Local Agency (Battle Creek)
Utilities	MDOT Catch Basins	MDOT
Utilities	MDOT Culvert Points	MDOT
Utilities	MDOT Culverts	MDOT
Utilities	MDOT Freeway Lighting	MDOT
Utilities	MDOT Freeway Lighting Controller	MDOT
Zoning	Battle Creek Zoning	Local Agency (Battle Creek)
Zoning	Emmett/Marshall Twp Zoning	Local Agency (Calhoun Co.)
Zoning	Charleston Twp Zoning	Local Agency (Kalamazoo Co.)

APPENDIX E –

PROCEDURES FOR CREATING A ROADSIDE CORRIDOR ANALYSIS GRID IN ARCGIS

1. Identify the desired roadway section and create a new shapefile with only the desired segment. Generally, this is accomplished by selecting the segment from the All Roads shapefile and creating a new shapefile from that selection.
2. Create parallel lines offset from the previously identified roadway section. These will act as the boundaries for the grid.
    a. ESRI provides help documentation for creating parallel offset lines here: http://resources.arcgis.com/en/help/main/10.1/index.html#//01m600000025000000
    b. Distance offset will be in the same units as your data frame projection. In this case we are using Michigan GeoRef as our projection and our data frame is in meters as indicated in the lower right of our map window. The offset used for this project is measured as 804.672 meters, which is equivalent to 0.5 miles.
    c. Here is an example of offset lines after completing this procedure twice:

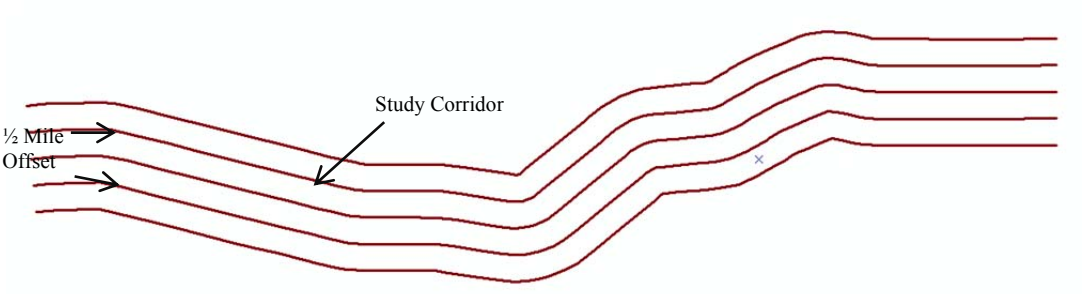

Figure - Offset Corridor Example

3. Next, generate the grid using the 'Grid Index Features' tool located under Data Driven Pages within the Cartography toolbox. Use the previously created shapefile with the corridor offsets as the input feature.
    a. Uncheck the "Generate Polygon Grid that intersects input feature layers or datasets" box, which allows cells to be created between our offset lines.
    b. Enter the desired Polygon width and height; make sure the correct units are selected. Leave all other boxes as default.
4. Split the grid using the offset corridor lines. Use the advanced editing "Split Polygons" tool (on the Advanced Editing toolbar) to accomplish this task. To access the Advanced Editing toolbar: Click on Customize, then toolbars, then click the Advanced Editing option.

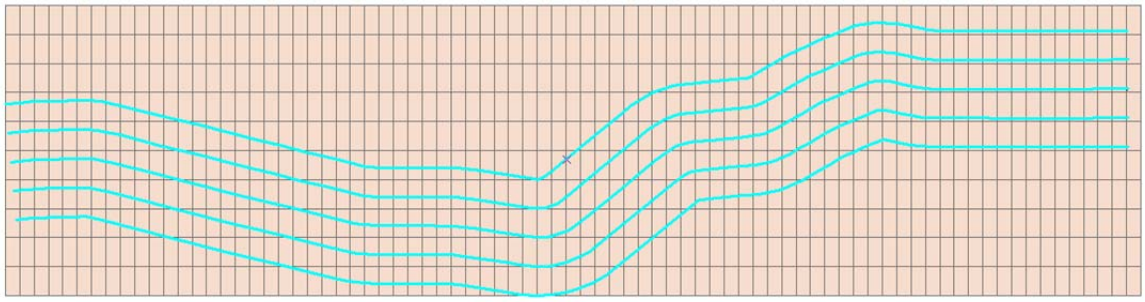

Figure - Split Polygon Grid Using Corridor Offset Lines

a. Trim the grid to match our study corridor. Use basic editing techniques. Delete all cells that are not included in our grid, and merge any errant corners to their specific 0.25 x 0.5 mile cell area. Each of these tasks is completed using the basic editing toolbar.

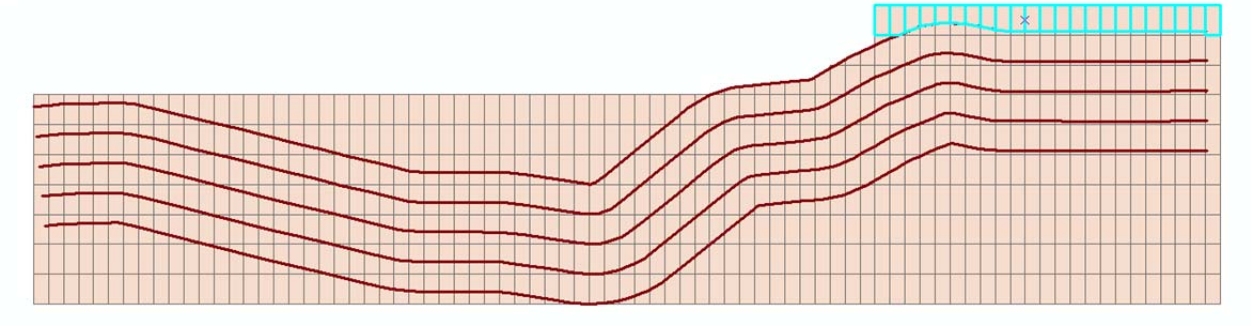

Figure - Rough Trimming of the Grid

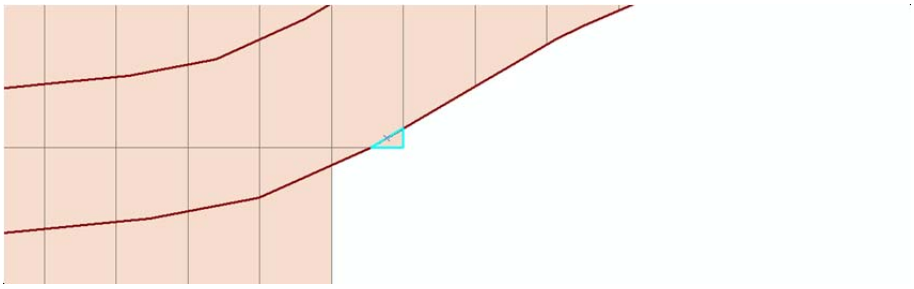

Figure - Detailed Grid Trimming

b. Here is an example of merging a cell within the boundary lines:

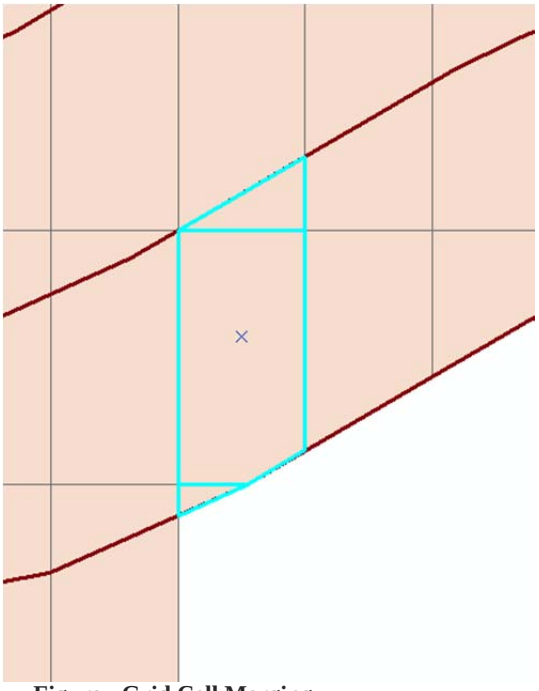

Figure - Grid Cell Merging

The final result of the merging operation is shown as follows:

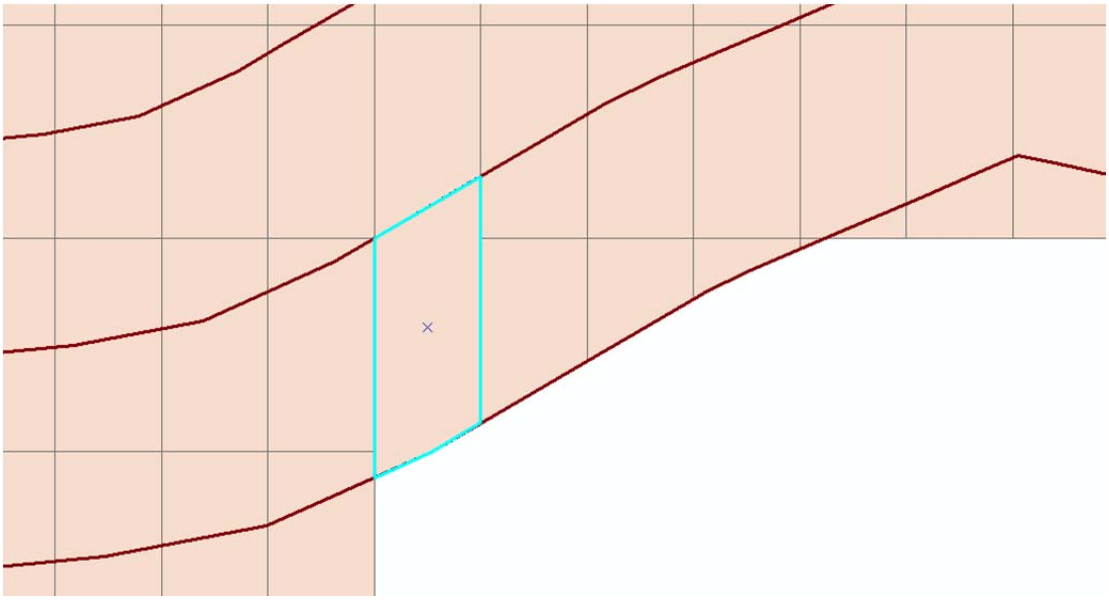

Figure - Final Merged Cell

5. In some cases, a road segment may be angled preventing a generated grid from being used for the entire segment. Manual editing is necessary to cover these sections. An example of this scenario is shown below:

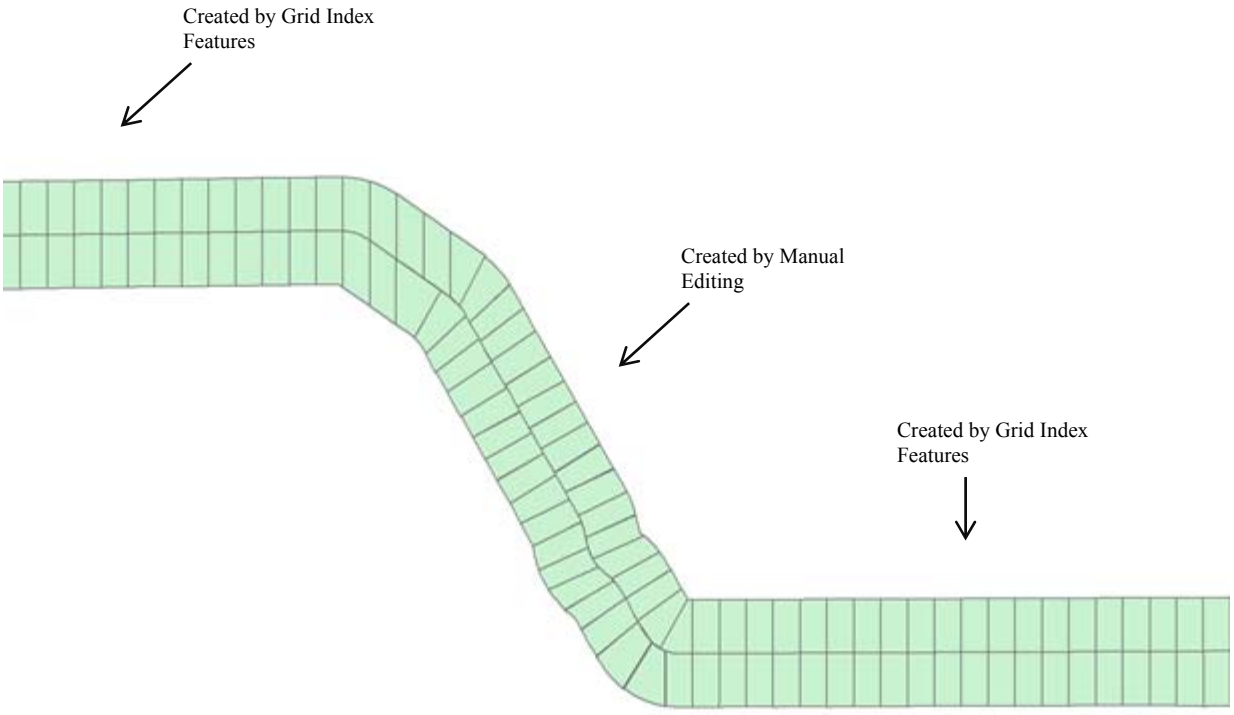

Figure – Manually Created Section

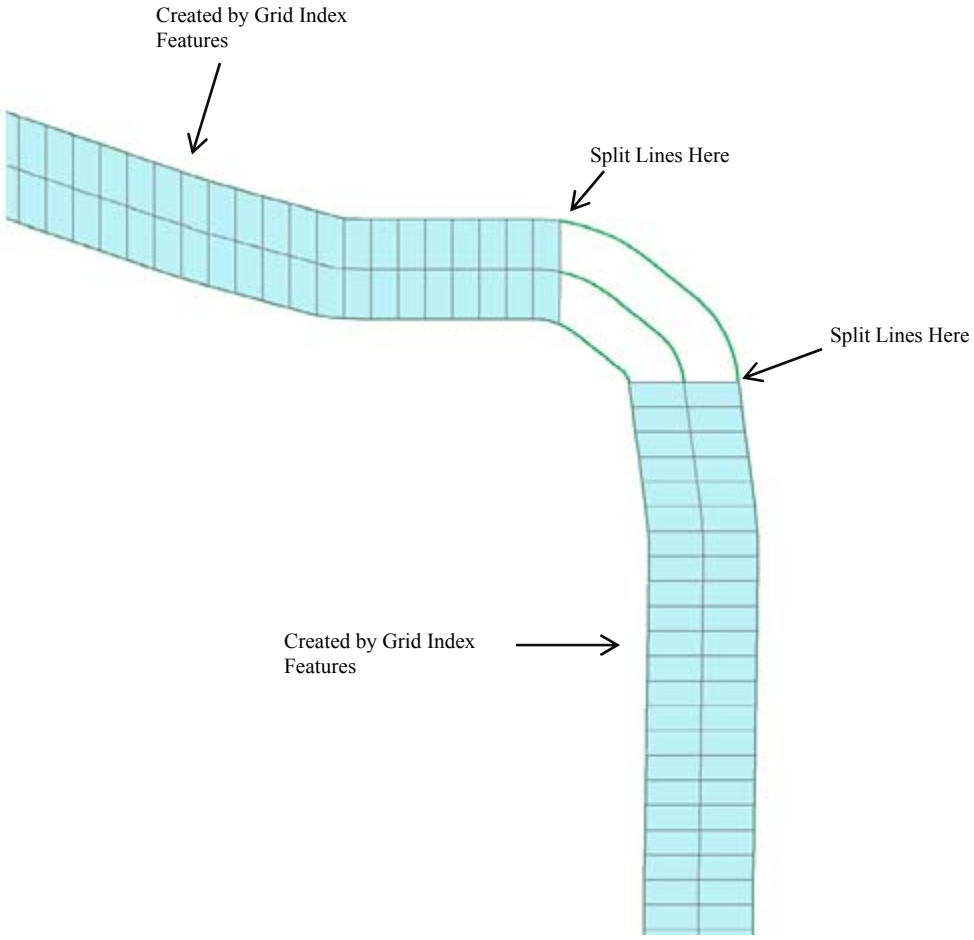

Figure – Splitting Roadway Segment Lines

6. To create the manual section of the grid, the angled sections must be cut from the North-South and East-West sections of roadway. This is accomplished by splitting the lines of the roadway segments from the adjoining grid area. The figure above shows where to split the lines in a typical scenario. Here are the steps for accomplishing this:
    a. To split a line, start editing the shapefile.
    b. Select the line with the editing pointer and click on the split tool in the editing toolbar.
    c. Click the point on the line that you would like to split.
    d. Once the roadway is split, select the individual segments and use them to create their own Shapefiles.
    e. Finally, generate the grid in the dimensions that will create an even polygon area.

7. Once the roadway segments are separated, the internal areas of the grid can now be created.
    a. To create segments by hand, first start editing.
    b. Then go the create features tool on the far right end of the editing toolbar.
    c. Next, click on the grid shapefile that you are working on.
    d. Then click polyline at the bottom of the dialogue box, underneath Construction Tools. Now your pointer is capable of generating a polygon.
    e. Click to begin creating a point. Remember that three points are needed to create a polygon.
    f. Complete the polygon by double clicking on the red vertex.
    g. Use this process to fill the remainder of the blank section between the two generated grid areas.

8. Once all trimming and merging is complete, the final grid should follow the corridor as desired and have a uniform cell size across the entire grid. For analysis purposes, a column can be added within the grid's attribute table and identification numbers may be assigned to all cells within the grid.

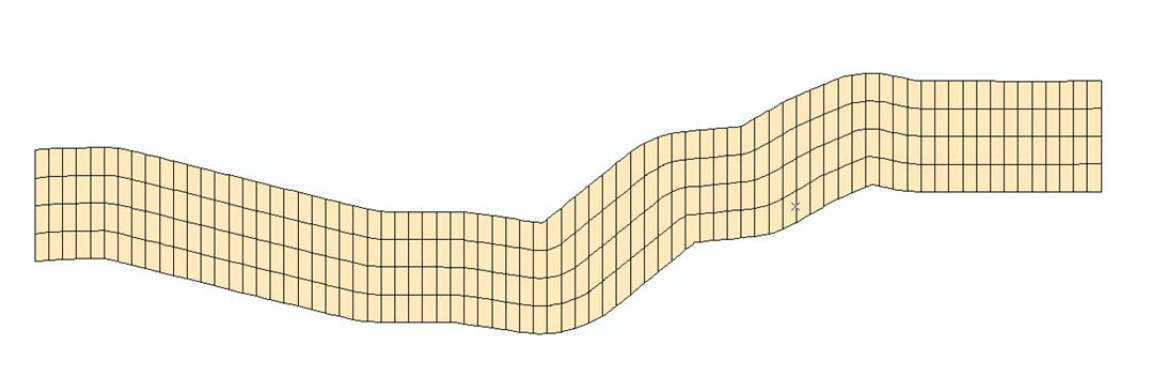

Figure - Complete Corridor Grid

Pilot Corridor with Grid and Cell ID Numbers

APPENDIX F –

PROCEDURE FOR MERGING GPS VIDEO LOG IMAGERY INTO ARCGIS

Data were collected along the pilot I94 corridor in both directions using GPS-enabled video camera, which produced a video stream and GPS tracking log linked together by time stamp. Video was collected at approximately 30 frames per second, while the GPS log was written at a frequency of one stamp per second. Special care was taken by the driver to maintain a speed of 60 miles per hour, which created accurate spacing of data points for mapping purposes. The following six step process was utilized to create geocoded images from the captured video log:

1. Video recording was conducted using a Sony brand consumer grade GPS video camera. Our particular camera captured video in the .MTS format. This is a video format based on .MPEG (an industry standard) which also includes the GPS log information.

2. Next, a specialized program called "ExifTool" by independent programmer Phil Harvey was employed (Source: http://www.sno.phy.queensu.ca/~phil/exiftool/) to extract the GPS log associated with the video file. The program provides an output in the form of a comma delimited text file, which is then imported into a workbook and formatted with Microsoft Excel.

3. Now, each frame of video was extracted using the Windows command prompt and VLC video player (Source:http://www.videolan.org/vlc/). The output provided a .jpeg image for each frame of video, which included the frame number as each image title.

4. Each frame must have a time stamp assigned in order to be linked to the GPS log. A separate excel document was created with each frame number (approx. 1 to 40,000) and a time stamp was generated for each frame based on total video runtime and the rate at which video was captured. This calculation was periodically checked for accuracy by relating the calculated time stamp against the captured video stream.

5. Finally, the time stamp of each frame was related to the GPS log. From there, only 1 frame per second was included for analysis purposes. The final workbook included coordinate information, a frame number, and location of each .jpeg on the server.

6. The final step required importation of the excel document as XY data into GIS in order to output a shapefile with all relevant image and GPS information. This shapefile was then published to our server instance for availability in the flex viewer application. A series of example screenshots follow.

Figure – Corridor with image locations and example image selected

Figure – Corridor with location characteristics (same location as previous)

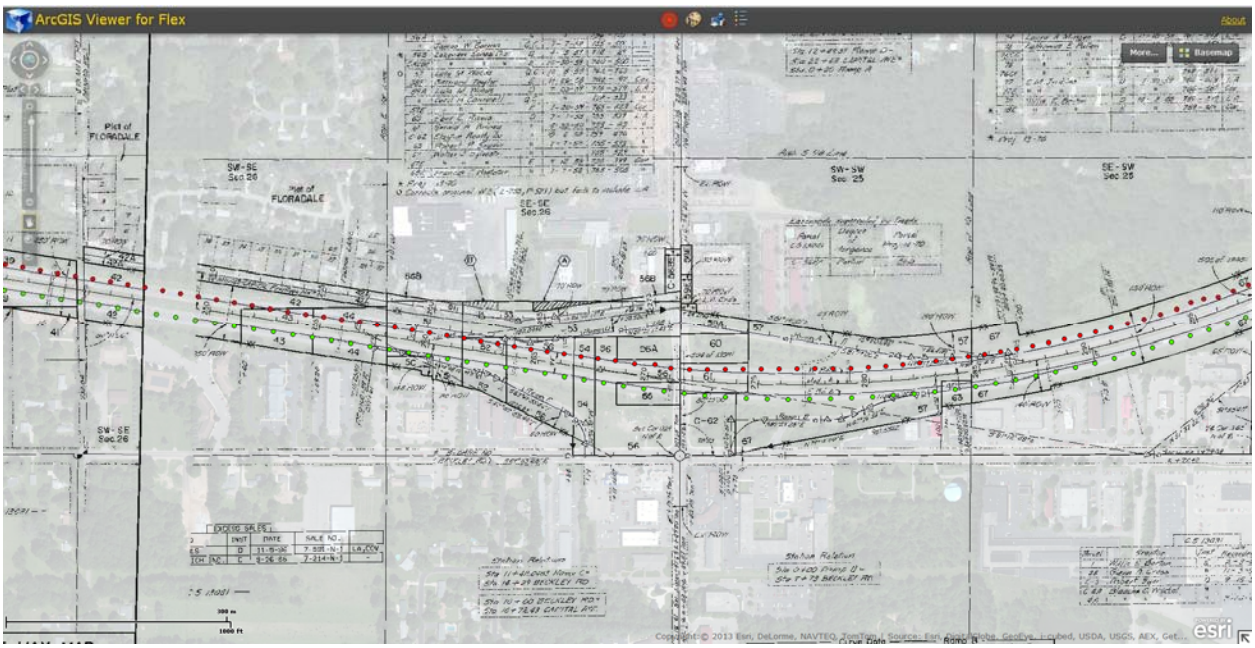

Figure – Current right-of-way drawings superimposed on aerial imagery of the corridor

Once the geocoded images collected in the field had been extracted and located along the corridor route based on their coordinates, additional feature characteristics were collected. Each image was reviewed to collect specific feature information related to the ground cover within and beyond the right-of-way, the presence and degree of slopes along drainage ditches, and a series of culvert, catch basin, signage, railing, utility poles and appurtenances and service road characteristics. Ground cover within the right-of-way was categorized based on the number of trees present and identified as grassy, grassy with a few trees, or grassy with several trees. Predominate land use beyond the right-of-way line was identified as agricultural, commercial, golf course, grassy pasture, railroad, residential river, or wooded depending on what was viewed along the corridor in Google Earth. Similarly, the slopes were rated as either flat, moderately sloped, or steeply sloped for the fore and backslope grades. Signs, railing, utility poles and appurtenances were noted when they were present while the identification of a culvert at the location included its orientation in with the road (parallel or perpendicular). The location of each image was used in conjunction with overlaid right-of-way maps to determine the approximate width of the right-of-way at each station. This information was coded into the images available at each station along the route.

APPENDIX G –

ROADSIDE SUITABILITY INDEX SCORES FOR I-94 PILOT CORRIDOR

Comparison of Scores Calculated based on All Contextual Variables, All Statewide Geospatial Contextual Variables with Statewide Availability, and Subset of Statewide Geospatial Contextual Variables

Stronger positives scores (green) indicate that the area is suitable for development within the roadside ROW.
Stronger negative scores (red) indicate that the area is not suitable for development within the roadside ROW.
Cell ID numbers are referenced to the gridded map found at the end of Appendix E.

ALL CONTEXTUAL VARIABLES (includes geospatial, non-geospatial, non-geospatial, and local data)

NORTH SIDE OF I-94 CORRIDOR						SOUTH SIDE OF I-94 CORRIDOR					
Cell	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score	**Cell**	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score
001	-4.5	-6.0	13.0	-7.7	8.3	**101**	-0.6	0.6	4.6	-2.7	4.9
002	-3.4	-6.8	12.2	-4.6	7.4	**102**	-0.3	-2.9	7.3	-1.2	6.3
003	-1.9	-5.1	10.2	-2.1	7.0	**103**	0.1	-2.3	7.4	-0.9	6.1
004	-3.8	-7.7	12.6	-4.8	8.6	**104**	-2.0	-4.4	9.6	-3.4	6.9
005	-4.2	-8.4	13.4	-5.3	8.8	**105**	-3.1	-4.9	7.8	-4.1	6.9
006	-3.6	-7.1	12.7	-4.8	7.6	**106**	-2.2	-3.8	5.9	-3.4	6.1
007	-2.9	-6.8	12.2	-3.6	8.1	**107**	-0.2	-3.2	3.3	-2.1	5.5
008	-3.9	-7.7	12.6	-4.8	8.4	**108**	-0.6	-2.9	2.7	-3.5	5.1
009	-4.8	-8.6	13.7	-6.4	8.5	**109**	-2.6	-6.2	7.8	-6.0	6.9
010	-4.9	-8.0	12.9	-6.4	8.4	**110**	-4.2	-7.9	8.7	-7.8	8.6
011	-5.5	-9.1	14.1	-7.2	8.8	**111**	0.0	-1.8	4.3	-0.2	3.9
012	-5.3	-8.1	11.4	-6.2	8.6	**112**	1.8	1.9	2.3	3.2	3.0
013	-5.7	-8.1	11.8	-7.0	8.5	**113**	1.0	2.7	2.8	3.7	2.7
014	-3.3	-5.3	11.6	-4.6	8.6	**114**	3.5	2.4	1.5	4.9	2.4
015	-1.9	-0.9	6.8	0.2	5.0	**115**	0.5	2.2	2.6	2.8	2.9
016	-2.3	-1.3	9.3	-2.8	7.0	**116**	1.3	0.9	13.4	-0.6	11.8
017	-3.8	-2.9	10.5	-5.4	8.0	**117**	1.1	1.8	4.5	0.2	5.5
018	-3.5	-3.4	10.3	-5.9	6.4	**118**	0.3	2.5	3.5	0.5	3.1
019	-8.3	-10.8	13.9	-11.6	8.2	**119**	-6.4	-8.6	12.4	-9.3	6.8
020	-3.8	-1.5	6.2	-2.1	5.8	**120**	-2.2	-0.9	4.0	-1.0	4.4
021	-2.6	-1.5	4.7	-0.9	6.2	**121**	-0.7	-3.0	5.7	-0.6	5.5
022	1.4	0.2	3.0	2.0	4.4	**122**	-2.7	-6.1	7.5	-4.0	7.0
023	1.7	-0.9	3.9	-2.0	5.4	**123**	1.0	-0.5	2.7	1.7	3.5
024	-0.2	-4.4	8.9	-5.2	8.3	**124**	1.7	0.1	2.3	2.5	3.4
025	-2.8	-7.2	11.7	-7.5	11.4	**125**	-2.5	-4.4	7.1	-2.5	7.0
026	0.2	-2.2	8.1	-3.3	7.0	**126**	-1.6	-4.6	8.0	-2.6	6.1
027	2.0	-0.5	4.9	0.6	5.7	**127**	2.5	0.9	1.4	3.2	2.9
028	0.4	3.0	4.1	1.3	4.0	**128**	1.2	2.1	3.6	0.9	3.6
029	-2.5	-1.5	7.8	-4.0	6.2	**129**	-4.9	-2.9	6.5	-6.9	6.7
030	-2.9	-3.1	9.3	-4.4	7.1	**130**	-4.3	-5.0	6.9	-4.7	5.8
031	-7.8	-11.5	14.3	-10.2	10.1	**131**	-8.5	-11.2	11.2	-9.8	9.8
032	-11.0	-12.9	13.4	-11.8	10.2	**132**	2.2	2.4	3.3	1.7	6.2
033	-4.7	-5.2	6.6	-4.8	5.9	**133**	1.2	2.7	4.4	-0.3	7.4
034	-6.0	-6.2	7.3	-7.9	6.7	**134**	-2.6	-0.6	2.0	-0.6	3.3
035	-5.8	-5.4	6.0	-6.3	5.9	**135**	-3.8	1.0	1.8	-1.0	3.3
036	-3.6	-0.9	4.1	-4.9	4.8	**136**	-3.5	2.9	4.4	-3.2	5.8
037	-2.0	2.0	0.7	-3.7	3.4	**137**	-2.8	1.8	0.9	-4.1	2.9
038	-5.0	-3.3	6.6	-7.3	6.0	**138**	-0.9	3.0	0.4	-4.8	2.5
039	-7.5	-6.9	7.6	-7.8	5.6	**139**	-5.1	-2.7	1.6	-8.2	5.5
040	-7.8	-6.8	10.2	-9.4	11.9	**140**	0.4	8.1	2.2	-4.5	5.2
041	-7.7	-3.8	12.0	-8.5	16.6	**141**	-1.4	6.3	4.0	-2.4	8.5
042	-8.9	-6.5	12.3	-9.6	11.0	**142**	-2.9	-1.8	8.1	-5.7	6.1
043	-7.8	-8.4	9.0	-7.9	8.5	**143**	-4.1	-5.0	7.6	-4.8	7.5

NORTH SIDE OF I-94 CORRIDOR						SOUTH SIDE OF I-94 CORRIDOR					
Cell	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score	**Cell**	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score
044	-5.3	-7.3	9.6	-5.8	7.6	**144**	-4.8	-4.2	7.6	-4.6	5.7
045	-4.7	-1.9	5.7	-5.5	6.6	**145**	-4.3	-2.8	8.9	-6.0	6.4
046	-4.3	-1.0	5.7	-5.5	5.9	**146**	-6.0	-5.9	10.3	-9.2	9.1
047	-4.9	-7.8	11.5	-6.3	7.6	**147**	-8.7	-12.1	12.4	-13.4	8.8
048	-6.8	-11.0	16.3	-10.6	10.5	**148**	-5.3	-9.7	8.9	-11.6	9.3
049	-4.0	-7.0	12.7	-4.5	8.3	**149**	-5.4	-7.3	7.4	-7.7	6.6
050	-5.1	-8.0	14.0	-6.6	8.1	**150**	-3.3	-4.6	5.9	-5.3	4.8
051	-5.7	-9.9	15.0	-7.8	9.3	**151**	-2.3	-5.2	9.4	-3.4	7.0
052	-3.4	-6.4	13.0	-5.1	9.9	**152**	0.3	-1.5	5.9	0.7	4.4
053	-4.2	-6.9	14.4	-6.7	13.4	**153**	-1.4	-3.7	9.3	-1.2	7.5
054	-7.3	-7.9	11.6	-8.0	9.2	**154**	-1.9	-5.6	11.2	-3.0	8.4
055	-9.1	-9.3	11.1	-10.3	7.5	**155**	-6.5	-9.3	11.2	-8.2	9.3
056	-4.4	-6.1	11.0	-5.4	7.2	**156**	-0.2	-2.0	6.2	0.5	5.4
057	-6.0	-7.9	10.1	-8.3	6.5	**157**	1.6	0.4	3.4	2.8	3.4
058	-4.9	-6.1	12.8	-6.8	9.1	**158**	1.7	1.2	2.2	3.0	2.7
059	-0.7	-0.8	6.4	-0.2	4.5	**159**	2.2	2.2	1.7	4.2	2.9
060	-0.9	-0.5	3.4	1.1	4.6	**160**	0.8	1.7	4.1	-0.3	5.8
061	-2.9	-1.3	6.4	-4.9	8.0	**161**	1.8	3.3	2.4	0.4	4.5
062	-0.6	1.4	4.1	1.3	4.3	**162**	4.2	4.7	6.4	3.2	7.3
063	0.0	0.0	5.8	2.1	4.9	**163**	1.1	-0.4	5.3	1.1	5.1
064	-4.5	-7.0	8.5	-5.7	7.5	**164**	2.7	1.2	2.1	3.8	3.3
065	-6.6	-9.1	9.1	-8.6	8.2	**165**	4.1	1.8	1.0	4.8	2.5
066	0.4	0.1	3.1	1.7	3.9	**166**	-4.3	-7.0	7.8	-5.9	6.8
067	0.2	-1.4	4.0	0.8	5.6	**167**	-4.7	-6.9	7.1	-6.1	7.6
068	0.4	-0.2	3.3	1.8	4.4	**168**	-5.3	-7.1	8.3	-6.3	7.7
069	0.8	0.5	4.2	1.8	3.0	**169**	-3.7	-6.2	7.7	-4.8	6.5
070	2.5	1.7	2.3	4.0	3.6	**170**	-3.1	-5.7	7.3	-4.2	6.6
071	3.3	1.5	1.0	4.3	3.0	**171**	1.9	0.5	1.7	2.7	3.2
072	3.7	2.5	1.4	5.1	2.7	**172**	2.6	1.6	1.8	3.9	2.4
073	3.2	1.4	1.8	3.4	3.0	**173**	2.9	0.7	1.8	3.4	2.7
074	3.8	2.4	1.6	5.1	2.8	**174**	4.2	1.9	0.9	4.8	2.2
075	2.9	2.0	2.4	3.4	1.9	**175**	3.2	1.1	1.3	3.6	2.6
076	3.2	4.4	1.7	2.9	2.8	**176**	2.7	4.9	1.8	2.8	3.1
077	0.9	1.7	3.9	0.4	4.8	**177**	0.1	3.9	2.6	0.2	4.0
Avg.	-3.2	-4.2	8.5	-4.0	7.0	**Avg.**	-1.2	-1.7	5.4	-1.9	5.5

Note: Cells ascend from west to east along the corridor.

ALL GEOSPATIAL CONTEXTUAL VARIABLES WITH STATEWIDE AVAILABILITY

NORTH SIDE OF I-94 CORRIDOR						SOUTH SIDE OF I-94 CORRIDOR					
Cell	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score	**Cell**	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score
001	-0.3	-0.3	6.2	-1.3	5.5	**101**	0.2	1.5	2.4	-1.7	3.2
002	0.7	-1.1	5.7	1.6	4.7	**102**	1.1	-0.8	4.0	0.8	4.3
003	0.8	-1.0	5.6	1.8	4.7	**103**	1.4	-0.3	4.3	1.0	3.9
004	0.5	-1.2	5.7	1.4	4.8	**104**	0.7	-0.7	4.3	0.7	4.1
005	0.8	-1.0	5.5	1.7	4.7	**105**	-1.7	-2.6	4.3	-1.9	4.4
006	1.0	-0.8	5.4	2.0	4.6	**106**	-1.2	-2.3	3.5	-2.0	4.3
007	1.2	-0.6	5.4	2.3	4.5	**107**	-0.1	-3.0	2.3	-1.9	4.7
008	0.4	-1.2	5.4	1.4	4.7	**108**	-0.9	-3.3	2.2	-3.9	4.4
009	0.4	-1.3	5.5	1.2	4.6	**109**	-0.5	-3.7	3.8	-2.8	5.5
010	-0.3	-1.9	5.9	0.5	5.2	**110**	-1.1	-4.4	3.4	-4.1	5.9
011	-0.8	-2.4	6.4	-0.2	5.6	**111**	1.4	0.3	1.2	1.7	2.2
012	-2.5	-3.7	6.5	-2.2	6.1	**112**	2.4	0.8	1.5	2.6	2.5
013	-2.3	-3.5	6.5	-1.9	6.1	**113**	2.5	0.7	1.5	2.8	2.4
014	-0.3	-1.0	6.4	-0.1	6.3	**114**	3.7	1.6	0.8	4.4	2.1
015	0.0	-1.1	4.1	0.7	3.6	**115**	1.5	0.5	1.4	2.0	2.5
016	0.3	0.7	4.8	-0.5	4.3	**116**	0.2	0.9	3.9	-1.2	4.2
017	-0.8	0.3	4.0	-1.6	4.0	**117**	1.1	1.7	2.4	0.3	3.1
018	0.1	1.0	4.1	-0.7	4.0	**118**	1.3	1.7	2.9	0.2	3.1
019	-1.4	-2.3	3.6	-1.4	4.0	**119**	-0.1	-1.6	3.2	-0.4	4.1
020	-1.2	-2.5	3.7	-1.0	4.3	**120**	-0.1	-1.1	1.9	-0.3	3.4
021	-0.9	-1.2	1.8	-0.1	3.8	**121**	2.0	-0.2	2.3	2.3	3.7
022	2.3	0.1	1.8	2.3	3.2	**122**	0.2	-1.8	3.1	0.1	4.4
023	1.7	-1.1	3.6	-2.1	5.0	**123**	1.8	0.3	1.7	2.6	2.8
024	1.9	-1.6	5.4	-2.5	6.4	**124**	2.0	0.1	2.1	2.5	3.2
025	0.7	-2.6	7.0	-2.9	7.6	**125**	1.3	-0.5	2.6	1.6	4.0
026	2.3	-1.1	5.5	-1.2	6.2	**126**	1.8	-0.1	3.1	2.2	3.7
027	2.6	0.0	4.1	1.2	4.5	**127**	3.1	1.3	1.0	3.6	2.3
028	2.0	2.1	3.0	1.2	3.4	**128**	3.6	3.2	1.3	2.7	2.5
029	0.3	1.2	3.1	-0.6	3.5	**129**	-2.0	0.2	2.5	-3.5	3.8
030	0.4	0.6	4.2	-0.6	4.4	**130**	-2.0	-2.5	4.0	-1.6	4.7
031	-0.7	-2.3	3.9	0.1	4.9	**131**	-4.2	-5.2	4.9	-3.5	6.6
032	-5.6	-5.5	4.5	-3.8	6.5	**132**	2.8	2.9	2.2	2.2	5.0
033	-2.0	-1.1	1.8	-1.0	3.2	**133**	1.3	2.5	3.9	-0.4	6.6
034	-3.1	-2.0	2.5	-3.9	3.7	**134**	-1.8	-0.9	1.7	-0.6	3.0
035	-2.9	-1.3	1.2	-2.4	2.9	**135**	-1.3	-0.2	0.8	-0.3	2.5
036	-1.4	1.7	0.4	-2.4	2.4	**136**	-0.2	2.2	3.0	-2.1	4.4
037	-1.2	2.1	-0.1	-3.7	2.0	**137**	-0.6	2.7	0.3	-3.6	2.4
038	-2.4	0.3	2.2	-3.8	3.6	**138**	0.2	3.1	-0.2	-4.4	1.9
039	-4.0	-3.0	2.4	-2.4	4.5	**139**	-3.5	-2.3	1.0	-7.6	4.4
040	-6.8	-5.3	4.7	-7.1	7.6	**140**	2.4	5.4	-1.9	-4.9	0.4
041	-5.4	-3.8	3.7	-6.7	5.9	**141**	-0.2	2.8	-0.8	-4.0	1.4
042	-5.2	-4.5	6.0	-5.9	7.2	**142**	2.0	3.1	1.6	-0.6	2.5
043	-4.4	-4.3	4.6	-3.4	5.9	**143**	-1.7	-1.4	2.4	-1.6	3.6

NORTH SIDE OF I-94 CORRIDOR						SOUTH SIDE OF I-94 CORRIDOR					
Cell	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score	**Cell**	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score
044	-1.7	-2.3	4.1	-0.9	4.6	**144**	-1.6	-1.5	2.9	-1.6	3.6
045	-1.1	0.7	2.4	-2.7	4.0	**145**	-0.9	0.2	4.2	-2.2	4.5
046	-1.6	-0.1	3.3	-3.4	4.2	**146**	-2.0	-0.6	4.4	-3.7	5.0
047	-0.5	-1.8	4.4	0.1	4.4	**147**	-1.6	-3.0	2.3	-3.1	4.5
048	-0.4	-2.4	5.0	-0.9	5.6	**148**	-1.3	-5.0	3.1	-5.9	7.5
049	0.9	-0.7	4.9	1.7	4.3	**149**	-2.0	-2.8	2.3	-3.0	4.4
050	0.9	-0.7	4.9	1.6	4.1	**150**	-0.9	-3.5	3.2	-2.3	5.0
051	0.5	-1.2	5.0	1.2	4.5	**151**	0.7	-0.9	4.9	0.8	4.4
052	0.4	-1.3	6.8	0.6	7.4	**152**	2.7	0.8	2.4	3.3	2.9
053	-0.5	-1.5	7.8	-1.3	9.1	**153**	2.3	0.8	2.9	3.3	3.6
054	-2.2	-1.9	3.2	-1.1	4.6	**154**	2.0	0.0	4.4	2.9	4.1
055	-3.6	-2.7	2.5	-1.8	3.5	**155**	-1.7	-2.8	3.5	-0.8	4.2
056	-0.5	-2.1	4.5	-0.4	4.5	**156**	2.4	0.5	2.7	3.2	3.1
057	-2.0	-3.1	3.9	-2.3	4.3	**157**	3.0	1.0	1.9	3.8	2.6
058	-0.4	-1.4	6.3	-0.8	6.6	**158**	2.6	1.0	1.6	3.4	2.4
059	2.0	0.3	3.0	2.8	3.6	**159**	3.6	1.5	1.0	4.2	2.3
060	2.1	0.5	1.3	2.6	2.6	**160**	2.1	2.6	1.0	1.1	2.4
061	-0.4	1.0	2.7	-2.1	3.4	**161**	2.2	3.1	1.3	0.3	2.9
062	1.4	-0.2	2.6	1.7	3.1	**162**	4.9	4.7	6.1	3.4	6.8
063	0.7	-1.0	5.2	1.6	4.7	**163**	2.5	1.2	3.4	2.7	4.0
064	-1.4	-2.5	3.9	-1.3	4.2	**164**	4.1	1.7	0.9	4.7	2.2
065	-2.8	-3.6	3.5	-3.3	4.2	**165**	4.1	1.8	0.9	4.8	2.1
066	1.8	-0.2	1.9	2.0	3.1	**166**	-1.3	-2.5	3.1	-1.6	3.8
067	2.3	0.2	2.0	2.7	3.1	**167**	-2.2	-3.4	3.8	-2.7	4.6
068	1.5	0.2	2.2	2.4	3.1	**168**	-2.0	-3.3	3.7	-2.3	4.8
069	1.8	0.3	2.8	2.7	3.2	**169**	-1.3	-2.4	3.3	-1.2	4.1
070	2.7	1.0	1.6	3.6	2.6	**170**	-1.1	-2.5	3.6	-1.2	4.4
071	3.1	1.3	0.6	4.1	2.0	**171**	1.9	0.4	1.1	2.8	2.5
072	3.8	1.7	0.7	4.5	2.0	**172**	3.2	1.4	1.2	4.0	2.3
073	3.3	1.4	1.0	3.7	2.3	**173**	3.5	1.6	0.9	4.3	2.1
074	4.0	1.8	1.0	4.7	2.1	**174**	4.2	1.9	0.9	4.9	2.0
075	4.1	1.9	0.7	4.8	1.9	**175**	3.2	1.1	1.3	3.6	2.4
076	3.9	3.5	1.1	2.5	2.3	**176**	4.1	3.4	1.2	3.0	2.4
077	0.6	1.4	3.4	0.0	3.5	**177**	1.2	2.1	1.4	0.0	2.5
Avg.	-0.2	-0.9	3.8	-0.2	4.4	**Avg.**	0.8	0.0	2.4	0.1	3.6

Note: Cells ascend from west to east along the corridor.

SUBSET OF GEOSPATIAL CONTEXTUAL VARIABLES WITH STATEWIDE AVAILABILITY

NORTH SIDE OF I-94 CORRIDOR						SOUTH SIDE OF I-94 CORRIDOR					
Cell	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score	**Cell**	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score
001	-0.3	-2.0	5.9	0.4	5.1	**101**	0.3	-0.1	2.0	0.4	2.8
002	0.7	-1.1	5.7	1.6	4.7	**102**	1.5	-0.5	3.6	2.0	4.1
003	0.8	-1.0	5.6	1.8	4.7	**103**	2.0	0.2	3.6	3.0	3.5
004	0.5	-1.2	5.7	1.4	4.8	**104**	1.1	-0.4	3.9	1.9	3.9
005	0.8	-1.0	5.5	1.7	4.7	**105**	-1.4	-2.4	4.1	-1.1	4.3
006	1.0	-0.8	5.4	2.0	4.6	**106**	-0.8	-2.0	3.2	-0.8	4.1
007	1.2	-0.6	5.4	2.3	4.5	**107**	0.0	-2.9	2.1	-1.5	4.6
008	0.4	-1.2	5.4	1.4	4.7	**108**	-0.3	-2.8	1.6	-1.9	4.0
009	0.4	-1.3	5.5	1.2	4.6	**109**	-0.3	-3.5	3.6	-2.0	5.4
010	-0.3	-1.9	5.9	0.5	5.2	**110**	-0.8	-4.1	3.0	-2.9	5.7
011	-0.8	-2.4	6.4	-0.2	5.6	**111**	1.5	0.4	1.1	2.1	2.1
012	-2.5	-3.7	6.5	-2.2	6.1	**112**	2.7	0.9	1.2	3.4	2.4
013	-2.4	-3.6	6.4	-1.9	6.0	**113**	2.6	0.8	1.4	3.2	2.4
014	-1.7	-2.0	3.4	-1.3	3.4	**114**	3.7	1.6	0.8	4.4	2.1
015	0.0	-1.1	4.1	0.7	3.6	**115**	1.7	0.7	1.1	2.8	2.4
016	0.3	-1.0	4.5	1.2	4.0	**116**	0.5	-0.5	3.2	1.6	3.7
017	0.0	-0.9	3.8	0.6	3.7	**117**	2.0	0.7	2.0	2.9	2.7
018	0.2	-0.6	3.6	1.3	3.5	**118**	1.3	0.0	2.6	1.9	2.8
019	-1.4	-2.3	3.6	-1.4	4.0	**119**	0.2	-1.4	3.0	0.4	4.0
020	-0.4	-2.0	3.7	-0.4	4.3	**120**	0.9	-0.4	1.9	0.7	3.3
021	-0.9	-1.2	1.8	-0.1	3.8	**121**	2.0	-0.2	2.3	2.3	3.7
022	2.2	0.2	1.6	2.5	3.0	**122**	0.2	-1.8	3.1	0.1	4.4
023	1.4	-0.2	1.7	1.8	2.9	**123**	1.8	0.3	1.7	2.6	2.8
024	1.1	-0.6	3.2	1.7	3.8	**124**	2.0	0.1	2.1	2.5	3.2
025	-0.3	-1.8	5.0	0.5	5.2	**125**	1.4	-0.4	2.4	2.0	3.9
026	1.5	-0.3	3.6	2.3	3.9	**126**	1.9	0.0	3.0	2.6	3.7
027	2.3	0.4	3.0	3.2	3.3	**127**	3.2	1.4	0.9	4.0	2.2
028	2.0	0.4	2.7	2.8	3.0	**128**	3.6	1.6	1.0	4.4	2.2
029	1.2	0.2	2.7	2.1	3.1	**129**	-0.6	-0.5	1.8	0.4	3.2
030	0.4	-1.0	3.8	1.1	4.0	**130**	-0.3	-0.9	3.0	0.7	3.6
031	0.9	-0.8	3.1	1.4	3.8	**131**	-1.8	-2.8	3.7	-1.5	4.9
032	-1.7	-1.5	2.5	-0.4	3.7	**132**	0.6	0.4	0.6	1.8	2.3
033	-1.5	-0.7	1.4	0.0	2.9	**133**	-1.3	-0.5	1.3	0.2	2.8
034	-2.1	-1.3	1.5	-0.6	3.2	**134**	-1.5	-0.7	1.4	0.2	2.9
035	-2.3	-0.8	0.5	-0.4	2.5	**135**	-1.3	-0.2	0.8	-0.3	2.5
036	-1.4	0.0	0.0	-0.7	2.1	**136**	-0.7	0.2	0.8	-0.3	2.4
037	-0.4	0.9	-0.4	-1.4	1.7	**137**	-0.1	1.3	-0.7	-1.7	1.4
038	-1.8	-0.9	1.3	-0.1	3.0	**138**	0.4	1.6	-0.7	-2.3	1.4
039	-1.7	-0.8	1.3	-0.2	2.9	**139**	1.2	2.4	-1.3	-3.7	1.1
040	-1.8	-2.0	2.0	-1.2	3.7	**140**	2.4	3.7	-2.2	-3.2	0.1
041	-1.7	-2.3	2.5	-2.1	4.0	**141**	1.4	2.2	-1.0	-1.2	1.1
042	-1.1	-2.0	3.6	-0.8	4.0	**142**	2.0	1.4	1.2	1.1	2.1
043	-1.1	-1.2	2.8	0.2	3.7	**143**	-1.2	-1.0	1.9	0.0	3.3

NORTH SIDE OF I-94 CORRIDOR						SOUTH SIDE OF I-94 CORRIDOR					
Cell	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score	**Cell**	Wind Score	Solar Score	Veg. Mgmt. Score	Agriculture Score	Green Infr. Score
044	-0.8	-1.4	3.6	0.1	4.0	**144**	-1.2	-1.2	2.5	-0.4	3.4
045	-1.1	-1.0	2.1	-1.0	3.7	**145**	-0.6	-1.2	3.6	0.3	4.0
046	-1.4	-1.7	2.8	-1.3	3.8	**146**	-1.6	-2.0	3.7	-0.9	4.5
047	-0.5	-1.8	4.4	0.1	4.4	**147**	-1.2	-2.7	1.9	-1.9	4.3
048	-0.8	-2.7	4.1	-1.2	4.8	**148**	-1.6	-5.2	0.9	-5.0	5.5
049	0.8	-0.8	4.7	1.6	4.1	**149**	-2.0	-2.8	1.7	-2.3	3.8
050	1.1	-0.6	4.8	2.0	4.1	**150**	-0.9	-3.5	3.2	-2.3	5.0
051	0.5	-1.2	5.0	1.2	4.5	**151**	1.1	-0.6	4.5	2.0	4.2
052	-0.8	-2.2	4.2	-0.5	4.8	**152**	2.8	0.9	2.3	3.7	2.8
053	-2.2	-2.7	2.9	-1.9	4.4	**153**	2.0	0.6	2.2	3.0	2.9
054	-2.4	-2.1	2.6	-1.3	4.0	**154**	1.9	0.0	4.1	2.8	3.8
055	-1.0	-1.0	2.6	0.3	3.4	**155**	0.8	-1.3	3.8	0.9	4.2
056	-0.5	-2.1	4.5	-0.4	4.5	**156**	2.4	0.5	2.7	3.2	3.1
057	-2.0	-3.1	3.9	-2.3	4.3	**157**	3.0	1.0	1.9	3.8	2.6
058	-1.3	-2.1	3.4	-1.0	3.9	**158**	2.6	1.0	1.6	3.4	2.4
059	1.8	0.2	2.7	2.7	3.3	**159**	3.6	1.5	1.0	4.2	2.3
060	2.9	1.0	1.4	3.1	2.6	**160**	3.0	1.5	0.7	3.3	2.1
061	0.5	-0.1	2.5	0.1	3.0	**161**	2.7	1.7	0.3	2.5	1.8
062	1.6	-0.1	2.4	2.1	3.1	**162**	2.9	1.2	1.4	3.8	2.3
063	0.7	-1.0	5.2	1.6	4.7	**163**	2.2	0.8	1.8	3.2	2.6
064	-1.4	-2.5	3.9	-1.3	4.2	**164**	4.1	1.7	0.9	4.7	2.2
065	-2.8	-3.6	3.5	-3.3	4.2	**165**	4.1	1.8	0.9	4.8	2.1
066	1.8	-0.2	1.9	2.0	3.1	**166**	-1.3	-2.5	3.1	-1.6	3.8
067	2.3	0.2	2.0	2.7	3.1	**167**	-2.2	-3.4	3.8	-2.7	4.6
068	1.5	0.2	2.2	2.4	3.1	**168**	-2.0	-3.3	3.7	-2.3	4.8
069	1.8	0.3	2.8	2.7	3.2	**169**	-1.3	-2.4	3.3	-1.2	4.1
070	2.7	1.0	1.6	3.6	2.6	**170**	-1.1	-2.5	3.6	-1.2	4.4
071	3.9	1.8	0.7	4.7	2.0	**171**	2.7	0.9	1.1	3.4	2.5
072	3.8	1.7	0.7	4.5	2.0	**172**	3.2	1.4	1.2	4.0	2.3
073	3.4	1.5	0.9	4.1	2.2	**173**	3.5	1.6	0.9	4.3	2.1
074	4.0	1.8	1.0	4.7	2.1	**174**	4.2	1.9	0.9	4.9	2.0
075	4.1	1.9	0.7	4.8	1.9	**175**	3.2	1.1	1.3	3.6	2.4
076	4.1	1.9	0.6	4.6	1.9	**176**	4.1	1.8	0.9	4.7	2.1
077	1.5	0.2	3.1	2.3	3.2	**177**	2.0	0.9	1.1	2.2	2.2
Avg.	0.2	-0.9	3.2	0.8	3.7	**Avg.**	1.0	-0.2	1.9	1.1	3.1

Note: Cells ascend from west to east along the corridor.