Internet Citations in Oklahoma Attorney General Opinions

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Lee F. Peoples**

This article reports the results of a study finding a forty-nine percent failure rate of links to Internet resources in Oklahoma attorney general opinions. This phenomenon, known as link rot and reference rot, can frustrate the efforts of future researchers, weaken public confidence in the law, undermine stare decisis, and hinder the law's natural growth and expansion. Specific solutions for addressing the problem are proposed.

Introduction

The citation of authority is a fundamental component of the common law legal tradition. Citations communicate that a line of argument is supported by an authoritative source that can be retrieved and reviewed to better understand the argument’s underpinnings. For centuries, lawyers and judges cited stable print sources that were relatively easy to locate. Once a source was in hand, a researcher had no reason to doubt that she was viewing anything other than the exact content as cited.

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The citation of Internet resources in legal materials has turned this stable system on its head. As one commentator recently noted, “the footnote, a landmark in the history of civilization, took centuries to invent and to spread. It has taken mere years to nearly destroy.”

Citations to Internet resources began appearing in law reviews, judicial opinions, and other legal materials in the late 1990s. Some citations are for trivial matters or dicta, while others are used to support logic or legal reasoning.

An alarming number of links to Internet resources cited in legal materials no longer work. No one can “predict what links will rot, even within individual Supreme Court cases. The Internet’s ephemeral nature means websites can be available today—and gone tomorrow.” The constantly changing nature of the Internet has the potential to dramatically impact the law. One study posited that the citation of Internet resources that no longer function “is contributing to the slow erosion of one of common law’s most fundamental principles—stare decisis.”

Internet resources become unavailable over time due to “link rot” and “reference rot.” Link rot refers to a link that no longer displays any content. Researchers who click on a link that has succumbed to link rot typically see a “404 not found” error page. Reference rot describes a link that “still works but the information referenced by the citation is no longer present, or has changed.”

Link and reference rot occur for a variety of reasons. Links are references to content maintained by third parties, many with no interest in ensuring that links continue to function in perpetuity. Links often fail when websites are reorganized and link addresses, technically referred to as URLs, change. Link rot can occur when a website owner loses interest in maintaining a website, removes content from a website, or fails to renew a domain registration. Reference rot can occur when a website owner updates content to provide more current information or alters a website in any way.

Previous studies have demonstrated that link failure is widespread. One study examining links in law journals published between 1999 and 2011 found a seventy percent failure rate. Other studies found link failure rates ranging from twenty-seven to fifty percent in opinions of the Supreme Court of the United States and in state court appellate opinions from Washington, New York, Kentucky, and Texas. No study has examined link rot in attorney general opinions.

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2. Raizel Liebler & June Liebert, Something Rotten in the State of Legal Citation: The Life Span of a United States Supreme Court Citation Containing an Internet Link (1996–2010), 15 YALE J. L. & TECH. 273, 277 (2013).
5. Id. at 166.
6. Id. at 165.
7. Liebler & Liebert, supra note 2, at 278.
9. Id.
11. Arturo Torres, Is Link Rot Destroying Stare Decisis As We Know It? The Internet-Citation Practice of the Texas Appellate Courts, 13 J. APP. PRAC. & PROCESS 269, 277 (2012).
This article begins by introducing the Oklahoma Office of the Attorney General and explaining the role of attorney general opinions in Oklahoma law. The second section presents the study methodology and summarizes study findings. The next three sections describe specific instances of link rot and reference rot in attorney general opinions and explore the consequences of these failures. The citation of Internet sources that are not stable, reliable, or authoritative is then examined. The article concludes with specific recommendations for improvement.

The Role of Attorney General Opinions in Oklahoma Law

The Oklahoma attorney general is an elected official who serves as the “chief law officer of the state.” Among the duties of the attorney general is giving a written opinion on questions of law when requested to do so by “the Legislature or either branch thereof, or by any state officer, board, commission or department, or by district attorneys.” Attorney general opinions are primary legal authority and are “binding on state officials until a court of competent jurisdiction renders an inconsistent decision.” Opinions “stating an act of the legislature is unconstitutional should be considered advisory only, and thus not binding until finally so determined by an action in the District Court of this state.” The attorney general has issued a small number of unpublished opinions. Unpublished opinions are “not an official Opinion of the Attorney General, but rather legal advice from an Assistant Attorney General in the form of a letter.”

The preface to the annually published compilation of opinions explains:

Opinions are the product of a time-honored and well-established procedure used by Attorneys General. With each Opinion request eligible for review, an Assistant Attorney General is assigned to thoroughly research the legal context and precedent of all issues involved in order to draft a proposed opinion. The draft is presented in opinion conference by the Assistant Attorney General for debate and analysis among the Attorney General, the First Assistant Attorney General, the Solicitor General and a group of senior Assistant Attorneys General. Often, an Opinion is the subject of rigorous debate and multiple drafts before it is approved and signed by [the] Attorney General. . . . As has been stated by previous Attorneys General, Attorney General Opinion conferences are among the most intellectually stimulating exercises in the practice of law. The discussions range from legal history to language syntax to punctuation. While enunciating the views of the Attorney General, an opinion reflects the minds and effort of the many participants in the process.

Oklahoma attorney general opinions are an important part of Oklahoma law. The purpose of this study is not to criticize the substance of opinions, their authors, or the Office of the Attorney General. The findings and suggestions of this study are offered to make sources cited in opinions more accessible, to aid the development of Oklahoma law, and to help ensure its long-term stability.

13. Id. § 18b(A)(5).
Study Methodology and Results

¶11 The data forming the basis of this study was compiled by searching the WestlawNext database of Oklahoma attorney general opinions to locate opinions citing Internet resources. The initial search query used to locate opinions citing Internet resources was adv: www https http website internet “web page.” An additional query was used to locate Internet resources cited in opinions but only referred to by a top-level domain, adv: com org mil gov.

¶12 These searches returned a total of eighty-five attorney general opinions.18 Opinions that merely contained a search term but did not cite an Internet resource for factual information or to support the logic or reasoning of the opinion were removed from the dataset. This left a total of sixty-eight opinions citing an Internet resource for factual information or to support the logic or reasoning of the opinion.19 An Internet citation in an opinion referenced multiple times was counted only once.

¶13 The first citation to an Internet resource in an attorney general’s opinion appeared in 2002. The rate of citations has been growing steadily since 2002, as depicted in figure 1. The sixty-eight opinions citing Internet resources since 2002 comprise approximately fifteen percent of all opinions published during that time period. Interestingly, the percentage of attorney general opinions citing Internet resources is nearly identical to that of the U.S. Supreme Court. Fourteen percent of U.S. Supreme Court opinions published since 2000 include a citation to an Internet resource.20

¶14 The total number of links found in all opinions was ninety-five.21 Forty-seven Internet resources were cited for factual information. Forty-eight Internet resources were cited to support the logic or legal reasoning of the opinion. Each link was checked to verify that it still worked. The content displayed on web pages was checked to determine whether it suffered from reference rot (not containing the information it was cited for). Advanced Internet search techniques were used to try and locate cited web pages that were inaccessible due to link rot (not displaying any content). Finally, each Internet resource cited in opinions was subjectively evaluated to determine its accuracy, reliability, and suitability for inclusion in an opinion.

¶15 Initial results revealed that seventy-three out of the ninety-five links cited in opinions did not work. This high failure rate can be explained because of the way WestlawNext formats links. WestlawNext occasionally inserts extra spaces into links, causing them to fail when cut and pasted into an Internet browser. For example, Opinion 2014-17 cites the Oklahoma secretary of state’s website for the text of a state question.22 The link is displayed as follows in WestlawNext (note the additional space after the “://” symbols): https://www.sos.ok.gov/gov/questions.aspx.

20. Liebler & Liebert, supra note 2, at 297.
21. Several of the sixty-eight opinions citing Internet resources contained more than one link.
WestlawNext typically inserts an extra space after the “://” symbol in a URL, but sometimes extra spaces are added elsewhere in links. Opinion 2008-2 cites an article appearing at the website religionandsocialpolicy.org. The link displayed in WestlawNext contains an extra space following the “://” symbol and following the “?” symbol: http://www.religionandsocialpolicy.org/interviews/interview_upd.cfin?id=87&pageMode=general.

Of the seventy-three links that initially appeared to fail, twenty-five were made to work by removing extra spaces inserted by WestlawNext. WestlawNext’s practice of inserting extra spaces into links may be obvious to an Internet savvy researcher. But an average or unsophisticated researcher may give up after retrieving an error message.

After correcting for link failures caused by WestlawNext’s insertion of spaces, the actual failure rate of links in attorney general’s opinions was determined to be forty-nine percent (forty-seven out of ninety-five links did not work). This failure rate is roughly comparable with the failure rate found in other studies of judicial opinions: Kentucky appellate courts (forty-seven percent failure rate);

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24. See the studies discussed infra about the lack of basic Internet research skills among members of the general public, law students, and lawyers.
Texas appellate courts (thirty-nine percent failure rate); published judicial opinions in Washington State (forty percent failure rate); published judicial opinions in New York State (twenty-seven percent failure rate); and the U.S. Supreme Court (twenty-nine percent failure rate).

The past twelve years of data demonstrate that the older a link in an Oklahoma attorney general opinion is, the more likely it is to fail. Grouping opinions by year reveals that links in opinions from 2002 to 2006 have a failure rate of sixty-eight percent, links in opinions from 2007 to 2010 have a failure rate of forty-six percent, and links in opinions from 2011 to 2014 have a failure rate of twenty-six percent (see figure 2). These results are consistent with studies finding that links in judicial opinions and law review articles are more likely to fail as they age.

Finding Information Hidden by Link Rot

Of the forty-seven links that did not work, twenty-six could be located by conducting additional Internet searches or modifying the link provided in the opinion. Some of this additional research was relatively straightforward and required a simple Google search or use of state government legal research websites. Some rotten links required more advanced research techniques to locate, including use of the Internet Archive’s Wayback Machine and other archives of web content.

Opinion 06-4 cited a rotten link to an unpublished Oklahoma Court of Civil Appeals opinion in answering the question of whether Indian tribes are required to purchase workers’ compensation insurance for their employees. The unpublished Court of Civil Appeals opinion is important to the legal reasoning of the attorney general’s opinion. The opinion notes it is “the only case to discuss the application of the Oklahoma Workers’ Compensation Act to a federally recognized Indian tribe.” The link to the case at the Oklahoma Public Legal Research System does not work because the address of the site recently changed. Some researchers not aware of the change may be alarmed to find a rotten link to primary legal authority in an attorney general’s opinion.

26. Torres, supra note 11, at 281.
27. Aldrich, supra note 8, at 227.
28. Id.
29. Liebler & Liebert, supra note 2, at 282. But see Zittrain et al., supra note 4, at 175 (noting a forty-nine percent reference rot rate in links found in U.S. Supreme Court opinions).
30. See Torres, supra note 11, at 282 (“As a whole, the data show an upward trajectory of link rot with the passage of time.”); Zittrain et al., supra note 4, at 167 (citing an early study by Mary Rumsey finding a “steady decrease in working links” in law review articles). But see Liebler & Liebert, supra note 2, at 298–99 (“Based on statistical tests, we found no clear relationship between the time elapsed since a link was cited and whether the link still works.”).
32. The link was to http://www.oklegal.onenet.net/oklegal-cgi/isearch. The address of the Oklahoma Public Legal Research System is now http://www.oklegal.onenet.net/ (last visited Aug. 24, 2015) [http://perma.cc/S2HK-SFA6].
Rotten links to the Oklahoma secretary of state’s website were found in several opinions.\(^3\)\(^4\) Citations to this website were problematic because links have changed as the website has been reorganized in recent years. For example, a link to the text of a state question available from the secretary of state’s website is cited to explain a change to the Oklahoma Constitution.\(^3\)\(^5\) The link brings up a “404” error page. However, a researcher with some legal research ability could locate the state question at the secretary of state’s website. In this instance, the rotten link could have been avoided if the opinion included a parallel citation to the text of the state question as published in a newspaper of general statewide circulation.\(^3\)\(^6\) In Opinion 09-10, a link the Oklahoma Funeral Board’s website to the text of proposed administrative rules is rotten.\(^3\)\(^7\) Researchers with an understanding of Oklahoma

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36. OKLA. STAT. ANN. tit. 34, § 17 (West 2015) requires the secretary of state to publish state questions in “two different newspapers of general statewide circulation.”
administrative law can locate the proposed rule by searching the Oklahoma secretary of state’s website.

\¶ More skill is required to retrieve other rotten links. Opinion 08-2 addresses the question of whether the Office of Faith-Based and Community Initiatives is a state agency and who has the authority to determine its budget.\(^{38}\) The opinion reaches the conclusion that the office is not a state agency but functions within the Department of Human Services (DHS). In supporting these conclusions, the opinion cites traditional legal sources including state statutes and executive orders. The opinion also cites less traditional sources including an interview with the office’s former director.\(^{39}\) The interview is cited to explain that the office previously functioned under the State Department of Health (OSDH), but was brought under the umbrella of the DHS in July 2002 and renamed the Office of Faith-Based and Community Initiatives following the expiration of a contract between OSDH and DHS.\(^{40}\) The interview is the only source cited in the opinion to explain the office’s shift from OSDH to DHS.

\¶ The link for the interview provided in the opinion indicates that the interview appeared at the website religionandsocialpolicy.org. Entering the complete link into a web browser returns a “404 file not found” error. Religionandsocialpolicy.org is no longer a functioning website. The link redirects researchers to the website of the Nelson A. Rockefeller Institute of Government.\(^{41}\) A search of the Nelson A. Rockefeller Institute of Government website or a general web search will not locate the interview. The only way to locate the interview is through a careful search of the Internet Archive’s Wayback Machine. The Wayback Machine is a digital archive of 425 billion webpages.\(^{42}\) To locate the interview, a researcher must know that the Wayback Machine exists, enter the link for religionandsocialpolicy.org, browse to the archived version of the site available after the date of the interview, and search for the name of the office’s former director. Many researchers may be unfamiliar with the Wayback Machine and assume that the interview is unavailable.

\¶ Opinion 08-1 addressed the question of whether an “Emergency Detention Order” is required to involuntarily admit a person believed to be in need of mental health treatment to a hospital or other facility. The opinion cites the Oklahoma Department of Mental Health and Substance Abuse Services’ Emergency Detention and Civil Commitment Manual (2007) numerous times and includes a link to the manual. The manual is cited as legal authority to support the opinion’s main conclusion that an emergency detention order is not required to involuntary admit a person believed to be in need of treatment.\(^{43}\) The opinion also refers readers to the

\begin{footnotes}
\footnotetext[40]{Id.}
\footnotetext[42]{INTERNET ARCHIVE WAYBACK MACHINE, supra note 31.}
\end{footnotes}
manual “for a much more extensive discussion of the emergency custody and detention process.” The opinion does not paraphrase or quote relevant language directly from the manual. Unfortunately, the link provided to the manual returns a “404” error page. A researcher savvy enough to look can obtain the manual from the Oklahoma Digital Prairie, a digital archive of state government publications.

¶26 Opinion 02-38 considers whether text message solicitations from telemarketers are covered under Oklahoma’s Telemarketer Restriction Act (TRA). In answering the question, the opinion notes that the TRA does not contain legislative findings. The opinion goes on to presume that the legislature “knew about telemarketing fraud through the use of text messaging.” The sole citation to support this assertion is a link to a Federal Trade Commission (FTC) Consumer Alert titled Phone, E-Mail, and Pager Messages May Signal Costly Scams. The cited Consumer Alert is not quoted or paraphrased in the opinion. The link to this document created by a federal government agency no longer works, but the document can be retrieved by searching the National Archives. The National Archives created several digital snapshots of agency public websites over the past fifteen years. Researchers who were unfamiliar with these digital snapshots or how to locate them would be unable to uncover this important FTC Consumer Alert cited as the only source of support for the opinion’s presumption of legislative knowledge.

¶27 Opinion 12-21 attempts to determine whether in the Oklahoma Nursing Practice Act the legislature intended a “supervising practitioner be onsite for consultation throughout all the stages of administration of anesthesia.” In support of its conclusion that the legislature intended supervising practitioners to be onsite, the opinion cites several Internet sources, including guidance from the now defunct Oklahoma Workers Compensation Court in the form of the Court’s Schedule of Medical and Hospital Fees. The link provided retrieves a “404” error page. An Internet search for the Schedule of Medical and Hospital Fees returns a “download page” from the Workers Compensation Court providing links to several schedules from the years 2005 through 2012. The January 19, 2012, date included in the opinion’s citation to the bad link should clue a researcher to review the 2012 schedule available from the court’s website. However, many researchers may not take the extra step to conduct an Internet search to locate the schedule or know which schedule to download if they locate the court’s “download page.”

44. Id.
47. Id.
52. The citation is to http://www.owcc.state.ok.us/PDF/2012FeeSchedule-1-19-12edits_FINAL.pdf.
Skills Needed to Find Information Hidden by Link Rot

¶28 Researchers who discover a broken link in an attorney general opinion may not take the time to try and locate the missing information. Many researchers are not aware of specialized digital archives like the Wayback Machine or the Oklahoma Digital Prairie. Some may not have the skill to use digital archives or perform other advanced searching techniques to find information made inaccessible by link rot.

¶29 Studies conducted over the past several decades have documented the inability of large segments of the population to use the Internet. One study found that members of the general user population lack the basics of surfing the Web. A few people barely know what a Back button is, and thus have an incredibly hard time moving from screen to screen. Many people rarely use search engines, and solely rely on functions of their browsers or Internet service providers. Some respondents also have a hard time entering valid search terms including the common occurrence of spelling mistakes.53

A more recent study debunked the general perception that “young users are generally savvy with digital media.”54 The study found “considerable variation . . . even among fully wired college students when it comes to understanding various aspects of Internet use. Moreover, these differences are not randomly distributed. Students of lower socioeconomic status, women, students of Hispanic origin, and African Americans exhibit lower levels of Web know-how than others.”55

¶30 A 2011 study found that one in five American adults does not use the Internet.56 Other studies have demonstrated that the vast majority of users are not familiar with many of the techniques described above to fix rotten links found in Oklahoma attorney general opinions. In a study measuring Internet searching skills, only one out of 100 participants knew how to use the “find function (available in all browsers and on all platforms) to search for a term on a Web page.”57 This technique was used to find the interview cited above in Opinion 08-2.58

¶31 As these studies demonstrate, many members of the general public do not possess basic Internet research skills. When these citizens encounter link rot in attorney general opinions, they almost certainly will presume the cited source is unavailable. If a rotten link is cited to support something significant, they may lose confidence in the opinion’s reasoning, doubt its conclusion, and question the underlying authority of attorney general opinions.

¶32 The research skills of law students and recent graduates have also been called into question. Unlike members of the general population, law students and

55. Id.
recent law school graduates receive basic legal research instruction as part of their law school’s curriculum. Some take advantage of courses in advanced legal research. Studies examining the research abilities of law students have revealed deficiencies relating to specific skills needed to find information made unavailable by rotten links. For example, sixty percent of students surveyed in a 2011 study reported not validating information they find on free websites. Another study of nearly 3600 law students revealed that “it was unclear if the respondents understood that reliability might be an issue with the sources that they use.” The research abilities of recent law school graduates were critiqued in another study concluding that “[l]egal professionals in particular are critical of new lawyers’ research skills; they say that these new lawyers are unprepared to conduct legal research and that their research skills are unsophisticated.”

More experienced lawyers may not have the advanced research skills required to locate information made inaccessible by link rot. A recent study found that “[e]mployers, particularly those with more years in practice, rely on new attorneys to be research experts.” One attorney commented “I really have a huge reliance on [the person] . . . doing my research for me because I don’t do it.” Another study found a “decline in the research competency of legal practitioners” and found “a gap in the research skills and knowledge of legal resources among attorneys in general, not just new associates.”

The availability of roughly half of the rotten links in Oklahoma attorney general opinions through advanced Internet searching does not diminish their harm. As the studies mentioned above demonstrate, the general public and many lawyers do not possess the advanced legal research skills needed to locate information hidden by link rot. As explained below, opinions that link to unavailable information can reduce the public’s confidence in law, weaken the doctrine of stare decisis, and thwart the development of law.

63. Id.
The Consequences of Link Rot

§35 The prevalence of link rot in attorney general opinions erodes the public’s confidence in the opinions and the broader legal system. Thomas Jefferson and James Madison firmly believed that for the American people to govern themselves, they had to know what their government was doing. Contemporary legal scholars share the founding fathers’ concerns. In the context of judges searching the Internet, Collen Barger warns:

When, however, a court purportedly bases its understanding of the law or the law’s application to case facts upon a source that cannot subsequently be located or confirmed, the significance of the citation to that source becomes more ominous. If present readers of the opinion cannot determine how much persuasive weight was or should be accorded to the unavailable source, they have little reason to place much confidence in the opinion’s authoritativeness.66

§36 The common law values transparency and accountability. The Canadian legal scholar Karen Eltis provides the following example from a decision of the Supreme Court of Canada: “[R]easons for judgment are the primary mechanisms by which judges account to the parties and to the public for the decisions they render. The courts frequently say that justice must not only be done but must be seen to be done.” In the context of judges citing unreliable information, Eltis notes:

Public access to the court’s “thought process” is an integral element of the much-cherished value of transparency and forms the basis for the public’s confidence in the judiciary. These “thought processes,” however, cannot be subject to proper scrutiny—be it public, academic, or appellate—unless the sources that nourish it are clearly and verifiably identifiable.68

§37 Although these examples deal with judges and judicial opinions, they are applicable to attorney general opinions. Attorney general opinions, like judicial opinions, are primary legal authority and are “binding on state officials until a court of competent jurisdiction renders an inconsistent decision.” The public’s confidence is eroded when these primary sources of law cite unavailable sources.

§38 Link rot in attorney general opinions is harmful to the doctrine of stare decisis. For centuries lawyers, judges, and the public-at-large could readily access the sources cited in legal opinions. Citations in these opinions have traditionally been to a “stable universe of settled sources.” These settled sources consisted of

68. Id.
print materials that are “essentially fixed for all time.”\textsuperscript{72} Citations to sources in a legal opinion are more than just a reference to the source’s content. They send a signal to the reader of “the nature of the authority upon which a statement is based.”\textsuperscript{73}

\textsuperscript{¶}39 When sources cited for something important in an attorney general’s opinion disappear, a component of the opinion vanishes as well.\textsuperscript{74} Lawyers, judges, or members of the public who are unable to access the sources cited in support of the opinion’s conclusion may reasonably question the opinion’s validity. The inaccessibility of these sources undermines the opinion’s authority and introduces instability and uncertainty into the law.\textsuperscript{75} As Michael Whiteman explains, “legal arguments are constructed on a foundation of supporting authorities, and, like any construction, they can fail if their foundation is not secure.”\textsuperscript{76} Courts may no longer be able to “let the decision stand if the cited authority is no longer available.”\textsuperscript{77}

\textsuperscript{¶}40 The unavailability of sources cited in attorney general opinions will hamper the development of the law. Citations “leave bread crumb trails for future readers allowing them to retrace the logical steps of an argument. Accurate and complete citations are essential for unpacking legal arguments, advocating for their expansion or contraction in future cases, and for developing the law.”\textsuperscript{78} An essential component of lawyering is analogizing and distinguishing sources cited in primary legal authority.\textsuperscript{79} When sources cited in attorney general opinions are unavailable, it becomes difficult or impossible for lawyers to develop creative legal arguments based on cited sources.

\textsc{Link Rot and Lost Context}

\textsuperscript{¶}41 The impact of a link not taking the researcher to the correct source is mitigated if the opinion includes a quotation from the source or paraphrases the source. Including language from an Internet source in an opinion is a prudent way to preserve the source’s content. Language quoted or paraphrased will be preserved indefinitely as part of the text of the opinion. Seventy-four out of the ninety-five Internet sources examined in this study were quoted or paraphrased in the text of the opinion.

\textsuperscript{¶}42 Unfortunately, merely quoting or paraphrasing an Internet source in an opinion is not a perfect solution to the problem of link rot. Researchers are not able

\textsuperscript{72.} Id.
\textsuperscript{73.} Paul Axel-Lute, Legal Citation from Theory to Practice, 75 LAW LIBR. J. 148 (1982).
\textsuperscript{74.} Whiteman, supra note 70, at 33. This paragraph was adapted from Whiteman’s discussion of these concepts in the context of case law. These concepts are applicable to attorney general opinions because opinions, as binding primary legal authority, are used to make legal arguments in the same manner as case law.
\textsuperscript{75.} Id. at 48.
\textsuperscript{76.} Id. at 33.
\textsuperscript{78.} Peoples, supra note 71, at 36.
\textsuperscript{79.} Aldrich, supra note 8, at 220.
to place the cited language in its proper context when a cited source becomes unavailable through link rot. Disappearing sources rob researchers of the ability to judge for themselves whether cited language was taken out of context or used to support a strained analogy.

¶43 Opinion 08-33 considers whether “an Oklahoma public school’s interlocal agreement with a Texas purchasing cooperative, which follows Texas competitive bidding procedures,” satisfies the requirements of Oklahoma’s public bidding act. The opinion provides a link to the Texas Interlocal Purchasing System (TIPS) and to the specific purchase agreement at issue in the opinion. The link to the TIPS website is active, but the link to the agreement is rotten. Searching the TIPS website returns no mention of the agreement, and it cannot be located using any advanced searching techniques. According to the opinion, “Under the agreement with the Texas purchasing cooperative, Oklahoma schools would contract with these pre-selected vendors.” The opinion does not indicate whether this language came from the text of the purchase agreement, the TIPS website, or other information provided by the state senator who requested the opinion. The fact that Oklahoma schools would contract with preselected vendors is critical to the opinion’s conclusion that the agreement does not satisfy Oklahoma’s competitive bidding law. The rotten link to the specific purchase agreement at issue prevents researchers from verifying its terms or placing them in context.

¶44 Opinion 2013-16 considered several questions related to the Oklahoma Tourism and Recreation Department including whether the department’s partnership with the Oklahoma Travel Industry Association (OTIA) was exempt from compliance with the state’s competitive bidding law. The Tourism Department enjoys a specific statutory exemption from the competitive bidding law when entering into “partnerships for promotional programs and projects” with private entities that involve the promotion of “tourism and tourism economic development.”

¶45 The opinion concludes that the partnership in question qualifies for this exemption by quoting language from the Tourism Department’s website:

In our view, the partnership between the Tourism Department and OTIA falls squarely within this category of contracts. As discussed above, the statutory purpose of the Conference is “to promote the tourism and recreation industry” within Oklahoma. 74 O.S. 2011, § 2232. The OTIA website describes the purpose of the Conference in more detail, stating that attendees are informed of, among other things, “the latest trends, tactics and tools needed to . . . energize marketing efforts” and “how to reach more prospective travelers each day.” OTIA website. Based on these descriptions, the Conference qualifies as a promotional program or project that is intended to promote tourism and tourism economic development.

84. Id.
85. Id.
A researcher who attempts to view the website using the link provided in the opinion will see only a generic “404” error page. The language taken from the website was critical to the opinion's conclusion that the Tourism Department’s partnership with OTIA fell within the statutory exemption to the competitive bidding law. While it is helpful to have the language quoted in the opinion, the rotten link prohibits researchers from viewing the language themselves or reading other parts of the website to put the language in context.

¶ 46 Opinion 07-37 answers the question of whether a policy council and task force “preempt the statutory authority of the State Board of Corrections to establish policies for the operation of the Department of Corrections.” The opinion cites several policies at the Department of Correction’s website in support of this conclusion. The opinion includes quotations and paraphrased language from several of the policy documents cited at the department’s website. The documents are cited to show that the department is making the policies at issue in the opinion. None of the links to these policy documents work. The links direct researchers to the generic State of Oklahoma “404” error page.

¶ 47 A savvy researcher who tracks down the Department of Correction’s website and searches for the names of the policy documents can retrieve some relevant documents by searching for the titles included in the opinion. Unfortunately, the documents are not the same documents cited in the 2007 opinion. For example, a link was provided in the opinion for a document titled “Community Corrections Assessment.” Searching the Department of Correction’s website for “Community Corrections Assessment” retrieves a document containing that title, but the document includes the effective date “11/18/2014.” Clearly, this document dated 2014 was not referenced in Opinion 07-37, released in 2007.

¶ 48 The opinion cites another Department of Correction’s webpage in support of the opinion’s essential conclusion that “the Board establishes policies for the Department of Corrections” but does not include a quotation or paraphrased language from that page. The link provided as support for the opinion’s conclusion returns the generic State of Oklahoma “404” error page.

86. The OTIA website was accessed by removing parts of the link cited in the opinion. Okla. Travel Industry Ass’n, http://www.otia.info/ (last visited Aug. 24, 2015) [http://perma.cc/RL2W-86WY]. Many researchers are not familiar with modifying links to make them function properly. See Hargittai, supra note 57, at 832.
87. See also Okla. Att’y Gen. Op. No. 09-17 (June 23, 2009). This is another opinion citing to an Internet source that is no longer available to support an essential part of the opinion’s reasoning. Language from the website is quoted in the opinion, but the website is unavailable. Researchers who want to review the website to place the quoted language in context are out of luck.
89. Id.
90. Id.
92. The link was to http://www.doc.state.ok.us/offtech/policies.htm.
¶ 49 Opinion 2011-4 explores the question of whether participating in the Nurse Licensure Compact would “constitute an unlawful delegation of the State’s sovereign power as the Compact authorizes the legislatures of other states, through absolute reciprocity, to determine the qualifications of persons authorized to practice nursing in Oklahoma?” The opinion cites the website of the national organization that created the compact, the National Council of State Boards of Nursing (NCSBN). The link returns a “404” error message, but the website can be found using Internet searching techniques. Several paragraphs of the opinion include quotations and paraphrased language from the website. The opinion includes a discussion of the legislative history of the adoption of the compact. Quotes attributed to the NCSBN website in the opinion cannot be found in content currently available at the website.

¶ 50 The reasoning of the opinion includes several assertions and hypotheticals referencing the terms of the compact. For example, the opinion states:

Under the Compact, nurses licensed to practice in any state that is a party to the contract would be authorized to practice in Oklahoma. See Compact, art. III(a). There are no standards or guidelines in the Compact for determining whether nurses meet the requirements for qualification established by the Oklahoma Legislature to engage in the practice of nursing in Oklahoma. See Compact.

And

Similarly, a nurse could practice in Oklahoma who has a recent felony conviction if such were not disallowed in another party state. Id. Further, Oklahoma would not be assured that the licensing restrictions which are in place in other states at the time of joining the Compact would remain in place throughout the terms of the contract.

¶ 51 These examples are the primary justifications offered to support the crux of the opinion’s reasoning “that the Compact constitutes unlawful legislative delegation.” A researcher reviewing this opinion may want to verify the assertions and hypotheticals by reviewing not only the text of the compact but the legislative history surrounding its adoption by the NCSBN and other information at the NCSBN website. The opinion’s rotten link robs researchers of the chance to verify its assertions and view the quoted language in the context of the entire website.

Implications of Lost Context

¶ 52 The impact of link rot is softened when an opinion includes language from an inaccessible source. However, the unavailability of a source in its entirety keeps researchers from viewing cited language in context. Sources cited in primary legal authority like attorney general’s opinions are often used to analogize or distinguish

94. The link was to https://www.ncsbn.org/156.htm.
95. For example, “At the 1997 Delegate Assembly, delegates unanimously agreed to endorse a mutual recognition model of nursing regulation” cannot be located using the search function of the website.
97. Id.
the opinion they are cited in from factual situations that arise in the future. It is impossible for the author of an attorney general’s opinion to envision the multitude of ways the opinion and all the sources it cites will be used in the future. Citations to sources for points that seem insignificant at the time an opinion is drafted may take on more significance in the future.

Even dicta . . . can provide the inspiration for someone’s good faith argument to change the law at a later date. The principles of the common law that we rely on today were developed through centuries of “application, re-application or non-application to varying fact situations. They are re-phrased, re-stated and re-iterated over and over again, and what eventually emerges is often startlingly different from that from which one started. The great principle of the common law in this context is that ‘great oaks from little acorns grow’—this is the leitmotif of the judicial process.”

¶53 Researchers who have access to sources cited in opinions will be able to test assertions made about underlying sources and view cited sources in their proper context. Opinions are more likely to be used in arguments for the development or expansion of legal concepts when their underlying sources are accessible. The recommendations given near the end of this article could be useful in preserving access to Internet resources cited in opinions.

Reference Rot

¶54 The opinions discussed above provide examples of link rot. Link rot is frustrating for researchers attempting to verify the content of a cited source or view cited language in its proper context. Researchers attempting to access web links in Oklahoma attorney general opinions will also be frustrated by the prevalence of reference rot. Dealing with citations afflicted by reference rot has been compared to “trying to stand on quicksand.”

¶55 The term “reference rot” is used to describe a link that “still works but the information referenced by the citation is no longer present, or has changed.” A recent study found that seventy percent of links in Harvard law journals and fifty percent of links in U.S. Supreme Court opinions were compromised by reference rot. Links in Oklahoma attorney general opinions fare comparatively better: only thirteen percent of links in Oklahoma attorney general opinions suffered from reference rot.

98. Aldrich, supra note 8, at 220.
100. Lepore, supra note 1, at 36.
101. Zittrain et al., supra note 4, at 166.
102. Id. at 167.
103. Six of the forty-eight working links did not contain the information they were cited for. The forty-eight working links included links that could be fixed by removing extra spaces inserted by WestlawNext. The twenty-six links that could be found by other means were not included in this figure in order to directly compare with the study examining Harvard journals and U.S. Supreme Court opinions. In that study, no extra steps were taken to locate broken links. When all seventy-four working links and links that could be found by other means were examined, ten were found to suffer from reference rot.
§56 Opinion 08-2 cites an organizational chart to support the conclusion that the Office of Faith-Based and Community Initiatives functions within the Department of Human Services, despite the fact that the office is not listed in DHS’s rules.\textsuperscript{104} A researcher who clicks on the link provided for the organizational chart will be taken to a “404” error page.\textsuperscript{105} A researcher who searches the DHS website can locate an organizational chart containing the notation “Updated 10/31/2014.” Obviously this was not the organizational chart cited in the opinion issued February 19, 2008. The organizational chart dated 10/31/2014 does not show an Office of Faith-Based and Community Initiatives, but instead shows an “Office of Community and Faith Engagement.”

§57 Another example of reference rot is found in Opinion 06-24, which cites a Wikipedia entry about American jurist John Forrest Dillon.\textsuperscript{106} The opinion’s footnote mentions that Dillon “authored the first treatise on the law of municipal corporations”\textsuperscript{107} and cites the Wikipedia page as support. A researcher who visits John Forrest Dillon’s Wikipedia page will not find a reference to Dillon authoring the “first treatise on the law of municipal corporations.”\textsuperscript{108} Instead, the Wikipedia entry credits Dillon as being the “author of a highly influential treatise on the power of states over municipal governments.”\textsuperscript{109} The footnote citing the Wikipedia page includes the date the page was visited, June 20, 2006. A researcher possessing advanced Wikipedia search skills will know to consult the page’s history tab and review a version of the page as it existed on June 20, 2006. Many researchers do not possess this advanced knowledge, as discussed above. The reference to Wikipedia as a source of information about John Forrest Dillon’s treatise was not essential to the opinion.\textsuperscript{110} However, this instance of reference rot demonstrates how dynamic sources like Wikipedia change frequently over time and are not always the best sources to include in judicial or attorney general opinions.\textsuperscript{111}

§58 Opinion 12-13 examines two sections of the Oklahoma Sex Offender Registration Act to determine whether they conflict with each other.\textsuperscript{112} The opinion includes a paragraph of text paraphrased and quoted from the Department of Corrections Sex Offender Registry website in explaining how the Act functions. The

\textsuperscript{108} John Forrest Dillon, supra note 106.
\textsuperscript{109} Id.
\textsuperscript{110} Another example of reference rot that is not essential to the opinion comes from Okla. Att’y Gen. Op. No. 05-4 (Feb. 3, 2005), citing the website bondbuyer.com for an example of a derivative swap as background information not essential to the opinion’s logic or legal reasoning. Researchers visiting bondbuyer.com will not find the example provided in the opinion.
\textsuperscript{111} See generally Peoples, supra note 71.
opinion includes a link to a PDF document that returns a “404” error message. A Google search for the Department of Corrections Sex Offender Registry retrieves the current website. The site includes language explaining how the Oklahoma Sex Offender Registration Act functions. The language at the website differs from the paraphrased and quoted language found in the opinion. This discrepancy might prompt readers to conduct additional research to determine whether the Act changed following the opinion’s publication.

¶59 Another example of reference rot is found in Opinion 05-44, where a website is quoted for background information about an association “comprised of 41 designated not-for-profit youth service agenc(ies).” Researchers visiting the link will discover that the association now includes only forty agencies. This discrepancy is minor as the number of not-for-profit youth services agencies was not an essential part of the opinion’s logic or reasoning. However, the inconsistency might cause researchers to question the accuracy of other aspects of the opinion.

The Implications of Reference Rot

¶60 Links that have succumbed to reference rot share all the negative attributes of rotten links. Reference rot links weaken the public’s confidence in law, undermine the doctrine of stare decisis, and hinder law’s natural growth and expansion.

¶61 The category of links affected by reference rot could also include Internet resources that are intentionally changed to mislead or deceive. Wikipedia, blogs, and other platforms that allow crowdsourced content are susceptible to “opportunistic editing.” A Wikipedia entry could be edited by an unscrupulous lawyer (or client) . . . to frame the facts in a light more favorable to the client’s issue. Likewise, an opposing lawyer critical of the Wikipedia reference could edit the entry, reframing the facts and creating the appearance that the first lawyer was misrepresenting or falsifying the source’s content.

¶62 Lawyers or parties to a case could create a blog, edit existing blog content, or leave anonymous blog comments in an effort to impact litigation. The perpetual malleability of Internet content creates the possibility of more “Orwellian” examples of reference rot. The White House has changed the content of press

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116. This change is similar to reference rot in a U.S. Supreme Court opinion citing the website of the Corporation of Public Broadcasting for the total number of public television stations. F.C.C. v. Fox Television Stations, Inc., 556 U.S. 502, 559 (2009).
119. Zittrain et al., supra note 4, at 177.
releases without giving any indication that the document’s content was modified.\textsuperscript{120} The world of e-books provides simultaneously entertaining and disturbing examples of publishers surreptitiously deleting or altering e-book text. An e-book version of \textit{War and Peace} sold through the Barnes & Noble Nook store had every instance of the word “kindle” in \textit{War and Peace} replaced with “nook.”\textsuperscript{121} Amazon mistakenly sold e-book copies of George Orwell’s \textit{1984} without obtaining proper copyright clearance.\textsuperscript{122} Amazon removed copies of the novel from the devices of those who had purchased it without their knowledge.\textsuperscript{123}

§63 The impermanence of Internet content invites changes to sources cited in opinions for nefarious purposes. Future opinions that cite Internet content should take steps to preserve sources as cited to avoid the impact of reference rot. The disappearance or change in content of sources cited in the Oklahoma attorney general’s opinions discussed in this study can be attributed to routine website updates and reorganizations. None of the content appears to have been changed or removed for any reason related to the opinion’s citation of the content. In the future, authors of attorney general opinions should take steps recommended near the end of this article to reduce the occurrence of reference rot.

\section*{Citation of Questionable Sources}

§64 Some of the opinions examined in this study include links that are functional but lead to sources that are not stable, reliable, or authoritative. Several of these opinions rely on questionable sources to explain terms that are not defined under Oklahoma law. Stable, reliable, and authoritative sources should be used when giving meaning to previously undefined terms or otherwise developing new law.

§65 Opinion 07-33 explored the question of whether the commissioner of labor has jurisdiction over the inspection of water rides at amusement parks.\textsuperscript{124} The opinion notes that the term “water ride” is not found in Oklahoma statutes or in agency regulations. Statutory construction is used to define the term according to its common meaning.\textsuperscript{125} \textit{Webster’s Third New International Dictionary} is cited for definitions of “water” and “ride.”\textsuperscript{126} \textit{Webster’s} does not include a definition of the term “water ride.” Several Wikipedia entries are cited including the pages defining

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{120} \textit{Id.}
\item \textsuperscript{122} Zittrain, \textit{ supra} note 121.
\item \textsuperscript{123} \textit{Id.}
\item \textsuperscript{125} \textit{Id.} (citing OKLA. STAT. ANN. tit. 25, § 1).
\item \textsuperscript{126} \textit{Id.}
\end{itemize}
\end{footnotesize}
“water rides,” 127 “log flumes,” 128 “water slide,” 129 and “river rafting ride.” 130 Cautionary language is included in the footnote reminding readers that Wikipedia “is not generally recognized as authoritative.” 131

%66 Oklahoma attorney general opinions have shown restraint in their citation of Wikipedia. Only four of the ninety-five citations to Internet resources in opinions cite to Wikipedia. A 2010 study revealed that more than 400 federal courts had cited Wikipedia. 132 Judicial opinions “have taken judicial notice of Wikipedia content, based their reasoning on Wikipedia entries, and decided dispositive motions on the basis of Wikipedia content.” 133 Refraining from extensive citations to Wikipedia in the future will help preserve attorney general opinions’ authority, consistency, and stability.

%67 Opinion 10-2 provides another example of an opinion attempting to explain a term that has no definition in Oklahoma law. The opinion answers the question of whether weight limits in the Oklahoma Highway Safety Code apply to vehicles with split tandem axles or tri-axles. The opinion cites a definition from the website logisticsworld.com, noting that these terms have not been defined under Oklahoma or federal law. 134 The opinion could have referred to the law of other states for a definition of the term before citing an online transportation dictionary. For example, a Kansas statute has defined the term “triple-axles.” 135 Looking to Kansas law for a term’s definition is consistent with the historical development of Oklahoma law. The Legislature of Oklahoma Territory adopted the Kansas Code

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131. Okla. Att’y Gen. Op. No. 07-33 (Oct. 16, 2007). As discussed above with Opinion 06-24, only savvy researchers may know how to use the page’s history tab to view the entries as they existed on the dates they were cited.


133. Id. at 1.


after a failed experiment with the Indiana Code.\textsuperscript{136} Oklahoma courts have looked to Kansas judicial opinions for the definition and construction of terms.\textsuperscript{137}

\textsection{68} Another questionable source is cited in Opinion 12-11, which addressed several issues, including the following:

Once a county has elected to be governed by the County Budget Act, do the provisions of the County Budget Act require that the budget format which is to be prescribed by the State Auditor and Inspector include the same funds and accounts that are subject to audit and the same funds that are included in the county’s Comprehensive Annual Financial Reports (“CAFR”)? Must the county budget board include in its budget the actual funds and accounts that are included in the county CAFR?\textsuperscript{138}

\textsection{69} In answering this question, the opinion correctly notes that CAFR is not defined in the County Budget Act. The opinion cites the online source yourdictionary.com to define a CAFR as “the official annual report of a government. The report includes a balance sheet, a statement of changes in financial position, and a statement of revenues and expenses.”\textsuperscript{139} The opinion concludes that

[a]s such, a CAFR is a distinct document from a county budget, serving a different purpose. . . . The County Budget Act does not address a county’s Comprehensive Annual Financial Report. Thus, there is no requirement in the County Budget Act that a county’s budget include the same funds and accounts as included in the Comprehensive Annual Financial Report.\textsuperscript{140}

\textsection{70} A researcher who visits yourdictionary.com\textsuperscript{141} to confirm the definition of CAFR as stated in the opinion will discover yourdictionary.com no longer contains a definition of the term. CAFR is a technical accounting term defined by the Governmental Accounting Standards Board (GASB), an “independent organization that establishes and improves standards of accounting and financial reporting for U.S. state and local government.”\textsuperscript{142} “The GASB is recognized by governments, the accounting industry, and the capital markets as the official source of generally accepted accounting principles (GAAP) for state and local governments.”\textsuperscript{143} The GASB issues Statements of Governmental Accounting Standards. Statement 34

\begin{footnotes}
\textsuperscript{137} See Cahill v. Pine Creek Oil Co., 1913 OK 489, 34 P. 64; Holland v. Cofield, 1910 OK 336, 112 P. 1032.
\textsuperscript{139} Id.
\textsuperscript{140} Id. The opinion notes that whether certain requirements are mandated by generally accepted accounting principles is beyond the scope of the opinion.
\textsuperscript{141} The “About Us” page for yourdictionary.com states: “YourDictionary is owned by LoveToKnow Corporation, an innovative online media company with rapid fire growth. The family of privately-held LoveToKnow web sites is dedicated to providing useful, high quality and unique content to Internet users.” About YourDictionary, YourDictionary (1996–2015), http://www.yourdictionary.com/about.html [http://perma.cc/99AG-GGJH].
\end{footnotes}
defines and explains the term “Comprehensive Annual Financial Report.” Statement 34 devotes more than ten pages of text to explaining what a CAFR is, what it contains, and the level of detail, notes, and narrative statements that it must include. Statement 34 provides a detailed discussion of why a CAFR should include this information. The text of Statement 34 mentions several of the terms quoted in the opinion from yourdictionary.com, including “balance sheet” and “statement of revenues.” Statement 34 also includes many terms not found in the yourdictionary.com definition, including “propriety funds” and “fiduciary funds.”

¶ 71 The opinion should have cited the GASB definition instead of yourdictionary.com. CAFR was not defined in the statute, and the opinion reached the conclusion that the County Budget Act does not require counties to include the same funds and accounts as are included in the CAFR. Researchers consulting the opinion in the future could justifiably be curious about the contents of a CAFR. If these researchers visit yourdictionary.com for more context, they will find nothing. Citing the GASB definition would have placed this opinion on a firmer foundation.

¶ 72 Several other opinions cite questionable Internet sources. Opinion 11-10 cites the website emedtv.com for the definition of “pseudoephedrine.” A reliable print or online medical dictionary would have been a more authoritative source. Opinion 07-25 cites an online quotation dictionary, quotedb.com, for the Benjamin Franklin quotation “In this world nothing is certain but death and taxes.” Any number of authoritative print quotation dictionaries would have been a better choice than the quotedb.com website, which may change or disappear at any time.

Consequences of Citing Questionable Sources

¶ 73 The citation of sources that are not stable, reliable, or authoritative in attorney general opinions can have the same negative impact as link rot and reference rot. Citing these sources can diminish the public’s confidence in law, weaken stare decisis, and make the development of the law more difficult. Citing sources like Wikipedia can weaken the authority of an opinion and also weaken any future judicial opinions or briefs citing the opinion.

¶ 74 Oklahoma attorney general’s opinions are not alone in citing sources that are not stable, reliable, or authoritative. Michael Whiteman has traced a shift away

145. Id. at 336.
147. A definition of “pseudoephedrine” is found in Dorland’s Illustrated Medical Dictionary 1377 (18th ed. 1994).
149. The quotation is found in the seminal work The Oxford Dictionary of Quotations 323 (Elizabeth Knowles ed., 5th ed. 1999).
from citing “old” more stable sources toward “more ephemeral, but easily accessible, Internet sources.”\(^{151}\) The citation of these sources is part of a broader trend of citing nonlegal sources described as the “de-legalization of law.” This trend has occurred gradually, described by Frederick Schauer as an “informal, evolving, andscalar process by which some sources become progressively more and more authoritative as they are increasingly used and accepted.”\(^{152}\) Continued citation of these sources serves to legitimize their use.\(^{153}\) Schauer sees de-legalization as a reflection of “something deeper: a change in what counts as a legal argument. And what counts as a legal argument—as opposed to a moral, religious, economic, or political one—is the principal component in determining just what law is.”\(^{154}\)

¶75 Authors of future Oklahoma attorney general opinions should carefully consider the Internet sources they cite. Including Internet sources in opinions legitimizes their use and gives the sources an imprimatur of authority. The suggestions offered in the next section can help ensure that citations to Internet resources are stable and reliable over time.

**Recommendations**

¶76 Many causes are responsible for the link and reference rot discussed in this study. Websites are reorganized over time and links change; content is updated, revised, or removed entirely; organizations responsible for websites change focus or are dissolved. Authors of attorney general opinions have no control over the longevity or stability of the Internet resources they cite. But authors can reduce the chances that cited links will suffer reference rot or link rot by judiciously choosing which links to include their opinions.

¶77 Opinion authors should consider the advice provided to the federal judiciary in the Judicial Conference of the United States’ Guidelines on Citing to, Capturing, and Maintaining Internet Resources in Judicial Opinions/Using Hyperlinks in Judicial Opinions.\(^{155}\) Released in May 2009, the guidelines provide a set of criteria to use when determining whether to cite an Internet resource. The guidelines state that it may not be necessary to cite an Internet source if there is a “readily accessible and reliable print version.”\(^{156}\) Judges are urged to evaluate Internet sources using the same criteria that apply to traditional media, including accuracy, scope of cov-


153. *Id.*


155. JUDICIAL CONFERENCE OF THE UNITED STATES, GUIDELINES ON CITING TO, CAPTURING, AND MAINTAINING INTERNET RESOURCES IN JUDICIAL OPINIONS/USING HYPERLINKS IN JUDICIAL OPINIONS (2009) [https://perma.cc/QIL3-AQFH?type=pdf]. As noted with irony by Liebler and Liebert, an Internet search for the guidelines returns a page that has succumbed to link rot. Liebler & Liebert, *supra* note 2, at 291.

156. JUDICIAL CONFERENCE OF THE UNITED STATES, *supra* note 155 at 2. This is similar to the stance taken by Bluebook Rule 18.2.1, which “requires the use and citation of traditional printed sources when available, unless there is a digital copy of the source available that is authenticated, official, or an exact copy of the printed source.” THE BLUEBOOK: A UNIFORM SYSTEM OF CITATION R.18.2.1, at 179 (20th ed. 2015) [hereinafter THE BLUEBOOK].
verage, objectivity, timeliness, authority, and verifiability.\textsuperscript{157} Cited Internet materials “should be stable and likely to remain accessible using the citation the judge employed when originally visiting the site.”\textsuperscript{158}

\S 78 Additional helpful advice comes from a set of “linking best practices” prepared in conjunction with a 2014 symposium titled “404/File Not Found: Link Rot, Legal Citation and Projects to Preserve Precedent” sponsored by the Georgetown Law Library.\textsuperscript{159} The best practices suggest including only links that “are essential to the subject at hand.”\textsuperscript{160} Several of the opinions examined in this study link to websites for background information that is not essential to the questions at issue. For example, Opinion 09-23 includes a rotten link for the background information that “there are currently 28 Oklahoma Indian Housing Authorities.”\textsuperscript{161} This information is dicta and is not relevant to the questions addressed in the opinion. Including this rotten link needlessly diminishes the perceived authority of the opinion.

\S 79 The best practices suggest not linking to materials that might go away or change, similar to the Judicial Conference Guidelines’ advice on citing stable sources. Wikipedia should be cited only when something on Wikipedia “is the subject at hand.”\textsuperscript{162} Opinions citing a Wikipedia entry should cite to the “cite this page” link available on the left-hand side of each entry. Future researchers who click a “cite this page” link in an opinion will see the page exactly as it looked when the opinion author viewed it. Changes made to the page by Wikipedia contributors after the opinion author copied the “cite this page” link will not be displayed.

\S 80 When opinion authors are given a choice of linking to content available in a PDF document or webpage, they should link to the webpage. The best practices explain that webpages are generally more stable, links to PDFs tend to change frequently as they are moved around on websites, and PDF links contain “unsafe” characters like commas, spaces, and accent marks that cause link failure.\textsuperscript{163} The opinions examined in this study included links to twenty-two PDF documents. Only four of the twenty-two PDF links worked. Sixteen suffered link rot, and two suffered reference rot. The eighty-two percent failure rate of links to PDFs in opinions validates the best practices suggestion to avoid linking to PDFs when possible.

\begin{footnotes}
\footnotetext[157]{Judicial Conference of the United States, supra note 155 at 1–2.}
\footnotetext[158]{Id. Bluebook Rule 18.2.2 takes a similar approach, urging citation “to the most stable electronic location available.” The Bluebook, supra note 156, at 182.}
\footnotetext[160]{Id. at 15.}
\footnotetext[162]{Linking Best Practices, supra note 159, at 16. The crowdsourced nature of Wikipedia content makes it potentially useful in other instances. Courts have cited Wikipedia entries for definitions not found in traditional dictionaries including slang terms, popular culture references, or technical jargon or lingo; for evidence of the common usage or ordinary and plain meaning of a contract term; and to determine the perception of the public or community standards. Peoples, supra note 71, at 30–34.}
\footnotetext[163]{Linking Best Practices, supra note 159, at 16.}
\end{footnotes}
¶81 The best practices recommend simplifying links whenever possible by “removing all unnecessary information after the core of the URL.”164 Text following “.html” or “?” characters can normally be removed without breaking the link. This extra text is typically “dead weight, and could, down the line, break a link that is actually good.”165 Any link that is modified should be tested to verify that it functions properly. Several links included in opinions suffer from link rot caused by extra information in the URL. Opinion 13-16 cites to the Oklahoma Travel Industry Association website using a link that does not work (http://www.otia.info/displaycommon.cfm?an=2). Removing all text after the “.info.” makes the link operable.

¶82 Another helpful suggestion is to avoid linking deeply into websites. When websites are rearranged, these deep links frequently break. Opinion 03-50 provides an example of unnecessary deep linking. The link http://www.occ.treas.gov/aboutocc.htm is provided as a source of background information on the history of the Office of the Comptroller of the Currency. The link suffers from reference rot as the page it retrieves does not say what it is cited for.166 If the opinion author had linked to the main page (http://www.occ.treas.gov), the link would not have failed.

¶83 Opinion authors can reduce instances of link and reference rot by using links sparingly and applying the recommendations described above. The Attorney General’s Office could take the additional step of archiving any web content cited in future opinions.

¶84 Three opinions examined in this study include language explaining that the opinion authors have kept a copy of cited Internet content “on file.”167 Keeping paper copies of web content cited in opinions is one method of preservation. However, only a handful of opinion authors are keeping copies of web content cited in opinions. Paper archives kept in the files of opinion authors are not easily accessed by the general public.168 Researchers wanting to view a copy of a cited resource would at the very least have to track down the author and request a copy. A visit to the Attorney General’s Office in Oklahoma City may be required.

¶85 The best solution for archiving and providing access to online resources cited in opinions is to store copies of cited resources in a digital archive. The most

164. Id. at 17. Bluebook Rule 18.2.2 offers similar guidance: “The Internet citation should include information designed to facilitate the clearest path of access to the cited reference . . . . ” THE BLUEBOOK, supra note 156, at 182.
166. The text of Okla. Att’y Gen. Op. No. 03-50 (Nov. 24, 2003) cites the Office of the Comptroller of the Currency webpage for the statement “The OCC was established in 1863 as a bureau of the U.S. Department of the Treasury. The OCC is headed by the Comptroller, who is appointed by the President, with the advice and consent of the Senate, for a five-year term.” The language is available from the link following the OCC’s main page by clicking the link “About the OCC.”
168. Similar criticisms have been made of the U.S. Supreme Court’s practice of keeping print copies of cited Internet resources. See Liebler & Liebert, supra note 2, at 300.
reliable archive currently available is Perma. A description of how Perma operates is found on its homepage:

When a user creates a Perma.cc link, Perma.cc archives a copy of the referenced content, and generates a link to an unalterable hosted instance of the site. Regardless of what may happen to the original source, if the link is later published by a journal using the Perma.cc service, the archived version will always be available through the Perma.cc link. ¹⁶⁹

¶86 Perma was developed by the Harvard Library Innovation Lab and was initially used by law journals. Currently more than 100 law journals and courts from Colorado, Indiana, Maryland, Massachusetts, Michigan, and the Virgin Islands archive cited Internet resources using Perma. ¹⁷⁰ Any user can create a Perma link that will be preserved for two years. Libraries, journals, and courts that serve as “vesting organizations” have the authority to permanently preserve web content submitted to Perma.

¶87 Perma distributes “the Perma caches, architecture, and governance structure to libraries across the world. So long as any library or successor within the system survives, the links within a Perma architecture will remain.” ¹⁷¹ Several other webpage archives exist, but none have Perma’s collaborative roots and distributed architecture. WebCite is a “free on-demand archiving service that allows users to enter a specific URL to be archived.” ¹⁷² It is hosted by the University of Toronto and run by academic editors and publishers. ¹⁷³ Concerns over the long-term viability of WebCite surfaced in 2013 when it withdrew its membership from the International Internet Preservation Consortium and announced that new submissions for preservation would not be accepted unless a fund-raising goal was reached. ¹⁷⁴ A fee-based preservation option is offered by the organization behind the Wayback Machine called Archive-it. ¹⁷⁵ The expense of Archive-it might deter governmental entities like the Oklahoma Office of the Attorney General from adopting it.

¶88 Perma is clearly the best option given the financial difficulties that WebCite has experienced and the extra cost associated with Archive-it. Perma would welcome the Oklahoma Attorney General’s Office to join as a vesting institution. ¹⁷⁶ Perma is the most stable web archival solution available because of its collaborative roots in the law library community and the distributed architecture of its network. Opinion authors may consider retaining paper copies of Internet sources cited in opinions as an extra level of security.

¹⁷⁰. Id.; E-mail from Claire DeMarco, Research Librarian, Harvard Library, Cambridge, Mass. (Feb. 18, 2015, 09:22 CST) (on file with author).
¹⁷¹. Zittrain et al., supra note 4, at 167.
¹⁷³. Id.
¹⁷⁴. Liebler & Liebert, supra note 2, at 304–05. The WebCite webpage indicates that it is still accepting submissions. WebCite Consortium FAQ, supra note 172.
¹⁷⁶. E-mail from Claire DeMarco, supra note 170.
¶89 If this suggestion is adopted, future opinions should use a parallel citation format when citing Internet resources. The citation should include the original online resource’s link and a link to the version available from the digital archive. For example, the Michigan Supreme Court recently began preserving Internet resources cited in its opinions using Perma. Michigan Supreme Court opinions include the online resource’s original link and a link to the version preserved in Perma. See State ex rel. Gurganus v. CVS Caremark Corp.’s citation of an Internet resource:


¶90 Clicking on the Perma link pulls up a version of the article captured very close to the date it was accessed by the court. See figure 3. The article is time- and date-stamped June 5, 2014 8:46 am, approximately three days after it was viewed by the court. The time and date stamp assures researchers they are viewing the cited resource as it existed exactly or extremely close in time to when it was viewed by the opinion’s author.

Figure 3

Perma Archived Webpage with Time and Date Stamp

¶91 The recently released 20th edition of The Bluebook encourages archiving Internet sources using a reliable archival tool. A Perma citation is included as an example following the text of the rule in The Bluebook. This clearly indicates that Perma meets The Bluebook’s definition of a reliable tool.

177. 852 N.W.2d 103, 111 n.35 (Mich. 2014).
178. R. 18.2.1(d). The Bluebook, supra note 156, at 181.
Conclusion

¶92 Oklahoma attorney general opinions serve an important function in Oklahoma law. The prevalence of link rot and reference rot in opinions is roughly comparable with the link and reference rot in judicial opinions from other state and federal courts found by other studies. The unavailability of cited sources in attorney general opinions could have negative implications for the authority, stability, and growth of Oklahoma law.

¶93 While this study examined link and reference rot in attorney general opinions, additional research could shed light on the prevalence of link and reference rot in Oklahoma appellate judicial opinions and appellate briefs written by Oklahoma lawyers. Lawyers, judges, assistant attorneys general, and legal scholars should carefully evaluate any Internet resource before citing it. Link and reference rot can be prevented through the use of digital archives.