

Ethics, Climate Change, and the Role of the Surveyor

Timothy BURCH, United States

Key words: ethics, climate change, responsibility, trust, activism

SUMMARY

Long before licensing and certifications were the norm, there were several occupations prior to the Industrial Revolution that earned trust from local citizens simply based upon the service they provided. The land surveyor was known as a trustworthy, non-biased fellow who was considered the local authority on property boundaries. For many years, the surveyor was considered in high regard like the doctor and clergy. For many families, their only possession was their home and property, so showing them where the parcel existed was entrusted to the local surveyor to impart that knowledge. The surveyor has remained a respected part of our society.

The role of the surveyor has changed, however, due to evolving technology and the world we live in. Part of our advancing society has included technology that has led to inventions that are damaging the climate of this world. Greenhouse gases caused by inventions of the Industrial Revolution is leading to a degradation of our climate. Climate change will require environmental and habitual changes from our societies and cultures but establishing the current and evolving conditions must be the responsibility of the surveyor. Our ethical past and high moral code provide the best guide for the job at hand. The time has come for the surveyor to take a bigger role in the fight in dealing with climate change. Why? We have an ethical obligation to do so.

Ethics, Climate Change, and the Role of the Surveyor

Timothy BURCH, United States

1. BACKGROUND

History has shown that surveyors have typically been held in high regard within their communities and within professional environments. The reputation achieved by the surveying profession is mainly due to the ethical standards set by the practitioners and the clients they serve. These implied standards have become the basis of published guidelines for ethics and professional conduct for surveying organizations around the world.

Also important is the realization that our physical world is changing. Studies performed by scientists worldwide have factually determined our climate is warmer, the polar ice caps are shrinking, and our seas are rising. Deforestation and increased urbanization are also factoring into the change of our climate. Greenhouse gases caused by our dependency on petroleum is also adding to the change by effecting atmospheric conditions. Research and technology have provided evidence of climate change and steps must be taken to mitigate the damage.

2. ETHICAL STANDARDS OF THE SURVEYOR

Surveyors carry with them the responsibility to use their skills with the utmost ethical and professional standards. As our world is changing, the surveyor is tasked with measuring those changes with an unbiased opinion of information they are collecting. Because much of the information gathered by the surveyor is environmentally based, it is imperative that this information be of the highest quality and provides a true depiction of the area conditions.

2.1 FIG

A good example of a published guide is the FIG Publication No. 17, “Statement of Ethical Principles and Model Code of Professional Conduct” and contains important values and ideologies for conduct becoming a professional surveyor. Among the standards within the Code that best establish the high regard for ethics by the surveyor include, (*italics added for specific portions of the Code*):

2.1.1 FIG Publication No. 17

Integrity

Surveyors

- *maintain the highest standards of honesty and integrity towards those with whom they come into contact, either directly or indirectly; and*
- *accurately and conscientiously measure, record and interpret all data and offer impartial advice based thereon.*

Independence

Surveyors

- diligently and faithfully execute their role according to the law; and
- *maintain their objectivity and give their clients and employers unbiased advice, without prejudice or favour either towards or against other organisations or persons.*

Care and competence

Surveyors

- *maintain their knowledge and skills, keep abreast of developments in their fields of practice and apply their expertise for the benefit of society;*
- only take on work that they reasonably believe they will be able to carry out in a professional manner; and
- exercise care in the performance of their duties.

Duty

Surveyors

- maintain confidentiality about the affairs of their current and former clients and employers unless required by law to make disclosures;
- avoid conflicts of interest;
- *take environmental concerns into account in their operations and activities;*
- *recognise the interests of the public when providing services to their clients or employers; and*
- conduct their work to the best of their ability, giving due consideration to the rights of all parties.

The Public Interest

1. The first duty of surveyors is normally to their clients or employers *but as professionals they also have a duty to the public*. Surveyors are fact finders and providers of opinions and advice. It is important that they are diligent, competent, impartial and of unquestionable integrity in ensuring that the information they provide is true and complete and that the opinions and advice that they give are of the highest quality.
2. *The work of surveyors has cumulative and long term effects on future generations*. Many of the functions of surveyors, even those performed for private clients, are by their nature functions that have a lasting impact on society. Most information becomes public information at some point in time and may be used for purposes other than those for which it was initially intended. The information recorded by early surveyors and explorers has, for example, subsequently been used for the expansion of geographical knowledge and for land development. Similarly, land management systems designed for

today create an environment in which future generations will live, work and play. *The principles of sustainable development require surveyors to work as much for the future as for the present.*

3. Clients, employers and the public must be confident that surveyors have exercised objectivity in arriving at their professional opinions. These obligations may sometimes appear to be in conflict with the obligations that surveyors owe to their clients, their employers and their peers. *Surveyors have a duty to the truth, even when it may not be in the best interest of their clients or employers.*
4. All surveyors, whether they be private practitioners, employees in the private sector, public servants or educators, should discharge their professional duties and adhere to ethical principles in accordance with the following model code of professional conduct.

Model Code of Professional Conduct

FIG recommends the following code of conduct as the minimum to be expected of all professional surveyors.

1. In general, surveyors
 - exercise unbiased independent professional judgement;
 - act competently and do not accept assignments that are outside the scope of their professional competence;
 - advance their knowledge and skills by participating in relevant programmes of continuing professional development;
 - ensure that they understand the fundamental principles involved when working in new areas of expertise, conducting thorough research and consulting with other experts as appropriate; and
 - do not accept assignments that are beyond their resources to complete in a reasonable time and in a professional manner.
2. As employers, surveyors:
 - assume responsibility for all work carried out by their professional and non-professional staff;
 - assist their employees to achieve their optimum levels of technical or professional advancement;
 - ensure that their employees have proper working conditions and equitable remuneration; and
 - cultivate in their employees integrity and an understanding of the professional obligations of surveyors to society.
3. When dealing with clients, surveyors:

- avoid any appearance of professional impropriety;
 - disclose any potential conflicts of interest, affiliations or prior involvement that could affect the quality of service to be provided;
 - avoid associating with any persons or enterprises of doubtful character;
 - do not receive remuneration for one project from multiple sources without the knowledge of the parties involved;
 - preserve the confidences and regard as privileged all information about their clients' affairs; and
 - maintain confidentiality during as well as after the completion of their service.
4. When providing professional services, surveyors:
- seek remuneration commensurate with the technical complexity, level of responsibility and liability for the services rendered;
 - make no fraudulent charges for services rendered;
 - provide details on the determination of remuneration at the request of their clients; and
 - do not sign certificates, reports or plans unless these were prepared and completed under their personal supervision.
5. As members of a professional association, surveyors:
- do not enter into arrangements that would enable unqualified persons to practise as if they were professionally qualified;
 - report any unauthorised practice to the governing body of the profession;
 - refuse to advance the application for professional status of any person known to be unqualified by education, experience or character; and
 - promote the surveying profession to clients and the public
6. As business practitioners, surveyors:
- do not make false or misleading statements in advertising or other marketing media;
 - do not, either directly or indirectly, act to undermine the reputation or business prospects of other surveyors;
 - do not supplant other surveyors under agreement with their clients; and
 - do not establish branch offices that purport to be under the direction and management of a responsible professional surveyor unless this is actually the case.
7. As resource managers, surveyors:
- approach environmental concerns with perception, diligence and integrity;
 - develop and maintain a reasonable level of understanding of environmental issues and the principles of sustainable development;
 - bring any matter of concern relating to the physical environment and sustainable development to the attention of their clients or employers;

- employ the expertise of others when their knowledge and ability are inadequate for addressing specific environmental issues;
- include the costs of environmental protection and remediation among the essential factors used for project evaluation;
- ensure that environmental assessment, planning and management are integrated into projects that are likely to impact on the environment; and
- encourage additional environmental protection when the benefits to society justify the costs.

2.2 IESC ETHICS STANDARDS

The International Ethics Standards Coalition (IESC) began in 2014 as a group working with the United Nations. Their mission is to create ethical standards in which organizations worldwide will use as a reference guide to foster professionalism and common goals for appropriate behavior. In December 2016, the IESC published their work titled "International Ethics Standards – An ethical framework for the global property market" for organizations to review, adopt and promote common ethic norms. Goals and terms within the publication include important ethical principles:

2.2.1 International Ethics Standards

Ethical Principles

The public interest embraces but is not limited to:

- The maintenance of reliable services for clients,
- sustaining proper standards of conduct and behaviour, and
- upholding the reputation of the profession.

Accountability: Practitioners shall take full responsibility for the services they provide; shall recognise and respect client, third party and stakeholder rights and interests; and shall give due attention to social and environmental considerations throughout.

Integrity: Practitioners shall act with honesty and fairness and shall base their professional advice on relevant, valid and objective evidence.

Lawfulness: Practitioners shall observe the legal requirements applicable to their discipline for the jurisdictions in which they practise, together with any applicable international laws.

Reflection: Practitioners shall regularly reflect on the standards for their discipline, and shall continually evaluate the services they provide to ensure that their practice is consistent with evolving ethical principles and professional standards.

Standard of Service: Practitioners shall only provide services for which they are competent and qualified; shall ensure that any employees or associates assisting in the provision of services have the necessary competence to do so and shall provide reliable professional leadership for their colleagues or teams.

Transparency: Practitioners shall be open and accessible; shall not mislead or attempt to mislead; shall not misinform or withhold information as regards products or terms of service; and shall present relevant documentary or other material in plain and intelligible language.

Trust: Practitioners shall uphold their responsibility to promote the reputation of their profession and recognise that their practice and conduct bears upon the maintenance of public trust and confidence in the IESC professional organisations and the professions they represent.

2.3 SIMILAR SURVEYING & GEOSPATIAL ORGANIZATIONS

Ethics standards are not limited to global organizations; non-governmental surveying and geospatial organizations within regions and countries recognize the importance of established guidelines for ethics. These guides provide their members and practitioners with standards to implement in their daily practice.

The following list includes, but limited to, professional associations worldwide providing ethics standards for their membership to observe:

National Society of Professional Surveyors (NSPS) – United States
Council of European Geodetic Surveyors (CLGE) – Europe
Royal Institute of Chartered Surveyors (RICS) – United Kingdom
The Surveying & Spatial Sciences Institute (SSSI) – Australia
Professional Surveyors Canada (PSC) – Canada

3. CLIMATE CHANGE

The Greek philosopher Heraclitus is famously quoted for stating “The constant in life is change.” The developing world we live in has brought us many great discoveries and technologies to increase practical living in most developed countries. Through new inventions and applied studies in math and science, our world has increased in technology and production exponentially in the past 120 years versus the entire lifespan of the planet prior to 1900. However, these advancements have come at a price.

3.1 USE OF FOSSIL FUELS

The invention of the engines and powerplants that burn fossil fuels has spurred many additional advancements, including the automobile and energy-providing facilities. The Industrial Revolution brought us the ability to mass-produce and bring products to market that improved our daily lives, yet our world did not have the ability to measure the long-term damage that emissions from fossil fuels. The science had not yet been discovered to allow us to establish the damage being done to our atmosphere from greenhouse gas

emissions. CO₂ released into the air from inefficient fossil fuel plants and engines, while seemingly harmless in its early days, has grown to be a substantial problem with our restless society and demand for mobility. Also increased rapidly has been our consumption of power, with much of the megawatt generation being produced by facilities burning fossil fuels. By continuing the use of these facilities and our conventional automobiles, we will also continue to produce more greenhouse gases to deteriorate our atmosphere. As this deterioration continues, the amount of protection for our environment reduces and temperatures throughout the planet rises.

3.2 OCEANS AND GLOBAL WATERS

The oceans comprises of over 70% of the surface of the earth and over 96% of the earth's water supply. Heat transfer is more rapid in water than the earth's varied soil, so significant changes to the atmosphere are felt and retained by the oceans much sooner than the rest of the planet. So it should be no surprise that the main area affected by greenhouse gases and global warming are the oceans.

Past scientists have theorised that global warming has existed under natural conditions for centuries, but we have not had the technology to prove it. Only in the past 50-70 years have scientists proven the warming theory through experiments and emerging technology not before available. Satellite and sensor advancements have proven what scientists believed all along; greenhouse gases are effectively destroying the ozone and allowing temperatures to increase in all sectors of the world, especially our oceans.

Warming oceans are leading to many slow moving, but albeit troublesome disasters: melting polar ice caps, glacial and ice sheet shrinkage, and decreased snow cover. These factors are leading to rising sea levels and encroachment on shorelines worldwide. The rising water levels also have a direct effect on the elevations of the rivers and lakes with direct flowage into the oceans. The earth's surface is gradually being covered by rising water so inhabited areas on these coasts will be forever affected.

3.3 DEFORESTATION

A significant figure in the balance of naturally occurring CO₂ and the atmosphere are the forest habitats worldwide. These spaces account for over 31 percent of the coverage of the earth's land surface and serves as a natural air purifier. Studies during our formidable school years and science classes taught us how plants and trees consume the CO₂ we exhale to refresh the air in our environment. Elevated CO₂ and greenhouse gases have increased the need for forests for this air purification, but population and agriculture needs have driven the forest footprint in the reverse direction through deforestation.

Most associate South America and the Amazon forest with the bulk of the world's deforestation operation, as agriculture producers and farmers increase their need on open range for farms and pastures. However, deforestation is an issue worldwide; significant reductions in forest areas are occurring in Central and Western Africa, Eastern Australia, and throughout Southeast Asia, Malaysia and Indonesia. These areas are being stripped to

increase growth areas for goods that are distributed worldwide. The loss of these forest areas has been proven in many studies to have a significant contribution of reduced impact on our increase of greenhouse gases.

3.4 OVERDEVELOPMENT / OVERCONSUMPTION

Most cultures and societies are social in nature, and have a tendency to reside in areas with a minimal amount of environmental challenges. Temperate climate and access to water are two large factors, so it is not surprising that many large urban areas are found on ocean coastlines and large bodies of water. With rural living and small communities lacking in most technological and commercial advantages, the urban areas continue to grow exponentially.

Sometimes, movement within populations is brought on by changes in situations not anticipated. Many lessons are to be learned from the pandemic of COVID-19 worldwide, including where people live and work. While many workers in service industries were displaced, the office worker was forced to quickly adapt to continue their employment from a place other than their normal place of business. Social distancing became the norm, and employees have begun a new mindset of working in locations further from their normal offices.

With more movement from the rural locations to the urban regions, building areas for residential and commercial development become more valuable. Land that was previously not considered for development is now ground zero for overcoming any environmental challenges to use for more installations. Watersheds are being effected, natural drainage is being rerouted and greatly increased, and forest areas are being replaced with less efficient greenspace. Urban flooding is more now likely due to our development patterns. These recent improvements are changing the ecological landscape of places around the world, and the lifecycle balance of the earth with it.

4. OVERCOMING CLIMATE CHANGE

“When you are finished changing, you are finished.” - Benjamin Franklin

While these preceding conditions are not the only factors to contribute to climate change, they do remain a significant part of identifying the problem areas our world population need to address. This is a global problem, and together we must face these challenges to set forth a plan. We must correct our past beliefs, policies, and procedures to revise the path ahead for our one and only planet.

4.1 PARIS AGREEMENT OF 2015

In 2015, the United Nations gathered in Paris bringing together national leaders to discuss the current climate situation. Over several weeks, this group began the framework of a pact unifying the processes necessary to mitigate and/or reverse the ongoing damage of climate change. Because of the nature of the changes needed to minimize future damage, the

conversations that took place during this historic summit were difficult. The summit ended with the introduction of the Paris Agreement, a historic accord to begin the process of healing our world. We must honor this endeavor and see the necessary changes are made for survival.

4.1.1 GOALS OF THE PARIS AGREEMENT

- Creates common goals for nations worldwide to reduce climate change
- Limit global warming to 2-degree Celsius increase per year
- Reduce greenhouse gas emissions worldwide
- Engage countries to initiate long-term low greenhouse gas emissions development strategies

4.2 CLIMATE CHANGE STRATEGIES

There are many strategies being developed to reduce climate change on many fronts, but most will take a significant amount of time, resources, and buy-in from consumers and citizens of the world. Here are six (6) areas highlighted by the United Nations Environment Programme as the most important:

4.2.1 Energy Sector

Renewable energy sources exist now to begin replacing the outdated fossil fuel generation with cleaner and more efficient operations

4.2.2 Food Systems

Production solutions are available to reduce emissions and by reducing food waste with a move towards more sustainable diets

4.2.3 Reduce Deforestation

By working with local governments to reduce and/or eliminate deforestation, it will also increase air quality and help to increase our water supplies

4.2.4 Transportation

Embracing electric vehicles including public transit, in addition to non-motorized methods

4.2.5 Cities & Developments

Adopt energy-efficient codes and policies, and encourage to reduce the global carbon footprint

4.2.6 Commercial/Industrial Industry

Encourage/incentivize renewable energy sources, employee flexibility where possible, reduce waste

5. THE SURVEYOR'S ROLE

History has shown that surveyors have typically been held in high regard within their communities and within professional environments. The reputation achieved by the surveying profession is mainly due to the ethical standards set by the practitioners and the clients they serve. These implied standards have become the basis of published guidelines for ethics and professional conduct for surveying organizations around the world.

5.1 GEOSPATIAL MAPPING & ADVANCING TECHNOLOGIES

While mapping of territories and parcels has been memorialized through paintings, murals, and historical documents, modern cadasters did not formally exist until the 20th century. The personal computer and satellite navigation merged in the 1980's to create the beginning of today's geographical information system (G.I.S.) bringing mapping capability to our entire world. The United States created their global positioning system (GPS) and was quickly followed by the implementation of GLONASS, Galileo, and BeiDou to provide worldwide coverage of global positioning. Use of these global navigation satellites systems (GNSS) provide substantial information to create the basis for new enhanced horizontal and vertical datums. Another big step to shrink our world is a growing communications network. Cellular and satellite communication now leaves few places on the globe with the inability to talk and transmit data.

5.2 ESTABLISHMENT OF DIGITAL CADASTERS

Because of the continued advancement of data collection methods and devices, the implementation of complex digital cadasters has harnessed the increased capability of computer processing power, breakthroughs in digital storage, and enhanced graphical displays. The power of GIS now has more applications to potential users and can help monitor many environmental and cultural attributes than ever before.

5.3 PROFESSIONAL INFLUENCE

By using our relationships through international governing bodies and advocacy groups, the professional surveyor can help identify, map, and monitor situations throughout the world. We possess unique skills to measure existing land and parcel markings, buildings and infrastructure, and can help assess environmental situations for future disaster avoidance. Our role as a professional surveyor can also transcend political confrontation to help reduce trust issues with cultures we are serving. The ethical oath of a professional surveyor guides their actions in protecting the public's interest. It is this unbiased service and mission that make the professional surveyor well suited for the creation of important cadasters and mapping.

5.4 VOLUNTEERISM

The efforts to adequately measure, map and monitor harmful environmental situations in underdeveloped countries around the world often go unfulfilled because of lack of qualified individuals to perform the work. Humanitarian efforts from the surveying profession can help in this cause. Formal education and training are lacking for many areas, so the profession must be willing to go into these areas, not just to perform their work, but also to train and teach the profession. By providing training, the profession is providing opportunities for many who would not have other options.

5.5 CONCLUSION

Like many professions, the surveyor takes pride in being ethically strong and trustworthy. Years of education and training can provide a strong background of knowledge, but the

mindset of providing unbiased service defensible not just in the court of law but also in the court of public opinion. Having the trust of the public is paramount to the professional surveyor, so applying these ethical standards to climate change is no different. The professional surveyor is tasked with accurate and responsible mapping, so helping to track the environmental changes happening around the world is part of their ethical duty. The surveyor has been a trusted member of society for centuries and should not relinquish that duty any time soon. By providing accurate data, mapping, and monitoring of climate change worldwide, the professional surveyor seeks to continue that public trust as our world evolves around us.

REFERENCES

- International Federation of Surveyors (FIG) - Netherlands, *FIG Publication No. 17 - Statement of Ethical Principles and Model Code of Professional Conduct*. September 1998
- International Ethics Standards Coalition (IESC), Standards Setting Committee. *International Ethics Standards - An ethical framework for the global property market*. December 2016
- National Society of Professional Surveyors (NSPS) – United States. *Creeds and Canons*. Undated
- Council of European Geodetic Surveyors (CLGE) – Europe. *Code of Conduct for European Surveyors*. September 2009
- Royal Institute of Chartered Surveyors (RICS) – United Kingdom. *The Global Professional and Ethical Standards*. Undated
- The Surveying & Spatial Sciences Institute (SSSI) – Australia. *SSSI Code of Ethics*. Undated
- Professional Surveyors Canada (PSC) – Canada. *Education, Licensing, And Standards* (website: psc-gpc.ca) Undated
- United Nations, *Framework Convention on Climate Change. Paris Agreement of 2015*. January 2016

BIOGRAPHICAL NOTES

Tim currently serves as President-Elect of the National Society of Professional Surveyors (NSPS) Board of Directors. He served as Vice President, Secretary for four (4) years and as Governor/Director representing Illinois (2007 to 2014). Tim currently co-hosts and produces the NSPS podcast, “Surveyor Says!” along with assisting with oversight of NSPS social media accounts.

Tim is the Vice President - Director of Survey for SPACECO, Inc., Rosemont, Illinois, where his duties include establishing new markets and clients and mentoring of surveying staff. He is a co-contributing editor for survey in GPS World Magazine (2015-present) and contributor to the various surveying society newsletters and blogs. Tim was recently named to the Editorial Advisory Board for Point of Beginning (POB) Magazine.

He also serves as a Brand Ambassador for the “Get Kids into Survey” initiative created by Elaine and Elly Ball.

CONTACTS

Mr. Timothy W. Burch, PLS
National Society of Professional Surveyors
5119 Pegasus Court, Suite Q
Frederick, MD
United States
Tel. +1 773.329.019
Email: tim.burch@nsps.us.com
Web site: www.nsps.us.com

Ethics, Climate Change, and the Role of the Surveyor (11121)
Timothy Burch (USA)

FIG e-Working Week 2021
Smart Surveyors for Land and Water Management - Challenges in a New Reality
Virtually in the Netherlands, 21–25 June 2021